

AIRBUS

A318/A319/A320/A321



FLIGHT CREW OPERATING MANUAL

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 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	TRANSMITTAL LETTER
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Issue date: 09 FEB 26

This is the FLIGHT CREW OPERATING MANUAL at issue date 09 FEB 26 for the A318/A319/A320/A321 and replacing last issue dated 27 JAN 26

A318/A319/A320/A321
FLIGHT CREW
OPERATING MANUAL

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	FILING INSTRUCTIONS
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Please incorporate this revision as follow:

Localization Subsection Title	Remove	Insert
		Rev. Date
PLP-LESS LIST OF EFFECTIVE SECTIONS/SUBSECTIONS	ALL	09 FEB 26
PLP-LOM LIST OF MODIFICATIONS	ALL	09 FEB 26
PLP-SOH SUMMARY OF HIGHLIGHTS	ALL	09 FEB 26
GEN-PLP-TOC TABLE OF CONTENTS	ALL	09 FEB 26
GEN-PLP-SOH SUMMARY OF HIGHLIGHTS	ALL	09 FEB 26
GEN General Information	ALL	09 FEB 26
DSC-20-PLP-TOC TABLE OF CONTENTS	ALL	09 FEB 26
DSC-20-PLP-SOH SUMMARY OF HIGHLIGHTS	ALL	09 FEB 26
DSC-20-40 Ground Clearance Diagram	ALL	09 FEB 26
DSC-21-PLP-TOC TABLE OF CONTENTS	ALL	09 FEB 26
DSC-21-PLP-SOH SUMMARY OF HIGHLIGHTS	ALL	09 FEB 26
DSC-21-10-20 Main Components	ALL	09 FEB 26
DSC-21-20-30 System Operation	ALL	09 FEB 26
DSC-21-20-40 Controls and Indicators	ALL	09 FEB 26
DSC-21-30-10 General	ALL	09 FEB 26
DSC-21-30-20 Avionics Ventilation	ALL	09 FEB 26
DSC-21-40-10 General	ALL	09 FEB 26
DSC-21-40-30 Controls and Indicators	ALL	09 FEB 26
DSC-22_20-PLP-TOC TABLE OF CONTENTS	ALL	09 FEB 26

Continued on the following page

A318/A319/A320/A321
FLIGHT CREW
OPERATING MANUAL
Continued from the previous page

Localization Subsection Title	Remove	Insert
		Rev. Date
DSC-22_20-PLP-SOH SUMMARY OF HIGHLIGHTS	ALL	09 FEB 26
DSC-22_20-10-30-12 Lateral Functions - FMS2 HONEYWELL	ALL	09 FEB 26
DSC-22_20-10-30-20 Vertical Functions - General	ALL	09 FEB 26
DSC-22_20-10-30-23 Vertical Functions - FMS2 Thales	ALL	09 FEB 26
DSC-22_20-10-80 Print Functions	ALL	09 FEB 26
DSC-22_20-20-10-25 FMS2 Honeywell	ALL	09 FEB 26
DSC-22_20-20-10-28 FMS2 Thales	ALL	09 FEB 26
DSC-22_20-20-20 MCDU - Messages	ALL	09 FEB 26
DSC-22_20-30-20 Insertion of Approach Minima	ALL	09 FEB 26
DSC-22_30-PLP-TOC TABLE OF CONTENTS	ALL	09 FEB 26
DSC-22_30-PLP-SOH SUMMARY OF HIGHLIGHTS	ALL	09 FEB 26
DSC-22_30-30-20 AP Engagement	ALL	09 FEB 26
DSC-22_30-40-80-20 G/S Mode	ALL	09 FEB 26
DSC-22_30-40-110 AP/FD Mode Reversions	ALL	09 FEB 26
DSC-22_30-60-20 Managed Speed/Mach	ALL	09 FEB 26
DSC-22_30-80-10 Autoland Light	ALL	09 FEB 26
DSC-22_30-80-20 FMA	ALL	09 FEB 26
DSC-22_46-PLP-TOC TABLE OF CONTENTS	ALL	09 FEB 26
DSC-22_46-PLP-SOH SUMMARY OF HIGHLIGHTS	ALL	09 FEB 26
DSC-22_46 Auto Flight - Print Interface	ALL	09 FEB 26

Continued on the following page

Continued from the previous page

Localization Subsection Title	Remove	Insert
		Rev. Date
DSC-23-PLP-TOC TABLE OF CONTENTS	ALL	09 FEB 26
DSC-23-PLP-SOH SUMMARY OF HIGHLIGHTS	ALL	09 FEB 26
DSC-23-30-10 Radio Communication	ALL	09 FEB 26
DSC-23-40-20 Emergency Cockpit Alerting System	ALL	09 FEB 26
DSC-23-50 Memo Display	ALL	09 FEB 26
DSC-23-60 How to	ALL	09 FEB 26
DSC-25-PLP-TOC TABLE OF CONTENTS	ALL	09 FEB 26
DSC-25-PLP-SOH SUMMARY OF HIGHLIGHTS	ALL	09 FEB 26
DSC-25-10-20 Cockpit Plan	ALL	09 FEB 26
DSC-25-10-30 Seats	ALL	09 FEB 26
DSC-27-PLP-TOC TABLE OF CONTENTS	ALL	09 FEB 26
DSC-27-PLP-SOH SUMMARY OF HIGHLIGHTS	ALL	09 FEB 26
DSC-27-20-10-20 Pitch Control	ALL	09 FEB 26
DSC-27-20-20 Reconfiguration Control Laws	ALL	09 FEB 26
DSC-28-PLP-TOC TABLE OF CONTENTS	ALL	09 FEB 26
DSC-28-PLP-SOH SUMMARY OF HIGHLIGHTS	ALL	09 FEB 26
DSC-28-20 Controls and Indicators	ALL	09 FEB 26
DSC-31-PLP-TOC TABLE OF CONTENTS	ALL	09 FEB 26
DSC-31-PLP-SOH SUMMARY OF HIGHLIGHTS	ALL	09 FEB 26
DSC-31-10 ECAM Description	ALL	09 FEB 26

Continued on the following page

A318/A319/A320/A321
FLIGHT CREW
OPERATING MANUAL
Continued from the previous page

Localization Subsection Title	Remove	Insert
		Rev. Date
DSC-31-15 Indications on E/WD	ALL	09 FEB 26
DSC-31-27 OEB Reminder	ALL	09 FEB 26
DSC-31-30 ECAM Controls	ALL	09 FEB 26
DSC-31-40 Indications on PFD	ALL	09 FEB 26
DSC-31-45 Indications on ND	ALL	09 FEB 26
DSC-31-60-30 Aircraft Integrated Data System	ALL	09 FEB 26
DSC-32-PLP-TOC TABLE OF CONTENTS	ALL	09 FEB 26
DSC-32-PLP-SOH SUMMARY OF HIGHLIGHTS	ALL	09 FEB 26
DSC-32-30-10 Description	ALL	09 FEB 26
DSC-32-30-20 Controls and Indicators	ALL	09 FEB 26
DSC-33-PLP-TOC TABLE OF CONTENTS	ALL	09 FEB 26
DSC-33-PLP-SOH SUMMARY OF HIGHLIGHTS	ALL	09 FEB 26
DSC-33-10-30 Controls and Indicators	ALL	09 FEB 26
DSC-33-40-10 Controls and Indicators	ALL	09 FEB 26
DSC-34-SURV-PLP-TOC TABLE OF CONTENTS	ALL	09 FEB 26
DSC-34-SURV-PLP-SOH SUMMARY OF HIGHLIGHTS	ALL	09 FEB 26
DSC-34-SURV-40-20 GPWS Basics Modes	ALL	09 FEB 26
DSC-34-SURV-40-40 Controls and Indicators	ALL	09 FEB 26
DSC-34-SURV-60 - Temporary Abnormal Behaviors	ALL	
DSC-34-SURV-60-20 Controls and Indicators	ALL	09 FEB 26

Continued on the following page

Continued from the previous page

Localization Subsection Title	Remove	Insert
		Rev. Date
DSC-35-PLP-TOC TABLE OF CONTENTS	ALL	09 FEB 26
DSC-35-PLP-SOH SUMMARY OF HIGHLIGHTS	ALL	09 FEB 26
DSC-35-40-10 Description	ALL	09 FEB 26
DSC-35-40-20 How To	ALL	09 FEB 26
DSC-46-PLP-TOC TABLE OF CONTENTS	ALL	09 FEB 26
DSC-46-PLP-SOH SUMMARY OF HIGHLIGHTS	ALL	09 FEB 26
DSC-46-10-10 General System Description	ALL	09 FEB 26
DSC-46-10-30-20 Controller/Pilot Datalink Communication (CPDLC)	ALL	09 FEB 26
DSC-46-10-40-30 MCDU Datalink Pages	ALL	09 FEB 26
DSC-49-PLP-TOC TABLE OF CONTENTS	ALL	09 FEB 26
DSC-49-PLP-SOH SUMMARY OF HIGHLIGHTS	ALL	09 FEB 26
DSC-49-30 Abnormal Operations	ALL	09 FEB 26
DSC-70-PLP-TOC TABLE OF CONTENTS	ALL	09 FEB 26
DSC-70-PLP-SOH SUMMARY OF HIGHLIGHTS	ALL	09 FEB 26
DSC-70-90-40 Engine Display	ALL	09 FEB 26
PRO-PLP-LETDU LIST OF EFFECTIVE TEMPORARY DOCUMENTARY UNITS	ALL	09 FEB 26
PRO-ABN-PLP-TOC TABLE OF CONTENTS	ALL	09 FEB 26
PRO-ABN-PLP-SOH SUMMARY OF HIGHLIGHTS	ALL	09 FEB 26
PRO-ABN-ABN-00 INTRODUCTION	ALL	09 FEB 26
PRO-ABN-ABN-ADV [ADV] ECAM ADVISORY	ALL	09 FEB 26

Continued on the following page

Continued from the previous page

Localization Subsection Title	Remove	Insert
		Rev. Date
PRO-ABN-ABN-QRH [QRH] PROCEDURES	ALL	09 FEB 26
PRO-ABN-A-ICE A-ICE	ALL	09 FEB 26
PRO-ABN-AIR AIR	ALL	09 FEB 26
PRO-ABN-AUTO_FLT AUTO FLT	ALL	09 FEB 26
PRO-ABN-BRAKES BRAKES	ALL	09 FEB 26
PRO-ABN-CAB_PR CAB PR	ALL	09 FEB 26
PRO-ABN-COM COM	ALL	09 FEB 26
PRO-ABN-COND COND	ALL	09 FEB 26
PRO-ABN-DOOR DOOR	ALL	09 FEB 26
PRO-ABN-ELEC ELEC	ALL	09 FEB 26
PRO-ABN-ENG ENG	ALL	09 FEB 26
PRO-ABN-F_CTL F/CTL	ALL	09 FEB 26
PRO-ABN-FUEL FUEL	ALL	09 FEB 26
PRO-ABN-FWS FWS	ALL	09 FEB 26
PRO-ABN-HYD HYD	ALL	09 FEB 26
PRO-ABN-LG L/G	ALL	09 FEB 26
PRO-ABN-MISC MISC	ALL	09 FEB 26
PRO-ABN-NAV NAV	ALL	09 FEB 26
PRO-ABN-SMOKE SMOKE	ALL	09 FEB 26
PRO-ABN-VENT VENT	ALL	09 FEB 26

Continued on the following page

Continued from the previous page

Localization Subsection Title	Remove	Insert
		Rev. Date
PRO-ABN-W_A_ICE WING A.ICE	ALL	09 FEB 26
PRO-NOR-PLP-TOC TABLE OF CONTENTS	ALL	09 FEB 26
PRO-NOR-PLP-SOH SUMMARY OF HIGHLIGHTS	ALL	09 FEB 26
PRO-NOR-SOP-04 Preliminary Cockpit Preparation	ALL	09 FEB 26
PRO-NOR-SOP-06 Cockpit Preparation	ALL	09 FEB 26
PRO-NOR-SOP-09 After Start	ALL	09 FEB 26
PRO-NOR-SOP-10 Taxi	ALL	09 FEB 26
PRO-NOR-SOP-13 After Takeoff	ALL	09 FEB 26
PRO-NOR-SOP-14 Climb	ALL	09 FEB 26
PRO-NOR-SOP-16 Descent Preparation	ALL	09 FEB 26
PRO-NOR-SOP-17 Descent	ALL	09 FEB 26
PRO-NOR-SOP-18-A Approach General	ALL	09 FEB 26
PRO-NOR-SOP-18-C Aircraft Guidance Management	ALL	09 FEB 26
PRO-NOR-SOP-19 Landing	ALL	09 FEB 26
PRO-NOR-SOP-23 Securing the Aircraft	ALL	09 FEB 26
PRO-NOR-SCO Standard Callouts	ALL	09 FEB 26
PRO-NOR-TSK Tasksharing	ALL	09 FEB 26
PRO-NOR-SUP-SUP Supplementary Procedures Menu	ALL	09 FEB 26
PRO-NOR-SUP-ADVWXR Adverse Weather	ALL	09 FEB 26
PRO-NOR-SUP-FUEL Fuel	ALL	09 FEB 26

Continued on the following page

A318/A319/A320/A321
FLIGHT CREW
OPERATING MANUAL
Continued from the previous page

Localization Subsection Title	Remove	Insert
		Rev. Date
PRO-NOR-SUP-GPSINT GPS Interference	ALL	09 FEB 26
PRO-NOR-SUP-LG-LG_DN Flight With Landing Gear Down	ALL	09 FEB 26
PRO-NOR-SUP-MISC-A High Altitude Airport Operations	ALL	09 FEB 26
PRO-NOR-SUP-MISC-C Operations at QNH above 1050 hPa (31.00 inHg)	ALL	09 FEB 26
PRO-NOR-SUP-MISC-F Operations with QFE Barometric Reference		09 FEB 26
PRO-SPO-PLP-TOC TABLE OF CONTENTS	ALL	09 FEB 26
PRO-SPO-PLP-SOH SUMMARY OF HIGHLIGHTS	ALL	09 FEB 26
PRO-SPO-40-30 Dispatch Consideration	ALL	09 FEB 26
PRO-SPO-51 Performance-Based Navigation (PBN)	ALL	09 FEB 26
LIM-PLP-TOC TABLE OF CONTENTS	ALL	09 FEB 26
LIM-AG-PLP-TOC TABLE OF CONTENTS	ALL	09 FEB 26
LIM-AG-PLP-SOH SUMMARY OF HIGHLIGHTS	ALL	09 FEB 26
LIM-AG-OPS Operational Parameters	ALL	09 FEB 26
LIM-NAV-PLP-TOC TABLE OF CONTENTS	ALL	09 FEB 26
LIM-NAV-PLP-SOH SUMMARY OF HIGHLIGHTS	ALL	09 FEB 26
LIM-NAV Navigation	ALL	09 FEB 26
LIM-OXY-PLP-TOC TABLE OF CONTENTS	ALL	09 FEB 26
LIM-OXY-PLP-SOH SUMMARY OF HIGHLIGHTS	ALL	09 FEB 26
LIM-OXY Oxygen	ALL	09 FEB 26
TAB-PLP-TOC TABLE OF CONTENTS	ALL	09 FEB 26

Continued on the following page

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	FILING INSTRUCTIONS
--	----------------------------

Continued from the previous page

Localization Subsection Title	Remove	Insert
		Rev. Date
TAB-PLP-SOH SUMMARY OF HIGHLIGHTS	ALL	09 FEB 26
TAB Temporary Abnormal Behaviors	ALL	09 FEB 26
EFB-PLP-TOC TABLE OF CONTENTS	ALL	09 FEB 26
-EFB Performance (EFB)	ALL	
EFB Performance		09 FEB 26

A318/A319/A320/A321
FLIGHT CREW
OPERATING MANUAL

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PRELIMINARY PAGES

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PRELIMINARY PAGES

LIST OF EFFECTIVE SECTIONS/SUBSECTIONS

M⁽¹⁾	Localization	Subsection Title	Rev. Date
R	PLP-LESS	LIST OF EFFECTIVE SECTIONS/SUBSECTIONS	09 FEB 26
	GEN-PLP-LETDU	LIST OF EFFECTIVE TEMPORARY DOCUMENTARY UNITS	11 APR 14
R	GEN	General Information	09 FEB 26
	DSC-PLP-LETDU	LIST OF EFFECTIVE TEMPORARY DOCUMENTARY UNITS	11 APR 14
	DSC-20-10	Overview	10 AUG 21
	DSC-20-20	Description	12 JAN 22
	DSC-20-30	Ground Handling	12 JAN 22
R	DSC-20-40	Ground Clearance Diagram	09 FEB 26
	DSC-20-50	Landing Geometry	05 SEP 17
	DSC-20-60	Visual Ground Geometry	05 SEP 17
	DSC-21-10-10	General	20 AUG 25
R	DSC-21-10-20	Main Components	09 FEB 26
	DSC-21-10-30	Temperature and Flow Regulation	17 AUG 22
	DSC-21-10-40	System Operation under Failure Condition	23 AUG 23
	DSC-21-10-50	Controls and Indicators	21 AUG 24
	DSC-21-20-10	General	22 MAR 16
	DSC-21-20-20	Main Components	22 MAR 16
R	DSC-21-20-30	System Operation	09 FEB 26
R	DSC-21-20-40	Controls and Indicators	09 FEB 26
R	DSC-21-30-10	General	09 FEB 26
R	DSC-21-30-20	Avionics Ventilation	09 FEB 26
	DSC-21-30-40	Battery Ventilation	22 MAR 16
	DSC-21-30-50	Lavatory and Galley Ventilation	11 APR 14
	DSC-21-30-60	Controls and Indicators	02 MAR 23
R	DSC-21-40-10	General	09 FEB 26
	DSC-21-40-20	System Operation	21 AUG 24
R	DSC-21-40-30	Controls and Indicators	09 FEB 26
	DSC-21-40-35	ECAM Cond Page	12 JAN 22
	DSC-22_10-10	Description	20 AUG 25
	DSC-22_10-20	System Interface Diagram	20 AUG 25
	DSC-22_10-30	FMGS Modes of Operation	21 AUG 24
	DSC-22_10-40-05	Management of the Displays	11 APR 14
	DSC-22_10-40-10	MCDU	23 AUG 23
	DSC-22_10-40-20	FCU	21 AUG 24
	DSC-22_10-40-30	Thrust Levers	11 APR 14
	DSC-22_10-40-40	Primary Flight Display	04 SEP 19
	DSC-22_10-40-50	Navigation Display	02 MAR 23
	DSC-22_10-50-10	General	22 MAR 17
	DSC-22_10-50-20	Characteristic Speeds	12 JAN 22
	DSC-22_10-50-30	Limit Speeds	22 MAR 17

Continued on the following page

PRELIMINARY PAGES

LIST OF EFFECTIVE SECTIONS/SUBSECTIONS

Continued from the previous page

M⁽¹⁾	Localization	Subsection Title	Rev. Date
	DSC-22_10-50-40	Protection Speeds	22 MAR 17
	DSC-22_10-50-50	Other Speeds	21 AUG 24
	DSC-22_20-10-10	Overview	20 AUG 25
	DSC-22_20-10-20-05	General	20 AUG 25
	DSC-22_20-10-20-10	Position Computation	20 AUG 25
	DSC-22_20-10-20-20	Evaluation of Position Accuracy	20 AUG 25
	DSC-22_20-10-20-30	Radio Navigation Tuning	20 AUG 25
	DSC-22_20-10-20-40	Alignment of Inertial Reference System	20 AUG 25
	DSC-22_20-10-20-50	Navigation Database	20 AUG 25
	DSC-22_20-10-30-05	General	20 AUG 25
	DSC-22_20-10-30-10	Lateral Functions - General	20 AUG 25
R	DSC-22_20-10-30-12	Lateral Functions - FMS2 HONEYWELL	09 FEB 26
	DSC-22_20-10-30-13	Lateral Functions - FMS2 Thales	20 AUG 25
R	DSC-22_20-10-30-20	Vertical Functions - General	09 FEB 26
R	DSC-22_20-10-30-23	Vertical Functions - FMS2 Thales	09 FEB 26
	DSC-22_20-10-30-22	Vertical Functions - FMS2 Honeywell	20 AUG 25
	DSC-22_20-10-30-30	Diversion	20 AUG 25
	DSC-22_20-10-30-40	Secondary Flight Plan	20 AUG 25
	DSC-22_20-10-40-10	Optimization	20 AUG 25
	DSC-22_20-10-40-20	Cost Index	20 AUG 25
	DSC-22_20-10-40-30	Predictions	20 AUG 25
	DSC-22_20-10-50	Engine Out	20 AUG 25
	DSC-22_20-10-70-10	Takeoff Surveillance Function	02 MAR 23
R	DSC-22_20-10-80	Print Functions	09 FEB 26
R	DSC-22_20-20-10-25	FMS2 Honeywell	09 FEB 26
R	DSC-22_20-20-10-28	FMS2 Thales	09 FEB 26
R	DSC-22_20-20-20	MCDU - Messages	09 FEB 26
	DSC-22_20-20-30	MCDU - Data Format List	21 AUG 24
	DSC-22_20-30-10	Rejected Takeoff	20 AUG 25
R	DSC-22_20-30-20	Insertion of Approach Minima	09 FEB 26
	DSC-22_20-30-30	Effect of Baro Reference Setting	20 AUG 25
	DSC-22_20-30-40	Clear Key (Clearing Function)	20 AUG 25
	DSC-22_20-30-50	Pilots/Stored Route Function	20 AUG 25
	DSC-22_20-30-60	Report Page	20 AUG 25
	DSC-22_20-30-70	Time Marker	20 AUG 25
	DSC-22_20-30-80	AOC Functions	20 AUG 25
	DSC-22_20-40-10	FMGC Reset	20 AUG 25
	DSC-22_20-40-20	"CHECK GW" or "CHECK WEIGHT" Message	04 SEP 19
	DSC-22_20-40-30	MCDU Back Up Navigation	20 AUG 25

Continued on the following page

PRELIMINARY PAGES

LIST OF EFFECTIVE SECTIONS/SUBSECTIONS

Continued from the previous page

M⁽⁷⁾	Localization	Subsection Title	Rev. Date
	DSC-22_20-40-50	Other Abnormal Operations	20 AUG 25
	DSC-22_20-100-20	FMS2 HONEYWELL Temporary Abnormal Behaviors	20 AUG 25
	DSC-22_20-100-30	FMS2 THALES Temporary Abnormal Behaviors	12 JAN 22
	DSC-22_30-10	General	17 AUG 22
	DSC-22_30-20-10	General	17 AUG 22
	DSC-22_30-20-20	FD Engagement	23 AUG 23
	DSC-22_30-20-30	FD Symbology - Display	17 AUG 22
	DSC-22_30-20-40	FD Symbology - Non Display	17 AUG 22
	DSC-22_30-20-50	FD Disengagement	17 AUG 22
	DSC-22_30-20-60	FD Warnings	23 AUG 23
	DSC-22_30-30-10	General	17 AUG 22
R	DSC-22_30-30-20	AP Engagement	09 FEB 26
	DSC-22_30-30-30	AP Disengagement	20 AUG 25
	DSC-22_30-40-10	General	20 AUG 25
	DSC-22_30-40-20-10	General	17 AUG 22
	DSC-22_30-40-20-20	SRS TO Mode	23 AUG 23
	DSC-22_30-40-20-30	RWY Mode	23 AUG 23
	DSC-22_30-40-20-40	RWY TRK Mode	23 AUG 23
	DSC-22_30-40-30-10	HDG/TRACK Mode	23 AUG 23
	DSC-22_30-40-30-20	NAV Mode	23 AUG 23
	DSC-22_30-40-40-10	OP CLB Mode	21 AUG 24
	DSC-22_30-40-40-20	CLB Mode	23 AUG 23
	DSC-22_30-40-40-30	EXP CLB Mode	17 AUG 22
	DSC-22_30-40-50-10	ALT	23 AUG 23
	DSC-22_30-40-50-20	ALT CST	02 JAN 23
	DSC-22_30-40-50-30	ALT CRZ	02 JAN 23
	DSC-22_30-40-60-10	General	17 AUG 22
	DSC-22_30-40-60-20	OP DES Mode	17 AUG 22
	DSC-22_30-40-60-30	DES Mode	23 AUG 23
	DSC-22_30-40-60-40	EXP DES Mode	17 AUG 22
	DSC-22_30-40-70	V/S / FPA Mode	23 AUG 23
	DSC-22_30-40-80-00	General	23 AUG 23
	DSC-22_30-40-80-10	LOC Mode	23 AUG 23
R	DSC-22_30-40-80-20	G/S Mode	09 FEB 26
	DSC-22_30-40-80-30	LAND Mode	17 AUG 22
	DSC-22_30-40-80-40	FLARE Mode	23 AUG 23
	DSC-22_30-40-80-50	ROLL OUT Mode	17 AUG 22
	DSC-22_30-40-80-80	LOC B/C Mode	23 AUG 23
	DSC-22_30-40-80-90	FINAL APP Mode	23 AUG 23

Continued on the following page

PRELIMINARY PAGES

LIST OF EFFECTIVE SECTIONS/SUBSECTIONS

Continued from the previous page

M⁽¹⁾	Localization	Subsection Title	Rev. Date
	DSC-22_30-40-90-10	General	23 AUG 23
	DSC-22_30-40-90-20	SRS GA Mode	23 AUG 23
	DSC-22_30-40-90-30	GA TRK Mode	23 AUG 23
	DSC-22_30-40-100	AP/FD TCAS Mode	21 AUG 24
R	DSC-22_30-40-110	AP/FD Mode Reversions	09 FEB 26
	DSC-22_30-40-120-20	Takeoff	23 AUG 23
	DSC-22_30-40-120-30	Climb with OP CLB Mode	23 AUG 23
	DSC-22_30-40-120-40	Climb with CLB Mode	17 AUG 22
	DSC-22_30-40-120-50	Altitude with ALT	17 AUG 22
	DSC-22_30-40-120-60	Altitude with ALT CST	17 AUG 22
	DSC-22_30-40-120-70	Altitude with ALT CRZ	17 AUG 22
	DSC-22_30-40-120-80	Approach and Landing	21 AUG 24
	DSC-22_30-50-10	General	17 AUG 22
	DSC-22_30-50-20	Thrust Levers	17 AUG 22
	DSC-22_30-50-30	A/THR Arming and Activation	20 AUG 25
	DSC-22_30-50-40	A/THR Disconnection	25 MAR 24
	DSC-22_30-50-50	A/THR Modes	20 AUG 25
	DSC-22_30-50-60	Scenario Examples	17 AUG 22
	DSC-22_30-60-10	General	17 AUG 22
R	DSC-22_30-60-20	Managed Speed/Mach	09 FEB 26
	DSC-22_30-60-30	Selected Speed/Mach	17 AUG 22
	DSC-22_30-60-40	Speed/MACH FCU Window Synchronization	17 AUG 22
	DSC-22_30-60-50	Speed/Mach Switching	20 AUG 25
	DSC-22_30-70	Approach and Landing Capability	20 AUG 25
R	DSC-22_30-80-10	Autoland Light	09 FEB 26
R	DSC-22_30-80-20	FMA	09 FEB 26
	DSC-22_30-110	Temporary Abnormal Behaviors	23 AUG 23
	DSC-22_40-10	General	27 APR 15
	DSC-22_40-20	Yaw Functions	11 APR 14
	DSC-22_40-30	Flight Envelope Function	02 MAR 23
	DSC-22_40-40	Windshear Detection Function	20 AUG 25
	DSC-22_40-50	Controls and Indicators	11 APR 14
	DSC-22_45	Auto Flight - AOC Functions	02 MAR 23
R	DSC-22_46	Auto Flight - Print Interface	09 FEB 26
	DSC-23-10-10	Introduction	10 AUG 21
	DSC-23-10-20	Radio Tuning	20 AUG 25
	DSC-23-10-30	Intercommunication Systems	20 AUG 25
	DSC-23-10-40	Cockpit Voice Recorder	12 JAN 22
	DSC-23-10-50	Controls	20 AUG 25

Continued on the following page

PRELIMINARY PAGES

LIST OF EFFECTIVE SECTIONS/SUBSECTIONS

Continued from the previous page

M⁽¹⁾	Localization	Subsection Title	Rev. Date
	DSC-23-20-10	Flight Crew Interphone System	10 AUG 21
	DSC-23-20-20	Cabin Interphone System	20 AUG 25
	DSC-23-20-30	Service Interphone System	20 AUG 25
	DSC-23-20-40	Passenger Address	17 AUG 22
	DSC-23-20-50	Landscape Camera	20 AUG 25
R	DSC-23-30-10	Radio Communication	09 FEB 26
	DSC-23-30-20-10	General	24 FEB 20
	DSC-23-30-20-20	Controls and Indicators	24 FEB 20
	DSC-23-40-10	Emergency Evacuation	21 AUG 24
R	DSC-23-40-20	Emergency Cockpit Alerting System	09 FEB 26
	DSC-23-40-30	Emergency Locator Transmitter	02 MAR 23
R	DSC-23-50	Memo Display	09 FEB 26
R	DSC-23-60	How to	09 FEB 26
	DSC-24-10-10	General	22 MAR 16
	DSC-24-10-20	Generation of Electrical Power	22 MAR 16
	DSC-24-10-30-10	General	22 MAR 16
	DSC-24-10-30-20	Normal Configuration	02 MAR 23
	DSC-24-10-30-30	Abnormal Configurations	20 AUG 25
	DSC-24-10-30-40	Distribution Table	23 AUG 23
	DSC-24-20	Controls and Indicators	20 AUG 25
	DSC-25-10-10	General	22 MAR 17
R	DSC-25-10-20	Cockpit Plan	09 FEB 26
R	DSC-25-10-30	Seats	09 FEB 26
	DSC-25-10-40	Main Instrument Panels	02 SEP 20
	DSC-25-10-50	Pedestal	22 MAR 17
	DSC-25-10-60	Overhead Panel	02 JAN 23
	DSC-25-10-70	C/B Panels	22 MAR 17
	DSC-25-10-80	Foot Warmer (If Installed)	22 MAR 17
	DSC-25-20	Emergency Equipment	04 SEP 19
	DSC-26-10	General	22 MAR 17
	DSC-26-20-10	System Description	23 NOV 21
	DSC-26-20-20	Controls and Indicators	17 AUG 22
	DSC-26-30-10	System Description	22 MAR 17
	DSC-26-30-20	Controls and Indicators	22 MAR 17
	DSC-26-40-10	System Description	22 MAR 17
	DSC-26-50-10	System Description	20 AUG 25
	DSC-26-50-20	Controls and Indicators	22 MAR 17
	DSC-27-10-10	General	10 AUG 21
	DSC-27-10-20	Architecture	25 MAR 24

Continued on the following page

PRELIMINARY PAGES

LIST OF EFFECTIVE SECTIONS/SUBSECTIONS

Continued from the previous page

M⁽¹⁾	Localization	Subsection Title	Rev. Date
	DSC-27-20-10-10	General	22 MAR 17
R	DSC-27-20-10-20	Pitch Control	09 FEB 26
	DSC-27-20-10-30	Lateral Control	22 MAR 17
	DSC-27-20-10-40	Load Alleviation Function	12 JAN 22
	DSC-27-20-10-50	Sideslip Target	22 MAR 17
	DSC-27-20-10-70	Aircraft Trimming	20 AUG 25
R	DSC-27-20-20	Reconfiguration Control Laws	09 FEB 26
	DSC-27-20-30	Controls and Indicators	20 AUG 25
	DSC-27-30-10	Description	21 AUG 24
	DSC-27-30-20	Controls and Indicators	02 MAR 23
	DSC-28-10-10	General	12 JAN 22
	DSC-28-10-20	Tanks	02 MAR 23
	DSC-28-10-30	Engine Feed	21 AUG 24
	DSC-28-10-50	APU Feed	11 APR 14
	DSC-28-10-60	Fuel Recirculation System	21 AUG 24
	DSC-28-10-70	Refueling and Defueling	21 AUG 24
	DSC-28-10-80	Fuel Quantity Indication and Level Sensing	12 JAN 22
	DSC-28-10-90	Fuel Tank Inerting System	10 AUG 21
R	DSC-28-20	Controls and Indicators	09 FEB 26
	DSC-29-10-10	General	22 MAR 16
	DSC-29-10-20	Generation	04 SEP 19
	DSC-29-10-30	Distribution	17 AUG 22
	DSC-29-20	Controls and Indicators	02 MAR 23
	DSC-30-10-10	Description	22 MAR 16
	DSC-30-20-10	Description	22 MAR 16
	DSC-30-20-20	Controls And Indicators	24 FEB 20
	DSC-30-30-10	Description	20 AUG 25
	DSC-30-30-20	Controls and Indicators	24 FEB 20
	DSC-30-40-10	Description	02 JAN 23
	DSC-30-40-20	Controls and Indicators	22 MAR 16
	DSC-30-50-10	Description	22 MAR 16
	DSC-30-50-20	Controls and Indicators	02 JAN 23
	DSC-30-60-10	Description	05 SEP 17
	DSC-30-60-20	Controls and Indicators	22 MAR 16
	DSC-30-70-10	Description	24 FEB 20
	DSC-31-05-10	Introduction	22 MAR 16
	DSC-31-05-20	Cockpit Arrangement	11 APR 14
	DSC-31-05-30	Architecture	02 MAR 23
	DSC-31-05-40	Controls and Switching	22 MAR 16

Continued on the following page

PRELIMINARY PAGES

LIST OF EFFECTIVE SECTIONS/SUBSECTIONS

Continued from the previous page

M⁽⁷⁾	Localization	Subsection Title	Rev. Date
	DSC-31-05-50	Reconfiguring the DMC	02 MAR 23
	DSC-31-05-60	Reconfiguring DUs	02 MAR 23
R	DSC-31-10	ECAM Description	09 FEB 26
R	DSC-31-15	Indications on E/WD	09 FEB 26
	DSC-31-20	Indications on SD	02 MAR 23
	DSC-31-25-10	General	22 MAR 16
	DSC-31-25-20	Example	02 MAR 23
R	DSC-31-27	OEB Reminder	09 FEB 26
R	DSC-31-30	ECAM Controls	09 FEB 26
R	DSC-31-40	Indications on PFD	09 FEB 26
R	DSC-31-45	Indications on ND	09 FEB 26
	DSC-31-50	EFIS Controls	20 AUG 25
	DSC-31-55-10	General	22 MAR 16
	DSC-31-55-20	Controls and Indicators	21 AUG 24
	DSC-31-60-10	Flight Data Recording System	11 APR 14
	DSC-31-60-20	Controls and Indicators	04 SEP 18
R	DSC-31-60-30	Aircraft Integrated Data System	09 FEB 26
	DSC-32-10-10	Description	21 AUG 24
	DSC-32-10-20	Landing Gear System/Interface	10 AUG 21
	DSC-32-10-30	Interactions between Landing Gear and Aircraft Systems	20 AUG 25
	DSC-32-10-40	Controls and Indicators	25 MAR 24
	DSC-32-20-10	Description	17 AUG 22
	DSC-32-20-20	Controls and Indicators	25 MAR 24
R	DSC-32-30-10	Description	09 FEB 26
R	DSC-32-30-20	Controls and Indicators	09 FEB 26
	DSC-32-40-10	Description	12 JAN 22
	DSC-32-40-20	Controls and Indicators	12 JAN 22
	DSC-33-10-10	General	22 MAR 16
	DSC-33-10-20	Description	20 AUG 25
R	DSC-33-10-30	Controls and Indicators	09 FEB 26
	DSC-33-20-10	General	22 MAR 16
	DSC-33-20-20	Controls and Indicators	23 AUG 23
	DSC-33-30-10	Description	10 AUG 21
	DSC-33-30-20	Controls and Indicators	02 MAR 23
R	DSC-33-40-10	Controls and Indicators	09 FEB 26
	DSC-34-NAV-10-10	Description	22 MAR 16
	DSC-34-NAV-10-20	Controls and Indicators	20 AUG 25
	DSC-34-NAV-10-30-10	Backup Speed/Altitude Scale	12 JAN 22
	DSC-34-NAV-15-10	Description	22 MAR 16

Continued on the following page

PRELIMINARY PAGES

LIST OF EFFECTIVE SECTIONS/SUBSECTIONS

Continued from the previous page

M⁽¹⁾	Localization	Subsection Title	Rev. Date
	DSC-34-NAV-20	Standby Instruments	23 AUG 23
	DSC-34-NAV-30-10	Tuning	22 MAR 16
	DSC-34-NAV-30-20	Nav aids	20 AUG 25
	DSC-34-NAV-30-30	Controls and Indicators	20 AUG 25
	DSC-34-NAV-40-10	Description	20 AUG 25
	DSC-34-SURV-10-10	Description	17 AUG 22
	DSC-34-SURV-10-20	Controls and Indicators	20 AUG 25
	DSC-34-SURV-30-10	Description	20 AUG 25
	DSC-34-SURV-30-15	On Path Envelope Boundaries Definition	12 JAN 22
	DSC-34-SURV-30-20	Predictive Windshear System	02 MAR 23
	DSC-34-SURV-30-30	Controls and Indicators	20 AUG 25
	DSC-34-SURV-30-40	Temporary Abnormal Behaviors	23 AUG 23
	DSC-34-SURV-40-10	Description	20 AUG 25
R	DSC-34-SURV-40-20	GPWS Basics Modes	09 FEB 26
	DSC-34-SURV-40-35	Predictive GPWS Functions	20 AUG 25
R	DSC-34-SURV-40-40	Controls and Indicators	09 FEB 26
	DSC-34-SURV-60-10	Description	17 AUG 22
R	DSC-34-SURV-60-20	Controls and Indicators	09 FEB 26
	DSC-35-10	General	11 APR 14
	DSC-35-20-10	Description	02 JAN 23
	DSC-35-20-20	Controls and Indicators	02 MAR 23
	DSC-35-20-30	How to	10 AUG 21
	DSC-35-30-10	Description	20 SEP 16
	DSC-35-30-20	Controls and Indicators	20 AUG 25
R	DSC-35-40-10	Description	09 FEB 26
R	DSC-35-40-20	How To	09 FEB 26
	DSC-36-10-10	General	22 MAR 17
	DSC-36-10-20	Engine Bleed System	02 MAR 23
	DSC-36-10-30	APU Bleed Air Supply	04 SEP 18
	DSC-36-10-40	Crossbleed	02 MAR 23
	DSC-36-10-50	Leak Detection	22 MAR 17
	DSC-36-10-60	Operation Following Failures	22 MAR 16
	DSC-36-20	Controls and Indicators	02 MAR 23
	DSC-38-10	Description	02 SEP 20
	DSC-45-10	Description	22 MAR 16
	DSC-45-20	System Operation	20 AUG 25
	DSC-45-25	Data Loading	25 MAR 24
	DSC-45-30	Printer	20 AUG 25
R	DSC-46-10-10	General System Description	09 FEB 26

Continued on the following page

PRELIMINARY PAGES

LIST OF EFFECTIVE SECTIONS/SUBSECTIONS

Continued from the previous page

M⁽⁷⁾	Localization	Subsection Title	Rev. Date
	DSC-46-10-20-10	General	22 MAR 17
	DSC-46-10-30-10	Notifications	02 MAR 23
R	DSC-46-10-30-20	Controller/Pilot Datalink Communication (CPDLC)	09 FEB 26
	DSC-46-10-30-70	Message Record	02 MAR 23
	DSC-46-10-40-10	ATC Message Pushbutton (ATC MSG PB)	20 AUG 25
	DSC-46-10-40-20	Datalink Control and Display Unit (DCDU)	20 AUG 25
R	DSC-46-10-40-30	MCDU Datalink Pages	09 FEB 26
	DSC-46-10-40-40	MCDU Scratchpad Messages	02 MAR 23
	DSC-46-10-40-50	MCDU Data Entry Format	20 AUG 25
	DSC-46-10-40-60	ECAM	22 MAR 17
	DSC-46-10-50	How To	20 AUG 25
	DSC-46-10-60	Temporary Abnormal Behaviors	20 AUG 25
	DSC-46-40-10	General	04 SEP 18
	DSC-46-40-20	In Seat Power Supply System	04 SEP 18
	DSC-46-40-30	Controls and Indicators	17 AUG 22
	DSC-49-10-10	General	02 MAR 23
	DSC-49-10-20	Main Components	20 AUG 25
	DSC-49-20	Controls and Indicators	20 AUG 25
R	DSC-49-30	Abnormal Operations	09 FEB 26
	DSC-52-10-10	General	10 AUG 21
	DSC-52-10-20	Passenger Doors	17 AUG 22
	DSC-52-10-30	Emergency Exits	10 AUG 21
	DSC-52-10-40	Cargo Doors	22 MAR 17
	DSC-52-10-50	Avionics Compartment Access Door	22 MAR 16
	DSC-52-10-60	Cockpit Door	22 MAR 17
	DSC-52-10-80	Escape Slides/Rafts	10 AUG 21
	DSC-52-20	Controls and Indicators	02 SEP 20
	DSC-52-40-10	Description	20 AUG 25
	DSC-52-40-20	Cockpit Door Locking System (CDLS)	22 MAR 17
	DSC-52-40-30	Cockpit Door Surveillance System (CDSS)	20 AUG 25
	DSC-52-50	How to	20 AUG 25
	DSC-52-70	Temporary Abnormal Behaviors	20 AUG 25
	DSC-56-10	General	22 MAR 17
	DSC-56-20	Fixed Windows	22 MAR 17
	DSC-56-30	Sliding Windows	22 MAR 17
	DSC-56-40	Description	22 MAR 17
	DSC-70-05	Overview	22 MAR 16
	DSC-70-10	System Description	22 MAR 17
	DSC-70-20	FADEC	25 MAR 24

Continued on the following page

PRELIMINARY PAGES

LIST OF EFFECTIVE SECTIONS/SUBSECTIONS

Continued from the previous page

M⁽¹⁾	Localization	Subsection Title	Rev. Date
	DSC-70-30-10	General	22 MAR 17
	DSC-70-30-20	Thrust Levers	02 SEP 20
	DSC-70-30-30	Thrust Rating Limit	22 MAR 16
	DSC-70-30-40	Thrust Control	21 AUG 24
	DSC-70-40	Fuel System (CFM56)	23 AUG 23
	DSC-70-50	Oil System	22 MAR 16
	DSC-70-60	Airbleed System (CFM56)	22 MAR 17
	DSC-70-70	Thrust Reverser System	04 APR 22
	DSC-70-80-10	General	02 SEP 20
	DSC-70-80-20	Architecture	22 MAR 16
	DSC-70-80-30	Ignition System	12 JAN 22
	DSC-70-80-40	Engine Starting System	23 AUG 23
	DSC-70-90-10	Overhead Panel	20 SEP 16
	DSC-70-90-20	Pedestal	17 AUG 22
	DSC-70-90-30	Maintenance Panel	22 MAR 17
R	DSC-70-90-40	Engine Display	09 FEB 26
	DSC-70-90-50	Memo Display	20 SEP 16
R	PRO-PLP-LETDU	LIST OF EFFECTIVE TEMPORARY DOCUMENTARY UNITS	09 FEB 26
R	PRO-ABN-ABN-00	INTRODUCTION	09 FEB 26
R	PRO-ABN-ABN-ADV	[ADV] ECAM ADVISORY	09 FEB 26
	PRO-ABN-ABN-MEM	[MEM] MEMORY ITEMS	20 AUG 25
R	PRO-ABN-ABN-QRH	[QRH] PROCEDURES	09 FEB 26
R	PRO-ABN-A-ICE	A-ICE	09 FEB 26
R	PRO-ABN-AIR	AIR	09 FEB 26
	PRO-ABN-APU	APU	17 AUG 22
	PRO-ABN-APUF	APU FIRE	22 MAR 17
R	PRO-ABN-AUTO_FLT	AUTO FLT	09 FEB 26
	PRO-ABN-AVNCS	AVIONICS SMOKE	22 MAR 17
	PRO-ABN-BLEED	BLEED	10 AUG 21
R	PRO-ABN-BRAKES	BRAKES	09 FEB 26
	PRO-ABN-NWS	BRAKES-NWS	10 AUG 21
R	PRO-ABN-CAB_PR	CAB PR	09 FEB 26
	PRO-ABN-CRG_SMOKE	CARGO SMOKE	17 AUG 22
	PRO-ABN-C_B	C/B	20 AUG 25
R	PRO-ABN-COM	COM	09 FEB 26
R	PRO-ABN-COND	COND	09 FEB 26
	PRO-ABN-CONFIG	CONFIG	05 SEP 17
	PRO-ABN-DATALINK	DATALINK	02 MAR 23
E	PRO-ABN-DOOR	DOOR	09 FEB 26

Continued on the following page

PRELIMINARY PAGES

LIST OF EFFECTIVE SECTIONS/SUBSECTIONS

Continued from the previous page

M⁽⁷⁾	Localization	Subsection Title	Rev. Date
	PRO-ABN-EIS	EIS	20 AUG 25
R	PRO-ABN-ELEC	ELEC	09 FEB 26
R	PRO-ABN-ENG	ENG	09 FEB 26
R	PRO-ABN-F_CTL	F/CTL	09 FEB 26
R	PRO-ABN-FUEL	FUEL	09 FEB 26
R	PRO-ABN-FWS	FWS	09 FEB 26
R	PRO-ABN-HYD	HYD	09 FEB 26
R	PRO-ABN-LG	L/G	09 FEB 26
R	PRO-ABN-MISC	MISC	09 FEB 26
R	PRO-ABN-NAV	NAV	09 FEB 26
	PRO-ABN-OVERSPEED	OVERSPEED	05 SEP 17
	PRO-ABN-RECORDER	RECORDER	23 NOV 21
	PRO-ABN-SEVERE_ICE	SEVERE ICE	24 FEB 20
R	PRO-ABN-SMOKE	SMOKE	09 FEB 26
	PRO-ABN-SURV	SURV	20 AUG 25
R	PRO-ABN-VENT	VENT	09 FEB 26
	PRO-ABN-WHEEL	WHEEL	17 AUG 22
R	PRO-ABN-W_A_ICE	WING A.ICE	09 FEB 26
	PRO-ABN-90	Detailed Cockpit Evacuation Procedure	20 AUG 25
	PRO-NOR-SOP-01	General Information	04 SEP 18
	PRO-NOR-SOP-02	Flight Preparation	25 MAR 24
	PRO-NOR-SOP-03	Safety Exterior Inspection	25 MAR 24
R	PRO-NOR-SOP-04	Preliminary Cockpit Preparation	09 FEB 26
	PRO-NOR-SOP-05	Exterior Walkaround	25 MAR 24
R	PRO-NOR-SOP-06	Cockpit Preparation	09 FEB 26
	PRO-NOR-SOP-07	Before Pushback or Start	20 AUG 25
	PRO-NOR-SOP-08	Engine Start	20 AUG 25
R	PRO-NOR-SOP-09	After Start	09 FEB 26
R	PRO-NOR-SOP-10	Taxi	09 FEB 26
	PRO-NOR-SOP-10B	Departure Change	20 AUG 25
	PRO-NOR-SOP-11	Before Takeoff	20 AUG 25
	PRO-NOR-SOP-12	Takeoff	17 AUG 22
R	PRO-NOR-SOP-13	After Takeoff	09 FEB 26
R	PRO-NOR-SOP-14	Climb	09 FEB 26
	PRO-NOR-SOP-15	Cruise	25 MAR 24
R	PRO-NOR-SOP-16	Descent Preparation	09 FEB 26
E	PRO-NOR-SOP-17	Descent	09 FEB 26
R	PRO-NOR-SOP-18-A	Approach General	09 FEB 26
	PRO-NOR-SOP-18-B	Aircraft Configuration Management	20 AUG 25

Continued on the following page

PRELIMINARY PAGES

LIST OF EFFECTIVE SECTIONS/SUBSECTIONS

Continued from the previous page

M⁽¹⁾	Localization	Subsection Title	Rev. Date
R	PRO-NOR-SOP-18-C	Aircraft Guidance Management	09 FEB 26
R	PRO-NOR-SOP-19	Landing	09 FEB 26
	PRO-NOR-SOP-20	Go-Around	25 MAR 24
	PRO-NOR-SOP-21	After Landing	20 AUG 25
	PRO-NOR-SOP-21B	One Engine Taxi At Arrival	25 MAR 24
	PRO-NOR-SOP-22	Parking	20 AUG 25
R	PRO-NOR-SOP-23	Securing the Aircraft	09 FEB 26
R	PRO-NOR-SCO	Standard Callouts	09 FEB 26
R	PRO-NOR-TSK	Tasksharing	09 FEB 26
R	PRO-NOR-SUP-SUP	Supplementary Procedures Menu	09 FEB 26
R	PRO-NOR-SUP-ADVWXR	Adverse Weather	09 FEB 26
	PRO-NOR-SUP-ENG	Engines	20 AUG 25
R	PRO-NOR-SUP-FUEL	Fuel	09 FEB 26
R	PRO-NOR-SUP-GPSINT	GPS Interference	09 FEB 26
E	PRO-NOR-SUP-LG-LG_DN	Flight With Landing Gear Down	09 FEB 26
	PRO-NOR-SUP-LG-LG	Operation with Nosewheel Steering Offset	05 SEP 17
	PRO-NOR-SUP-MISC-E	Flight Without Cabin Pressurization	17 AUG 22
R	PRO-NOR-SUP-MISC-A	High Altitude Airport Operations	09 FEB 26
R	PRO-NOR-SUP-MISC-C	Operations at QNH above 1050 hPa (31.00 inHg)	09 FEB 26
N	PRO-NOR-SUP-MISC-F	Operations with QFE Barometric Reference	09 FEB 26
	PRO-NOR-SUP-MISC-D	Pushback with Power Push Unit	17 AUG 22
	PRO-NOR-SUP-SURV	Surveillance	11 DEC 19
	PRO-NOR-SRP-01-05	Introduction	11 APR 14
	PRO-NOR-SRP-01-10	Cockpit Preparation	20 AUG 25
	PRO-NOR-SRP-01-15	Before Pushback or Start	02 MAR 23
	PRO-NOR-SRP-01-20	Taxi	02 MAR 23
	PRO-NOR-SRP-01-30	Takeoff	02 MAR 23
	PRO-NOR-SRP-01-40	Climb	20 AUG 25
	PRO-NOR-SRP-01-50	Cruise	02 MAR 23
	PRO-NOR-SRP-01-60	Descent	20 AUG 25
	PRO-NOR-SRP-01-70	Approach	20 AUG 25
	PRO-NOR-SRP-01-80	Go-Around	02 MAR 23
R	PRO-SPO-40-30	Dispatch Consideration	09 FEB 26
	PRO-SPO-40-40	Diversion During Extended Range Operations	02 JAN 23
	PRO-SPO-40-50	Procedures	12 JAN 22
	PRO-SPO-40-60	Performance	12 JAN 22
	PRO-SPO-45	Engine Intermix Operations	05 SEP 17
	PRO-SPO-50	Reduced Vertical Separation Minimum - RVSM	22 MAR 17
R	PRO-SPO-51	Performance-Based Navigation (PBN)	09 FEB 26

Continued on the following page

PRELIMINARY PAGES

LIST OF EFFECTIVE SECTIONS/SUBSECTIONS

Continued from the previous page

M⁽⁷⁾	Localization	Subsection Title	Rev. Date
	PRO-SPO-60	Operations on Narrow Runways	17 AUG 22
	PRO-SPO-85	Simultaneous Parallel Approach Operations	11 DEC 19
	LIM-PLP-LETDU	LIST OF EFFECTIVE TEMPORARY DOCUMENTARY UNITS	10 AUG 21
	LIM-INT	Introduction	05 SEP 17
	LIM-AG-F_CTL	Flight Maneuvering Load Acceleration Limits	22 MAR 17
R	LIM-AG-OPS	Operational Parameters	09 FEB 26
	LIM-AG-SPD	Speeds	10 AUG 21
	LIM-AG-WGHT	Weights	02 MAR 23
	LIM-AIR	Air Bleed/Cond/Press/Vent	22 MAR 17
	LIM-AFS-10	General	20 AUG 25
	LIM-AFS-20	Automatic Approach, Landing and Rollout	02 MAR 23
	LIM-APU	Auxiliary Power Unit	02 MAR 23
	LIM-CAB	Cabin Systems	12 JAN 22
	LIM-COM	Communication	05 SEP 17
	LIM-ENG	Engines	10 AUG 21
	LIM-F_CTL	Flight Controls	22 MAR 17
	LIM-FUEL	Fuel	12 JAN 22
	LIM-ICE_RAIN	Ice and Rain Protection	04 SEP 18
	LIM-LG	Landing Gear	04 SEP 18
R	LIM-NAV	Navigation	09 FEB 26
R	LIM-OXY	Oxygen	09 FEB 26
	LIM-SURV	Surveillance	02 SEP 20
	TAB-PLP-LETDU	LIST OF EFFECTIVE TEMPORARY DOCUMENTARY UNITS	30 NOV 20
R	TAB	Temporary Abnormal Behaviors	09 FEB 26
	EFB-PLP-LETDU	LIST OF EFFECTIVE TEMPORARY DOCUMENTARY UNITS	04 SEP 19
	EFB-LOD-FUL	FUEL	21 AUG 24
	EFB-TOF-10	Takeoff Performance Optimization	20 AUG 25
	EFB-TOF-20-10	Takeoff at Maximum Thrust	11 DEC 19
	EFB-TOF-20-20-10	General	11 DEC 19
	EFB-TOF-20-20-20	Flexible Takeoff	10 AUG 21
	EFB-TOF-20-20-30	Derated Takeoff (If Installed)	11 DEC 19
	EFB-TOF-20-20-40	Flexible Takeoff vs Derated Takeoff	11 DEC 19
	EFB-TOF-30-10	Takeoff on Dry Runway	02 SEP 20
	EFB-TOF-30-20	Takeoff on Wet Runways	23 NOV 21
	EFB-TOF-30-30	Takeoff on Contaminated Runway	20 AUG 25
	EFB-TOF-40	Takeoff with MEL or CDL Item	11 DEC 19
	EFB-TOF-50	Takeoff Recommendations	20 AUG 25
	EFB-IFT-10	In-Flight Performance Calculation	20 AUG 25
	EFB-IFT-20-10-10	General	11 DEC 19

Continued on the following page

PRELIMINARY PAGES

LIST OF EFFECTIVE SECTIONS/SUBSECTIONS

Continued from the previous page

M⁽¹⁾	Localization	Subsection Title	Rev. Date
	EFB-IFT-20-10-20	Climb Thrusts	11 DEC 19
	EFB-IFT-20-20-10	Speeds	11 DEC 19
	EFB-IFT-20-20-20	Altitude/Ceilings	20 AUG 25
	EFB-IFT-20-30	Descent	11 DEC 19
	EFB-IFT-20-40	Holding	11 DEC 19
	EFB-IFT-30	One Engine Inoperative Operations	11 DEC 19
	EFB-LDG-10	Landing Performance Calculation	20 AUG 25
	EFB-LDG-20	Landing Speeds and Distances Definitions	23 NOV 21
	EFB-LDG-30	Runway Conditions	02 JAN 23
	EFB-LDG-40	Dispatch Requirements	20 AUG 25
	EFB-LDG-50	In-Flight Performance Assessment	20 AUG 25

(1) Evolution code : N=New, R=Revised, E=Effectivity, M=Moved

This table gives, for each delivered aircraft, the cross reference between:

- The Manufacturing Serial Number (MSN).
- The Fleet Serial Number (FSN) of the aircraft as known by AIRBUS S.A.S.
- The registration number of the aircraft as known by AIRBUS S.A.S.
- The aircraft model.

M⁽¹⁾	MSN	FSN	Registration Number	Model
	02155		AP-BLB	320-214
	02212		AP-BLC	320-214
	02719		AP-BLU	320-214
	02758		AP-BLV	320-214
	02789		AP-BLW	320-214
	02926		AP-BLY	320-216
	02944		AP-BLZ	320-216
	03031		AP-BLA	320-214
	03060		AP-BLS	320-214
	04392		AP-BMX	320-214
	05152		AP-BMV	320-214
	05162		AP-BMY	320-214
	05253		AP-BOM	320-214
	05746		AP-BON	320-214
	07784		AP-BOK	320-214
	07792		AP-BOL	320-214

(1) Evolution code : N=New, R=Revised

PRELIMINARY PAGES
AIRCRAFT ALLOCATION TABLE

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M ⁽¹⁾	CRITERION	Linked SB	Incorp. Date	Title
	G1147		10 AUG 21	PNEUMATIC - ENGINE BLEED AIR SUPPLY SYSTEM - Increase OPV internal leakage and re-opening setting values
	Applicable to: MSN 07784-07792			
	J0006		11 APR 14	FUEL SYSTEM - ADDITIONAL TREATMENT OF CENTRE TANK STRUCTURE AND INSTALLATION OF CENTRE TANK SYSTEM
	Applicable to: ALL			
	J0012		11 APR 14	NAVIGATION LIGHTS SYSTEM - INSTALLATION OF A SECOND NAVIGATION LIGHT SYSTEM
	Applicable to: ALL			
	J0022		27 APR 15	INSTALLATION OF A FUEL QUANTITY SELECTOR IN THE FLIGHT COMPARTMENT
	Applicable to: MSN 02719-02789, 03031-03060, 05152-05746			
	J0071		11 APR 14	WING STRUCTURE-INTRODUCTION OF A WING TIP INCORPORATING A TIP FENCE FOR 72T MTOW A/C
	Applicable to: ALL			
	J0664		11 APR 14	FUEL SYSTEM-TO IMPROVE LOW LEVEL WARNING
	Applicable to: ALL			
	J0689		23 NOV 21	WING-TO DELETE L/E VENTILATION SYSTEM (PICCOLO TUBE)
	Applicable to: ALL			
	J1255		11 APR 14	FUEL - TANK LEVEL SENSING - CHANGE TO LOW PRESSURE WARNING
	Applicable to: ALL			
	J1334		11 APR 14	LANDING GEAR-MLG-LGCIU-INTRODUCTION OF A NEW STANDARD FOR IMPROVED PROXIMITY SENSOR FAULT MONITORING FUNCTION
	Applicable to: ALL			
	J1617		11 APR 14	FLIGHT CONTROLS - GENERAL - DELETE LAF FEATURE FROM A320 DEFINITION (PRODUCTION SOLUTION)
	Applicable to: ALL			
	J2190		11 APR 14	FUEL - MAIN FUEL PUMPS SYSTEMS - CENTRE TANK PUMPS AUTO FEED FAULT.ADAPT PUMP CONTROL LATCH FOR FLIGHT DECK REFUEL CABABILITY
	Applicable to: ALL			
	J2257		11 APR 14	FUEL - MANUAL MAGNETIC INDICATORS - ATTITUDE MONITOR DELETION
	Applicable to: ALL			

Continued on the following page

PRELIMINARY PAGES

LIST OF MODIFICATIONS

Continued from the previous page

M ⁽¹⁾	CRITERION	Linked SB	Incorp. Date	Title
	J2360		27 APR 15	FUEL - QUANTITY INDICATION - INTRODUCE FUEL LEAK DETECTION ASSOCIATED WITH FQIC - 13 - 9
	Applicable to: MSN 02719-07792			
	J2361	28-1150 01	18 MAY 15	FUEL - QUANTITY INDICATION - REMOVAL OF FUEL LEAK DETECTION FUNCTION ASSOCIATED WITH THE FQIC 13 - 9
	Applicable to: MSN 02719-02789, 03031-07792			
	J2816		11 DEC 19	WING - FIXED PARTITION - INTRODUCED A STANDARD OF BOX WITHOUT DRY BAY
	Applicable to: MSN 04392-07792			
	J2879		11 DEC 19	INERT GAS SYSTEM - CERTIFICATION OF FUEL TANK INERTING SYSTEM
	Applicable to: MSN 04392-07792			
	J2963		11 DEC 19	REDUCTION IN QUANTITY OF MAGNETIC LEVEL INDICATORS
	Applicable to: MSN 04392-07792			
	J3238		10 AUG 21	FUEL - QUANTITY INDICATING - INTRODUCE NEW STANDARD OF FQIC (P/N SIC5059-14-30).
	Applicable to: MSN 07784-07792			
R	J3240	28-1214 03	10 AUG 21	FUEL - QUANTITY INDICATING - ACTIVATE FUEL LEAK DETECTION WARNING SYSTEM
	Applicable to: MSN 05152-07792			
	J3265		20 AUG 25	LIGHTS - NAVIGATION LIGHTS - INTRODUCE NAVIGATION LIGHTS & HARNESSSES FOR SHARKLET.
	Applicable to: MSN 05746-07792			
	J3282		10 AUG 21	WINGS - General - Define and Certify Structural Provisions for Sharklet for A320 family
	Applicable to: MSN 05746-07792			
	J3283		10 AUG 21	WINGS - GENERAL - Certify Sharklet Installation for A320/A319/A318
	Applicable to: MSN 05746-07792			
	J3527		10 AUG 21	FUEL - MAIN TRANSFER SYSTEM - Introduce the A321 Centre Tank Fuel Transfer System onto A319 and A320 Single Aisle Variants
	Applicable to: MSN 07784-07792			
	J3559	28-1216 01	10 AUG 21	FUEL - TANK LEVEL SENSING - ACTIVATE FUEL OVERFLOW CAUTION ON A318/A319/A320
	Applicable to: MSN 05152-07792			
	J3703		10 AUG 21	FUEL - QUANTITY INDICATING - INSTALL FQIS ONTO A319 and A320 A/C.
	Applicable to: MSN 07784-07792			

Continued on the following page

Continued from the previous page

M ⁽¹⁾	CRITERION	Linked SB	Incorp. Date	Title
	J3739	28-1215 00	10 AUG 21	FUEL - QUANTITY INDICATING - INTRODUCE NEW FQIC SIC5059-14-31.
	Applicable to: MSN 02719-07792			
	J4030	32-1432 01	10 AUG 21	LANDING GEAR - NORMAL BRAKING - INTRODUCE NEW BSCU SOFTWARE STANDARD (L4.10).
	Applicable to: MSN 02155-03060, 05152-07792			
	J4209		10 AUG 21	FUEL - QUANTITY INDICATING - INTRODUCE FQIC SOFTWARE DEVELOPMENT
	Applicable to: MSN 07784-07792			
	J4302		10 AUG 21	FUEL - FUEL RECIRCULATION - COOLING - ESTABLISH MISSING GRND CONNECTION TO INHIBIT RECIRCULATION DURING GRAVITY FEED
	Applicable to: MSN 07784-07792			
	J4376		10 AUG 21	FUEL - QUANTITY INDICATING - Update Software FQIC (-0203)
	Applicable to: MSN 07792			
	K0024		11 APR 14	INSTALLATION OF ADDITIONAL CARGO DOOR (BULK DOOR)
	Applicable to: ALL			
	K0026		11 APR 14	LIGHTS - LOGOLIGHTS - INSTALLATION OF LOGOLIGHTS SYSTEM
	Applicable to: ALL			
	K0035		11 APR 14	FIRE PROTECTION - FWD LOWER HOLD - INSTALLATION OF SMOKE DETECTION SYSTEM
	Applicable to: ALL			
	K0036		11 APR 14	FIRE PROTECTION - AFT LOWER HOLD - INSTALLATION OF SMOKE DETECTION SYSTEM
	Applicable to: ALL			
	K0037		11 APR 14	FIRE PROTECTION - FWD AND AFT LOWER HOLD INSTALLATION OF A SINGLE SHOT FIRE EXTINGUISHING SYSTEM
	Applicable to: ALL			
	K0052		11 APR 14	INSTALLATION OF AN AIDS
	Applicable to: ALL			
	K0064		11 APR 14	LIGHTS - INSTALLATION OF STROBE LIGHTS SYNCHRONISED MODE
	Applicable to: ALL			
	K0066		12 JAN 22	AIR CONDITIONING - VENTILATION SYSTEM FOR FWD CARGO COMPARTMENT
	Applicable to: MSN 05152-05746			

Continued on the following page

PRELIMINARY PAGES

LIST OF MODIFICATIONS

Continued from the previous page

M ⁽¹⁾	CRITERION	Linked SB	Incorp. Date	Title
	K0067		12 JAN 22	AIR CONDITIONING - HEATING SYSTEM FOR FWD CARGO COMPARTMENT
Applicable to: MSN 05152-05746				
	K0070		01 JUL 14	AIR CONDITIONING - VENTILATION SYSTEM FOR AFT CARGO COMPARTMENT
Applicable to: MSN 02155-02789, 03031-04392, 07784-07792				
	K0071		01 JUL 14	AIR CONDITIONING - HEATING SYSTEM FOR AFT CARGO COMPARTMENT -
Applicable to: MSN 02155-02789, 03031-04392				
	K0082		11 APR 14	WATER WASTE-INSTALL VACUUM TOILET SYSTEM
Applicable to: ALL				
	K0344		01 JUL 14	LIGHTS-INSTALLATION OF A LSI-EEPMS FOR 164
Applicable to: MSN 02155-02212				
	K10003		18 MAY 15	AIRBORNE AUXILIARY POWER - CONTROL AND MONITORING INTRODUCE SOFTWARE VERSION 06.00.000
Applicable to: MSN 02926-07792				
	K10009		27 APR 15	EQUIPMENT/FURNISHINGS - CURTAINS AND PARTITIONS INTRODUCE IMPROVED STRIKES FOR COCKPIT DOOR
Applicable to: MSN 02719-07792				
	K10072		27 APR 15	GENERAL-DESIGN WEIGHTS- MULTIPLE WEIGHT VARIANT CAPABILITY - MTOW 73,5T, 75,5T & 77T
Applicable to: MSN 02719-02789, 03031-03060				
	K1014		11 APR 14	WATER/WASTE-RELOCATION OF POT.WATER TANK FROM SECTION 18 TO SECTION 15 AND REDESIGN OF POT.WATERSYSTEM
Applicable to: ALL				
	K10143		17 AUG 15	EQUIPMENT/FURNISHING - MISC.EMERGENCY EQUIPMENT - INSTALL ELT (406AF) WITH PROG. DONGLE AND RCP IN COCKPIT - THALES
Applicable to: MSN 02926-02944, 04392, 07784-07792				
	K10273		17 AUG 15	GENERAL-DESIGN WEIGHTS- DUAL WEIGHT VARIANT CERTIFICATION- WV011(75.5T/66T/62.5T) AND WV016 (73.5T/66T/62
Applicable to: MSN 02926-02944				
	K10359		27 APR 15	LIGHTS - EMERGENCY LIGHTING - DEFINE FLOOR MOUNTED LUFTHANSA TECHNIK 900 SERIES EEPMS
Applicable to: MSN 02719-05746				

Continued on the following page

Continued from the previous page

M ⁽⁷⁾	CRITERION	Linked SB	Incorp. Date	Title
	K10494		27 APR 15	AIRBORNE AUXILIARY POWER - CHANGE STANDARD APU HONEYWELL GTCP36-300 TO APIC APS3200
Applicable to: MSN 02719-07792				
	K10516	49-1075 01	18 MAY 15	AIRBORNE AUXILIARY POWER - CONTROL AND MONITORING INTRODUCE HONEYWELL VECB WITH SOFTWARE -04
Applicable to: MSN 02719-03060, 07784-07792				
	K11528		10 AUG 21	INDICATING/RECORDING SYSTEMS - DFDR INTER-CONNECTION - INSTALL FULL PROVISIONS FOR WGL QAR (ARINC 600 / 256W/S)
Applicable to: MSN 04392, 07784-07792				
	K11694		12 JAN 22	EQUIPMENT/FURNISHINGS-MISCELLANEOUS EMERGENCY EQUIPMENT-INSTALLATION OF ELT(406AFN) WITH RCP IN COCKPIT AND NAV PROVISIONS-HONEYWELL
Applicable to: MSN 05152-05746				
	K12337	23-1373 03	23 AUG 23	COMMUNICATIONS - ANTI HIJACK CAMERA MONITORING - REPLACE HINGE FOR CDSS CONTROLLER/MONITOR
Applicable to: MSN 02155-02212, 04392-07792				
	K12405		11 DEC 19	COMMUNICATIONS-CIDS-INTRODUCE HANDSET SERIES N40A FROM VENDOR HOLMBERG
Applicable to: MSN 04392-07792				
	K12882		11 DEC 19	DOORS-EMERGENCY EXIT-DE-ACTIVATE FORWARD OVERWING EMERGENCY EXIT ON A320 A/C
Applicable to: MSN 04392				
	K13015		10 AUG 21	EQUIPMENT/FURNISHING-MISC. EMERGENCY EQUIPMENT-REPLACE REMOTE CONTROL PANEL RC500 BY RC800 - THALES
Applicable to: MSN 04392, 07784-07792				
	K13046		10 AUG 21	OXYGEN - CONTROL AND INDICATING - ADAPT PASS INFO RELAY, RELAY SOCKET AND WIRINGS FOR CHEMICAL OXYGEN SYSTEM
Applicable to: MSN 07784-07792				
	K13078		11 DEC 19	OXYGEN - PASSENGER OXYGEN - INTRODUCE OPTIONAL CHEMICAL OXYGEN HYBRID CONTAINER 22 MIN (DAE SYSTEMS)
Applicable to: MSN 04392				
	K1420		11 APR 14	DOORS-FWD/AFT CARGO DOOR-INTRODUCTION OF LOCKING INDICATION
Applicable to: ALL				

Continued on the following page

PRELIMINARY PAGES

LIST OF MODIFICATIONS

Continued from the previous page

M ⁽¹⁾	CRITERION	Linked SB	Incorp. Date	Title
	K15195		20 AUG 25	Lights - Anti-Collision/Strobe Lighting - Define and Install Wing Strobe Lights and Power Supply Units for Sharklets
Applicable to: MSN 05746-07792				
	K16010		20 AUG 25	DOORS - PASSENGER COMPARTMENT FIXED INTERIOR DOORS - INTRODUCE IMPROVED KEYPAD FOR COCKPIT DOOR LOCKING SYSTEM
Applicable to: MSN 05152, 05253-07792				
	K16128		12 JAN 22	AIR CONDITIONING - AVIONICS EQUIPMENT VENTILATION - Introduce Avionics Comfort Duct Temperature Sensor (FIN 34HQ)
Applicable to: MSN 07784-07792				
	K17120		10 AUG 21	Lights - Cabin Emergency Lighting Define Floor Mounted EEPMS Lufthansa Technik 1000 Series
Applicable to: MSN 07784-07792				
	K1806		11 APR 14	AIR CONDITIONING SYSTEM POWER SUPPLY - MODIFY POWER TO FLOW CONTROL VALVE
Applicable to: ALL				
	K18102		10 AUG 21	AIR CONDITIONING - PACK TEMPERATURE CONTROL - Introduce improved Air Conditioning System Controller
Applicable to: MSN 07784-07792				
	K2335		11 APR 14	LAVATORY SMOKE DETECTION - IMPROVEMENT OF SMOKE DETECTION
Applicable to: ALL				
	K2393		11 APR 14	AIR COND.-CABIN PRESSURE CONTROL-IMPROVE CONTROLLER TO ENABLE USE OF EXTERNAL MODE
Applicable to: ALL				
	K2450		11 APR 14	AUXILIARY POWER UNIT - INTRODUCTION OF APIC APS-3000
Applicable to: ALL				
	K2938		11 APR 14	DOORS - C.C.DOOR HYDRAULIC SYSTEM - INTRODUCE MODIFIED ELECTRICAL (MANUAL) SELECTOR VALVE -
Applicable to: ALL				
	K2962		11 APR 14	HYDRAULIC POWER - MAIN BLUE HYDRAULIC POWER - IMPROVE MAINTENACE STATUS OF BLUE HYDRAULIC RESERVOIR -
Applicable to: ALL				
	K3065		11 APR 14	INCREASED MAXIMUM TAKE OFF WEIGHT(MTOW) TO 77T
Applicable to: MSN 07784-07792				

Continued on the following page

Continued from the previous page

M ⁽⁷⁾	CRITERION	Linked SB	Incorp. Date	Title
	K3118		11 APR 14	AUXILIARY POWER UNIT - CONTROL AND MONITORING - INTRODUCTION OF NEW ECB P/N 304817-1
Applicable to: ALL				
	K3279		11 APR 14	AUXILIARY POWER UNIT - CONTROL AND MONITORING - MODIFIED WIRE HARNESSSES TO NEW ECB
Applicable to: ALL				
	K3471		11 APR 14	GENERAL - INCREASE DESIGN WEIGHT TO 61T MZFW
Applicable to: ALL				
	K3599		11 APR 14	AIR CONDITIONING - COCKPIT AND CABIN TEMPERATURE CONTROL - INTRODUCE IMPROVED ZONE TEMPERATURE CONTROLLER -03
Applicable to: ALL				
	K3867		04 SEP 18	HYDRAULIC POWER-AUXILLIARY HYDRAULIC POWER- INTRODUCE R.A.T. WITH IMPROVED MAIN BEARING
Applicable to: ALL				
	K3984		04 SEP 18	AIR CONDITIONIN -COCKPIT AND CABIN TEMPERATURE CONTROL-INTRODUCE MODIFIED TEMPERATURE SENSOR -02 ON MIXER UNIT
Applicable to: ALL				
	K4457		27 APR 15	INTRODUCTION OF NEW ALLIED SIGNAL APU GTCP 131-9 (A)
Applicable to: MSN 02719-03060, 07784-07792				
	K4574		11 APR 14	AIR CONDITIONING-FLOW CONTROL AND INDICATING- INTRODUCE IMPROVED AIR CONDITIONING PACKAGE FOR FLOW CONTROL
Applicable to: ALL				
	K4725		20 SEP 16	DOORS - CARGO COMPARTMENT DOOR FWD AND AFT - MODIFY CARGO DOORS
Applicable to: ALL				
	K4726		11 APR 14	WATER/WASTE-TOILET SYSTEM-INTRODUCE IMPROVED TOILET ASSY
Applicable to: ALL				
	K4787		11 APR 14	LIGHTS - INTRODUCTION OF A COMMON EPSU
Applicable to: ALL				
	K4793		11 APR 14	AIR CONDITIONING-AIR COOLING SYSTEM-INTRODUCE AN IMPROVED RAM OUTLET (RAO)
Applicable to: ALL				

Continued on the following page

PRELIMINARY PAGES

LIST OF MODIFICATIONS

Continued from the previous page

M ⁽¹⁾	CRITERION	Linked SB	Incorp. Date	Title
	K4913		11 APR 14	HYDRAULIC POWER - AUXILIARY HYDRAULIC POWER - INSTALL A319 RAM AIR TURBINE ON A320
	Applicable to: ALL			
	K5070		12 JAN 22	COMMUNICATIONS - CIDS - DUAL DIAL CODE ON HANDSET KEYBOARD (A319/A321)
	Applicable to: MSN 05152-05746			
	K5157		11 DEC 19	OXYGEN-PASSENGER OXYGEN-INTRODUCE IMPROVED OPTIONAL CHEMICAL OXYGEN CONTAINER (22 MIN) TO REPLACE "HIGH FLOW" CONTAINER
	Applicable to: MSN 04392			
	K5213		11 APR 14	AIR CONDITIONING - PACK TEMPERATURE CONTROL - INTRODUCE IMPROVED PACK TEMPERATURE CONTROLLER
	Applicable to: ALL			
	K5446		11 APR 14	INDICATING/RECORDING SYSTEMS - INSTALLATION OF A COMBINED FDIU/DMU
	Applicable to: ALL			
	K5549		11 APR 14	OXYGEN - PASSENGER OXYGEN - INTRODUCE CHEMICAL OXYGEN CONTAINER (15MIN) WITH IMPROVED ACTUATOR (VENDOR PURITAN)
	Applicable to: ALL			
	K5637		20 AUG 25	COMMUNICATION - INSTALL A LANDSCAPE CAMERA FROM VENDOR LATECOERE
	Applicable to: MSN 07784-07792			
	K5801		11 APR 14	AIR CONDITIONING-PRESSURE CONTROL AND MONITORING- INTRODUCE MODIFIED PRESSURE CONTROLLER P/N 9022-15702-10
	Applicable to: ALL			
	K6156		11 APR 14	AIR CONDITIONING-PACK TEMPERATURE CONTROL- INTRODUCE MODIFIED PACK TEMPERATURE CONTROLLER
	Applicable to: ALL			
R	K6164	00-1069 60	27 APR 15	GENERAL-INCREASE A320 DESIGN WEIGHTS TO 77,0T MTOW; 66,0T MLW AND 62.5T MZFW (WV012)
	Applicable to: MSN 02155-02789, 03031-05746			
	K6318		11 APR 14	APU-CONTROL AND MONITORING-INTRODUCE APIC ECB SOFTWARE VERSION 5
	Applicable to: ALL			
	K6443		27 APR 15	AIR CONDITIONING_AIR COOLING INSTALL A NEW ECS
	Applicable to: MSN 02719-07792			

Continued on the following page

Continued from the previous page

M ⁽¹⁾	CRITERION	Linked SB	Incorp. Date	Title
	K6699		17 AUG 15	GENERAL-INCREASE A320 DESIGN WEIGHTS TO 75,5 MTOW ; 66,0T MLW AND 62,5T MZFW (WV011)
	Applicable to: MSN 02926-02944			
	K6807		01 JUL 14	EQUIPMENT/FURNISHINGS -MISCELLANEOUS EMERGENCY EQUIPMENT- INSTALL AN SEXTANT ELT WITH CONTROL PANEL IN COCKPIT AND PROGRAMMING DONGLE
	Applicable to: MSN 02155-02212			
	K6936		11 APR 14	AUXILIARY POWER UNIT (APU)-GENERAL- INCREASE OPERATION ENVELOPE TO 39800 FT. FOR GTCP36-300
	Applicable to: ALL			
	K7072		11 APR 14	LIGHTS-EMERGENCY LIGHTING- EPSU LOAD DISTRIBUTION IMPROVEMENT
	Applicable to: ALL			
	K7755		11 APR 14	EQUIPMENT/FURNISHINGS PAX COMPARTMENT INTRODUCE A MODIFIED INTRUSION AND PENETRATION RESISTANCE COCKPIT DOOR
	Applicable to: ALL			
	K7778	23-1373 03	27 APR 15	COMMUNICATIONSAUDIO AND VIDEO MONITORING INSTALL A COCKPIT DOOR SURVEILLANCE SYSTEM
	Applicable to: ALL			
	K7782		12 JAN 22	COMMUNICATIONS CABIN INTERCOMMUNICATION COCKPIT CREW TO CABIN CREW ALERTING SYSTEM (COCKPIT PART)
	Applicable to: MSN 05152-05746			
	K7784		12 JAN 22	COMMUNICATIONS CABIN INTERCOMMUNICATION CABIN CREW TO COCKPIT CREW ALERTING SYSTEM (COCKPIT PART)
	Applicable to: MSN 05152-05746			
	K7790		11 APR 14	DOORS PASSENGER COMPARTMENT FIXED PARTITIONS INTERIOR DOOR-ELECTRICAL COCKPIT DOOR RELEASE SYSTEM
	Applicable to: ALL			
	K7847		11 DEC 19	EQUIPMENT/FURNISHINGS PASSENGER COMPARTMENT DEFINITION OF A PED POWER SUPPLY SYSTEM PROVIDING 110/60 HZ FROM VENDOR THALES
	Applicable to: MSN 04392-05746			

Continued on the following page

PRELIMINARY PAGES

LIST OF MODIFICATIONS

Continued from the previous page

M ⁽¹⁾	CRITERION	Linked SB	Incorp. Date	Title
	K8400		27 APR 15	COMMUNICATIONS CABIN INTERCOMMUNICATION MODIFY CABIN INTERCOMMUNICATION DATA SYSTEM ON A319
Applicable to: MSN 02719-07792				
	K8734		27 APR 15	AIR CONDITIONING - AIR COOLING ADAPT A318 ECS TO A320
Applicable to: MSN 02719-07792				
	K8905		27 APR 15	EQUIPMENT/FURNISHINGS -CURTAINS AND PAR INSTALL A DEADBOLT FOR THE REINFORCED COCKPIT DOOR
Applicable to: MSN 02719-02789, 03031-03060, 05152-07792				
	K9009		27 APR 15	COMMUNICATIONS-PASSENGER ADDRESS EMERGENCY POWER SIMPLIFICATION
Applicable to: MSN 02719-02789, 03031-03060				
	K9231		27 APR 15	EQUIPMENT/FURNISHINGS - MISCELLANEOUS EMER EQPT INSTALL AN ELT WITH RCP IN COCKPIT BASED ON ENHANCED PROVISIONS - HONEYWELL
Applicable to: MSN 02719-02789, 03031-03060				
	K9235	23-1373 03	22 MAR 17	COMMUNICATIONS - ANTI HIJACK CAMERA MONITORING REPLACE HINGE ASSEMBLY FOR CDSS LCD/SYSTEM CONTROLLER
Applicable to: ALL				
	K9473		27 APR 15	AIR CONDITIONING-PRESSURE CONTROL AND MONITORING-INTRODUCE RESIDUAL PRESSURE CONTROL UNIT (RPCU)
Applicable to: MSN 02719-07792				
	K9877		27 APR 15	EQUIPMENT / FURNISHINGS - CURTAINS AND PARTITIONS - MODIFY DEADBOLT FOR REFORCED COCKPIT DOOR
Applicable to: MSN 02719-02789, 03031-03060, 05152-07792				
	K9920	23-1373 03	27 APR 15	COMMUNICATIONS - ANTI HIJACK CAMERA MONITORING REPLACE CDSS LCD /SYSTEM CONTROLLER
Applicable to: ALL				
	P0014		20 AUG 25	THIRD VHF COMMUNICATION SYSTEM
Applicable to: ALL				
	P0033		11 APR 14	COMMUNICATIONS - HF1 SYSTEM PROVISION FOR HF1 SYSTEM
Applicable to: ALL				
	P0034		11 APR 14	SINGLE HF SYSTEM
Applicable to: ALL				

Continued on the following page

Continued from the previous page

M ⁽⁷⁾	CRITERION	Linked SB	Incorp. Date	Title
	P0040		01 JUL 14	4TH OCCUPANT SEAT
	Applicable to: MSN 02155-02789, 03031-07792			
	P0046		27 APR 15	ELECTRICAL FOOT WARMERS FOR CAPTAIN AND FIRST OFFICER
	Applicable to: MSN 02719-02789, 03031-03060			
	P0052		11 DEC 19	TYRE PRESSURE INDICATION SYSTEM
	Applicable to: MSN 04392-05746			
	P0078		20 AUG 25	COMMUNICATIONS - AUDIO INTEGRATING - INSTALL AN AUDIO CONTROL PANEL IN E/E COMPARTMENT
	Applicable to: MSN 04392			
	P0091		11 APR 14	ALTERNATIVE FLIGHT CREW OXYGEN BOTTLE (77.1CU/FT) IN COMPOSITE MATERIAL FOR FIXED SYSTEM
	Applicable to: ALL			
	P0143		01 JUL 14	COMMUNICATIONS - INSTALLATION OF A 3RD RMP
	Applicable to: MSN 02155-02789, 03031-07792			
	P0147		11 APR 14	DESIGN WEIGHT-MTOW 72T-STRUCTURAL REINFORCEMENT
	Applicable to: ALL			
	P0160		17 AUG 15	OXYGEN-FLIGHT CREW OXYGEN STORAGE-INSTALLATION OF A 115 CU/FT (STEEL) OXYGEN CYLINDER
	Applicable to: MSN 02926-02944, 04392			
	P0197		01 JUL 14	COMMUNICATIONS-SINGLE HF SYSTEM INSTALLATION
	Applicable to: MSN 02155-02212, 02926-02944, 04392			
	P0198		21 AUG 24	COMMUNICATIONS-2ND HF SYSTEM INSTALLATION
	Applicable to: MSN 02926-02944			
	P0287		01 JUL 14	NAVIGATION-REPLACE EXISTING VOR DDRMI WITH A COMBINED VOR ADF DDRMI COLLINS
	Applicable to: MSN 02155-02212			
	P0357		27 APR 15	ELECTRICAL GENERATION-PUBLIC ADDRESS SWITCHING BY P/B ON HOT BUS BUSBAR
	Applicable to: MSN 02719-02789, 03031-03060			
	P0415		11 APR 14	COMMUNICATIONS-HOT MIKE RECORDING
	Applicable to: ALL			
	P0435		27 APR 15	ICE AND RAIN PROTECTION-WINDSHIELD WIPER SYSTEM- ADDITION OF AN INTERMITTENT FUNCTION
	Applicable to: MSN 02719-02789, 03031-03060			
	P0622		01 JUL 14	NAVIGATION-USE OF THE QFE BARO SETTING
	Applicable to: MSN 02155-02212			

Continued on the following page

PRELIMINARY PAGES

LIST OF MODIFICATIONS

Continued from the previous page

M ⁽¹⁾	CRITERION	Linked SB	Incorp. Date	Title
N	P10094		09 FEB 26	EQUIPEMENT/FURNISHINGS - COCKPIT SEATS INSTALL TAAI3 COCKPIT SEATS WITH REINFORCED STOP-PIN IN SEAT BASE
Applicable to: MSN 03031-07792				
	P10098	24-1120 04	18 MAY 15	ELECTRICAL POWER AC ESSENTIAL GENERATION SWITCHING INSTALL AUTO SWITCHING SYSTEM FOR AC&DC ESS BUS.
Applicable to: ALL				
	P10178		11 DEC 19	AUTO FLIGHT - FLIGHT MANAGEMENT AND GUIDANCE COMPUTER (FMGC)- RE-INSTALL HONEYWELL FMS PERFORMANCE DATA BASE (PDB) -901
Applicable to: MSN 04392, 07784-07792				
	P10187		12 JAN 22	AIR CONDITIONING - COCKPIT AIR HEATING INSTALL ADDITIONNAL HEATERS ON THE FOOT AIR OUTLET FOR CAPTAIN AND F/O
Applicable to: MSN 05152-05746				
	P10257		11 DEC 19	LANDING GEAR - WHEELS AND BRAKES - INTRODUCE REDESIGNED MESSIER-BUGATTI SEPCARB BRAKES ON MLG
Applicable to: MSN 04392-07792				
	P10267		12 JAN 22	NAVIGATION - RADIO MAGNETIC INFORMATION SWITCHING AND INDICATING : RE-INSTALL THALES DDRMI VOR/DME INDICATORS (ANTI-MOD 33503)
Applicable to: MSN 05152-05746				
	P10321	22-1289 01	11 DEC 19	AUTO-FLIGHT - GENERAL - REMOVE AFM LIMITATION ON NON PRECISION APPROACHES WITH ONE ENGINE OUT
Applicable to: MSN 02155-02789, 03031-07792				
	P10383	31-1334 04 31-1414 03	11 DEC 19	INDICATING/RECORDING SYSTEMS FLIGHT WARNING COMPUTER (FWC) INSTALL FWC STANDARD H2-F5
Applicable to: ALL				
	P10402	23-1333 05	11 DEC 19	COMMUNICATIONS - AUDIO MANAGEMENT- MODIFY AMU POWER SUPPLY TO COPE WITH DC ESSENTIAL BUS LOSS
Applicable to: MSN 02155-02789, 03031-07792				
	P10439	22-1248 01	11 DEC 19	AUTO-FLIGHT FMGC INSTALL FMGC HNWL STD P1C12 ON CFM A/C
Applicable to: MSN 02155-02789, 03031-07792				

Continued on the following page

Continued from the previous page

M ⁽¹⁾	CRITERION	Linked SB	Incorp. Date	Title
	P10440	22-1247 01	11 DEC 19	AUTO-FLIGHT FMGC INSTALL FMGC THALES S4C12 ON CFM A/C
	Applicable to: MSN 02926-02944, 04392, 07784-07792			
	P10443	27-1182 04	11 DEC 19	FLIGHT CONTROL - ELAC SYSTEM - INTRODUCE ELAC "L93" SOFTWARE STANDARD
	Applicable to: ALL			
	P10493		11 DEC 19	FLIGHT CONTROL - ELAC - ACTIVATE HIGH ALTITUDE UPSETS VMO/MMO OVERSHOOT PROTECTION FUNCTION ON ELAC
	Applicable to: MSN 04392-07792			
	P10527	31-1372 10 31-1415 00 31-1433 01 31-1601 02	10 AUG 21	INDICATING/RECORDING SYSTEM - ELECTRONIC INSTRUMENT SYSTEM (EIS)- INSTALL DISPLAY MANAGEMENT COMP. SOFTW. EIS2 S8-1
	Applicable to: ALL			
	P10686	22-1266 03	11 DEC 19	AUTO-FLIGHT - FMGC INSTALL HONEYWELL PERFORMANCE DATABASE RELEASE 1A (PS4087592-901)
	Applicable to: MSN 02155-02789, 03031-07792			
N	P1069		09 FEB 26	NAVIGATION-MDA/MDH SELECTION
	Applicable to: MSN 02155-02212			
	P10694	22-1296 06	11 DEC 19	AUTO-FLIGHT - FMGC ACTIVATE "MOD NAV IN GO AROUND" ON FMGC
	Applicable to: MSN 02155-02789, 03031-07792			
	P10721	73-1090 00	11 DEC 19	ENGINE FUEL AND CONTROL - FADEC SYSTEM INTRODUCE "5BQ" FADEC SOFTWARE STANDARD ON CFM56-5B ENGINES - CNF CFM 111B -
	Applicable to: ALL			
	P10762	22-1269 05	10 AUG 21	AUTO FLIGHT - FMGC INSTALL FMGC HWL H2C12 (RELEASE 1A) ON CFM A/C
	Applicable to: MSN 02155-02789, 03031-03060, 05152-07792			
	P10785	22-1362 03	10 AUG 21	AUTO-FLIGHT - FMGC INSTALL FMGC THALES S5C12 (RELEASE 1A) ON CFM A/C
	Applicable to: MSN 02926-02944, 04392, 07784-07792			
	P10960		10 AUG 21	NAVIGATION - T3CAS - INSTALL T3CAS COMPUTER WITH TRANSPONDER FUNCTION INACTIVE
	Applicable to: MSN 07784-07792			
	P11146		10 AUG 21	LANDING GEAR - PARKING/ULTIMATE EMERGENCY BRAKING ACTIVATE PARKING BRAKE MONITORING FUNCTION ON SA A/C
	Applicable to: MSN 05152-07792			

Continued on the following page

PRELIMINARY PAGES

LIST OF MODIFICATIONS

Continued from the previous page

M ⁽¹⁾	CRITERION	Linked SB	Incorp. Date	Title
	P11246		10 AUG 21	AUTO FLIGHT - FLIGHT MANAGEMENT AND GUIDANCE COMPUTER - INTRODUCE FMGC S6PC12 (THALES/CFM)
	Applicable to: MSN 07784-07792			
R	P11247	46-1049 41 46-1062 21	12 JAN 22	INFORMATION SYSTEMS - GENERAL - CERTIFY FANS B+ CONFIGURATION (OVERALL MODIFICATION)
	Applicable to: MSN 02719-02789, 03031-03060, 05152-07792			
	P11325	73-1095 02	11 DEC 19	ENGINE FUEL AND CONTROL - FADEC SYSTEM INTRODUCE ECU SOFTWARE STANDARD "5BR" ON CFM56-5B ENGINES
	Applicable to: ALL			
	P11355		10 AUG 21	AUTO FLIGHT - FLIGHT MANAGEMENT AND GUIDANCE COMPUTER - INTRODUCE FMGC H2PC12 (HONEYWELL/CFM)
	Applicable to: MSN 07784-07792			
	P11363		10 AUG 21	AUTO FLIGHT - AUTOPILOT/FLIGHT DIRECTOR (AP/FD)- ACTIVATE AP/FD TCAS FUNCTION
	Applicable to: MSN 07784-07792			
	P11473	22-1315 05	10 AUG 21	AUTO FLIGHT - FLIGHT MANAGEMENT SYSTEM (FMS) ACTIVE BARO RADIO SETTING FUNCTION
	Applicable to: ALL			
	P11490		10 AUG 21	NAVIGATION - TRAFFIC AND TERRAIN INTEGRATED SURVEILLANCE (T/TISS) ACTIVATE XPDR FUNCTION ON T3CAS
	Applicable to: MSN 07784-07792			
	P11510	34-1506 34	10 AUG 21	NAVIGATION - TCAS - INSTALL TCAS HONEYWELL TPA-100B CHANGE 7.1 CAPABLE OF ATSAW
	Applicable to: MSN 02719-02789, 03031-03060, 05152-07792			
	P11588	34-1712 17	11 DEC 19	NAVIGATION - ATC - INSTALL "ACSS" ATC XS 950 P/N 7517800-10100 COMPLIANT WITH DO-260A
	Applicable to: MSN 02926-02944, 04392, 07784-07792			
	P11592		10 AUG 21	COMMUNICATION - COCKPIT VOICE RECORDER SUPPLY THE CVR 28VDC TO COMPLY WITH FAA REGULATION (FAR 25.14.57 (D) (5))
	Applicable to: MSN 04392-07792			
	P11614	31-1601 02	10 AUG 21	INDICATING/RECORDING SYSTEMS - EIS - INSTALL ENHANCED DU INSTEAD OF EIS2 LCDU
	Applicable to: MSN 07784-07792			

Continued on the following page

Continued from the previous page

M ⁽⁷⁾	CRITERION	Linked SB	Incorp. Date	Title
	P11620		10 AUG 21	INDICATING/RECORDING SYSTEMS - FWC - ACQUISITION/INTERFACE - ACTIVATE MONITORING OF ATC / XPDR
	Applicable to: MSN 05152-07792			
	P11744	27-1219 03	10 AUG 21	FLIGHT CONTROLS - SEC SYSTEM - INTRODUCE NEW SPOILER ELEVATOR COMPUTER (SEC) SOFTWARE STD 120 WITH HARD B'
	Applicable to: MSN 04392-07792			
	P11807	31-1372 10 31-1415 00 31-1433 01 31-1601 02	10 AUG 21	INDICATING/RECORDING SYSTEM ELECTRONIC INSTRUMENT SYSTEM (EIS) INSTALL NEW EIS2 SOFTWARE S9
	Applicable to: ALL			
	P11819	31-1373 00 31-1414 03	10 AUG 21	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) INSTALL FWC STANDARD H2-F6
	Applicable to: ALL			
R	P11844	46-1047 13 46-1121 19	12 JAN 22	RFC FIN091010D4610 - SA - INFORMATION SYSTEM - UPGRADE ATSU WITH FANS B+ APPLICATION
	Applicable to: MSN 02719-02789, 03031-03060, 05152-07792			
	P11856	22-1315 05	10 AUG 21	AUTO - FLIGHT FMGC: ACTIVATE NO AP DISCONNECTION BELOW MDA/MDH UNTIL MISSED APPROACH POINT
	Applicable to: ALL			
	P11935		12 JAN 22	NAVIGATION - WEATHER RADAR SYSTEM - INSTALL DUAL WEATHER RADAR RDR 4000 HONEYWELL
	Applicable to: MSN 05152-05746			
	P11955	31-1374 01	10 AUG 21	INDICATING/RECORDING SYSTEMS -GENERAL - SYSTEM DATA ACQUISITION CONCENTRATOR (SDAC) - INSTALL SDAC STANDARD H2-E3
	Applicable to: MSN 02155-03060, 05152-07792			
	P12034		17 AUG 22	AUTO FLIGHT - FLIGHT MANAGEMENT AND GUIDANCE COMPUTER (FMGC) - ACTIVATE AP/FD TCAS FUNCTION ON FMGC BY PIN PROGRAMMING
	Applicable to: MSN 07784-07792			
	P12060		10 AUG 21	AUTO FLIGHT - FMGC HONEYWELL REINSTALL FMGC CFM MOD 31896 (ANTI-MOD 38778)
	Applicable to: MSN 07784-07792			
	P12083		10 AUG 21	COMMUNICATIONS - COCKPIT VOICE RECORDER(CVR) - IMPROVE CVR/FDR RECORDING LOGIC INDEPENDENCE
	Applicable to: MSN 04392-07792			

Continued on the following page

PRELIMINARY PAGES

LIST OF MODIFICATIONS

Continued from the previous page

M ⁽¹⁾	CRITERION	Linked SB	Incorp. Date	Title
	P12092	22-1362 03	10 AUG 21	AUTOFLIGHT - FMGC INSTALL FMS THALES RELEASE 1A S6 (WITH FG C12) ON CFM A/C
Applicable to: MSN 02926-02944, 04392, 07784-07792				
	P12094		10 AUG 21	NAVIGATION - TRAFFIC AND TERRAIN - INTEGRATED SURVEILLANCE SYSTEM (T/TISS)ACTIVATE OBSTACLE FUNCTION
Applicable to: MSN 07784-07792				
	P12095		10 AUG 21	NAVIGATION -TRAFFIC AND TERRAIN - INTEGRATED SURVEILLANCE SYTEM (T/TISS) ACTIVATE ELEVVIEW FUNCTION
Applicable to: MSN 07784-07792				
	P12110		25 MAR 24	INDICATING/RECORDING SYSTEMS - UP AND DOWN DATA LOADING SYSTEM - Remove MDDU and install PDL connector on overhead panel (forward fit)
Applicable to: MSN 05152-07792				
	P12126		12 JAN 22	AUTO FLIGHT - FLIGHT AUGMENTATION COMPUTER - INSTALL FAC B0622 (SHARKLET PROJECT)
Applicable to: MSN 05746				
	P12127	27-1238 00	10 AUG 21	FLIGHT CONTROLS - ELEVATOR AILERON COMPUTER SYSTEM - INSTALL ELAC B L96 (SHARKLET PROJECT)
Applicable to: MSN 02155-03060, 05746-07792				
	P12171		10 AUG 21	NAVIGATION - WEATHER RADAR SYSTEM - INSTALL COLLINS SINGLE WEATHER RADAR CAPABLE OF PWS FUNCTION IN SINGLE CONFIG (WITH TRANSCEIVER -624)
Applicable to: MSN 05152-07792				
	P12172		20 AUG 25	NAVIGATION - WEATHER RADAR SYSTEM - INSTALL COLLINS MANUAL WXR-700X (-120) AND DEACT. PWS FUNCTION (ANTI MOD 26270)
Applicable to: MSN 05152-05746				
	P12173		10 AUG 21	NAVIGATION - WEATHER RADAR SYSTEM - INSTALL COLLINS MULTISCAN WXR IN FULL SINGLE CONFIG (WITH P/N -213) AND MULTISCAN FUNCTION ACTIVATED
Applicable to: MSN 07784-07792				
	P12301		12 JAN 22	COMMUNICATIONS - COCKPIT VOICE RECORDER - INSTALL CVR STANDARD L3-C P/N 2100-1025-02 (ANTI-MOD 150806 and 157368 and 159888)
Applicable to: MSN 05152-05746				

Continued on the following page

Continued from the previous page

M ⁽⁷⁾	CRITERION	Linked SB	Incorp. Date	Title
	P12367	73-1100 02	10 AUG 21	ENGINE FUEL AND CONTROL - FADEC SYSTEM - INSTALL ECU SOFTWARE STANDARD 5BS ON CFM56-5B ENGINES
	Applicable to: ALL			
	P12484		10 AUG 21	INDICATING/RECORDING SYSTEMS - SDAC - ACQUISITION/INTERFACE - REMOVE USELESS PIN PROGRAMMING ON SDAC (FWC H2-F5 INSTALLED)
	Applicable to: MSN 05746-07792			
	P12511		10 AUG 21	AUTO FLIGHT - GENERAL - AUTO FLIGHT - GENERAL ACTIVATE ROPS FUNCTION
	Applicable to: MSN 07792			
	P12697	31-1415 00 31-1433 01 31-1601 02	10 AUG 21	INDICATING/RECORDING SYSTEMS - Electronic Instrument System (EIS) - Introduce EIS2 Standard S10
	Applicable to: ALL			
	P12746		10 AUG 21	NAVIGATION - Traffic and Terrain Integrated Surveillance (T/TISS) - Install T3CAS corrective standard STD1-1
	Applicable to: MSN 07784-07792			
	P12753		10 AUG 21	AUTO-FLIGHT - FLIGHT AUGMENTATION COMPUTER (FAC) - INSTALL STANDARD FAC CAA02 (SHARKLETS CAPABILITY AND ROPS FUNCTION)
	Applicable to: MSN 07784-07792			
	P12909		10 AUG 21	NAVIGATION - AIR DATA/INERTIAL REFERENCE SYSTEM - Install ADIRU Honeywell OPS Software STD L4.2 (Vzbi evolution and hybrid FPA within Block III ADIRU)
	Applicable to: MSN 05746-07792			
	P12911	22-1359 05 22-1360 02	10 AUG 21	AUTO FLIGHT SYSTEM <i>i</i> FMGC <i>i</i> ACTIVATE "NO AP DISCONNECTION UPON PROFILE OR F-PLAN INVALIDATION IN FINAL DES MODE" FUNCTION BY PIN-PROGRAMMING
	Applicable to: MSN 02155-03060, 05152-07792			
	P12946		10 AUG 21	NAVIGATION - SENSORS, POWER SUPPLY AND SWITCHING - Define static probe monitoring on ground function on FWC/SDAC
	Applicable to: MSN 05746-07792			
	P12994		10 AUG 21	NAVIGATION - WEATHER RADAR SYSTEM - INSTALL COLLINS WXR CAPABLE MULTISCAN WITH TRANSCIVER WRT-2100 (P/N 822-1710-214)
	Applicable to: MSN 07784-07792			

Continued on the following page

PRELIMINARY PAGES

LIST OF MODIFICATIONS

Continued from the previous page

M ⁽¹⁾	CRITERION	Linked SB	Incorp. Date	Title
	P1302		11 APR 14	LANDING GEAR-POST EIS STANDARD 4 OF BSCU EQUIPMENT
	Applicable to: ALL			
	P13023	31-1414 03	10 AUG 21	INDICATING RECORDING SYSTEMS - FWC - Introduce FWC Standard H2-F7
	Applicable to: ALL			
	P1312		11 APR 14	LIGHTS-COCKPIT-INTEGRALLY LIGHTED PLACARD 25VU,ANTI ICE PART MODIFIED
	Applicable to: ALL			
	P13120		25 MAR 24	NAVIGATION - MMR - RE-INSTALL MMR COLLINS -121 (ANTI-MOD DUE TO MMR GLU-925 STANDARDIZATION) IN ORDER TO COME BACK TO HONEYWELL MMR
	Applicable to: MSN 05253-05746			
	P13210		10 AUG 21	NAVIGATION - TRAFFIC AND TERRAIN INTEGRATED SURVEILLANCE SYSTEM(T/TISS) - INSTALL ACSS T3CAS STD 1.2
	Applicable to: MSN 07784-07792			
	P13321		10 AUG 21	AUTO FLIGHT - FMGC - INTRODUCE FMS HONEYWELL PEGASUS II ASSOCIATED WITH FG 3G PC13
	Applicable to: MSN 07784-07792			
	P13357	22-1480 03	10 AUG 21	AUTO FLIGHT & FLIGHT AUGMENTATION COMPUTER (FAC) - DEFINE STOP RUDDER INPUT WARNING FUNCTION ON AIRCRAFT
	Applicable to: ALL			
	P13476		10 AUG 21	AUTO-FLIGHT - FLIGHT AUGMENTATION COMPUTER (FAC) - INSTALL FAC CAA03 STANDARD
	Applicable to: MSN 07784-07792			
	P13482	27-1251 01	10 AUG 21	FLIGHT CONTROLS - ELEVATOR AILERON COMPUTER SYSTEM (ELAC) - Install ELAC L98 STANDARD WITH DATA LOADING CAPABILITY
	Applicable to: MSN 04392-07792			
E	P13487	31-1492 00	10 AUG 21	INDICATING/RECORDING SYSTEMS - FWC - Install FWC H2-F8 for NEO EIS
1	Applicable to: ALL			
	P13507		10 AUG 21	AUTO FLIGHT - FLIGHT MANAGEMENT AND GUIDANCE COMPUTER - INSTALL FMGC S7PC13 THALES ON CFM AIRCRAFT
	Applicable to: MSN 07784-07792			
	P13619	27-1234 01 27-1243 01	10 AUG 21	FLIGHT CONTROLS - ELEVATOR AILERON COMPUTER SYSTEM (ELAC) - INSTALL L97

Continued on the following page

Continued from the previous page

M ⁽⁷⁾	CRITERION	Linked SB	Incorp. Date	Title
				STANDARD ON ELAC B WITH DATALOADING CAPABILITY
	Applicable to: MSN 04392-07792			
	P13630	31-1450 01	10 AUG 21	INDICATING/RECORDING SYSTEMS - SDAC ACQUISITION/INTERFACE - Install SDAC standard H2-E4
	Applicable to: MSN 02155-03060, 05152-07792			
	P13843	34-1712 17	10 AUG 21	NAVIGATION - ATC - INSTALL ACSS ATC XS-950 P/N 7517800-12401 COMPLIANT WITH DO-260B MANDATE
	Applicable to: MSN 02926-02944, 07784-07792			
	P1390		11 APR 14	ELECTRICAL GENERATION-BCL'S CHANGE
	Applicable to: ALL			
	P13937	31-1433 01 31-1601 02	10 AUG 21	INDICATING/RECORDING SYSTEMS - ELECTRONIC INSTRUMENT SYSTEM (EIS) - INTRODUCE EIS2 STANDARD S11
	Applicable to: ALL			
	P14131		10 AUG 21	AUTO FLIGHT - FLIGHT MANAGEMENT AND GUIDANCE - INSTALL FMGC S7APC13 THALES ON CFM A/C
	Applicable to: MSN 07784-07792			
R	P14155	34-1595 26 34-1630 19	10 AUG 21	NAVIGATION - ATC/MODE S (SELECT) - ACTIVATE ADS-B OUT DO-260B CAPABILITY FOR ATC TRANSPONDEUR
	Applicable to: MSN 02155-03060, 05152-07792			
	P14160		10 AUG 21	NAVIGATION - TRAFFIC AND TERRAIN INTEGRATED SURVEILLANCE SYSTEM (T/TISS) - Install ACSS T3CAS std 2 P/N 9005000-11203 capable DO-260B and ROPS
	Applicable to: MSN 07784-07792			
	P14161		10 AUG 21	NAVIGATION - WEATHER RADAR SYSTEM - INSTALL COLLINS WXR SYSTEM WITH HAZARD FUNCTION (P/N 822-1710-411) IN FULL SINGLE CONFIGURATION
	Applicable to: MSN 07784-07792			
	P1450		11 APR 14	NAVIGATION - ATC MODE "S" - ACTIVATION OF SELECTIVE INTERROGATION FUNCTION
	Applicable to: ALL			
	P14510	27-1243 01	10 AUG 21	FLIGHT CONTROLS - ELEVATOR AILERON COMPUTER SYSTEM (ELAC) - INSTALL ELAC B L97+ WITH DATA LOADING CAPABILITY
	Applicable to: MSN 04392-07792			

Continued on the following page

PRELIMINARY PAGES
LIST OF MODIFICATIONS
Continued from the previous page

M ⁽¹⁾	CRITERION	Linked SB	Incorp. Date	Title
R	P14582	34-1692 09 34-1712 17 34-1720 05 34-1763 19	10 AUG 21	NAVIGATION - ATC/MODE S (SELECT) - Configure DO-260B TRANSPONDER ATC 1
Applicable to: MSN 02155-03060, 05152-07792				
R	P14628	31-1482 07 31-1601 02	10 AUG 21	INDICATING/RECORDING SYSTEMS - ELECTRONIC INSTRUMENT SYSTEM (EIS) - INTRODUCE EIS2 S12 STANDARD
Applicable to: ALL				
E	P14629	31-1492 00	10 AUG 21	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC H2-F8P FOR A320NEO PW TC
2	Applicable to: ALL			
	P14708	73-1103 00	10 AUG 21	ENGINE FUEL AND CONTROL - FADEC SYSTEM - INTRODUCE ECU SOFTWARE "5BTF3" ON CFM56-5B ENGINES
Applicable to: MSN 05746-07792				
	P14762	71-1068 01	10 AUG 21	POWER PLANT - FAN COWL DOORS - INTRODUCE IMPROVED FAN COWL DOOR LATCH WITH KEY & FLAG ON CFM56-5A/5B ENGINE
Applicable to: MSN 02155-02719, 02789-03060, 05152-07792				
R	P14825	31-1482 07 31-1601 02	10 AUG 21	INDICATING/RECORDING SYSTEM - EIS - INTRODUCE EIS2 S13 STANDARD
Applicable to: ALL				
E	P14826	31-1492 00	10 AUG 21	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC H2-F9 STANDARD
3	Applicable to: ALL			
	P1485		11 APR 14	ELECTRICAL POWER-"BAT OFF"INDICATOR LIGHT POWER SOURCE MODIFIED
Applicable to: ALL				
	P14947		10 AUG 21	AUTO FLIGHT - FMGC - INSTALL FMGC HONEYWELL STANDARD H2BPC15 FOR NEO CONFIGURATION - A320 CFM
Applicable to: MSN 07784-07792				
	P15119		10 AUG 21	AUTO FLIGHT - FLIGHT MANAGEMENT AND GUIDANCE COMPUTER - INTRODUCE THALES FMGC S7APC14 ON CFM AIRCRAFT
Applicable to: MSN 07784-07792				
R	P15322	34-1692 09 34-1712 17 34-1720 05	10 AUG 21	NAVIGATION - ATC/MODE S (SELECT) - RE-ACTIVATE THE TRANSPONDER MONITORING ON SDAC / FWC

Continued on the following page

Continued from the previous page

M ⁽⁷⁾	CRITERION	Linked SB	Incorp. Date	Title
		34-1763 19		
	Applicable to: MSN 02155-03060, 05152-07792			
	P15557		10 AUG 21	AUTO FLIGHT - FMGC - INSTALL FMGC THALES STANDARD S7APC15 FOR NEO CONFIGURATION - A320 CFM
	Applicable to: MSN 07784-07792			
	P15706		10 AUG 21	AUTO FLIGHT - FMGC MANAGE FMGC S HONEYWELL CFM STARTING FROM H2BPC15 TO GO BACK TO THALES BRANCH (ANTI-MOD)
	Applicable to: MSN 07784-07792			
	P15825		10 AUG 21	NAVIGATION - AIR DATA - Install and define reversible Back-Up Speed Scale function
	Applicable to: MSN 07784-07792			
	P15826		20 AUG 25	INDICATING/RECORDING SYSTEM - DMC - Activate reversible Back-Up Speed Scale (BUSS) through push button function (UAMM 1.1) by pin programming
	Applicable to: MSN 07784-07792			
	P15872		10 AUG 21	AUTO-FLIGHT - FLIGHT AUGMENTATION COMPUTER (FAC) - INSTALL FAC CAA06
	Applicable to: MSN 07784-07792			
E	P15991	31-1492 00	10 AUG 21	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC H2-F9C STANDARD
4	Applicable to: ALL			
E	P15992	31-1492 00	10 AUG 21	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC H2-F9D
5	Applicable to: ALL			
	P1631		11 APR 14	NAVIGATION - MODIFY GPWC WARNINGS
	Applicable to: ALL			
	P1752		11 APR 14	HYDRAULICS-MODIFICATION OF ELECTRICAL ROUTING OF GREEN LEAKAGE MEASUREMENT ELECTROVALVE CONTROL
	Applicable to: ALL			
	P1850		11 APR 14	FLIGHT CONTROLS-ELAC SYSTEM-EFCS ELAC -SOFTWARE L62
	Applicable to: ALL			
	P1872		01 JUL 14	AIR CONDITIONING-INSTALLATION OF CIRCUIT BREAKER FOR REAR CARGO COMPARTMENT VALVE SUPPLY
	Applicable to: MSN 02155-02789, 03031-04392, 07784-07792			

Continued on the following page

PRELIMINARY PAGES
LIST OF MODIFICATIONS
Continued from the previous page

M ⁽¹⁾	CRITERION	Linked SB	Incorp. Date	Title
	P1873		12 JAN 22	AIR CONDITIONING-ESSENTIAL DC SUPPLY FOR FORWARD CARGO COMPARTMENT SHUT-OFF VALVES
Applicable to: MSN 05152-05746				
	P1874		12 JAN 22	AIR CONDITIONING-ESSENTIAL DC SUPPLY FOR FORWARD CARGO COMPARTMENT HEATING CONTROLLER
Applicable to: MSN 05152-05746				
	P1875		01 JUL 14	AIR CONDITIONING-ESSENTIAL DC SUPPLY FOR REAR CARGO COMPARTMENT HEATING CONTROLLER
Applicable to: MSN 02155-02789, 03031-04392				
	P1883		11 APR 14	FLIGHT CONTROLS-FCDC L 40
Applicable to: ALL				
	P1906		01 JUL 14	ENGINES FUEL AND CONTROL-EIU FOR CFMI POWERPLANT (SOFTWARE VERSION 11)
Applicable to: ALL				
	P1970	23-1396 01 23-1719 06	11 APR 14	COMMUNICATIONS-INSTALL HF1 IN EMERGENCY CONFIG. (ETOPS)
Applicable to: ALL				
	P20095		10 AUG 21	COMMUNICATIONS - COCKPIT VOICE RECORDER - Install new L3COM CVR to remove Larsen Noise during CVR test
Applicable to: MSN 07784-07792				
	P20249		10 AUG 21	AUTO FLIGHT - GENERAL - Deactivate ROPS function
Applicable to: MSN 07792				
	P2040		11 APR 14	OXYGENE-COCKPIT-MODIFY LP VALVE
Applicable to: ALL				
	P2196		11 APR 14	BATCH OF MINOR IMPROVEMENTS OF SERIES A/C DESIGN (AS ZONE) FROM A/C N 268
Applicable to: ALL				
	P2205		11 APR 14	FIRE PROTECTION - REPLACE ENGINE/APU FIRE PANEL
Applicable to: ALL				
	P2218		11 APR 14	NAVIGATION - TCAS II COMPLETE PROVISIONS
Applicable to: ALL				
	P2223		11 APR 14	NAVIGATION - INSTALLATION OF GPWC MARK V WITH INTERFACE WITH CFDS
Applicable to: ALL				
	P2294		01 JUL 14	ENGINE FUEL AND CONTROL - CFM 56 POWERPLANT EIU VERSION 12
Applicable to: ALL				

Continued on the following page

Continued from the previous page

M ⁽⁷⁾	CRITERION	Linked SB	Incorp. Date	Title
	P2316		11 APR 14	AUTOFLIGHT - ACTIVATE WINDSHEAR FUNCTION
	Applicable to: ALL			
	P2336		27 APR 15	NAVIGATION - INSTALL DDRMI COLLINS 743 P/N 622.5001.503
	Applicable to: MSN 02719-02789, 03031-03060			
	P2493		11 APR 14	COCKPIT - INSTALL A340 TYPE PILOT SEATS
	Applicable to: ALL			
	P2546		11 APR 14	INDICATING/RECORDING SYSTEMS - INSTRUMENTS - DEFINE SDAC STANDARD FOR A321 COF A
	Applicable to: ALL			
	P2547		01 JUL 14	INDICATING/RECORDING SYSTEMS - INSTRUMENTS - DEFINE DMC STANDARD FOR A321 COF A
	Applicable to: ALL			
	P2590		27 APR 15	NAVIGATION - INSTALL A TCAS II COLLISION AVOIDANCE SYSTEM
	Applicable to: MSN 02719-02789, 03031-07792			
	P2650		27 APR 15	ICE AND RAIN DETECTION - DUAL ADVISORY - ICE DETECTION SYSTEM INSTALLATION
	Applicable to: MSN 02719-02789, 03031-04392			
	P2859		17 AUG 15	NAVIGATION - INSTALL A TCAS II COLLISION AVOIDANCE SYSTEM (HONEYWELL)
	Applicable to: MSN 02926-02944, 04392, 07784-07792			
	P2878		01 JUL 14	INDICATING RECORDING SYSTEM - SDAC - DEFINE A PIN PROGRAM FOR REAR C.C. VENTILATION
	Applicable to: MSN 02155-02789, 03031-04392, 07784-07792			
	P2879		12 JAN 22	INDICATING RECORDING SYSTEM - SDAC - DEFINE A PIN PROGRAM FOR FWD C.C VENTILATION
	Applicable to: MSN 05152-05746			
	P2960		17 AUG 15	CERTIFICATION DOCUMENTS - GENERAL - CERTIFICATION FOR TAKING OFF WITH 15 KNOT TAILWING
	Applicable to: MSN 02926-02944			
	P2963		11 APR 14	AIR CONDITIONING - IMPROVE CABIN PRESSURIZATION CONTROL ON 25VU -
	Applicable to: ALL			
	P3004		11 APR 14	LIGHTS-COCKPIT LIGHTING-IMPROVE COCKPIT LIGHTING
	Applicable to: ALL			
	P3011		11 APR 14	FMS - FMS CROSS LOAD
	Applicable to: ALL			

Continued on the following page

PRELIMINARY PAGES

LIST OF MODIFICATIONS

Continued from the previous page

M ⁽¹⁾	CRITERION	Linked SB	Incorp. Date	Title
	P3044		11 APR 14	NAVIGATION - ADAPT SHELVES FOR INSTALLATION OF 4MCUADIRS -
Applicable to: ALL				
	P3102		11 APR 14	AUTO FLIGHT - FCU-CPIP1 STANDARD
Applicable to: ALL				
	P3105		01 JUL 14	ENGINE FUEL AND CONTROL - CFM 56 - EIU VERSION 13
Applicable to: ALL				
	P3112		01 JUL 14	NAVIGATION - INSTALLATION OF TCAS II COLLINS SYSTEM
Applicable to: MSN 02155-02212				
	P3197		27 APR 15	GENERAL - OPERATION FROM HIGH ALTITUDE AIRPORTS (CFM ENGINES) (PRESSURE ALTITUDE LIMIT 9200 FT)
Applicable to: MSN 02719-02789, 03031-03060, 07784-07792				
	P3202		11 APR 14	AUTOFLIGHT - FCU - CPIP 2 STANDARD M10
Applicable to: ALL				
	P3204		01 JUL 14	AUTO FLIGHT - FMGC - A320/A321 STANDARD WITH SOFTWARE OPTIONS + 400 KILOWORDS DATA BASE OPTION + ACARS HARDWARE PROVISION (B1 CFM VERSION)
Applicable to: ALL				
	P3365		11 APR 14	ICE PROTECTION - ICING INDICATOR ILLUMINATION
Applicable to: ALL				
	P3379		11 APR 14	INDICATING/RECORDING SYSTEMS - GENERAL - DEFINE PIN PROGRAMMING FOR STD VERSIONS
Applicable to: ALL				
	P3401		12 JAN 22	AUTOFLIGHT - FCU - DELETE "EXPEDITE" FUNCTION FROM FCU
Applicable to: MSN 05152-05746				
	P3420		22 MAR 16	A320/321 ENERGY MANAGEMENT FUNCTIONS - ACTIVATION BY PIN PROGRAMMING FOR IAE AND CFM ENGINES
Applicable to: ALL				
	P3510		11 APR 14	NAVIGATION - ADIRS - IMPROVED STANDARD OF A320 ADIRU
Applicable to: ALL				
	P3511		11 APR 14	AUTO FLIGHT - FLIGHT AUGMENTATION - AFS COMPUTER A320/A321 FAC CFM/IAE
Applicable to: ALL				

Continued on the following page

Continued from the previous page

M ⁽⁷⁾	CRITERION	Linked SB	Incorp. Date	Title
	P3524		11 APR 14	ELECTRICAL GENERATION - APU GENERATOR NEW STANDARD
	Applicable to: ALL			
	P3560		04 SEP 18	AUTO FLIGHT - FMGC - PROVIDE TIME CONSTRAINT AND TEN CHARACTERS RTE IDENT FUNCTIONS
	Applicable to: ALL			
	P3565		04 SEP 18	NAVIGATION - INSTALLATION OF COLLINS TCAS II (-320) UPGRADED WITH CHANGE 6.04A
	Applicable to: MSN 02155-02212			
	P3588		11 APR 14	LANDING GEAR - A320/A321 TWIN WHEELS BSCU STANDARD 7 (70B VERSION)
	Applicable to: ALL			
	P3594		11 APR 14	INDICATING/RECORDING SYSTEMS - ELECTRICAL CLOCK - INSTALLATION OF A CLOCK SMITHS TYPE 2610
	Applicable to: ALL			
	P3660		11 APR 14	FLIGHT CONTROLS - EFCS EQUIPMENT - MODIFY SEC STANDARD FOR A320 AND A321
	Applicable to: ALL			
	P3686		11 APR 14	AUTO FLIGHT: FLIGHT AUGMENTATION COMPUTER INTRODUCE FAC POST CDN ON A320/321.
	Applicable to: ALL			
	P3694		01 JUL 14	AUTO FLIGHT-FMGC-A320/321-FG STANDARD FOR A321 CFM CAT III
	Applicable to: ALL			
	P3737		04 SEP 18	ENGINE FUEL AND CONTROL-FUNCTIONAL INTERFACES- INTRODUCE A NEW EIU VERSION 14 ON CFM56 ENGINES
	Applicable to: ALL			
	P3752		04 SEP 18	NAVIGATION- SWITCHING AND INDICATING-INSTALL RMI/VOR/DME SEXTANT WITH SOFTWARE MODIFICATION.
	Applicable to: ALL			
	P3756		27 APR 15	AUTO FLIGHT - GENERAL - EXTEND CAT III B AUTOMATICLANDING CAPABILITY (FOR CFM ENGINES)
	Applicable to: MSN 02719-02789, 03031-03060			
	P3790		11 APR 14	NAVIGATION-IRS-IMPROVED STANDARD OF HONEYWELL 4 MCU ADIRU
	Applicable to: ALL			

Continued on the following page

PRELIMINARY PAGES

LIST OF MODIFICATIONS

Continued from the previous page

M ⁽¹⁾	CRITERION	Linked SB	Incorp. Date	Title
	P3830		11 APR 14	FLIGHT CONTROLS-PARTIAL LIFT DUMPING FUNCTION ACTIVATION
Applicable to: ALL				
	P3957		20 SEP 16	ATA 2900 HYDRAULIC POWER-GENERAL INSTALL AN HYDRAULIC SHUT-OFF VALVE ON THE CFM THRUST REVERSER SYSTEM
Applicable to: ALL				
	P3964		11 APR 14	NAVIGATION-WEATHER RADAR SYSTEM-NEW SEXTANT ATC/TCAS CONTROL PANEL -SFE WITH FULL TIME AND ABOVE BELOW FUNCTIONS
Applicable to: ALL				
	P4017		10 AUG 21	NAVIGATION - ADIRS - INSTALLATION OF ADIRS LITTON 4MCU ON A320
Applicable to: MSN 02926-02944				
	P4054		11 APR 14	AUTOFLIGHT-FCU-INSTALL M11 STANDARD
Applicable to: ALL				
	P4055		12 JAN 22	AUTOFLIGHT-FCU-INSTALL M11 STANDARD WITH EXPEDITE FUNCTION DELETED
Applicable to: MSN 05152-05746				
	P4087		11 APR 14	NAVIGATION-ADIRS-INSTALL HONEYWELL ADIRS PROVIDING THE GPS PRIMARY NAVIGATION CAPABILITY
Applicable to: ALL				
	P4089		11 APR 14	AUTO-FLIGHT - FMGC - REDUCE VAPP FOR A320 CFM/IAE
Applicable to: ALL				
	P4099		23 AUG 23	COMMUNICATIONS - RADIO MANAGEMENT - INSTALL A NEW STANDARD RMP3 (DEGRE) WITH VHF SPACING 8, 33KHZ
Applicable to: MSN 02155-02789, 03031-07792				
	P4121		11 APR 14	EXHAUST - THRUST REVERSER CONTROL AND INDICATING -ACTIVATE ADDITIONAL THRUST REVERSER LOCK CONTROL
Applicable to: ALL				
	P4151		11 APR 14	INDICATING/RECORDING SYSTEMS - UP AND DOWN DATA LOADING SYSTEM - INSTALL A "PORTABLE DATA LOADER" CONNECTOR AND DISK STOWAGE.
Applicable to: ALL				
	P4155		11 APR 14	AUTOFLIGHT - FLIGHT MANAGEMENT AND GUIDANCE COMPUTER - ACTIVATION OF ACARS

Continued on the following page

Continued from the previous page

M ⁽⁷⁾	CRITERION	Linked SB	Incorp. Date	Title
				AND PRINTER INTERFACES IN F.M.S (CFM ENGINES)
	Applicable to: ALL			
	P4170		11 APR 14	FLIGHT CONTROLS - FCDC - PROVIDE A VISUAL INDICATION FOR SIMULTANEOUS SIDE STICK ACTION
	Applicable to: ALL			
	P4191		11 APR 14	NAVIGATION AND COMMUNICATIONS REPLACE BFE EQUIPMENT BY SFE EQUIPMENT
	Applicable to: ALL			
	P4205		11 APR 14	AUTOFLIGHT - FMGC - ACTIVATE PRINTER INTERFACE IN FMS (CFM AND IAE ENGINES)
	Applicable to: ALL			
	P4230		01 JUL 14	POWER PLANT-GENERAL INTRODUCTION OF CFM56-5B/P
	Applicable to: ALL			
	P4234		11 APR 14	ICE AND RAIN PROTECTION-WINDSHIELD RAIN PROTECTION DESACTIVATION OF RAIN REPELLENT SYSTEM.
	Applicable to: ALL			
	P4271		12 JAN 22	NAVIGATION - RMI - INSTALLATION OF VOR/ADF/DDRMI (SEXTANT) P/N 63543-253-2
	Applicable to: MSN 05152-05746			
	P4281		01 JUL 14	ENGINE FUEL AND CONTROL-CONTROLLING INTRODUCE OF A NEW ECU SOFTWARE STANDARD 5BE-1 FOR CFM56-5B SAC ENGINES
	Applicable to: ALL			
	P4287	31-1264 04	11 APR 14	INDICATING-RECORDING SYSTEM FWC DEFINE OEB REMINDER NEW FUNCTION IN FWC
	Applicable to: ALL			
	P4319		11 APR 14	AUTO FLIGHT/FCU DEFINE FD ENGAGEMENT IN CROSSED BARS AT GO AROUND
	Applicable to: ALL			
	P4320		11 APR 14	AUTO FLIGHT - ACTIVATE GLOBAL SPEED PROTECTION AND FD DISENGAGEMENT UPON SPEED CONDITIONS
	Applicable to: ALL			
	P4417		04 SEP 18	ELECTRICAL POWER - IMPROVE DESIGN OF TRU INSTALLATION ON A/C TO AVOID TRANSFORMER RECTIFIER MISBEHAVIOUR
	Applicable to: ALL			

Continued on the following page

PRELIMINARY PAGES

LIST OF MODIFICATIONS

Continued from the previous page

M ⁽¹⁾	CRITERION	Linked SB	Incorp. Date	Title
	P4495		04 SEP 18	INDICATING/RECORDING SYSTEMS- DISPLAY MANAGEMENT COMPUTER (DMC) DEFINE DMC V32 STANDARD
Applicable to: ALL				
	P4497		11 APR 14	DOORS-EMERGENCY ESCAPE SLIDE RELEASE AND OVERPRESSURE WARNING SYSTEMS-MODIFY CONTROL LOGIC OF THE OVERPRESSURE WARNING SYSTEM
Applicable to: ALL				
	P4502		11 APR 14	INFORMATION SYSTEMS - ATIMS - INSTALL ATSU COMPUTER FOR PRE-FANS CONFIGURATION
Applicable to: ALL				
	P4528		01 JUL 14	ENGINE FUEL AND CONTROL -CONTROLLING-INTRODUCE AN ECU SOFTWARE STD 5BH FOR CFM56-5B SAC ENGINES.
Applicable to: ALL				
	P4539		11 APR 14	AUTO FLIGHT-GENERAL/FLIGHT CONTROL UNIT- DEFINE AND INSTALL SEXTANT MODULAR FCU
Applicable to: ALL				
	P4576		27 APR 15	LANDING GEAR-GENERAL WHEELS AND BRAKES EQUIPMENT COST REDUCTION ELECTRICAL ALTERNATE BRAKING
Applicable to: MSN 02719-07792				
	P4613	23-1396 01 23-1719 06	22 MAR 17	COMMUNICATIONS - HF SYSTEM - INSTALL ONE ALLIED SIGNAL HF VOICE SYSTEM
Applicable to: MSN 02719-02789, 03031-03060, 05152-07792				
	P4642		11 DEC 19	NAVIGATION - WETAHER RADAR SYSTEM - ACTIVATE DUAL PREDICTIVE WINDSHEAR FUNCTION
Applicable to: MSN 04392-05746				
	P4647		27 APR 15	NAVIGATION - WEATHER RADAR SYSTEM - COLLINS DUAL PWS ACTIVATOR
Applicable to: MSN 02719-04392				
	P4682		11 DEC 19	NAVIGATION - WEATHER RADAR SYSTEM - ALLIED SIGNAL CONFIGURATION WITH ALLIED SIGNAL FULL PROVISION FOR THE SECOND TRANSCEIVER
Applicable to: MSN 04392-05746				
	P4697		11 DEC 19	NAVIGATION - INSTALL SEXTANT ATC/TCAS CONTROL PANEL P/N C124-02-AA01
Applicable to: MSN 04392				

Continued on the following page

Continued from the previous page

M ⁽¹⁾	CRITERION	Linked SB	Incorp. Date	Title
	P4706		22 MAR 16	NAVIGATION - ADF - INSTALLATION OF 1 ADF QUANTUM LINE P/N 066-50014-0202
	Applicable to: MSN 02719-02789, 03031-03060, 05152-05746			
	P4709		17 AUG 15	LANDING WITH A 15 KNOT TAILWIND
	Applicable to: MSN 02926-02944			
	P4766		11 APR 14	NAVIGATION - SINGLE PWS - COLLINS SINGLE PWS ACTIVATION
	Applicable to: MSN 02155-02212, 05152-07792			
	P4770		11 APR 14	NAVIGATION - WEATHER RADAR SYSTEM. INSTALL FULL PROVISION FOR THE SECOND TRANSCEIVER.
	Applicable to: MSN 02155-05746			
	P4773		01 JUL 14	NAVIGATION - INSTALL DUAL COLLINS ADF 700 - P/N 622-5222-020
	Applicable to: MSN 02155-02789, 03031-03060			
	P4789		11 APR 14	NAVIGATION-MMR-INSTALLATION OF SEXTANT MULTICI-MODE RECEIVERS PROVIDING ILS (FM IMMUNE) AND GPS PRIMARY FUNCTION
	Applicable to: ALL			
	P4801		27 APR 15	ELECTRICAL POWER - GENERATION SYSTEM - DEFINE AND INSTALL ON A320 FAMILY NEW ELECTRICAL GENERATION CONCEPT (WIRING/EQUIPMENT)
	Applicable to: MSN 02719-07792			
	P4808		11 APR 14	LANDING GEAR - GENERAL - WHEELS AND BRAKES - EQUIPMENT COST REDUCTION BSCU REDESIGN
	Applicable to: ALL			
	P4859		22 MAR 16	NAVIGATION - ADF - INSTALL AN ADF 900 RECEIVER P/N 822-0299-020
	Applicable to: ALL			
	P4867		22 MAR 17	NAVIGATION - EGPWS - INSTL. NEW SPECIFICATION INSTALLATION OF EGPWC (NEW SPECIFICATION)
	Applicable to: ALL			
	P4885		11 APR 14	NAVIGATION - EGPWS - ACTIVATION OF ENHANCED FUNCTIONS OF THE EGPWS
	Applicable to: ALL			
	P4906		25 MAR 24	NAVIGATION - WEATHER RADAR SYSTEM - INSTALL 2ND WEATHER RADAR TRANSCEIVER
	Applicable to: MSN 04392			
	P4916		11 APR 14	FLIGHT CONTROL - GENERAL - ELAC-SYSTEM - INSTALL ELAC COMPATIBLE A320/321/319 (EM2 PROGRAM)
	Applicable to: ALL			

Continued on the following page

PRELIMINARY PAGES

LIST OF MODIFICATIONS

Continued from the previous page

M ⁽¹⁾	CRITERION	Linked SB	Incorp. Date	Title
	P4954		01 JUL 14	AUTO FLIGHT - FMGC - DEFINE AND INSTALL FMGC B546CAM0102 FOR A319 AUTOLAND CFM ENGINES (CAPABLE OF GPS/ACARS FUNCTION)
	Applicable to: ALL			
	P4977	31-1264 04	11 APR 14	INDICATING/RECORDING SYSTEMS - FWC - PROVIDE NEW SYNTHETIC VOICE "DUAL INPUT"
	Applicable to: ALL			
	P4983		11 APR 14	AUTO FLIGHT - FLIGHT AUGMENTATION - DEFINE FAC STANDARD B0513
	Applicable to: ALL			
	P5008		20 AUG 25	COMMUNICATIONS - RADIO MANAGEMENT - INSTALL TWO RMP COST REDUCTION EQUIPMENT PRODUCT IMPROVEMENT
	Applicable to: ALL			
	P5066		04 SEP 18	PNEUMATIC-ENGINE BLEED AIR SYSTEM-INTRODUCE AN IMPROVED DEFINITION OF TLT
	Applicable to: ALL			
	P5071		11 APR 14	ICE AND RAIN PROTECTION-WINDSHIELD RAIN PROTECTIONREACTIVATE RAIN REPELLENT SYSTEM WITH FLUID COMPATIBLE WITH OZONE PROTECTION RULES
	Applicable to: ALL			
	P5138		11 APR 14	FLIGHT CONTROLS-GENERAL-ELAC SYSTEM-INSTALL ELAC STANDARD L80
	Applicable to: ALL			
	P5168		11 APR 14	NAVIGATION-MMR-INSTALLATION OF COLLINS MULTI-MODE RECEIVERS PROVIDING ILS (FM IMMUNE) AND GPS PRIMARY FUNCTION
	Applicable to: ALL			
	P5175		20 AUG 25	COMMUNICATIONS - AUDIO MANAGEMENT - INSTALL SENNHEISER HEADSET HD45K P/N : 045-260-011
	Applicable to: MSN 02719-02789, 03031-03060			
	P5201		11 DEC 19	NAVIGATION-ATC/TCAS-INSTALL SEXTANT ATC/TCAS CONTROL UNIT P/N C12402AA02
	Applicable to: MSN 04392			
	P5239		11 APR 14	NAVIGATION-ATC MODE "S"-INSTALL ATC/TCAS CONTROL UNIT P/N C12240B02
	Applicable to: ALL			

Continued on the following page

Continued from the previous page

M ⁽⁷⁾	CRITERION	Linked SB	Incorp. Date	Title
	P5241		11 APR 14	NAVIGATION-WEATHER RADAR SYSTEMS-INSTALL COLLINS SINGLE WITH PROVISION FOR THE SECOND SYSTEM
	Applicable to: ALL			
	P5253		11 DEC 19	NAVIGATION ADIRS REMOVE ADIRS CDU
	Applicable to: MSN 04392-07792			
	P5314		11 APR 14	AUTO FLIGHT - GENERAL - MULTIPURPOSE CONTROL AND DISPLAY UNIT (MCDU) - INSTALL MCDU HONEYWELL 2ND GENERATION P/N : 4077880-980
	Applicable to: ALL			
	P5429		01 JUL 14	ENGINE FUEL AND CONTROL - GENERAL FADEC SYSTEM A320/CFM56-5B - INTRODUCE ECU SOFTWARE STANDARD 5BI
	Applicable to: ALL			
	P5451		11 APR 14	ELECTRICAL POWER - GENERAL AC & DC MAIN DISTRIBUTION - INSTALL A/C AND DC SHEDDABLE BUSBARS
	Applicable to: ALL			
	P5459		11 APR 14	POWER PLANT - GENERAL - ADD RELAY LOGIC FOR CONTROL PACK CLOSURE AT ENGINE START
	Applicable to: ALL			
	P5465		11 APR 14	INDICATING/RECORDING SYSTEMS - ELECTRICAL CLOCKS - INSTALL AIR PRECISION P/N APE5100-1 CAPABLE OF GPS TIME
	Applicable to: ALL			
	P5486		17 AUG 15	AUTO FLIGHT - MULTIPURPOSE CONTROL AND DISPLAY UNIT (MCDU) - INSTALL MCDU SEXTANT 2ND GENERATION P/N C19266AA01
	Applicable to: MSN 02926-02944, 04392, 07784-07792			
	P5567		11 APR 14	INDICATING/RECORDING SYSTEM - DMC - DEFINE DMC V40 STANDARD
	Applicable to: ALL			
	P5583		11 APR 14	NAVIGATION - ADIRS - REDUCED VERTICAL SEPARATION MINIMUM (RVSM) USING ADR 1 AND ADR 2 ONLY (A319/A320/A321 APPLICABLE)
	Applicable to: ALL			
R	P5586	32-1384 51	22 MAR 16	LANDING GEAR - BRAKE COOLING - INSTALL UNIVERSAL BRAKE COOLING FAN ON ALL AIRCRAFT FAMILIES
	Applicable to: ALL			

Continued on the following page

PRELIMINARY PAGES

LIST OF MODIFICATIONS

Continued from the previous page

M ⁽¹⁾	CRITERION	Linked SB	Incorp. Date	Title
	P5591		20 AUG 25	NAVIGATION - MMR - INSTALL SEXTANT MMR (WITH ADIRUHNW) PROVIDING ILS (FM IMMUNE) AND GPS PRIMARY FUNCTION (HYBRID)
Applicable to: MSN 02155-02212				
	P5613		01 JUL 14	NAVIGATION - TCAS - INSTALL COLLINS TCAS TTR921 WITH COLLINS ATC TPR901
Applicable to: MSN 02155-02212				
	P5622		27 APR 15	AUTO FLIGHT - MCDU - INSTALL AN MCDU 2ND GENERATION HONEYWELL FMS (MCDU WITH A340 KEYBOARD)
Applicable to: MSN 02719-02789				
	P5638		11 APR 14	NAVIGATION - STANDBY DATA : ALTITUDE AND HEADING -INSTALL ISIS (INTEGRATED STANDBY INSTRUMENT SYSTEM) - SERIAL SOLUTION -
Applicable to: ALL				
	P5669		27 APR 15	NAVIGATION - TCAS - INSTALL ALLIED SIGNAL TCAS COMPUTER P/N 066-50000-2220 (WITH CHANGE 7.0) (BFE)
Applicable to: MSN 02719-02789, 03031-07792				
	P5685		11 DEC 19	COMMUNICATIONS - AUDIO MANAGEMENT - INSTALL SATCOM AMU AND ACP
Applicable to: MSN 04392				
	P5698		11 DEC 19	NAVIGATION - WEATHER RADAR SYSTEM - INSTALL ALLIED SIGNAL WEATHER RADAR TRANSCEIVER P/N 066-50008-0405
Applicable to: MSN 04392-05746				
	P5706	31-1257 01	11 APR 14	INDICATING/RECORDING SYSTEMS- FLIGHT WARNING COMPUTER (FWC) INSTALL FWC STD H2/E3
Applicable to: ALL				
	P5711		04 SEP 18	PNEUMATIC - ENGINE BLEED AIR SYSTEM - INSTALL TLT P/N 341E030000
Applicable to: ALL				
	P5726		01 JUL 14	NAVIGATION - MMR - INSTALL SEXTANT MMR PROVIDING ILS (FM IMMUNE) P/N TLS755-01-0101B
Applicable to: MSN 02155-02212				
	P5768		11 APR 14	ELECTRICAL POWER - AC EMERGENCY GENERATION - ACTIVATE ON A320 SAME ELECTRICAL EMERG. CONFIGURATION THAN A321
Applicable to: ALL				

Continued on the following page

Continued from the previous page

M ⁽⁷⁾	CRITERION	Linked SB	Incorp. Date	Title
	P5895		11 APR 14	NAVIGATION-GPWS-INSTALL EGPWS P/N-206-206 & INHIBIT AUTOMATIC DEACTIVATION OF ENHANCED FUNCTIONS.
	Applicable to: ALL			
	P5981		27 APR 15	ICE AND RAIN PROTECTION - GENERAL - ICE DETECTION INSTALL ICE DETECTOR P/N 0871DP4
	Applicable to: MSN 02719-02789, 03031-04392			
	P6030		05 SEP 17	ELECTRICAL POWER - AC GENERATION - INSTALL ELECTRICAL OUTLETS IN COCKPIT
	Applicable to: MSN 02719-07792			
	P6054		01 JUL 14	NAVIGATION - MMR - SEXTANT MMR - ACTIVATE GPS PRIMARY FUNCTION (HYBRID) (WITH HONEYWELL OR LITTON ADIRU)
	Applicable to: MSN 02155-02212			
R	P6071	31-1132 69	01 JUL 14	INDICATING/RECORDING SYSTEMS - DMC - DISPLAY THE ALTITUDE IN METRES ON THE PRIMARY FLIGHT DISPLAY (PFD)
	Applicable to: MSN 02155-03060			
	P6142		11 APR 14	NAVIGATION -STANDBY BY DATA-ATTITUDE AND HEADING-COMPLETE PROVISIONS FOR ISIS ELECTRICAL SUPPLY
	Applicable to: ALL			
	P6146		11 APR 14	INDICATING/RECORDING SYSTEM - FWC - INTRODUCE "F/CTL FLAP LVR NOT ZERO" RED WARNING
	Applicable to: MSN 02155-05253			
	P6183		01 JUL 14	NAVIGATION - MMR - REMOVE COLLINS MMR PROVIDING ILS (FM IMMUNE) AND GPS PRIMARY FUNCTION
	Applicable to: MSN 02155-02212			
	P6201		11 APR 14	GENERAL-FLIGHT ENVIRONMENTAL ENVELOPE- EXTENSION TO 12100 M
	Applicable to: ALL			
	P6314		11 APR 14	AUTO FLIGHT - DEFINE "GUIDED RADAR APPROACH WITH AUTOPILOT ENGAGED" PROCEDURE (MUH 250 FT)
	Applicable to: MSN 02155-03060, 05152-05746			
	P6316		17 AUG 15	NAVIGATION - TCAS - INSTALL HONEYWELL COMPUTER TCAS 2000 WITH CHANGE 7.0
	Applicable to: MSN 02926-02944, 04392, 07784-07792			

Continued on the following page

PRELIMINARY PAGES

LIST OF MODIFICATIONS

Continued from the previous page

M ⁽¹⁾	CRITERION	Linked SB	Incorp. Date	Title
	P6319		01 JUL 14	COMMUNICATIONS - AUDIO MANAGEMENT - INSTALL TEAM DIGITAL AMU P/N 4031-SA-01
Applicable to: ALL				
	P6375		11 APR 14	LANDING GEAR-PARKING/ULTIMATE EMERGENCY BRAKING -INSTALL A PRESSURE SWITCH (PARKING BRAKE SYSTEM IMPROVEMENT
Applicable to: ALL				
	P6538		04 SEP 18	INDICATING/RECORDING SYSTEMS - FWC - IMPROVE FWC TO COMPLY WITH NEW EMM BSCS WARNINGS AND ECAM INDICATIONS
Applicable to: MSN 02719-07792				
	P6544		11 APR 14	INDICATING RECORDING SYSTEM - FWC ACTIVATE SPECIFIC FWC PROCEDURE
Applicable to: ALL				
	P6578	31-1601 02	27 APR 15	INDICATING RECORDING SYSTEMS- EIS-INSTALL DMC, DU AND DISKETTES FOR EIS2
Applicable to: ALL				
	P6588		11 APR 14	INFORMATION SYSTEM - ATIMS IMPROVE ATSU AIRCRAFT INTERFACE SOFTWARE TO UPDATE SERVICE PROVIDERS LIST AND MANAGEMEN
Applicable to: ALL				
	P6589		11 APR 14	INDICATING/RECORDING SYSTEMS - CFDIU INTRODUCE CFDIU STANDARD 9B
Applicable to: ALL				
	P6630		27 APR 15	CERTIFICATION DOCUMENTS - GENERAL - CERTIFY AIRCRAFT FOR OPERATION ON RUNWAYS LESS THAN 45 M WIDTH
Applicable to: MSN 02719-04392				
	P6687		11 APR 14	COMMUNICATION - RADIO MANAGAMENT INTRODUCE NEW RMP STANDARD 2 P/N C12848AB02
Applicable to: ALL				
	P6688		01 JUL 14	COMMUNICATIONS - RADIO MANAGEMENT INSTALL A THIRD RADIO MANAGEMENT PANEL
Applicable to: MSN 02155-02789, 03031-07792				
	P6703	22-1079 08 22-1102 02 22-1226 04	27 APR 15	AUTO FLIGHT - FLIGHT AUGMENTATION COMPUTER INSTALL NEW FAC SOFTWARE STANDARD P/N B397BAM0515
Applicable to: ALL				

Continued on the following page

Continued from the previous page

M ⁽⁷⁾	CRITERION	Linked SB	Incorp. Date	Title
	P6766		19 OCT 15	NAVIGATION - ILS (MMR) - INSTALL HONEYWELL MMR PROVIDING ILS (FM IMMUNE) AND GPS PRIMARY FUNCTIONS (HYBRID ARCHITECTURE)
	Applicable to: MSN 02719-02789, 03031-03060, 05152-05746			
R	P6777	46-1121 19	11 APR 14	INFORMATION SYSTEM - ATIMS - UPGRADE ATSU HARDWARE FOR NEW ARINC 429 I/O BOARD
	Applicable to: ALL			
	P6801	31-1257 01	11 APR 14	INDICATING RECORDING SYSTEM - FWC INSTALL FWC STANDARD H2E4
	Applicable to: ALL			
	P6832		11 APR 14	INFORMATION SYSTEMS - ATIMS - DEFINE AND INSTALL NEW SOFTWARE ATSU A/C INTERFACE UPGRADED
	Applicable to: ALL			
	P6901	27-1160 01	27 APR 15	FLIGHT CONTROLS - ELAC SYSTEM - INTRODUCE ELAC SOFTWARE "L90" CAPABLE OF A318
	Applicable to: ALL			
	P6911		27 APR 15	INDICATING/RECORDING SYSTEM : FROM FWC-F1 PIN-PROGRAMMING FOR IMPROVING THE MONITORING ABOUT THE NORMAL BRAKING SYSTEM
	Applicable to: MSN 02719-07792			
	P6954	22-1102 02 22-1226 04	27 APR 15	AUTO FLIGHT - FLIGHT AUGMENTATION COMPUTER (FAC SYSTEM) - INTRODUCE FAC SOFTWARE "BAM0516" CAPABLE OF A318
	Applicable to: ALL			
	P6985	34-1332 02	27 APR 15	NAVIGATION - ADIRS - INSTALL HONEYWELL ADIRU 4MCU CAPABLE OF A318 A/C
	Applicable to: MSN 02155-02789, 03031-07792			
	P6987		01 JUL 14	AUTO FLIGHT - FMGC INSTALL FMGC P/N B546CAM0103 (CFM GPS/ACARS)
	Applicable to: ALL			
	P7009		11 DEC 19	COMMUNICATION - AUDIO MANAGEMENT INSTALL A DIGITAL SATCOM AMU P/N AMU4031L*01
	Applicable to: MSN 04392			
	P7062		27 APR 15	OXYGEN - CREW OXYGEN - INSTALL ALTERNATIVE 115CU FT FLIGHT CREW OXYGEN CYLINDER COMPOSITE - SCOTT P/N 897940-15
	Applicable to: MSN 02719-02789, 03031-03060			

Continued on the following page

PRELIMINARY PAGES

LIST OF MODIFICATIONS

Continued from the previous page

M ⁽¹⁾	CRITERION	Linked SB	Incorp. Date	Title
	P7092		27 APR 15	INDICATING/RECORDING SYSTEM - EIS - ACTIVATE FUEL FLOW/DELTA ISA FUNCTION BY PIN PROGRAMMING ON DMC
	Applicable to: ALL			
	P7125	31-1257 01	27 APR 15	INDICATING/RECORDING SYSTEMS - FWC - INSTALL FWC STANDARD H2 F1 ON A318 PW
	Applicable to: ALL			
	P7148		01 JUL 14	COMMUNICATIONS - HF SYSTEM - ACTIVATE DATA LINK FUNCTION FOR HFDR 1
	Applicable to: MSN 02155-02789			
	P7175		11 APR 14	ELECTRICAL POWER - GENERAL - INSTALL A COMMERCIAL SHEDDING PUSH-BUTTON SWITCH IN COCKPIT
	Applicable to: ALL			
	P7185		05 SEP 17	NAVIGATION - EGPWS -INSTALL ENHANCED GPWS P/N 965-1676-001
	Applicable to: ALL			
	P7186	34-1345 04	27 APR 15	NAVIGATION - EGPWS ACTIVATE PEAKS MODE OF EGPWS IN CONJUNCTION WITH THE TERRAIN DISPLAY
	Applicable to: ALL			
	P7187	34-1351 03	27 APR 15	NAVIGATION - EGPWS ACTIVATE GEOMETRIC ALTITUDE FUNCTION IN THE EGPWS
	Applicable to: ALL			
	P7188	34-1345 04	27 APR 15	NAVIGATION - EGPWS ACTIVATE OBSTACLE OPTION ON THE EGPWS
	Applicable to: ALL			
	P7218		22 MAR 16	AUTOFLIGHT - FLIGHT MANAGEMENT AND GUIDANCE COMPUTER (FMGC) DEVELOP FMS 2ND GENERATION HONEYWELL STEP1
	Applicable to: ALL			
	P7268		11 APR 14	NAVIGATION - ADIRU RESTORE RVSM 3 CIRCUITS CAPABILITIES - SERIAL SOLUTION
	Applicable to: ALL			
	P7278	31-1601 02	27 APR 15	INDICATING RECORDING SYSTEM - EIS2 INSTALL EIS2 SOFTWARE CAPABLE OF A318 A/C
	Applicable to: ALL			
	P7300		05 SEP 17	ELECTRICAL POWER - AC GENERATION - INSTALL ELECTRICAL OUTLETS IN COCKPIT 4MM AND 4.8MM DIA. PLUGS
	Applicable to: MSN 02719-07792			

Continued on the following page

Continued from the previous page

M ⁽⁷⁾	CRITERION	Linked SB	Incorp. Date	Title
	P7373		17 AUG 15	AUTOFLIGHT - FMGC DEFINE AND INSTALL FMGC CFM C13043AA01 THALES (EQUIPPED WITH "FMS2" THALES/SMITH)
	Applicable to: MSN 02926-02944, 04392, 07784-07792			
	P7397	34-1332 02	27 APR 15	NAVIGATION - ADIRS INSTALL HONEYWELL ADIRU 4MCU CAPABLE OF A318
	Applicable to: MSN 02155-02789, 03031-07792			
	P7407		12 JAN 22	COMMUNICATION - RADIO MANAGEMENT INSTALL RMP STANDARD 3 WITH MLS AND GLS FUNCTION CAPABILITY
	Applicable to: MSN 05152-05746			
	P7424	34-1712 17	20 SEP 16	NAVIGATION - ATC - INSTALL L3-COM ATC XS950 INCORPORATING EUROPEAN MODE S REGULATIONS
	Applicable to: MSN 02926-02944, 04392, 07784-07792			
R	P7425	34-1720 05 34-1763 19	22 MAR 16	NAVIGATION - ATC - INSTALL HONEYWELL ATC TRA67A INCORPORATING EUROPEAN MODE S REGULATIONS
	Applicable to: MSN 02719-07792			
	P7455		11 APR 14	ELECTRICAL POWER - GENERAL IN FLIGHT ENTERTAINMENT (IFE) POWER SUPPLY ON SHEDDABLE BUSBARS CONTROLLED BY "GALY & CAB" SW
	Applicable to: ALL			
	P7519		01 JUL 14	AUTOFLIGHT - FMGC - INSTALL FMGC CFM C13042AA01 (EQUIPPED WITH FMS2 HONEYWELL)
	Applicable to: ALL			
	P7585	34-1692 09	22 MAR 16	NAVIGATION - ATC - INSTALL COLLINS ATC MODE S TPR901 INCORPORATING ELEMENTARY AND ENHANCED SURVEILLANCE
	Applicable to: MSN 02155-02212			
	P7605		04 SEP 18	INDICATING RECORDING SYSTEM - SDAC INSTALL WIRING PROVISIONS FOR SDAC H2E1A PIN PROGRAMMING.
	Applicable to: ALL			
	P7613		27 APR 15	AUTO-FLIGHT - FMGC - ACTIVATE MORA DISPLAY ON ND
	Applicable to: MSN 02719-02789, 03031-05746			
	P7635	27-1160 01	27 APR 15	FLIGHT CONTROLS - ELAC SYSTEM INTRODUCE ELAC SOTWARE L82
	Applicable to: ALL			

Continued on the following page

PRELIMINARY PAGES
LIST OF MODIFICATIONS
Continued from the previous page

M ⁽¹⁾	CRITERION	Linked SB	Incorp. Date	Title
	P7666		22 MAR 17	AUTO FLIGHT - FMGC DEVELOP FMS 2ND GENERATION THALES/SMITH REV 1 STANDARD
Applicable to: MSN 02926-02944, 04392, 07784-07792				
	P7790		11 APR 14	AUTO FLIGHT FLIGHT MANAGEMENT AND GUIDANCE SYSTEM ACTIVATE FMA ENHANCEMENT FUNCTION
Applicable to: ALL				
	P7919		01 JUL 14	ENGINE FUEL AND CONTROL - FADEC SYSTEM - INTRODUCE NEW FADEC SOFTWARE "5BK" ON SAC CFM56-5B ENGINES
Applicable to: ALL				
	P7929	34-1820 00	27 APR 15	NAVIGATION - WEATHER RADAR SYSTEM INSTALL COLLINS DUAL CONTROL PANEL TO ACTIVATE MULTISCAN FUNCTION
Applicable to: MSN 02155-03060				
	P7976		11 DEC 19	COMMUNICATION - AUDIO MANAGEMENT REMOVE "LS" FUNCTIONS ACP (ANTI MOD 32526)
Applicable to: MSN 04392				
	P7977		17 AUG 15	AUTO FLIGHT - FMGC INSTALL FMGC CFM C13043AA02 THALES (EQUIPPED WITH FMS2 THALES/SMITH)
Applicable to: MSN 02926-02944, 04392, 07784-07792				
	P8014		17 AUG 15	AUTO FLIGHT - FMGC RE-INSTALL FMGC2 CFM P/N C13042AA01 (ANTI MOD 32222)
Applicable to: MSN 02926-02944, 04392				
	P8025	34-1538 35	01 JUL 14	NAVIGATION - TCAS INSTALL ROCKWELL/COLLINS TCAS TTR921 (P/N 822-1293-322)
Applicable to: MSN 02155-02212				
	P8069		01 JUL 14	ENGINE FUEL AND CONTROL - FADEC SYSTEM INTRODUCE NEW ECU SOFTWARE STANDARD "5BL" FOR CFM56-5B ENGINES CAPABLE OF A318 CFM A/C
Applicable to: ALL				
	P8076	32-1335 00	11 APR 14	LANDING GEAR NORMAL BRAKING INSTALL BSCU STD L4.5
Applicable to: ALL				
	P8161		27 APR 15	AUTO FLIGHT - FMS - ACTIVATE LOC BACK - BEAM APPROACH & BACK COURSE TAKE OFF OPTION ON THALES & HONEYWELL FMS2
Applicable to: MSN 02719-03060				

Continued on the following page

Continued from the previous page

M ⁽¹⁾	CRITERION	Linked SB	Incorp. Date	Title
	P8175		27 APR 15	INDICATING/RECORDING SYSTEMS - SDAC - ACTIVATE IAS DISCREPANCY MONITORING BY PIN PROGRAMMING
Applicable to: MSN 02719-05253				
	P8176		27 APR 15	INDICATING/RECORDING SYSTEMS - SDAC - ACTIVATE DUAL PITOT MONITORING BY PIN PROGRAMMING
Applicable to: MSN 02719-05253				
	P8194	34-1550 02	27 APR 15	NAVIGATION - ADIRS ACTIVATE ALIGNMENT IMPROVEMENT FUNCTION ON ADIRU
Applicable to: MSN 02155-02789, 03031-07792				
	P8232	31-1266 02	27 APR 15	INDICATING/RECORDING SYSTEMS - FWC - INTRODUCE IAS DISCREPANCY AND DUAL PITOT MONITORING ON FWC H2F1
Applicable to: ALL				
	P8241		20 AUG 25	PLACARDS AND MARKINGS - CABIN - CONFIGURATE THE CABIN FOR NON SMOKING FLIGHT
Applicable to: MSN 07784-07792				
	P8243		27 APR 15	CERTIFICATION DOCUMENTS / EXTEND OPERATING FLIGHT ENVELOPE TO MINUS 2000FT PRESSURE ALTITUDE
Applicable to: MSN 02719-07792				
	P8256	22-1102 02 22-1226 04	27 APR 15	AUTO FLIGHT FLIGHT AUGMENTATION COMPUTER INSTALL FAC STANDARD BAM0617 FOR A318 EIS
Applicable to: ALL				
	P8274	31-1257 01	27 APR 15	INDICATING RECORDING SYSTEM FWC INSTALL FWC STANDARD H2F2
Applicable to: ALL				
	P8303		11 DEC 19	NAVIGATION DDRMI REMOVE DDRMI VOR/ADF/DME INDICATORS
Applicable to: MSN 04392-07792				
	P8315		11 DEC 19	COMMUNICATION - AUDIO MANAGEMENT RE-INSTALL TEAM ANALOGIQUE AMU (ANTI MOD 31296)
Applicable to: MSN 04392				
	P8454		17 AUG 15	NAVIGATION - T2CAS - INSTALL ACSS TRAFFIC & TERRAIN COLLISION AVOIDANCE SYSTEM (T2CAS)
Applicable to: MSN 02926-02944, 04392				
	P8483	22-1171 02	11 DEC 19	AUTO FLIGHT - FMGC - INSTALL A NEW FMS2 THALES SMITH S3 STANDARD ON CFM A/C
Applicable to: MSN 02926-02944, 04392, 07784-07792				

Continued on the following page

PRELIMINARY PAGES

LIST OF MODIFICATIONS

Continued from the previous page

M ⁽¹⁾	CRITERION	Linked SB	Incorp. Date	Title
	P8484		04 APR 22	NAVIGATION - MMR - INSTALL MMR COLLINS GLU 925 PN -430 CAPABLE ILS/GPS/FLS/MIX LOC VNAV/GLS AND ASSOCIATED GPS ANTENNA
Applicable to: MSN 05253-07792				
	P8564	31-1331 03	11 DEC 19	INDICATING/RECORDING SYSTEM EIS ACTIVATE ENGINE AVAIL DISPLAY
Applicable to: MSN 02155-02212, 04392-07792				
	P8572		10 AUG 21	AUTO-FLIGHT - FAC - DEFINE NEW PIN PROGRAMMING FOR WEIGHT AND CG COMPUTATION BASED ON FMS REFERENCES
Applicable to: MSN 05746-07792				
	P8625		17 AUG 15	AUTO-FLIGHT - FMGC - INSTALL NEW FMGC STANDARD S2C11 ON CFM ENGINES
Applicable to: MSN 02926-02944, 04392, 07784-07792				
	P8626		11 DEC 19	NAVIGATION - STANDBY DATA (ISIS) - INSTALL ISIS STANDARD VA01 WITH CORRECTION OF "OUT OF ORDER" MESSAGE & "NEW IMU STANDARD"
Applicable to: MSN 04392-07792				
	P8629		02 SEP 20	INFORMATION SYSTEMS - ATIMS - UPGRADE SOFTWARE - ATSU A/C INTERFACE FOR FAN A+ IMPLEMENTATION CSB.1
Applicable to: MSN 02719-02789, 03031-07792				
	P8671	31-1601 02	27 APR 15	INDICATING RECORDING SYSTEM EIS INSTALL DMC SOFTWARE EIS2 S4-2 TO CORRECT TEMPORARY LOSS OF ALL EIS2 IMAGES
Applicable to: ALL				
	P8708	22-1168 01	27 APR 15	AUTOFLIGHT - FMGC INSTALL FMS2 HONEYWELL P1C11 ON A/C FITTED WITH CFMI PPS
Applicable to: ALL				
	P8710	34-1820 00	27 APR 15	NAVIGATION - WEATHER RADAR SYSTEM - INSTALL COLLINS TRANSCEIVER FULLY COMPLIANT WITH MULTISCAN FUNCTION
Applicable to: MSN 02155-03060				
	P8751	34-1345 04	18 MAY 15	NAVIGATION - EGPWS - INSTALL AN EGPWC CAPABLE OF PEAKS/OBSTACLE FUNCTIONS WITH EIS1 & OF USING GPS LATERAL POSITION
Applicable to: MSN 02155-02212, 02926-07792				
	P8757		04 SEP 18	ENGINE FUEL AND CONTROL - GENERAL INTRODUCE HMU P13 ON CFM56-5A/5B ENGINES
Applicable to: MSN 02719-07792				

Continued on the following page

Continued from the previous page

M ⁽¹⁾	CRITERION	Linked SB	Incorp. Date	Title
	P8770		11 DEC 19	NAVIGATION - TCAS - ACTIVATE OPTIONAL AURAL WARNINGS FOR T2CAS AND T3CAS (FAA)
	Applicable to: MSN 04392			
	P8799	34-1352 01	18 MAY 15	NAVIGATION - EGPWS - INSTALL AN EGPWC CAPABLE OF PEAKS/OBSTACLE FUNCTIONS WITH EIS1 & OF USING GPS LATERAL POSITION
	Applicable to: MSN 02155-02212, 02926-07792			
	P8850		11 DEC 19	PNEUMATIC - ENGINE BLEED AIR SUPPLY - INTRODUCE BMC STD 9 CAPABLE OF A318 PW
	Applicable to: MSN 04392-07792			
	P8863		27 APR 15	INDICATING/RECORDING SYSTEM FWC ACQUISITION INTERFACE CONNECT FWC TO RPWS TO PREVENT DOOR OPENING WITH RESIDUAL CABIN PRESSURE
	Applicable to: MSN 02719-07792			
	P8866		27 APR 15	LANDING GEAR NORMAL BRAKING INSTALL BSCU STD L4.8 (EM2)
	Applicable to: MSN 02719-07792			
	P9034		11 DEC 19	NAVIGATION - GPWS - GROUND PROXIMITY WARNING SYSTEM (GPWS) DEACTIVATE GEOMETRIC ALTITUDE FUNCTION (ANTI MOD 31426)
	Applicable to: MSN 04392, 07784-07792			
	P9038		18 MAY 15	AUTOFLIGHT-MULTIPURPOSE CONTROL AND DISPLAY UNIT (MCDU) - INSTALL HONEYWELL LCD MCDU
	Applicable to: MSN 03031-07792			
	P9050		17 AUG 15	NAVIGATION-T2CAS (TRAFFIC 2 COLLISION AVOIDANCE SYST) - ACTIVATE AUTOMATIC DEACTIVATION OF T2CAS - TAWS
	Applicable to: MSN 02926-02944, 04392, 07784-07792			
	P9051		17 AUG 15	NAVIGATION-T2CAS (TRAFFIC 2 COLLISION AVOIDANCE SYST) - ACTIVATE ALTERNATE LATERAL POSITION T2CAS - TAWS
	Applicable to: MSN 02926-02944, 04392, 07784-07792			
	P9107	31-1267 03 31-1300 02	11 DEC 19	INDICATING/RECORDING SYSTEM FLIGHT WARNING COMPUTER - FWC - INSTALL FWC STANDARD H2 F3
	Applicable to: ALL			
	P9159		17 AUG 15	ENGINE - GENERAL INSTALL RATING 5B6 SELECTION ON CFM56-5B ENGINES A320 AIRCRAFT
	Applicable to: MSN 02926-02944			

Continued on the following page

PRELIMINARY PAGES

LIST OF MODIFICATIONS

Continued from the previous page

M ⁽¹⁾	CRITERION	Linked SB	Incorp. Date	Title
	P9171	34-1397 05	11 DEC 19	NAVIGATION - ADIRS INTRODUCE AIR DATA MONITORING FUNCTION
	Applicable to: MSN 02719-07792			
	P9196	34-1335 02	27 APR 15	NAVIGATION - STANDBY DATA (ISIS) INSTALL ISIS STD WB01 WITH CORRECTION OF "OUT OF ORDER" MESSAGE
	Applicable to: ALL			
	P9207	34-1369 02	11 DEC 19	NAVIGATION - ATC / MODE S - CERTIFY EHS FUNCTION
	Applicable to: MSN 02155-05746			
	P9225		18 MAY 15	INDICATING / RECORDING SYSTEM : ELECTRONIC INSTRUMENT SYSTEM (EIS) - INSTALL DISPLAY MANAGEMENT COMPUTER SOFTWARE EIS2 S6-1
	Applicable to: MSN 03031-07792			
	P9332		17 AUG 15	NAVIGATION - ADIRU - INSTALL NORTHROP GRUMAN ADIRU P/N 465020-0303-0316
	Applicable to: MSN 02926-02944			
	P9333	34-1356 04	02 JAN 23	NAVIGATION - AIR DATA/INERTIAL REFERENCE SYSTEM - INSTALL HONEYWELL ADIRU P/N HG2030-AE23
	Applicable to: MSN 02155-02212, 03031-07792			
	P9355		11 DEC 19	NAVIGATION - WEATHER RADAR SYSTEM - REMOVE WXR TRANSCEIVER COLLINS "-623" AND DEACTIVATE (ANTI MOD 32740 AND 26560)
	Applicable to: MSN 04392			
	P9457		11 DEC 19	COMMUNICATIONS - SATELLITE COMMUNICATIONS - INSTALL AND ACTIVATE COLLINS AERO H+ SATCOM SRT 2100 (IN THE E/BAY)
	Applicable to: MSN 04392			
R	P9486	46-1040 16 46-1121 19	10 AUG 21	INFORMATION SYSTEM - ATIMS - INSTALL NEW ATSU HARDWARE A10
	Applicable to: MSN 02719-02789, 03031-03060, 05152-07792			
	P9508		10 AUG 21	INDICATING/RECORDING SYSTEMS - SDAC - ACQUISITION/INTERFACE CONFIGURATION CABIN FOR NO PED FLIGHTS
	Applicable to: MSN 07784-07792			
	P9522		11 DEC 19	AUTO FLIGHT - MCDU ACTIVATE BACK UP NAV FUNCTION
	Applicable to: MSN 04392-07792			

Continued on the following page

Continued from the previous page

M ⁽¹⁾	CRITERION	Linked SB	Incorp. Date	Title
	P9580		11 DEC 19	COMMUNICATION - SATELLITE COMMUNICATION - ACTIVATE COCKPIT VOICE FOR ROCKWELL COLLINS AERO H+ SATCOM
	Applicable to: MSN 04392			
	P9594		11 DEC 19	PNEUMATIC LEAK DETECTION ACTIVATE PYLON LEAK DETECTION MONITORING
	Applicable to: MSN 04392-07792			
	P9625	34-1365 01	11 DEC 19	NAVIGATION TRAFFIC AND TERRAIN COLLISION AVOIDANCE SYSTEM(T2CAS) - INSTALL T2CAS STD 2(-11111)
	Applicable to: MSN 02926-02944, 04392			
	P9652	22-1205 02	11 DEC 19	AUTO-FLIGHT FMGC INSTALL FMS2 THALES S4 (REV2+) STD ON CFM A/C
	Applicable to: MSN 02926-02944, 04392, 07784-07792			
	P9654		17 AUG 15	NAVIGATION EGPWS RE-INSTALL EGPWS P/N 965-1676-001 (ANTI-MOD 34634)
	Applicable to: MSN 02926-02944, 04392, 07784-07792			
	P9655	32-1335 00	11 DEC 19	LANDING GEAR NORMAL BRAKING INSTALL BSCU SOFTWARE STD "L4.9" (EM2)
	Applicable to: MSN 02926-02944, 04392-07792			
	P9676		12 JAN 22	NAVIGATION - GPWS - ACTIVATE RUNWAY AWARENESS AND ADVISORY SYSTEM (RAAS) FUNCTION ON HWL EGPWS-002
	Applicable to: MSN 05152-05746			
	P9824	31-1276 02 31-1601 02	18 MAY 15	INDICATING/RECORDING SYSTEMS - ELECTRONIC INSTRUMENT SYSTEM(EIS)- INSTALL DISPLAY MANAGEMENT COMPUTER SOFTWARE EIS2 S7
	Applicable to: ALL			
	P9867		17 AUG 15	NAVIGATION - GPWS - DEACTIVATE PEAKS AND OBSTACLE FUNCTIONS ON THE EGPWS (ANTI MODS 31367/P7186 AND 31375/P
	Applicable to: MSN 02926-02944, 04392, 07784-07792			
	P9873		11 DEC 19	POWER PLANT - GENERAL - INTRODUCE CFM56-5BX/3 ENGINE (SAC) "TECH INSERTION PROGRAM"
	Applicable to: MSN 04392-07792			
	P9891	31-1281 02	04 SEP 18	INDICATING RECORDING SYSTEM SDAC INSTALL SDAC STANDARD H2-E2
	Applicable to: ALL			

Continued on the following page

PRELIMINARY PAGES

LIST OF MODIFICATIONS

Continued from the previous page

M ⁽¹⁾	CRITERION	Linked SB	Incorp. Date	Title
	P9894		11 DEC 19	AUTO FLIGHT - FLIGHT AUGMENTATION COMPUTER - INTRODUCE TAIL STRIKE INDICATION ON PFD FOR A320 & A321 A/C
Applicable to: MSN 04392-07792				
	P9895		11 DEC 19	AUTO FLIGHT - FLIGHT AUGMENTATION COMPUTER - INTRODUCE TAIL STRIKE "PITCH-PITCH" CALL-OUT FOR A320 & A321 AIRCRAFT
Applicable to: MSN 04392-07792				
	P9978	34-1418 76 34-1575 12	11 DEC 19	NAVIGATION - ATC/MODE S (SELECT) CERTIFY ADS-B OUT CAPABILITY THROUGH EXTENDED SQUITTER 1090 MHZ
Applicable to: MSN 02155-02212, 02926-02944, 04392-05746				
N	00-1069 60		09 FEB 26	DESIGN WEIGHTS - INCREASE FROM WV008 (MTOW 73.5T MLW 64.5T MZFW 61T) TO WV012 (MTOW 77T MLW 66T MZFW 62.5T)
Applicable to: MSN 02155-02212				
N	21-1263 04		09 FEB 26	ADAPT AEVS CONTROL LOGIC FOR IMPROVEMENT OF SAOV RE-CONFIGURATION (CEO)
Applicable to: MSN 05152, 07792				
	22-1079 08		04 SEP 18	AUTO FLIGHT - FLIGHT AUGMENTATION COMPUTER - INSTALL NEW FAC SOFTWARE STANDARD PN B397BAM0515.
Applicable to: MSN 02155-02212				
	22-1102 02		04 SEP 18	AUTO FLIGHT - FLIGHT AUGMENTATION COMPUTER - INSTALL FAC STANDARD BAM0617.
Applicable to: MSN 02155-02212				
	22-1168 01		04 SEP 18	AUTO FLIGHT - FLIGHT MANAGEMENT AND GUIDANCE COMPUTER (FMGC) - INSTALL FMS2 HONEYWELL P1C11 ON A/C WITH CFMI PPS.
Applicable to: MSN 02155-02212				
	22-1171 02		17 AUG 15	AUTO FLIGHT - FMGC - INSTALL A NEW FMS2 THALES SMITHS S3 STANDARD ON CFM A/C.
Applicable to: MSN 02926-02944				
	22-1205 02		17 AUG 15	AUTO FLIGHT - FLIGHT MANAGEMENT AND GUIDANCE COMPUTER (FMGC) - INSTALL FMS2 THALES S4 (REV2+) STD ON CFM A/C.
Applicable to: MSN 02926-02944				
	22-1226 04		04 SEP 18	AUTO FLIGHT - FLIGHT AUGMENTATION (FAC) INTRODUCE FAC SOFTWARE STD "BAM0619".
Applicable to: MSN 02155-02212				

Continued on the following page

Continued from the previous page

M ⁽¹⁾	CRITERION	Linked SB	Incorp. Date	Title
	22-1247 01		17 AUG 15	AUTO-FLIGHT - FMGC - INSTALL FMGC THALES S4C12 ON CFM A/C.
	Applicable to: MSN 02926-02944			
	22-1248 01		01 JUL 14	AUTO-FLIGHT - FMGC - INSTALL FMGC HNWL STD P1C12 ON CFM A/C.
	Applicable to: MSN 02155-02789, 03031-03060			
	22-1266 03		27 APR 15	AUTO-FLIGHT - FMGC - INSTALL HONEYWELL PERFORMANCE DATABASE RELEASE 1A (PS4087592-901).
	Applicable to: MSN 02155-02789, 03031-03060			
	22-1269 05		27 APR 15	AUTO FLIGHT - FMGC - INSTALL FMGC HWL H2C12 (RELEASE 1A) ON CFM A/C.
	Applicable to: MSN 02155-02789, 03031-03060			
	22-1289 01		19 OCT 15	AUTO FLIGHT - GENERAL - REMOVE AFM LIMITATION ON NON-PRECISION APPROACHES WITH ONE ENGINE OUT ON A320/A318 A/C.
	Applicable to: MSN 02155-02789, 03031-03060			
	22-1296 06		22 MAR 16	AUTO-FLIGHT - FMGC - ACTIVATE MOD NAV GO AROUND ON FMGC
	Applicable to: MSN 02155-02789, 03031-03060			
	22-1315 05		27 APR 15	AUTO FLIGHT- FLIGHT MANAGEMENT SYSTEM - ACTIVATE NO AP DISCONNECTION BELOW MDA/MDH UNTIL MISSED APPROACH POINT AND ACTIVATE BARO RADIO SETTING FUNCTION.
	Applicable to: MSN 02155-04392			
	22-1359 05		22 MAR 16	AUTO-FLIGHT-FLIGHT MANAGEMENT AND GUIDANCE COMPUTER (FMGC)-INSTALL FMGC HONEYWELL H2C13 ON CFM A/C
	Applicable to: MSN 02155-02789, 03031-03060, 05152-05746			
	22-1360 02		05 SEP 17	AUTO-FLIGHT-FLIGHT MANAGEMENT AND GUIDANCE COMPUTER (FMGC)-INSTALL FMGC THALES S6C13 ON CFM A/C
	Applicable to: MSN 02926-02944			
	22-1362 03		17 AUG 15	AUTOFLIGHT-FMGC-INSTALL FMS THALES RELEASE 1A S6 (WITH FG C12) ON CFM A/C
	Applicable to: MSN 02926-02944, 04392			
	22-1375 00		05 SEP 17	AUTO FLIGHT - FLIGHT AUGMENTATION COMPUTER (FAC) - INTRODUCE FAC SOFTWARE STANDARD BAM0621 (ROPS FUNCTION).
	Applicable to: MSN 02155-02926, 03031-05253			

Continued on the following page

PRELIMINARY PAGES
LIST OF MODIFICATIONS
Continued from the previous page

M ⁽¹⁾	CRITERION	Linked SB	Incorp. Date	Title
	22-1462 02		05 SEP 17	AUTOFLIGHT - FMGC - INSTALL FMS THALES RELEASE 1A S7A (WITH FG C13) ON CFM A/C
	Applicable to: MSN 02926-02944			
	22-1480 03		05 SEP 17	AUTO FLIGHT-FLIGHT AUGMENTATION (FAC) DEFINE STOP RUDDER INPUT WARNING FUNCTION ON AIRCRAFT
	Applicable to: MSN 02155-05746			
	22-1523 02		04 SEP 18	AUTO FLIGHT - FLIGHT MANAGEMENT AND GUIDANCE COMPUTER (FMGC) - INSTALL FMGC HONEYWELL H2CC14 ON CFM A/C
	Applicable to: MSN 02155-02789, 03031-03060, 05152-05746			
	22-1545 01		10 AUG 21	FLIGHT MANAGEMENT AND GUIDANCE COMPUTER (FMGC) - INSTALL FMGC S7AC14 THALES ON CFM A/C
	Applicable to: MSN 02926-02944			
	22-1553 01		17 AUG 22	INTRODUCE FAC B624 (ROPS AND SHARKLET)
	Applicable to: MSN 02155-03060, 05152-05746			
	22-1629 01		20 AUG 25	FLIGHT AUGMENTATION COMPUTER (FAC) - INSTALL FAC CAA09 FOR CEO AIRCRAFT
	Applicable to: MSN 07784-07792			
	22-1736 01		20 AUG 25	FAC - INSTALL FAC CAA12
	Applicable to: MSN 07784-07792			
	22-1797 02		20 AUG 25	INSTALL FAC CAA13 SUPPORTING ROPS EVOLUTION FUNCTIONS ON CEO AIRCRAFT
	Applicable to: MSN 07784-07792			
	23-1333 05		11 DEC 19	AUDIO MANAGEMENT - MODIFY AMU POWER SUPPLY TO COPE WITH DC ESSENTIAL BUS LOSS
	Applicable to: MSN 02155-02789, 03031-03060			
	23-1362 06		23 AUG 23	HF SYSTEM - DEACTIVATE DATA LINK ON THE FIRST HF SYSTEM.
	Applicable to: MSN 02719-02789			
	23-1373 03		04 SEP 18	COMMUNICATIONS - ANTI HIJACK CAMERA MONITORING - INSTALL UNITS FOR A COCKPIT DOOR SURVEILLANCE SYSTEM (CDSS)
	Applicable to: MSN 02155-02212			
	23-1396 01		23 AUG 23	HF SYSTEM - INSTALL A SINGLE HF DATA RADIO (HFDR) SYSTEM HONEYWELL
	Applicable to: MSN 07784-07792			
N	23-1713 22		09 FEB 26	COCKPIT VOICE RECORDER - ACTIVATION OF DATALINK RECORDING FUNCTION
	Applicable to: MSN 07784-07792			

Continued on the following page

Continued from the previous page

M ⁽¹⁾	CRITERION	Linked SB	Incorp. Date	Title
	23-1719 06		25 MAR 24	HF SYSTEM - INSTALL A SINGLE HF DATA RADIO (HFDR) SYSTEM HONEYWELL
	Applicable to: MSN 05152-05746			
	24-1120 04		04 SEP 18	ELECTRICAL POWER - AC ESSENTIAL GENERATION SWITCHING - INSTALL AUTO SWITCHING SYSTEM FOR AC AND DC ESS BUS.
	Applicable to: MSN 02155-03060			
	25-1444 02		01 JUL 14	EQUIPMENT/FURNISHINGS - CURTAINS AND PARTITIONS - INTRODUCE PPTC FOR COCKPIT DOOR STRIKE PROTECTION
	Applicable to: MSN 02155-02212			
E	25-1BPJ 01		12 JAN 22	COCKPIT - REINFORCE COCKPIT DOCUMENTS STOWAGE BOX
6	Applicable to: MSN 02155-02789, 02944-07792			
	25-1BZB 04		20 AUG 25	REPLACE HONEYWELL 406AF FIXED ELT BY A HONEYWELL 406AFN2 FIXED ELT
	Applicable to: MSN 05152-05746			
	27-1160 01		04 SEP 18	FLIGHT CONTROLS - ELAC SYSTEM - INSTALL ELAC L91 SOFTWARE.
	Applicable to: MSN 02155-02212			
	27-1182 04		17 AUG 15	FLIGHT CONTROL - ELAC SYSTEM - INTRODUCE ELAC L93 SOFTWARE STANDARD.
	Applicable to: MSN 02155-03060			
	27-1219 03		11 DEC 19	SPOILER AND ELEVATOR COMPUTER - INSTALL SEC 121 HARDWARE B'
	Applicable to: MSN 04392-05253			
	27-1230 02		04 SEP 19	SPOILER AND ELEVATOR COMPUTER (SEC) - INSTALL SEC 123 HARDWARE B
	Applicable to: MSN 02155-03060			
	27-1234 01		11 DEC 19	FLIGHT CONTROL - ELEVATOR AILERON COMPUTER SYSTEM (ELAC)-INSTALL L97 STANDARD ON ELAC B WITH DATA LOADING CAPABILITY
	Applicable to: MSN 04392-05746			
	27-1238 00		17 AUG 15	FLIGHT CONTROLS - ELAC - INSTALL L97 STANDARD ON ELAC B WITHOUT DATA LOADING CAPABILITY
	Applicable to: MSN 02155-03060			
	27-1243 01		11 DEC 19	FLIGHT CONTROLS - ELEVATOR AILERON COMPUTER SYSTEM (ELAC) - INSTALL ELAC B L97+ WITH DATA LOADING CAPABILITY
	Applicable to: MSN 04392-05746			

Continued on the following page

PRELIMINARY PAGES

LIST OF MODIFICATIONS

Continued from the previous page

M ⁽¹⁾	CRITERION	Linked SB	Incorp. Date	Title
	27-1244 00		04 SEP 18	FLIGHT CONTROLS - ELEVATOR AILERON COMPUTER SYSTEM (ELAC) - INSTALL ELAC B L97+ WITHOUT DATALOADING
	Applicable to: MSN 02155-03060			
	27-1251 01		10 AUG 21	FLIGHT CONTROLS - ELEVATOR AILERON COMPUTER SYSTEM (ELAC) - INSTALL SOFTWARE STANDARD L98 ON ELAC B WITH DATA LOADING CAPABILITY
	Applicable to: MSN 04392-05746			
	27-1255 01		22 MAR 17	FLIGHT CONTROLS - ELEVATOR AILERON COMPUTER SYSTEM (ELAC) - INSTALL SOFTWARE STANDARD L98 ON ELAC B WITHOUT DATA LOADING CAPABILITY
	Applicable to: MSN 02155-03060			
	27-1267 00		02 SEP 20	FLIGHT CONTROLS - ELEVATOR AILERON COMPUTER SYSTEM (ELAC) - INSTALL SOFTWARE STANDARD L101 ON ELAC B WITHOUT DATA LOADING CAPABILITY
	Applicable to: MSN 02155-03060			
	27-1269 01		10 AUG 21	ELEVATOR AILERON COMPUTER SYSTEM (ELAC) - INSTALL SOFTWARE STANDARD L101 ON ELAC B WITH DATA LOADING CAPABILITY
	Applicable to: MSN 04392-07792			
	28-1150 01		04 SEP 18	FUEL - QUANTITY INDICATION - REMOVE FUEL LEAK DETECTION FUNCTION ASSOCIATED WITH FQIC 13-10 (ANTI-MOD FOR MOD 32650)
	Applicable to: MSN 02719-02789, 03031			
N	28-1214 03		09 FEB 26	ACTIVATE FUEL LEAK DETECTION WARNING SYSTEM
	Applicable to: MSN 05152-05253			
	28-1215 00		11 DEC 19	FUEL - QUANTITY INDICATING - INTRODUCE NEW STANDARD OF FQIC
	Applicable to: MSN 02719-05746			
	28-1216 01		12 JAN 22	FUEL - TANK LEVEL SENSING - ACTIVATE FUEL OVERFLOW CAUTION ON A318/319/320
	Applicable to: MSN 05152-05253			
N	31-1132 69		09 FEB 26	DMC - DISPLAY ALTITUDE IN METRIC UNITS ON THE PRIMARY FLIGHT DISPLAY (PFD)
	Applicable to: MSN 02926-02944			

Continued on the following page

Continued from the previous page

M ⁽⁷⁾	CRITERION	Linked SB	Incorp. Date	Title
	31-1257 01		04 SEP 18	INDICATING RECORDING SYSTEM - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC STANDARD H2-F2.
	Applicable to: MSN 02155-02212			
	31-1264 04		27 APR 15	INDICATING RECORDING SYSTEM - ACTIVATION OF FWC HARD PIN PROGRAMMED FUNCTIONS.
	Applicable to: MSN 02155-03060			
	31-1266 02		04 SEP 18	INDICATING/RECORDING SYSTEMS - SDAC - ACTIVATION OF HARD PIN PROGRAMMED FONCTIONS.
	Applicable to: MSN 02155-02212			
	31-1267 03		26 AUG 14	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC STANDARD H2F3.
	Applicable to: MSN 02155-03060			
	31-1276 02		04 SEP 18	INDICATING/RECORDING SYSTEMS - ELECTRONIC INSTRUMENT SYSTEM(EIS) - INSTALL DISPLAY MANAGEMENT COMPUTER SOFTWARE EIS2 S7
	Applicable to: MSN 02719-02944			
	31-1281 02		11 DEC 19	INDICATING RECORDING SYSTEM - SYSTEM DATA ACQUISITION CONCENTRATOR (SDAC) - INSTALL SDAC STANDARD H2-E2.
	Applicable to: MSN 02155-02944			
	31-1286 01		01 JUL 14	INDICATING/RECORDING SYSTEMS - DMC - INTRODUCE DMC EIS1 V60 STANDARD.
	Applicable to: MSN 02155-02212			
	31-1300 02		26 AUG 14	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC STANDARD H2-F3P.
	Applicable to: MSN 02155-03060			
	31-1331 03		21 AUG 24	ACTIVATE ENGINE AVAIL DISPLAY
	Applicable to: MSN 02155-02212			
	31-1334 04		26 AUG 14	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC STANDARD H2-F5
	Applicable to: MSN 02155-03060			
	31-1372 10		17 AUG 15	INDICATING/RECORDING SYSTEM - EIS - INSTALL EIS2 SOFTWARE S9
	Applicable to: MSN 02926-02944, 04392			

Continued on the following page

PRELIMINARY PAGES

LIST OF MODIFICATIONS

Continued from the previous page

M ⁽¹⁾	CRITERION	Linked SB	Incorp. Date	Title
	31-1373 00		11 APR 14	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC STANDARD H2-F6
	Applicable to: MSN 02155-05253			
	31-1374 01		11 DEC 19	INDICATING RECORDING SYSTEMS-SYSTEM DATA ACQUISITION CONCENTRATOR - INSTALL SDAC H2-E3.
	Applicable to: MSN 02155-03060			
	31-1414 03		27 APR 15	INDICATING RECORDING SYSTEMS - FWC - INTRODUCE FWC STANDARD H2-F7
	Applicable to: MSN 02155-05253			
	31-1415 00		17 AUG 15	INDICATING/RECORDING SYSTEMS - ELECTRONIC INSTRUMENT SYSTEM (EIS) - INTRODUCE NEW EIS2 STANDARD S10
	Applicable to: MSN 02926-02944			
	31-1433 01		19 OCT 15	INDICATING/RECORDING SYSTEMS - ELECTRONIC INSTRUMENT SYSTEM (EIS) - INTRODUCE EIS2 STANDARD S11
	Applicable to: MSN 02719-05746			
	31-1450 01		11 DEC 19	INDICATING/RECORDING SYSTEMS - SDAC ACQUISITION/INTERFACE - INSTALL SDAC STANDARD H2-E4
	Applicable to: MSN 02155-03060, 05152-05746			
N	31-1482 07		09 FEB 26	DMC - INTRODUCE EIS2 S13-2 STANDARD FOR CEO CONFIGURATION
	Applicable to: MSN 02719-05746			
E	31-1492 00		04 SEP 18	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC H2-F9D FOR CEO AIRCRAFT
7	Applicable to: MSN 02155-05746			
N	31-1574 03		09 FEB 26	INSTALL FWC H2-F12E (CEO)
	Applicable to: ALL			
	31-1576 02		25 MAR 24	ELECTRONIC INSTRUMENT SYSTEM (EIS) - INTRODUCE EIS2 STANDARD S16 (SAFETY BEYOND STANDARD STEP 1)
	Applicable to: MSN 02719-07792			
	31-1601 02		17 OCT 22	EIS - REPLACE EIS1 BY EIS2 OR ENHANCED EIS2 WITH S16 SOFTWARE
	Applicable to: MSN 02155-02212			
N	31-1608 04		09 FEB 26	INTRODUCE FWS S/W STANDARD F13 (CEO)
	Applicable to: ALL			

Continued on the following page

Continued from the previous page

M ⁽⁷⁾	CRITERION	Linked SB	Incorp. Date	Title
	32-1305 00		01 JUL 14	LANDING GEAR - NORMAL BRAKING - INSTALL BSCU STD L4.8 (EM2).
	Applicable to: MSN 02155-02212			
	32-1335 00		04 SEP 18	LANDING GEAR - NORMAL BRAKING - INSTALL BSCU SOFTWARE STD "L4.9".
	Applicable to: MSN 02926-02944			
N	32-1384 51		09 FEB 26	BRAKE COOLING - INTRODUCE UNIVERSAL BRAKE COOLING FAN
	Applicable to: MSN 02155-02212			
	32-1432 01		04 SEP 18	LANDING GEAR - NORMAL BRAKING - INSTALL BSCU SOFTWARE STANDARD L4.10
	Applicable to: MSN 02155-03060, 05152-05746			
	32-1464 02		23 AUG 23	NORMAL BRAKING - MODIFY AUTOBRAKE LOW MODE SETTINGS
	Applicable to: MSN 02155-05746			
	34-1332 02		04 SEP 19	ADIRS - INTRODUCE HONEYWELL ADIRU 4 MCU P/N HG2030AE22.
	Applicable to: MSN 02155-02212			
	34-1335 02		04 SEP 18	NAVIGATION - STANDBY DATA : INTEGRATED STANDBY INSTRUMENT SYSTEM (ISIS) - INSTALL ISIS STD WB01.
	Applicable to: MSN 02155-02212			
	34-1345 04		25 MAR 24	INSTALL EGPWS CAPABLE OF USING THE GPS LATERAL POSITION AND ACTIVATION OF PEAKS AND OBSTACLES FUNCTIONS.
	Applicable to: MSN 02155-02212			
	34-1351 03		04 SEP 18	NAVIGATION - EGPWS - ACTIVATE GEOMETRIC ALTITUDE FUNCTION IN THE EGPWS.
	Applicable to: MSN 02155-02212			
	34-1352 01		04 SEP 18	NAVIGATION - GPWS - USE LATERAL GPS POSITION WITH AUTOMATIC DESELECTION OF TERRAIN MODES.
	Applicable to: MSN 02155-02212			
	34-1356 04		20 AUG 25	ADIRU - INSTALL HONEYWELL ADIRU P/N HG2030-AE23
	Applicable to: MSN 02155-02212			
	34-1365 01		17 AUG 15	NAVIGATION - TRAFFIC AND TERRAIN COLLISION AVOIDANCE SYSTEM - INSTALL T2CAS STD 2 (-11111)
	Applicable to: MSN 02926-02944			

Continued on the following page

PRELIMINARY PAGES

LIST OF MODIFICATIONS

Continued from the previous page

M ⁽¹⁾	CRITERION	Linked SB	Incorp. Date	Title
	34-1369 02		27 APR 15	NAVIGATION - ATC/MODE S (SELECT) - CERTIFY EHS FUNCTION.
	Applicable to: MSN 02155-03060			
	34-1397 05		20 SEP 16	NAVIGATION - AIR DATA/INERTIAL REFERENCE SYSTEM (ADIRS) - INTRODUCE BACK-UP SPEED SCALE FUNCTION
	Applicable to: MSN 02719-03060			
	34-1418 76		02 JAN 23	ATC/MODE S (SELECT) - CERTIFY ADS-B OUT CAPABILITY THROUGH EXTENDED SQUITTER 1090 MHZ
	Applicable to: MSN 02926-02944			
	34-1443 03		27 APR 15	NAVIGATION - WEATHER RADAR SYSTEM - INSTALL COLLINS TRANSCIEVER FULLY COMPLIANT WITH MULTISCAN FUNCTION PN 822-1710-203.
	Applicable to: MSN 02719-03060			
	34-1506 34		22 MAR 17	NAVIGATION - TCAS - INSTALL A NEW HONEYWELL TCAS TPA-100B
	Applicable to: MSN 02719-02789, 03031-03060			
	34-1516 00		17 AUG 15	NAVIGATION - TRAFFIC COLLISION AVOIDANCE SYSTEM (TCAS) - INSTALL ACSS T2CAS STANDARD 3 CHANGE 7.0
	Applicable to: MSN 02926-02944, 04392			
	34-1530 05		11 DEC 19	NAVIGATION - WEATHER RADAR SYSTEM - INSTALLATION OF DUAL WEATHER RADAR HONEYWELL RDR-4000 SYSTEM.
	Applicable to: MSN 04392			
	34-1538 35		24 FEB 20	TCAS - INSTALL ROCKWELL COLLINS TCAS CHANGE 7.1 (-332)
	Applicable to: MSN 02155-02212			
	34-1539 39		10 AUG 21	T2CAS - INSTALL ACSS T2CAS CHANGE 7.1
	Applicable to: MSN 02926-02944, 04392			
	34-1550 02		04 SEP 19	ADIRS - ACTIVATE ALIGNMENT IMPROVEMENT FUNCTION ON ADIRU
	Applicable to: MSN 02155-02212			
	34-1575 12		04 SEP 19	ATC/MODE S (SELECT) - CERTIFY ADS-B OUT CAPABILITY THROUGH EXTENDED SQUITTER 1090 MHZ
	Applicable to: MSN 02155-02212			
N	34-1595 26		09 FEB 26	ATC/MODE S (SELECT) - ACTIVATE ADS-B OUT DO-260B CAPABILITY FOR ATC TRANSPONDER
	Applicable to: MSN 02155-03060			

Continued on the following page

Continued from the previous page

M ⁽¹⁾	CRITERION	Linked SB	Incorp. Date	Title
	34-1630 19		20 AUG 25	ATC/MODE S (SELECT) - ACTIVATE ADS-B OUT DO-260B CAPABILITY FOR ATC TRANSPONDER
	Applicable to: MSN 05152-05746			
	34-1692 09		10 AUG 21	ATC - INSTALLATION OF ATC TRANSPONDER TPR901 COMPLIANT ADS-B OUT DO-260B
	Applicable to: MSN 02155-02212			
	34-1712 17		25 MAR 24	ATC - INSTALL ACSS TRANSPONDERS XS950 P/N 7517800-12402 COMPLIANT WITH ADS-B OUT DO-260B
	Applicable to: MSN 02926-02944			
	34-1720 05		23 AUG 23	ATC - INSTALL ATC TRANSPONDER HONEYWELL TRA-100B P/N -0102 COMPLIANT ADS-B OUT DO-260B
	Applicable to: MSN 05152-05746			
N	34-1763 19		09 FEB 26	ATC - INSTALL ATC TRANSPONDER HONEYWELL TRA-100B P/N -0102 COMPLIANT ADS-B OUT DO-260B
	Applicable to: MSN 02719-02789, 03031-03060			
	34-1820 00		17 OCT 22	WEATHER RADAR SYSTEM - INSTALL COLLINS MULTISCAN PN 822-1710-213
	Applicable to: MSN 02155-02212			
	35-1089 00		04 SEP 18	OXYGEN - PASSENGER OXYGEN - REPLACE PASSENGER OXYGEN CONTAINERS OF 15 MIN DURATION BY 22 MIN DURATION
	Applicable to: MSN 02719, 02789			
N	35-1119 00		09 FEB 26	REPLACE CHEMICAL OXYGEN CONTAINERS IN CABIN FROM 15 TO 22 MIN DURATION
	Applicable to: MSN 03060, 07792			
	46-1018 20		27 APR 15	INFORMATION SYSTEMS - ATIMS - FANS B INSTALLATION AND ACTIVATION
	Applicable to: MSN 02719-02789, 03031-03060			
	46-1040 16		27 APR 15	INFORMATION SYSTEMS - ATIMS - INSTALL ATSU CSB5/HW-A10 WITH FANS B APPLICATIONS WITH VDL MODE 2 ACTIVATED
	Applicable to: MSN 02719-02789, 03031-03060			
	46-1047 13		27 APR 15	INFORMATION SYSTEMS - ATIMS - INSTALL ATSU CSB6/HW-A10 WITH FANS B+ APPLICATIONS AND WITH VDL MODE 2 ACTIVATED
	Applicable to: MSN 02719-02789, 03031-03060			
N	46-1049 41		09 FEB 26	GENERAL - CERTIFY FANS B+ CONFIGURATION (OVERALL MODIFICATION)
	Applicable to: MSN 02719-02789, 03031-03060			

Continued on the following page

PRELIMINARY PAGES

LIST OF MODIFICATIONS

Continued from the previous page

M ⁽¹⁾	CRITERION	Linked SB	Incorp. Date	Title
N	46-1062 21		09 FEB 26	GENERAL - CERTIFY FANS B+ CONFIGURATION (OVERALL MODIFICATION)
Applicable to: MSN 07784-07792				
	46-1095 03		04 APR 22	ATIMS - INSTALL ATSU CSB8 CORRECTIVE STANDARD
Applicable to: MSN 02719-02789, 03031-03060, 05152-05746				
N	46-1121 19		09 FEB 26	ATIMS - INSTALL ATSU CSB8.3/HW-A10 WITH FANS B+ APPLICATIONS AND WITH VDL MODE 2 ACTIVATED
Applicable to: MSN 07784-07792				
	49-1075 01		04 SEP 18	AIRBORNE AUXILIARY POWER - CONTROL AND MONITORING - INTRODUCE HONEWELL VECB WITH SOFTWARE -04
Applicable to: MSN 02719-02789				
	52-1182 01		10 AUG 21	EMERGENCY EXIT - REACTIVATE OVERWING EXIT DOORS DUE TO INCREASE OF SEAT CAPACITY FOR MAXPAX
Applicable to: MSN 04392				
N	71-1043 07		09 FEB 26	GENERAL - DEFINE ENGINE INTERMIX CONFIGURATIONS BETWEEN CFM56-5BX/P, CFM56-5BX, CFM56-5BX/3 AND CFM56-5BX/P TI HPC KIT (SAC ENGINES ONLY)
Applicable to: MSN 02926				
	71-1068 01		05 SEP 17	POWER PLANT - FAN COWL DOORS - INTRODUCE NEW FAN COWL DOOR LATCH WITH KEY & FLAG ON CFM56-5A/5B ENGINE.
Applicable to: MSN 02155-02719, 02789-03060, 05152-05746				
	73-1090 00		04 SEP 18	ENGINE FUEL AND CONTROL- FADEC SYSTEM- INTRODUCE 5BQ FADEC SOFTWARE STANDARD ON CFM56-5B ENGINES - CNF CFM 111B.
Applicable to: MSN 02155-03060				
	73-1095 02		17 AUG 15	ENGINE FUEL AND CONTROL - FADEC SYSTEM - INTRODUCE ECU SOFTWARE STANDARD "5BR" ON CFM56-5B ENGINES.
Applicable to: MSN 02155-03060				
	73-1100 02		01 JUL 14	ENGINE FUEL AND CONTROL- FADEC SYSTEM- INSTALL ECU SOFTWARE STANDARD 5BS2 ON CFM56-5B ENGINES.
Applicable to: MSN 02155-04392				

Continued on the following page

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M ⁽¹⁾	CRITERION	Linked SB	Incorp. Date	Title
	73-1103 00		12 JAN 22	ENGINE FUEL & CONTROL - FADEC SYSTEM - INTRODUCE ECU SOFTWARE "5BTF3" ON CFM56-5B ENGINES
	Applicable to: MSN 05746			
	73-1112 01		12 JAN 22	ENGINE FUEL AND CONTROL - FADEC SYSTEM - INTRODUCE ECU SOFTWARE STANDARD 5.B.T.F1 ON FADEC1+ HARDWARE ON CFM56-5B ENGINES.
	Applicable to: MSN 05152-05253			

(1) Evolution code : N=New, R=Revised, E=Effectivity

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Localization Title	Toc Index	ID	Reason
PLP-LOM-P13487	18	1	Effectivity update: The information now applies to all MSN.
PLP-LOM-P14629	20	2	Effectivity update: The information now applies to all MSN.
PLP-LOM-P14826	20	3	Effectivity update: The information now applies to all MSN.
PLP-LOM-P15991	21	4	Effectivity update: The information now applies to all MSN.
PLP-LOM-P15992	21	5	Effectivity update: The information now applies to all MSN.
PLP-LOM-25-1BPJ	47	6	Effectivity update: The information now also applies to MSN 07792.
PLP-LOM-31-1492	50	7	Effectivity update: The information now also applies to MSN 03031, 04392.

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GENERAL INFORMATION

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1	Aircraft Configuration Summary.....	A
	If Installed Table.....	B
	Airbus Copyright & Export Control Classification.....	C
	Main FCOM Changes.....	D
	FCOM Purpose.....	E
	List of Effective Sections/Subsections (LESS) - Paper ONLY.....	F
	List of Effective Documentary Units (LEDU) - Paper Only.....	G
	List of Effective Temporary Documentary Units (LETDU) - Paper Only.....	H
	Aircraft Allocation Table (AAT) - Paper Only.....	I
	List of Modifications (LOM) - Paper Only.....	J
	FCOM Use and Organization.....	K
	FCOM Format and Style Information - Paper only.....	L
	FCOM Revisions.....	M
	OEB General Description.....	N
	TDU General Description.....	O
	TAB General Description.....	P
	Abbreviations.....	Q

GENERAL INFORMATION

PRELIMINARY PAGES

TABLE OF CONTENTS

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	GENERAL INFORMATION PRELIMINARY PAGES SUMMARY OF HIGHLIGHTS
--	--

Localization Title	Toc Index	ID	Reason
GEN-PLP-TOC If Installed Table		1	Documentation update: Deletion of "Main Instrument Panel floodlight (00028935)".
			Documentation update: Deletion of "Print Function (00028334)".
			Documentation update: Deletion of "SYNCHRO AVIONICS (00022422)".
			Documentation update: Deletion of "Main Instrument Panel floodlight (00028935.0001001)".
			Documentation update: Deletion of "Print Function (00028334.0002001)".
			Documentation update: Deletion of "SYNCHRO AVIONICS (00022422.0001001)".
			Documentation update: Deletion of "SATCOM IRIDIUM (00028507.0002001)".
			Documentation update: Deletion of "Call (00028460.0002001)".
GEN PED compatible Flight Document Stowage	A	1	Documentation update: Addition of "PED compatible Flight Document Stowage" documentary unit
GEN PED compatible Operation Manual and Checklist Stowage	A	3	Documentation update: Deletion of information.
GEN PED compatible Operation Manual and Checklist Stowage	A	4	Clarification of the item title.
GEN PED compatible Operation Manual and Checklist Stowage	A	6	Documentation update: Deletion of information.
GEN PED compatible Operation Manual and Checklist Stowage	A	7	Clarification of the item title.
GEN QNH Operations above 1050 hPa	A	8	Documentation update: Addition of "QNH Operations above 1050 hPa" documentary unit
GEN ACARS Management Unit	B	9	Documentation update: Addition of "ACARS Management Unit" documentary unit
GEN AFT Cargo Heating	B	10	Removal of: "temperature selector" "HOT AIR pb" "AFT ISOL VALVE" "Forward (aft) cargo heat controller" "Cargo Heat" "CRG HEAT"
			Documentation update: Deletion of text.
GEN	B	11	Removal of:

Continued on the following page

GENERAL INFORMATION

PRELIMINARY PAGES

SUMMARY OF HIGHLIGHTS

Continued from the previous page

Localization Title	Toc Index	ID	Reason
AFT Cargo Heating			"temperature selector" "HOT AIR pb" "AFT ISOL VALVE" "Forward (aft) cargo heat controller" "Cargo Heat" "CRG HEAT" Documentation update: Deletion of text.
GEN AFT Cargo Ventilation	B	12	Layout modification. No technical change. Removal of: "FWD(AFT) CARGO DUCT OVHT" "FWD(AFT) CRG HEAT" "FWD(AFT) CRG HEAT FAULT" "FWD(AFT) CRG ISOL VALVE" "FWD(AFT) CRG VENT FAULT" "FWD(AFT) CRG VENT" "isolation valves"
GEN AFT Cargo Ventilation	B	13	Layout modification. No technical change. Documentation update: Deletion of text. Removal of: "FWD(AFT) CARGO DUCT OVHT" "FWD(AFT) CRG HEAT" "FWD(AFT) CRG HEAT FAULT" "FWD(AFT) CRG ISOL VALVE" "FWD(AFT) CRG VENT FAULT" "FWD(AFT) CRG VENT" "isolation valves"
GEN AOC Datalink	B	14	Documentation update: Addition of "AOC Datalink" documentary unit
GEN Calls panel ALL pb	B	16	Title enhancement to be in accordance with the cockpit layout.
GEN Calls panel ALL pb	B	17	Addition of "Calls Panel ALL pb". Layout modification. No technical change.
GEN CIDS SDF	B	20	Addition of tag "CIDS 2 SMOKE DETECT".
GEN CIDS SDF	B	21	Addition of tag "CIDS 2 SMOKE DETECT".
GEN DDRMI	B	22	Layout modification. No technical change.
GEN Cabin signs EXIT	B	23	Title enhancement to be in accordance with cockpit layout.
GEN	B	24	Addition of:

Continued on the following page

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	GENERAL INFORMATION PRELIMINARY PAGES SUMMARY OF HIGHLIGHTS
--	---

Continued from the previous page

Localization Title	Toc Index	ID	Reason
Cabin signs EXIT			Cabin signs EXIT Exit sw. Layout modification. No technical change.
GEN Cabin signs EXIT	B	25	Title enhancement to be in accordance with cockpit layout.
GEN Cabin signs EXIT	B	26	Addition of: Cabin signs EXIT Exit sw. Layout modification. No technical change.
GEN FANS A+	B	27	Addition of: ATSU ATC Datalink ADS-C. Documentation update: Deletion of text.
GEN FANS A+B	B	28	Addition of: ATSU ATC Datalink ADS-C. Documentation update: Deletion of text.
GEN FANS B	B	29	Addition of: ATSU ATC Datalink. Layout modification. No technical change. Documentation update: Deletion of text.
GEN FANS B+	B	30	Documentation update: Deletion of text. Layout modification. No technical change. Addition of: ATC Datalink ATSU.
GEN FANS B+	B	31	Addition of: ATC Datalink ATSU. Layout modification. No technical change.
GEN FANS C	B	32	Documentation update: Deletion of text. Addition of: ATSU ATC Datalink ADS-C. Layout modification. No technical change.
GEN	B	33	Addition of If-installed tag "AFT cargo fire extinguishing".

Continued on the following page

GENERAL INFORMATION

PRELIMINARY PAGES

SUMMARY OF HIGHLIGHTS

Continued from the previous page

Localization Title	Toc Index	ID	Reason
Fire Extinguishing in the AFT Cargo			
GEN Fire Extinguishing in the FWD Cargo	B	34	Addition of If-installed tag "Forward cargo fire extinguishing".
GEN FWD Cargo Heating	B	35	Documentation update: Deletion of text. Removal of: "Temperature selector" "FWD(AFT) CARGO DUCT OVHT" "FWD(AFT) CRG HEAT" "FWD(AFT) CRG HEAT FAULT" "Cargo Heat" "CRG HEAT" "HOT AIR"
			Layout modification. No technical change.
GEN FWD Cargo Heating	B	36	Removal of: "Temperature selector" "FWD(AFT) CARGO DUCT OVHT" "FWD(AFT) CRG HEAT" "FWD(AFT) CRG HEAT FAULT" "Cargo Heat" "CRG HEAT" "HOT AIR"
			Layout modification. No technical change.
			Documentation update: Deletion of text.
GEN FWD Cargo Ventilation	B	37	Layout modification. No technical change. Removal of "isolation valves".
GEN FWD Cargo Ventilation	B	38	Layout modification. No technical change. Removal of "isolation valves".
GEN GPS PRIMARY Function	B	39	Addition of the GPS Primary Lost
GEN HEAD REST ADJUSTMENT	B	41	Documentation update: Addition of "HEAD REST ADJUSTMENT" documentary unit
GEN LOC B/C	B	42	Layout modification. No technical change.
GEN No Portable Elec Device	B	43	Documentation update: Addition of "No Portable Elec Device" documentary unit
GEN No Portable Elec Device	B	44	Documentation update: Addition of "No Portable Elec Device" documentary unit
GEN Printer Function in FMS	B	45	Addition of "PRINT". Addition of "QUEUED TO PRINT". Addition of "NOT XMITTED TO PRINTER".

Continued on the following page

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	GENERAL INFORMATION PRELIMINARY PAGES SUMMARY OF HIGHLIGHTS
--	---

Continued from the previous page

Localization Title	Toc Index	ID	Reason
			Addition of "PRINTER BUSY".
			Addition of "PRINT IN PROGRESS".
GEN SATCOM VOICE CHANNEL 2	B	47	Title enhancement to be in accordance with the cockpit layout.
GEN SATCOM VOICE CHANNEL 2	B	48	Layout modification. No technical change. Addition of "SATCOM Voice Channel 2".
GEN SBAS	B	49	Layout modification. No technical change.
GEN TLM	B	50	Addition of LANDING ON TAXIWAY.
GEN Abbreviations	Q	51	Update of "DCL" abbreviation.
GEN Abbreviations	Q	52	Addition of "FZFG" abbreviation.
GEN Abbreviations	Q	53	Addition of NEOL abbreviation
GEN PED compatible Operation Manual and Checklist Stowage	A	2	Effectivity update: The information no longer applies to MSN 07792.
GEN PED compatible Operation Manual and Checklist Stowage	A	5	Effectivity update: The information now also applies to MSN 07792.
GEN Calls panel ALL pb	B	15	Effectivity update: The information now applies to all MSN.
GEN Chemical Oxygen System 22 min	B	18	Effectivity update: The information now also applies to MSN 03060, 07792.
GEN Chemical Oxygen System 15 min	B	19	Effectivity update: The information no longer applies to MSN 03060, 07792.
GEN HEAD REST ADJUSTMENT	B	40	Effectivity update: The information no longer applies to all MSN.
GEN SATCOM VOICE CHANNEL 2	B	46	Effectivity update: The information now applies to all MSN.

GENERAL INFORMATION

PRELIMINARY PAGES

SUMMARY OF HIGHLIGHTS

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	GENERAL INFORMATION PRELIMINARY PAGES LIST OF EFFECTIVE TEMPORARY DOCUMENTARY UNITS
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M	Localization	DU Title	DU identification	DU date
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No Temporary Documentary Unit

GENERAL INFORMATION**PRELIMINARY PAGES**

LIST OF EFFECTIVE TEMPORARY DOCUMENTARY UNITS

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	GENERAL INFORMATION
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AIRCRAFT CONFIGURATION SUMMARY

Ident.: GEN-ACS-00016449.0001001 / 26 JUN 15

Applicable to: ALL

For awareness and for the specified aircraft, the following table provides the flight crew with a list of optional aircraft systems and functions related to flight and aircraft operations.

Ident.: GEN-ACS-00018963.0001001 / 04 MAR 16

Applicable to: ALL

Item	System	Installed
------	--------	-----------

Ident.: GEN-ACS-00015613.0002001 / 23 JUN 15

Applicable to: ALL

ADS-B OUT	SURV	Yes
-----------	------	-----

Ident.: GEN-ACS-00016448.0001001 / 23 JUN 15

Applicable to: ALL

AP Automatic Disconnection at Minima	AUTO FLT	No
--------------------------------------	----------	----

AP/FD TCAS

Ident.: GEN-ACS-00015927.0001001 / 26 JUN 15

Applicable to: MSN 02155-05746

AP/FD TCAS	AUTO FLT	No
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Ident.: GEN-ACS-00015927.0002001 / 26 JUN 15

Applicable to: MSN 07784-07792

AP/FD TCAS	AUTO FLT	Yes
------------	----------	-----

Ident.: GEN-ACS-00015892.0002001 / 19 FEB 16

Applicable to: ALL

Automatic FD Bar Engagement	AUTO FLT	Yes
-----------------------------	----------	-----

BACKUP NAVIGATION FUNCTION OF THE MCDU

Ident.: GEN-ACS-00016009.0001001 / 23 JUN 15

Applicable to: MSN 02155-03060

Backup Navigation Function of the MCDU	AUTO FLT	No
--	----------	----

Ident.: GEN-ACS-00016009.0002001 / 23 JUN 15

Applicable to: MSN 04392-07792

Backup Navigation Function of the MCDU	AUTO FLT	Yes
--	----------	-----

A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL

Ident.: GEN-ACS-00025300.0001001 / 05 MAY 22

Applicable to: ALL

BACF	DATALINK	No
------	----------	----

BUSS

Ident.: GEN-ACS-00016014.0001001 / 23 JUN 15

Applicable to: MSN 02155-02212

BUSS	NAV	No
------	-----	----

Ident.: GEN-ACS-00016014.0003001 / 04 JUN 19

Applicable to: MSN 02784-07792

BUSS Reversible	NAV	Yes
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Ident.: GEN-ACS-00016014.0002001 / 23 JUN 15

Applicable to: MSN 02719-05746

BUSS	NAV	Yes
------	-----	-----

Ident.: GEN-ACS-00027769.0001001 / 02 MAY 24

Applicable to: ALL

Continuous Descent Approach (CDA)	AUTO FLT	No
-----------------------------------	----------	----

CPDLC

Ident.: GEN-ACS-00016010.0001001 / 23 JUN 15

Applicable to: MSN 02155-02212, 02926-02944, 04392

CPDLC	DATALINK	No
-------	----------	----

Ident.: GEN-ACS-00016010.0002001 / 23 JUN 15

Applicable to: MSN 02719-02789, 03031-03060, 05152-07792

CPDLC	DATALINK	Yes
-------	----------	-----

Ident.: GEN-ACS-00015917.0001001 / 23 JUN 15

Applicable to: ALL

Derated Takeoff	ENG	No
-----------------	-----	----

Ident.: GEN-ACS-00019728.0002001 / 06 JUN 16

Applicable to: ALL

Descent Profile Optimization (DPO)	AUTO FLT	No
------------------------------------	----------	----

FANS

Ident.: GEN-ACS-00023360.0001001 / 26 NOV 19

Applicable to: MSN 02155-02212, 02926-02944, 04392

FANS	DATALINK	No
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Ident.: GEN-ACS-00023360.0004001 / 26 NOV 19

Applicable to: MSN 02719-02789, 03031-03060, 05152-07792

FANS B+	DATALINK	Yes
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Ident.: GEN-ACS-00015912.0001001 / 23 JUN 15

Applicable to: ALL

FLS Function in the FMS	AUTO FLT	No
-------------------------	----------	----

Ident.: GEN-ACS-00015913.0005001 / 16 NOV 18

Applicable to: ALL

FMS2 Release 1A (including RF leg capability)	AUTO FLT	Yes
---	----------	-----

Ident.: GEN-ACS-00026015.0002001 / 03 NOV 22

Applicable to: ALL

G/S Mode Engagement before LOC Mode Engagement	AUTO FLT	No
--	----------	----

Ident.: GEN-ACS-00015899.0001001 / 23 JUN 15

Applicable to: ALL

GLS	AUTO FLT	No
-----	----------	----

Ident.: GEN-ACS-00015924.0002001 / 23 JUN 15

Applicable to: ALL

GPS	NAV	Yes
-----	-----	-----

Ident.: GEN-ACS-00016553.0002001 / 23 JUN 15

Applicable to: ALL

GPS PRIMARY Function	NAV	Yes
----------------------	-----	-----

Ident.: GEN-ACS-00022547.0002001 / 30 OCT 18

Applicable to: ALL

HPFD	EIS	No
------	-----	----

METRIC ALTITUDE INDICATIONS ON THE PFD

Ident.: GEN-ACS-00015926.0001001 / 23 JUN 15

Applicable to: MSN 04392-07792

Metric Altitude Indications on the PFD	EIS	No
--	-----	----

Ident.: GEN-ACS-00015926.0002001 / 23 JUN 15

Applicable to: MSN 02155-03060

Metric Altitude Indications on the PFD	EIS	Yes
--	-----	-----

Ident.: GEN-ACS-00015900.0001001 / 23 JUN 15

Applicable to: ALL

MLS	AUTO FLT	No
-----	----------	----

A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL

NAV MODE AUTOMATICALLY ENGAGED (ARMED) AT GO-AROUND

Ident.: GEN-ACS-00015923.0001001 / 19 FEB 16

Applicable to: MSN 02926-02944

NAV Mode automatically Engaged (Armed) in Go-Around	AUTO FLT	No
---	----------	----

Ident.: GEN-ACS-00015923.0002001 / 19 FEB 16

Applicable to: MSN 02155-02789, 03031-07792

NAV Mode automatically Engaged (Armed) in Go-Around	AUTO FLT	Yes
---	----------	-----

Ident.: GEN-ACS-00026830.0001001 / 24 NOV 23

Applicable to: ALL

One Engine Taxi Without APU Running	Fire Protection	No
-------------------------------------	-----------------	----

Ident.: GEN-ACS-00029100.0001001 / 07 NOV 25

Applicable to: ALL

PED compatible Flight Document Stowage	EQPT	Yes
--	------	-----

PED COMPATIBLE OPERATION MANUAL AND CHECKLIST STOWAGE

Ident.: GEN-ACS-00024439.0001001 / 07 NOV 25

Applicable to: MSN 02926

PED compatible Operation Manual and Checklist Stowage	EQPT	No
---	------	----

Ident.: GEN-ACS-00024439.0002001 / 07 NOV 25

Applicable to: MSN 02155-02789, 02944-07792

PED compatible Operation Manual and Checklist Stowage	EQPT	Yes
---	------	-----

Ident.: GEN-ACS-00016013.0002001 / 23 JUN 15

Applicable to: ALL

PWS	SURV	Yes
-----	------	-----

QFE BARO SETTING

Ident.: GEN-ACS-00015920.0001001 / 23 JUN 15

Applicable to: MSN 02719-07792

QFE BARO Setting	NAV	No
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Ident.: GEN-ACS-00015920.0002001 / 23 JUN 15

Applicable to: MSN 02155-02212

QFE BARO Setting	NAV	Yes
------------------	-----	-----

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	GENERAL INFORMATION
--	----------------------------

8 Ident.: GEN-ACS-00029225.0002001 / 06 NOV 25
Applicable to: ALL

QNH Operations above 1050 HPA	NAV	Yes
-------------------------------	-----	-----

RAAS

Ident.: GEN-ACS-00019573.0001001 / 10 MAY 16
Applicable to: MSN 02155-04392, 07784-07792

RAAS	SURV	No
------	------	----

Ident.: GEN-ACS-00019573.0002001 / 10 MAY 16
Applicable to: MSN 05152-05746

RAAS	SURV	Yes
------	------	-----

Ident.: GEN-ACS-00015897.0001001 / 23 JUN 15
Applicable to: ALL

RNP AR	AUTO FLT	No
--------	----------	----

Ident.: GEN-ACS-00016008.0001001 / 23 JUN 15
Applicable to: ALL

ROW/ROPS	SURV	No
----------	------	----

Ident.: GEN-ACS-00025170.0001001 / 12 MAY 22
Applicable to: ALL

SLS	NAV	No
-----	-----	----

Ident.: GEN-ACS-00016015.0001001 / 22 MAR 17
Applicable to: ALL

Soft Go-Around	ENG	No
----------------	-----	----

Ident.: GEN-ACS-00027768.0001001 / 02 MAY 24
Applicable to: ALL

TOS2	AUTO FLT	No
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IF INSTALLED TABLE

Ident.: GEN-IFIT-00016590.0001001 / 23 JUN 15
Applicable to: ALL

The "If Installed Table" provides a list of optional systems and functions of the aircraft. For most of the optional systems or functions associated with the "if installed"  symbol in the FCOM, the table indicates if the optional systems or functions are installed, or not installed.

Note: Highly customized options such as cabin installations are not covered in the following table.

A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL

Ident.: GEN-IFIT-00018965.0001001 / 22 MAR 16

Applicable to: ALL

Item	System	Installed
------	--------	-----------

Ident.: GEN-IFIT-00015896.0001001 / 14 NOV 24

Applicable to: ALL

L13		
Fourth occupant ACP 4th OCC ACP 4 4th Occupant Fourth Occupant Fourth	COM	No

4TH OXYGEN MASK

Ident.: GEN-IFIT-00016012.0001001 / 21 MAR 16

Applicable to: MSN 02926-02944

L13		
4th Oxygen Mask Four	OXY	No

Ident.: GEN-IFIT-00016012.0002001 / 21 MAR 16

Applicable to: MSN 02155-02789, 03031-07792

L13		
4th Oxygen Mask Four	OXY	Yes

Ident.: GEN-IFIT-00018779.0002001 / 21 MAR 16

Applicable to: ALL

AC ESS FEED Auto Switching	ELEC	Yes
----------------------------	------	-----

9 Ident.: GEN-IFIT-00029085.0001001 / 07 NOV 25

Applicable to: ALL

L13		
ACARS ACARS Management Unit ACARS FAULT WIND REQUEST	DATALINK	No

Ident.: GEN-IFIT-00028475.0001001 / 12 MAY 25

Applicable to: ALL

ACP	COM	Yes
-----	-----	-----

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	GENERAL INFORMATION
--	----------------------------

Ident.: GEN-IFIT-00016516.0001001 / 12 NOV 24

Applicable to: ALL

L13

ACT 1 ACT 2 ACTs ACT PUMP ACT PUMP LO PR ACT XFR FAULT ACT1 ACT 1 ACT2 ACT 2 ACTs FWD ACT AFT1 ACT AFT2 ACT	FUEL	No
--	------	----

ADF

Ident.: GEN-IFIT-00028289.0001001 / 14 NOV 24

Applicable to: MSN 02926-02944, 04392-07792

L13

One ADF ADF ADF1 ADF 1 ADF1(2) ADFs	NAV	Yes
--	-----	-----

Ident.: GEN-IFIT-00028289.0004001 / 14 NOV 24

Applicable to: MSN 02155-02789, 03031-03060

L13

Two ADFs ADF ADF1 ADF 1 ADF2 ADF 2 ADF1(2) ADFs	NAV	Yes
--	-----	-----

Ident.: GEN-IFIT-00016641.0002001 / 23 JUN 15

Applicable to: ALL

ADS-B OUT	SURV	Yes
-----------	------	-----

A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL

AFT CARGO HEATING

Ident.: GEN-IFIT-00015891.0001001 / 06 NOV 25

Applicable to: MSN 02926-02944, 05152-07792

10 L13

AFT Cargo Heating AFT CRG HOT AIR AFT CRG HEAT AFT CARGO HEAT AFT CARGO DUCT OVHT AFT Cargo heat controller AFT Cargo Temperature Regulation HOT AIR AFT TEMPERATURE SELECTOR	COND	No
---	------	----

Ident.: GEN-IFIT-00015891.0002001 / 06 NOV 25

Applicable to: MSN 02155-02789, 03031-04392

11 L13

AFT Cargo Heating AFT CRG HOT AIR AFT CRG HEAT AFT CARGO HEAT AFT CARGO DUCT OVHT AFT Cargo heat controller AFT Cargo Temperature Regulation HOT AIR AFT TEMPERATURE SELECTOR	COND	Yes
---	------	-----

Ident.: GEN-IFIT-00015901.0002001 / 21 MAR 16

Applicable to: ALL

L13

AFT Cargo Smoke Detector SMOKE AFT CARGO SMOKE SMOKE AFT CRG DET FAULT AFT CRG DET AFT CARGO SMOKE AFT CRG DET FAULT	FIRE	Yes
---	------	-----

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	GENERAL INFORMATION
--	----------------------------

AFT CARGO VENTILATION

Ident.: GEN-IFIT-00015931.0001001 / 06 NOV 25

Applicable to: MSN 02926-02944, 05152-05746

12 L13

AFT Cargo Ventilation AFT Cargo Ventilation AFT ISOL VALVE AFT CRG VENT AFT CRG VENT FAULT AFT Cargo isol valves AFT cargo isolation valves AFT CARGO ISO VALVES	VENT	No
---	------	----

Ident.: GEN-IFIT-00015931.0002001 / 06 NOV 25

Applicable to: MSN 02155-02789, 03031-04392, 07784-07792

13 L13

AFT Cargo Ventilation AFT Cargo Ventilation AFT ISOL VALVE AFT CRG VENT AFT CRG VENT FAULT AFT Cargo isol valves AFT cargo isolation valves AFT CARGO ISO VALVES	VENT	Yes
---	------	-----

Ident.: GEN-IFIT-00016522.0002001 / 23 JUN 15

Applicable to: ALL

Aileron Anti Droop	F/CTL	Yes
--------------------	-------	-----

AIR CONDITIONING SYSTEM CONTROLLER (ACSC)

Ident.: GEN-IFIT-00015919.0001001 / 21 MAR 16

Applicable to: MSN 02155-02212

L13

Air Conditioning System Controller (ACSC) ACSC ACSC 1 ACSC 2 Air Conditioning System Controllers	COND	No
--	------	----

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	GENERAL INFORMATION
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Ident.: GEN-IFIT-00015919.0002001 / 21 MAR 16

Applicable to: MSN 02719-07792

L13

Air Conditioning System Controller (ACSC) ACSC ACSC 1 ACSC 2 Air Conditioning System Controllers	COND	Yes
--	------	-----

Ident.: GEN-IFIT-00028485.0001001 / 12 MAY 25

Applicable to: ALL

L13

Airstair STAIR SYMBOL AIRSTAIRS AIR STAIRS STAIRS STAIRS DOOR	DOOR	No
--	------	----

Ident.: GEN-IFIT-00027246.0001001 / 13 MAY 25

Applicable to: ALL

L13

Altimeter Setting Monitor ALTSM	SURV	No
------------------------------------	------	----

14Ident.: GEN-IFIT-00029144.0002001 / 07 NOV 25

Applicable to: ALL

L13

AOC Datalink AOC ATSU INIT Request UPLINK to DATA WIND REQUEST	DATALINK	Yes
---	----------	-----

AP/FD TCAS

Ident.: GEN-IFIT-00016523.0001001 / 04 JUN 19

Applicable to: MSN 02155-05746

L13

AP/FD TCAS AP/FD TCAS function	AUTO FLT	No
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A318/A319/A320/A321
FLIGHT CREW
OPERATING MANUAL
GENERAL INFORMATION

Ident.: GEN-IFIT-00016523.0002001 / 04 JUN 19

Applicable to: MSN 07784-07792
L13

AP/FD TCAS	AUTO FLT	Yes
AP/FD TCAS function		

Ident.: GEN-IFIT-00027247.0001001 / 13 MAY 25

Applicable to: ALL
L13

Approach Stabilization Monitor	SURV	No
APPSM		

Ident.: GEN-IFIT-00016640.0001001 / 21 MAR 16

Applicable to: ALL
L13

ATSAW	SURV	No
ADS-B IN		

Ident.: GEN-IFIT-00016524.0002001 / 23 JUN 15

Applicable to: ALL

Automatic FD Bar Engagement	AUTO FLT	Yes
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Ident.: GEN-IFIT-00028042.0002001 / 13 MAY 24

Applicable to: ALL

Automatic TOGA	ENG	Yes
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AVAIL INDICATION DURING ENGINE START

Ident.: GEN-IFIT-00018780.0001001 / 21 MAR 16

Applicable to: MSN 02719-03060
L13

Avail Indication During Engine Start	ENG	No
AVAIL Indication		

Ident.: GEN-IFIT-00018780.0002001 / 21 MAR 16

Applicable to: MSN 02155-02212, 04392-07792
L13

Avail Indication During Engine Start	ENG	Yes
AVAIL Indication		

A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL

BACKUP NAVIGATION FUNCTION OF THE MCDU

Ident.: GEN-IFIT-00016681.0001001 / 21 MAR 16

Applicable to: MSN 02155-03060

L13

Backup Navigation Function of the MCDU BACK UP NAV	AUTO FLT	No
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Ident.: GEN-IFIT-00016681.0002001 / 21 MAR 16

Applicable to: MSN 04392-07792

L13

Backup Navigation Function of the MCDU BACK UP NAV	AUTO FLT	Yes
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BKUP SPD-ALT

Ident.: GEN-IFIT-00028482.0001001 / 12 MAY 25

Applicable to: MSN 02155-05746

L13

BKUP SPD-ALT Backup SPD-ALT Backup Speed-ALT Back up SPD-ALT Back up Speed-ALT Back-up SPD-ALT Back-up Speed-ALT	AUTO FLT	No
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Ident.: GEN-IFIT-00028482.0002001 / 12 MAY 25

Applicable to: MSN 07784-07792

L13

BKUP SPD-ALT Backup SPD-ALT Backup Speed-ALT Back up SPD-ALT Back up Speed-ALT Back-up SPD-ALT Back-up Speed-ALT	AUTO FLT	Yes
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Ident.: GEN-IFIT-00016525.0002001 / 12 MAY 25

Applicable to: ALL

L13

BARO/RADIO Instead of MDA/MDH/DH BARO BARO/RADIO RADIO	NAV	Yes
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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	GENERAL INFORMATION
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Ident.: GEN-IFIT-00016526.0002001 / 14 NOV 24
Applicable to: ALL

L13		
Brake Fans Brake cooling fans BRK FAN BRK FAN pb-sw Brake Fan Brake fans 1, 2, 3 and 4 Brake fans 5, 6, 7 and 8	BRAKE	Yes

Ident.: GEN-IFIT-00015875.0002001 / 21 MAR 16
Applicable to: ALL

L13		
Bulk Cargo Door Bulk Cargo Compartment Door Bulk Door	DOORS	Yes

BUSS

Ident.: GEN-IFIT-00018781.0001001 / 13 MAY 25
Applicable to: MSN 02155-02212

L13		
Backup Speed Scale BUSS Backup Speed/Altitude Scale BKUP SPD	NAV	No

Ident.: GEN-IFIT-00018781.0002001 / 13 MAY 25
Applicable to: MSN 02719-07792

L13		
Backup Speed Scale BUSS Backup Speed/Altitude Scale BKUP SPD	NAV	Yes

Ident.: GEN-IFIT-00028460.0001001 / 06 NOV 25
Applicable to: ALL

L13		
Calls Panel ALL pb All	COM	No

A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL

CARGO VENTILATION SYSTEM

Ident.: GEN-IFIT-00021488.0001001 / 17 MAR 17

Applicable to: MSN 02926-02944

L13

Cargo ventilation system	VENT	No
Cargo isolation valves		
Extraction fan		

Ident.: GEN-IFIT-00021488.0002001 / 17 MAR 17

Applicable to: MSN 02155-02789, 03031-07792

L13

Cargo ventilation system	VENT	Yes
Cargo isolation valves		
Extraction fan		

CENTER TANK TRANSFER VALVES

Ident.: GEN-IFIT-00016535.0001001 / 22 MAR 17

Applicable to: MSN 02155-05746

L13

Center Fuel Tank Transfer Valves	FUEL	No
Center Tank Transfer Valves		
L CTR TK XFR valve		
CTR TK XFR valve R		

Ident.: GEN-IFIT-00016535.0004001 / 22 MAR 17

Applicable to: MSN 07784-07792

L13

Center Fuel Tank Transfer Valves	FUEL	Yes
Center Tank Transfer Valves		
L CTR TK XFR valve		
CTR TK XFR valve R		

CENTER FUEL TANK PUMPS

Ident.: GEN-IFIT-00021220.0004001 / 22 MAR 17

Applicable to: MSN 07784-07792

L13

Center Fuel Tank Pumps	FUEL	No
CTR TK PUMP 1		
CTR TK PUMP 2		

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	GENERAL INFORMATION
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Ident.: GEN-IFIT-00021220.0001001 / 22 MAR 17

Applicable to: MSN 02155-05746

L13

Center Fuel Tank Pumps CTR TK PUMP 1 CTR TK PUMP 2	FUEL	Yes
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CHEMICAL OXYGEN SYSTEM

Ident.: GEN-IFIT-00015930.0002001 / 21 MAR 16

18 Applicable to: MSN 02719, 02789, 03060-04392, 07792

L13

Chemical Oxygen System 22 min Chemical Oxygen System 22 min	OXY	Yes
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Ident.: GEN-IFIT-00015930.0003001 / 21 MAR 16

19 Applicable to: MSN 02155-02212, 02758, 02926-03031, 05152-07784

L13

Chemical Oxygen System 15 min Chemical Oxygen System 15 min	OXY	Yes
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CIDS-SDF

Ident.: GEN-IFIT-00016625.0001001 / 06 NOV 25

Applicable to: MSN 02155-02212

20 L13

CIDS-SDF CIDS 1 SMOKE DETECT CIDS 2 SMOKE DETECT Smoke Detection Function (SDF)	SMOKE	No
--	-------	----

Ident.: GEN-IFIT-00016625.0002001 / 06 NOV 25

Applicable to: MSN 02719-07792

21 L13

CIDS-SDF CIDS 1 SMOKE DETECT CIDS 2 SMOKE DETECT Smoke Detection Function (SDF)	SMOKE	Yes
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A318/A319/A320/A321
FLIGHT CREW
OPERATING MANUAL
COCKPIT DOOR DEADBOLT

Ident.: GEN-IFIT-00015929.0001001 / 17 MAR 17

Applicable to: MSN 02155-02212, 02926-02944, 04392

L13

Cockpit Door Deadbolt Deadbolt	EQUIPMENT	No
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Ident.: GEN-IFIT-00015929.0002001 / 17 MAR 17

Applicable to: MSN 02719-02789, 03031-03060, 05152-07792

L13

Cockpit Door Deadbolt Deadbolt	EQUIPMENT	Yes
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Ident.: GEN-IFIT-00018782.0002001 / 21 MAR 16

Applicable to: ALL

Cockpit Door Escape Panel	DOOR	Yes
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Ident.: GEN-IFIT-00016690.0001001 / 12 MAY 23

Applicable to: ALL

Cockpit Fixed Second Oxygen Bottle	OXY	No
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COCKPIT FOOT HEATER

Ident.: GEN-IFIT-00016612.0001001 / 23 JUN 15

Applicable to: MSN 02155-04392, 07784-07792

Cockpit Foot Heater	COND	No
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Ident.: GEN-IFIT-00016612.0002001 / 23 JUN 15

Applicable to: MSN 05152-05746

Cockpit Foot Heater	COND	Yes
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COCKPIT FOOT WARMER

Ident.: GEN-IFIT-00016639.0001001 / 17 MAR 17

Applicable to: MSN 02155-02212, 02926-02944, 04392-07792

L13

Cockpit Foot Warmer Foot Warmer System Foot Warmer ON/OFF Control Switch	EQUIPMENT	No
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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	GENERAL INFORMATION
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Ident.: GEN-IFIT-00016639.0002001 / 17 MAR 17

Applicable to: MSN 02719-02789, 03031-03060

L13

Cockpit Foot Warmer Foot Warmer System Foot Warmer ON/OFF Control Switch	EQUIPMENT	Yes
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COCKPIT POWER OUTLET

Ident.: GEN-IFIT-00021875.0001001 / 12 NOV 24

Applicable to: MSN 02155-02212

L13

Cockpit Power Outlet Power Outlet Power Outlets	EQUIPMENT	No
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Ident.: GEN-IFIT-00021875.0002001 / 12 NOV 24

Applicable to: MSN 02719-07792

L13

Cockpit Power Outlet Power Outlet Power Outlets	EQUIPMENT	Yes
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Ident.: GEN-IFIT-00016614.0002001 / 21 MAR 16

Applicable to: ALL

L13

COMMERCIAL pb COMMERCIAL	ELEC	Yes
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CVR DATALINK FUNCTION

Ident.: GEN-IFIT-00016615.0001001 / 23 JUN 15

Applicable to: MSN 02155-05746

CVR Datalink Function	COM	No
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Ident.: GEN-IFIT-00016615.0002001 / 23 JUN 15

Applicable to: MSN 07784-07792

CVR Datalink Function	COM	Yes
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Ident.: GEN-IFIT-00016626.0001001 / 04 SEP 18

Applicable to: ALL

CVR ERASE Function	COM	Yes
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 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	GENERAL INFORMATION
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Ident.: GEN-IFIT-00025082.0001001 / 09 NOV 21

Applicable to: ALL

L13		
Data Loading Selector Unit DLSU	DATA LOADING	No

Ident.: GEN-IFIT-00028964.0003001 / 13 MAY 25

Applicable to: ALL

L13		
Digital Backup Speed DBUS	NAV	No

Ident.: GEN-IFIT-00016647.0001001 / 21 MAR 17

Applicable to: ALL

L13		
DC BUS Entertainment TR Entertainment DC BUS Ent DC BUS Entertainment TR Ent TR Ent.	ELEC	No

DDRMI

Ident.: GEN-IFIT-00016527.0001001 / 21 MAR 16

Applicable to: MSN 04392, 07784-07792

L13		
DDRMI Digital Distance and Radio Magnetic Indicator	NAV	No

Ident.: GEN-IFIT-00016527.0002001 / 18 NOV 25

Applicable to: MSN 02155-03060, 05152-05746

22 L13		
DDRMI Digital Distance and Radio Magnetic Indicator	NAV	Yes

DECEL MESSAGE ON THE PFD

Ident.: GEN-IFIT-00023538.0001001 / 28 MAY 20

Applicable to: MSN 04392

L13		
DECEL Message on the PFD DECEL	EIS	No

A318/A319/A320/A321
FLIGHT CREW
OPERATING MANUAL
GENERAL INFORMATION

Ident.: GEN-IFIT-00023538.0002001 / 28 MAY 20

Applicable to: MSN 02155-03060, 05152-07792

L13

DECEL Message on the PFD DECEL	EIS	Yes
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Ident.: GEN-IFIT-00016528.0001001 / 13 MAY 24

Applicable to: ALL

L13

Derated Takeoff DERATE Derated Level Derated DRT TO	ENG	No
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Ident.: GEN-IFIT-00019730.0002001 / 06 JUN 16

Applicable to: ALL

L13

Descent Profile Optimization DPO	AUTO FLT	No
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Ident.: GEN-IFIT-00016580.0002001 / 21 MAR 16

Applicable to: ALL

L13

Display of Delta ISA Delta ISA	EIS	Yes
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Ident.: GEN-IFIT-00024932.0001001 / 09 NOV 21

Applicable to: ALL

Drain Mast	WATER	No
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DUAL ICE DETECTION SYSTEM

Ident.: GEN-IFIT-00016529.0001001 / 23 JUN 15

Applicable to: MSN 02155-02212, 02926-02944, 05152-07792

Dual Ice Detection System	ICE	No
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Ident.: GEN-IFIT-00016529.0002001 / 23 JUN 15

Applicable to: MSN 02719-02789, 03031-04392

Dual Ice Detection System	ICE	Yes
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Ident.: GEN-IFIT-00016574.0002001 / 23 JUN 15

Applicable to: ALL

Dual Navigation Lights	LIGHTS	Yes
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GENERAL INFORMATION

A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL

Ident.: GEN-IFIT-00025910.0002001 / 03 NOV 22

Applicable to: ALL

Single Navigation Lights	LIGHTS	No
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EGPWS

Ident.: GEN-IFIT-00016628.0001001 / 13 MAR 18

Applicable to: MSN 02926-02944, 04392, 07784-07792

EGPWS	SURV	No
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Ident.: GEN-IFIT-00016628.0002001 / 13 MAR 18

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

EGPWS	SURV	Yes
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ELECTRICAL ALTERNATE BRAKING

Ident.: GEN-IFIT-00016530.0001001 / 23 JUN 15

Applicable to: MSN 02155-02212

Electrical Alternate Braking	L/G	No
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Ident.: GEN-IFIT-00016530.0002001 / 23 JUN 15

Applicable to: MSN 02719-07792

Electrical Alternate Braking	L/G	Yes
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Ident.: GEN-IFIT-00016575.0002001 / 12 NOV 24

Applicable to: ALL

ELT	COM	Yes
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Ident.: GEN-IFIT-00022409.0001001 / 05 MAR 19

Applicable to: ALL

Enhanced RTA RTA MISSED	AUTO FLT	No
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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	GENERAL INFORMATION
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Ident.: GEN-IFIT-00020758.0002001 / 12 NOV 24
Applicable to: ALL

L13		
EVAC PANEL COMMAND pb-sw Evacuation Signaling System EVAC HORN HORN SHUT OFF pb CAPT and PURS sw (EVAC) panel EVAC COMMAND EVAC SIGNAL SYSTEM EVAC SIGNALS	COM	Yes

CABIN SIGNS EXIT

Ident.: GEN-IFIT-00028925.0001001 / 12 NOV 25
Applicable to: MSN 02155-05746

24 L13		
Cabin signs EXIT Exit Exit sw	LIGHT	No

Ident.: GEN-IFIT-00028925.0002001 / 12 NOV 25
Applicable to: MSN 07784-07792

26 L13		
Cabin signs EXIT Exit Exit sw	LIGHT	Yes

EXPEDITE FUNCTION

Ident.: GEN-IFIT-00021713.0002001 / 12 NOV 24
Applicable to: MSN 05152-05746

L13		
Expedite function EXP CLB EXP DES EXPED pb EXP EXPED MODE EXPED EXPEDITE EXPED CLIMB	AUTO FLT	No

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	GENERAL INFORMATION
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Ident.: GEN-IFIT-00021713.0001001 / 12 NOV 24

Applicable to: MSN 02155-04392, 07784-07792

L13

Expedite function EXP CLB EXP DES EXPED pb EXP EXP MODE EXPED EXPEDITE EXPEDITE CLIMB	AUTO FLT	Yes
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Ident.: GEN-IFIT-00015918.0001001 / 23 JUN 15

Applicable to: ALL

Extended FLEX Takeoff	ENG	No
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Ident.: GEN-IFIT-00016531.0002001 / 21 MAR 16

Applicable to: ALL

L13

External Ice Detector Light ICE IND	ICE	Yes
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Ident.: GEN-IFIT-00021527.0001001 / 07 NOV 25

Applicable to: ALL

27 L13

FANS A+ DCDU ATC MSG pb ATSU ATC Datalink ADS-C	DATALINK	No
--	----------	----

Ident.: GEN-IFIT-00022629.0001001 / 07 NOV 25

Applicable to: ALL

28 L13

FANS A+B DCDU ATC MSG pb ATSU ATC Datalink ADS-C	DATALINK	No
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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	GENERAL INFORMATION
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Ident.: GEN-IFIT-00021529.0001001 / 07 NOV 25
Applicable to: ALL

29 L13 FANS B DCDU ATC MSG pb ATSU ATC Datalink	DATALINK	No
--	----------	----

FANS B+

Ident.: GEN-IFIT-00021530.0001001 / 07 NOV 25
Applicable to: MSN 02155-02212, 02926-02944, 04392

30 L13 FANS B+ DCDU ATC MSG pb ATC Datalink ATSU	DATALINK	No
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Ident.: GEN-IFIT-00021530.0002001 / 07 NOV 25
Applicable to: MSN 02719-02789, 03031-03060, 05152-07792

31 L13 FANS B+ DCDU ATC MSG pb ATC Datalink ATSU	DATALINK	Yes
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Ident.: GEN-IFIT-00022627.0001001 / 07 NOV 25
Applicable to: ALL

32 L13 FANS C DCDU ATC MSG pb ATSU ATC Datalink ADS-C	DATALINK	No
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Ident.: GEN-IFIT-00015909.0001001 / 21 MAR 16
Applicable to: ALL

L13 Fan Speed Controller (FSC) Two Operating Speeds	VENT	No
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 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	GENERAL INFORMATION
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Ident.: GEN-IFIT-00016629.0003001 / 06 NOV 25

Applicable to: ALL

33 L13

Fire Extinguishing in the AFT Cargo SMOKE FWD(AFT) CRG BTL 1(2) FAULT Forward (aft) cargo fire extinguishing AFT cargo fire extinguishing	FIRE	Yes
--	------	-----

Ident.: GEN-IFIT-00016630.0005001 / 06 NOV 25

Applicable to: ALL

34 L13

Fire Extinguishing in the FWD Cargo SMOKE FWD(AFT) CRG BTL 1(2) FAULT Forward (aft) cargo fire extinguishing Forward cargo fire extinguishing	FIRE	Yes
--	------	-----

Ident.: GEN-IFIT-00015898.0001001 / 13 MAY 25

Applicable to: ALL

L13

FLS F-G/S F-G/S* F-G/S BASED ON ISA F-G/S-F-LOC F-G/S-LOC F-LOC F-LOC* F-LOC*/F-LOC FLS 1 FLS 2 FLS function NO FLS FOR THIS APPR	AUTO FLT	No
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Ident.: GEN-IFIT-00022411.0001001 / 04 SEP 18

Applicable to: ALL

FLS/FINAL APP - Coexistence	AUTO FLT	No
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Ident.: GEN-IFIT-00016579.0002001 / 12 NOV 24

Applicable to: ALL

L13

FMS Crossload Crossload	AUTO FLT	Yes
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FTIS

Ident.: GEN-IFIT-00015617.0001001 / 23 JUN 15

Applicable to: MSN 02155-03060

FTIS	FUEL	No
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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	GENERAL INFORMATION
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Ident.: GEN-IFIT-00015617.0002001 / 23 JUN 15		
Applicable to: MSN 04392-07792		
FTIS	FUEL	Yes

FUEL LEAK DETECTION

Ident.: GEN-IFIT-00016532.0001001 / 23 JUN 15		
Applicable to: MSN 02155-02789, 03031-04392		
Fuel Leak Detection	FUEL	No
Fuel Leak Detection	FUEL	Yes

FUEL TANK OVERFLOW ALERT

Ident.: GEN-IFIT-00016533.0001001 / 23 JUN 15		
Applicable to: MSN 02155-04392		
Fuel Tank Overflow Alert	FUEL	No
Fuel Tank Overflow Alert	FUEL	Yes

FWD CARGO HEATING

Ident.: GEN-IFIT-00015893.0001001 / 06 NOV 25		
Applicable to: MSN 02155-04392, 07784-07792		

35	L13		
FWD Cargo Heating		COND	No
FWD CRG HEAT			
FWD Cargo Temperature Regulation			
Forward cargo heat controller			
Fwd cargo heat controller			
Forward cargo heat controller			
FWD Temperature Selector			

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	GENERAL INFORMATION
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Ident.: GEN-IFIT-00015893.0002001 / 06 NOV 25

Applicable to: MSN 05152-05746

36

L13

FWD Cargo Heating FWD CRG HEAT FWD Cargo Temperature Regulation Forward cargo heat controller Fwd cargo heat controller Forward cargo heat controller FWD Temperature Selector	COND	Yes
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Ident.: GEN-IFIT-00015925.0002001 / 12 NOV 24

Applicable to: ALL

L13

FWD Cargo Smoke Detector SMOKE FWD CARGO SMOKE FWD CARGO SMOKE SMOKE FWD CRG DET FAULT FWD CRG DET FWD CRG DET FAULT	FIRE	Yes
---	------	-----

FWD CARGO VENTILATION

Ident.: GEN-IFIT-00015932.0001001 / 06 NOV 25

Applicable to: MSN 02155-04392, 07784-07792

37

L13

FWD Cargo Ventilation FWD Cargo Outlet Isolation Valve FWD Cargo Ventilation FWD ISOL Valve FWD CRG VENT FWD CARGO ISOL VALVE Forward cargo isolation valves Fwd cargo isol valves FWD CARGO ISO VALVES Forward cargo isol valves	VENT	No
--	------	----

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	GENERAL INFORMATION
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Ident.: GEN-IFIT-00015932.0002001 / 06 NOV 25
Applicable to: MSN 05152-05746

L13 FWD Cargo Ventilation FWD Cargo Outlet Isolation Valve FWD Cargo Ventilation FWD ISOL Valve FWD CRG VENT FWD CARGO ISOL VALVE Forward cargo isolation valves Fwd cargo isol valves FWD CARGO ISO VALVES Forward cargo isol valves	VENT	Yes
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Ident.: GEN-IFIT-00016617.0001001 / 21 MAR 16
Applicable to: ALL

L13 Galley Bus Automatic Shedding Galley Load Automatic Shedding	ELEC	No
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GAPCU

Ident.: GEN-IFIT-00016618.0001001 / 15 MAY 25
Applicable to: MSN 02155-02212

L13 GAPCU Ground and Auxiliary Power Control Unit Ground and Auxiliary Power Control Unit (GAPCU)	ELEC	No
---	------	----

Ident.: GEN-IFIT-00016618.0002001 / 15 MAY 25
Applicable to: MSN 02719-07792

L13 GAPCU Ground and Auxiliary Power Control Unit Ground and Auxiliary Power Control Unit (GAPCU)	ELEC	Yes
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Ident.: GEN-IFIT-00019705.0001001 / 13 MAY 16
Applicable to: ALL

L13 Gaseous Oxygen Generators in lavatories Gaseous Generators	OXY	No
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 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	GENERAL INFORMATION
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Ident.: GEN-IFIT-00016534.0001001 / 21 MAR 16

Applicable to: ALL

L13

GLS GLS Autoland GLS1 GLS2	AUTO FLT	No
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Ident.: GEN-IFIT-00016649.0002001 / 02 MAY 24

Applicable to: ALL

L13

GPS FM/GPS POS DISAGREE GPS 1(2) FAULT GPS 1 GPS 2	NAV	Yes
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Ident.: GEN-IFIT-00016650.0002001 / 07 NOV 25

Applicable to: ALL

39L13

GPS PRIMARY Function GPS PRIMARY GPS PRIMARY LOST	NAV	Yes
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Ident.: GEN-IFIT-00020297.0001001 / 17 MAR 17

Applicable to: ALL

GSM Onboard	COM	No
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HEAD REST ADJUSTMENT

Ident.: GEN-IFIT-00028934.0001001 / 15 MAY 25

Applicable to: MSN 02155-02944

40

HEAD REST ADJUSTMENT	SEAT	No
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Ident.: GEN-IFIT-00028934.0002001 / 15 MAY 25

Applicable to: MSN 03031-07792

41

HEAD REST ADJUSTMENT	SEAT	Yes
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HF DATALINK

Ident.: GEN-IFIT-00015911.0001001 / 30 AUG 18

Applicable to: MSN 02719-07792

L13

HF Datalink HF 1(2) DATA FAULT HF DATA LINK	COM	No
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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	GENERAL INFORMATION
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Ident.: GEN-IFIT-00015911.0002001 / 30 AUG 18

Applicable to: MSN 02155-02212

L13

HF Datalink HF 1(2) DATA FAULT HF DATA LINK	COM	Yes
---	-----	-----

Ident.: GEN-IFIT-00020132.0002001 / 12 NOV 24

Applicable to: ALL

L13

HF System HF HF COMMUNICATION SYSTEM HF SYSTEMS HIGH FREQUENCY (HF)	COM	Yes
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Ident.: GEN-IFIT-00027974.0002001 / 12 NOV 24

Applicable to: ALL

L13

HF1 HF 1	COM	Yes
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Ident.: GEN-IFIT-00027975.0001001 / 12 NOV 24

Applicable to: MSN 02926-02944

L13

HF2 HF 2	COM	Yes
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Ident.: GEN-IFIT-00016644.0001001 / 13 MAY 25

Applicable to: ALL

L13

HIGH ALT LANDING pb Operation on High Altitude Airfields HIGH ALT LANDING pb-sw	OXY	No
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Ident.: GEN-IFIT-00018783.0001001 / 03 NOV 21

Applicable to: ALL

L13

HUD HUDs	SURV	No
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IRS ALIGNMENT BASED ON GPS POSITION

Ident.: GEN-IFIT-00016651.0001001 / 23 JUN 15

Applicable to: MSN 02926-02944

IRS Alignment Based on GPS Position	NAV	No
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A318/A319/A320/A321
FLIGHT CREW
OPERATING MANUAL

Ident.: GEN-IFIT-00016651.0002001 / 23 JUN 15

Applicable to: MSN 02155-02789, 03031-07792

IRS Alignment Based on GPS Position	NAV	Yes
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Ident.: GEN-IFIT-00015618.0002001 / 23 JUN 15

Applicable to: ALL

ISIS	NAV	Yes
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Ident.: GEN-IFIT-00020693.0001001 / 17 MAR 17

Applicable to: ALL

L13 ITP ATSA ITP ITP TRAFFIC LIST page IN TRAIL PROCEDURE IN TRAIL PROCEDURE page	SURV	No
--	------	----

LAF

Ident.: GEN-IFIT-00016594.0002001 / 23 JUN 15

Applicable to: MSN 02155-05253

LAF	F/CTL	No
-----	-------	----

Ident.: GEN-IFIT-00016594.0001001 / 23 JUN 15

Applicable to: MSN 05746-07792

LAF	F/CTL	Yes
-----	-------	-----

Ident.: GEN-IFIT-00028527.0001001 / 13 MAY 25

Applicable to: ALL

L13 Landscape camera OVRD Override function OVRD pb	COM	No
--	-----	----

LOC B/C

Ident.: GEN-IFIT-00016600.0001001 / 12 MAY 23

Applicable to: MSN 02155-02212, 04392-07792

L13 LOC B/C LOC B/C*	AUTO FLT	No
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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	GENERAL INFORMATION
--	----------------------------

Ident.: GEN-IFIT-00016600.0002001 / 18 NOV 25
Applicable to: MSN 02719-03060

L13 LOC B/C LOC B/C*	AUTO FLT	Yes
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Ident.: GEN-IFIT-00016602.0002001 / 21 MAR 16
Applicable to: ALL

L13 Logo Light LOGO Logo Lights	LIGHTS	Yes
---	--------	-----

Ident.: GEN-IFIT-00016604.0001001 / 23 JUN 15
Applicable to: ALL

Manual Flush Control	WATER	No
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Ident.: GEN-IFIT-00016605.0002001 / 21 MAR 16
Applicable to: ALL

Manual Shutoff Valves	WATER	Yes
-----------------------	-------	-----

METRIC ALTITUDE INDICATIONS ON THE PFD

Ident.: GEN-IFIT-00016688.0001001 / 23 JUN 15
Applicable to: MSN 04392-07792

Metric Altitude Indications on the PFD	EIS	No
--	-----	----

Ident.: GEN-IFIT-00016688.0002001 / 23 JUN 15
Applicable to: MSN 02155-03060

Metric Altitude Indications on the PFD	EIS	Yes
--	-----	-----

Ident.: GEN-IFIT-00016536.0001001 / 21 MAR 16
Applicable to: ALL

L13 MLS MLS1 MLS2	AUTO FLT	No
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MORA

Ident.: GEN-IFIT-00022761.0001001 / 04 JUN 19
Applicable to: MSN 02155-02212, 02926-02944, 07784-07792

L13 MORA Minimum Off Route Altitude (MORA)	AUTO FLT	No
---	----------	----

A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL

Ident.: GEN-IFIT-00022761.0002001 / 04 JUN 19

Applicable to: MSN 02719-02789, 03031-05746

L13

MORA Minimum Off Route Altitude (MORA)	AUTO FLT	Yes
---	----------	-----

NAV MODE AUTOMATICALLY ENGAGED (ARMED) IN GO-AROUND

Ident.: GEN-IFIT-00016603.0001001 / 23 JUN 15

Applicable to: MSN 02926-02944

NAV Mode automatically Engaged (Armed) in Go-Around	AUTO FLT	No
---	----------	----

Ident.: GEN-IFIT-00016603.0002001 / 23 JUN 15

Applicable to: MSN 02155-02789, 03031-07792

NAV Mode automatically Engaged (Armed) in Go-Around	AUTO FLT	Yes
---	----------	-----

NEAR END OF LIFE LIGHT

Ident.: GEN-IFIT-00028553.0001001 / 15 MAY 25

Applicable to: MSN 02155-05253

L13

A LED BLUE LIGHT BLUE LIGHT LED BLUE LIGHT LIGHT	LIGHT	No
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Ident.: GEN-IFIT-00028553.0002001 / 15 MAY 25

Applicable to: MSN 05746-07792

L13

A LED BLUE LIGHT BLUE LIGHT LED BLUE LIGHT LIGHT	LIGHT	Yes
---	-------	-----

NO PORTABLE ELEC DEVICE

43 Ident.: GEN-IFIT-00029030.0001001 / 07 NOV 25

Applicable to: MSN 02155-05746

L13

NO PORTABLE ELEC DEVICE NO PORTABLE ELEC DEVICE sw	LIGHT	No
---	-------	----

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	GENERAL INFORMATION
--	----------------------------

44 Ident.: GEN-IFIT-00029030.0002001 / 07 NOV 25
Applicable to: MSN 07784-07792

L13		
NO PORTABLE ELEC DEVICE	LIGHT	Yes
NO PORTABLE ELEC DEVICE sw		

NO SMOKING OR SEAT BELT SIGNS AUTOMATIC MODE

Ident.: GEN-IFIT-00028554.0001001 / 15 MAY 25
Applicable to: MSN 02155-05746

L12		
AUTO Mode	LIGHT	No
Signs AUTO Mode		

Ident.: GEN-IFIT-00028554.0002001 / 15 MAY 25
Applicable to: MSN 07784-07792

L12		
AUTO Mode	LIGHT	Yes
Signs AUTO Mode		

OBSTACLE

Ident.: GEN-IFIT-00028486.0001001 / 12 MAY 25
Applicable to: MSN 02155-05746

L13		
Obstacle		
OBST (AMBER)		
OBST (RED)		
OBST AHEAD (AMBER)		
OBST AHEAD (RED)		
OBSTACLE AHEAD	SURV	No
OBSTACLE AHEAD, PULL UP		
OBSTACLE OBSTACLE, PULL UP		
AVOID OBSTACLE		
CAUTION OBSTACLE		

A318/A319/A320/A321
FLIGHT CREW
OPERATING MANUAL

Ident.: GEN-IFIT-00028486.0002001 / 12 MAY 25

Applicable to: MSN 07784-07792

L13

Obstacle OBST (AMBER) OBST (RED) OBST AHEAD (AMBER) OBST AHEAD (RED) OBSTACLE AHEAD OBSTACLE AHEAD, PULL UP OBSTACLE OBSTACLE, PULL UP AVOID OBSTACLE CAUTION OBSTACLE	SURV	Yes
---	------	-----

OBSTACLE FUNCTION

Ident.: GEN-IFIT-00020306.0002001 / 15 MAY 25

Applicable to: MSN 02926-02944, 04392

L13

Man-Made Obstacle Function Obstacles	SURV	No
---	------	----

Ident.: GEN-IFIT-00020306.0001001 / 15 MAY 25

Applicable to: MSN 02155-02789, 03031-03060, 05152-07792

L13

Man-Made Obstacle Function Obstacles	SURV	Yes
---	------	-----

Ident.: GEN-IFIT-00016645.0002001 / 23 JUN 15

Applicable to: ALL

OEB Reminder	EIS	Yes
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Ident.: GEN-IFIT-00021528.0001001 / 03 NOV 22

Applicable to: ALL

L13

Optional Applications: A623 ATS623 OCL DCL D-ATIS	FANS	No
--	------	----

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	GENERAL INFORMATION
--	----------------------------

Ident.: GEN-IFIT-00016597.0003001 / 03 NOV 21

Applicable to: ALL

L12

2 Pairs of Overwing Emergency Exit Overwing Escape Route FWD EMER EXIT AFT EMER EXIT	DOORS	Yes
---	-------	-----

Ident.: GEN-IFIT-00028963.0001001 / 12 MAY 25

Applicable to: ALL

L13

Para Visual Indicator PVI	ELEC	No
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PARKING BRAKE MONITORING

Ident.: GEN-IFIT-00016538.0001001 / 21 MAR 16

Applicable to: MSN 02155-04392

L13

Parking Brake Monitoring PARK BRK FAULT	BRAKE	No
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Ident.: GEN-IFIT-00016538.0002001 / 21 MAR 16

Applicable to: MSN 05152-07792

L13

Parking Brake Monitoring PARK BRK FAULT	BRAKE	Yes
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Ident.: GEN-IFIT-00024889.0001001 / 09 NOV 21

Applicable to: ALL

PAX Oxygen Discharge Indicator	OXY	No
--------------------------------	-----	----

Ident.: GEN-IFIT-00028333.0001001 / 12 NOV 24

Applicable to: ALL

L13

Polar Navigation Function NORTH REF PUSH BUTTON NORTH REF PB TRUE	NAV	No
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Ident.: GEN-IFIT-00021553.0002001 / 17 MAR 17

Applicable to: ALL

Predictive GPWS	SURV	Yes
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 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	GENERAL INFORMATION
---	----------------------------

Ident.: GEN-IFIT-00016608.0002001 / 12 NOV 25

Applicable to: ALL

45 **L13**

Printer Function in FMS PRINT PRINT FUNCTION PRINTER NOT AVAILABLE PRINT IN PROGRESS PRINTER BUSY NOT XMITTED TO PRINTER QUEUED TO PRINT	AUTO FLT	Yes
---	----------	-----

Ident.: GEN-IFIT-00016609.0002001 / 21 MAR 16

Applicable to: ALL

Push to Level Off	AUTO FLT	Yes
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Ident.: GEN-IFIT-00016648.0002001 / 12 NOV 24

Applicable to: ALL

L13

PWS Windshear DET WINDSHEAR DETECTION PRED W/S DET FAULT W/S AHEAD WINDSHEAR AHEAD Windshear PRED W/S DET predictive windshear system PWS SCAN WINDSHEAR / PWS WINDSHEAR/PWS WINDSHEAR DETECTION FUNCTION PREDICTIVE WINDSHEAR	SURV	Yes
---	------	-----

QAR

Ident.: GEN-IFIT-00016695.0001001 / 23 JUN 15

Applicable to: MSN 02155-03060, 05152-05746

QAR	RECORDING	No
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Ident.: GEN-IFIT-00016695.0002001 / 23 JUN 15

Applicable to: MSN 04392, 07784-07792

QAR	RECORDING	Yes
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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	GENERAL INFORMATION
--	----------------------------

QFE BARO SETTING

Ident.: GEN-IFIT-00016643.0001001 / 12 NOV 24

Applicable to: MSN 02719-07792

L13

QFE BARO Setting QFE OPTION QFE	NAV	No
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Ident.: GEN-IFIT-00016643.0002001 / 12 NOV 24

Applicable to: MSN 02155-02212

L13

QFE BARO Setting QFE OPTION QFE	NAV	Yes
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RAAS

RAAS

Ident.: GEN-IFIT-00016610.0001001 / 12 NOV 24

Applicable to: MSN 02155-04392, 07784-07792

L13

RAAS Runway Awareness and Advisory System	SURV	No
--	------	----

Ident.: GEN-IFIT-00016610.0002001 / 12 NOV 24

Applicable to: MSN 05152-05746

L13

RAAS Runway Awareness and Advisory System	SURV	Yes
--	------	-----

RAAS

Ident.: GEN-IFIT-00016539.0003001 / 21 MAR 16

Applicable to: ALL

L13

Rain Repellent System Rain Repellent RAIN RPLNT pb RAIN RPLNT	RAIN	Yes
--	------	-----

RMP 3

Ident.: GEN-IFIT-00026520.0001001 / 20 MAY 25

Applicable to: MSN 02926-02944

L12

RMP 3 RMP3	COM	No
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A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL

Ident.: GEN-IFIT-00026520.0002001 / 20 MAY 25

Applicable to: MSN 02155-02789, 03031-07792

L12

RMP 3 RMP3	COM	Yes
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Ident.: GEN-IFIT-00016737.0001001 / 06 NOV 23

Applicable to: ALL

L13

RMP Load Function LOAD function	COM	No
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Ident.: GEN-IFIT-00016581.0001001 / 23 JUN 15

Applicable to: ALL

RNP pb	NAV	No
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Ident.: GEN-IFIT-00016582.0001001 / 20 JUN 24

Applicable to: ALL

L13

ROW/ROPS ROW/ROP ROW ROPS	SURV	No
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RPCU

Ident.: GEN-IFIT-00016583.0001001 / 23 JUN 15

Applicable to: MSN 02155-02212

RPCU	CAB PR	No
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Ident.: GEN-IFIT-00016583.0002001 / 23 JUN 15

Applicable to: MSN 02719-07792

RPCU	CAB PR	Yes
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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	GENERAL INFORMATION
--	----------------------------

SATCOM

Ident.: GEN-IFIT-00016642.0001001 / 12 MAY 25

Applicable to: MSN 02155-03060, 05152-07792

L13

SATCOM SATCOM DATA FAULT SATCOM FAULT SATCOM DATA Satellite Communications (SATCOM) SATCOM System SATCOM DATALINK	COM	No
---	-----	----

Ident.: GEN-IFIT-00016642.0002001 / 12 MAY 25

Applicable to: MSN 04392

L13

SATCOM SATCOM DATA FAULT SATCOM FAULT SATCOM DATA Satellite Communications (SATCOM) SATCOM System SATCOM DATALINK	COM	Yes
---	-----	-----

Ident.: GEN-IFIT-00028507.0001001 / 12 NOV 25

46 Applicable to: ALL

48 L13

SATCOM Voice Channel 2 THE VOICE CHANNEL 2 (SAT 2)	COM	No
---	-----	----

Ident.: GEN-IFIT-00026476.0002001 / 18 NOV 25

Applicable to: ALL

SBAS	NAV	No
------	-----	----

SDCU

Ident.: GEN-IFIT-00016646.0001001 / 17 MAR 17

Applicable to: MSN 02719-07792

L13

SDCU Smoke Detection Control Unit SDCU	SMOKE	No
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A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL

Ident.: GEN-IFIT-00016646.0002001 / 12 MAY 25

Applicable to: MSN 02155-02212

L13

SDCU Smoke Detection Control Unit SDCU	SMOKE	Yes
---	-------	-----

Ident.: GEN-IFIT-00016584.0001001 / 23 JUN 15

Applicable to: ALL

Second Fire Extinguishing Bottle	FIRE	No
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Ident.: GEN-IFIT-00024807.0001001 / 12 MAY 25

Applicable to: ALL

L13

SLS SLS Function	AUTO FLT	No
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Ident.: GEN-IFIT-00018784.0001001 / 04 DEC 17

Applicable to: ALL

L13

Soft go-around GA SOFT	ENG	No
---------------------------	-----	----

Ident.: GEN-IFIT-00018785.0001001 / 12 NOV 24

Applicable to: ALL

L13

Steep Approach Capability STEEP APPR Steep Approach Capability and Landing Function	NAV	No
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Ident.: GEN-IFIT-00028228.0001001 / 29 JUL 24

Applicable to: ALL

L13

Surface Alerting Function SURF-A TRAF	SURV	No
--	------	----

T2CAS OR T3CAS

Ident.: GEN-IFIT-00016586.0001001 / 15 NOV 24

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

L13

T2CAS or T3CAS T2CAS T3CAS AVOID TERRAIN	SURV	No
---	------	----

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	GENERAL INFORMATION
--	--

Ident.: GEN-IFIT-00016586.0002001 / 15 NOV 24

Applicable to: MSN 02926-02944, 04392

L13

T2CAS AVOID TERRAIN	SURV	Yes
------------------------	------	-----

Ident.: GEN-IFIT-00016586.0003001 / 15 NOV 24

Applicable to: MSN 07784-07792

L13

T3CAS AVOID TERRAIN	SURV	Yes
------------------------	------	-----

TAIL STRIKE PITCH LIMIT INDICATOR

Ident.: GEN-IFIT-00016588.0001001 / 21 MAR 17

Applicable to: MSN 02155-03060

L13

Tail Strike Pitch Limit Indicator Tailstrike Pitch Limit Indicator	EIS	No
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Ident.: GEN-IFIT-00016588.0002001 / 21 MAR 17

Applicable to: MSN 04392-07792

L13

Tail Strike Pitch Limit Indicator Tailstrike Pitch Limit Indicator	EIS	Yes
---	-----	-----

TAWS ENHANCED FUNCTION

Ident.: GEN-IFIT-00028366.0002001 / 15 NOV 24

Applicable to: MSN 04392

L13

TAWS Enhanced Function TERRAIN AHEAD TERRAIN AHEAD PULL UP	SURV	No
--	------	----

Ident.: GEN-IFIT-00028366.0001001 / 15 NOV 24

Applicable to: MSN 02155-03060, 05152-07792

L13

TAWS Enhanced Function TERRAIN AHEAD TERRAIN AHEAD PULL UP	SURV	Yes
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A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL

TAWS ENHANCED FUNCTION WITH OPTIONAL AURAL WARNINGS

Ident.: GEN-IFIT-00028367.0001001 / 15 NOV 24

Applicable to: MSN 02155-03060, 05152-07792

L13

TAWS Enhanced Function with Optional Aural Warnings CAUTION TERRAIN TERRAIN TERRAIN PULL UP	SURV	No
---	------	----

Ident.: GEN-IFIT-00028367.0002001 / 15 NOV 24

Applicable to: MSN 04392

L13

TAWS Enhanced Function with Optional Aural Warnings CAUTION TERRAIN TERRAIN TERRAIN PULL UP	SURV	Yes
---	------	-----

TAWS OBSTACLE FUNCTION

Ident.: GEN-IFIT-00028368.0001001 / 15 NOV 24

Applicable to: MSN 02926-02944, 04392

L13

TAWS Obstacle Function OBSTACLE AHEAD OBSTACLE AHEAD PULL UP	SURV	No
--	------	----

Ident.: GEN-IFIT-00028368.0003001 / 20 NOV 24

Applicable to: MSN 02155-02789, 03031-03060, 05152-07792

L13

TAWS Obstacle Function OBSTACLE AHEAD OBSTACLE AHEAD PULL UP	SURV	Yes
--	------	-----

TAWS OBSTACLE FUNCTION ON T3CAS

Ident.: GEN-IFIT-00028370.0001001 / 15 NOV 24

Applicable to: MSN 02155-05746

L13

TAWS Obstacle Function on T3CAS AVOID OBSTACLE	SURV	No
---	------	----

Ident.: GEN-IFIT-00028370.0003001 / 15 NOV 24

Applicable to: MSN 07784-07792

L13

TAWS Obstacle Function on T3CAS AVOID OBSTACLE	SURV	Yes
---	------	-----

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	GENERAL INFORMATION
--	----------------------------

Ident.: GEN-IFIT-00028369.0001001 / 15 NOV 24
Applicable to: ALL

L13 TAWS Obstacle Function with Optional Aural Warnings CAUTION OBSTACLE OBSTACLE OBSTACLE PULL UP	SURV	No
--	------	----

Ident.: GEN-IFIT-00027153.0001001 / 06 NOV 25
Applicable to: ALL

L13 Taxiway Landing Monitor TLM LANDING ON TAXIWAY	SURV	No
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TEMPERATURE CONTROL PANEL

Ident.: GEN-IFIT-00018786.0001001 / 21 MAR 16
Applicable to: MSN 02155-02212

Temperature Control Panel	COND	No
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Ident.: GEN-IFIT-00018786.0002001 / 21 MAR 16
Applicable to: MSN 02719-07792

Temperature Control Panel	COND	Yes
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Ident.: GEN-IFIT-00028331.0001001 / 12 NOV 24
Applicable to: ALL

L13 Third MCDU MCDU3 MCDU 3	AUTO FLT	No
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Ident.: GEN-IFIT-00016541.0001001 / 23 JUN 15
Applicable to: ALL

Thrust Bump	ENG	No
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Ident.: GEN-IFIT-00024888.0002001 / 09 NOV 21
Applicable to: ALL

Toilet Servicing Door	WATER	No
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Ident.: GEN-IFIT-00028229.0001001 / 12 NOV 24
Applicable to: ALL

L13 TOS2 TO SURV	SURV	No
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A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL

TPIS

Ident.: GEN-IFIT-00016011.0001001 / 21 MAR 16

Applicable to: MSN 02155-03060, 07784-07792

L13

TPIS	WHEEL	No
TYRE LO PR		

Ident.: GEN-IFIT-00016011.0002001 / 21 MAR 16

Applicable to: MSN 04392-05746

L13

TPIS	WHEEL	Yes
TYRE LO PR		

TWO WEATHER RADAR SYSTEMS

Ident.: GEN-IFIT-00027135.0001001 / 15 MAY 25

Applicable to: MSN 02155-03060, 07784-07792

L13

Two Weather Radar Systems	SURV	No
WXR2		
WXR 2		

Ident.: GEN-IFIT-00027135.0002001 / 15 MAY 25

Applicable to: MSN 04392-05746

L13

Two Weather Radar Systems	SURV	Yes
WXR2		
WXR 2		

Ident.: GEN-IFIT-00028474.0002001 / 12 MAY 25

Applicable to: ALL

L13

VHF 3	COM	Yes
VHF3		
THIRD VHF SYSTEM		

WEATHER HAZARD PREDICTION FUNCTION

Ident.: GEN-IFIT-00017055.0001001 / 30 AUG 18

Applicable to: MSN 02155-05746

L13

HZD switch ON	SURV	No
Weather Hazard Prediction Function		
WX+T+H		
WX+T+HZD		

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	GENERAL INFORMATION
--	--

Ident.: GEN-IFIT-00017055.0002001 / 30 AUG 18

Applicable to: MSN 07784-07792

L13

HSD switch ON Weather Hazard Prediction Function WX+T+H WX+T+HSD	SURV	Yes
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Ident.: GEN-IFIT-00020783.0001001 / 20 DEC 16

Applicable to: ALL

Weight and Balance System (WBS)	EIS	No
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Ident.: GEN-IFIT-00024931.0002001 / 09 NOV 21

Applicable to: ALL

Wing Leading Edge Ventilation Intake	VENT	No
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WHITE LIGHT ON

Ident.: GEN-IFIT-00028488.0001001 / 12 MAY 25

Applicable to: MSN 02155-04392, 05162

White Light ON	COM	No
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Ident.: GEN-IFIT-00028488.0002001 / 12 MAY 25

Applicable to: MSN 05152, 05253-07792

White Light ON	COM	Yes
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WIPER INTERMITTENT POSITION

Ident.: GEN-IFIT-00016543.0001001 / 21 MAR 16

Applicable to: MSN 02155-02212, 02926-02944, 04392-07792

L13

Wiper Intermittent Position Intermittent Sweep Function Intermittent Sweeping	RAIN	No
---	------	----

Ident.: GEN-IFIT-00016543.0002001 / 21 MAR 16

Applicable to: MSN 02719-02789, 03031-03060

L13

Wiper Intermittent Position Intermittent Sweep Function Intermittent Sweeping	RAIN	Yes
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AIRBUS COPYRIGHT & EXPORT CONTROL CLASSIFICATION

Ident.: GEN-00024289.0001001 / 08 NOV 24

Applicable to: ALL**EXPORT CONTROL**

This Manual has been reviewed under European Export control Regulations (EU) 2021/821 and was determined as EC_EU_NotListed (Not Listed: This Item is not listed against the EC regulations in the EU).

If the engine is provided by IAE, then the following section of the Manual is controlled under EC_US_EX_EAR99, pursuant to US Export Control Regulations (15 CFR Part 774): PERFORMANCE/THRUST RATINGS/N1 MODE THRUST CONTROL.

EC_US_EX_EAR99: This Item is considered subject to US dual use export control regulations and may require an export authorization to be re-exported.

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MAIN FCOM CHANGES

Ident.: GEN-00012867.0001001 / 03 AUG 17

Applicable to: ALL

The purpose of the Main FCOM Changes is to provide operators with general information about the most significant changes that are introduced in the current revision of the manual.

The main FCOM changes are available on the Airbus World portal, under the path: Content Library / Flight Operations / Manuals / Main FCOM - FCTM - MMEL Changes.

In addition, every revised Documentary Unit (DU) has a revision highlight (HL) that:

- Indicates the change(s) made to the DU
- Can be found in the associated “Preliminary Pages – Summary of Highlights” subchapter.

In addition to the Main FCOM Changes, the Modification Operational Impact (MOI) documents available on the Airbus World portal provide the operational impact linked to a MOD number.

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	GENERAL INFORMATION
--	----------------------------

FCOM PURPOSE

Ident.: GEN-00012627.0001001 / 13 MAY 25

Applicable to: ALL

FCOM PURPOSE

The Flight Crew Operating Manual is a support document for flight crew.

The purpose of the FCOM is to:

- Provide all necessary operating limitations, procedures, performance and system information the flight crew needs to safely and efficiently operate A320 family aircraft during normal, abnormal, and emergency situations
- Serve directly as Flight Crew Operating Manual, or as a basis for Operators to develop their own customized Airline Operations Manual, in accordance with applicable requirements
- Serve as a comprehensive reference guide during initial and refresher flight crew training.

Note: *This manual is not designed:*

- *To teach basic piloting skills*
- *To provide basic piloting techniques applicable to jet aircraft, or information, that are considered as basic airmanship for trained flight crews who are familiar with that type of aircraft and its general handling characteristics.*

As per CS-25 (Chapter AMC 25.1581, paragraph 3-b), the FCOM is a document developed by a manufacturer that describes, in detail, the characteristics and operation of the aeroplane or its systems.

If the FCOM data differs from the AFM data, the AFM remains the reference.

As a supplement to the FCOM, the FCTM may provide additional information that the flight crew should read in conjunction with the FCOM. For more information, *Refer to FCTM/GI FCTM Purpose.*

For any questions or comments related to this manual, the Operator's Flight Operations Management can contact the Airbus Flight Operations Support & Training Standards department.

A318/A319/A320/A321
FLIGHT CREW
OPERATING MANUAL**FCOM CONTENTS**

The FCOM has four sections:

- Aircraft Systems : This section is divided into ATA chapters for each aircraft system. This section includes a specific description of each system and its associated cockpit interfaces.
When several layouts are possible for the same cockpit interface (e.g. when the position of the ON/OFF label of a switch changes depending on the aircraft configuration), the FCOM may describe only one typical layout.
- Procedures : This section contains the following chapters:
 - Abnormal and Emergency Procedures
 - Normal Procedures that include the SOP, the SUP, and the SRP
 - Special Operations.
- Limitations : This section provides the aircraft and system limitations that the flight crew must know or refer to in operations.
- Performance : This section includes the performance computation description for each flight phase.

DOCUMENTARY UNITS

The FCOM is made of Documentary Units. The DU is the smallest part of information with a technical content.

The DUs are listed on a separate "List of Effective Documentary Units" (LEDU). *Refer to the General section.*

- Note:
1. DUs can be grouped into Group of DU (GDU)
 2. Temporary information may be provided via Temporary DU (TDU).

IDENTIFICATION STRIP

Below the title of the DU, the identification strip provides:

- The list of MSN the DU is applicable to
- For TDU, the reference to the DU impacted by the TDU.

LIST OF EFFECTIVE SECTIONS/SUBSECTIONS (LESS) - PAPER ONLY

Ident.: GEN-00013786.0001001 / 23 JUN 15

Applicable to: ALL

The List of Effective Sections/Subsections (LESS) summarizes all the sections and subsections contained in the FCOM. For each revision, a new LESS is issued when at least one DU of the section/subsection is changed.

The LESS consists of:

- The "M" field that may provide the following evolution code:
 - The "N" letter indicates a new section introduced by the revision
 - The "R" letter indicates a section in which the content has been revised
 - The "E" letter indicates an aircraft validity change within the section
 - The "M" letter indicates a section that have move within the FCOM
- The "Localization" field that allows localizing the section within the manual with the product structure
- The "Subsection title" field
- The "Rev. Date" field that indicated the date at which the section was changed.

LIST OF EFFECTIVE DOCUMENTARY UNITS (LEDU) - PAPER ONLY

Ident.: GEN-00013789.0001001 / 23 MAR 11

Applicable to: ALL

For each revision, a new List of Effective Documentary Units (LEDU) is issued at the section level. The LEDU provides information about the DU localization, applicability, identification and issue date.

The LEDU consists of:

- The "M" field that may provide the following Evolution Code:
 - The "N" letter indicates a new DU introduced by the revision
 - The "R" letter indicates a revised DU: The content of the DU is updated by the revision. A vertical line in the margin of the DU locates the modified part
 - The "E" letter indicates an aircraft validity change for the DU: The list of MSNs for which the DU is effective has been changed compared to the previous LEDU, by addition or deletion of one or several MSN
- The "Localization" field that allows localizing the DU in the manual with the product structure of the manual
- The "T" field (Temporary Information) that contains a cross if the associated DU is a TDU
- The "DU title" that provides the title of the DU
- The "DU identification" that identifies the DU with its own unique identification number or the GDU with its own unique code.
- The "DU date" that indicates when the DU has been released
- The DU criteria which lists the technical or operational criteria for which the DU and solution is applicable to.
- The "Applicable to" which provides the list of aircraft this DU and solution is applicable to
- The "Impacted by TDU" which is the identification of the TDU superseding the DU

**A318/A319/A320/A321
FLIGHT CREW
OPERATING MANUAL****LIST OF EFFECTIVE TEMPORARY DOCUMENTARY UNITS (LETDU) - PAPER ONLY**

Ident.: GEN-00013803.0001001 / 23 JUN 15

Applicable to: ALL

The List of Effective Temporary Documentary Units (LETDU) provides a summary of the Temporary DU impacting the section.

The LETDU consists of:

- The "M" field that may provide the following Evolution Code:
 - The "N" letter indicates a new TDU introduced by the revision
 - The "R" letter indicates a revised TDU: The content of the TDU is updated by the revision. A vertical line in the margin of the TDU locates the modified part
 - The "E" letter indicates an aircraft validity change for the TDU: The list of MSNs the TDU is applicable to has been changed compared to the previous LETDU, by addition or deletion of one or several MSN
- The "Localization" field that allows localizing the TDU in the manual with the product structure of the manual
- The "TDU Title" that provides the title of the TDU
- The "TDU identification" that identifies the TDU with its identification number with its own unique code
- The "TDU date" that indicates when the TDU has been released
- The TDU criteria which lists the technical or operational criteria, the it is applicable to
- The "Applicable to" which provides the list of aircraft this TDU is applicable to
- The "Impacted DU" which is the Identification of DU superseded by the TDU
- The "Reason for issue" of the TDU

- Note:
1. TDU is displayed on a yellow background
 2. within the QRH the TDU replaces the impacted DU

AIRCRAFT ALLOCATION TABLE (AAT) - PAPER ONLY

Ident.: GEN-00013804.0001001 / 23 JUN 15

Applicable to: ALL

The Aircraft Allocation Table (AAT) provides a view of the fleet covered in the FCOM. For each aircraft, the AAT provides its MSN, its registration number and the model.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	GENERAL INFORMATION
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LIST OF MODIFICATIONS (LOM) - PAPER ONLY

Ident.: GEN-00013805.0001001 / 23 JUN 15

Applicable to: ALL

The List of Modifications (LOM) lists the criteria (Modification Proposal (MP) or Service Bulletins (SB)) which the installation on the aircraft affects the FCOM.

Note: Each MP has one or more associated MODs. The MP/MOD correlation is available in AirN@v / Engineering.

The LOM also indicates:

- The title of the criteria
- The date of incorporation of the criteria in the FCOM
- The list of aircraft that have the criteria
- The "M" field that may indicate the following evolution code
 - The "E" letter indicates an aircraft validity change of the criteria. The list of aircraft to which the criteria applies has changed compared to the previous FCOM revision, by addition or deletion of one or several aircraft.
 - The "N" letter indicates new criteria added by this FCOM revision
 - The "R" letter indicates a change in the criteria title or associated SB

FCOM USE AND ORGANIZATION

Ident.: GEN-00012688.0001001 / 12 NOV 24

Applicable to: ALL

DEFINITIONS OF WARNINGS, CAUTIONS AND NOTES

The following are the official definitions of warnings, cautions and notes taken directly from the JAR25/CS-25 and applicable to Airbus flight operation documentation:

- | | |
|----------------|---|
| WARNING | An operating procedure, technique, etc. that may result in personal injury or loss of life if not followed. |
| CAUTION | An operating procedure, technique, etc. that may result in damage to equipment if not followed. |
| NOTE | An operating procedure, technique, etc. considered essential to emphasize. Information contained in notes may also be safety related. |

INFORMATION TYPE AND LAYERS

The FCOM has technical information that may be used for:

- Flight crew operations in flight, or on ground
- Airlines operations on ground
- Training.

To take the above-noted objectives into account, the FCOM is organized in three layers as follows:

- Layer 1: "Need to know"

Layer 1 presents information that is necessary in the cockpit.

- Layer 2: "Nice to know"

Layer 2 presents information that is used as a reference, in order to fully understand the logic of the aircraft and pilot interfaces.

- Layer 3: Detailed information

Layer 3 provides more detailed explanations, that are not necessarily needed in flight.

Note: For paper only, the following examples show the visual characteristics of each kind of layer

EXAMPLE

- Text in layer 1
Layer 1 is the default layer. No symbology when not following layer 2 or layer 3 information.

L2

EXAMPLE

- Text in layer 2

L3

EXAMPLE

- Text in layer 3

L1

EXAMPLE

- Text in layer 1 (as this text follows a text in layer 2 or 3, symbology "L1")

IF INSTALLED



This symbol indicates that a paragraph or an illustration is applicable to an optional equipment.

The "If Installed" table provides a list of optional systems and functions of the aircraft are installed, or not installed. *Refer to GEN If Installed Table Foreword*

FCOM FORMAT AND STYLE INFORMATION - PAPER ONLY

Ident.: GEN-00013793.0001001 / 09 NOV 20

Applicable to: ALL

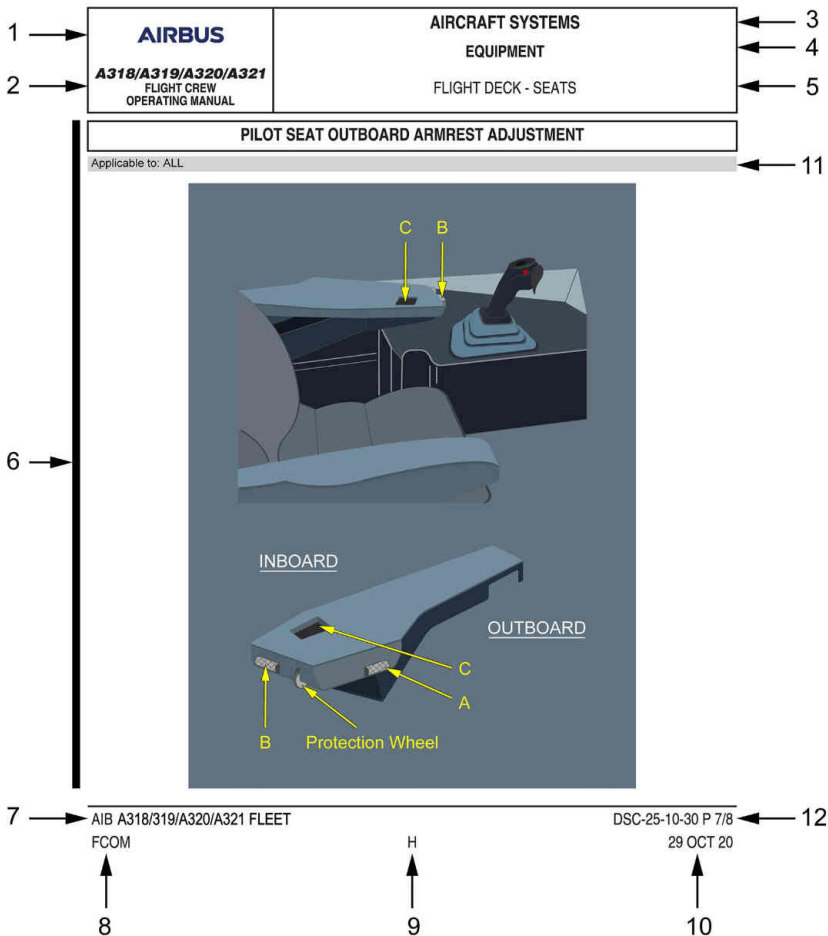
TABLE OF CONTENTS

Each TOC entry has an alphabetical index that identifies this TOC entry within its subsection. The manual user can easily find a TOC entry content within the manual thanks to this alphabetical index and the subsection identification. Both are indicated in the TOC and both cross-refer to the paper page footer (see the TOC indexing part below).

- DSC-35 Oxygen
 - Preliminary Pages
 - Table of Contents
 - Summary of Highlights
 - DSC-35-10 General
 - Description
 - DSC-35-20 Fixed Oxygen System for Cockpit
 - DSC-35-20-10 Description
 - General
 - Operation
 - Schematic
 - Mask Setting
 - Mask Stowage
 - DSC-35-20-20 Controls and Indicators
 - Overhead Panel
 - Stowage Box
 - Crew Oxygen Mask
 - Pressure Regulator
 - DOOR/OXY ECAM Page
 - DSC-35-20-30 Electrical Supply
 - DSC-35-30 Fixed Oxygen System for Cabin
 - DSC-35-40 Portable Oxygen System

	AIRCRAFT SYSTEMS OXYGEN PRELIMINARY PAGES -TABLE OF CONTENTS
DSC-35-10 General Description..... A	
DSC-35-20 Fixed Oxygen System for Cockpit DSC-35-20-10 Description General..... A Operational..... B Schematic..... C Mask Setting..... D Mask Stowage..... E	
DSC-35-20-20 Controls and Indicators Overhead Panel..... A Stowage Box..... B Crew Oxygen Mask..... C Pressure Regulator..... D DOOR/OXY ECAM Page..... E	
DSC-35-20-30 Electrical Supply Bus Equipment List..... A	

HEADER AND FOOTER



1. Airline logo
2. Aircraft types and manual
3. Level 2 chapter (Section level 2: GEN, DSC, PRO, LIM, PER)
4. Level 3 chapter
5. Level 4 chapter

A318/A319/A320/A321
FLIGHT CREW
OPERATING MANUAL

6. Revision mark
7. Key product (document identification and aircraft designation)
8. Key product (manual code)
9. Page index
10. Last evolution date
11. Identification strip (list of impacted aircraft)
12. Section path

REVISION MARK

In the paper format, a vertical bar in the margin of the DU identifies the modified part. Each vertical bar has a numerical index that refers to the associated reason of the change in the Summary of Highlight.

This Summary of Highlight lists all the changes and associated reasons of the change (if necessary) that the revision has introduced.

TOC INDEXING

In the paper page footer, the TOC indexing is of the following type:

- | | | |
|------------|---|---|
| A | : | The paper page contains the whole "A" TOC entry content |
| A to B | : | The paper page contains the whole "A" and "B" TOC entries contents |
| A → | : | The "A" TOC entry content starts on this paper page and continues on the following paper page |
| ← A | : | The "A" TOC entry content starts on a previous paper page and finishes on this paper page |
| ← A → | : | The "A" TOC entry content starts on a previous paper page and continues on the following paper page |
| A to C→ | : | The paper page contains the whole "A" and "B" TOC entries contents but the "C" TOC entry content starts on this paper page and continues on the following paper page |
| ← A to C | : | The paper page contains the whole "B" and "C" TOC entries contents but the "A" TOC entry content starts on a previous paper page and finishes on this paper page |
| ← A to C → | : | The paper page contains the whole "B" TOC entry content but the "A" TOC entry content starts on a previous paper page and finishes on this paper page and the "C" TOC entry content starts on this paper page and continues on the following paper page |

**A318/A319/A320/A321
FLIGHT CREW
OPERATING MANUAL**

- Note:
1. The indexes follow the alphabetical order: A, B, C, ..., Z, AA, AB, AC, ..., AZ, BA, BB, BC, ...
 2. For each subsection, the index starts again from A.
 3. When a TOC entry content continues on the following paper page, the text "Continued on the following page" is also indicated.

FCOM REVISIONS

Ident.: GEN-00012634.0001001 / 09 NOV 20

Applicable to: **ALL****FCOM REVISION**

FCOM revisions are issued to add, update, or revise information. The Operator determines the revision periodicity.

When necessary, a revision may be issued in between the defined periodicity (e.g. need for urgent update).

A vertical bar appears to the left of all revised parts of the manual.

TEMPORARY INFORMATION

Some FCOM sections may need a temporary update (e.g. to explain a system behavior that will be modified by a future standard). In such cases, the applicable FCOM section is updated with a TDU.

Information contained in the TDU is highlighted in the manual and the initial content of the FCOM remains available for consultation and comparison and is highlighted (identification strip) as being impacted by the TDU.

A LEDU is provided in the FCOM.

OEB GENERAL DESCRIPTIONApplicable to: **ALL**

Ident.: GEN-A-00022458.0001001 / 09 NOV 20

DEFINITION

An Operations Engineering Bulletin is published to inform Operators of any deviations from initial design objectives that have a significant operational impact. An OEB provides the Operators with technical information and temporary operational procedures that take into account these deviations.

An OEB:

- Is temporary and usually focuses on one operational subject only
- Is included in the OEB section of the QRH so that the flight crew can easily access it
- At any time during the flight, if the OEB conditions are applicable, the flight crew must apply the operational procedure(s) that is in the QRH OEB section.

Ident.: GEN-A-00022459.0001001 / 09 NOV 20

TYPE OF OEB

OEBs can either be red or white, depending on their level of priority.

- RED OEBs are published to indicate that non-compliance with the recommended procedures may have a significant impact on the safe operation of the aircraft. The Operators shall provide all flight crews with these OEBs or their content without delay.
- WHITE OEBs are published to indicate that non-compliance with the recommended procedures may have a significant impact on aircraft operation. Airbus recommends that the Operators apply these OEBs within 30 days from the date of publication of these OEBs.

The information in OEBs is recommended by Airbus. If the OEB has an impact on the airworthiness of the aircraft, Airbus also issues a Temporary Revision of the Airplane Flight Manual. If the procedures contained in the red OEB differ from the procedures in the AFM TR, the approved AFM TR remains the reference.

Airbus recommends that all operators rapidly incorporate the corrective Service Bulletins that cancel the OEB when they become available.

Ident.: GEN-A-00022460.0001001 / 09 NOV 20

OEB CONTENT AND MANAGEMENT

OEB IN THE QRH

Each OEB includes all of the following items:

- The title of the OEB PROC
- The "ECAM ENTRY" field:

This section identifies if one of the possible conditions to apply the OEB PROC is an ECAM warning/caution.

The flight crew must disregard the ECAM procedure and/or STATUS of the ECAM alerts listed in the "ECAM ENTRY" field and must apply the QRH's OEB procedure instead.

- The OEB operational procedure(s) that the flight crew must apply
- The technical explanation of the deviation from the initial design objectives.

OEB IMMEDIATE ACTIONS

OEB Immediate Actions are actions that the flight crew must memorize, in order to be able to rapidly apply them, without referring the OEB.

A318/A319/A320/A321
FLIGHT CREW
OPERATING MANUAL

OEB Immediate Actions are surrounded by a box in the OEB procedure, in order to enable the flight crew to easily identify them and are preceded by the phrase 'IMMEDIATELY APPLY'.

QRH LIST OF EFFECTIVE OEBs

The LEOEB enables the flight crew to identify all the OEBs that are applicable to one specific aircraft.

< My Aircraft

17-IUTE
A320-232

QRH - 06 Apr 2018

ABN

SOP

OPS

OEB

C/L

OEBPROC - Operations Engineering Bulletin

OEB38 Issue 2.0	Erroneous Radio Altimeter Height Indication <u>ECAM Entry</u> None
OEB44 Issue 6.0	L/G GEAR NOT DOWNLOCKED <u>ECAM Entry</u> L/G GEAR NOT DOWNLOCKED
OEB48 Issue 2.0	Abnormal V Alpha Prot <u>ECAM Entry</u> None
OEB50 Issue 2.0	Modification of the AFTER START Normal Procedure <u>ECAM Entry</u> None
OEB36 Issue 2.0	No SRS Engagement During Go Around in the Case of EPR Mode Fault <u>ECAM Entry</u> ENG 1(2) EPR MODE FAULT

The QRH LEOEB includes:

- The "Identification" field that identifies the OEB number and its issue number. The identification number and title of red OEBs are in red font in the eQRH. The identification number and title of white OEBs are in white font in the eQRH. This identification field enables the flight crew to easily identify the applicable OEBs before flight.

Note: OEBs are listed in numerical order and red OEBs are displayed before white OEBs.

- The "Title" field provides the OEB title and the "ECAM Entry" part of the OEB PROC. This enables the flight crew to easily identify the ECAM procedure that is affected by the OEB.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	GENERAL INFORMATION
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CAUTION	When Airbus provides the Operator with the LEOEB, the information “<u>ECAM Entry</u>” does not necessarily mean that (for Operators that use the OEB REMINDER function) the Operator’s maintenance personnel activated the OEB REMINDER codes for this OEB onboard the aircraft. It is the Operator’s responsibility to define an appropriate process to provide the flight crew with confirmation that the OEB REMINDER codes are activated for the ECAM alerts affected by OEBs.
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TDU GENERAL DESCRIPTION

Ident.: GEN-00023795.0001001 / 29 NOV 19

Applicable to: ALL

A TDU in the FCOM informs the flight crew about a temporary change in a normal Standard Operating Procedure, Advisory or Limitations. The TDU contains the reason for change in order to better understand and memorize this temporary change.

The TDU contains several indications:

- The date of application of the new or revised content
- The reason for change explains why the section is updated with a short general description of the malfunction
- The yellow dash line indicates the affected documentary unit
- When applicable, the arrow link provides a link to the previous content.

TAB GENERAL DESCRIPTION

Ident.: GEN-00023794.0001001 / 29 NOV 19

Applicable to: ALL

A TAB is a description of a system behavior that temporarily deviates from the intended system design and that the flight crew can notice.

The TAB enables the flight crew to better recognize, understand and if applicable, react to the abnormal system behavior in order to avoid any undue operational delay.

When applicable, temporary abnormal behaviors are described in the related section of the Aircraft System in a dedicated product folder identified as "Temporary Abnormal Behaviors".

Each TAB contains a description of the malfunction with alternative instruction called "Operational recommendation" (if applicable).

A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL

ABBREVIATIONS

Ident.: GEN-00012598.0001001 / 14 NOV 25

Applicable to: **ALL**

A

Abbreviation	Term
A/BRK	Autobrake
A/C	Aircraft
A/L	Airline
A/SKID	Anti-skid
A/THR	Autothrust
AA	Airworthiness Authorities
AAL	Above Aerodrome Level
AAT	Aircraft Allocation Table
ABCU	Alternate Braking Control Unit
ABN	Abnormal
ABV	Above
AC	Alternating Current
ACARS	Aircraft Communication Addressing and Reporting System
ACAS	Airborne Collision Avoidance System
ACC	Active Clearance Control
ACCEL	Acceleration
ACCU	Accumulator
ACD	Airworthiness Compliance Document
ACK	Acknowledge
ACMS	Aircraft Condition Monitoring System
ACN	Aircraft Customer Number
ACP	Audio Control Panel
ACSC	Air Conditioning System Controller
ACT	Additional Center Tank
ADC	Air Data Computer
ADF	Automatic Direction Finder
ADIRS	Air Data Inertial Reference System
ADIRU	Air Data Inertial Reference Unit
ADLU	Airborne Data Loading Unit
ADM	Air Data Module
ADR	Air Data Reference
ADS	Automatic Dependent Surveillance
ADS-B	Automatic Dependent Surveillance - Broadcast
ADS-C	Automatic Dependent Surveillance - Contract
ADT	Autonomous Distress Tracking
ADV	Advisory

Continued on the following page

Continued from the previous page

Abbreviation	Term
AEO	All Engines Operative
AEVC	Avionic Equipment Ventilation Computer
AFM	Airplane Flight Manual
AFMC	Auxiliary Fuel Management Computer
AFMS	Auxiliary Fuel Management System
AFS	Auto Flight System
AGL	Above Ground Level
AIDS	Aircraft Integrated Data System
AIL	Aileron
AIME	Autonomous Integrity Monitoring Extrapolation
AIP	Attendant Indication Panel
AIRAC	Aeronautical Information Regulation And Control
ALD	Actual Landing Distance
ALT	Altitude
ALTN	Alternate
ALTSM	Altimeter Setting Monitor
AMC	Acceptable Means of Compliance
AMI	Airline Modifiable Information
AMM	Aircraft Maintenance Manual
AMSL	Above Mean Sea Level
AMU	Audio Management Unit
ANT	Antenna
AOA	Angle of Attack
AOC	Airline Operational Control
AP	Autopilot
APP	Approach
APPR	Approach
APPSM	Approach Stabilization Monitor
APPU	Asymmetry Position Pick-off Unit
APU	Auxiliary Power Unit
AR	Authorization Required
ARINC	Aeronautical Radio Incorporated
ARN	Aircraft Registration Number
ARPT	Airport
ARR	Arrival
ARS	Automatic Retraction System
ASAP	As Soon As Possible
ASD	Accelerate Stop Distance
ASDA	Accelerate Stop Distance Available
ASI	Air Speed Indicator

Continued on the following page

A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL

Continued from the previous page

Abbreviation	Term
ATA	Air Transport Association
ATC	Air Traffic Control
ATIS	Automatic Terminal Information System
ATM	Air Traffic Management
ATN	Aeronautical Telecommunications Network
ATS	Air Traffic Service
ATSAW	Airborne Traffic Situational Awareness
ATSU	Air Traffic Service Unit
ATT	Attitude
AUTO	Automatic
AVNCS	Avionics
AWY	Airway

B

Abbreviation	Term
B/C	Back Course
BACF	Braking Action Computation Function
BACV	Buffer Air Check Valve
BARO	Barometric
BASOV	Buffer Air Shut Off Valve
BAT	Battery
BCM	Backup Control Module
BCL	Battery Charge Limiter
BCU	Backup Control Unit
BDDV	Brake Dual Distribution Valve
BFO	Beat Frequency Oscillator
BITE	Built-In Test Equipment
BKUP	Backup
BLW	Below
BMC	Bleed Monitoring Computer
BPS	Back-Up Power Supply
BRG	Bearing
BRK	Brake
BRT	Bright
BSCU	Brake and Steering Control Unit
BSV	Burner Staging Valve
BTC	Bus Tie Contactor
BTL	Bottle
BTS	Bleed Temperature Sensor
BUS	Busbar
BUSS	Back Up Speed Scale

C

Abbreviation	Term
C/B	Circuit Breaker
C/L	Checklist
CAB	Cabin
CAPT	Captain, Capture
CAS	Calibrated Airspeed
CAT	Category
CCD	Cursor Control Device
CDA	Continuous Descent Approach
CDL	Configuration Deviation List
CDLS	Cockpit Door Locking System
CDO	Continuous Descent Operations
CDSS	Cockpit Door Surveillance System
CDU	Control Display Unit
CF	Cost of Fuel
CFDIU	Centralized Fault Display Interface Unit
CFDS	Centralized Fault Display System
CFIT	Controlled Flight Into Terrain
CG	Center of Gravity
CHAN	Channel
CHG	Change
CI	Cost Index
CIDS	Cabin Intercommunication Data System
CIDS-SDF	Cabin Intercommunication Data System - Smoke Detection Function
CINS	Cabin Information Network System
CKPT	Cockpit
CL	Climb, Checklist
CLB	Climb
CLR	Clear
CM1	Crewmember 1 (left seat)
CM2	Crewmember 2 (right seat)
CMS	Centralized Maintenance System, Constant Mach Segment
CO	Company
CO RTE	Company Route
COM	Communication
COMM	Communication
COND	Conditioning
CONF	Configuration
CONFIG	Configuration
CONT	Continuous

Continued on the following page

A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL

Continued from the previous page

Abbreviation	Term
CP	Control Panel
CPC	Cabin Pressure Controller
CPCS	Cabin Pressure Control System
CPDLC	Controller-Pilot Datalink Communication
CRC	Continuous Repetitive Chime
CRG	Cargo
CRS	Course
CRT	Cathode Ray Tube
CRZ	Cruise
CSAS	Conditioned Service Air System
CSI	Cockpit Static Inverter
CST	Constraint
CSTR	Constraint
CT	Cost of Time
CTL	Control
CTL PNL	Control Panel
CTR	Center
CVR	Cockpit Voice Recorder

51 D

Abbreviation	Term
DA	Drift Angle
DAC	Double Annular Combustor
D-ATIS	Datalink Automatic Terminal Information Service
DBUS	Digital Backup Speed
DC	Direct Current
DCDU	Datalink Control and Display Unit
DCL	Departure Clearance
DCMS	Doors Control and Monitoring System
DDRMI	Digital Distance and Radio Magnetic Indicator
DECEL	Deceleration
DES	Descent
DEST	Destination
DET	Detection, Detector
DEV	Deviation
DFDR	Digital Flight Data Recorder
DH	Decision Height
DIR	Direction
DIR TO	Direct To
DISC	Disconnect

Continued on the following page

Continued from the previous page

Abbreviation	Term
DIST	Distance
DLSU	Data Loading Selector Unit
DMC	Display Management Computer
DME	Distance Measuring Equipment
DMU	Data Management Unit (Aids)
DN	Down
DPO	Descent Profile Optimization
DPOS	Decentralized Pulsed Oxygen System
DRT	Derated
DSDL	Dedicated Serial Datalink
DTG	Distance To Go
DTO	Derated Takeoff
DU	Display Unit, Documentary Unit

E

Abbreviation	Term
E/WD	Engine/Warning Display
EASA	European Union Aviation Safety Agency
ECAM	Electronic Centralized Aircraft Monitoring
ECB	Electronic Control Box (APU)
ECM	Engine Condition Monitoring
ECON	Economic
ECP	ECAM Control Panel
ECU	Engine Control Unit
EDP	Engine-Driven Pump
EEC	Electronic Engine Computer
EFB	Electronic Flight Bag
EFF	Electronic Flight Folder
EFIS	Electronic Flight Instruments System
eFLSCU	Enhanced Fuel Level Sensing Control Unit
EFOB	Estimated Fuel On Board
EGPWS	Enhanced Ground Proximity Warning System
EGT	Exhaust Gas Temperature
EIS	Electronic Instruments System
EIU	Engine Interface Unit
EIVMU	Engine Interface and Vibration Monitoring Unit
ELAC	Elevator Aileron Computer
ELEC	Electrics
ELEV	Elevator
ELT	Emergency Locator Transmitter

Continued on the following page

A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL

Continued from the previous page

Abbreviation	Term
ELV	Elevation
EMER	Emergency
EMER GEN	Emergency Generator
ENG	Engine
ENR	En-Route
EO	Engine-Out
EOSID	Engine-Out Standard Instrument Departure
EPE	Estimated Position Error
EPR	Engine Pressure Ratio
EPU	Emergency Power Unit, Estimated Position Uncertainty
EQPT	Equipment
ESS	Essential
ETA	Estimated Time of Arrival
ETOC	Enhanced Takeoff Configuration
ETOPS	Extended Twin Operations
ETP	Equal Time Point
ETT	Estimated Time of Takeoff
EVAC	Evacuation
EVMU	Engine Vibration Monitoring Unit
EWD	Engine/Warning Display
EXP	Expedite
EXT PWR	External Power
EXTN	Extension

52 F

Abbreviation	Term
F	Minimum Flap Retract Speed
F/CTL	Flight Control
F/O	First Officer
FAA	Federal Aviation Administration
FAC	Flight Augmentation Computer
FADEC	Full Authority Digital Engine Control System
FAF	Final Approach Fix
FANS	Future Air Navigation System
FAP	Flight Attendant Panel, Forward Attendant Panel, Final Approach Point
FAR	Federal Aviation Regulations
FAS	Final Approach Segment
FCDC	Flight Control Data Concentrator
FCOM	Flight Crew Operating Manual
FCTM	Flight Crew Techniques Manual

Continued on the following page

Continued from the previous page

Abbreviation	Term
FCU	Flight Control Unit
FD	Flight Director
FDGS	Fan Drive Gear System
FDIMU	Flight Data Interface and Management Unit
FDIU	Flight Data Interface Unit
FDP	Final Descent Point
FDR	Flight Data Recorder
FDU	Fire Detection Unit
FEP	Final End Point
FF	Fuel Flow
FG	Flight Guidance
F-G/S	FLS Glide Slope
FL	Flight Level
FLD	Factored In-Flight Landing Distance
FLEX	Flexible
F-LOC	FLS Localizer
FLRF	Flap Load Relief Function
FLS	FMS Landing System
FLSCU	Fuel Level Sensing Control Unit
FLT	Flight
FLX	Flexible
FLXTO	Flexible Takeoff
FM	Flight Management
FMA	Flight Mode Annunciator
FMC	Flight Management Computer
FMGC	Flight Management and Guidance Computer
FMGS	Flight Management and Guidance System
FMS	Flight Management System
FMV	Fuel Metering Valve
FOB	Fuel On Board
FOD	Foreign Object Debris, Foreign Object Damage
FOHE	Fuel Oil Heat Exchanger
FOM	Figure Of Merit
FPA	Flight Path Angle
FPD	Flight Path Director
F-PLN	Flight Plan
FPPU	Feedback Position Pick-off Unit
FPV	Flight Path Vector
FQ	Fuel Quantity
FQI	Fuel Quantity Indication

Continued on the following page

**A318/A319/A320/A321
 FLIGHT CREW
 OPERATING MANUAL**
Continued from the previous page

Abbreviation	Term
FQIC	Fuel Quantity Indication Computer
FQMS	Fuel Quantity and Management System
FREQ	Frequency
FRV	Fuel Return Valve
FTIS	Fuel Tank Inerting System
FU	Fuel Used
FWC	Flight Warning Computer
FWD	Forward
FWS	Flight Warning System
FZFG	Freezing Fog

G

Abbreviation	Term
G/S	Glideslope
GA	Go-Around
GAPCU	Ground and Auxiliary Power Control Unit
GBAS	Ground Based Augmentation System
GCAS	Ground Collision Avoidance System
GCS	Ground Clutter Suppression
GCU	Generator Control Unit
GDU	Group of Documentary Unit
GE	General Electric
GEN	Generator
GES	Ground Earth Station
GLC	Generator Line Contactor
GLS	GBAS Landing System, GNSS Landing System
GMT	Greenwich Mean Time
GND	Ground
GND TEMP	Ground Temperature
GNSS	Global Navigation Satellite System
GPCU	Ground Power Control Unit
GPIRS	Global Positioning and Inertial Reference System
GPS	Global Positioning System
GPSSU	GPS Sensor Unit
GPU	Ground Power Unit
GPWS	Ground Proximity Warning System
GRND	Ground
GRVTY	Gravity
GS	Ground Speed
GSM	Global System for Mobile Communication
GW	Gross Weight

H

Abbreviation	Term
HCU	Hydraulic Control Unit, HUD Combiner Unit
HDG	Heading
HF	High Frequency
HI	High
HM	Holding Pattern with a Manual Termination
HMU	Hydrau-Mechanical Unit
HP	High Pressure
HPA	Hectopascal
HPC	High Pressure Compressor
HPFD	Harmonized Primary Flight Display
HPSOV	High Pressure Shut-off Valve
HPT	High Pressure Turbine
HPV	High Pressure Valve
HUD	Head Up Display
HUDC	Head Up Display Computer
HYD	Hydraulic

I

Abbreviation	Term
I/P	Input or Intercept Profile
IAF	Initial Approach Fix
IAS	Indicated Airspeed
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
ID	Identification
IDENT	Identification
IDG	Integrated Drive Generator
IFE	In Flight Entertainment
IFPC	Integrated Fuel Pump and Control
IFR	Instrument Flight Rules
IGGS	Inert Gas Generation System
IGN	Ignition
IGV	Inlet Guide Vanes
ILS	Instrument Landing System
IM	Inner Marker
IMC	Instrument Meteorological Conditions
IMM	Immediate
INB	Inbound
IND	Indicator

Continued on the following page

A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL

Continued from the previous page

Abbreviation	Term
INIT	Initialization
INOP	Inoperative
INR	Inner
INST	Instrument
INT	Interphone, Internal, Integrated, Interior
INTCP	Intercept
INTCPT	Intercept
INV	Inverter
IP	Intermediate Pressure
IPPU	Instrumentation Position Pick-off Unit
IR	Inertial Reference
IRS	Inertial Reference System
ISA	International Standard Atmosphere
ISIS	Integrated Standby Instrument System
ISOL	Isolation
ISPSS	In-Seat Power Supply System
ISPSU	In-Seat Power Supply Unit
ITP	In-Trail Procedure
IPSB	Installed Physical Secondary Barrier

J

Abbreviation	Term
JAA	Joint Aviation Authorities
JAR	Joint Aviation Requirements

K

Abbreviation	Term
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L

Abbreviation	Term
L/DEV	Lateral Deviation
L/G	Landing Gear
LAF	Load Alleviation Function
LAT	Lateral, Latitude
LAT REV	Lateral Revision
LAV	Lavatory
LCD	Liquid Crystal Display
LDA	Landing Distance Available, Localizer Directional Aid
LDG	Landing
LDS	Laptop Docking Station

Continued on the following page

Continued from the previous page

Abbreviation	Term
LED	Light Emitting Diode
LEDU	List of Effective Documentary Units
LEOEB	List of Effective Operations Engineering Bulletins
LESS	List of Effective Section/Subsections
LGCIU	Landing Gear Control Interface Unit
LH	Left-Hand
LIM	Limitation
LK	Lock
LL	Latitude/Longitude
LNAV	Lateral Navigation
LO	Low
LOC	Localizer
LONG	Longitude
LP	Low Pressure, Localizer Performance
LPC	Low Pressure Compressor
LPT	Low Pressure Turbine
LPV	Localizer Performance with Vertical guidance
LRU	Line Replaceable Unit
LS	Loudspeaker
LSK	Line Select Key
LT	Light
LVL	Level
LVL/CH	Level Change
LVR	Lever
LW	Landing Weight

M

Abbreviation	Term
MAC	Mean Aerodynamic Chord
MAG	Magnetic
MAINT	Maintenance
MAN	Manual
MAP	Missed Approach Point
MAX	Maximum
MCDU	Multipurpose Control and Display Unit
MCT	Maximum Continuous Thrust
MDA	Minimum Descent Altitude
MDCD	Main Deck Cargo Door
MDDU	Multifunction Disk Drive Unit
MDH	Minimum Descent Height

Continued on the following page

**A318/A319/A320/A321
 FLIGHT CREW
 OPERATING MANUAL**
Continued from the previous page

Abbreviation	Term
MEA	Minimum En Route Altitude
MECH	Mechanic
MED	Medium
MEL	Minimum Equipment List
MEM	Memory
MFRL	Multi-Functional Runway Light
MGB	Main Gearbox
MID	Middle
MIN	Minimum
MKR	Marker
MLG	Main Landing Gear
MLS	Microwave Landing System
MLW	Maximum Landing Weight
MM	Middle Marker
MMEL	Master Minimum Equipment List
MMO	Mach Maximum Operational
MMR	Multi Mode Receiver
MN	Mach number
MOD	Modification
MORA	Minimum Off Route Altitude
MP	Modification Proposal
MRP	Map Reference Point
MSA	Minimum Safe Altitude
MSG	Message
MSL	Mean Sea Level
MSN	Manufacturer Serial Number
MTOW	Maximum Takeoff Weight
MZFW	Maximum Zero Fuel Weight

53

N

Abbreviation	Term
N/A	Not Applicable
N1	Low Pressure Rotor Speed (in %)
N2	High Pressure Rotor Speed (in %)
NAI	Engine Nacelle Anti-Ice
NAV	Navigation
NAVAID	Navigation Aid
NBR	Number
NCD	Non Computed Data
ND	Navigation Display

Continued on the following page

Continued from the previous page

Abbreviation	Term
NDB	Non Directional Beacon
NEA	Nitrogen Enriched Air
NEOL	Near End Of Life
NLG	Nose Landing Gear
NORM	Normal
NOTAM	Notice To Airmen
NPA	Non Precision Approach
NW	Nosewheel
NWS	Nosewheel Steering

O

Abbreviation	Term
OANS	On-board Airport Navigation System
OAT	Outside Air Temperature
OCL	Oceanic Clearance
OEB	Operations Engineering Bulletin
OEI	One Engine Inoperative
OFST	Offset
OFV	Outflow Valve
OIT	Onboard Information Terminal
OLB	OPS Library Browser
OM	Outer Marker
OP	Open
OPP	Opposite
OPS	Operations
OPT	Optimum
OVHD	Overhead
OVHT	Overheat
OVRD	Override
OXY	Oxygen

P

Abbreviation	Term
P/B	Pushbutton
P/N	Part Number
PA	Passenger Address
PAC	Path Attenuation Compensation
PAX	Passenger
PB	Pushbutton
PBCS	Performance-Based Communication and Surveillance

Continued on the following page

**A318/A319/A320/A321
 FLIGHT CREW
 OPERATING MANUAL**
Continued from the previous page

Abbreviation	Term
PBE	Portable Breathing Equipment
PBN	Performance Based Navigation
PCU	Power Control Unit
PED	Portable Electronic Device
PERF	Performance
PES	Passenger Entertainment System
PF	Pilot Flying
PFC	Porous Friction Course
PFD	Primary Flight Display
PGE	Page
PHC	Probes Heat Computer
PIREP	Pilot Report
PM	Pilot Monitoring
PMV	Pilot Metering Valve
PNL	Panel
POB	Pressure Off Brake
POS	Position
PPOS	Present Position
PPU	Position Pick-off Unit
PR	Pressure
PRAM	Pre-recorded Announcement and Music
PRED	Prediction
PRESS	Pressure, Pressurization
PREV	Previous
PROC	Procedure
PROG	Progress
PROT	Protection
PROTEC	Protection
PRSOV	Pressure Regulating and Shut-Off Valve
PRV	Pressure Regulating Valve
PSCU	Proximity Switch Control Unit
PTT	Push To Talk
PTU	Power Transfer Unit (Hydraulic)
PVI	Paravision Indicator
PWIP	Potable Water Indication Panel
PWR	Power
PWS	Predictive Windshear System
PWSP	Potable Water Service Panel

Q

Abbreviation	Term
QAR	Quick Access Recorder
QCCU	Quantity Calculation Control Unit
QFE	Field Elevation Atmosphere Pressure
QFU	Runway Heading
QNH	Sea Level Atmosphere Pressure
QRH	Quick Reference Handbook
QT	Quart (US)
QTY	Quantity

R

Abbreviation	Term
RA	Radio Altimeter, Resolution Advisory
RAAS	Runway Awareness and Advisory System
RACC	Rotor Active Clearance Control
RAD	Radio
RAIM	Receiver Autonomous Integrity Monitoring
RAT	Ram Air Turbine
RBPU	Rudder and Brake Pedal Unit
RCAM	Runway Condition Assessment Matrix
RCDF	Runway Condition Degradation Function
RCP	Required Communication Performance
RCT	Rear Centre Tank
REAC	Reactive
REC	Recommended
RED	Reduction
REF	Reference, Refer
REG	Regulation
REL	Release
REQ	Request, Require, Required
REV	Reverse
RF	Radio Frequency
RFCF	Runway Field Clearance Floor
RH	Right-Hand
RLD	Required Landing Distance
RMI	Radio Magnetic Indicator
RMP	Radio Management Panel
RNAV	Area Navigation
RNG	Range
RNP	Required Navigation Performance

Continued on the following page

A318/A319/A320/A321
FLIGHT CREW
OPERATING MANUAL
Continued from the previous page

Abbreviation	Term
ROP	Runway Overrun Protection
ROPS	Runway Overrun Prevention System
ROW	Runway Overrun Warning
RPCU	Residual Pressure Control Unit
RPLNT	Repellent
RPTG	Repeating, Reporting
RQRD	Required
RSP	Required Surveillance Performance
RSV	Reserves
RSVR	Reservoir
RTA	Required Time of Arrival
RTE	Route
RTO	Rejected Takeoff
RTOW	Regulatory Takeoff Weight
RUD	Rudder
RVR	Runway Visual Range
RVSM	Reduced Vertical Separation Minimum
RWY	Runway
RWYCC	Runway Condition Code

S

Abbreviation	Term
S	Minimum Slat Retract Speed
S/C	Step Climb
S/D	Step Descent, Shut Down
S/F	Slats/Flaps
SAAAR	Special Aircrew and Aircraft Authorization Required
SAC	Single Annular Chamber
SAL	System Address Label
SAR	Search And Rescue
SAT	Static Air Temperature
SATCOM	Satellite Communication
SAV	Starter Air Valve
SB	Service Bulletin
SBAS	Satellite Based Augmentation System
SC	Single Chime
SCA/SVU	Split Control Unit/Servo Valve Assembly
SD	System Display
SDAC	System Data Acquisition Concentrator
SDCU	Smoke Detection Control Unit

Continued on the following page

Continued from the previous page

Abbreviation	Term
SDF	Smoke Detection Function, Simplified Directional Facility
SDU	Satellite Data Unit
SEC	Spoiler Elevator Computer, Secondary
SEL	Selector
SELCAL	Selective Calling
SFCC	Slat/Flap Control Computer
SI	Slip Indicator
SID	Standard Instrument Departure
SLS	SBAS Landing System
SOP	Standard Operating Procedure
SOV	Shut-Off Valve
SPD	Speed
SPD LIM	Speed Limit
SPLR	Spoiler
SQWK	Squawk
SRS	Speed Reference System
STAR	Standard Terminal Arrival Route
STAT	Static
STAT INV	Static Inverter
STBY	Standby
STD	Standard
STRG	Steering
STS	Status
SURF-A	Surface Alerting Function
SURV	Surveillance
sw	Switch
SWTG	Switching
SYS	System

I

Abbreviation	Term
T/C	Top of Climb
T/D	Top of Descent
T/O	Takeoff
T2CAS	Traffic and Terrain Collision Avoidance System
T3CAS	Traffic and Terrain Collision Avoidance System
TA	Traffic Advisory
TAB	Temporary Abnormal Behavior
TAC	Taxiing Aid Camera
TACAN	Tactical Air Navigation

Continued on the following page

A318/A319/A320/A321
FLIGHT CREW
OPERATING MANUAL
Continued from the previous page

Abbreviation	Term
TAD	Terrain Awareness Display
TAS	True Air Speed
TAT	Total Air Temperature
TAU	Time to intercept
TAWS	Terrain Awareness and Warning System
TBD	To Be Determined
TBV	Transient Bleed Valve
TCA	Turbine Cooling Air
TCAS	Traffic Alert and Collision Avoidance System
TCC	Turbine Case Cooling
TCF	Terrain Clearance Floor
TCM	Thrust Control Malfunction
TCMA	Thrust Control Malfunction Accommodation
TDU	Temporary Documentary Unit
TEL	Telephone
TEMP	Temperature
TERR	Terrain
TFLEX	Flexible Temperature
TGT	Target
THR	Thrust
THRT	Threat
THS	Trimmable Horizontal Stabilizer
THSA	Trimmable Horizontal Stabilizer Actuator
TK	Tank, Track
TLA	Throttle Lever Angle
TLM	Taxiway Landing Monitor
TLU	Travel Limitation Unit
TMPY	Temporary
TMR	Timer
TO	Takeoff
TOC	Table of Contents
TOD	Takeoff Distance
TODA	Takeoff Distance Available
TOGA	Takeoff - Go-Around
TOR	Takeoff Run
TORA	Takeoff Run Available
TOS	Takeoff Surveillance
TOW	Takeoff Weight
T-P	Turn Point
TPIS	Tire Pressure Indicating System

Continued on the following page

Continued from the previous page

Abbreviation	Term
TR	Transformer Rectifier
TRAF	Traffic
TRANS	Transition
TREF	Flat Rating Temperature
TRK	Track
TROPO	Tropopause
TRU	Transformer Rectifier Unit
TRV	Travel
TSM	Trouble Shooting Manual
TTG	Time to Go
TVMC	Minimum Control Speed Temperature
TWY	Taxiway

U

Abbreviation	Term
UNLK	Unlock
UP	Up, Upper
USB	Universal Serial Bus
UTC	Universal Coordinated Time

V

Abbreviation	Term
V/DEV	Vertical Deviation
V/S	Vertical Speed
V1	Decision Speed
V2	Takeoff Safety Speed
VAPP	Approach Speed
VBV	Variable Bypass Valve
VC	Calibrated airspeed
VDEV	Vertical Deviation
VDL	VHF Datalink
VERT	Vertical
VERT REV	Vertical Revision
VFE	Maximum Speed for each Flap configuration
VFTO	Final Takeoff Speed
VHF	Very High Frequency
VIB	Vibration
VIP	Vertical Intersection Point
VLE	Maximum Landing Gear Extended Speed
VLS	Lowest Selectable Speed

Continued on the following page

A318/A319/A320/A321
FLIGHT CREW
OPERATING MANUAL
Continued from the previous page

Abbreviation	Term
VM	Maneuvering Speed
VMAX	Maximum Allowable Speed
VMC	Visual Meteorological Conditions
VMCA	Minimum Control Speed in the Air
VMCG	Minimum Control Speed on Ground
VMCL	Minimum Control Speed at Landing
VMIN	Minimum Operating Speed
VMO	Maximum Operating Speed
VMU	Minimum Unstick Speed
VNAV	Vertical Navigation
VOR	VHF Omnidirectional Range
VOR-D	VOR-DME
VR	Rotation Speed
VREF	Landing Reference Speed
VS	Reference Stalling Speed
VS1G	Stall Speed at 1g load factor
VSC	Vacuum System Controller
VSI	Vertical Speed Indicator
VSV	Variable Stator Vane
VSW	Stall Warning Speed
VU	Visual Unit, Virtual Unit

W

Abbreviation	Term
W/S	Wind Shear
WAI	Wing Anti-Ice
WARN	Warning
WBC	Weight and Balance Computer
WBS	Weight and Balance System
WD	Warning Display
WHC	Window Heat Computer
WPT	Waypoint
WS	Windshear
WSHLD	Windshield
WT	Weight
WTB	Wing Tip Brake
WX	Weather
WXR	Weather Radar

X

Abbreviation	Term
XFR	Transfer
XLS	x Landing System (e.g. ILS, GLS, ...)
XPDR	Transponder
XPNDR	Transponder
XTK	Crosstrack Error

Y

Abbreviation	Term
--------------	------

Z

Abbreviation	Term
ZFCG	Zero Fuel Center of Gravity
ZFW	Zero Fuel Weight
ZFWCG	Zero Fuel Weight Center of Gravity field

SYMBOLS

Abbreviation	Term
<	less than
>	more than
≤	less than or equal to
≥	more than or equal to
=	equal to

A318/A319/A320/A321
FLIGHT CREW
OPERATING MANUAL

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AIRCRAFT SYSTEMS

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DSC-20 Aircraft General

DSC-21 Air Conditioning / Pressurization / Ventilation

DSC-22_10 Auto Flight - General

DSC-22_20 Auto Flight - Flight Management

DSC-22_30 Auto Flight - Flight Guidance

DSC-22_40 Auto Flight - Flight Augmentation

DSC-22_45 Auto Flight - AOC Functions

DSC-22_46 Auto Flight - Print Interface

DSC-23 Communications

DSC-24 Electrical

DSC-25 Equipment

DSC-26 Fire Protection

DSC-27 Flight Controls

DSC-28 Fuel

DSC-29 Hydraulic

DSC-30 Ice and Rain Protection

DSC-31 Indicating/Recording Systems

DSC-32 Landing Gear

DSC-33 Lights

DSC-34-NAV Navigation

Continued on the following page

*Continued from the previous page***DSC-34-SURV Surveillance****DSC-35 Oxygen****DSC-36 Pneumatic****DSC-38 Water / Waste****DSC-45 Maintenance System****DSC-46 Information Systems****DSC-49 APU****DSC-52 Doors****DSC-56 Cockpit Windows****DSC-70 Engines**

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS PRELIMINARY PAGES LIST OF EFFECTIVE TEMPORARY DOCUMENTARY UNITS
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M	Localization	DU Title	DU identification	DU date
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No Temporary Documentary Unit

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AIRCRAFT SYSTEMS

AIRCRAFT GENERAL

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DSC-20-10 Overview

General.....	A
Engines.....	B
Cockpit.....	C
Cabin.....	D
Cargo.....	E

DSC-20-20 Description

General Arrangement.....	A
Principal Dimensions.....	B
Unpressurized Compartments.....	C
Antenna Locations.....	D
Ground Service Connections and Panels.....	E

DSC-20-30 Ground Handling

Taxiing.....	A
180 degrees Turn on Runway.....	B

DSC-20-40 Ground Clearance Diagram

Ground Clearance Diagram.....	A
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DSC-20-50 Landing Geometry

ILS/GLS  /MLS  Final Approach and Landing Geometry.....	A
Minimum Visual Ground Segments (Flare Phase).....	B

DSC-20-60 Visual Ground Geometry

Visual Ground Geometry.....	A
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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AIRCRAFT GENERAL PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS
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Localization Title	Toc Index	ID	Reason
DSC-20-40 Ground Clearance Diagram	A	1	Update of the illustration to include pitch and roll angle values. No technical change.

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AIRCRAFT GENERAL OVERVIEW
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GENERAL

Ident.: DSC-20-10-00000284.0001001 / 22 MAR 16

Applicable to: ALL

The A320 is a subsonic, medium-range, civil transport aircraft.

ENGINES

Ident.: DSC-20-10-00000285.0001001 / 13 DEC 10

Applicable to: ALL

The aircraft has two high bypass turbofan engines mounted under the wings.

COCKPIT

Ident.: DSC-20-10-00000286.0001001 / 13 DEC 10

Applicable to: MSN 02926-02944

The cockpit is designed for a two-member crew. It also has a place for 1 observer.

COCKPIT

Ident.: DSC-20-10-00000286.0002001 / 13 DEC 10

Applicable to: MSN 02155-02789, 03031-07792

The cockpit is designed for a two-member crew. It also has a place for 2 observers.

CABIN

Ident.: DSC-20-10-00000287.0007001 / 05 FEB 15

Applicable to: ALL

The passenger seating layout may vary, depending on operating requirements.

CARGO

Ident.: DSC-20-10-00000289.0001001 / 13 DEC 10

Applicable to: ALL

Two cargo compartments are under the cabin floor.

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AIRCRAFT GENERAL DESCRIPTION
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GENERAL ARRANGEMENT

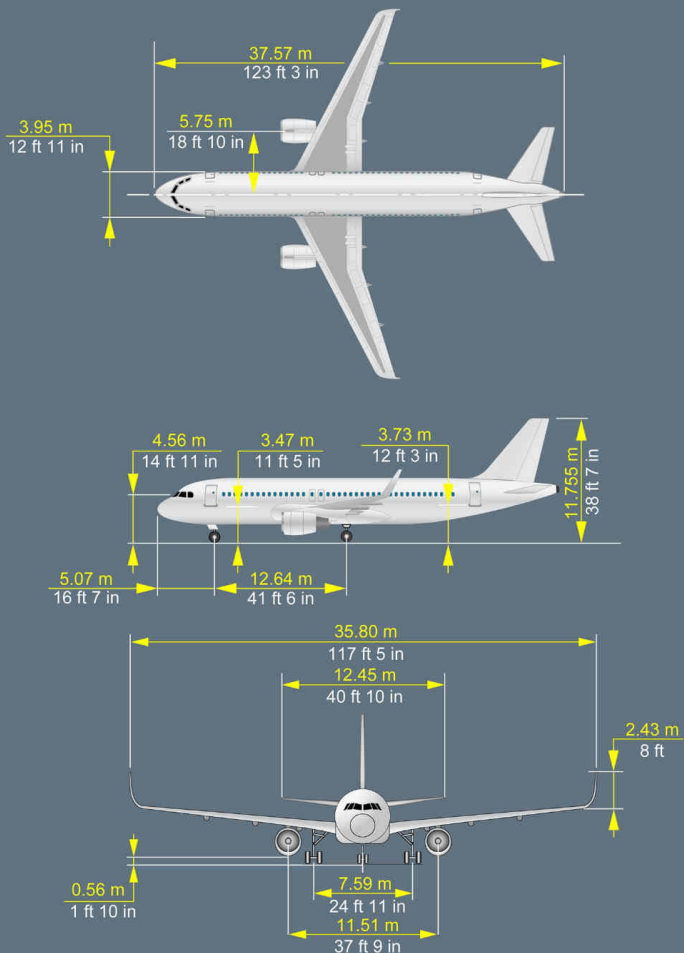
Ident.: DSC-20-20-00000290.0001001 / 21 MAR 16 Applicable to: ALL

This subchapter gives the principal aircraft dimensions, location of unpressurized areas, antennas, ground service connections, and ground maneuvering characteristics.

PRINCIPAL DIMENSIONS

Ident.: DSC-20-20-00000291.0008001 / 04 NOV 21

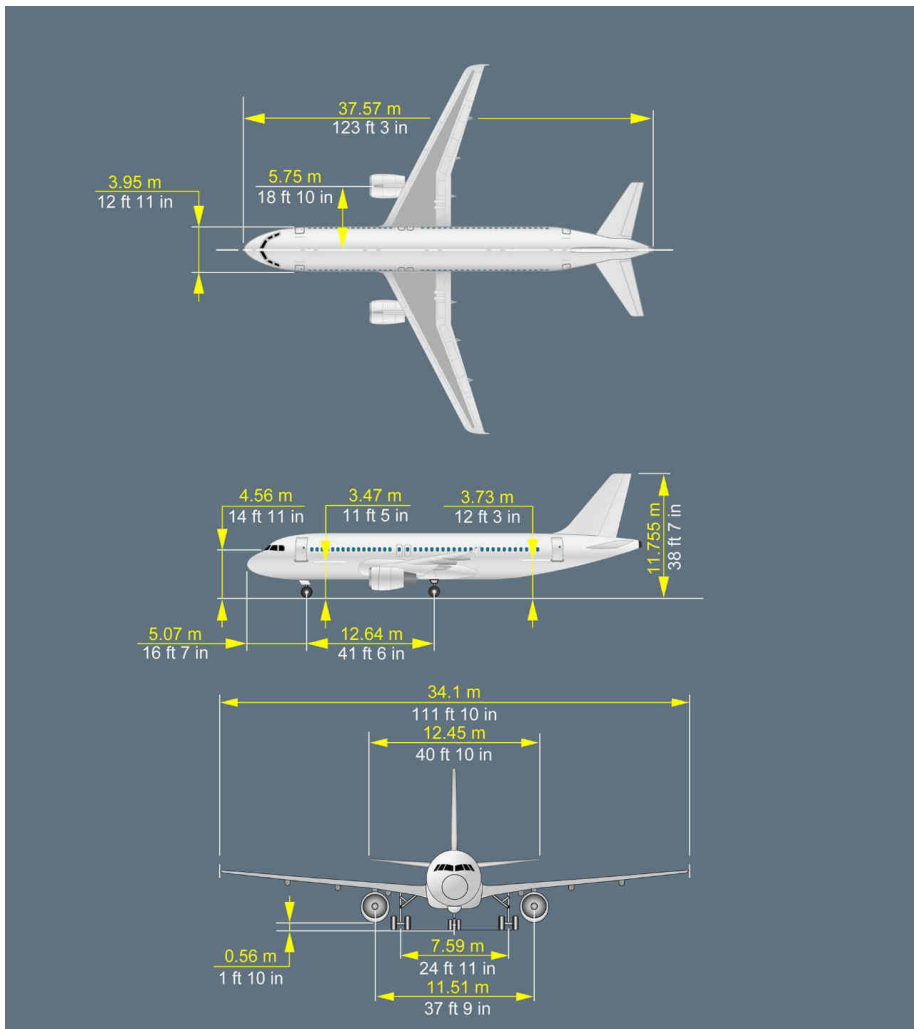
Applicable to: MSN 05746-07792



PRINCIPAL DIMENSIONS

Ident.: DSC-20-20-00000291.0001001 / 04 NOV 21

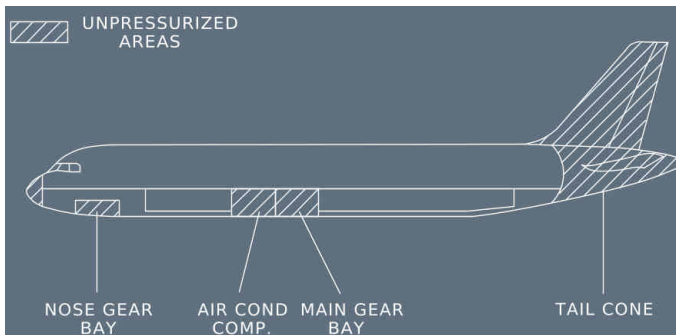
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UNPRESSURIZED COMPARTMENTS

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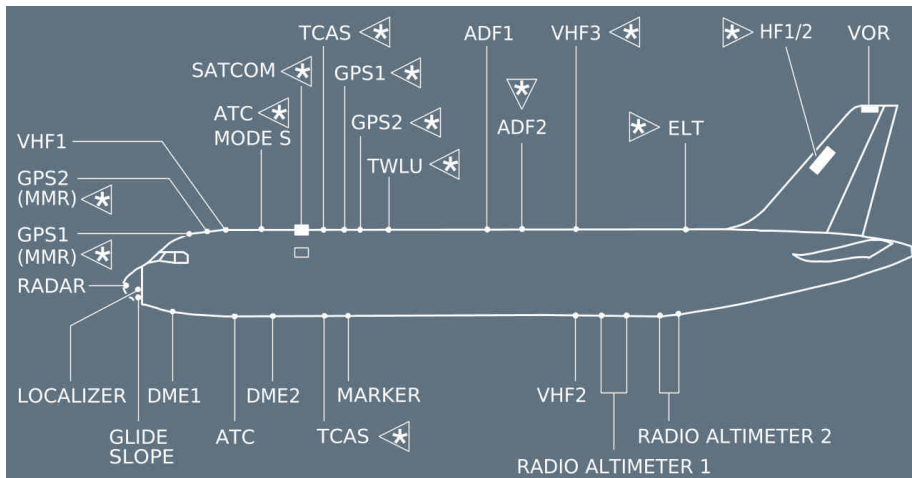
Applicable to: ALL



ANTENNA LOCATIONS

Ident.: DSC-20-20-00000293.0001001 / 28 JUL 14

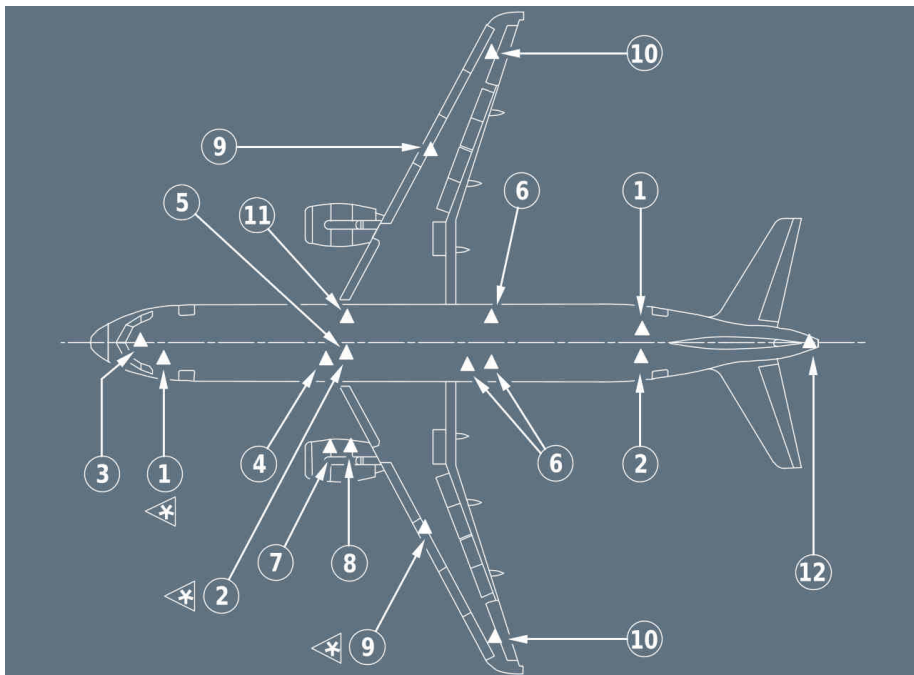
Applicable to: ALL



GROUND SERVICE CONNECTIONS AND PANELS

Ident.: DSC-20-20-00000295.0001001 / 09 OCT 12

Applicable to: ALL



- (1) Toilet servicing
- (2) Water filling and/or draining
- (3) Electrical ground power receptacle
- (4) LP ground air supply connector
- (5) HP ground air supply connector
- (6) Hydraulic
- (7) IDG oil filling
- (8) Engine oil filling
- (9) Refueling/defueling

AIRCRAFT SYSTEMS**AIRCRAFT GENERAL**

DESCRIPTION

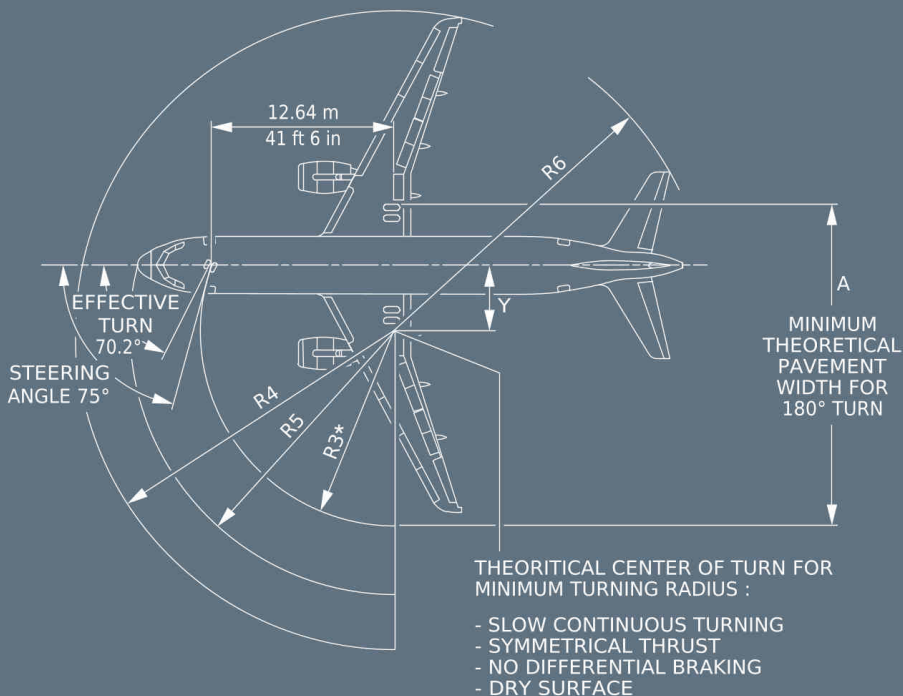
- (10) Gravity filling panels
- (11) Refueling/defueling panel
- (12) APU oil filling

TAXIING

Ident.: DSC-20-30-00000294.0007001 / 01 JUN 17

Applicable to: MSN 05746-07792

MINIMUM TURNING RADIUS



	Y	A	R3	R4	R5	R6
FT	15	75	44	75	60	72
M	4.5	22.8	13.6	22.9	18.3	21.8

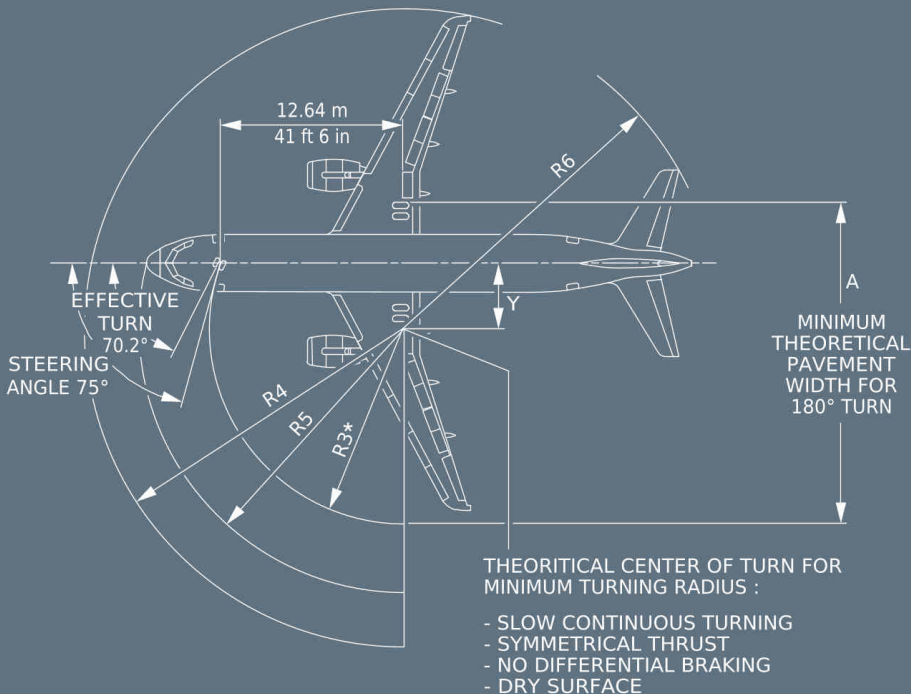
* NOSE GEAR RADIUS (R3) MEASURED FROM OUTSIDE FACE OF TIRE

TAXIING

Ident.: DSC-20-30-00000294.0002001 / 01 JUN 17

Applicable to: MSN 02155-05253

MINIMUM TURNING RADIUS



	Y	A	R3	R4	R5	R6
FT	15	75	44	72	60	72
M	4.5	22.8	13.6	22.0	18.3	21.8

★ NOSE GEAR RADIUS (R3) MEASURED FROM OUTSIDE FACE OF TIRE

180 DEGREES TURN ON RUNWAY

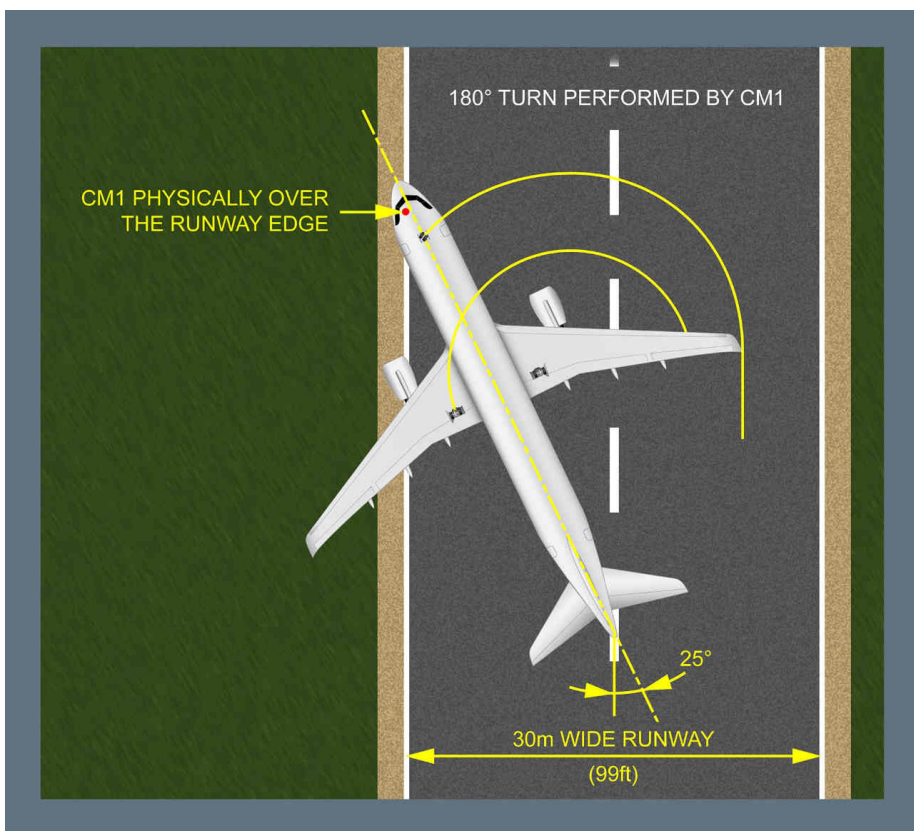
Ident.: DSC-20-30-00021674.0001001 / 06 JUN 17

Applicable to: ALL

With the recommended 180 ° turn technique, on dry runway, the approximate turn width is 24 m (79 ft) without margin.

Note: The flight crew should consider additional margin when the runway is wet or contaminated.

For more information about the 180 ° Turn Technique, Refer to FCTM/PR-NP-SOP-100 180 degrees Turn on Runway.

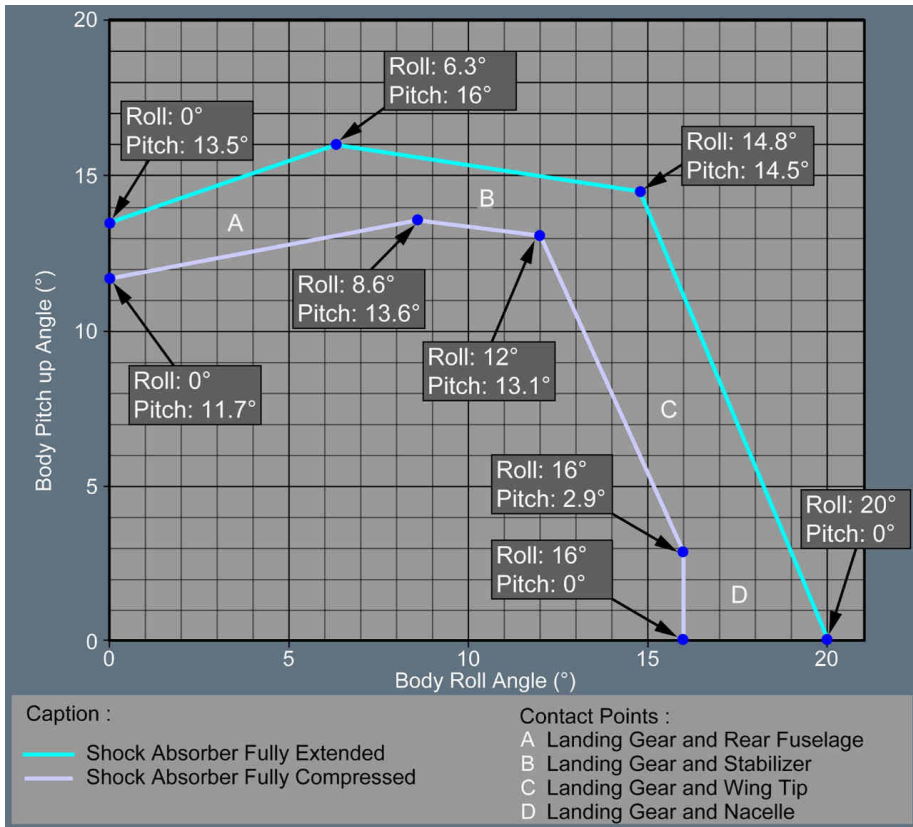


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GROUND CLEARANCE DIAGRAM

Ident.: DSC-20-40-00018435.0001001 / 06 NOV 25

Applicable to: ALL

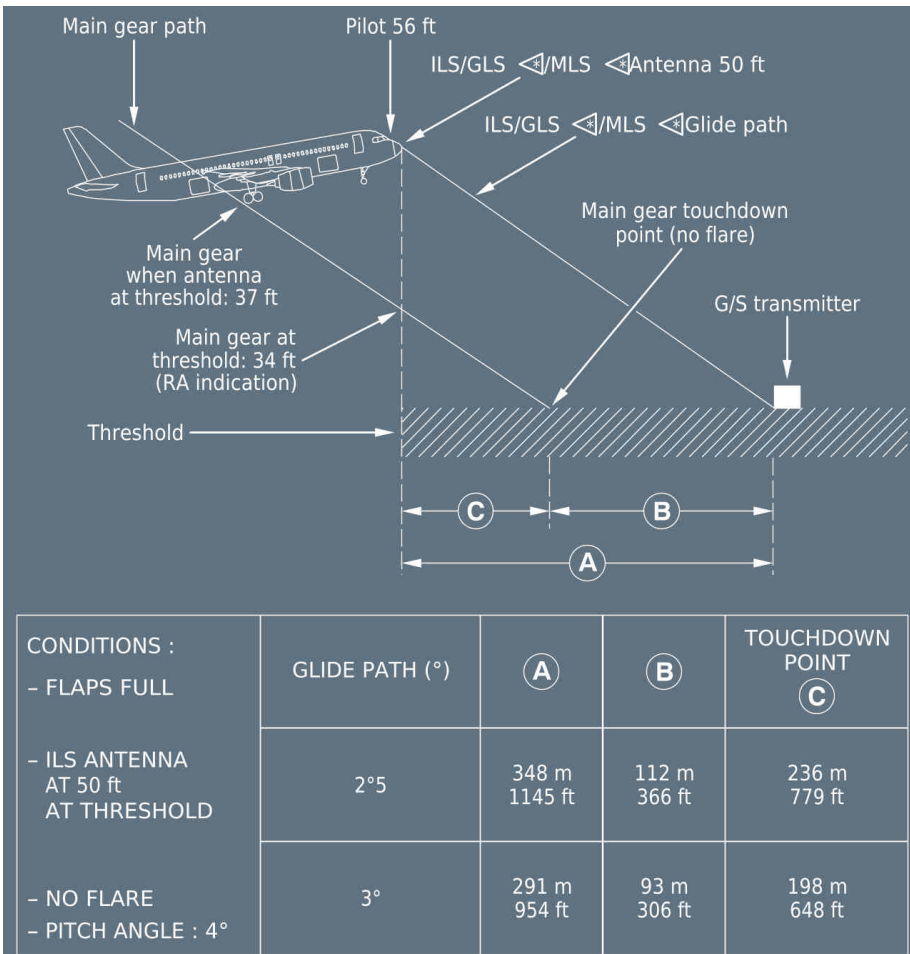


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ILS/GLS /MLS FINAL APPROACH AND LANDING GEOMETRY

Ident.: DSC-20-50-00019878.0001001 / 22 FEB 17

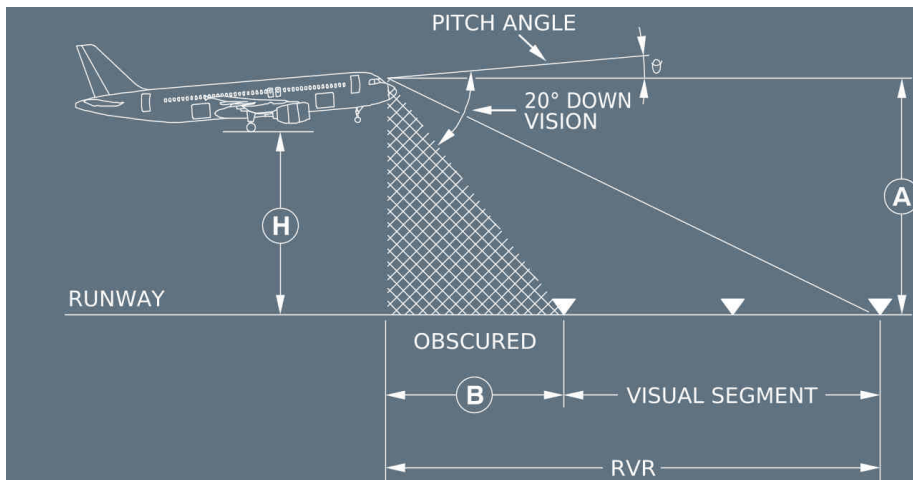
Applicable to: ALL



MINIMUM VISUAL GROUND SEGMENTS (FLARE PHASE)

Ident.: DSC-20-50-00019879.0001001 / 22 FEB 17

Applicable to: ALL



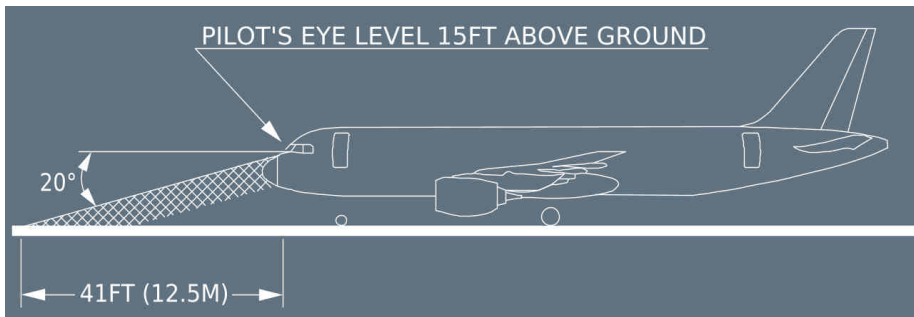
	CAT III		CAT II
H	15 ft ($\theta = 5.4^\circ$)	50 ft ($\theta = 4.7^\circ$)	100 ft ($\theta = 4.7^\circ$)
VISUAL SEGMENT	60 m (197 ft)		120 m (394 ft)
A	36 ft	71 ft	121 ft
OBSCURED B	43 m (140 ft)	79 m (259 ft)	134 m (442 ft)
MINIMUM RVR	103 m (337 ft)	139 m (456 ft)	254 m (836 ft)

Note: This drawing illustrates that, for a CAT III landing (60 m minimum visual segment), the minimum Runway Visual Range (RVR) is 103 m at 15 ft.

VISUAL GROUND GEOMETRY

Ident.: DSC-20-60-00010294.0001001 / 22 MAY 12

Applicable to: ALL



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AIRCRAFT SYSTEMS

AIR CONDITIONING / PRESSURIZATION /
VENTILATION

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DSC-21-10 Air Conditioning

DSC-21-10-10 General

General.....	A
Architecture.....	B

¹DSC-21-10-20 Main Components

Air Conditioning Pack.....	A
Pack Schematic (Simplified).....	B
Pack Flow Control Valve.....	C
Emergency Ram Air.....	D
Mixer Unit.....	E
Hot-Air Pressure-Regulating Valve.....	F
Trim Air Valves.....	G

DSC-21-10-30 Temperature and Flow Regulation

General.....	A
Pack Controller.....	B
Zone Controller.....	C
Temperature Regulation.....	D
Air Conditioning System Controllers.....	E
Cockpit - Electrical Heaters.....	F

DSC-21-10-40 System Operation under Failure Condition

General.....	A
Zone Controller.....	B
Pack Controllers.....	C
Air Conditioning System Controllers 	D
Air Cycle Machine Failure.....	E
Hot Air Pressure Regulating Valve Failure.....	F
Trim Air Valve Failure.....	G

DSC-21-10-50 Controls and Indicators

Controls on Overhead Panel.....	A
ECAM BLEED Page.....	B
ECAM COND Page.....	C
ECAM CAB PRESS Page.....	D
ECAM Cruise Page.....	E
Memo Display.....	F

Continued on the following page

Continued from the previous page
DSC-21-20 Pressurization
DSC-21-20-10 General

General.....	A
Automatic Operation.....	B
Manual Operation.....	C
SCHEMATICS.....	D

DSC-21-20-20 Main Components

Cabin Pressure Controllers.....	A
Outflow Valve.....	B
Safety Valves.....	C
Residual Pressure Control Unit (RPCU ).....	D

DSC-21-20-30 System Operation

Automatic Pressure Control Mode.....	A
Pressurization Flight Profile.....	B
Manual Pressure Control Mode.....	C
Ditching.....	D

DSC-21-20-40 Controls and Indicators

Overhead Panel.....	A
ECAM CAB PRESS Page.....	B
ECAM Cruise Page.....	C
ECAM DOOR/OXY Page.....	D
Memo Display.....	E

DSC-21-30 Ventilation
DSC-21-30-10 General

General.....	A
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DSC-21-30-20 Avionics Ventilation

General.....	A
Main Components.....	B
Normal Operation, Open-Circuit Configuration.....	C
Normal Operation, Close-Circuit Configuration.....	D
Normal Operation, Intermediate Configuration.....	E
Abnormal Operation.....	F

DSC-21-30-40 Battery Ventilation

Battery Ventilation.....	A
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Continued on the following page

Continued from the previous page

DSC-21-30-50 Lavatory and Galley Ventilation

 Lavatory and Galley.....A

DSC-21-30-60 Controls and Indicators

 Overhead Panel.....A

 ECAM CAB PRESS Page.....B

DSC-21-40 Cargo

DSC-21-40-10 General

 General.....A

 Schematic.....B

DSC-21-40-20 System Operation

 FWD Cargo Ventilation A

 AFT Cargo Ventilation B

 AFT Cargo Heating C

 FWD Cargo Heating D

DSC-21-40-30 Controls and Indicators

 Overhead Panel.....A

DSC-21-40-35 ECAM Cond Page

 ECAM COND Page.....A

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AIRCRAFT SYSTEMS
AIR CONDITIONING / PRESSURIZATION / VENTILATION
PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS

Localization Title	Toc Index	ID	Reason
DSC-21-PLP-TOC Main Components		1	Documentation update: Deletion of "Pack Schematic (Simplified) (00000299.0008001)".
			Simplification of configuration management
DSC-21-10-20 Pack Schematic (Simplified)	B	1	Documentation update: Addition of "Pack Schematic (Simplified)" documentary unit
DSC-21-20-30 Automatic Pressure Control Mode	A	1	Modification from 14 100 ft to 14 500 ft of the maximum pressure that the CPC can manage during ground, climb and descent phases in the High Altitude Operations (HAO) in order to be in accordance with maximum HAO certification level.
DSC-21-20-40 ECAM CAB PRESS Page	B	1	Update of the Delta P range for safety valve opening (8.2 to 8.9 PSI instead of 8.9 to 9.7 PSI) to be in accordance with the system behavior.
DSC-21-30-10 General	A	1	Removal of the If-installed tag. No technical change.
DSC-21-30-20 Normal Operation, Open-Circuit Configuration	C	1	Documentation update: Addition of "Normal Operation, Open-Circuit Configuration" documentary unit
DSC-21-30-20 Normal Operation, Close-Circuit Configuration	D	5	Documentation update: Addition of "Normal Operation, Close-Circuit Configuration" documentary unit
DSC-21-30-20 Normal Operation, Intermediate Configuration	E	7	Documentation update: Addition of "Normal Operation, Intermediate Configuration" documentary unit
DSC-21-40-10 General	A	1	Update of the titles to be in accordance with the cockpit layout.
DSC-21-40-10 General	A	2	Update of the titles to be in accordance with the cockpit layout.
DSC-21-40-30 Overhead Panel	A	1	Documentation update: Deletion of information.
			Enhancement of the illustration. No technical change.
DSC-21-40-30 Overhead Panel	A	2	Layout modification. No technical change.
DSC-21-40-30 Overhead Panel	A	3	Layout modification. No technical change.
DSC-21-40-30 Overhead Panel	A	4	Layout modification. No technical change.
DSC-21-40-30 Overhead Panel	A	5	Layout modification. No technical change.
DSC-21-40-30 Overhead Panel	A	6	Layout modification. No technical change.
			Removal of the Note 2 to simplify the content.
DSC-21-30-20	C	2	Effectivity update: The information no longer applies to MSN 07792.

Continued on the following page

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Localization Title	Toc Index	ID	Reason
Normal Operation, Open-Circuit Configuration			
DSC-21-30-20 Normal Operation, Open-Circuit Configuration	C	3	Effectivity update: The information no longer applies to MSN 05152.
DSC-21-30-20 Normal Operation, Close-Circuit Configuration	D	4	Effectivity update: The information no longer applies to MSN 07792.
DSC-21-30-20 Normal Operation, Close-Circuit Configuration	D	6	Effectivity update: The information no longer applies to MSN 05152.
DSC-21-30-20 Normal Operation, Intermediate Configuration	E	8	Effectivity update: The information no longer applies to all MSN.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AIR CONDITIONING / PRESSURIZATION / VENTILATION AIR CONDITIONING - GENERAL
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GENERAL

Ident.: DSC-21-10-10-00017767.0001001 / 13 MAY 25

Applicable to: ALL

The air conditioning system is fully automatic.

It provides continuous air renewal and maintains a constant, selected temperature in the following three zones : COCKPIT, FWD CABIN, AFT CABIN. These three zones are independently controlled.

Air is supplied by the pneumatic system, via:

- Two pack flow control valves,
- Two packs,
- The mixing unit, which mixes the air that comes from the cabin and the packs.

Air is then distributed to the cockpit and to the cabin.

In an emergency, a ram air inlet can provide ambient air to the mixing unit.

The temperature in the flight deck and in the cabin can be selected from the AIR COND overhead panel. Temperature regulation is ensured by a zone controller and two pack controllers, or two ACSC  .

Temperature regulation is optimized via the hot air pressure regulating valve, and the trim air valves that add hot air, tapped upstream of the packs, to the air coming from the mixing unit.

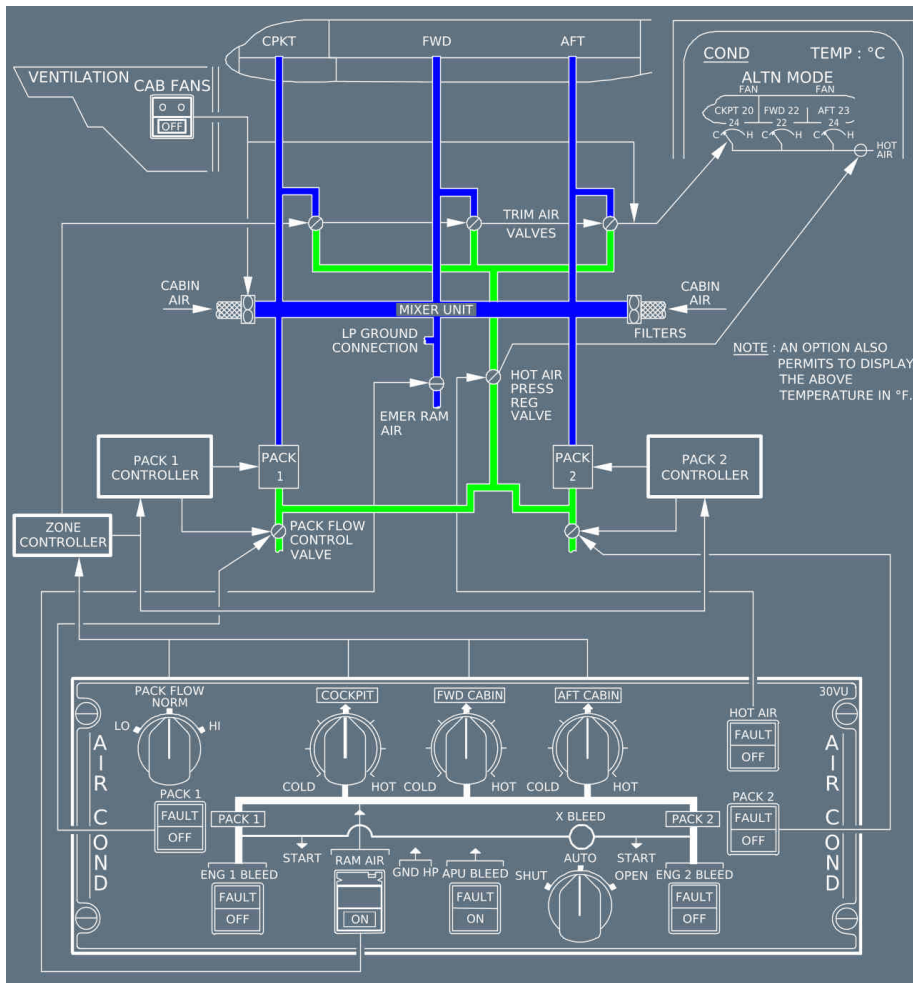
A temperature control panel  is also available on the FAP. During cruise, the cabin crew can modify each cabin zone temperature that is selected from the cockpit, with a limited authority of $\pm 2.5^{\circ}\text{C}$. ($\pm 4.5^{\circ}\text{F}$).

Low-pressure air can be supplied to the mixing unit by a ground connection.

ARCHITECTURE

Ident.: DSC-21-10-10-00000297.0001001 / 22 MAY 12

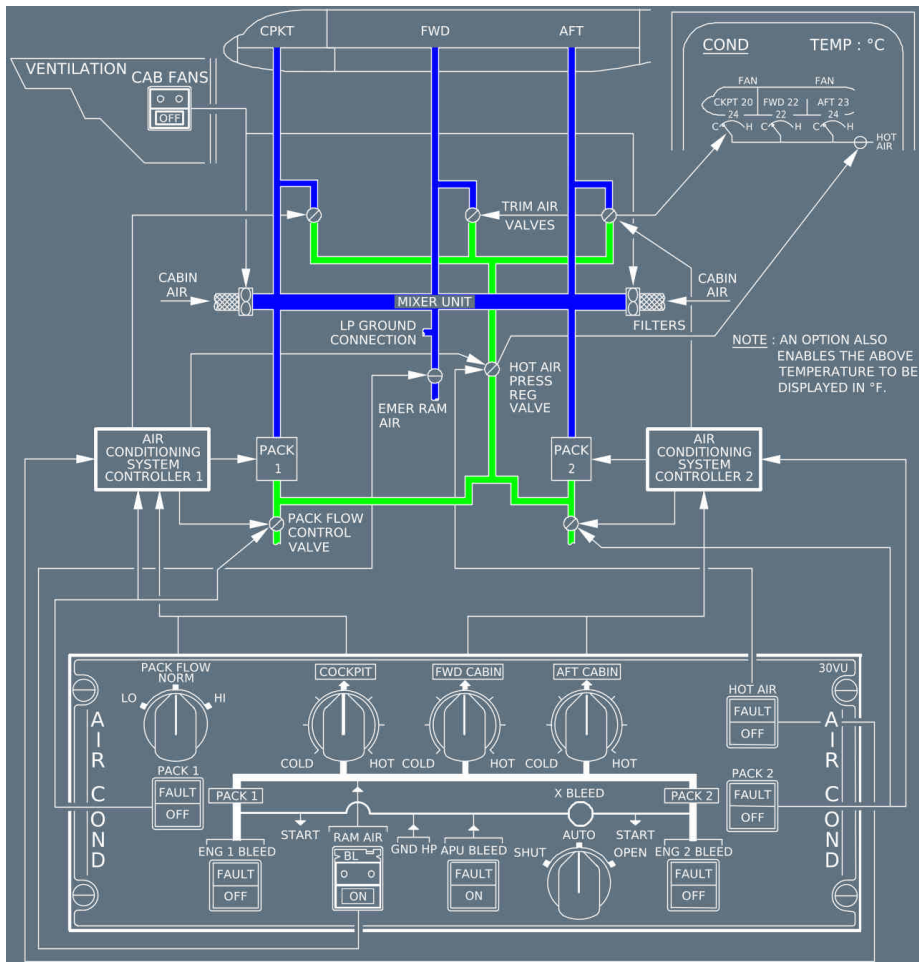
Applicable to: MSN 02155-02212



ARCHITECTURE

Ident.: DSC-21-10-10-00000297.0003001 / 22 MAY 12

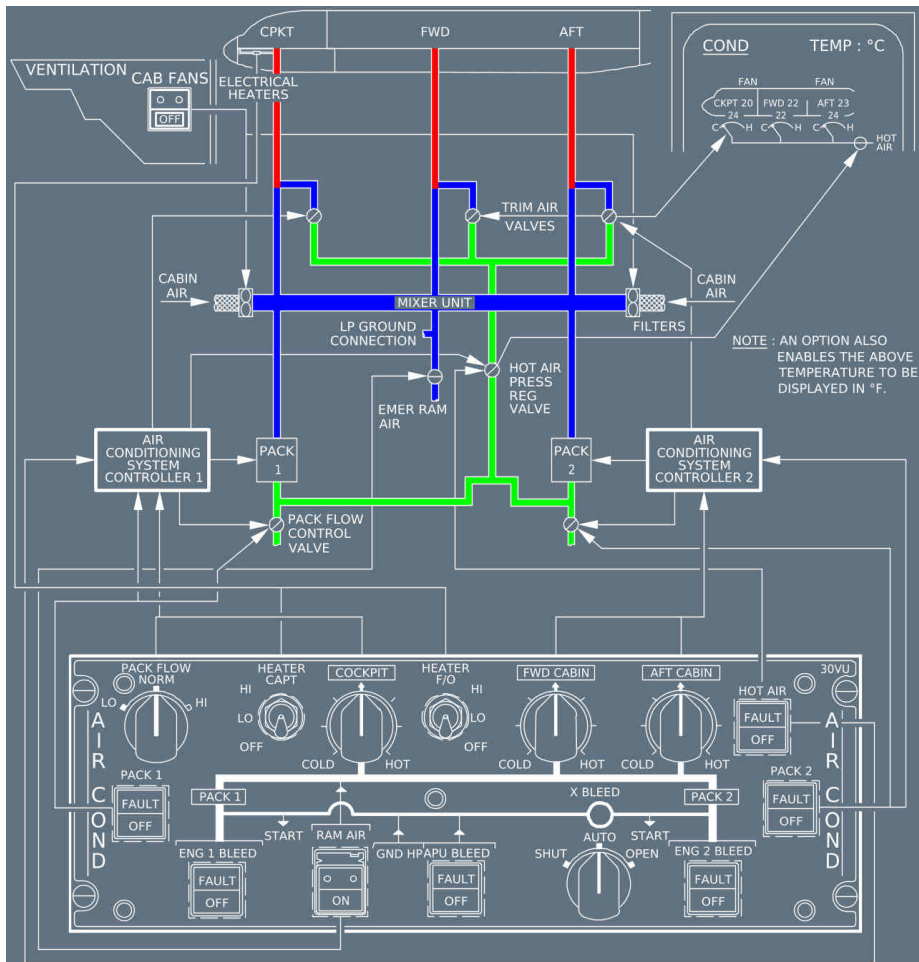
Applicable to: MSN 02719-04392, 07784-07792



ARCHITECTURE

Ident.: DSC-21-10-10-00000297.0009001 / 22 MAY 12

Applicable to: MSN 05152-05746



 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AIR CONDITIONING / PRESSURIZATION / VENTILATION AIR CONDITIONING - MAIN COMPONENTS
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AIR CONDITIONING PACK

Ident.: DSC-21-10-20-00017768.0001001 / 21 MAR 16

Applicable to: ALL

The two packs operate automatically and independently of each other. Pack operation is controlled by signals coming from the pack controller or the Air Conditioning System Controller (ACSC)  . Warm pre-conditioned bleed air enters the cooling path via the pack flow control valve, and is ducted to the primary heat exchanger.

Then, the cooled bleed air enters the compressor section of the air-cycle machine and is compressed to a higher pressure and temperature.

It is cooled again in the main heat exchanger and enters the turbine section, where it expands and, in expanding, generates power to drive the compressor and cooling air fan.

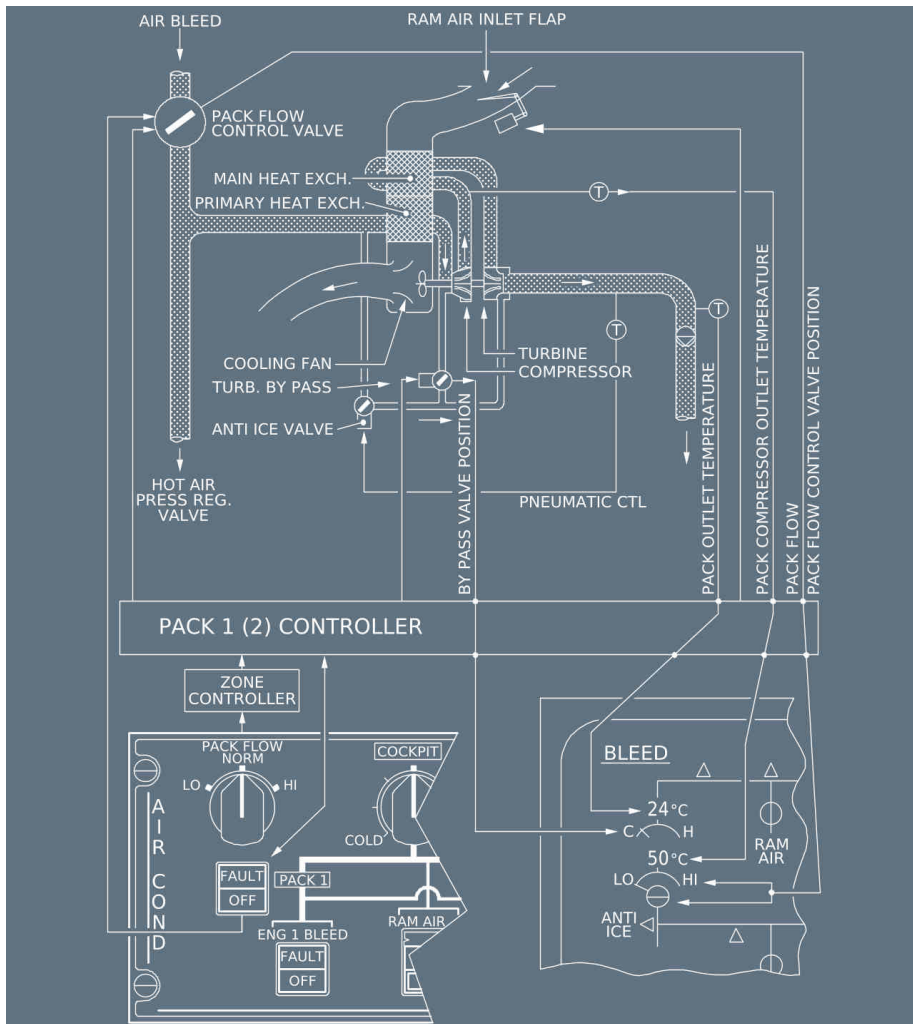
The removal of energy during this process reduces air temperature, resulting in very low air temperature at turbine discharge.

 A water separator system dries the air before it enters the turbine section.

PACK SCHEMATIC (SIMPLIFIED)

Ident.: DSC-21-10-20-00000299.0003001 / 22 MAY 12

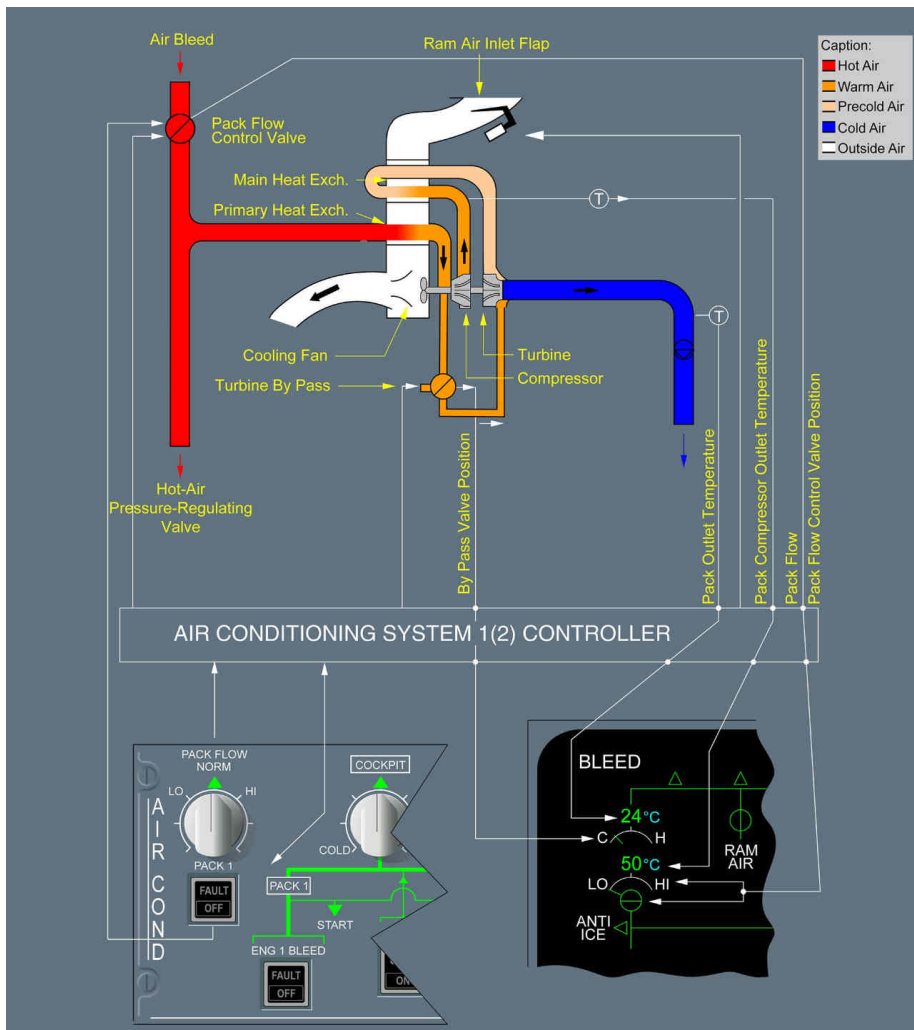
Applicable to: MSN 02155-02212



PACK SCHEMATIC (SIMPLIFIED)

1 Ident.: DSC-21-10-20-00000299.0013001 / 10 MAY 21

Applicable to: MSN 02719-07792



AIRCRAFT SYSTEMS**AIR CONDITIONING / PRESSURIZATION / VENTILATION****AIR CONDITIONING - MAIN COMPONENTS****PACK FLOW CONTROL VALVE**

Ident.: DSC-21-10-20-00017769.0001001 / 24 AUG 18

Applicable to: ALL

This valve is pneumatically-operated and electrically-controlled. It regulates the air flow in accordance with signals received from the pack controllers or the ACSC  .

In the absence of air pressure, a spring keeps the valve closed.

The valve closes automatically in case of pack overheat (on ground only), engine start, or operation of the fire or ditching pushbutton. The valve is controlled from the AIR COND panel.

EMERGENCY RAM AIR

Ident.: DSC-21-10-20-00000301.0001001 / 20 DEC 16

Applicable to: ALL

An emergency ram air inlet ventilates the cockpit and cabin to remove smoke, or if both packs fail.

The emergency ram air inlet valve is controlled by the RAM AIR pushbutton on the AIR COND panel.

This pushbutton opens the ram air valve, provided that ditching is not selected.

When the RAM AIR pushbutton is ON : The outflow valve opens about 50 %, provided that it is under automatic control and ΔP is less than 1 PSI. The outflow valve does not automatically open if it is under manual control, even if ΔP is less than 1 PSI. If ΔP is greater than 1 PSI, the check valve located downstream the ram air door will not open, even if the ram air door has been selected open. No airflow will then be supplied.

MIXER UNIT

Ident.: DSC-21-10-20-00000302.0001001 / 21 MAR 16

Applicable to: ALL

This unit mixes cold fresh air from the packs with the cabin air being recirculated through recirculation fans. The mixer unit is also connected to the emergency ram air inlet and the low pressure ground inlets.

HOT-AIR PRESSURE-REGULATING VALVE

Ident.: DSC-21-10-20-00000303.0002001 / 05 MAY 22

Applicable to: MSN 02155-02212

This valve regulates the pressure of hot air, tapped upstream of the packs.

It is pneumatically-operated and electrically-controlled from the HOT AIR pb-sw on the AIR COND panel. In the absence of air, a spring keeps the valve closed.

AIRCRAFT SYSTEMS**AIR CONDITIONING / PRESSURIZATION / VENTILATION****AIR CONDITIONING - MAIN COMPONENTS**

The valve closes automatically, if:

- The duct overheats, or
- The cockpit trim air valve fails, or
- The zone controller fails.

The valve remains operative, even if either the forward or aft cabin trim air valve fails.

HOT-AIR PRESSURE-REGULATING VALVE

Ident.: DSC-21-10-20-00000303.0003001 / 05 MAY 22

Applicable to: MSN 02719-07792

This valve regulates the pressure of hot air, tapped upstream of the packs.

It is pneumatically-operated and electrically-controlled from the HOT AIR pb-sw on the AIR COND panel. The ACSC 1 regulates this valve. In the absence of air, a spring keeps the valve closed.

The valve closes automatically, if:

- Both lanes of ACSC 1 or ACSC 2 fail, or
- The duct overheats, or
- At least two trim air valves fail.

The valve remains operative, even if either the forward or aft cabin trim air valve fails.

TRIM AIR VALVES

Ident.: DSC-21-10-20-00017771.0001001 / 21 MAR 16

Applicable to: ALL

These valves are electrically-controlled by the zone controller or the ACSC . A trim air valve, associated with each zone, adjusts the temperature by adding hot air.

The cockpit trim air valve is controlled by the ACSC 1 , and the cabin trim air valves are controlled by the ACSC 2 .

AIRCRAFT SYSTEMS

AIR CONDITIONING / PRESSURIZATION / VENTILATION

AIR CONDITIONING - MAIN COMPONENTS

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AIRCRAFT SYSTEMS**AIR CONDITIONING / PRESSURIZATION / VENTILATION****AIR CONDITIONING - TEMPERATURE AND FLOW REGULATION****GENERAL**

Ident.: DSC-21-10-30-00017772.0001001 / 21 MAR 16

Applicable to: ALL

Temperature regulation is automatic and controlled by one zone controller and two pack controllers, or the ACSC .

PACK CONTROLLER

Ident.: DSC-21-10-30-00000306.0002001 / 15 FEB 11

Applicable to: MSN 02155-02212

Each pack controller regulates the temperature of its associated pack, in accordance with a demand signal from the zone controller, by modulating the bypass valve and the ram air inlet flaps. The ram air inlet flaps close during takeoff and landing to avoid ingestion of foreign matter.

Note: During takeoff, the ram air inlet flaps close when TO power is set and the main landing gear struts are compressed.

During landing they close as soon as the main landing gear struts are compressed, as long as speed is at or above 70 kt.

They open 20 s after the speed drops below 70 kt.

The pack controllers also regulate flow by modulating the associated pack flow control valve.

ZONE CONTROLLER

Ident.: DSC-21-10-30-00000307.0001001 / 05 MAR 19

Applicable to: MSN 02155-02212**PACK FLOW CONTROL**

The crew can use the PACK FLOW selector to adjust the pack flow for the number of passengers and for external conditions.

Whatever the crew selects, the system delivers higher flow for any of the following circumstances:

- In single-pack operation,
- When the APU is supplying bleed air.

The system delivers normal flow if the crew selects LO flow and the temperature demand cannot be satisfied.

ENGINE PRESSURE DEMAND

When the cooling demand in one zone cannot be satisfied, if the bleed pressure is too low, the zone controller sends a pressure demand signal to both Engine Interface Units (EIU) to increase the minimum idle and to raise the bleed pressure.

AIRCRAFT SYSTEMS**AIR CONDITIONING / PRESSURIZATION / VENTILATION****AIR CONDITIONING - TEMPERATURE AND FLOW REGULATION****APU FLOW DEMAND**

When the APU bleed valve is open, the zone controller signals the APU's Electronic Control Box (ECB) to increase the APU flow output when any zone temperature demand cannot be satisfied.

TEMPERATURE REGULATION

Ident.: DSC-21-10-30-00017773.0001001 / 21 MAR 16

Applicable to: ALL

Temperature regulation is achieved by the zone controller or the ACSC  .

The zone controller regulates the temperature of the two cabin zones and the cockpit. The ACSC 2  regulates the temperature of the two cabin zones, and the ACSC 1  regulates the cockpit temperature.

BASIC TEMPERATURE REGULATION

The flight crew uses the temperature selectors on the air conditioning panel to select the reference temperatures. The zone controller or the ACSC  computes a temperature demand from the selected temperature and the actual temperature. The reference temperatures are then fine tuned for each cabin zone through the temperature control panel  installed on the FAP.

The actual temperature is measured by sensors:

- In the cockpit, for the cockpit zone;
- In the lavatory extraction circuit and galley ventilation system, for the cabin.

A signal corresponding to the lowest demanded zone temperature goes to the pack controller or the ACSC  , which then make both packs supply the required outlet temperature.

OPTIMIZED TEMPERATURE REGULATION

The zone controller or the ACSC  optimizes temperature by acting on the trim air valves. The temperature selection range is from 18 °C (64 °F) to 30 °C (86 °F).

AIR CONDITIONING SYSTEM CONTROLLERS

Ident.: DSC-21-10-30-00017775.0001001 / 20 DEC 16

Applicable to: MSN 02719-07792

Each air conditioning system controller regulates the temperature of its associated pack, by modulating the bypass valve and the ram air inlet flap.

The ram air inlet flap closes during takeoff and landing to avoid the ingestion of foreign matter.

Note: During takeoff, the ram air inlet flap closes when takeoff power is set, and the main landing gear struts are compressed.
During landing, it closes as soon as the main landing gear struts are compressed, as long as speed is at or above 70 kt.
It opens 20 s after the speed drops below 70 kt.

The air conditioning system controllers also regulate flow by modulating the associated pack flow control valve.

PACK FLOW CONTROL

The flight crew can use the PACK FLOW selector to adjust the pack flow for the number of passengers and for external conditions.

Whatever the crew selects, the system delivers higher flow for any of the following circumstances:

- In single-pack operation,
- When the APU is supplying bleed air.

The system delivers normal flow if the flight crew selects LO flow and the temperature demand cannot be satisfied.

ENGINE PRESSURE DEMAND

When the cooling demand in one zone cannot be satisfied, if the bleed pressure is too low, the air conditioning system controller sends a pressure demand signal to both Engine Interface Units (EIU) to increase the minimum idle and to raise the bleed pressure.

APU FLOW DEMAND

When the APU bleed valve is open, the air conditioning system controller signals the APU's Electronic Control Box (ECB) to increase the APU flow output when any zone temperature demand cannot be satisfied.

COCKPIT - ELECTRICAL HEATERS

Ident.: DSC-21-10-30-00013186.0001001 / 15 FEB 11

Applicable to: MSN 05152-05746

The ambient temperature of the cockpit is regulated via the COCKPIT selector, located on the AIR COND panel. In addition, an electrical heater is installed inside each foot air outlet ducting to enable the increase of the air temperature in the foot area. Two HEATER switches, located on the AIR COND panel, control these electrical heaters (one for the Captain's side and one for the First Officer's side).

AIRCRAFT SYSTEMS

AIR CONDITIONING / PRESSURIZATION / VENTILATION

AIR CONDITIONING - TEMPERATURE AND FLOW REGULATION

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GENERAL

Ident.: DSC-21-10-40-00000309.0001001 / 15 FEB 11

Applicable to: MSN 02155-02212

Each controller consists of a primary channel that is normally in control and a secondary channel that acts as a backup if the primary channel fails.

GENERAL

Ident.: DSC-21-10-40-00000309.0002001 / 21 MAR 16

Applicable to: MSN 02719-07792

Each controller is comprised of two lanes. One lane controls the system, the other takes over full control, in case of an active lane failure.

ZONE CONTROLLER

Ident.: DSC-21-10-40-00000310.0001001 / 15 FEB 11

Applicable to: MSN 02155-02212

PRIMARY CHANNEL FAILURE

The secondary channel operates as backup.

The flow setting function and optimized temperature regulation are not available. HOT AIR and TRIM AIR valves close.

The zones are controlled to 24 °C (76 °F) (backup regulation). Pack 1 controls the cockpit temperature. Pack 2 controls the FWD and AFT cabin temperatures.

ALTN MODE appears on the ECAM (Electronic Centralized Aircraft Monitoring) COND page.

SECONDARY CHANNEL FAILURE

This has no effect on zone temperature regulation.

Backup mode is lost.

PRIMARY AND SECONDARY CHANNEL FAILURE

Optimized and backup temperature regulation is lost.

The packs deliver a fixed temperature: 20 °C (68 °F) for pack 1, 10 °C (50 °F) for pack 2. The failure removes all information from the ECAM COND page, which then displays PACK REG.

PACK CONTROLLERS

Ident.: DSC-21-10-40-00000311.0001001 / 15 FEB 11

Applicable to: MSN 02155-02212

PRIMARY CHANNEL FAILURE

The secondary computer operates as a backup.

AIRCRAFT SYSTEMS**AIR CONDITIONING / PRESSURIZATION / VENTILATION****AIR CONDITIONING - SYSTEM OPERATION UNDER FAILURE CONDITION**

Regulation is not optimized.

Pack flow is fixed at the previous setting.

SECONDARY CHANNEL FAILURE

This failure has no effect on pack regulation. Backup mode is lost.

ECAM signals related to the corresponding pack are lost.

PRIMARY AND SECONDARY CHANNEL FAILURE

As a backup, corresponding pack outlet temperature is controlled by the anti-ice valve and is stabilized to a temperature between 5 °C (41 °F) and 30 °C (86 °F) in a maximum of 6 min.

ECAM signals, related to the corresponding pack, are lost.

AIR CONDITIONING SYSTEM CONTROLLERS

Ident.: DSC-21-10-40-00018747.0001001 / 03 MAY 23

Applicable to: ALL

ONE LANE FAILURE

No effect, as the second lane takes over.

BOTH LANES FAILURE

The related pack is lost and the hot air pressure-regulating valve closes. The associated trim air valve(s) remain(s) in the current position at the time of the failure.

AIR CYCLE MACHINE FAILURE

Ident.: DSC-21-10-40-00000312.0002001 / 15 FEB 11

Applicable to: MSN 02155-02212

If the Air Cycle Machine (ACM) fails (compressor/turbine seizure), the affected pack may be operated in heat exchanger cooling mode.

Warm pre-conditioned bleed air enters the cooling path via the pack valve and goes to the primary heat exchanger. Then, the main part of the cooled air goes directly downstream of ACM turbine through the bypass valve, and the rest goes through the failed ACM.

The ACM seizure reduces the pack flow.

As for normal pack operation:

- The pack controller regulates temperature, in accordance with zone controller demand, by modulating the bypass valve and the ram air inlet flap.
- The zone controller regulates the hot air flow through the hot air valves to optimize cockpit/cabin temperature regulation. Hot air flow is lower than in normal pack operation, because pack flow is reduced.

AIR CYCLE MACHINE FAILURE

Ident.: DSC-21-10-40-00000312.0003001 / 21 MAR 16

Applicable to: MSN 02719-07792

If the Air Cycle Machine (ACM) fails (compressor/turbine seizure), the affected pack may be operated in heat exchanger cooling mode.

Warm pre-conditioned bleed air enters the cooling path via the pack valve and goes to the primary heat exchanger. Then, the main part of the cooled air goes directly downstream of ACM turbine through the bypass valve, and the rest goes through the failed ACM.

The ACM seizure reduces the pack flow.

As for normal pack operation :

- The air conditioning system controller regulates temperature by modulating the bypass valve and the ram air inlet flap.
- The air conditioning system controller regulates the hot air flow through the trim air valves to optimize cockpit/cabin temperature regulation. Hot air flow is lower than in normal pack operation, because pack flow is reduced.

HOT AIR PRESSURE REGULATING VALVE FAILURE

Ident.: DSC-21-10-40-00000313.0001001 / 21 MAR 16

Applicable to: ALL

Failed open : No effect.

Failed closed : Optimized regulation is lost. Trim air valves are driven to the fully closed position. Pack 1 controls the cockpit temperature to the selected value and pack 2 controls the cabin temperature (FWD and AFT) to the mean value of the selected temperatures.

TRIM AIR VALVE FAILURE

Ident.: DSC-21-10-40-00000314.0001001 / 21 MAR 16

Applicable to: ALL

Optimized temperature regulation of the corresponding zone is lost.

AIRCRAFT SYSTEMS

AIR CONDITIONING / PRESSURIZATION / VENTILATION

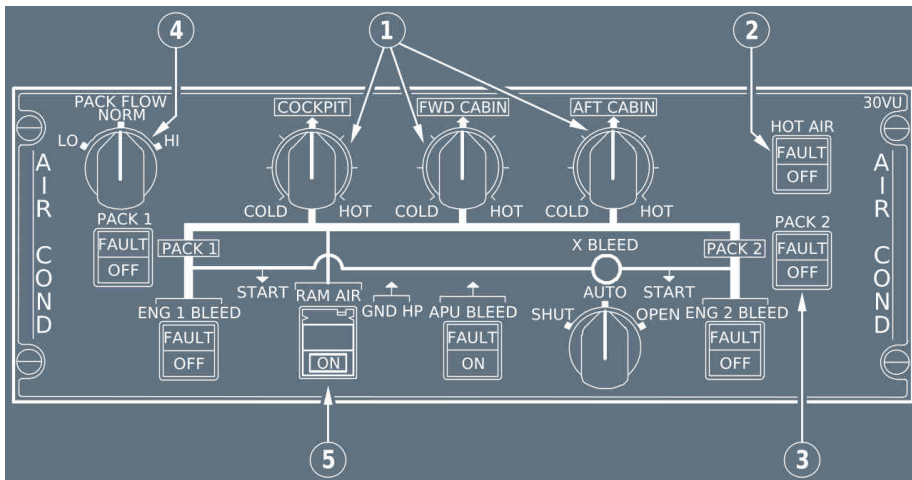
AIR CONDITIONING - SYSTEM OPERATION UNDER FAILURE CONDITION

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CONTROLS ON OVERHEAD PANEL

Ident.: DSC-21-10-50-00000315.0002001 / 12 MAY 23

Applicable to: MSN 02155-04392, 07784-07792



(1) Zone temperature selector

- 12 o'clock position: 24 °C (76 °F)
- COLD position: 18 °C (64 °F)
- HOT position: 30 °C (86 °F).

(2) HOT AIR pb

ON : The valve regulates hot air pressure.

OFF : The valve closes, and the trim air valves close.

The FAULT circuit is reset.

FAULT : The FAULT light comes on amber, along with an associated ECAM caution, when duct overheat is detected. The fault circuit detects an overheat when the duct temperature reaches 88 °C (190 °F) once.

The valve and trim air valves close automatically.

The FAULT light goes off when the temperature drops below 70 °C (158 °F), and the flight crew selects OFF.

(3) PACK pb-sw

ON : The pack flow control valve is automatically-controlled.

It opens, except in the following cases:

- Upstream pressure below minimum
- Compressor outlet overheat
- Engine start sequence:
 1. If the crossbleed valve is closed, the valve located on the starting engine side immediately closes, when the ENG MODE selector is set to IGN (or CRK)
 2. It remains closed on the starting engine side (provided the crossbleed valve is closed) when:
 - The ENG MASTER lever is set to ON (or ENG MAN START pb-sw is set to ON)
 - The start valve is open
 - N2 < 50 %.

Note: If the crossbleed valve is open at engine start, both pack flow control valves close.

3. On ground, reopening of the valves is delayed for 30 s to avoid a supplementary pack closure cycle during second engine start.

- FIRE pb, of the engine on the related side, is pressed
- Ditching is selected.

OFF : The pack flow control valve closes.

FAULT It : Comes on amber, and a caution appears on the ECAM, if the pack flow control valve position disagrees with the selected position, or in the case of compressor outlet overheat or pack outlet overheat.

(4) PACK FLOW selector

- Permits the selection of pack valve flow, according to the number of passengers and ambient conditions (smoke removal, hot or wet conditions)
 LO (80 %) – NORM (100 %) – HI (120 %)
- Manual selection is irrelevant in single pack operation, or with APU bleed supply. In these cases, HI is automatically selected
- If LO is selected, the pack flow can be automatically selected up to 100 % when the cooling demand cannot be satisfied.

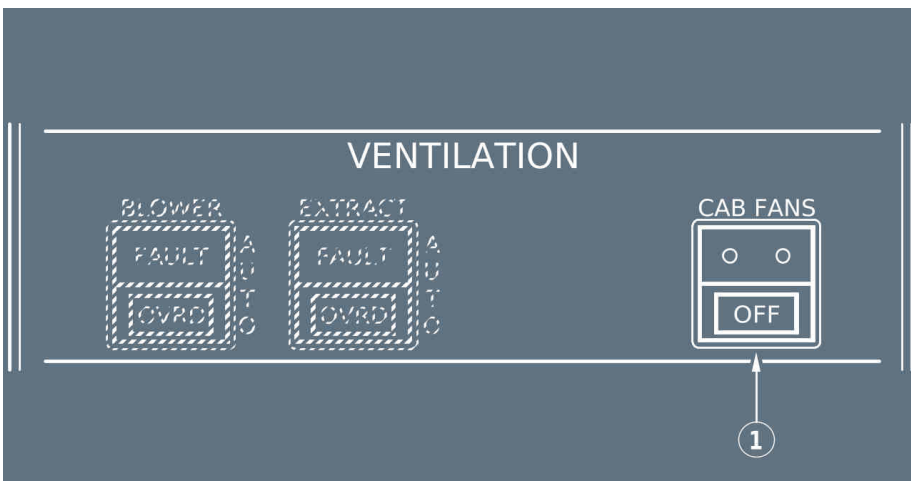
(5) RAM AIR pb (guarded)

ON : The ON light comes on white.

If the DITCHING pb, on the CABIN PRESS panel, is in normal position:

- The emergency ram air inlet opens
- If $\Delta p \geq 1$ PSI: The outflow valve control remains normal. No emergency ram air flows in
- If $\Delta p < 1$ PSI: The outflow valve opens to about 50 % when under automatic control. It does not automatically open when it is under manual control. Emergency ram airflow is directly supplied to the mixer unit.

OFF: The emergency ram air inlet closes.



(1) CAB FAN pb

ON : The two cabin fans are on.

OFF: The two cabin fans are off.

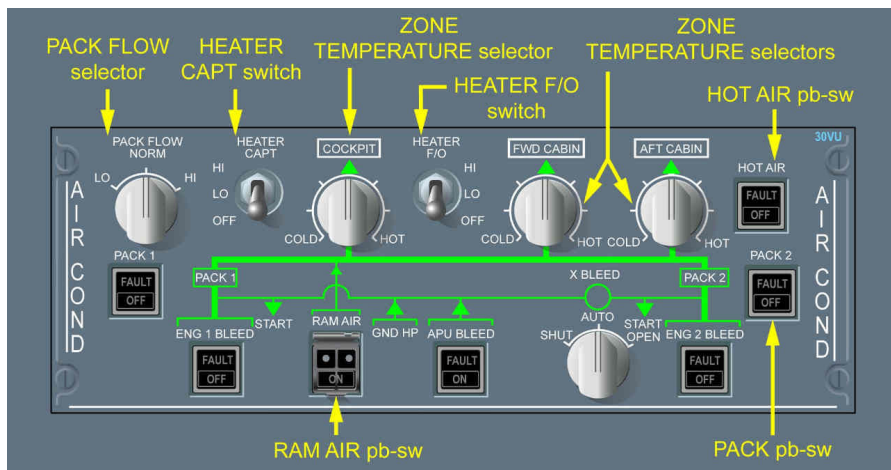
CONTROLS ON OVERHEAD PANEL

Ident.: DSC-21-10-50-00000315.0010001 / 04 SEP 18

Applicable to: MSN 05152-05746

AIR COND PANEL

AIR COND Panel



(1) ZONE TEMPERATURE SELECTOR



24 °C (76 °F)



18 °C (64 °F)



30 °C (86 °F).

(2) HOT AIR PB-SW



The valve regulates hot air pressure.



The valve closes, and the trim air valves close.
The FAULT circuit is reset.



The FAULT light comes on amber, along with an associated ECAM caution, when duct overheat is detected. The fault circuit detects an overheat when the duct temperature reaches 88 °C (190 °F).
The valve and trim air valves close automatically.
The FAULT light goes off when the temperature drops below 70 °C (158 °F), and the flight crew selects OFF.

(3) PACK PB-SW



The pack flow control valve is automatically-controlled.

It opens, except in the following cases:

- Upstream pressure below minimum
- Compressor outlet overheat
- Engine start sequence:
 1. If the crossbleed valve is closed, the valve located on the starting engine side immediately closes, when the MODE selector is set to IGN (or CRK)
 2. It remains closed on the starting engine side (provided the crossbleed valve is closed) when:
 - The MASTER sw is set to ON (or MAN START pb is set to ON)
 - The start valve is open
 - N2 < 50 %.

Note: If the crossbleed valve is open at engine start, both pack flow control valves close.
 3. On ground, reopening of the valves is delayed for 30 s to avoid a supplementary pack closure cycle during second engine start.
- FIRE pb, of the engine on the related side, is pressed
- Ditching is selected.

AIRCRAFT SYSTEMS

AIR CONDITIONING / PRESSURIZATION / VENTILATION

AIR CONDITIONING - CONTROLS AND INDICATORS



The pack flow control valve closes.



Comes on amber, and a caution appears on the ECAM, if the pack flow control valve position disagrees with the selected position, or in the case of compressor outlet overheat or pack outlet overheat.

(4) PACK FLOW SELECTOR



Permits the selection of pack valve flow, according to the number of passengers and ambient conditions (smoke removal, hot or wet conditions) LO (80 %) – NORM (100 %) – HI (120 %)

Note:

- Manual selection is irrelevant in single pack operation, or with APU bleed supply. In these cases, HI is automatically selected
- If LO is selected, the pack flow can be automatically selected up to 100 % when the cooling demand cannot be satisfied.

(5) RAM AIR PB-SW



The ON light comes on white.

If the DITCHING pb, on the CABIN PRESS panel, is in normal position:

- The emergency ram air inlet opens
- If $\Delta p \geq 1$ PSI: The outflow valve control remains normal. No emergency ram air flows in
- If $\Delta p < 1$ PSI: The outflow valve opens to about 50 % when under automatic control. It does not automatically open when it is under manual control. Emergency ram airflow is directly supplied to the mixer unit.



The emergency ram air inlet closes.

(6) HEATER CAPT (F/O) SWITCH



The foot heater is off. Air outlet temperature is based on the COCKPIT selector.



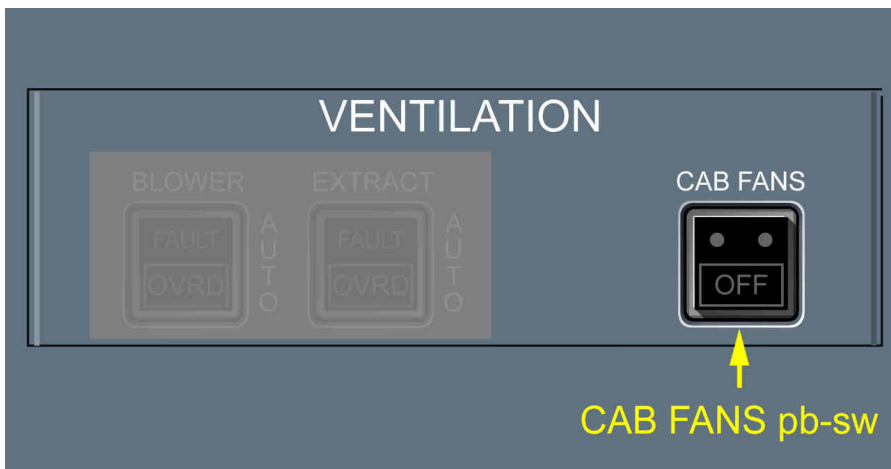
Air temperature at heater air outlet increased by 12.5 °C.



Air temperature at heater air outlet increased by 25 °C.

VENTILATION PANEL

VENTILATION Panel



(1) CAB FANS PB-SW



The two cabin fans are on.

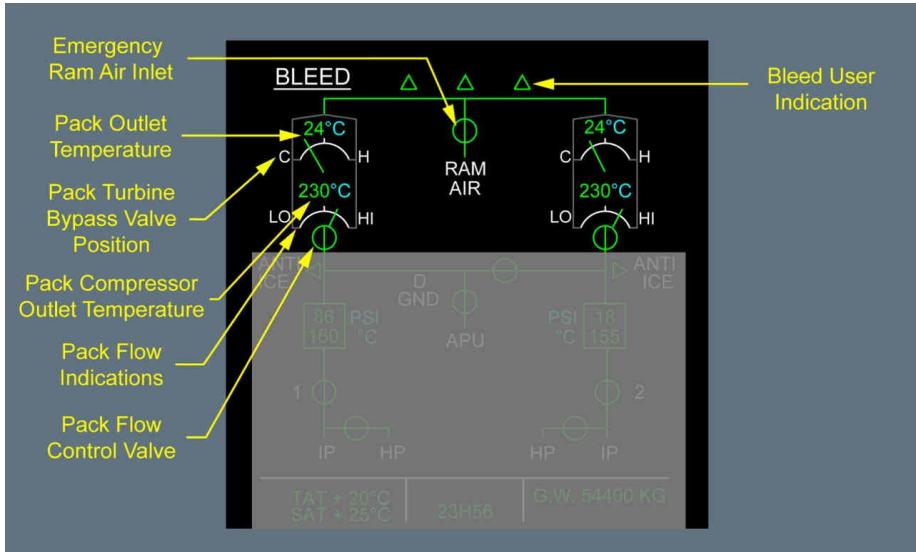


The two cabin fans are off.

ECAM BLEED PAGE

Ident.: DSC-21-10-50-00000316.0006001 / 03 MAY 23

Applicable to: MSN 02719-07792



EMERGENCY RAM AIR INLET



The valve is normally closed.



The valve is partially open.



The valve is fully open on ground.

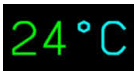


The valve is fully open in flight.

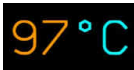


The information is not valid.

PACK OUTLET TEMPERATURE



The pack outlet temperature is normal.



The pack outlet temperature is equal to or above 90 °C.



The information is not valid.

PACK TURBINE BYPASS VALVE POSITION



The bypass valve is closed.



The bypass valve is fully open.



The bypass valve information is not reliable.



The information is not valid.

AIRCRAFT SYSTEMS

AIR CONDITIONING / PRESSURIZATION / VENTILATION

AIR CONDITIONING - CONTROLS AND INDICATORS

PACK COMPRESSOR OUTLET TEMPERATURE



The pack compressor outlet temperature is normal.

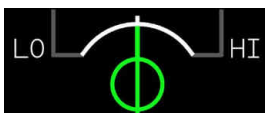


The pack compressor outlet temperature is equal to or above 260 °C.

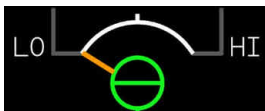


The information is not valid.

PACK FLOW INDICATIONS



The pack flow is normal.



There is no flow rate. The pack flow control valve is closed.



The information is not valid.

PACK FLOW CONTROL VALVE



The valve is open.



The valve is open, and disagrees with the control position.



The valve is fully closed.



The value is fully closed, and disagrees with the control position.



The information is not valid.

BLEED USER INDICATION



User indication is normal.

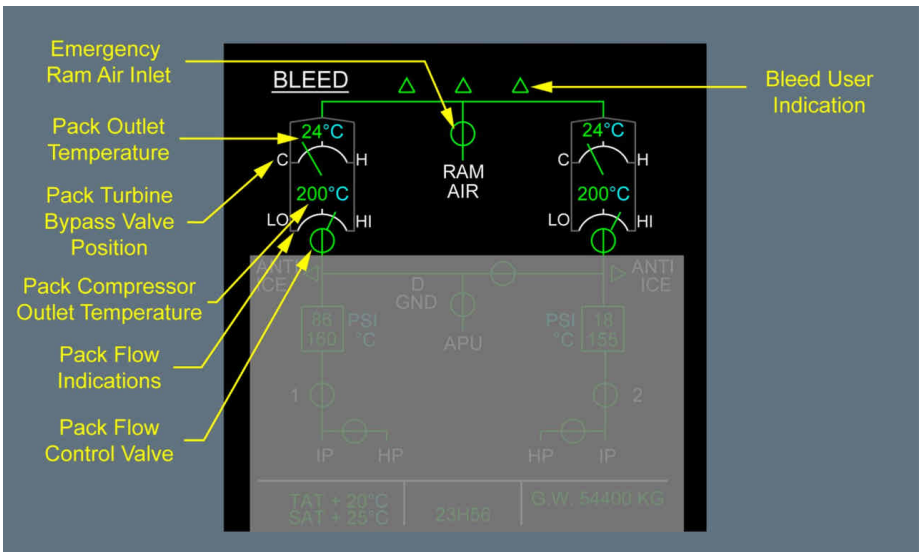


RAM AIR valve and both pack flow control valves are fully closed.

ECAM BLEED PAGE

Ident.: DSC-21-10-50-00000316.0005001 / 03 MAY 23

Applicable to: MSN 02155-02212



EMERGENCY RAM AIR INLET



The valve is normally closed.

AIRCRAFT SYSTEMS

AIR CONDITIONING / PRESSURIZATION / VENTILATION

AIR CONDITIONING - CONTROLS AND INDICATORS



The valve is partially open.



The valve is fully open on ground.



The valve is fully open in flight.

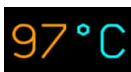


The information is not valid.

PACK OUTLET TEMPERATURE



The pack outlet temperature is normal.



The pack outlet temperature is equal to or above 90 °C.



The information is not valid.

PACK TURBINE BYPASS VALVE POSITION



The bypass valve is closed.



The bypass valve is fully open.



The information is not valid.

PACK COMPRESSOR OUTLET TEMPERATURE



The pack compressor outlet temperature is normal.

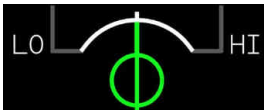


The pack compressor outlet temperature is equal to or above 230 °C.

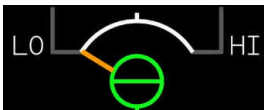


The information is not valid.

PACK FLOW INDICATIONS



The pack flow is normal.



There is no flow rate. The pack flow control valve is closed.



The information is not valid.

PACK FLOW CONTROL VALVE



The valve is open.



The valve is open, and disagrees with the control position.



The valve is fully closed.



The valve is fully closed, and disagrees with the control position.

AIRCRAFT SYSTEMS

AIR CONDITIONING / PRESSURIZATION / VENTILATION

AIR CONDITIONING - CONTROLS AND INDICATORS



The information is not valid.

BLEED USER INDICATION



User indication is normal.

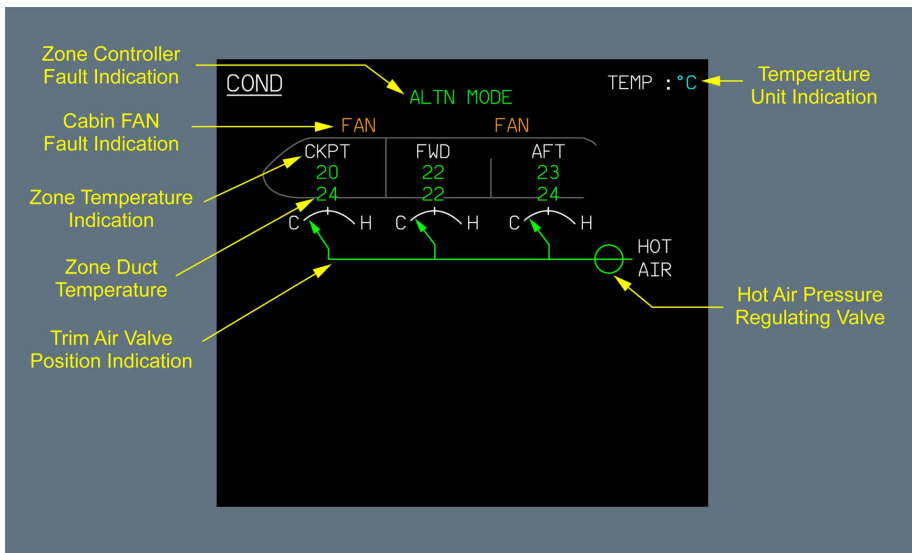


RAM AIR valve and both pack flow control valves are fully closed.

ECAM COND PAGE

Ident.: DSC-21-10-50-00000317.0003001 / 02 MAY 24

Applicable to: MSN 02155-02212



ZONE CONTROLLER FAULT INDICATION

ALTN MODE

Primary zone controller is failed.

PACK REG

Zone controller is failed (basic regulation by packs only).

Zone controller operates normally.

CABIN FAN FAULT INDICATION



The recirculation fan is failed.

ZONE TEMPERATURE INDICATION



The zone temperature is normal.



The information is not valid.

ZONE DUCT TEMPERATURE



The zone duct temperature is normal.



The cockpit and cabin duct temperature are above 80 °C (176 °F).



The information is not valid.

TRIM AIR VALVE POSITION INDICATION



The trim air valve is fully closed.



The trim air valve is fully open.



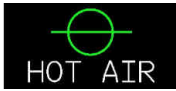
The information is not valid.

AIRCRAFT SYSTEMS

AIR CONDITIONING / PRESSURIZATION / VENTILATION

AIR CONDITIONING - CONTROLS AND INDICATORS

HOT AIR PRESSURE REGULATION VALVE



The valve is normally open.



The valve is abnormally open (disagrees with the HOT AIR pb-sw position).



The valve is fully closed, and the HOT AIR pb-sw is set in auto mode.



The valve is closed, and the HOT AIR pb-sw is set to OFF, or the valve is abnormally closed (disagrees with the HOT AIR pb-sw position).



The information is not valid.

TEMPERATURE UNIT INDICATION



The temperature unit is in degree Celsius.

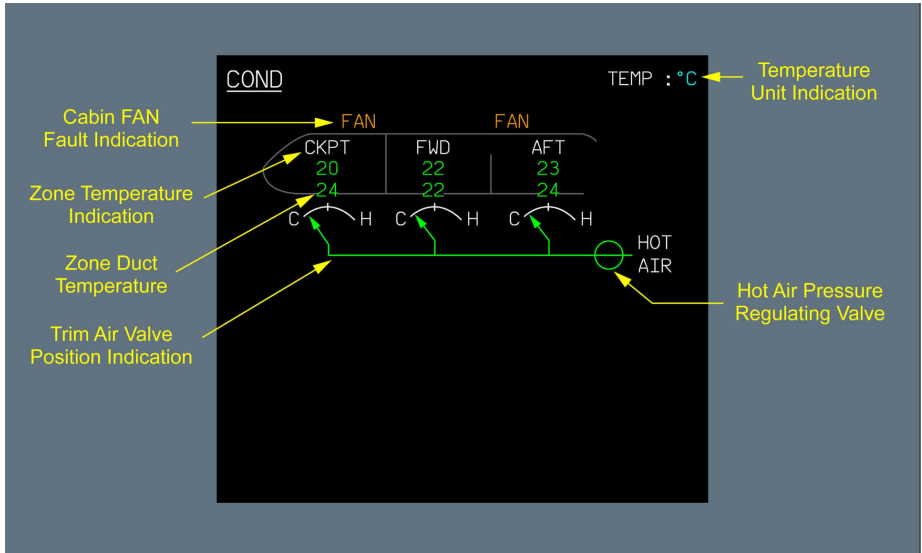


The temperature unit is in degree Fahrenheit.

ECAM COND PAGE

Ident.: DSC-21-10-50-00000317.0004001 / 02 MAY 24

Applicable to: MSN 02719-04392, 07784-07792



CABIN FAN FAULT INDICATION

FAN

The recirculation fan is failed.

ZONE TEMPERATURE INDICATION

FWD
22

The zone temperature is normal.

FWD
XX

The information is not valid.

ZONE DUCT TEMPERATURE

22

The zone duct temperature is normal.

AIRCRAFT SYSTEMS

AIR CONDITIONING / PRESSURIZATION / VENTILATION

AIR CONDITIONING - CONTROLS AND INDICATORS



The cockpit and cabin duct temperature are above 80 °C (176 °F).



The information is not valid.

TRIM AIR VALVE POSITION INDICATION



The trim air valve is fully closed.



The trim air valve is fully open.



The information is not valid.

HOT AIR PRESSURE REGULATION VALVE



The valve is normally open.



The valve is abnormally open (disagrees with the HOT AIR pb-sw position).



The valve is fully closed, and the HOT AIR pb-sw is set in auto mode.



The valve is closed, and the HOT AIR pb-sw is set to OFF, or the valve is abnormally closed (disagrees with the HOT AIR pb-sw position).



The information is not valid.

TEMPERATURE UNIT INDICATION



The temperature unit is in degree Celsius.

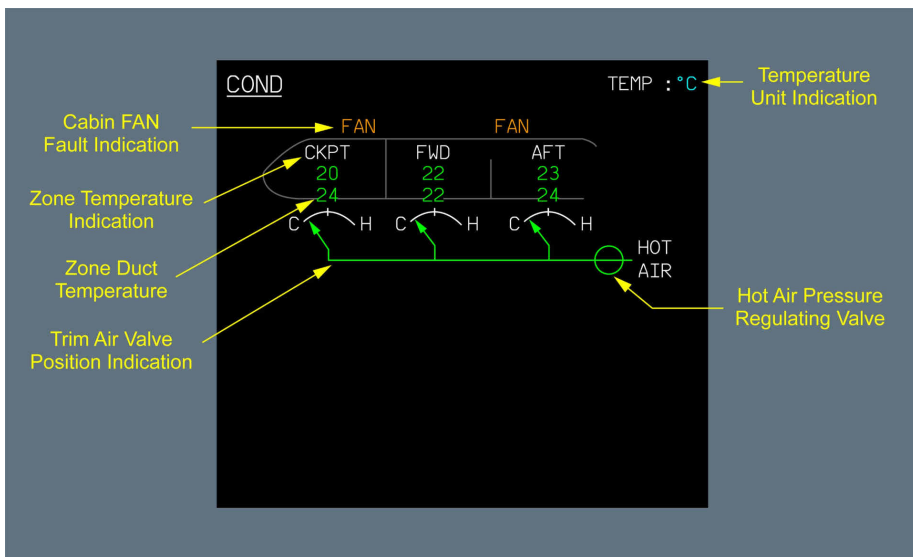


The temperature unit is in degree Fahrenheit.

ECAM COND PAGE

Ident.: DSC-21-10-50-00000317.0005001 / 02 MAY 24

Applicable to: MSN 05152-05746



CABIN FAN FAULT INDICATION



The recirculation fan is failed.

AIRCRAFT SYSTEMS

AIR CONDITIONING / PRESSURIZATION / VENTILATION

AIR CONDITIONING - CONTROLS AND INDICATORS

ZONE TEMPERATURE INDICATION



The zone temperature is normal.



The information is not valid.

ZONE DUCT TEMPERATURE



The zone duct temperature is normal.



The cockpit and cabin duct temperature are above 80 °C (176 °F).



The information is not valid.

TRIM AIR VALVE POSITION INDICATION



The trim air valve is fully closed.



The trim air valve is fully open.



The information is not valid.

HOT AIR PRESSURE REGULATION VALVE



The valve is normally open.

AIRCRAFT SYSTEMS

AIR CONDITIONING / PRESSURIZATION / VENTILATION

AIR CONDITIONING - CONTROLS AND INDICATORS



The valve is abnormally open (disagrees with the HOT AIR pb-sw position).



The valve is fully closed, and the HOT AIR pb-sw is set in auto mode.



The valve is closed, and the HOT AIR pb-sw is set to OFF, or the valve is abnormally closed (disagrees with the HOT AIR pb-sw position).

Note: When the hot air valve is closed, a spurious **FWD CRG HEATING** message may appear in the INOP SYS list, even if the system remains operative.



The information is not valid.

TEMPERATURE UNIT INDICATION



The temperature unit is in degree Celsius.



The temperature unit is in degree Fahrenheit.

AIRCRAFT SYSTEMS

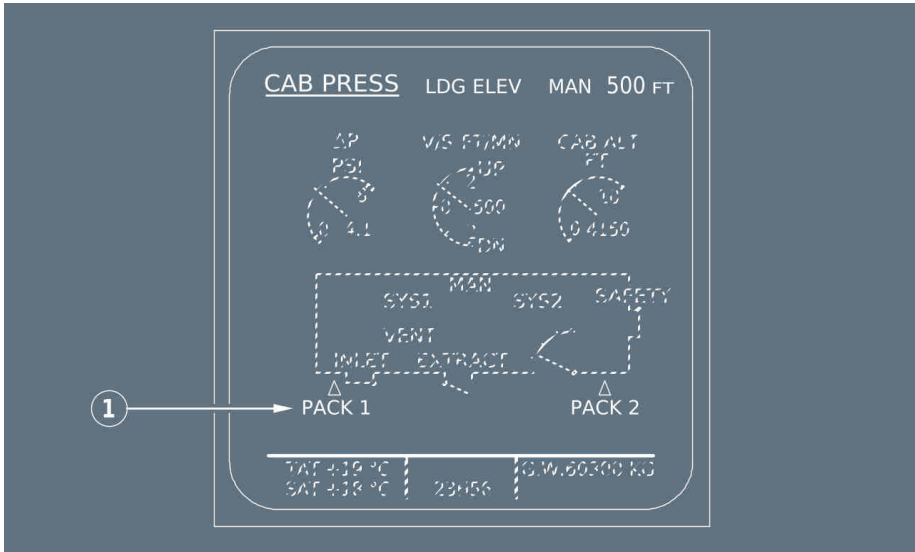
AIR CONDITIONING / PRESSURIZATION / VENTILATION

AIR CONDITIONING - CONTROLS AND INDICATORS

ECAM CAB PRESS PAGE

Ident.: DSC-21-10-50-00000318.0001001 / 09 OCT 12

Applicable to: ALL



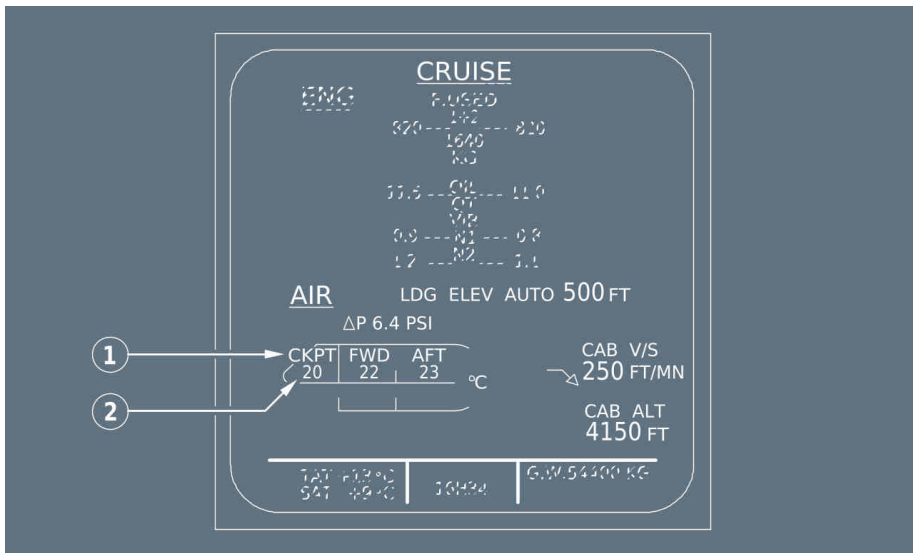
(1) PACK indication

Triangle normally green, PACK 1(2) indication normally white. Both become amber when pack flow control valve is closed with associated engine running.

ECAM CRUISE PAGE

Ident.: DSC-21-10-50-00000319.0002001 / 09 OCT 12

Applicable to: ALL



(1) Zone indication

This field also displays the temperature scale in use (°C or °F).

(2) Zone temperature

MEMO DISPLAY

Ident.: DSC-21-10-50-00016760.0001001 / 21 MAR 16

Applicable to: ALL

RAM AIR ON : This memo appears in green, if the RAM AIR pb-sw is ON.

AIRCRAFT SYSTEMS

AIR CONDITIONING / PRESSURIZATION / VENTILATION

AIR CONDITIONING - CONTROLS AND INDICATORS

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AIRCRAFT SYSTEMS**AIR CONDITIONING / PRESSURIZATION / VENTILATION****PRESSURIZATION - GENERAL****GENERAL**

Ident.: DSC-21-20-10-00017903.0001001 / 21 MAR 16

Applicable to: ALL

The cabin pressurization system has four general functions:

- Ground function : Fully opens the outflow valve on ground
- Prepressurization : During takeoff, increases cabin pressure to avoid a surge in cabin pressure during rotation
- Pressurization in flight : Adjusts cabin altitude, and rate of change to provide passengers with a comfortable flight
- Depressurization : After touchdown, gradually releases residual cabin overpressure before the ground function fully opens the outflow valve.

The system consists of:

- Two Cabin Pressure Controllers (CPC)
- One Residual Pressure Control Unit (RPCU ())
- One outflow valve, with an actuator that incorporates three motors (two for automatic operation, one for manual operation)
- One control panel
- Two safety valves.

Any one of the three independent electric motors may power the outflow valve.

Normally, one of the two cabin pressure controllers operates the outflow valve by means of its associated automatic motor.

In case of ditching, an override switch on the control panel allows the flight crew to close the outflow valve and all valves below the flotation line.

The flight crew can set the system to operate automatically, semi-automatically, or manually.

In normal operation, cabin pressurization is fully automatic.

AUTOMATIC OPERATION

Ident.: DSC-21-20-10-00000323.0001001 / 21 MAR 16

Applicable to: ALL

The flight crew monitors the operation of the system, but does nothing to control it. Air pressure in the cabin follows external schedules that the system receives as signals from the Flight Management and Guidance System (FMGS).

When FMGS data is not available for automatic pressurization, the crew only needs to select the landing field elevation.

The pressurization system then uses the manually-selected landing field elevation for internal schedules.

AIRCRAFT SYSTEMS**AIR CONDITIONING / PRESSURIZATION / VENTILATION****PRESSURIZATION - GENERAL****MANUAL OPERATION**

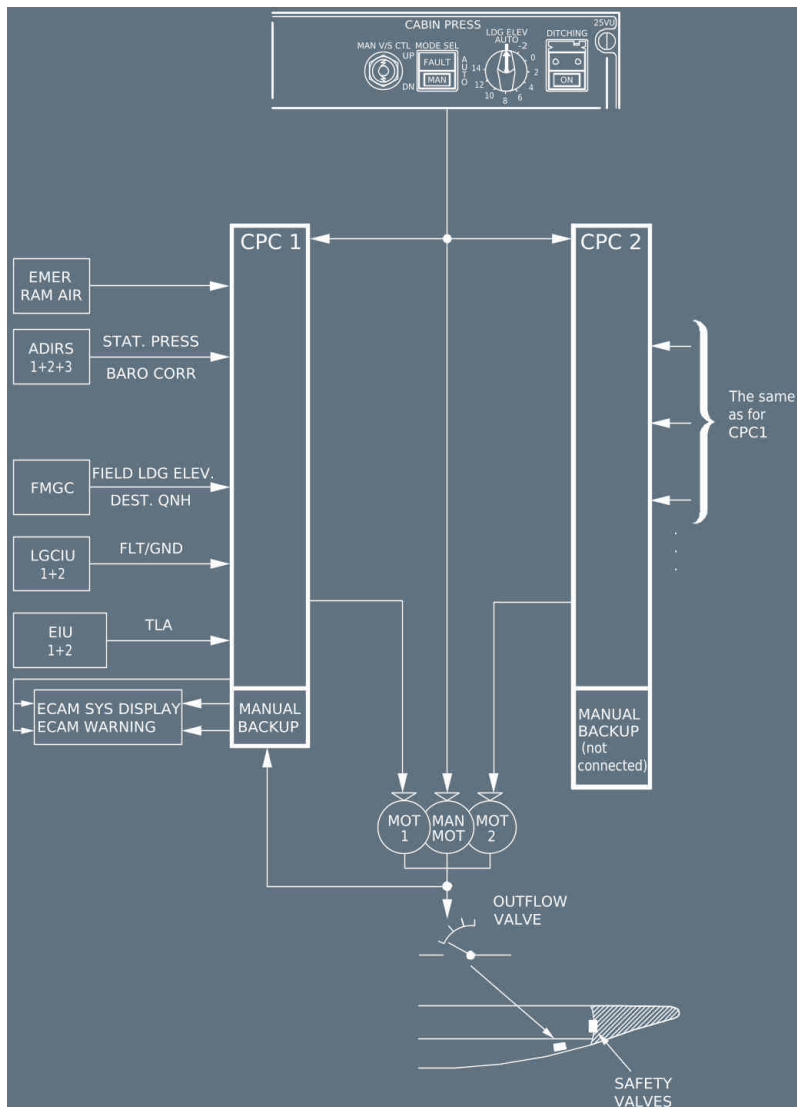
Ident.: DSC-21-20-10-00000324.0001001 / 21 MAR 16

Applicable to: ALL

In manual mode, the flight crew controls the cabin altitude via the manual motor of the outflow valves, by operating controls on the pressurization control panel.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AIR CONDITIONING / PRESSURIZATION / VENTILATION PRESSURIZATION - GENERAL
SCHEMATICS	
Ident.: DSC-21-20-10-00000325.0002001 / 21 MAR 16	

Applicable to: ALL



AIRCRAFT SYSTEMS**AIR CONDITIONING / PRESSURIZATION / VENTILATION****PRESSURIZATION - MAIN COMPONENTS****CABIN PRESSURE CONTROLLERS**

Ident.: DSC-21-20-20-00000326.0001001 / 21 MAR 16

Applicable to: ALL

Two identical, independent, digital controllers automatically control the system, by maintaining the proper cabin pressure. They receive signals from the Air Data Inertial Reference System (ADIRS), the Flight Management and Guidance Computer (FMGC), the Engine Interface Unit (EIU), and the Landing Gear Control Interface Unit (LGCIU).

When the system is in automatic or semi-automatic mode, one controller is active, the other is on standby.

The controllers also generate signals for the Electronic Centralized Aircraft Monitoring (ECAM). For operation in manual mode, each controller has a backup section, which is powered by an independent power supply in the controller N°1 position. This section also has a pressure sensor that generates the cabin altitude and pressure signal for the ECAM, when MAN mode is selected.

The controllers communicate with each other via a cross-channel link.

OUTFLOW VALVE

Ident.: DSC-21-20-20-00000327.0001001 / 21 MAR 16

Applicable to: ALL

The outflow valve is on the right-hand side of fuselage, behind the aft cargo compartment and below the flotation line.

The outflow valve assembly consists of a flush, skin-mounted, rectangular frame, carrying inward and outward opening flaps linked to the actuator. The actuator contains the drives of the two automatic motors and the manual motor. Either of two automatic motors operates the valve in automatic mode, and the manual motor operates it in manual mode.

In automatic mode, the operating controller signals the position of the valve to the ECAM.

In manual mode, the backup section of the N° 1 controller signals the position of the valve to the ECAM.

Note: When the RAM AIR pushbutton is ON, and Δp is below 1 PSI, the system drives the outflow valve about 50 % open if it is under automatic control. If the system is under manual control, the outflow valve does not automatically open, even if Δp is below 1 PSI.

SAFETY VALVES

Ident.: DSC-21-20-20-00000328.0001001 / 21 MAR 16

Applicable to: ALL

Two independent pneumatic safety valves prevent cabin pressure from going too high (8.6 PSI above ambient) or too low (1 PSI below ambient).

They are located on the rear pressure bulkhead, above the flotation line.

AIRCRAFT SYSTEMS**AIR CONDITIONING / PRESSURIZATION / VENTILATION**

PRESSURIZATION - MAIN COMPONENTS

RESIDUAL PRESSURE CONTROL UNIT (RPCU)

Ident.: DSC-21-20-20-00017788.0001001 / 21 MAR 16

Applicable to: ALL

The RPCU automatically depressurizes the aircraft in case of abnormal residual pressure on ground.
It automatically opens the outflow valve, when:

- The outflow valve is not fully open, and
- Both CPCs are failed, or manual mode is selected, and
- The aircraft is on ground, and
- All engines are shutdown, or all ADIRS indicate an airspeed below 100 kt.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AIR CONDITIONING / PRESSURIZATION / VENTILATION PRESSURIZATION - SYSTEM OPERATION
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AUTOMATIC PRESSURE CONTROL MODE
--

Ident.: DSC-21-20-30-00000329.0001001 / 06 NOV 25

Applicable to: ALL

1 GENERAL

- Two identical, independent, automatic systems (each consisting of a controller and its associated motors) control cabin pressure.
Either system controls the single outflow valve.
Only one controller operates at a time.

An automatic transfer occurs:
 - 70 s after each landing.
 - If the operating system fails.
- The controller automatically controls the cabin pressure. It limits the cabin pressure to approximately 8 000 ft maximum during CRUISE mode and is optimized to support high airfield operations up to a pressure of 14 500 ft during ground, climb and descent phases.
- The controller normally uses the landing elevation and the QNH from the FMGC, and the pressure altitude from ADIRS.
If FMGC data are not available, the controller uses the captain BARO Reference from the ADIRS and the LDG ELEV selection.
- Pressurization is assumed through the following modes:

GROUND (GN)

Before takeoff, and 55 s after landing, the outflow valve fully opens to ensure that there is no residual cabin pressure. At touchdown, any remaining cabin pressure is released at a cabin vertical speed of 500 ft/min.

TAKEOFF (TO)

To avoid a pressure surge at rotation, the controller pre-pressurizes the aircraft at a rate of 400 ft/min, until the ΔP reaches 0.1 PSI. At liftoff, the controller initiates the climb phase.

CLIMB (CL)

During climb, the cabin altitude varies according to a fixed pre-programmed law that takes into account the aircraft's actual rate of climb.

CRUISE (CR)

During cruise, the controller maintains cabin altitude at the level-off value, or at the landing field elevation, whichever is higher, but the cabin altitude target is limited to a maximum of approximately 8 000 ft.

DESCENT (DE)

During descent, the controller maintains a cabin rate of descent, such that the cabin pressure is equal to the landing field pressure +0.1 PSI, shortly before landing.

The maximum descent rate is 750 ft/min.

ABORT (AB)

The ABORT mode controls the cabin altitude back to the altitude pressure of the takeoff airport +0.1 PSI.

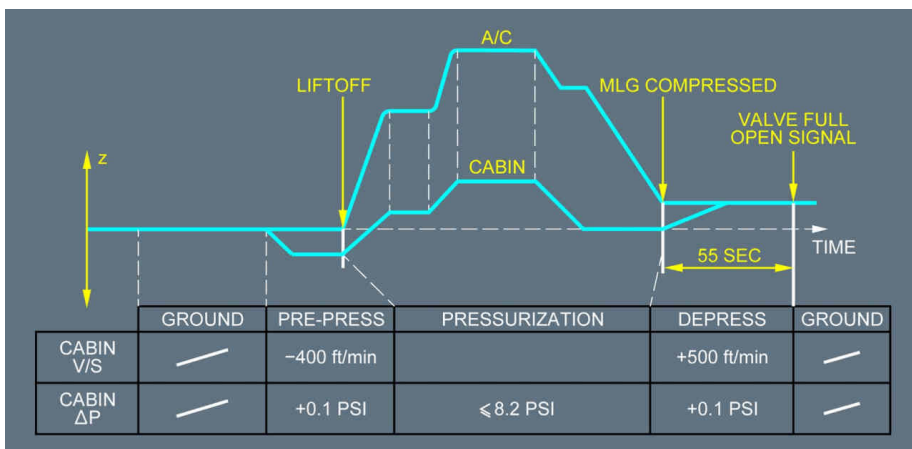
The ABORT mode activates if the aircraft descends and one of the following conditions occur:

- The aircraft does not climb more than 5 000 ft AAL, or
- The aircraft does not reach an altitude of 8 000 ft MSL.

PRESSURIZATION FLIGHT PROFILE

Ident.: DSC-21-20-30-00000331.0005001 / 12 NOV 24

Applicable to: ALL



MANUAL PRESSURE CONTROL MODE

Ident.: DSC-21-20-30-00000332.0001001 / 21 MAR 16

Applicable to: ALL

If both automatic systems fail, the flight crew may use the CABIN PRESS control panel to take over manual control of cabin pressurization.

- Release the MODE SEL pushbutton to select MAN, and
- Push the MAN V/S CTL switch UP or DN to increase or decrease cabin altitude.

AIRCRAFT SYSTEMS**AIR CONDITIONING / PRESSURIZATION / VENTILATION****PRESSURIZATION - SYSTEM OPERATION**

The first of these actions cuts off power to the AUTO motors, and enables the MAN motor to control the outflow valve.

- Note:
- 1. Due to the slow operation of the outflow valves in manual mode, and the limited resolution of the outflow valves' position on the ECAM, the visual ECAM indication of a change in the outflow valves' position can take up to 5 s.*
 - 2. As the pressurization system is manually-controlled, the outflow valve does not open automatically at touchdown.*

DITCHING

Ident.: DSC-21-20-30-00017789.0001001 / 21 MAR 16

Applicable to: ALL

To prepare for ditching, the flight crew must press the DITCHING pb on the CABIN PRESS control panel to close the outflow valve, the emergency ram air inlet, the avionics ventilation inlet and extract valves, the pack flow control valves, and the FWD cargo outlet isolation valve .

AIRCRAFT SYSTEMS

AIR CONDITIONING / PRESSURIZATION / VENTILATION

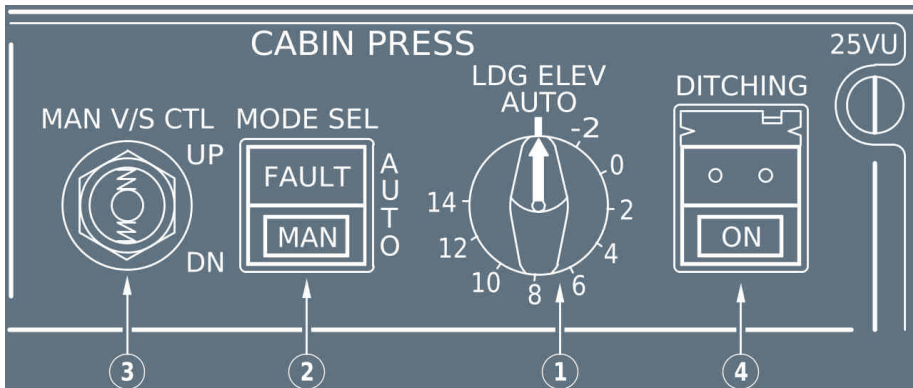
PRESSURIZATION - SYSTEM OPERATION

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OVERHEAD PANEL

Ident.: DSC-21-20-40-00000334.0003001 / 07 MAY 13

Applicable to: MSN 02155-04392, 07784-07792



(1) LDG ELEV knob

AUTO : The pressurization system uses the FMGS data to construct an optimized pressure schedule.

To exit the AUTO position, pull out and turn the selector.

Other positions : The pressurization schedule does not use the landing elevation from the FMGS, but instead uses the landing elevation selected with this knob (from -2 000 to +14 000 ft) as its reference.

Note: The LDG ELEV knob scale is only given as an indication; refer to the ECAM information for accurate adjustment.

(2) MODE SEL pb

AUTO : Automatic mode is operating. One of the two systems controls the outflow valve.

MAN : This legend appears in white, and FAULT does not come on. The flight crew then uses the MAN V/S CTL selector to control the outflow valve.

Note: Switching the MODE SEL pb to MAN, for at least 10 s, then returning it to AUTO will select the other system.

AIRCRAFT SYSTEMS

AIR CONDITIONING / PRESSURIZATION / VENTILATION

PRESSURIZATION - CONTROLS AND INDICATORS

FAULT It : This legend appears in amber and the ECAM caution light comes on only when both automatic systems are faulty.

Note: *The pilot may notice a variation in the CAB ALT indication on the ECAM PRESS page, when the system switches from the cabin pressure control AUTO mode to MAN mode, due to the reduced resolution of the backup pressure sensor.*

(3) MAN V/S CTL toggle switch

The switch, springloaded to neutral controls the outflow valve position through operation of the MAN motor, when the MODE SEL pb is in the MAN position.

UP : The valve moves towards the open position.

DN : The valve moves towards the closed position.

Note: *To target precise cabin vertical speed rate, only short inputs should be applied on the toggle switch.*

(4) DITCHING guarded pushbutton

Normal : The system functions normally.

ON : The operating system sends a “close” signal to the outflow valve, emergency ram air inlet, avionics ventilation inlet and extract valves, pack flow control valves.

Note: *The outflow valve will not close automatically, if it is under manual control.*

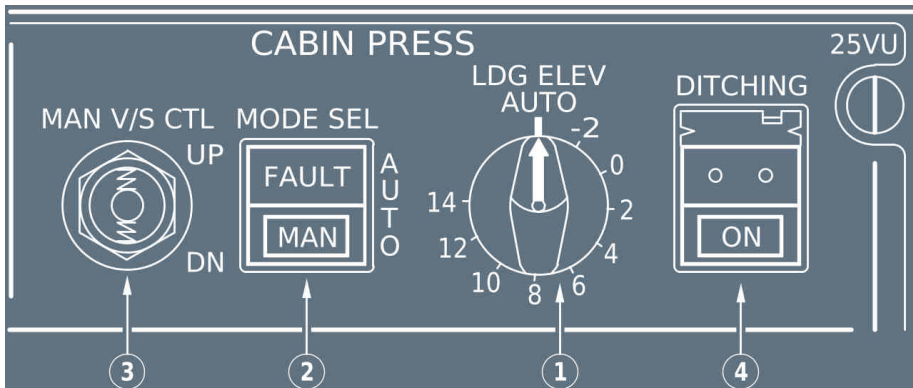
CAUTION

If the ditching pb is set to ON, with the low pressure ground cart connected and all doors closed, a differential pressure will build up.

OVERHEAD PANEL

Ident.: DSC-21-20-40-00000334.0004001 / 07 MAY 13

Applicable to: MSN 05152-05746



(1) LDG ELEV knob

AUTO : The pressurization system uses the FMGS data to construct an optimized pressure schedule.

To exit the AUTO position, pull out and turn the selector.

Other positions : The pressurization schedule does not use the landing elevation from the FMGS, but instead uses the landing elevation selected with this knob (from -2 000 to +14 000 ft) as its reference.

Note: The LDG ELEV knob scale is only given as an indication; refer to the ECAM information for accurate adjustment.

(2) MODE SEL pb

AUTO : Automatic mode is operating. One of the two systems controls the outflow valve.

MAN : This legend appears in white, and FAULT does not come on. The flight crew then uses the MAN V/S CTL selector to control the outflow valve.

Note: Switching the MODE SEL pb to MAN, for at least 10 s, then returning it to AUTO will select the other system.

AIRCRAFT SYSTEMS

AIR CONDITIONING / PRESSURIZATION / VENTILATION

PRESSURIZATION - CONTROLS AND INDICATORS

FAULT It : This legend appears in amber and the ECAM caution light comes on only when both automatic systems are faulty.

Note: *The pilot may notice a variation in the CAB ALT indication on the ECAM PRESS page, when the system switches from the cabin pressure control AUTO mode to MAN mode, due to the reduced resolution of the backup pressure sensor.*

(3) MAN V/S CTL selector

The switch is springloaded to neutral and controls the outflow valve position through operation of the MAN motor, when the MODE SEL pb is in the MAN position.

UP : The valve moves towards the open position.

DN : The valve moves towards the closed position.

Note: *To target precise cabin vertical speed rate, only short inputs should be applied on the selector.*

(4) DITCHING pb (guarded)

Normal : The system functions normally.

ON : The operating system sends a “close” signal to the outflow valve, emergency ram air inlet, avionics ventilation inlet and extract valves, pack flow control valves, and forward cargo isolation outlet valve.
The cargo extract fans stop automatically.

Note: *The outflow valve will not close automatically, if it is under manual control.*

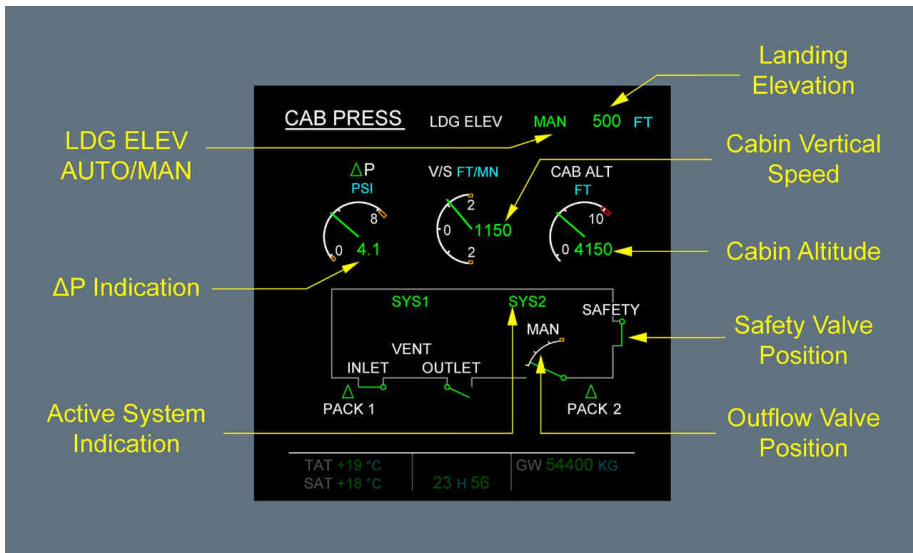
CAUTION

On ground, If the ditching pushbutton is set to ON, with the low pressure ground cart connected and all doors closed, a differential pressure will build up.

ECAM CAB PRESS PAGE

Ident.: DSC-21-20-40-00000335.0003001 / 06 NOV 25

Applicable to: ALL



LDG ELEV AUTO/MAN

LDG ELEV **AUTO**

The LDG ELEV selector is in AUTO.

LDG ELEV **MAN**

The LDG ELEV selector is not in AUTO.

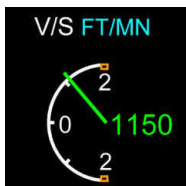
Neither appears when the indications from SDAC are not valid.

LANDING ELEVATION

500 FT

Selected either automatically by the FMGS or manually by the flight crew (but not when the MODE SEL pb-sw is in MAN).

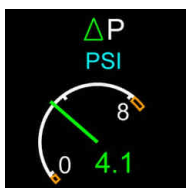
CABIN VERTICAL SPEED



Cabin vertical speed is in the normal range.

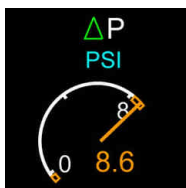
It flashes when the cabin vertical speed reaches 1 750 ft/min and stop flashing when returning below 1 650 ft/min.

ΔP INDICATION



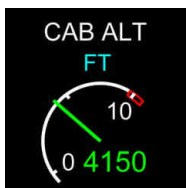
ΔP is in the normal range.

It flashes if ΔP is more than 1.5 PSI and stop flashing when returning at 1 PSI during flight phase 7. (Refer to DSC-31-15 Flight Phases).



ΔP is out of normal range (≤ -0.4 PSI or ≥ 8.5 PSI).

CABIN ALTITUDE



Cabin altitude is in normal range.

It flashes when the cabin altitude reaches 8 800 ft and stop flashing when returning below 8 600 ft.



Cabin altitude is at or above 9 550 ft.

ACTIVE SYSTEM INDICATION



SYS 1 or SYS 2 is active.



SYS 1 or SYS 2 is faulty.

When either system is inactive, its title does not appear.



MODE SEL pb-sw is in MAN.

1 SAFETY VALVE POSITION



Both safety valves are fully closed.



Either safety valve is open.

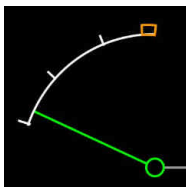
Note: The safety valve opens when the indicated ΔP is between 8.2 and 8.9 PSI. The range is due to the reduced accuracy of ΔP measurements (in MAN mode), combined with the decrease in ΔP that occurs immediately after the safety valves open.

AIRCRAFT SYSTEMS

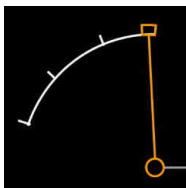
AIR CONDITIONING / PRESSURIZATION / VENTILATION

PRESSURIZATION - CONTROLS AND INDICATORS

OUTFLOW VALVE POSITION



The valve is operating normally.

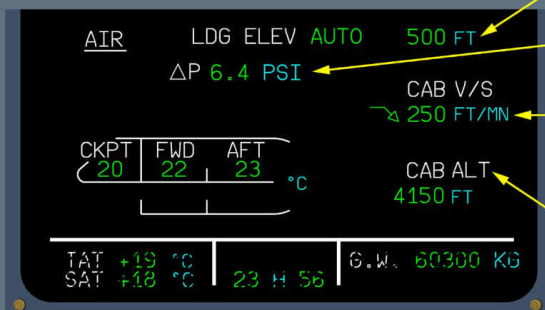


In automatic mode, the valve opens more than 95 % during flight.

ECAM CRUISE PAGE

Ident.: DSC-21-20-40-00000336.0002001 / 03 NOV 21

Applicable to: ALL



LANDING ELEVATION


Refer to DSC-21-20-40 ECAM CAB PRESS Page.

CABIN VERTICAL SPEED



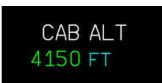
Cabin vertical speed in AUTO mode.



Cabin vertical speed in MAN mode.

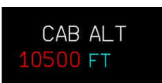
It flashes when the cabin vertical speed reaches 1 750 ft/min and stop flashing when returning below 1 650 ft/min.

CABIN ALTITUDE



The cabin altitude is in normal range.

It flashes when the cabin altitude reaches 8 800 ft and stop flashing when returning below 8 600 ft.



The cabin altitude is at or above 9 550 ft.

ΔP INDICATION



ΔP is in normal range.

It flashes if ΔP is more than 1.5 PSI.



 ΔP is out of normal range (≤ -0.4 PSI or ≥ 8.5 PSI).

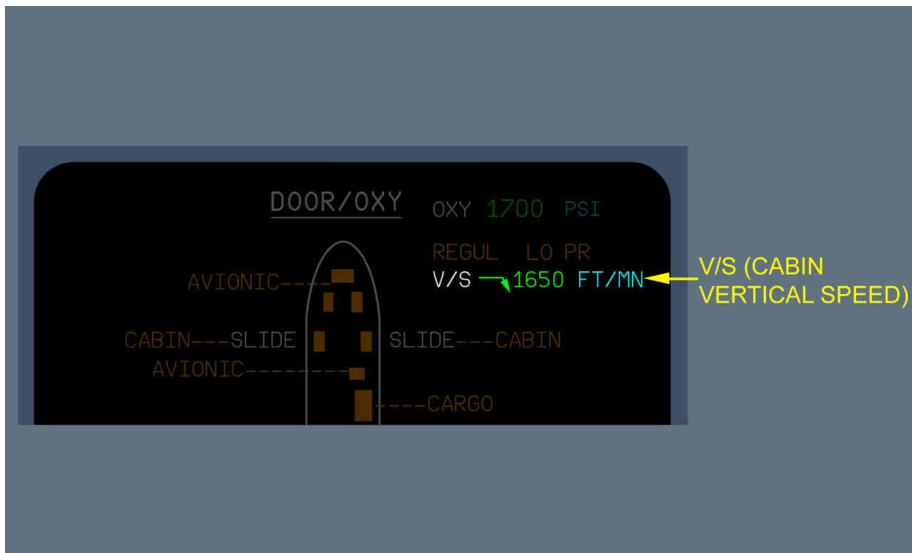
AIRCRAFT SYSTEMS
AIR CONDITIONING / PRESSURIZATION / VENTILATION

PRESSURIZATION - CONTROLS AND INDICATORS

ECAM DOOR/OXY PAGE

Ident.: DSC-21-20-40-00000337.0003001 / 02 JUN 20

Applicable to: ALL


V/S (CABIN VERTICAL SPEED)

The cabin vertical speed is displayed during flight phases 5, 6 and 7. (Refer to DSC-31-15 Flight Phases for flight phase definitions).

V/S 1650 FT/MN

The V/S indication is within the normal range.

The V/S arrow and digital indication pulses in green, when the absolute value of V/S is greater than 1 800 ft/min during more than 5.5 s and stops pulsing, when less than 1 600 ft/min.

V/S - XX FT/MN

When the V/S data are invalid.

MEMO DISPLAY

Ident.: DSC-21-20-40-00016761.0001001 / 21 MAR 16

Applicable to: ALL

MAN LDG ELEV : This memo appears in green, if the LDG ELEV knob is not in the AUTO position.

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AIR CONDITIONING / PRESSURIZATION / VENTILATION VENTILATION - GENERAL
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GENERAL

Ident.: DSC-21-30-10-00017790.0001001 / 06 NOV 25

Applicable to: ALL

1

The ventilation system includes ventilation for:

- The avionics, controlled by the Avionics Equipment Ventilation Computer (AEVC),
- The batteries,
- The lavatories and galleys.

| Note: For more information about cargo ventilation, Refer to DSC-21-40-10 General.

AIRCRAFT SYSTEMS

AIR CONDITIONING / PRESSURIZATION / VENTILATION

VENTILATION - GENERAL

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AIRCRAFT SYSTEMS**AIR CONDITIONING / PRESSURIZATION / VENTILATION**

VENTILATION - AVIONICS VENTILATION

GENERAL

Ident.: DSC-21-30-20-00000341.0001001 / 24 FEB 11

Applicable to: ALL

The avionics ventilation system is fully automatic.

It cools the electrical and electronic components in the avionics compartment and on the flight deck, including the instrument and circuit breaker panels. It uses two electric fans to force the circulation of cooling air.

Whatever the configuration of the avionics ventilation system is, a part of the avionics ventilation air is sucked from the cockpit through the different cockpit panels.

MAIN COMPONENTS

Ident.: DSC-21-30-20-00017791.0001001 / 13 MAY 25

Applicable to: ALL

FANS

Two electric fans continuously circulate air around the avionics equipment, when the aircraft is electrically supplied.

The Fan Speed Controller (FSC)  controls the avionics ventilation fan speed as a function of temperature::

1. High speed when the ventilation air temperature is above +40 °C (104 °F)
2. Low speed when the ventilation air temperature is below +35 °C (95 °F)

SKIN AIR INLET AND OUTLET VALVES

These valves admit air from outside the aircraft and evacuate hot air from the avionics equipment.

SKIN EXCHANGE INLET AND OUTLET BYPASS VALVES

These valves enable air to circulate between the avionics bay and the space under the cargo compartment floor.

AIR CONDITIONING INLET VALVE

This valve opens to enable the air conditioning circuit to supply fresh air to the avionics bay.

SKIN EXCHANGE ISOLATION VALVE

This valve connects or isolates the skin heat exchanger.

AVIONICS EQUIPMENT VENTILATION COMPUTER (AEVC)

The AEVC controls the operation of all fans and valves in the avionics ventilation system.

AIRCRAFT SYSTEMS**AIR CONDITIONING / PRESSURIZATION / VENTILATION**

VENTILATION - AVIONICS VENTILATION

NORMAL OPERATION, OPEN-CIRCUIT CONFIGURATION

Ident.: DSC-21-30-20-00000343.0004001 / 15 MAY 24

Applicable to: MSN 05152, 07792

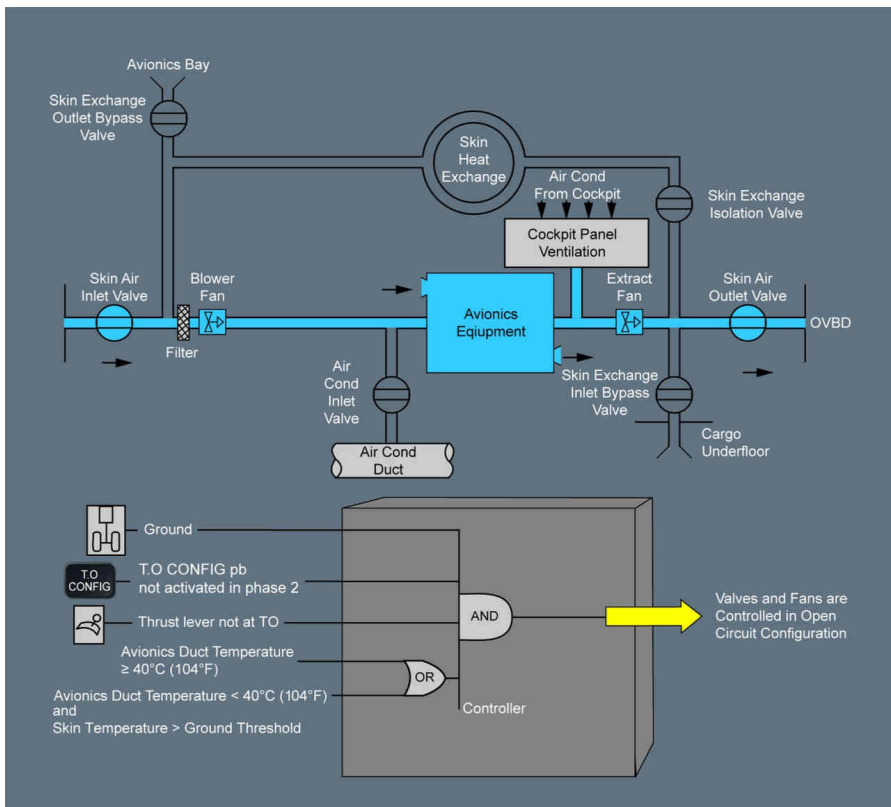
GROUND OPERATIONS

The open-circuit configuration operates when:

- The T.O CONFIG pb is not activated, and
- The thrust levers are not at TO position, and
- The avionics duct temperature is equal or above 40 °C (104 °F), or
- The avionics duct temperature is below 40 °C (104 °F), and the skin temperature is above the ground threshold.

The skin temperature is above the ground threshold when:

- It is above 12 °C (53 °F), or
- It is between 9 °C (48 °F) and 12 °C (53 °F) with temperature decreasing.



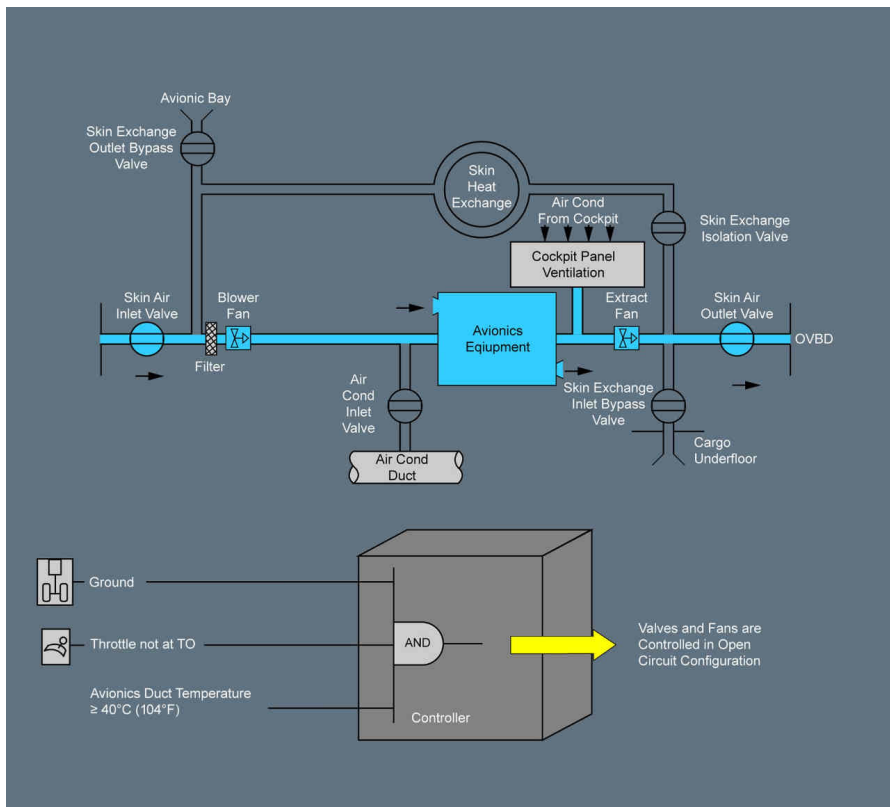
NORMAL OPERATION, OPEN-CIRCUIT CONFIGURATION

Ident.: DSC-21-30-20-00000343.0003001 / 11 JAN 22

2 Applicable to: MSN 07784

GROUND OPERATIONS

The open-circuit configuration operates when the avionics duct temperature is equal or above 40°C (104°F).



NORMAL OPERATION, OPEN-CIRCUIT CONFIGURATION

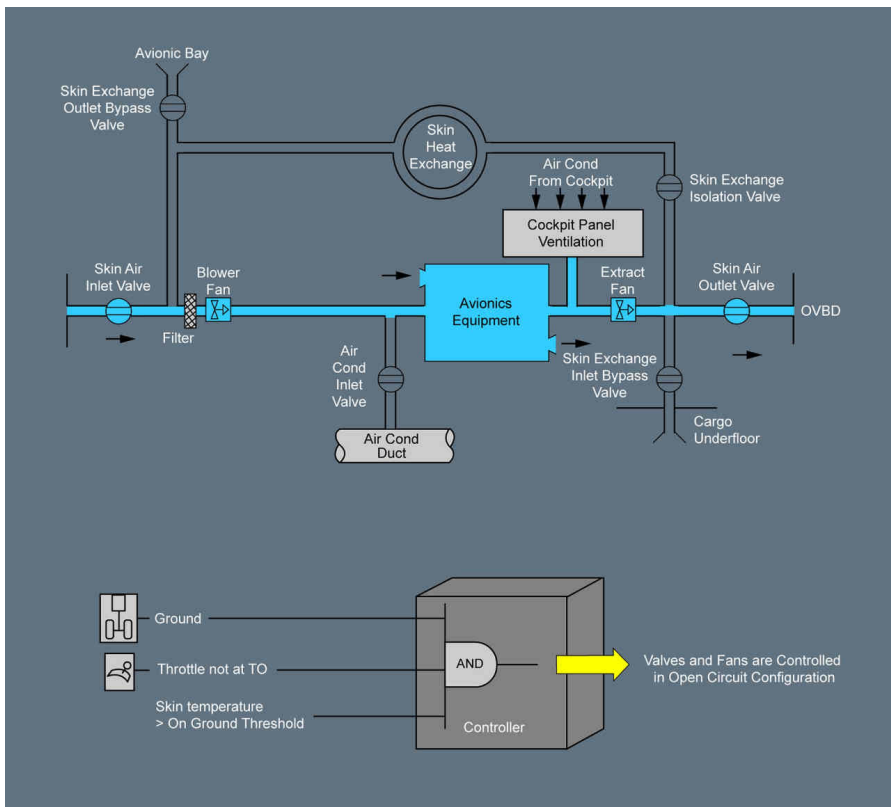
Ident.: DSC-21-30-20-00000343.0001001 / 11 JAN 22

Applicable to: MSN 02155-04392, 05162-05746

GROUND OPERATIONS

The open-circuit configuration operates when skin temperature is above the on-ground threshold.

On-ground threshold = $+12^{\circ}\text{C}$ (53 °F), temperature increasing, or
 $+9^{\circ}\text{C}$ (48 °F), temperature decreasing.



NORMAL OPERATION, CLOSE-CIRCUIT CONFIGURATION

Ident.: DSC-21-30-20-00000345.0004001 / 03 MAY 23

4 Applicable to: MSN 07784

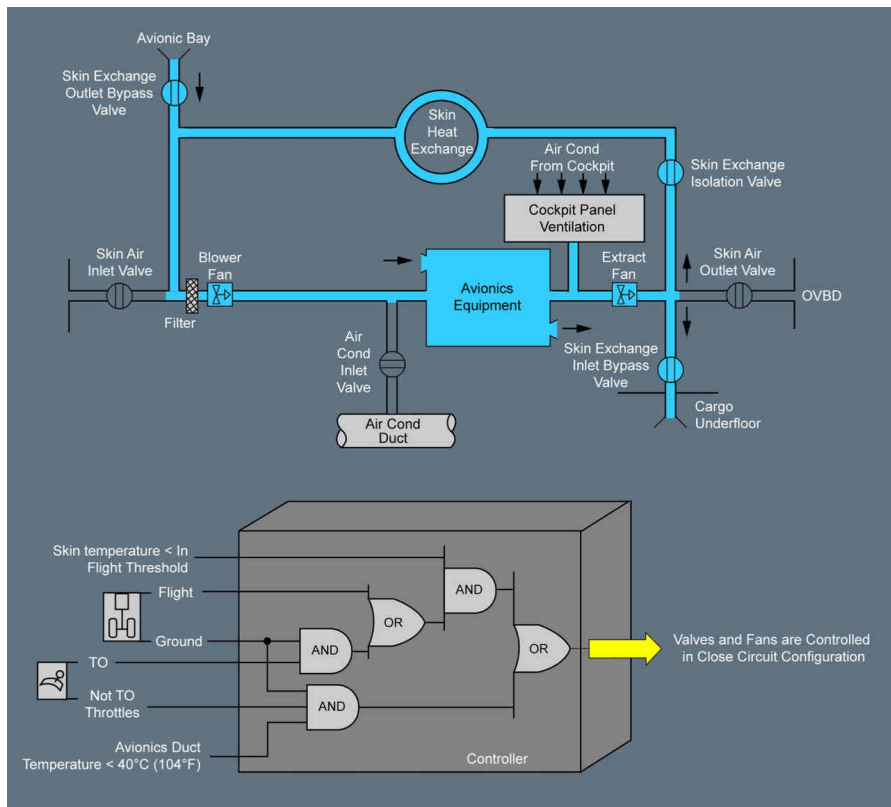
FLIGHT OPERATIONS

The close-circuit configuration operates when skin temperature is beneath the in-flight threshold.

In-flight threshold = +35 °C (95 °F), temperature increasing, or
+32 °C (90 °F), temperature decreasing.

GROUND OPERATIONS

The close-circuit configuration operates when the avionics duct temperature is below 40 °C (104 °F).



NORMAL OPERATION, CLOSE-CIRCUIT CONFIGURATION

Ident.: DSC-21-30-20-00000345.0003001 / 15 MAY 24

Applicable to: MSN 05152, 07792

FLIGHT OPERATIONS

The close-circuit configuration operates when the skin temperature is below the in-flight threshold.

The skin temperature is below the in-flight threshold when:

- It is below or equal to 32 °C (90 °F), or
- It is between 32 °C (90 °F) and 35 °C (95 °F) with temperature increasing.

GROUND OPERATIONS

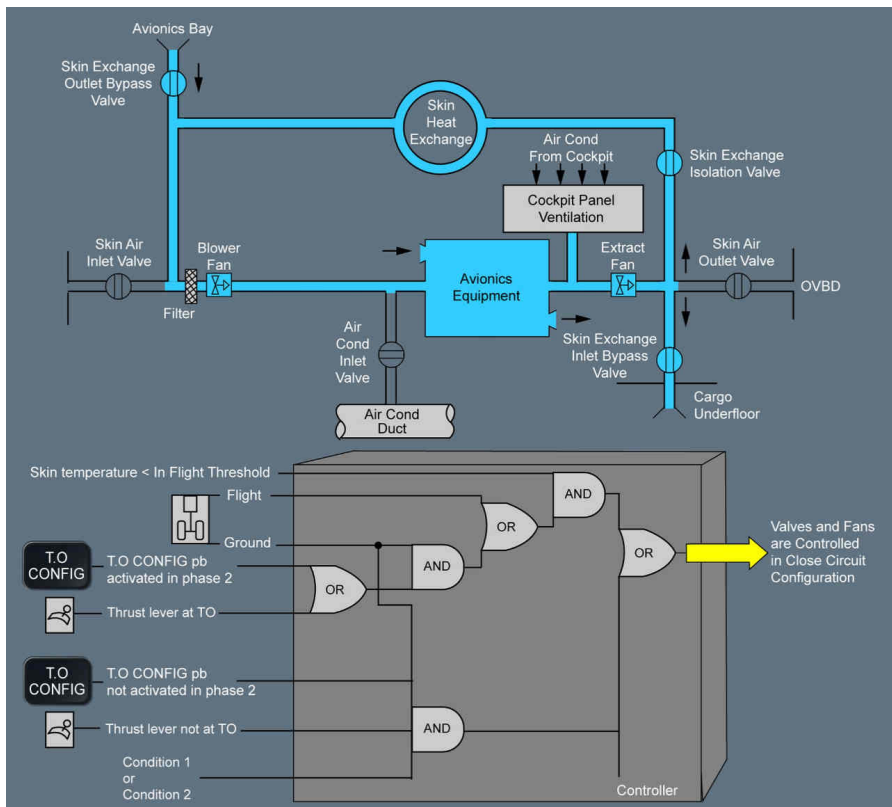
The close-circuit configuration operates when:

- The T.O CONFIG pb-sw is activated or the thrust levers are at TO position with the skin temperature below the in-flight threshold, or
- The T.O CONFIG pb-sw is not activated and the thrust levers are not at TO position with either:
 - The avionics duct temperature below 40 °C (104 °F) (condition 1 on the illustration), or
 - The skin temperature below the ground threshold (condition 2 on the illustration).

The skin temperature is below the ground threshold when:

- It is below or equal to 9 °C (48 °F), or
- It is between 9 °C (48 °F) and 12 °C (53 °F) with temperature increasing.

Note: The closure of the skin air valves by activation of the T.O CONFIG pb-sw on ground remains active for 10 minutes. If the takeoff does not occur within 10 minutes after T.O CONFIG pb-sw activation, the skin air valves may reopen depending on avionics duct and skin temperatures. An additional activation of the T.O CONFIG pb-sw during the same taxi phase will not close the skin air valves again.



NORMAL OPERATION, CLOSE-CIRCUIT CONFIGURATION

Ident.: DSC-21-30-20-00000345.0001001 / 09 OCT 12

6 Applicable to: MSN 02155-04392, 05162-05746

FLIGHT OPERATIONS

The close-circuit configuration operates when skin temperature is beneath the in-flight threshold.

In flight threshold = +35 °C (95 °F), temperature increasing, or
+32 °C (90 °F), temperature decreasing.

GROUND OPERATIONS

The close-circuit configuration operates when skin temperature is beneath the on-ground threshold.

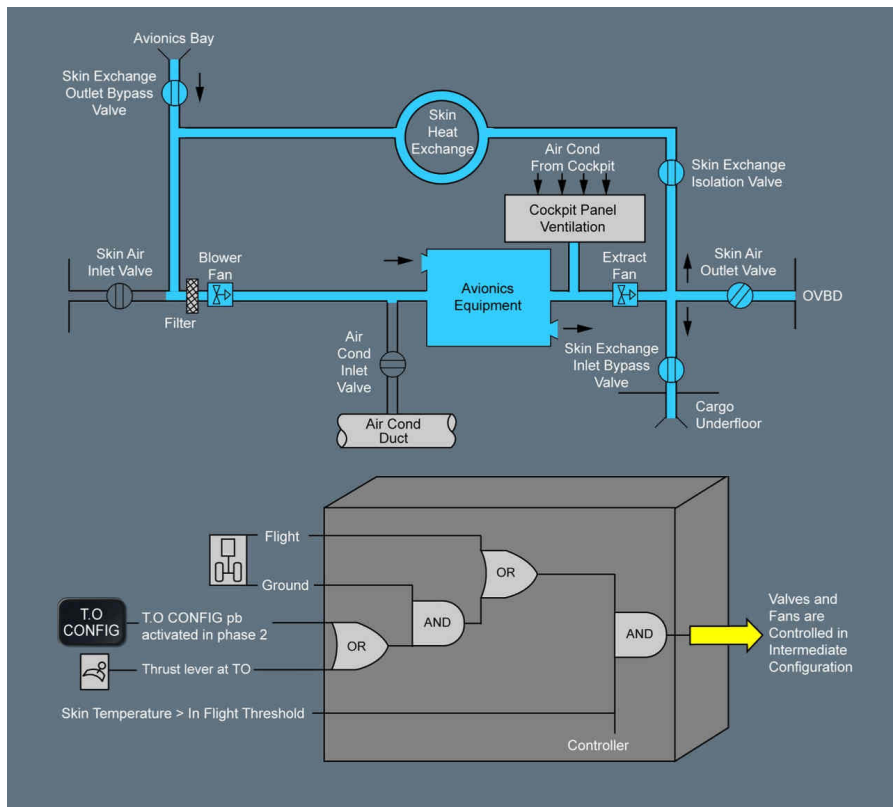
AIRCRAFT SYSTEMS**AIR CONDITIONING / PRESSURIZATION / VENTILATION****VENTILATION - AVIONICS VENTILATION**

Note: The system takes into account a range of skin temperature between -50 °C and 80 °C. Outside of this range, the AEVC sets the avionics ventilation configuration to the intermediate configuration (partially open) until the temperature is within the operation range again.

GROUND OPERATIONS

The intermediate configuration operates when the T.O CONFIG pb is activated or the thrust levers are at TO position if the skin temperature is above the in-flight threshold.

Note: The closure of the skin air valves by activation of the T.O CONFIG pb-sw on ground remains active for 10 minutes. If the takeoff does not occur within 10 minutes after T.O CONFIG pb-sw activation, the skin air valves may reopen depending on avionics duct and skin temperatures. An additional activation of the T.O CONFIG pb-sw during the same taxi phase will not close the skin air valves again.



NORMAL OPERATION, INTERMEDIATE CONFIGURATION

Ident.: DSC-21-30-20-00000344.0001001 / 09 OCT 12

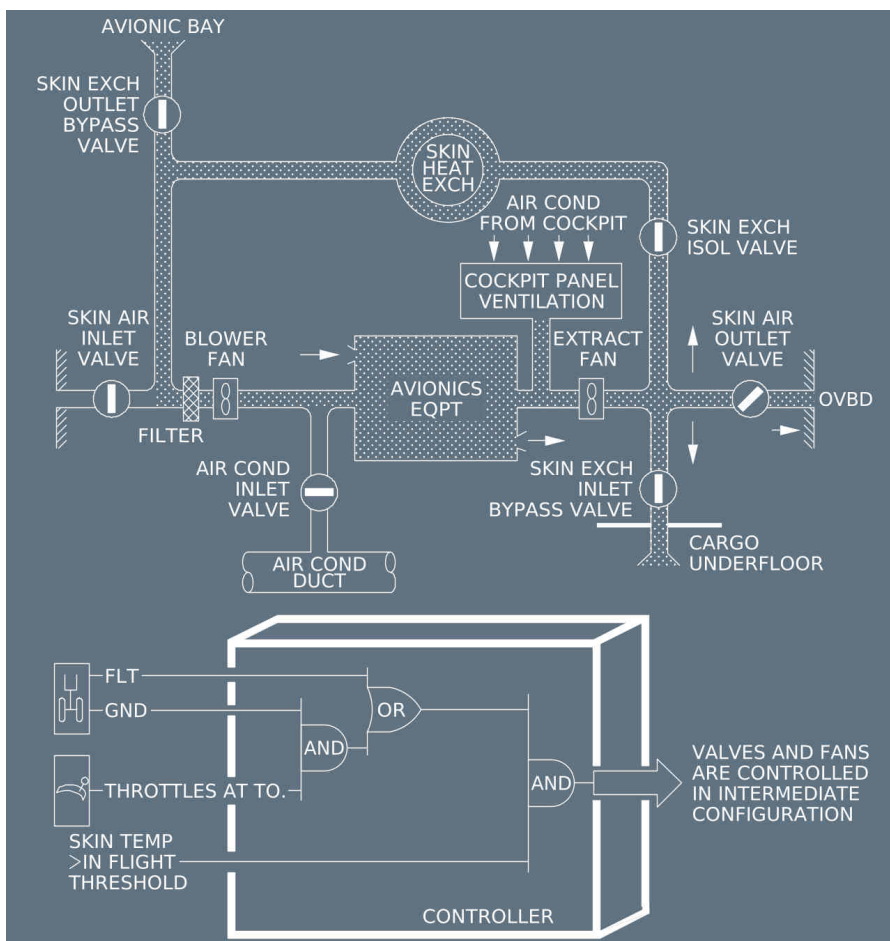
8 Applicable to: MSN 02155-04392, 05162-07784

FLIGHT OPERATIONS

The intermediate configuration operates when skin temperature is above the in-flight threshold.

In flight threshold = +35 °C (95 °F), temperature increasing, or
+32 °C (90 °F), temperature decreasing.

Note: The measuring range of the skin temperature sensed is between -50°C and 80°C . Outside of this range, the AEVC sets the avionics ventilation configuration to the intermediate configuration (partially open) until the temperature is within the operation range again.



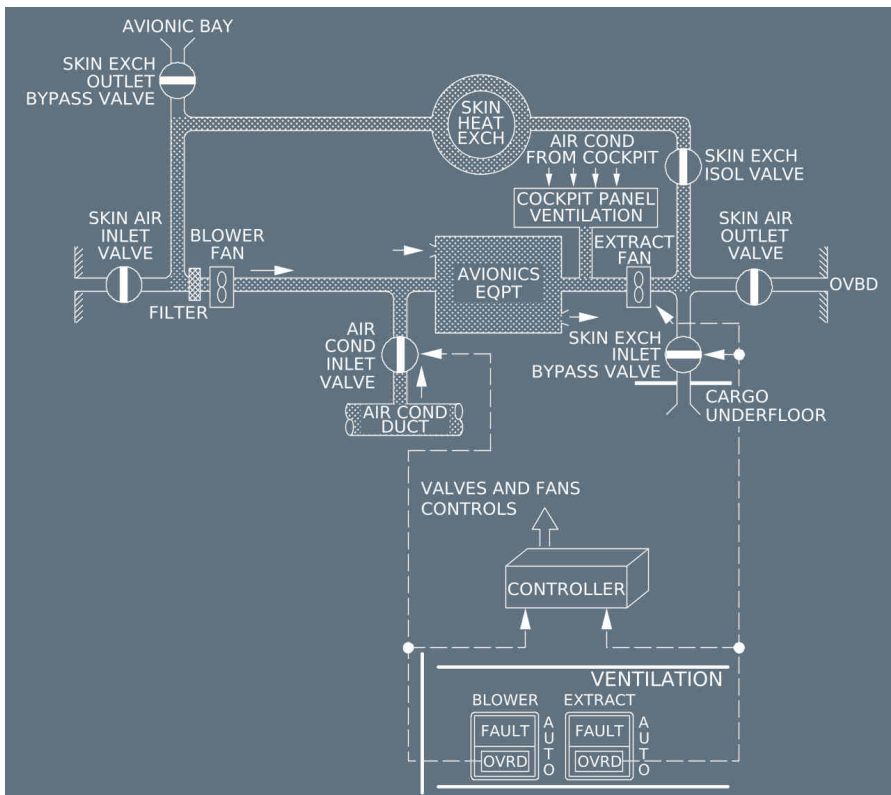
ABNORMAL OPERATION

Applicable to: **ALL**

Ident.: DSC-21-30-20-A-00000346.0001001 / 20 JAN 15

BLOWER FAULT OR EXTRACT FAULT ALERT

When the BLOWER or the EXTRACT pushbutton switch is set at the OVRD (override) position, the system is in closed-circuit configuration and adds air from the air conditioning system to the ventilation air.



When the BLOWER pushbutton switch is set at OVRD, the blower fan is stopped and the extract fan continues to run.

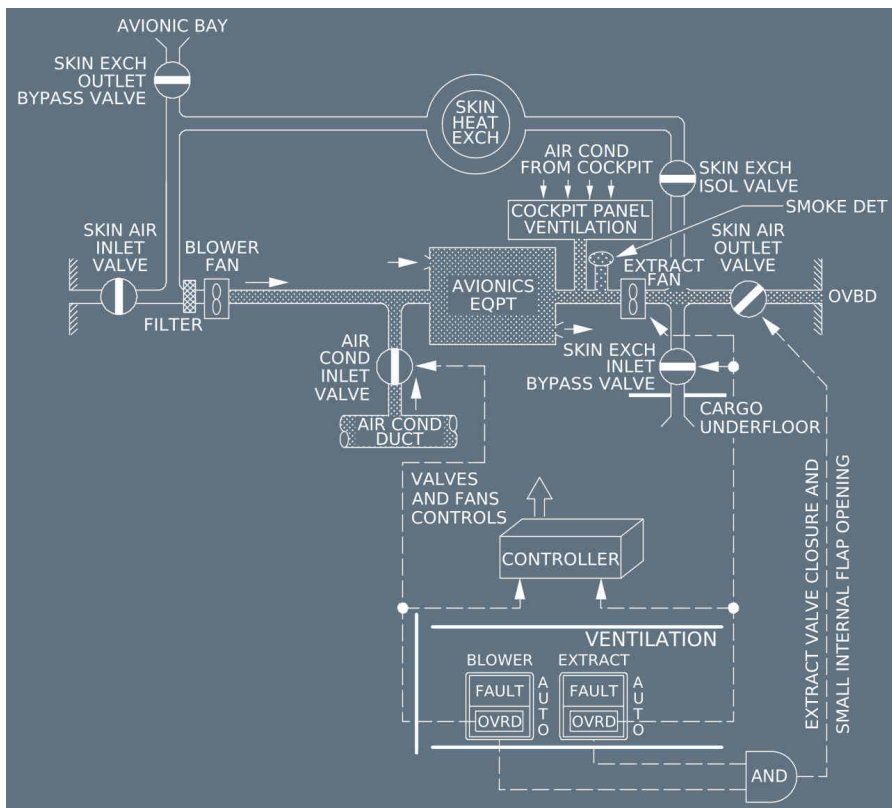
When the EXTRACT pushbutton switch is set at OVRD, the extract fan is controlled directly from the pushbutton. Both fans continue to run.

Ident.: DSC-21-30-20-A-00000347.0001001 / 09 OCT 12

SMOKE CONFIGURATION

When the smoke detector detects smoke in the avionics ventilation air the BLOWER and the EXTRACT FAULT lights come on.

When both the BLOWER and the EXTRACT pushbuttons are set to the OVRD position, the air conditioning system supplies cooling air, which is then exhausted overboard. The blower fan stops.



Ident.: DSC-21-30-20-A-00000348.0001001 / 10 MAY 21

CONTROLLER FAILURE

In case of a controller failure, the BLOWER and the EXTRACT FAULT lights come on and both the BLOWER and the EXTRACT push-buttons are set to the OVRD position.

AIRCRAFT SYSTEMS**AIR CONDITIONING / PRESSURIZATION / VENTILATION**

VENTILATION - AVIONICS VENTILATION

The controller failure configuration is the same as the SMOKE configuration concerning the blower fan, the skin exchange inlet bypass valve and the skin air outlet valve.

The skin air inlet valve, the skin exchange isolation valve and the skin exchange outlet bypass valve remain in the last position checked before the failure occurred.

The extract fan keeps running.

AIRCRAFT SYSTEMS

AIR CONDITIONING / PRESSURIZATION / VENTILATION

VENTILATION - AVIONICS VENTILATION

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AIR CONDITIONING / PRESSURIZATION / VENTILATION VENTILATION - BATTERY VENTILATION
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BATTERY VENTILATION

Ident.: DSC-21-30-40-00000350.0001001 / 21 MAR 16
Applicable to: ALL

A venturi in the skin of the aircraft draws air from the space around the batteries and vents it overboard. The resulting airflow ventilates the batteries.

AIRCRAFT SYSTEMS

AIR CONDITIONING / PRESSURIZATION / VENTILATION

VENTILATION - BATTERY VENTILATION

Intentionally left blank

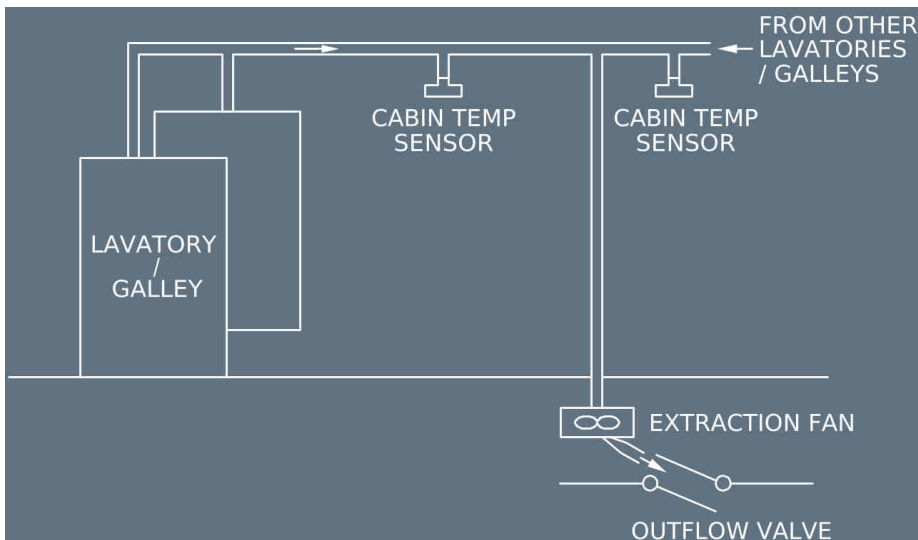
LAVATORY AND GALLEY

Ident.: DSC-21-30-50-00000351.0001001 / 09 OCT 12

Applicable to: ALL

An extraction fan draws ambient cabin air through the lavatories and galleys and exhausts it near the outflow valve.

The extraction fan runs continually when electric power is available.



AIRCRAFT SYSTEMS

AIR CONDITIONING / PRESSURIZATION / VENTILATION

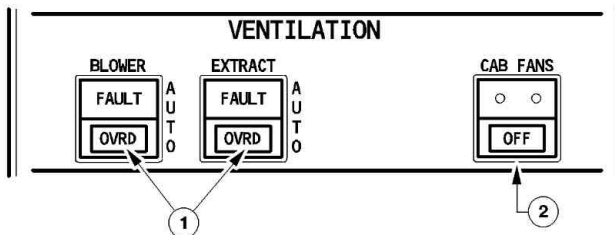
VENTILATION - LAVATORY AND GALLEY VENTILATION

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OVERHEAD PANEL

Ident.: DSC-21-30-60-00000352.0001001 / 24 FEB 11

Applicable to: ALL



(1) BLOWER pb-sw and EXTRACT pb-sw

AUTO: : When both pushbutton switches are on AUTO:

- On the ground before the application of TO power, the ventilation system is in open circuit configuration (closed configuration when the skin temperature is below the ground threshold).
- On the ground after the application of TO power, and in flight, the ventilation system is in closed circuit configuration.

OVRD: : When either pushbutton switch is on OVRD:

- The system goes to closed circuit configuration.
- Air from the air conditioning system is added to ventilation air. (The blower fan stops if the BLOWER pushbutton switch is in the OVRD position).

When both pushbutton switches are on OVRD:

- Air flows from the air conditioning system and then overboard.
- The extract fan continues to run.

FAULT : Lights up amber (and ECAM activates)

It: in the blower switch, if :

- blowing pressure is low (See *)
- duct overheats (See *)
- computer power supply fails

in the extract switch, if :

- smoke warning is activated
- extract pressure is low (See *)
- computer power supply fails
- smoke warning is activated.

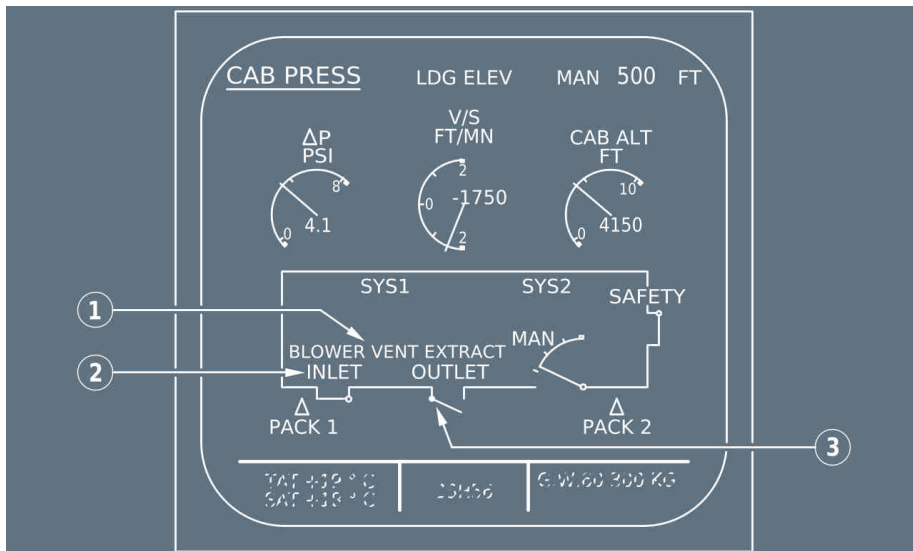
* If the warning occurs on the ground when the engines are stopped, the external horn sounds.

(2) *Refer to DSC-21-10-50 Controls on Overhead Panel*

ECAM CAB PRESS PAGE

Ident.: DSC-21-30-60-00000353.0006001 / 03 APR 13

Applicable to: ALL


(1) BLOWER, VENT and EXTRACT Indications

VENT message normally appears in white. It becomes amber, if there is a BLOWER FAULT, EXTRACT FAULT, or AVNCS SYS FAULT.

BLOWER message appears in amber if there is a BLOWER FAULT.

EXTRACT message appears in amber if there is an EXTRACT FAULT.

(2) INLET and OUTLET Indications

Normally white. The corresponding indication becomes amber, when the inlet valve or the outlet valve is failed.

(3) INLET and OUTLET Valve Diagrams



This indicates that the valve is fully closed.
It is normally green, but is amber if there is a disagreement.



This indicates that the valve is fully open.
It is normally green, but is amber if there is a disagreement.



This indicates that the inlet valve is in transit (inlet valve only).
It is amber.



This indicates that the outlet valve is partially open (the outlet valve is closed but a small internal flap is open).



If the valve position is not available or the received status for the valve is inconsistent, XX appears in amber.

AIRCRAFT SYSTEMS

AIR CONDITIONING / PRESSURIZATION / VENTILATION

VENTILATION - CONTROLS AND INDICATORS

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AIR CONDITIONING / PRESSURIZATION / VENTILATION CARGO - GENERAL
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GENERAL

Ident.: DSC-21-40-10-00017795.0001001 / 06 NOV 25

Applicable to: ALL

**1 AFT CARGO VENTILATION / FWD CARGO VENTILATION **

An extraction fan draws air from forward cargo compartment or aft cargo compartment, and exhausts it overboard. Air from the cabin replaces the exhausted air, thus ventilating the cargo compartments.

**2 AFT CARGO TEMPERATURE REGULATION / FWD CARGO TEMPERATURE REGULATION **

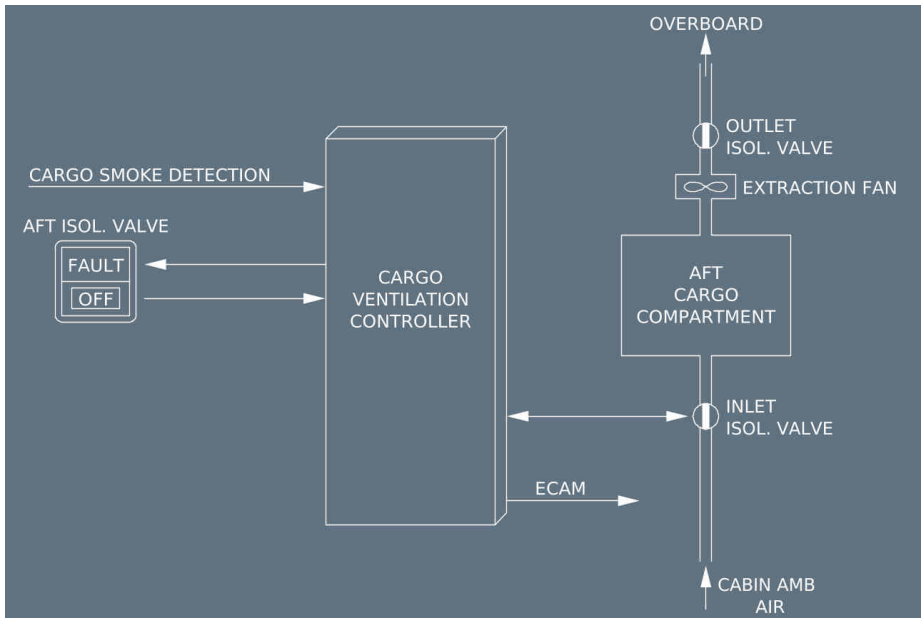


The system can mix hot bleed air with the air coming from the cabin, therefore giving the flight crew control of the temperature in the forward or aft cargo compartment.

SCHEMATIC

Ident.: DSC-21-40-10-00000357.0002001 / 22 MAY 12

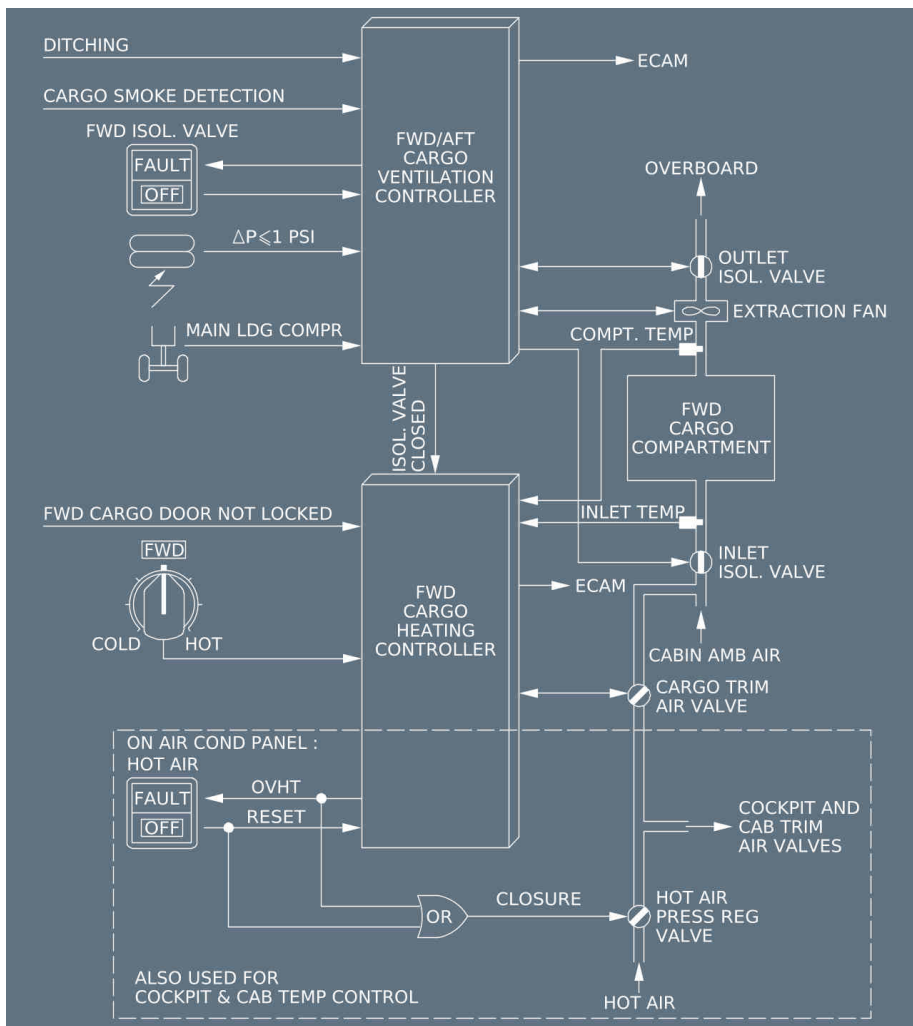
Applicable to: MSN 07784-07792



SCHEMATIC

Ident.: DSC-21-40-10-00000357.0005001 / 22 MAY 12

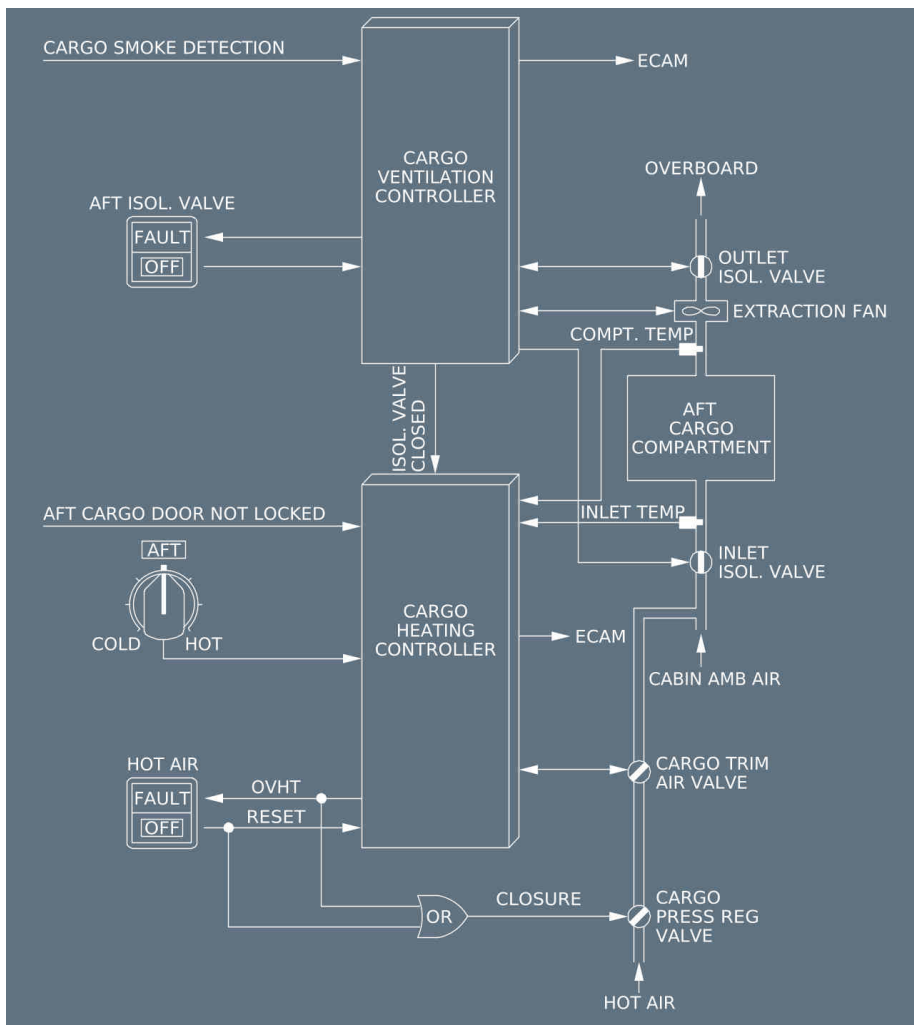
Applicable to: MSN 05152-05746



SCHEMATIC

Ident.: DSC-21-40-10-00000357.0004001 / 22 MAY 12

Applicable to: MSN 02155-02789, 03031-04392



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FWD CARGO VENTILATION

Ident.: DSC-21-40-20-00017796.0001001 / 21 MAR 16

Applicable to: ALL

Air from the cabin goes via the inlet isolation valve to the forward cargo compartment, driven either by an extraction fan or by differential pressure in flight. A skin-mounted venturi discharges the air overboard via the outlet isolation valve. The cargo ventilation controller controls the operation of the inlet and outlet isolation valves and the extraction fan.

The ventilation system operates in two modes:

- On the ground or when $\Delta P \leq 1$ PSI in flight, the controller opens the isolation valves, then starts the extraction fan
- In flight when $\Delta P > 1$ PSI, the controller stops the fan, and differential pressure maintains the ventilation.

The controller closes the isolation valves and stops the extraction fan when:

- The flight crew sets the FWD ISOL VALVE pb-sw to OFF, or
- The forward cargo smoke detection unit detects smoke.

The outlet valve closes and the extraction fan stops when the flight crew sets the DITCHING pb-sw to ON.

AFT CARGO VENTILATION

Ident.: DSC-21-40-20-00017797.0001001 / 21 MAR 16

Applicable to: ALL

Air from the cabin goes via the inlet isolation valve to the aft cargo compartment, driven by an extraction fan. Air is controlled by the outlet isolation valve and then goes outboard through the outflow valve.

The cargo ventilation controller controls the operation of the inlet and outlet isolation valves and the extraction fan.

When the isolation valves are fully open, the extraction fan operates continuously when the aircraft is on the ground and during flight.

The controller closes the isolation valves and stops the extraction fan when:

- The flight crew sets the AFT ISOL VALVE pb-sw to OFF, or
- The aft cargo smoke detection unit detects smoke.

AIRCRAFT SYSTEMS**AIR CONDITIONING / PRESSURIZATION / VENTILATION****CARGO - SYSTEM OPERATION****AFT CARGO HEATING**

Ident.: DSC-21-40-20-00017798.0001001 / 21 MAR 16

Applicable to: ALL

The ventilation system for the aft cargo compartment uses hot engine bleed air (upstream of the packs), mixing it with the ambient cabin air that flows through the cargo compartment.

The cargo regulating valve regulates the pressure of this hot air supply, and the trim air valve, which is modulated electrically by the controller, controls the flow.

The cargo pressure regulating valve is pneumatically operated and electrically controlled from the HOT AIR pb on the CARGO HEAT panel.

The hot air is controlled by the cargo trim air valve which is modulated electrically by the controller.

The hot air is then mixed with air from the cabin and supplied to the cargo compartment through the ventilation inlet isolation valve.

According to the temperature selector demand, the controller regulates the amount of hot air added by the trim air valve, until the desired temperature is reached.

If the inlet temperature exceeds 70 °C, the controller closes the trim air valve.

If the inlet temperature exceeds 88 °C, the controller interprets this as a duct overheat and closes the pressure regulating valve. This valve then remains closed until the flight crew resets the system by pressing the HOT AIR pb — which it cannot do until the temperature drops below 70 °C.

FWD CARGO HEATING

Ident.: DSC-21-40-20-00017799.0001001 / 21 MAY 24

Applicable to: ALL

The ventilation system for the forward cargo compartment uses hot engine bleed air, which is also used for cockpit and cabin temperature control, mixing it with the ambient cabin air that flows through the cargo compartment.

The cockpit and cabin hot air pressure regulating valve regulates the pressure of this hot air supply, and the cargo trim air valve, which is modulated electrically by the controller, controls the flow.

The hot air mixes with air from the cabin as it supplied to the cargo compartment through the ventilation inlet isolation valve.

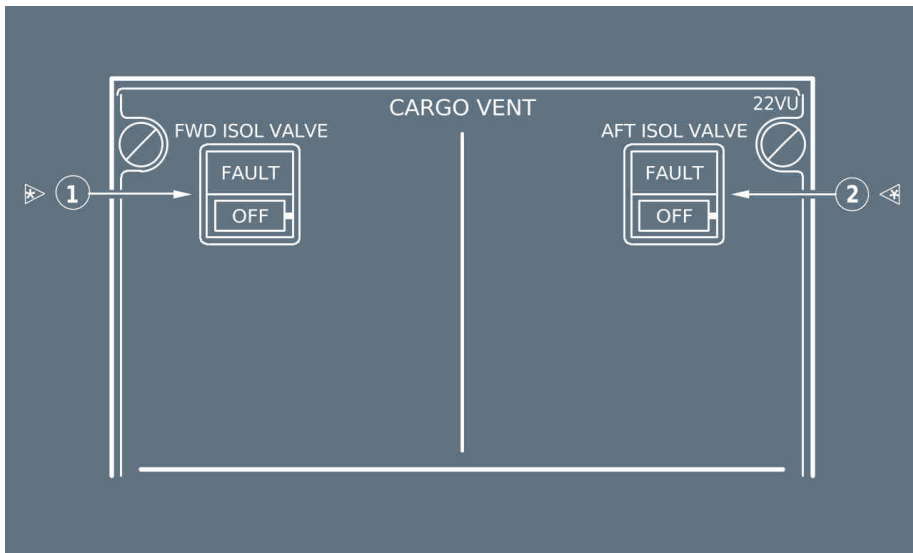
The controller regulates the amount of hot air added by the trim air valve to get the desired temperature, per the temperature selector.

If the inlet temperature exceeds 70 °C, the controller closes the trim air valve. If the inlet temperature reaches 88 °C, the controller interprets this as a duct overheat and closes the pressure regulating valve. This valve then remains closed until the flight crew resets the system by pressing the HOT AIR pb - which it cannot do until the temperature drops below 70 °C.

OVERHEAD PANEL

Ident.: DSC-21-40-30-00017800.0001001 / 20 MAR 17

Applicable to: MSN 07784-07792



(1) **FWD ISOL VALVE pb-sw**

The switch controls the forward isolation valves and the extraction fan.

Auto : The inlet and outlet isolation valves open, extraction fan runs if there is no smoke detected in the fwd cargo bay.

OFF : The inlet and outlet isolation valves and the trim air valve close, the extraction fan stops.

FAULT It : The light, associated with the ECAM caution, comes on amber when either inlet or outlet valve is not in the selected position.

(2) **AFT ISOL VALVE pb-sw**

The switch controls the isolation valves and the extraction fan.

Auto : The inlet and outlet isolation valves open, extraction fan runs if there is no smoke detected in the aft cargo bay.

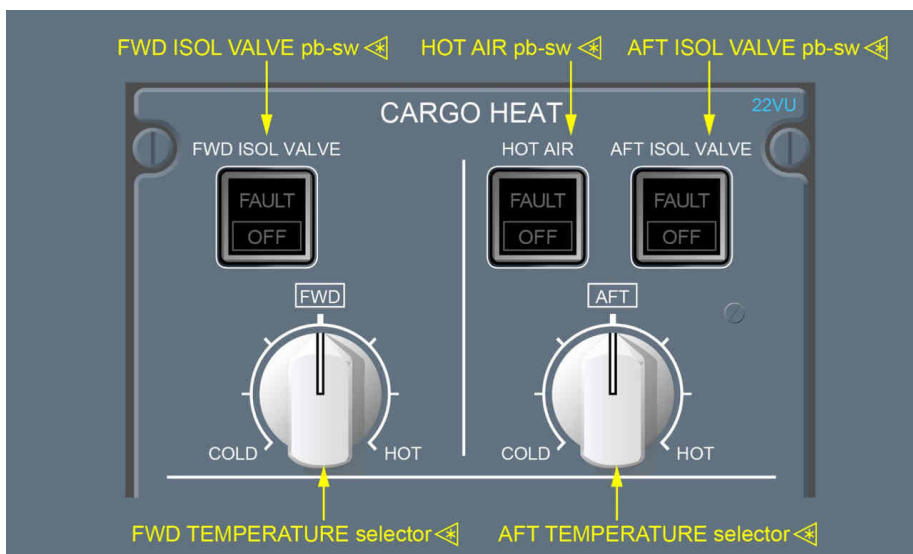
OFF : The inlet and outlet isolation valves and the trim air valve close, the extraction fan stops.

FAULT It : The light, associated with the ECAM caution, comes on amber when either inlet or outlet valve is not in the selected position.

OVERHEAD PANEL

Ident.: DSC-21-40-30-00017800.0006001 / 06 NOV 25

Applicable to: MSN 02155-02789, 03031-05746



FWD ISOL VALVE pb-sw

The switch controls the forward isolation valves and the extraction fan.



The inlet and the outlet isolation valves open. The extraction fan runs if there is no smoke detected in the FWD cargo bay.



The inlet and the outlet isolation valves and the trim air valve close. The extraction fan stops.

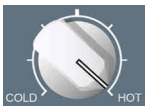


The inlet or the outlet valve is not in the selected position. The **COND FWD CRG ISOL VALVE** alert triggers.

3 FWD Temperature selector



Approximately 5 °C (41 °F)



Approximately 26 °C (79 °F)



Approximately 15 °C (59 °F)

Note: The cargo compartment temperature may vary, depending on external factors (flight duration, outside temperature...).

4 AFT ISOL VALVE pb-sw

The switch controls the isolation valves and the extraction fan.



The inlet and the outlet isolation valves open. The extraction fan runs if there is no smoke detected in the aft cargo bay.



The inlet and the outlet isolation valves and the trim air valve close. The extraction fan stops.



The inlet or the outlet valve is not in the selected position. The **COND AFT CRG ISOL VALVE** ECAM alert is triggered.

5 HOT AIR pb-sw



The pressure regulating valve regulates the hot air pressure.



The pressure regulating valve and the trim air valve close. The fault circuit is reset.



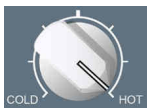
A duct overheat is detected 88 °C (190 °F).

The **FAULT** light goes out, when the temperature drops below 70 °C (158 °F), and the HOT AIR pb-sw is set OFF. Then the system resets when the HOT AIR pb-sw is set On.

6 AFT temperature selector



Approximately 5 °C (41 °F)



Approximately 26 °C (79 °F)



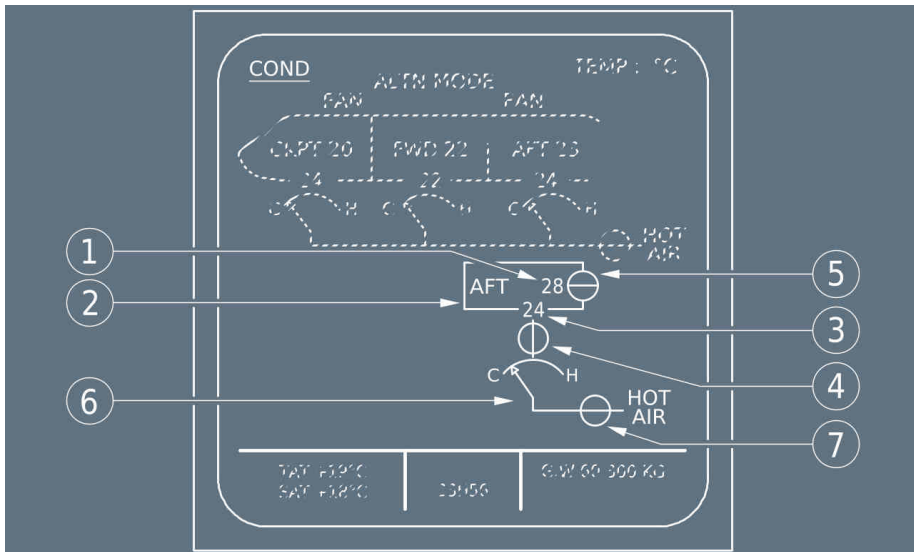
Approximately 15 °C (59 °F)

Note: The cargo compartment temperature may vary, depending on external factors (flight duration, outside temperature...).

ECAM COND PAGE

Ident.: DSC-21-40-35-00006005.0003001 / 22 MAY 12

Applicable to: MSN 02155-02789, 03031-04392



- (1) Cargo compartment temperature
This indication is green.
- (2) Zone indication
It is white.
- (3) Duct inlet temperature
This is normally green, it becomes amber when $T \geq 80^{\circ}\text{C}$.
- (4) Inlet isolation valve
In line – Green : Valve is open.
Crossline – Amber : Valve is closed.
- (5) Outlet isolation valve
Crossline – Green : Valve is open.
In line – Amber : Valve is closed.

(6) Trim air valve

H - Hot (Green) : Valve is open.

C - Cold (Green) : Valve is closed.

(7) Hot air pressure regulating valve

In line and green : valve is open.

In line and amber : valve failed open.

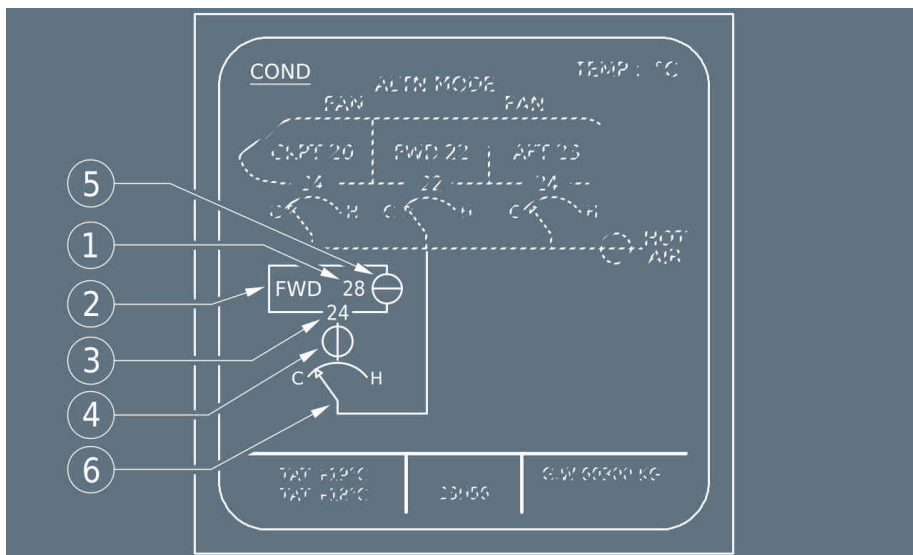
Cross line and green : valve normally closed with the pushbutton in ON position.

Cross line and amber : valve is closed and the pushbutton in OFF position.

ECAM COND PAGE

Ident.: DSC-21-40-35-00006005.0008001 / 22 MAY 12

Applicable to: MSN 05152-05746



(1) Cargo compartment temperature indication

Light is green.

(2) Zone indication

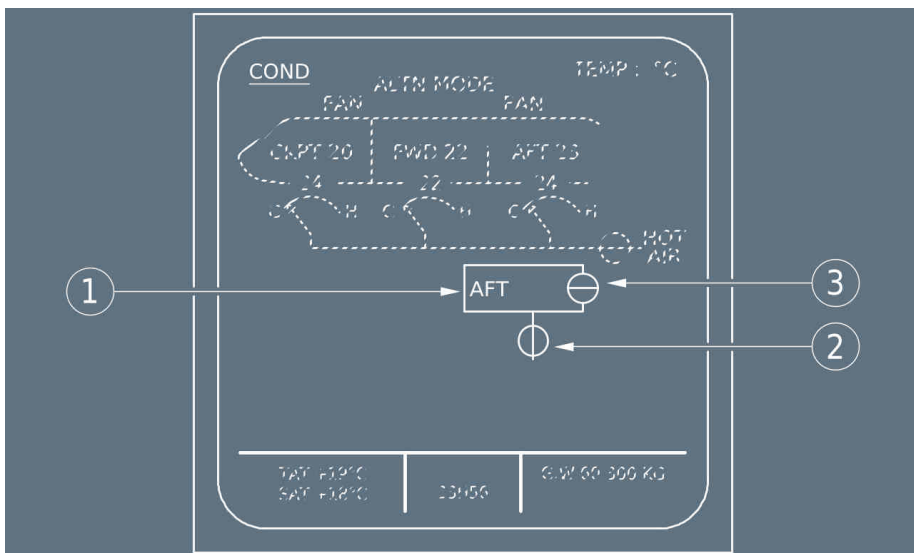
Light is white.

- (3) Duct inlet temperature indication
Light is normally green, it becomes amber when $T \geq 80^{\circ}\text{C}$.
- (4) Inlet isolation valve
In line – Green : Valve is open.
Crossline – Amber : Valve is closed.
- (5) Outlet isolation valve
Crossline – Green : Valve is open.
In line – Amber : Valve is closed.
- (6) Trim air valve
H - Hot (Green) : Valve is open.
C - Cold (Green) : Valve is closed.

ECAM COND PAGE

Ident.: DSC-21-40-35-00006005.0002001 / 22 MAY 12

Applicable to: MSN 07784-07792



- (1) Zone indication
It is white.

(2) Inlet isolation valve

In line – Green : Valve is open.

Crossline – Amber : Valve is closed.

(3) Outlet isolation valve

Crossline – Green : Valve is open.

In line – Amber : Valve is closed.

AIRCRAFT SYSTEMS

AUTO FLIGHT - GENERAL

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DSC-22_10-10 Description

FMGC Standard.....	A
Preamble.....	B
Description.....	C
General Philosophy.....	D
Flight Management Guidance Computer (FMGC).....	E
Multipurpose Control and Display Unit (MCDU).....	F
Flight Control Unit (FCU).....	G
Flight Augmentation Computer (FAC).....	H
Other Flight Crew Interfaces.....	I
Flight Crew Interface with FMGC.....	J

DSC-22_10-20 System Interface Diagram

System Interface Diagram.....	A
-------------------------------	---

DSC-22_10-30 FMGS Modes of Operation

General.....	A
Dual Mode.....	B
Independent Mode.....	C
Single Mode.....	D
Back Up Navigation Mode.....	E

DSC-22_10-40 Pilot Interface
DSC-22_10-40-05 Management of the Displays

General.....	A
--------------	---

DSC-22_10-40-10 MCDU

MCDU.....	A
-----------	---

DSC-22_10-40-20 FCU

FCU.....	A
FCU Philosophy.....	B
Speed/Mach Control Area.....	C
Lateral Control Area.....	D
AP-A/THR Control Area.....	E
Vertical Control Area.....	F

DSC-22_10-40-30 Thrust Levers

Thrust Levers.....	A
--------------------	---

DSC-22_10-40-40 Primary Flight Display

PFD.....	A
----------	---

Continued on the following page

*Continued from the previous page***DSC-22_10-40-50 Navigation Display**

ND.....	A
Arc Mode.....	B
Plan Mode.....	C
Rose Modes.....	D
Flight Plan Display Colors.....	E

DSC-22_10-50 Speeds Definition**DSC-22_10-50-10 General**

General.....	A
--------------	---

DSC-22_10-50-20 Characteristic Speeds

Characteristic Speeds.....	A
----------------------------	---

DSC-22_10-50-30 Limit Speeds

Limit Speeds.....	A
-------------------	---

DSC-22_10-50-40 Protection Speeds

Protection Speeds.....	A
------------------------	---

DSC-22_10-50-50 Other Speeds

Other Speeds.....	A
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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - GENERAL DESCRIPTION
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FMGC STANDARD

Ident.: DSC-22_10-10-00022442.0043001 / 03 SEP 18 Applicable to: MSN 02155-02789, 03031-03060, 05152-05746
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The aircraft is equipped with FMS2 HONEYWELL Release 1A H2C and FG C14.

FMGC STANDARD

Ident.: DSC-22_10-10-00022442.0015001 / 03 SEP 18 Applicable to: MSN 04392
--

The aircraft is equipped with FMS2 THALES Release 1A S6 and FG C12.

FMGC STANDARD

Ident.: DSC-22_10-10-00022442.0053001 / 03 SEP 18 Applicable to: MSN 02926-02944
--

The aircraft is equipped with FMS2 THALES Release 1A S7A and FG C14.

FMGC STANDARD

Ident.: DSC-22_10-10-00022442.0108001 / 03 SEP 18 Applicable to: MSN 07784-07792
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The aircraft is equipped with FMS2 THALES Release 1A S7A and FG PC15.

PREAMBLE

Ident.: DSC-22_10-10-00010067.0001001 / 17 AUG 10 Applicable to: ALL
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This section gives a general description of the Auto Flight System and its functions:

- Architecture
- Function description
- Basic principle of systems:
 - Reversion
 - Protection
 - Managed and selected guidance modes.
- Mode information
- Display characteristics
- Operational principles
- Flight crew interface (MCDU pages)
- Degraded modes of operations.

DESCRIPTION

Ident.: DSC-22_10-10-00010068.0001001 / 17 AUG 10

Applicable to: ALL

The Flight Management Guidance System (FMGS) contains the following units:

- Two Flight Management Guidance Computers (FMGC)
- Two Multipurpose Control and Display Units (MCDU) (third MCDU optional)
- One Flight Control Unit (FCU)
- Two Flight Augmentation Computers (FAC).

GENERAL PHILOSOPHY

Ident.: DSC-22_10-10-00010069.0001001 / 17 AUG 10

Applicable to: ALL

The Flight Management and Guidance System (FMGS) provides predictions of flight time, mileage, speed, economy profiles and altitude.

It reduces cockpit workload, improves efficiency, and eliminates many routine operations generally performed by the flight crew.

The Flight Management Guidance System (FMGS) operates as follows:

- During cockpit preparation the flight crew uses the Multipurpose Control and Display Unit (MCDU) to insert a preplanned route from origin to destination. This route includes SID, EN ROUTE, WAYPOINTS, STAR, APPROACH, MISSED APPR, and ALTN route as available from the navigation database.
- Subsequently the system defines a vertical profile and a speed profile, taking into account ATC requirements and performance criteria.

Either FMGC performs all operations, if one FMGC fails.

The FMGS computes the aircraft position continually, using stored aircraft performance data and navigation data. Therefore it can steer the aircraft along a preplanned route and vertical and speed profiles. This type of guidance is said to be "managed".

If the flight crew wants to modify any flight parameter (SPD, V/S, HDG, etc.) temporarily, they may do so by using the various Flight Control Unit (FCU) selectors. The FMGS then guides the aircraft to the target value of this parameter that they have selected. This type of guidance is said to be "selected".

The two available types of guidance, then, are:

- Managed guidance guides the aircraft along the preplanned route and the vertical and speed/Mach profile. (The FMGS computes the target values of the various flight parameters).
- Selected guidance guides the aircraft to the target values of the various flight parameters the flight crew selects by using the FCU selectors.

Selected guidance always has priority over managed guidance.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - GENERAL DESCRIPTION
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FLIGHT MANAGEMENT GUIDANCE COMPUTER (FMGC)

Ident.: DSC-22_10-10-00010073.0002001 / 28 MAY 20
Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

Each FMGC is divided into two main parts:

- The Flight Management (FM) part controls the following functions:
 - Navigation and management of navigation radios
 - Management of flight planning
 - Prediction and optimization of performance
 - Display management.
- The Flight Guidance (FG) part performs the following functions:
 - Autopilot (AP) command
 - Flight Director (FD) command
 - Autothrust (A/THR) command.

Each FMGC has its own set of databases. The individual databases can be independently loaded into their respective FMGC, or independently copied from one FMGC to the other.

Each FMGC contains these main databases:

1. The Navigation database contains standard navigation data: Navaids, waypoints, airways, enroute information, holding patterns, airports, runways, procedures (SIDs, STARs, etc.), company routes, alternates.
The airline updates this part every 28 days, and is responsible for defining, acquiring, updating, loading, and using this data. The updating operation takes 20 min to complete or 5 min if cross loaded from the opposite FMGC.
2. The Airline Modifiable Information (AMI), also described as the FM Airline Configuration file, contains:
 - Airline policy values: THR RED altitude, ACC altitude, EO ACC altitude, PERF factor, IDLE factor.
 - Fuel policy values: Fuel for taxi, % of route reserve, maximum and minimum values of route reserve, etc.
 - AOC functions customization.
3. The Aircraft Performance database includes the Engine model, Aerodynamical model, and Performance model. The airline cannot modify this database.
4. The Magnetic Variation database.
5. Each FMGC contains elements stored by the flight crew that enable them to create 20 waypoints, 10 runways, 20 navaids, and 5 routes.

FLIGHT MANAGEMENT GUIDANCE COMPUTER (FMGC)

Ident.: DSC-22_10-10-00010073.0004001 / 28 MAY 20

Applicable to: MSN 02926-02944, 04392, 07784-07792

Each FMGC is divided into two main parts:

- The Flight Management (FM) part controls the following functions:
 - Navigation and management of navigation radios
 - Management of flight planning
 - Prediction and optimization of performance
 - Display management.
- The Flight Guidance (FG) part performs the following functions:
 - Autopilot (AP) command
 - Flight Director (FD) command
 - Autothrust (A/THR) command.

Each FMGC has its own set of databases. The individual databases can be independently loaded into their respective FMGC, or independently copied from one FMGC to the other.

Each FMGC contains these main databases:

1. The Navigation database contains standard navigation data: Nav aids, waypoints, airways, enroute information, holding patterns, airports, runways, procedures (SIDs, STARs, etc.), company routes, alternates.
 The airline updates this part every 28 days, and is responsible for defining, acquiring, updating, loading, and using this data. The updating operation takes 20 min to complete or 5 min if cross loaded from the opposite FMGC.
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 - Fuel policy values: Fuel for taxi, % of route reserve, maximum and minimum values of route reserve, etc.
 - AOC functions customization.
3. The Aircraft Performance database includes the Engine model, Aerodynamical model, and Performance model. The airline cannot modify this database.
4. The Magnetic Variation database.
5. Each FMGC contains elements stored by the flight crew that enable them to create 20 waypoints, 10 runways, 20 nav aids, and 5 routes.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - GENERAL DESCRIPTION
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MULTIPURPOSE CONTROL AND DISPLAY UNIT (MCDU)

Ident.: DSC-22_10-10-00010074.0001001 / 17 AUG 10

Applicable to: MSN 02155-03060

Two MCDUs are installed on the pedestal for flight crew loading and display of data. The use of the MCDU allows the flight crew to interface with the FMGC by selection of a flight plan for lateral and vertical trajectories and speed profiles. The flight crew may also modify selected navigation or performance data and specific functions of Flight Management (revised flight plan, engine-out, secondary flight plan, etc.). Additional data from peripherals (Centralized Fault Display System (CFDS), ARINC Communication Addressing and Reporting System (ACARS), Air Traffic Service Unit (ATSU)...) can also be displayed. Data that is entered into the MCDU that is illogical or beyond the aircraft capabilities will either be disregarded or will generate an advisory message.

MULTIPURPOSE CONTROL AND DISPLAY UNIT (MCDU)

Ident.: DSC-22_10-10-00010074.0002001 / 17 AUG 10

Applicable to: MSN 04392-07792

Two MCDUs are installed on the pedestal for flight crew loading and display of data. The use of the MCDU allows the flight crew to interface with the FMGC by selection of a flight plan for lateral and vertical trajectories and speed profiles. The flight crew may also modify selected navigation or performance data and specific functions of Flight Management (revised flight plan, engine-out, secondary flight plan, etc.). Additional data from peripherals (Centralized Fault Display System (CFDS), ARINC Communication Addressing and Reporting System (ACARS), Air Traffic Service Unit (ATSU)...) can also be displayed. Data that is entered into the MCDU that is illogical or beyond the aircraft capabilities will either be disregarded or will generate an advisory message.

The MCDUs allow the activation of the back-up navigation in the case of a dual FM Failure.

FLIGHT CONTROL UNIT (FCU)

Ident.: DSC-22_10-10-00010075.0001001 / 17 AUG 10

Applicable to: ALL

The FCU located on the glareshield, is the short-term interface between the flight crew and the FMGC. It is used to select any flight parameters or modify those selected in the MCDU. The autopilots and autothrust functions may be engaged or disengaged. Different guidance modes can be selected to change various targets (speed, heading, track, altitude, flight path angle, vertical speed).

FLIGHT AUGMENTATION COMPUTER (FAC)

Ident.: DSC-22_10-10-00010076.0001001 / 17 AUG 10

Applicable to: ALL

The FAC controls rudder, rudder trim and yaw damper inputs. It computes data for the flight envelope and speed functions. The FAC also provides warning for low-energy and windshear detection if these functions are installed.

OTHER FLIGHT CREW INTERFACES

Applicable to: ALL

Ident.: DSC-22_10-10-A-00010077.0001001 / 23 JUN 15

THRUST LEVERS

The thrust levers are the main interface between the Flight Management Guidance Computer (FMGC), the Full Authority Digital Engine Control System (FADEC), and the flight crew.

The thrust levers:

- Arm the autothrust at takeoff, when FLX or TOGA is selected
- Limit the maximum thrust by their position when autothrust is active
- Disconnect the autothrust system when the flight crew sets them to IDLE
- Command the thrust manually when autothrust is not active
- Engage the common modes (takeoff or go-around) when TOGA (or FLX for takeoff) is set
- Set the autothrust to the active mode when they are between IDLE and CL detent (MCT in engine out).

Ident.: DSC-22_10-10-A-00010078.0001001 / 14 NOV 24

ELECTRONIC FLIGHT INSTRUMENTS (EFIS)

Two Primary Flight Displays (PFD) and Navigation Displays (ND) provide the flight crew with full-time flight guidance, navigation and system advisory information for all flight phases. An EFIS control panel is located at each end of the glareshield and is used to control both Primary and Navigation Displays. This panel includes controls to select various modes within the PFD. A selector allows the barometric altimeter setting to be displayed on the PFD. Various distance ranges can be selected on the ND, and two switches allow either the left or right VOR/ADF  bearing pointers to be displayed on the ND.

Ident.: DSC-22_10-10-A-00010079.0001001 / 17 AUG 10

PRIMARY FLIGHT DISPLAYS

The PFDs combine several conventional flight instrument indications on one color display panel, for centralized reference of flight data.

This centralized color display includes:

- Flight Director attitude guidance targets
- Armed and engaged modes
- Navigation and instrument approach information
- Altimeter setting
- Barometric altitude
- System messages.

Ident.: DSC-22_10-10-A-00010080.0002001 / 17 AUG 10

NAVIGATION DISPLAYS

Five different color navigation compass displays can be selected:

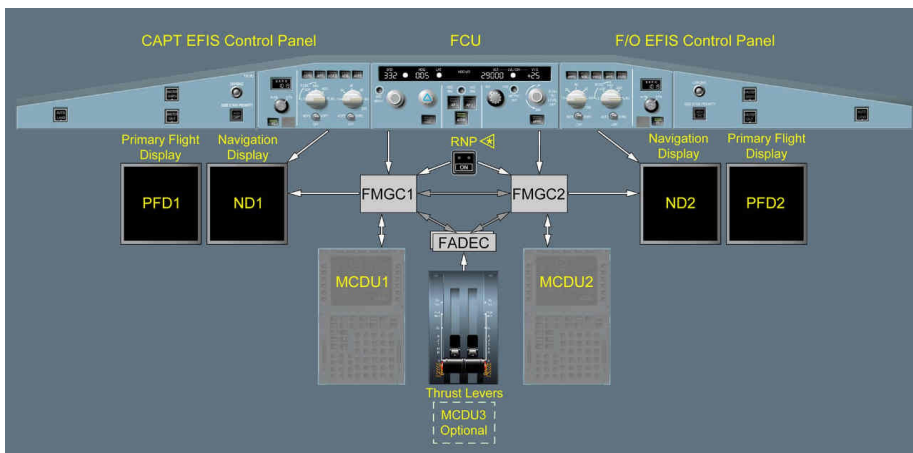
- ARC (map mode)
- ROSE NAV (map mode)
- ROSE VOR
- ROSE LS
- PLAN.

Information displayed on these modes uses the aircraft's position as a reference point for the flight plan navigation data (lateral and vertical information).

FLIGHT CREW INTERFACE WITH FMGC

Ident.: DSC-22_10-10-00010082.0001001 / 05 MAR 19

Applicable to: ALL

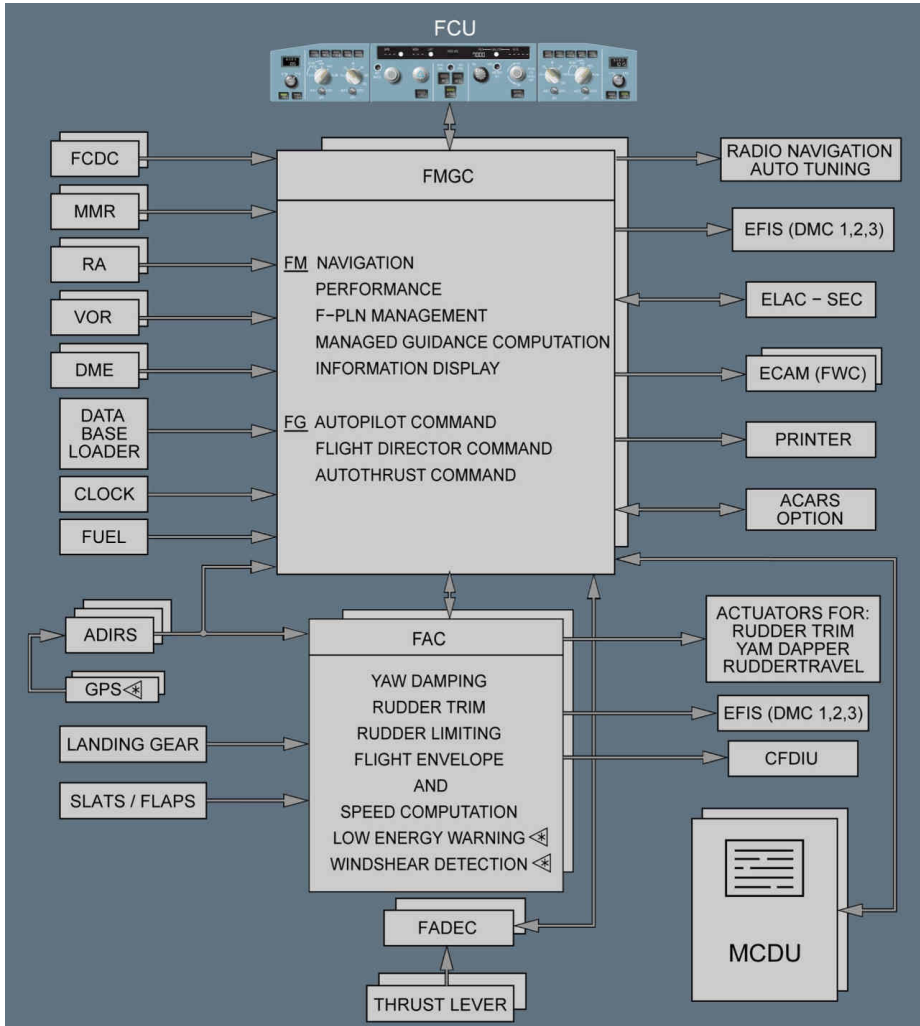


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SYSTEM INTERFACE DIAGRAM

Ident.: DSC-22_10-20-00010084.0001001 / 12 MAY 25

Applicable to: ALL



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GENERAL

Ident.: DSC-22_10-30-00010085.0001001 / 17 AUG 10

Applicable to: MSN 02155-03060

The FMGS has three modes of operation:

- Dual mode (the normal mode)
- Independent mode. Each FMGC being controlled by its associated MCDU
- Single mode (using one FMGC only).

GENERAL

Ident.: DSC-22_10-30-00010085.0002001 / 17 AUG 10

Applicable to: MSN 04392-07792

The FMGS has four modes of operation:

- Dual mode (the normal mode)
- Independent mode. Each FMGC being controlled by its associated MCDU
- Single mode (using one FMGC only)
- Back-up navigation mode.

DUAL MODE

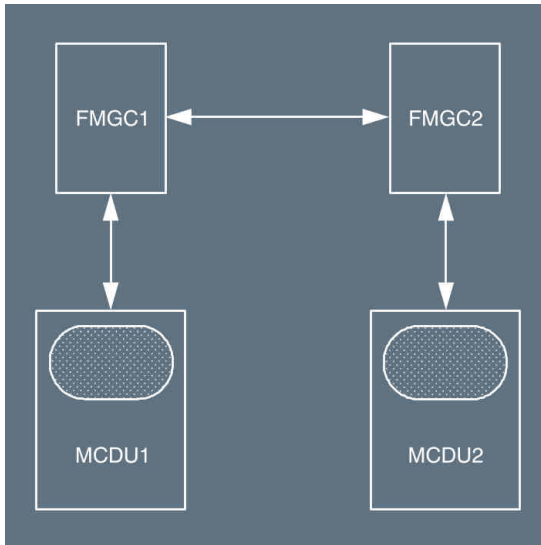
Ident.: DSC-22_10-30-00010086.0001001 / 01 OCT 12

Applicable to: ALL

This is the normal mode. The two FMGCs are synchronized: each performs its own computations and exchanges data with the other through a crosstalk bus.

One FMGC is the master, the other the slave, so that some data in the slave FMGC comes from the master.

All data inserted into any MCDU is transferred to both FMGCs and to all peripherals.



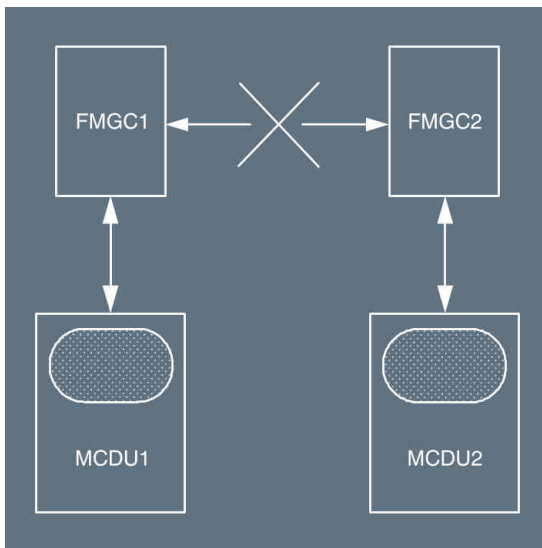
MASTER FMGC LOGIC

- If one autopilot (AP) is engaged, the related FMGC is master:
 - It uses the onside FD for guidance
 - It controls the A/THR
 - It controls the FMA 1 and 2.
- If two APs are engaged, FMGC1 is master.
- If no AP is engaged, and
 - The FD1 pb is on, then FMGC1 is master
 - The FD1 pb is off, and FD2 pb on then FMGC2 is master.
- If no AP/FD is engaged, A/THR is controlled by FMGC1.

INDEPENDENT MODE

Ident.: DSC-22_10-30-00010087.0001001 / 02 MAY 24

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746



The system automatically selects this degraded mode under specific abnormal conditions (e.g. different database validity on both FMGCs).

Both FMGCs work independently and are linked only to peripherals on their own sides of the flight deck (“onside” peripherals).

When this occurs, the “INDEPENDENT OPERATION” message is displayed on both MCDU scratchpads.

Each MCDU transmits data it receives from its onside FMGC. It affects only the onside EFIS (Electronic Flight Instrument System) and RMP (Radio Management Panel).

On the POS MONITOR page (and GPS MONITOR page ), FMGS position (and GPS position ) from the opposite FMGC is not displayed.

On the RAD NAV page (and PROG page, if the FMGS GPS is not installed), nav aids tuned on the opposite MCDU are not displayed. Corresponding fields are blank.

PROCEDURES ON GROUND

- If each FMGC is loaded with a different database, the FMGS will only operate in independent mode.

CHECK the database number and validity.

CROSSLOAD  the database to restore the dual operation.

Crossload function is available on ground only (in preflight or done phase), when an independent operation is detected.

Note: Only authorized personnel should take the responsibility to crossload the FMGC database.

PROCEDURES IN FLIGHT

DO NOT SWITCH the navigation databases.

MAKE the same entries on both MCDUs to have both AP/FDs similar orders.

Both FGs being valid, 2 APs may be engaged for CAT II or CAT III operations.

● In the event of a go-around and when the second AP is disconnected:

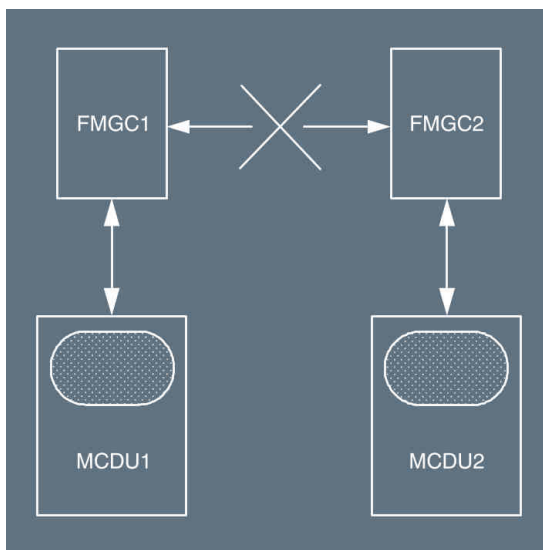
ENSURE that the FMGC in command has correct flight plan orders and an updated nav database.

Airbus does not recommend pulling one FMGC circuit breaker to force the system to operate in SINGLE mode.

INDEPENDENT MODE

Ident.: DSC-22_10-30-00010087.0002001 / 02 MAY 24

Applicable to: MSN 02926-02944, 04392, 07784-07792



The system automatically selects this degraded mode under specific abnormal conditions (e.g. different database validity on both FMGCs).

Both FMGCs work independently and are linked only to peripherals on their own sides of the flight deck ("onside" peripherals).

When this occurs, the "INDEPENDENT OPERATION" message is displayed on both MCDU scratchpads. "IND" annunciator on top of the MCDU is lit.

Each MCDU transmits data it receives from its onside FMGC. It affects only the onside EFIS (Electronic Flight Instrument System) and RMP (Radio Management Panel).

On the POS MONITOR page (and GPS MONITOR page ) , FMGS position (and GPS position ) from the opposite FMGC is not displayed.

On the RAD NAV page, nav aids tuned on the opposite MCDU are not displayed. Corresponding fields are blank.

PROCEDURES ON GROUND

- **If each FMGC is loaded with a different database**, the FMGS will only operate in independent mode.

CHECK the database number and validity.

CROSSLOAD the database to restore the dual operation.

Crossload function is available on ground only (in preflight or done phase), when an independent operation is detected.

Note: Only authorized personnel should take the responsibility to crossload the FMGC database.

PROCEDURES IN FLIGHT

DO NOT SWITCH the navigation databases.

MAKE the same entries on both MCDUs to have both AP/FDs similar orders.

Both FGs being valid, 2 APs may be engaged for CAT II or CAT III operations.

- **In the event of a go-around and when the second AP is disconnected:**

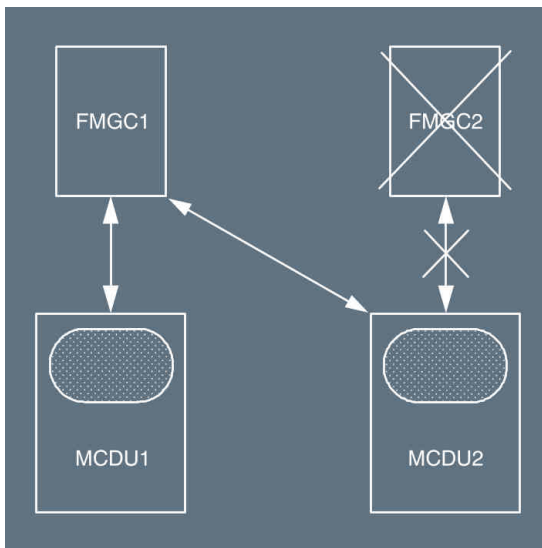
ENSURE that the FMGC in command has correct flight plan orders and an updated nav database.

Airbus does not recommend pulling one FMGC circuit breaker to force the system to operate in SINGLE mode.

SINGLE MODE

Ident.: DSC-22_10-30-00010088.0004001 / 01 OCT 12

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746



The system automatically selects this degraded mode when one FMGC fails. When this occurs, the failed FMGC displays "OPP FMGC IN PROCESS" in white on the MCDU scratchpad.

On the ND usually associated with the failed FM:

- If the NDs are not both in the same mode or range, the associated ND displays "MAP NOT AVAIL" and "SET OFFSIDE RNG/MODE".
- If the NDs are in the same mode and range, the associated ND displays the "OFFSIDE FM CONTROL" amber message.

Both POS MONITOR pages display the same position (operative FMGC position).

Both FDs are driven by the same FMGC. Any entry on either MCDU is sent to the operative FMGC.

PROCEDURES
● If a transient failure triggers a single mode of operation:

DO NOT USE the MCDU(s) until the PLEASE WAIT message is suppressed.

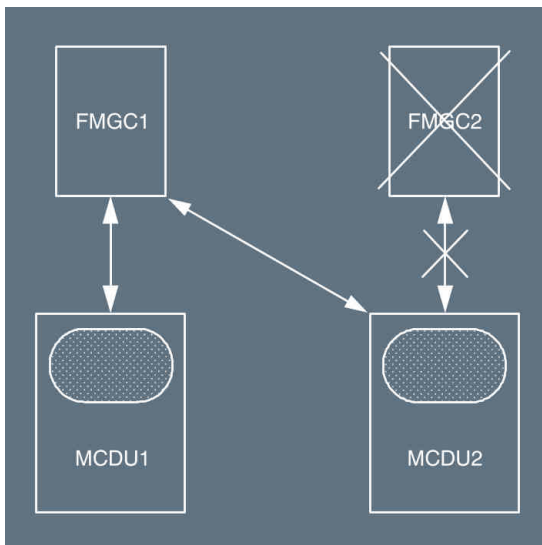
SET both NDs on the same range and mode to display the same information from the operative FMGC.

When convenient, RESET the failed FMGC. (*Refer to DSC-22_20-40-10 Manual FMGC Reset - General*).

SINGLE MODE

Ident.: DSC-22_10-30-00010088.0016001 / 01 OCT 12

Applicable to: MSN 02926-02944, 04392, 07784-07792



The system automatically selects this degraded mode when one FMGC fails.

When this occurs, the MCDU on the side of the failed FMGC reverts to MCDU MENU page, and a prompt to connect the MCDU on the opposite FMGC is displayed. When this prompt is pressed, the "OPP FMGC IN PROCESS" message is displayed in white on the MCDU scratchpad.

On the ND usually associated with the failed FM:

- If the NDs are not both in the same mode or range, the associated ND displays "MAP NOT AVAIL" and "SET OFFSIDE RNG/MODE".
- If the NDs are in the same mode and range, the associated ND displays the "OFFSIDE FM CONTROL" amber message.

Both POS MONITOR pages display the same position (operative FMGC position).

Both FDs are driven by the same FMGC. Any entry on either MCDU is sent to the operative FMGC.

PROCEDURES

● If a transient failure triggers a single mode of operation:

DO NOT USE the MCDU(s) until the PLEASE WAIT message is suppressed.

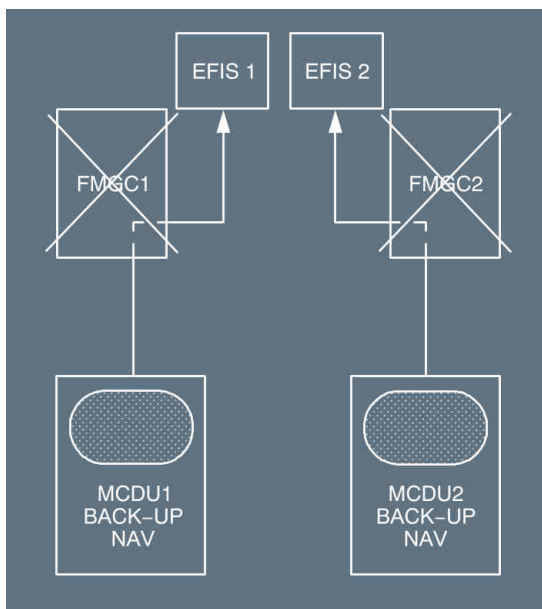
SET both NDs on the same range and mode to display the same information from the operative FMGC.

When convenient, RESET the failed FMGC. (*Refer to DSC-22_20-40-10 Manual FMGC Reset - General*).

BACK UP NAVIGATION MODE

Ident.: DSC-22_10-30-00010089.0001001 / 01 OCT 12

Applicable to: MSN 04392-07792



The flight crew selects on the MCDU MENU page this degraded mode when both FMGCs fail. They recover the navigation function through the MCDU and IRS/GPS .

The MCDU continuously memorizes the active flight plan in its memory.

If both FMGCs fail, the back up navigation provides the following functions:

- Flight Planning
- Aircraft position using outside IRS, IRS3, or GPIRS position (if GPS )

- F-PLN display on ND
- No AP/FD NAV mode
- Limited lateral revision
- F-PLN automatic sequencing.

Intentionally left blank

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - GENERAL PILOT INTERFACE - MANAGEMENT OF THE DISPLAYS
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GENERAL

Ident.: DSC-22_10-40-05-00010083.0001001 / 17 AUG 10

Applicable to: ALL

The flight management system displays navigation, performance and guidance information on the:

- Multipurpose Control and Display Unit (MCDU)
- Navigation Display (ND) of the Electronic Flight Instrument System (EFIS)
- Primary Flight Display (PFD) of the EFIS.

Intentionally left blank

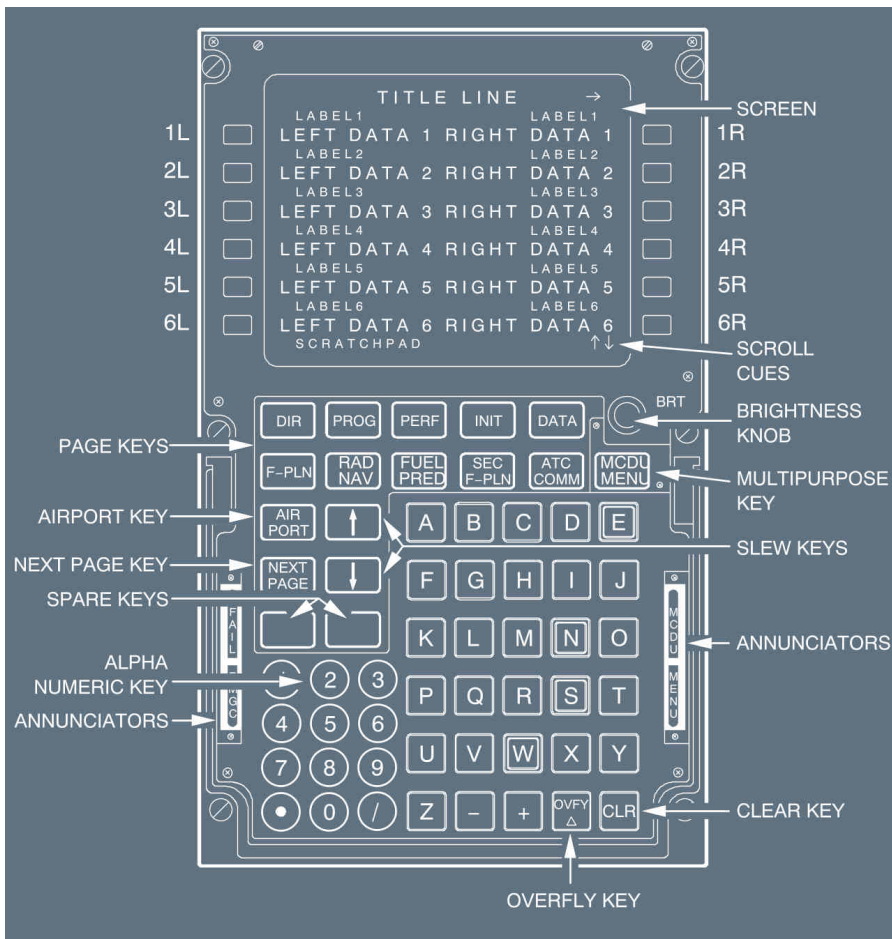
MCDU

MCDU - MCDU INTERFACE

Ident.: DSC-22_10-40-10-A-00010090.0002001 / 14 MAY 12

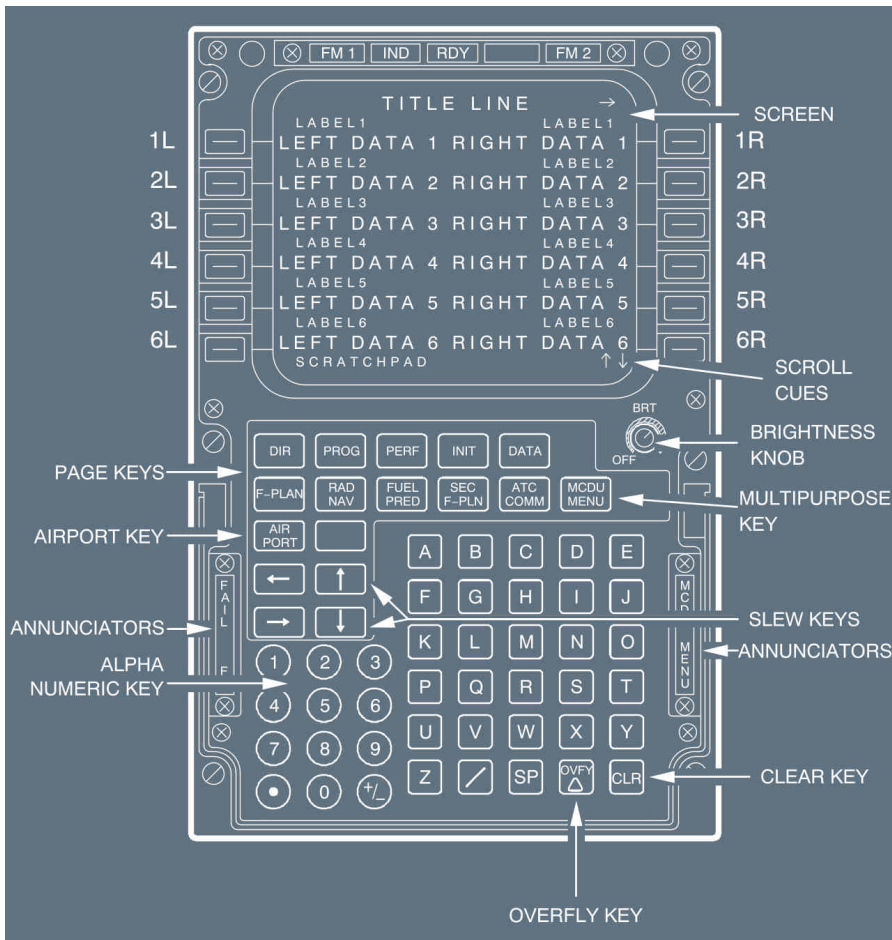
Applicable to: MSN 02155-02212

MCDU INTERFACE



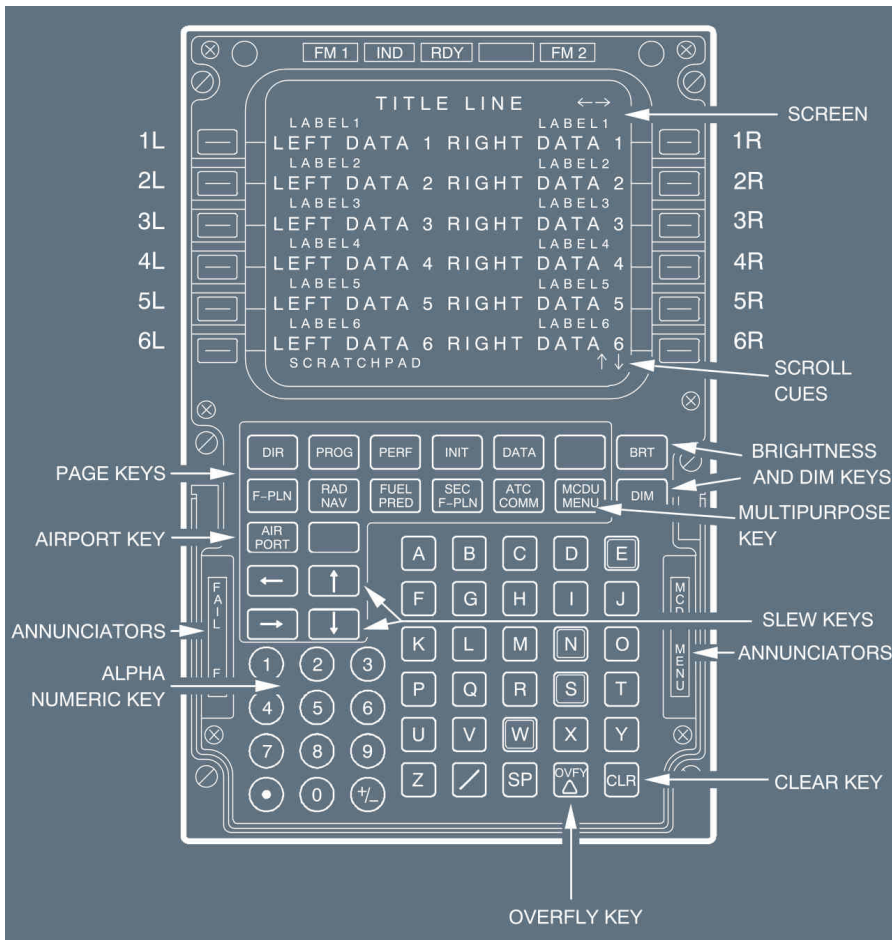
Ident.: DSC-22_10-40-10-A-00010090.0008001 / 14 MAY 12
Applicable to: MSN 02719-02789

MCDU INTERFACE



Ident.: DSC-22_10-40-10-A-00010090.0003001 / 14 MAY 12
Applicable to: MSN 02926-07792

MCDU INTERFACE



GENERAL

The Multipurpose Control and Display Unit (MCDU) is a cathode ray tube that generates 14 lines of 24 characters each, including:

- A title line that gives the name of the current page in large letters
- Six label lines, each of which names the data displayed just below it (on the data field line)
- Six data field lines that display computed data or data inserted by the flight crew
- The scratchpad line that displays:
 - Specific messages
 - Information the flight crew has entered by means of the number and letter keys and which can then be moved to one of the data fields.

GENERAL

The Multipurpose Control and Display Unit (MCDU) has a Liquid Crystal Display (LCD) with 14 lines of 24 characters each, including:

- A title line that gives the name of the current page in large letters
- Six label lines, each of which names the data displayed just below it (on the data field line)
- Six data field lines that display computed data or data inserted by the flight crew
- The scratchpad line that displays:
 - Specific messages
 - Information the flight crew has entered by means of the number and letter keys and which can then be moved to one of the data fields.

LINE SELECT KEYS

There is a column of Line Select Keys (LSKs) on each side of the screen.

The flight crew uses these keys to:

- Move a parameter they have entered in the scratchpad to the appropriate line on the main screen
- Call up a specific function page indicated by a prompt displayed on the adjacent line
- Call up lateral or vertical revision pages from the flight plan page.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - GENERAL PILOT INTERFACE - MCDU
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Ident.: DSC-22_10-40-10-A-00010093.0001001 / 17 AUG 10
Applicable to: MSN 02155-02212

KEYBOARD

- The keyboard includes:
- Function and Page keys Call up functions and pages the flight crew uses for flight management functions and computations.
 - ↑ ↓ (or SLEW) keys Move a page up or down to display portions that are off the screen.
 - NEXT PAGE key Moves to the next page of a multi-page element. An arrow in the top right corner indicates that another page is available.
 - AIRPORT key Calls up the flight plan page that contains the next airport along the current flight plan. Successive pushes on the key show the alternate airport, the origin airport (before takeoff), and the next airport again.
 - Number and letter keys allow the flight crew to insert data in the scratchpad so that they can use a line select key to enter it in the main display.
 - Two keys have special functions:
 - CLR (clear) key Erases material (messages or inserted data) from the scratchpad or from certain areas of displayed pages.
 - OVFY (overfly) key Allows the aircraft to overfly a selected waypoint.

Ident.: DSC-22_10-40-10-A-00010093.0002001 / 17 AUG 10

Applicable to: MSN 02719-07792

KEYBOARD

The keyboard includes:

- Function and Page keys Call up functions and pages the flight crew uses for flight management functions and computations.
- ↑ ↓ (or SLEW) keys Move a page up or down to display portions that are off the screen.
- ← → keys Moves to the next page of a multi-page element. An arrow in the top right corner indicates that another page is available.
- AIRPORT key Calls up the flight plan page that contains the next airport along the current flight plan. Successive pushes on the key show the alternate airport, the origin airport (before takeoff), and the next airport again.
- Number and letter keys allow the flight crew to insert data in the scratchpad so that they can use a line select key to enter it in the main display.
- Three keys have special functions:
 - CLR (clear) key Erases material (messages or inserted data) from the scratchpad or from certain areas of displayed pages.
 - OVFY (overfly) key Allows the aircraft to overfly a selected waypoint.
 - SP (space) key Allows to insert a space in specific message.

MCDU - ANNUNCIATORS (ON THE SIDE OF THE KEYBOARD)

Ident.: DSC-22_10-40-10-A-00010094.0001001 / 17 AUG 10

Applicable to: MSN 02155-02212

ANNUNCIATORS (ON THE SIDE OF THE KEYBOARD)

- FAIL (amber) Indicates that the Multipurpose Control and Display Unit (MCDU) has failed.
- MCDU MENU (white) Indicates that the flight crew should call up a peripheral linked to the MCDU (such as ACARS, ATSU or CFDS).
- FMGC (white) Comes on while the flight crew is using the MCDU to display peripherals. This light tells the flight crew that the FMGC has an important message to deliver. The flight crew accesses the message by pressing the MCDU MENU key and the line select key adjacent to the FMGC prompt.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - GENERAL PILOT INTERFACE - MCDU
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Ident.: DSC-22_10-40-10-A-00010094.0002001 / 17 AUG 10

Applicable to: MSN 02719-07792

ANNUNCIATORS (ON THE SIDE OF THE KEYBOARD)

- | | |
|-------------------|--|
| FAIL (amber) | Indicates that the Multipurpose Control and Display Unit (MCDU) has failed. |
| MCDU MENU (white) | Indicates that the flight crew should call up a peripheral linked to the MCDU (such as ACARS, ATSU or CFDS). |
| FM (white) | Comes on while the flight crew is using the MCDU to display peripherals. This light tells the flight crew that the FMGC has an important message to deliver. The flight crew accesses the message by pressing the MCDU MENU key and the line select key adjacent to the FMGC prompt. |

MCDU - ANNUNCIATORS (ON THE TOP OF THE KEYBOARD)

Ident.: DSC-22_10-40-10-A-00010757.0001001 / 17 AUG 10

Applicable to: MSN 02719-02789

ANNUNCIATORS (ON THE TOP OF THE KEYBOARD)

- | | |
|-----------------------|---|
| FM 1 and FM 2 (amber) | The onside FM is failed |
| IND (amber) | The onside FM detects an independent mode of operation while both FM are healthy. |
| RDY (green) | MCDU has passed its power up test after its BRT knob was turned to OFF. |

Ident.: DSC-22_10-40-10-A-00010757.0002001 / 17 AUG 10

Applicable to: MSN 02926-07792

ANNUNCIATORS (ON THE TOP OF THE KEYBOARD)

- | | |
|-----------------------|---|
| FM 1 and FM 2 (amber) | The onside FM is failed |
| IND (amber) | The onside FM detects an independent mode of operation while both FM are healthy. |
| RDY (green) | MCDU has passed its power up test after it was turned off using its DIM key. |

Ident.: DSC-22_10-40-10-A-00010750.0001001 / 17 AUG 10

Applicable to: MSN 02926-07792

BRT AND DIM KEYS

Control the light intensity of the entire MCDU. MCDU power up is performed with the BRT key and MCDU shut down is performed with the DIM key.

Ident.: DSC-22_10-40-10-A-00010095.0001001 / 17 AUG 10

Applicable to: MSN 02155-02789

BRT knob

Controls the light intensity of the entire MCDU.

Ident.: DSC-22_10-40-10-A-00010097.0001001 / 17 AUG 10

Applicable to: ALL

DATA ENTRY

The flight crew enters data by typing it into the scratchpad on the MCDU. Next, pressing the line select key (LSK) will load the data from the scratchpad into the desired field. An error message displays if the data is out of range or not formatted correctly. To correct data, the flight crew may clear the message with the clear (CLR) key and then retype the message into the scratchpad. Pressing the CLR key when the scratchpad is empty displays "CLR". To clear data from a field, select CLR from the scratchpad to the data field to be cleared.

Ident.: DSC-22_10-40-10-A-00010098.0001001 / 17 AUG 10

Applicable to: ALL

MCDU ENTRY FORMAT

The flight crew enters information into the MCDU at the bottom line of the scratchpad. When data has lead zeros, they may be omitted if desired. For example a three-digit wind direction of 060 may be typed as 60. The display will still show 060. To enter an altitude below 1 000 ft, the lead zero must be added as 0400 for 400 ft. This differentiates the altitude from a flight level.

To enter a double data entry such a speed/altitude, the separating slash must be used. If entering only the first part of a double entry, omit the slash. To enter only the second part of a double entry, a leading slash must be used i.e. /0400.

Ident.: DSC-22_10-40-10-A-00010099.0001001 / 17 AUG 10

Applicable to: ALL

MESSAGES

The scratchpad displays various messages for flight crew information. These messages are prioritized by importance to the flight crew as either amber or white.

- Amber messages are:
- Navigation messages
 - Data entry messages
 - EFIS repeat messages.

- Amber messages are categorized into two types:
- Type 1 message that is a direct result of a flight crew action. Type 1 messages are displayed immediately in the scratchpad ahead of other messages.
 - Type 2 messages inform the flight crew of a given situation or request a specific action. Stored in “last in”, “first out” message queue that holds maximum of 5 messages.
- Type 2 messages are displayed in the scratchpad only if there are no Type 1 messages or other data and will remain until all the messages have been viewed and cleared with the CLR key.

White messages are advisory only.

Ident.: DSC-22_10-40-10-A-00010101.0001001 / 17 AUG 10
Applicable to: ALL

CHARACTERS

- Small and large fonts are displayed according to the following rules:
- The title line and the scratchpad are displayed in large font
 - Datafields are usually displayed in large font
 - Label lines are displayed in small font
 - Flight crew entries and modifiable data are displayed in large font
 - Defaulted/computed and non modifiable data are displayed in small font.

MCDU - COLORS

Ident.: DSC-22_10-40-10-A-00010102.0001001 / 17 AUG 10
Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

COLORS

DATA	MCDU COLOR
TITLES, COMMENTS, <, >, ↑ ↓, ← →, DASHES, MINOR MESSAGES	WHITE
- MODIFIABLE DATA - SELECTABLE DATA - BRACKETS	BLUE
- NON MODIFIABLE DATA - ACTIVE DATA	GREEN

Continued on the following page

Continued from the previous page

DATA	MCDU COLOR
- MANDATORY DATA (BOXES) - FLIGHT CREW ACTION REQUIRED - IMPORTANT MESSAGES - MISSED CONSTRAINT	AMBER
- CONSTRAINTS - MAX ALTITUDE	MAGENTA
PRIMARY F-PLN	GREEN WAYPOINTS, WHITE LEGS
TEMPORARY F-PLN	YELLOW WAYPOINTS, WHITE LEGS
SECONDARY F-PLN	WHITE WAYPOINTS AND LEGS
MISSED APPROACH (not active)	BLUE WAYPOINTS, WHITE LEGS
ALTERNATE F-PLN (not active)	BLUE WAYPOINTS, WHITE LEGS
OFFSET	GREEN WAYPOINTS, WHITE LEGS, OFST DISPLAYED IN THE TITLE OF THE F-PLN PAGE
TUNED NAVAID	BLUE
"TO" WAYPOINT AND DESTINATION	WHITE

Ident.: DSC-22_10-40-10-A-00010102.0002001 / 23 JUN 15

Applicable to: MSN 02926-02944, 04392, 07784-07792

COLORS

DATA	MCDU COLOR
TITLES, COMMENTS, <, >, ↑ ↓, ← →, DASHES, MINOR MESSAGES	WHITE
- MODIFIABLE DATA - SELECTABLE DATA - BRACKETS	BLUE
- NON MODIFIABLE DATA - ACTIVE DATA	GREEN
- MANDATORY DATA (BOXES) - FLIGHT CREW ACTION REQUIRED - IMPORTANT MESSAGES - MISSED CONSTRAINT	AMBER
- CONSTRAINTS - MAX ALTITUDE	MAGENTA
PRIMARY F-PLN	GREEN WAYPOINTS, WHITE LEGS
TEMPORARY F-PLN	YELLOW WAYPOINTS, WHITE LEGS

Continued on the following page

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - GENERAL PILOT INTERFACE - MCDU
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Continued from the previous page

DATA	MCDU COLOR
SECONDARY F-PLN	WHITE WAYPOINTS AND LEGS
MISSED APPROACH (not active), INCLUDING IN TMPY F-PLN	BLUE WAYPOINTS, WHITE LEGS
ALTERNATE F-PLN (not active), INCLUDING IN TMPY F-PLN	BLUE WAYPOINTS, WHITE LEGS
OFFSET	GREEN WAYPOINTS, WHITE LEGS, OFST DISPLAYED IN THE TITLE OF THE F-PLN PAGE
TUNED NAVAID	BLUE
"TO" WAYPOINT AND DESTINATION	WHITE

MCDU - SCREEN PROMPTS

Ident.: DSC-22_10-40-10-A-00010103.0001001 / 14 MAY 12
Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

SCREEN PROMPTS

□□□: Data entry is mandatory to allow the FGMC to perform all its functions.

↑↓: When these arrows are beside a label line, it is possible to increase or decrease the value displayed below by pressing [↑] or [↓] keys on the keyboard.

Label line

Dateline or data field

← →: A turn (left ← or right →) is specified on the leg which started at the waypoints adjacent to the arrow.

Δ: Displayed beside a fixed waypoint on the F-PLN page to indicate that the A/C will overfly the fixed point

← →: Indicate that pressing the adjacent LS key will activate the prompt or select some data.

< or >: Means that another page may be accessed by pressing the adjacent key.

1L	COR RTE	INIT	FROM/TO	1R
2L	ALTN RTE		ALTN	2R
3L	FLT NBR			3R
4L	LAT↑↓		LONG	4R
5L	COST INDEX		WIND>	5R
6L	CRZ FL/TEMP		TROPO	6R
			36090	

→ Upper right corner of screen indicates that next page is available by depressing next page key.

---: This data will be computed by the FGMC if it has enough information, or provided out of the database or inserted by the crew.

1L	FROM	TMPY	UT1234	1R
2L	BET←	1020	2500	2R
3L	NABIE		52NM	3R
4L	W175	TRK249	146	4R
5L	W176Δ		37	5R
6L	W177		37	6R
	←ERASE	INSERT*	↑↓	

*: Indicates that a constraint has been inserted. Displayed only if predictions available.

*: Indicates that pressing the adjacent LS key will change parameters affecting the active situation.

↑↓: Scrolling is available by pressing ↑ or ↓ key on the keyboard. The page is not large enough to display the whole information.

1L	LAT REV	FRZ	1R
2L	44°01.8N/011°00.2E		2R
3L	<HOLD	VIA/GO TO	3R
4L	ENABLE	[]/[]	4R
5L	←ALTN	NEXT WPT	5R
6L	<RETURN	NEW DEST	6R

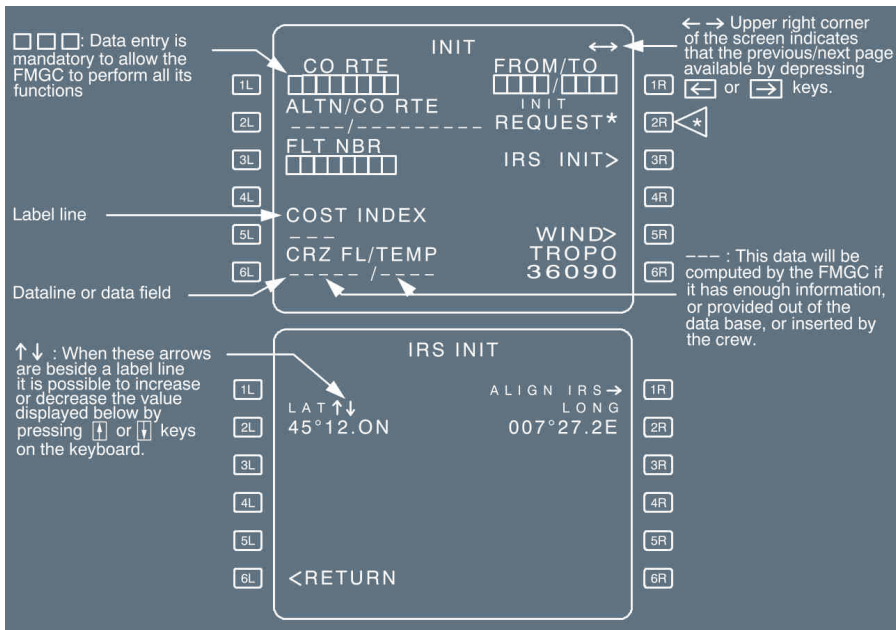
[]: A data insertion is possible.

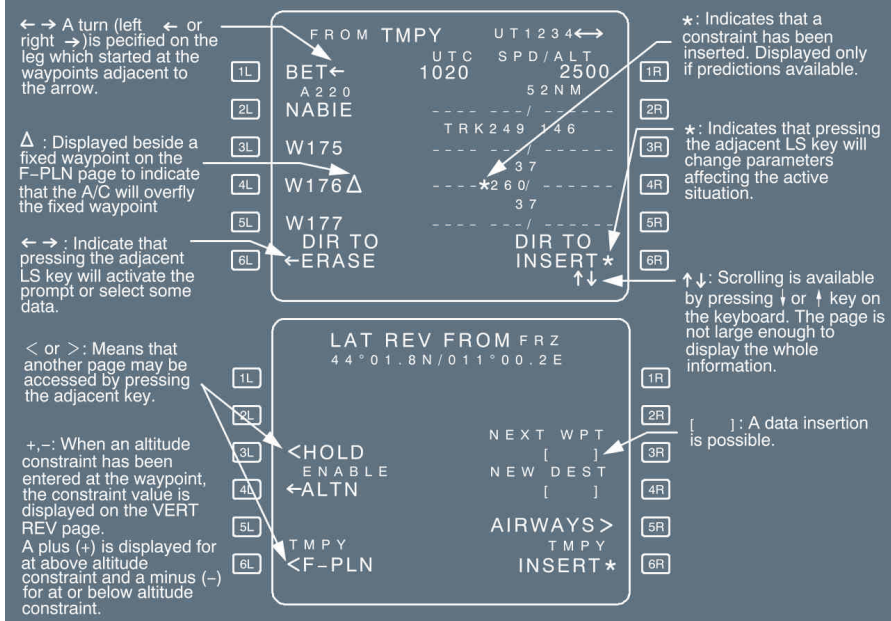
+,-: When an altitude constraint has been entered at the waypoint, the constraint value is displayed on the VERT REV page. A plus (+) is displayed for at above altitude constraint and a minus (-) for at or below altitude constraint.

Ident.: DSC-22_10-40-10-A-00010103.0003001 / 14 MAY 12

Applicable to: MSN 02926-02944, 04392, 07784-07792

SCREEN PROMPTS





MCDU - MCDU FUNCTION KEYS

Ident.: DSC-22_10-40-10-A-00010104.0002001 / 12 MAY 23

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

MCDU FUNCTION KEYS

The function keys on the Multipurpose Control and Display Units allow the flight crew to call up MCDU pages quickly.

The following is a summary of the purpose of each key:

DIR Calls up the DIR TO page, and enables the flight crew to proceed directly from the present position to any waypoint, entered manually or selected in the active flight plan.

PROG Calls up the progress page corresponding to the phase of the active flight plan that is in progress.

This page displays navigation information and active data such as the optimum and maximum recommended cruise flight levels. It enables the flight crew to update the FMGS position and to obtain a bearing and distance to any location.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - GENERAL PILOT INTERFACE - MCDU
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PERF	Calls up the performance pages, that display the optimum speed or Mach number for each phase. The flight crew can amend these pages. The first page to be displayed is the one corresponding to the current flight phase (except for preflight and done phases). The flight crew can then use the appropriate 6L or 6R LSK to call up pages corresponding to future flight phases.
INIT	Calls up the flight plan initialization A page, which also gives the flight crew access to the B page. The flight crew uses the INIT pages to initialize Flight Management for the flight. The flight crew uses the INIT A page primarily to insert his flight plan and to align the inertial reference system. The flight crew uses the INIT B page to insert aircraft weight, fuel on board, CG and various fuel requirements. The FMGS uses this data to compute predictions and fuel planning parameters. The flight crew has access to the INIT A page only in the preflight phase. INIT B page (not accessible after engine start) is called up by pressing the "NEXT PAGE" key.
DATA	Calls up the data index page. This gives the flight crew access to various reference pages that show aircraft position, aircraft status, runways, waypoints, navaids, routes, and data stored by the flight crew.
F-PLN	Calls up the flight plan A and B pages, which contain a leg-by-leg description of the active primary flight plan. The flight crew can use the slewing keys to review the entire active flight plan. They can make all lateral and vertical revisions to the flight plan through these pages, using the left LSKs for lateral revision and the right keys for vertical revision.
RAD NAV	Calls up the radio navigation page. This page displays the Radio Navaids tuned automatically or manually through the FMGC.
FUEL PRED	Calls up the fuel prediction page. Once the engines are started, this page displays the fuel predicted to be remaining at the destination and the alternate, as well as fuel management data.
SEC F-PLN	Calls up the index page for the secondary flight plan. The flight crew can use this page to call up the secondary flight plan and all the functions related to it (copying, deleting, reviewing, activating, and the INIT and PERF pages).
ATC COMM	Calls up the ATC applications (if activated).

MCDU MENU Calls up the MCDU MENU page, which displays the subsystems currently addressed via the MCDU. The key next to the name of a subsystem enables the flight crew to select that subsystem.

When the MCDU MENU annunciator lights up, the flight crew should press the MCDU MENU key. The menu will have [REQ] displayed next to the name of the subsystem that requires attention.

Ident.: DSC-22_10-40-10-A-00010104.0009001 / 12 MAY 23

Applicable to: MSN 02926-02944, 04392, 07784-07792

MCDU FUNCTION KEYS

The function keys on the Multipurpose Control and Display Units allow the flight crew to call up MCDU pages quickly.

The following is a summary of the purpose of each key:

- DIR** Calls up the DIR TO page, and enables the flight crew to proceed directly from the present position to any waypoint, entered manually or selected in the active flight plan.
- PROG** Calls up the progress page corresponding to the phase of the active flight plan that is in progress.
- This page displays navigation information and active data such as the optimum and maximum recommended cruise flight levels. It enables the flight crew to update the FMGS position and to obtain a bearing and distance to any location.
- PERF** Calls up the performance pages, that display the optimum speed or Mach number for each phase. The flight crew can amend these pages. The first page to be displayed is the one corresponding to the current flight phase (except for preflight and done phases).
- The flight crew can then use the appropriate 6L or 6R LSK to call up pages corresponding to future flight phases.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - GENERAL PILOT INTERFACE - MCDU
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INIT	Calls up the flight plan initialization (INIT) A page, that also gives access to the INIT B page and the IRS INIT page. The flight crew uses the INIT pages to initialize the Flight Management System for the flight. The flight crew uses the INIT A page to initialize the flight plan, set the departure and arrival airports, and the main flight parameters (for example, cruise FL, Cost Index). The IRS INIT page enables the alignment of the Inertial Reference System (IRS). The flight crew then uses the INIT B page to insert the aircraft weight, block fuel, Center of Gravity (CG), and other fuel requirements. The FMGS uses this data to compute predictions and other fuel planning parameters. The INIT A page is accessed in pre-flight phase to initialize the flight plan. It can also be accessed in flight. The IRS INIT page is accessed via the “IRS INIT” prompt on the INIT A page. The INIT B page is accessed from the INIT A page, by pressing the “←” or “→” scroll keys. It can only be accessed in the pre-flight phase; pressing the scroll keys in flight will revert to the FUEL PRED page.
DATA	Calls up the data index page. This gives the flight crew access to various reference pages that show aircraft position, aircraft status, runways, waypoints, nav aids, routes, and data stored by the flight crew.
F-PLN	Calls up the flight plan A and B pages, which contain a leg-by-leg description of the active primary flight plan. The flight crew can use the slewing keys to review the entire active flight plan. They can make all lateral and vertical revisions to the flight plan through these pages, using the left LSKs for lateral revision and the right keys for vertical revision.
RAD NAV	Calls up the radio navigation page. This page displays the Radio Nav aids tuned automatically or manually through the FMGC.
FUEL PRED	Calls up the fuel prediction page. Once the engines are started, this page displays the fuel predicted to be remaining at the destination and the alternate, as well as fuel management data.
SEC F-PLN	Calls up the index page for the secondary flight plan. The flight crew can use this page to call up the secondary flight plan and all the functions related to it (copying, deleting, reviewing, activating, and the INIT and PERF pages).
ATC COMM	Calls up the ATC applications (if activated).

MCDU MENU Calls up the MCDU MENU page, which displays the subsystems currently addressed via the MCDU. The key next to the name of a subsystem enables the flight crew to select that subsystem.

When the MCDU MENU annunciator lights up, the flight crew should press the MCDU MENU key. The menu will have [REQ] displayed next to the name of the subsystem that requires attention.

Ident.: DSC-22_10-40-10-A-00010107.0005001 / 01 OCT 12

Applicable to: **ALL**

MCDU DISPLAY

The MCDUs display:

- Position and accuracy information
- Tuned nav aids
- Lateral and vertical flight plans (waypoints, pseudo waypoints, constraints)
- Predictions (SPD, TIME, ALT, WIND)
- Fuel predictions and fuel management information (estimated fuel on board, extra fuel)
- Performance data.

F-PLN A page

FROM	AF5612	→
TOP9A	TIME	SPD/ALT
LSGG23	0000	148/ 1365
TOP9A	BRG228°	6NM
PAS	0003	210/*5500
HOLD L	TRK228°	12
7000	0006	" / 7000
[SPD]		0
[LIM]	0006	210/ 7000
TOP9A		5
D136E	0007	*230/*FL90
DEST	TIME	DIST EFOB
LGAT33R	0220	990 8.4
		↑↓

1L

2L

3L

4L

5L

6L

1R

2R

3R

4R

5R

6R

RADIO NAV PAGE

RADIO NAV			
VOR1/FREQ	FREQ/VOR2		
STU/113.10	112.5 / TGO		
CRS	CRS		
[]	[]		
ILS/FREQ			
ISW / 109.90			
CRS SLOPE			
227 -3.0			
ADF1/FREQ	FREQ/ADF2		
TOE/415.00	[] []		
← ADF1 BFO			

1L

2L

3L

4L

5L

6L

1R

2R

3R

4R

5R

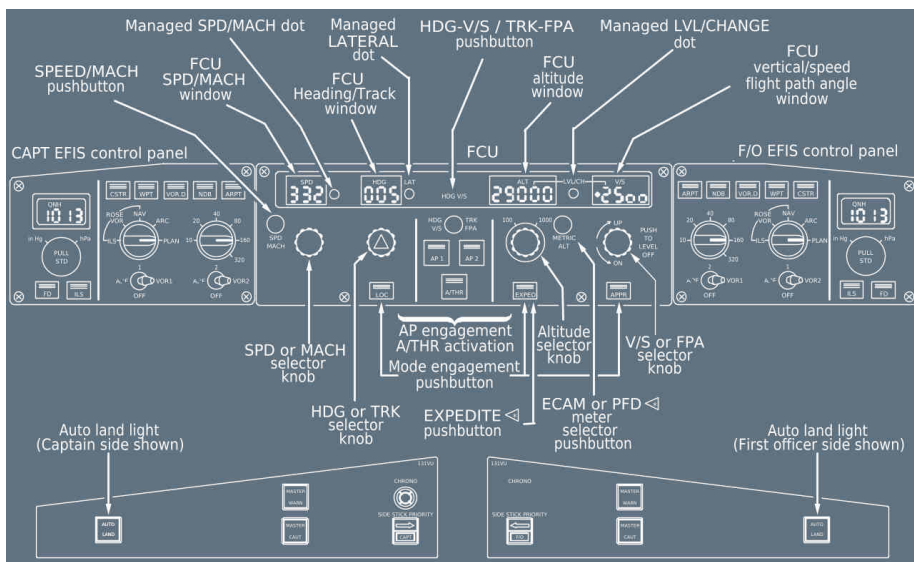
6R

FCU

Ident.: DSC_22_10-40-20-00010112.0003001 / 03 AUG 17

Applicable to: ALL

The Flight Control Unit (FCU) is located on the glareshield and is constituted of three control panels: One for the automatic flight controls and two for the Electronic Flight Instrument System (EFIS). The FCU has two channels, each of which can independently command the central control panel. If one channel fails, the other channel can control all the functions.



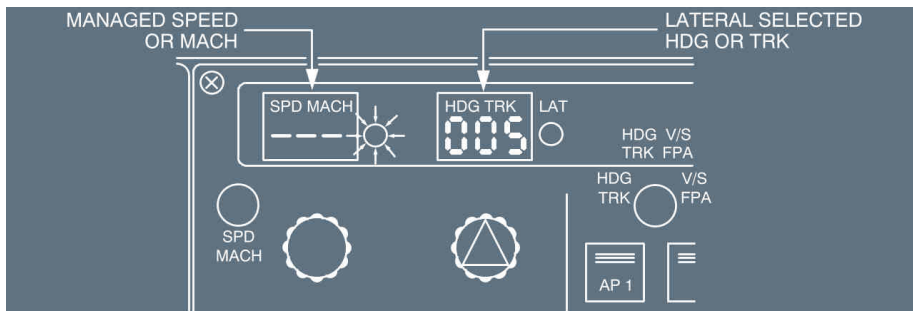
FCU PHILOSOPHY

Ident.: DSC_22_10-40-20-00010113.0002001 / 14 MAY 12

Applicable to: ALL

The flight crew can use two types of guidance to control the aircraft in auto flight. One type is managed by the Flight Management Guidance System (FMGS). The other uses target quantities which are manually entered by the flight crew.

When the aircraft uses target quantities from the FMGS (managed guidance), the FCU windows display dashes and the white dots next to those windows light up. When the aircraft uses target quantities, entered by the flight crew (selected guidance), the windows display the selected numbers and the white dots do not light up.



Note: The altitude window always displays an altitude selected by the flight crew (never dashes).

The FCU has four knobs:

- SPD-MACH
- HDG-TRK
- ALT
- V/S-FPA.

The knobs can be rotated, pushed in, and pulled out:

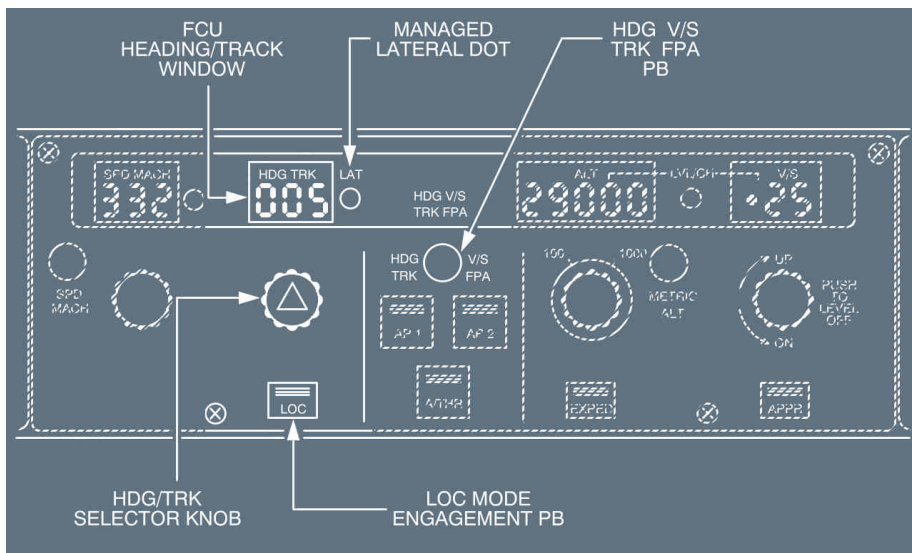
- In order to arm or engage managed guidance for a given mode, the flight crew pushes in the associated knob. If, for example, they push in the HDG knob, they engage or arms the NAV mode.
- In order to engage a selected guidance mode, the flight crew turns the knob to set the desired value, then pulls the knob out to engage the mode with a target value equal to the selected value.

Note: In managed guidance (lateral, vertical guidance or managed speed), the corresponding window is dashed. Turning a knob without pulling it, displays a value that is the sum of the current target and the turn action value. The display remains 45 s on the HDG/TRK and V/S windows and 10 s on the SPD/MACH window before the dashes reappear. This rule does not apply to the ALT knob/window.

LATERAL CONTROL AREA

Ident.: DSC-22_10-40-20-00010115.0007001 / 14 MAY 12

Applicable to: MSN 02155-02212, 04392-07792


HDG/TRK knob

Display range: between 0 ° and 359 °.

One rotation of the knob corresponds to 32 ° (1 ° per click).

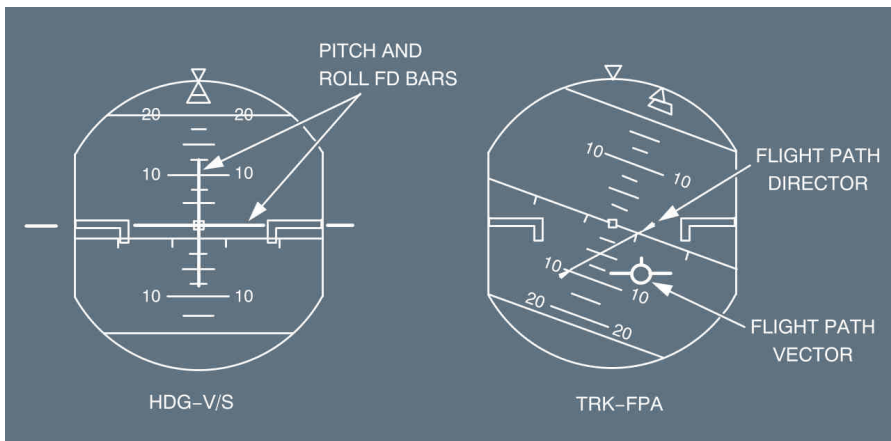
LOC pb

Pushing this pushbutton arms, engages, or disengages the LOC mode.

HDG V/S – TRK FPA pb

The flight crew uses this pushbutton to select HDG (associated with V/S) or TRK (associated with FPA). Pushing it:

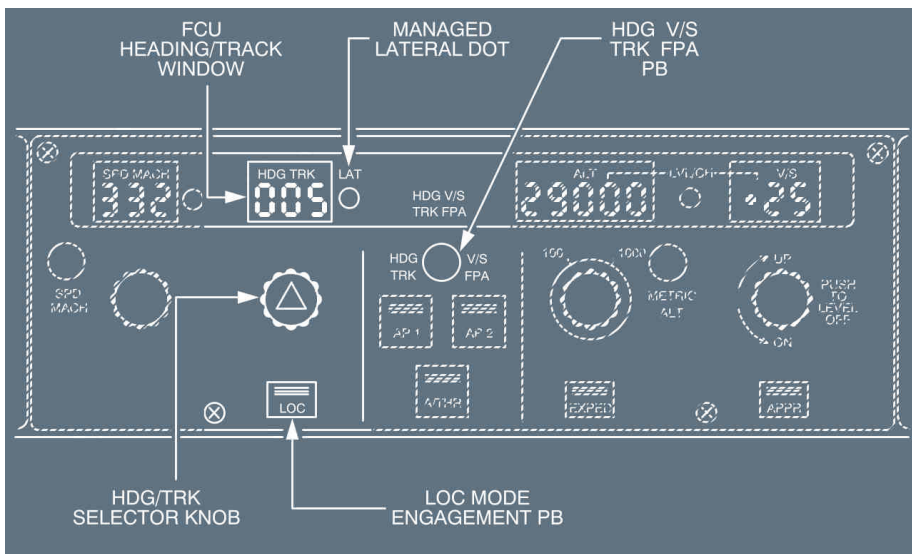
- Displays the Flight Path Vector (FPV) on the Primary Flight Display (PFD) or deletes it.
- On the PFD, changes the FD crossbar display (with the aircraft attitude as its reference) to the aircraft Flight Path Director (with the flight path vector as its reference) and vice versa.
- Changes heading reference into track reference in the HDG/TRK window and vice versa.
- Changes vertical speed reference target into flight path angle reference target in the V/S-FPA window and vice versa.



LATERAL CONTROL AREA

Ident.: DSC-22_10-40-20-00010115.0009001 / 14 MAY 12

Applicable to: MSN 02719-03060



HDG/TRK knob

Display range: between 0 ° and 359 °.

One rotation of the knob corresponds to 32 ° (1 ° per click).

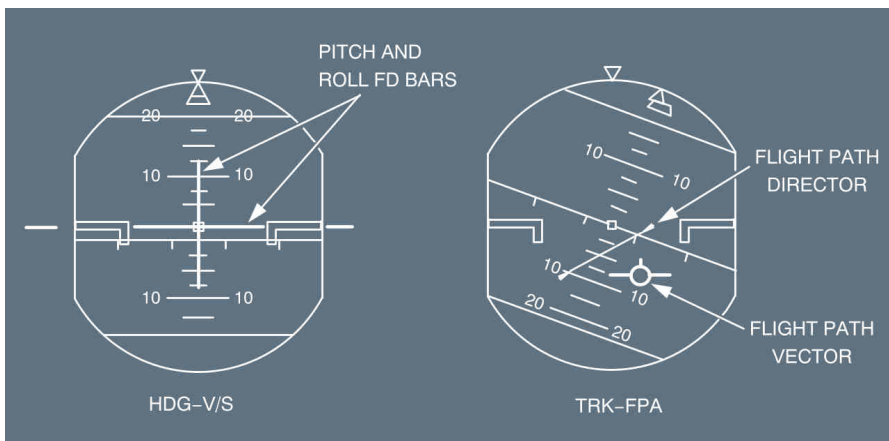
LOC pb

Pushing this pushbutton arms, engages, or disengages the LOC mode or the LOC B/C mode.

HDG V/S – TRK FPA pb

The flight crew uses this pushbutton to select HDG (associated with V/S) or TRK (associated with FPA). Pushing it:

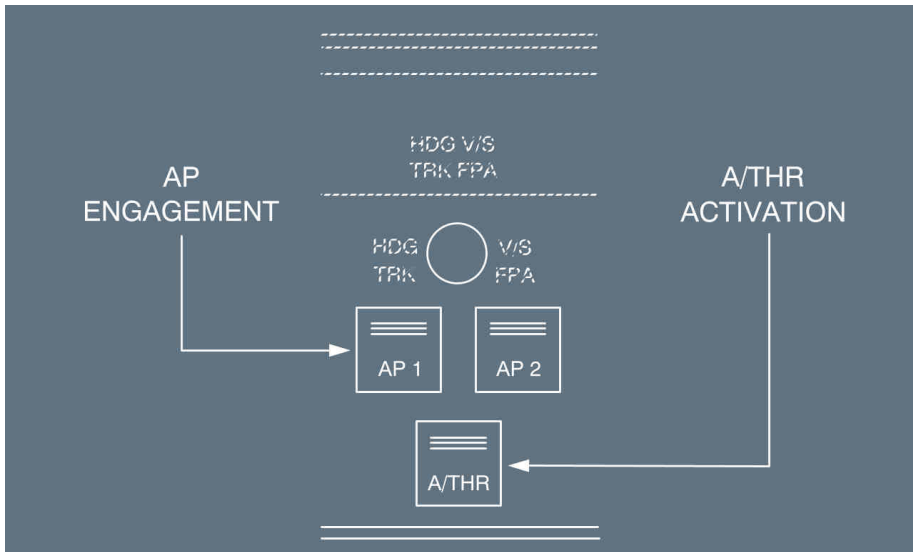
- Displays the Flight Path Vector (FPV) on the Primary Flight Display (PFD) or deletes it.
- On the PFD, changes the FD crossbar display (with the aircraft attitude as its reference) to the aircraft Flight Path Director (with the flight path vector as its reference) and vice versa.
- Changes heading reference into track reference in the HDG/TRK window and vice versa.
- Changes vertical speed reference target into flight path angle reference target in the V/S-FPA window and vice versa.



AP-A/THR CONTROL AREA

Ident.: DSC-22_10-40-20-00010116.0001001 / 14 MAY 12

Applicable to: ALL


AP1 pb AND AP2 pb

The flight crew uses these pushbuttons to engage or disengage the autopilots. The buttons illuminate green when the autopilot is engaged.

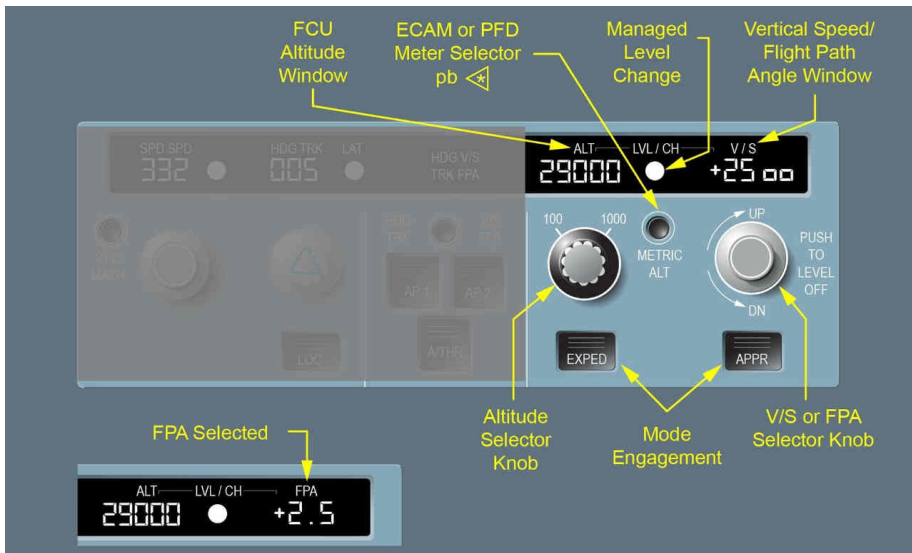
A/THR pb

The flight crew uses this pushbutton to arm, activate, or disconnect the autothrust (A/THR). This button illuminates green if the A/THR is armed or active.

VERTICAL CONTROL AREA

Ident.: DSC-22_10-40-20-00010117,0006001 / 18 MAY 22

Applicable to: MSN 02155-04392, 07784-07792



The FCU altitude window always displays a target value selected by the flight crew. It never displays dashes.

Altitude knob (INNER AND OUTER)

Display range: 100 to 49 000 ft

- The outer knob has two positions: 100 and 1000
- The inner knob sets the altitude in the FCU window in increments of 100 or 1 000 ft, depending upon the position of the outer knob.

EXPED pb

This pushbutton is used to engage the expedite mode (*Refer to DSC-22_30-80-20 EXP CLB, Refer to DSC-22_30-80-20 EXP DES*).

METRIC ALT pb

This pushbutton is used to display the FCU altitude target in meters on the ECAM, or the current altitude and FCU/FM altitude target in meters on the PFD .

V/S or FPA knob

Range (V/S) : -6 000 to +6 000 ft/min

2 clicks = 100 ft/min

If the flight crew turns the knob slowly, each click equals 100 ft/min.

Range (FPA) : -9.9 ° to +9.9 °

1 click = 0.1 °

The flight crew turns this knob to set the value of V/S or FPA to be displayed in the V/S or FPA window (they choose which, V/S or FPA, is to be displayed by pushing the HDG V/S - TRK FPA pb).

One rotation of the knob corresponds to 32 clicks. One complete rotation sets:

FPA = 3.2 °

V/S = 1 600 ft/min

When turned, if in **V/S** or **FPA** mode, selects a vertical speed or flight path angle target. If not in **V/S** or **FPA** mode (V/S / FPA window is dashed), preselects a vertical speed or flight path angle target. When the **V/S** or **FPA** mode engages (flight crew action or mode reversion), this preselected value becomes the target.

***Note:** If the **V/S** or **FPA** mode is not engaged within 45 s after preselection, the preselected value is cancelled and the dashes reappear.*

When the flight crew pushes the V/S or FPA knob, the system commands an immediate level-off by engaging the **V/S** or **FPA** mode with a target of zero. When the aircraft V/S or FPA becomes zero, the FMA displays **V/S = 0**. If the flight crew then turns the knob to set a new value for V/S or FPA, the aircraft changes flight path accordingly.

APPR pb

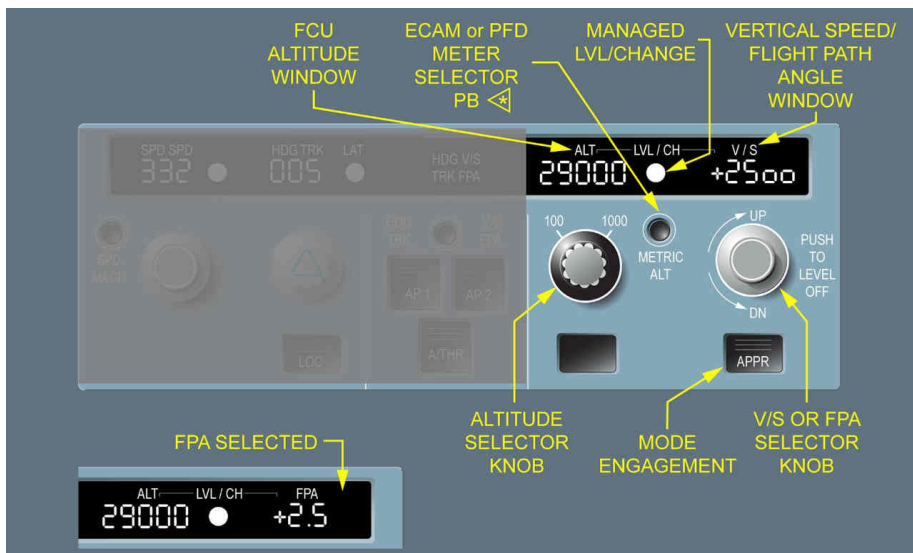
This pushbutton arms, disarms, engages, or disengages the approach modes:

- LOC and G/S modes, if an ILS approach is selected in the active F-PLN.
- APP NAV-FINAL modes, if a non precision approach is selected in the active F-PLN.

VERTICAL CONTROL AREA

Ident.: DSC-22_10-40-20-00010117.0012001 / 28 MAY 20

Applicable to: MSN 05152-05746



The FCU altitude window always displays a target value selected by the flight crew. It never displays dashes.

Altitude knob (INNER AND OUTER)

Display range: 100 to 49 000 ft

- The outer knob has two positions: 100 and 1000
- The inner knob sets the altitude in the FCU window in increments of 100 or 1 000 ft, depending upon the position of the outer knob.

METRIC ALT pb

This pushbutton is used to display the FCU altitude target in meters on the ECAM, or the current altitude and FCU/FM altitude target in meters on the PFD  .

V/S or FPA knob

Range (V/S) : -6 000 to +6 000 ft/min

2 clicks = 100 ft/min

If the flight crew turns the knob slowly, each click equals 100 ft/min.

Range (FPA) : -9.9° to $+9.9^{\circ}$
1 click = 0.1°

The flight crew turns this knob to set the value of V/S or FPA to be displayed in the V/S or FPA window (they choose which, V/S or FPA, is to be displayed by pushing the HDG V/S - TRK FPA pb).

One rotation of the knob corresponds to 32 clicks. One complete rotation sets:

FPA = 3.2°

V/S = 1 600 ft/min

When turned, if in **V/S** or **FPA** mode, selects a vertical speed or flight path angle target. If not in **V/S** or **FPA** mode (V/S / FPA window is dashed), preselects a vertical speed or flight path angle target. When the **V/S** or **FPA** mode engages (flight crew action or mode reversion), this preselected value becomes the target.

Note: If the **V/S** or **FPA** mode is not engaged within 45 s after preselection, the preselected value is cancelled and the dashes reappear.

When the flight crew pushes the V/S or FPA knob, the system commands an immediate level-off by engaging the **V/S** or **FPA** mode with a target of zero. When the aircraft V/S or FPA becomes zero, the FMA displays **V/S = 0**. If the flight crew then turns the knob to set a new value for V/S or FPA, the aircraft changes flight path accordingly.

APPR pb

This pushbutton arms, disarms, engages, or disengages the approach modes:

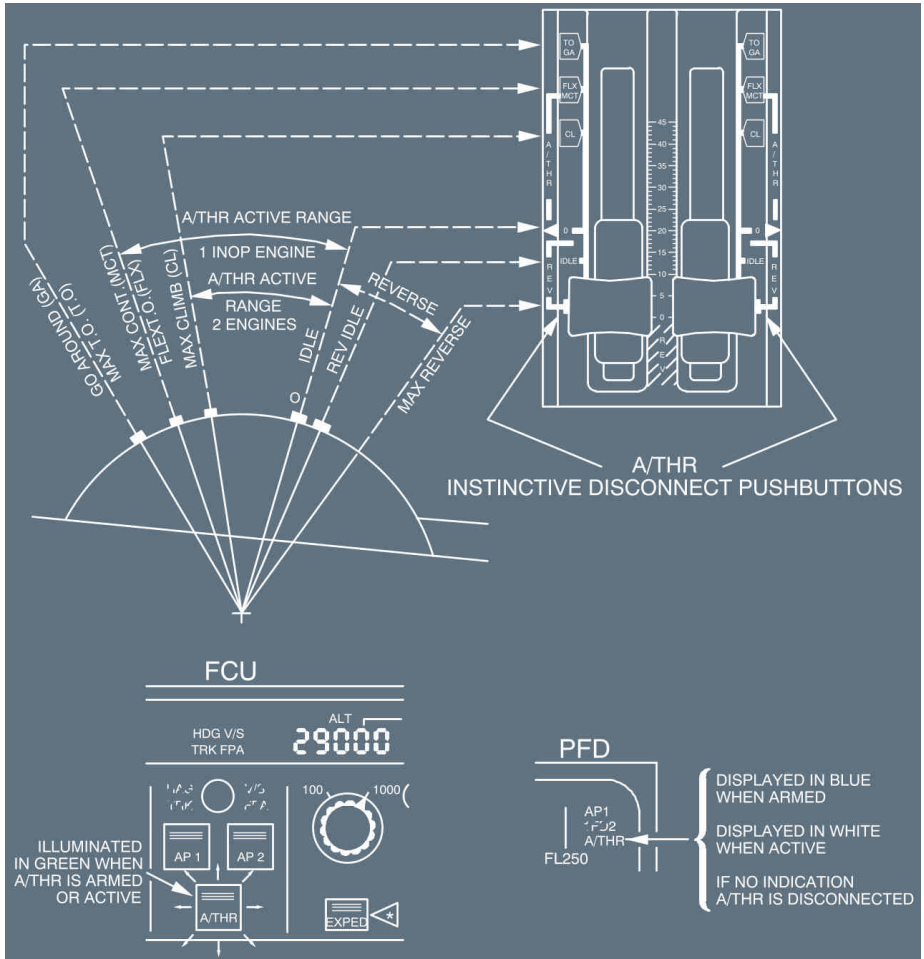
- LOC and G/S modes, if an ILS approach is selected in the active F-PLN.
- APP NAV-FINAL modes, if a non precision approach is selected in the active F-PLN.

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THRUST LEVERS

Ident.: DSC-22_10-40-30-00010119.0001001 / 14 MAY 12

Applicable to: ALL



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PFD

Ident.: DSC-22_10-40-40-00010677.0001001 / 05 MAR 19

Applicable to: ALL

The FMGS generates the following information to the PFD:

- Armed and Engaged modes on the FMA
- FMGS guidance targets on the SPD, ALT, and HDG scales
- Vertical deviation from descent profile on the ALT scale
- Approach trajectory deviations
- Flight crew awareness messages.

For all details, *Refer to DSC-31_40 Indications on PFD.*

Intentionally left blank

ND

Ident.: DSC-22_10-40-50-00010123.0001001 / 17 AUG 10

Applicable to: ALL

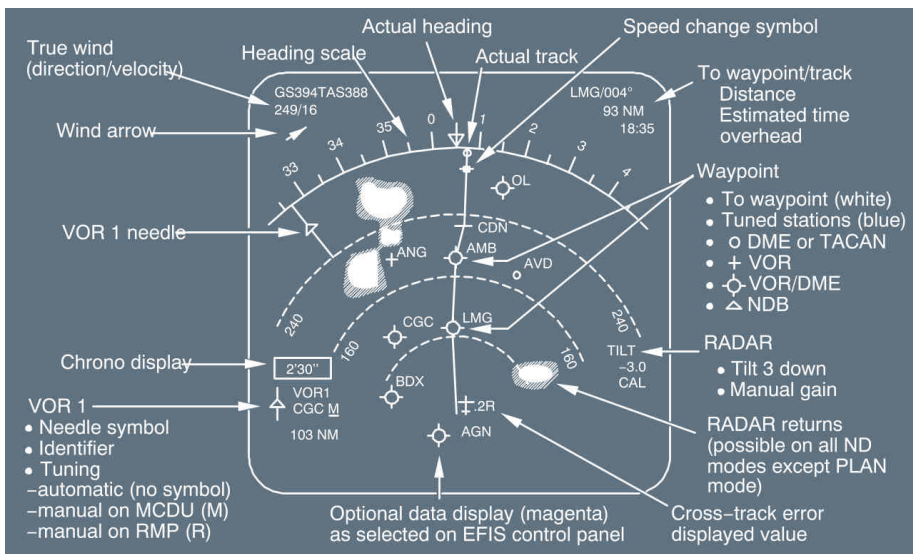
The FMGS generates the following information, displayed on the EFIS Navigation Displays:

- Flight plan (active secondary, temporary, dashed)
- Aircraft position and lateral deviation from the flight plan
- Pseudo-waypoints along the flight plan
- Raw data from tuned Nav aids and type of selected approach
- Various display options (waypoints, Nav aids, NDBs, airports, constraints)
- Wind information and various messages.

ARC MODE

Ident.: DSC-22_10-40-50-00010124.0001001 / 14 MAY 12

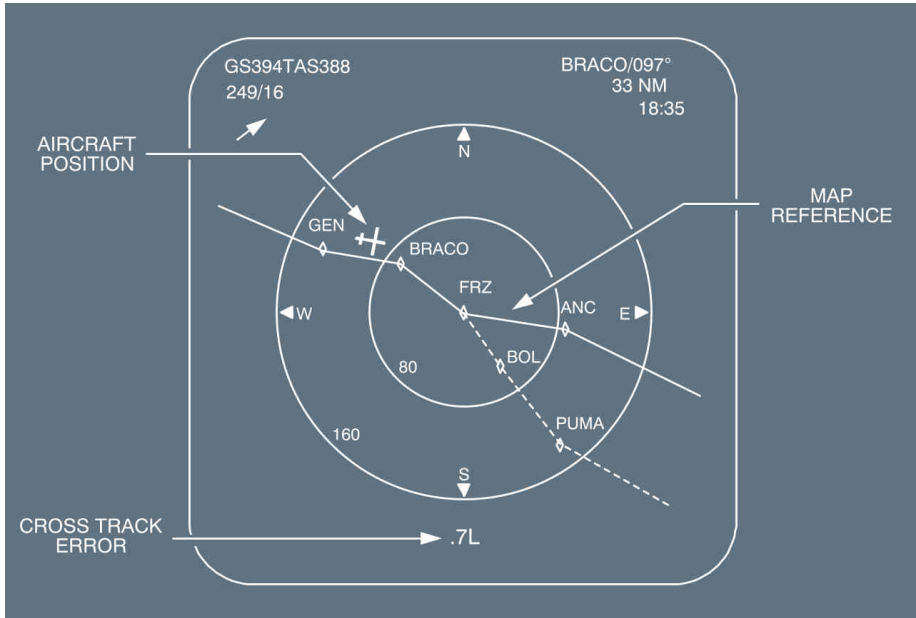
Applicable to: ALL



PLAN MODE

Ident.: DSC-22_10-40-50-00010125.0001001 / 01 OCT 12

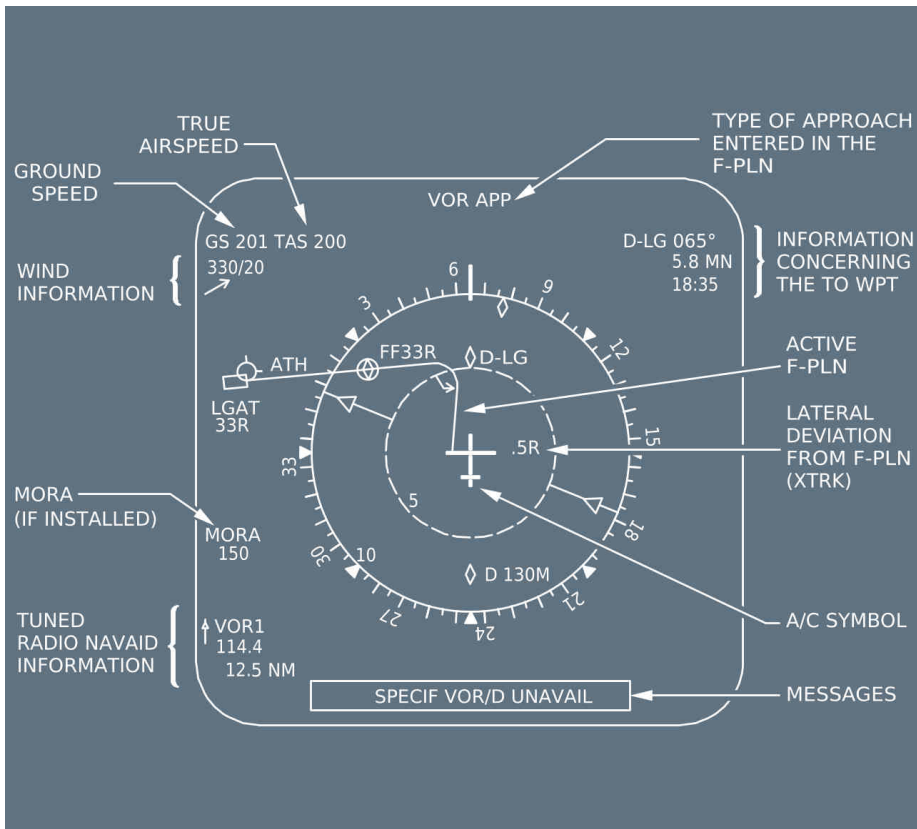
Applicable to: ALL



ROSE MODES

Ident.: DSC-22_10-40-50-00010126.0022001 / 09 MAR 15

Applicable to: ALL



AIRCRAFT SYSTEMS
AUTO FLIGHT - GENERAL
PILOT INTERFACE - NAVIGATION DISPLAY
FLIGHT PLAN DISPLAY COLORS

Ident.: DSC-22_10-40-50-00010127.0001001 / 17 AUG 10

Applicable to: MSN 02926-02944, 04392, 07784-07792

F-PLN	Color
Primary Flight Plan	- Managed mode: Steady green - Selected mode: Dashed green
Track line	Steady green
Alternate flight plan	Dashed blue
Missed approach	Steady blue
Offset flight plan	Steady green (Original flight plan: Dashed green)
Temporary flight plan	Dashed yellow
Engine-out SID (not inserted)	Steady yellow
Secondary flight plan	Steady dimmed white

FLIGHT PLAN DISPLAY COLORS

Ident.: DSC-22_10-40-50-00010127.0002001 / 17 AUG 10

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

F-PLN	Color
Primary Flight Plan	- Managed mode: Steady green - Selected mode: Dashed green
Track line	Steady green
Alternate flight plan	Dashed blue
Missed approach	Steady blue
Offset flight plan	Steady green (Original flight plan: Dashed green)
Temporary flight plan	Dashed yellow
Engine-out SID (not inserted)	Steady yellow
Secondary flight plan	Steady dimmed white
Abeam/Radial	Dashed blue

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - GENERAL SPEEDS DEFINITION - GENERAL
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GENERAL

Ident.: DSC-22_10-50-10-00020369.0001001 / 17 MAR 17

Applicable to: ALL

This chapter shows the speed symbols and definitions.
The source of the computation is also given, when applicable.

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CHARACTERISTIC SPEEDS

Ident.: DSC-22_10-50-20-00020370.0002001 / 03 DEC 19

Applicable to: MSN 02155-05253

The characteristic speeds displayed on the PFD are computed by the Flight Augmentation Computer (FAC), according to aerodynamic data.

VLS (of normal landing configuration: CONF 3 or FULL), F, S and Green Dot speeds are also displayed on the MCDU TAKEOFF and/or APPR pages.

The speeds displayed by the MCDU are computed by the FMS, based on the aircraft gross weight (which is computed according to the entered ZFW and the FOB), or the predicted gross weight (for approach or go-around).

VS : Stalling speed.

Not displayed.

For a conventional aircraft, the reference stall speed, VSmin, is based on a load factor that is less than 1 g. This gives a stall speed that is lower than the stall speed at 1 g. All operating speeds are expressed as functions of this speed (for example, VREF = 1.3 VSmin).

Because aircraft of the A320 family have a low-speed protection feature (alpha limit) that the flight crew cannot override, Airworthiness Authorities have reconsidered the definition of stall speed for these aircraft.

All the operating speeds must be referenced to a speed that can be demonstrated by flight tests. This speed is designated VS1g.

Airworthiness Authorities have agreed that a factor of 0.94 represents the relationship between VS1g for aircraft of the A320 family and VSmin for conventional aircraft types. As a result, Authorities allow aircraft of the A320 family to use the following factors :

$$V_2 = 1.2 \times 0.94 \text{ VS1g} = 1.13 \text{ VS1g}$$

$$V_{\text{REF}} = 1.3 \times 0.94 \text{ VS1g} = 1.23 \text{ VS1g}$$

These speeds are identical to those that the conventional 94 % rule would have defined for these aircraft. The A318, A319, A320 and A321 have exactly the same maneuver margin that a conventional aircraft would have at its reference speeds.

The FCOM uses VS for VS1g.

AIRCRAFT SYSTEMS
AUTO FLIGHT - GENERAL
SPEEDS DEFINITION - CHARACTERISTIC SPEEDS

VLS : Lowest Selectable Speed.

Represented by the top of an amber strip along the airspeed scale on the PFD.

Computed by the FAC, based on aerodynamic data, and corresponds to 1.13 VS during takeoff, or following a touch and go.

Becomes 1.23 VS, after retraction of one step of flaps.

Becomes 1.28 VS, when in clean configuration.

***Note:** If in CONF 0 VLS were 1.23 VS (instead of 1.28 VS), the alpha protection strip would hit the VLS strip on the PFD.*

Above 20 000 ft, VLS is corrected for Mach effect to maintain a buffet margin of 0.2 g.

In addition, VLS increases when the speedbrakes are extended.

F : Minimum speed at which the flaps may be retracted at takeoff.

In approach, used as a target speed when the aircraft is in CONF 2 or CONF 3.

Represented by "F" on the PFD speed scale. Equal to about 1.18 VS to 1.22 VS of CONF 1 + F.

S : Minimum speed at which the slats may be retracted at takeoff.

In approach, used as a target speed when the aircraft is in CONF 1.

Represented by "S" on the PFD airspeed scale.

Equal to about 1.22 VS to 1.25 VS of clean configuration.

O : Green dot speed.

Engine-out operating speed in clean configuration.

(Best lift-to-drag ratio speed).

Also corresponds to the final takeoff speed.

Represented by a green dot on the PFD scale.

Below 20 000 ft equal to 2 × weight (metric tons) +85

Above 20 000 ft, add 1 kt per 1 000 ft

CHARACTERISTIC SPEEDS

Ident.: DSC-22_10-50-20-00020370.0012001 / 03 DEC 19

Applicable to: MSN 05746-07792

The characteristic speeds displayed on the PFD are computed by the Flight Augmentation Computer (FAC), according to the FMS weight data (for PFD/MCDU display consistency and accuracy purposes), and aerodynamic data as a backup.

VLS (of normal landing configuration: CONF 3 or FULL), F, S, and Green Dot speeds are also displayed on the MCDU TAKEOFF and/or APPR pages.

The speeds displayed by the MCDU are computed by the FMS, based on the aircraft gross weight (which is computed according to the entered ZFW and the FOB), or the predicted gross weight (for approach or go-around).

VS : Stalling speed.

Not displayed.

For a conventional aircraft, the reference stall speed, VSmin, is based on a load factor that is less than 1 g. This gives a stall speed that is lower than the stall speed at 1 g. All operating speeds are expressed as functions of this speed (for example, VREF = 1.3 VSmin).

Because aircraft of the A320 family have a low-speed protection feature (alpha limit) that the flight crew cannot override, Airworthiness Authorities have reconsidered the definition of stall speed for these aircraft.

All the operating speeds must be referenced to a speed that can be demonstrated by flight tests. This speed is designated VS1g.

Airworthiness Authorities have agreed that a factor of 0.94 represents the relationship between VS1g for aircraft of the A320 family and VSmin for conventional aircraft types. As a result, Authorities allow aircraft of the A320 family to use the following factors:

- $V_2 = 1.2 \times 0.94 \text{ VS1g} = 1.13 \text{ VS1g}$
- $V_{\text{REF}} = 1.3 \times 0.94 \text{ VS1g} = 1.23 \text{ VS1g}$

These speeds are identical to those that the conventional 94 % rule would have defined for these aircraft. The A318, A319, A320, and A321 have exactly the same maneuver margin that a conventional aircraft would have at its reference speeds.

The FCOM uses VS for VS1g.

VLS : Lowest Selectable Speed.

Represented by the top of an amber strip along the airspeed scale on the PFD.

Computed by the FAC based on FMS weight data, and on aerodynamic data as a backup, and corresponds to 1.13 VS during takeoff or following a touch and go.

Becomes 1.23 VS, after retraction of one step of flaps.

Becomes 1.28 VS, when in clean configuration.

Note: If in CONF 0 VLS were 1.23 VS (instead of 1.28 VS), the alpha protection strip would hit the VLS strip on the PFD.

Above 20 000 ft, VLS is corrected for Mach effect to maintain a buffet margin of 0.2 g.

In addition, VLS increases when the speedbrakes are extended.

F : Minimum speed at which the flaps may be retracted at takeoff.

In approach, used as a target speed when the aircraft is in CONF 2 or CONF 3.

Represented by "F" on the PFD speed scale. Equal to about 1.18 VS to 1.22 VS of CONF 1 + F.

AIRCRAFT SYSTEMS**AUTO FLIGHT - GENERAL****SPEEDS DEFINITION - CHARACTERISTIC SPEEDS**

- S** : Minimum speed at which the slats may be retracted at takeoff.
In approach, used as a target speed when the aircraft is in CONF 1.
Represented by “S” on the PFD airspeed scale.
Equal to about 1.22 VS to 1.25 VS of clean configuration.
- O** : Green dot speed.
Engine-out operating speed in clean configuration.
(Best lift-to-drag ratio speed).
Also corresponds to the final takeoff speed.
Represented by a green dot on the PFD scale.
Below 20 000 ft equal to $2 \times \text{weight (metric tons)} + 85$
Above 20 000 ft, add 1 kt per 1 000 ft

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - GENERAL SPEEDS DEFINITION - LIMIT SPEEDS
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LIMIT SPEEDS

Ident.: DSC-22_10-50-30-00020383.0001001 / 17 MAR 17

Applicable to: ALL

- VA : Maximum design maneuvering speed. This corresponds to the maximum structural speed permitted for full control deflection, if alternate or direct law is active.
- VMCG : Minimum speed, on the ground during takeoff, at which the aircraft can be controlled by only using the primary flight controls, after a sudden failure of the critical engine, the other engine remaining at takeoff thrust.
- VMCA : Minimum control speed in flight at which the aircraft can be controlled with a maximum bank of 5 °, if one engine fails, the other engine remaining at takeoff thrust (takeoff flap setting, gear retracted).
- VMCL : Minimum control speed in flight, at which the aircraft can be controlled with a maximum bank of 5 °, if one engine fails, the other engine remaining at takeoff thrust (approach flap setting).
- VFE : Maximum speed for each flap configuration.
- VLE : Maximum speed with landing gear extended.
- VLO : Maximum speed for landing gear operation.
- VMO : Maximum speed.
- VFE NEXT : Maximum speed for the next (further extended) flap lever position.

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - GENERAL SPEEDS DEFINITION - PROTECTION SPEEDS
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PROTECTION SPEEDS

Ident.: DSC-22_10-50-40-00020382.0001001 / 17 MAR 17

Applicable to: ALL

V α PROT, V α MAX and VSW are computed by the FAC, based on aerodynamic data. They are only used for display on the PFD, and not for flight control protection (the activation of the protections is computed by the ELAC).

V α PROT : Angle of attack protection speed.

Corresponds to the angle of attack at which the angle of attack protection becomes active.

Represented by the top of a black and amber strip along the PFD speed scale, in normal law.

V α MAX : Maximum angle of attack speed.

Corresponds to the maximum angle of attack that may be reached in pitch normal law.

Represented by the top of a red strip along the PFD speed scale, in normal law.

VSW : Stall warning speed.

Represented by a red and black strip along the speed scale when the flight control normal law is inoperative.

VMAX : Represented by the bottom of a red and black strip along the speed scale.

Determined by the FAC according to the aircraft configuration.

Is equal to VMO (or speed corresponding to MMO), VLE or VFE.

AIRCRAFT SYSTEMS

AUTO FLIGHT - GENERAL

SPEEDS DEFINITION - PROTECTION SPEEDS

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - GENERAL SPEEDS DEFINITION - OTHER SPEEDS
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OTHER SPEEDS

Ident.: DSC-22_10-50-50-00020384.0004001 / 02 MAY 24

Applicable to: ALL

- V1** : The highest speed, during takeoff, at which the flight crew has a choice between continuing the takeoff or stopping the aircraft.
Represented by “1” on the airspeed scale (or the V1 value when it is off the airspeed scale).
Inserted manually through the MCDU by the flight crew.
Displayed on the MCDU TAKEOFF page.
- VR** : The speed at which the pilot rotates in order to reach V2 at an altitude of 35 ft at the latest after an engine failure.
Inserted manually through the MCDU by the flight crew.
Displayed on the MCDU TAKEOFF page.
- V2** : Takeoff safety speed that the aircraft attains at the latest at an altitude of 35 ft with one engine failed, and maintains during the second segment of the takeoff.
Represented by the SPEED SELECT symbol on the speed scale.
Minimum value equal to 1.13 VS for the corresponding configuration.
Inserted manually through the MCDU by the flight crew.
Displayed on the MCDU TAKEOFF page.
- VREF** : Reference speed used for normal final approach.
Equal to VLS of CONF FULL.
Displayed on the MCDU APPR page, if landing is planned in CONF FULL (VLS CONF FULL).
- VAPP** : Final approach speed.
Displayed on MCDU APPR page.
Calculated by the FMGCs.
Represents : $VAPP = VLS + \text{wind correction}$
The wind correction is limited to a minimum of 5 kt and a maximum of 15 kt.
Considering operational conditions, the flight crew may modify VAPP through the MCDU. *Refer to EFB-LDG-50 Landing Performance without In-Flight Failure*

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AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

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DSC-22_20-10 System Description

DSC-22_20-10-10 Overview

Overview.....	A
---------------	---

DSC-22_20-10-20 Navigation

DSC-22_20-10-20-05 General

Navigation.....	A
-----------------	---

DSC-22_20-10-20-10 Position Computation

General.....	A
MIX IRS Position.....	B
GPS Position.....	C
Radio Position.....	D
FM Position.....	E
Position Monitor.....	F
Takeoff Update.....	G
Navigation Modes.....	H

DSC-22_20-10-20-20 Evaluation of Position Accuracy

General.....	A
Estimated Position Uncertainty.....	B
FM/GPS Position Disagreement.....	C

DSC-22_20-10-20-30 Radio Navigation Tuning

General.....	A
Architecture.....	B
VOR.....	C
DME.....	D
ADF.....	E
ILS.....	F
Selection of Nav aids on MCDU Pages.....	G
Manual Tuning.....	H
Nav aid Identification.....	I

DSC-22_20-10-20-40 Alignment of Inertial Reference System

Alignment of Inertial Reference System.....	A
---	---

DSC-22_20-10-20-50 Navigation Database

General.....	A
--------------	---

DSC-22_20-10-30 Flight Planning

DSC-22_20-10-30-05 General

Flight Planning.....	A
----------------------	---

Continued on the following page

Continued from the previous page

DSC-22_20-10-30-10 Lateral Functions - General

General.....	A
Manual Legs.....	B
Flight Plan Construction.....	C
Flight Plan Capacity.....	D
Lateral Revisions.....	E

DSC-22_20-10-30-12 Lateral Functions - FMS2 HONEYWELL

General.....	A
Temporary F-PLN (TMPY).....	B
Inserting an Airway with "Via".....	C
Inserting a Waypoint.....	D
Fix Info.....	E
Inserting a New Destination.....	F
Holding Pattern.....	G
Offset.....	H
Alternate Function.....	I
Enable ALTN.....	J
DIR Key (Direct-to-Function).....	K
OVFY (Overfly) Key.....	L
POSITION update at.....	M

DSC-22_20-10-30-13 Lateral Functions - FMS2 Thales

General.....	A
Temporary F-PLN (TMPY).....	B
Inserting an Airway with "VIA".....	C
Inserting a Waypoint.....	D
Fix Info.....	E
Inserting a New Destination.....	F
Holding Pattern.....	G
Offset.....	H
Alternate Function.....	I
Enable ALTN.....	J
DIR Key (DIRECT-TO-FUNCTION).....	K
OVFY (Overfly) Key.....	L
POSITION UPDATE AT.....	M
UPDATE AT.....	N
Changing the Departure/Arrival.....	O

Continued on the following page

*Continued from the previous page***1 DSC-22_20-10-30-20 Vertical Functions - General**

General.....	A
Vertical Flight Planning.....	B
Introduction.....	C
Flight Phases.....	D
Vertical Revision.....	E
Vertical Constraints (Speed, Altitude, Time).....	F
General.....	G
Estimated Takeoff Time (ETT).....	H
Step Climb/Step Descent.....	I

DSC-22_20-10-30-23 Vertical Functions - FMS2 Thales

General.....	A
Time Constraint/RTA.....	B
Wind - Temperature - QNH.....	C
Constant Mach.....	D

DSC-22_20-10-30-22 Vertical Functions - FMS2 Honeywell

General.....	A
Required Time of Arrival (RTA).....	B
Wind - Temperature - QNH.....	C
Constant Mach Segment.....	D

DSC-22_20-10-30-30 Diversion

General.....	A
Diversion to Preplanned Alternate Airport.....	B
En Route Diversion with Several Airports Available.....	C
En Route Diversion over Oceanic or Desertic Area.....	D
Diversion Preparation on the Secondary Flight Plan.....	E
Miscellaneous.....	F
Execution of the Diversion.....	G
Diversion to the Alternate Airport.....	H
Using the Secondary Flight Plan Function.....	I
Using New Destination Function.....	J
Equitime Point.....	K
Equitime Point Entry.....	L
Closest Airports.....	M

DSC-22_20-10-30-40 Secondary Flight Plan

Secondary Flight Plan.....	A
----------------------------	---

Continued on the following page

Continued from the previous page

DSC-22_20-10-40 Performance

DSC-22_20-10-40-10 Optimization

General.....	A
Optimization.....	B
Descent Profile Optimization 	C

DSC-22_20-10-40-20 Cost Index

Cost Index (CI).....	A
----------------------	---

DSC-22_20-10-40-30 Predictions

General.....	A
Predictions for the Primary Flight Plan.....	B
Computation of Predictions.....	C
Predictions Displayed on the Navigation Display.....	D
Predictions Displayed on the MCDU.....	E
Type of Predictions.....	F
Examples of MCDU Predictions.....	G
Constraint Symbols (Star).....	H
Vertical Deviation.....	I
Operation Rules Concerning Predictions.....	J
Other Computations.....	K
Return-to-Trajectory Assumptions.....	L
Energy Circle.....	M
Introduction to PERF and IDLE Factors.....	N
PERF Factor.....	O
IDLE Factor.....	P
Procedure to Modify the PERF and IDLE Factors.....	Q

DSC-22_20-10-50 Engine Out

General.....	A
Flight Management Part.....	B
Flight Guidance Part.....	C
Autothrust.....	D
Engine-Out Conditions.....	E
Engine-Out SID.....	F
Engine-Out in CLB Phase (above acceleration altitude).....	G
Engine-Out in Cruise Phase.....	H
Engine-Out in Descent Phase.....	I
Engine-Out In Approach Phase.....	J
Engine-Out in Go-Around Phase.....	K

Continued on the following page

Continued from the previous page

DSC-22_20-10-70 Takeoff Surveillance and Monitoring

DSC-22_20-10-70-10 Takeoff Surveillance Function

Takeoff Surveillance Function.....	A
Associated Alerts and Messages.....	B

DSC-22_20-10-80 Print Functions

Print Function.....	A
Print Function Access.....	B
On Ground Before Engine Start.....	C
Example (FM Preflight Report).....	D
In Flight.....	E
Example (FM Inflight Report).....	F
Reaching the Gate After Landing.....	G
Example (FM Postflight Report).....	H

DSC-22_20-20 Controls and Indicators

DSC-22_20-20-10 MCDU - Page Description

DSC-22_20-20-10-25 FMS2 Honeywell

General.....	A
MCDU MENU Page.....	B
INIT A Page.....	C
Route Selection Page.....	D
IRS INIT Page.....	E
WIND Pages.....	F
INIT B Page.....	G
Fuel Prediction Page.....	H
Flight Plan Pages.....	I
Lateral Revision Pages.....	J
Fix Info Page.....	K
Offset Page.....	L
Airways Page.....	M
Departure Pages.....	N
Hold Pages.....	O
Direct TO Page.....	P
ARRIVAL Pages.....	Q
Alternate Page.....	R
Route Selection Page for Alternate.....	S
VERTICAL REVISION Pages.....	T
Step ALTS Page.....	U

Continued on the following page

Continued from the previous page

RTA Page.....	V
Data Index Pages.....	W
Waypoint/Stored Waypoint/New Waypoint Pages.....	X
NAVAID/Stored NAVAID/New NAVAID Pages.....	Y
Runways/Stored Runways/New Runway Pages.....	Z
Route/Stored Route/New Route Pages.....	AA
Aircraft Status Page.....	AB
P/N XLOAD Page.....	AC
P/N Status Pages.....	AD
Duplicate Names Page.....	AE
Position Monitor Page.....	AF
Position Monitor and Position Frozen Page.....	AG
Selected NAVAIDS Page.....	AH
IRS Monitor Page.....	AI
GPS Monitor Page 	AJ
Closest Airports Pages.....	AK
Equi-Time Point Page.....	AL
Print Function Pages.....	AM
ACARS Function Page.....	AN
ACARS Function Page 1.....	AO
Uplink TO Data REQ Pages.....	AP
Uplink MAX TO Data Pages.....	AQ
Uplink FLX TO Data Pages.....	AR
ACARS Function Page 2.....	AS
PERF Page.....	AT
PERF Takeoff Page.....	AU
PERF Climb Page.....	AV
PERF Cruise Page.....	AW
PERF Descent Page.....	AX
PERF APPR Page.....	AY
PERF Go Around Page.....	AZ
PROG Pages.....	BA
Predictive GPS Pages.....	BB
Report Page.....	BC
RADIO NAV Page.....	BD
Secondary Pages.....	BE
Back Up NAV Pages.....	BF

Continued on the following page

Continued from the previous page
DSC-22_20-20-10-28 FMS2 Thales

GENERAL.....	A
MCDU MENU Page.....	B
INIT A Page.....	C
ROUTE SELECTION Page.....	D
IRS INIT Page.....	E
WIND Pages.....	F
INIT B Page.....	G
FUEL PREDICTION Page.....	H
FLIGHT PLAN Pages.....	I
LATERAL REVISION Pages.....	J
AIRWAYS Page.....	K
DEPARTURE Pages.....	L
HOLD Pages.....	M
DIRECT TO Page.....	N
ARRIVAL Pages.....	O
ALTERNATE Page.....	P
ROUTE SELECTION Page for Alternate.....	Q
VERTICAL REVISION Pages.....	R
STEP ALTS Page.....	S
DATA INDEX Pages.....	T
WAYPOINT/PILOTS WAYPOINT/NEW WAYPOINT Pages.....	U
NAVAID/PILOTS' NAVAID/NEW NAVAID Pages.....	V
RUNWAYS/PILOTS' RUNWAYS/NEW RUNWAY PAGES.....	W
ROUTE/PILOTS' ROUTE/NEW ROUTE PAGES.....	X
AIRCRAFT STATUS Page.....	Y
P/N XLOAD PAGE.....	Z
P/N STATUS PAGES.....	AA
POSITION MONITOR Page.....	AB
SELECTED NAVAIDS Page.....	AC
IRS MONITOR Page.....	AD
DUPLICATE NAMES PAGE.....	AE
GPS  MONITOR Page.....	AF
PRINT FUNCTION Pages.....	AG
AOC FUNCTION Page (If installed).....	AH
PERF Page.....	AI
PROG Pages.....	AJ
RADIO NAV Page.....	AK
SECONDARY Pages.....	AL

Continued on the following page

Continued from the previous page

RADIAL FIX INFO Pages.....	AM
CLOSEST AIRPORTS Pages.....	AN
EQUI - TIME POINT Page.....	AO
RTA Page.....	AP
CONSTANT MACH Page.....	AQ
BACK UP NAV Pages.....	AR

DSC-22_20-20-20 MCDU - Messages

General.....	A
A/C POSITION INVALID.....	B
ABEAM POINTS LIST FULL.....	C
ALIGN IRS.....	D
ALTN F-PLN DELETED.....	E
AOC XXX F-PLN UPLINK.....	F
AREA RNP IS XX.XX.....	G
AWY/WPT MISMATCH.....	H
BLOCK IGNORES RTA.....	I
CABIN RATE EXCEEDED.....	J
CHECK ALTN WIND.....	K
CHECK APPR SELECTION.....	L
CHECK CO RTE.....	M
CHECK DATA BASE CYCLE.....	N
CHECK DEST DATA.....	O
CHECK FLT NBR.....	P
CHECK IRS 1(2)(3)/FM POSITION.....	Q
CHECK IRS/AIRPORT POS.....	R
CHECK MIN DEST FOB.....	S
CHECK NORTH REF.....	T
CHECK ONSIDE P/N.....	U
CHECK QFE.....	V
CHECK TAKE OFF DATA.....	W
CHECK WEIGHT.....	X
CLK IS TAKE OFF TIME.....	Y
CLOCK/GPS TIME DIFF.....	Z
CLOCK IS TAKE OFF TIME.....	AA
CLOSE RTE REQ FIRST.....	AB
CONSTANT MACH DELETED.....	AC
CROSSLOAD ABORTED.....	AD
CROSSLOAD COMPLETE.....	AE
CRZ FL ABOVE MAX FL.....	AF
CSTR DEL ABOVE CRZ FL.....	AG

Continued on the following page

Continued from the previous page

CSTR DEL UP TO XXXXXXXX.....	AH
DATABASE CODING ERROR.....	AI
DECELERATE.....	AJ
DELETING OFFSET.....	AK
DELETING SEC OFFSET.....	AL
DEST/ALTN MISMATCH.....	AM
DEST EFOB BELOW MIN.....	AN
DIR TO IN PROCESS.....	AO
ENTER DEST DATA.....	AP
ENTRY OUT OF RANGE.....	AQ
F-G/S BASED ON ISA 	AR
F-PLN DATALINK IN PROG.....	AS
F-PLN ELEMENT RETAINED.....	AT
F-PLN FULL.....	AU
FLS  SEL: UPDATE MINIMA.....	AV
FLT NBR UPLINK.....	AW
FM DATALINK UNAVAIL.....	AX
FM PREDICTIONS LOST.....	AY
FMS1/FMS2 A/C STS DIFF.....	AZ
FMS1/FMS2 GW DIFF.....	BA
FMS1/FMS2 PGM PIN DIFF.....	BB
FMS1/FMS2 POS DIFF.....	BC
FMS1/FMS2 SPD TGT DIFF.....	BD
FORMAT ERROR.....	BE
GPS  IS DESELECTED.....	BF
GPS PRIMARY 	BG
GPS PRIMARY  LOST.....	BH
INDEPENDENT OPERATION.....	BI
INIT DATA UPLINK.....	BJ
INITIALIZE WEIGHT/CG.....	BK
INITIALIZE WEIGHTS.....	BL
INSRT/ERASE TMPY FIRST.....	BM
INVALID ATC UPLINK.....	BN
INVALID F-PLN UPLINK.....	BO
INVALID FLT NBR UPLINK.....	BP
INVALID INIT UPLINK.....	BQ
INVALID PERF UPLINK.....	BR
INVALID TAKEOFF UPLINK.....	BS
INVALID WIND UPLINK.....	BT
IRS ONLY NAVIGATION.....	BU

Continued on the following page

Continued from the previous page

LAT DISCONT AHEAD.....	BV
LIST OF 10 IN USE.....	BW
LIST OF 20 IN USE.....	BX
MACH SEGMENT DELETED.....	BY
MANUAL HOLD DELETED.....	BZ
MCDU OVERHEATED.....	CA
MORE DRAG.....	CB
NAV ACCUR DOWNGRAD.....	CC
NAV ACCUR UPGRAD.....	CD
NEW ACC ALT - HHHH.....	CE
NEW ACC ALT HHHHH.....	CF
NEW CRZ ALT - HHHHH.....	CG
NEW CRZ ALT HHHHH.....	CH
NEW THR RED ALT - HHHH.....	CI
NEW THR RED ALT HHHHH.....	CJ
NO ANSWER TO REQUEST.....	CK
NO FLS FOR THIS APPR 	CL
NO INTERSECTION FOUND.....	CM
NO NAV INTERCEPT.....	CN
NO SLS  FOR THIS APPR.....	CO
NO SLS  MAN TUNING.....	CP
NO SLS  : SBAS DESELECTED.....	CQ
NO VERT PATH INTERCEPT.....	CR
NON UNIQUE ROUTE IDENT.....	CS
NOT ALLOWED.....	CT
NOT ALLOWED IN NAV.....	CU
NOT IN DATABASE.....	CV
NOT XMITTED TO ACARS.....	CW
NOT XMITTED TO PRINTER 	CX
OFST DELETED IN TMPY.....	CY
ONLY SPD ENTRY ALLOWED.....	CZ
OPP FMGC IN PROCESS.....	DA
PAGE UPDATE IN PROCESS.....	DB
PERF DATA UPLINK.....	DC
PILOT ELEMENT RETAINED.....	DD
PILOTS ROUTES FULL.....	DE
PLACE/D IN TRANSITION.....	DF
PLACE/WPT MISMATCH.....	DG
PLEASE WAIT.....	DH
PRINT ABORTED.....	DI

Continued on the following page

Continued from the previous page

PRINT IN PROGRESS 	DJ
PRINTER BUSY 	DK
PRINTER NOT AVAILABLE 	DL
PROCEDURE RNP IS XX.XX	DM
QUEUED TO PRINT 	DN
RADIONAV IS DESELECTED	DO
REF/GPS POS DIFF	DP
REF/LAST IRS POS DIFF	DQ
RESET IRS TO NAV	DR
REVISION IN PROCESS	DS
REVISIONS NOT STORED	DT
RTA DELETED	DU
RTA EXISTS	DV
RWY/LS MISMATCH	DW
SELECT DESIRED SYSTEM	DX
SELECT HDG/TRK FIRST	DY
SELECT TRUE	DZ
SENSOR IS INVALID	EA
SET GREEN DOT SPEED	EB
SET HOLD SPEED	EC
SET MANAGED SPEED	ED
SETTING SPD/RTA	EE
SPD ERROR AT XXXXXXXX	EF
SPD LIM EXCEEDED	EG
SPECIF NDB UNAVAIL	EH
SPECIF VOR-D UNAVAIL	EI
STEP ABOVE MAX FL	EJ
STEP AHEAD	EK
STEP DELETED	EL
STORED ROUTES FULL	EM
SYSTEM NOT AVAILABLE	EN
TAKE OFF DATA UPLINK	EO
TEMPORARY F-PLN EXISTS	EP
TIME ERROR AT XXXXXXXX	EQ
TIME MARKER LIST FULL	ER
TIME TO EXIT	ES
TMPY F-PLN EXISTS	ET
TO SPEED TOO LOW	EU
TOO STEEP PATH AHEAD	EV
TUNE BBB FFF.FF	EW

Continued on the following page

Continued from the previous page

TURN AREA EXCEEDANCE.....	EX
UPLINK INSERT IN PROG.....	EY
UNKNOWN PROGRAM PIN.....	EZ
USING COST INDEX-NNN.....	FA
USING COST INDEX NNN.....	FB
V1/VR/V2 DISAGREE.....	FC
WAIT FOR SYSTEM RESPONSE.....	FD
WIND DATA UPLINK.....	FE
WIND UPLINK EXISTS.....	FF
WIND UPLINK PENDING.....	FG
XXXX IS DESELECTED.....	FH

DSC-22_20-20-30 MCDU - Data Format List

MCDU Data Format List.....	A
----------------------------	---

DSC-22_20-30 How To
DSC-22_20-30-10 Rejected Takeoff

How to Change T.O Data or Departure Runway after Rejected Takeoff.....	A
--	---

DSC-22_20-30-20 Insertion of Approach Minima

QNH Use for Aircraft NOT Equipped with QFE Option.....	A
QNH Use for Aircraft Equipped with QFE Option.....	B
QFE Use for Aircraft NOT Equipped with QFE Option.....	C
QFE Use for Aircraft Equipped with QFE Option.....	D

DSC-22_20-30-30 Effect of Baro Reference Setting

GENERAL.....	A
MCDU Altitude Predictions.....	B
Target Altitude on PFD.....	C
Procedures.....	D

DSC-22_20-30-40 Clear Key (Clearing Function)

Clearing the Scratchpad of Data or Messages.....	A
Clearing Data Fields.....	B

DSC-22_20-30-50 Pilots/Stored Route Function

Pilots Route Function.....	A
Stored Route Function.....	B

DSC-22_20-30-60 Report Page

General.....	A
Report Page Access.....	B

Continued on the following page

Continued from the previous page

Report Page Acces.....	C
DSC-22_20-30-70 Time Marker	
General.....	A
How to Insert a Time Marker.....	B
DSC-22_20-30-80 AOC Functions	
Flight Plan Initialization Through ACARS.....	A
Flight Plan Initialization Through ACARS (if installed).....	B
Takeoff Data.....	C
Wind Data.....	D
DSC-22_20-40 Abnormal Operations	
DSC-22_20-40-10 FMGC Reset	
Automatic FMGC Reset and Resynchronization.....	A
Manual FMGC Reset.....	B
DSC-22_20-40-20 "CHECK GW" or "CHECK WEIGHT" Message	
"CHECK WEIGHT" Message.....	A
DSC-22_20-40-30 MCDU Back Up Navigation	
General.....	A
Back Up NAV Selection.....	B
Back Up NAV Operation.....	C
DSC-22_20-40-50 Other Abnormal Operations	
Erroneous Predictions.....	A
Spurious Engine Out Indication.....	B
DSC-22_20-100 Temporary Abnormal Behaviors	
DSC-22_20-100-20 FMS2 HONEYWELL Temporary Abnormal Behaviors	
Incorrect Management Of SPD CSTR For Arrival Procedure Holds.....	A
Misalignment Of FMS F-PLN Legs For ILS Approaches.....	B
Incorrect Management Of ETA Entry On Predictive GPS Page.....	C
Flight Number Erased Upon AOC Flight Plan Uplink.....	D
Erroneous Fuel Prediction In The Case Of Descent With Two Altitude Constraints.....	E
Unexpected Switch Of Speed Target When RTA Is Used.....	F
VOR/DME and VOR/TACAN Not Automatically Tuned.....	G
Optimum Target Speeds not Updated following the Automatic Deletion of a Step Climb.....	H
Erroneous Lateral Guidance in NAV Mode with LOC Mode Armed during Approach.....	I
Undue Reduction of the Speed Target in case of DIR TO/ABEAM while Flying a Constant Mach Segment.....	J

Continued on the following page

Continued from the previous page

Loss of Fuel and Time Predictions During Takeoff Data Insertion.....	K
Erroneous Trajectory during Procedures with a Turn Direction on a Leg with an Altitude Termination.....	L
Erroneous Vertical Profile during LOC B/C Approaches with a MAP Located Before the Runway Threshold.....	M
Erroneous Vertical Guidance in Approach Subsequent to a DIR TO Performed when Near the Top of Descent....	N
No Engagement of the PRESEL SPD TARGET in Climb.....	O
Erroneous CF Leg Computation following FMS NEW RUNWAY with LS IDENT creation.....	P
Unexpected ILS Auto-tuning.....	Q
Erroneous Managed Approach Speed after Descent Wind Uplink.....	R
Inadvertent T.O. Data Reversion Upon RWY Change.....	S

DSC-22_20-100-30 FMS2 THALES Temporary Abnormal Behaviors

MCDU Frozen After the Flight Crew Accesses the "DIR TO", "HOLD" or "OFFSET" Function.....	A
Erroneous Cross Track Error/FD Display Orders After a Dir TO on Aligned Waypoint.....	B
Erroneous Offset.....	C
Erroneous Fuel Predictions In The Case of Descent With Two Altitude Constraints.....	D
"FM PREDICTIONS LOST" Message When Using the FUEL PLANNING Function.....	E
Erroneous Lateral Guidance in NAV Mode during Procedures that Use Not Collocated NAVAIDS.....	F
Erroneous Trajectory during Departure Procedures with a Course-to-Fix Leg and an Arc Leg.....	G
Erroneous Lateral Guidance in NAV Mode with LOC Mode Armed during Approach.....	H
Erroneous Trajectory Computation while in HDG/TRK Mode during Procedures with a Turn Direction on a Leg With an Altitude Termination.....	I
Erroneous Vertical Profile in Final Approach.....	J
Uncommanded Climb near the Top of Descent (T/D).....	K
Erroneous Altitude Constraint after SID or STAR Selection Change.....	L
Waypoint Not Sequenced After DIR TO RADIAL IN.....	M
Unusable MIN DEST FOB Value in the Secondary Flight Plan.....	N
Unexpected DECELERATE displayed on MCDU (and "T/D REACHED" on PFD) during Climb.....	O
Missing or Incorrect Insert UPLINK Prompt on UPLINK T.O DATA Page.....	P
FMS Reset upon crossing the 180th Meridian.....	Q
Dual FMS Reset with Loss of Data upon DIR TO/ABEAM Insertion with 3 STEP ALTS.....	R

Localization Title	Toc Index	ID	Reason
DSC-22_20-PLP-TOC Vertical Functions - General		1	Documentation update: Deletion of "Flight Phases (00011024)".
			Documentation update: Deletion of "Flight Phases (00011024.0011001)".
			Documentation update: Deletion of "Flight Phases (00011024.0007001)".
			Documentation update: Deletion of "Flight Phases (00011024.0002001)".
DSC-22_20-10-30-12 DIR Key (Direct-to-Function) - Particular Cases for Use of DIR TO	K	1	Layout modification. No technical change.
DSC-22_20-10-30-20 Introduction	C	1	Documentation update: Addition of "Introduction" documentary unit
DSC-22_20-10-30-20 Preflight	D	2	Documentation update: Addition of "Preflight" documentary unit
DSC-22_20-10-30-20 Takeoff	D	3	Documentation update: Addition of "Takeoff" documentary unit
DSC-22_20-10-30-20 Climb	D	4	Documentation update: Addition of "Climb" documentary unit
DSC-22_20-10-30-20 Cruise	D	5	Documentation update: Addition of "Cruise" documentary unit
DSC-22_20-10-30-20 Descent	D	6	Documentation update: Addition of "Descent" documentary unit
DSC-22_20-10-30-20 Approach	D	7	Documentation update: Addition of "Approach" documentary unit
DSC-22_20-10-30-20 Go-Around	D	8	Documentation update: Addition of "Go-Around" documentary unit
DSC-22_20-10-30-20 Done	D	9	Documentation update: Addition of "Done" documentary unit
DSC-22_20-10-30-20 Preflight	D	10	Documentation update: Addition of "Preflight" documentary unit
DSC-22_20-10-30-20 Takeoff	D	11	Documentation update: Addition of "Takeoff" documentary unit
DSC-22_20-10-30-20 Climb	D	12	Documentation update: Addition of "Climb" documentary unit
DSC-22_20-10-30-20 Cruise	D	13	Documentation update: Addition of "Cruise" documentary unit
DSC-22_20-10-30-20 Descent	D	14	Documentation update: Addition of "Descent" documentary unit
DSC-22_20-10-30-20 Approach	D	15	Documentation update: Addition of "Approach" documentary unit
DSC-22_20-10-30-20	D	16	Documentation update: Addition of "Go-Around" documentary unit

Continued on the following page

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS

Continued from the previous page

Localization Title	Toc Index	ID	Reason
Go-Around			
DSC-22_20-10-30-20 Done	D	17	Documentation update: Addition of "Done" documentary unit
DSC-22_20-10-30-23 Wind - Temperature - QNH - Entering the Wind and Temperature During F-PLN Initialization	C	1	Correction of Illustration, move of the entry "WIND REQUEST" to the [3R] key, and addition of the associated If Installed symbol. Update of the link. No technical change. Correction of a typo error. No technical change. Removal of abbreviation tags to comply with the Airbus authoring policy. Layout modifications, no technical changes. Documentation update: Deletion of information.
DSC-22_20-10-30-23 Wind - Temperature - QNH - Entering the Wind and Temperature During F-PLN Initialization	C	2	Documentation update: Information "N.00009486.0002001.037" moved from "N.00009486.0002001.036" to "N.00009486.0019001.050" Layout modifications, no technical changes. Documentation update: Deletion of information.
DSC-22_20-10-30-23 Wind - Temperature - QNH - Entering the Wind and Temperature During F-PLN Initialization	C	3	Correction of Illustration, move of the entry "WIND REQUEST" to the [3R] key, and addition of the associated If Installed symbol. Correction of a typo error. No technical change. Documentation update: Information "N.00009486.0002001.043" moved from "N.00009486.0002001.042" to "N.00009486.0019001.051" Removal of abbreviation tags to comply with the Airbus authoring policy. Layout modifications, no technical changes. Documentation update: Deletion of information.
DSC-22_20-10-80 Print Function Access	B	1	Layout modification. No technical change.
DSC-22_20-10-80 Print Function Access	B	2	Layout modification. No technical change.
DSC-22_20-20-10-25 GPS Monitor Page 	AJ	1	Addition of a note to explain the conditions that may result in the absence of GPS data.
DSC-22_20-20-10-28 INIT A Page	C	1	Layout modification. No technical change.
DSC-22_20-20-10-28 WIND Pages	F	2	Layout modification. No technical change.
DSC-22_20-20-10-28 WIND Pages	F	3	Layout modification. No technical change.
DSC-22_20-20-10-28 WIND Pages	F	4	Layout modification. No technical change.

Continued on the following page

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS
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Continued from the previous page

Localization Title	Toc Index	ID	Reason
DSC-22_20-20-10-28 GPS MONITOR Page	AF	5	Addition of a note to explain the conditions that may result in the absence of GPS data.
DSC-22_20-20-20 NOT XMITTED TO PRINTER 	CX	1	Documentation update: Addition of "NOT XMITTED TO PRINTER (If Installed)" documentary unit
DSC-22_20-20-20 PRINT IN PROGRESS 	DJ	2	Documentation update: Addition of "PRINT IN PROGRESS (If Installed)" documentary unit
DSC-22_20-20-20 PRINTER BUSY 	DK	3	Documentation update: Addition of "PRINTER BUSY (If Installed)" documentary unit
DSC-22_20-20-20 QUEUED TO PRINT 	DN	4	Documentation update: Addition of "QUEUED TO PRINT (If Installed)" documentary unit
DSC-22_20-30-20 QFE Use for Aircraft NOT Equipped with QFE Option	C	1	Update of the reference to the new operational limitation for operations with the QFE barometric reference

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT SYSTEM DESCRIPTION - OVERVIEW
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OVERVIEW

Ident.: DSC-22_20-10-10-00010128.0001001 / 13 MAY 25

Applicable to: ALL

The Flight Management System (FMS) provides:

- Flight planning and navigation information
- Performance calculation and optimization
- Long-term guidance targets.

The FMS also has:

- An Engine-Out (EO) mode
- A print function
- A takeoff surveillance function
- FMS Landing System (FLS ) function.

The FMS information appears on different displays.

FLIGHT PLANNING

The flight crew can create an entire flight plan (lateral flight plan and vertical flight plan) in the FMS. The flight crew first selects or creates a basic flight plan, and then inserts the fuel, load, and wind information. When all of the necessary data is inserted, the FMS computes and displays the track, speed, altitude, time, wind, and fuel predictions that are associated with the flight plan. The flight crew can modify the flight plan at any time. These modifications are referred to as revisions.

NAVIGATION

The FMS tunes the radio navigation aids, provides information about the aircraft position, and defines the navigation accuracy.

PERFORMANCE CALCULATION AND OPTIMIZATION

The FMS computes optimized performance data that is associated with each flight phase.

LONG-TERM GUIDANCE TARGETS

The FMS sends targets to the Flight Guidance (FG) in order to guide the aircraft along the FMS flight plan.

ENGINE-OUT MODE

In the case of an engine failure, the Engine-Out (EO) mode of the FMS becomes active. When the EO mode is active, the FMS takes the engine failure into account for the computation of the performance data, the flight plan predictions, and the long-term guidance targets.

PRINT FUNCTION

The print function of the FMS enables the flight crew to print data and reports.

FLS FUNCTION

The FMS Landing System (FLS ) function allows the flight crew to fly VOR, VOR/DME, NDB, NDB/DME, RNAV or LOC only approaches, in managed lateral and vertical modes, and with an ILS-look alike way.

TAKEOFF SURVEILLANCE FUNCTION

The Takeoff Surveillance (TOS) function checks the takeoff data that the flight crew enters and selects on the FMS pages.

INFORMATION DISPLAY

The FMS information appears on:

- The Multipurpose Control and Display Units (MCDUs)
- The Navigation Displays (NDs)
- The Primary Flight Displays (PFDs).

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT SYSTEM DESCRIPTION - NAVIGATION
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General

NAVIGATION

Ident.: DSC-22_20-10-20-05-00010129.0001001 / 17 AUG 10
Applicable to: ALL

- Essential navigation functions are:
- Computation of position
 - Evaluation of position accuracy
 - Radio navigation tuning
 - Alignment of Inertial Reference System.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

SYSTEM DESCRIPTION - NAVIGATION

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT SYSTEM DESCRIPTION - NAVIGATION
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Position Computation

GENERAL

Ident.: DSC-22_20-10-20-10-00010130.0002001 / 16 MAR 11
Applicable to: ALL

Each FMGC computes its own aircraft position (called the "FM position") from a MIX IRS position and a computed radio position, or a GPS position.

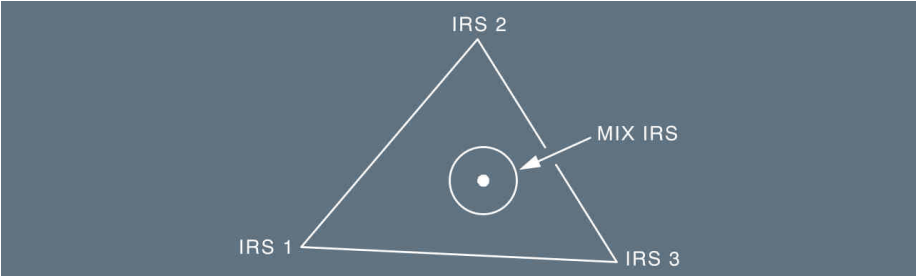
The FMGS selects the most accurate position, considering the estimated accuracy and integrity of each positioning equipment.

GPS/INERTIAL is the basic navigation mode, provided GPS data is valid and successfully tested. Otherwise, nav aids plus inertial or inertial only are used. (*Refer to DSC-22_20-10-20-10 Navigation Modes*).

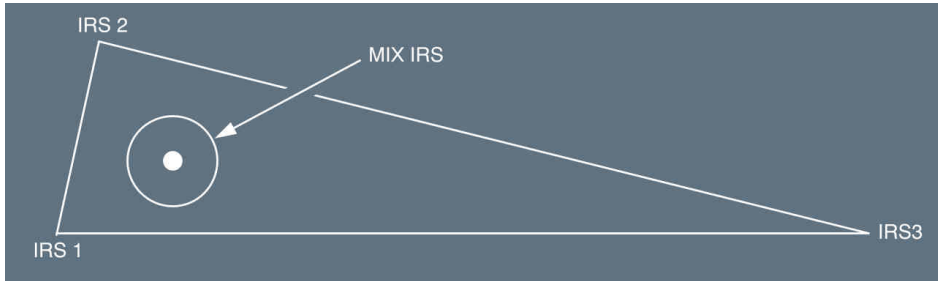
MIX IRS POSITION

Ident.: DSC-22_20-10-20-10-00010131.0002001 / 03 NOV 22
Applicable to: ALL

Each FMGC receives a position from each of the three IRS, and computes a mean-weighted average called the "MIX IRS" position:



- If one of the IRS drifts abnormally, the MIX IRS position uses an algorithm that decreases the influence of the drifting IRS within the MIX IRS position



- If one of the IRS fails, each FMGC uses only one IRS (onside IRS or IRS3). Each IRS position and inertial speed are continuously tested. If the test fails, the corresponding IRS is rejected.
- When each IRS position is compared to the FM position, and the difference is more than a threshold function of time, the **CHECK IRS 1(2)(3)/FM POSITION** message is displayed on the MCDU.

GPS POSITION

Ident.: DSC-22_20-10-20-10-00010132.0002001 / 23 JUN 15
 Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

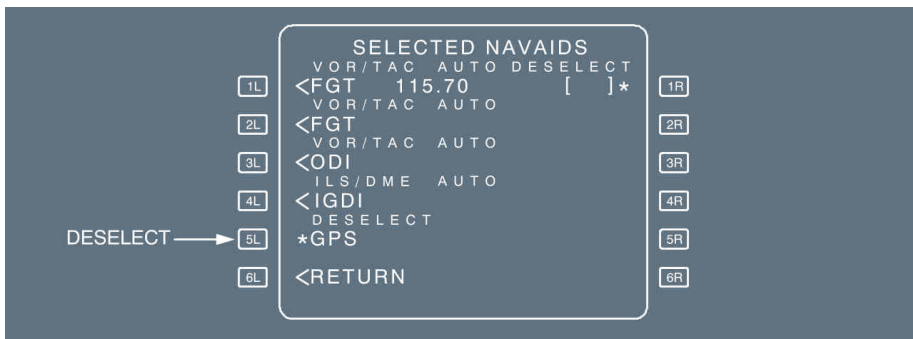
Each IRS computes a mixed IRS/GPS position called the GPIRS position. For this, each IRS can independently select their GPS source in order to maximize the availability of GPS data. Of the three GPIRS positions that each FMGC receives, the FMS selects one GPIRS position based on a figure of merit and priority.

The FMS uses the following hierarchy to perform the selection:

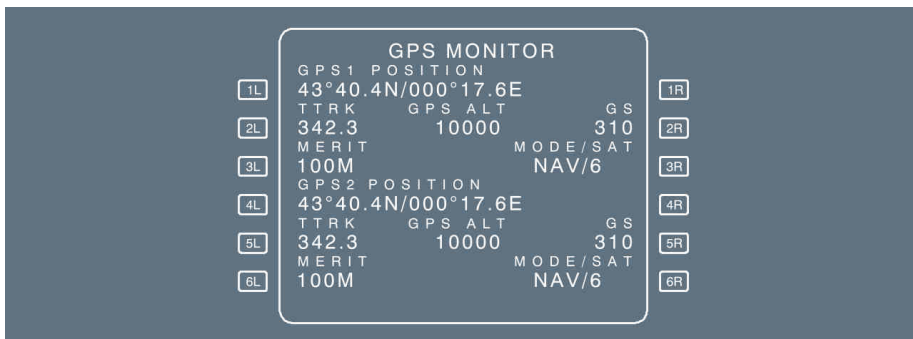
- Onside GPIRS position
- GPIRS 3
- Opposite GPIRS position.

If the GPIRS data does not comply with an integrity criterion that is based on a Horizontal Integrity Limit (HIL) and on the automatic detection of failed satellites, the FMS rejects the GPS mode and uses the radio position update.

The flight crew can deselect/select the GPS position on the SELECTED NAVAIDS page, if necessary.



Information about the GPS position is displayed on the GPS MONITOR page.



Note: In nominal case, ADIRU1 selects GPS1 and ADIRU2 selects GPS2. The GPS selection by ADIRU3 depends on the position of the ATT HDG selector switch. If one of the GPS source is rejected by the ADIRUs, all ADIRUs will select the same GPS source. As a result, the data of the GPS that is not selected is dashed on the GPS MONITOR page. The “GPS PRIMARY LOST” message may not be displayed.

GPS POSITION

Ident.: DSC-22_20-10-20-10-00010132.0015001 / 23 JUN 15

Applicable to: MSN 02926-02944, 04392, 07784-07792

Each IRS computes a mixed IRS/GPS position called the GPIRS position. For this, each IRS can independently select their GPS source in order to maximize the availability of GPS data. Of the three GPIRS positions that each FMGC receives, the FMS selects one GPIRS position based on a figure of merit and priority.

The FMS uses the following hierarchy to perform the selection:

- Onside GPIRS position
- GPIRS 3
- Opposite GPIRS position.

If the GPIRS data does not comply with an integrity criterion that is based on a Horizontal Integrity Limit (HIL) and on the automatic detection of failed satellites, the FMS rejects the GPS mode and uses the radio position update.

The flight crew can deselect/select the GPS position on the SELECTED NAVAIDS page, if necessary.

SELECTED NAVAIDS		
VOR/DME	AUTO	DESELECT
1L <GEN 115.20	TOU	1R
2L <NIZ 115.10	[]*	2R
3L <TOP		3R
4L <NA 110.70		4R
5L *GPS		5R
6L <RETURN		6R

DESELECT →

Information about the GPS position is displayed on the GPS MONITOR page.

GPS MONITOR		
GPS1 POSITION		
1L 89°59.9N/179°59.9W		1R
2L TTRK UTC GS		2R
3L 359.9 10:37:42 450		3R
4L MERIT GPS ALT MODE/SAT		4R
5L 100M 32000 NAV/6		5R
6L GPS2 POSITION		6R
89°59.9N/179°59.9W		
TTRK UTC GS		
342.3 10:37:42 450		
MERIT GPS ALT MODE/SAT		
100M 32000 NAV/6		

Note: In nominal case, ADIRU1 selects GPS1 and ADIRU2 selects GPS2. The GPS selection by ADIRU3 depends on the position of the ATT HDG selector switch. If one of the GPS source is rejected by the ADIRUs, all ADIRUs will select the same GPS source. As a result, the data of the GPS that is not selected is dashed on the GPS MONITOR page. The “GPS PRIMARY LOST” message may not be displayed.

RADIO POSITION

Ident.: DSC-22_20-10-20-10-00010669.0020001 / 01 OCT 12

Applicable to: ALL

Each FMGC uses onside nav aids to compute its own radio position. These nav aids are displayed on the SELECTED NAVAIDS page.

The available nav aids are:

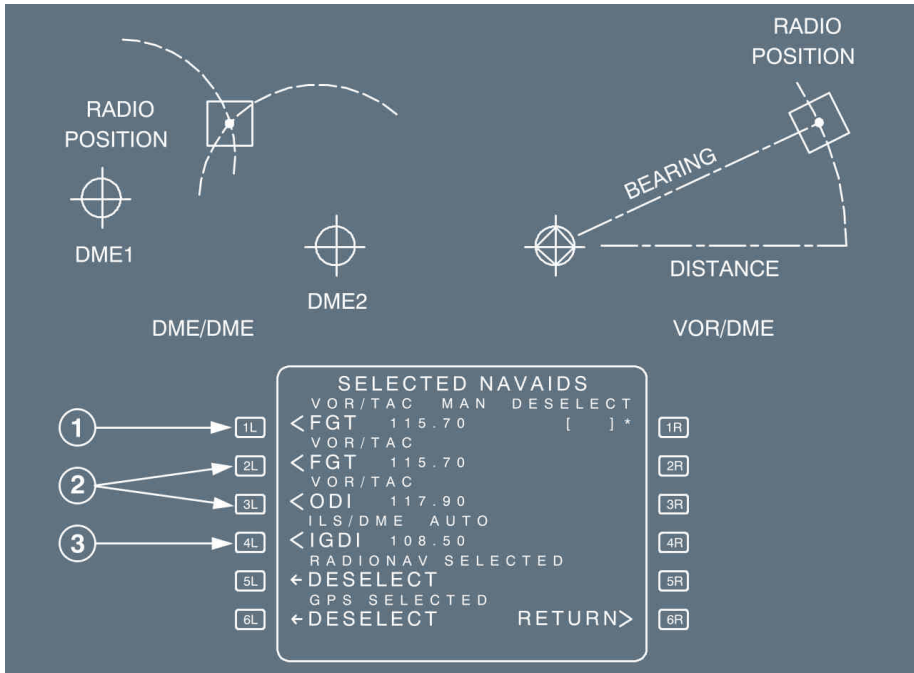
- DME/DME
- VOR/DME
- LOC
- DME/DME-LOC
- VOR/DME-LOC.

It uses LOC to update the lateral position, using LOC beam during ILS approach.

LOC is also used for quick update, when in GPS/IRS mode.

If one or more nav aids fail, each FMGC can use offside nav aids to compute the VOR/DME, or the DME/DME radio position.

The radio nav aid selection is displayed on the DATA “SELECTED NAVAIDS” page.



- (1) VOR/DME selection (auto or manual) for display (onside VOR).
- (2) DMEs automatic selection for DME/DME onside radio position.
- (3) ILS selection (auto or manual) for LOC update computation.

FM POSITION

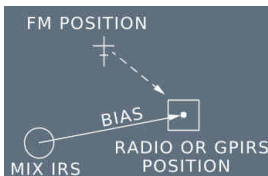
Ident.: DSC-22_20-10-20-10-00010135.0017001 / 17 AUG 10

Applicable to: **ALL**

At flight initialization, each FMGC displays an FM position that is a MIX IRS/GPS position (GPIRS):

- At takeoff, when the FM position is updated to the runway threshold position as stored in the database, possibly corrected by the takeoff shift entered on PERF TO page.
- In flight, the FM position approaches the radio position or the GPS position at a rate depending upon the aircraft altitude.

Note: The FM position update at takeoff is inhibited when GPS PRIMARY is active.



BIAS

Each FMGC computes a vector from its MIX IRS position to the radio position or GPIRS position. This vector is called the “bias”.

Each FMGC updates its bias continuously as long as a radio position or a GPIRS position is available.

If an FMGC loses its radio/GPIRS position, it memorizes the bias and uses it to compute the FM position, which equals the MIX IRS position plus the bias. Until the radio or the GPIRS position is restored, the bias does not change.

The flight crew can update the FM position manually. This also updates the bias.

POSITION MONITOR

Ident.: DSC-22_20-10-20-10-00010136.0016001 / 07 MAY 13

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

The flight crew may check the position computation using the GPS MONITOR or POSITION MONITOR page.

GPS MONITOR					
GPS1 POSITION					
1L	43°40.4N/000°17.6E				1R
	TTRK	UTC	GS		
2L	342.3	10:37:42	310		2R
	MERIT	GPS ALT	MODE/SAT		
3L	100M	10000	NAV/6		3R
GPS2 POSITION					
4L	43°40.4N/000°17.6E				4R
	TTRK	UTC	GS		
5L	342.3	10:37:42	310		5R
	MERIT	GPS ALT	MODE/SAT		
6L	100M	10000	NAV/6		6R

POSITION MONITOR					
1L	FMS 1	4340.4N/00017.6E			1R
		3 IRS/GPS			
2L	FMS 2	4340.4N/00017.6E			2R
		3 IRS/GPS			
3L	GPIRS	4340.4N/00017.6E			3R
4L	MIX IRS	4340.4N/00017.6E			4R
	IRS1	IRS2	IRS3		
5L	NAV 0.4	NAV 0.2	NAV 0.4		5R
			SEL		
6L	←FREEZE	NAVAIDS>			6R

- 1L FM POSITION (FMGC1)
- 2L FM POSITION (FMGC2)
- 3L GPIRS OR RADIO POSITION (ONside FMGC) WHICHEVER IS USED FOR POSITION UPDATING
- 4L MIX IRS POSITION (ONside FMGC)

POSITION MONITOR

Ident.: DSC-22_20-10-20-10-00010136.0019001 / 07 MAY 13

Applicable to: MSN 02926-02944, 04392, 07784-07792

The flight crew may check the position computation using the GPS MONITOR or POSITION MONITOR page.

GPS MONITOR					
GPS1 POSITION					
1L	89°59.9N/179°59.9W			1R	
2L	TTRK UTC	GS		2R	
3L	359.9 10:37:42 450			3R	
4L	MERIT GPS ALT MODE/SAT			4R	
5L	100M 32000 NAV/6			5R	
6L	GPS2 POSITION				6R
	89°59.9N/179°59.9W				
	TTRK UTC	GS			
	359.9 10:37:42 450				
	MERIT GPS ALT MODE/SAT				
	100M 32000 NAV/6				

POSITION MONITOR					
1L	FMGC 1	4408.9N/00754.9E			1R
2L	FMGC 2	4408.9N/00754.9E			2R
3L	RADIO	4408.9N/00754.9E			3R
4L	MIX IRS	4408.9N/00754.9E			4R
5L	IRS1 IRS2 IRS3				5R
6L	NAV 0.4 NAV 0.2 NAV 0.3				6R
	←FREEZE	SEL			
		NAVAIDS>			

1L FM POSITION (FMGC1)

2L FM POSITION (FMGC2)

3L GPIRS OR RADIO POSITION (ONside FMGC) WHICHEVER IS USED FOR POSITION UPDATING

4L MIX IRS POSITION (ONside FMGC)

TAKEOFF UPDATE

Ident.: DSC-22_20-10-20-10-00010137.0017001 / 04 AUG 16

Applicable to: ALL

A takeoff update requires that the takeoff runway be part of the flight plan. This provides the most accurate position update.

If the takeoff run starts at an intersection, enter a takeoff shift on the PERF TO page to refine the takeoff update.

An accurate takeoff update ensures a precise aircraft position during departure.

PERF TO PAGE

Takeoff runway in the flight plan.

TAKE OFF

V1	FLP RETR	RWY			
130	F=138	15R			
VR	SLT RETR	TO SHIFT			
131	S=179	CM 900			
V2	CLEAN	FLAPS/THS			
131	O=202	CJ/C J			
TRANS ALT			FLX TO TEMP		
4800			45°		
THR RED/ACC			ENG OUT ACC		
3000/4365					

NEXT
 PHASE>

1R

2R

3R

4R

5R

6R

If the takeoff is not initiated from runway threshold, to shift should be inserted to update the position.

Takeoff runway in the flight plan.

FROM

FROM	AF5612 →				
LFB015R	0000	148/1490			
H146	BRG145	3NM			
TOU/08					
6034	TRK034	14			
D0730					
HUM20		21			
CRESP					
MUPA2D		24			
DO432					
DEST	TIME	DIST	EFOB		
EDHI	0148	759			

↑ ↓

1R

2R

3R

4R

5R

6R

F-PLN A PAGE (WITHOUT PREDICTIONS)

NAVIGATION MODES

Ident.: DSC-22_20-10-20-10-00010138.0001001 / 12 MAY 22

Applicable to: ALL

The FMGS updates the FM position via the use of radio nav aids or GPS, if available. It can use four different FM navigation modes to make this update.

The decreasing order of priority is:

- IRS-GPS
- IRS-DME/DME
- IRS-VOR/DME
- IRS only.

During approach flown with ILS / MLS  / GLS  / SLS  / the system performs a temporary lateral update, via one of the following modes:

- IRS-GPS/LOC
- IRS-DME/DME-LOC

- IRS-VOR/DME-LOC
- IRS-LOC.



A318/A319/A320/A321
FLIGHT CREW
OPERATING MANUAL

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

SYSTEM DESCRIPTION - NAVIGATION

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Evaluation of Position Accuracy

GENERAL

Ident.: DSC-22_20-10-20-20-00010448.0023001 / 27 MAY 13

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

The FMGS continuously computes an Estimated Position Uncertainty (EPU).

It is an estimate of how much the FM position diverged, and it is a function of the navigation mode that the system uses.

CURRENT NAV MODE	EPU (RATE or THRESHOLD)	REMARK
IRS/GPS	$\sqrt{(FOM^2 + 100^2)}$ (in meters).	FOM = Figure of Merit of GPS. If above 0.28 NM, the FMS rejects the GPS position.
IRS/DME/DME	Moves toward 0.28 NM.	EPU decreases from initial value to 0.28 NM.
IRS/VOR/DME	0.1 NM + 0.05 X DME DIST. Minimum : 0.28 NM.	Dependent on the distance between the aircraft and the VOR/DME.
IRS ONLY	+8 nm/h for the first 30 min. 0 nm/h for the following 60 min. +4 nm/h for the following 30 min. 0 nm/h for the following 60 min. +2 nm/h after.	EPU increases continuously.

Note: After an IRS alignment or at takeoff, the EPU is set to 0.2 NM.

GENERAL

Ident.: DSC-22_20-10-20-20-00010448.0044001 / 27 MAY 13

Applicable to: MSN 02926-02944, 04392, 07784-07792

The FMGS continuously computes an Estimated Position Uncertainty (EPU).

It is an estimate of how much the FM position diverged, and it is a function of the navigation mode that the system uses.

CURRENT NAV MODE	EPU (RATE or THRESHOLD)	REMARK
IRS/GPS	0.05 NM.	
IRS/DME/DME	0.27 NM - 0.37 NM.	

Continued on the following page

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

SYSTEM DESCRIPTION - NAVIGATION

Continued from the previous page

CURRENT NAV MODE	EPU (RATE or THRESHOLD)	REMARK
IRS/VOR/DME	0.30 NM - 0.42 NM.	Dependent on the distance between the aircraft and the VOR/DME.
IRS ONLY	+6 nm/h for the first 40 min. 0 nm/h for the following 50 min. +4 nm/h for the following 40 min. 0 nm/h for the following 45 min. +2 nm/h after.	EPU increases continuously.

Note:

- After an IRS alignment, the EPU is set at 5 NM.
- At takeoff, the EPU is set at 0.2 NM.

ESTIMATED POSITION UNCERTAINTY

Ident.: DSC-22_20-10-20-20-00010499.0077001 / 23 JUN 15

Applicable to: MSN 02926-02944, 07784-07792

The FMS displays the EPU to the flight crew and compares it with the Required Navigation Performance (RNP):

- If the EPU does not exceed the RNP, accuracy is HIGH
- If the EPU exceeds the RNP, accuracy is LOW.

The RNP is displayed in the REQUIRED field of the PROG page. The displayed RNP is (in a decreasing order of priority):

- The value that the flight crew entered
- The navigation database procedure value
- The system's default value.

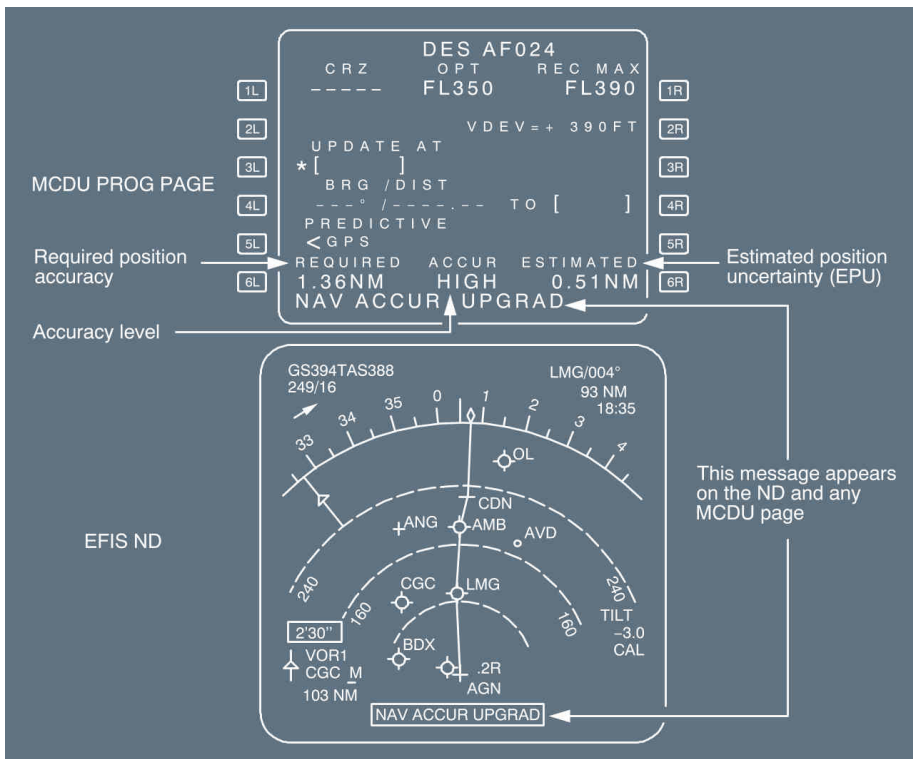
When a flight crew enters an RNP that is higher than the published value, one of the following messages is displayed : "PROCEDURE RNP IS XX.XX", or "AREA RNP IS XX.XX". When this occurs, the flight crew should verify the RNP value that was manually entered in the REQUIRED field of the PROG page, and clear or modify it if necessary.

The "AREA RNP IS XX.XX" message is also displayed at the change of flight area if the new RNP (default value) is smaller than the displayed RNP (manually entered).

DEFAULT AREA RNP VALUES

EN ROUTE	2.0 NM
TERMINAL	1.0 NM
APPROACH	GPS / RNAV(GNSS) 0.3 NM OTHER CASES 0.5 NM

When one FMGC changes the NAV accuracy from LOW to HIGH (or HIGH to LOW), the MCDU and the ND display the "NAV ACCUR UPGRAD" (or DOWNGRAD) message.



When in IRS/GPS mode, the GPS PRIMARY status combines two different criteria:

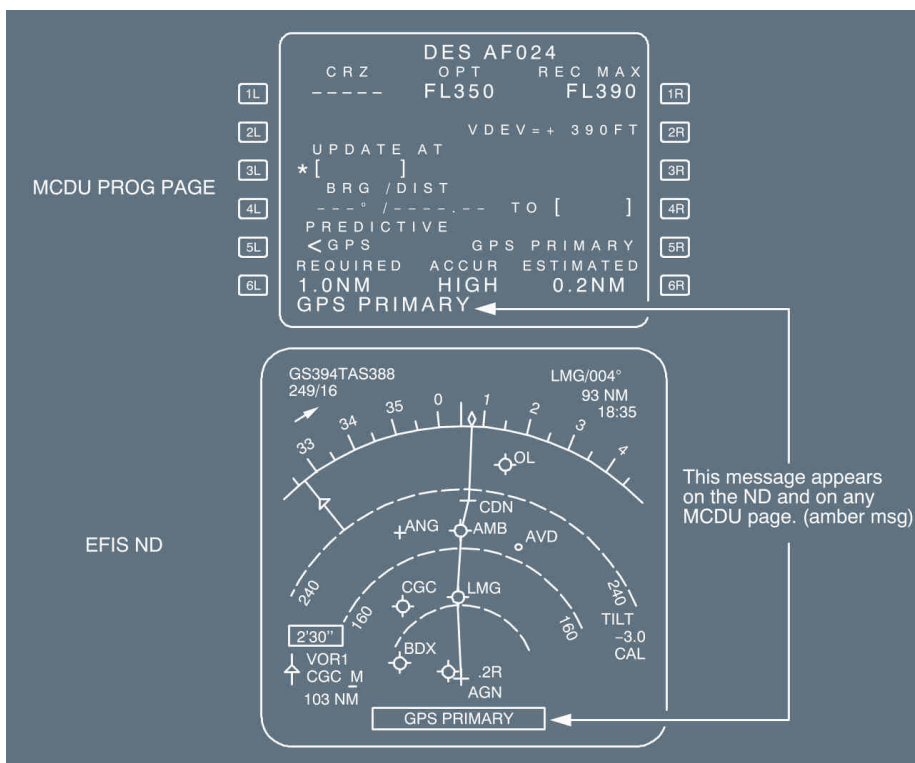
- The accuracy criterion previously described (HIGH/LOW accuracy)
- An integrity criterion: This is the capability to detect a failure and provide appropriate warning of it. This criterion indicates the confidence that the flight crew can have in the FMS position.

If the GPS PRIMARY status complies with both criteria, "GPS PRIMARY" is displayed on the MCDU (PROG page, [5R] field and scratchpad) and temporarily on the ND.

If the GPS PRIMARY status no longer complies with one of these criteria (Navigation downgraded or integrity lost), the GPS PRIMARY status is lost and the MCDU and the ND display the "GPS PRIMARY LOST" message. It is possible to clear the scratchpad message on the MCDU, but not on the ND.

CAUTION

"HIGH" or "LOW" on the PROG page indicates the FM position accuracy, based on estimated uncertainty. When GPS PRIMARY mode is lost, the flight crew must periodically check this position accuracy. In GPS PRIMARY mode, the position accuracy is always at HIGH.



When the GPS is manually deselected, the "GPS IS DESELECTED" message is displayed on the MCDU, 80 NM before the T/D or at approach phase transition.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT SYSTEM DESCRIPTION - NAVIGATION
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ESTIMATED POSITION UNCERTAINTY

Ident.: DSC-22_20-10-20-20-00010499.0076001 / 01 OCT 12

Applicable to: MSN 02155-02789, 03031-05746

The FMS displays the EPU to the flight crew and compares it with the Required Navigation Performance (RNP):

- If the EPU does not exceed the RNP, accuracy is HIGH
- If the EPU exceeds the RNP, accuracy is LOW.

The RNP is displayed in the REQUIRED field of the PROG page. The displayed RNP is (in a decreasing order of priority):

- The value that the flight crew entered
- The navigation database procedure value
- The system's default value.

When a flight crew enters an RNP that is higher than the published value, one of the following messages is displayed : "PROCEDURE RNP IS XX.XX", or "AREA RNP IS XX.XX". When this occurs, the flight crew should verify the RNP value that was manually entered in the REQUIRED field of the PROG page, and clear or modify it if necessary.

The "AREA RNP IS XX.XX" message is also displayed at the change of flight area if the new RNP (default value) is smaller than the displayed RNP (manually entered).

DEFAULT AREA RNP VALUES	
EN ROUTE	2.0 NM
TERMINAL	1.0 NM
APPROACH	GPS 0.3 NM OTHER CASES 0.5 NM

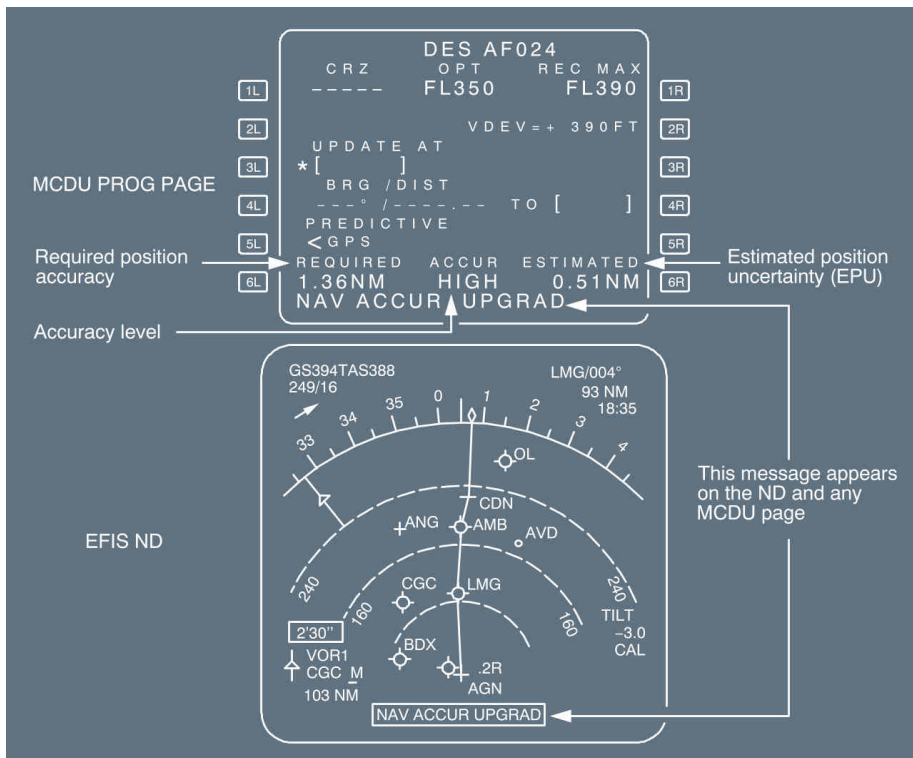
When one FMGC changes the NAV accuracy from LOW to HIGH (or HIGH to LOW), the MCDU and the ND display the "NAV ACCUR UPGRAD" (or DOWNGRAD) message.

These messages are inhibited when the navigation mode is IRS/GPS.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

SYSTEM DESCRIPTION - NAVIGATION



When in IRS/GPS mode, the GPS PRIMARY status combines two different criteria:

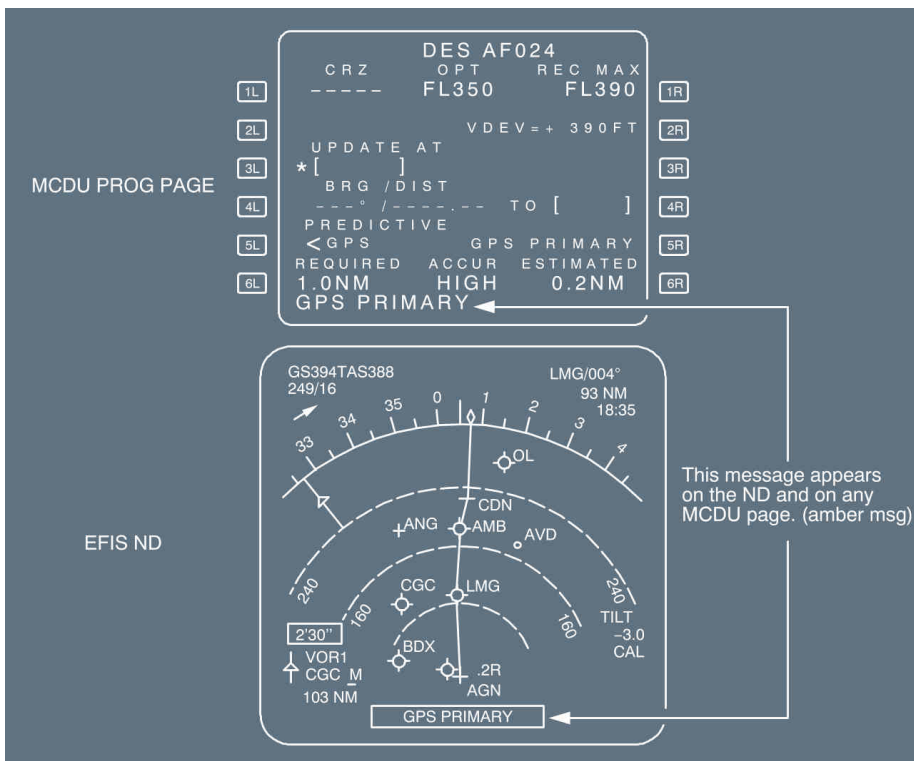
- The accuracy criterion previously described (HIGH/LOW accuracy)
 - An integrity criterion: This is the capability to detect a failure and provide appropriate warning of it.
- This criterion indicates the confidence that the flight crew can have in the FMS position.

If the GPS PRIMARY status complies with both criteria, "GPS PRIMARY" is displayed on the MCDU (PROG page, [5R] field and scratchpad) and temporarily on the ND.

If the GPS PRIMARY status no longer complies with one of these criteria (Navigation downgraded or integrity lost), the GPS PRIMARY status is lost and the MCDU and the ND display the "GPS PRIMARY LOST" message. It is possible to clear the scratchpad message on the MCDU, but not on the ND.

CAUTION

"HIGH" or "LOW" on the PROG page indicates the FM position accuracy, based on estimated uncertainty. When GPS PRIMARY mode is lost, the flight crew must periodically check this position accuracy. In GPS PRIMARY mode, the position accuracy is always at HIGH.



When the GPS is manually deselected, the "GPS IS DESELECTED" message is displayed on the MCDU, 80 NM before the T/D or at approach phase transition.

FM/GPS POSITION DISAGREEMENT

Ident.: DSC-22_20-10-20-20-00010500.0011001 / 17 AUG 10

Applicable to: ALL

When the GPS PRIMARY function is active, and either of the FM positions deviate from the GPS positions 1 or 2 by more than:

- A longitude threshold that depends on the latitude:
 - 0.5' for latitudes below 55°
 - 0.9' for latitudes at or above 55°, and below 70°.
- A latitude threshold of 0.5', regardless of the latitude,

then, the lower ECAM displays the NAV FM/GPS POS DISAGREE amber caution. The master caution light comes on and the single chime sounds.

This amber caution is inhibited during the takeoff phase.

Above 70° of latitude, a longitude difference does not trigger the alarm.

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Radio Navigation Tuning

GENERAL

Ident.: DSC-22_20-10-20-30-00010478.0001001 / 17 AUG 10

Applicable to: ALL

Radio nav aids are tuned for two different purposes: Display and computation.

It is possible to perform tuning for display in three different ways:

- Automatic tuning via FMGC software
- Manual tuning via the MCDU RAD NAV page
- Manual tuning via the Radio Management Panel (RMP) if both FMGCs or both MCDUs fail.

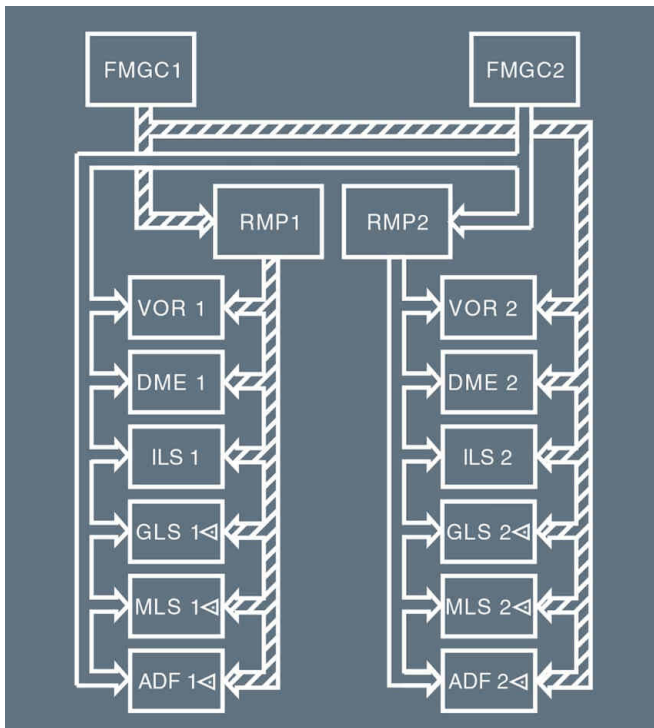
The FMGS automatically tunes the radio nav aids for computation of the radio position.

Note: *The manual selection of a VOR or VOR/DME may prevent the FMGS from automatically tuning a VOR/DME to compute position. In this case, the related MCDU displays “TUNE BBB FFF.FF” (BBB = ident, FFF.FF = frequency).*

ARCHITECTURE

Ident.: DSC-22_20-10-20-30-00010479.0001001 / 14 NOV 24

Applicable to: ALL



- In dual mode and independent mode, each FMGC simultaneously tunes the NAVAIDs on its own side (one VOR, one DME, one ILS, one GLS , one MLS , and one ADF ). In these modes, the flight crew can also manually tune the VOR (and associated DME), ILS, GLS , MLS , and ADF .
- In single mode, the valid FMGC tunes NAVAIDs on both sides. The flight crew can also use the RADIO NAV page to manually tune both VORs, both ADFs , and the ILS / GLS  / MLS .

Manual tuning has priority over automatic tuning.

Note: If one receiver fails, both FMGCs use the operative radio receiver to compute the position of the aircraft.

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VOR

Ident.: DSC-22_20-10-20-30-00010480.0001001 / 17 AUG 10

Applicable to: ALL

Each FMGC may tune only one VOR (manually or automatically).

Automatic tuning complies with the following priorities for tuning the VOR:

1. The specified navaid for the approach
2. The navaid that the flight crew should use to compute the current radio position
3. For display purposes:
 - A navaid specified for the active flight leg
 - The “TO” waypoint (TO WPT), if it is a navaid
 - The “FROM” waypoint (FROM WPT), if it is a navaid
 - A waypoint farther along the flight path, if it is a navaid
 - The navaid closest to the current position of the aircraft.

The scratchpad displays “SPECIFIC VOR-D UNAVAIL”, if the VOR or the VOR/DME that the flight crew requires for tuning is deselected.

DME

Ident.: DSC-22_20-10-20-30-00010481.0001001 / 17 AUG 10

Applicable to: MSN 02926-02944, 04392, 07784-07792

Each FMGC automatically uses its five DME frequencies as follows:

- One DME frequency for display. It is possible to tune it manually or automatically.
- Two DME frequencies in DME/DME mode for calculating the radio position of the aircraft. The FMGC automatically tunes these as a function of their best accuracy. The flight crew does not receive any indication that this process is happening.
- One DME frequency automatically tuned for radio position. This occurs in the VOR/DME mode, when the DME/DME is not available and the flight crew complies with the conditions for a VOR/DME update. In this case, the VOR/DME that the flight crew uses for display, is identical to the VOR/DME navaid that the flight crew uses for computation of the radio position.
- One DME frequency is connected to the ILS/DME.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT
SYSTEM DESCRIPTION - NAVIGATION**DME**

Ident.: DSC-22_20-10-20-30-00010481.0002001 / 17 AUG 10

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

Each FMGC automatically uses its four DME frequencies as follows:

- One DME frequency for display. It is possible to tune it manually or automatically. This DME frequency is also used for VOR/DME position computation.
- Two DME frequencies in DME/DME mode for calculating the radio position of the aircraft. The FMGC automatically tunes these as a function of their best accuracy. The flight crew does not receive any indication that this process is happening.
- One DME frequency is connected to the ILS/DME.

ADF

Ident.: DSC-22_20-10-20-30-00010482.0001001 / 17 AUG 10

Applicable to: ALL

The FMGC automatically tunes one ADF, when the flight plan specifies a Non Directional Beacon (NDB) approach and a fix in the approach is the "TO" waypoint.

The scratchpad displays "SPECIFIC NDB UNAVAIL", if the NDB that the flight crew requires for autotuning is deselected.

ILS

Ident.: DSC-22_20-10-20-30-00010483.0001001 / 17 AUG 10

Applicable to: ALL

Each FMGC automatically tunes one ILS frequency:

- In the PREFLIGHT or TAKEOFF phase, when the takeoff runway has an associated ILS.
- In the CLIMB, CRUISE, DESCENT, APPROACH, or GO-AROUND phase, when the type of approach in the flight plan is ILS.

The scratchpad displays "RWY/ILS MISMATCH" when the flight crew manually tunes the ILS and the entered frequency does not agree with the ILS or the LOC IDENT/FREQ that the flight crew requests for automatic tuning. The FMGS logic does not enable the flight crew to modify the course of an ILS when its frequency is identical to the ILS selected in the F-PLN.

SELECTION OF NAVAIDS ON MCDU PAGES

Ident.: DSC-22_20-10-20-30-00010485.0032001 / 31 AUG 17

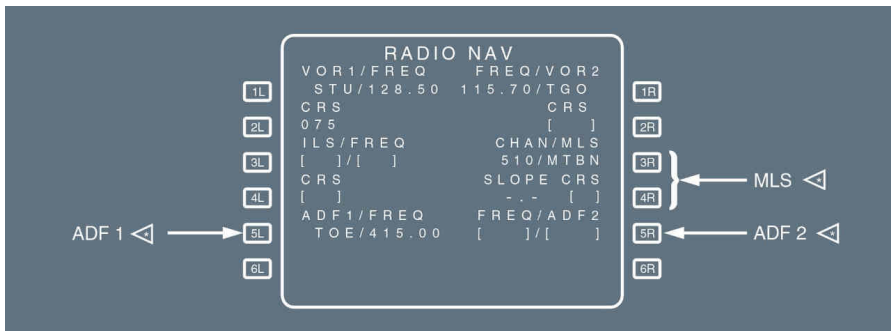
Applicable to: ALL

The MCDU displays the navaids tuned by the FMGC on two pages:

- RADIO NAV Page
- SELECTED NAVAIDS Page.

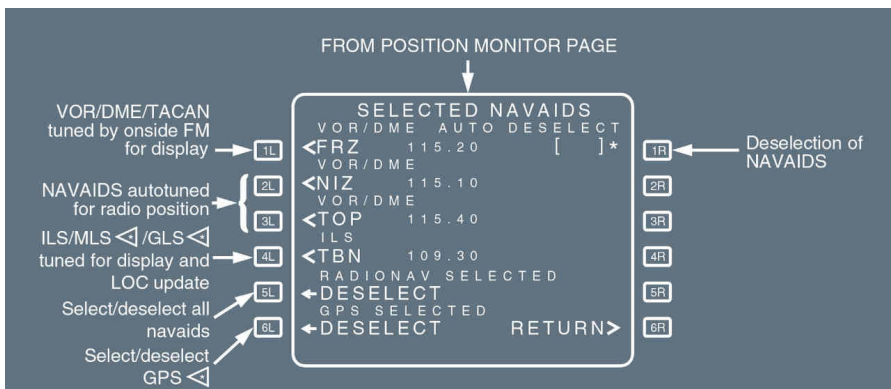
RADIO NAV PAGE

This page shows which navaids have been tuned automatically or manually for display purposes.



SELECTED NAVAIDS PAGE

This page lists the navaids tuned by the onside FMGC. No navaids can be modified on this page. The flight crew may deselect navaids and or GPS  for the whole flight.



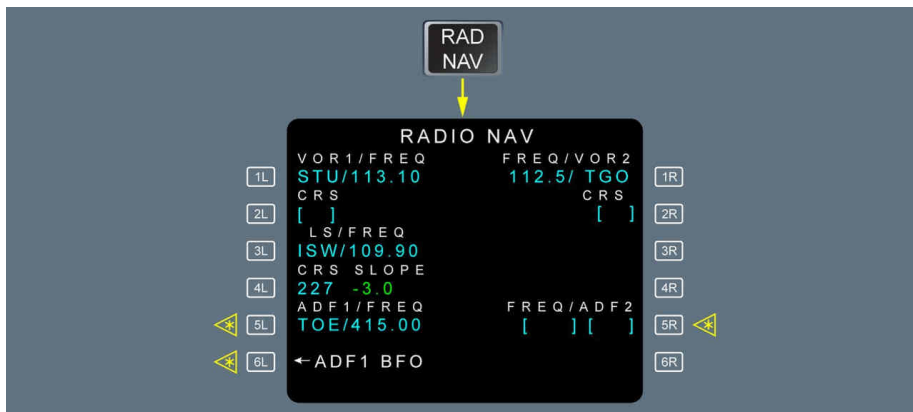
MANUAL TUNING

Ident.: DSC-22_20-10-20-30-00010486.0002001 / 14 NOV 24

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

INSERT the identifier on the RADIO NAV page.

Preferably use the identifier.



Note: The RADIO NAV page may differ according to option installed (ADF 1 , ADF 2 , XLS).

● If the MCDU displays **NOT IN DATA BASE:**

INSERT the frequency.

DISREGARD the ident that appears in small font on the MCDU.

When a frequency is entered in the VOR field, the FMGC automatically associates to the tuned frequency the closest navaid identifier with the same frequency, and displays it on the RADIO NAV page. This identifier may not correspond to the tuned navaid.

If the closest navaid, found in the database, is of a different type (e.g. VOR instead of VOR/DME), the flight crew will obtain a partial tuning (e.g. VOR indication instead of VOR/DME indication).

ENTER the course.

If the flight crew intends to manually tune an ILS that is not in the Navigation Database or to manually tune an ILS by its frequency (ident not entered), and if they do not enter the course, the flight crew will not be able to arm approach modes.

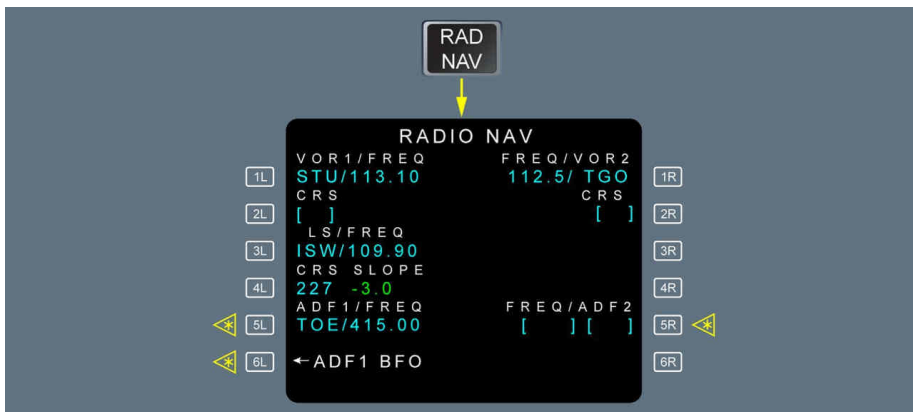
MANUAL TUNING

Ident.: DSC-22_20-10-20-30-00010486.0057001 / 14 NOV 24

Applicable to: MSN 02926-02944, 04392, 07784-07792

INSERT the identifier on the RADIO NAV page.

Preferably use the identifier.



Note: The RADIO NAV page may differ according to option installed (ADF 1 , ADF 2 , XLS).

● If the MCDU displays **NOT IN DATA BASE**:

INSERT the frequency.

DISREGARD the ident that appears in small font on the MCDU.

When a frequency is entered in the VOR field, the FMGC automatically associates to the tuned frequency the closest navaid identifier with the same frequency, and displays it on the RADIO NAV page. This identifier may not correspond to the tuned navaid.

If the closest navaid, found in the database, is of a different type (e.g. VOR instead of VOR/DME), the flight crew will obtain a partial tuning (e.g. VOR indication instead of VOR/DME indication).

ENTER the course.

NAVAID IDENTIFICATION

Ident.: DSC-22_20-10-20-30-00010487.0001001 / 13 MAY 25

Applicable to: ALL

CHECK the XLS (ILS or GLS ) or MLS ) or SLS ) identifier decoded on the PFD, and the VOR or ADF  on the ND.

When the navaid identifier is decoded in agreement with that published, no audio check is necessary. When the decoding is different from the published one, check the audio. Due to morse coding inaccuracy, wrong decoding may sometimes occur.

For GLS , the audio signal may be inaudible. However, the GLS  identifier displayed on ND and PFD is raw data. Consequently, for GLS , no audio check is necessary.

For SLS  , no audio signal is available.

Note: When a DME or a TACAN only is selected using either its identifier or its frequency, the NDs do not display the decoded indication.

Alignment of Inertial Reference System

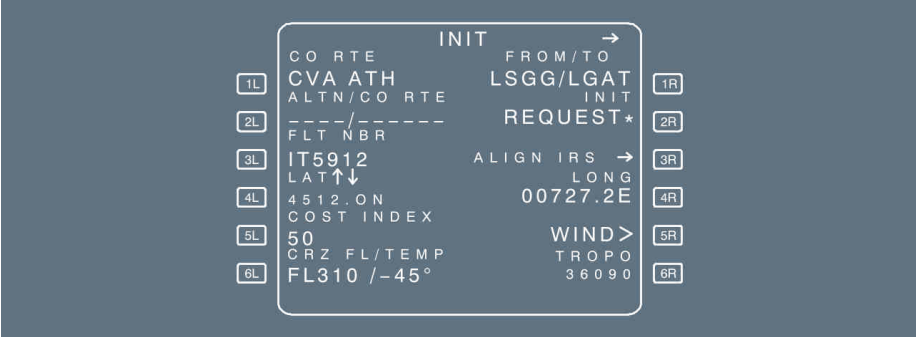
ALIGNMENT OF INERTIAL REFERENCE SYSTEM

Ident.: DSC-22_20-10-20-40-00010143.0002001 / 01 OCT 12
 Applicable to: MSN 02155-02789, 03031-03060

The FMGS uses the reference point coordinates of the departure airport to align the IRS.

It calls these up from the database automatically after the flight crew has entered a company route or an origin-destination city pair and pressed the ALIGN IRS key on the MCDU. The flight crew can adjust these coordinates manually to the gate position. A normal alignment takes 10 min, a fast alignment 30 s.

Fast alignment is used to refine a position when time is limited.



- Note: If "ALIGN" flashes on the ADIRS overhead CDU during the alignment process, it indicates one of the following:
- It has detected excessive motion. (It automatically restarts the alignment)
 - It has detected a disagreement between the position the MCDU has sent to the IRS, and the last memorized IRS position. The flight crew must enter new coordinates in the MCDU, and realign the IRS
 - It has detected a disagreement between the latitude the MCDU has sent to the IRS, and the latitude the IRS has computed during the alignment
 - The IRS has not received a position from the MCDU or the ADIRS overhead CDU.

ALIGNMENT OF INERTIAL REFERENCE SYSTEM

Ident.: DSC-22_20-10-20-40-00010143.0013001 / 01 OCT 12
 Applicable to: MSN 05152-05746

The FMGS uses the reference point coordinates of the departure airport to align the IRS.

It calls these up from the database automatically after the flight crew has entered a company route or an origin-destination city pair and pressed the ALIGN IRS key on the MCDU. The flight crew can adjust these coordinates manually to the gate position. A normal alignment takes 10 min, a fast alignment 30 s.

Fast alignment is used to refine a position when time is limited.



INIT		FROM/TO	
1L	CO RTE CVA ATH	LSGG/LGAT	1R
2L	ALTN/CO RTE -----/-----	INIT REQUEST*	2R
3L	FLT NBR IT5912	ALIGN IRS →	3R
4L	LAT ↑↓ 4512.ON	LONG 00727.2E	4R
5L	COST INDEX 50	WIND>	5R
6L	CRZ FL/TEMP FL310 /-45°	TROPO 36090	6R

Note: If the “IRS IN ALIGN” memo flashes on the E/WD during the alignment process, it indicates one of the following:

- It has detected excessive motion. (It automatically restarts the alignment)
- It has detected a disagreement between the position the MCDU has sent to the IRS, and the last memorized IRS position. The flight crew must enter new coordinates in the MCDU, and realign the IRS
- It has detected a disagreement between the latitude the MCDU has sent to the IRS, and the latitude the IRS has computed during the alignment
- The IRS has not received a position from the MCDU .

ALIGNMENT OF INERTIAL REFERENCE SYSTEM

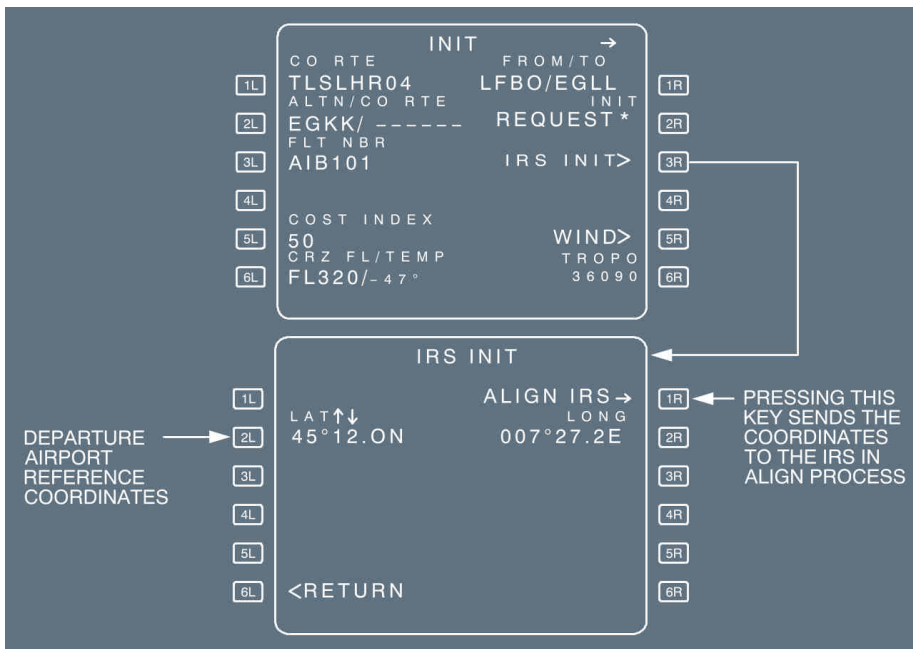
Ident.: DSC-22_20-10-20-40-00010143.0006001 / 01 OCT 12

Applicable to: MSN 02926-02944

The flight crew accesses the page dedicated to IRS alignment by pressing the [3R] key.

The FMGS uses the reference point coordinates of the departure airport to align the IRS. The flight crew can manually adjust these coordinates to the gate position. A normal alignment takes 10 min and a fast alignment takes 30 s.

Fast alignment is used to refine a position, when time is limited.



Note: If "ALIGN" flashes on the ADIRS overhead CDU during the alignment process, it indicates one of the following:

- It has detected excessive motion. (It automatically restarts the alignment)
- It has detected a disagreement between the position the MCDU has sent to the IRS, and the last memorized IRS position. The flight crew must enter new coordinates in the MCDU, and realign the IRS
- It has detected a disagreement between the latitude the MCDU has sent to the IRS, and the latitude the IRS has computed during the alignment
- The IRS has not received a position from the MCDU or the ADIRS overhead CDU.

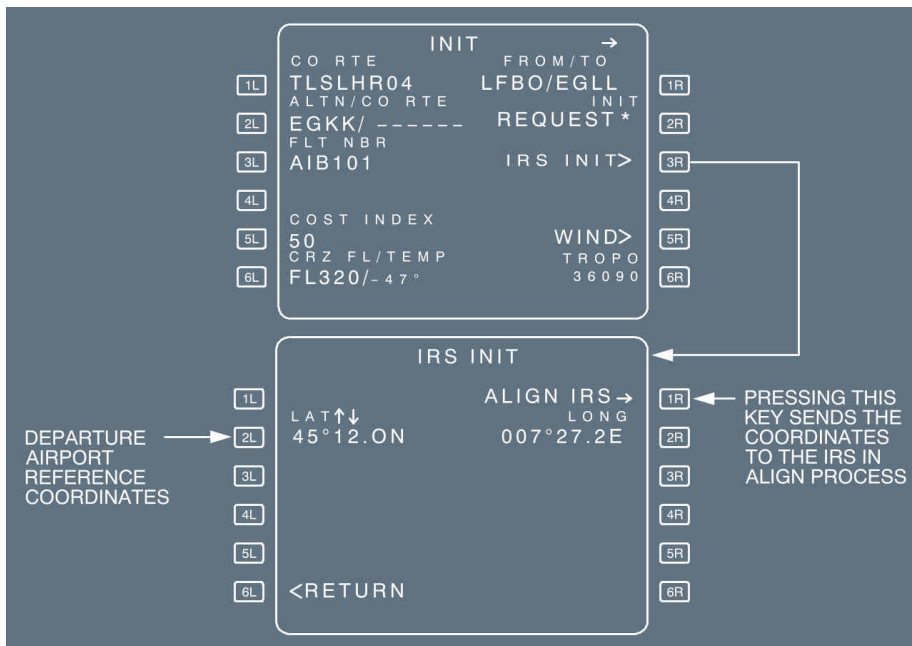
ALIGNMENT OF INERTIAL REFERENCE SYSTEM

Ident.: DSC-22_20-10-20-40-00010143.0029001 / 01 OCT 12

Applicable to: MSN 04392, 07784-07792

The flight crew accesses the page dedicated to IRS alignment by pressing the [3R] key. The FMGS uses the reference point coordinates of the departure airport to align the IRS. The flight crew can manually adjust these coordinates to the gate position. A normal alignment takes 10 min and a fast alignment takes 30 s.

Fast alignment is used to refine a position, when time is limited.



Note: If the "IRS IN ALIGN" memo flashes on the E/WD during the alignment process, it indicates one of the following:

- It has detected excessive motion. (It automatically restarts the alignment)
- It has detected a disagreement between the position the MCDU has sent to the IRS, and the last memorized IRS position. The flight crew must enter new coordinates in the MCDU, and realign the IRS
- It has detected a disagreement between the latitude the MCDU has sent to the IRS, and the latitude the IRS has computed during the alignment
- The IRS has not received a position from the MCDU.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT SYSTEM DESCRIPTION - NAVIGATION
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Navigation Database

GENERAL

Ident.: DSC-22_20-10-20-50-00010410.0001001 / 09 MAR 15
Applicable to: ALL

- Overall navigation performance is mainly based on two elements:
- The accuracy of the aircraft position calculation
 - The validity of the flight path definition, as extracted from the navigation database.

The level of validation depends on the type of operations. For example, JAA TGL 10 requires that, for Precision RNAV in terminal area, providers and operators implement a quality assurance program for the navigation database, which may include a navigation database validation process. The highest level of validation is required for RNAV approach, with lateral and vertical navigation.

The navigation databases are revised every 28 days (AIRAC cycle). Flights should be conducted with a navigation database that is within its cycle. This should be checked on the AIRCRAFT STATUS MCDU page.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

SYSTEM DESCRIPTION - NAVIGATION

Intentionally left blank

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT SYSTEM DESCRIPTION - FLIGHT PLANNING
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General

FLIGHT PLANNING

Ident.: DSC-22_20-10-30-05-00010492.0002001 / 17 AUG 10

Applicable to: ALL

The flight crew uses the MCDU to insert flight plans into the FMGS:

- A lateral flight plan that defines the intended horizontal flight path
- A vertical flight plan that defines the intended speed and altitude profile for the aircraft to follow while flying the lateral flight plan.

Note: The flight planning function is available for both the primary and secondary flight plans.

The FMGS can contain two different flight plans:

- The ACTIVE flight plan, which is the basis for:
 - Lateral and vertical guidance
 - MCDU and ND display
 - Radio navigation autotuning
 - Performance predictions
 - Fuel planning.
- The SECONDARY flight plan which the flight crew may use:
 - When an alternate takeoff runway is probable
 - To plan a diversion
 - To prepare the next flight
 - To compare predictions or evaluations.

Each flight plan is composed of the same elements:

- The primary flight plan, from origin to destination and missed approach
- The alternate flight plan, from destination to alternate destination.

The flight crew enters the flight plan in either of two ways:

- Automatically by selecting a company route. Such a selection will call all the elements of the route out of the database.
- Manually by selecting an ORIGIN/DEST pair, and then selecting all successive waypoints, procedures, and vertical constraints on the MCDU.

The flight crew may then modify the flight plan on the ground or in flight, by making lateral and vertical revisions.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

SYSTEM DESCRIPTION - FLIGHT PLANNING

Intentionally left blank

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT SYSTEM DESCRIPTION - FLIGHT PLANNING
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Lateral Functions - General

GENERAL

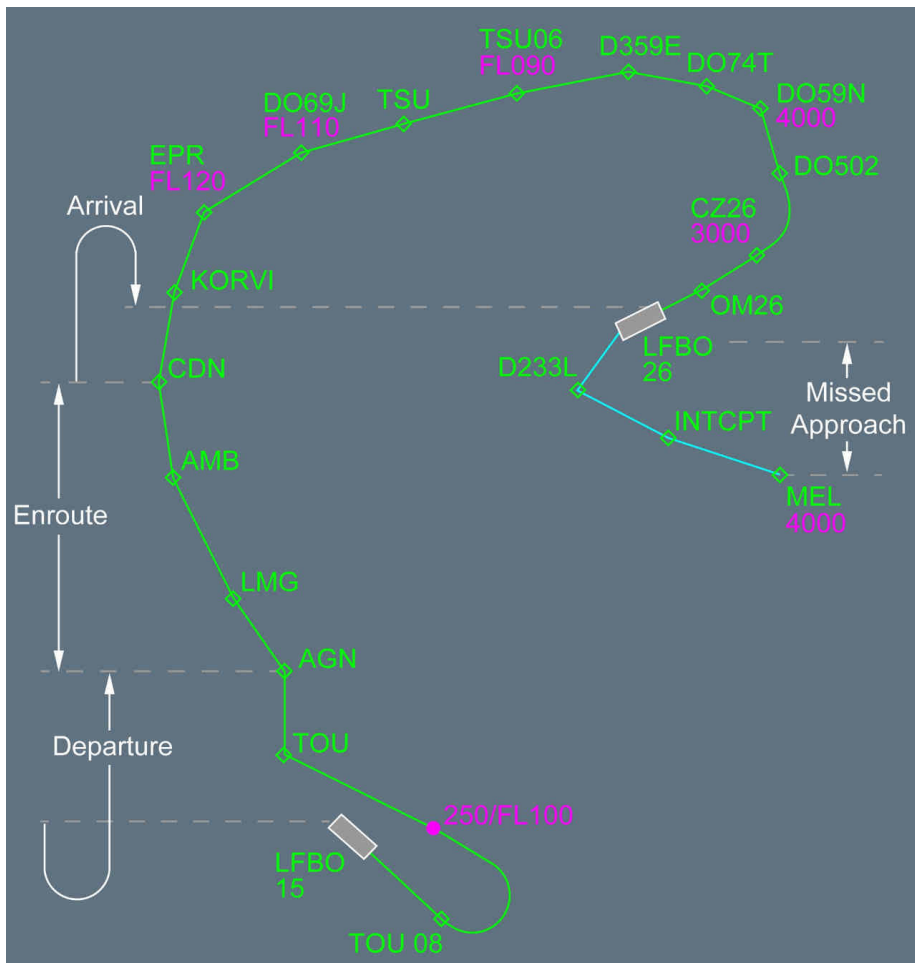
Ident.: DSC-22_20-10-30-10-00011075.0002001 / 05 MAR 19
 Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

To insert the lateral flight plan, the flight crew can use either a company route number or an ICAO four-letter city pair.

The lateral flight plan includes the following elements:

- Departure
 - Takeoff runway
 - SID
 - En route transition.
- En route
 - En route waypoints and airways.
- Arrival
 - En route transition
 - STARs/VIAs
 - Landing runway with selected approach
 - Missed approach.
- Alternate flight plan.

These elements are defined by waypoints and legs between the waypoints.



The FMGC automatically strings the legs in sequence.

The flight plan has a discontinuity if any two waypoints do not have a leg defined between them.

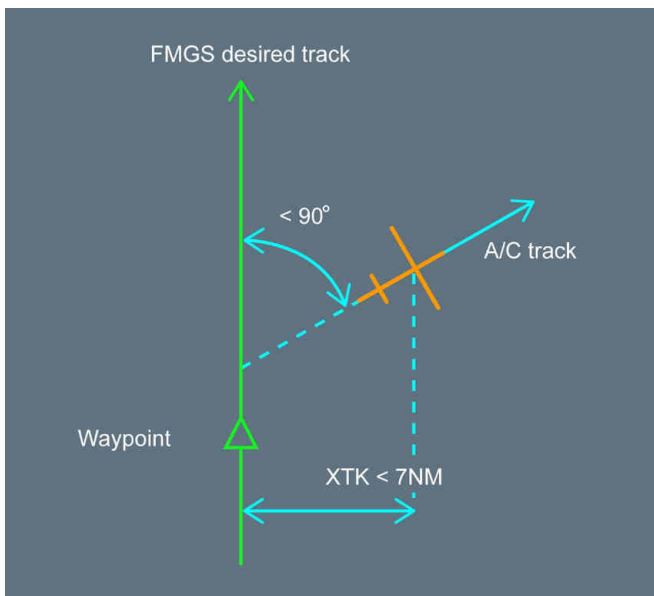
The computer assumes that the aircraft will fly a direct leg between the two waypoints that define the discontinuity.

Note: When the aircraft overflies a flight plan discontinuity, the NAV mode automatically reverts to the HDG/TRK mode.

In HDG/TRK mode, a flight plan waypoint is sequenced if the following conditions are met:

- The waypoint is behind the aircraft and the aircraft is less than 7 NM from it
- The angle between the current aircraft track and the track of the leg is less than 90° .
- If the aircraft is flying a discontinuity towards a waypoint, this waypoint is sequenced when the aircraft is less than 5NM from it.

The same conditions apply in NAV mode, except that no distance to the waypoint is taken into account.



Note: If the flight crew revises the lateral flight plan with the DIR TO INTERCEPT function, the waypoints of the revised flight plan are sequenced when the aircraft is in the above mentioned conditions.

The FMGS automatically strings additional types of legs, when departure or arrival procedures (SID - STAR - TRANS) are defined.

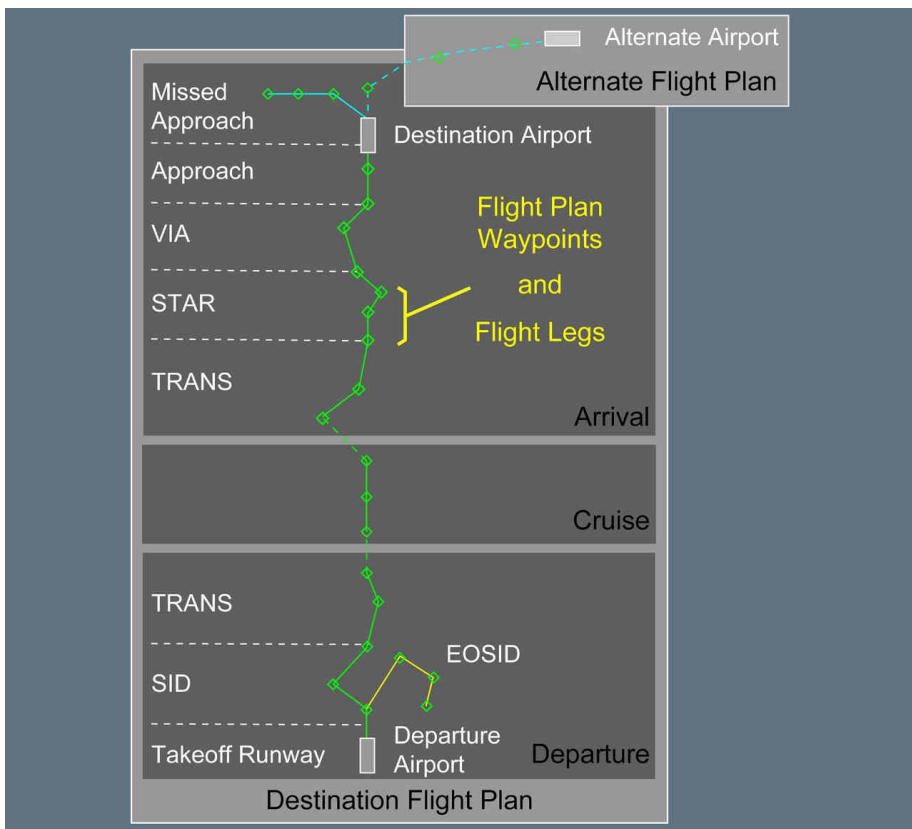
Those strings correspond to specific patterns that are heading or track referenced and are defined in the database, such as:

- DME arc leg
- Holding pattern to a fix, or reverse turn
- Course-to-fix leg

- Radius-to-fix leg
- Heading leg
- MANUAL leg.

The flight crew cannot create these types of legs: They are part of the stored departure/arrival procedures they have selected.

The flight crew can only create direct legs between manually defined geographic points (navaids, airports, waypoints).



 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT SYSTEM DESCRIPTION - FLIGHT PLANNING
--	---

Note: The departure and arrival procedures are defined in the database to minimize the amount of memory required.

They are divided, as follows:

- DEPARTURE = SID + EN ROUTE TRANSITION
- ARRIVAL = APPR VIA + STAR + EN ROUTE TRANSITION

The SID is the central common part of the departure procedure, as the STAR is of the arrival procedure. Enroute transitions (TRANS) are the various possible trajectories defined between the last SID point and the first enroute waypoints, and between the last enroute waypoint and the first fix of the STAR. "APPR VIAs" are the possible trajectories, defined between the last STAR point and the first point of the approach.

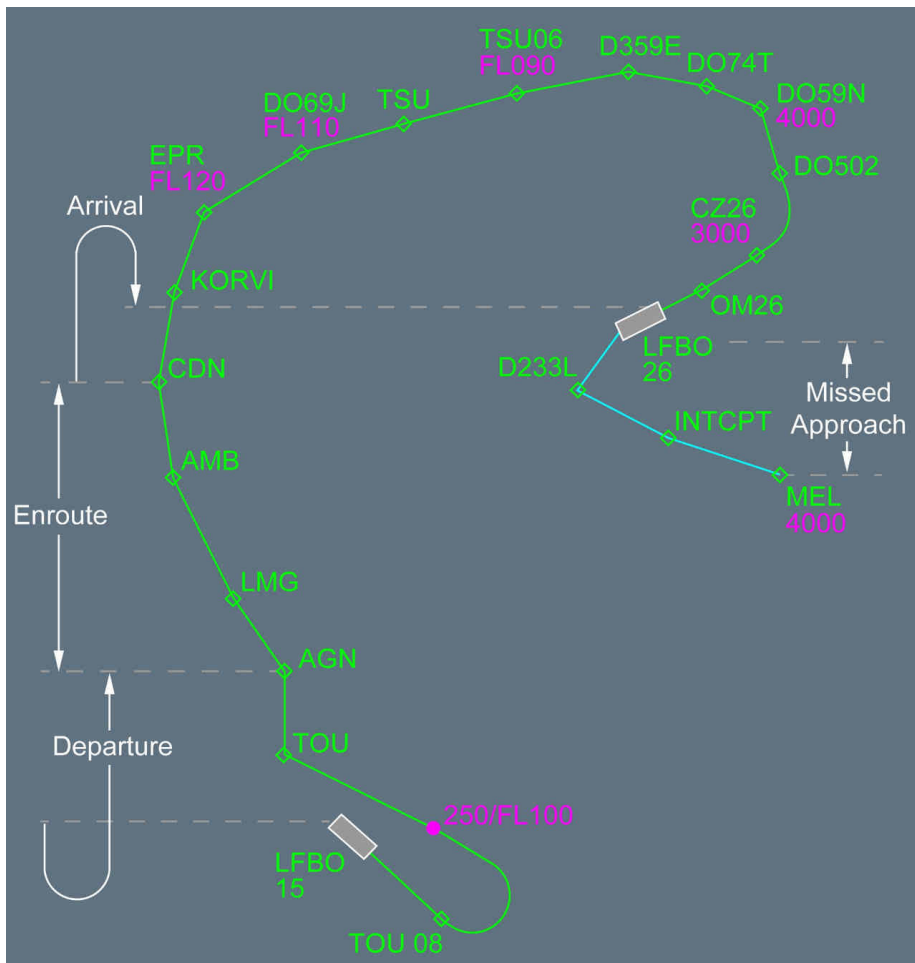
GENERAL
Ident.: DSC-22_20-10-30-10-00011075.0004001 / 05 MAR 19 Applicable to: MSN 02926-02944, 04392, 07784-07792

To insert the lateral flight plan, the flight crew can use either a company route number or an ICAO four-letter city pair.

The lateral flight plan includes the following elements:

- Departure
 - Takeoff runway
 - SID
 - En route transition.
- En route
 - En route waypoints and airways.
- Arrival
 - En route transition
 - STARs/VIAs
 - Landing runway with selected approach
 - Missed approach.
- Alternate flight plan.

These elements are defined by waypoints and legs between the waypoints.



The FMGC automatically strings the legs in sequence.

The flight plan has a discontinuity if any two waypoints do not have a leg defined between them.

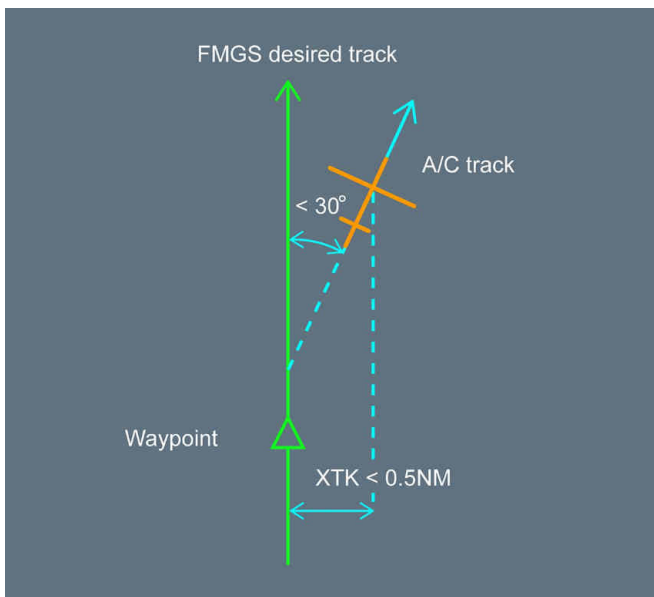
The computer assumes that the aircraft will fly a direct leg between the two waypoints that define the discontinuity.

Note: When the aircraft overflies a flight plan discontinuity, the NAV mode automatically reverts to the HDG/TRK mode.

In HDG/TRK mode, a waypoint is sequenced when it passes behind the aircraft, and the aircraft is less than 5 NM from it. In addition, when the waypoint is the Destination Airport (DEST), the sequencing is inhibited, unless the following conditions are fulfilled within the 3 s following the general rules fulfilment:

- The cross-track is less than 0.5 NM
- The difference between the track of the aircraft and the track of the leg is less than 30° .

The same conditions apply in NAV mode, except that no distance to the waypoint is taken into account.



Note: If the flight crew revises the lateral flight plan with the DIR TO INTERCEPT function, the waypoints of the revised flight plan are sequenced when the aircraft is in the above mentioned conditions.

The FMGS automatically strings additional types of legs, when departure or arrival procedures (SID - STAR - TRANS) are defined.

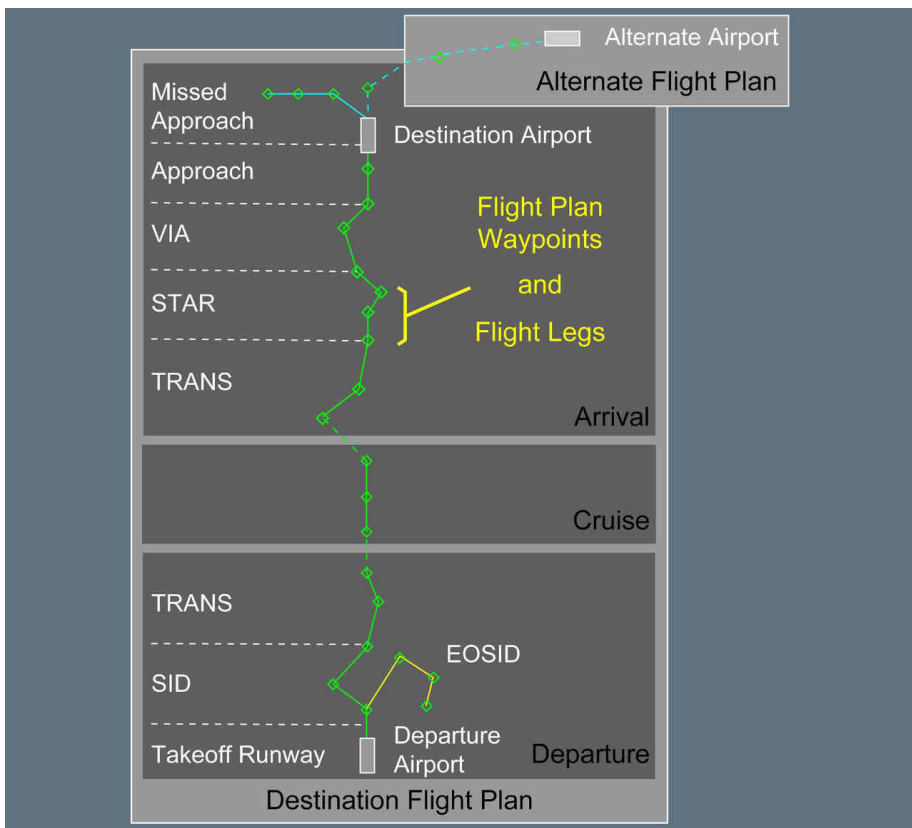
Those strings correspond to specific patterns that are heading or track referenced and are defined in the database, such as:

- DME arc leg
- Holding pattern to a fix, or reverse turn

- Course-to-fix leg
- Radius-to-fix leg
- Heading leg
- MANUAL leg.

The flight crew cannot create these types of legs: They are part of the stored departure/arrival procedures they have selected.

The flight crew can only create direct legs between manually defined geographic points (navaids, airports, waypoints).



FLIGHT PLAN CONSTRUCTION

Ident.: DSC-22_20-10-30-10-00011076.0032001 / 04 JUN 19
Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

There are three ways of defining the route:

1. A company route, that is in the database, and is known by the flight crew.
The flight crew enters the name of the CO RTE into the [1L] field of the INIT A page. This action enters all the elements of the flight plan. The database usually includes an alternate route associated with the destination.

1L

2L

3L

4L

5L

6L

INIT

CO RTE
20441
ALTN/CO RTE
LGTS/LGATLS01
FLT NBR
IT5612

COST INDEX
60
CRZ FL/TEMP
FL290/-42°

FROM/TO
LSGG/LGAT
INIT
REQUEST ★
IRIS INIT >

WIND >
TROPO
36090

1R

2R

3R

4R

5R

6R

2. A company route, that is in the database, but the flight crew does not know it is there.
The flight crew enters a city pair in the [1R] field. The ROUTE SELECTION page automatically appears and enables the flight crew to review all stored routes between the two cities before selecting one of them.

1L

2L

3L

4L

5L

6L

INIT

CO RTE
□□□□□□□□

ALTN/CO RTE
- - - - / - - - - -

FLT NBR
□□□□□□□□

COST INDEX
- - -

CRZ FL/TEMP
- - - - - / - - -

KM SP / KL GA

FROM/TO
□□□□/□□□□

INIT
REQUEST*

IRS INIT>

WIND>
TROPO
36090

1R

2R

3R

4R

5R

6R

Enter

1L

2L

3L

4L

5L

6L

KM SP / KL GA 1/6

MSPLGA

J34
ETG

DLL
DJB
MIP

DIR
J146
MIP5

BAE
ETG
PROUD

<RETURN

INSERT*

1R

2R

3R

4R

5R

6R

3. There is no company route between the two cities.

The flight crew enters the city pair in the [1R] field. The ROUTE SELECTION page appears and displays “NONE”.

The flight crew has to manually construct the entire flight plan.

For procedure, *Refer to PRO-NOR-SRP-01-10 Flight Plan Initialization - General.*

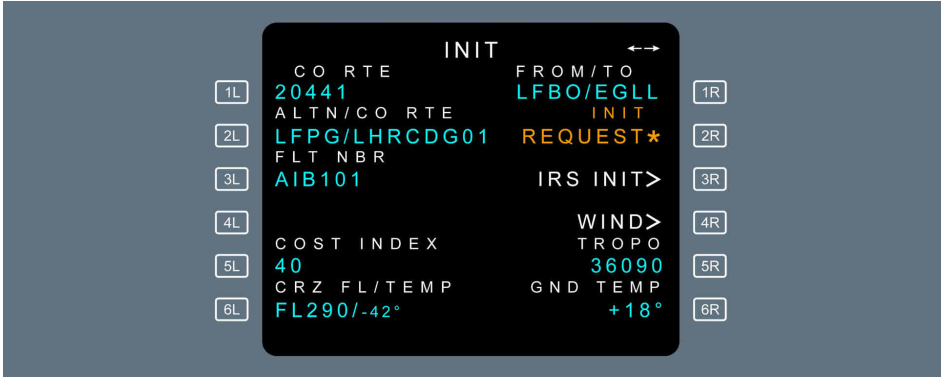
FLIGHT PLAN CONSTRUCTION

Ident.: DSC-22_20-10-30-10-00011076.0042001 / 04 JUN 19
Applicable to: MSN 02926-02944, 04392, 07784-07792

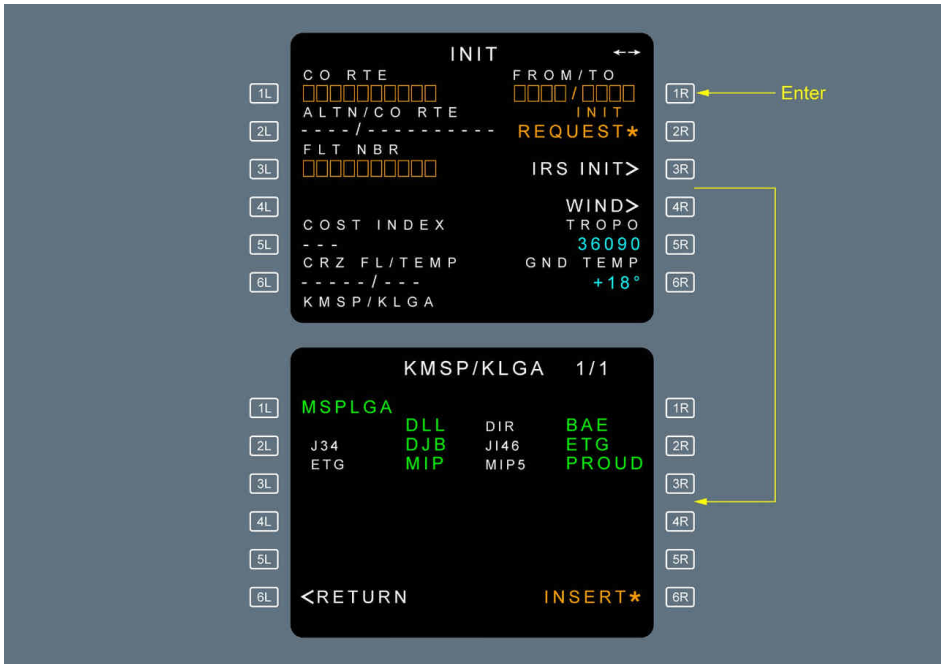
There are three ways of defining the route:

1. A company route, that is in the database, and is known by the flight crew.

The flight crew enters the name of the CO RTE into the [1L] field of the INIT A page. This action enters all the elements of the flight plan. The database usually includes an alternate route associated with the destination.



2. A company route, that is in the database, but the flight crew does not know it is there. The flight crew enters a city pair in the [1R] field. The ROUTE SELECTION page automatically appears and enables the flight crew to review all stored routes between the two cities before selecting one of them.



INIT

CO RTE FROM/TO
 [1L] [1R] ← Enter
 [2L] [2R]
 [3L] [3R]
 [4L] [4R]
 [5L] [5R]
 [6L] [6R]

ALTN/CO RTE REQUEST*
 FLT NBR IRS INIT>
 COST INDEX WIND>
 --- TROPO
 CRZ FL/TEMP 36090
 --- / --- GND TEMP
 --- / --- +18°
 KMSP/KLGA

KMSP/KLGA 1/1

MSPLGA
 [1L] [1R]
 [2L] [2R]
 [3L] [3R]
 [4L] [4R]
 [5L] [5R]
 [6L] [6R]

J34 DLL DIR BAE
 ETG DJB J146 ETG
 MIP MIP5 PROUD
 <RETURN INSERT*

3. There is no company route between the two cities.

The flight crew enters the city pair in the [1R] field. "NONE" automatically appears in the CO RTE [1L] field, without automatically displaying the ROUTE SELECTION page.

The flight crew has to manually construct the entire flight plan.

For procedure, *Refer to PRO-NOR-SRP-01-10 Flight Plan Initialization - General.*

FLIGHT PLAN CAPACITY

Ident.: DSC-22_20-10-30-10-00010631.0002001 / 04 NOV 20

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

In terms of flight plan capacity, the FMS takes into account 3 flight plans:

- The active flight plan
- The secondary flight plan
- The temporary flight plan.

Each flight plan can contain up to 200 legs. If a flight plan contains 200 legs, and if the flight crew attempts to perform a lateral revision that increases the number of legs of this flight plan, the FMS rejects the revision and the MCDU displays the **F-PLN FULL** message.

For the active and secondary flight plans, the primary parts must contain less than 165 legs, and the alternate parts must contain less than 35 legs.

FLIGHT PLAN CAPACITY

Ident.: DSC-22_20-10-30-10-00010631.0008001 / 17 AUG 10

Applicable to: MSN 02926-02944, 04392, 07784-07792

In terms of flight plan capacity, the FMS takes into account 5 elements:

- The primary part of the active flight plan
- The alternate part of the active flight plan
- The primary part of the secondary flight plan
- The alternate part of the secondary flight plan
- The temporary flight plan.

Each element can contain up to 200 legs. If an element contains 200 legs, and if the flight crew attempts to perform a lateral revision that increases the number of legs of this element, the FMS rejects the revision and the MCDU displays the “F-PLN FULL” message.

LATERAL REVISIONS

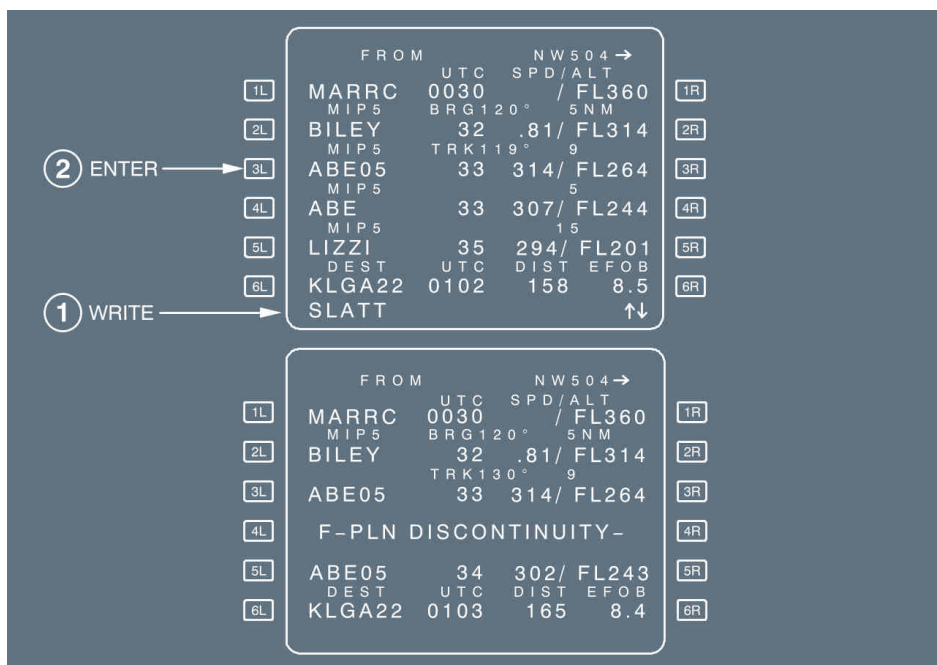
Ident.: DSC-22_20-10-30-10-00010632.0002001 / 07 APR 17

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

The flight crew can revise the lateral flight plan following two types of revisions:

1. Lateral revisions that have an immediate effect on the active flight plan:

- The flight crew inserts a new waypoint directly on the F-PLN page, deletes, or changes a waypoint from it:



1 WRITE →

	FROM	UTC	SPD/ALT	
1L	MARRC	0030	NW504 → / FL360	1R
2L	BILEY	32	BRG 120° / FL314	2R
3L	ABE05	33	TRK 119° / FL264	3R
4L	ABE	33	314 / FL244	4R
5L	LIZZI	35	294 / FL201	5R
6L	KLGA22	0102	DIST 158 EFOB 8.5	6R
	SLATT		↑↓	

2 ENTER →

	FROM	UTC	SPD/ALT	
1L	MARRC	0030	NW504 → / FL360	1R
2L	BILEY	32	BRG 120° / FL314	2R
3L	ABE05	33	TRK 130° / FL264	3R
4L	F-PLN DISCONTINUITY-			4R
5L	ABE05	34	302 / FL243	5R
6L	KLGA22	0103	DIST 165 EFOB 8.4	6R

When the flight crew enters a new waypoint, which does not exist in the flight plan, the following waypoint moves down the flight plan, with a discontinuity shown after the new waypoint.

- The flight crew adds a direct leg (DIR TO) from his present position to a selected waypoint: The flight crew can change the "TO" waypoint of the active leg. The DIR TO function gives access to DIR TO, DIR TO ABEAM, or DIR TO/INTERCEPT. The active leg then goes from the present position (T/P) to the waypoint selected or inserted as the new "TO" waypoint.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT

SYSTEM DESCRIPTION - FLIGHT PLANNING

① SELECT →

DIR TO		FBS1	
1L	* []	1R	
2L	LMG 0708 .79 / FL350	2R	
3L	(T/D) 0718 .79 / FL350	3R	
4L	AMB ^{TRK 004°} 0721 273 / FL301	4R	
5L	VILRO 0723 " / FL253	5R	
6L	(LIM) ^(SPD) 0730 *250 / FL100	6R	
		↑↓	

② SELECT →

DIR TO		FBS1 RADIAL IN	
1L	* AMB 184° *	1R	
2L	WITH * ABEAM PTS [] °	2R	
3L	LMG 0709 .79 / FL350	3R	
4L	(T/D) 0719 .79 / FL350	4R	
5L	AMB ^{TRK 004°} 0722 273 / FL301	5R	
6L	VILRO 0724 " / FL253	6R	
		↑↓	

FROM UTC		FBS1 SPD / ALT	
1L	T-P 0709 .79 / FL350	1R	
2L	(T/D) 0722 .80 / FL350	2R	
3L	AMB 0724 283 / FL301	3R	
4L	VILRO 0727 " / FL253	4R	
5L	(LIM) ^(SPD) 0734 250 / FL100	5R	
6L	DEST UTC DIST EFOB LFP007 0745 207 16.5	6R	
		↑↓	

2. Lateral revisions that lead to a temporary flight plan (TMPY) before they take effect:

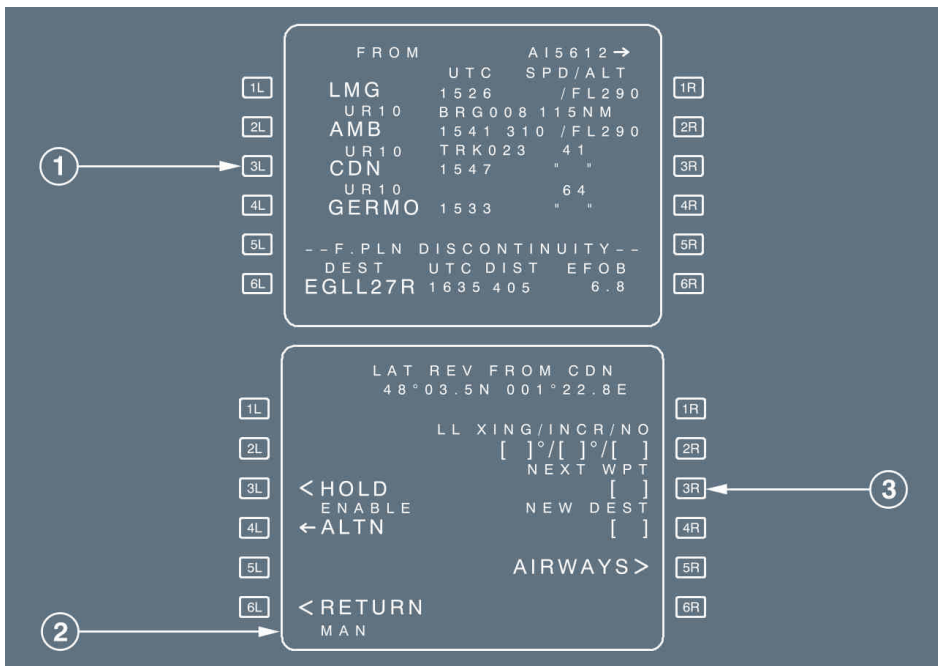
The flight crew creates a temporary flight plan, then inserts it as a revision to the active flight plan. The flight crew does this when selecting, deleting, or modifying several waypoints of an airway or procedure at once (SID, STAR, HOLD, TAKEOFF or LANDING RWY). This modification is made on specific "LAT REV" pages from the flight plan page.

Possible revisions are:

- Insert or modify the departure procedure
- Insert or modify the arrival procedure
- Insert a waypoint
- Change the destination
- Insert an airway
- Insert an offset
- Insert a holding pattern
- Select or enable an alternate flight plan
- Fix information.

The purpose of the temporary flight plan is to allow the flight crew to check a revision on the MCDU and on the ND before inserting the changes into the active flight plan. It is a copy of the active flight plan that has been changed according to the flight crew revision. While it is displayed, the aircraft will continue to follow the original active flight plan.

No predictions are computed or displayed on the pages of the temporary flight plan.



1L

2L

3L

4L

5L

6L

FROM AI5612 →

LMG	1526	SPD/ALT	
UR10	BRG008	115NM	
AMB	1541 310	FL290	
UR10	TRK023	41	
CDN	1547	" "	
UR10		64	
GERMO	1533	" "	

-- F. PLN DISCONTINUITY --

DEST	UTC DIST	EFOB
EGLL27R	1635 405	6.8

1R

2R

3R

4R

5R

6R

1L

2L

3L

4L

5L

6L

LAT REV FROM CDN

48°03.5N 001°22.8E

LL XING/INCR/NO

[]/[]/[]

NEXT WPT []

NEW DEST []

AIRWAYS>

< HOLD

ENABLE

< ALTN

< RETURN

MAN

1R

2R

3R

4R

5R

6R

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT
SYSTEM DESCRIPTION - FLIGHT PLANNING

A temporary flight plan is displayed for a check and/or new modification. Inserting the temporary revision will modify the active flight plan.

1L

2L

3L

4L

5L

6L

1L

2L

3L

4L

5L

6L

FROM
TMPY
AI5612 →

LMG	UTC	SPD/ALT
	1526	/FL290
UR10	BRG008	115NM
AMB	----	---/----
UR10	TRK023	41
CDN	----	---/----
UB19		55
MAN	----	---/----
UB19		20
PON	----	---/----

← ERASE
INSERT *
↑↓

1R

2R

3R

4R

5R

6R

1R

2R

3R

4R

5R

6R

1L

2L

3L

4L

5L

6L

FROM
AI5612 →

LMG	1526	/FL290
UR10	BRG008	115NM
AMB	1541	310/FL290
UR10	TRK023	" / " 41
CDN	1547	" / " 55
UB19		" / " 20
MAN	1553	" / " 20
UB19		" / " 20
PON	1558	" / " 20
DEST UTC DIST EFOB		
EGLL27R	1638	405 6.7

1R

2R

3R

4R

5R

6R

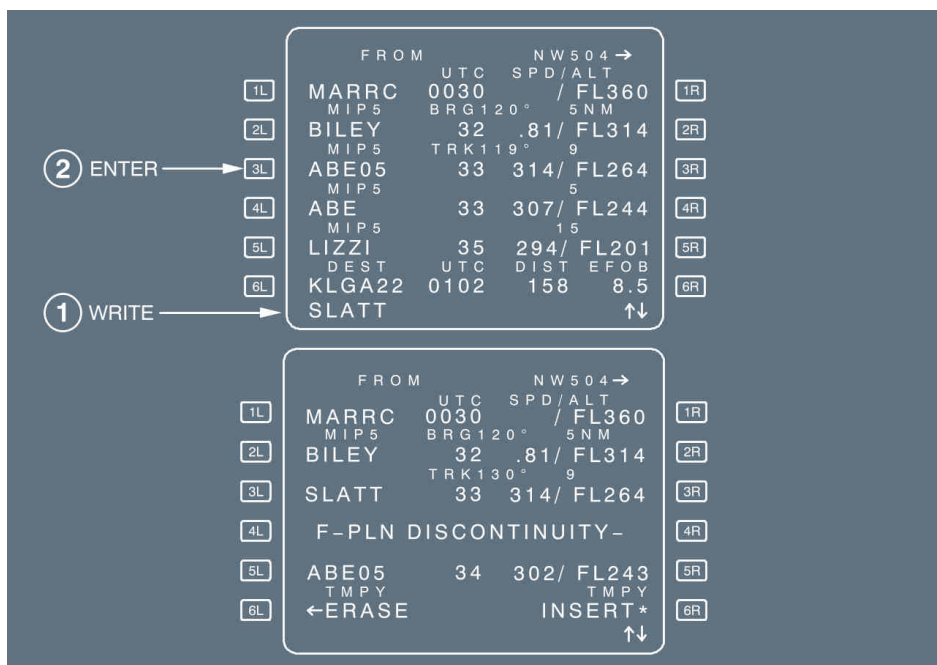
LATERAL REVISIONS

Ident.: DSC-22_20-10-30-10-00010632.0005001 / 23 JUN 15

Applicable to: MSN 02926-02944, 04392, 07784-07792

The flight crew can revise the lateral flight plan in three ways. All lateral revisions of the F-PLN lead the FMS to create a temporary flight plan (TMPY) before they take effect:

- The flight crew inserts a new waypoint directly on the F-PLN page, deletes, or changes a waypoint from it:



Initial F-PLN State:

FROM	UTC	SPD/ALT
MARRC	0030	FL360
BILEY	32	.81/ FL314
ABE05	33	314/ FL264
ABE	33	307/ FL244
LIZZI	35	294/ FL201
KLGA22	0102	158 8.5
SLATT		

After Insertion (F-PLN DISCONTINUITY):

FROM	UTC	SPD/ALT
MARRC	0030	FL360
BILEY	32	.81/ FL314
SLATT	33	314/ FL264
F-PLN DISCONTINUITY-		
ABE05	34	302/ FL243
←ERASE INSERT*		

- After inserting a waypoint, a F-PLN discontinuity is inserted between the inserted waypoint and the following one.
- After deleting a waypoint, a F-PLN discontinuity is inserted between the preceding waypoint and the following one.

The flight crew should clear the discontinuity as appropriate, check the temporary F-PLN and insert it in the active F-PLN.

- The flight crew adds a direct leg (DIR TO):

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT

SYSTEM DESCRIPTION - FLIGHT PLANNING

1 SELECT →

WAYPOINT	DIR TO	UTC	DIST
[]	----	---	
F-PLN WPTS			
←TOP	DIRECT TO		
←GEN	WITH		
	ABEAM PTS		
	RADIAL IN		
	[]°		
	RADIAL OUT		
	[]°		

↑↓

1R

2R

3R

4R

5R

6R

(IN YELLOW)

WAYPOINT	DIR TO	UTC	DIST
BEROK		1055	20
F-PLN WPTS			
←TOP	DIRECT TO		
←GEN	WITH		
	ABEAM PTS→		
	RADIAL IN		
	150° →		
	RADIAL OUT		
	[]°		
	DIR TO		
	INSERT*		

↑↓

1R

2R *

3R

4R

5R

6R ← SELECT 2

(IN GREEN)

FROM	UTC	AIB5612 ↔
		SPD/ALT
T-P	1025	6000
	BRG 013°	27 NM
ABTOP	1041	.80 / FL290
	TRK 122°	56
ABGEN	1048	" "
		43
BEROK	1057	" "
	UB 25	25
FRZ	1113	" "
	DEST	UTC DIST EFOB
ARPT33R	1259	1200 8.4

↑↓

1R

2R

3R

4R

5R

6R

*DIRECT TO is the default option

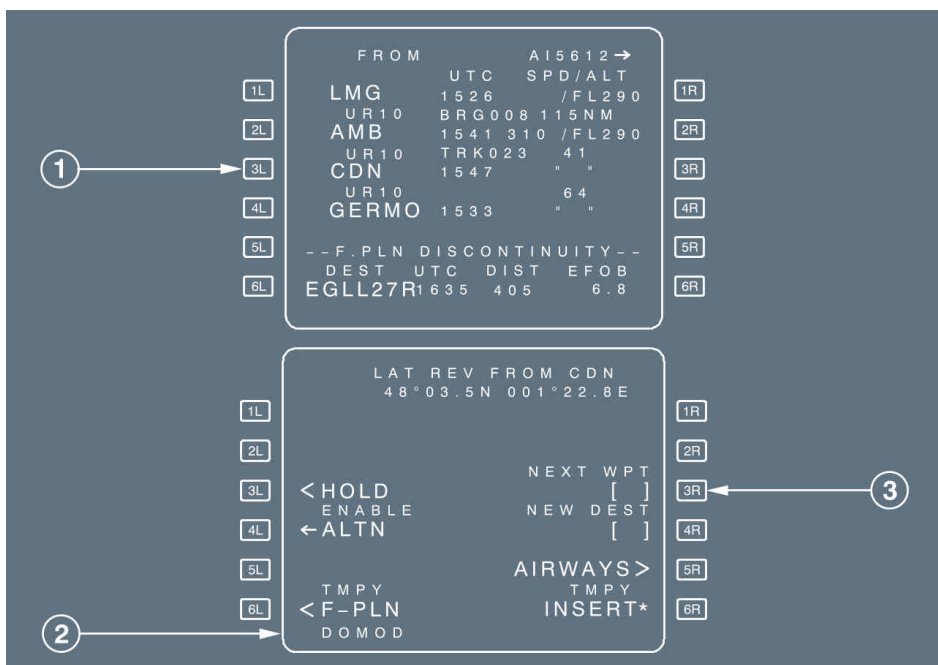
The flight crew can perform a “DIR TO” to a waypoint in the F-PLN. Different options may be used to perform a “DIR TO”: DIRECT TO, DIR TO WITH ABEAM POINTS, RADIAL IN, RADIAL OUT. A single revision DIR TO temporary F-PLN specific to the DIR TO action is automatically created when the waypoint has been selected. After inserting the “DIR TO”, the active leg goes from present position (T/P) to the selected waypoint.

- The flight crew uses the LAT REV function. Possible revisions are:

- Insert or modify the departure procedure
- Insert or modify the arrival procedure
- Insert a waypoint
- Change the destination
- Insert an airway
- Insert an offset
- Insert a holding pattern
- Select or enable an alternate flight plan
- Radial fix information
- Insert LAT/LONG crossing waypoint.

The purpose of the temporary flight plan is to allow the flight crew to check a revision on the MCDU and on the ND before inserting the changes into the active flight plan. It is a copy of the active flight plan that has been changed according to the flight crew revision. While it is displayed, the aircraft will continue to follow the original active flight plan.

Predictions are computed or displayed on the pages of the temporary flight plan.



AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT
SYSTEM DESCRIPTION - FLIGHT PLANNING

A temporary flight plan is displayed for a check and/or new modification. Inserting the temporary revision will modify the active flight plan.

1L

2L

3L

4L

5L

6L

FROM
TMPY
AI5612 →

LMG
UTC 1526
SPD/ALT /FL290

UR10
BRG008
115NM

AMB
1541
310/FL290

UR10
TRK023
41

CDN
1547
" / "

UB19

55

DOMOD
1553
" / "

UB19

20

PON
1558
" / "

TMPY

TMPY

← ERASE
INSERT*
↑↓

1R

2R

3R

4R

5R

6R

1L

2L

3L

4L

5L

6L

FROM
AI5612 →

LMG
UTC 1526
SPD/ALT /FL290

UR10
BRG008
115NM

AMB
1541
310/FL290

UR10
TRK023
41

CDN
1547
" / "

UB19

55

DOMOD
1553
" / "

UB19

20

PON
1558
" / "

DEST
UTC 1638
DIST 405
EFOB 6.7

EGLL27R

1R

2R

3R

4R

5R

6R

Lateral Functions - FMS2 HONEYWELL**GENERAL**

Ident.: DSC-22_20-10-30-12-00005067.0001001 / 03 NOV 21

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

The lateral revision function allows the flight crew to create or modify the following parts of the flight plan:

- Airway
- Waypoint
- New destination
- Holding pattern
- Offset
- Alternate
- Fix information

Each time the flight crew activates one of the above-listed revisions, the flight crew accesses a temporary flight plan that enables the modification to be checked before inserting it in the active flight plan. The flight crew selects these functions by pressing the left keys on F-PLN A or B.

- Direct to and overfly functions are accessed via the MCDU keys. No temporary flight plan is created with these functions.
- "Update at" capability is a specific function that manually updates the FM position. It does not use a temporary flight plan, but the flight crew must confirm its insertion before it is activated.

TEMPORARY F-PLN (TMPY)

Ident.: DSC-22_20-10-30-12-00000460.0001001 / 01 OCT 12

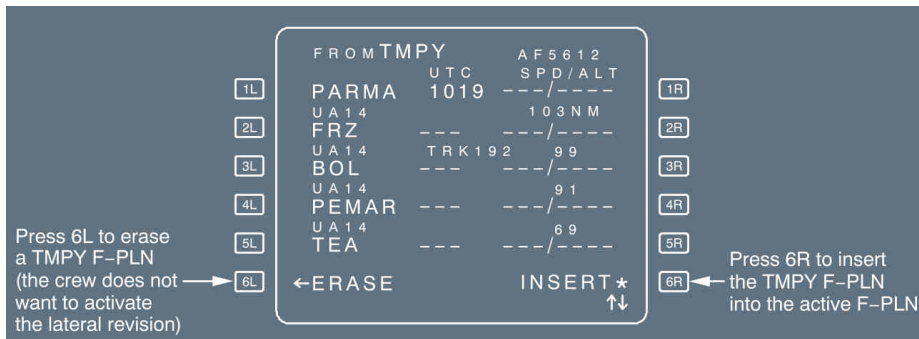
Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

When a pilot makes a lateral revision to the F-PLN, the FMGS creates a temporary flight plan. This is a copy of the active F-PLN, but is corrected by the lateral revision in progress.

The aircraft continues to follow the active F-PLN, until the temporary revision is inserted.

The revision appears in yellow font on both MCDUs and NDs.

- Lateral and vertical revisions cannot be made to a temporary F-PLN.
- Only one temporary F-PLN may be accessed at a time.
- The "DIRECT TO" function, when used, erases a temporary F-PLN.
- When a DIR TO is in process, a temporary revision cannot be displayed on the other MCDU.
- A TMPY F-PLN changes the title of the flight plan pages. (TMPY appears in all titles).
- No predictions are computed for a temporary flight plan (dashes are displayed).



Temporary data is displayed in yellow (ND and MCDU). Once inserted, it becomes active and is displayed in green.

INSERTING AN AIRWAY WITH "VIA"

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

Ident.: DSC-22_20-10-30-12-E-00012828.0001001 / 14 MAY 12

GENERAL

In the active flight plan, the pilot can insert up to 5 successive airway segments, going from a revised waypoint or ending at a given waypoint of the flight plan.

① SELECT →

1L
2L
3L
4L
5L
6L

FROM AI5612 →

LMG	UTC	SPD/ALT
UR10	1526	/FL180
AMB	BRG008	115NM
UR10	1541	310 /FL290
CDN	UR10	TRK023 41
	1547	" " "
GERMO	1533	" " "

--F.PLN DISCONTINUITY--

DEST UTC DIST EFOB

EGLL27R 1635 405 6.8

1R
2R
3R
4R
5R
6R

1L
2L
3L
4L
5L
6L

LAT REV FROM CDN

44°01.8N/011°00.2E

FIX INFO>

LL XING/INCR/NO

[]°/[]°/[]

NEXT WPT

[]

<HOLD

ENABLE

<ALTN

NEW DEST

[]

AIRWAYS>

<RETURN

1R
2R
3R
4R
5R
6R

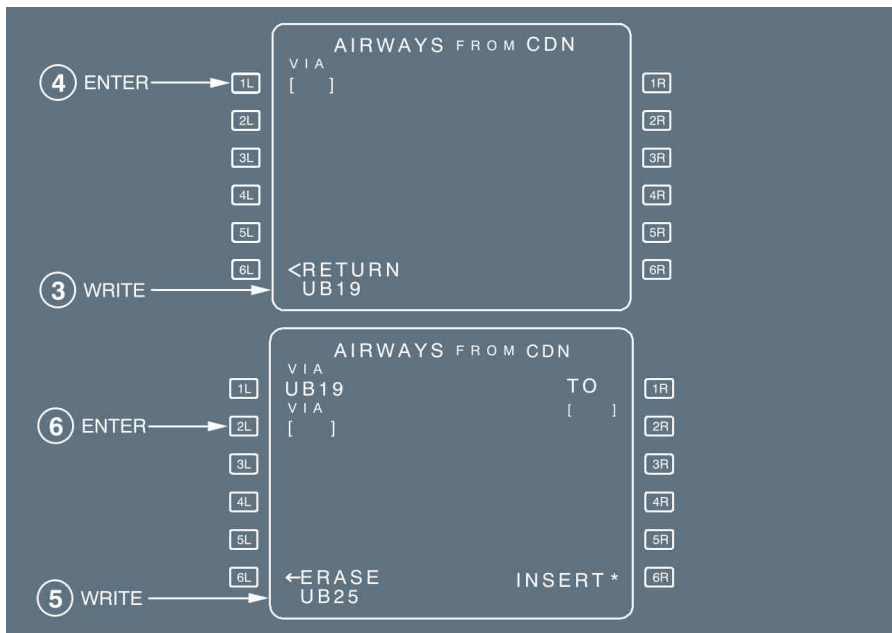
← SELECT ②

SELECT the revised waypoint (here CDN).
PRESS [5R] to select the airways function.

Ident.: DSC-22_20-10-30-12-E-00012829.0001001 / 03 NOV 21

THE FLIGHT CREW WISHES TO INSERT SUCCESSIVE AIRWAY SEGMENTS FROM A WAYPOINT

e.g. from CDN - Airways UB19 – Airways UB25 – Ending point AAA.



WRITE the first airway in the scratchpad (here UB19).

PRESS [1L] to insert it into the VIA field.

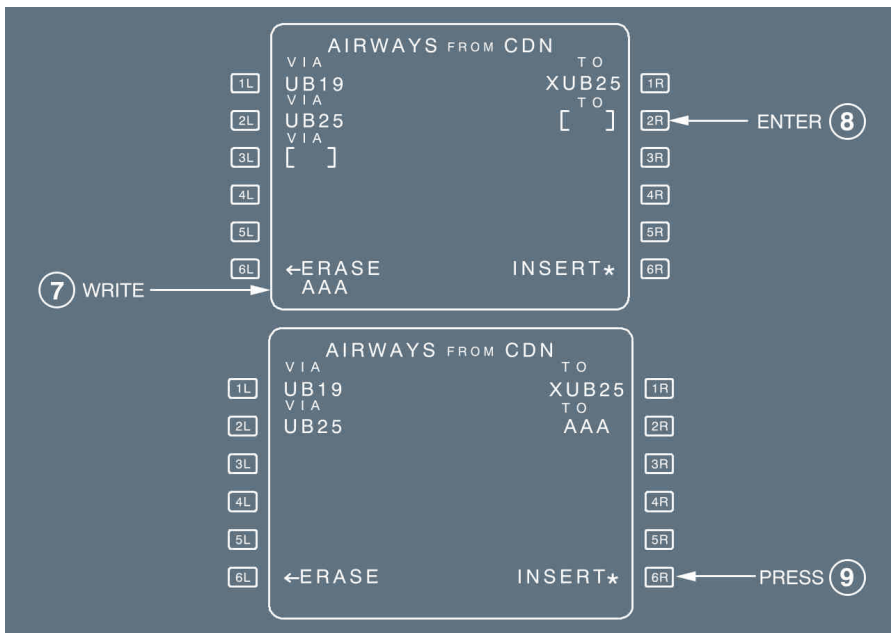
WRITE the second airway in the scratchpad (here UB25).

PRESS [2L] to insert it into the VIA field.

The system automatically determines the first downpath intersection point between the 2 airways.

- If the airways have a common waypoint, the system selects it as the ending point of the first VIA.
- If they have no common waypoint, but have a single intersection, the system creates this intersection as an FM-computed point and displays X followed by the airway IDENT (here XUB25).
- If they have no common waypoint or intersection, the system displays NO INTERSECTION FOUND in the scratchpad.

Once the flight crew has entered the required airways (up to 5), the flight crew must enter the ending point of the last selected airways:



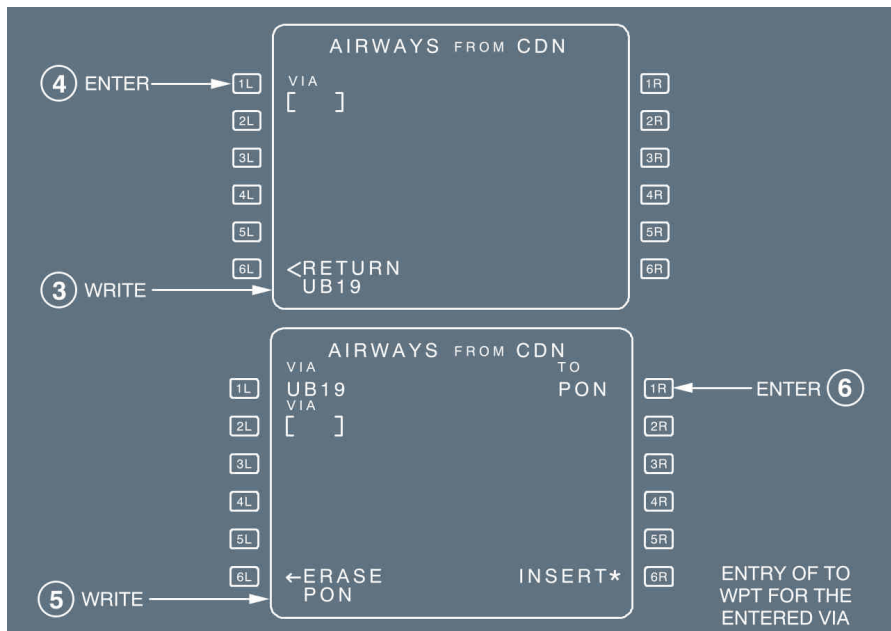
WRITE the ending waypoint in the scratchpad (here AAA).

PRESS [2R] to insert the ending waypoint into the TO field.

Note: If two waypoints with the same IDENT belong to the same airway, the DUPLICATE NAMES page will not be called up, and the system selects the first one in the database.

Ident.: DSC-22_20-10-30-12-E-00012830.0001001 / 01 OCT 12

THE PILOT WISHES TO INSERT ONE AIRWAY SEGMENT TO AN ENDING WAYPOINT



AIRWAYS FROM CDN

VIA []

<RETURN
UB19

AIRWAYS FROM CDN TO PON

VIA UB19
TO PON

ERASE
PON

INSERT*

ENTRY OF TO
WPT FOR THE
ENTERED VIA

WRITE the airway IDENT in the scratchpad (here UB19).

PRESS [1L] to insert it into the VIA field.

WRITE the ending waypoint in the scratchpad (here PON).

PRESS [1R] to insert it into the TO field.

- Note:**
- If the revise waypoint, or the ending waypoint, does not belong to the entered airway, the system displays AWY/WPT MISMATCH in the scratchpad.
 - If two waypoints with the same IDENT belong to the same airway, the DUPLICATE NAMES page will not be called up and the system selects the first one in the database.

Ident.: DSC-22_20-10-30-12-E-00012831.0001001 / 09 FEB 11

FLIGHT PLAN INSERTION

The flight crew either inserts the flight plan directly from the AIRWAYS page, or from the TMPY F-PLN page. In both cases:

PRESS [6R] to insert the temporary flight plan. Clear flight plan discontinuity, as needed.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT SYSTEM DESCRIPTION - FLIGHT PLANNING
--	---

INSERTING A WAYPOINT

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

Ident.: DSC-22_20-10-30-12-F-00012832.0001001 / 09 FEB 11

GENERAL

Waypoints can be inserted in two ways:

- Directly into the flight plan. All modifications go directly into the active flight plan. No temporary flight plan is created.
- By means of a lateral revision at the “NEXT WAYPOINT”, a process that creates a temporary flight plan.

The second method enables the temporary flight plan to be checked before it is inserted.

Ident.: DSC-22_20-10-30-12-F-00012833.0001001 / 09 FEB 11

WAYPOINT IDENTIFICATION

The pilot can identify a waypoint by:

- Its identifier (if it is in the navigation database).
- A Latitude/Longitude (LL).
- A Place/Bearing/Distance (PBD). The waypoint is defined by its bearing and distance from a place.
- A Place-Bearing/Place-Bearing (PBX). The waypoint is defined by the interception of 2 radials from 2 places.
- A Place/Distance (PD). The waypoint is defined by a distance from a place, along the F-PLN.

Note: *If a slash or a dash is not entered properly, the MCDU displays a “FORMAT ERROR” message.*

When the Flight Management Guidance System receives a waypoint that is not in the database, it identifies it as LLxx or PBD xx or PBX xx or PD xx (xx is a two-digit number between 01 and 20) and stores it in the stored waypoints file of the database.

Note: *When NAV mode is engaged, the crew cannot modify the “TO” waypoint (active leg) using the waypoint insertion function. If the crew wants to modify it, the DIR TO function will be used.*

Ident.: DSC-22_20-10-30-12-F-00012834.0001001 / 14 MAY 12

WAYPOINT INSERTED DIRECTLY IN THE FLIGHT PLAN

② SELECT →

① WRITE →

FROM	UTC	AI5612
TOU	1013	SPD/ALT /FL220
LMG2D	BRG 308	23NM
AGN	1020	.78/ FL290
UR10	TRK004	116
LMG	1035	.78/ FL290
UR10		97
AMB	1051	" / "
		40
CND	1056	" / "
DEST	UTC	DIST EFOB
LFPG1D	1134	352 → 8.4
LMG/330/135		↑ ↓

1R

2R

3R

4R

5R

6R

FROM	UTC	AI5612
TOU	1013	SPD/ALT /FL220
LMG2D	BRG308	23NM
AGN	1022	.80/ FL290
DIRECT	TRK346	237
PBD02	1050	.80/ FL290
--- F-PLN DISCONTINUITY ---		
LMG	1101	" "
DEST	UTC	DIST EFOB
LFPG1D	1154	554 7.2
		↑ ↓

1L

2L

3L

4L

5L

6L

1R

2R

3R

4R

5R

6R

CORRESPONDING ND



WRITE the waypoint identifier or LAT/LONG, Place/Bearing/Distance or Place-Bearing/Place-Bearing into the scratchpad. (Example: Place: LMG, Bearing: 330 °, Distance: 135 NM).

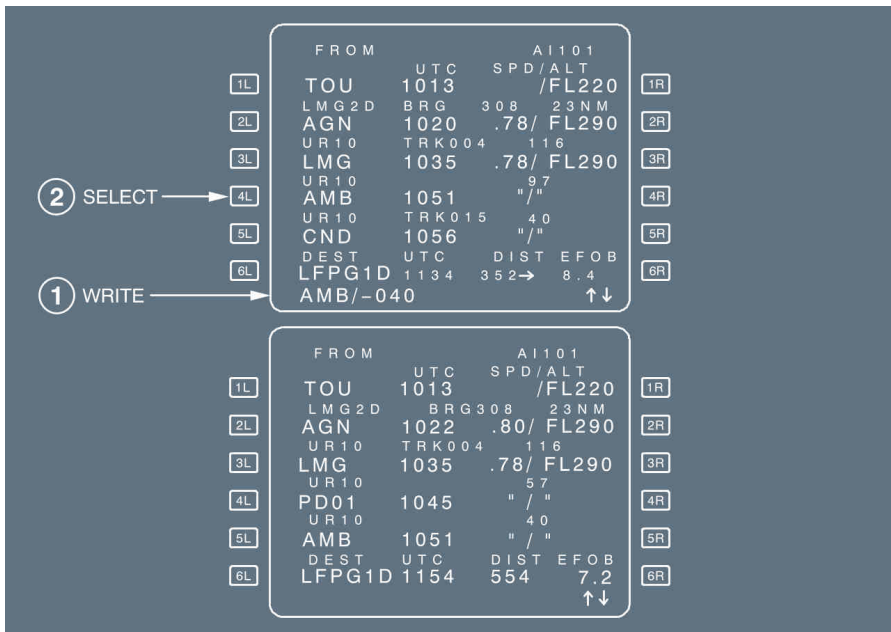
PRESS the appropriate key to enter the waypoint into the flight plan. The rule is that the new waypoint appears next to the pressed key, and the previous waypoint moves down the flight plan path.

This operation creates a discontinuity between the new waypoint and the previous one. The new flight plan will have to be cleared of the discontinuity and some waypoints erased.

Ident.: DSC-22_20-10-30-12-F-00012835.0001001 / 01 OCT 12

ALONG TRACK WAYPOINT INSERTION

On the F-PLN or STEP ALTS page, the pilot can enter an along track waypoint, defined as a place/distance waypoint.



The diagram illustrates the process of inserting an along track waypoint into the flight plan. It shows two states of the F-PLN page:

Top Screenshot (Initial State):

- Left Panel (Waypoint List):**
 - 1L: []
 - 2L: []
 - 3L: []
 - 4L: []
 - 5L: []
 - 6L: []
- Right Panel (Flight Plan Data):**
 - FROM: A1101
 - UTC: 1013
 - SPD/ALT: /FL220
 - LMG2D: BRG 308 23 NM
 - AGN: 1020 .78/ FL290
 - UR10: TRK004 116
 - LMG: 1035 .78/ FL290
 - UR10: " / " 9.7
 - AMB: 1051 " / " 4.0
 - CND: 1056 " / " 4.0
 - DEST: UTC DIST EFOB
 - LFPG1D: 1134 352 → 8.4
 - AMB/-040
- Annotations:**
 - (2) SELECT** points to the 4L key.
 - (1) WRITE** points to the 4L key.

Bottom Screenshot (After Insertion):

- Left Panel (Waypoint List):**
 - 1L: []
 - 2L: []
 - 3L: []
 - 4L: []
 - 5L: []
 - 6L: []
- Right Panel (Flight Plan Data):**
 - FROM: A1101
 - UTC: 1013
 - SPD/ALT: /FL220
 - LMG2D: BRG 308 23 NM
 - AGN: 1022 .80/ FL290
 - UR10: TRK004 116
 - LMG: 1035 .78/ FL290
 - UR10: " / " 5.7
 - PD01: 1045 " / " 4.0
 - UR10: " / " 4.0
 - AMB: 1051 " / " 4.0
 - DEST: UTC DIST EFOB
 - LFPG1D: 1154 554 → 7.2



WRITE the waypoint identifier and distance from this place.

According to the sign of the distance, the crew may define an along track waypoint before or after the revised place. (Example: AMB/-040).

PRESS the appropriate key adjacent to the place identifier. The system automatically positions the waypoint in the flight plan.

This operation does not create any discontinuity.

The system does not accept an along track waypoint entered at the FROM waypoint.

Ident.: DSC-22_20-10-30-12-F-00012836.0001001 / 01 OCT 12

WAYPOINT INSERTED THROUGH THE USE OF "NEXT WAYPOINT"

① SELECT →

1L
2L
3L
4L
5L
6L

FROM UTC SPD/ALT IT5612

AGN 1013 /FL220

LMG2D BRG004 93NM

LMG 1025 .78/FL290

UR10 TRK006 97

AMB 1030 " / "

UR10 " / " 40

CDN 1043 " / " 60

DIRECT " / " 60

EVX 1051 " / " 60

DEST UTC DIST EFOB

LFPG1D 1134 352 8.4

↑ ↓

1R
2R
3R
4R
5R
6R

② WRITE →

1L
2L
3L
4L
5L
6L

LAT REV FROM LMG

45°49.0N/001°01.6E

FIX INFO>

LL XING/INCR/NO

[]°[]°/[]

NEXT WPT

[]

<HOLD

ENABLE

<ALTN

NEW DEST

[]

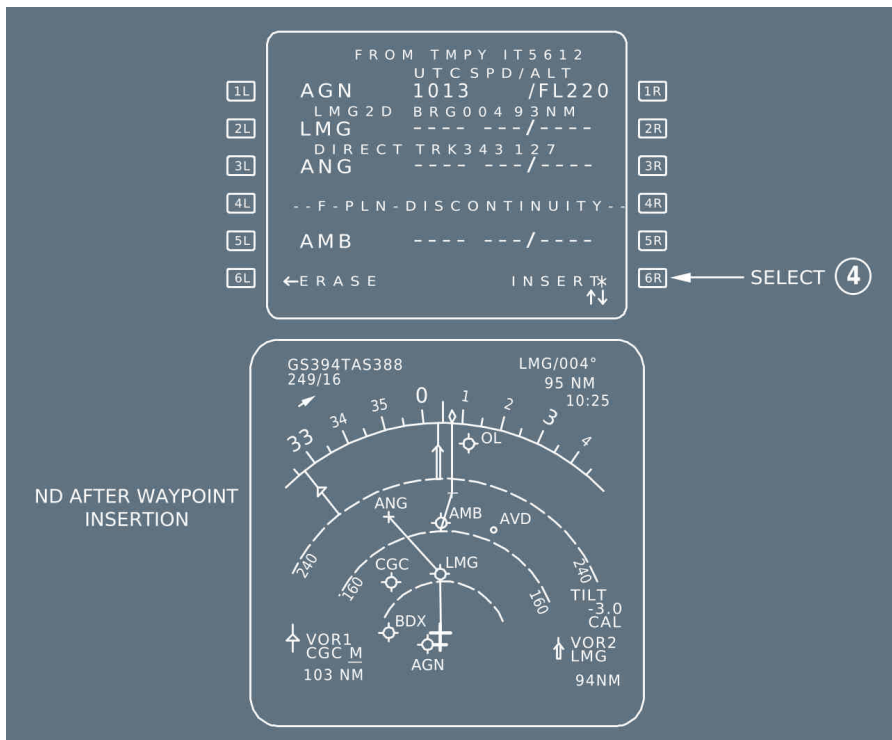
AIRWAYS>

<RETURN

ANG

1R
2R
3R
4R
5R
6R

ENTER **③**



SELECT the lateral revision (LAT REV) function at an appropriate waypoint.
 WRITE the waypoint identifier, or LAT/LONG, or Place/Bearing/Distance, or Place-Bearing / Place-Bearing into the scratchpad.
 ENTER it in the brackets under NEXT WPT (next waypoint).
 INSERT the temporary flight plan by pressing the [6R] key.
 CLEAR the F-PLN discontinuity, as appropriate.

Ident.: DSC-22_20-10-30-12-F-00012837.0001001 / 14 MAY 12

LATITUDE/LONGITUDE CROSSING WAYPOINT INSERTION

This function allows the insertion of one or several points along the flight-plan beyond the revised waypoint, at fixed latitude or longitude intervals (INCR) from a specified latitude or longitude. These waypoints are not considered as part of the pilot-defined elements. The system deletes them when sequenced.

LAT REV AT A WPT

1 WRITE →

LAT REV FROM LMG
45°49.0N/001°01.6E

LL XING/INCR/NO
[]°[]°/[]

NEXT WPT
[]

NEW DEST
[]

AIRWAYS>

<HOLD
ENABLE
←ALTN

<RETURN
N46/1/3

1R

2R ← ENTER 2

3R

4R

5R

6R

1L

2L

3L

4L

5L

6L

FROM	UTC	SPD/ALT
T-P	1038	.70/ FL350
LMG	1211	250/ 2000
N46	1213	" / 11
N47	1227	" / 60
N48	1241	" / 61
DEST	UTC	DIST EFOB
LFP007	1300	206 12.7

↑ ↓

1R

2R

3R

4R

5R

6R ← INSERT 3



WRITE the latitude (NXX, XXN, SXX or XXS), the required increment in degrees between the successive waypoints, and the number of required waypoints.

(Example: The pilot wants to obtain 3 points, every degree from latitude N46: He enters N46/1/3).

AIRCRAFT SYSTEMS**AUTO FLIGHT - FLIGHT MANAGEMENT****SYSTEM DESCRIPTION - FLIGHT PLANNING**

PRESS [2R] to insert it into the LL XING/INCR/NO field.

PRESS [6R] to insert the new waypoints in the flight plan without discontinuity.

The system does not store these waypoints in the database.

FIX INFO

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

Ident.: DSC-22_20-10-30-12-G-00012838.0008001 / 09 FEB 11

GENERAL

When using the FIX INFO function, the flight crew defines waypoint intersections of the flight plan with radials, circle or abeam associated to a fix.

When the flight crew inserts the intersection points, the system automatically identifies these points, but does not store them in the navigation database.

Ident.: DSC-22_20-10-30-12-G-00012839.0008001 / 10 MAY 21

INSERTING A RADIAL INTERCEPT WAYPOINT

The flight crew accesses the radial intercept function from the lateral revision page at the origin or “from” waypoint.

LAT REV AT THE FROM WAYPOINT

LAT REV FROM PPOS
45°37.7N/001°01.8E

FIX INFO>

LL XING/INCR/NO
[]°/[]°/[]

<OFFSET

<HOLD

<RETURN

1R ← Select ①

2R

3R

4R

5R

6R

③ Enter →

② Write →

FIX INFO 1/4 ↔

REF FIX 1
0000000

POI

1R

2R

3R

4R

5R

6R



SELECT FIX INFO in [1R].

WRITE the reference fix IDENT into the scratchpad (for example, POI), and ENTER in [1L].

Note: It may be any database or pilot-defined fix.

WRITE the radial into the scratchpad (for example, 120 °) and ENTER in [2L].

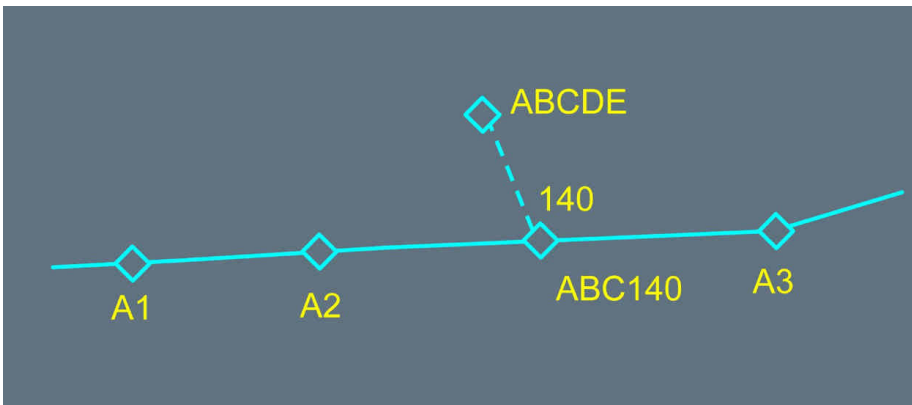
Note:

- The defined radial appears as a blue dashed line on the ND
- If the radial line intersects the active flight plan, an asterisk is displayed next to the entered radial and degree sign. The system computes the time, distance to go, and the altitude at the intersection point
- Up to two radials can be entered.

SELECT in [2L] or [3L] the required radial to insert the associated waypoint into the flight plan.

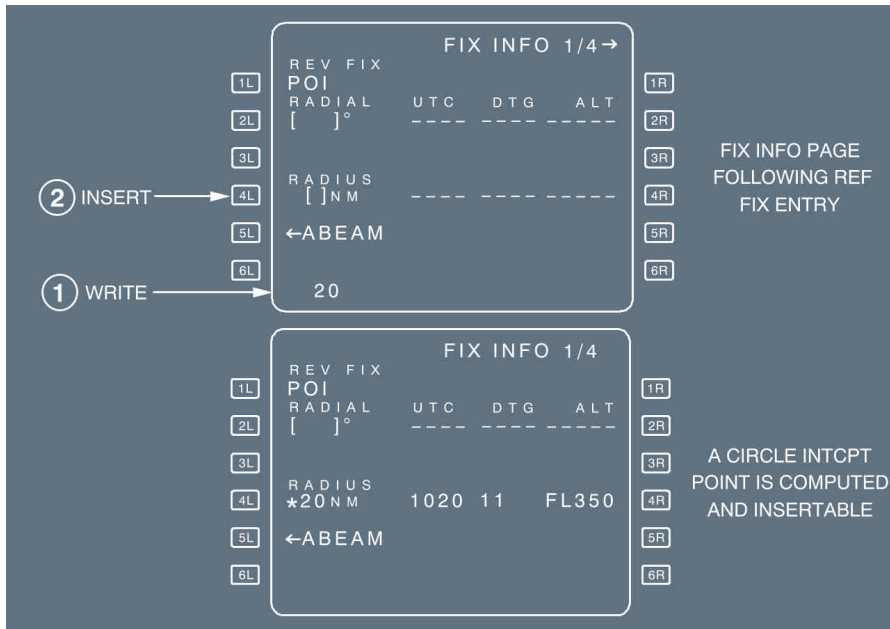
When a radial has been inserted into the flight plan, an additional radial from the selected waypoint can be inserted as well in the flight plan.

Note: The system automatically assigns its IDENT as the three first characters of the reference fix IDENT, followed by the radial (for example, ABC 140). The blue dashed line disappears from the ND.



Ident.: DSC-22_20-10-30-12-G-00012840.0001001 / 01 OCT 12

INSERTING A CIRCLE INTERCEPT WAYPOINT



FIX INFO 1/4

REV	FIX	POI	RADIAL	UTC	DTG	ALT
[1L]		[]°		---	---	---
[2L]						
[3L]						
[4L]						
[5L]						
[6L]						

←ABEAM

20

FIX INFO 1/4

REV	FIX	POI	RADIAL	UTC	DTG	ALT
[1L]		[]°		---	---	---
[2L]						
[3L]						
[4L]						
[5L]						
[6L]						

←ABEAM

★20 NM 1020 11 FL350

FIX INFO PAGE FOLLOWING REF FIX ENTRY

A CIRCLE INTCPT POINT IS COMPUTED AND INSERTABLE

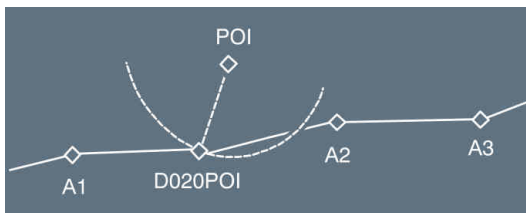
WRITE the reference fix identifier into the scratchpad (here POI), and ENTER it [1L].

WRITE the circle radius in the scratchpad (here 20 NM), and ENTER it [4L]:

The defined circle appears as a blue dashed circle on the ND. If the circle intersects the active flight plan, the system computes the time, along path distance to go and altitude at the first intersection point from the current aircraft position.

SELECT the required radius to insert the associated waypoint into the flight plan (if needed).

The system automatically assigns its IDENT as a D, followed by the radius, and followed by the three first characters of the reference fix IDENT (example D020 POI). The blue dashed circle disappears from the ND.



Ident.: DSC-22_20-10-30-12-G-00012841.0008001 / 01 OCT 12

INSERTING AN ABEAM INTERCEPT WAYPOINT

SELECT →

1L

2L

3L

4L

5L

6L

FIX INFO 1/4 →

REF FIX			
POI			
RADIAL	UTC	DTG	ALT
[]°	---	---	---
RADIUS			
[]NM	---		
←ABEAM			

FIX INFO 1/4

REF FIX			
POI			
RADIAL	UTC	DTG	ALT
[]°	---	---	---
RADIUS			
[]NM	---		
ABEAM	1505	52	FL350

1R

2R

3R

4R

5R

6R

FIX INFO PAGE
FOLLOWING REF
FIX ENTRY

ABEAM INTCP
POINT IS COMPUTED
AND INSERTABLE

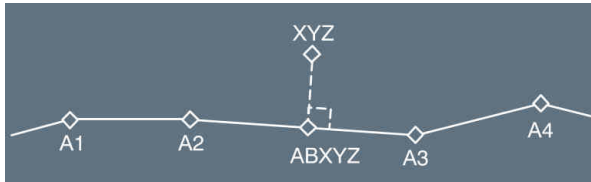
WRITE the reference fix identifier into the scratchpad (here POI), and ENTER it [1L]

SELECT the ABEAM prompt [5L]:

A blue dashed line from the reference fix and perpendicular to the flight plan appears on the ND. The system computes the radial, time, distance to go, altitude and predictions related to the waypoint abeam the reference fix.

SELECT [5L] to insert the abeam intercept waypoint into the flight plan (if needed):

The system automatically assigns its identifier as AB, followed by the first five characters of the reference fix identifier (Example ABXYZ). The blue dashed line disappears from the ND.



INSERTING A NEW DESTINATION

Ident.: DSC-22_20-10-30-12-00000471.0001001 / 14 MAY 12

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

The pilot may define a new destination and insert it via the lateral revision page. The pilot may then call up the new destination from any waypoint along the flight plan, except the FROM waypoint, the destination, and the missed-approach waypoint. When the new destination has been inserted, a flight plan discontinuity appears between the revision waypoint and the new destination. All waypoints beyond the revision waypoint (including the previous destination and associated missed approach) are deleted.

1 SELECT →

2 WRITE →

FROM	UTC	AI5612→
ROCCA	1013	FL220
TOP9C	BRG136	32NM
TOP	1022	.78 / FL290
UB25	TRK122	60
GEN	1030	" "
UB25		57
BEROK	1037	" "
UB25		29
FRZ	1041	" "
DEST	UTC	DIST EFOB
LGAT33R	1220	898 8.4

↑↓

LAT REV FROM GEN	44°01.8N/011°00.2E
	FIX INFO>
	LLXING/INCR/NO
	[]/[]
	NEXT WPT
	[]
<HOLD	
ENABLE	NEW DEST
<ALTN	[]
	AIRWAYS>
<RETURN	
EHAM	

FROM	TMPY	AI5612→
ROCCA	1013	FL220
TOP9C	BRG136	32NM
TOP	1022	.78 / FL290
UB25	TRK122	60
GEN	1030	" "
--F.PLN DISCONTINUITY		
DEST	UTC	DIST EFOB
EHAM	----	350 ----
← ERASE		INSERT*

↑↓

SELECT the lateral revision function at an appropriate waypoint.

WRITE the new destination in the scratchpad.

Enter it in the brackets under "NEW DEST".

INSERT the temporary flight plan ([6R] key), and complete the flight plan to the new destination.

HOLDING PATTERN

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

Ident.: DSC-22_20-10-30-12-A-00007222.0001001 / 09 FEB 11

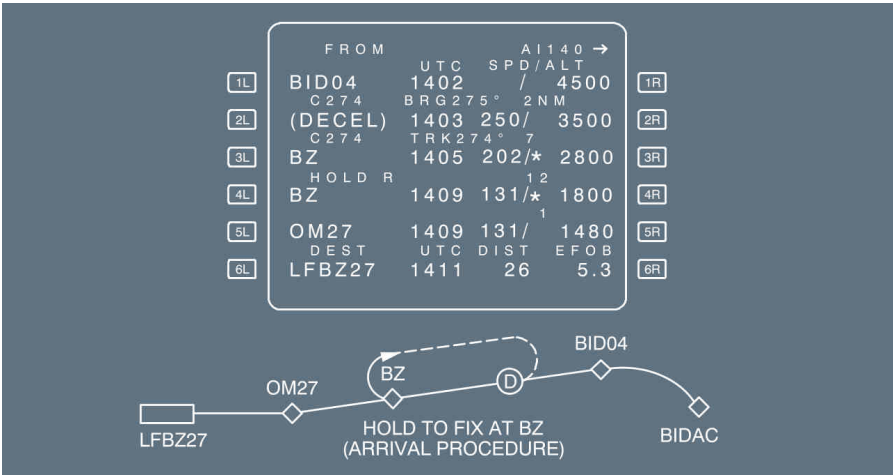
GENERAL

This section describes holding patterns, associated guidance and flight crew procedures. The Flight Management and Guidance Computer (FMGC) has three types of holding patterns that the pilot can use in a flight plan.

Ident.: DSC-22_20-10-30-12-A-00007163.0001001 / 01 OCT 12

HOLD TO FIX (HF)

The holding pattern is always part of an arrival or departure procedure. The aircraft flies it once and then automatically exits the holding pattern at the fix. The predicted speed in the holding pattern is the lowest of the ICAO speed limit, max endurance speed, or any speed constraint. Guidance to the fix in the holding pattern is similar to that on any leg of a flight plan. The HF patterns are part of the navigation database and cannot be created by the crew.



Ident.: DSC-22_20-10-30-12-A-00007182.0001001 / 01 OCT 12

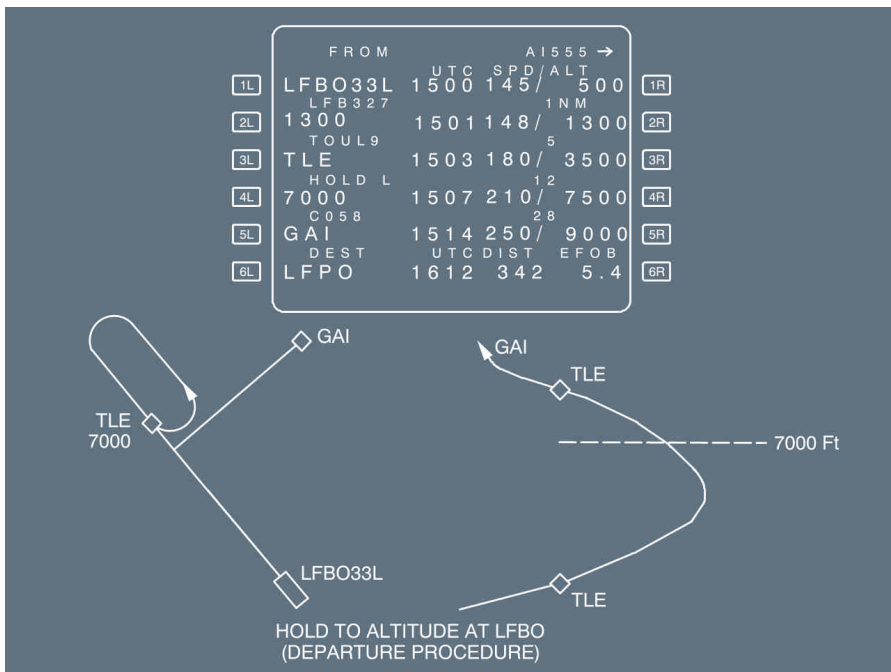
HOLD TO ALTITUDE (HA)

The aircraft flies the hold until it reaches the specified altitude. Then, it automatically exits the hold at the fix. The predicted speed for the holding pattern is the lowest of the ICAO speed limits, the max endurance speed, or any speed constraint.

The size of the holding pattern is a function of the predicted speed.

Guidance in a hold to altitude (HA) is similar to that for any leg of a flight plan.

The HAs are in the navigation database, as part of the arrival or departure procedures, and cannot be created by the crew.



Ident.: DSC-22_20-10-30-12-A-00007206.0013001 / 14 NOV 24

HOLD WITH MANUAL TERMINATION (HM)

This type of holding pattern may be part of an arrival procedure, or the flight crew may enter it at the present position or at any flight plan waypoint.

The flight crew will use this type of holding pattern to comply with a defined procedure or a clearance limit, or to meet an operational need (such as losing altitude, holding for weather improvement, or absorbing an ATC delay).

This type of holding pattern is exited according to the decision of the flight crew, and not automatically.

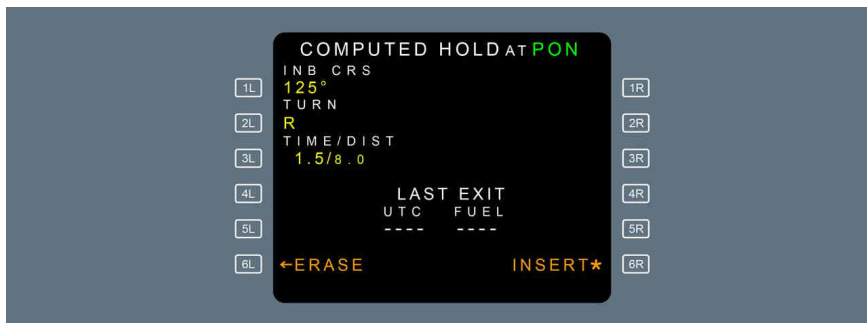
There are 2 types of HMs, and all are modifiable.

DATABASE HOLD



If the holding pattern is part of the database, all its associated data (inbound course, turn direction, time/distance) are defined in the database. The flight crew can modify this data.

COMPUTED HOLD



If the holding pattern is not in the database, the FMS designs a holding pattern and proposes it to the flight crew. The associated data consists of default values that the flight crew can modify.

HOLD AT

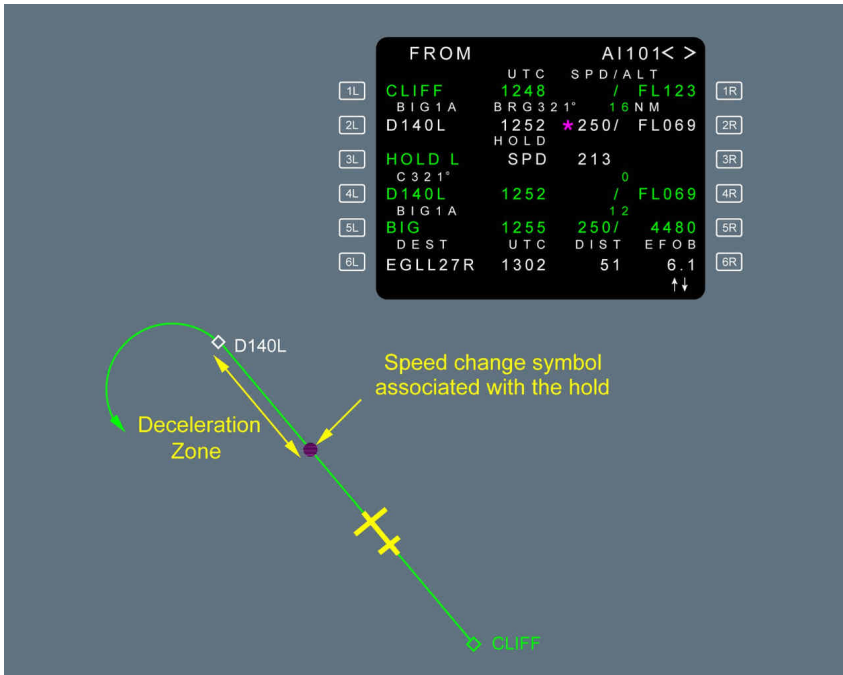


If the flight crew modifies any parameters of the database/computed holding, the screen displays a "HOLD AT ..." page displays. The field 2R displays "REVERT TO DATABASE" or "REVERT TO COMPUTED" to enable the flight crew to revert to default parameters.

PREDICTIONS AND GUIDANCE ASSOCIATED WITH A HM HOLDING PATTERN (HOLD WITH MANUAL TERMINATION)

Before Deceleration

If an altitude constraint is defined at the hold entry fix, then the FMS duplicates this constraint on the hold exit.
However, different constraints may be inserted at entry and exit fixes.
Although the hold is inserted in the flight plan, the FMS does not take it into account for predictions until the aircraft enters the hold.
However, if the hold is not deleted by the flight crew, the FMS schedules a deceleration point and displays it on the ND.



The FMS predicts the estimated time and amount of fuel remaining at which the aircraft must exit holding, so as to comply with the fuel policy specified on the FUEL PRED page. When the aircraft enters the holding pattern, the FMS revises all predictions and assumes the aircraft will fly one turn of the holding pattern.

Each time the aircraft flies over the holding fix, the FMS updates the predictions for one more holding circuit.

Upon Reaching the Speed Change Pseudo Waypoint

The FMS either causes the aircraft to decelerate to the hold speed (if managed speed is active and NAV mode engaged), or displays **SET HOLD SPEED** on the MCDU and **SET HOLD SPEED** on the PFD, if the flight crew selected a speed target.

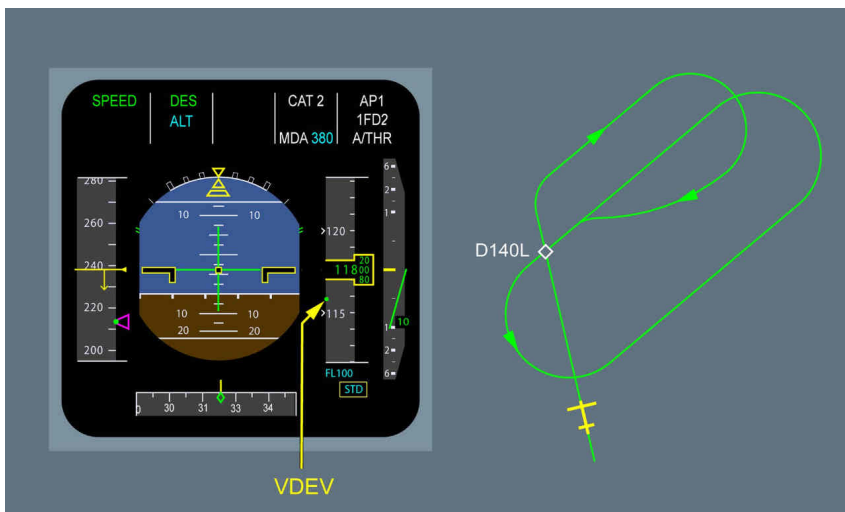
The default hold speed is the lowest of the following:

- Maximum endurance speed
- ICAO limit holding speed
- Speed constraint (if any).

When no specific speed limit applies, the default hold speed is approximately equal to the following:

- Green Dot speed on the A318, A319, A320 (CFM or PW) and A321, or
- Green Dot +20 kt for altitude lower than 20 000 ft, on the A320 (IAE), or
- Green Dot +5 kt for altitude higher than 20 000 ft, on the A320 (IAE).

The flight plan predictions for time and fuel do not yet consider that the hold will be flown. However, the ND shows the hold entry and holding pattern trajectory.



Deceleration receives priority, so that when in **DES** mode, the aircraft will deviate above the descent path to decelerate. (VDEV becomes positive on the PROG page).

The F-PLN displays **IMM EXIT** prompt.

If the flight crew presses the key next to **IMM EXIT**, before arriving at the holding fix, the aircraft will not enter the holding pattern, but will resume its applicable manage speed of the current flight phase.



After Reaching the Hold Entry Fix

The aircraft enters the hold. The HOLD page displays the associated holding data:

- The inbound course (INB CRS)
- The TURN direction (L or R)
- The TIME/DIST
- The LAST EXIT time and the associated fuel to reach the alternate airport with no extra fuel.

The FMS assumes that the aircraft will fly one turn of the holding pattern, and revises the predictions accordingly.

When the holding pattern is defined by a leg time (and not a leg distance), the FMS revises the size of the hold as a function of the target speed:

- If managed speed is active, the FMS uses the predicted holding speed to calculate the size of the holding pattern
- If the selected speed is active, the FMS uses the target speed selected by the flight crew at the entry fix sequencing to calculate the size of the holding pattern
- The VDEV, displayed on the PFD and the PROG page, when the aircraft is flying in the HM, is the difference between the aircraft's current altitude and the altitude at which it should be when it reaches the hold exit fix in order to be correctly positioned on the descent path.

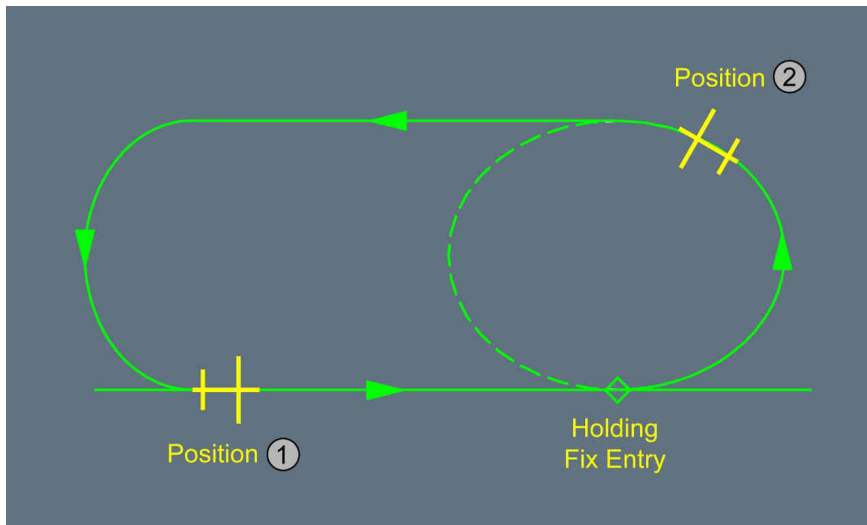


With **IMM EXIT** Pressed (Aircraft in the Holding Pattern)

The predictions and guidance assume that the aircraft is immediately returning to the hold fix. Sequencing the hold fix, the aircraft exits the holding pattern and resumes its navigation. The flight plan page displays **RESUME HOLD** instead of **IMM EXIT**.



HOLD EXIT PROCEDURE



At position (1), if the flight crew selects **IMM EXIT**, the aircraft will exit at the next fix overfly.
At position (2), if the flight crew selects **IMM EXIT**, the aircraft will make an immediate turn to the fix where the hold will be exited.

If managed speed is active, the FMS sets the target speed to the applicable speed of the current phase (for example, speed constraint, ECON speed, or speed limit).
The FMS then assumes that the flight crew will continue on the descent path, if the aircraft is in descent.

If **DES** mode is engaged, the following applies:

- The holding pattern is never included in the descent path computation
- The flight crew cannot enter altitude and speed constraints at the hold exit fix (this is only allowed at the hold entry fix)
- The vertical guidance in the HM, during the descent phase, is set to -1 000 ft/min but the FMS considers altitude constraints that will take effect farther down the flight path. The FMS will not allow the aircraft to descend below the next altitude constraint, neither to the FCU selected altitude. If the aircraft reaches the next altitude constraint, it will level off and the **ALT CST** mode will engage.

With **RESUME HOLD** Pressed

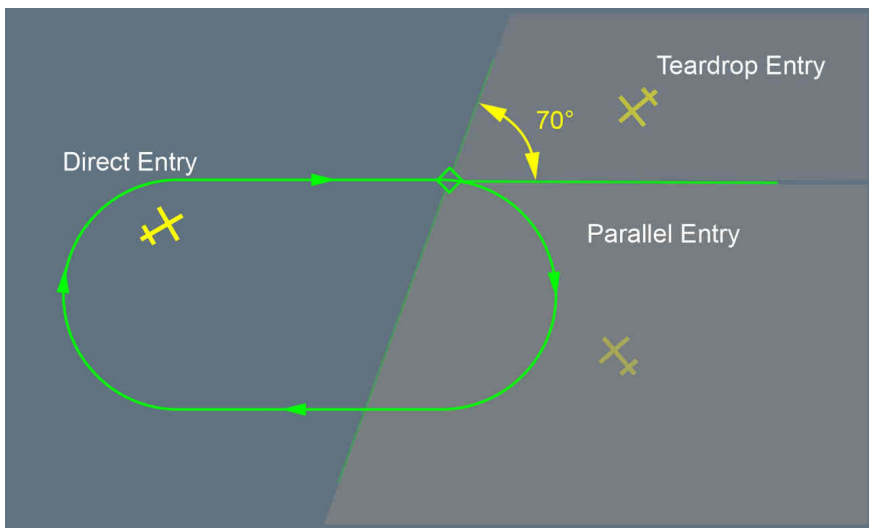
If the flight crew presses the key next to **RESUME HOLD**, the aircraft remains in the holding pattern, and **IMM EXIT** is displayed again.

After that, each time the aircraft flies over the holding fix, the FMS updates the predictions for one more holding circuit.

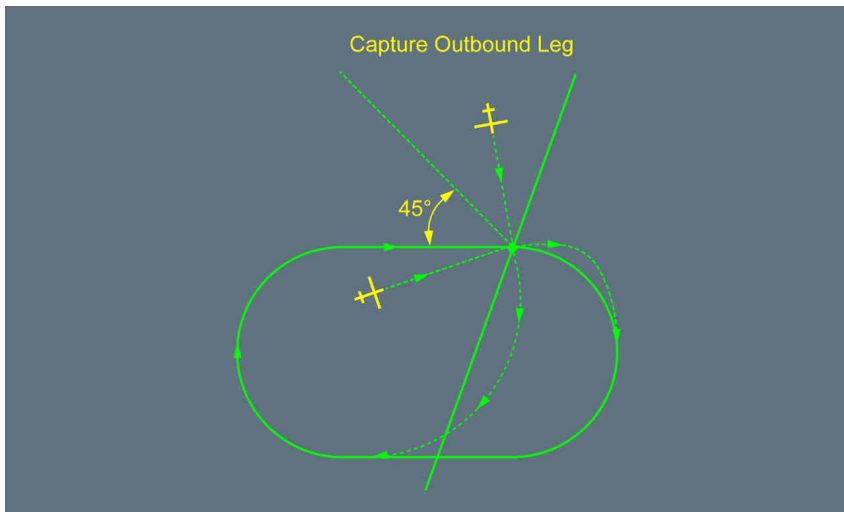
HOLDING PATTERN ENTRIES

The FMS offers three types of entry into holding patterns:

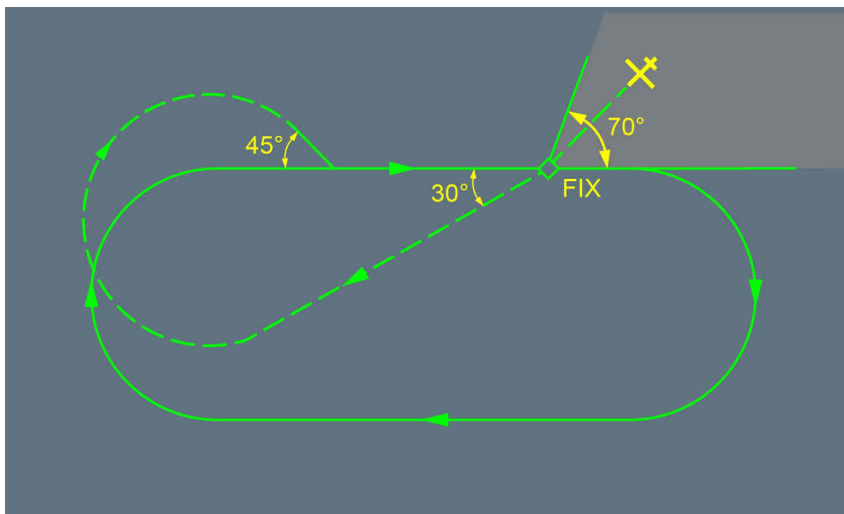
1. Direct entry
2. Teardrop entry
3. Parallel entry.



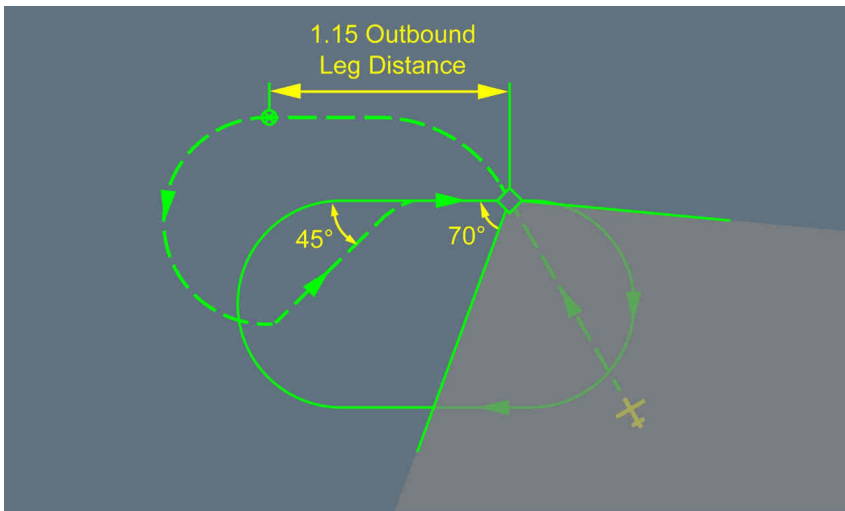
1. Direct entry



2. Teardrop entry

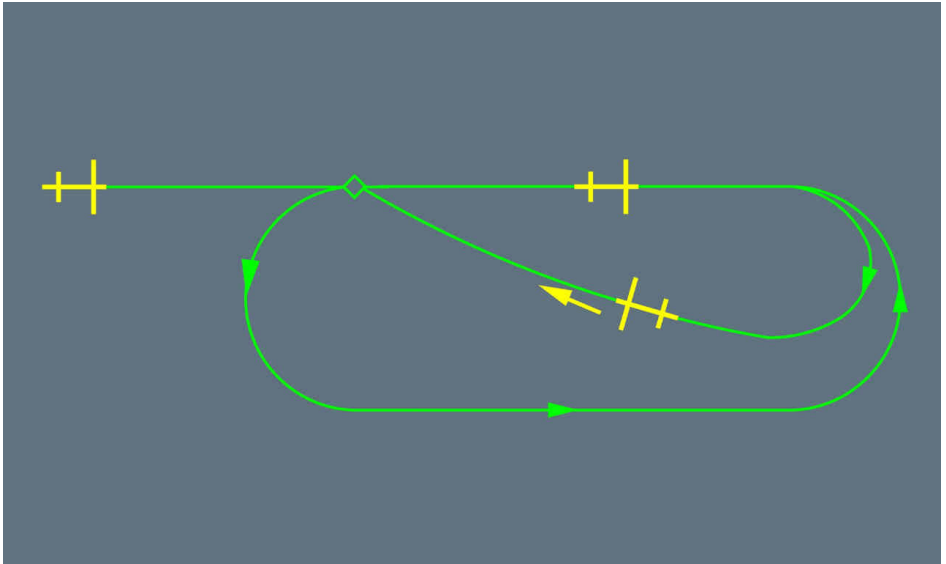


3. Parallel entry



Note: If the flight plan leg toward the holding fix is on a “limit” between a teardrop entry and a parallel entry, the FMS may compute and display either of the two entries. The flight crew should keep this in mind, and should not assume that the FMS is malfunctioning.

If the flight plan leg toward the hold entry fix is on a course that is the reciprocal of the inbound course of the holding pattern, the aircraft will fly a parallel entry.



Ident.: DSC-22_20-10-30-12-A-00007220.0001001 / 09 FEB 11

PROCEDURE TO INSERT A HOLD (HOLD WITH MANUAL TERMINATION)

The HOLD prompt allows the flight crew to enter a hold with manual termination (HM), at the revised waypoint or at the present position.

The flight crew accesses the HOLD page from a lateral revision at the present position (PPOS) or at a waypoint.

LAT REV FROM PPOS			LAT REV FROM VNE		
1L	OFFSET LL	FIX INFO>	1R	44°01.8N/011°00.2E	1R
2L	[]	LL INCR/NO	2R	[]/[]/[]	2R
3L	<HOLD	NEXT WPT	3R	[]	3R
4L		NEW DEST	4R	[]	4R
5L		AIRWAYS>	5R		5R
6L	<RETURN		6L	<RETURN	6R

LAT REV AT PRESENT POSITION **LAT REV AT A WPT**

SELECT lateral revision at present position (PPOS), or an applicable waypoint.
 PRESS the HOLD prompt [3L].

*A TMPY F-PLN is created and if applicable, the database hold is proposed.
 If no database hold is available, the computed hold is proposed.*

CHECK and (if necessary) MODIFY the HOLD data.

CHECK the temporary flight plan and INSERT it, if appropriate.

COMPUTED HOLD AT PON								
1L	INB CRS	1R						
2L	125°	2R						
3L	TURN	3R						
4L	R	4R						
5L	TIME/DIST	5R						
6L	1.5 / 8.0	6R						
<table border="0"> <tr> <td>LAST</td> <td>EXIT</td> </tr> <tr> <td>UTC</td> <td>FUEL</td> </tr> <tr> <td>1205</td> <td>8.8</td> </tr> </table>			LAST	EXIT	UTC	FUEL	1205	8.8
LAST	EXIT							
UTC	FUEL							
1205	8.8							
<ERASE		INSERT*						

Ident.: DSC-22_20-10-30-12-A-00007219.0001001 / 09 FEB 11

PROCEDURE TO DELETE A HOLD (HOLD WITH MANUAL TERMINATION)

CLEAR the HOLD directly in the flight plan, as can be done for a normal waypoint.

OFFSET

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

Ident.: DSC-22_20-10-30-12-B-00007230.0009001 / 02 MAY 24

GENERAL

Offset allows the flight crew to define an offset of the active flight plan. The offset can be immediate or deferred to start on a downstream leg. The offset will end by default or at a pre-planned end waypoint. Additionally, the flight crew can specify the intercept angle used for the transitions to and from the offset path.

In most cases, the pilot will use it enroute because of an ATC clearance, or to avoid bad weather expected along the flight plan route.

This page is accessed from LAT REV page at the FROM waypoint or at any waypoint downpath the flight plan, except the destination airport.

After inserting the offset in the flight plan, the flight plan page shows OFST in its title, left or right arrows are displayed on every label line between the start and end waypoints of the offset, and the navigation display shows the offset flight plan with a solid green line and the original flight plan with a dashed green line.

The offset is cleared:

- Automatically (holding pattern, approach), or
- Manually with the clear (CLR) key, or by entering "o" in the offset value field [1L] or by using the delete prompt in the OFFSET page.

Note: If the pilot enters an **OFFSET** when the aircraft is too close to the **TO** waypoint, the **FMGS** may refuse to accept it, in which case the **MCDU** displays the **"ENTRY OUT OF RANGE"** message.

Note: The insertion of an offset near a waypoint may cause the aircraft to overshoot from the offset path. The insertion of the offset far ahead of the waypoint may avoid the overshoot.

① SELECT →

1L

2L

3L

4L

5L

6L

LAV REV FROM PP0S

<OFFSET

<HOLD

<RETURN

FIX INFO>

LL XING/INCR/NO

[]°/[]°/[]

1R

2R

3R

4R

5R

6R

1L

2L

3L

4L

5L

6L

OFFSET

OFFSET	INTCPT	ANGLE
5L		25°
STAR WPT		END WPT
ALCOA		BEROK
	F - PLN WPTS	
ALCOA		ALCOA
←AMILL		AMILL→
←ABDEN		ABDEN→
←RETURN		INSERT★
		↑↓

1R

2R

3R

4R

5R

6R

Ident.: DSC-22_20-10-30-12-B-00007207.0010001 / 01 OCT 12

INSERTING AN OFFSET

SELECT LAT REV page at a waypoint.

SELECT OFFSET function by pressing [2L].

WRITE the required offset value and direction (for example, L5 or 5L), and enter it into [1L] field.

CHECK or INSERT the START WPT from the list in [3L] - [5L] fields or manually enter it.

CHECK or ENTER the INTCPT ANGLE in [1R] field.

CHECK OR INSERT the END WPT from the list in [3R] - [5R] fields or manually enter it.

PRESS INSERT in [6R] field to activate the OFFSET.

FLIGHT PLAN IN
CRUISE WITH A LEFT
OFFSET CURRENTLY
FLOWN.

	FROM	OFST	→
[1L]	LMG	1205	UTC SPD/ALT /FL330
[2L]	←UR10	BRG004°	74NM
[3L]	AMB	1217	.79 / FL330
[4L]	←UB19	TRK023	42
[5L]	CDN	1222	" / "
[6L]	HOLD R	SPD 227	
	CD23°	0	
	CDN	1222	/FL330
	DEST	UTC	DIST EFOB
	EGLL27R	1300	363 6.3
			↑↓



Ident.: DSC-22_20-10-30-12-B-00007218.0009001 / 14 MAY 12

MANUAL CANCELLATION OF AN OFFSET

There are two standard methods for cancelling an offset:

1. SELECT DIR TO a waypoint (the next waypoint, for example).
2. SELECT a Lateral Revision (LAT REV) at FROM WPT.

CLEAR the OFFSET field or enter "0" in the OFFSET value field [1L], and press INSERT* in [6R] to activate the temporary flight plan (cancelling OFFSET), or PRESS the OFFSET DELETE prompt [6R] to activate the temporary flight plan (cancelling OFFSET).

1L		2L		3L		4L		5L		6L	
OFFSET OFFSET INTcpt ANGLE 0 25°						1R					
STAR WPT ALCOA						END WPT BEROK					
ALCOA						F-PLN WPTS ALCOA					
←AMILL						AMILL→					
←ABDEN						ABDEN→					
←RETURN						INSERT★ ↑↓					

1L		2L		3L		4L		5L		6L	
OFFSET OFFSET INTcpt ANGLE 5L 25°						1R					
STAR WPT ALCOA						END WPT BEROK					
ALCOA						F-PLN WPTS ALCOA					
←AMILL						AMILL→					
←ABDEN						ABDEN→					
<RETURN						OFFSET DELETE★ ↑↓					

ALTERNATE FUNCTION

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

Ident.: DSC-22_20-10-30-12-C-00007240.0001001 / 09 FEB 11

GENERAL

The ALTERNATE FUNCTION performs two actions:

- It reviews and defines alternate airports and inserts them into the flight plan.
- It allows a diversion to be activated through the ENABLE ALTN command.

Ident.: DSC-22_20-10-30-12-C-00007217.0009001 / 23 JUN 15

REVIEW AND SELECTION OF ALTERNATE AIRPORT

Several alternate airfields may be stored in the database and assigned to a destination. When the pilot selects a company route (CO RTE) (or a city pair), the computer strings the preferred alternate into the active flight plan.

The pilot may review the alternate airports on the ALTN page and, if the one selected is not suitable because of weather or fuel considerations, another alternate may be strung into the active flight plan.

AIRCRAFT SYSTEMS**AUTO FLIGHT - FLIGHT MANAGEMENT**

SYSTEM DESCRIPTION - FLIGHT PLANNING

The pilot may define an additional alternate airport into the list, if necessary.

The ALTERNATE page shows the track and distance (airway or direct) between destination and alternate, as well as fuel management data (EXTRA fuel, assuming the associated airfield is the alternate airport). This data will help the pilot change the preferred alternate, if necessary.

Access the ALTERNATE page through the ALTN prompt on the LAT REV page at destination.

Alternate airfields are attached to the destination.

ENTERING NEW ALTERNATE INTO THE F-PLN

If the preferred alternate is unsuitable, proceed as follows:

SELECT F-PLN key on MCDU.

SELECT LAT REV at destination.

SELECT ALTN [5L].

SELECT an AIRFIELD IDENTIFIER.

INSERT the temporary flight plan.

Note: If weather and destination airfield conditions permit, you may select "NO ALTN".
Fuel predictions will be computed without alternate fuel.

		LAT REV FROM EGLL 51° 22.5N / 00027.0W ARRIVAL>			
1L		1R			
2L		2R			
3L		3R			
4L		4R		LAT REV FROM THE DESTINATION	
5L	1 SELECT →	5R			
6L		6R			
		NEXT WPT []			
		ENABLE ←ALTN			
		<ALTN			
		<RETURN			
		ALTERNATES FOR EGLL ALTN CO RTE			
1L		1R			
2L		2R			
3L	2 SELECT →	3R			
4L		4R			
5L		5R			
6L		6R			
		EINN TRK EXTRA DIST EINN 287° 10.4 72NM			
		←EGKK 152° 12.2 121NM OTHER ALTN			
		[]			
		←NO ALTN			
		<RETURN			
		ALTERNATES FOR EGLL ALTN CO RTE			
1L		1R			
2L		2R			
3L		3R			
4L		4R			
5L		5R			
6L		6R			
		EGKK TRK EXTRA DIST EGKK 152° 12.2 121NM			
		←EINN 287° 10.4 72NM OTHER ALTN			
		[]			
		←NO ALTN			
		<ERASE INSERT *		SELECT 3 →	

SELECTION OF ANOTHER ALTERNATE

Fuel management information for flight to another alternate airfield may be obtained by selecting the OTHER ALTN field.

SELECT LAT REV at DESTINATION.

SELECT ALTN [5L].

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

SYSTEM DESCRIPTION - FLIGHT PLANNING

ENTER the airfield identifier in the brackets.

- If the airfield is not in the database, the **NEW RUNWAY** page automatically appears.
- If the airfield is in the database and there is a company route (CO RTE) to it, the **ROUTE SELECTION** page automatically appears.

SELECT the route, as appropriate, or RETURN to the ALTN page.

ENTER the distance in the brackets (if required). XTRA fuel and track (TRK) will appear.

SELECT the other alternate (OTHER ALTN) as a primary alternate if convenient. (EXTRA fuel and DIST revert to AIRWAY distance).

INSERT it, if you want to have it as a primary alternate.

- Note:
- The pilot can always overwrite the "OTHER ALTN". The new "OTHER ALTN" then replaces the previous one, which is lost.
 - The pilot can select OTHER ALTN as a primary alternate (active flight plan), to replace any alternate on the initial list.
 - If the pilot selects the other alternate as a primary alternate, and overwrites the OTHER ALTN field by entering a new airport, the first one will remain a primary alternate and the system will memorize a second OTHER ALTN.

② ENTER →

① WRITE →

ALTERNATES FOR EGLL
ALTN CO RTE

1L	EINN	TRK	EXTRA	DIST	1R
2L	EINN	287°	10.4	72NM	2R
3L	←EGUF	226°	12.1	117NM	3R
4L	←EGKK	152°	12.1	121NM	4R
5L	[]	OTHER ALTN			5R
6L	<RETURN EHAM				6R

1R

2R

3R

4R

5R

6R

② ENTER →

① WRITE →

EGLL/EHAM 1/1

1L	LONAMS	RWY	09R	BPK2J	BPK	1R
2L	DIR	CLN	DIR	RED	FA	2R
3L						3R
4L						4R
5L						5R
6L	<RETURN	INSERT*			6R	
						↑

1R

2R

3R

4R

5R

6R

SELECT ③ →

④ SELECT →

ALTERNATES FOR EGLL

ALTN	CO RTE
EINN	
←EINN	TRK EXTRA DIST 287° 10.8 72NM
←EGUF	226° 12.1 117NM
←EGKK	152° 12.1 121NM
OTHER ALTN	
EHAM	0.73° 6.5 250
←RETURN	INSERT* 250 ↑

ALTERNATES FOR EGLL

ALTN	CO RTE
EHAM	LONAMS
←EINN	TRK EXTRA DIST 287° 0.8 322NM
←EGUF	226° 2.1 17NM
←EGKK	152° 2.1 21NM
OTHER ALTN	
EHAM	073° 8.9 214NM
←ERASE	INSERT* ↑

The pilot may enter a distance in the OTHER ALTN field. The system will compute the extra fuel and the track for this distance.

PREDICTED DATA FOR ALTERNATE

Data predictions are based on:

- Aircraft weight being equal to landing weight at primary destination.
- Flight at FL 100 if the alternate F-PLN length is less than 100 NM , at FL 220 if the alternate F-PLN length is comprised between 100 and 200 NM , or else at FL 310.
- Cost index 0.
- Constant wind (as entered in the alternate field of the DES WIND page).
- Constant delta ISA (equal to delta ISA at primary destination).
- The along flight path distance from the destination to the alternate airport. If the flight crew enters an ALTN fuel value, this value is the one taken into account.

PIA A318/A319/A320/A321 FLEET
 FCOM

← |

DSC-22_20-10-30-12 P 43/60

09 FEB 26

ENABLE ALTN

Ident.: DSC-22_20-10-30-12-00000467.0009001 / 03 MAY 23

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

This enables the flight crew to initiate a diversion by entering the alternate flight plan just after the revision waypoint (with a discontinuity).

The flight crew may have to adjust the resulting flight plan (use “direct to”, or add or suppress waypoints), depending on the circumstances.



TO ACTIVATE THE PRIMARY ALTN:

SELECT a LAT REV at the TO waypoint (or at another suitable waypoint).

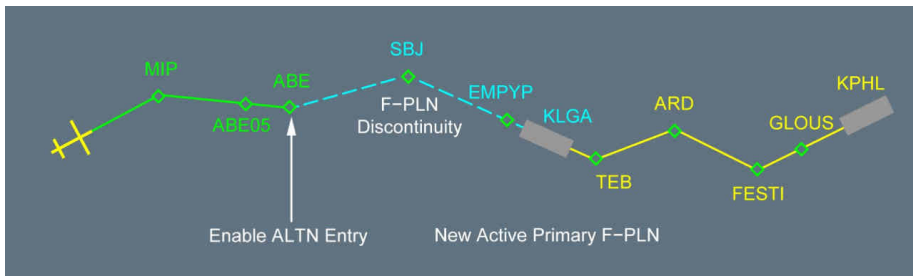
SELECT the ENABLE ALTN.

INSERT the temporary flight plan.

 The temporary flight plan is created and displayed.

 ENTER an appropriate waypoint in DIRECT TO and adjust the flight plan.

ADJUST the cost index on the PERF page and the defaulted CRZ FL on the PROG page, as required.



When ENABLE ALTN is selected at ABE, a flight plan discontinuity is created from ABE down to destination and the alternate route is linked to the active flight plan.

DIR KEY (DIRECT-TO-FUNCTION)

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

Ident.: DSC-22_20-10-30-12-D-00007243.0001001 / 30 MAR 18

GENERAL

The pilot uses the “Direct To” function to define a direct leg from the present position to any waypoint on the active flight plan or to any waypoint.

The designated waypoint may be entered by its identifier (if it is stored in the database) or by a latitude/longitude, place/bearing/distance, or a place-bearing/place-bearing.

- Note:**
1. If the autopilot or flight director is in the heading/track or localizer mode, the DIR TO function engages the NAV mode.
 2. A lateral revision of the flight plan obtained with a DIR TO may also affect the vertical profile of the flight plan.

Three functions are available through the DIR TO key:

- The DIR TO defines a direct leg from the present position to a specified waypoint.
NAV mode engages simultaneously to the DIR TO selection.
When the pilot uses DIR TO, the present position (PPOS) becomes the “FROM” waypoint and the active flight plan shows it as the T-P (turn point).
- The DIR TO/ABEAM function, defines the abeam waypoints along the direct leg. These waypoints are the projection on the direct leg of the initial F-PLN waypoints located between the aircraft position and the specified waypoint.
NAV mode engages simultaneously to the DIR TO/ABEAM selection.
- The DIR TO/INTCPT function allows the definition of a specified RADIAL INBOUND or OUTBOUND at an inserted waypoint. The current aircraft track is used to compute the INTCPT point with the specified radial.
NAV mode is armed simultaneously to the DIR TO/INTCPT selection.

The ND displays the DIR TO leg as a temporary flight plan leg between current aircraft position and specified waypoint. In case of a DIR TO/INTCPT, the leg is not displayed when the angle between the current aircraft track and the intercept radial exceeds 160 °.

Ident.: DSC-22_20-10-30-12-D-00007216.0001001 / 14 MAY 12

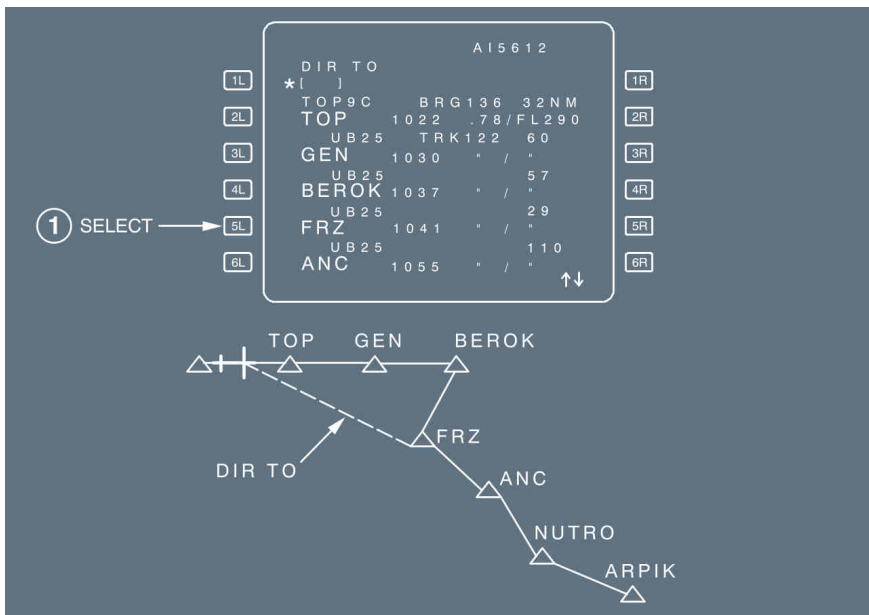
PROCEDURE FOR DIR TO WAYPOINT

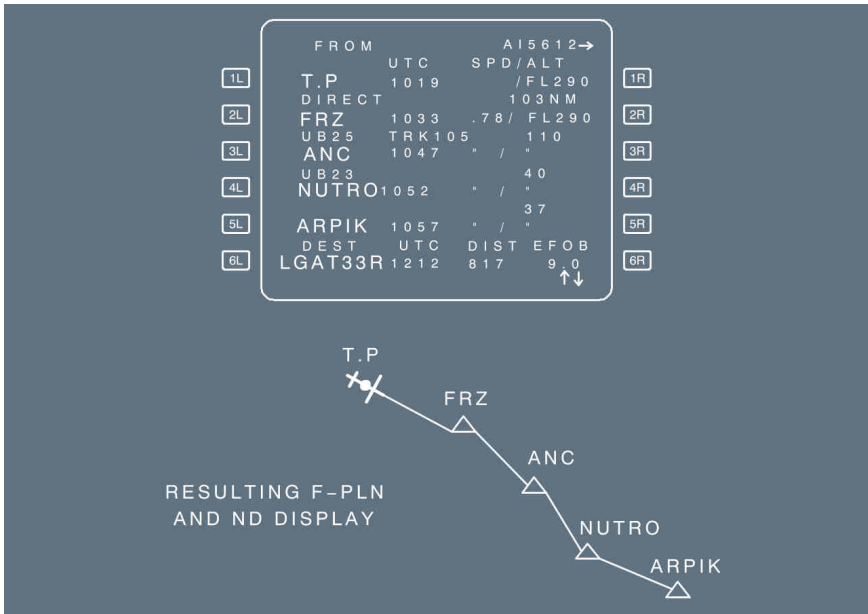
CASE 1. THE “TO” WAYPOINT IS IN THE FLIGHT PLAN

Example : DIR TO FRZ

PRESS the DIR key on the MCDU.

PRESS the line select key next to “FRZ”.





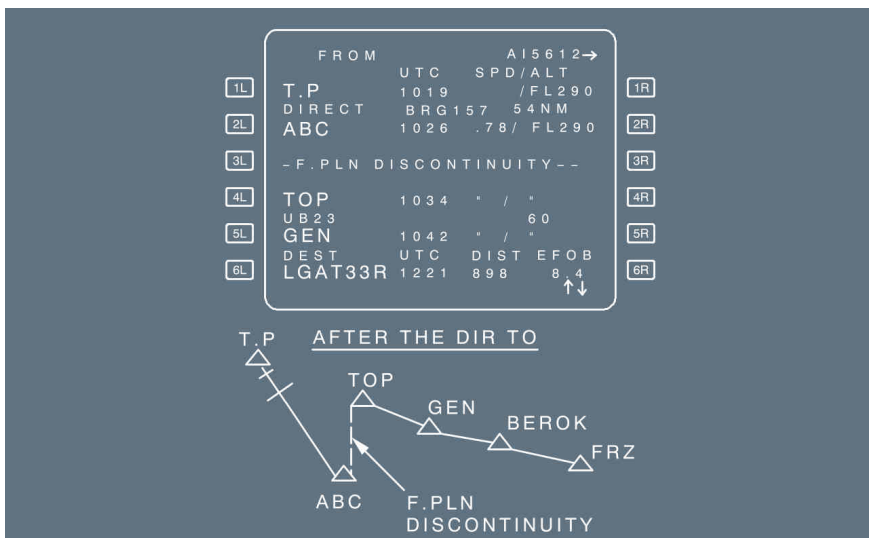
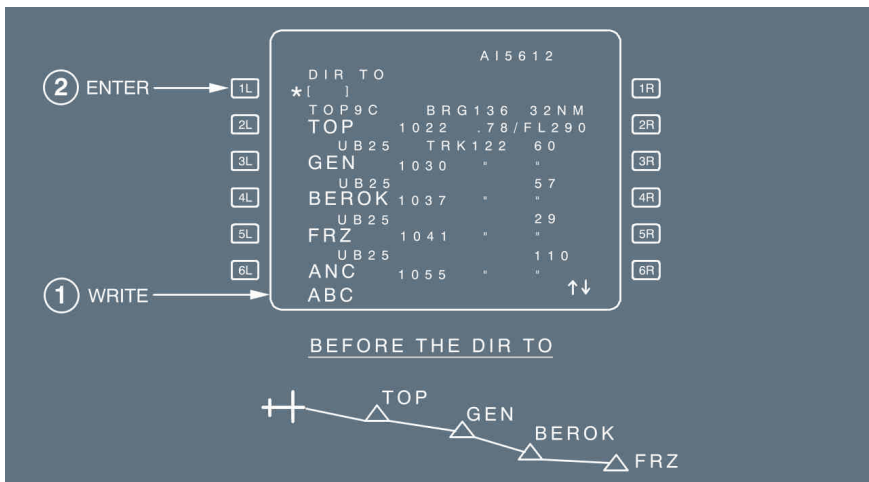
CASE 2. THE “TO” WAYPOINT DOES NOT BELONG TO THE FLIGHT PLAN

Example : Direct to ABC (ABC being an ident, LL or PBD or PBX (Place/Bearing-Place/Bearing))

PRESS the DIR key.

WRITE the waypoint identifier (e.g. ABC) into the scratchpad.

PRESS [1 L] to enter “ABC” in the “DIR TO” field.



Clear the discontinuity and the waypoints that are not included in the new flight plan.

PARTICULAR CASES FOR USE OF DIR TO

- If the pilot is flying a manual leg (part of a SID or STAR), the flight plan page displays “F-PLN DISCONTINUITY”, preceded by “MANUAL” (see below).
 These legs are specific heading or track legs flown with no defined end waypoint.

1L	FROM	AI5625	1R
	UTC	SPD/ALT	
2L	AAA	1436	2R
		FL320	
3L	MANUAL		3R
	--F.PLN DISCONTINUITY--		
4L	CCC	1459	4R
		----/----	

- When the pilot encounters a flight plan discontinuity, or if a major reset occurs, the flight plan page displays “PPOS - F-PLAN DISCONTINUITY”, and the pilot loses managed guidance in both the lateral and vertical planes.
 The autopilot or flight director reverts to the basic HDG V/S (or TRK FPA) modes. Predictions remain available and are based on the assumption that the aircraft will fly a direct leg from its present position to the next waypoint.

1L	FROM	AI5613	1R
	UTC	SPD/ALT	
2L	PPOS	1320	2R
		FL220	
3L	--F.PLN DISCONTINUITY--		3R
	GEN	1341	
		.78/FL220	
4L	UB25	.57	4R
	BEROK	" / "	

- In both of these cases, the only way to get back to a standard flight plan is to perform a “DIR TO” to a designated waypoint.
- Following a DIR TO, the message “MAP PARTLY DISPLAYED” may appear on the NDs, if the new flight plan includes a very long leg. (*Refer to DSC-31-45 Flags and Messages Displayed on ND*). When this message comes up, enter an intermediate waypoint to shorten the leg.

Note: During cruise, the DIR TO function is not available as long as uplink wind data, received through ACARS  /AOC , is not inserted or cancelled on the CRUISE WIND page.

Ident.: DSC-22_20-10-30-12-D-00007208.0009001 / 22 OCT 13

PROCEDURE FOR DIR TO/ABEAM

Example : DIR TO/ABEAM BEROK

PRESS the DIR on the MCDU.

WRITE the waypoint identifier into the scratchpad (Example : BEROK).

PRESS [1 L] to enter the waypoint in the DIR TO field.

SELECT the ABEAM PTS function.

The display reverts to F-PLN A page.

② ENTER →

		AI101	
DIR TO			
[]			
TOP GC BRG136° 33NM			
TOP 1022 .78 / FL290			
UB25 TRK122° 60			
N18E008 1030 " "			
UB25 " 57			
BEROK 1041 " "			
UB25 " 29			
FRZ 1041 " "			
UB25 " 110			
ANC 1055 " "			
BEROK			
			↑↓

1R

2R

3R

4R

5R

6R

① WRITE →

		AI101	
DIR TO			
*BEROK			
WITH			
*ABEAM PTS			
TOP GC BRG136° 33NM			
TOP 1022 .78 / FL290			
UB25 TRK122° 60			
N18E008 1030 " "			
UB25 " 57			
BEROK 1037 " "			
UB25 " 29			
FRZ 1041 " "			
			↑↓

1R

2R

3R

4R

5R

6R

③ SELECT →

		AI101	
FROM			
T.P			
UTC SPD/ALT			
1025 /6000			
BRG013° 27NM			
1041 .78 / FL290			
TRK122° 55			
1048 " "			
" 43			
BEROK 1057 " "			
UB25 " 25			
FRZ 1113 " "			
DEST UTC DIST EFOB			
ARPT33R 1259 1200 8.4			
			↑↓

1R

2R

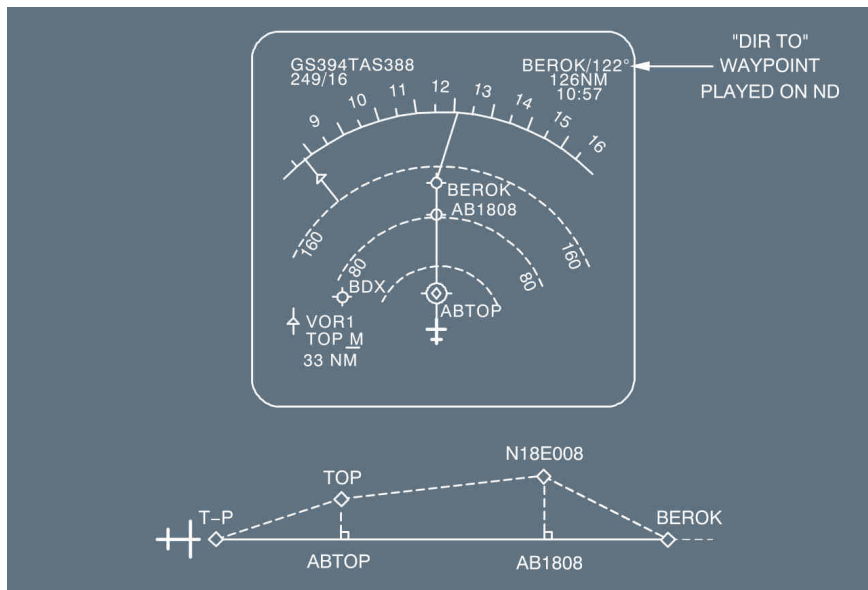
3R

4R

5R

6R

F-PLN A PAGE



- Note:**
1. If, between two waypoints projected on the direct leg, there was a discontinuity in the original flight plan, this discontinuity disappears between the corresponding abeam points on the direct leg.
 2. . Abeam waypoints computed from latitude/longitude-type waypoints are renamed by the system as "AB XXXXX", where "xxxxx" is an abbreviation in 5 characters, of the latitude and longitude of the initial waypoints.

Ident.: DSC-22_20-10-30-12-D-00007221.0001001 / 14 MAY 12

PROCEDURE FOR DIR TO/INTERCEPT

PRESS the DIR key.

WRITE the waypoint identifier into the scratchpad.

PRESS [1L] to enter the waypoint in the DIR TO field.

In the [1R] and [2R] fields, the MCDU displays the functions radial inbound and radial outbound from the waypoint.

If the waypoint belongs to the flight plan, the system displays the flight plan track as the default inbound radial. The crew can modify it.

WRITE the required in or out radial into the scratchpad.

PRESS [1R] or [2R] to enter the radial in the required field.

The ND displays the entered radial as an amber dotted line : The pilot can still modify it.

PRESS [1R] or [2R] to confirm the DIR TO/INTERCEPT selection.

The display reverts to the F-PLN A page, the system arms the NAV mode, and engages the HDG mode. The FROM waypoint is the aircraft position at the time of the DIR TO/INTERCEPT selection. The MCDU indicates it as INBND or OUTBND.

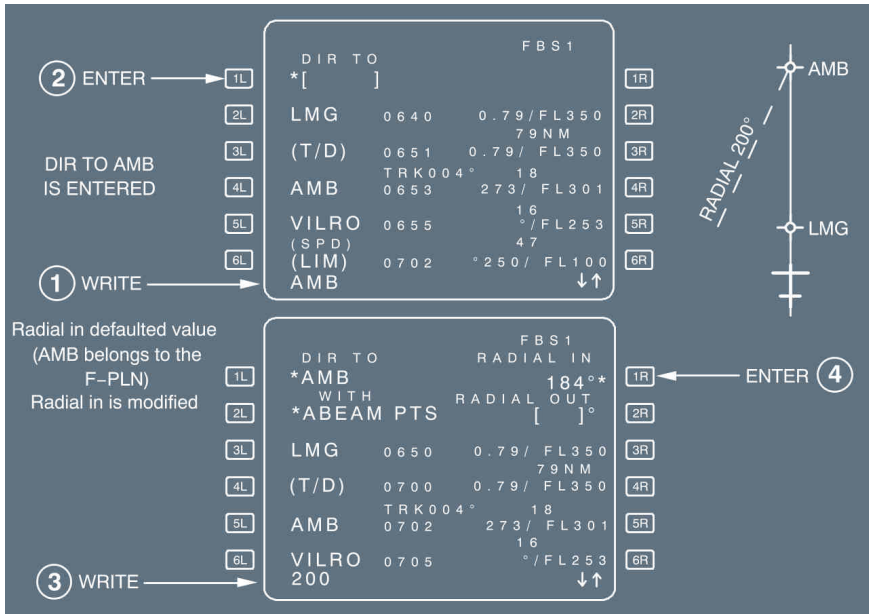
Note:

1. If the waypoint does not belong to the flight plan, the system strings the DIR TO/INTERCEPT leg to this waypoint, and inserts a discontinuity following the waypoint.
2. A DIR TO/INTERCEPT cancels any active offset.
3. If the current AP/FD lateral mode is HDG or TRK, NAV becomes armed. If the NAV mode was engaged, NAV becomes armed. FCU HDG or TRK must be used to guide the aircraft.

The ND displays an intercept point, if the intercept angle is less than 120°. The system constantly updates it to reflect the current aircraft track and position with respect to the intercept radial. The NAV mode engages when reaching the intercept point.

EXAMPLE: RADIAL INBND

DIR TO AMB - RADIAL 200° INBOUND



Step 1: WRITE (Arrow to [1L])

DIR TO AMB IS ENTERED

DIR TO		FBS1	
*[]			
LMG	0640	0.79 / FL350	
		79 NM	
(T/D)	0651	0.79 / FL350	
		TRK004°	18
AMB	0653	273 / FL301	
		16	
VILRO	0655	° / FL253	
(SPD)		47	
(LIM)	0702	°250 / FL100	
AMB			↓↑

Step 2: WRITE (Arrow to [1L])

Radial in defaulted value (AMB belongs to the F-PLN)
Radial in is modified

DIR TO		FBS1	
*AMB			
WITH			
*ABEAM PTS			
LMG	0650	0.79 / FL350	
		79 NM	
(T/D)	0700	0.79 / FL350	
		TRK004°	18
AMB	0702	273 / FL301	
		16	
VILRO	0705	° / FL253	
200			↓↑

Diagram: A vertical line represents the flight path. A point labeled 'AMB' is at the top, and a point labeled 'LMG' is below it. A dashed line from 'AMB' at an angle of 200° is labeled 'RADIAL 200°'. A horizontal line with a crossbar is shown below 'LMG'.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT

SYSTEM DESCRIPTION - FLIGHT PLANNING

New radial
is confirmed

F-PLN
A PAGE

DIR TO		FBS1	
		RADIAL IN	
1L	*AMB	200°*	
2L	WITH	RADIAL OUT	
3L	*ABEAM PTS	[]°	
4L	LMG	0650 0.79 / FL350	
		79NM	
5L	(T/D)	0700 0.79 / FL350	
	TRK004°	18	
6L	AMB	0702 273 / FL301	
		16	
	VILRO	0705 ° / FL253	
		↓↑	

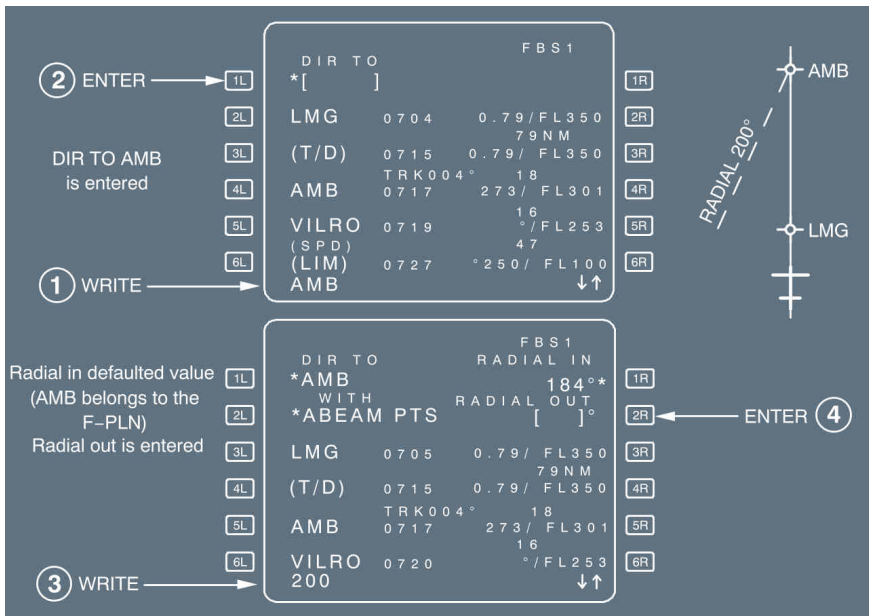
FROM		FBS1 →	
		UTC SPD / ALT	
1R	IN-BND	0650 0.79 / FL350	
	BRG004°	87NM	
2R	(T/D)	0703 0.80 / FL350	
	TRK004°	17	
3R	AMB	0706 283 / FL301	
		16	
4R	VILRO	0708 ° / FL350	
	(SPD)	47	
5R	(LIM)	0715 °250 / FL100	
	DEST UTC	DIST EFOB	
6R	LFP007	0727 207 16.5	
		↓↑	

← CONFIRM ⑤



EXAMPLE: RADIAL OUTBND

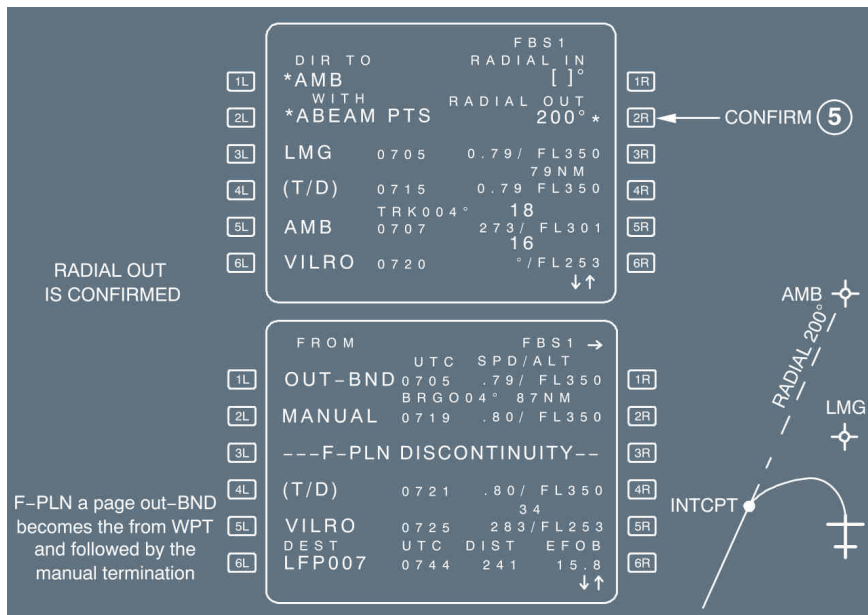
DIR TO AMB - RADIAL 200 ° OUTBOUND



AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

SYSTEM DESCRIPTION - FLIGHT PLANNING



OVFY (OVERFLY) KEY

Ident.: DSC-22_20-10-30-12-00000469.0001001 / 01 OCT 12

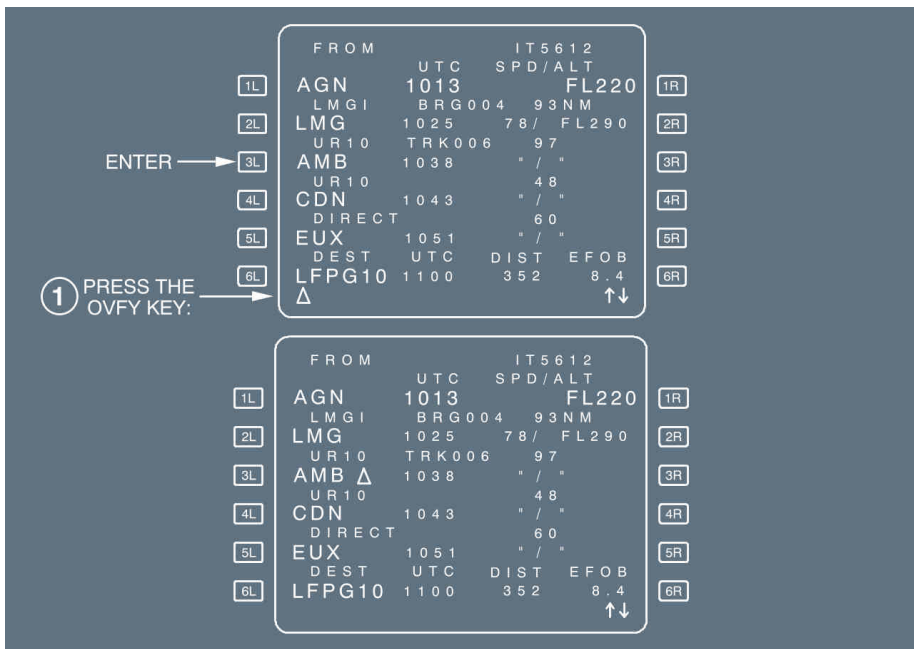
Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

The overfly key programs the Flight Management Guidance Computer to fly over a specific waypoint or NAVAID. To use it:

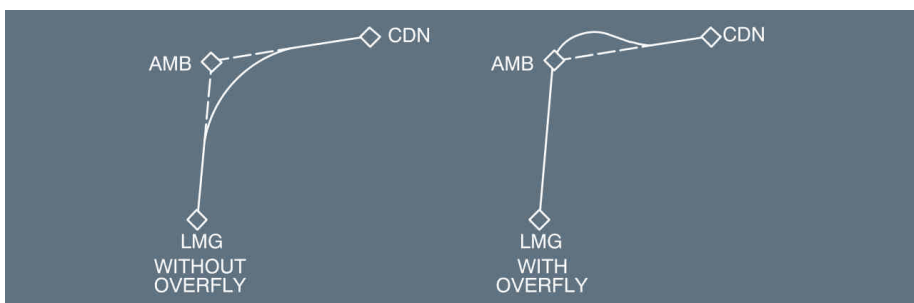
PRESS the "OVFY" key.

A "Δ" appears in the scratchpad.

INSERT it by pressing the key adjacent to the waypoint to be overflown. [3L] in this example.



The pilot cannot cancel the overfly program. If you do not want to fly over the point you have entered, use DIR TO (direct to) the next waypoint or engage the heading mode, whichever is more suitable.



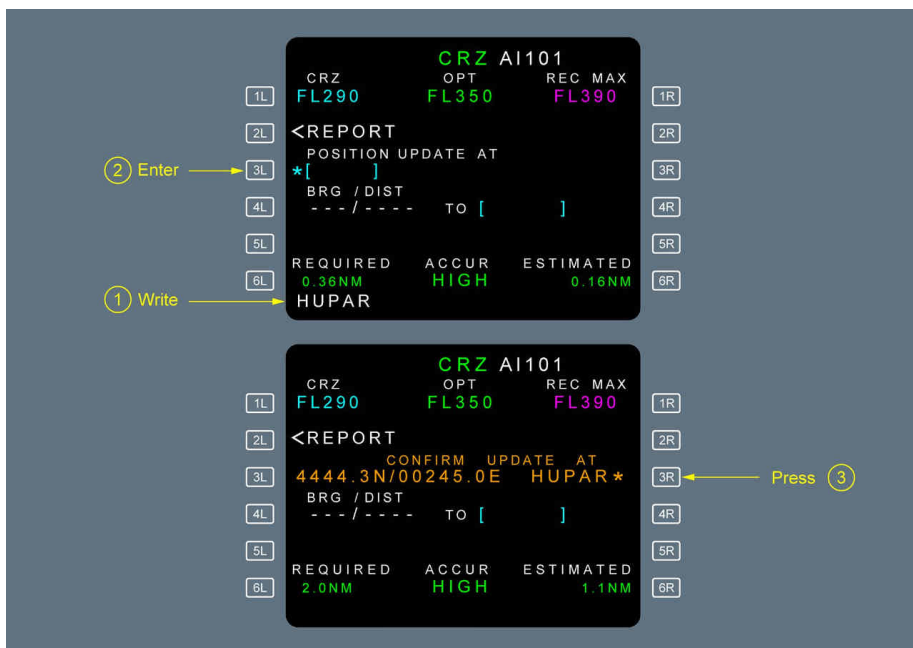
The overfly function allows you to fly over a specific waypoint, and return the aircraft to the great circle track.

POSITION UPDATE AT

 Ident.: DSC-22_20-10-30-12-00000470.0003001 / 04 JUN 19
 Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

To manually change the position computed by the FMGC (FM position and bias), the pilot uses “POSITION UPDATE AT” on the progress page.

Use this facility with extreme caution: It is apt to be inaccurate, because it relies on the pilot's estimation of when a designated position has been reached.



Top Screenshot:

1L	CRZ	FL290	OPT	FL350	REC	MAX	FL390	1R
2L	<REPORT							2R
3L	POSITION UPDATE AT							3R
4L	* []							4R
5L	BRG / DIST							5R
6L	--- / --- TO []							6R
		REQUIRED	ACCUR	ESTIMATED				
		0.36NM	HIGH	0.16NM				
HUPAR								

Bottom Screenshot:

1L	CRZ	FL290	OPT	FL350	REC	MAX	FL390	1R
2L	<REPORT							2R
3L	CONFIRM UPDATE AT							3R
4L	4444.3N/00245.0E HUPAR *							4R
5L	BRG / DIST							5R
6L	--- / --- TO []							6R
		REQUIRED	ACCUR	ESTIMATED				
		2.0NM	HIGH	1.1NM				

WRITE the ident for the NAVAID (or waypoint or airport), or the coordinates, or the PBD or PBX (Place/Bearing-Place/Bearing) at which the update is intended.

Press [3L] to ENTER the ident in the “POSITION UPDATE AT” field. The coordinates of the point, along with its identifier (or “ENTRY”, if the identifier is not in the database), appear in that field.

PRESS [3R] to activate the update, when you estimate that you are at the position.

Note: The system reinitializes the Estimated Position Error computation when a position update is performed. This may lead to the appearance of a “NAV ACCUR DOWNGRAD” or “NAV ACCUR UPGRAD” message.

If the "POSITION UPDATE AT" does not properly take effect, it corrupts the FM position.

- In an area with good radio NAVAID coverage:
 - If the update error is small, subsequent radio position updating will correct the FM position.
 - If the update error is large, the system will reject any radio updating because its internal "reasonableness test" will reject the various NAVAIDs. Thus, the FM position will only be the MIX IRS position corrected by the position bias, determined at the time of the update, and the error will be maintained.
- In an area without proper NAVAID coverage, radio position updating will not be available and the FM position, if incorrect, will remain incorrect until a new manual update is performed.
- Therefore, the pilot should only use "POSITION UPDATE AT" in case of a major position problem, such as:
 - On the ground, no flight plan appears on the navigation display and ARC/ROSE NAV mode is selected.
 - A "CHECK IRS/FM POSITION" message appears on the MCDU.
 - A "FM/IR POSITION DISAGREE" message appears on the ECAM.

When the GPS PRIMARY  is operative, the POSITION UPDATE AT is inhibited.

Intentionally left blank

Lateral Functions - FMS2 Thales**GENERAL**

Ident.: DSC-22_20-10-30-13-00005068.0004001 / 03 NOV 21

Applicable to: MSN 02926-02944, 07784-07792

The lateral revision function enables the flight crew to create or modify the following parts of the flight plan:

- Airway
- Waypoint
- New destination
- Holding pattern
- Offset
- Alternate
- Fix information

Each time the flight crew activates one of the above-listed revisions, the flight crew accesses a temporary flight plan that enables the modification to be checked before inserting it in the active flight plan. The flight crew selects these functions by pressing the left keys on F-PLN A or B.

- Direct to and overfly functions are accessed via the MCDU keys. No temporary flight plan is created with these functions.
- "Position Update at" capability is a specific function that manually updates the FM position. It does not use a temporary flight plan, but the flight crew must confirm its insertion before it is activated.

GENERAL

Ident.: DSC-22_20-10-30-13-00005068.0002001 / 03 NOV 21

Applicable to: MSN 04392

The lateral revision function enables the flight crew to create or modify the following parts of the flight plan:

- Airway
- Waypoint
- New destination
- Holding pattern
- Offset
- Alternate
- Fix information

Each time the flight crew activates one of the above-listed revisions, the flight crew accesses a temporary flight plan that enables the modification to be checked before inserting it in the active flight plan. The flight crew selects these functions by pressing the left keys on F-PLN A or B.

AIRCRAFT SYSTEMS**AUTO FLIGHT - FLIGHT MANAGEMENT**

SYSTEM DESCRIPTION - FLIGHT PLANNING

- Direct to and overfly functions are accessed via the MCDU keys. No temporary flight plan is created with these functions.
- “Update at” capability is a specific function that manually updates the FM position. It does not use a temporary flight plan, but the flight crew must confirm its insertion before it is activated.

TEMPORARY F-PLN (TMPY)

Ident.: DSC-22_20-10-30-13-00000472.0002001 / 23 JUN 15

Applicable to: MSN 02926-02944, 04392, 07784-07792

A temporary F-PLN is created whenever a revision is performed on either of the following pages:

- The F-PLN A or B pages, or
- The LAT REV page, or
- The VERT REV page.

The flight crew can perform several revisions in the same temporary flight plan before inserting it.

The TMPY F-PLN is a copy of the active F-PLN, but is corrected by the lateral or vertical revisions in progress.

The UNDO function is available when there is more than one pending revision in the temporary F-PLN. It can only be used once by the crew to cancel the last revision in the temporary F-PLN.

The temporary F-PLN created subsequently to a DIR TO function can only be modified once.

The aircraft continues to follow the active F-PLN, until the temporary revision is inserted.

The temporary F-PLN is continually sequenced as the active F-PLN, until it diverges from the active F-PLN.

The revision data appears in yellow (except Missed approach and Alternate parts that are displayed in blue) on both MCDUs and NDs.

- Lateral and vertical revisions can be made on a temporary F-PLN
- Only one temporary F-PLN may be accessed at a time
- A TMPY F-PLN cannot be created when a DIR TO is already in process. (The “DIR TO IN PROCESS” message appears on the MCDU).
- A TMPY F-PLN changes the title of the flight plan pages. (TMPY appears in all titles)
- The predictions are continually updated for a temporary flight plan.

Press 6L to erase a TMPY F-PLN (the crew does not want to activate the lateral revision) →

Press 6L to cancel the last revision in the temporary F-PLN →

FROM TMPY ↔

UTC SPD/ALT

FRZ	1019	FL290
UA 14	95 NM	
BOL	1029 .80 /	"
UA 14 TRK 152 T	51	
PEMAR	1036 " /	"
UA 14	65	"
TEA	1041 " /	"
H 238 ° T	80	
SRV350	1050 " / * FL 290	
TMPY		TMPY
←ERASE	INSERT*	↑↓

FROM TMPY ↔

UTC SPD/ALT

FRZ	1019	FL290
UA 14	95 NM	
BOL	1029 .80 /	"
UA 14 TRK 152 T	51	
PEMAR	1036 " /	"
UA 14	65	"
TEA	1041 " /	"
H 238 ° T	80	
SRV350	1050 " / * FL 290	
TMPY		TMPY
←UNDO/ERASE	INSERT*	↑↓

Press 6R to activate the temporary F-PLN ←

Once inserted temporary data becomes active and is displayed in green.

As soon as a TMPY F-PLN is created, "TMPY F-PLN" and "TMPY INSERT" are displayed on most pages in [6L] and [6R] fields. "TMPY F-PLN" allows access to temporary flight plan page, and "TMPY INSERT" allows insertion of the TMPY F-PLN.

The temporary flight plan can be inserted from the TMPY F-PLN page or from some other MCDU pages through the TMPY INSERT prompt.

Prior to insertion the flight crew should check the temporary flight plan. This check can be performed through:

- A simple check of parameters entered on the MCDU (e.g. for altitude or speed constraints entries)
- A visual check of the TMPY F-PLN on ND (e.g. for holds and offsets insertions)
- An access to the TMPY F-PLN page and a precise review of all this flight plan (e.g. for departure or arrival entries).

It is up to the flight crew to determine which check is necessary depending on the complexity of the revision and the moment when this revision is performed.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT

SYSTEM DESCRIPTION - FLIGHT PLANNING

INSERTING AN AIRWAY WITH "VIA"

Applicable to: MSN 02926-02944, 04392, 07784-07792

Ident.: DSC-22_20-10-30-13-A-00000473.0003001 / 01 OCT 12

In the active F-PLN, the crew can insert up to 5 successive airway segments, going from a revised waypoint or ending at a given waypoint of the flight plan.

① SELECT →

1L
2L
3L
4L
5L
6L

FROM AI5612 ↔

LMG	1526	UTC	SPD/ALT
UR10	BRG008	115NM	/FL180
AMB	1541	310	/FL290
UR10	TRK023	41	
CDN	1547	" "	
UR10	" "	64	
GERMO	1533	" "	

--F.PLN DISCONTINUITY--

DEST	UTC	DIST	EFOB
EGLL27R	1635	405	6.8

1R
2R
3R
4R
5R
6R

1L
2L
3L
4L
5L
6L

LAT REV FROM CDN

44°01.8N/011°00.2E

<HOLD
ENABLE
←ALTN

NEXT WPT
[DEST]
NEW DEST
[]

AIRWAYS>

<RETURN

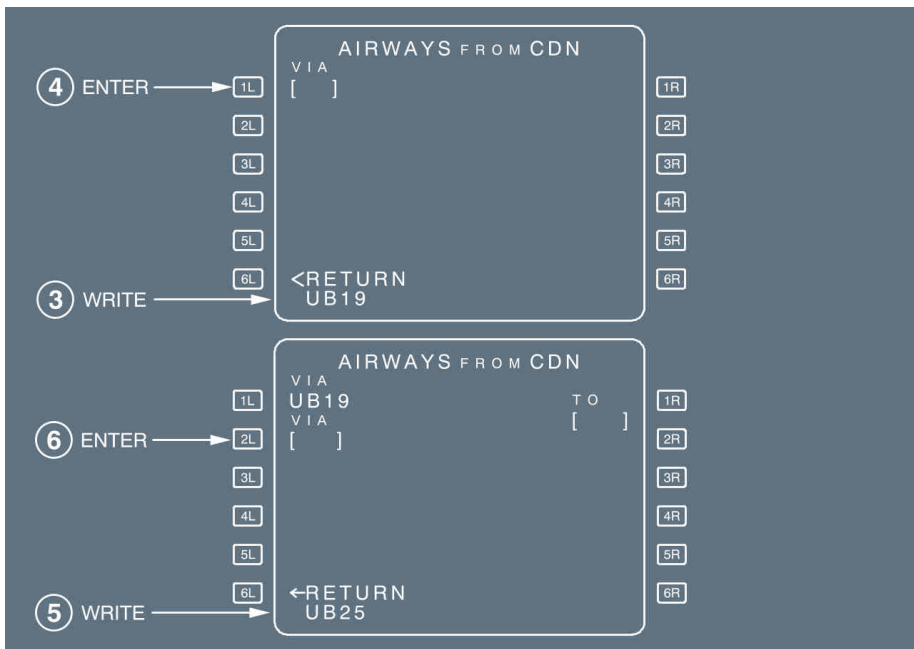
1R
2R
3R
4R
5R
6R

← SELECT ②

SELECT the revised waypoint (Here: CDN).
 PRESS [5R] to select the AIRWAYS prompt.

Ident.: DSC-22_20-10-30-13-A-00009501.0003001 / 01 OCT 12

For example, from CDN - Airways UB19 - Airways UB25 - Ending point AAA.



WRITE the first airway ident in the scratchpad (here: "UB19").

PRESS [1L] to insert it into the VIA field.

WRITE the second airway ident in the scratchpad (here: "UB25").

PRESS [2L] to insert it into the VIA field.

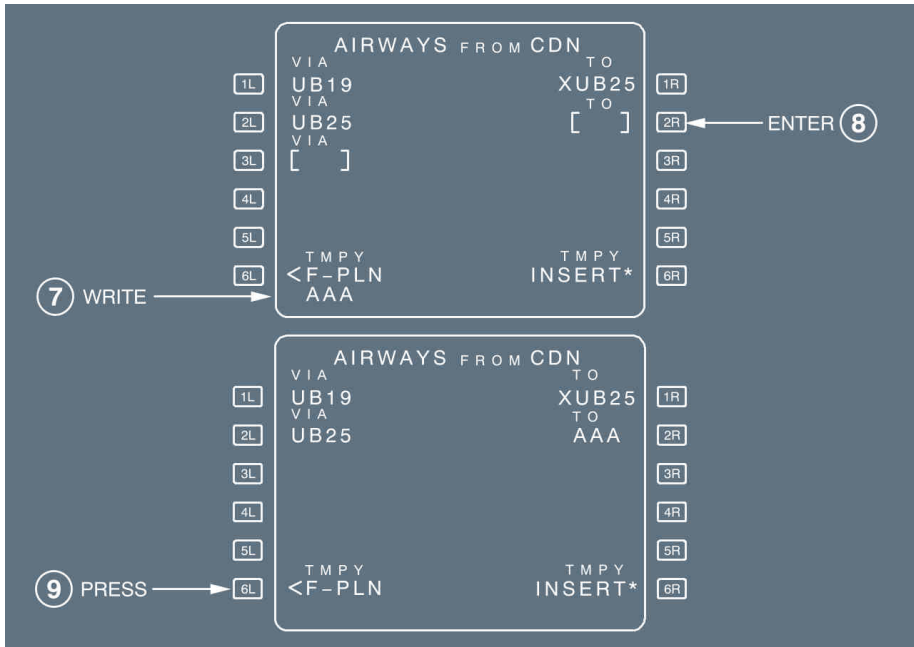
The system automatically determines the first downpath intersection point between the two airways.

- If the airways have a common waypoint, the system selects it as the ending point of the first airway.
- If they have no common waypoint, but have a single intersection, the system creates this intersection as an FM-computed point and displays "X", followed by the second airway's ident (here XUB25).
- If they have no common waypoint or intersection, the system displays NO INTERSECTION FOUND in the scratchpad.

When the required airways (up to 5) have been entered, the crew enters the ending point of the last selected airway :

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT

SYSTEM DESCRIPTION - FLIGHT PLANNING



CHECK if autoselection of the intersection point is correct

If not, WRITE the ending waypoint of first airway in the scratchpad and PRESS [2R] to insert it.

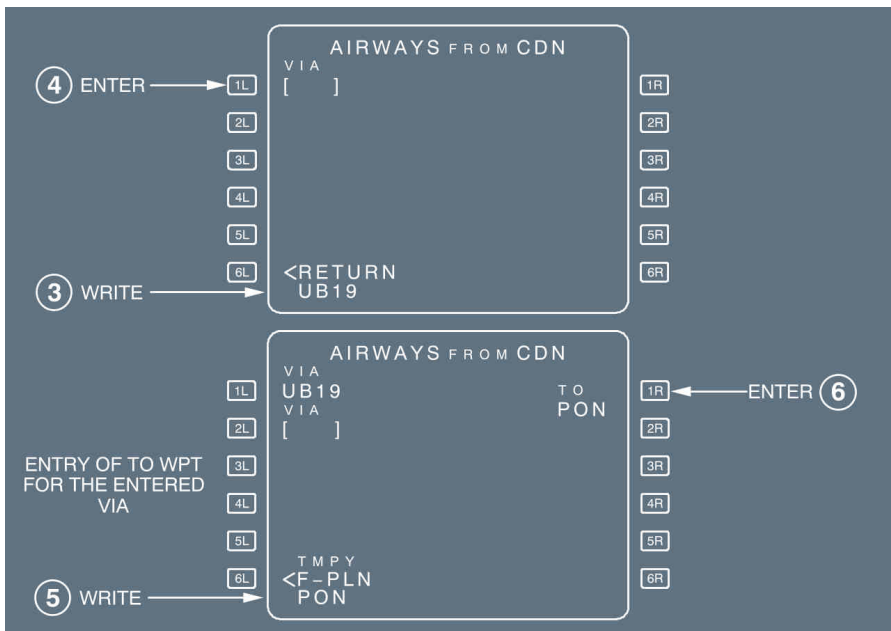
WRITE the ending waypoint in the scratchpad (here: "AAA").

PRESS [2R] to insert the ending waypoint into the TO field.

CHECK and INSERT the TMPY F-PLN or continue with next revision.

Ident.: DSC-22_20-10-30-13-A-00009502.0003001 / 01 OCT 12

TO INSERT ONE AIRWAY SEGMENT TO AN ENDING WAYPOINT



WRITE the airway ident in the scratchpad (here UB19).

PRESS [1L] to insert it into the VIA field.

WRITE the ending waypoint in the scratchpad (here PON).

PRESS [1R] to insert it into the TO field.

Note:

- If the revise waypoint, or the ending waypoint, does not belong to the entered airway, the system displays **AWY/WPT MISMATCH** in the scratchpad.
- If two waypoints with the same ident belong to the same airway, the **DUPLICATE NAMES** page will not be called up, and the system selects the first one in the database.

Ident.: DSC-22_20-10-30-13-A-00009503.0003001 / 24 JAN 11

FLIGHT PLAN INSERTION

The flight crew uses the "< TMPY F-PLN" prompt to access and review the TMPY F-PLN.

When the TMPY F-PLN has been checked, and if necessary modified, the crew inserts it.

CHECK and INSERT the TMPY F-PLN, or continue with the next revision

INSERTING A WAYPOINT

Applicable to: MSN 02926-02944, 04392, 07784-07792

Ident.: DSC-22_20-10-30-13-B-00000474.0007001 / 24 JAN 11

GENERAL

Waypoints can be inserted by means of a lateral revision at the "NEXT WAYPOINT". This process creates a temporary flight plan. This method enables the temporary flight plan to be checked before it is inserted.

Ident.: DSC-22_20-10-30-13-B-00009504.0001001 / 24 JAN 11

WAYPOINT IDENTIFICATION

The pilot can identify a waypoint by :

- Its identifier (if it is in the navigation database).
- A Latitude/Longitude (LL).
- A Place/Bearing/Distance (PBD). The waypoint is defined by its bearing and distance from a place.
- A Place-Bearing/Place-Bearing (PBX). The waypoint is defined by the interception of 2 radials from 2 places.
- A Place/Distance (PD). The waypoint is defined by a distance from a place, along the F-PLN.

Note: If a slash or a dash is not entered properly, the MCDU displays a "FORMAT ERROR" message.

When the Flight Management Guidance System receives a pilot defined waypoint that is not in the database, it identifies it as LLxx, or PBD xx, or PBX xx, or PD xx (xx is a two-digit number between 01 and 20) and stores it in the stored waypoints file of the database.

Note: When NAV mode is engaged, the crew cannot modify the "TO" waypoint (active leg) using the waypoint insertion function. If the crew wants to modify it, the DIR TO function will be used.

Ident.: DSC-22_20-10-30-13-B-00009505.0001001 / 14 MAY 12

ALONG TRACK OFFSET WAYPOINT INSERTION

On the F-PLN or STEP ALTS page, the pilot can enter an along track offset waypoint, defined as a place/distance waypoint. This results in the creation of a temporary F-PLN. The function has no effect on the active F-PLN until the temporary F-PLN is inserted.

② SELECT →

① WRITE →

FROM	UTC	AI101 SPD/ALT
TOU	1013	/FL220
LMG2D	BRG 308	23NM
AGN	1020	.78/FL290
UR10	TRK004	116
LMG	1035	.78/FL290
UR10		97
AMB	1051	" / "
UR10	TRK015	40
CND	1056	" / "
DEST	UTC	DIST EFOB
LFPG1D	1134	352 → 8.4
AMB/-040		↑↓

①L

②L

③L

④L

⑤L

⑥L

FROM	UTC	AI101 SPD/ALT
TOU	1013	/FL220
LMG2D	BRG308	23NM
AGN	1022	.80/FL290
UR10	TRK004	116
LMG	1035	.78/FL290
UR10		57
PD01	1045	" / "
UR10		40
AMB	1051	" / "
DEST	UTC	DIST EFOB
LFPG1D	1154	554 7.2
		↑↓

①R

②R

③R

④R

⑤R

⑥R



WRITE the waypoint identifier and the distance from this place.

According to the sign of the distance, the crew may define an along track waypoint before or after the revised place (Example : AMB/-040).

PRESS the appropriate key adjacent to the place identifier. The system automatically positions the waypoint in the flight plan.

This operation does not create any discontinuity.

The system does not accept an along track waypoint entered at the FROM waypoint.

PRESS the [6L] key to access the temporary F-PLN. Revise as necessary.

PRESS the [6R] key to insert the temporary into the active F-PLN.

Ident.: DSC-22_20-10-30-13-B-00009507.0001001 / 14 MAY 12

WAYPOINT INSERTED BY USING THE "NEXT WAYPOINT"

Use of the "NEXT WAYPOINT" function results in the creation of a temporary F-PLN. It has no effect on the active F-PLN, until the temporary F-PLN is inserted.

② SELECT →

① WRITE →

FROM	UTC	AI101 SPD/ALT
TOU	1013	/FL220
LMG2D	BRG 308	23 NM
AGN	1020	.78/FL290
UR10	TRK004	116
LMG	1035	.78/FL290
UR10		97
AMB	1051	" / "
UR10	TRK015	40
CND	1056	" / "
DEST	UTC	DIST EFOB
LFPG1D	1134	352 → 8.4
AMB/-040		↑↓

1L

2L

3L

4L

5L

6L

1R

2R

3R

4R

5R

6R

FROM	UTC	AI101 SPD/ALT
TOU	1013	/FL220
LMG2D	BRG308	23 NM
AGN	1022	.80/FL290
UR10	TRK004	116
LMG	1035	.78/FL290
UR10		57
PD01	1045	" / "
UR10		40
AMB	1051	" / "
DEST	UTC	DIST EFOB
LFPG1D	1154	554 7.2
		↑↓

1L

2L

3L

4L

5L

6L

1R

2R

3R

4R

5R

6R



SELECT the lateral revision (LAT REV) function at an appropriate waypoint.

WRITE the waypoint identifier, or LAT/LONG, or Place/Bearing/Distance, or Place-Bearing in the scratchpad.

ENTER it in the brackets under the NEXT WPT (next waypoint). A temporary F-PLN is automatically displayed.

CLEAR the F-PLN discontinuity, as appropriate, in the temporary F-PLN. Revise as necessary.

PRESS the [6R] key to insert the temporary into the active F-PLN.

FIX INFO

Applicable to: MSN 02926-02944, 04392, 07784-07792

Ident.: DSC-22_20-10-30-13-H-00012787.0001001 / 24 JAN 11

When using the FIX INFO function, the flight crew defines waypoint intersections of the flight plan with radials, circle or abeam associated to a fix.

When the flight crew inserts the intersection points, the system automatically identifies these points, but does not store them in the navigation database.

Ident.: DSC-22_20-10-30-13-H-00012788.0001001 / 01 OCT 12

The flight crew accesses the radial intercept function from the LAT REV page at the origin, at the FROM waypoint, or at a waypoint.

LAT REV AT
THE FROM WPT

LAT REV FROM PPOS
45°37.7N/001°01.8E
FIX INFO>

OFFSET LL XING/INCR/NO
[] []°/[]°/[]

<HOLD

<RETURN

SELECT ①

③ ENTER →

FIX INFO 1/4 ↔

REF FIX

1L	2L	3L	4L
5L	6L	1R	2R
3R	4R	5R	6R

POI

② WRITE →

⑤ INSERT →

④ WRITE →

A RADIAL INTERCEPT
POINT IS COMPUTED
AND CAN BE INSERTED

FIX INFO 1/4 ↔			
REF	FIX	UTC	DTG
POI			
RADIAL	[]°		
RADIUS []NM			
←ABEAM			
120			

FIX INFO 1/4 ↔			
REF	FIX	UTC	DTG
	←120°	1546	37
	[]°		
RADIUS []NM			
←ABEAM			

WRITE the reference fix identifier into the scratchpad (here POI), and ENTER it [1L].

It may be any database or pilot-defined fix.

WRITE the radial in the scratchpad (here 120 °), and ENTER it [2L].

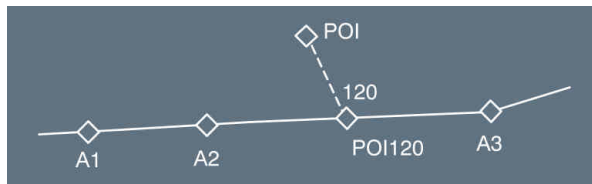
The defined radial appears as a blue dashed line on the ND.

If the radial line intersects the active flight plan, the system computes the time, the along path Distance (DIST), and the altitude at the intersection point.

Up to two radials can be entered.

SELECT the required radial to insert the associated waypoint into the flight plan, if needed:

The system automatically assigns its ident as the three first characters of the reference fix ident, followed by the radial. (Example: POI120). The blue dashed line disappears from the ND.



INSERTING A CIRCLE INTERCEPT WAYPOINT

② INSERT →

① WRITE →

FIX INFO 1/4 ↔

REF FIX			
POI			
RADIAL	UTC	DTG	ALT
120°	1606	39	FL350
[]°	----	----	----
RADIUS			
[]NM	----	----	----
←ABEAM			
40			

1R

2R

3R FIX INFO PAGE
FOLLOWING
REF FIX ENTRY

4R

5R

6R

1L

2L

3L

4L

5L

6L

FIX INFO 1/4 ↔

REF FIX			
POI			
RADIAL	UTC	DTG	ALT
120°	1546	37	FL350
[]°	----	----	----
RADIUS			
40 NM	1022	16	FL350
←ABEAM			

1R

2R

3R A CIRCLE INTERCEPT
POINT IS COMPUTED
AND INSERTABLE

4R

5R

6R

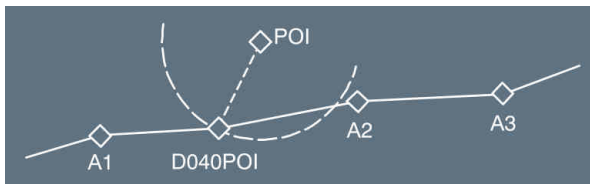
WRITE the reference fix identifier into the scratchpad (here POI), and ENTER it [1L].

WRITE the circle radius in the scratchpad (here 40 NM), and ENTER it [4L]:

The defined circle appears as a blue dashed circle on the ND. If the circle intersects the active flight plan, the system computes the time, along path distance and altitude at the first intersection point from the current aircraft position.

SELECT the required radius to insert the associated waypoint into the flight plan, if needed:

The system automatically assigns its ident as a D, followed by the radius, and followed by the three first characters of the reference fix ident. (Example: D040POI). The blue dashed circle disappears from the ND.



Ident.: DSC-22_20-10-30-13-H-00012790.0001001 / 01 OCT 12

INSERTING AN ABEAM INTERCEPT WAYPOINT

SELECT →

[1L] [2L] [3L] [4L] [5L] [6L]

FIX INFO 1/4 ↔

REF FIX
POI

RADIAL	UTC	DTG	ALT
120°	1606	39	FL350
[]°	----	----	----
RADIUS []NM	----	----	----

←ABEAM

[1R] [2R] [3R] [4R] [5R] [6R]

FIX INFO PAGE
FOLLOWING
REF FIX ENTRY

[1L] [2L] [3L] [4L] [5L] [6L]

FIX INFO 1/4 ↔

REF FIX
POI

RADIAL	UTC	DTG	ALT
120°	1606	39	FL350
[]°	----	----	----
RADIUS []NM	----	----	----
ABEAM ←134°	1609	47	FL350

[1R] [2R] [3R] [4R] [5R] [6R]

ABEAM INTCP
POINT IS COMPUTED
AND INSERTABLE

WRITE the reference fix identifier into the scratchpad (here POI), and ENTER it [1L].

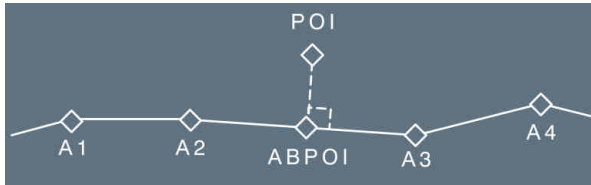
SELECT the ABEAM prompt [5L]:

A blue dashed line from the REF FIX and perpendicular to the flight plan appears on the ND.

The system computes the radial, time, along path distance, altitude and predictions related to the waypoint abeam the reference fix.

SELECT [5L] to insert the abeam intercept waypoint into the flight plan, if needed:

The system automatically assigns its identifier as AB, followed by the first five characters of the reference fix identifier (Example ABPOI). The blue dashed line disappears from the ND.



INSERTING A NEW DESTINATION

Ident.: DSC-22_20-10-30-13-00000475.0001001 / 01 OCT 12

Applicable to: MSN 02926-02944, 04392, 07784-07792

The pilot may define a new destination, and insert it via the lateral revision page. This results in the creation of a temporary F-PLN. The function has no effect on the active F-PLN, until the temporary F-PLN is inserted. The pilot may then call up the new destination from any waypoint along the flight plan, except the FROM waypoint, the destination, and the missed-approach waypoint. When the new destination has been inserted, a flight plan discontinuity appears between the revision waypoint and the new destination. All waypoints beyond the revision waypoint (including the previous destination and associated missed approach) are deleted.

1 SELECT →

2 WRITE →

FROM AI5612 →

UTC SPD/ALT

ROCCA 1013 FL220

TOP9C BRG136 32NM

TOP 1022 .78/ FL290

UB25 TRK122 60

GEN 1030 " "

UB25 57

BEROK 1037 " "

UB25 29

FRZ 1041 " "

DEST UTC DIST EFOB

LGAT33R 1220 898 8.4

↑↓

LAT REV FROM GEN

44°01.8N/011°00.2E

NEXT WPT []

<HOLD ENABLE NEW DEST []

<ALTN

AIRWAYS>

<RETURN EHAM

FROM TMPY AI5612 →

UTC SPD/ALT

ROCCA 1013 FL220

TOP9C BRG136 32NM

TOP 1022 .78/ FL290

UB25 TRK122 60

GEN 1030 " "

--F-PLN DISCONTINUITY

DEST UTC DIST EFOB

EHAM ---- 350 ----

ONCE/THEN TMPY

← UNDO/ERASE INSERT *↑↓

1R

2R

3R

4R

5R

6R

ENTER **3**

INSERT **4**

SELECT the lateral revision function at an appropriate waypoint.

WRITE the new destination in the scratchpad.

Enter it in the brackets under "NEW DEST". A temporary F-PLN is automatically displayed.

CLEAR the F-PLN discontinuity in the temporary F-PLN. Revise as necessary.

PRESS the [6R] key to insert the temporary into the active F-PLN.

HOLDING PATTERN

Applicable to: MSN 02926-02944, 04392, 07784-07792

Ident.: DSC-22_20-10-30-13-C-00000476.0001001 / 24 JAN 11

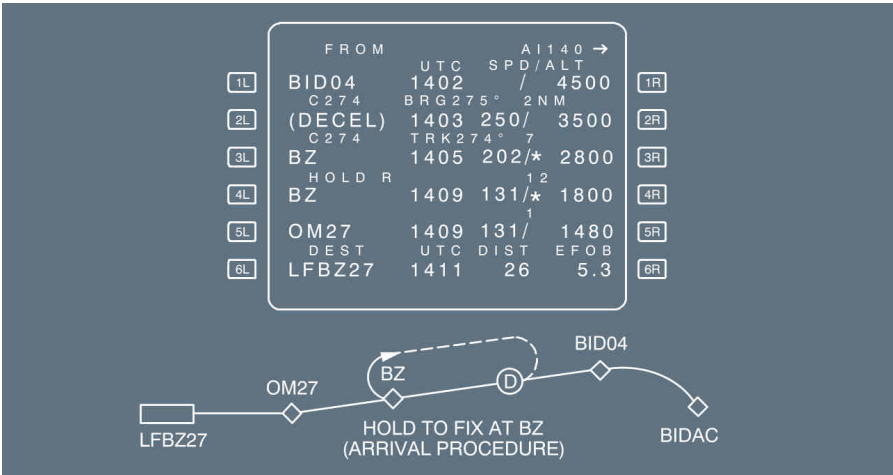
GENERAL

This section describes holding patterns, associated guidance and flight crew procedures. The Flight Management and Guidance Computer (FMGC) has three types of holding patterns that the pilot can use in a flight plan.

Ident.: DSC-22_20-10-30-13-C-00009509.0001001 / 01 OCT 12

HOLD TO FIX (HF)

The holding pattern is always part of an arrival or departure procedure. The aircraft flies it once, and then automatically exits the holding pattern at the fix. The predicted speed in the holding pattern is the lowest of the ICAO speed limit, max endurance speed, or any speed constraint. Guidance to the fix in the holding pattern is similar to that on any leg of a flight plan. The HF patterns are part of the navigation database and cannot be created by the crew.



Ident.: DSC-22_20-10-30-13-C-00009513.0001001 / 19 DEC 12

HOLD TO ALTITUDE (HA)

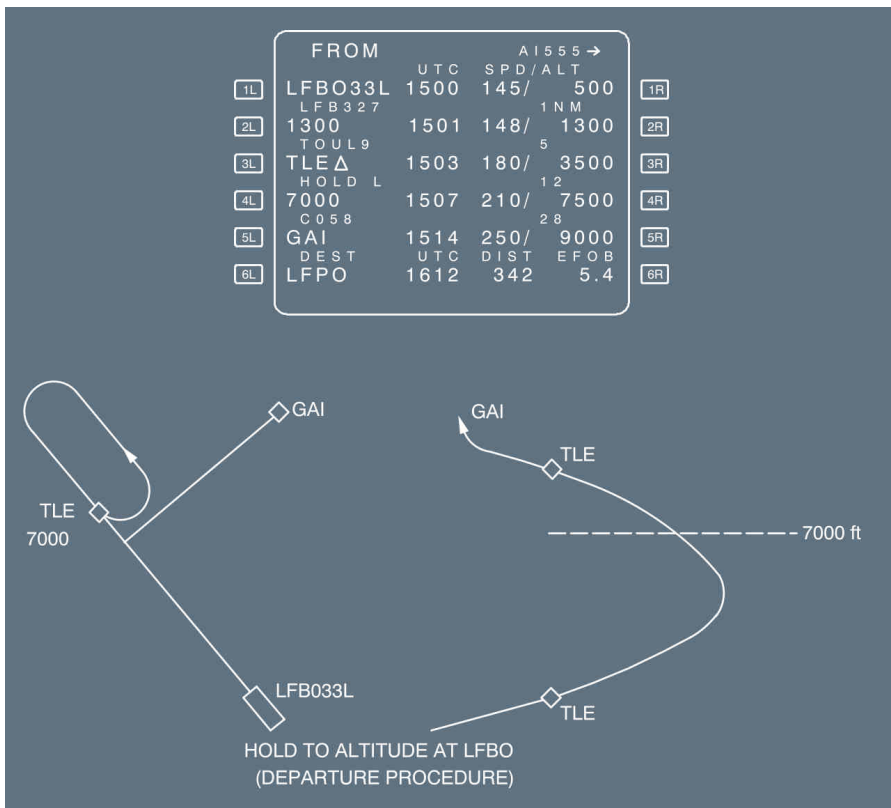
The aircraft flies the hold until it reaches the specified altitude. Then, it automatically exits the hold at the fix.

The predicted speed for the holding pattern is the lowest of the ICAO speed limits, the max endurance speed, or any speed constraint.

The size of the holding pattern is a function of the predicted speed.

Guidance in a hold to altitude (HA) is similar to that for any leg of a flight plan.

The HAs are in the navigation database, as part of the arrival or departure procedures, and cannot be created by the crew.



Ident.: DSC-22_20-10-30-13-C-00009514.0015001 / 14 NOV 24

HOLD WITH MANUAL TERMINATION (HM)

This type of holding pattern may be part of an arrival procedure, or the flight crew may enter it at the present position or at any flight plan waypoint.

The flight crew will use this type of holding pattern to comply with a defined procedure or a clearance limit, or to meet an operational need (such as losing altitude, holding for weather improvement, or absorbing an ATC delay).

This type of holding pattern is exited according to the decision of the flight crew, not automatically. There are 2 types of HMs, and all are modifiable.

DATABASE HOLD

1L

2L

3L

4L

5L

6L

HOLD AT VNE

INB CRS
103°

COMPUTED →

TURN
R

TIME/DIST
1.0/4.0

LAST EXIT

UTC FUEL

1205 8.8

<RETURN

1R

2R

3R

4R

5R

6R

If the holding pattern is part of the database, all its associated data (inbound course, turn direction, time/distance) are defined in the database. The flight crew can modify this data, leading to the creation of a temporary F-PLN.

COMPUTED HOLD

1L

2L

3L

4L

5L

6L

HOLD AT PON

INB CRS
125°

COMPUTED

TURN
R

TIME/DIST
1.5/8.0

LAST EXIT

UTC FUEL

1202 8.8

<RETURN

1R

2R

3R

4R

5R

6R

If the holding pattern is not in the database, the FMS designs a holding pattern and proposes it to the flight crew. The associated data consists of default values that the flight crew can modify. This results in creating a temporary F-PLN.

PREDICTIONS AND GUIDANCE ASSOCIATED WITH A HM HOLDING PATTERN (HOLD WITH MANUAL TERMINATION)

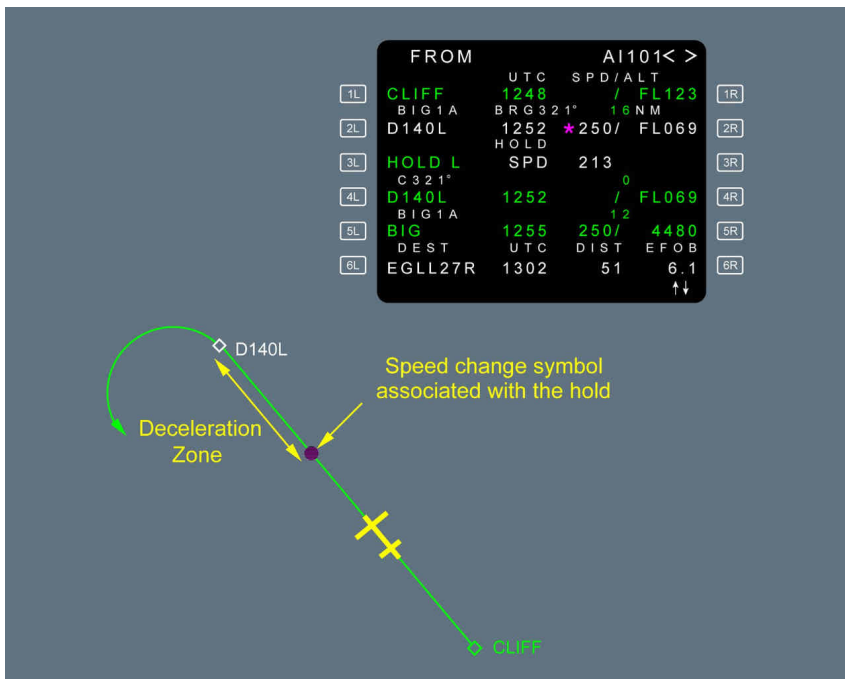
Before Deceleration

If an altitude constraint is defined at the hold entry fix, then the FMS duplicates this constraint on the hold exit.

However, different constraints may be inserted at entry and exit fixes.

Although the hold is inserted in the flight plan, the FMS does not take it into account for predictions until the aircraft enters the hold.

However, if the hold is not deleted by the flight crew, the FMS schedules a deceleration point and displays it on the ND.



Note: The deceleration zone allows to decelerate from the current speed to the holding speed to reach the holding speed when overflying the hold entry fix. The deceleration zone is limited to a maximum length of 20 NM.



The FMS predicts the estimated time and amount of fuel remaining at which the aircraft must exit holding, so as to comply with the fuel policy specified on the FUEL PRED page.

When the aircraft enters the holding pattern, the FMS revises all predictions and assumes the aircraft will fly one turn of the holding pattern.

Each time the aircraft flies over the holding fix, the FMS updates the predictions for one more holding circuit.

Upon Reaching the Speed Change Pseudo Waypoint

The FMS either causes the aircraft to decelerate to the hold speed (if managed speed is active and NAV mode engaged), or displays **SET HOLD SPEED** on the MCDU and **SET HOLD SPEED** on the PFD, if the flight crew selected a speed target.

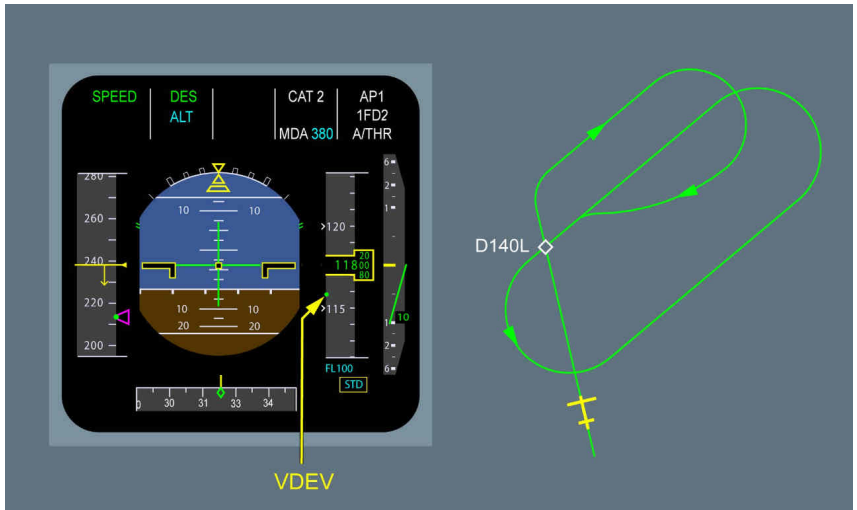
The default hold speed is the lowest of the following:

- Maximum endurance speed
- ICAO limit holding speed
- Speed constraint (if any).

When no specific speed limit applies, the default hold speed is approximately equal to the following:

- Green Dot speed on the A318, A319, A320 (CFM or PW) and A321, or
- Green Dot +20 kt on the A320 (IAE).

The flight plan predictions for time and fuel do not yet consider that the hold will be flown. However, the ND shows the hold entry and holding pattern trajectory.



Deceleration receives priority, so that when in **DES** mode, the aircraft will deviate above the descent path to decelerate. (VDEV becomes positive on the PROG page).

The F-PLN displays **IMM EXIT** prompt.

If the flight crew presses the key next to **IMM EXIT**, before arriving at the holding fix, the aircraft will not enter the holding pattern, but will resume its applicable manage speed of the current flight phase.



After Reaching the Hold Entry Fix

The aircraft enters the hold. The HOLD page displays the associated holding data:

- The inbound course (INB CRS)
- The TURN direction (L or R)

- The TIME/DIST
- The LAST EXIT time and the associated fuel to reach the alternate airport with no extra fuel.

The FMS assumes that the aircraft will fly one turn of the holding pattern, and revises the predictions accordingly.

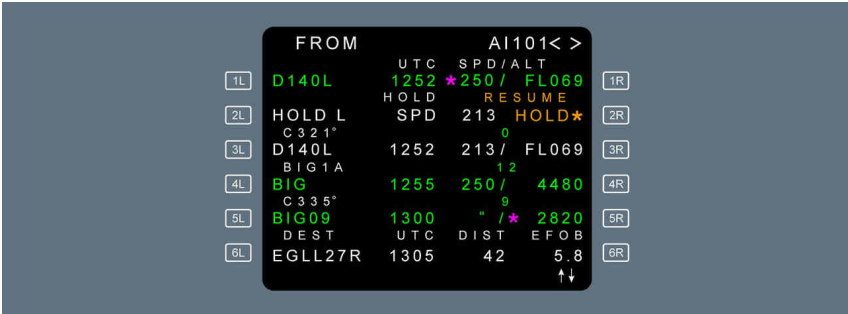
When the holding pattern is defined by a leg time (and not a leg distance), the FMS revises the size of the hold as a function of the target speed:

- If the managed speed is active, the FMS uses the predicted holding speed to calculate the size of the holding pattern
- If the selected speed is active, the FMS uses the target speed selected by the flight crew at the entry fix sequencing to calculate the size of the holding pattern
- The VDEV, displayed on the PFD and the PROG page, when the aircraft is flying in the HM, is the difference between the aircraft's current altitude and the altitude at which it should be when it reaches the hold exit fix in order to be correctly positioned on the descent path.

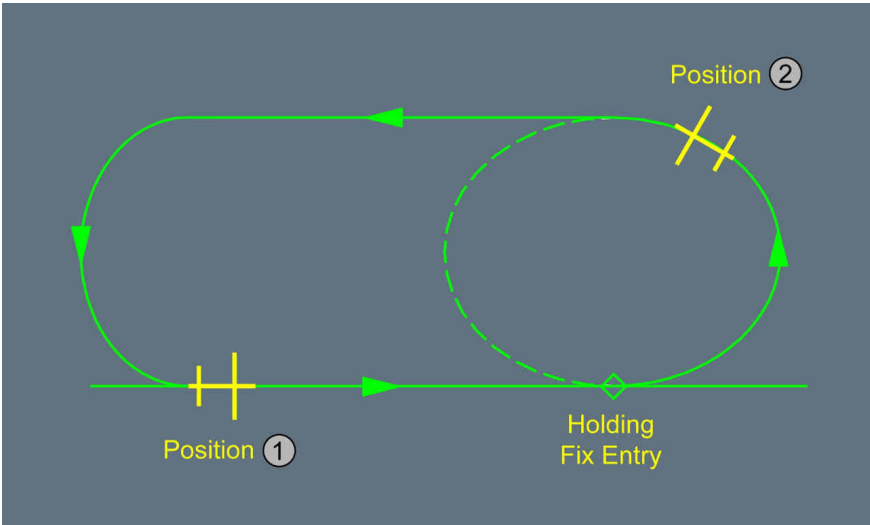


With IMM EXIT Pressed (Aircraft in the Holding Pattern)

The predictions and guidance assume that the aircraft is immediately returning to the hold fix. Sequencing the hold fix, the aircraft exits the holding pattern and resumes its navigation. The flight plan page displays RESUME HOLD, instead of IMM EXIT.



HOLD EXIT PROCEDURE



At position (1), if the flight crew selects IMM EXIT, the aircraft will exit at the next fix overfly. At position (2), if the flight crew selects IMM EXIT, the aircraft will make an immediate turn to the fix where the hold will be exited.

AIRCRAFT SYSTEMS**AUTO FLIGHT - FLIGHT MANAGEMENT**

SYSTEM DESCRIPTION - FLIGHT PLANNING

If managed speed is active, the FMS sets the target speed to the applicable speed of the current phase (for example, speed constraint, ECON speed, or speed limit). The FMS then assumes that the flight crew will continue on the descent path, if the aircraft is in descent.

If **DES** mode is engaged, the following applies:

- The holding pattern is never included in the descent path computation
- The flight crew cannot enter altitude and speed constraints at the hold exit fix (This is only allowed at the hold entry fix)
- The vertical guidance in the HM, during the descent phase, is set to -1 000 ft/min but the FMS considers altitude constraints that will take effect farther down the flight path. The FMS will not allow the aircraft to descend below the next altitude constraint, neither to the FCU selected altitude. If the aircraft reaches the next altitude constraint, it will level off and the **ALT CST** mode will engage.

With **RESUME HOLD** Pressed

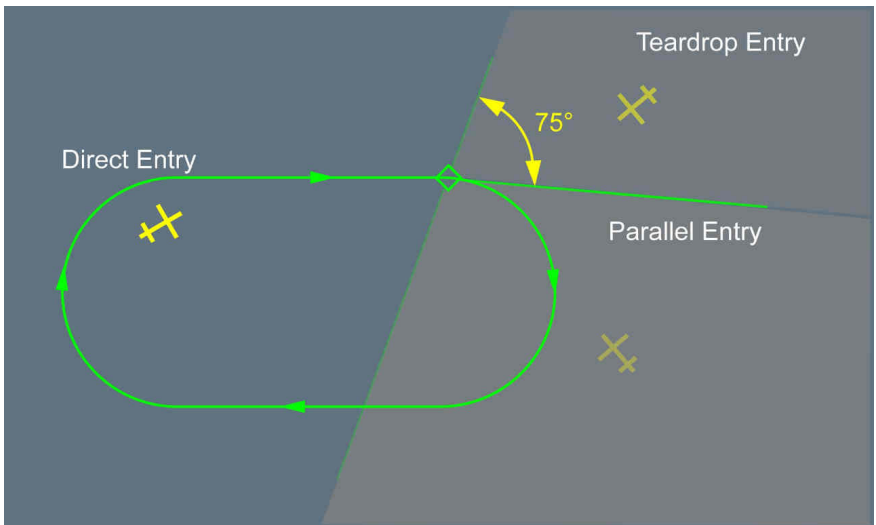
If the flight crew presses the key next to **RESUME HOLD**, the aircraft remains in the holding pattern, and **IMM EXIT** is displayed again.

After that, each time the aircraft flies over the holding fix, the FMS updates the predictions for one more holding circuit.

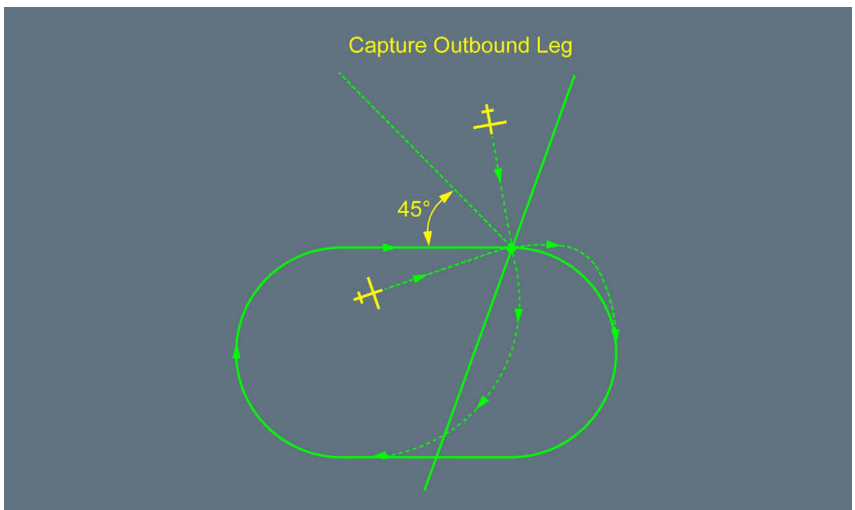
HOLDING PATTERN ENTRIES

The FMS offers three types of entry into holding patterns:

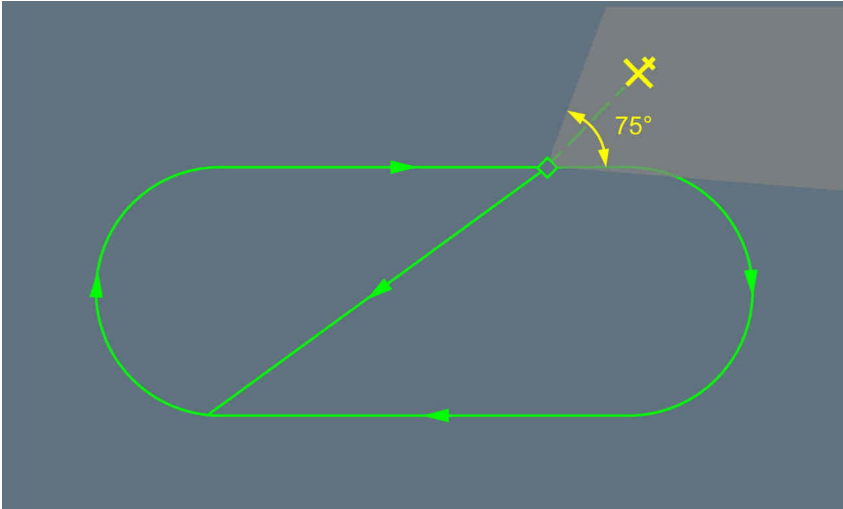
1. Direct entry
2. Teardrop entry
3. Parallel entry.



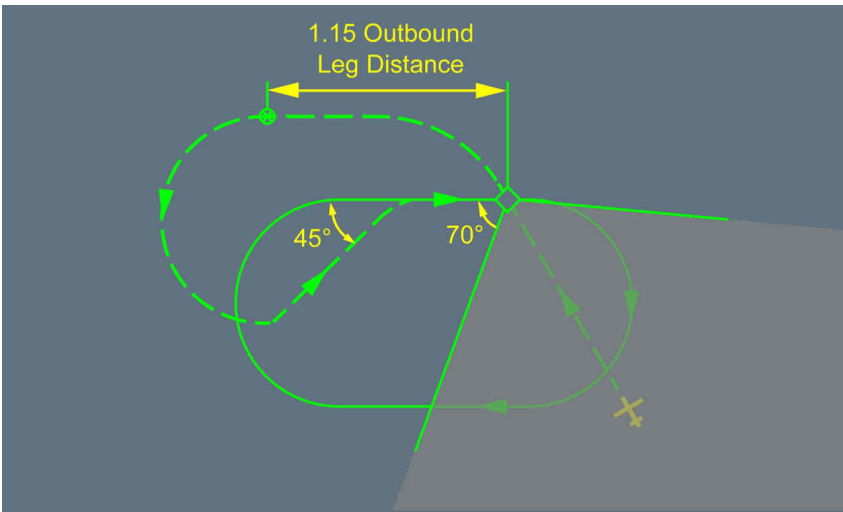
1. Direct entry



2. Teardrop entry

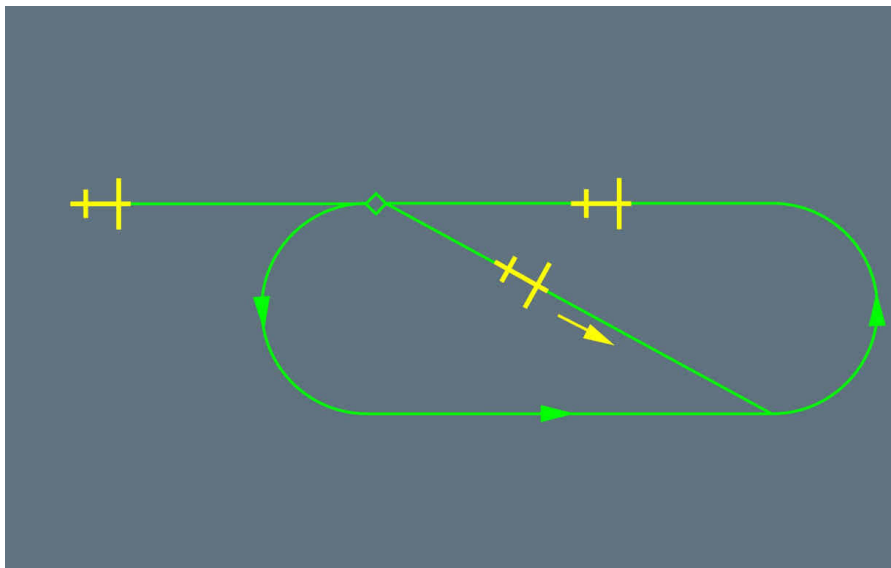


3. Parallel entry



Note: If the flight plan leg toward the holding fix is on a "limit" between a teardrop entry and a parallel entry, the FMS may compute and display either of the two entries. The flight crew should keep this in mind, and should not assume that the FMS is malfunctioning.

If the flight plan leg toward the hold entry fix is on a course that is the reciprocal of the inbound course of the holding pattern, the aircraft will fly a teardrop entry.



Ident.: DSC-22_20-10-30-13-C-00009515.0015001 / 01 OCT 12

PROCEDURE TO INSERT A HOLD (HOLD WITH MANUAL TERMINATION)

The HOLD prompt enables the crew to enter a holding pattern, with manual termination (HM), at the revised waypoint or at the present position.

The crew accesses the HOLD page from a lateral revision at the present position (PPOS), or at a waypoint. Using the HOLD function results in the creation of a temporary F-PLN. The function has no effect on the active F-PLN, until the temporary F-PLN is inserted.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT

SYSTEM DESCRIPTION - FLIGHT PLANNING

LAT REV FROM PPOS		
[1L]	FIX INFO>	[1R]
[2L]	LL XING/INCR/NO	[2R]
	<OFFSET []°/[]°/[]	
[3L]	<HOLD	[3R]
[4L]		[4R]
[5L]		[5R]
[6L]	<RETURN	[6R]
		LAT REV AT PRESENT POSITION
LAT REV FROM VNE 44°01.8N/011°00.2E		
[1L]	FIX INFO>	[1R]
[2L]		[2R]
[3L]	NEXT WPT	[3R]
[4L]	NEW DEST	[4R]
[5L]	[]	[5R]
[6L]	AIRWAYS>	[6R]
	TMPY TMPY	
	<F-PLN INSERT*	
		LAT REV AT A WPT

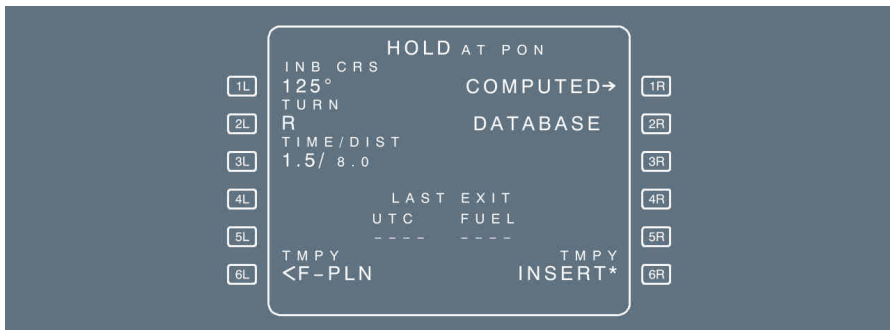
SELECT a lateral revision at the applicable waypoint, or at the present position (PPOS),
 PRESS the HOLD prompt [3L],

*A TMPY F-PLN is created and a default hold is proposed: if applicable, the database hold is
 proposed. If no database hold is available, the computed hold is proposed.*

CHECK the proposed hold. If not appropriate, SELECT COMPUTED [1R] or DATABASE [2R] (if
 applicable),

CHECK the hold parameters and MODIFY them if necessary

INSERT the TMPY F-PLN or continue with next revision.



Ident.: DSC-22_20-10-30-13-C-00009516.0002001 / 24 JAN 11

PROCEDURE TO DELETE A HOLD (HOLD WITH MANUAL TERMINATION)

CLEAR the HOLD directly in the flight plan, as can be done for a normal waypoint.

CHECK and INSERT the TMPY F-PLN or continue with next revision

Note: Only the constraint on the entry fix of the hold are preserved.

OFFSET

Applicable to: MSN 02926-02944, 04392, 07784-07792

Ident.: DSC-22_20-10-30-13-D-00000477.0003001 / 17 MAY 21

The OFFSET prompt enables the crew to define a lateral offset to the left or right of the active flight plan. Once inserted, the offset applies from the present position (PPOS) all along the flight plan to the first waypoint (WPT) at which a holding pattern is defined, or to the last waypoint before the runway. In most cases, the crew will use it en-route, because of an ATC clearance, or to avoid bad weather expected along the flight plan route. Accessed from a lateral revision (LAT REV) at the FROM waypoint, an offset may be defined between 1 and 50 NM in one-nautical-mile steps and starts at PPOS. Using the offset function results in the creation of a temporary F-PLN. The function leads to the creation of a temporary flight plan. Once this TMPY F-PLN is inserted, the flight plan page shows OFFSET in its title, and the navigation display shows the offset flight plan with a solid green line and the original flight plan with a dashed green line. The offset can be manually suppressed by clearing the offset value in [1L] or by performing a DIR TO.

1. If a hold is inserted at PPOS, this hold is flown on the offset path. If a hold is inserted at another waypoint, the offset will be automatically deleted before the hold.
2. No offset can be computed on approach legs.
3. If the crew enters an OFFSET when the aircraft is too close to the TO waypoint, the FMGS may refuse to accept it, in which case the MCDU displays the "ENTRY OUT OF RANGE" message.

SELECT →

1L

2L

3L

4L

5L

6L

LAV REV FROM PPOS

LL XING/INCR/NO
[]°/[]°/[]

<OFFSET

<HOLD

<RADIAL FIX INFO

<RETURN

1R

2R

3R

4R

5R

6R

1L

2L

3L

4L

5L

6L

OFFSET FROM PPOS

OFFSET
15L

TMPY TMPY
<F-PLN INSERT*

1R

2R

3R

4R

5R

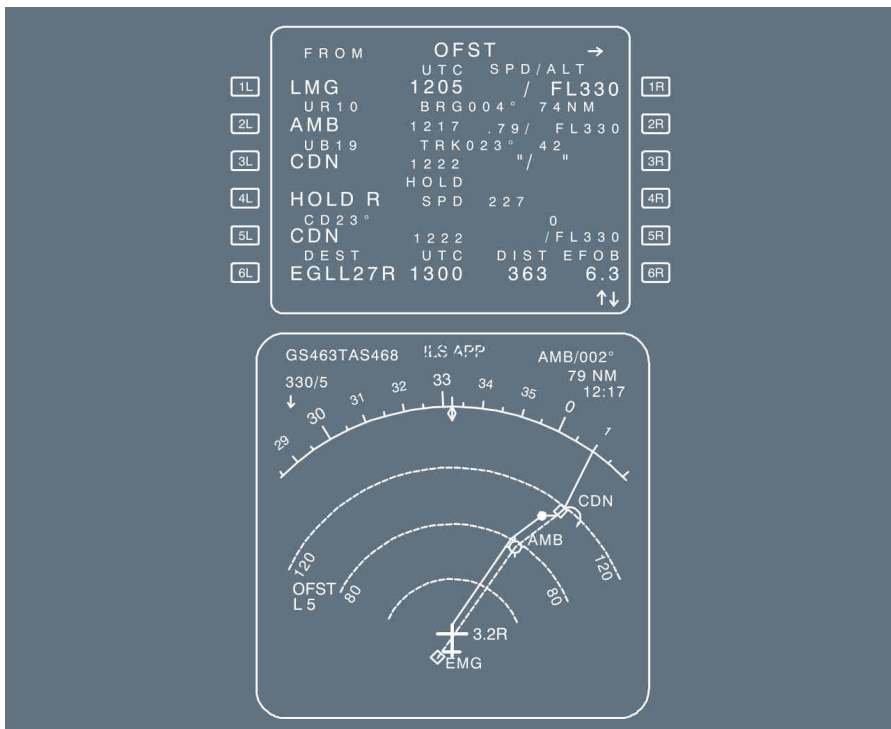
6R

SELECT →

Ident.: DSC-22_20-10-30-13-D-00009517.0003001 / 01 OCT 12

INSERTING AN OFFSET

- SELECT LAT REV at the present position (PPOS).
- SELECT the OFFSET prompt.
- WRITE the required offset value and direction (Example : L15 or 15L).
- PRESS [1L] to enter the offset in the OFFSET field.
- CHECK and INSERT the TMPY F-PLN or continue with next revision.



Ident.: DSC-22_20-10-30-13-D-00009518.0002001 / 14 MAY 12

MANUAL CANCELLATION OF AN OFFSET

There are two standard methods of cancelling an offset :

1. PERFORM DIR TO a waypoint (the next waypoint, for example).
2. SELECT a Lateral Revision (LAT REV) at FROM WPT.

SELECT the OFFSET prompt.

CLEAR the OFFSET field (or ENTER a zero value in the OFFSET field).

CHECK and INSERT the TMPY F-PLN or continue with next revision.



ALTERNATE FUNCTION

Applicable to: MSN 02926-02944, 04392, 07784-07792

Ident.: DSC-22_20-10-30-13-E-00000478.0002001 / 24 JAN 11

The ALTERNATE FUNCTION performs two actions:

- It reviews and defines alternate airports and inserts them into the flight plan
- It allows a diversion to be activated through the ENABLE ALTN command.

Using the ALTERNATE function results in the creation of a temporary F-PLN. The function has no effect on the active F-PLN until the temporary is inserted.

An alternate airport may also be entered or modified through the dedicated field on INIT A page. In this case, no TMPY F-PLN is created.

Ident.: DSC-22_20-10-30-13-E-00009519.0003001 / 13 DEC 12

REVIEW AND SELECTION OF ALTERNATE AIRPORT

Several alternate airfields may be stored in the database and assigned to a destination. When the pilot selects a company route (CO RTE) (or a city pair), the computer strings the preferred alternate into the active flight plan.

The pilot may review the alternate airports on the ALTN page and change the selected one if not suitable.

The ALTERNATE page shows the track and distance (airway or direct) between destination and alternate, as well as fuel management data (EXTRA fuel, assuming the associated airfield is the alternate airport). This data will help the pilot change the preferred alternate, if necessary.

ENTERING NEW ALTERNATE INTO THE F-PLN

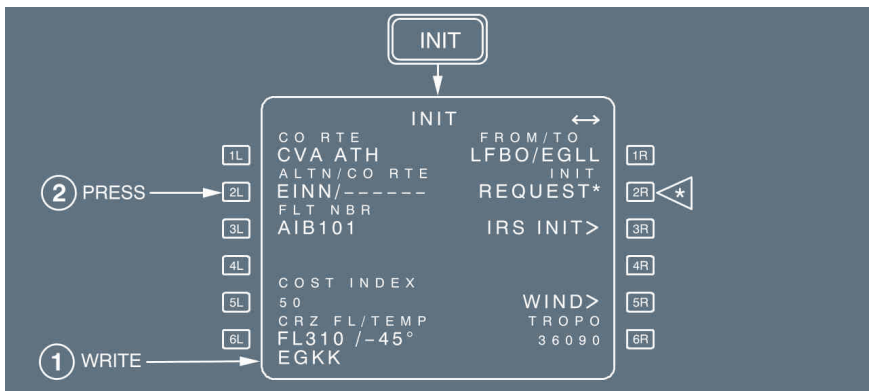
SELECT INIT key on the MCDU.

ENTER an AIRFIELD IDENTIFIER in [2L] field.

PRESS FUEL PRED key and CHECK or MODIFY the specified ALTN fuel.

Note: If weather and destination airfield conditions permit, you may select "NO ALTN". Fuel predictions will be computed without alternate fuel.

Note: A new alternate may also be entered in the F-PLN by selection of LAT REV and then ALTN page. In this case, a temporary flight plan will be created before final insertion.



SELECTION OF ANOTHER ALTERNATE

Fuel management information for flight to another alternate airfield may be obtained by selecting the OTHER ALTN field.

SELECT LAT REV at DESTINATION.

SELECT ALTN [3L].

ENTER the airfield identifier in the brackets.

- If the airfield is not in the database, the NEW RUNWAY page automatically appears.
- If the airfield is in the database and there is a company route (CO RTE) to it, the ROUTE SELECTION page automatically appears.

SELECT the route, as appropriate, or RETURN to the ALTN page.

ENTER the distance in the brackets (if required). XTRA fuel and track (TRK) will appear.

SELECT the other alternate (OTHER ALTN) as a primary alternate, if convenient. (EXTRA fuel and DIST revert to AIRWAY distance).

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT

SYSTEM DESCRIPTION - FLIGHT PLANNING

CHECK and INSERT the TMPY F-PLN, or continue with next revision.

- Note:
- The pilot can always overwrite the "OTHER ALTN". The new "OTHER ALTN" then replaces the previous one, which is lost.
 - The pilot can select OTHER ALTN as a primary alternate (active flight plan), to replace any alternate on the initial list.
 - If the pilot selects the other alternate as a primary alternate, and overwrites the OTHER ALTN field by entering a new airport, the first one will remain a primary alternate and the system will memorize a second OTHER ALTN.

② ENTER →

① WRITE →

ALTERNATES FOR EGLL
ALT N CO RTE

1L	EINN	TRK	EXTRA	DIST	1R
2L	EINN	287°	10.4	72NM	2R
3L	←EGUF	226°	12.1	117NM	3R
4L	←EGKK	152°	12.1	121NM	4R
			OTHER ALTN		
	[]				5R
	<RETURN				6R
	EHAM				

1L

2L

3L

4L

5L

6L

EGLL/EHAM 1/1

LONAMS	RWY	09R	BPK2J	BPK	1R
	DIR	CLN	DIR	REDF A	2R
					3R
					4R
					5R
					6R

<RETURN
SELECT →

↑

1R

2R

3R

4R

5R

6R

SELECT ③ ←

④ SELECT →

ALTERNATES FOR EGLL

ALTN	TRK	EXTRA	DIST	CO RTE
EINN	287°	10.8	72NM	
←EGUF	226°	12.1	117NM	
←EGKK	152°	12.1	121NM	
←EHAM	---	---	[]	OTHER ALTN
TMPY				TMPY
<F-PLN				INSERT*

ALTERNATES FOR EGLL

ALTN	TRK	EXTRA	DIST	CO RTE
EHAM				LONAMS
EINN	287°	0.8	322NM	
←EGUF	226°	2.1	17NM	
←EGKK	152°	2.1	21NM	
EHAM	073°	8.9	214NM	
TMPY				TMPY
<F-PLN				INSERT*

The pilot may enter a distance in the OTHER ALTN field. The system will compute the extra fuel, and the track for this distance.

When the OTHER ALTN is selected as a primary alternate, the FMGC will also compute the predictions for the other alternate.

PREDICTED DATA FOR ALTERNATE

Data predictions can be based on:

- Aircraft weight being equal to landing weight at the primary destination.
- Flight at FL 100 if the alternate F-PLN length is less than 100 NM, at FL 220 if the alternate F-PLN length is comprised between 100 NM and 200 NM, or else at FL 310.
- Cost index 0.
- Constant wind (as entered in the alternate field of the DES WIND page).
- Constant delta ISA (equal to delta ISA at primary destination).
- The along flight plan distance from the destination to the alternate airport.

If the crew enters an ALTN fuel value, this value is the one taken into account.

PIA A318/A319/A320/A321 FLEET
 FCOM

← |

DSC-22_20-10-30-13 P 37/60
 20 AUG 25

ENABLE ALTN

Ident.: DSC-22_20-10-30-13-00000479.0002001 / 03 MAY 23

Applicable to: MSN 02926-02944, 04392, 07784-07792

This enables the flight crew to initiate a diversion by entering the alternate flight plan just after the revision waypoint (with a discontinuity). Using the ENABLE ALTN function results in the creation of a temporary F-PLN. This function has no effect on the active F-PLN until the temporary F-PLN is inserted.

The flight crew may have to adjust the resulting flight plan (add or delete waypoints), depending on the circumstances.



TO ENABLE THE ALTN F-PLN:

SELECT LAT REV at the waypoint where the ALTN part is to be strung.
 SELECT the ENABLE ALTN.

 *The temporary flight plan is created and displayed.*

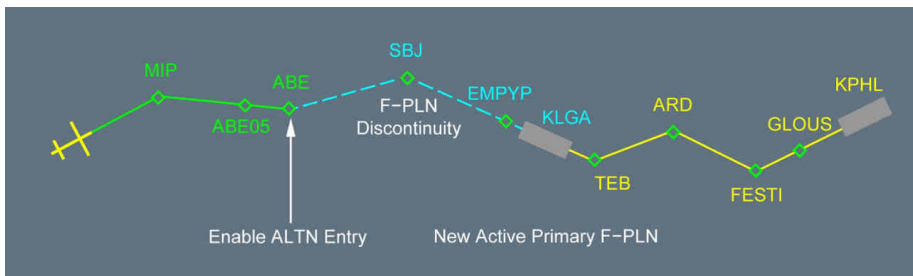
 REVISE the temporary F-PLN as necessary.

INSERT the temporary F-PLN or continue with next revision.

[L2] The message **USING COST INDEX 0** is displayed in the scratchpad on the side where the **ENABLE ALTN** function was used.

[L1] If necessary, perform a DIR TO the first waypoint of the alternate.

ADJUST the cost index on the PERF page and the defaulted CRZ FL on the PROG page, as required.



When **ENABLE ALTN** is selected at **ABE**, a flight plan discontinuity is created from **ABE** down to destination and the alternate route is linked to the active flight plan.

DIR KEY (DIRECT-TO-FUNCTION)

Applicable to: MSN 02926-02944, 04392, 07784-07792

Ident.: DSC-22_20-10-30-13-F-00000480.0003001 / 30 MAR 18

The pilot uses the “Direct To” function to define a direct leg, potentially with inbound/outbound course or abeam waypoint, from the present position to any waypoint on the active flight plan or to any waypoint.

The designated waypoint may be entered by its identifier (if it is stored in the navigation database), or as a pilot defined element, or by a latitude/longitude, place/bearing/distance, a place-bearing/place-bearing, or a place distance (PD) along the F-PLN.

- Note:**
1. If the autopilot or flight director is in the heading/track or localizer mode, the “DIR TO” function engages the NAV mode.
 2. A lateral revision of the flight plan obtained with a DIR TO may also affect the vertical profile of the flight plan.

Three functions are available through the DIR TO key:

- DIR TO defines a direct leg from the present position to a specified waypoint.
NAV mode simultaneously engages upon DIR TO selection.
When the pilot uses DIR TO, the present position (PPOS) becomes the “FROM” waypoint and the active flight plan shows it as the T-P (turn point)
- The DIR TO/ABEAM function, computes the abeam waypoints along the direct leg. These waypoints are the projection on the direct leg of the initial F-PLN waypoints, located between the aircraft position and the specified waypoint.
NAV mode simultaneously engages upon DIR TO/ABEAM selection
- The DIR TO/INTCPT function allows the definition of a specified RADIAL INBOUND or OUTBOUND at an inserted waypoint. The current aircraft track is used to compute the INTCPT point with the specified radial.

If the DIR TO waypoint is part of the F-PLN, the FMS computes and proposes a default radial in NAV mode is simultaneously armed upon DIR TO/INTCPT selection.

Using the DIRECT TO function results in the creation of a DIR TO temporary flight plan. This flight plan only reflects the insertion of the direct leg in the active flight plan.

A DIR TO TMPY F-PLN can be deleted with [6L] prompt DIR TO ERASE or inserted [6R] prompt DIR TO INSERT.

With the DIR TO TMPY F-PLN:

- The aircraft continues to follow the active F-PLN until the DIR TO is inserted
- The DIR TO TMPY F-PLN is displayed in yellow on both MCDUs and NDs
- A DIR TO TMPY F-PLN cannot be created when a multi-revisions TMPY F-PLN is already in process.

Note: In the case a DIR TO/INTCPT is performed:

- When the angle between the current aircraft track and the intercept course exceeds 140 °, the transition is not displayed
- When the angle between the current aircraft track and the intercept course exceeds 160 °, the interception with the radial is not computed and the message NO NAV INTERCEPT is displayed.

Note: As soon as a designated waypoint is entered or selected, the DIRECT TO or DIRECT-TO-WITH ABEAM POINTS function is selected by default, and displayed (in yellow), depending on the Airline option on the AMI file.
The following examples assume that the activated AMI default option is the “DIRECT TO” function.

Ident.: DSC-22_20-10-30-13-F-00009520.0001001 / 01 OCT 12

PROCEDURE FOR DIR TO WAYPOINT

CASE 1. THE "TO" WAYPOINT IS IN THE FLIGHT PLAN

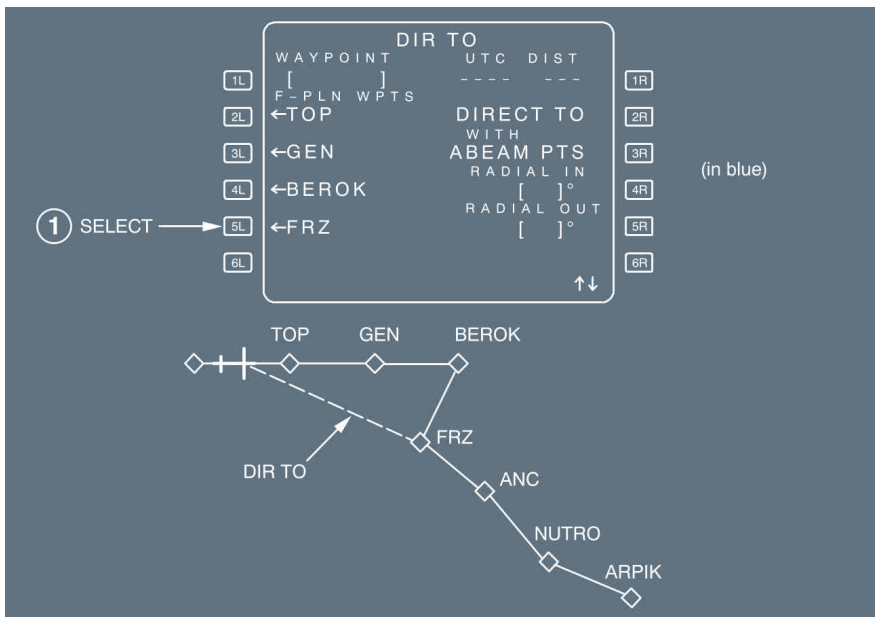
Example: DIR TO FRZ (with the AMI default DIRECT TO option activated)

PRESS the DIR key on the MCDU.

PRESS the line select key next to "FRZ".

CHECK that a temporary F-PLN is automatically displayed on both NDs.

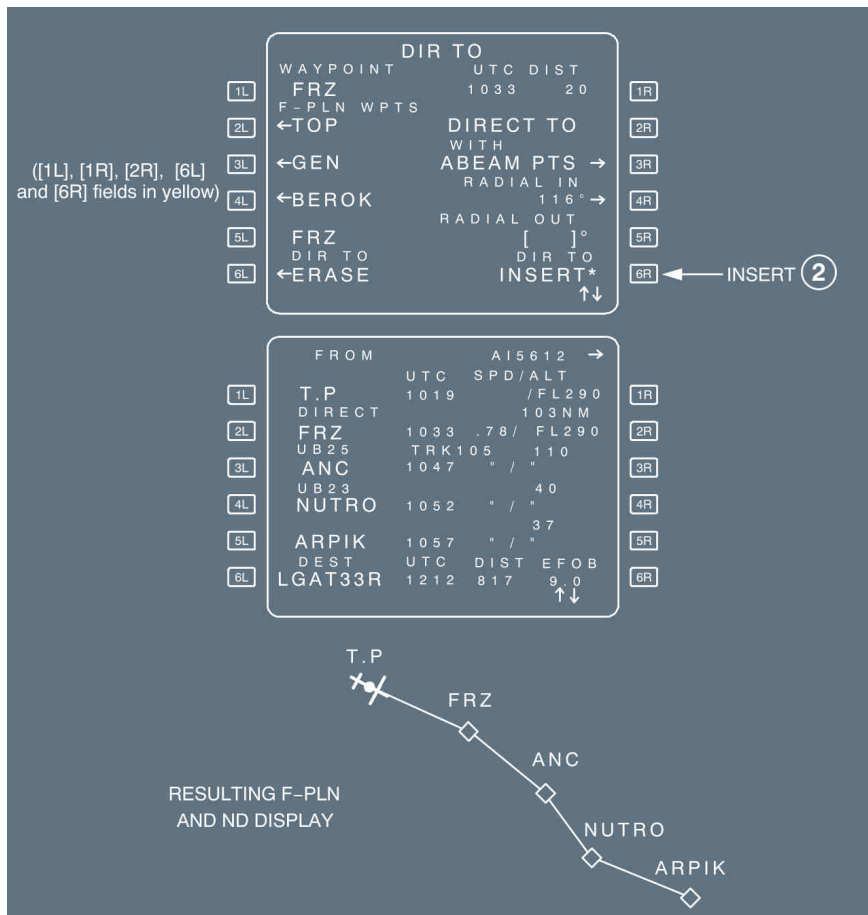
INSERT the DIR TO in the active F-PLN.



AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

SYSTEM DESCRIPTION - FLIGHT PLANNING



CASE 2. THE “TO” WAYPOINT DOES NOT BELONG TO THE FLIGHT PLAN

Example: Direct to ABC (ABC being an ident, LL or PBD, PB/PB or a PD), with the AMI default DIRECT TO option activated.

PRESS the DIR key.

WRITE the waypoint identifier (e.g. ABC) in the scratchpad.

PRESS [1 L] to enter “ABC” in the “WAYPOINT” field.

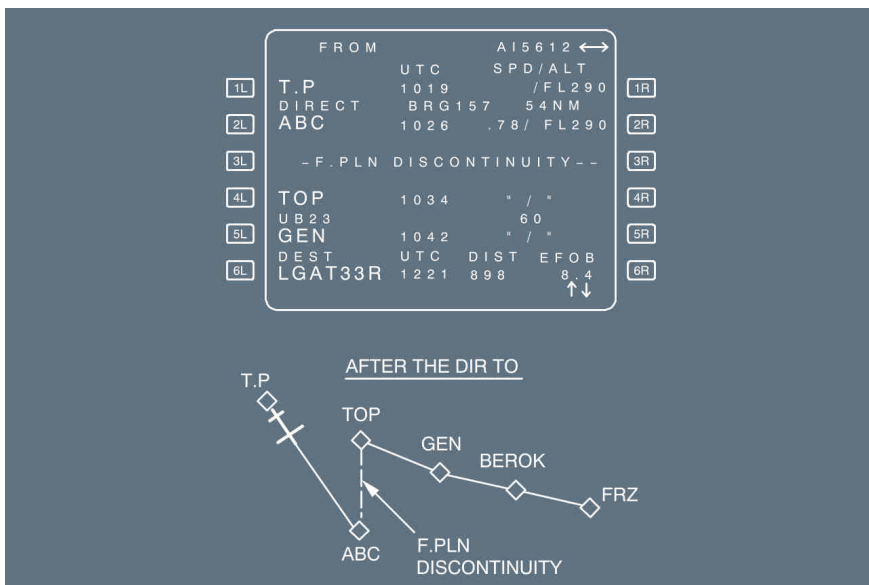
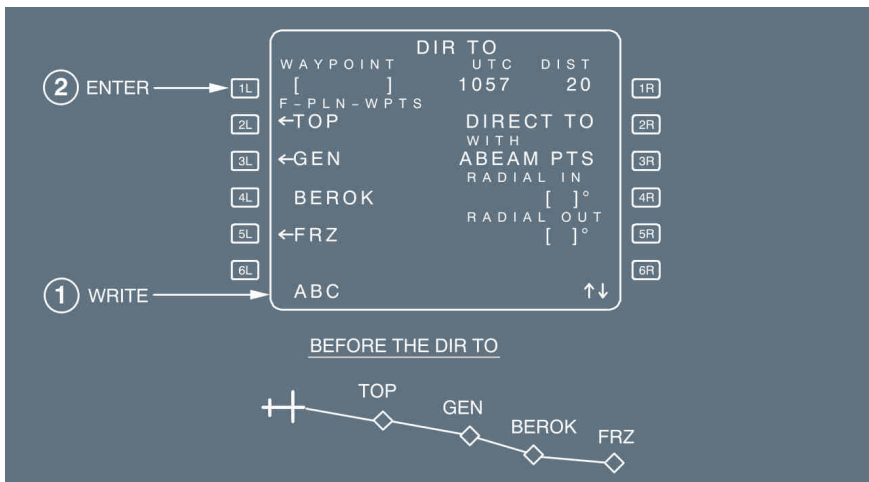
CHECK that a temporary F-PLN is automatically displayed on both NDs.

INSERT the DIR TO in the active F-PLN.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

SYSTEM DESCRIPTION - FLIGHT PLANNING



Clear the discontinuity and the waypoints that are not included in the new flight plan.

Ident.: DSC-22_20-10-30-13-F-00009521.0001001 / 05 JUN 18

PARTICULAR CASES FOR USE OF DIR TO

- If the pilot is flying a manual leg (part of a SID or STAR), the flight plan page displays "F-PLN DISCONTINUITY", preceded by "MANUAL" (see below).
 These legs are specific heading or track legs flown with no defined end waypoint.

1L	FROM	AI5625	1R
2L	UTC	SPD/ALT	2R
3L	AAA	1436	3R
4L	MANUAL	FL320	4R
-- F . P L N D I S C O N T I N U I T Y --			
1L	CCC	1459	1R
2L		----	2R
3L		----	3R
4L		----	4R

- When the pilot encounters a flight plan discontinuity, or if a major reset occurs, the flight plan page displays "PPOS – F-PLN DISCONTINUITY", and the pilot loses managed guidance in both the lateral and vertical planes.
 The autopilot or flight director reverts to the basic HDG V/S (or TRK FPA) modes. Predictions remain available and are based on the assumption that the aircraft will fly a direct leg from its present position to the next waypoint.

1L	FROM	AI5613	1R
2L	UTC	SPD/ALT	2R
3L	PPOS	1320	3R
4L	MANUAL	FL220	4R
-- F . P L N D I S C O N T I N U I T Y --			
1L	GEN	1341	1R
2L	UB25	.78/FL220	2R
3L	BEROK	.57	3R
4L		" / "	4R

- In both of these cases, the only way to get back to a standard flight plan is to perform a "DIR TO" to a designated waypoint.
- Following a DIR TO, the "MAP PARTLY DISPLAYED" message may appear on the NDs, if the new flight plan includes a very long leg. When this message comes up, enter an intermediate waypoint to shorten the leg.
- If another lateral or vertical revision is attempted, while a DIR TO is pending, the MCDU message "DIR TO IN PROCESS" is displayed.

Ident.: DSC-22_20-10-30-13-F-00009525.0002001 / 01 OCT 12

PROCEDURE FOR DIR TO/ABEAM

Example: DIR TO/ABEAM to BEROK (with the AMI default DIRECT TO option activated).

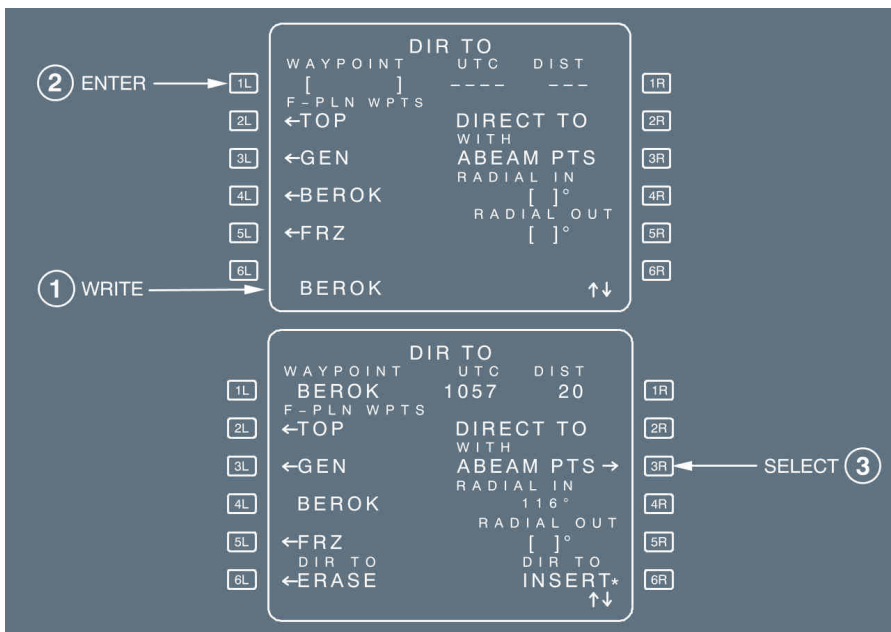
PRESS the DIR key on the MCDU.

WRITE the waypoint identifier in the scratchpad (Here: BEROK).

PRESS [1L] to enter the waypoint identifier in the WAYPOINT field.

SELECT the ABEAM PTS function, and CHECK that a TMPY F-PLN is displayed on both NDs.

INSERT the temporary F-PLN by pressing the [6R] key.



The diagram illustrates the MCDU interface for setting a DIR TO/ABEAM flight plan. It shows two states of the display, with numbered callouts indicating the sequence of actions.

Initial State (Top Display):

- Left Side (Waypoint Selection):**
 - 1L: WAYPOINT
 - 2L: F-PLN WPTS
 - 3L: ←TOP
 - 4L: ←GEN
 - 5L: ←BEROK
 - 6L: ←FRZ
- Right Side (Function Selection):**
 - 1R: []
 - 2R: []
 - 3R: []
 - 4R: []
 - 5R: []
 - 6R: []
- Center Display:**
 - DIR TO
 - UTC: ---
 - DIST: ---
 - DIRECT TO WITH ABEAM PTS
 - RADIAL IN: []°
 - RADIAL OUT: []°
 - BEROK

Action 1: WRITE (Callout 1) points to the 6L key.

Action 2: ENTER (Callout 2) points to the 1L key.

Final State (Bottom Display):

- Left Side:**
 - 1L: BEROK
 - 2L: ←TOP
 - 3L: ←GEN
 - 4L: BEROK
 - 5L: ←FRZ
 - 6L: DIR TO / ←ERASE
- Right Side:**
 - 1R: []
 - 2R: []
 - 3R: []
 - 4R: []
 - 5R: []
 - 6R: []
- Center Display:**
 - DIR TO
 - UTC: 1057
 - DIST: 20
 - DIRECT TO WITH ABEAM PTS →
 - RADIAL IN: 116°
 - RADIAL OUT: []°
 - DIR TO INSERT*

Action 3: SELECT (Callout 3) points to the 3R key.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT

SYSTEM DESCRIPTION - FLIGHT PLANNING

TMPLY F-PLN A

FROM TMPY

T.P 1025 6000

(ABEAM PTS)

BEROK 1057 " "

UB25 25

FRZ 1113 " "

UB25 31

ANC 1120 " "

DIR TO DIR TO

←ERASE INSERT* ↑↓

AF5612↔

UTC SPD/ALT

BRGO13° 56NM

1R

2R

3R

4R

5R

6R ← SELECT

ACTIVE F-PLN

FROM

T.P 1025 6000

ABTOP 1041 .78/ FL290

ABGEN 1048 " "

UB25 43

BEROK 1057 " "

UB25 25

FRZ 1113 " "

DEST UTC DIST EFOB

ARPT33R 1259 1200 8.4

↑↓

AF5612↔

UTC SPD/ALT

BRGO13° 27NM

TRK122° 56

1R

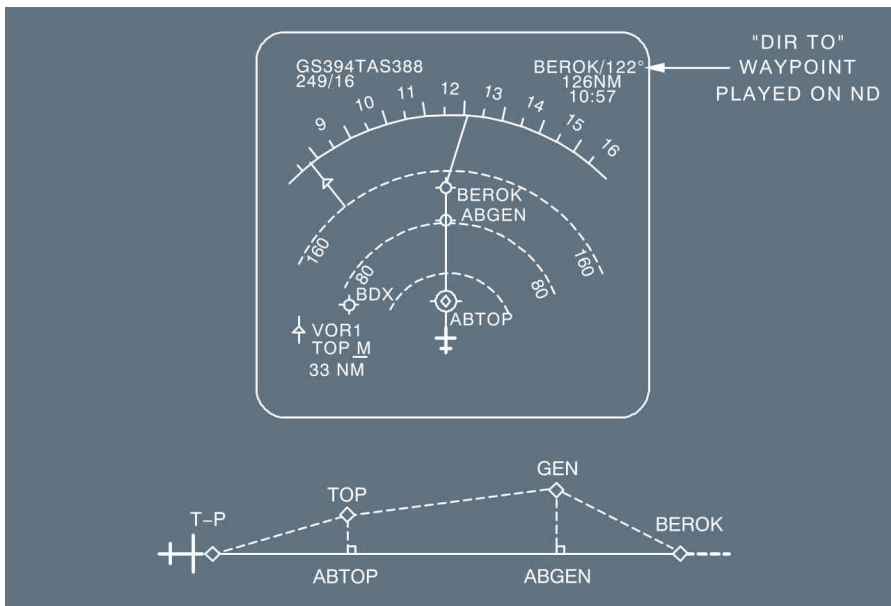
2R

3R

4R

5R

6R



- Note:**
1. The DIR TO waypoint is displayed on the top right corner of the ND.
 2. Abeam waypoints computed from latitude/longitude-type waypoints are renamed by the system as "AB XXXXX", where "XXXXX" is an abbreviation in, 5 characters, of the latitude and longitude of the initial waypoints.

Ident.: DSC-22_20-10-30-13-F-00009526.0002001 / 01 OCT 12

PROCEDURE FOR DIR TO/INTERCEPT

PRESS the DIR key.

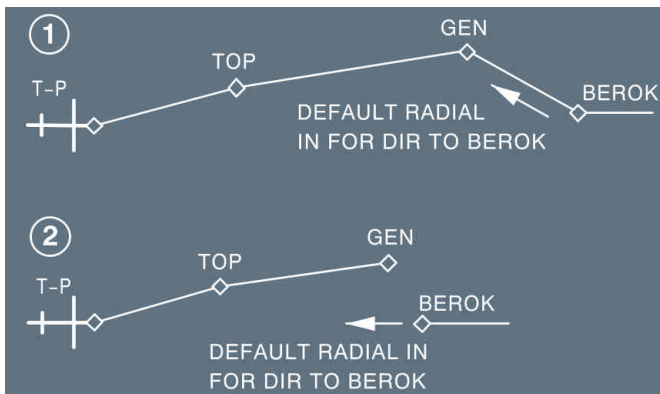
WRITE the waypoint identifier in the scratchpad.

PRESS [1L] to enter the waypoint in the WAYPOINT field.

In the [4R] and [5R] fields, the MCDU displays the functions radial inbound and radial outbound from the waypoint. If the DIR TO waypoint belongs to the flight plan and is not preceded by a discontinuity, the system displays the flight plan track to the DIR TO waypoint as the default inbound radial (figure 1). If the DIR TO waypoint belongs to the flight plan and is preceded by a discontinuity, the system displays the flight plan track from the DIR TO waypoint as the default inbound radial (figure 2).

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT

SYSTEM DESCRIPTION - FLIGHT PLANNING



WRITE the required in or out radial in the scratchpad, as necessary.

PRESS [4R] or [5R] to enter the radial in the required field.

The ND displays the temporary F-PLN. The pilot can still modify it:

CHECK and INSERT the DIR TO/INTERCEPT into the active F-PLN by using the [6R] key.

The display reverts to the F-PLN A page, the system arms the NAV mode, and engages the HDG mode. The FROM waypoint is the aircraft position at the time of the DIR TO/INTERCEPT selection. The MCDU indicates it as INBND or OUTBND.

Note: 1. If the waypoint does not belong to the flight plan, the system strings the DIR TO/INTERCEPT leg to this waypoint, and inserts a discontinuity following the waypoint.

2. A DIR TO/INTERCEPT cancels any active offset.

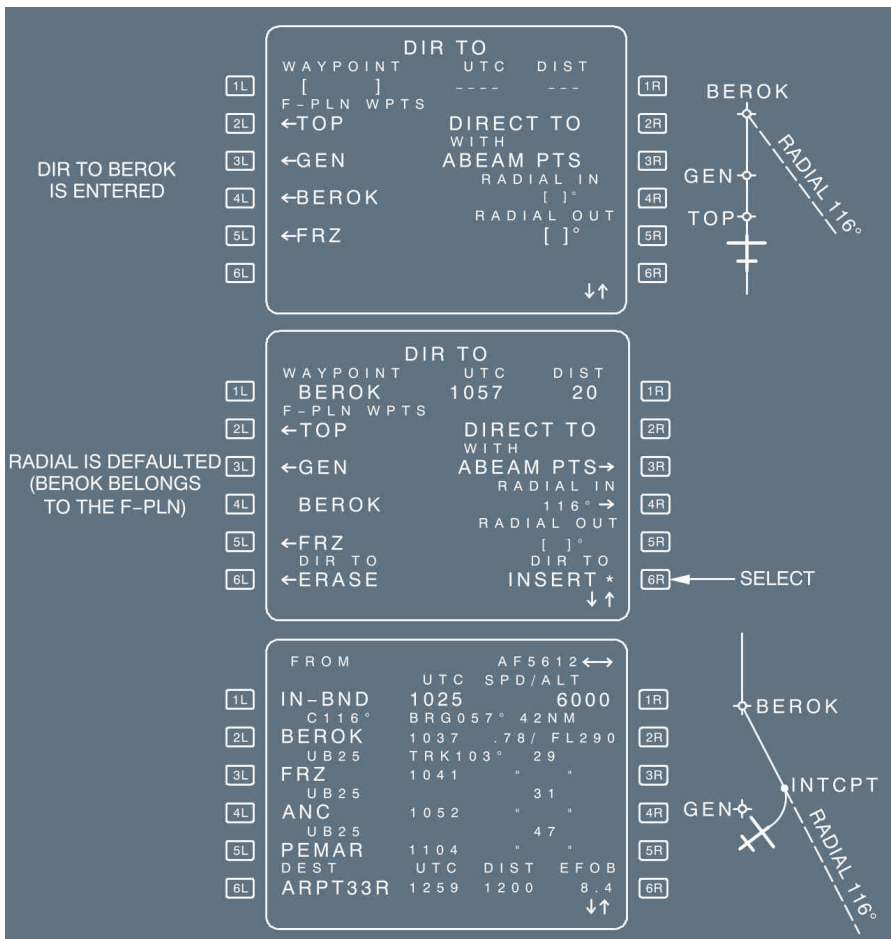
3. If the current AP/FD lateral mode is HDG or TRK, NAV becomes armed.

If the NAV mode was engaged, NAV becomes armed. FCU HDG or TRK must be used to guide the aircraft.

The ND displays an intercept point, if the intercept angle is less than 160 °. The system constantly updates it to reflect the current aircraft track and position with respect to the intercept radial. The NAV mode engages when reaching the intercept point.

Example: RADIAL INBND

DIR TO BEROK-RADIAL 116 ° INBOUND

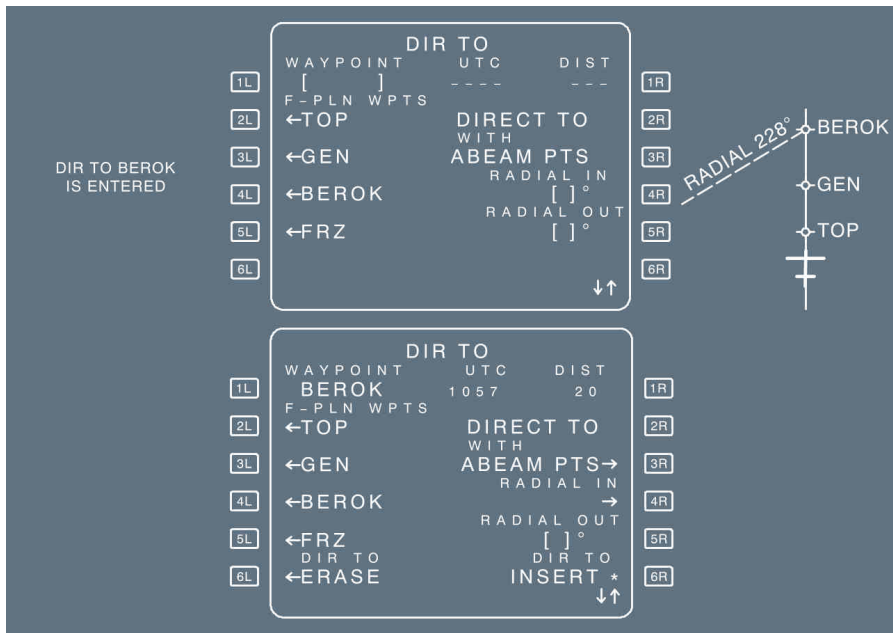


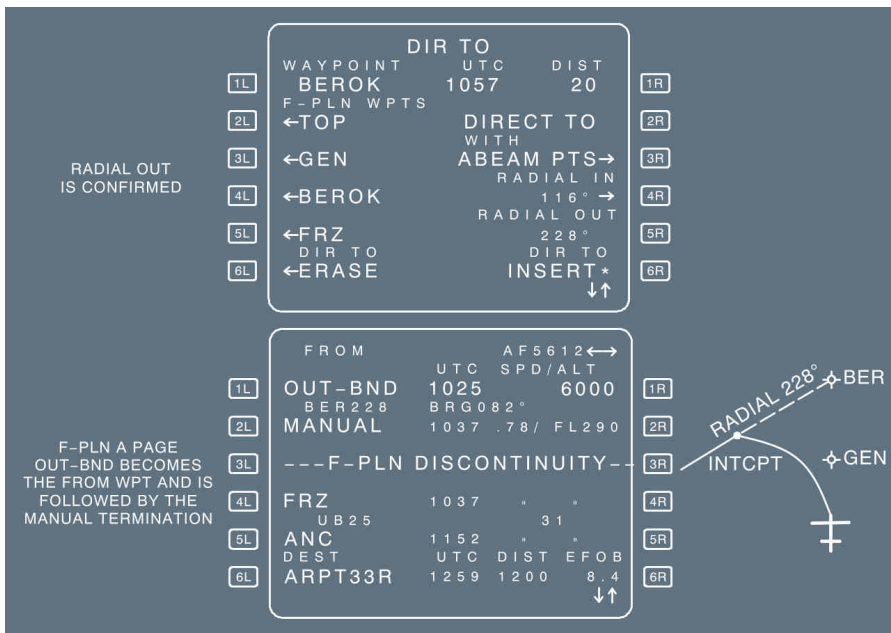
Example: RADIAL OUTBND
DIR TO BEROK-RADIAL 228 ° OUTBOUND

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

SYSTEM DESCRIPTION - FLIGHT PLANNING





OVFY (OVERFLY) KEY

Ident.: DSC-22_20-10-30-13-00000481.0001001 / 21 MAY 24

Applicable to: MSN 02926-02944, 04392, 07784-07792

The overfly key programs the Flight Management Guidance Computer to fly over a specific waypoint or navaid. Using the overfly function results in the creation of a temporary F-PLN. The function has no effect on the active F-PLN, until the temporary is inserted in the active F-PLN.

PRESS the "OVFY" key.

A "Δ" appears in the scratchpad.

INSERT it, by pressing the key adjacent to the waypoint to be overflown. [3L], in this example. INSERT the temporary into the active F-PLN.

ENTER →

1 PRESS THE OVFY KEY: →

FROM	UTC	IT5612 SPD/ALT
1L AGN	1013	FL220
2L LMG	1025	78 / FL290
3L UR10	TRK006	97
4L AMB	1038	" / "
5L UR10		48
6L CDN	1043	" / "
	DIRECT	60
EUX	1051	" / "
DEST	UTC	DIST EFOB
LFPG10	1100	352 8.4
Δ		↑↓

1R

2R

3R

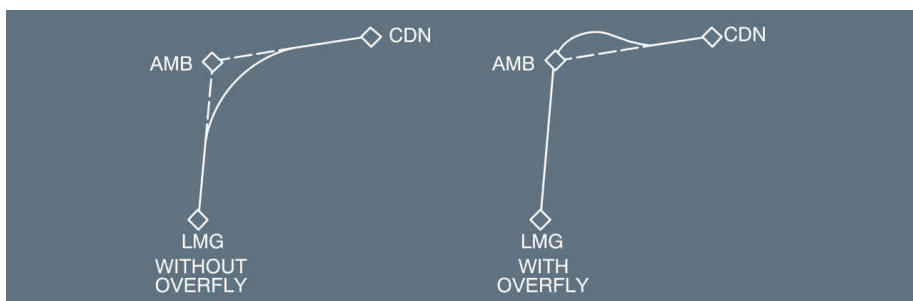
4R

5R

6R

FROM	UTC	IT5612 SPD/ALT
1L AGN	1013	FL220
2L LMG	1025	78 / FL290
3L UR10	TRK006	97
4L AMB Δ	1038	" / "
5L UR10		48
6L CDN	1043	" / "
	DIRECT	60
EUX	1051	" / "
DEST	UTC	DIST EFOB
LFPG10	1100	352 8.4
		↑↓

To cancel the overfly function, associated to a waypoint, press the OVFY Δ key again on the MCDU.



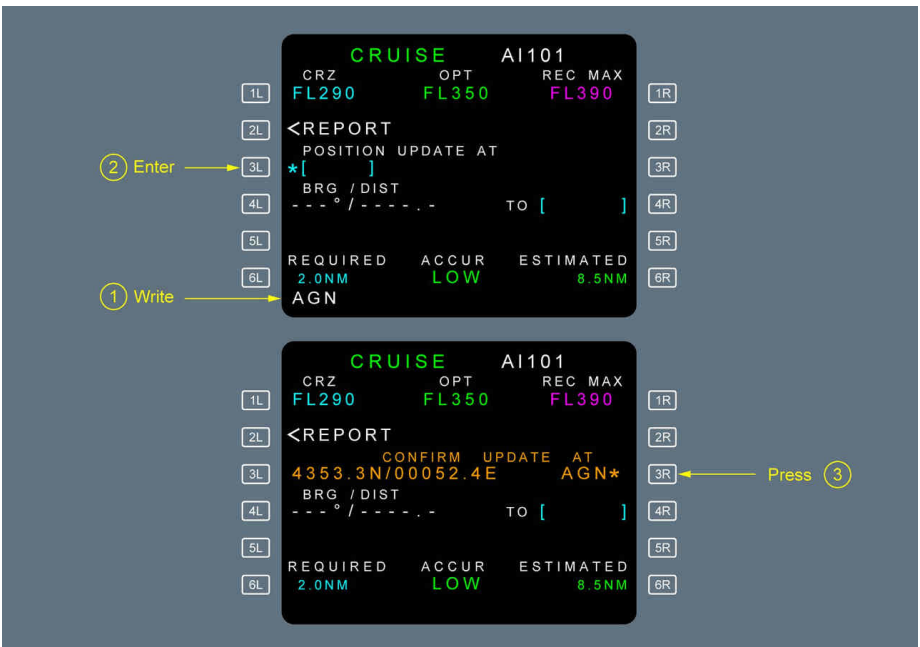
The overfly function allows you to fly over a specific waypoint, and return the aircraft to the great circle track.

POSITION UPDATE AT

Ident.: DSC-22_20-10-30-13-00000482,0003001 / 04 JUN 19
 Applicable to: MSN 02926-02944, 07784-07792

To manually change the position computed by the FMGC (FM position and bias), the pilot uses “POSITION UPDATE AT” on the progress page.

Use this function with extreme caution : It is apt to be inaccurate, because it relies on the pilot's estimation of when a designated position has been reached.



WRITE the IDENT at which the position update is intended. The identifier format are

- NAVAID
- Waypoint, Airport or runway identifier
- LAT / LONG coordinates
- PLACE BRG / PLACE BRG
- PLACE BRG DIST

Press [3L] to ENTER the IDENT in the “POSITION UPDATE AT” field. The coordinates of the point, along with its identifier (or “ENTRY”, if the identifier is not in the database), appear in that field.

PRESS [3R] to activate the update, when you estimate that you are at the position.

Note: The system reinitializes the Estimated Position Error computation when a position update is performed. This may lead to the appearance of a “NAV ACCUR DOWNGRAD” or “NAV ACCUR UPGRAD” message.

If the “POSITION UPDATE AT” does not properly take effect, it corrupts the FM position.

- In an area with good radio NAVAID coverage :
 - If the update error is small, subsequent radio position updating will correct the FM position.
 - If the update error is large, the system will reject any radio updating because its internal “reasonableness test” will reject the various NAVAIDs. Thus, the FM position will only be the MIX IRS position corrected by the position bias, determined at the time of the update, and the error will be maintained.
- In an area without proper NAVAID coverage, radio position updating will not be available and the FM position, if incorrect, will remain incorrect until a new manual update is performed.
- Therefore, the pilot should only use “POSITION UPDATE AT” in case of a major position problem, such as :
 - On the ground, no flight plan appears on the navigation display and ARC/ROSE NAV mode is selected .
 - A “CHECK IRS/FM POSITION” message appears on the MCDU.
 - A “FM/IR POSITION DISAGREE” message appears on the ECAM.

When the GPS PRIMARY  is operative, the POSITION UPDATE AT is inhibited.

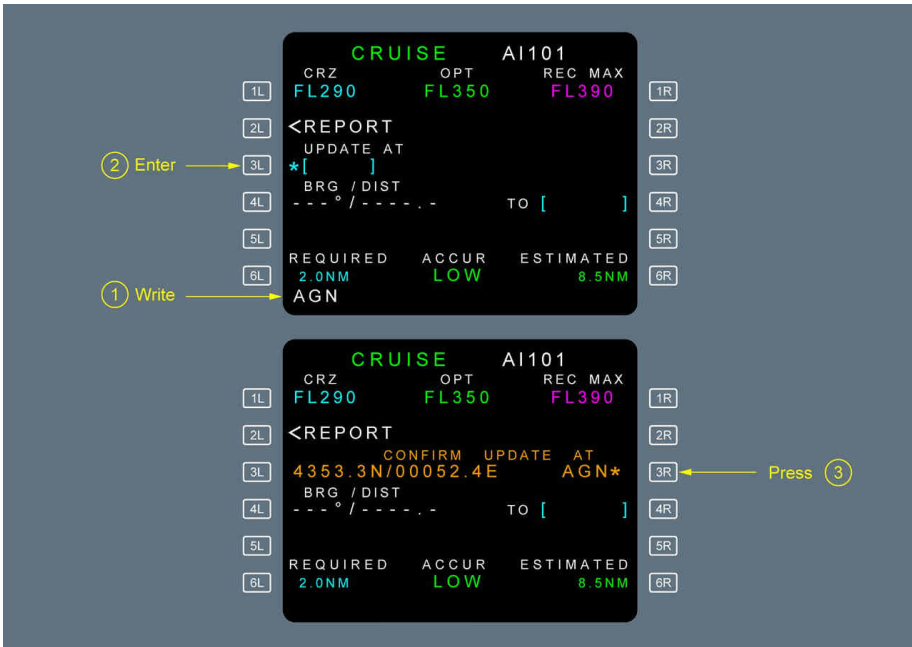
UPDATE AT

Ident.: DSC-22_20-10-30-13-00000482.0001001 / 04 JUN 19

Applicable to: MSN 04392

To manually change the position computed by the FMGC (FM position and bias), the pilot uses “UPDATE AT” on the progress page.

Use this function with extreme caution : It is apt to be inaccurate, because it relies on the pilot's estimation of when a designated position has been reached.



CRUISE AI101

CRZ OPT REC MAX
 FL290 FL350 FL390

1L 2L 3L 4L 5L 6L 1R 2R 3R 4R 5R 6R

<REPORT
 UPDATE AT
 * []
 BRG / DIST
 - - ° / - - - - - TO []

REQUIRED ACCUR ESTIMATED
 2.0NM LOW 8.5NM
 AGN

② Enter → ① Write →

CRUISE AI101

CRZ OPT REC MAX
 FL290 FL350 FL390

1L 2L 3L 4L 5L 6L 1R 2R 3R 4R 5R 6R

<REPORT
 CONFIRM UPDATE AT
 4353.3N/00052.4E AGN*
 BRG / DIST
 - - ° / - - - - - TO []

REQUIRED ACCUR ESTIMATED
 2.0NM LOW 8.5NM

Press ③ →

WRITE the IDENT for the NAVAID (or waypoint, or airport), or the coordinates, or the PBD PB/PB at which the update is intended.

Press [3L] to ENTER the IDENT in the “UPDATE AT” field. The coordinates of the point, along with its identifier (or “ENTRY”, if the identifier is not in the database), appear in that field.

PRESS [3R] to activate the update, when you estimate that you are at the position.

Note: The system reinitializes the Estimated Position Error computation when a position update is performed. This may lead to the appearance of a “NAV ACCUR DOWNGRAD” or “NAV ACCUR UPGRAD” message.

If the “UPDATE AT” does not properly take effect, it corrupts the FM position.

- In an area with good radio NAVAID coverage :

- If the update error is small, subsequent radio position updating will correct the FM position.
- If the update error is large, the system will reject any radio updating because its internal “reasonableness test” will reject the various NAVAIDs. Thus, the FM position will only be the MIX IRS position corrected by the position bias, determined at the time of the update, and the error will be maintained.

- In an area without proper NAVAID coverage, radio position updating will not be available and the FM position, if incorrect, will remain incorrect until a new manual update is performed.

- Therefore, the pilot should only use “UPDATE AT” in case of a major position problem, such as :

- On the ground, no flight plan appears on the navigation display and ARC/ROSE NAV mode is selected .
- A “CHECK IRS/FM POSITION” message appears on the MCDU.
- A “FM/IR POSITION DISAGREE” message appears on the ECAM.

When GPS PRIMARY  is operative, the FM position will always converge towards the GPS position at a rate depending on the aircraft altitude. Therefore, when GPS PRIMARY is operative, an inaccurate “update at” will have a temporary effect on the FM position.

CHANGING THE DEPARTURE/ARRIVAL

Ident.: DSC-22_20-10-30-13-00000483.0003001 / 23 JUN 15

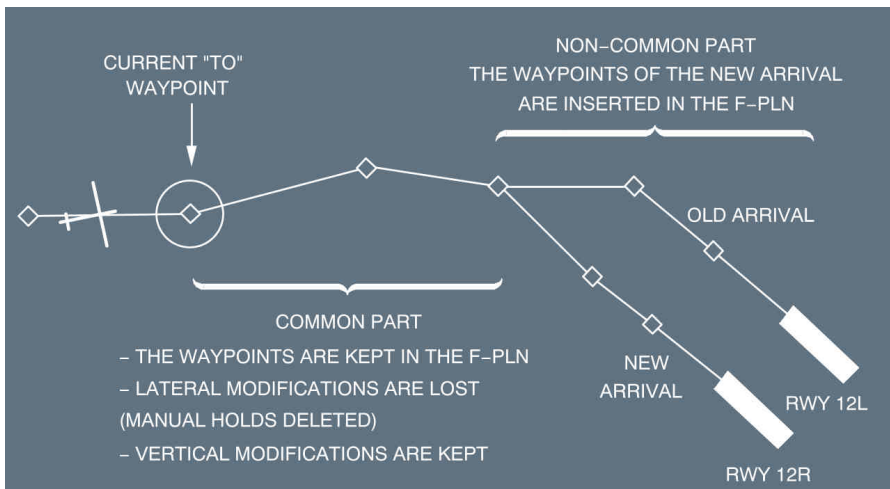
Applicable to: MSN 02926-02944, 04392, 07784-07792

CHANGING THE ARRIVAL

In approach, the flight crew may be assigned a new arrival procedure or landing runway, while already flying the initially selected arrival. Usually, at that point, the aircraft will still be in a part of the arrival that is common to the old and new procedure. When the new arrival or runway is selected, the FMS strings the remaining part of the new procedure, after the current “TO” waypoint, (see picture below).

All the lateral pilot modifications (including Holds) made to the previous arrival procedure are erased. This includes modifications made to the “TO” waypoint. The vertical pilot modifications (such as speed/altitude constraints) are kept on the waypoints in the common part (including the “TO” waypoint).

If a hold had been inserted in the old arrival procedure, it is deleted and the MCDU displays the “MANUAL HOLD DELETED” message in the scratchpad.



The crew should check and revise the TMPY F-PLN , as necessary, prior to inserting the TMPY F-PLN in the active F-PLN.

IF THE CURRENT “TO” WAYPOINT IS NOT COMMON TO THE OLD AND NEW PROCEDURE

Then, the FMS stacks the current active leg, and the entire new arrival procedure as follows:

- The active “TO” waypoint is kept,
- A “F-PLN DISCONTINUITY” is inserted,
- The entire new procedure is strung after the discontinuity.

The crew should check and revise the TMPY F-PLN, as necessary, prior to inserting the TMPY F-PLN in the active F-PLN.

***Note:** Depending on the actual progress of the flight, the flight crew may choose the NO STAR and/or NO VIA options on the ARRIVAL page, in order to string only the final part of the approach in the F-PLN.*

CHANGING THE DEPARTURE

If the flight crew changes the departure procedure, the FMS replaces the entire departure procedure by the new selected one .

However, if a lateral modification had been performed within the initially selected departure procedure, the waypoints following the modified waypoint are considered as “en-route” waypoints by the FMS. When a new runway or a new departure is selected, these “en-route” waypoints are kept in the F-PLN, and inserted after the new selected departure.

LATITUDE/LONGITUDE CROSSING WAYPOINT INSERTION

This function enables the crew to insert one or several points along the flight plan beyond the revised waypoint, at fixed latitude or longitude intervals (INCR), from a specified latitude or longitude.

These waypoints can be inserted in the F-PLN, and visualized on the ND. They are part of cruise only. They are not stored in the pilot-defined elements; the system deletes them when sequenced.

LAT REV AT A WPT

1 WRITE →

LAT REV FROM LMG
45°49.0N/001°01.6E

LL XING/INCR/NO
[]°/[]°/[]

NEXT WPT
[]

NEW DEST
[]

AIRWAYS>

<RETURN
N46/1/3

1R

2R ← ENTER 2

3R

4R

5R

6R

1L

2L

3L

4L

5L

6L

FROM	UTC	FBS1	SPD/ALT
T-P	1038	.70/	FL350
	BRG004°	7	NM
LMG	1211	250/	2000
	TRK004°	11	
N46	1213	" /	"
		60	"
N47	1227	" /	"
		61	"
N48	1241	" /	"
DEST	UTC	DIST	EFOB
LFP007	1300	206	12.7

↑↓

1R

2R

3R

4R

5R

6R



WRITE the latitude (NXX or XXN, SXX or XXS) or longitude (EXX, XXE, WXX, XXW), the required increment in degrees between the successive waypoints, and the number of required waypoints.

(Example: If the crew wants to obtain 3 points, at every degree of latitude from N46: Enter N46/1/3).

PRESS [2R] to insert it into the LL XING/INCR/NO field.

PRESS [6R] to insert the new waypoints in the flight plan without discontinuity.

The system does not store these waypoints in the database.

Note: *If one of the obtained waypoints corresponds to an already existing waypoint, it is not inserted.*

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

SYSTEM DESCRIPTION - FLIGHT PLANNING

Intentionally left blank

Vertical Functions - General

GENERAL

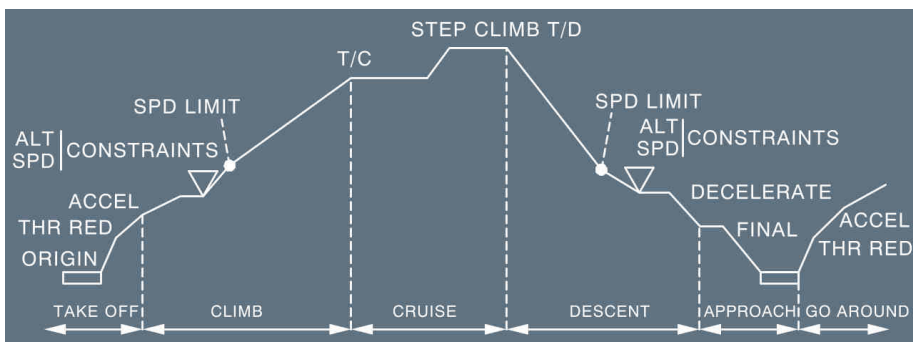
Ident.: DSC-22_20-10-30-20-00010939.0001001 / 01 OCT 12

Applicable to: ALL

The vertical flight plan is divided into the following flight phases:

Preflight - Takeoff - Climb - Cruise - Descent - Approach - Go-Around - Done.

All but "Preflight" and "Done" phases are associated with speed and altitude profiles.



Each phase has an assigned profile of target speeds. For each phase the FMGS computes an optimum (ECON) speed as a function of the strategic parameters (CI, CRZ FL, ZFW, ZFWCG, block FUEL) and performance criteria.

ECON speed is the basis of the managed speed profile.

The ECON speed can be modified by:

- Presetting a speed or Mach number on the MCDU (PERF page) for the next phase
- Selecting on the FCU a speed or a Mach number for the active phase
- Inserting speed constraints or speed limits on the MCDU vertical revision (VERT REV) page.

The vertical flight plan includes vertical constraints (altitude, speed, time) that may be stored in the data base or entered manually by the flight crew through vertical revision pages.

The flight crew may also define step climbs or step descents for cruise purposes. If the flight crew plans to climb to a higher flight level or descend to a lower level, they can use a vertical revision at any waypoint to insert the new level.

When all the vertical data has been defined, the FMGC computes the vertical profile and the managed speed/Mach profile from takeoff to landing.

AIRCRAFT SYSTEMS**AUTO FLIGHT - FLIGHT MANAGEMENT**

SYSTEM DESCRIPTION - FLIGHT PLANNING

VERTICAL FLIGHT PLANNING

Ident.: DSC-22_20-10-30-20-00011065.0002001 / 17 AUG 10

Applicable to: ALL**DATA ENTRY**

The vertical flight plan provides the FMGS with all the data required to calculate performance and predictions. This data is either entered by the flight crew or calculated by the FMS.

There are three categories of data:

- Strategic data, that applies to the overall flight profile:
 - Cost Index (CI)
 - Cruise Flight Level (CRZ FL) and STEP ALTS if any
 - Zero-Fuel Weight (ZFW)
 - Zero-Fuel Weight Center of Gravity (ZFWCG)
 - Block Fuel.
- Weather data:
 - Winds (for climb, cruise, descent, approach)
 - Sea level atmospheric pressure (QNH) at destination
 - Surface temperature (TEMP) at destination
 - Temperature in cruise phase
 - The Tropopause altitude (TROPO).
- Tactical data for the flight phases:
 - Phase switching conditions:
 - Setting of the thrust levers to TOGA or FLEX positions
 - Reaching acceleration altitude (ACCEL ALT)
 - Entering cruise (T/C)
 - Initiation of descent (T/D)
 - Passing a deceleration pseudo waypoint (DECEL PSEUDO WPT)
 - Touchdown.
 - Speed profile:
 - V2
 - Economy climb speed or Mach (ECON CLB SPD/MACH)
 - Preselected speed or Mach (SPD/MACH PRESELECTION)
 - Economy cruise Mach (ECON CRZ MACH)
 - Constant Mach
 - Economy descent Mach or speed (ECON DES MACH/SPD)
 - Approach speed (VAPP).
 - Vertical limitations:
 - Speed limits (SPD LIMIT)
 - Speed and altitude constraints (SPD AND ALT CSTR)
 - Time constraints or Required Time of Arrival (RTA).

In addition to the data entered by the flight crew, the FMS uses some real flight data parameters (CRZ SAT, actual wind) to improve the accuracy of the computed predictions.



A318/A319/A320/A321
FLIGHT CREW
OPERATING MANUAL

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

SYSTEM DESCRIPTION - FLIGHT PLANNING

INTRODUCTION

Ident.: DSC-22_20-10-30-20-00029119.0001001 / 12 NOV 25

Applicable to: ALL

The vertical flight plan is divided into flight phases. For each phase, the FMS computes the optimum speed or Mach Profile. These flight phases are:

Preflight - Takeoff - Climb - Cruise - Descent - Approach - Go-Around - Done.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT SYSTEM DESCRIPTION - FLIGHT PLANNING
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FLIGHT PHASES

Applicable to: MSN 02155-03060, 05152-07792

FLIGHT PHASES	OPTIMUM SPEED PROFILE	SWITCHING CONDITIONS TO NEXT PHASE
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²Ident.: DSC-22_20-10-30-20-A-00029120.0001001 / 12 NOV 25

PREFLIGHT ^(a)	/	The flight phases changes from Preflight to Takeoff, when: - SRS TO mode is engaged, and - N1 is more than 85 % (EPR is more than or equal to 1.25) or Ground Speed is more than 90 kt.
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³Ident.: DSC-22_20-10-30-20-A-00029121.0001001 / 12 NOV 25

TAKEOFF	V2 (V2+10)	The flight phase changes from Takeoff to Climb, when: - The aircraft is at acceleration altitude, or - One of the following mode engages: V/S, FPA, ALT*, ALT, ALT CST*, ALT CST, CLB, OP CLB, DES or OP DES.
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⁴Ident.: DSC-22_20-10-30-20-A-00029122.0001001 / 12 NOV 25

CLIMB	ECON CLB SPD / MACH	The flight phase changes from Climb to Cruise, when the aircraft reaches the cruise flight level.
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⁵Ident.: DSC-22_20-10-30-20-A-00029123.0001001 / 12 NOV 25

CRUISE	ECON CRZ MACH	The flight phase changes from Cruise to Descent, when the flight crew orders a descent below the cruise flight level while one of the following occurs: - The flight plan has no step descent ahead of the aircraft, and the distance to the destination airport (along the flight plan) is less than 200 NM, or - All engines are operative and the selected altitude target is below the highest of the following: • FL 50 • The highest descent altitude constraint.
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⁶Ident.: DSC-22_20-10-30-20-A-00029124.0002001 / 12 NOV 25

Continued on the following page

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

SYSTEM DESCRIPTION - FLIGHT PLANNING

Continued from the previous page

FLIGHT PHASES	OPTIMUM SPEED PROFILE	SWITCHING CONDITIONS TO NEXT PHASE
DESCENT	ECON DES MACH / SPD	The flight phase changes from Descent to Approach, when: - The aircraft overflies the DECEL pseudo waypoint with NAV, LOC*, LOC, F-LOC* , or F-LOC  mode engaged, and the altitude is less than 9 500 ft AGL, or - The flight crew manually activates the approach phases.

7 Ident.: DSC-22_20-10-30-20-A-00029125.0001001 / 12 NOV 25

APPROACH	VAPP (GS Mini)	The flight phase changes from Approach to Go-Around, when the SRS GA mode engages. The flight phase changes from Approach to Done 30 s after landing. The flight phase changes from Approach to Climb, when the flight crew defines a new cruise flight level, and the aircraft altitude is below the cruise flight level.
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8 Ident.: DSC-22_20-10-30-20-A-00029126.0001001 / 12 NOV 25

GO-AROUND	VAPP or current SPD whichever is higher. Green Dot at ACC ALT	The flight phase changes from Go-Around to Approach, when the flight crew manually activates the approach phase. The flight phase changes from Go-Around to Climb, when the aircraft is above the acceleration altitude, and the flight crew modifies the destination airport by: - The selection of ALTN, or - The insertion of NEW DEST, or - The insertion of a SEC F-PLN with a destination airport different from the destination airport of the active F-PLN.
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9 Ident.: DSC-22_20-10-30-20-A-00029127.0001001 / 12 NOV 25

DONE ^(b)	/	The flight phase change from Done to Preflight, when the INIT or PERF key is pressed.
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(a) *In the Preflight phase, the flight crew inserts the flight plan, and all other data that is necessary for the flight.*

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT SYSTEM DESCRIPTION - FLIGHT PLANNING
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- (b) *In the Done phase, the FMS erases the data entered for the flight. If the Descent or the Approach phase is inadvertently activated (for example by manual activation of the Approach phase), the flight crew may reselect a CRZ FL on the PROG page to reactivate the Cruise phase.*

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

SYSTEM DESCRIPTION - FLIGHT PLANNING

FLIGHT PHASES

Applicable to: MSN 04392

FLIGHT PHASES	OPTIMUM SPEED PROFILE	SWITCHING CONDITIONS TO NEXT PHASE
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10 Ident.: DSC-22_20-10-30-20-A-00029120.0001001 / 12 NOV 25

PREFLIGHT ^(a)	/	The flight phases changes from Preflight to Takeoff, when: - SRS TO mode is engaged, and - N1 is more than 85 % (EPR is more than or equal to 1.25) or Ground Speed is more than 90 kt.
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11 Ident.: DSC-22_20-10-30-20-A-00029121.0001001 / 12 NOV 25

TAKEOFF	V2 (V2+10)	The flight phase changes from Takeoff to Climb, when: - The aircraft is at acceleration altitude, or - One of the following mode engages: V/S, FPA, ALT*, ALT, ALT CST*, ALT CST, CLB, OP CLB, DES or OP DES.
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12 Ident.: DSC-22_20-10-30-20-A-00029122.0001001 / 12 NOV 25

CLIMB	ECON CLB SPD / MACH	The flight phase changes from Climb to Cruise, when the aircraft reaches the cruise flight level.
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13 Ident.: DSC-22_20-10-30-20-A-00029123.0001001 / 12 NOV 25

CRUISE	ECON CRZ MACH	The flight phase changes from Cruise to Descent, when the flight crew orders a descent below the cruise flight level while one of the following occurs: - The flight plan has no step descent ahead of the aircraft, and the distance to the destination airport (along the flight plan) is less than 200 NM, or - All engines are operative and the selected altitude target is below the highest of the following: • FL 50 • The highest descent altitude constraint.
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14 Ident.: DSC-22_20-10-30-20-A-00029124.0001001 / 12 NOV 25

Continued on the following page

Continued from the previous page

FLIGHT PHASES	OPTIMUM SPEED PROFILE	SWITCHING CONDITIONS TO NEXT PHASE
DESCENT	ECON DES MACH / SPD	The flight phase changes from Descent to Approach, when: - The aircraft overflies the DECEL pseudo waypoint with NAV, LOC*, LOC, F-LOC* , or F-LOC  mode engaged, and the altitude is less than 7 200 ft AGL, or - The flight crew manually activates the approach phases.

15 Ident.: DSC-22_20-10-30-20-A-00029125.0001001 / 12 NOV 25

APPROACH	VAPP (GS Mini)	The flight phase changes from Approach to Go-Around, when the SRS GA mode engages. The flight phase changes from Approach to Done 30 s after landing. The flight phase changes from Approach to Climb, when the flight crew defines a new cruise flight level, and the aircraft altitude is below the cruise flight level.
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16 Ident.: DSC-22_20-10-30-20-A-00029126.0001001 / 12 NOV 25

GO-AROUND	VAPP or current SPD whichever is higher. Green Dot at ACC ALT	The flight phase changes from Go-Around to Approach, when the flight crew manually activates the approach phase. The flight phase changes from Go-Around to Climb, when the aircraft is above the acceleration altitude, and the flight crew modifies the destination airport by: - The selection of ALTN, or - The insertion of NEW DEST, or - The insertion of a SEC F-PLN with a destination airport different from the destination airport of the active F-PLN.
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17 Ident.: DSC-22_20-10-30-20-A-00029127.0001001 / 12 NOV 25

DONE ^(a)	/	The flight phase change from Done to Preflight, when the INIT or PERF key is pressed.
---------------------	---	---

(a) In the Preflight phase, the flight crew inserts the flight plan, and all other data that is necessary for the flight.

- A step climb or a step descent
- New wind data.

The vertical revision page is accessed by pressing a right hand select key of the flight plan page.

VERT REV AT D136E
E F O B = 14.5 E X T R A = 0.8

1L		1R
2L	C L B S P D L I M 2 1 0 / 7 0 0 0	2R
3L	S P D C S T R A L T C S T R [] 5000	3R
4L	<CONSTANT MACH A L T E R R O R - 5 0 0	4R
5L	<WIND DATA S T E P A L T S >	5R
6L	<RETURN	6R

VERT REV AT A CLIMB WPT

VERTICAL CONSTRAINTS (SPEED, ALTITUDE, TIME)

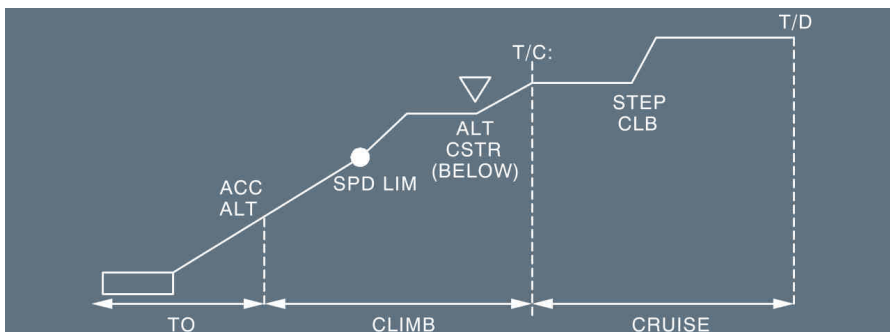
Ident.: DSC-22_20-10-30-20-00012689.0005001 / 18 FEB 15

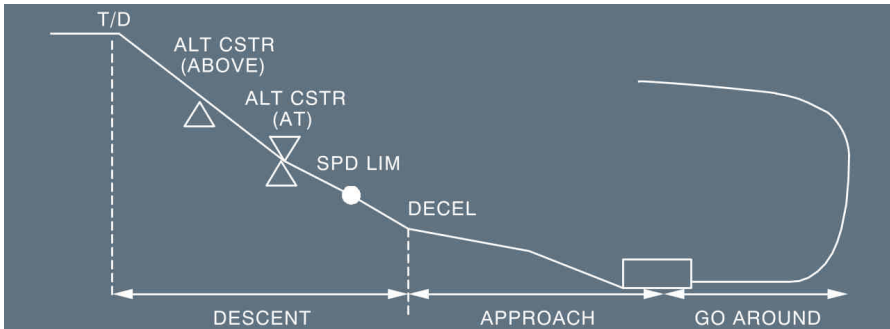
Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

The flight crew enters speed, altitude and time constraint, either to comply with ATC requests and specified procedures, or at the discretion of the flight crew, in response to operational variables.

SPEED LIMIT

A speed limit is associated with altitude as a maximum speed below a specified altitude (only one in climb and one in descent).





ALTITUDE CONSTRAINT

Altitude constraints may be attached to specific waypoints in the climb, descent, or approach phases.

To meet the altitude constraint, the aircraft must fly over the waypoint at an altitude equal, above or below the altitude constraint as specified by the flight crew or the database.

Note: The database may contain an altitude constraint window (two altitudes between which the aircraft must fly passing over a given waypoint), but the flight crew cannot enter such a constraint manually.

An altitude constraint is considered as missed if the system predicts more than 250 ft of difference between the constraint value and the predicted aircraft altitude.

Altitude constraints are observed in CLB or DES or APP NAV-FINAL modes.

The FMS automatically deletes from the F-PLN:

- The altitude constraints ("AT", "AT OR ABOVE", or "AT OR BELOW") with values greater than the CRZ FL
- The altitude constraint windows with the upper constraint greater than the CRZ FL.

The MCDU and the ND no longer display the deleted altitude constraints. These altitude constraints are no longer used for the computation of the FMS climb and descent profile. In that case, the scratchpad of the MCDU displays the "CSTR DEL ABOVE CRZ FL" message. The FMS does not delete the altitude constraints at the CRZ FL. The FMS computes the T/D, in order to respect these altitude constraints. However these altitude constraints are not used for guidance. If the flight crew initiates the descent before reaching the T/D, the aircraft descends below the altitude constraints, and the altitude constraints are missed (amber on the MCDU and on the ND).

SPEED CONSTRAINT

Speed constraints may be attached to specific waypoints in the climb, descent or approach phases. To meet the speed constraint, the aircraft must fly over the waypoint with a speed equal or less than the speed constraint.

A speed constraint is considered as missed if the system predicts an aircraft speed 10 kt greater than the speed constraint.

Speed constraints are observed when NAV mode is engaged and speed target is managed. Otherwise speed constraints are disregarded.

TIME CONSTRAINT

Time constraint may be attached to any waypoint except the "from" waypoint.

Note: No constraint can be associated with go-around waypoints.

VERTICAL CONSTRAINTS (SPEED, ALTITUDE, TIME)

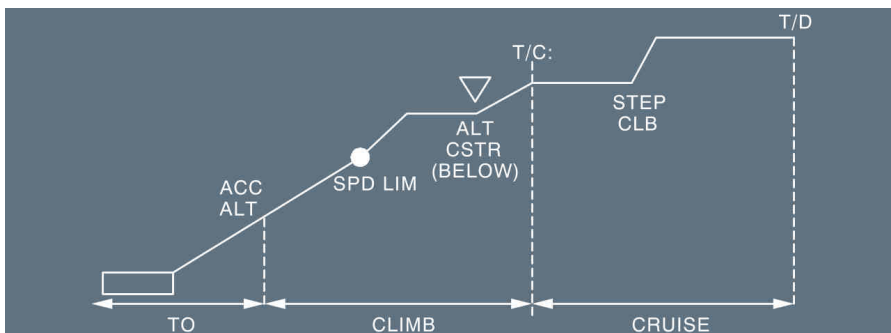
Ident.: DSC-22_20-10-30-20-00012689.0004001 / 18 FEB 15

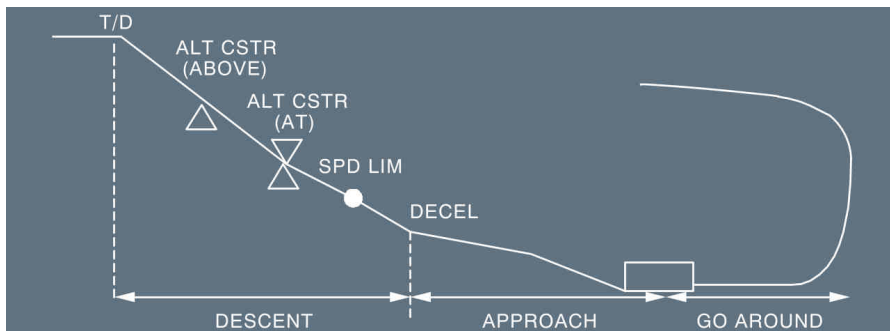
Applicable to: MSN 02926-02944, 04392, 07784-07792

The flight crew enters speed, altitude and time constraint, either to comply with ATC requests and specified procedures, or at the discretion of the flight crew, in response to operational variables.

SPEED LIMIT

A speed limit is associated with altitude as a maximum speed below a specified altitude (only one in climb and one in descent).





ALTITUDE CONSTRAINT

Altitude constraints may be attached to specific waypoints in the climb, descent, or approach phases.

To meet the altitude constraint, the aircraft must fly over the waypoint at an altitude equal, above or below the altitude constraint as specified by the flight crew or the database.

Note: The database may contain an altitude constraint window (two altitudes between which the aircraft must fly passing over a given waypoint), but the flight crew cannot enter such a constraint manually.

An altitude constraint is considered as missed if the system predicts more than 250 ft of difference between the constraint value and the predicted aircraft altitude.

Altitude constraints are observed in CLB or DES or APP NAV-FINAL modes.

The FMS automatically deletes from the F-PLN:

- The altitude constraints ("AT", "AT OR ABOVE", or "AT OR BELOW") with values equal to the CRZ FL, or greater than the CRZ FL
- The altitude constraint windows with lower constraints equal to the CRZ FL, or greater than the CRZ FL
- The upper constraint of altitude constraint windows with upper constraints equal to the CRZ FL, or greater than the CRZ FL. If the lower constraint of the altitude constraint window is below the CRZ FL, the FMS deletes only the upper constraint of the altitude constraint window and keeps the lower constraint of the altitude constraint window.

The MCDU and the ND no longer display the deleted altitude constraints. These altitude constraints are no longer used for the computation of the FMS climb and descent profile. In that case, the scratchpad of the MCDU displays the "CSTR DEL ABOVE CRZ FL" message.

SPEED CONSTRAINT

Speed constraints may be attached to specific waypoints in the climb, descent or approach phases. To meet the speed constraint, the aircraft must fly over the waypoint with a speed equal or less than the speed constraint.

A speed constraint is considered as missed if the system predicts an aircraft speed 10 kt greater than the speed constraint.

Speed constraints are observed when NAV mode is engaged and speed target is managed. Otherwise speed constraints are disregarded.

TIME CONSTRAINT

Time constraint may be attached to any waypoint except the "from" waypoint.

Note: No constraint can be associated with go-around waypoints.

GENERAL

Ident.: DSC-22_20-10-30-20-00006021.0001001 / 01 OCT 12

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

A time constraint (RTA) may be assigned at any waypoint of the F-PLN, downpath of the origin and the FROM waypoint. It can be an "AT", "AT OR BEFORE", or "AT OR AFTER" constraint.

The FMS computes a new managed speed profile from the aircraft position to the constrained waypoint, in order to match the 30 s difference (ΔT) between the time predicted at the constrained waypoint and the RTA. This modified managed speed profile can be checked using the speed prediction, displayed for each waypoint of the F-PLN page.

The RTA function uses a speed range between Green Dot speed and VMO - 10 (or MMO - 0.02). When the constrained waypoint is sequenced, the ECON SPD/MACH is resumed unless the constrained waypoint is located in a descent segment.

Note: The FM does not compute a new managed speed profile when a RTA is entered in the descent profile while the aircraft is in cruise within 40 NM from the top of descent.

The time constraint is inserted on the RTA page. A time constraint may be inserted at any waypoint of the primary or secondary flight plan.

If an engine-out condition is detected, the time constraint is automatically deleted and RTA DELETED message on scratchpad.

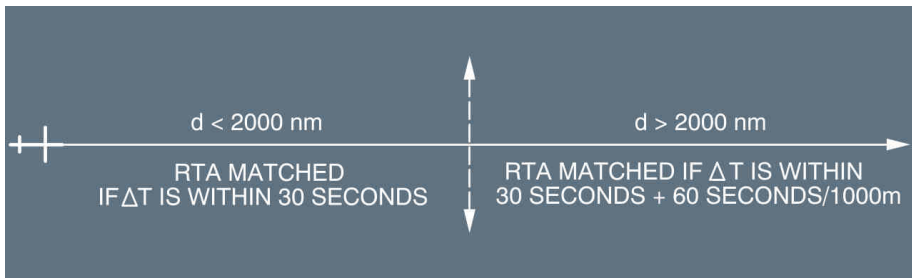
If the aircraft enters a holding pattern, the downpath time constraint is deleted.

Once inserted in the F-PLN, the RTA is displayed in magenta on the F-PLN page, as long as no predictions are available.

Once the predictions are available, the time constraint is replaced by the new predicted time at the associated waypoint, and highlighted by a star: (*)

- The (*) is magenta, if the time constraint is matched with the 30 s criteria.
- The (*) is amber, if the time constraint is missed.

Time constraint matching criteria:



Note: ΔT is the time difference between the time predicted at the constrained waypoint and the RTA.

TIME CSTR ENTRY

PRESS the F-PLN key.

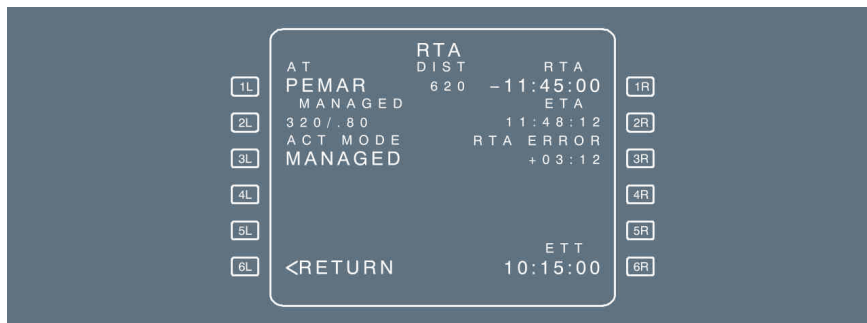
SELECT vertical revision at the revised waypoint.

SELECT the RTA key.

ENTER a waypoint at which a time constraint is to be defined.

WRITE the time constraint (+/-HHMMSS) into the scratchpad and ENTER

The display automatically reverts to the F-PLN A page.



The screenshot shows the aircraft's display interface. On the left, there are six line select keys labeled 1L through 6L. On the right, there are six line select keys labeled 1R through 6R. The central display area shows the following information:

AT	RTA DIST	RTA
PEMAR	620	-11:45:00
MANAGED		ETA
320/.80		11:48:12
ACT MODE	RTA ERROR	
MANAGED	+03:12	
		ETT
<RETURN		10:15:00

- Note:
- The TIME CSTR can be directly cleared on the F-PLN A page, using the CLR key.
 - The time constraint is automatically deleted in the following cases:
 - Engine out, or
 - When entering a holding pattern, or
 - In case of Go-Around, or
 - A time constraint is entered at another waypoint, while another time constraint already exists.

A scratchpad "RTA DELETED" message is displayed.

GENERAL

Ident.: DSC-22_20-10-30-20-00006021.0011001 / 01 OCT 12

Applicable to: MSN 02926-02944, 04392, 07784-07792

A time constraint (RTA) may be assigned at any waypoint of the F-PLN, downpath of the origin and the FROM waypoint. It can be an "AT", "AT OR BEFORE", or "AT OR AFTER" constraint.

The FMS computes a new managed speed profile from the aircraft position to the constrained waypoint, in order to match the 30 s difference (ΔT) between the time predicted at the constrained waypoint and the RTA. This modified managed speed profile can be checked using the speed prediction, displayed for each waypoint of the F-PLN page.

The RTA function uses a speed range between Green Dot speed and VMO - 10 (or MMO - 0.02).

When the constrained waypoint is sequenced, the ECON SPD/MACH is resumed unless the constrained waypoint is located in a descent segment.

The time constraint is inserted on the RTA page. A time constraint may be inserted at any waypoint of the active or secondary flight plan.

If an engine-out condition is detected, the time constraint is automatically deleted and RTA DELETED message on scratchpad.

If the aircraft enters a holding pattern, the downpath time constraint is deleted.

Once inserted in the F-PLN, the RTA is displayed in magenta on the F-PLN page, as long as no predictions are available. On the PERF page, the Cost Index value is replaced by "RTA CI".

Once the predictions are available, the time constraint is replaced by the new predicted time at the associated waypoint, and highlighted by a star: (*)

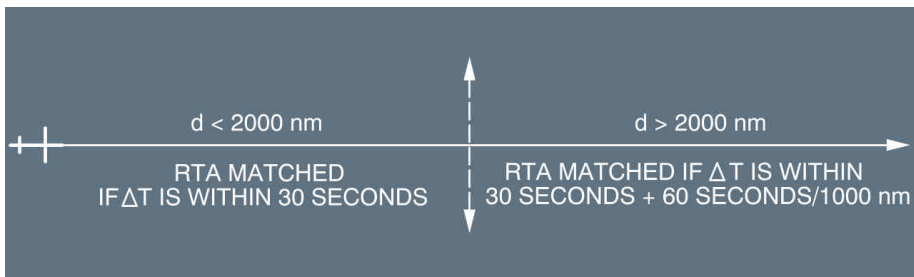
- The (*) is magenta, if the time constraint is matched with the 30 s criteria.
- The (*) is amber, if the time constraint is missed.

Time constraint matching criteria:

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

SYSTEM DESCRIPTION - FLIGHT PLANNING



Note: ΔT is the time difference between the time predicted at the constrained waypoint and the RTA. It is used to define the “missed” or “made” status.

ENTRY OF A REQUIRED TIME OF ARRIVAL

PRESS the F-PLN key.

SELECT VERT REV at any waypoint.

SELECT the RTA prompt [2R].

ENTER the waypoint at which a time constraint is to be defined in the [1L] field

When accessing the RTA page, the [1L] field is defaulted to the waypoint at which the vertical revision has been performed.

WRITE the RTA in the scratchpad and ENTER in the [1R] field.

The format to be used is:

- “HHMMSS” for “AT HHMMSS” (ex : “124500”)
- “+HHMMSS” for “AT OR AFTER HHMMSS” (ex : “+124500”)
- “-HHMMSS” for “AT OR BEFORE HHMMSS” (ex : “-124500”)

[1L]	AT WPT	RTA		[1R]
	PEMAR	DIST	RTA	
		620	-11:45:00	
[2L]	MANAGED		ETA	[2R]
	320/.80		11:48:12	
[3L]	ACT MODE		RTA ERROR	[3R]
	MANAGED		+03:12	
[4L]			ETT	[4R]
			10:15:00	
[5L]				[5R]
[6L]	<RETURN			[6R]

Note: - The RTA can be directly cleared on the F-PLN A page, using the CLR key.

The time constraint is automatically deleted in the following cases:

- Engine out, or
- When entering a holding pattern, or
- In case of Go-Around, or
- A time constraint is entered at another waypoint, while another time constraint already exists.
- The waypoint where the RTA was entered is deleted.

In case a time constraint is deleted, the "RTA DELETED" scratchpad message is displayed.

ESTIMATED TAKEOFF TIME (ETT)

Ident.: DSC-22_20-10-30-20-00009523.0001001 / 23 JUN 15

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

The Estimated Takeoff Time (ETT) may be entered by the pilot during the preflight phase at the origin airport. This time is used as the initialization time for predictions.

The entry is accepted in the preflight phase, if the ETT is greater than the clock time.

PROCEDURE

PRESS the F-PLN key

SELECT a vertical revision at origin

SELECT the RTA page

WRITE the ETT into the scratchpad, and ENTER in the ETT field.

The display automatically reverts to the F-PLN A page.

- Note:
- If the current time exceeds the ETT entry, the CLK IS TAKE OFF TIME message is displayed ; the ETT is replaced by the clock time.
 - At takeoff, the takeoff time is automatically updated using the actual clock time.
 - An ETT entry is automatically deleted, if the origin airport is modified, or if the clock is inoperative.
 - If a time constraint is entered at a waypoint in the F-PLN, the takeoff time required to match the constraint is automatically computed by the FM. This result is displayed in magenta as ETT at the origin.

USE OF TIME/ETT CONSTRAINT

- During preflight :
- If an ETT has been entered, time predictions are based on the entered value (or clock time, if greater).
 - If both an ETT and a time constraint have been entered, time predictions are based on the entered ETT value (or clock time, if greater). The managed speed profile is computed to match the time constraint, as closely as possible, using a pseudo cost index value. (Not displayed).
 - If only a time constraint has been entered:
 - Optimum speeds are computed to determine the ETT, so as to satisfy the time constraint.
 - If necessary, flight time (based on optimum speeds) plus clock time (current) is greater than the time constraint ; optimum speeds are modified to match the time constraint as closely as possible.
- After Takeoff :
- The predictions are based on the current time.
 - Speeds are adjusted to satisfy the time constraint.

ESTIMATED TAKEOFF TIME (ETT)

Ident.: DSC-22_20-10-30-20-00009523.0011001 / 23 JUN 15

Applicable to: MSN 02926-02944, 04392, 07784-07792

The Estimated Takeoff Time (ETT) may be entered by the pilot during the preflight phase at the origin airport. This time is used as the initialization time for predictions.

The entry is accepted in the preflight phase, if the ETT is greater than the clock time.

No temporary flight plan is created upon insertion or modification of an ETT

PROCEDURE

PRESS the F-PLN key
 SELECT VERT REV at departure
 SELECT the RTA prompt [2R]
 ENTER the ETT in the [5R] field of RTA page

- Note:
- If the current time exceeds the ETT entry, the CLK IS TAKE OFF TIME message is displayed ; the ETT is replaced by the clock time.
 - At takeoff, the takeoff time is automatically updated using the actual clock time.
 - An ETT entry is automatically deleted, if the origin airport is modified, or if the clock is inoperative.
 - If a time constraint is entered at a waypoint in the F-PLN, the takeoff time required to match the constraint is automatically computed by the FM. This result is displayed in magenta as ETT at the origin.

USE OF TIME/ETT CONSTRAINT

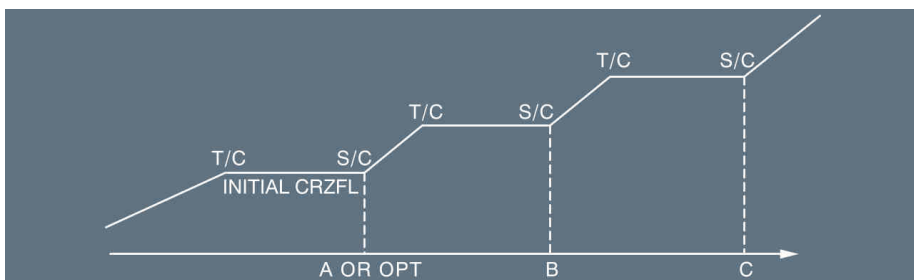
- During preflight :
- If an ETT has been entered, time predictions are based on the entered value (or clock time, if greater).
 - If both an ETT and a time constraint have been entered, time predictions are based on the entered ETT value (or clock time, if greater). The managed speed profile is computed to match the time constraint, as closely as possible, using a pseudo cost index value. (Not displayed).
 - If only a time constraint has been entered:
 - Optimum speeds are computed to determine the ETT, so as to satisfy the time constraint.
 - If necessary, flight time (based on optimum speeds) plus clock time (current) is greater than the time constraint ; optimum speeds are modified to match the time constraint as closely as possible.
- After Takeoff :
- The predictions are based on the current time.
 - Speeds are adjusted to satisfy the time constraint.

STEP CLIMB/STEP DESCENT

Ident.: DSC-22_20-10-30-20-00006020.0012001 / 12 APR 17

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

The STEP ALTS function enables to define the successive cruise Flight Levels. The optimum position to initiate a climb, from the initial (or current) cruise Flight Level to the next one, can also be determined.



PRINCIPLE

GEOGRAPHIC STEPS

Up to four geographic steps may be defined on the STEP ALTS page. These steps are initiated at the geographical position, along the F-PLN.

Rules

- The minimum step size is 1 000 ft.
- A Step Climb (S/C) cannot follow a Step Descent (S/D).
- A STEP is automatically cleared, if:
 - The S/C (S/D) is sequenced without any level change done by the crew.
 - The crew achieves a LAT REV, which deletes the associated waypoint from the F-PLN
 - By EO condition.
- A STEP is manually cleared:
 - On the STEP ALTS page, by CLEARING the corresponding field.
 - On the F-PLN page, by CLEARING the (S/C) or (S/D) pseudo-waypoints.
- A STEP entry is IGNORED, if the remaining CRZ distance is less than about 50 NM.
- Once the steps are inserted in the F-PLN, they are displayed:
 - On the MCDU, as (S/C), (S/D), (T/C), (T/D) pseudo waypoints.
 - On the ND, by associated , , ,  white symbols.

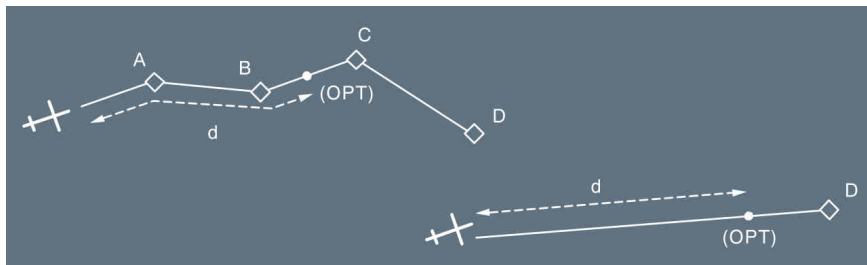
OPTIMUM STEP

When geographic steps are inserted, or an altitude is entered, the FM proposes an OPTIMUM STEP start of climb position for the first step climb altitude ahead. Predicted FUEL and TIME savings are displayed when calculated to be greater than 100 kg or 1 min respectively. If no savings are found, no optimum step is proposed.

The OPT STEP is not automatically inserted. The crew must insert it, if appropriate. Once inserted, the OPT STEP point (OPT) becomes a fixed geographical point.

If some F-PLN parameters are subsequently changed (e.g. winds, new waypoints), an update of the optimum position relative to the previous one may be proposed. If savings exist, this new optimum may be inserted to replace the previous optimum step point.

Once an OPT STEP is inserted in the F-PLN, and the crew achieves a lateral F-PLN revision, the FM keeps the (OPT) along the new F-PLN, at the same distance from the aircraft's position, as previously determined.



Rules

- The OPT STEP is only computed by the FM, if data required for the prediction computation are inserted : F-PLN, CRZ FL, CI, GW, CG at least.
- The search of the OPT STEP begins 20 NM beyond (T/C) before Cruise, or ahead of the aircraft's position.
- The search of the OPT STEP ends 20 NM before the next STEP POINT, or 300 NM before the (T/D).
- Only one OPT STEP is computed at a time.

Guidance

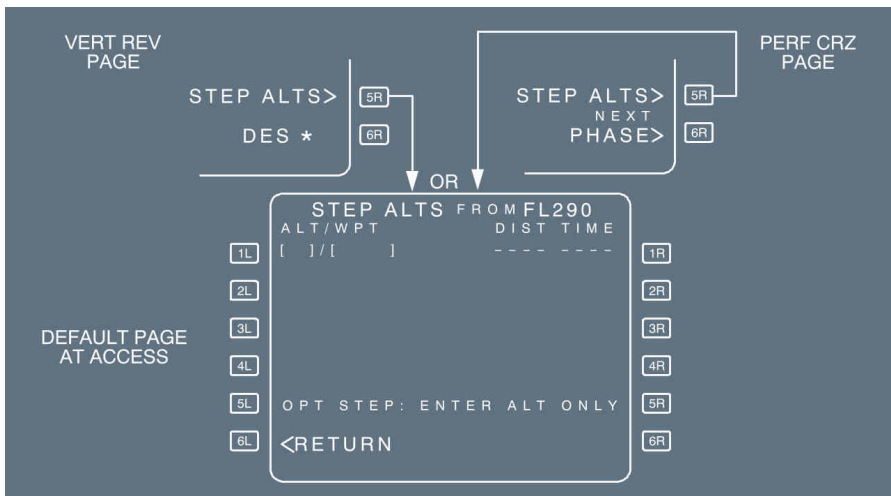
When reaching the step point, the steps must be initiated by the crew by selecting the new CRZ FL, and pressing the FCU ALT selector knob. If sequenced without any crew action, the step is automatically deleted.

If the crew initiates the step:

- The CRZ FL is automatically reassigned to its new value.
- The guidance is THR CLB/CLB for a step climb.
THR IDLE/DES with V/S = -1 000 ft/min for a step descent.

STEP ENTRY

The STEP ALTS page is either accessed from : - The VERT REV page, or
the - PERF CRZ page.



FOR GEOGRAPHIC STEP:

PRESS the F-PLN or PERF key.

SELECT vertical revision at a cruise waypoint.

SELECT the STEP ALTS prompt.

WRITE the ALT/WPT in the scratchpad, and ENTER it in [1L] to [4L].

- Note:
- The position may be a waypoint ident, PBD, PD.
 - The pilot may enter FL 350/LMG/-20. The FM will compute the geographic step 20 NM before LMG to FL 350.
 - To modify an inserted STEP:
 - To modify the CRZ FL only, enter it in the left key, as "FLXXX".
 - To modify the position only, enter it in the left key, as "/XXX".
 - To modify both, modify the position first, and then the CRZ FL (it is not possible to modify both in a single entry).

CHECK the PREDICTIONS.

② ENTER →

① WRITE →

STEP ALTS FROM FL290

ALT/WPT	DIST	TIME
[]/[]	----	----

OPT STEP: ENTER ALT ONLY

<RETURN

STEP ALTS FROM FL290

ALT/WPT	DIST	TIME
FL330/PD07	167	0844
FL390/N45W014	ABOVE MAX	
FL350/BANCS	1827	1157
[]/[]		

<RETURN

[1R]

[2R]

[3R]

[4R]

[5R]

[6R]

GEOGRAPHIC STEP
ALTS INSERTION

[1R]

[2R]

[3R]

[4R]

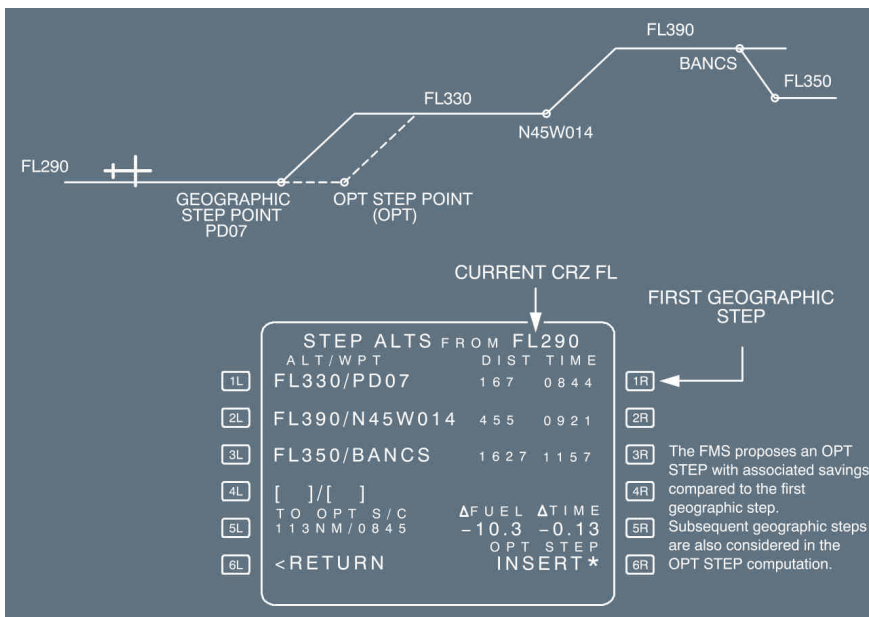
[5R]

[6R]

INSERTED
GEOGRAPHIC
STEP ALTS

FOR OPTIMAL STEP

Once all geographical steps are inserted, and the predictions are available, the STEP ALTS page displays the FUEL/TIME savings for the first step climb. If no significant savings are predicted, the NO OPTIMAL message is displayed.



To INSERT the proposed OPT STEP displayed in [5L]:

SELECT the INSERT* prompt in [6R].



The computed (OPT) step replaces the initially inserted step position, and is then considered at a fixed geographic position. Savings are no longer displayed, and the UPDATE* prompt replaces the INSERT* prompt. This prompt allows the crew to update the (OPT) step position, considering possible F-PLN or inserted wind changes.

If pressed, a new OPT point is proposed, with the associated SAVINGS and INSERT prompt, or NO OPTIMAL.

UPDATE prompt has been pressed, the new OPT STEP point gives additional savings:

STEP ALTS FROM FL290			
ALT/WPT	DIST	TIME	
[1L] FL330/(OPT)	167	0844	[1R]
[2L] FL390/N45W014	455	0921	[2R]
[3L] FL350/BANCS	1627	1157	[3R]
[4L] []/[]			[4R]
[5L] TO OPT S/C 420NM/0916	ΔFUEL	ΔTIME -1.2 -0.03	[5R]
[6L] <RETURN	OPT STEP	INSERT*	[6R]

THERE ARE ONLY 2 CRZ FLS IN THE F-PLN:

The pilot may obtain the OPT position of the STEP point, as follows:

INSERT the initial cruise FL on the INIT A page.

ENSURE that the ZFW, ZFWCG and BLOCK fuel are inserted on the INIT B page.

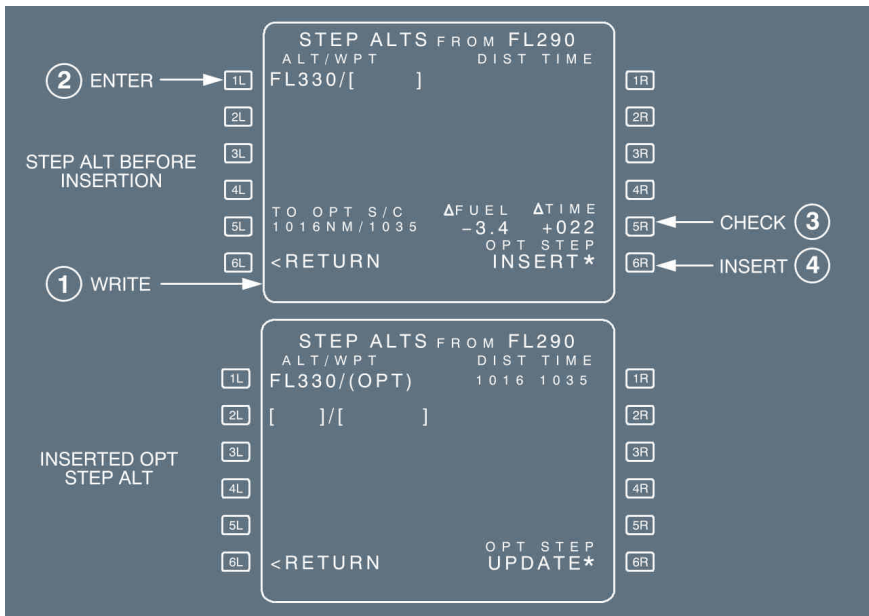
WRITE the new CRZ FL in the STEP ALTS page, in the [1L] field.

Distance and time to optimum point and fuel/time saving are displayed.

CHECK the fuel and time savings and prediction on the [5R] field.

Savings are computed by comparing the entered step altitude, and the origin altitude of the step.

INSERT, if suitable.



Note: No OPT STEP is available in the SEC F-PLN.

MESSAGES

Messages may be displayed in the DIST/TIME field:

- “ABOVE MAX”, if the inserted step altitude exceeds the REC MAX ALT.
The “STEP ABOVE MAX FL” scratchpad message is associated to the “ABOVE MAX” message.
- “IGNORED”

This message is displayed in the following cases:

- Step climb is located prior to the top of climb, or after the top of descent.
- Step end is at less than 50 NM from the top of descent. An optimum step point, < 200 NM from top of descent, cannot be inserted

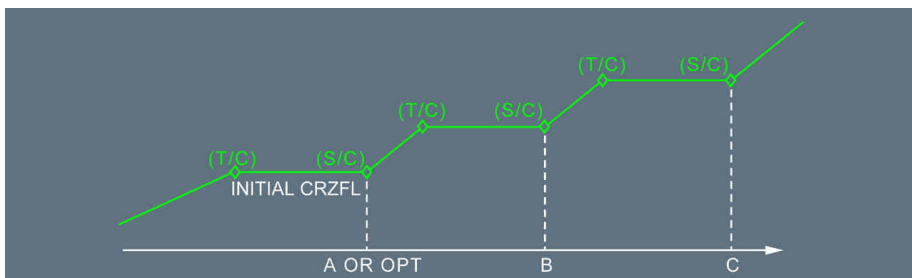
- “STEP AHEAD”, when the distance to the step point is less than 20 NM . A “STEP AHEAD” scratchpad message is also displayed.
The following message may be displayed in the scratchpad:
- “NOT ALLOWED”, if:
 - Four steps already exist in the F-PLN, and an additionnal entry is attempted.
 - Any attempt to enter a step at the FROM waypoint, or at a pseudo waypoint is done.
 - Two consecutive steps are entered at the same waypoint (e.g. step climb after step descent).

STEP CLIMB/STEP DESCENT

Ident.: DSC-22_20-10-30-20-00006020.0011001 / 28 MAY 20

Applicable to: MSN 02926-02944, 04392, 07784-07792

The STEP ALTS function enables to define the successive cruise Flight Levels. The optimum position to initiate a climb, from the initial (or current) cruise Flight Level to the next one, can also be determined.



PRINCIPLE

GEOGRAPHIC STEPS

Up to four geographic steps may be defined on the STEP ALTS page. These steps are initiated at the geographical position, along the F-PLN.

Rules

- The minimum step size is 500 ft
- A Step Climb (S/C) cannot follow a Step Descent (S/D).
- A STEP is automatically cleared, if:
 - The S/C (S/D) is sequenced without any level change done by the crew
 - The crew achieves a LAT REV, which deletes the associated waypoint from the F-PLN
 - By EO condition.

- A STEP is manually cleared:
 - On the STEP ALTS page, by CLEARING the corresponding field
 - On the F-PLN page, by CLEARING the (S/C) or (S/D) pseudo-waypoints
- A STEP entry is IGNORED, if the remaining CRZ distance is less than about 50 NM.
- Once the steps are inserted in the F-PLN, they are displayed:
 - On the MCDU, as (S/C), (S/D), (T/C), (T/D) pseudo waypoints
 - On the ND, by associated , , ,  white symbols.

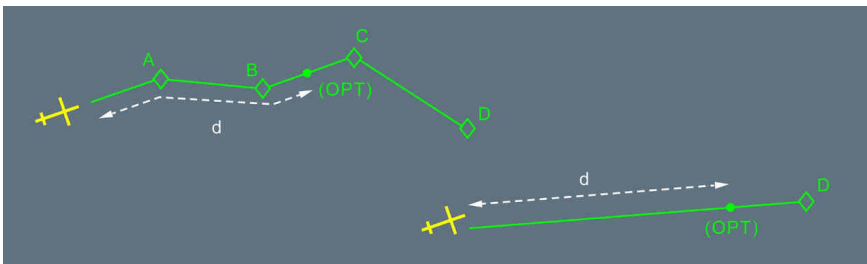
OPTIMUM STEP

When geographic steps are inserted, or an altitude is entered, the FM proposes an OPTIMUM STEP start of climb position for the first step climb altitude ahead. Predicted FUEL and TIME savings are displayed when calculated to be greater than 100 kg or 1 min respectively. If no savings are found, no optimum step is proposed.

The OPT STEP is not automatically inserted. The crew must insert it, if appropriate. Once inserted, the OPT STEP point (OPT) becomes a fixed geographical point.

If some F-PLN parameters are subsequently changed (e.g. winds, new waypoints), an update of the optimum position relative to the previous one may be proposed. If savings exist, this new optimum may be inserted to replace the previous optimum step point.

Once an OPT STEP is inserted in the F-PLN, and the crew achieves a lateral F-PLN revision, the FM keeps the (OPT) along the new F-PLN, at the same distance from the aircraft's position, as previously determined.



Rules

- The OPT STEP is only computed by the FM, if data required for the prediction computation are inserted : F-PLN, CRZ FL, CI, GW, CG at least
- The search of the OPT STEP begins 20 NM beyond (T/C) before Cruise, or ahead of the aircraft's position
- The search of the OPT STEP ends 20 NM before the next STEP POINT, or 300 NM before the (T/D)
- Only one OPT STEP is computed at a time.

Guidance

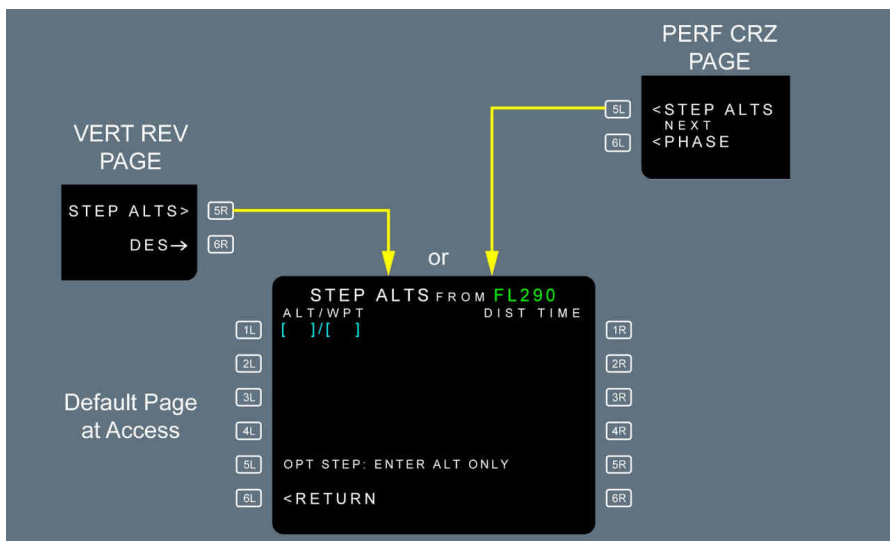
When reaching the step point, the steps must be initiated by the crew by selecting the new CRZ FL, and pressing the FCU ALT selector knob. If sequenced without any crew action, the step is automatically deleted.

If the crew initiates the step:

- The CRZ FL is automatically reassigned to its new value
- The guidance is THR CLB/CLB for a step climb or THR IDLE/DES with V/S = -1 000 ft/min for a step descent.

STEP ENTRY

The STEP ALTS page is either accessed from the : - The VERT REV page, or
 the - PERF CRZ page.



FOR GEOGRAPHIC STEP:

PRESS the PERF key, or PRESS the F-PLN key and SELECT VERT REV at a cruise waypoint. SELECT the STEP ALTS prompt.

1. WRITE the ALT/WPT in the scratchpad
2. ENTER it in [1L] to [4L].

- Note:
- The position may be a waypoint ident, PBD, PD
 - The crew may enter LMG/-20/350. The FMS will compute the geographic step to FL 350 20 NM before LMG
 - To modify an inserted STEP:
 - To modify the CRZ FL only, enter it in the left key, as "FLXXX"
 - To modify the position only, enter it in the left key, as "XXX"
 - To modify both, modify the position first, and then the CRZ FL (it is not possible to modify both in a single entry).

CHECK the PREDICTIONS.



The diagram illustrates the process of inserting geographic steps into the STEP ALTS FROM screen. It shows two states of the screen: before and after insertion.

Initial State (Top):

- Screen title: STEP ALTS FROM **FL290**
- Fields: ALT/WPT, DIST, TIME
- Buttons: 1L, 2L, 3L, 4L, 5L, 6L (left); 1R, 2R, 3R, 4R, 5R, 6R (right)
- Text: OPT STEP: ENTER ALT ONLY
- Return key: <RETURN FL390/BGR
- Annotation: (2) Enter → points to the 1L button.
- Annotation: (1) Write → points to the 1L button.
- Annotation: Geographic STEP ALTS Insertion

After Insertion State (Bottom):

- Screen title: STEP ALTS FROM **FL290**
- Fields: ALT/WPT, DIST, TIME
- Buttons: 1L, 2L, 3L, 4L, 5L, 6L (left); 1R, 2R, 3R, 4R, 5R, 6R (right)
- Text: NO OPTIMAL STEP
- Return key: <RETURN
- Annotations: Inserted Geographic STEP ALTS

Data from the After Insertion State:

ALT/WPT	DIST	TIME
FL330/PD07	300	0900
FL390/N45W014	455	0921
FL350/BANCS	1210	1131

FOR OPTIMAL STEP

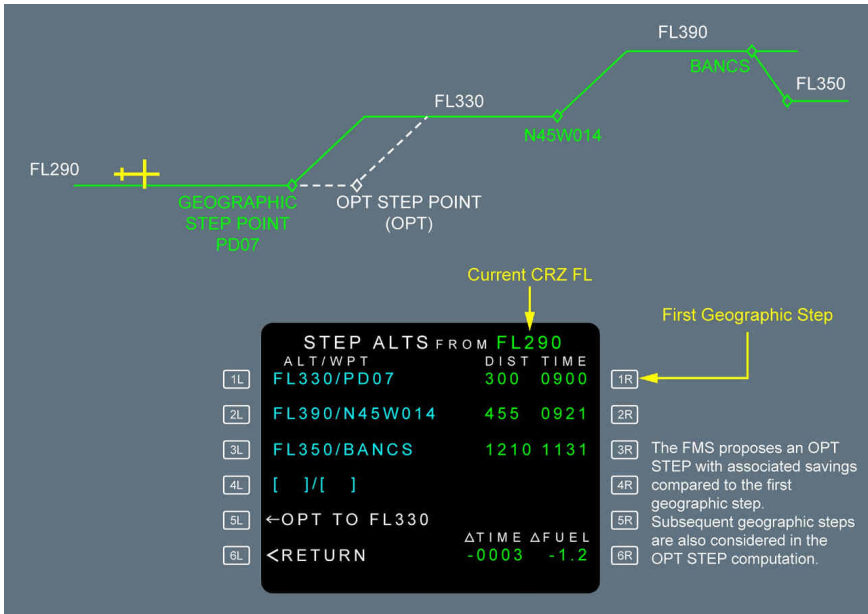
Once the geographic steps are inserted, and the predictions are available, the FMGS computes an optimal location for the first step, and the STEP ALTS page displays the associated FUEL/TIME savings.

Note: If the FMGS cannot determine an optimal step for the selected altitude, "NO OPTIMAL STEP" is displayed in the [5L] field.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

SYSTEM DESCRIPTION - FLIGHT PLANNING



To INSERT the proposed OPT STEP:
SELECT the [5L] prompt.



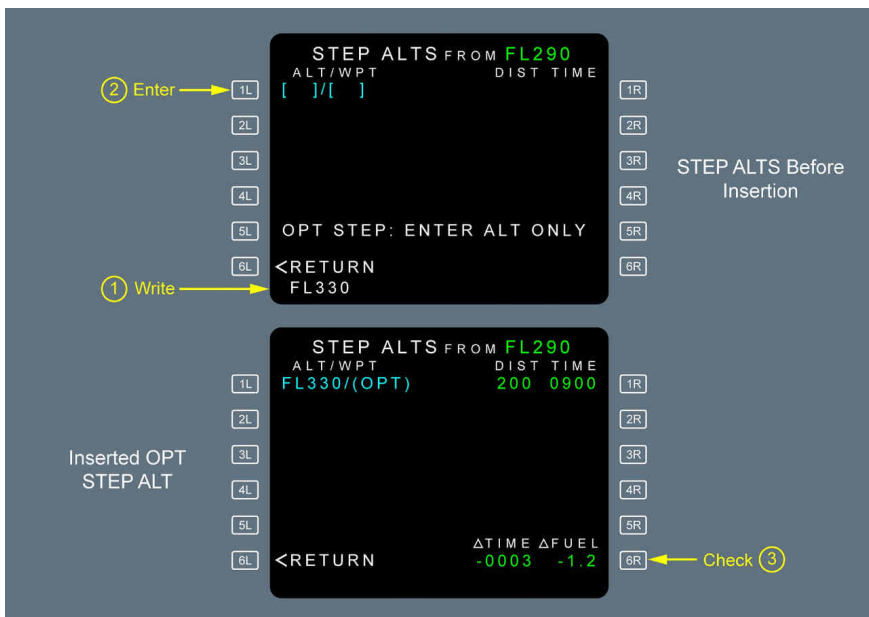
The computed (OPT) step replaces the initially inserted step position. Once inserted, the time and fuel savings associated to the optimal step are no longer displayed. The optimum step position is regularly updated until the aircraft is within 20 NM of the optimum step point.

Note: If the circumstances lead to a situation where the entered optimal step is no longer optimal, "NO OPTIMAL" is displayed in the [1R] field.

TO DETERMINE THE OPTIMAL STEP LOCATION WHEN THERE ARE ONLY 2 CRZ FLS IN THE F-PLN:

The crew may obtain the optimal position for the STEP as follows:

1. INSERT the initial CRZ FL on the INIT A page.
 ENSURE that the ZFW, ZFWCG and BLOCK fuel are inserted on the INIT B page.
2. ENTER the new CRZ FL in the STEP ALTS page in the [1L] field.
 If an optimal step can be determined, the FMGS automatically computes the optimal position of the step, with associated fuel/time savings.
3. CHECK the fuel and time savings and prediction on the [6R] field.
 Savings are computed by comparing the entered step altitude, and the origin altitude of the step.



MESSAGES

Messages may be displayed in the DIST/TIME field:

- “ABOVE MAX”, if the inserted step altitude exceeds the REC MAX ALT.
The “STEP ABOVE MAX FL” scratchpad message is associated to the “ABOVE MAX” message.
- “IGNORED” displayed in the following cases:
 - Step climb is located prior to the top of climb, or after the top of descent.
 - Step end is at less than 50 NM from the top of descent. An optimum step point, < 200 NM from top of descent, cannot be inserted.
- “STEP AHEAD”, when the distance to the step point is less than 20 NM. A “STEP AHEAD” scratchpad message is also displayed.
- A “NOT ALLOWED” message is displayed in the scratchpad, if:
 - Four steps already exist in the F-PLN, and an additional step is entered.
 - A step is entered at the FROM waypoint, or at a pseudo-waypoint.
 - Two consecutive steps are entered at the same waypoint (e.g. step climb after step descent).

Vertical Functions - FMS2 Thales
GENERAL

Ident.: DSC-22_20-10-30-23-00000492.0002001 / 01 OCT 12

Applicable to: MSN 02926-02944, 04392, 07784-07792

The vertical revision function allows the crew to insert or modify the following items:

- The Speed limit (SPD LIM)
- Speed and altitude constraints
- Time constraints (RTA)
- Predicted Winds
- Step climb or step descent
- Constant Mach in cruise

The crew calls up the VERT REV page by pressing the right key on F-PLN A or B page.

1L	FROM	AF5612	←→	1R
2L	TOP9A	TIME	SPD/ALT	2R
3L	LSGC23	0000	148/ 1365	3R
4L	TOP9A	BRG228°	6NM	4R
5L	PAS	0003	210/ * 5500	5R
6L	HOLD L	TRK228°	12	6R
	7000	0006	" / 7000	
	(SPD)		0	
	(LIM)	0006	210/ 7000	
	TOP9A		5	
	D136E	0007	*230/ * FL90	
	DEST	TIME	DIST	
	LGAT33R	0220	990 8.4	
			↑↓	

SELECT →

1L	VERT REV AT D136E		1R
2L	EFOB=14.5	EXTRA=0.8	2R
3L	CLB SPD LIM	RTA>	3R
4L	210 / 7000		4R
5L	SPD CSTR	ALT CSTR	5R
6L	[]	5000	6R
		ALT ERROR	
	<CONSTANT MACH	- 500	
	<WIND DATA	STEP ALTS>	
	<RETURN		

Note: This vertical functions section only describes the following three functions: Wind and time constraints, and Constant Mach Segment.

For other vertical revision functions: Refer to the Systems Related Procedures section.

TIME CONSTRAINT/RTA

Applicable to: MSN 02926-02944, 04392, 07784-07792

Ident.: DSC-22_20-10-30-23-A-00000493.0002001 / 09 FEB 11

GENERAL

A Required Time of Arrival (RTA) is a time requirement to be met over a specified waypoint of the lateral flight plan, including destination but excluding the origin and FROM waypoints.

Once the predictions are available, the time constraint value is replaced by the predicted time at the related waypoint, highlighted by a star (*):

- If the RTA is predicted as matched, the star (*) is in magenta.
- If the RTA is predicted as missed, the star (*) is in amber.

No specific symbol is provided on the ND.

A time constraint is cleared as any other constraints. If a time constraint is automatically deleted, a "RTA DELETED" message is displayed on the MCDU.

Ident.: DSC-22_20-10-30-23-A-00009483.0006001 / 01 OCT 12

TIME CSTR/RTA ENTRY - ENTERING A REQUIRED TIME OF ARRIVAL

SELECT the F-PLN Key on the MCDU.

SELECT a VERT REV at any waypoint.

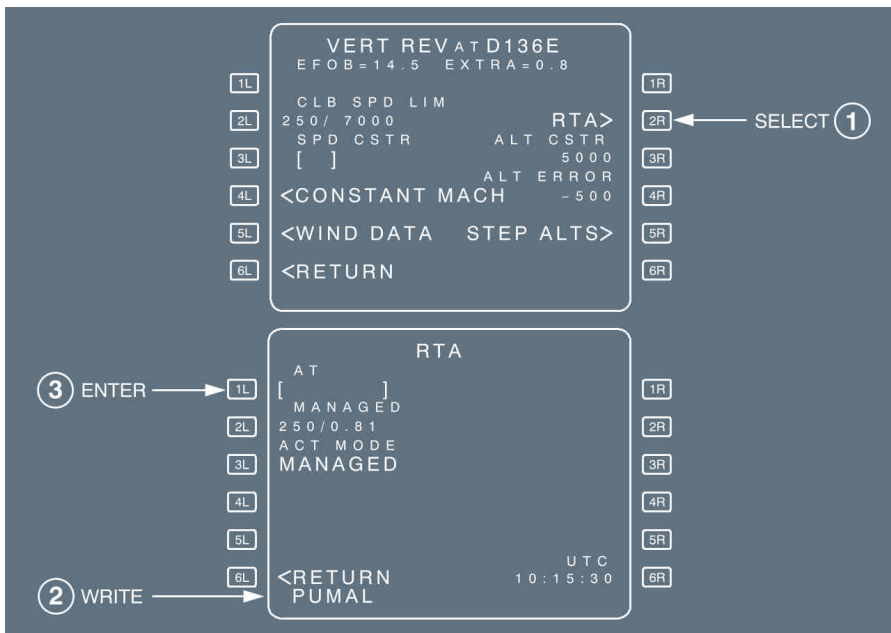
SELECT the RTA prompt (2R).

The MCDU displays the RTA page.

ENTER the waypoint where the time constraint has to be defined, in the [1L] prompt.

The RTA prompt and the distance indications appear.

CHECK and INSERT the TMPY F-PLN, or continue with next revision



AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

SYSTEM DESCRIPTION - FLIGHT PLANNING

1L	AT	RTA		RTA	1R
2L	PUMAL	DIST	620	[] *	2R
3L	MANAGED				3R
4L	250/.81				4R
5L	ACT MODE				5R
6L	MANAGED				6R
				UTC	
				10:15:30	
4 WRITE	<RETURN				
	-114500				

1L	AT	RTA		RTA	1R
2L	PUMAL	DIST	620	-11:45:00	2R
3L	MANAGED			ETA	3R
4L	320/.81			11:48:12	4R
5L	ACT MODE			RTA ERROR	5R
6L	MANAGED			+03:12	6R
				UTC	
				10:15:00	
	<RETURN				

ENTER the required time of arrival, in the [1R] field.

The format is +/- HHMMSS (entry of seconds is not mandatory).

CHECK the 2R and 3R fields to determine whether the entered constraint can be met.

WIND - TEMPERATURE - QNH

Applicable to: MSN 02926-02944, 04392, 07784-07792

Ident.: DSC-22_20-10-30-23-B-00009484.0002001 / 09 FEB 11

GENERAL

In order to obtain the best predictions, the crew must enter wind values for the different phases and for various waypoints of cruise phase.

The system uses the temperature value at a given altitude, associated with the tropopause entered on the INIT A page, to optimize the temperature profile.

Ident.: DSC-22_20-10-30-23-B-00009485.0013001 / 01 OCT 12

ENTERING THE TRIP WIND AND TEMPERATURE DURING F-PLN INITIALIZATION

The trip wind is a mean wind component for the entire flight from origin to destination. The crew can enter it on the INIT B page before engine start. It is usually shown on the computerized flight plan.

The FMGS does not consider the trip wind for alternate predictions.

Trip wind function is intended for on-ground predictions only. If it is used for this purpose, the crew should then enter winds on WIND pages prior to departure. In this case, TRIP WIND field on INIT B page will be dashed.

PRESS the INIT key.

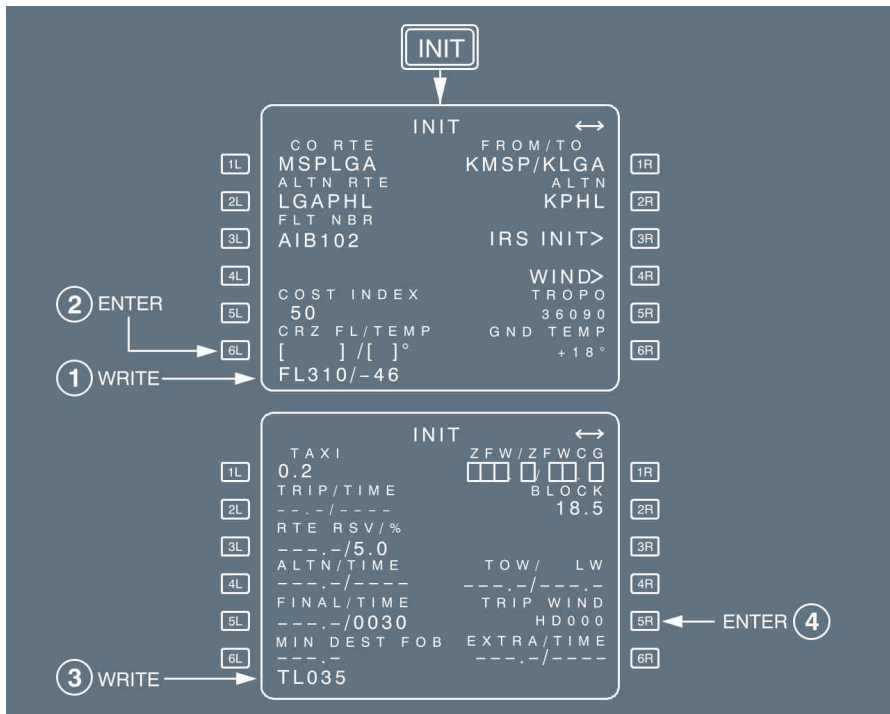
INSERT the temperature at CRZ FL (6L field).

This temperature is negative by default. As a consequence, entry of "50" is automatically converted by the FMS into "-50".

On the INIT B page, INSERT the TRIP WIND (5R field).

The trip wind, is defined as a headwind component (HDXX, XXHD or - XX), or as a tailwind (TLXX, XXTL or + XX).

The FMGS uses the trip wind to compute preliminary performance, time and fuel predictions.



Ident.: DSC-22_20-10-30-23-B-00009486.0019001 / 06 NOV 25

ENTERING THE WIND AND TEMPERATURE DURING F-PLN INITIALIZATION

When completing the INIT A page, and once the wind and cruise flight level temperature forecasts are available, the crew can enter them, if significantly different, by pressing the wind prompt. The crew accesses the various WIND pages by using the NEXT PHASE and PREV PHASE prompts. They can slew the CRZ WIND page to access the various wind values at each cruise waypoints.

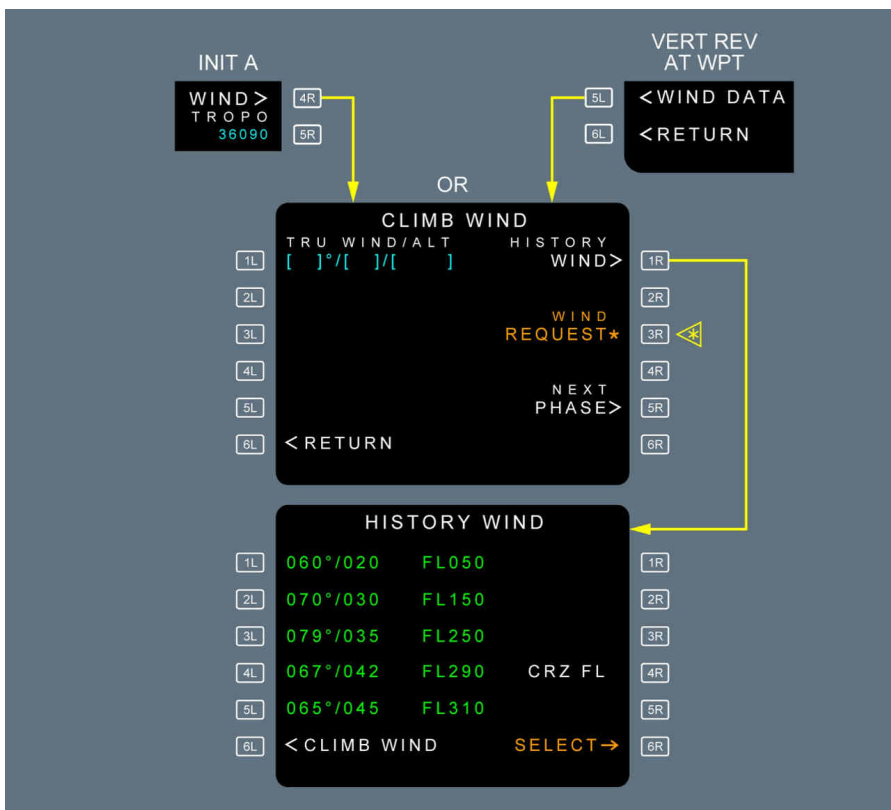
The crew can enter wind data as follows:

- For climb phase: By inserting either the HISTORY WIND data (as recorded during the last descent), or by inserting winds (at up to 5 altitudes or flight levels) on the CLIMB WIND page.
- For cruise phase: By inserting winds (at up to 4 flight levels) at various CRZ waypoints on the CRZ WIND pages. The 4 levels are the same for all the cruise waypoints. The crew may enter the temperature at each waypoint on this page.

- For descent phase: By inserting winds (at up to 5 altitudes or flight levels) on the DES WIND page.
- For the ALTN F-PLN, an average wind may be entered on the DES WIND page for alternate cruise flight level.

Note: Wind can be automatically received (and inserted) via the ACARS system. Refer to DSC-22_20-30-80 Wind Data - Request for Wind Data.

Once a CLIMB, CRZ, or DESCENT WIND is entered, the system ignores the TRIP WIND. Once temperature and winds are inserted, the FMGS computes the ISA profile, and the F-PLN B page displays the forecast wind profile (by linear interpolation and propagation).



WIND ENTRY RULES

When a wind entry is performed from an empty field, direction/velocity/altitude (or flight level) must be entered simultaneously. One entry in each bracket.

Overwriting a wind cancels the previous one. Entered wind data can be cleared: The field reverts to brackets.

Propagated wind cannot be cleared.

Entering a new altitude, over an existing altitude, replaces that existing altitude at all cruise waypoints. Any winds entered at the overwritten altitude are lost at all cruise waypoints.

2 ENTERING THE HISTORY WIND (F-PLN INITIALIZATION)

The crew may insert the history winds, but cannot modify this page.

● If convenient:

PRESS the [6R] key on the HISTORY WIND page to insert them. After insertion, the [6R] key is suppressed, but the page still displays the wind values for information.

3 ENTERING THE CLIMB WIND (F-PLN INITIALIZATION)

● If history winds are not convenient:

SELECT CLIMB WIND page from INIT A page or VERT REV page.

WRITE new winds in the scratchpad and ENTER them in the empty fields.



PRESS the WIND UPDATE [6R] key to insert the winds.

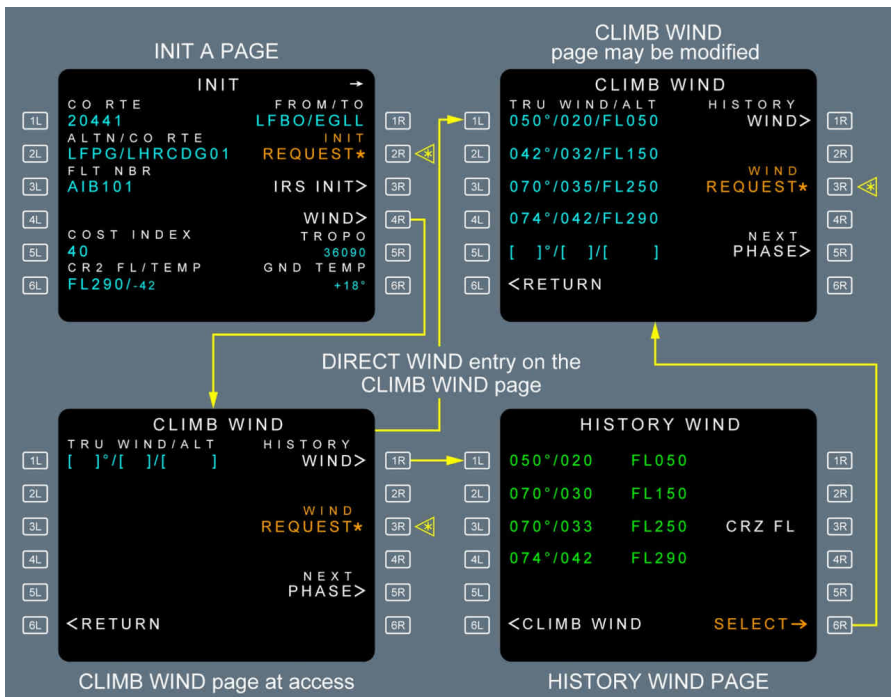
DRAFT disappears and the wind data become blue.

The crew can enter GRND in the altitude field to specify the wind at ground level, at the departure airport.

CLIMB WIND cannot be modified when the climb phase is active.

At climb phase transition, wind data switches from blue to green color and any attempted modification will trigger the **NOT ALLOWED** message.

The system interpolates winds between two entered levels.



Ident.: DSC-22_20-10-30-23-B-00009487.0019001 / 01 OCT 12

ENTERING THE CRUISE WINDS AND TEMPERATURE

A flight plan initialization, the CRZ WIND page displays all cruise waypoints with empty brackets. Until predictions are available, all the waypoints not being part of a SID, STAR or approach are considered as cruise waypoints. In flight only downpath waypoints are displayed.

SELECT INIT or VERT REV at WPT.

PRESS the WIND DATA prompt.

SELECT NEXT PAGE, to reach the CRZ WIND page.

For each desired waypoint:

SCROLL until the waypoint is displayed.

WRITE the new temperature and altitude in the scratchpad, and ENTER it.

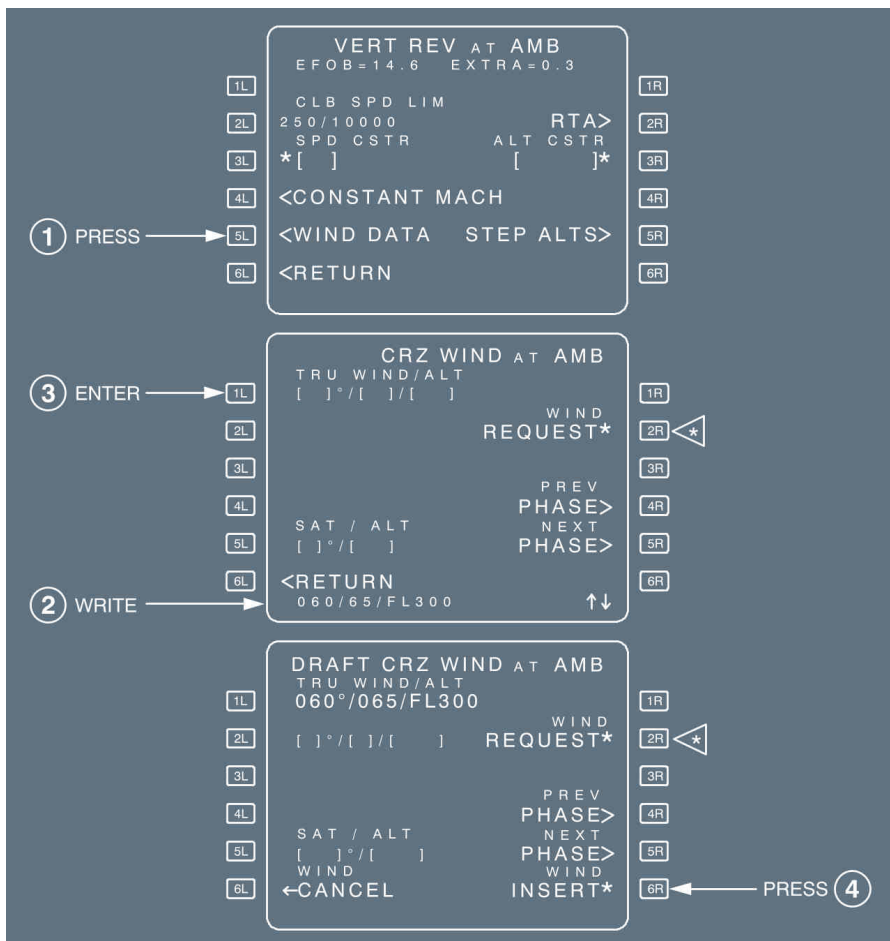
WRITE the new wind data and altitude in the scratchpad, and ENTER IT

WIND and temperature may be entered through the ACARS pages. Refer to DSC-22_20 Auto Flight - Flight Management / 70 AOC Functions / B Wind Data / Wind Data - Request for Wind Data..

Then, when wind update is complete for all these waypoints:

PRESS the UPDATE INSERT prompt.

The wind profile is updated and predictions are re-computed only once this prompt is pressed.



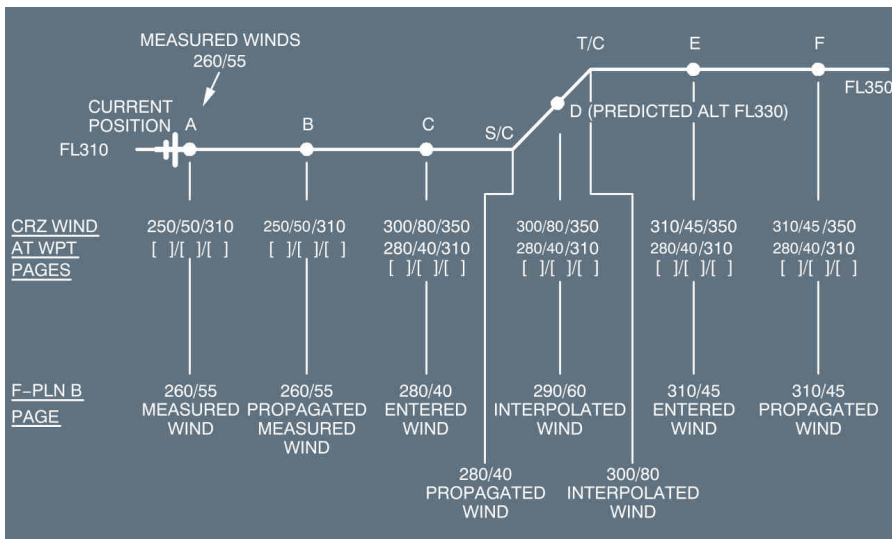
The crew should modify the entered winds and temperatures in flight, if a significant difference is expected (greater than 30 kt or 30 ° for the wind data and greater than 5 °C for the temperature). The FMS propagates the crew (or AOC) wind and temperature entries downpath, until a waypoint for which a different temperature or wind has been entered (for the same flight level), or until the last cruise waypoint.

The forecast winds at a waypoint are determined as follows:

- If the predicted altitude at the waypoint matches an altitude defined in the CRUISE WIND page, the forecast wind is the corresponding entered or propagated wind, displayed at that waypoint on the CRUISE WIND page
- If the predicted altitude lies between two altitudes entered on the CRUISE WIND page, the wind direction and velocity are linearly interpolated
- If the predicted altitude is above or below the set of CRUISE altitudes, the forecast wind is a constant value extrapolated from the entered or propagated wind at the highest (or lowest) altitude displayed on the CRUISE WIND page for that waypoint.

The CRUISE WIND pages display the propagated values in small cyan font, and the crew (or AOC) entries in large cyan font.

Note: The CRUISE WIND page displays AOC data, crew-entered data or propagated data. It never displays computed data (displayed on the F-PLN B page only).



Ident.: DSC-22_20-10-30-23-B-00009488.0002001 / 09 FEB 11

EFFECT OF WIND ENTRIES ON OPTIMUM FLIGHT LEVEL

The OPT FL computation considers the wind entries made at different altitudes (normally at the different CRZ FL).

When flying the subsequent CRZ FL, the OPT FL proposed by the PROG page may be affected by the wind entries made at the previous CRZ FL; these winds are automatically propagated and may be significantly different from the actual winds.

We recommended the following procedure:

- **if the propagated winds at the lower altitudes are significantly different from the actual winds, enter the wind at these altitudes, or if not available, the wind measured at the current CRZ FL.**

Ident.: DSC-22_20-10-30-23-B-00009489.0021001 / 14 MAY 12

ENTERING THE DESCENT WINDS

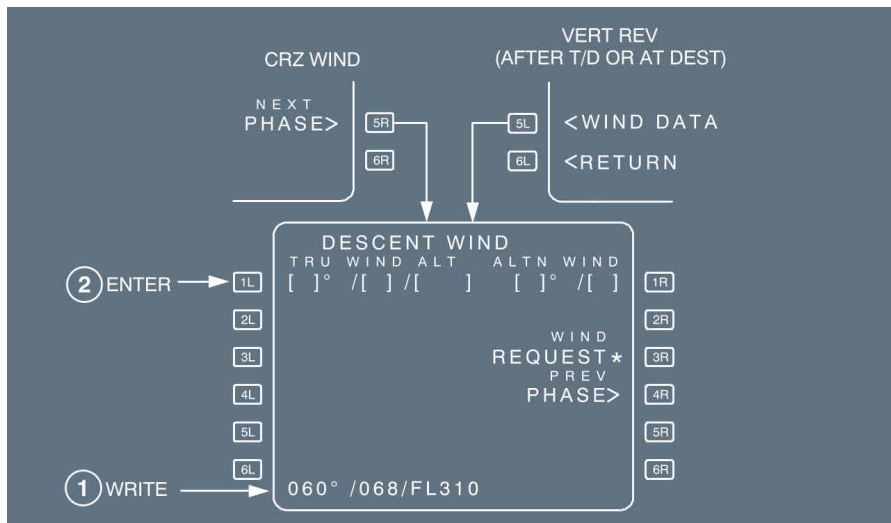
The crew will enter as many as one wind at 5 different FL or altitudes. This wind data will be used for descent profile and prediction computation.

From the vertical revision page, or from the CRUISE WIND page:

PRESS the WIND prompt.

SELECT the DESCENT WIND page.

ENTER up to 5 different "wind/altitude".



A wind is written as true direction/velocity/flight level or altitude in feet.

- If the crew enters "GRND" in the altitude field, the system uses the associated wind as wind at destination.

The descent profile is corrected, as well as the tower wind entered in the PERF APPR page.

DRAFT DESCENT WIND	
TRU WIND/ALT	ALTN WIND
060°/060/FL310	[]°/[] FL220
060°/050/FL200	
060°/020/FL100	WIND REQUEST*
050°/010/FL050	
040°/010/GRND	NEXT PHASE>
WIND ←CANCEL	WIND UPDATE* ↑↓

WIND AT DESTINATION

APPR	
QNH	FLP RETR FINAL
[] [] []	F=137 ILS 33R
TEMP	SLT RETR BARO
[]°	S=175 []
MAG WIND	CLEAN RADIO
052°/10	0=196 210
TRANS FL	LDG CONF
FL45	CONF3 *
VAPP	VLS
135	127 FULL
PREV	NEXT
<PHASE	PHASE>

When the winds have been entered, the F-PLN B page displays the forecast wind profile at all descent waypoints using values it has interpolated from manual entries. Descent winds are not modifiable when descent, approach or go around phase is active. At descent phase transition, wind data changes color from blue to green and any attempted modification triggers the "NOT ALLOWED" message.

Ident.: DSC-22_20-10-30-23-B-00009490.0001001 / 09 FEB 11

ENTERING THE ALTERNATE WIND

Alternate wind is entered in the DESCENT WIND page. The altitude is blanked if no alternate destination is defined.

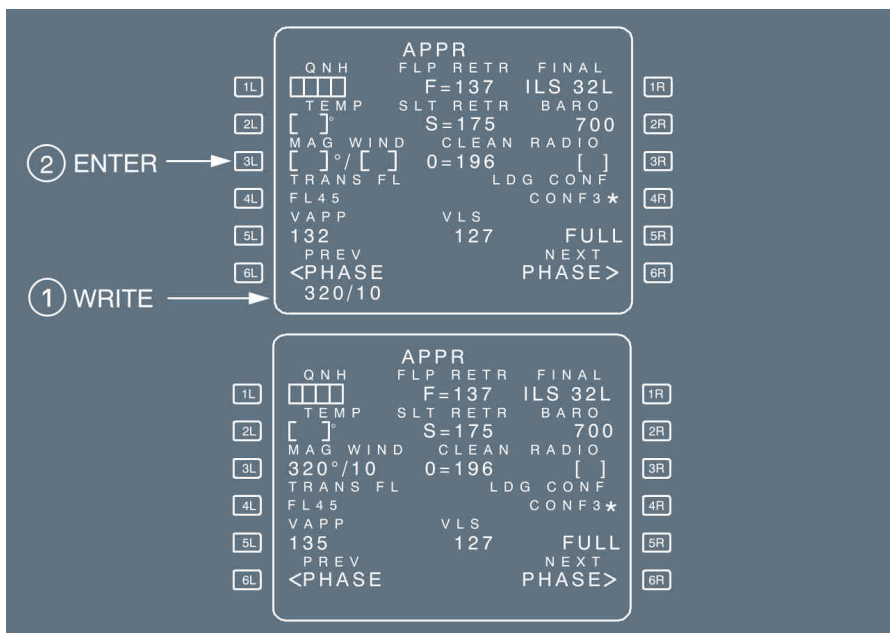
- If an alternate wind is not defined, the predictions are computed with a wind defaulted to zero.

Alternate wind can be modified at any time.

Ident.: DSC-22_20-10-30-23-B-00009491.0021001 / 14 MAY 12

ENTERING THE APPROACH WIND

The wind at destination is entered on the PERF APPR page, [3L] field. It is a magnetic referenced wind, copied in true reference into DESCENT WIND page at ground level (GRND) and F-PLN B page at destination. A ground entry on the DESCENT WIND page is in the same way, copied to F-PLN B page and PERF APPR page (Magnetic) automatically. This wind is modifiable in descent and approach and go-around phase.



The diagram illustrates the process of entering approach wind on the PERF APPR page. It shows two states of the page: the initial state and the state after entering the wind.

Initial State (Top Screen):

- QNH: [] [] [] []
- TEMP: [] [] [] []
- MAG WIND: [] [] [] []
- TRANS FL: [] [] [] []
- FL 45: [] [] [] []
- V APP: [] [] [] []
- PREV: [] [] [] []
- <PHASE: [] [] [] []
- 320/10
- FLP RETR: F=137
- SLT RETR: S=175
- CLEAN RADIO: 0=196
- LDG CONF: CONF3*
- VLS: 127
- FULL: FULL
- NEXT: NEXT
- PHASE: PHASE>

Final State (Bottom Screen):

- QNH: [] [] [] []
- TEMP: [] [] [] []
- MAG WIND: [] [] [] []
- TRANS FL: [] [] [] []
- FL 45: [] [] [] []
- V APP: [] [] [] []
- PREV: [] [] [] []
- <PHASE: [] [] [] []
- 320°/10
- FLP RETR: F=137
- SLT RETR: S=175
- CLEAN RADIO: 0=196
- LDG CONF: CONF3*
- VLS: 127
- FULL: FULL
- NEXT: NEXT
- PHASE: PHASE>

Arrows indicate the sequence of actions:

- 1. WRITE in the scratchpad (indicated by arrow 1 pointing to the bottom screen).
- 2. ENTER in the [3L] field (indicated by arrow 2 pointing to the top screen).

SELECT the PERF key on the MCDU

PRESS the NEXT PHASE key [6R], to reach PERF APPR page.

WRITE the surface wind (magnetic) in the scratchpad and ENTER it in the [3L] field.

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CONSTANT MACH

Applicable to: MSN 02926-02944, 04392, 07784-07792

Ident.: DSC-22_20-10-30-23-C-00009492.0006001 / 09 FEB 11

GENERAL

The crew can specify a part of the F-PLN to be flown at a given Mach value, using the Constant Mach function.

Only one Constant Mach segment may be defined in the active or temporary flight plan, and one in the secondary flight plan. No Constant Mach segment can be defined in the alternate flight plan.

Ident.: DSC-22_20-10-30-23-C-00009493.0006001 / 14 MAY 12

ENTERING A CONSTANT MACH SEGMENT

SELECT the F-PLN key on the MCDU.

SELECT VERT REV at any cruise waypoint.

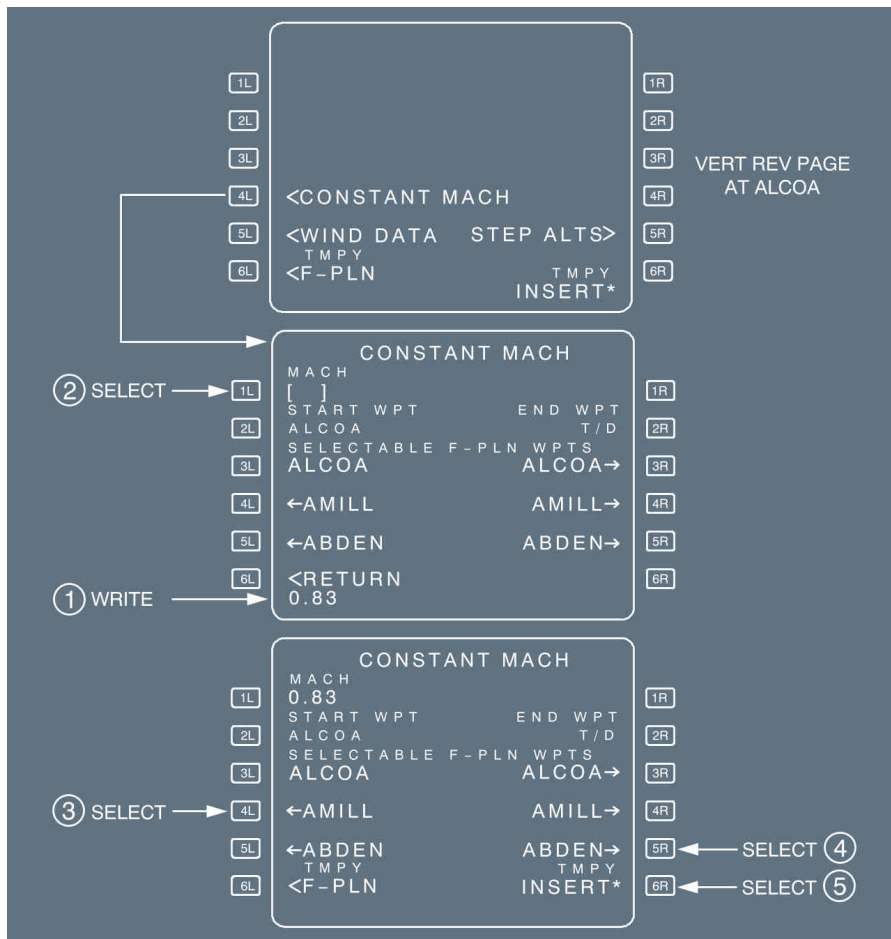
SELECT the CONSTANT MACH prompt [4L], to access the CONSTANT MACH page.

ENTER the desired Mach value in the [1L] field.

SELECT the Start waypoint [2L] and End waypoint [2R] within the list of selectable waypoint (3L → 5L, 3R → 5R, "SELECTABLE F-PLN WPTS").

When accessing the CONSTANT MACH page, the Start waypoint is defaulted to the first downpath waypoint at which a CMS can be entered. The End waypoint is defaulted to the Top of Descent (T/D).

CHECK and INSERT the TMPY F-PLN, or continue with next revision.



Ident.: DSC-22_20-10-30-23-C-00009494.0006001 / 23 JUN 15

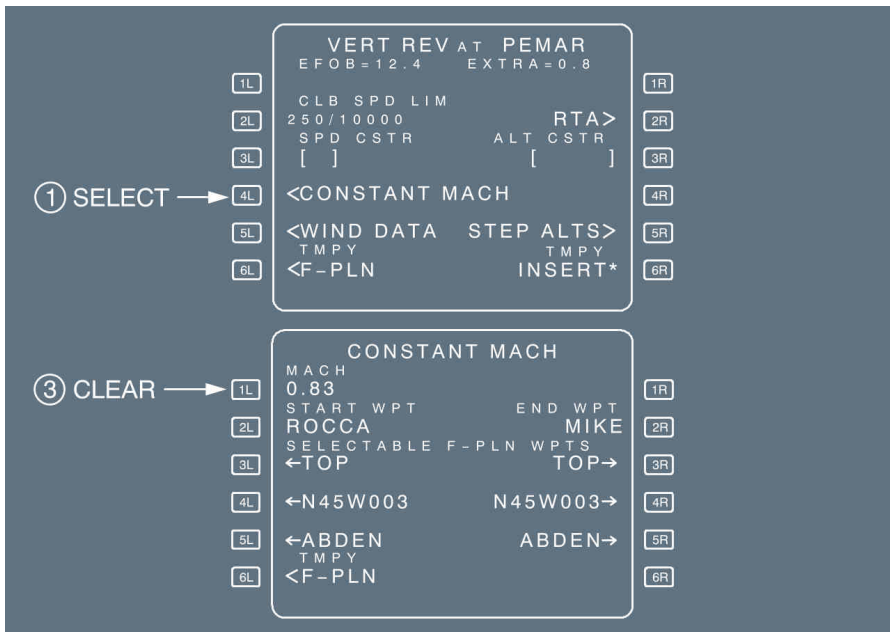
DELETING A CONSTANT MACH

To delete a previously-entered Constant Mach:

SELECT the F-PLN key on the MCDU

SELECT VERT REV at any F-PLN waypoint

SELECT the CONSTANT MACH prompt (4L)



PRESS the CLR key on the MCDU control panel, then SELECT [1L]

The constant Mach is deleted, and no message is displayed to confirm the deletion.

CHECK and INSERT the TMPY F-PLN or continue with next revision.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

SYSTEM DESCRIPTION - FLIGHT PLANNING

Intentionally left blank

Vertical Functions - FMS2 Honeywell
GENERAL

Ident.: DSC-22_20-10-30-22-00009323.0008001 / 14 MAY 12

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

The vertical revision function allows the pilot to modify the following parts of the flight plan:

- Speed limit
- Speed and altitude constraints
- Time constraints
- Wind
- Step climb or step descent
- Constant Mach Segment

The pilot selects these functions by pressing the right key on flight plan A or B.

	FROM	AI504 →	
1L	ADALE	EFOB 15.3	WIND 246°/076
2L	J34 01CRL	BRG 104°	28 NM
3L	J34 HASTE	15.1	" ° / "
4L	J34 ALPHE	TRK 120°	17
5L	J34 CRL	14.9	" ° / "
6L	DEST KLG22	14.6	32
		240°/092	52
		14.1	" ° / "
		UTC 0058	DIST 636
		EFOB 9.3	↑↓
1R			
2R			
3R			
4R			← SELECT
5R			
6R			

	VERT REV AT ALPHE		
	EFOB=14.6 EXTRA=0.3		
1L	CLB SPD LIM		1R
2L	250/10000	RTA>	2R
3L	SPD CSTR	ALT CSTR	3R
4L	*[]	[]*	4R
5L	MACH/START WPT		5R
6L	*[]/ALPHE		6R
	<WIND	STEP ALTS>	
	<RETURN		

Note: This vertical functions section only describes the following three functions: Wind and time constraints, and Constant Mach Segment.

For other vertical revision functions: Refer to the Systems Related Procedures section.

REQUIRED TIME OF ARRIVAL (RTA)

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

Ident.: DSC-22_20-10-30-22-A-00009324.0001001 / 24 JAN 11

GENERAL

A Required Time of Arrival (RTA) is a time requirement to be met over a specified waypoint of the lateral flight plan, including destination but excluding the origin and FROM waypoints. When the predictions are available, the time constraint value is replaced by the predicted time at the related waypoint, highlighted by a star (*):

- If the RTA is predicted as matched, the star (*) is in magenta.
- If the RTA is predicted as missed, the star (*) is in amber.

No specific symbol is provided on the ND.

A time constraint is cleared in the same way as any other constraints. If a time constraint is automatically deleted. The MCDU displays an "RTA DELETED" message.

Ident.: DSC-22_20-10-30-22-A-00000489.0008001 / 14 MAY 12

ENTERING A REQUIRED TIME OF ARRIVAL

SELECT the F-PLN key on the MCDU.

SELECT a VERT REV at the revised waypoint.

SELECT the RTA prompt (2R).

CHECK, ENTER or MODIFY the identifier of the waypoint at which the time constraint is to be defined in the [1L] field.

② ENTER → 1L 2L 3L 4L 5L 6L		RTA AT [MANAGED 250/0.81 ACT MODE MANAGED UTC 10:15:30 <RETURN PUMAL	1R 2R 3R 4R 5R 6R
① WRITE → 1L 2L 3L 4L 5L 6L		RTA AT PUMAL MANAGED 250/.81 ACT MODE MANAGED RTA DIST 620 UTC 10:15:30 <RETURN -114500	1R ← ENTER ④ 2R 3R 4R 5R 6R
③ WRITE → 1L 2L 3L 4L 5L 6L		RTA AT PUMAL MANAGED 320/.81 ACT MODE MANAGED RTA DIST 620 RTA -11:45:00 ETA 11:48:12 RTA ERROR +03:12 UTC 10:15:00 <RETURN	1R 2R 3R 4R 5R 6R

WRITE the required time of arrival.

The format is +/- HHMMSS (entry of seconds is not mandatory).

ENTER it in the 1R field.

CHECK the 2R and 3R fields to determine whether the entered constraint can be met.

WIND - TEMPERATURE - QNH

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

Ident.: DSC-22_20-10-30-22-B-00000490.0001001 / 24 JAN 11

GENERAL

In order to receive the best predictions, the pilot must enter wind and temperature values for the different phases and for the various waypoints of the cruise phase.

The system uses the temperature value at a given altitude, associated with the tropopause entered on the INIT A page, to optimize the temperature profile.

Ident.: DSC-22_20-10-30-22-B-00009327.0001001 / 24 JAN 11

ENTERING THE TRIP WIND AND TEMPERATURE DURING F-PLN INITIALIZATION

The trip wind is a mean wind component for the entire flight from origin to destination. The pilot can enter it on the INIT B page prior to engine start. It is usually defined by the airline's flight operations on the computerized flight plan.

The FMGS does not consider the trip wind for alternate predictions.

The trip wind is used as long as no winds are entered in the CLB, CRZ, and DES WIND pages. When the pilot enters a CLB, CRZ or DES WIND, the FMGS disregards the trip wind.

PRESS the INIT key.

INSERT the temperature at cruise FL.

On the INIT B page, INSERT the TRIP WIND.

The trip wind is defined as a headwind component (HDXX, XXHD or -XX), or as a tailwind (TLXX, XXTL or +XX).

The FMGS uses the trip wind to compute preliminary performance, time and fuel predictions.

CHECK the predictions on the F-PLN B page.

Ident.: DSC-22_20-10-30-22-B-00009328.0008001 / 01 MAR 18

ENTERING THE WIND AND TEMPERATURE DURING F-PLN INITIALIZATION

When completing the INIT A page, and once the wind and cruise FL temperature forecasts are available, the pilot may enter them, if significantly different, by pressing the wind prompt.

The pilot will access the different wind pages by using the NEXT PHASE and PREV PHASE prompts. He will slew the CRZ WIND page to access the various cruise wind waypoints.

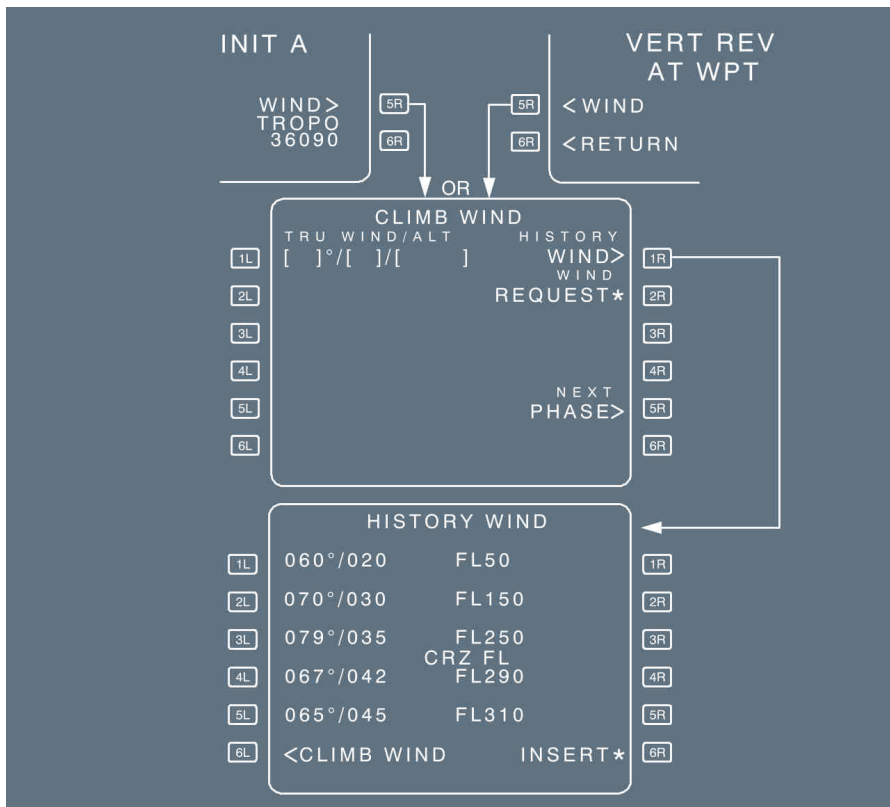
The pilot will enter wind data as follows:

- For climb phase: By inserting either the HISTORY WIND data (as recorded during the last descent), or by inserting winds (at up to 5 altitudes) on the CLIMB WIND page.
- For cruise phase: By inserting winds (at up to 4 FL) at various CRZ waypoints on the CRZ WIND pages. The 4 levels are the same for all the cruise waypoints. The pilot may enter the temperature of each waypoint and at destination on this page.
- For descent phase: By inserting winds (at up to 5 FL/altitudes) on the DES WIND page.
- For the ALTN F-PLN, an average wind may be entered on the DES WIND page for alternate cruise flight level.

Note: Wind can be automatically received (and inserted) through the ACARS system.

Once a CLIMB, CRZ, or DESCENT WIND is entered, the system ignores the TRIP WIND.

Once temperature and winds are inserted, the FMGS computes the ISA profile, and the F-PLN B page displays the forecast wind profile (by linear interpolation and propagation).



WIND ENTRY RULES

When a wind entry is performed from an empty field, direction/velocity/altitude (or flight level) must be entered simultaneously. One entry in each bracket.

Overwriting a wind cancels the previous one.

Entered wind data can be cleared: The field reverts to brackets.

Propagated wind cannot be cleared.

Entering a new altitude, over an existing altitude, replaces that existing altitude at all cruise waypoints. Any winds entered at the overwritten altitude are lost at all cruise waypoints.

ENTERING THE HISTORY WIND (F-PLN INITIALIZATION)

The pilot may insert the history wind, but cannot modify this page.

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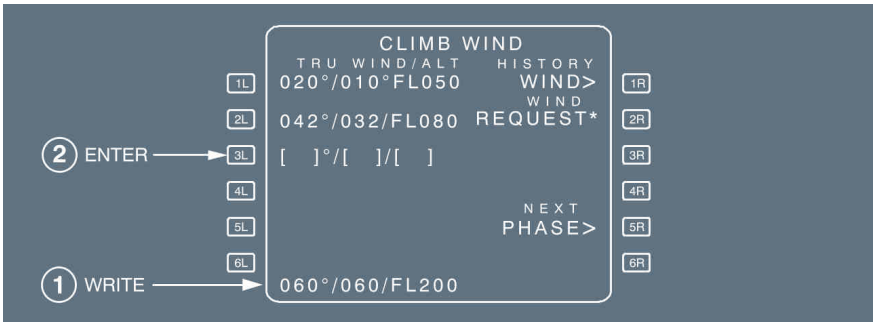
If convenient, PRESS the (6R) prompt to insert. After insertion, the [6R] prompt is suppressed, but the page still displays the wind values for information.

ENTERING THE CLIMB WIND (F-PLN INITIALIZATION)

If history winds are not convenient:

SELECT CLIMB WIND page from INIT A page or VERT REV page.

WRITE new winds into the scratchpad and ENTER.



CLIMB WIND	
TRU WIND/ALT	HISTORY
020°/010°FL050	WIND>
042°/032/FL080	WIND
[]°/[]/[]	REQUEST*
NEXT PHASE>	
060°/060/FL200	

Winds entered on the CLIMB, CRZ, and DESCENT WIND pages are always true north referenced.

Tower wind, entered on PERF APPR page is magnetic-referenced.

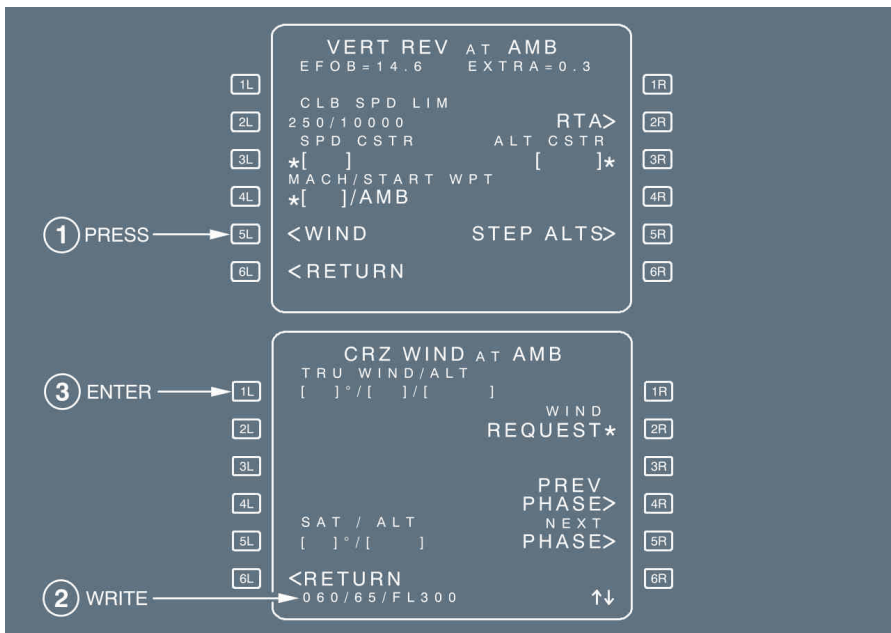
The pilot can enter “GRND” in the altitude field for wind at destination.

CLIMB WIND cannot be modified when the climb phase is active.

At climb phase transition, wind data switches from blue to green, and any attempted modification will trigger the “NOT ALLOWED” message.

The system extrapolates the highest wind entry to all higher levels.

The system interpolates winds between 2 entered levels.



The crew will modify the entered winds and temperatures in flight, if a significant difference is expected (greater than 30 kt or 30 ° for the wind data and greater than 5 °C for the temperature). The system propagates the pilot's (or ACARS) wind and temperature entries downpath, until a waypoint for which a different temperature or wind has been entered (for the same flight level), or until the last cruise waypoint.

The forecast winds at a waypoint are determined as follows:

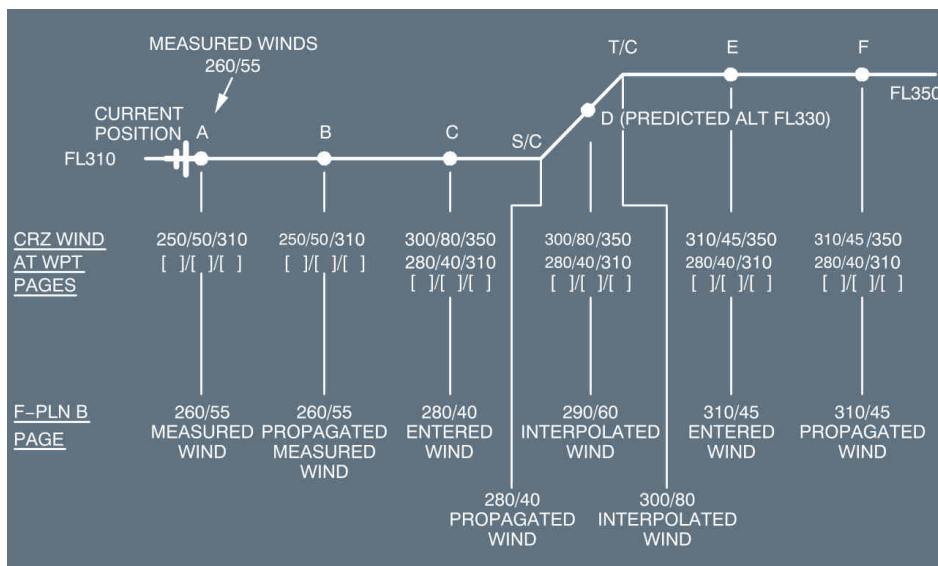
- If the predicted altitude at the waypoint matches an altitude defined in the CRZ WIND page, the forecast wind, is the corresponding entered or propagated wind, displayed at that waypoint on the CRZ WIND page.
- If the predicted altitude lies between two altitudes entered on the CRZ WIND page, the wind direction and velocity are linearly interpolated.
- If the predicted altitude is above or below the set of cruise altitudes, the forecast wind is a constant value extrapolated from the entered or propagated wind at the highest (or lowest) altitude displayed on the CRZ WIND page for that point.

Once in flight, the FMGS considers the actual measured wind up to 200 NM ahead of the aircraft to permanently update the wind profile. This updated wind profile is used to compute the predictions and the performance data, but is not displayed to the crew.

The CRZ WIND pages display the propagated values in small blue font, and the pilot (or ACARS) entries in large blue font.

Note: The CRZ WIND page displays ACARS or crew-entered or propagated data. It never displays computed data (F-PLN B page only).

Example:



Ident.: DSC-22_20-10-30-22-B-00009330.0001001 / 24 JAN 11

EFFECT OF WIND ENTRIES ON OPTIMUM FLIGHT LEVEL

The OPT FL computation considers the wind entries made at different altitudes (normally at the different CRZ FL).

When flying the subsequent CRZ FL, the OPT FL proposed by the PROG page may be affected by the wind entries made at the previous CRZ FL; these winds are automatically propagated and may be significantly different from the actual winds.

We recommend the following procedure: If the propagated winds at the lower altitudes are significantly different from the actual winds, enter the wind at these altitudes, or if not available, the wind measured at the current CRZ FL.

Ident.: DSC-22_20-10-30-22-B-00009331.0016001 / 14 MAY 12

ENTERING THE DESCENT WINDS

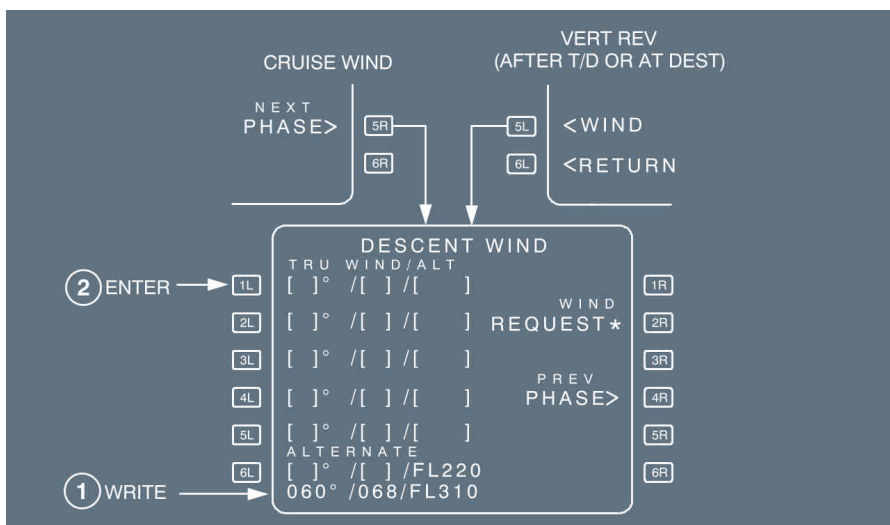
The pilot will enter as many as one wind at 5 different FL or altitudes. This wind data will be used for descent profile and prediction computation.

From the vertical revision page, or from the CRZ WIND page:

PRESS the WIND prompt.

SELECT the DESCENT WIND page.

ENTER up to 5 different “wind/altitude”.



A wind is written as true direction/velocity/flight level or altitude in feet.

If the crew enters “GRND” in the altitude field, the system uses the associated wind as wind at destination.

The descent profile is corrected, as well as the tower wind entered in the PERF APPR page.

TRUE WIND AT DESTINATION →	[1L]	DESCENT WIND TRU WIND/ALT 060°/060/FL310 WIND REQUEST 060°/050/FL200 060°/020/FL100 050°/010/FL050 NEXT PHASE> 040°/010/GRND ALTERNATE []°/[]/FL220		[1R]
	[2L]			[2R]
	[3L]			[3R]
	[4L]			[4R]
	[5L]			[5R]
	[6L]			[6R]
MAGNETIC WIND AT DESTINATION →	[1L]	APPR QNH FLP RETR FINAL [] [] F=137 ILS 33R TEMP SLT RETR BARO []° S=175 [] MAG WIND CLEAN RADIO 052°/10 0=196 210 TRANS ALT LDG CONF 4000 CONF3 * VAPP VLS FULL 135 127 PREV NEXT <PHASE PHASE>		[1R]
	[2L]			[2R]
	[3L]			[3R]
	[4L]			[4R]
	[5L]			[5R]
	[6L]			[6R]

When the winds have been entered, the F-PLN B page displays the forecasted wind profile at all descent waypoints, using values it has interpolated from manual entries. Descent winds are not modifiable when the descent, approach, or go-around phase is active. At descent phase transition, wind data switches from blue to green, and any attempted modification will trigger the “NOT ALLOWED” message.

Ident.: DSC-22_20-10-30-22-B-00009332.0001001 / 24 JAN 11

ENTERING THE ALTERNATE WIND

Alternate wind is entered on the DESCENT WIND page.

The alternate cruise (ALTN CRZ) level defaults to:

- FL 220 if the length of the ALTN F-PLN is less than 200 NM.
- FL 310 if the length of the ALTN F-PLN is greater than 200 NM.

If an alternate wind is not defined, the predictions are computed with a wind defaulted to zero. Alternate wind can be modified at any time.

The alternate wind profile is as follows:

- ALTN CLB wind : Mean wind between ALTN CRZ wind (as entered on the DESCENT WIND page), and the wind at primary DEST (as entered on the PERF APPR page).
- ALTN CRZ wind : If no ALTN WIND has been entered on the DESCENT WIND page, the WIND at primary DEST (as entered on the PERF APPR page) is considered.
In case no entry is made, zero wind is assumed.
- ALTN DES wind : Mean wind between ALTN CRZ WIND and wind at FL 100.
Wind at FL 100 = Interpolation between wind at ALTN CRZ FL and zero at ALTN DEST.

Ident.: DSC-22_20-10-30-22-B-00009333.0016001 / 06 NOV 23

ENTERING THE APPROACH WIND TEMPERATURE AND QNH

The wind at destination is entered in the 3L field of the PERF APPR page.

It is copied in true reference into the DESCENT WIND page at ground level (GRND), and F-PLN B page at destination. A ground entry on the DESCENT WIND page is, in the same way, automatically copied to F-PLN B page and the PERF APPR page.

This wind is modifiable in descent, approach, and go-around phases.



The screenshot shows the PERF APPR PAGE with the following fields and values:

DEST	QNH	FLP	RETR	FINAL
1015		F=187		VOR33R
TEMP		SLT	RETR	BARO
[]°		S=230		[]
MAG WIND		CLEAN		RADIO
[]/[]		O=267		210
TRANS ALT		LDG	CONF	
4000			CONF3*	
V APP		VLS		
135		127		FULL
PREV		NEXT		
<PHASE		PHASE>		
320/10				

Annotations on the left side of the screen:

- ② Enter → 3L field
- ① Write → 6L field

Annotation on the right side of the screen:

- PERF APPR PAGE

SELECT the PERF key on the MCDU.

PRESS NEXT PHASE (6R).

WRITE QNH and temperature, and enter them.

WRITE the surface wind in the scratchpad, and enter it.

Note: At each wind entry, the descent profile is recomputed. Therefore, it is recommended to enter all winds, temperature, and QNH at the same time in order to minimize recomputation time.

CONSTANT MACH SEGMENT

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

Ident.: DSC-22_20-10-30-22-C-00009334.0001001 / 14 MAY 12

GENERAL

The pilot can enter the start and end points of a constant Mach segment, and its associated Mach number, from the VERT REV page.

Only one constant Mach segment may be defined in the active flight plan, and only one in the secondary flight plan. No constant Mach segment can be defined in the alternate flight plan.

Ident.: DSC-22_20-10-30-22-C-00000491.0008001 / 01 OCT 12

ENTERING A CONSTANT MACH SEGMENT

SELECT the F-PLN key on the MCDU.

SELECT VERT REV at a waypoint.

(Except the destination and alternate flight plan waypoint).

WRITE the Mach/start waypoint pair.

It is possible to enter only the Mach or the waypoint. But, for the first entry, a Mach entry is mandatory.

The waypoint must be located in front of the aircraft and must be part of the cruise.

ENTER it in the 4L field

The END WPT prompt appears in the 4R field.

1L	VERT REV AT GEANT EFOB=12.4 EXTRA=0.8	1R
2L		2R
3L	SPD CSTR ALT CSTR *[] RTA> []*	3R
4L	MACH/START WPT	4R
5L	*[]/GEANT	5R
6L	<WIND STEP ALTS>	6R
① WRITE →	<RETURN .81/PUMAL	

1L	VERT REV AT GEANT EFOB=12.4 EXTRA=0.8	1R
2L		2R
3L	SPD CSTR ALT CSTR *[] RTA> []*	3R
4L	MACH/START WPT .81/PUMAL	4R
5L	<WIND STEP ALTS>	5R
6L	<RETURN ESTAT	6R
② ENTER →	END WPT [][][][][][]	← ENTER ④
③ WRITE →		

WRITE the end waypoint.

The end waypoint must be part of the cruise.

ENTER it in the 4R field.

Intentionally left blank

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT SYSTEM DESCRIPTION - FLIGHT PLANNING
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Diversion

GENERAL

Ident.: DSC-22_20-10-30-30-00000932.0002001 / 16 FEB 11

Applicable to: ALL

Various features are provided to the crew in order to execute a diversion:

- The EQUITIME POINT
- The CLOSEST AIRPORTS pages
- The SECONDARY F-PLN
- The ENABLE ALTN function
- The NEW DEST revision

DIVERSION TO PREPLANNED ALTERNATE AIRPORT

Ident.: DSC-22_20-10-30-30-00000933.0003001 / 16 FEB 11

Applicable to: MSN 02926-02944, 04392, 07784-07792

This would probably occur at the end of the cruise phase, during descent or go-around. The pilot can use this method for diverting if the primary flight plan includes an alternate flight plan from destination to a suitable alternate airport.

When decided to divert to the alternate airport from a given waypoint, simply execute an “ENABLE ALTN” (enable alternate) revision:

SELECT “LAT REV” at a given waypoint

PRESS the “ENABLE ALTN” key

CHECK the temporary flight plan (TMPY F-PLN) and INSERT.

USE the DIR TO function to go to the required waypoint.

Note: *In most cases, the LAT REV shall be selected at the TO waypoint. This will facilitate the subsequent selection of the DIR TO waypoint.*

EN ROUTE DIVERSION WITH SEVERAL AIRPORTS AVAILABLE

 Ident.: DSC-22_20-10-30-30-00009508.0002001 / 16 FEB 11
 Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

SELECT the CLOSEST AIRPORTS page.

1L
LGTS
E F O B
6 . 0
E F F
W I N D
TL025
1R

2L
LGKR
5 . 9

HD045
2R

3L
LGRP
5 . 9

HD045
3R

4L
LGTR
5 . 8

TL025
4R

5L
LGAT
5 . 7

HD070
5R

6L
<RETURN

6R

LIST FROZEN

CLOSEST AIRPORTS

PAGE 2

SELECT the EFOB/WIND prompt.

INSERT the effective wind at selected airport.

CHECK the predictions and CHOOSE the adequate diversion airport.

PREPARE the diversion flight plan on the SEC F-PLN.

Note: Fuel/time predictions on the CLOSEST AIRPORTS page assume managed speed profile.

EN ROUTE DIVERSION WITH SEVERAL AIRPORTS AVAILABLE

Ident.: DSC-22_20-10-30-30-00009508.0004001 / 16 FEB 11
Applicable to: MSN 02926-02944, 04392, 07784-07792

SELECT the CLOSEST AIRPORTS page.

CLOSEST AIRPORTS					
		E F O B	E F F	W I N D	
1L	LGTS	6 . 0		TL 0 2 5	1R
2L	LGKR	5 . 9		HD 0 4 5	2R
3L	LGRP	5 . 9		HD 0 4 5	3R
4L	LGTR	5 . 8		TL 0 2 5	4R
5L	LGAT	5 . 7		HD 0 7 0	5R
6L	LIST FROZEN				6R
	<RETURN				

CLOSEST AIRPORTS
PAGE 2

SELECT the EFOB/WIND prompt, to access the CLOSEST AIRPORTS Page 2.
CHECK/INSERT the effective wind at the selected airports.
CHECK the predictions and CHOOSE the adequate diversion airport.
PREPARE the diversion flight plan on the SEC F-PLN.

Note: Fuel/time predictions on the CLOSEST AIRPORTS page assume managed speed is used.

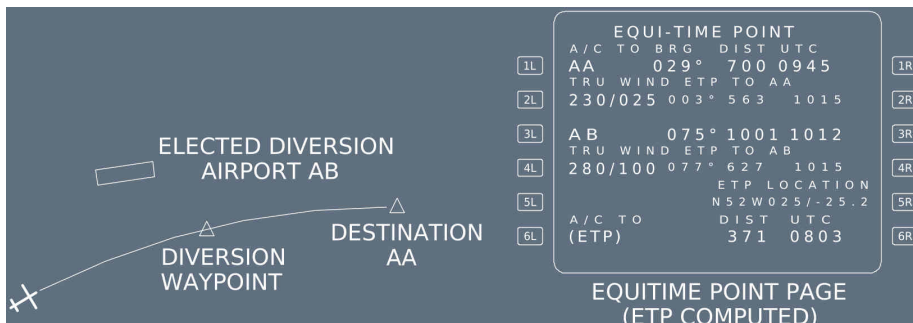
EN ROUTE DIVERSION OVER OCEANIC OR DESERTIC AREA

Ident.: DSC-22_20-10-30-30-00009528.0001001 / 16 FEB 11
Applicable to: ALL

The diversion airports are usually determined before departure or using the CLOSEST AIRPORTS data.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT
SYSTEM DESCRIPTION - FLIGHT PLANNING

SELECT the EQUI-TIME POINT page.



The screenshot shows the EQUI-TIME POINT page with a flight path diagram on the left and data fields on the right. The diagram illustrates a flight path from a starting point (marked with a cross) through a DIVERSION WAYPOINT (marked with a triangle) to a DESTINATION AA (marked with a triangle). An ELECTED DIVERSION AIRPORT AB is also indicated. The data fields are organized into two columns, 1L/3L and 2L/4L, with corresponding 1R/3R and 2R/4R fields on the right. The fields contain the following data:

EQUI-TIME POINT			
A/C TO BRG DIST UTC			
1L	AA	029°	700 0945
TRU WIND ETP TO AA			
2L	230/025	003°	563 1015
AB 075° 1001 1012			
3L	TRU WIND ETP TO AB		
4L	280/100	077°	627 1015
ETP LOCATION			
5L	N 52 W 025 / - 25.2		
A/C TO DIST UTC			
6L	(ETP)	371	0803

EQUITIME POINT PAGE
(ETP COMPUTED)

ENTER the airport ident's in 1L and 3L fields.

ENTER the associated winds in 2L and 4L fields.

CHECK the ETP position and time.

ENTER a predicted time at ETP as time marker.

PREPARE a diversion flight plan on the secondary flight plan.

DIVERSION PREPARATION ON THE SECONDARY FLIGHT PLAN

Ident.: DSC-22_20-10-30-30-00009530.0002001 / 16 FEB 11

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

The following procedure shall be applied for all diversion cases, once the diversion airport has been selected, as well as the "most probable diversion point of the F-PLN":

PRESS the SEC F-PLN key

PRESS the COPY ACTIVE prompt

SELECT a lateral revision at diversion waypoint

ENTER the ident of the diversion airport in the NEW DEST field.

Then finalize the flight plan between the diversion point and the diversion airport. When the diversion airport is no longer applicable or ETP is sequenced, repeat the same procedure for the next diversion airport.

MISCELLANEOUS

Ident.: DSC-22_20-10-30-30-00009531.0002001 / 16 FEB 11

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

In some cases, the diversion airport may be simply chosen using the airports displayed on ND when AIRPORT is selected on the EIS control panel.

During oceanic or deserts area flights, the flight crew may use the PROG page, as follows:

ENTER the ident of the diversion airport in the 4R field of MCDU 1

ENTER the next diversion airport in the 4R field of MCDU 2

Then, the FMS continuously calculated the BRG/DIST to the selected diversion airports.

UPDATE the PROG pages when sequencing the ETP.

EXECUTION OF THE DIVERSION

Ident.: DSC-22_20-10-30-30-00009532.0001001 / 16 FEB 11

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

When the crew decides to divert:

PRESS the SEC F-PLN key.

SELECT the ACTIVATE SEC prompt.

SELECT DIR TO required point.



DIVERSION TO THE ALTERNATE AIRPORT

Ident.: DSC-22_20-10-30-30-00009537.0001001 / 24 NOV 23

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

The primary F-PLN includes an alternate flight plan from destination to the preferred alternate airport. All fuel prediction and management (EXTRA fuel) take the alternate flight plan into consideration. If the crew decides to divert at the end of the cruise, or beyond the last ETP, or in the descent or go-around phases, this will most probably be to the alternate airport.

When the crew decides to divert:

SELECT a lateral revision at suitable waypoint

SELECT ENABLE ALTN prompt

CHECK the temporary flight plan and INSERT
 SELECT DIR TO required waypoint

Note:

- In most cases, the LAT REV shall be selected at the TO WPT. This will facilitate the subsequent selection of the DIR TO waypoint.
- The ALTN flight plan shall be finalized, whenever the landing runway is known by the crew (before arrival briefing).
 In most cases, this will ensure that the most probable flight plan is displayed on the MCDU once ENABLE ALTN is selected.

USING THE SECONDARY FLIGHT PLAN FUNCTION

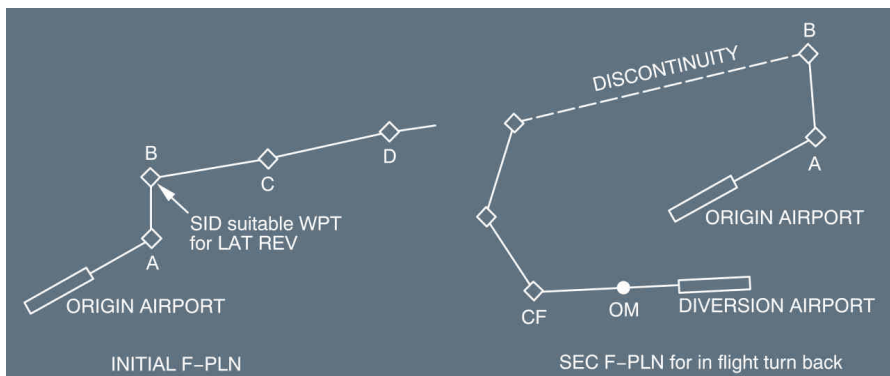
Ident.: DSC-22_20-10-30-30-00000935.0002001 / 19 DEC 12

Applicable to: MSN 02926-02944, 04392, 07784-07792

Use the SEC F-PLN function if a secondary flight plan for diversion has been prepared:

WHILE THE AIRCRAFT IS ON THE GROUND,

you have prepared the lateral path you would expect to use in case of an early in flight turn back (major failure after takeoff or during initial climbout), or the lateral path you would expect to use to land at a nearby diversion airport (weather at origin airport requires a takeoff alternate).

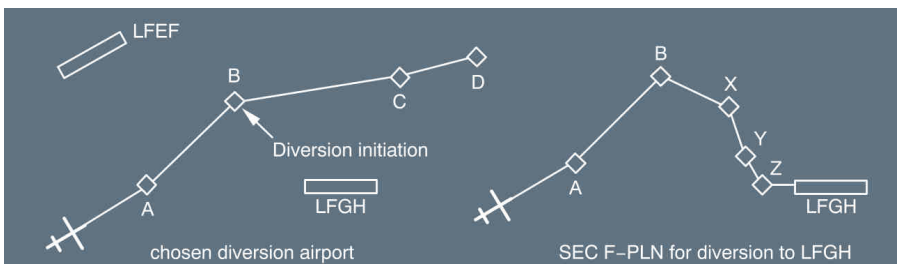


SELECT the “SEC F-PLN” key on the MCDU.
 DEPRESS the “COPY ACTIVE” key.
 SELECT “LAT REV” at a waypoint with a suitable SID.
 ENTER the ident of the diversion airport as the new destination.
 ENTER the expected approach and route.
 DEPRESS the PERF prompt on SEC INDEX page.
 SELECT the PERF APP page of the secondary F-PLN.
 ENTER the QNH and wind.
 SELECT the landing configuration.

TO PREPARE A DIVERSION, IN CRUISE PHASE

The flight crew should consider the adequate diversion airports as the aircraft proceeds along the route of the active flight plan. For this purpose, the CLOSEST AIRPORTS page, EQUI-TIME POINT function, or EFIS “Airports” feature on the ND may be used.

Once selected, the flight crew should enter the diversion airport as the destination of the secondary flight plan, and adjust the routing as required.



SELECT the “SEC F-PLN” function key on MCDU.
 PRESS the “COPY ACTIVE” prompt.
 USE the CLOSEST AIRPORTS page, the EQUI-TIME POINT function, or the “AIRPORT” display on the ND.

Choose an adequate diversion airport and diversion initial waypoint.

SELECT “LAT REV” at the chosen waypoint.
 ENTER the new destination (NEW DEST field).
 MODIFY/COMPLETE the lateral flight plan.

To initiate the prepared diversion:

The flight crew may initiate the diversion prepared in the SEC F-PLN, as follows:

SELECT the “SEC F-PLN” key on the MCDU.
 PRESS the “ACTIVE SEC” prompt [4L].

PERFORM a DIR TO to the desired waypoint in the new active flight plan.

USING NEW DESTINATION FUNCTION

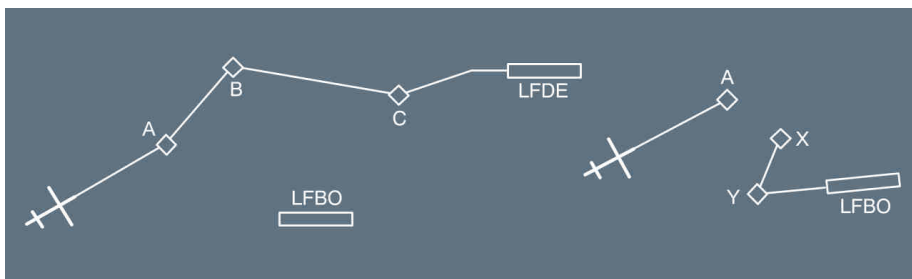
Ident.: DSC-22_20-10-30-00000936.0004001 / 01 OCT 12

Applicable to: MSN 02926-02944, 04392, 07784-07792

If the crew has not prepared a diversion in the SEC F-PLN, the “NEW DEST” function allows to make the required change on the active flight plan.

Because the crew will probably have to initiate the diversion quickly, the revision waypoint will probably be the “TO” waypoint.

The crew will have to adjust the resulting active flight plan in order to have the correct routing to destination and have the applicable performance data entered.



SELECT “LAT REV” at the “TO” waypoint.

ENTER the ident for the new destination in the NEW DEST field (4R).

In the TMPY F-PLN, COMPLETE the lateral flight plan to the diversion airport.

CHECK the TMPY F-PLN, and INSERT.

ENTER/CHECK performance data as applicable.

When the diversion is initiated, USE a “DIR TO” to the appropriate waypoint.

1 SELECT →

2 WRITE →

FROM AIB 104
 UTC SPD/ALT
 AGN 1013 FL220
 UA34 BRG007 116NM
 LMG 1025.70/FL290
 UR10 TAK006 97
 AMB 1038 " / "
 UR10 16

LAT REV FROM LMG
 45°49.0N/001°01.6E

<HOLD []
 ENABLE
 <ALTN []

NEXT WPT
 NEW DEST

AIRWAYS>

<RETURN
 LFBO

FROM TMPY AIB 104
 UTC SPD/ALT
 AGN 1013 FL220
 UA34 BRG007 96 NM
 LMG 1025 0.70/FL290

-- F-PLN-DISCONTINUITY --

LFBO ---- - / - -

END OF FPLN
 TMPY
 <ERASE INSERT *

1R

2R

3R

4R

5R

6R

1R

2R

3R

4R

5R

6R

1R

2R

3R

4R

5R

6R

ENTER **3**

SELECT **4**

Note: The temporary flight plan is displayed if the new destination airport is either in the Navigation Database, or in the pilot-defined runway file. Otherwise, the NEW RUNWAY page will appear so that the pilot can store a new runway.

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EQUITIME POINT

Ident.: DSC-22_20-10-30-00006015.0001001 / 16 MAR 11
Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

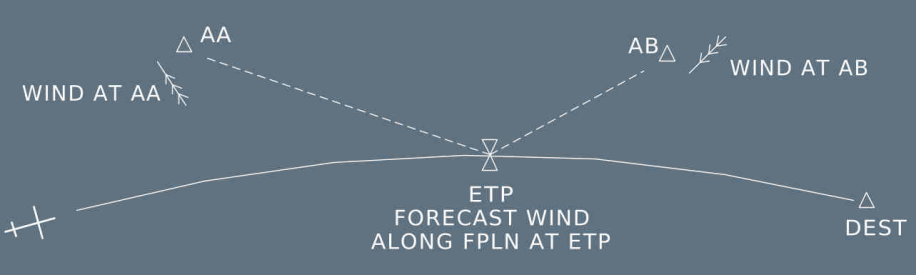
The equitime point page displays the ETP, computed along the F-PLN route between two referenced positions (airports, waypoints or nav aids), defined by the pilot (*Refer to DSC-22_20-20-10-25 Equi - Time Point Page* for the page description).

When first accessing the page, the FMS proposes origin and destination airfields, as defaulted positions.

The pilot may overwrite these two positions and insert the wind in their vicinity at the applicable CRZ FL.

The FMS then computes the resulting ETP, using the managed or selected speed, and blending the forecasted winds along the F-PLN route with the inserted winds.

- The FMS provides:
- TIME and DIST from the aircraft position (or origin on ground) to the ETP
 - The BRG/DIST from the ETP to the defined positions
 - TIME overhead each position, assuming the aircraft flies from the present position to the defined position via the ETP
 - (ETP) pseudo waypoint is displayed on the ND along the F-PLN
 - ETP location in relation to the subsequent waypoint.



EQUITIME POINT

Ident.: DSC-22_20-10-30-00006015.0002001 / 18 MAR 11
Applicable to: MSN 02926-02944, 04392, 07784-07792

The EQUI-TIME POINT page displays the ETP, computed along the F-PLN route between two referenced positions (airports, waypoints or nav aids), defined by the crew (*Refer to DSC-22_20-20-10-28 EQUI - TIME POINT Page* for the page description).

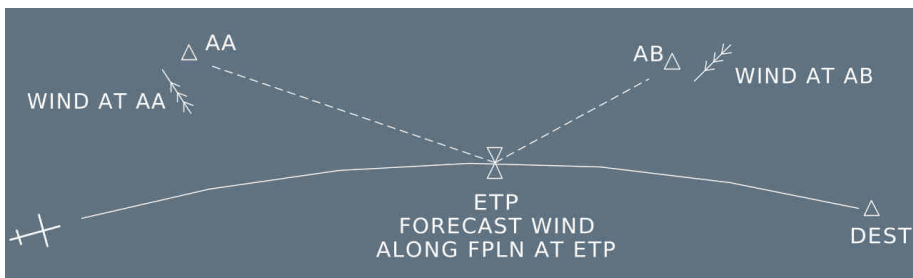
When first accessing the page, the FMS proposes origin and destination airfields, as defaulted positions.

The pilot may overwrite these two positions and insert the wind in their vicinity at the applicable CRZ FL.

The FMS then computes the resulting ETP, using the managed or selected speed, and blending the forecasted winds along the F-PLN route with the inserted winds.

The FMS provides:

- TIME and DIST from the aircraft position (or origin on ground) to the ETP
- The BRG/DIST from the ETP to the defined positions
- TIME overhead each position, assuming the aircraft flies from the present position to the defined position via the ETP
- (ETP) pseudo waypoint is displayed on the ND along the F-PLN
- ETP location in relation to the subsequent waypoint.



EQUITIME POINT ENTRY

Ident.: DSC-22_20-10-30-30-00009536.0001001 / 01 OCT 12

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

PRESS the DATA key.

SELECT the EQUI-TIME POINT prompt.

The EQUI-TIME POINT page is displayed. The origin and destination airports are used by default.

ENTER the REF POINT 1 in the [1L] field.

ENTER the associated wind in the [2L] field.

The wind to be inserted is the wind in the vicinity of the reference point at the CRZ FL.

ENTER the REF POINT 2 in the [3L] field.

ENTER the associated wind in the [4L] field.

The system displays the ETP location with regards to the next waypoint of the active flight plan following the ETP in the [5R] field, and the A/C TO (ETP) predictions in the [6R] field.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT
SYSTEM DESCRIPTION - FLIGHT PLANNING

EQUI-TIME PAGE
AT ACCESS
(DEFAULTED)

EQUI-TIME POINT

A/C TO	BRG	DIST	UTC
LFBO	176°	249	1139
TRU WIND ETP TO LF80			
110°/025	171°	265	1147

1L

2L

3L

4L

5L

6L

A/C TO	BRG	DIST	UTC
EGLL	007°	293	1147
TRU WIND ETP TO EGLL			
185°/045	006°	281	1147

1R

2R

3R

4R

5R

6R

ETP LOCATION
 N 52 W 025 / - 25.2

EQUI-TIME POINT

A/C TO	BRG	DIST	UTC
AA	029°	788	0945
TRU WIND ETP TO AA			
075°/020	003°	563	1015

1L

2L

3L

4L

5L

6L

A/C TO	BRG	DIST	UTC
AB	075°	1001	1012
TRU WIND ETP TO AB			
270°/030	077°	627	1015

1R

2R

3R

4R

5R

6R

ETP LOCATION
 N 52 W 025 / - 25.2

EQUI-TIME POINT

A/C TO	BRG	DIST	UTC
(ETP)		281	1112

- Note:**
- The ETP pseudo-waypoint is not displayed on the MCDU F-PLN page. In order to easily locate it, or when closing the applicable ETP, the TIME MARKER may be used; this allows the crew to visualize it in advance on the F-PLN page or, to prepare the next applicable ETP on the Equi-time Point page
 - The ETP is computed using speed according to the current mode (managed or selected).

EQUITIME POINT ENTRY

Ident.: DSC-22_20-10-30-30-00009536.0002001 / 01 OCT 12

Applicable to: MSN 02926-02944, 04392, 07784-07792

PRESS the DATA key.

SELECT the EQUI-TIME POINT prompt.

The EQUI-TIME POINT page is displayed. The origin and destination airports are used by default.

ENTER the REF POINT 1 in the [1L] field.

ENTER the associated wind in the [2L] field.

The wind to be inserted is the wind in the vicinity of the reference point at the CRZ FL.

ENTER the REF POINT 2 in the [3L] field.

ENTER the associated wind in the [4L] field.

The FMS computes the ETP location (ETP coordinates, and distance between the ETP and the following waypoint on the F-PLN) and displays it in the [5R] field. The FMS also computes predictions related to the ETP (the distance to go, and the predicted time at the ETP) and displays them in the [6R] field.

EQUI-TIME PAGE
AT ACCESS
(DEFAULTED)

EQUI-TIME POINT					
A/C TO	BRG	DIST	UTC		
LFBO	176°	249	1139		
TRU WIND	ETP TO LF80				
110°/025	171°	265	1147		
EGLL	007°	293	1147		
TRU WIND	ETP TO EGLL				
185°/045	006°	281	1147		
ETP LOCATION					
			N 52 W 025 / - 25.2		
A/C TO	DIST		UTC		
(ETP)	281		1112		

EQUI-TIME POINT					
A/C TO	BRG	DIST	UTC		
AA	029°	788	0945		
TRU WIND	ETP TO AA				
075°/020	003°	563	1015		
AB	075°	1001	1012		
TRU WIND	ETP TO AB				
270°/030	077°	627	1015		
ETP LOCATION					
			N 52 W 025 / - 25.2		
A/C TO	DIST		UTC		
(ETP)	371		0953		

- Note:
- The ETP pseudo-waypoint is not displayed on the MCDU F-PLN page. In order to easily locate it, or when closing the applicable ETP, the TIME MARKER may be used; this allows the crew to visualize it in advance on the F-PLN page or, to prepare the next applicable ETP on the Equi-time Point page
 - The ETP is computed using speed according to the current mode (managed or selected).

CLOSEST AIRPORTS

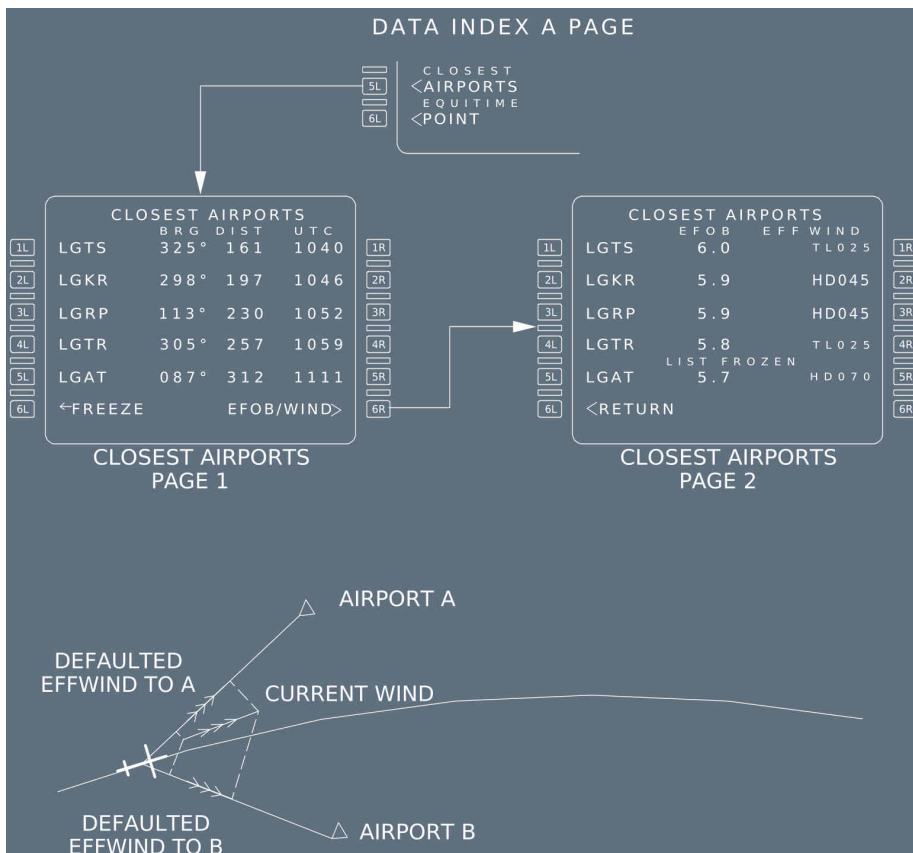
Ident.: DSC-22_20-10-30-30-00006018.0001001 / 07 APR 11

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

The CLOSEST AIRPORTS page displays the four closest airports, from the position of the aircraft, found in the navigation database (Refer to DSC-22_20-10-25 Closest Airports Pages for the page description), and the 5th airport, as selected by the crew.

For each airport, the FM computes:

- The BRG/DIST/ESTIMATED UTC from the position of the aircraft to the corresponding airport.
- The EFOB at the airport, assuming an EFFECTIVE WIND (defaulted or entered by the pilot).



Note: When the CLOSEST AIRPORTS page 2 is selected, the list of airports is automatically frozen, as indicated on the page.

The FUEL/TIME predictions to the closest airports use simplified assumptions:

- Managed speed profile in cruise, with the effective wind from the CLOSEST AIRPORTS page 2. In case of EO, Engine Out condition is considered.
- Continuous descent from CRZ FL down to the airport elevation.

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*Note: In case **SELECTED SPD** is used, the **CLOSEST AIRPORTS** page still provides good use to choose the applicable closest airport for diversion purposes. However, when **SELECTED SPD** is significantly different from **MANAGED SPD**, the predictions in terms of time and fuel must be disregarded since they are misleading.
The predictions may then be checked on the **SEC F-PLN**.*

CLOSEST AIRPORTS

Ident.: DSC-22_20-10-30-30-00006018.0002001 / 23 MAR 11

Applicable to: MSN 02926-02944, 04392, 07784-07792

The **CLOSEST AIRPORTS** page displays the four closest airports, from the position of the aircraft, found in the navigation database (*Refer to DSC-22_20-20-10-28 CLOSEST AIRPORTS Pages* for the page description), and the 5th airport, as selected by the crew.

- For each airport, the FM computes:
- The BRG/DIST/ESTIMATED UTC from the position of the aircraft to the corresponding airport.
 - The EFOB at the airport, assuming an EFFECTIVE WIND (defaulted or entered by the pilot).

DATA INDEX A PAGE

 CLOSEST
 <AIRPORTS
 EQUITIME
 <POINT

CLOSEST AIRPORTS

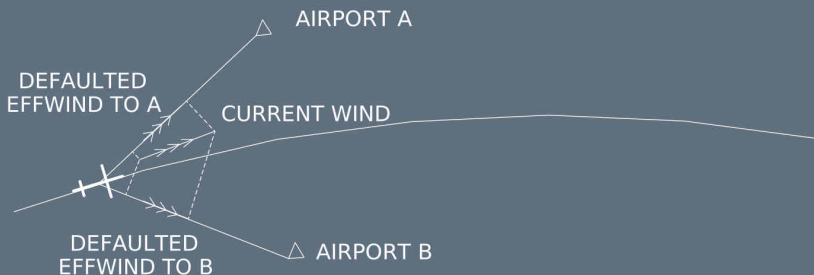
BRG DIST UTC

1L	LGTS	325°	161	1040
2L	LGKR	298°	197	1046
3L	LGRP	113°	230	1052
4L	LGTR	305°	257	1059
5L	LGAT	087°	312	1111
6L	<FREEZE	EFOB/WIND>		

CLOSEST AIRPORTS
PAGE 1
CLOSEST AIRPORTS

EFOB EFF WIND

1L	LGTS	6.0	TL025
2L	LGKR	5.9	HD045
3L	LGRP	5.9	HD045
4L	LGTR	5.8	TL025
5L	LGAT	LIST FROZEN 5.7	HD070
6L	<RETURN		

CLOSEST AIRPORTS
PAGE 2


Note: When the CLOSEST AIRPORTS page 2 is selected, the list of airports is automatically frozen, as indicated on the page.

The FUEL/TIME predictions to the closest airports use simplified assumptions:

- Managed speed profile in cruise, with the effective wind from the CLOSEST AIRPORTS page 2. In case of EO, Engine Out condition is considered.
- Continuous descent from CRZ FL down to the airport elevation.

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Note: *In case **SELECTED SPD** is used, the **CLOSEST AIRPORTS** page still provides good use to choose the applicable closest airport for diversion purposes. However, when **SELECTED SPD** is significantly different from **MANAGED SPD**, the predictions in terms of time and fuel must be disregarded since they are misleading.
The predictions may then be checked on the **SEC F-PLN**.*

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Secondary Flight Plan

SECONDARY FLIGHT PLAN

Ident.: DSC-22_20-10-30-40-00000954.0004001 / 14 MAY 12

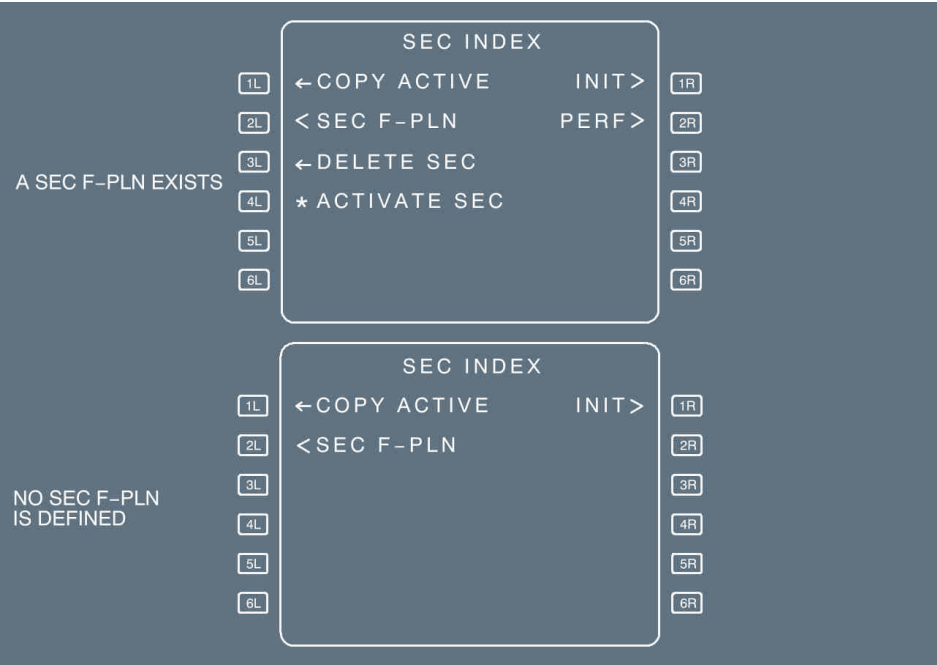
Applicable to: MSN 02926-02944, 04392, 07784-07792

The secondary flight plan (SEC F-PLN) is an alternative flight plan which can be activated when required.

It may include all the vertical elements except history wind data.

The flight crew can:

- Create a secondary flight plan independently from the active flight plan (a secondary flight plan can be created while a temporary flight plan exists).
- Copy it from the active flight plan.
- Delete it completely.
- Activate it, when the “ACTIVATE SEC” prompt is displayed: The secondary flight plan becomes the active flight plan.



AIRCRAFT SYSTEMS**AUTO FLIGHT - FLIGHT MANAGEMENT**

SYSTEM DESCRIPTION - FLIGHT PLANNING

- The screen displays the “ACTIVATE SEC” prompt in flight if:
 - HDG (or TRK) mode is engaged, or
 - NAV mode is engaged, and the active leg of the primary and secondary flight plans is the same.
- The screen displays the “INIT” prompt in all cases.
The FMS sequences the secondary flight plan the same way as the active flight plan, when it is a copy of the active flight plan.

The navigation display shows the secondary flight plan in white. In PLAN mode, the crew can use the slew keys to review the secondary flight plan (as for the primary flight plan).

PREDICTIONS

The FMGS computes predictions using the same performance methods and performance factor it uses for the active flight plan. However, it predicts pseudo waypoints only for the MCDU not for the Navigation Display (ND).

The FMGS does not provide any prediction in the secondary flight plan for the DESCENT, APPROACH and GO AROUND phases.

- **When the flight crew initializes the secondary flight plan with the SEC INIT function:**

The FMGS computes the secondary flight plan predictions as if the aircraft were on ground before engine start. The FMGS computes these predictions one time and does not update them to indicate the progress of the flight (aircraft position, fuel consumption, etc.).

- **When the flight crew initializes the secondary flight plan with the COPY ACTIVE function:**

- The FMGS computes the secondary flight plan predictions as for the active flight plan. However:

- The FMGS stops the update of the predictions if the first leg of the active flight plan is no longer the same as the active leg (i.e. if both flight plans diverge). The flight phase is the same as the flight phase at the time of the divergence.

Note: *This does not apply to the preflight phase, when the FMGS computes the predictions if the departure airports are the same, even if the takeoff runways are different.*

- The FMGS stops the update and the display of the predictions when the aircraft reaches the Top of Descent of the primary flight plan, or the Top of Descent of the secondary flight plan, whichever the aircraft reaches first.
- In the SEC F-PLN, the computed distance between the "TO" waypoint, and the following waypoints may be erroneous when:
 - The SEC F-PLN is created using the COPY ACTIVE function
 - Lateral modifications are performed in either the active, or the SEC F-PLN
 - The "TO" waypoint and/or the following waypoints differ between the ACTIVE, and the SEC F-PLN.

Note: *1. As a result, in the SEC F-PLN, fuel and time predictions are also erroneous because they are computed using the erroneous distance.*

2. If the SEC F-PLN is activated, the resulting ACTIVE F-PLN is not affected: distances and fuel/time computations in the active F-PLN are correct.

- **The flight crew may use the secondary flight plan in the following cases:**

- At takeoff when an alternate takeoff runway is probable
- On ground to initialize the FMGS again if the flight that the flight crew initially prepared is replaced by another flight (*Refer to PRO-NOR-SRP-01-05 Introduction*)
- In flight to prepare a diversion
- In flight when an alternate landing runway is probable
- To prepare the next flight.

SECONDARY FLIGHT PLAN

Ident.: DSC-22_20-10-30-40-00000954.0011001 / 14 MAY 12

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

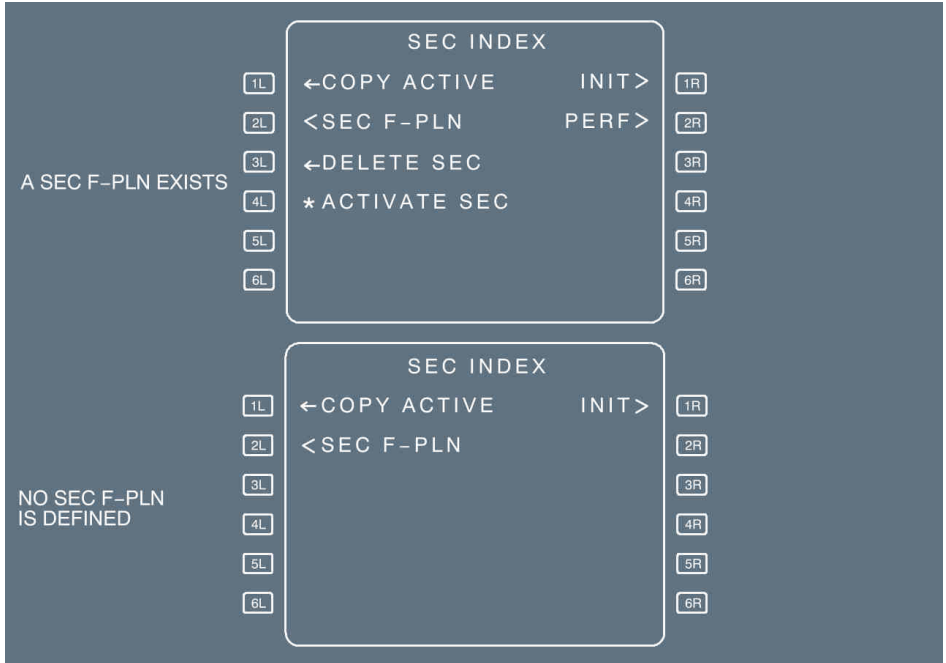
The secondary flight plan (SEC F-PLN) is an alternative flight plan which can be activated when required.

It may include all the vertical elements except history wind data.

The flight crew can:

- Create a secondary flight independently from the active flight plan (a secondary flight plan can be created while a temporary flight plan exists).
- Copy it from the active flight plan.
- Delete it completely.

- Activate it, when the “ACTIVATE SEC” prompt is displayed: The secondary flight plan becomes the active flight plan.



- The screen displays the “ACTIVATE SEC” prompt in flight if:
 - HDG (or TRK) mode is engaged, or
 - NAV mode is engaged, and the active leg of the primary and secondary flight plans is the same.
 The FMS sequences the secondary flight plan the same way as the active flight plan, when it is a copy of the active flight plan.

The navigation display shows the secondary flight plan in white. In PLAN mode, the crew can use the slew keys to review the secondary flight plan (as for the primary flight plan).

PREDICTIONS

The FMGS computes predictions using the same performance methods and performance factor it uses for the active flight plan. However, it predicts pseudo waypoints only for the MCDU not for the Navigation Display (ND).

AIRCRAFT SYSTEMS**AUTO FLIGHT - FLIGHT MANAGEMENT**

SYSTEM DESCRIPTION - FLIGHT PLANNING

- When the flight crew initializes the secondary flight plan with the SEC INIT function:

The FMGS computes the secondary flight plan predictions as if the aircraft were on ground before engine start. The FMGS computes these predictions one time and does not update them to indicate the progress of the flight (aircraft position, fuel consumption, etc.).

- When the flight crew initializes the secondary flight plan with the COPY ACTIVE function:

The FMGS computes the secondary flight plan predictions as for the active flight plan. However:

- The FMGS stops the update of the predictions if the first leg of the active flight plan is no longer the same as the active leg (i.e. if both flight plans diverge). The flight phase is the same as the flight phase at the time of the divergence.

Note: This does not apply to the preflight phase, when the FMGS computes the predictions if the departure airports are the same, even if the takeoff runways are different.

- The flight crew may use the secondary flight plan in the following cases:

- At takeoff when an alternate takeoff runway is probable
- On ground to initialize the FMGS again if the flight that the flight crew initially prepared is replaced by another flight (*Refer to PRO-NOR-SRP-01-05 Introduction*)
- In flight to prepare a diversion
- In flight when an alternate landing runway is probable
- To prepare the next flight.

Optimization**GENERAL**

Ident.: DSC-22_20-10-40-10-00011077.0001001 / 17 AUG 15

Applicable to: ALL

The performance function:

- Optimizes a flight plan
- Computes predictions.

OPTIMIZATION

Ident.: DSC-22_20-10-40-10-00011084.0029001 / 23 JUN 15

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

The FMGC minimizes cost by optimizing the following items:

- Takeoff, approach, and go-around speeds (F, S, Green Dot, VAPP)
- Target speed for CLB, CRZ and DES phases (ECON SPD/MACH)
- Flight Level (for flight crew's information)
- Descent profile from CRZ FL down to the destination airport.

These items depend on the data the flight crew inserts during lateral and vertical flight planning and revision procedures.

Most are displayed on the PERF pages associated with the appropriate flight phases.

WIND PROFILE

To obtain the best predictions, the flight crew must enter the wind for the various flight phases and specifically for waypoints in cruise.

■ ON GROUND:

During flight planning initialization, enter the winds for the climb and cruise phases using the HISTORY WIND and WIND pages. Enter, manually or with ACARS, different wind values in the climb and cruise phases. The system will compute a wind for all waypoints of the F-PLN using linear interpolation between manual/ACARS entries.

The wind profile will be displayed on the F-PLN B page, and is called forecast wind profile.

Flight crew or ACARS entries are displayed in large font, and system-computed winds in small font.

■ IN FLIGHT:

The system updates the predictions and the current ECON speed, using the measured wind at the present position. It combines actual wind and forecast winds to compute the wind ahead of the aircraft, but this is totally transparent to the flight crew.

During cruise, the flight crew will enter the descent winds and the approach wind. The system will update the final predictions, compute the optimum descent profile and compute the optimum speed in descent and approach.

The forecast wind profile will be used to compute fuel and time predictions, as well as ECON speed/Mach targets.

OPTIMUM TAKEOFF, APPROACH AND GO-AROUND SPEEDS

The FMGC computes takeoff speeds (F, S, Green Dot) during the preflight and takeoff phases, using the performance model in the database and the takeoff weight.

The flight crew has to insert V1, VR, and V2 in the PERF TO page manually.

The FMGC uses the performance model and either the predicted landing weight or the current gross weight at transition to the approach phase to compute approach speeds (VLS, VAPP, F, S, Green Dot).

On the PERF APPR page, the selected LDG CONF determines the applicable VLS and VAPP, the latter being updated by the WIND correction that the flight crew enters on the same page. The FMGC uses the performance model and gross weight to compute go-around speeds (F, S, Green Dot).

PERF APPROACH
PAGE

DEST QNH 1015 TEMP []° MAG WIND []°/[] TRANS ALT 4000 VAPP 145 PREV <PHASE	APPR FLP RETR FINAL F=187 VOR33R SLT RETR MDA S=230 640 CLEAN 0=267 LDG CONF CONF3* VLS 135 FULL NEXT PHASE>	1R 2R 3R 4R 5R 6R
--	--	----------------------------------

1L
2L
3L
4L
5L
6L

OPTIMUM TARGET SPEED FOR CLIMB, CRUISE AND DESCENT (ECON SPD/MACH)

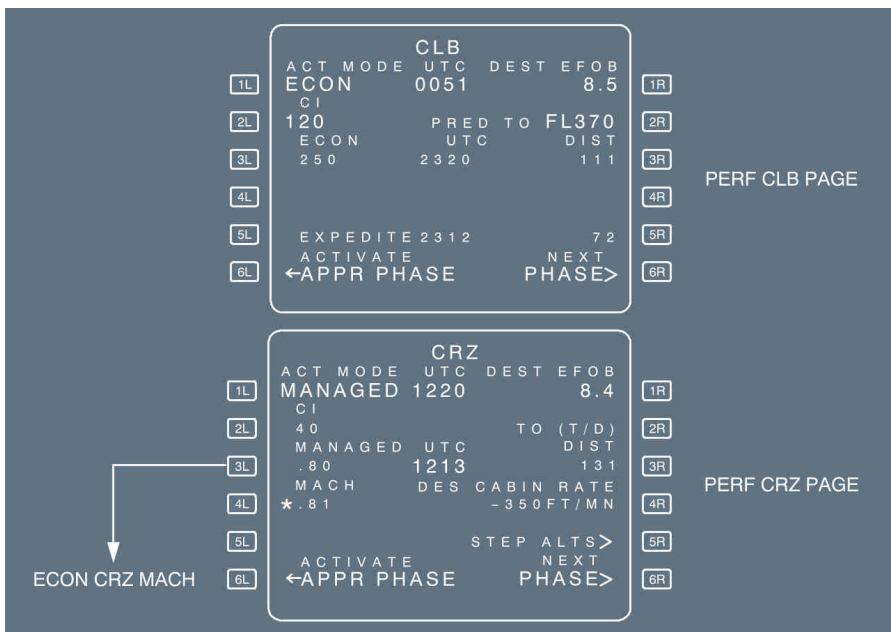
The FMGS computes the optimum target speed (ECON SPD/MACH) as a function of:

- Cost index (CI)
- Cruise flight level (CRZ FL)
- Gross weight (GW)
- Wind and temperature models
- Performance factor.

The computer processes the ECON SPDs for the climb and descent phases before the initiation of the flight phase, and freezes the values once the flight phase becomes active.

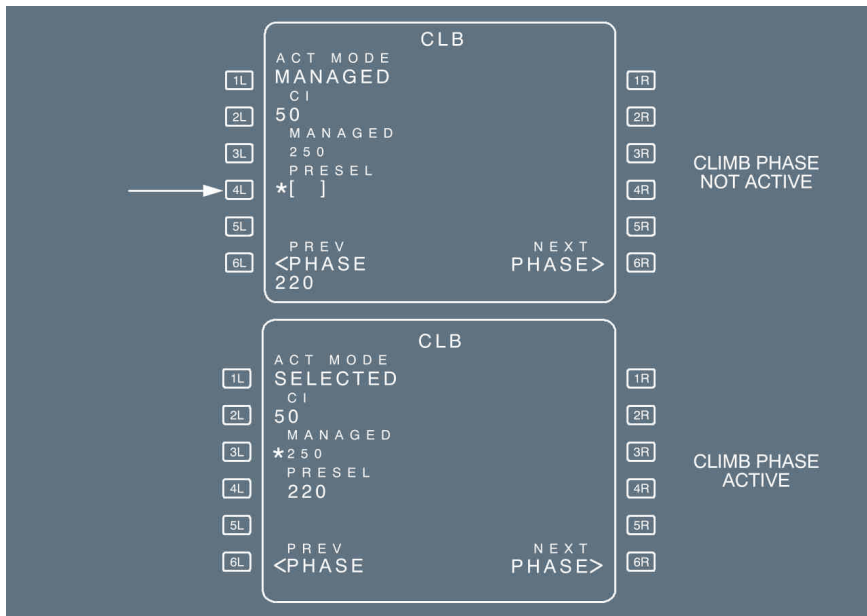
When there is no time or speed constraint/limit, ECON SPEED is the optimum speed for the selected cost index. It refers to fuel and time cost and not directly to fuel saving. The FM calculates ECON CLB, ECON DES and the associated top of climb and top of descent as a function of cost index, cruise FL, and meteo data. The computer continually updates ECON CRUISE MACH (SPD), taking into account current weather conditions and modifications to the flight plan.

Note: If the cruise FL is below FL 250, ECON CRUISE SPEED is computed.
 If the cruise FL is above FL 250, ECON CRUISE MACH is computed.



PRESET TARGET SPEED FOR CLB PHASE

The flight crew can preselect the climb speed before the CLB phase begins, by inserting a speed in the PRESEL field:

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT
SYSTEM DESCRIPTION - PERFORMANCE


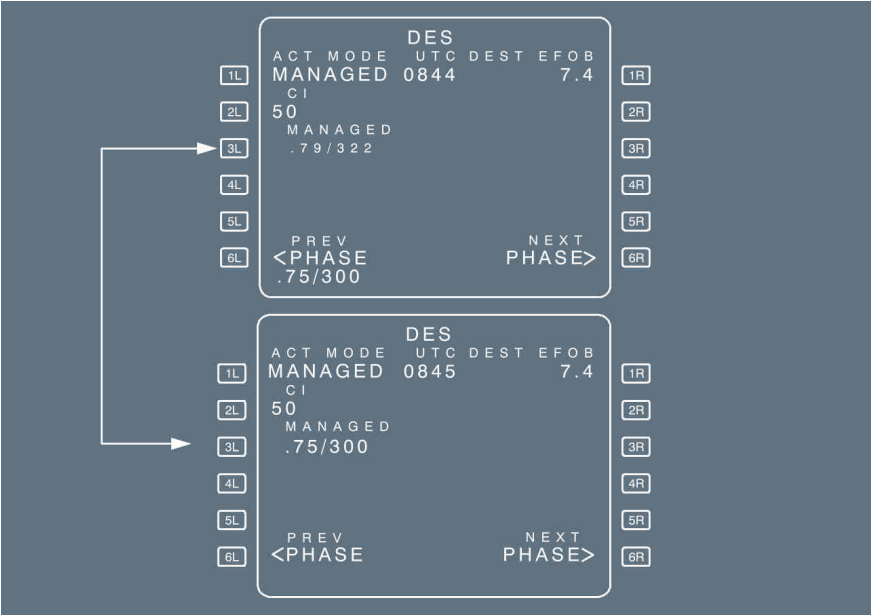
The active mode field changes from MANAGED to SELECTED, and the FM will use the entered speed for climb predictions computation.

The flight crew can revert to managed mode by pressing the 3L key.

PRESET TARGET SPEED/MACH FOR DES PHASE

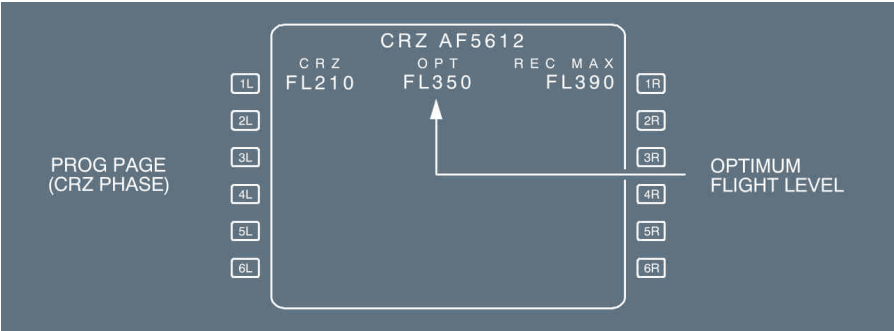
The flight crew can change the speed and/or Mach displayed in the MANAGED field by inserting a speed and/or Mach in the MANAGED field.

Although the entered speed is chosen by the flight crew, the FMGS uses it to compute the descent flight path and top of descent. It is therefore part of the managed descent profile.



The flight crew can revert to the optimum speed/Mach by clearing the 3L field.

OPTIMUM FLIGHT LEVEL



The optimum flight level (OPT FL) indicates the most economic flight level for a given cost index, weight, weather data. It is continuously updated in flight. It requires a 5 min minimum cruise time, at a minimum cruise flight level of FL 100.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT
SYSTEM DESCRIPTION - PERFORMANCE

The OPT FL is a compromise between fuel and time saving. As a result, the flight crew may observe jumps in OPT FL due to GW, ISA, or wind changes. The computation of the OPT FL considers the wind entries made at the different altitudes (normally at the different CRZ FL). When flying the subsequent CRZ FL, the OPT FL proposed by the PROG page may be affected by the wind entries made at the previous CRZ FL; these winds are automatically propagated and may be significantly different from the actual winds.

Note: For simplification purposes, the FCOM/QRH gives the OPT FL at a given Mach number. It does not consider the cost index, therefore the FMGS and the FCOM/QRH values are different.

FM displays OPT FL on the PROG page. The PROG page displays dashes for this quantity when the system detects an engine-out condition.

1L 2L 3L 4L 5L 6L 1R 2R 3R 4R 5R 6R					
ECON CRZ MACH CRZ ACT MODE UTC DEST EFOB SELECTED 1215 8.4 CI 40 MANAGED .82 DES CABIN RATE -300 FT/MN STEP ALTS> ACTIVATE NEXT ←APPR PHASE PHASE> PERF CRZ PAGE					
1L 2L 3L 4L 5L 6L 1R 2R 3R 4R 5R 6R					
PROG CRZ PAGE CRZ AI102 CRZ OPT REC MAX FL290 FL350 FL390 < REPORT UPDATE AT *[] BRG/DIST ---°/--- TO [] PREDICTIVE < GPS GPS PRIMARY REQUIRED ACCUR ESTIMATED 2.0 NM HIGH 0.15 NM OPTIMUM FL					

OPTIMUM DESCENT PATH

The vertical flight path is computed to minimize fuel consumption, while satisfying the various altitude constraints of the F-PLN and the descent speed profile, in order to reach VAPP at 1 000 ft.

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The computer calculates the descent profile before the descent phase is initiated, taking into account:

- All lateral and vertical flight plan data
- The descent and approach winds, as inserted into the DESCENT WIND page and PERF APPR page, and the required maximum cabin rate of descent.

During descent, the descent profile is updated only if the flight plan is modified, or if data for the APPR phase (WIND, VAPP, or LDG CONF) are changed.

OPTIMIZATION
Ident.: DSC-22_20-10-40-10-00011084.0038001 / 03 MAY 23 Applicable to: MSN 02926-02944, 04392, 07784-07792

The FMGC minimizes cost by optimizing the following items:

- Takeoff, approach, and go-around speeds (F, S, Green Dot, VAPP)
- Target speed for CLB, CRZ and DES phases (ECON SPD/MACH)
- Flight Level (for flight crew's information)
- Descent profile from CRZ FL down to the destination airport.

These items depend on the data the flight crew inserts during lateral and vertical flight planning and revision procedures.

Most are displayed on the PERF pages associated with the appropriate flight phases.

WIND PROFILE

To obtain the best predictions, the flight crew must enter the wind for the various flight phases and specifically for waypoints in cruise.

■ ON GROUND:

During flight planning initialization, enter the winds for the climb and cruise phases using the HISTORY WIND and WIND pages. Enter, manually or with AOC, different wind values in the climb and cruise phases. The system will compute a wind for all waypoints of the F-PLN using linear interpolation between manual/AOC entries.

The wind profile will be displayed on the F-PLN B page, and is called forecast wind profile. Flight crew or AOC entries are displayed in large font, and system-computed winds in small font.

■ IN FLIGHT:

The system updates the predictions and the current ECON speed, using the measured wind at the present position. It combines actual wind and forecast winds to compute the wind ahead of the aircraft.

During cruise, the flight crew will enter the descent winds and the approach wind. The system will update the final predictions, compute the optimum descent profile and compute the optimum speed in descent and approach.

The forecast wind profile will be used to compute fuel and time predictions, as well as ECON speed/Mach targets.

OPTIMUM TAKEOFF, APPROACH AND GO-AROUND SPEEDS

The FMGC computes takeoff speeds (F, S, Green Dot) during the preflight and takeoff phases, using the performance model in the database and the takeoff weight.

The flight crew has to insert V1, VR, and V2 in the PERF TAKE OFF page manually.

The FMGC uses the performance model and either the predicted landing weight or the current gross weight at transition to the approach phase to compute approach speeds (VLS, VAPP, F, S, Green Dot).

On the PERF APPR page, the selected LDG CONF determines the applicable VLS and VAPP, the latter being updated by the WIND correction that the flight crew enters on the same page. The FMGC uses the performance model and gross weight to compute go-around speeds (F, S, Green Dot).

		DEST		APPR			
		QNH		FLP RETR FINAL			
1L		1015		F=187 VOR33R		1R	
		TEMP		SLT RETE MDA			
2L		[]'		S=230 640		2R	
		MAG WIND		CLEAN			
3L		[]' / []'		O=267		3R	
		TRANS ALT		LDG CONF			
4L		4000		CONF3*		4R	
		VAPP		VLS			
5L		145		135		5R	
		PREV		NEXT			
6L		<PHASE		PHASE>		6R	

PREF APPROACH PAGE

OPTIMUM TARGET SPEED FOR CLIMB, CRUISE AND DESCENT (ECON/ECON SPD/MACH)

The FMGS computes the optimum target speed (ECON SPD/MACH) as a function of:

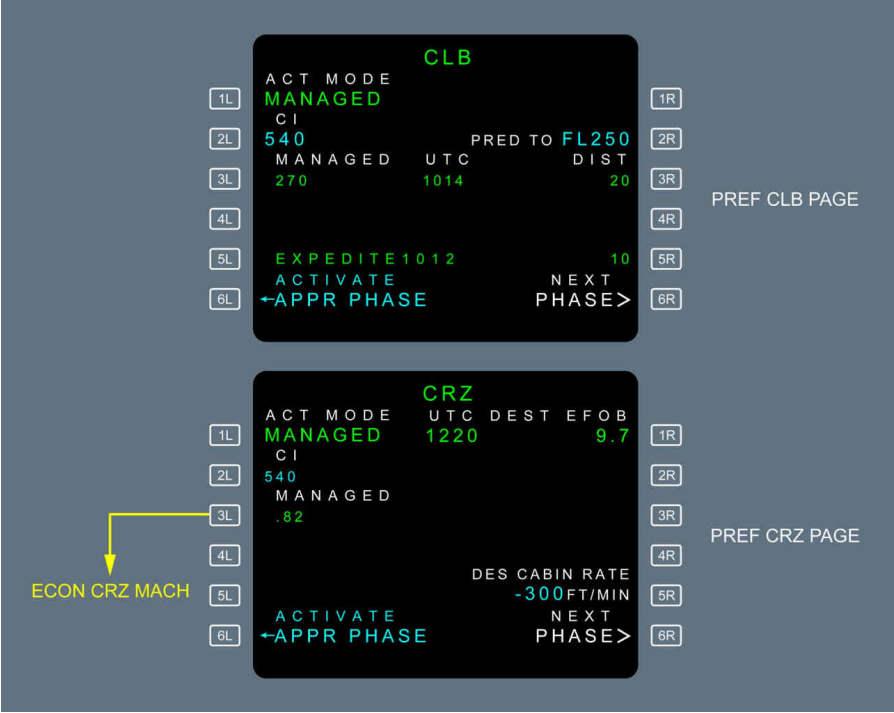
- Cost index
- Cruise flight level
- Gross weight
- Wind and temperature models
- Performance factor.

The computer processes the ECON SPDs for the climb and descent phases before the initiation of the flight phase, and freezes the values once the flight phase becomes active.

When there is no time or speed constraint/limit, ECON SPEED is the optimum speed for the selected cost index. It refers to fuel and time cost and not directly to fuel saving.

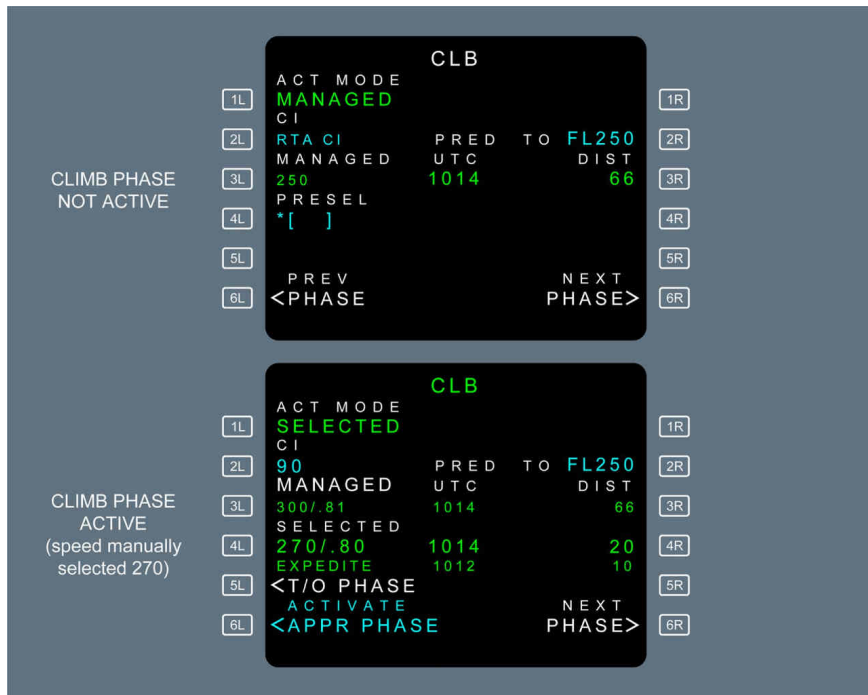
The FM calculates ECON CLB, ECON DES and the associated top of climb and top of descent as a function of cost index, cruise FL, and meteorological data.
The computer continually updates ECON CRUISE MACH (SPD), taking into account current weather conditions and modifications to the flight plan.

*Note: If the cruise FL is below FL 250, ECON CRUISE SPEED is computed.
If the cruise FL is above FL 250, ECON CRUISE MACH is computed.*



PRESET TARGET SPEED FOR CLB PHASE

The flight crew can preselect the climb speed before the CLB phase begins, by inserting a speed in the PRESEL field:



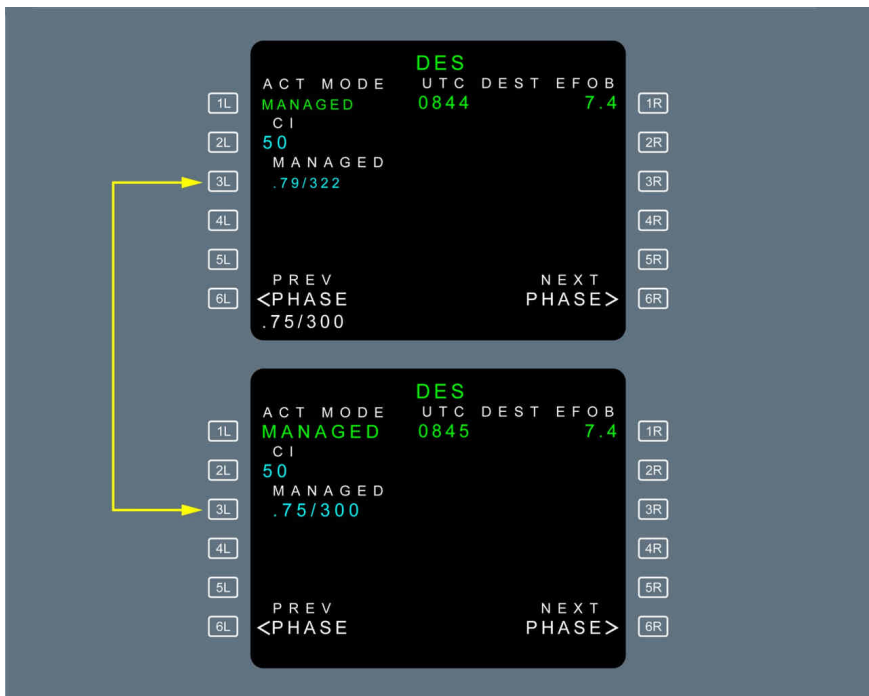
The active mode field changes from **MANAGED** to **SELECTED**, and the FM will use the entered speed for climb predictions computation.

The flight crew can revert to managed mode by pressing the 3L key.

PRESET TARGET SPEED/MACH FOR DES PHASE

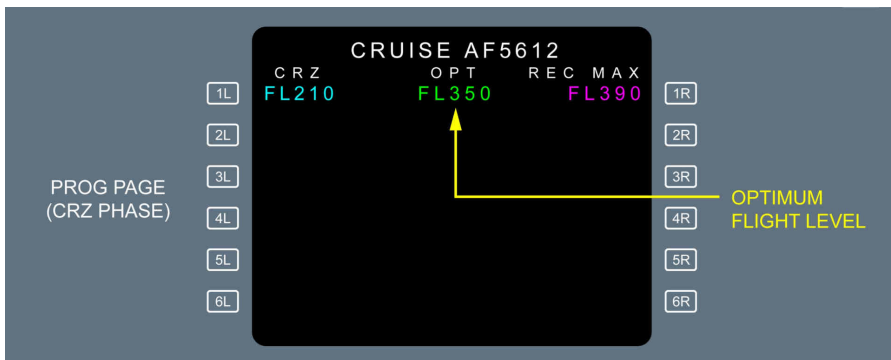
The flight crew can change the speed and/or Mach displayed in the MANAGED field by inserting a speed and/or Mach in the MANAGED field.

Although the entered speed is chosen by the flight crew, the FMGS uses it to compute the descent flight path and top of descent. It is therefore part of the managed descent profile.



The flight crew can revert to the optimum speed/Mach by clearing the 3L field.

OPTIMUM FLIGHT LEVEL

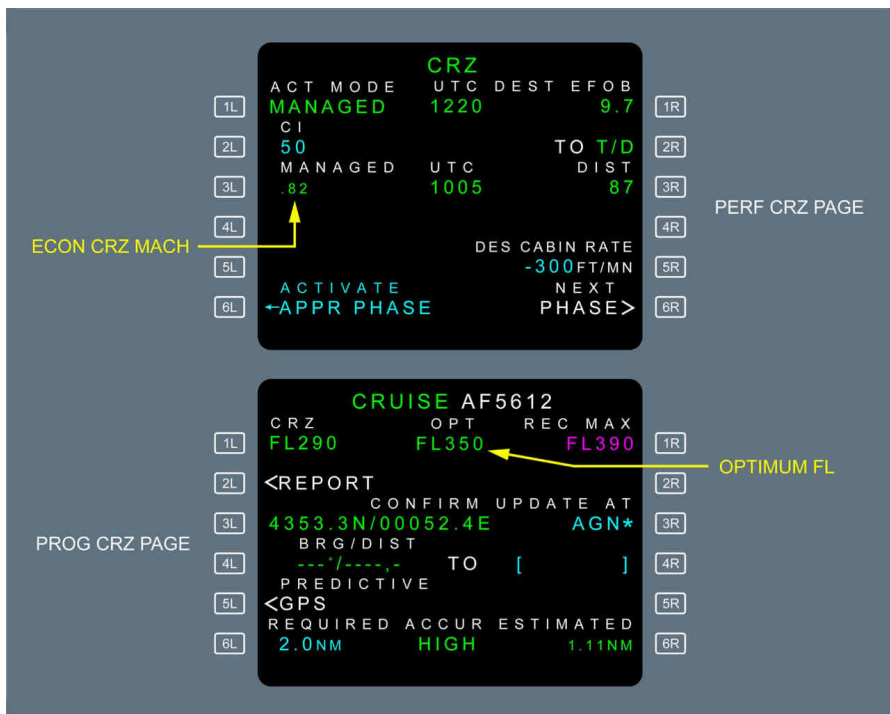


The OPT FL indicates the most economic flight level for a given cost index, weight, weather data. It is continuously updated in flight. It requires a 5 min minimum cruise time, at a minimum cruise flight level of FL 100.

The OPT FL is a compromise between fuel and time saving. As a result, the flight crew may observe jumps in OPT FL due to GW, ISA, or wind changes. The computation of the OPT FL takes into account the wind entries made by the flight crew, as well as the winds propagated by the FMS from previously entered winds.

Note: For simplification purposes, the FCOM/QRH gives the OPT FL at a given Mach number. It does not consider the cost index, therefore the FMGS and the FCOM/QRH values are different.

FM displays OPT FL on the PROG page. The PROG page displays dashes for this quantity when the system detects an engine-out condition.



OPTIMUM DESCENT PATH

The vertical flight path is computed to minimize fuel consumption, while satisfying the various altitude constraints of the F-PLN and the descent speed profile, in order to reach VAPP at 1 000 ft.

The computer calculates the descent profile before the descent phase is initiated, taking into account:

- All lateral and vertical flight plan data
- The descent and approach winds, as inserted into the DESCENT WIND page and PERF APPR page, and the required maximum cabin rate of descent.

During descent, the descent profile is updated only if the flight plan is modified, or if data for the APPR phase (WIND, VAPP, or LDG CONF) are changed.

DESCENT PROFILE OPTIMIZATION

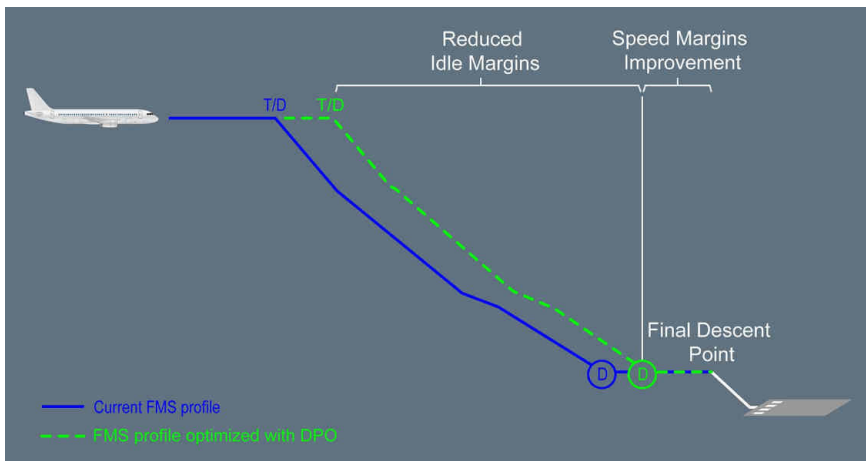
Ident.: DSC-22_20-10-40-10-00019723.0001001 / 07 JUN 16

Applicable to: ALL

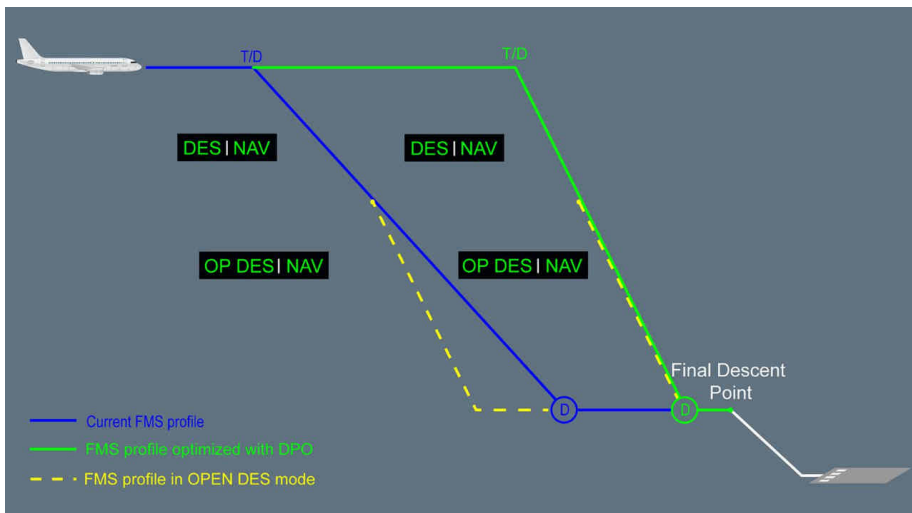
During the idle segment in descent, margins are added to the idle thrust to have more flexibility to maintain the aircraft on the computed descent profile in case of external perturbations such as important wind change.

The Descent Profile Optimization (DPO ) optimizes the computed vertical profile. It decreases the idle thrust margins in descent and the speed margins in approach to reduce fuel burn in descent phase.

With DPO , the computed vertical profile is steeper. The T/D is reached later. Before the final approach, the deceleration level-off is shorter.



With DPO , along the idle segment, without altitude constraint, the descent profile computed by the FMS is the same as the one flown in OPEN DES mode. Therefore, reverting in OPEN DES mode during the descent does not change the descent rate.



With DPO , the FMGS has less flexibility to maintain the aircraft on the computed vertical profile in case of difference between wind entry and effective wind. Therefore, the accurate winds have to be entered in the FMGS before descent.

During descent, the VDEV should be closely monitored. If the aircraft goes above the flight descent profile, the flight crew may have to extend speed brakes to go back on the computed descent profile. If ENG ANTI ICE or ENG ANTI ICE + WING ANTI ICE are used during descent (inducing an increased idle thrust), the flight crew may have to extend speed brakes to stay on the computed descent profile.

Cost Index**COST INDEX (CI)**

Ident.: DSC-22_20-10-40-20-00011041.0001001 / 17 AUG 10

Applicable to: ALL

The cost index is a fundamental input for the ECON SPEED or ECON MACH computation. ECON SPEED and ECON MACH reduce the total flight cost in terms of flight time and fuel consumption (and not only in terms of fuel saving).

CI is the ratio of flight time cost (CT) to fuel cost (CF).

$CI = CT/CF$ (kg/min or 100 lb/h).

CI = 0 corresponds to minimum fuel consumption (Max Range).

CI = 999 corresponds to minimum time.

CI = Long Range Cruise (Refer to PRO-NOR-SRP-01-50 Preparation for Descent and Approach - Cost Index for Long-Range Cruise).

Note: The airline's operations department usually defines the cost index, to optimize each company route. The flight crew does not ordinarily modify the cost index during a flight.

Intentionally left blank

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT SYSTEM DESCRIPTION - PERFORMANCE
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Predictions

GENERAL

Ident.: DSC-22_20-10-40-30-00011080.0002001 / 17 AUG 10

Applicable to: **ALL**

The FMGC computes predictions for the primary and secondary flight plans and displays them on the Multipurpose Control and Display Units (MCDUs), and on the navigation display (ND) of the Electronic Flight Instrument System (EFIS).

The computations use the current state of the aircraft (GW, CG, position, altitude, speed, engaged mode of the autopilot or flight director, time, wind, temperature) for the active flight plan.

The computations use data entered by the flight crew for the secondary flight plan when it is not a copy of the active flight plan. When the secondary flight plan is a copy of the active flight plan, it uses the same data.

PREDICTIONS FOR THE PRIMARY FLIGHT PLAN

Ident.: DSC-22_20-10-40-30-00011085.0001001 / 17 AUG 10

Applicable to: **ALL**

The predictions displayed on the MCDU assume that the FMGS will guide the aircraft along the preplanned lateral and vertical flight plans.

The predictions displayed on the ND assume that the aircraft will continue to operate in the modes (selected or managed) that are currently active.

As long as the aircraft is flying the flight plan under managed guidance, the predictions on the MCDU will match those on the ND.

If the flight crew does not fly the flight plan, the MCDU predictions assume that:

- The flight crew will fly back towards the flight-planned route
- The flight crew will immediately resume flying the FMGC managed modes.

If the flight crew does not fly the managed speed profile, the MCDU predictions assume that they will maintain the selected speed until they reach:

- In the climb or descent phase, the next speed limit or speed constraint if any, or next phase
- In cruise, the top of descent.

Then, the predictions assume that the flight crew will revert to managed speed.

AIRCRAFT SYSTEMS**AUTO FLIGHT - FLIGHT MANAGEMENT**

SYSTEM DESCRIPTION - PERFORMANCE

COMPUTATION OF PREDICTIONS

Ident.: DSC-22_20-10-40-30-00011086.0001001 / 17 AUG 10

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

The system calculates various predictions for the active flight plan and updates them continually during flight as functions of:

- Revisions to the lateral and vertical flight plans
- Cost index
- Current winds and temperature
- Present position versus lateral and vertical flight plans
- Current guidance modes
- Speed control (managed/selected).

The MCDU and the ND show these predictions, each of which is based on specific assumptions.

Note: During computation, prediction fields on the MCDU pages display dashes.

COMPUTATION OF PREDICTIONS

Ident.: DSC-22_20-10-40-30-00011086.0002001 / 17 AUG 10

Applicable to: MSN 02926-02944, 04392, 07784-07792

The system calculates various predictions for the active flight plan and updates them continually during flight as functions of:

- Revisions to the lateral and vertical flight plans
- Cost index
- Current winds and temperature
- Present position versus lateral and vertical flight plans
- Current guidance modes
- Cabin rate of descent
- ZFW/ZFWCG or GW/CG on the FUEL PRED page
- The engine anti-ice status during descent
- QNH on the PERF APPR page
- Speed control (managed/selected).

The MCDU and the ND show these predictions, each of which is based on specific assumptions.

Note: During computation, prediction fields on the MCDU pages display dashes.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT SYSTEM DESCRIPTION - PERFORMANCE
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PREDICTIONS DISPLAYED ON THE NAVIGATION DISPLAY

Ident.: DSC-22_20-10-40-30-00011090.0002001 / 17 AUG 10

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

These predictions consist of symbols positioned along the lateral flight plan (NAV mode engaged) or the track line (NAV mode not engaged). These symbols (named as pseudo waypoints) and their meanings are:

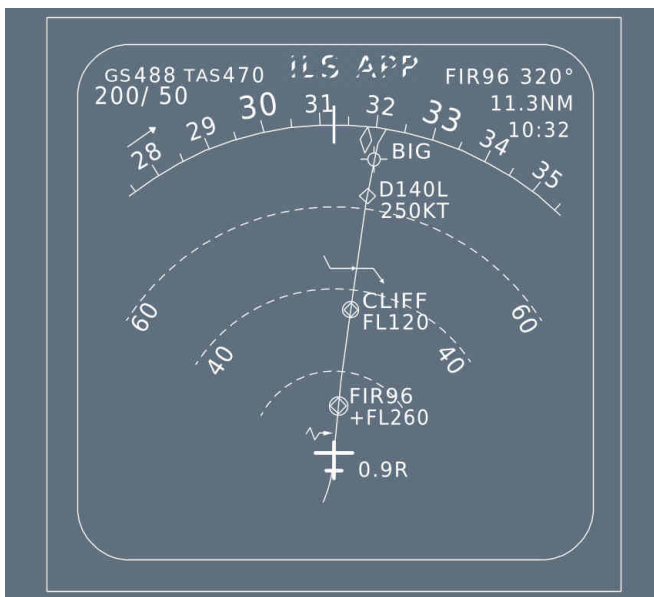
Pseudo waypoint	Definition
	Level symbol at the position (top of climb or level-off) where the aircraft will reach: - The FCU selected altitude (blue) or - The constrained altitude, if it is more restrictive than the FCU altitude and if appropriate modes are engaged (magenta).
	Top of descent or continue descent symbol: - Top of descent (always white) - Continue descent symbol (white if DES is not armed, blue if it is).
	Start of CLIMB symbol: - White if CLB is not armed - Blue if CLB is armed.
	Intercept point symbol: The point where the aircraft is predicted to intercept the descent path, if there is any vertical deviation when the aircraft is in DES mode (white if DES is not engaged, blue if it is).
	Speed change symbol: The point at which the aircraft will initiate an automatic ACCEL or DECEL from current speed to a new computed speed if it encounters a SPD LIM, SPD CSTR, or HOLDING SPD (magenta).
	Decelerate point symbol: - Indicates the point at which the aircraft is predicted to decelerate for approach (and thus switch to the approach phase) - Magenta, if in managed speed and NAV or approach mode is engaged - White, if in selected speed or HDG/TRK mode - Automatic deceleration only occurs when displayed in magenta.
	ALT CSTR symbol set around the constrained waypoint: - Magenta, when the ALT CSTR is predicted to be met - Amber, when the ALT CSTR is predicted to be missed - White, when the ALT CSTR is not taken into account by the FMGS, and the NAV mode is engaged.
 (10 45)  (ETP)	Time marker and equitime point symbols appear in green to indicate where the aircraft reaches the time marker or equitime point.

Continued on the following page

Continued from the previous page

Pseudo waypoint	Definition
	Energy circle symbol (green arc) centered on the aircraft position and oriented to the current track line. Represents the Required Distance to Land. Only displayed if the lateral guidance mode is heading or track, and the current FMS flight phase is in cruise, descent or approach, and the aircraft is within 180 NM of the destination.
Crosstrack error XX.XR or XX.XL (X is a number)	The crosstrack error displays the lateral deviation between the aircraft position and the track of the F-PLN active leg. The value is limited to 99.9 NM left or right.
INTCPT	Intercept waypoint is displayed on the ND at the point at which the present track intercepts the F-PLN.

The predicted time of arrival at the TO WPT is located in the upper right-hand corner of the ND. It assumes direct distance from the aircraft position to the TO WPT and assumes current ground speed will be constant.



As a general rule, the ND indicates what the aircraft will fly, with the current active FG modes.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT SYSTEM DESCRIPTION - PERFORMANCE
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For example:

- The continuous green line on the ND represents the track the aircraft is currently flying:
 - If HDG/TRK is engaged, the track line is green and the flight plan is dashed
 - If NAV mode is engaged, the green line is the flight plan.
- If the speed target is manually selected, the speed-change symbol is no longer displayed because it will not be taken into account.
- When the aircraft is not following the vertical flight plan (OP CLB, OP DES, V/S) but the NAV mode is engaged, the system disregards any altitude constraints and puts white circles around the waypoints that have these constraints and positions level symbols accordingly.
- Pseudo waypoints are adjusted each time predictions are updated.

PREDICTIONS DISPLAYED ON THE NAVIGATION DISPLAY

Ident.: DSC-22_20-10-40-30-00011090.0004001 / 20 JAN 15

Applicable to: MSN 02926-02944, 04392, 07784-07792

These predictions consist of symbols positioned along the lateral flight plan (NAV mode engaged) or the track line (NAV mode not engaged). These symbols (named as pseudo waypoints) and their meanings are:

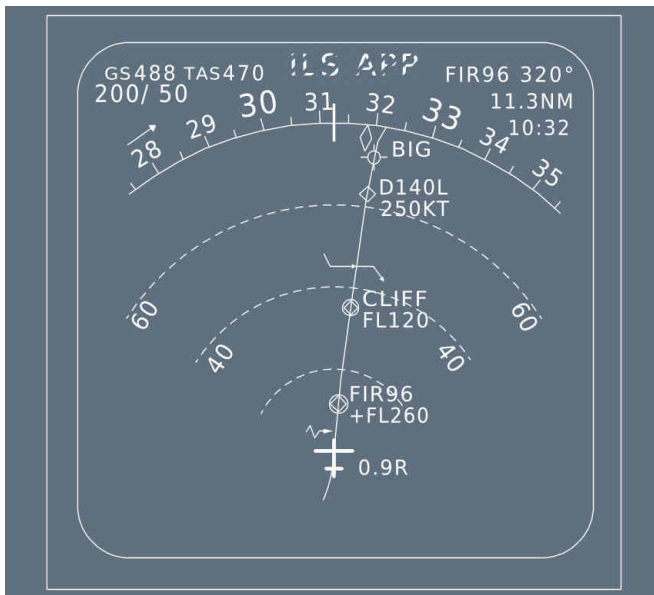
Pseudo waypoint	Definition
	Level symbol at the position (top of climb or level-off) where the aircraft will reach: - The FCU selected altitude (blue) or - The constrained altitude, if it is more restrictive than the FCU altitude and if appropriate modes are engaged (magenta).
	Top of descent or continue descent symbol: - Top of descent (always white) - Continue descent symbol (white if DES is not armed, blue if it is).
	Start of CLIMB symbol: - White if CLB is not armed - Blue if CLB is armed.
	Intercept point symbol: The point where the aircraft is predicted to intercept the descent path, if there is any vertical deviation when the aircraft is in DES mode (white if DES is not engaged, blue if it is).
	Speed change symbol: The point at which the aircraft will initiate an automatic ACCEL or DECEL from current speed to a new computed speed if it encounters a SPD LIM, SPD CSTR, or HOLDING SPD (magenta).

Continued on the following page

Continued from the previous page

Pseudo waypoint	Definition
	Decelerate point symbol: - Indicates the point at which the aircraft is predicted to decelerate for approach (and thus switch to the approach phase) - Magenta, if in managed speed and NAV or approach mode is engaged - White, if in selected speed or HDG/TRK mode - Automatic deceleration only occurs when displayed in magenta.
	ALT CSTR symbol set around the constrained waypoint: - Magenta, when the ALT CSTR is predicted to be met - Amber, when the ALT CSTR is predicted to be missed - White, when the ALT CSTR is not taken into account by the FMGS, and the NAV mode is engaged.
 (10 45)  (ETP)	Time marker and equitime point symbols appear in green to indicate where the aircraft reaches the time marker or equitime point.
	Energy circle symbol (green arc) centered on the aircraft position and oriented to the current track line. Represents the Required Distance to Land. Only displayed in descent and approach phases when a selected lateral mode is engaged (HDG or TRK).
Crosstrack error XX.XR or XX.XL (X is a number)	The crosstrack error displays the lateral deviation between the aircraft position and the track of the F-PLN active leg. The value is limited to 99.9 NM left or right.
INTCPT	Intercept waypoint is displayed on the ND at the point at which the present track intercepts the F-PLN.

The predicted time of arrival at the TO WPT is located in the upper right-hand corner of the ND. It assumes direct distance from the aircraft position to the TO WPT and assumes current ground speed will be constant.



As a general rule, the ND indicates what the aircraft will fly, with the current active FG modes.

For example:

- The continuous green line on the ND represents the track the aircraft is currently flying:
 - If HDG/TRK is engaged, the track line is green and the flight plan is dashed
 - If NAV mode is engaged, the green line is the flight plan.
- If the speed target is manually selected, the speed-change symbol is no longer displayed because it will not be taken into account.
- When the aircraft is not following the vertical flight plan (OP CLB, OP DES, V/S) but the NAV mode is engaged, the system disregards any altitude constraints and puts white circles around the waypoints that have these constraints and positions level symbols accordingly.
- Pseudo waypoints are adjusted each time predictions are updated.

PREDICTIONS DISPLAYED ON THE MCDU

Ident.: DSC-22_20-10-40-30-00011093.0001001 / 14 MAY 12

Applicable to: ALL

The predictions displayed on the MCDU assume that AP (or FD order) is controlling the aircraft and flying it along the preplanned lateral and vertical flight plan.

Therefore:

- If the aircraft is guided along the flight plan (managed guidance), the MCDU predictions correspond exactly to what the aircraft is doing
- If the aircraft is not guided along the flight plan (selected guidance), the MCDU predictions assume that it will return immediately to the flight plan, intercepting at a predetermined angle, and will then proceed under managed guidance
- If the aircraft does not fly the managed speed profile (ECON, SPD CSTR...), the MCDU predictions assume that it will remain at the present selected speed/Mach until it reaches the next SPD CSTR or SPD LIM or enters the next flight phase.

F-PLN A

FROM	AF 5612	→
LSGG23	TIME SPD/ALT	0000 148/ ★1365
TOP9A	BRG 228	6 NM
PAS	0003 210/	5500
HOLD L	TRK 228 12	
7000	0006 " /	7000
(SPD)		0
(LIM)	0006 210/	7000
TOP9A		
D136E	0007 230/	★ FL90
DEST TIME	DIST EFOB	
LGAT33R	0220 992	8.4
		↑↓

1R

2R

3R

4R

5R

6R

F-PLN B

FROM	AF 5612	←
LSGG23	EFOB WIND	15.0 060°/005
TOP9C	BRG 228	6 NM
PAS	14.7	" / 020
HOLD L	TRK 230 12	
7000	14.6	" / 022
(SPD)		0
(LIM)	"	"
TOP9C		5
D136E	14.5	066°/026
DEST TIME	DIST EFOB	
LGAT33R	0220 992	8.4
		↑↓

1R

2R

3R

4R

5R

6R

Note: For secondary flight plan predictions, Refer to DSC-22_20-10-30-40 Secondary Flight Plan.

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TYPE OF PREDICTIONS

Ident.: DSC-22_20-10-40-30-00011113.0002001 / 18 MAR 11

Applicable to: ALL

	MCDU PAGE
Pseudo waypoints: T/C, T/D, S/C, S/D, I/P, SPD LIM, DECEL	F-PLN A and B
TIME/SPD/ALT at each WPT and pseudo-WPT	F-PLN A
ETA/DIST TO DEST along F-PLN/EFOB at destination	F-PLN A and B
EFOB/T-WIND at each WPT and pseudo-WPT	F-PLN B
Constraint symbol * at each constrained WPT (TIME/SPD/ALT)	F-PLN A and B
Altitude error in case of missed ALT constraint	VERT REV
EFOB/EXTRA FUEL at each WPT	VERT REV
TIME/EFOB at destination	FUEL PRED/PERF CLB/CRZ/DES
TIME/DIST to a selected altitude	PERF CLB or DES
Fuel prediction prior engine start	INIT B
REC MAX FL	PROG
TIME/EFOB at Alternate	FUEL PRED
XTRA FUEL for various Alternates	ALTN
VDEV vertical deviation from vertical flight path	PROG

EXAMPLES OF MCDU PREDICTIONS

Ident.: DSC-22_20-10-40-30-00011120.0001001 / 14 MAY 12

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

The following MCDU pages display some of the prediction types.

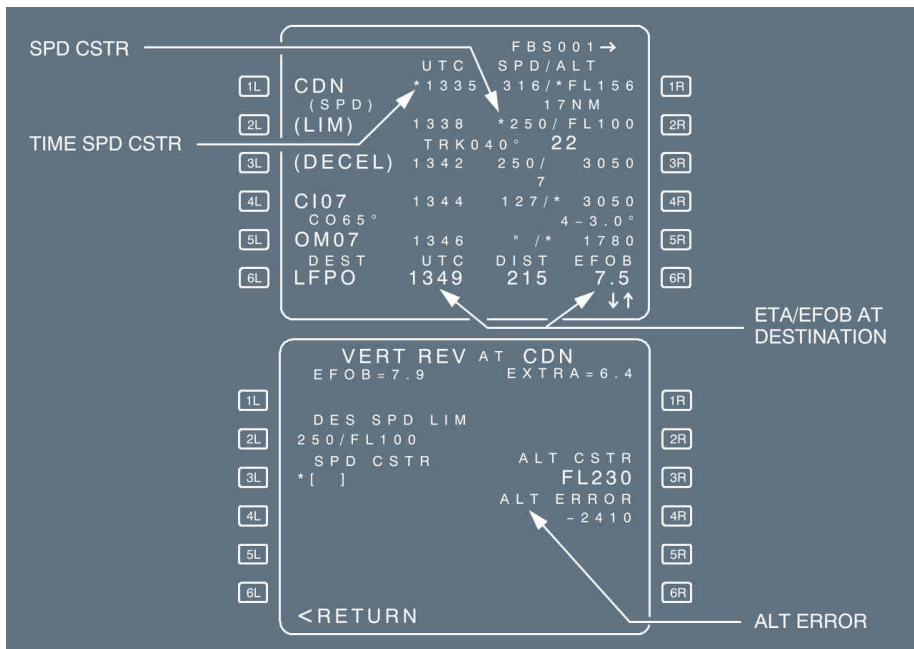
- Pseudo-waypoints:
Top of Climb (T/C), Top-of-Descent (T/D), Start of Climb (S/C) or Start of Descent (S/D) for Step Climb/Descent, Speed Limit (SPD LIM), deceleration to approach phase (DECEL)
- Time, speed, and altitude predictions:
TIME/SPD/ALT for all waypoints and pseudo-waypoints.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT

SYSTEM DESCRIPTION - PERFORMANCE

		UTC	FBS001→ SPD/ALT	
1L	TOU	1254	250 / 4240	1R
	(SPD)		8 NM	
2L	(LIM)	1256	250 / FL100	2R
	LMG3B	TRK337°	2	
3L	OSKAM	1257	315 / FL118	3R
	LMG3B		33	
4L	(T/C)	1302	.79 / FL310	4R
	LMG3B		86	
5L	LMG	1313	" / "	5R
	DEST	UTC	DIST	EFOB
6L	LFP007	1343	325 7.8	6R
	NAV ACCUR UPGRAD		↓↑	

	FROM	UTC	FBS001 SPD/ALT	
1L	OSKAM	1300	270 / FL107	1R
	LMG3B	BRG359°	33 NM	
2L	(T/C)	1322	.79 / FL310	2R
	LMG3B	TRK358°	85	
3L	LMG	1333	" / "	3R
			0	
4L	(S/C)	1333	.79 / FL310	4R
			5	
5L	(T/C)	1333	.79 / FL320	5R
	DEST	UTC	DIST	EFOB
6L	LFP007	1451	450 6.3	6R
			↓↑	



EXAMPLES OF MCDU PREDICTIONS

Ident.: DSC-22_20-10-40-30-00011120.0002001 / 14 MAY 12

Applicable to: MSN 02926-02944, 04392, 07784-07792

The following MCDU pages display some of the prediction types.

- Pseudo-waypoints:

Top of Climb (T/C), Top-of-Descent (T/D), Start of Climb (S/C) or Start of Descent (S/D) for Step Climb/Descent, Speed Limit (SPD LIM), deceleration to approach phase (DECEL)

- Time, speed, and altitude predictions:

TIME/SPD/ALT for all waypoints and pseudo-waypoints.

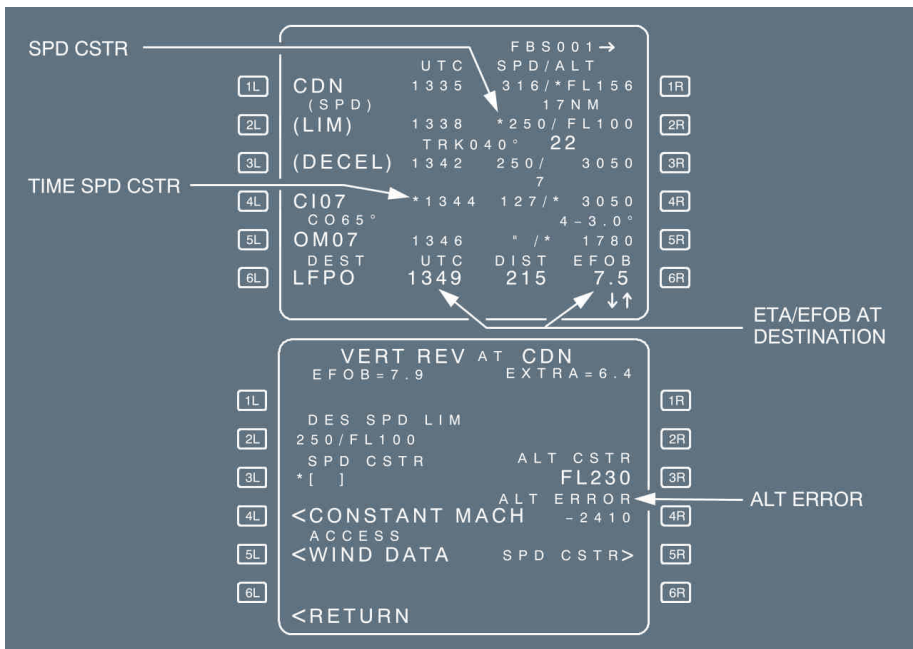
AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

SYSTEM DESCRIPTION - PERFORMANCE

		UTC	FBS001→ SPD/ALT	
1L	TOU	1254	250 / 4240	1R
	(SPD)		8 NM	
2L	(LIM)	1256	250 / FL100	2R
	LMG3B	TRK337°	2	
3L	OSKAM	1257	315 / FL118	3R
	LMG3B		33	
4L	(T/C)	1302	.79 / FL310	4R
	LMG3B		86	
5L	LMG	1313	" / "	5R
	DEST	UTC	DIST	EFOB
6L	LFP007	1343	325 7.8	6R
	NAV ACCUR	UPGRAD	↓↑	

	FROM	UTC	FBS001 SPD/ALT	
1L	OSKAM	1300	270 / FL107	1R
	LMG3B	BRG359°	33 NM	
2L	(T/C)	1322	.79 / FL310	2R
	LMG3B	TRK358°	85	
3L	LMG	1333	" / "	3R
			0	
4L	(S/C)	1333	.79 / FL310	4R
			5	
5L	(T/C)	1333	.79 / FL320	5R
	DEST	UTC	DIST	EFOB
6L	LFP007	1451	450 6.3	6R
			↓↑	



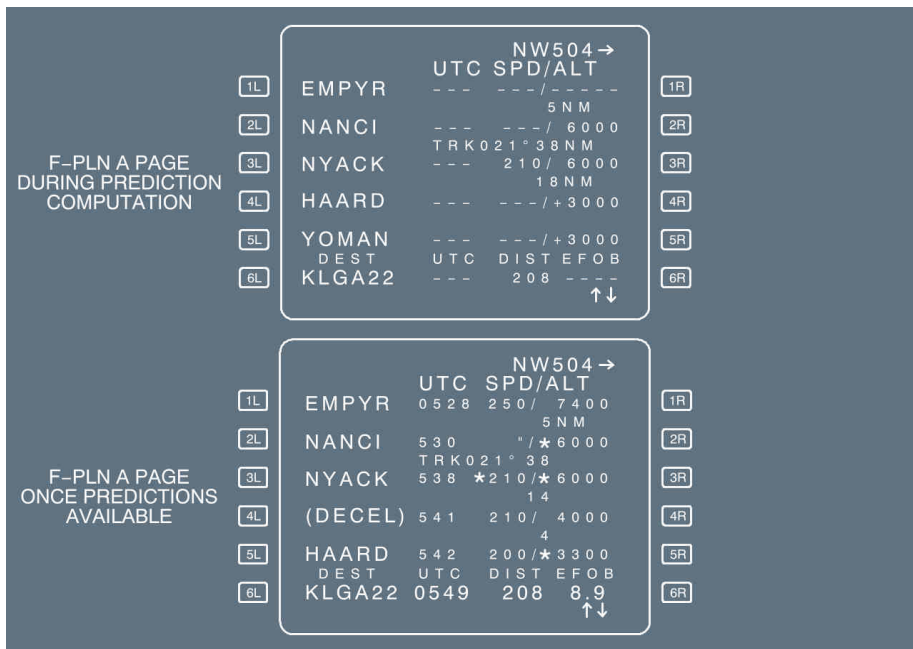
CONSTRAINT SYMBOLS (STAR)

Ident.: DSC-22_20-10-40-30-00011150.0001001 / 14 MAY 12

Applicable to: ALL

When a time speed or an altitude constraint is part of the vertical flight plan, it appears on the F-PLN A page only at the time of insertion, or when predictions are not yet available.

Once available, the time speed and altitude predictions are displayed for all F-PLN waypoints: when a speed or an altitude constraint is at a waypoint, a star symbol appears adjacent to the speed or altitude prediction. If the star is magenta, the constraint is predicted to be matched. If the star is amber, the constraint is predicted to be missed.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT
SYSTEM DESCRIPTION - PERFORMANCE


Note: If an altitude constraint is predicted as missed, the system tells you what will be the error at the specific waypoint.

VERTICAL DEVIATION

Ident.: DSC-22_20-10-40-30-00011139.0001001 / 29 SEP 15

Applicable to: ALL

During descent, the system indicates to the flight crew the vertical deviation from the computed descent profile (PFD and MCDU) and predicts where the flight crew can rejoin it.
 VDEV on the PFD and PROG page, predictions on the MCDU F-PLN page, symbols on the ND, enable assessment to the vertical position versus the computed flight profile.

OPERATION RULES CONCERNING PREDICTIONS

Ident.: DSC-22_20-10-40-30-00011140.0001001 / 17 AUG 10

Applicable to: ALL

The flight crew must properly update the flight plan data during the flight, in order to obtain accurate and meaningful predictions.

The flight crew should rely on the ND for short-term predictions. It indicates what the aircraft will do under the currently engaged modes (selected or managed).

The flight crew should rely on the MCDU for long-term predictions, when managed guidance is active or about to be reengaged.

OTHER COMPUTATIONS

OTHER COMPUTATIONS - ENGINE-OUT CASE

Ident.: DSC-22_20-10-40-30-A-00011141.0002001 / 17 AUG 10

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

ENGINE-OUT CASE

The FMGS computes an engine-out target speed for each flight phase. It computes an engine-out maximum altitude at long-range cruise speed, and displays it on the PROG page.

The new speed target becomes Green Dot in climb, and EO CRZ SPD in cruise.

The system computes the flight plan predictions down to the primary destination. If the aircraft is above EO MAX ALT, the predictions are computed, assuming that a drift down descent will immediately be performed to reach EO MAX ALT.

Ident.: DSC-22_20-10-40-30-A-00011141.0004001 / 17 AUG 10

Applicable to: MSN 02926-02944, 04392, 07784-07792

ENGINE-OUT CASE

The FMGS computes an engine-out target speed for each flight phase. It computes an engine-out maximum altitude at long-range cruise speed, and displays it on the PROG page.

The new speed target becomes Green Dot in climb, and EO CRZ SPD in cruise.

The system computes the flight plan predictions in all phases (except takeoff phase) down to the primary destination.

Ident.: DSC-22_20-10-40-30-A-00011142.0001001 / 03 MAY 23

Applicable to: ALL

RECOMMENDED MAXIMUM ALTITUDE (REC MAX)

The recommended maximum altitude is the lowest of the maximum altitude that:

- The aircraft can reach with a 0.3 g buffet margin
- The aircraft can fly in level flight at MAX CRZ rating
- The aircraft can maintain a V/S of 300 ft/min at MAX CLB thrust
- The aircraft can fly at a speed above the Green Dot and below the VMO/MMO
- The aircraft is certified at.

The REC MAX altitude is displayed on the PROG page.

Anti-ice is not taken into account for this computation. If icing conditions are expected, use the performance application of the EFB.

A maximum altitude using a 0.2 g buffet margin is also computed. It is not displayed, but the system uses it to limit CRZ ALT entry.

Ident.: DSC-22_20-10-40-30-A-00011250.0001001 / 17 AUG 10

Applicable to: **ALL**

PREDICTIONS FOR ALTERNATES

Predictions for alternates are displayed on the ALTERNATES page.

ALTERNATES FOR LGAT				
ALT N	COR TE			
LGTS 1987				1907
2AB3	TRK	EXTRA	DIST	
←LGTS	325°	0.9	161	
7113				
←LGRP	113°	0.7	230	
7113				
←LGKR	298°	0.8	197	
2828				
←LGTR	305°	0.5	257	
<RETURN				

They are based on:

- A default cruise FL equal to 220, if the airway distance is less than 200 NM. Otherwise, it is FL 310
- Simplified wind/temperature models, based on flight crew entries:
 - ALT CRZ wind, as entered on the FUEL PRED page
 - CRZ temperature interpolated from the temperature model for the primary flight plan.
- Airway distance, or direct distance, as provided by the database (manual entry, if not in the database)
- Cost index = 0 (minimum fuel)
- Initial aircraft weight equal to landing weight at primary destination.

Note:

1. No step can be inserted in an alternate flight plan
2. No predictions are displayed for the selected alternate on flight plan pages. However, the flight crew can read ALT N trip fuel and time on the INIT B page before engine start, and estimated time and estimated fuel on board at alternate on the FUEL PRED page after engine start.

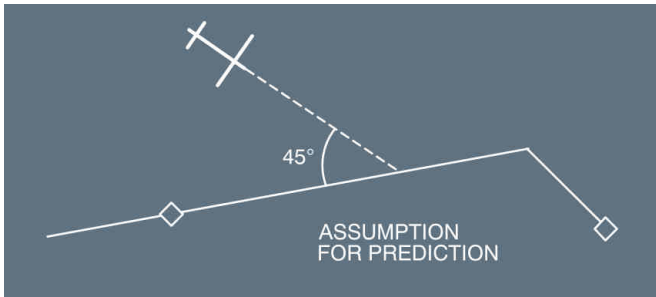
 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT SYSTEM DESCRIPTION - PERFORMANCE
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RETURN-TO-TRAJECTORY ASSUMPTIONS

Ident.: DSC-22_20-10-40-30-00011148.0001001 / 19 DEC 12

Applicable to: ALL

If the aircraft is not on the lateral flight plan, predictions assume an immediate return to the active lateral leg with a 45 ° convergence angle, or that it will fly directly to the “TO” waypoint, when the required convergence angle is greater than 45 °.



ENERGY CIRCLE

Ident.: DSC-22_20-10-40-30-00011144.0001001 / 17 AUG 10

Applicable to: ALL

The energy circle is a green arc, centered on the aircraft's position and oriented towards the current track line. It is displayed on the NDs during descent, when HDG or TRK mode is selected. It represents the required distance to land from the aircraft's position down to airport elevation at VAPP speed, considering all speed constraints on the vertical profile.

INTRODUCTION TO PERF AND IDLE FACTORS

Ident.: DSC-22_20-10-40-30-00014856.0001001 / 31 JAN 13

Applicable to: ALL

The FMGS contains a performance database to compute the predictions and the performance data. This performance database has a model of several aircraft configurations (aircraft type/engine model) to tune the performance and the FMGS predictions. For some aircraft configurations, the model can differ from the real aircraft performance. In these cases, the FMGS has to correct the computation of the performance and the predictions. This is the aim of PERF and IDLE factors. With time, the real aircraft drag and engine performance can deviate from the nominal model. The airline Flight Operations should periodically revise the value of these factors to adapt FMGS predictions to actual aircraft performance.

Note: The IDLE factor is not available on aircraft with FMS1 Honeywell Legacy.

AIRCRAFT SYSTEMS**AUTO FLIGHT - FLIGHT MANAGEMENT****SYSTEM DESCRIPTION - PERFORMANCE****PERF FACTOR****Applicable to: ALL**

Ident.: DSC-22_20-10-40-30-B-00011145.0001001 / 30 JAN 13

GENERAL

The FMGS uses the PERF factor to correct the predicted fuel flow that is used for the computation of the fuel predictions.

The PERF factor modifies the predicted fuel flow, according to the following formula:

$$FF_{pred} = FF_{model} \times \left(1 + \frac{PERF\ FACTOR}{100} \right)$$

FF_{pred} is the FF used for prediction.

FF_{model} is the FF from the aero-engine model.

This correction is applied throughout the entire flight, and modifies the performance predictions and the ECON speed or Mach.

For example: Entering a PERF factor of +1.5 means that Flight Operations have evaluated the aircraft fuel deviation as 1.5 %, compared to the basic performance model (0.0).

IDLE FACTOR**Applicable to: ALL**

Ident.: DSC-22_20-10-40-30-D-00014861.0001001 / 29 SEP 15

GENERAL

The FMGS uses the IDLE factor to adjust the computation of the vertical profile during the descent phase (IDLE segment).

The FMGS computes the vertical profile and the predictions from the Top of Descent (T/D) to the first altitude constraint with the following assumptions:

- The aircraft has a given thrust
- The aircraft has a given speed (within the speed target range).

The IDLE Factor adjusts the value of the given thrust by an addition of a delta (DELTA) thrust to IDLE thrust. With this additional thrust, the IDLE Factor gives flexibility to maintain the aircraft on the computed vertical profile in case of external perturbations such as windy conditions (previously entered by the flight crew in WIND pages).

Depending on the IDLE factor value, the FMGS modifies the position of the T/D and computes a vertical profile in function of the given thrust (IDLE + DELTA).

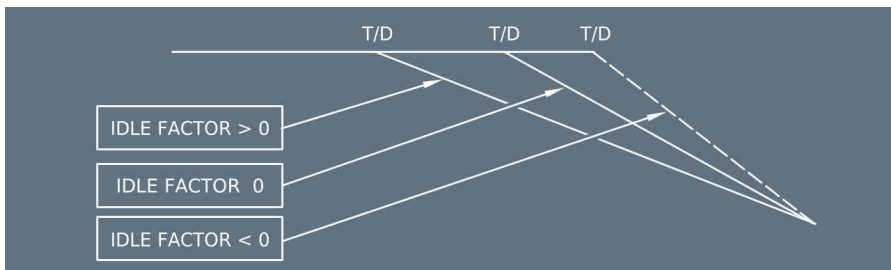
Therefore, the IDLE factor has a direct impact on:

- The computation of vertical profile
- The capability of the aircraft to maintain the vertical profile.

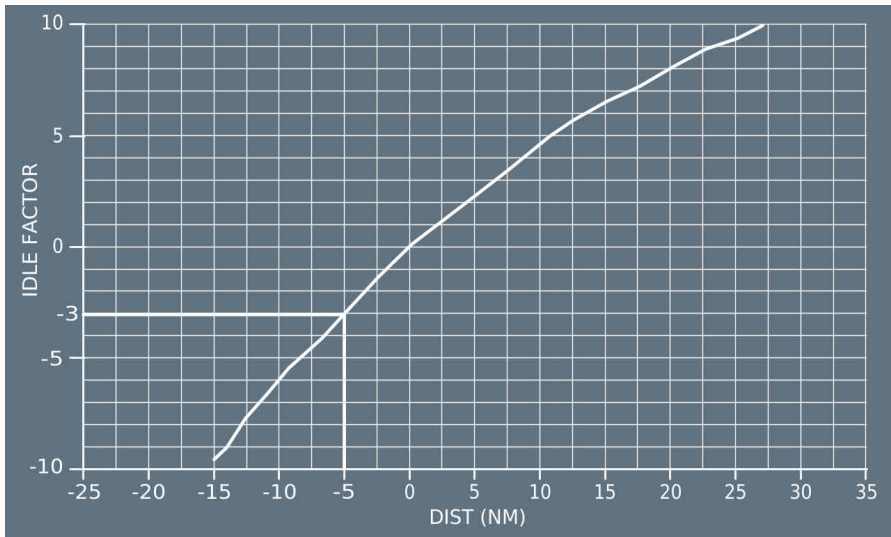
Ident.: DSC_22_20-10-40-30-D-00014862.0001001 / 23 JUN 15

IMPACT ON VERTICAL PROFILE

- If the IDLE factor is positive, the vertical profile is less steep than with IDLE factor 0. The descent phase starts earlier.
- If the IDLE factor is negative, the descent path is steeper than with IDLE factor 0. The descent phase starts later.



The following graph provides an example (average values) of the IDLE factor's effect on descent length:

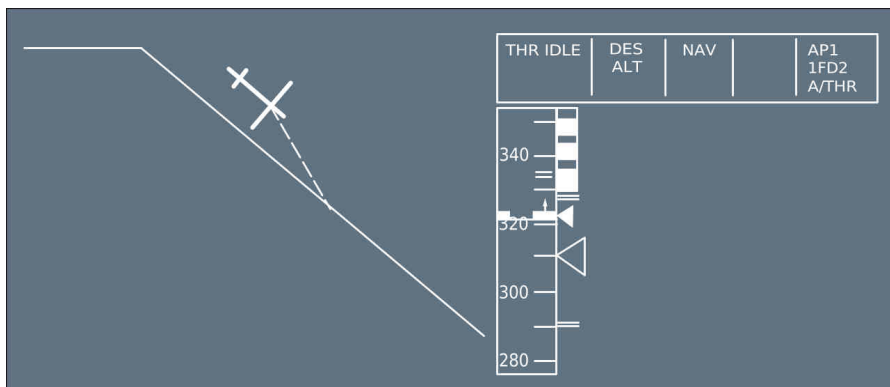


Example: An IDLE factor of -3 decreases the computed descent length by 5 NM.

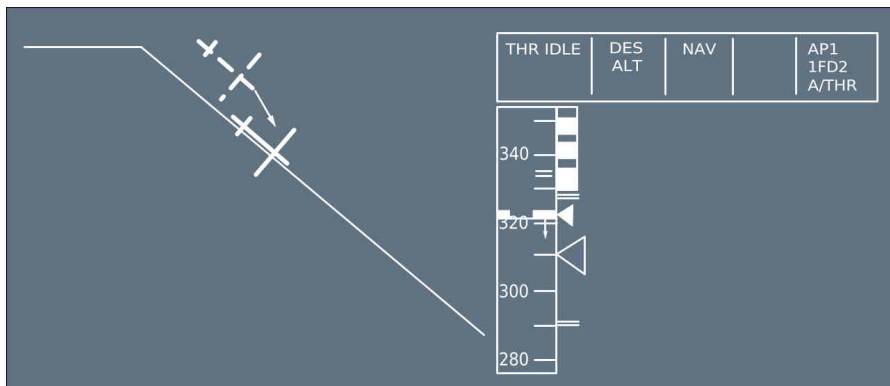
IMPACT ON GUIDANCE

In DES mode, the FMGS maintains the aircraft on the vertical profile and keeps the IAS within the speed target range.

If the aircraft deviates above the profile, the IAS will increase to return to the vertical profile.



When the aircraft returns to the descent profile, the IAS will decrease to the target speed.



 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT SYSTEM DESCRIPTION - PERFORMANCE
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PROCEDURE TO MODIFY THE PERF AND IDLE FACTORS
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Ident.: DSC-22_20-10-40-30-00014857.0001001 / 30 JAN 13

Applicable to: ALL

PROCEDURE TO MODIFY THE PERF AND IDLE FACTORS (ON GROUND ONLY)

- PRESS the MCDU DATA key and then the A/C STATUS prompt in order to access the A/C STATUS page
- For aircraft with FMS2 Honeywell or Thales:
 - ENTER the change code in the CHG CODE field.
The default value for this code is "ARM" but it is possible to modify it on airline request. The applicable code is then coded in the Airline Modifiable Information (AMI).
When a valid change code is entered, the IDLE and PERF factors are displayed in blue.
 - ENTER the new IDLE and PERF factors in the MCDU scratchpad separated by a "/".
For example: "-2/+1"
 - PRESS the corresponding key to insert the new IDLE and PERF factors.
The new IDLE and PERF factors are displayed in large blue font.

Note: *Only authorized personnel should take the responsibility to update the IDLE and PERF factor values.*

- For aircraft with FMS1 Honeywell Legacy:
 - ENTER the new PERF factor in the MCDU scratchpad.
 - PRESS the corresponding key to insert the new PERF factor.
The new PERF factor is displayed in large blue font.

Note: *1. Only authorized personnel should take the responsibility to update the PERF factor value.*

2. The IDLE Factor is not available on aircraft with FMS1 Honeywell Legacy.



A318/A319/A320/A321
FLIGHT CREW
OPERATING MANUAL

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

SYSTEM DESCRIPTION - PERFORMANCE

Intentionally left blank

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT SYSTEM DESCRIPTION - ENGINE OUT
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GENERAL

Ident.: DSC-22_20-10-50-00000937.0001001 / 16 FEB 11

Applicable to: ALL

When the FMGS detects an engine-out condition, the following occurs:

FLIGHT MANAGEMENT PART

Ident.: DSC-22_20-10-50-00000938.0030001 / 16 MAR 11

Applicable to: MSN 04392, 07784-07792

- The managed target speeds is immediately set to a value that depends upon the flight phase
- The following pilot entries are deleted: preselected speeds, steps, time constraints
- No predictions are available for the ALTN flight plan, and the associated fields are dashed
- Predictions on the secondary flight plan are lost, if it is a copy of the active flight plan
- The PROG page shows the engine-out maximum recommended (EO MAX REC) altitude
- The system automatically calls up the current performance page, which has the EO CLR (engine-out clear) prompt displayed in the 1R field (except during takeoff, before the diversion point is reached).

If the crew presses the EO CLR, the 2 engine predictions and performance will be restored.

Reverting back to one engine-out performance is not possible, unless the system detects a new EO condition. Therefore, the pilot should not press the EO CLR key, if an actual engine-out is detected

FLIGHT MANAGEMENT PART

Ident.: DSC-22_20-10-50-00000938.0020001 / 16 FEB 11

Applicable to: MSN 02926-02944

- The managed target speeds is immediately set to a value that depends upon the flight phase
- The following pilot entries are deleted: preselected speeds, steps, time constraints
- No predictions are available for the ALTN flight plan, and the associated fields are dashed
- Predictions on the secondary flight plan are lost, if it is a copy of the active flight plan
- The PROG page shows the engine-out maximum recommended (EO MAX REC) altitude

AIRCRAFT SYSTEMS**AUTO FLIGHT - FLIGHT MANAGEMENT**

SYSTEM DESCRIPTION - ENGINE OUT

- The system automatically calls up the current performance page, which has the EO CLR (engine-out clear) prompt displayed in the 1R field (except during takeoff, before the diversion point is reached).
If the crew presses the EO CLR, the 2 engine predictions and performance will be restored. Reverting back to one engine-out performance is not possible, unless the system detects a new EO condition. Therefore, the pilot should not press the EO CLR key, if an actual engine-out is detected
- It is not permitted to use the autopilot to perform non precision approaches in engine-out in the following modes: FINAL APP, NAV V/S, NAV/FPA. Only FD use is authorized.

FLIGHT MANAGEMENT PART

Ident.: DSC-22_20-10-50-00000938.0026001 / 16 MAR 11

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

- The managed target speeds is immediately set to a value that depends upon the flight phase
- All preselected speeds entered in the MCDU are deleted
- Step climb (or step descent), if entered, is deleted
- The time constraint is deleted
- The PROG page shows the engine-out maximum recommended (EO MAX REC) altitude
- The system automatically calls up the current performance page, which has the EO CLR (engine-out clear) prompt displayed in the 1R field (except during takeoff, before the diversion point is reached).
If the crew presses the EO CLR, the 2 engine predictions and performance will be restored. Reverting back to one engine-out performance is not possible, unless the system detects a new EO condition. Therefore, the pilot should not press the EO CLR key, if an actual engine-out is detected

AIRCRAFT SYSTEMS**AUTO FLIGHT - FLIGHT MANAGEMENT****SYSTEM DESCRIPTION - ENGINE OUT****FLIGHT GUIDANCE PART**

Ident.: DSC-22_20-10-50-00000939.0002001 / 04 JUL 17

Applicable to: ALL

- All selected modes remain available (the “HDG/TRK”, “V/S”, and “OPEN” modes, for example)
- In the speed reference system (SRS) mode, the takeoff speed target is V₂, or the current speed if it is higher but no more than V₂ +15. The magenta triangle indicates V₂ in all cases. The GO Around speed target is V_{APP}, or the current speed if higher, limited to VLS +15 kt
- The system limits autopilot (AP) and flight director (FD) bank angles during takeoff and approach phases as follows:
 - 15 ° when the aircraft speed is below the maneuvering speeds (F, S, or Green Dot speed) -10 kt , and then
 - In selected lateral guidance:
 - Linear increase to 25 ° up to maneuvering speeds (F, S, or Green Dot speed) -3 kt
 - 25 ° above maneuvering speeds (F, S, or Green Dot speed) -3 kt .
 - In managed lateral guidance:
 - Linear increase to 30 ° up to maneuvering speeds (F, S, or Green Dot speed) -3 kt
 - 30 ° above maneuvering speeds (F, S, or Green Dot speed) -3 kt .

Note: *The engine-out bank angle limits apply, when the FG part of the FMGS has detected an engine-out. It cannot be cleared by the crew through the MCDU EO CLEAR prompt.*

AUTOTHRUST

Ident.: DSC-22_20-10-50-00000940.0001001 / 16 FEB 11

Applicable to: ALL

The system extends the active range of the active engine from idle to maximum continuous thrust (MCT instead of CL thrust).

The Flight Mode Annunciator requests maximum continuous thrust on the live engine at a time that depends on when the engine-out occurs.

ENGINE-OUT CONDITIONS

Ident.: DSC-22_20-10-50-00000941.0001001 / 12 MAY 23

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

The FMGS considers the aircraft to be in an engine-out condition, when one of the following conditions is present and the aircraft has commenced takeoff or is in flight:

- One ENG MASTER lever off, or
- N₂ below idle, or

- One thrust lever angle is below 5 ° with the other above 22 °, or
- The FADEC shows an engine fault.

ENGINE-OUT CONDITIONS

Ident.: DSC-22_20-10-50-00000941.0002001 / 03 NOV 21

Applicable to: MSN 02926-02944, 04392, 07784-07792

The FMGS considers the aircraft to be in an engine-out condition, during takeoff or in flight phase when one of the following conditions is applicable:

- One engine master lever is off for CFM engines, one engine is shut down for IAE or PW engines, or
- N2 below idle, or
- One thrust lever angle is below 5 ° with the other above 22 °, or
- The FADEC shows an engine fault.

ENGINE-OUT SID

ENGINE-OUT SID - GENERAL

Ident.: DSC-22_20-10-50-A-00000942.0001001 / 14 MAY 12

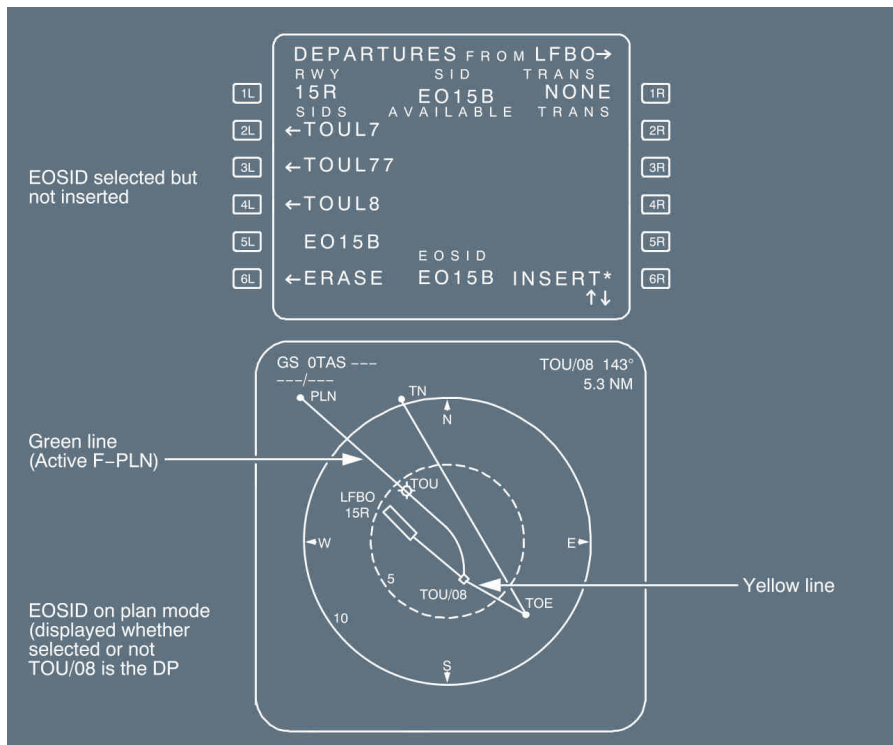
Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

GENERAL

An engine-out standard instrument departure (EOSID), when defined in the database, is always for a specific runway. It is indicated on the bottom line of the SID page for that runway, and you can select it manually.

The pilot can review the SID either by selecting the PLAN mode on the navigation display (solid yellow line), or by selecting it on the SID page. In the latter case, the navigation display shows the SID as a temporary flight plan.

The last point, if any, that is common to both the SID and engine-out SID is called the diversion point (DP).



Ident.: DSC-22_20-10-50-A-00000942.0002001 / 18 NOV 13

Applicable to: MSN 02926-02944, 04392, 07784-07792

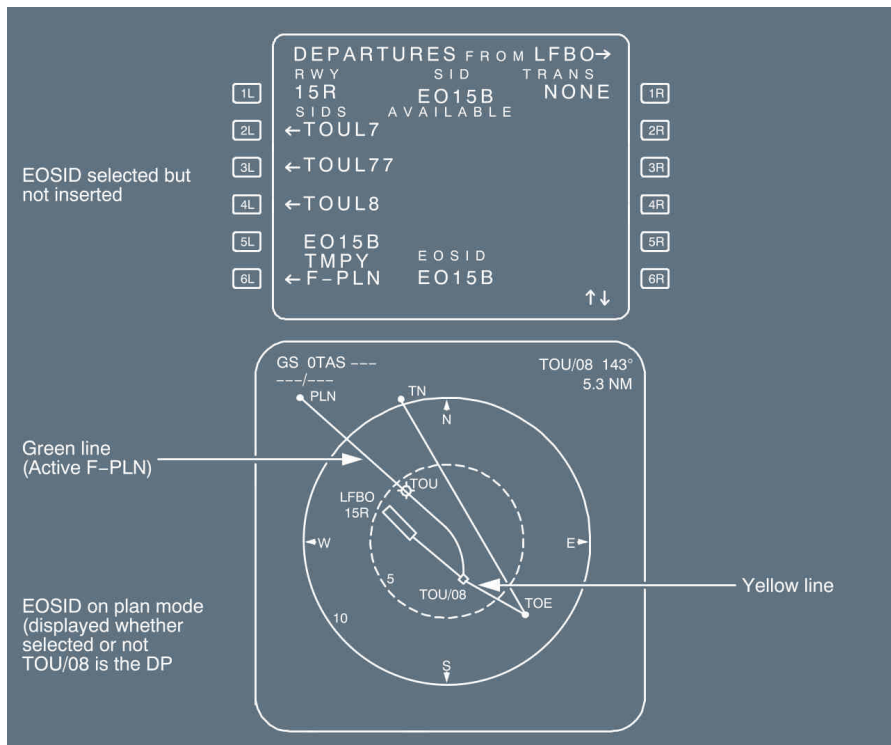
GENERAL

An engine-out standard instrument departure (EOSID), when defined in the database, is always for a specific runway. It is indicated on the bottom line of the SID page for that runway, and you can select it manually.

The pilot can review the SID either by selecting the PLAN mode on the navigation display (solid yellow line), or by selecting it on the SID page. In the latter case, the navigation display shows the SID as a temporary flight plan.

The last point, if any, that is common to both the SID and engine-out SID is called the diversion point (DP).

Note: When several EOSID exist for a specific runway, the FMS only considers the first EOSID in alphabetical order in case of engine-out, whatever the EOSID previously selected.



ENGINE-OUT SID - BEFORE THE DIVERSION POINT

Ident.: DSC-22 20-10-50-A-00000943.0001001 / 14 MAY 12

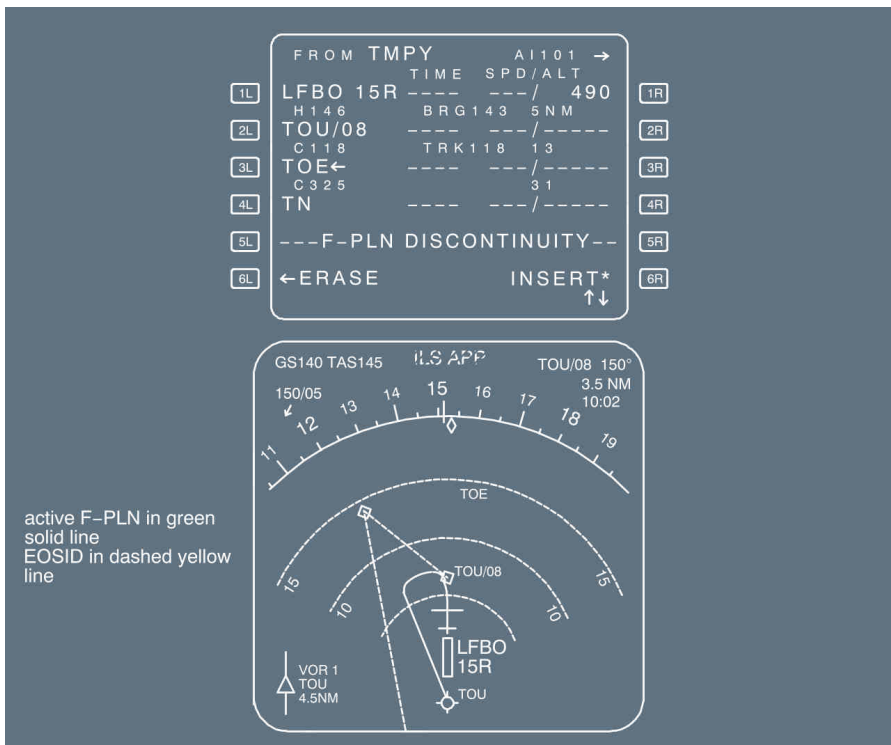
Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

WHEN AN ENGINE-OUT CONDITION OCCURS BEFORE THE DIVERSION POINT

The MCDU automatically shows the engine-out SID as a temporary flight plan on the F-PLN page and on the ND. The EOSID can be inserted or erased.

Note: The EOSID Diversion Point is the waypoint at which the EOSID diverges from the active SID.

If there is no common leg between the SID and the EOSID in the navigation database, the diversion point is by default the runway threshold. Therefore the SID and EOSID common leg(s) before the flight paths separation must be the same type and nature.



Ident.: DSC-22_20-10-50-A-00000943.0002001 / 14 MAY 12

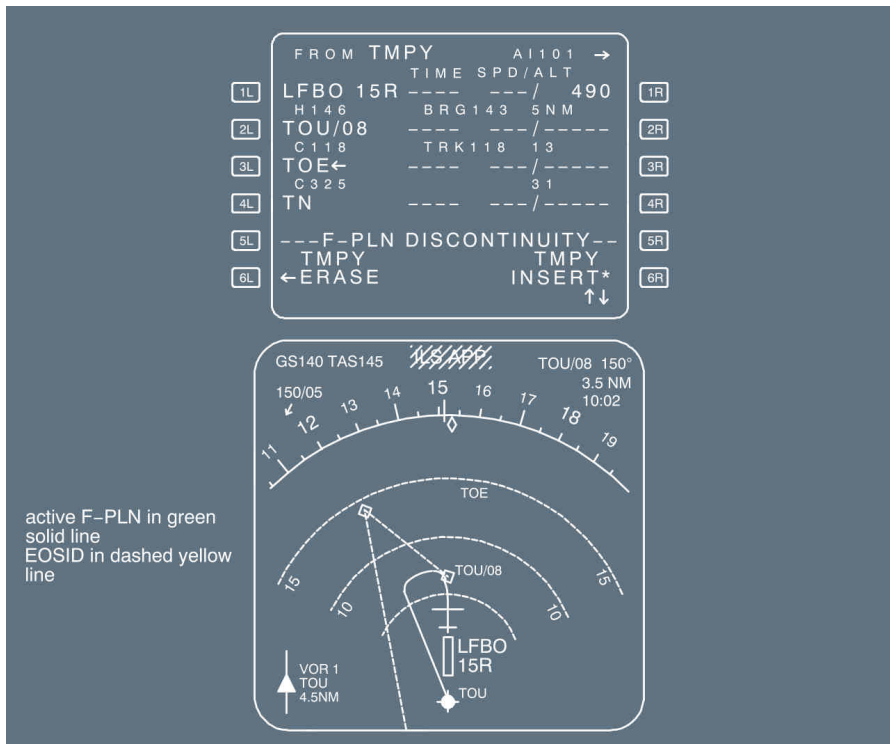
Applicable to: MSN 02926-02944, 04392, 07784-07792

WHEN AN ENGINE-OUT CONDITION OCCURS BEFORE THE DIVERSION POINT

The MCDU automatically shows the engine-out SID as a temporary flight plan on the F-PLN page and on the ND. The EOSID can be inserted or erased.

Note: The EOSID Diversion Point is the waypoint at which the EOSID diverges from the active SID.

If there is no common leg between the SID and the EOSID in the navigation database, the diversion point is by default the runway threshold. Therefore the SID and EOSID common leg(s) before the flight paths separation must be the same type and nature.



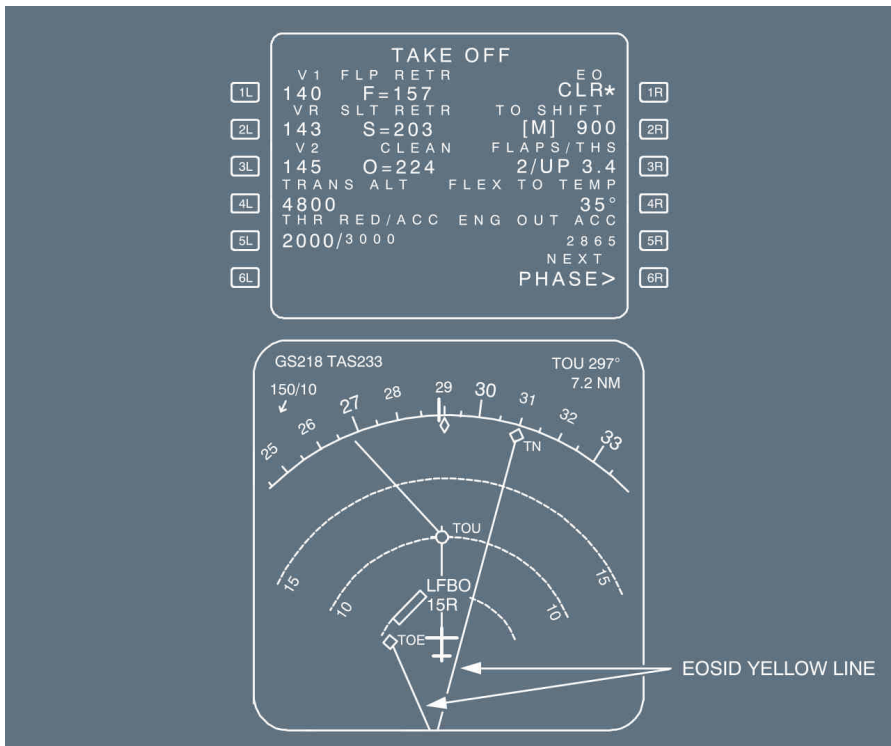
Ident.: DSC-22_20-10-50-A-00000944.0001001 / 14 MAY 12

Applicable to: ALL

WHEN AN ENGINE-OUT CONDITION OCCURS AFTER THE DIVERSION POINT

REMAIN on the SID path

Note: The navigation display shows the engine-out SID as a yellow line for your information. Directing the aircraft to the EOSID should not be performed unless it allows obstacle clearance and the flight crew considers it is the best strategy for a particular case.



Ident.: DSC-22_20-10-50-A-00000945.0002001 / 14 MAY 12

Applicable to: ALL

BELOW THRUST-REDUCTION (THR RED) ALTITUDE

- The managed target speed changes to V2
- The PROG page displays the engine-out maximum recommended altitude

- The PERF TO page comes up on the display automatically with the “EO CLR” prompt in the 1R field
- The MCDU and the navigation display show the engine-out SID as a temporary flight plan, or the navigation display shows it for information only, depending upon the diversion point location.



PROCEDURE

- **When the aircraft reaches the engine-out acceleration altitude**
 PUSH in the V/S knob to level off.
 CLEAN up your configuration as the speed increases toward target speed.
When the aircraft is clean and has reached Green Dot speed, “LVR MCT” flashes on the FMA,
 PULL out the altitude selector knob to resume the climb.
The OP CLB. mode engages.
 MOVE the thrust lever for the live engine to “MCT” detent.

Ident.: DSC-22_20-10-50-A-00000946.0006001 / 16 FEB 11

Applicable to: ALL

ABOVE THRUST REDUCTION (THR RED) ALTITUDE

- The managed target speed changes to V2
- “LVR MCT” flashes amber on the flight mode annunciator
- The PROG page displays the engine-out maximum recommended altitude
- The PERF TO page displays the “EO CLR*” prompt in the 1R field
- The navigation display shows the EO SID.

PROCEDURE

MOVE the thrust lever of the active engine to the MCT detent.

● **When the aircraft reaches the engine-out acceleration altitude:**

PUSH the V/S knob, in order to level off.

CLEAN UP configuration as the speed increases.

● **When the aircraft reaches Green Dot speed:**

PULL the ALT knob to resume the climb.

Note: If necessary, move the thrust lever of the active engine to the TOGA detent. The Flight Mode Annunciator will display "LVR MCT", flashing in white, when the aircraft reaches Green Dot speed.

ENGINE-OUT IN CLB PHASE (ABOVE ACCELERATION ALTITUDE)

Ident.: DSC-22_20-10-50-B-00000947.0003001 / 16 FEB 11

Applicable to: ALL

ENGINE-OUT OCCURS WHILE AIRCRAFT IS ACTUALLY CLIMBING

- The managed target speed changes to Green Dot speed
- "LVR MCT" flashes white on the Flight Mode Annunciator
- The climb mode reverts to open climb (OP CLB) and the aircraft slowly decelerates down to Green Dot speed
- The MCDU shows the PERF CLB page with an "EO CLR*" (clear engine-out) prompt
- The PROG page shows the engine-out maximum recommended altitude (EO MAX REC ALT).

PROCEDURE

MOVE the thrust lever of the active engine to the MCT detent.

SET the altitude on the Flight Control Unit to an altitude below the engine-out maximum recovery altitude, as cleared by ATC.

INITIATE a diversion, when cleared to do so.

Ident.: DSC-22_20-10-50-B-00000948.0001001 / 16 FEB 11

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

ENGINE-OUT OCCURS WHILE THE AIRCRAFT IS FLYING IN ALT MODE AT AN ALTITUDE SET ON THE FLIGHT CONTROL UNIT

- The target speed is set to engine-out cruise speed (EO CRZ SPD), computed at the altitude set on the Flight Control Unit, but limited by the limit speed (SPD LIM), if there is one.

Other consequences and procedures are similar to previous engine out climb.

ENGINE-OUT IN CRUISE PHASE

Ident.: DSC-22_20-10-50-00000949.0001001 / 17 NOV 20

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

- The system sets the managed target speed to the higher of engine-out cruise Mach number or speed, or current speed.
- “LVR MCT” (or MCT) flashes on the Flight Mode Annunciator.
- The PERF CRZ page appears with the “EO CLR*” (clear engine-out) prompt.
- The PROG page displays the engine-out maximum recommended altitude (EO MAX REC ALT).

PROCEDURE

Perform engine out abnormal procedure.

Refer to EFB-IFT-30 One Engine Inoperative Strategies.

Initiate a diversion if necessary.

Note: *The engine-out descent strategy requires disconnection of the autothrust, and descent in OPEN DES mode.*

Disconnecting the autothrust prevents an automatic setting of THR IDLE; therefore, the autopilot will fly the target speed in OP DES mode, with a thrust manually selected by the crew.

When reaching the FCU-selected altitude, or whenever normal descent is resumed to a lower altitude, reengage the autothrust.

ENGINE-OUT IN CRUISE PHASE

Ident.: DSC-22_20-10-50-00000949.0002001 / 17 NOV 20

Applicable to: MSN 02926-02944, 04392, 07784-07792

- The system sets the managed target speed to the higher of engine-out cruise Mach number or speed, or current speed.
- “LVR MCT” (or MCT) flashes on the Flight Mode Annunciator.
- The PERF CRZ page appears with the “EO CLR*” (clear engine-out) prompt.
- The PROG page displays the engine-out maximum recommended altitude (EO MAX REC ALT).

PROCEDURE

Perform engine out abnormal procedure.

Refer to EFB-IFT-30 One Engine Inoperative Strategies.

Initiate a diversion if necessary.

Note: The engine-out descent strategy requires disconnection of the autothrust, and descent in OPEN DES mode.

Disconnecting the autothrust prevents an automatic setting of THR IDLE; therefore, the autopilot will fly the target speed in OP DES mode, with a thrust manually selected by the crew.

When reaching the FCU-selected altitude, or whenever normal descent is resumed to a lower altitude, reengage the autothrust.

CHECK the MIN DEST FOB value on the FUEL PRED page.

If necessary, update the ALTN fuel value, according to the chosen flight strategy.

ENGINE-OUT IN DESCENT PHASE

Ident.: DSC-22_20-10-50-00000951.0001001 / 16 FEB 11

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

- The managed target speed remains unchanged (ECON DES Mach number or speed, with any speed limitations).
- "LVR MCT" (or MCT) flashes on the Flight Mode Annunciator.
- The PERF DES page appears, showing the "EO CLR" prompt.
- The PROG page displays the engine-out maximum recommended altitude (EO MAX REC ALT).
- The descent mode (if engaged) reverts to V/S, if the aircraft is above the EO REC MAX. If not, the descent mode is maintained.

PROCEDURE

MOVE the thrust lever for the live engine to the MCT detent.

If necessary, SELECT a suitable flight mode for descent.

DISCONNECT the autothrust and ADJUST thrust if necessary.

ENGINE-OUT IN DESCENT PHASE

Ident.: DSC-22_20-10-50-00000951.0004001 / 16 FEB 11

Applicable to: MSN 02926-02944, 04392, 07784-07792

- The managed target speed remains unchanged (ECON DES Mach number or speed, with any speed limitations).
- "LVR MCT" (or MCT) flashes on the Flight Mode Annunciator.
- The PERF DES page appears, showing the "EO CLR" prompt.
- The PROG page displays the engine-out maximum recommended altitude (EO MAX REC ALT).

PROCEDURE

MOVE the thrust lever for the live engine to the MCT detent.
If necessary, SELECT a suitable flight mode for descent.
DISCONNECT the autothrust and ADJUST thrust if necessary.

ENGINE-OUT IN APPROACH PHASE

Ident.: DSC-22_20-10-50-00000952.0001001 / 04 JUL 17

Applicable to: ALL

- The aircraft maintains approach speed (VAPP).
- "LVR MCT"(or MCT) flashes on the Flight Mode Annunciator.
- The PERF APPR page appears, showing the "EO CLR" prompt.
- The progress page displays the engine-out maximum recommended altitude (EO MAX REC ALT).

PROCEDURE

MOVE the thrust lever for the live engine to the MCT detent.

CAUTION

Below maneuvering speed (F, S, Green Dot) – 10 kt, the autopilot or flight director (AP/FD) cannot order a bank angle greater than 15 °.

Above maneuvering speed – 10 kt, this limit linearly increases until it reaches:

- In selected lateral guidance: 25 ° at maneuvering speed – 3 kt. The limit is then 25 ° for all speeds above maneuvering speed – 3 kt.
- In managed lateral guidance: 30 ° at maneuvering speed – 3 kt. The limit is then 30 ° for all speeds above maneuvering speed – 3 kt.

ENGINE-OUT IN GO-AROUND PHASE

Ident.: DSC-22_20-10-50-00000953.0002001 / 16 FEB 11

Applicable to: ALL

The results and procedures for takeoff phase apply, except that the displays do not show the engine-out SID.

Takeoff Surveillance Function**TAKEOFF SURVEILLANCE FUNCTION**

Ident.: DSC-22_20-10-70-10-10-00022107.0001001 / 05 JUN 18

Applicable to: ALL

The Takeoff Surveillance (TOS) function checks the takeoff data that the flight crew enters and selects on the FMS pages.

The takeoff surveillance function applies to the FMS pages that are associated with the active flight plan only.

The checks aim to ensure that the takeoff data is:

- Consistent
- Compatible with the aircraft performance data that is required for takeoff.

The FMS performs the following takeoff checks:

- The ZFW check
- The takeoff speeds check.

Ident.: DSC-22_20-10-70-10-10-00022108.0001001 / 03 NOV 22

Applicable to: ALL**ZFW CHECK**

The FMS checks that the ZFW value that the flight crew enters on the FUEL PRED page is within the acceptable range.

If the entered ZFW is not within the acceptable range, the MCDU scratchpad displays the **ENTRY OUT OF RANGE** message.

TAKEOFF SPEEDS CHECK

Ident.: DSC-22_20-10-70-10-10-00022109.0001001 / 03 NOV 22

Applicable to: MSN 04392**TAKEOFF SPEEDS CHECK**

For the takeoff speeds (V1, VR, and V2) that the flight crew enters on the PERF TAKEOFF page of the MCDU:

- The FMS compares V1, VR, and V2.

If the entered V1, VR, and V2 do not satisfy the condition $V1 \leq VR \leq V2$:

- The MCDU scratchpad displays the **V1/VR/V2 DISAGREE** message.

Ident.: DSC-22_20-10-70-10-10-00022109.0002001 / 03 NOV 22

Applicable to: MSN 02155-03060, 05152-07792

TAKEOFF SPEEDS CHECK

For the takeoff speeds (V1, VR, and V2) that the flight crew enters on the PERF TAKEOFF page of the MCDU:

- The FMS compares V1, VR, and V2.

If the entered V1, VR, and V2 do not satisfy the condition $V1 \leq VR \leq V2$:

- The MCDU scratchpad displays the **V1/VR/V2 DISAGREE** message.
- The FMS checks that V1, VR, and V2 satisfy the regulatory requirements for the minimum speeds (VMCG, VMCA, VMU, and VS1G). If the entered V1, VR, and V2 do not satisfy the regulatory requirements for the minimum speeds (VMCG, VMCA, VMU, and VS1G):
 - The MCDU scratchpad displays the **TO SPEED TOO LOW** message.

ASSOCIATED ALERTS AND MESSAGES

ASSOCIATED MESSAGES

Ident.: DSC-22_20-10-70-10-30-00022143.0004001 / 05 JUN 18

Applicable to: MSN 04392

ASSOCIATED MESSAGES

On the MCDU, the FMS message area displays the following messages:

- ENTRY OUT OF RANGE
- **V1/VR/V2 DISAGREE.**

Ident.: DSC-22_20-10-70-10-30-00022143.0002001 / 05 JUN 18

Applicable to: MSN 02155-03060, 05152-07792

ASSOCIATED MESSAGES

On the MCDU, the FMS message area displays the following messages:

- ENTRY OUT OF RANGE
- **TO SPEED TOO LOW**
- **V1/VR/V2 DISAGREE .**

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT SYSTEM DESCRIPTION - PRINT FUNCTIONS
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PRINT FUNCTION

Ident.: DSC-22_20-10-80-00000964.0011001 / 18 MAR 11
Applicable to: MSN 02926-02944, 04392, 07784-07792

The PRINT function allows various reports to be printed either automatically (when linked to ACARS  or ATSU ) or manually.

The manual PRINT function allows printing of FM-generated flight reports and additional data:

F-PLN	INITialization data
T.O.	Data
WIND	Data
PREFLIGHT	REPORT
IN FLIGHT	REPORT
POSTFLIGHT	REPORT

A detailed description of the PRINT FUNCTION pages is provided in *Refer to DSC-22_20-20-10-28 PRINT FUNCTION Pages*.

The print function is available if ACARS  or ATSU  are available or not.

The various flight reports contain most of the prediction information required by the flight crew to monitor the progress of the flight. The resulting documents can therefore be used as realistic master documents, based on the latest data provided by the flight crew to the computer, in terms of ATC clearances and weather information.

PRINT FUNCTION

Ident.: DSC-22_20-10-80-00000964.0009001 / 18 MAR 11
Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

The PRINT function allows various reports to be printed either automatically (when linked to ACARS  or ATSU ) or manually.

The manual PRINT function allows printing of FM-generated flight reports and additional data:

F-PLN	INITialization data
T.O.	Data
WIND	Data
PREFLIGHT	REPORT
IN FLIGHT	REPORT
POSTFLIGHT	REPORT

A detailed description of the PRINT FUNCTION pages is provided in *Refer to DSC-22_20-20-10-25 Print Function Pages*.

The print function is available if ACARS  or ATSU  are available or not.

The various flight reports contain most of the prediction information required by the flight crew to monitor the progress of the flight. The resulting documents can therefore be used as realistic master

documents, based on the latest data provided by the flight crew to the computer, in terms of ATC clearances and weather information.

PRINT FUNCTION ACCESS

Ident.: DSC-22 20-10-80-00000965.0004001 / 07 NOV 25

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

The PRINT FUNCTION page is accessed:

- From the DATA INDEX A PAGE, or
- From the AOC FUNCTION page (if ACARS  /AOC .

The diagram illustrates the layout of two pages from a flight deck manual, specifically the 'PRINT FUNCTION' section. Each page is represented by a central rectangular box containing text, flanked by two columns of six rectangular buttons each, labeled 1L through 6L on the left and 1R through 6R on the right.

Page 1: PRINT FUNCTION 1/2

- Left Margin (6L):** Buttons labeled 1L, 2L, 3L, 4L, 5L, 6L.
- Right Margin (6R):** Buttons labeled 1R, 2R, 3R, 4R, 5R, 6R.
- Central Box:**
 - Top line: PRINT FUNCTION 1/2 →
 - Second line: AUTO MANUAL
 - Third line: *YES F-PLN INIT PRINT *
 - Fourth line: TO DATA PRINT *
 - Fifth line: *NO WIND DATA PRINT *
 - Sixth line: <RETURN ACARS FUNCTION>

Page 2: PRINT FUNCTION 2/2

- Left Margin (6L):** Buttons labeled 1L, 2L, 3L, 4L, 5L, 6L.
- Right Margin (6R):** Buttons labeled 1R, 2R, 3R, 4R, 5R, 6R.
- Central Box:**
 - Top line: PRINT FUNCTION 2/2 →
 - Second line: AUTO MANUAL
 - Third line: *YES PREFLIGHT PRINT *
 - Fourth line: *NO INFLIGHT PRINT *
 - Fifth line: *YES POSTFLIGHT PRINT *
 - Sixth line: <RETURN ACARS FUNCTION>

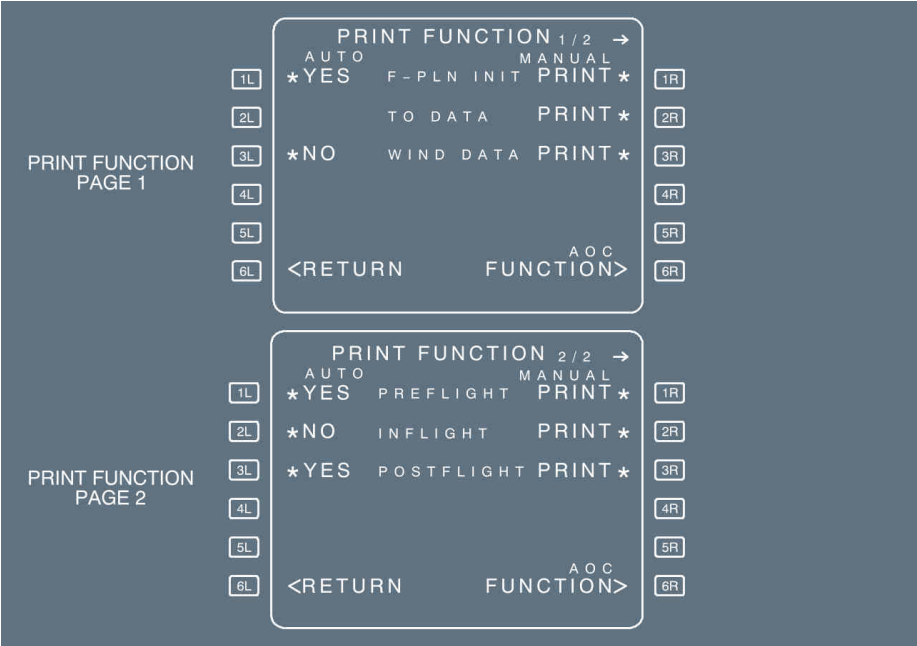
Note: For an automatic printing, "time" is the time of the reception of the message. For a manual printing, "time" is the time of the print request.

PRINT FUNCTION ACCESS

Ident.: DSC-22_20-10-80-00000965.0018001 / 07 NOV 25

Applicable to: MSN 02926-02944, 04392, 07784-07792

- 2 The PRINT FUNCTION page is accessed:
- From the DATA INDEX A PAGE, or
 - From the AOC FUNCTION page (if ACARS  /AOC ).



Note: For an automatic printing, “time” is the time of the reception of the message. For a manual printing, “time” is the time of the print request.

ON GROUND BEFORE ENGINE START

Ident.: DSC-22_20-10-80-00000966.0001001 / 23 JUN 15

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

When the overall F-PLN data (lateral, vertical including winds, steps, constraints) and the ZFW and ZFWCG values have been inserted:

SELECT the FUEL PLANNING prompt [3R],

- If the computed **BLOCK** fuel does not correspond to the actual block fuel required for the flight:

ENTER the actual block required for the flight in the [2R] field,

PRINT the PREFLIGHT report.

The flight crew may then use the PREFLIGHT report to monitor the progress of the flight.

Note: Before printing the PREFLIGHT report, the flight crew must check that the F-PLN is complete (all F-PLN discontinuities must be cleared) and that all the F-PLN elements (including winds, steps, constraints, alternate airport) have been inserted, in order to obtain an accurate PREFLIGHT report.

ON GROUND BEFORE ENGINE START

Ident.: DSC-22_20-10-80-00000966.0008001 / 18 MAR 11

Applicable to: MSN 02926-02944, 04392, 07784-07792

When the overall F-PLN data (lateral, vertical including winds, steps, constraints) and the ZFW and ZFWCG values have been inserted:

SELECT the FUEL PLANNING prompt [3R],

- If the computed **BLOCK** fuel does not correspond to the actual block fuel required for the flight :

ENTER the actual block required for the flight in the [2R] field,

PRINT the PREFLIGHT report.

The flight crew may then use the PREFLIGHT report to monitor the progress of the flight.

Note: 1. Before printing the PREFLIGHT report, the flight crew must check that the F-PLN is complete (all F-PLN discontinuities must be cleared) and that all the F-PLN elements (including winds, steps, constraints, alternate airport) have been inserted, in order to obtain an accurate PREFLIGHT report.

2. The following anomalies are known on Thales/Smiths FMS PREFLIGHT reports:

- Head trip wind values are always printed as 000 ° and Tail trip wind values as 180 °.
- The name of PLANA waypoint may erroneously be replaced with "SAURA".

EXAMPLE (FM PREFLIGHT REPORT)

Ident.: DSC-22_20-10-80-00000967.0001001 / 18 MAR 11

Applicable to: ALL

FM PREFLIGHT REPORT

DATE : 24 OCT 06

TIME : 07 : 24

A/C TYPE	: A320-200	DATABASE	: AB49402001
ENG TYPE	: CFM56-5B4	CYCLE	: 29 SEP-26 OCT
FLT NUMBER	: AIB 105	FROM/TO	: EINN/LFBO
CO RTE	:	ALTN	: LFBP
ALTN CO RTE	:		
PERF FACTOR	: +1.5	COST INDEX	: 100
IDLE FACTOR	: +0.0		
CRUISE FL/STEP START WPT			
CRZ FL 1	: FL410		
FLIGHT PLAN DATA			
DEST-LFBO	DIST : 714	TIME	CRZ FL
ALTN-LFBP	: 80	01:32	FL410
DEP RWY	: 24	01:52	FL220
DEP PRC	:	ARV PRC	:
		APR PRC	:
		ARV RWY	:

WPT	TIME	SPD/ALT	FOB	T. WIND	TAS	SAT	CRS	DIST
PREDICTED VALUES								
EINN24	00:00	133/-95	13.6	TL/040	-	+11	183	0
1520	00:00	159/1574	13.2	TL/040	163	+12	240	2
SHA	00:02	190/FL70	13.0	TL/040	211	+01	059	3
CRK	00:10	295/FL300	11.4	TL/040	459	-44	173	55
TIVLI	00:16	.82/FL400	11.2	TL/040	467	-57	140	50
LND	00:27	.84/FL410	11.0	TL/040	482	-57	140	99
NAKID	00:33	.84/FL410	10.9	TL/040	482	-57	130	46
LIZAD	00:34	.84/FL410	9.2	TL/040	482	-57	129	14
BALOT	00:38	.84/FL410	8.7	TL/040	482	-57	130	37
BERAT	00:41	.84/FL410	8.2	TL/040	482	-57	129	23
DIN	00:46	.84/FL410	7.6	TL/040	482	-57	128	47
NTS	00:56	.84/FL410	7.3	TL/040	482	-57	173	88
MINEL	01:02	.84/FL410	7.1	TL/040	482	-57	153	46
VENAR	01:05	.84/FL410	6.6	TL/040	482	-57	152	25
CGC	01:08	.84/FL410	6.1	TL/040	482	-57	153	34
VELIN	01:14	320/FL280	5.9	TL/040	482	-41	158	45
AGN	01:25	250/FL60	5.2	TL/040	274	+02	157	72
LFBO	01:32	128/550	5.2	TL/040	129	+14	001	27

FUEL PREDICTIONS

TAXI :	0.2	ZFWCG	: 25.0 %
TRIP (DEST) :	8.4	ZFW	: 51.2
RSV :	1.3	TOW	: 66.5
ALTN :	0.6	LW	: 55.9
FINAL :	1.8	CG	: —.-
EXTRA :	0.8		
BLOCK :	15.5		

MISC PERF DATA

TROPOPAUSE :	36090
CLB TRANS :	5000
CRZ TEMP :	-60

AIRCRAFT SYSTEMS**AUTO FLIGHT - FLIGHT MANAGEMENT****SYSTEM DESCRIPTION - PRINT FUNCTIONS****IN FLIGHT**

Ident.: DSC-22_20-10-80-00000968.0012001 / 18 MAR 11

Applicable to: MSN 02926-02944, 04392, 07784-07792

Once the aircraft has reached the CRZ FL once, all the latest ATC clearances have been inserted in the FM, when all the WINDS/STEPS have been properly updated:

ACCESS the PRINT FUNCTION page

PRINT the INFLIGHT REPORT

The inflight report provides the list of all the overflown F-PLN waypoints (HISTORY VALUES) with their associated data (Time, ALT, Fuel, ...), and the predictions to all the downpath waypoints (PREDICTED VALUES).

This new document replaces the PREFLIGHT report, since it carries all the latest expected F-PLN changes. It is the new applicable master document used to monitor the progress of the flight.

The inflight report will be printed after each important F-PLN modification.

Note: The following anomalies are known on Thales/Smiths FMS IN FLIGHT reports:

- Winds not yet inserted with the UPDATE INSERT prompt are erroneously printed on the INFLIGHT print as if they had been inserted.
- The distance on the last sequenced waypoint is erroneous.
- Head trip wind values are always printed as 000 ° and Tail trip wind values as 180 °.
- The TO waypoint of a DIR TO with ABEAM is not printed.
- The name of PLANA waypoint may erroneously be replaced with "SAURA".

IN FLIGHT

Ident.: DSC-22_20-10-80-00000968.0007001 / 18 MAR 11

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

Once the aircraft has reached the CRZ FL once, all the latest ATC clearances have been inserted in the FM, when all the WINDS/STEPS have been properly updated:

ACCESS the PRINT FUNCTION page

PRINT the INFLIGHT REPORT

The inflight report provides the list of all the overflown F-PLN waypoints (HISTORY VALUES) with their associated data (Time, ALT, Fuel, ...), and the predictions to all the downpath waypoints (PREDICTED VALUES).

This new document replaces the PREFLIGHT report, since it carries all the latest expected F-PLN changes. It is the new applicable master document used to monitor the progress of the flight.

The inflight report will be printed after each important F-PLN modification.

Note: If the selected Fuel Unit option is pounds, the HISTORY FOB values may be incorrectly printed in tons on the INFLIGHT REPORT. The CURRENT and PREDICTED FOB values, however, are correctly printed in pounds.

EXAMPLE (FM INFLIGHT REPORT)

Ident.: DSC-22_20-10-80-00000969.0001001 / 18 MAR 11

Applicable to: ALL

FM INFLIGHT REPORT

DATE : 24 OCT 06

TIME : 09 : 24

 A/C TYPE : A320-200
 ENG TYPE : CFM56-5B4
 FLT NUMBER : AIB 105
 CO RTE :
 ALTN CO RTE :
 PERF FACTOR : +1.5
 IDLE FACTOR : +0.0
 CRUISE FL/STEP START WPT
 CRZ FL 1 : FL390
 FLIGHT PLAN DATA

 DATABASE : AB49402001
 CYCLE : 29 SEP-26 OCT
 FROM/TO : LFBO/EINN
 ALTN : EIDW
 COST INDEX : 90

 DEST-EINN : 730 10:24
 ALTN-EIDW : 106 10:50
 DEP RWY : 14R
 DEP PRC : LMG3A

 ARV PRC :
 APR PRC :
 ARV RWY :

WPT	TIME	SPD/ALT	FOB	T. WIND	TAS	SAT	CRS	DIST
-----	------	---------	-----	---------	-----	-----	-----	------

HISTORY VALUES

LFBO14R	08:29	126/536	13.6	HD/070	-	+12	142	0
1000	08:30	141/982	13.2	056/003	141	+10	143	2

CURRENT POSITION : N43-37.9/E001-22.0

08:32	252FL63	13.6	HD/070	297	-11	350	10
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PREDICTED VALUES

OSKAM	08:34	320/FL130	10.4	HD/070	387	-11	350	14
LMG	08:52	.84/FL390	10.2	HD/070	482	-57	359	119
VERAC	08:59	.84/FL390	10.0	HD/070	482	-57	310	48
MAIXE	09:01	.84/FL390	9.9	HD/070	482	-57	310	18
NTS	09:11	.84/FL390	8.2	HD/070	482	-57	310	70
DIN	09:24	.84/FL390	7.7	HD/070	482	-57	352	88
BERAT	09:31	.84/FL390	7.2	HD/070	482	-57	309	47
BALOT	09:34	.84/FL390	6.6	HD/070	482	-57	309	23
LIZAD	09:40	.84/FL390	6.3	HD/070	482	-57	310	37
NAKID	09:42	.84/FL390	6.1	HD/070	482	-57	309	14
LND	09:48	.84/FL390	5.6	HD/070	482	-57	309	46
TIVLI	10:03	.84/FL390	5.1	HD/070	482	-57	322	99
CRK	10:10	320/FL170	4.9	HD/070	407	-19	319	50
SHA	10:23	128/900	4.2	HD/070	130	+13	353	55
EINN	10:24	128/100	4.2	HD/070	128	+15	001	2

FUEL INFORMATION AT 08:32

WEIGHT	CG	FOB	RSV/RSW%	FINAL	EXTRA
65.0	37.3%	13.6	0.4/5.0%	3.1	2.8

Note: In case of a major failure such as an engine out, a new print will be done when time permits.

REACHING THE GATE AFTER LANDING

Ident.: DSC-22_20-10-80-00000970.0012001 / 18 MAR 11

Applicable to: MSN 02926-02944, 04392, 07784-07792

The POSTFLIGHT REPORT gives a complete list of all the overflown waypoints during the flight (HISTORY VALUES).

Furthermore it provides:

- FUEL/TIME summary
- IRS Drift and G/S

Once at the gate, after engine shutdown:

- ACCESS the PRINT FUNCTION page
- PRINT the POSTFLIGHT REPORT

Note: The following anomalies are known on Thales/Smiths FMS POST FLIGHT reports:

- The IRS Drift value on the POST FLIGHT REPORT may be erroneous.
- Some ABEAM waypoints may not be printed on the POST FLIGHT REPORT.
- Head trip wind values are always printed as 000 ° and Tail trip wind values as 180 °.
- The name of PLANA waypoint may erroneously be replaced with "SAURA".

REACHING THE GATE AFTER LANDING

Ident.: DSC-22_20-10-80-00000970.0007001 / 18 MAR 11

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

The POSTFLIGHT REPORT gives a complete list of all the overflown waypoints during the flight (HISTORY VALUES).

Furthermore it provides:

- FUEL/TIME summary
- IRS Drift and G/S

When at the gate, after engine shutdown:

- ACCESS the PRINT FUNCTION page
- PRINT the POSTFLIGHT REPORT

Note: If the selected Fuel Unit option is pounds, the HISTORY FOB values may be incorrectly printed in tons on the POSTFLIGHT REPORT.

EXAMPLE (FM POSTFLIGHT REPORT)

Ident.: DSC-22_20-10-80-00000971.0001001 / 18 MAR 11

Applicable to: ALL

FM POSTFLIGHT REPORT

DATE : 24 OCT 06

TIME : 12 : 05

A/C TYPE	: A320-200	DATABASE	: AB49402001
ENG TYPE	: CFM56-5B4	CYCLE	: 29 SEP-26 OCT
FLT NUMBER	: AIB 105	FROM/TO	: EINN/LFBO
CO RTE	:	ALTN	: LFBP
ALTN CO RTE	:		
PERF FACTOR	: +1.5	COST INDEX	: 90
IDLE FACTOR	: +0.0		
FLIGHT PLAN DATA			

DIST	TIME	CRZ FL	
DEST-LFBO	: —	FL—	
ALTN/—	: —	FL—	
DEP RWY	: 06	ARV PRC	: AGN2T
DEP PRC	:	APR PRC	: VOR32L
		ARV RWY	: 32L
		T. WIND	

WPT	TIME	SPD/ALT	FOB	TAS	SAT	CRS	DIST
HISTORY VALUES							
EINN06	10:17	134/44	17.0	043/005	-	+11	053 0
1550	10:18	163/1536	16.9	235/019	165	+08	050 2
SHA	10:18	161/1691	16.9	236/019	163	+08	049 0
ABCRK	10:27	305/FL280	15.1	295/049	459	-41	149 53
TIVLI	10:33	.80/FL330	14.8	298/057	448	-64	143 46
LND	10:44	.84/FL330	14.1	320/034	477	-61	129 111
ABLIZAD	10:51	.84/FL330	13.6	326/034	474	-61	141 47
ABBERAT	10:58	.84/FL330	12.4	313/029	480	-59	141 21
ABOIN	11:03	.84/FL330	12.2	326/030	479	-60	142 44
ABNTS	11:13	.84/FL330	12.0	330/034	481	-60	142 126
ABVENAR	11:21	.84/FL330	10.2	335/028	479	-60	143 24
CGC	11:25	.84/FL330	9.7	339/031	476	-61	150 33
VELIN	11:31	.84/FL330	9.2	352/028	476	-60	154 45
AGN	11:40	312/FL220	8.6	050/024	429	-26	149 72
SOTAK	11:40	321/FL190	8.3	052/025	425	-20	141 5
D191K	11:44	253/FL90	8.1	347/015	288	+00	137 24
D165R	11:46	253/4360	7.6	309/014	265	+04	103 11
CD32L	11:49	175/2967	6.9	293/009	180	+05	322 5
FD32L	11:50	253/FL1609	6.2	308/007	132	+08	323 4
LFB032L	11:52	132/674	6.2	326/006	131	+11	321 3

FUEL AND TIME SUMMARY

START UP	SHUT DOWN
FUEL : 17.0	FUEL : 4.2
WEIGHT : 75.8	WEIGHT : 65.0
TIME : 10.09	TIME : 12:01
TO TIME : —,-	LDG TIME : 11:52

IRS DATA AT : LFB032L

IRS 1	IRS 2	IRS 3
AVERAGE DRIFT - 00.3 NM/H	00.4 NM/H	00.3 NM/H
RESIDUAL GND SPD - 01.0 KTS	03.0 KTS	1.0 KTS

Intentionally left blank

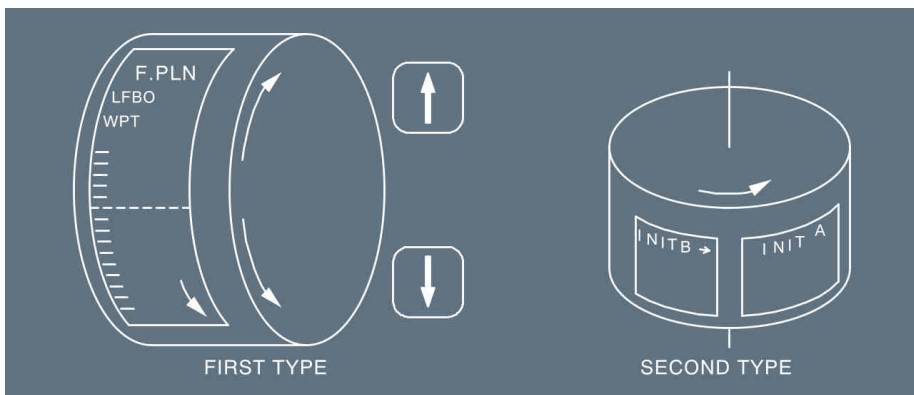
FMS2 Honeywell

GENERAL

Ident.: DSC-22_20-20-10-25-00000556.0001001 / 01 OCT 12

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

The Flight Management and Guidance System (FMGS) displays information on various “pages”. When a page cannot display all of the assigned information, it cues the pilot to call up additional information. There are three types of pages, and each type has its particular way of cuing the pilot to call up additional information.



FIRST TYPE

When this page cannot simultaneously display all the information on the screen (more information than the six pairs of lines can hold), the pilot can scroll the page up or down.

In this case, the screen displays a $\uparrow \downarrow$ symbol in the bottom righthand corner (F-PLN pages, secondary F-PLN page, departure/arrival pages,...).

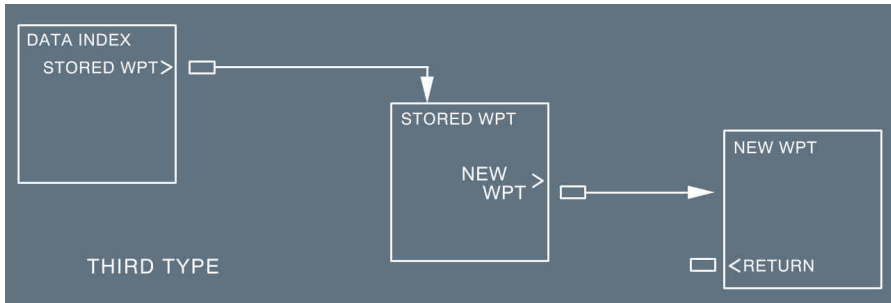
SECOND TYPE

When the information is on successive pages, the pilot presses the “NEXT PAGE” key to sequentially call up these pages.

In this case, an arrow is displayed in the top righthand corner of the screen (INIT pages).

THIRD TYPE

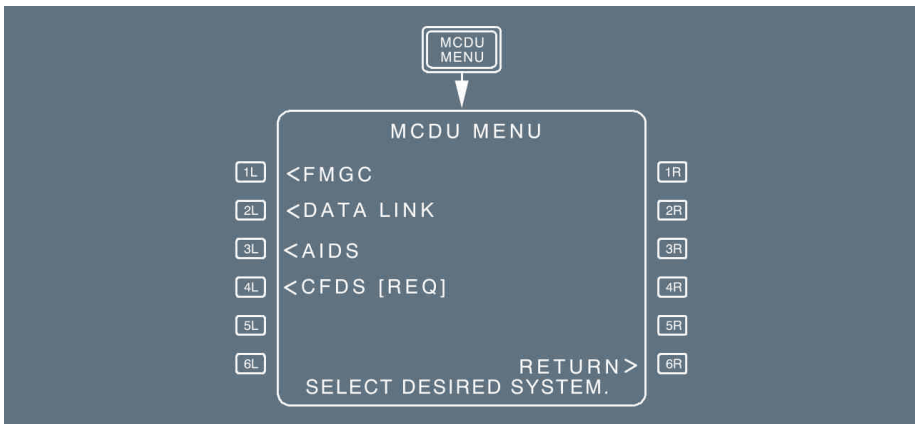
When different types of information are on successive pages, the pilot calls up these pages by pressing the key adjacent to the prompts $>$, $<$ or $*$.


MCDU MENU PAGE

Ident.: DSC-22_20-20-10-25-00000557.0001001 / 14 MAY 12

Applicable to: MSN 02155-02789, 03031-03060

This page lists the various systems which the pilot can access via the MCDU.



The pilot selects a system by pressing the key adjacent to the name of that system. The name of the selected system is displayed in green, all others in white.

If the MCDU cannot establish communication with the selected system, it displays “OUT”.

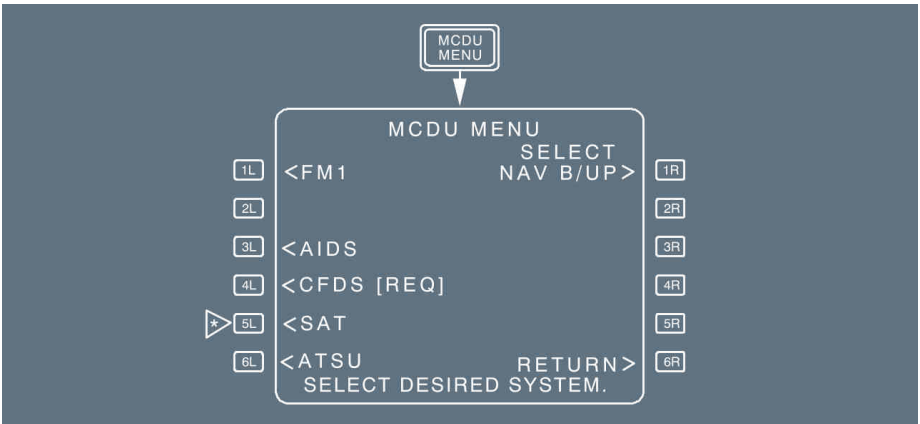
When a system calls for the pilot's attention, the MCDU displays “REQ” next to the system's name, and the “MCDU MENU” annunciator lights up.

When the pilot presses the key next to the name of the system requiring attention, the “MCDU MENU” annunciator light goes out.

MCDU MENU PAGE

Ident.: DSC-22_20-20-10-25-00000557.0010001 / 14 MAY 12
 Applicable to: MSN 05152-05746

This page lists the various systems which the pilot can access via the MCDU.



The flight crew selects a system by pressing the key adjacent to the name of that system. The name of the selected system is displayed in green, all others in white. If the MCDU cannot establish communication with the selected system, it displays “OUT”. When a system calls for the flight crew attention, the MCDU displays “REQ” next to the system’s name, and the “MCDU MENU” annunciator lights up. When the flight crew presses the key next to the name of the system requiring attention, the “MCDU MENU” annunciator light goes out.

SELECT Pressing the [1R] key selects the NAV B/UP function and DESELECT

NAV B/UP NAV B/UP appears in the [1R] field.

If the NAV B/UP is inoperative, the field is blank.

RETURN This field is displayed when a function is active

When the MCDU communicated with a system other than the FMGC, the flight crew should use the MCDU MENU page to revert to the FMGC system.

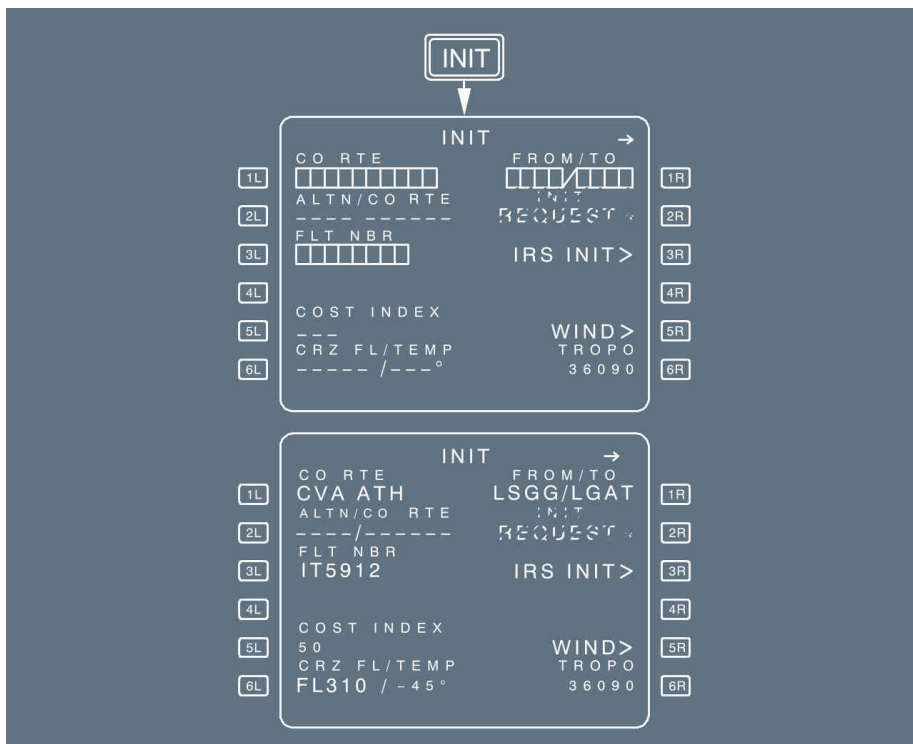
INIT A PAGE

Ident.: DSC-22_20-20-10-25-00000558.0009001 / 01 MAR 18

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

The flight crew uses the INIT A page to initialize the flight plan and align the inertial reference system.

- The flight crew accesses to this page by pressing the INIT key on the MCDU. The INIT A page can be accessed on ground or in flight.
- The flight crew may also call up this page by:
 - Pressing the “NEXT PAGE” key on the MCDU console, while on the INIT B page, or
 - Pressing the key next to “RETURN” or “INSERT” on the route selection page, or
 - Pressing the key next to “INSERT” on the wind page.
- When in the done phase, the pilot may press the INIT key to switch to the next preflight phase.



The diagram illustrates the INIT A page on the MCDU. It shows two states of the page: an initial state with empty fields and a populated state with specific data. The page is divided into two main sections, each with a central display area and a set of six line select keys (1L-6L on the left, 1R-6R on the right).

INIT A Page Structure:

- Top Section:**
 - INIT Key:** Located at the top center, with a downward arrow pointing to the first line select key (1L).
 - Central Display:**
 - CO RTE:** A row of eight empty boxes.
 - FROM/TO:** A row of eight empty boxes, with a right arrow above it.
 - ALTN/CO RTE:** A row of eight empty boxes.
 - FLT NBR:** A row of eight empty boxes.
 - COST INDEX:** A row of eight empty boxes.
 - CRZ FL/TEMP:** A row of eight empty boxes, with a slash and degree symbol at the end.
 - Right Side Labels:** 1R, 2R, 3R, 4R, 5R, 6R.
- Bottom Section:**
 - INIT Key:** Located at the top center of the bottom section, with a downward arrow pointing to the first line select key (1L).
 - Central Display:**
 - CO RTE:** A row of eight empty boxes.
 - FROM/TO:** A row of eight empty boxes, with a right arrow above it.
 - ALTN/CO RTE:** A row of eight empty boxes.
 - FLT NBR:** A row of eight empty boxes.
 - COST INDEX:** A row of eight empty boxes.
 - CRZ FL/TEMP:** A row of eight empty boxes, with a slash and degree symbol at the end.
 - Right Side Labels:** 1R, 2R, 3R, 4R, 5R, 6R.

Populated State Example:

- Top Section:**
 - CO RTE:** [Empty]
 - FROM/TO:** [Empty]
 - ALTN/CO RTE:** [Empty]
 - FLT NBR:** [Empty]
 - COST INDEX:** [Empty]
 - CRZ FL/TEMP:** [Empty]
- Bottom Section:**
 - CO RTE:** [Empty]
 - FROM/TO:** [Empty]
 - ALTN/CO RTE:** [Empty]
 - FLT NBR:** [Empty]
 - COST INDEX:** [Empty]
 - CRZ FL/TEMP:** [Empty]

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
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[1L] CO RTE	If the flight crew enters a company route number, the screen displays all data associated with that route (8 or 10 characters, depending on the pin program). Inserting the CO RTE into the RTE selection page also enters the CO RTE number in this field.
[2L] ALTN/CO RTE (blue)	This field is dashed, until a primary destination is entered in the 1R field. If a preferred alternate is associated with the primary destination, it is displayed in this field with the company route identification. The crew may manually enter an alternate and company route. If preferred alternate is not associated with the primary destination, NONE is displayed in this field. When the alternate route and the primary destination do not match, the MCDU scratchpad displays “DEST/ALTN MISMATCH”. If the primary destination is changed, this field is modified accordingly.
[3L] FLIGHT NUMBER	The flight number automatically appears in this field, if it is stored with the company route. The flight crew may modify it, or enter a new number here.
[5L] COST INDEX	This is usually stored in the database along with the company route. The flight crew may modify it, or enter a new value here. It defaults to the last entered value, if a value is not stored in the database.
[6L] CRZ FL/TEMP (cruise flight level and temperature)	The cruise flight level is usually stored in the database along with the company route. If not, it has to be entered manually. If no cruise flight level is entered, the system will not furnish predictions, while the aircraft is on the ground. The flight crew has to enter the temperature at cruise flight level in order to refine the predictions. Otherwise, these are computed for ISA conditions. (If no sign is entered, the system uses a plus).
[1R] FROM/TO	This field allows the pilot to enter a city pair (ICAO codes for city of origin and destination). This entry automatically deletes any previously entered company route and calls up the route selection page. If one airfield of the pair is not in the database, the display changes to the NEW RWY page.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT
CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
[2R] INIT REQUEST

This prompt is displayed if the pilot did not enter an active flight plan or entered a flight number or a company route that is not in the aircraft database. Selecting this prompt sends the ground a request for active flight plan initialization (downlink message). When the star is not displayed, a downlink message cannot be sent.

The uplink flight plan is automatically inserted in the active flight plan, prior to engine start, provided an active flight plan does not exist.

After engine start, the uplink flight plan is sent to the secondary flight plan and manually inserted or rejected.

[3R] IRS INIT

The flight crew presses this key to access the IRS INIT page.

[5R] WIND

The pilot presses this key in order to gain access to the climb wind page, unless a temporary flight plan exists. In this case, the scratchpad displays **TEMPORARY F-PLN EXISTS**.

[6R] TROPO

The default tropopause altitude is 36 090 ft. The pilot can use this field to modify it (60 000 ft maximum).

ROUTE SELECTION PAGE

Ident.: DSC-22_20-20-10-25-00000559.0001001 / 17 MAR 11

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

This page displays all the company routes, stored in the database, that are associated with the inserted city pair. They can be called up manually, or displayed automatically.

- Manually : The pilot presses the FROM/TO or ALTN key on the INIT A page when a city pair is displayed.
- Automatically : The system displays it, when the pilot enters a city pair, or defines an alternate on the INIT A page of the active or secondary flight plan.

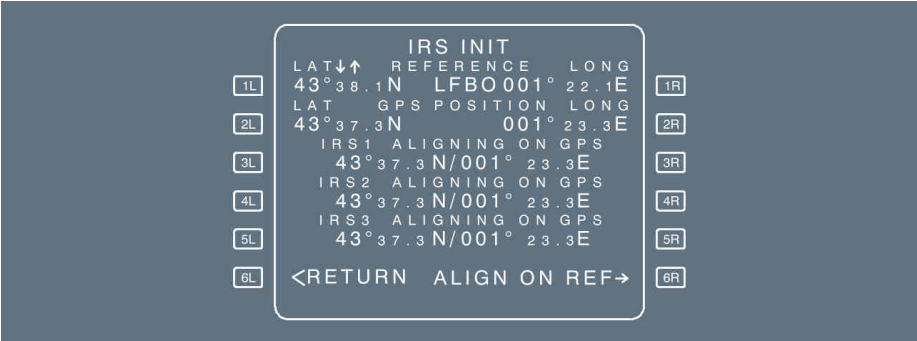
KMSP/KLGA 1 / 1			
1L	MSPLGA		1R
2L	J 3 4	DLR	2R
	ETG	DJB35	
3L		J 1 4 6	3R
		MIP	
4L		MIP5	4R
		PROUD	
5L			5R
6L	<RETURN	INSERT*	6R

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
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TITLE [1L] Line 2 to Line 5 [6L] RETURN [6R] INSERT	Idents for the city pair inserted on the INIT A page. (The numbers in the upper righthand corner are the total number of company routes from this city pair stored in the database). This field shows the name of the company route. NONE appears, if there is no company route for this city pair. These fields display the various elements of the company route: Waypoints in large green font, and airways in small white font. The pilot presses this key to return to the INIT A page. The pilot presses this key to insert the displayed company route in the flight plan, and return to the INIT A page. <i><u>Note:</u> The pilot can slew the display to show the rest of the route, if one page does not show it all, or to display other company routes for this city pair.</i>
--	--

IRS INIT PAGE Ident.: DSC-22_20-20-10-25-00013511.0051001 / 14 MAY 12 Applicable to: MSN 02155-02789, 03031-03060, 05152-05746
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The flight crew uses the IRS INIT page to align the inertial reference system. The crew accesses this page, by pressing the IRS INIT key on the INIT A page.



Line 1 LAT-REFERENCE-LONG	This line provides the latitude and longitude of the FM reference position. This reference is extracted from the navigation database. The flight crew can modify this reference. Only when the FM reference position matches the origin airport position, the airport identifier is displayed in green. Otherwise, there are dashes at the place of the airport identifier. Latitude and longitude of the FM reference position are displayed in blue. The flight crew can modify the latitude and longitude values using the scroll keys.
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AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION

Line 2 LAT-GPS
POSITION-LONG

This line displays the GPS position latitude and longitude.

Line 3 to 5

These lines display the IRS 1-2-3 alignment state, source and latitude/longitude.

The alignment status can be ALIGNING ON XXX, or ALIGNED ON XXX or IN ATT. XXX is the alignment source and can be GPS or CDU or REF. It is displayed in white font.

The latitude and longitude values are displayed in green.

[6L] RETURN

This prompt enables the flight crew to return to the INIT A page.

[6R]

If a reference is available, field displays ALIGN ON REF → in blue which is replaced by CONFIRM ALIGN* in amber when 6R prompt is pressed. Pressing again the 6R prompt enables the transmission of the FM reference position displayed in line 1.

WIND PAGES

Ident.: DSC-22_20-20-10-25-00000560.0009001 / 01 MAR 18

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

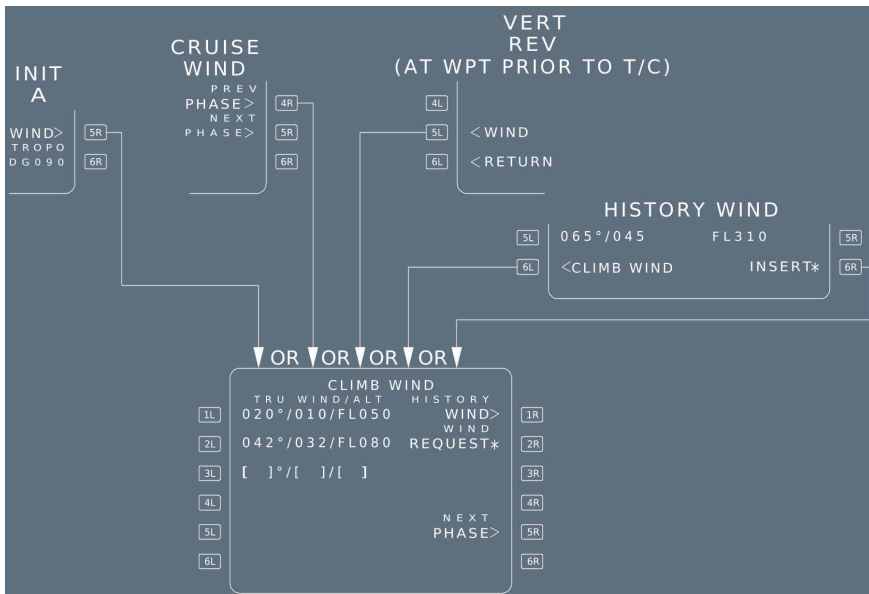
Winds in climb, cruise, descent and approach are necessary to provide the pilot with reliable predictions and performance. Wind pages enable the pilot to enter and/or review the winds propagated by the FMGS or sent by ACARS for the various flight phases.

Note: On WIND pages, wind direction is always true-referenced.

CLIMB WIND PAGE

This page enables the pilot to enter and/or review predicted wind vectors (direction and velocity) at up to 5 different levels.

THE CLIMB WIND PAGE IS ACCESSED FROM:



TITLE

[1L] to [5L] TRU
WIND/ALT

CLIMB WIND in large white font.

This field displays the winds, entered at various climb altitudes : In blue before climb phase activation, and in green after climb phase activation.

This field may also display history winds or uplink winds. Large blue brackets are displayed before any wind entry. Pilot-entered and uplinked winds are displayed in large font. History wind data is displayed in small font.

Upon sequencing the top of climb, the climb winds are deleted.

Note: Climb winds are not deleted, when the origin airport is changed.

[1R] HISTORY WIND

Displayed in preflight phase only. This key calls up the history wind page. This page is not modifiable (small green font), but can be inserted into the CLIMB WIND page by using the 6R key and modified accordingly.

[2R] WIND REQUEST

Pressing this key sends a request for ACARS winds.

[5R] NEXT PHASE

Pressing this key calls up the CRUISE WIND page, or the DESCENT WIND page, if no cruise waypoint exists.

HISTORY WIND PAGE



[6L] CLIMB WIND

This key reverts the display to the CLIMB WIND page.

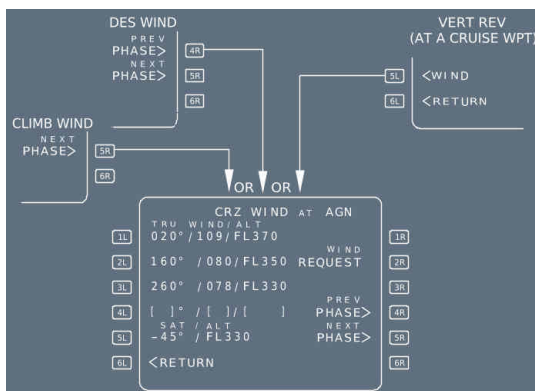
[6R] INSERT

This key inserts the history wind values into the CLIMB WIND page.

CRZ WIND PAGE

This page displays the wind direction and velocity for each cruise waypoint.

The cruise wind page enables the definition of a temperature at a given altitude, and is accessed as follows:



TITLE

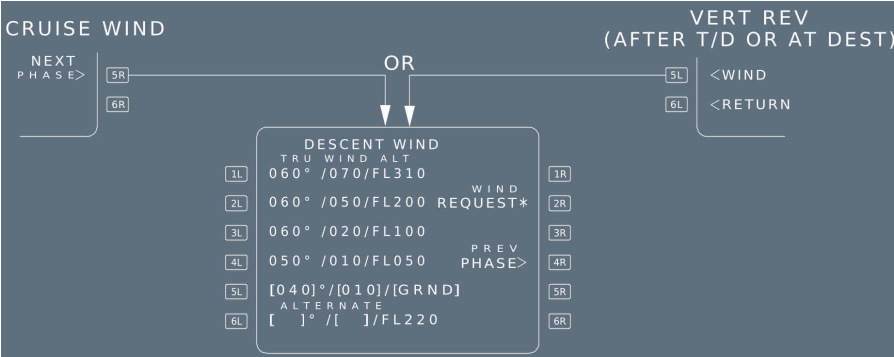
CRZ WIND AT in large white font.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
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[1L] to [4L] TRU WIND/ALT	These fields display the entered wind at various altitudes in blue. The entered winds are propagated at the same altitude to the downpath cruise waypoints, if no other winds are entered. The propagated wind direction and velocity are displayed in small fonts. Both uplinked winds and pilot-entered winds are displayed in large blue font. Wind data is modifiable during cruise.
[5L] SAT/ALT	This field allows the pilot to enter a temperature at a given flight level, or to display a propagated value. The crew must enter both temperature and altitude at the first entry. They can then independently modify the temperature, or the altitude.
[2R] WIND REQUEST	Pressing this key sends a request for ACARS winds.
[4R] PREV PHASE	This prompt is displayed in Preflight, Takeoff, Climb and Done phases. Pressing this prompt calls up the CLIMB WIND page.
[5R] NEXT PHASE	Pressing this prompt calls up the DES WIND page. Any new entry performed on the CRZ WIND page is immediately inserted into the corresponding flight plan. Predictions are dashed on the F-PLN pages during the recomputation time. CRZ WIND page automatically reverts to F-PLN page, if a temporary flight plan is created or the secondary flight plan is activated.

DESCENT WIND PAGE

This page enables the pilot to define and display the winds used for computing the descent profile. The pilot calls it up by selecting NEXT PHASE on the CRUISE WIND page, or the WIND prompt on the VERT REV page.



AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT
CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION

- [1L] to [5L] This displays inserted winds or uplinked winds, in large blue fonts, prior to activating the descent phase (modifiable values), and in green after descent phase activation (not modifiable values).
 An entry of "GRND" in the "ALT" field is seen as the wind at ground level. This wind is copied on the PERF APPR page (and corrected for the magnetic variation).
 A clear action on one key reverts the line to blue brackets.
- [6L] ALTERNATE This field is only displayed when an alternate is defined.
 The pilot-entered value or uplinked value is displayed in large blue font. It is always modifiable by the pilot.
- [2R] WIND REQUEST* Pressing this key sends a request for ACARS winds.
- [4R] PREV PHASE Pressing this key calls up the CRUISE WIND page. The field is erased after the top of descent has sequenced.

Note: *Descent winds and alternate wind are deleted, if the destination airport is changed.*

INIT B PAGE

Ident.: DSC-22_20-20-10-25-00000561.0009001 / 01 MAR 18

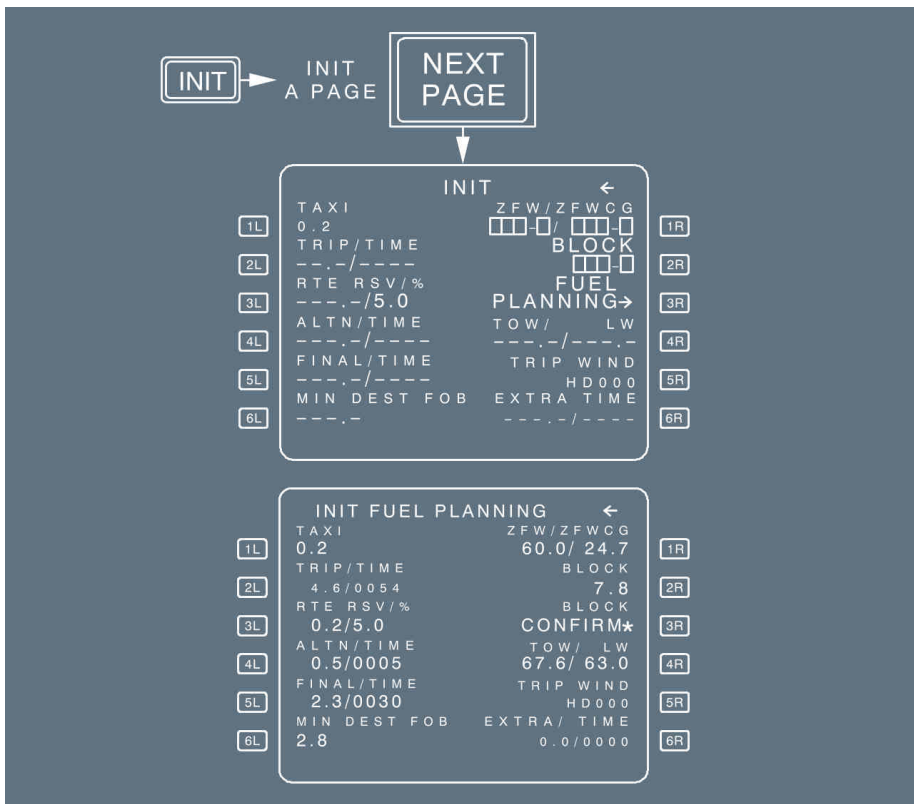
Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

The pilot uses this page to initialize the gross weight and center of gravity, before starting the engines.

The pilot can call it up from the INIT A page during preflight phase prior to engine start, by pressing the NEXT PAGE key on the MCDU console, as long as engines have not been started.

This page automatically reverts to the FUEL PRED page after the first engine is started.

The FMGC will stop using the pilot-entered block fuel and will compute its predictions based on the FOB indicated by the FQI computer (or the FAC as a back up) from that moment on.



- [1L] TAXI This is the taxi fuel, which defaults to a preset value, (usually 200 kg or 400 lb in the AMI file). The crew can change the value through this field.
- [2L] TRIP/TIME (green) This field displays trip fuel and time when predictions become available. The pilot cannot modify this data.
- [3L] RTE RSV/% (blue) This field displays the contingency fuel for the route and the corresponding percentage of trip fuel. It may be equal to 0.0, if such is the policy of the operator. The flight crew can either enter a fuel quantity, or a percentage.
- [4L] ALTN/TIME (blue/green) Displays alternate trip fuel and time, assuming that the Cost Index = 0 and that the aircraft flies at the default cruise flight level. The flight crew can modify the alternate fuel as required. In this case, alternate time will be dashed.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION

- [5L] FINAL/TIME (blue) Displays the final reserve fuel and time calculated at the alternate airport (or destination airport, if selected in the “airline fuel policy” section of the AMI). Before any crew entry, the FINAL field is dashed and FINAL TIME field is defaulted to the value specified in the AMI file (typically 30 min). The flight crew may enter a final fuel or time, and the system will compute associated holding time/fuel available.
The system assumes a holding pattern at 1 500 ft AGL, with the aircraft in CONF 1 at maximum endurance speed (racetrack pattern, altitude and selected airport can be modified through the “airline fuel policy” section of the AMI).
- [6L] MIN DEST FOB (blue) Displays the expected minimum fuel at destination. It is equal by default to the ALTN + FINAL fuel. This field can be modified directly by the flight crew, and is also impacted by the modification of ALTN and/or FINAL fuel.
Note: If pilot entry of MIN DEST FOB is lower than ALTN + FINAL fuel, the message “CHECK MIN DEST FOB” is triggered on the MCDU.
- [1R] ZFW/ZFWCG (blue) Displays the Zero Fuel Weight (ZFW) and Zero Fuel Weight CG (ZFWCG). The flight crew must enter the ZFW/ZFWCG values (as appropriate) to obtain a speed profile and predictions.
Note: If the flight crew enters a ZFW value that exceeds the acceptable range (as defined in the OPC or in the performance database), the “ENTRY OUT OF RANGE” message appears and the value is rejected.
- [2R] BLOCK The block fuel in this field is a mandatory entry.
When the flight crew enters a block fuel, the page title changes to INIT FUEL PREDICTION.
- [3R] FUEL PLANNING (amber) Initiates an FMGC block fuel computation using current hypothesis and extra = 0. When the pilot selects this function, FUEL PLANNING becomes green, and the BLOCK field is dashed during FMGC computation. The title of the page changes to INIT FUEL PLANNING, and BLOCK CONFIRM* replaces the FUEL PLANNING prompt, when the block fuel is computed by the FMGC. If the pilot modifies the parameters used to compute prediction before confirmation, the computation automatically restarts and FUEL PLANNING is displayed in green.
- [4R] TOW/LW (green) Displays the computed Takeoff Weight (TOW) and Landing Weight (LW) at the primary destination. This cannot be modified.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT
CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION

[1L] - [1R] AT-UTC/TIME-EFOB (green)	Display time and fuel predictions to the primary destination. TIME is displayed before takeoff. UTC predictions are displayed after takeoff. If the flight crew has entered an Estimated Takeoff Time (ETT), the UTC is displayed. The EFOB at destination will turn to amber, if it becomes less than the MIN DEST FOB value.
[2L] - [2R] AT-UTC/TIME-EFOB (green)	These lines display time and fuel predictions to the alternate airport.
[3L] RTE RSV% (blue)	Before departure, this field displays the route reserve fuel and the corresponding percentage of trip fuel. It may be equal to 0.0, if such is the policy of the operator. The crew can either enter a fuel quantity or a percentage. After takeoff, it becomes green 0.0/0.0, and the corresponding fuel is added to the EXTRA fuel.
[4L] ALTN/TIME (blue/green)	Displays alternate trip fuel and time, assuming that the Cost Index = 0 and that the aircraft flies at the default cruise flight level. The flight crew can modify the alternate fuel as required. In this case, alternate time will be dashed.
[5L] FINAL/TIME (blue)	Displays the final reserve fuel and time calculated at the alternate airport (or destination airport, if selected in the “airline fuel policy” section of the AMI). The flight crew may enter a final fuel or time, and the system will compute associated holding time/fuel available. The system assumes a holding pattern at 1 500 ft AGL, with the aircraft in CONF 1 at maximum endurance speed (racetrack pattern, altitude and selected airport can be modified through the “airline fuel policy” section of the AMI).
[6L] MIN DEST FOB (blue)	Displays the expected Minimum Fuel at Destination. It is equal to the FINAL + ALTN fuel. The field can be modified directly by the flight crew, and is also impacted by the modification of the ALTN and/or the FINAL fuel.
[3R] ZFW/ZFWCG (blue)	Displays the Zero Fuel Weight (ZFW) and Zero Fuel Weight Center of Gravity (ZFWCG) values, as entered before engine start on the INIT B page. The flight crew can re-enter or modify these values after engine start on the FUEL PRED page. If at engine start, no ZFW or ZFWCG values have been entered, amber boxes are displayed in the corresponding field. The flight crew must enter the ZFW/ZFWCG values to obtain a speed profile and predictions.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
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- [4R] FOB (blue) Displays the Fuel On Board (FOB) calculated by the FMGS and the following fuel sensors:
- Fuel flow and fuel quantity sensors (/FF+FQ)
 - Fuel flow sensors only (/FF).
 - Fuel quantity sensors only (/FQ).
- The flight crew can modify the FOB value in flight, or modify the sensors used by entering "/FF", "/FQ" or "/FF+FQ", as required.
- [5R] GW/CG (green) The FMS continuously updates the GrossWeight (GW) and Center of Gravity (CG) during the flight. The field displays dashes, as long as the system is not calculating the Fuel On Board, or the ZFW has not been entered by the flight crew.
- The field cannot be modified.
- [6R] EXTRA/TIME (green) Displays the amount of extra fuel, and the resulting time available for holding over the primary destination.
- EXTRA FUEL = FOB – (TAXI + TRIP + RSV + MIN DEST FOB).**
- This field displays its information in small green font, and it cannot be modified by the flight crew.

Note: *All fields are dashed before engines are started.*

FLIGHT PLAN PAGES

Ident.: DSC-22_20-20-10-25-00000563.0009001 / 26 NOV 19

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

These pages display all waypoints of the active and alternate flight plans, along with associated predictions.

The flight crew can make all revisions to the lateral and vertical flight plans from these pages:

The flight crew presses the left key to revise the lateral flight plan, and the right key to revise the vertical flight plan.

The flight crew presses the F-PLN key on the MCDU console to access the Flight Plan A page of the active flight plan.

FLIGHT PLAN A PAGE

Flight Plan A Page displays time, speed, and altitude predictions for each active flight plan waypoint.



TITLE

FLIGHT NUMBER (blank, if no flight number has been entered). This line may display: **TMPY** in yellow if a temporary flight plan exists; **OFST** in white, if a lateral offset is flown; or, **OFST** in yellow, if a lateral offset revision is pending.

Line 1 to Line 5 WPT,
UTC, SPD, ALT

These lines display consecutive waypoints along with associated predictions of time, speed or Mach and altitude for each. TIME is displayed before takeoff, and UTC after takeoff. After the flight crew enters an Estimated Takeoff Time (ETT), UTC is displayed. The time and flight level display at the FROM waypoint (first line of the flight plan) are values that the system memorized at waypoint sequencing.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
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[1R] SPD/ALT

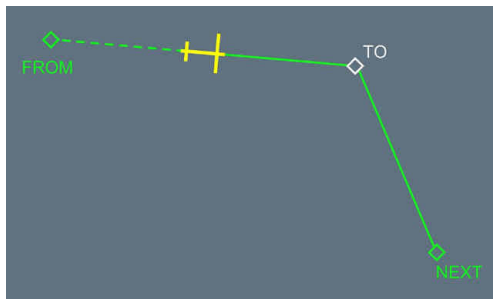
The field dedicated to SPEED or MACH is blank at the FROM waypoint, except at the departure airport (V1 associated with runway elevation, is displayed).

Note: When the HOLD marker is slewed, the HOLD SPD Label will overwrite the TIME/UTC title.

Line 6, DEST UTC/TIME
DIST, EFOB

DIST is the distance to destination along the displayed flight plan.
EFOB is the estimated fuel on board at destination. The EFOB at destination will turn to amber, if it becomes less than the MIN DEST FOB value.
The sixth line is permanent and is displayed in white font once predictions are available, except when a TMPY F-PLN is displayed or in some cases when an ALT CSTR is entered ("*CLB or DES*" prompt appears).

Note: The predicted altitude at a waypoint is related to the QNH below the transition altitude, and is given as a flight level above the transition altitude.



The generic flight plan page displays the FROM waypoint (last waypoint to be overflown) on the first line, and the TO waypoint (in white) on the second line. The FROM/TO flight plan leg is called the active leg.

The flight crew can use the scroll keys to review all flight plan legs down to the last point of the alternate flight plan. The AIRPORT key serves as a fast slew key. The flight crew can press it to call up the next airport (DEST, ALTN, ORIGIN) to be displayed on the flight plan page.

In order to return to the beginning of the flight plan page, the flight crew presses the F-PLN key on the MCDU console.

The display shows the name of the leg between two waypoints, and the distance between them on a line between the lines that identify them. During an approach, this in-between line also defines the angle of the final descent path. For example, "2-3 °" indicates that the leg is two nautical miles long, and the flight path angle is -3 °.

The display shows the bearing between FROM and TO waypoints as the bearing from the aircraft position to the TO waypoint. It shows track (TRK) between the waypoints shown in lines 2 and 3.

This is the outbound track of the next leg.

If the database contains a published missed approach procedure, or if someone has inserted one manually, the display shows it in blue after the destination runway identification. It turns green when the go-around phase becomes active.

After the last waypoint of the missed approach, the display shows the alternate flight plan in NAV mode.

When NAV mode is engaged, the flight crew can only clear or modify the TO waypoint by using the DIR key on the MCDU console.

PREDICTIONS

The system calculates and displays predictions for all waypoints.

It uses the current wind to compute TO waypoint predictions, and uses predicted winds to compute all others.

CONSTRAINTS

The database may define an altitude or speed constraint for each waypoint of the climb, descent, and approach phases, or the flight crew may manually insert such constraints (except at origin, destination, FROM, and pseudo-waypoints) or a time constraint (RTA).

The constraints are displayed in magenta, as long as predictions are not completed.

Once predictions are available, constraints are replaced by speed, time and altitude predictions, preceded by stars. If the star is in magenta, the system predicts that the aircraft will match the constraint (altitude within 250 ft, speed not more than 10 kt above the constraints, RTA within the required accuracy). If the star is in amber, the system predicts that the aircraft will miss the constraint and the MCDU displays: **SPD ERROR AT WPTXX** for speed constraint, or **RTA MISSED AT XXX** for time constraint.

Note: *SPD and ALT CSTR may either be entered on the VERT REV page or directly on the F-PLN A page, whereas TIME CSTR may only be entered from the RTA page.*

PSEUDO-WAYPOINTS

Pseudo-waypoints are geographical positions corresponding to an event in the vertical flight plan: T/C (top of climb), T/D (top of descent), SPD/LIM (speed limit), DECEL (deceleration for approach), etc. The display shows them as waypoints in parentheses.

APPROACH DISPLAY

The flight crew cannot enter an altitude constraint at destination or Missed Approach Point (MAP).



FLIGHT PLAN B PAGE

This page displays fuel predictions and forecast winds at each waypoint.
The flight crew calls it up by pressing the NEXT PAGE key when the FLIGHT PLAN A page is displayed.



TITLE FLIGHT NUMBER (blank if no flight number has been entered).

AIRCRAFT SYSTEMS**AUTO FLIGHT - FLIGHT MANAGEMENT****CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION**

Line 1 to Line 5
WPT-EFOB-WIND

These lines display consecutive waypoints and associated fuel predictions, and the forecast wind profile.
The direction of forecast winds is relative to true north.
Forecast winds include winds entered by the flight crew (large font) and the propagated winds at intermediate waypoints (small font).
If the flight crew uses a trip wind, it will be displayed for each waypoint.
If no other wind entry is made after takeoff, the FROM waypoint will display the actually recorded wind, and the waypoints downpath will still display the trip wind.

Line 6
DEST-UTC/DIST-EFOB

Identical to F-PLN A page.

LATERAL REVISION PAGES

Ident.: DSC-22_20-20-10-25-00000564.0009001 / 03 NOV 21

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

These pages give the flight crew a list of the lateral flight plan revisions, which can be used to change the flight plan beyond a selected waypoint.

The flight crew calls up these pages from the flight plan pages (A or B) by pressing the left key adjacent to the selected waypoint.

Different lateral flight plan revisions are available for different waypoints.

LAT REV AT THE ORIGIN	[1L]	LAT REV FROM LSGG 45°12.0N/007°27.2E		[1R]
	[2L]	<DEPARTURE FIX INFO>		[2R]
	[3L]	LL XING/INCR/NO []°/[]°/[]		[3R]
	[4L]	NEXT WPT []		[4R]
	[5L]	ENABLE NEW DEST []		[5R]
	[6L]	<RETURN		[6R]

LAT REV AT THE DESTINATION	[1L]	LAT REV FROM LGAT 37°53.8N/023°43.7E		[1R]
	[2L]	ARRIVAL>		[2R]
	[3L]	NEXT WPT []		[3R]
	[4L]	ENABLE ←ALTN		[4R]
	[5L]	<ALTN		[5R]
	[6L]	<RETURN		[6R]

LAT REV AT THE FROM WPT	[1L]	LAT REV FROM PPOS		[1R]
	[2L]	<OFFSET	FIX INFO>	[2R]
	[3L]	<HOLD	LL XING / INCR / NO	[3R]
	[4L]		[]°/[]°/[]	[4R]
	[5L]			[5R]
	[6L]	<RETURN		[6R]

LAT REV AT A WPT	[1L]	LAT REV FROM FRZ 44°01.8N/011°00.2E		[1R]
	[2L]	<OFFSET	LL XING / INCR / NO	[2R]
	[3L]	<HOLD	NEXT WPT	[3R]
	[4L]	ENABLE	NEW DEST	[4R]
	[5L]	<ALTN	[]	[5R]
	[6L]	<RETURN	AIRWAYS>	[6R]

TITLE	The ident of the waypoint or airport selected for revision, along with its latitude and longitude. If the selected waypoint is the FROM waypoint, the title omits the aircraft latitude and longitude, and displays the “PPOS” (present position) instead.
[1L] DEPARTURE	This prompt gives the flight crew access to the departure pages, where the flight crew can select and insert runways, SIDs, and TRANSs.
[2L] OFFSET	This prompt gives the flight crew access to the OFFSET page.
[3L] HOLD	This prompt gives access to the hold pages.
[4L] ENABLE ALTN	This prompt allows the flight crew to switch to the alternate flight plan at the selected revision waypoint, and use it as a new active flight plan. The system never displays this prompt at the FROM waypoint.
[5L] ALTN	This prompt gives access to the alternate airport page. The system displays it only at the destination.
[6L] RETURN	This prompt returns the display to the flight plan page.
[1R] ARRIVAL	This prompt calls up the arrival pages, where RWY, APPR, STAR TRANS and VIA can be selected and inserted.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
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- [1R] FIX INFO

FIX INFO is only displayed on the lateral revision page at the origin or FROM waypoint. It gives access to the FIX INFO page.
- [2R] LLXING/INCR/NO

This prompt allows the flight crew to create the latitude/longitude crossing point. The increment (INCR) ranges from 1 to 20 °, and the number of crossing points from 1 to 99. This prompt is not displayed for waypoints belonging to the descent procedure.
- [3R] NEXT WPT

The flight crew uses this prompt to enter the next waypoint. If this waypoint is a latitude/longitude, or is neither in the database nor in the flight crew-defined elements, the display reverts to the NEW WAYPOINT PAGE.
- [4R] NEW DEST

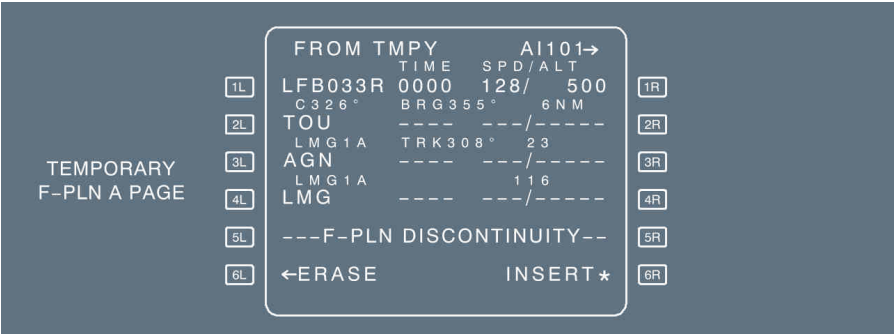
The flight crew uses this prompt to enter a new destination.
- [5R] AIRWAYS

The flight crew uses this prompt to access the AIRWAYS page.
- [6R] INSERT

This prompt is displayed when the flight crew has created a temporary flight plan. It can be used to activate the temporary flight plan.

TEMPORARY REVISION

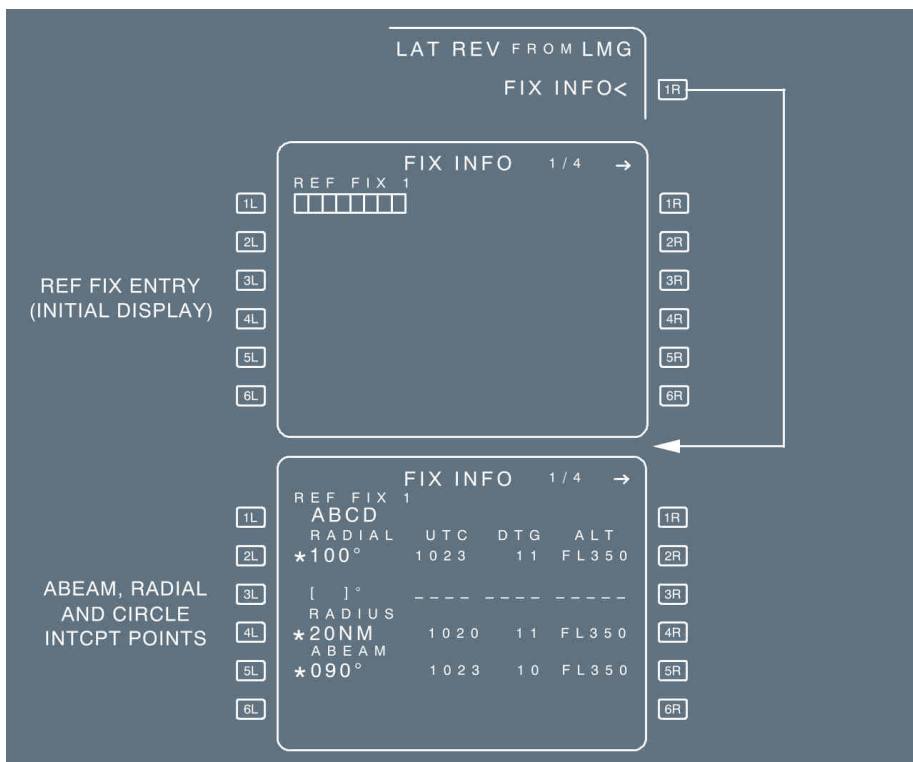
When the flight crew selects a lateral revision, the system creates a “Temporary F-PLN” and displays it in yellow on the MCDU, and as a dashed yellow line on the ND, enabling the flight crew to review the data before inserting it. As long as the temporary flight plan is not inserted, the previous the flight plan remains active and the system guides the aircraft along it.



FIX INFO PAGE
Ident.: DSC-22_20-20-10-25-00000565.0009001 / 14 MAY 12 Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

This page provides access to the RADIAL, CIRCLE, and ABEAM intercept functions. The reference may be a given database fix or a pilot-defined element. If the radial, circle or abeam intercepts the active flight plan, the intersection point can be converted to a waypoint and inserted into the flight plan.

The FIX INFO page may be accessed from the LAT REV page at the origin airport, or at FROM.



The diagram illustrates the MCDU FIX INFO page in two states, with a transition arrow from the top state to the bottom state.

Top State: REF FIX ENTRY (INITIAL DISPLAY)

- Top header: LAT REV FROM LMG
- Section header: FIX INFO<
- Left side buttons: 1L, 2L, 3L, 4L, 5L, 6L
- Right side buttons: 1R, 2R, 3R, 4R, 5R, 6R
- Central display:
 - REF FIX 1
 - A row of six empty boxes for entry.

Bottom State: ABEAM, RADIAL AND CIRCLE INTCP T POINTS

- Section header: FIX INFO 1 / 4 →
- Left side buttons: 1L, 2L, 3L, 4L, 5L, 6L
- Right side buttons: 1R, 2R, 3R, 4R, 5R, 6R
- Central display:
 - REF FIX 1
 - ABCD
 - RADIAL UTC DTG ALT
 - *100° 1 0 2 3 1 1 FL 3 5 0
 - [] ° - - - - -
 - RADIUS
 - *20NM 1 0 2 0 1 1 FL 3 5 0
 - ABEAM
 - *090° 1 0 2 3 1 0 FL 3 5 0

[1L] REF FIX (blue) Allows entries of the REF FIX. This reference may be any database element (navaid, waypoint, NDB, airport, runway) or a pilot-defined element. Prior to entry, amber boxes are displayed.

[2L] - [2R] RADIAL (blue) and [3L] - [3R] (blue) Enables entry of a radial from the REF FIX.

If the radial line intersects the active flight plan, the FMGS will compute the time, the along path DTG (Distance To Go), and the altitude at the intersection point (small green font). A large blue star is then displayed to insert the intersection waypoint into the flight plan. This waypoint is not part of the pilot-stored elements. Format of the created waypoint is:

XXXNNN	XXX =	First 3 letters of REF FIX ident.
NNN	=	Value of the radial

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
--	---

[4L] - [4R] **RADIUS**
(blue)

This function enables the flight crew to enter a radius that defines a circle around the REF FIX.
When the circle intercepts the current flight path, the FMGS will compute the time, the along path distance and the altitude at the first intersection point, from the current aircraft position (small green front).
A large blue star is then displayed to insert the intersection waypoint into the flight plan. This waypoint is not part of the pilot stored element.
The waypoint is automatically labelled:
“DNNNXXX” NNN = Value of the radius
 XXX = First 3 letters of the REF FIX ident.

[5L] - [5R] **ABEAM**

This function enables the pilot to create waypoints on a flight plan (primary or secondary) that are abeam a reference fix.
Once computed, the page displays the radial number in large green font. Time, distance and altitude predictions are displayed in small green font. Selecting the key adjacent to the star creates the waypoint and inserts it into the flight plan.
The waypoint is identified by AB + the REF FIX ident e.g. AB TLS.
Abeam waypoints are not stored in the pilot-stored waypoint database.

Note: *Four FIX INFO pages, providing the capability to define four different REF FIX elements, are available.*

OFFSET PAGE

Ident.: DSC-22_20-20-10-25-00013512.0019001 / 17 MAY 21
Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

This page allows the flight crew to insert a preplanned offset into the flight plan by entering:

- A start waypoint
- An end waypoint
- An offset distance to the left or to the right
- The intercept angle value.

The flight crew calls up this page from the LATERAL REVISION page, by pressing [2L] key.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT
CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION

OFFSET		INTCPT ANGLE	
[1L] OFFSET	5L	25°	[1R]
[2L] START WPT	ALCOA	END WPT	[2R] BEROK
[3L] F-PLN WPTS	ALCOA	ALCOA	[3R]
[4L] ←AMILL	AMILL→		[4R]
[5L] ←ABDEN	ABDEN→		[5R]
[6L] <RETURN	OFFSET DELETE*	↑↓	[6R]

TITLE	OFFSET in white large font. If a temporary flight plan exists, it is displayed in yellow large font.
[1L] OFFSET	This field displays the lateral offset distance, left or right, in the flight plan. The offset may be between 1 and 50 NM. Blue brackets are displayed until an offset is inserted. When the flight crew enters an offset, or modifies another element in the OFFSET page, the OFFSET field becomes yellow. One time the temporary flight plan is inserted, the field becomes blue. The flight crew can delete an inserted offset either by pressing the CLR key, by entering a zero for the amount of the offset, or by pressing OFFSET DELETE in 6L field.
[2L] START WPT	The START WPT ident for the offset is displayed in yellow if a temporary flight plan exists, in blue if already inserted, or in green when the field is not modifiable. The default START WPT shall be the waypoint where the lateral revision is performed, the first waypoint offsettable, or PPOS if the offset is currently flown. This waypoint can also be selected from the list of waypoints in the fields 3L to 5L, or can be manually entered by the flight crew.
[3L] to [5L]	Display the start waypoints available for selection. Two scrolling list are available. The active start waypoint is displayed in green in the list. Other waypoints are displayed in blue. The currently selected start waypoint does not have selection arrow associated.
[6L] RETURN ERASE	RETURN: The flight crew presses this key to return to the last displayed LAT REV page. ERASE: It is displayed when a temporary flight plan has been created, and it enables the flight crew to erase the temporary flight plan.

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
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- [1R] INTCPT ANGLE This field displays the intercept angle. The angle may be between 10 ° and 50 °. The intercept angle in the AMI is the default value, and is shown in blue. When the flight crew enters an intercept angle, or modifies another element in the OFFSET page, the field becomes yellow. When the temporary flight plan is inserted, the field becomes blue.
- [2R] END WPT The END WPT ident for the offset is displayed in yellow if a temporary flight plan exists, or in blue if already inserted. The default END WPT shall be the waypoint terminating the last consecutive offsettable leg from default or currently selected START WPT.
This waypoint can also be selected from the list of waypoints in the fields 3R to 5R, or can be manually entered by the flight crew.
- [3R] to [5R] Display the end waypoints available for selection. Two scrolling lists are available. The active end waypoint is displayed in green in the lists. Other waypoints are displayed in blue. The currently selected end waypoint does not have selection arrow associated.
- [6R] INSERT OFFSET INSERT: This field allows the flight crew to activate the temporary flight
DELETE plan and reverts the display to the active flight plan. This field is displayed when the offset segment is completely defined on OFFSET page.
OFFSET DELETE: This prompt enables the flight crew to create a temporary flight plan where the predefined offset is canceled. This field is displayed when an offset exists in the active flight plan.

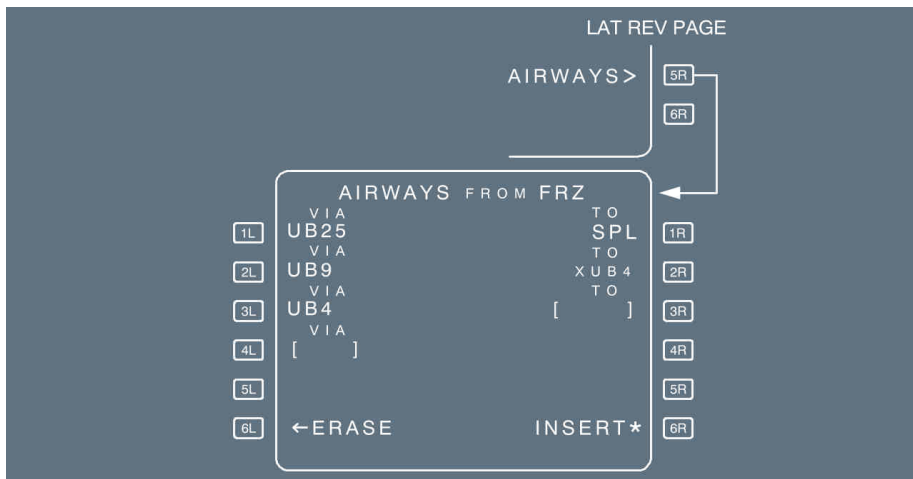
Note: If the waypoint lists in lines 3 to 5 do not fit in one page, the flight crew can scroll in an open loop, two lines by two lines. To keep the initial order of the list, two markers appear:

- - START OF LIST - : This marker is displayed at the beginning of the list
- - END OF LIST - : This marker is displayed at the end of the list.

AIRWAYS PAGE

Ident.: DSC-22_20-20-10-25-00000566.0009001 / 14 MAY 12
Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

This page allows the pilot to select up to five airways for stringing into the flight plan, after the revise waypoint.
The pilot calls up this page by pressing the lateral revision page [5R] key.



LAT REV PAGE

AIRWAYS >

[1L]

[2L]

[3L]

[4L]

[5L]

[6L]

AIRWAYS FROM FRZ

VIA	TO
UB25	SPL
VIA	TO
UB9	XUB4
VIA	TO
UB4	[]
VIA	
[]	

←ERASE INSERT*

[1R]

[2R]

[3R]

[4R]

[5R]

[6R]

TITLE	Revise point ident (large green font)
[1L] to [5L] VIA	This field displays the airways entered by the pilot.
[6L] ERASE or RETURN	The flight crew presses this key to return to the lateral revision page. This field displays ERASE when a temporary flight plan is created. It enables the temporary flight plan to be erased.
[1R] to [5R] TO	Displays the end points of the corresponding airways entered on the [1L] to [5L] entries. The ending point is displayed in large blue font, if manually-entered, in blue small font if FMGC-computed.
[6R] INSERT (amber)	Allows the entered VIA/TO segments to be inserted into the flight plan. The display reverts to the F-PLN page.

- Note:
- If the entered airway contains at least one fixed radius transition waypoint as defined in the navigation database, and the TO waypoint is defined and, the fixed radius transition waypoint is in the flight plan, then, "FIXED TURN RADIUS AWAY" is displayed between the VIA and TO fields.
 - If the condition for display "FIXED TURN RADIUS AWAY" is satisfied for two consecutive airways lines, the second line displays (") instead of the whole message.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
--	--

DEPARTURE PAGES

Ident.: DSC-22_20-20-10-25-00000567,0001001 / 17 MAR 11
Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

These pages allow the pilot to review departure procedures (RWY, SID, TRANS) and enter them into the active flight plan.

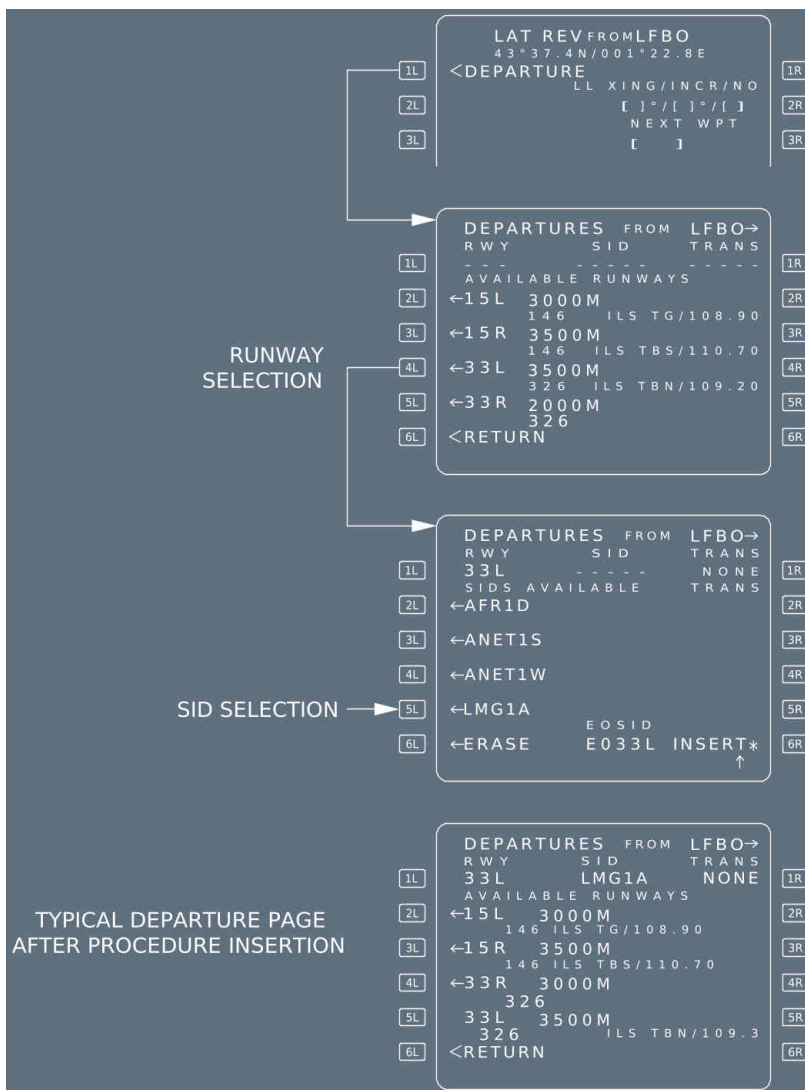
When the display shows the lateral revision page for the origin, the pilot calls them up by pressing the 1L key.

Three pages are available: RWY, and SIDS and TRANS (if any).

The pilot sequentially calls up each page by selecting a data item (such as RWY), or by pressing the NEXT PAGE key on the MCDU console.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION



Line 1 RWY, SID
TRANS

This line displays the RWY, SID, and TRANS in green after they have been inserted into the active flight plan, or in yellow if selected but not yet inserted. If nothing has been selected or inserted, the line displays dashes.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
--	---

[2L] to [5L] RWY/SIDs	These fields display selectable and selected RWYs or SIDs (including EOSID and NO SID option). The pilot can slew each list. Selectable RWYs and SIDs are displayed in blue with an arrow. Once a RWY or SID is selected, the arrow disappears. A RWY or SID, already inserted in the flight plan, is displayed in green. The display shows the length, heading, and, if available, the ILS ident and frequency for each runway.
[6L] ERASE or RETURN	The pilot presses this key to erase a selected data item and revert to the previous selection. If the pilot erases the page, the display reverts to the active flight plan page. The display shows RETURN instead of ERASE, when the pilot has not created a temporary flight plan.
[2R] to [5R] TRANS	This field displays the selectable and selected enroute transitions in blue and green respectively. They are blank, if there are no transitions.
[6R] INSERT or BLANK	The pilot uses this key to insert a temporary procedure into the flight plan. The page reverts to the active flight plan page, when the insertion is completed. It is associated with RETURN (6L).
[6M] EOSID	Once a runway is inserted into the flight plan, this field displays any ENG OUT SID for that runway. If there is none, it displays NONE.

HOLD PAGES

Ident.: DSC-22_20-20-10-25-00000568.0001001 / 01 OCT 12
Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

These pages allow the pilot to review and modify the holding pattern parameters at the selected revise waypoint.

The flight crew calls up these pages by pressing the HOLD key on the LAT REV page for the waypoint. The flight crew can insert database hold, holds computed by the FMS or holds that they manually define.

		LAT REV FROM VNE		
		44°01.8N/011°00.02E		
	1L			1R
	2L	LL XING/INCR/NO		2R
		[]°/[]°/[]		
		NEXT WPT		3R
PRESS →	3L	<HOLD		
	4L	<ENABLE		4R
		ALTN		
	5L			5R
	6L			6R
		AIRWAYS>		
		<RETURN		

At first access, the HOLD page appears as follow:

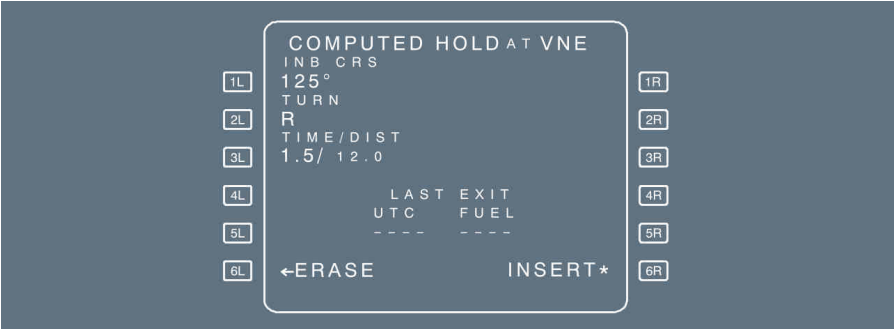
DATABASE HOLD

If a hold is defined in the navigation database for the revised waypoint, and can be inserted, the parameters in [1L], [2L] and [3L] appear in yellow.

		DATABASE HOLD AT VNE		
		INB CRS		
	1L	103°		1R
	2L	TURN		2R
		R		
	3L	TIME/DIST		3R
		1.0/ 7.6		
	4L	LAST EXIT		4R
		UTC FUEL		
	5L	----		5R
	6L			6R
		←ERASE		
		INSERT*		

COMPUTED HOLD

If a default hold is computed by the FMS and can be inserted, the parameters in [1L], [2L] and [3L] appear in yellow.



- A computed hold has the following default parameters:
- | | |
|------------------|--|
| [1L] INB CRS | Inbound track of the F-PLN leg leading to the revised waypoint |
| [2L] TURN | Direction right (R) to turn in the hold |
| [3L] TIME/DIST | TIME on outbound leg is 1.5 min above 14 000 ft, 1 min below 14 000 ft. |
| [2R] | This field shows “REVERT TO COMPUTED” when the flight crew has modified the holding pattern. |

HOLD MODIFIED BY FLIGHT CREW

If the flight plan contains a holding pattern that was defined by the pilot from an existing database or computed hold, the parameters in [1L], [2L] and [3L] appear in blue.

If the pilot has modified holding pattern data from the database, the field next to [2R] displays “REVERT TO DATABASE” or “REVERT TO COMPUTED” to enable the pilot to revert to default parameters.

1L

2L

3L

4L

5L

6L

1R

2R

3R

4R

5R

6R

HOLD AT VNE
 INB CRS
 103°
 TURN
 L
 TIME/DIST
 1.0/ 7.6
 LAST EXIT
 UTC FUEL
 1253 5.2
 <RETURN
 100

1L

2L

3L

4L

5L

6L

1R

2R

3R

4R

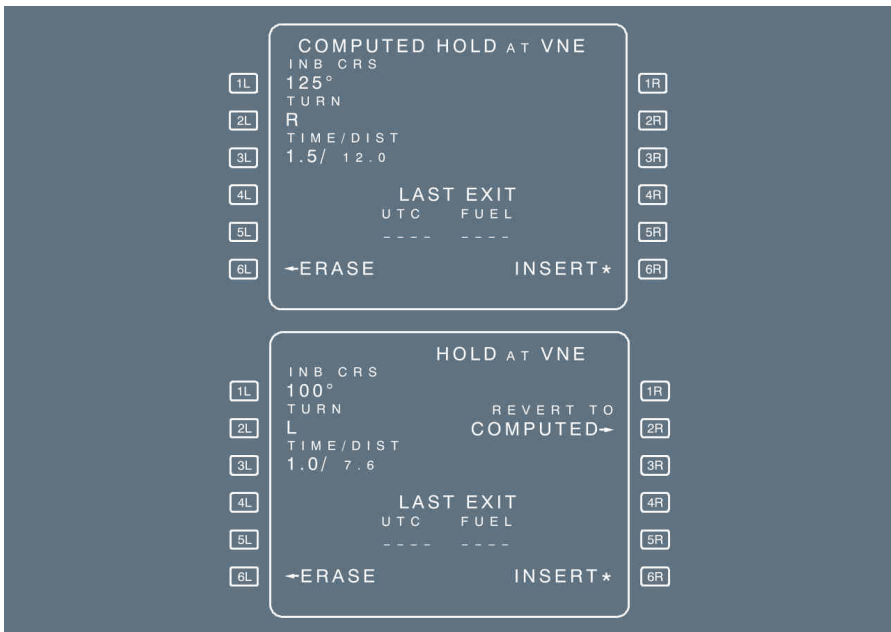
5R

6R

HOLD AT VNE
 INB CRS
 100°
 TURN
 L
 TIME/DIST
 1.0/ 7.6
 LAST EXIT
 UTC FUEL
 - - - - -
 <ERASE
 REVERT TO
 DATABASE→
 INSERT*

EXAMPLE

The pilot modifies the inbound course.



COMPUTED HOLD AT VNE

INB CRS
125°
TURN
R
TIME/DIST
1.5 / 12.0

LAST EXIT
UTC FUEL
- - - - -

←ERASE INSERT*

HOLD AT VNE

INB CRS
100°
TURN
L
TIME/DIST
1.0 / 7.6

REVERT TO
COMPUTED→

LAST EXIT
UTC FUEL
- - - - -

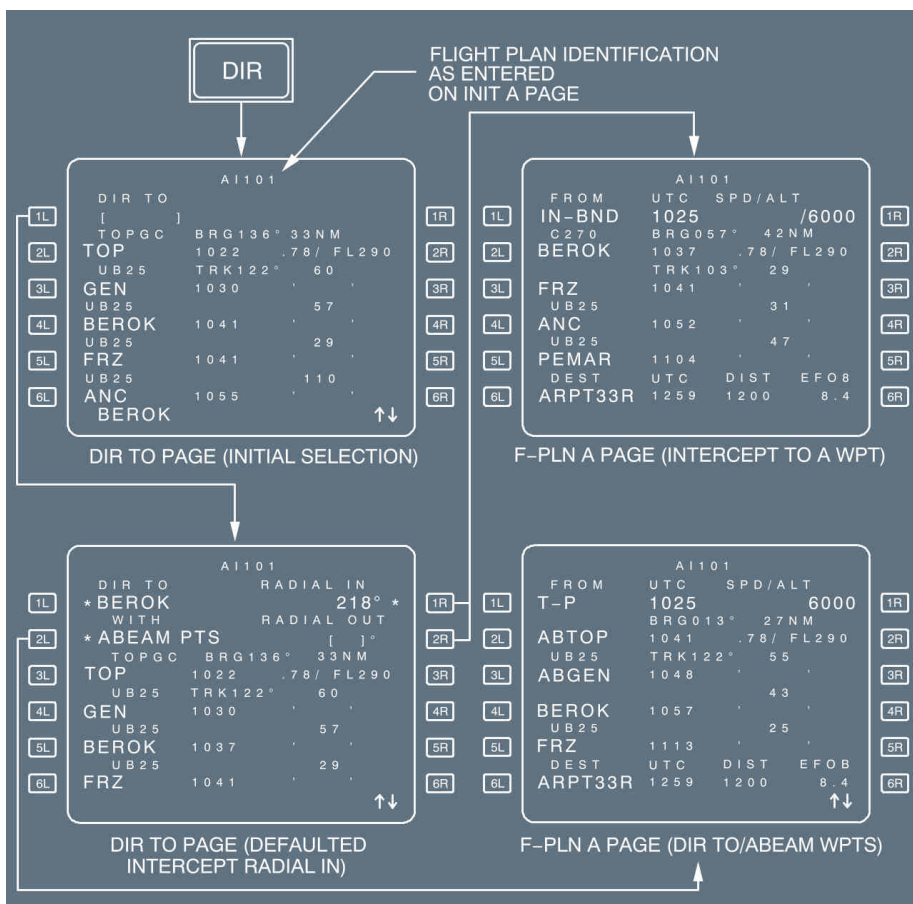
←ERASE INSERT*

- | | |
|------------------------|---|
| [1L] INB CRS | This field displays the inbound course of the holding pattern. The data may be manually or automatically modified. |
| [2L] TURN | This field shows the direction to turn in the hold (L or R). The data may be modified. |
| [3L] TIME/DIST | This field shows the time and distance for the outbound leg. The data may be modified, but time and distance cannot be entered simultaneously. Time and distance are dependent values that the system calculates from the predicted true airspeed, which in turn depends upon the holding speed (speed for maximum endurance, ICAO speed limit, or constraint speed, whichever is lower). |
| [6L] ERASE or RETURN | The pilot presses this key when the field shows "ERASE", to erase the holding pattern.
The pilot presses this key when the field shows "RETURN", to return to the LAT REV page, if the hold is already inserted in the flight plan. |
| [2R] REVERT TO... | The pilot presses this key to delete manual modifications to the database hold (or computed hold), and to revert to the database (or computed) holding data. |

- [6R] INSERT The pilot presses this key to insert the hold into the active flight plan.
- LAST EXIT UTC FUEL This field displays the time at which the aircraft must leave the holding pattern in order to meet fuel policy criteria (extra fuel = 0). The system also displays the estimated fuel on board at that time. Always displayed in thousand of kilograms or pounds.

DIRECT TO PAGE

Ident.: DSC-22_20-20-10-25-00000569.0001001 / 23 JUN 15
 Applicable to: MSN 02155-02789, 03031-03060, 05152-05746



 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
--	---

Pressing the “DIR” key under the MCDU screen brings up the DIR TO page. On this page, the [1L] key is the DIR TO key. The pilot presses it to modify the flight plan by creating a direct leg from the aircraft's present position to any selected waypoint. When in NAV mode, the pilot must use this key to modify the active leg or the TO waypoint. The pilot cannot call up this page when the aircraft's present position is not valid.

- [1L] DIR TO

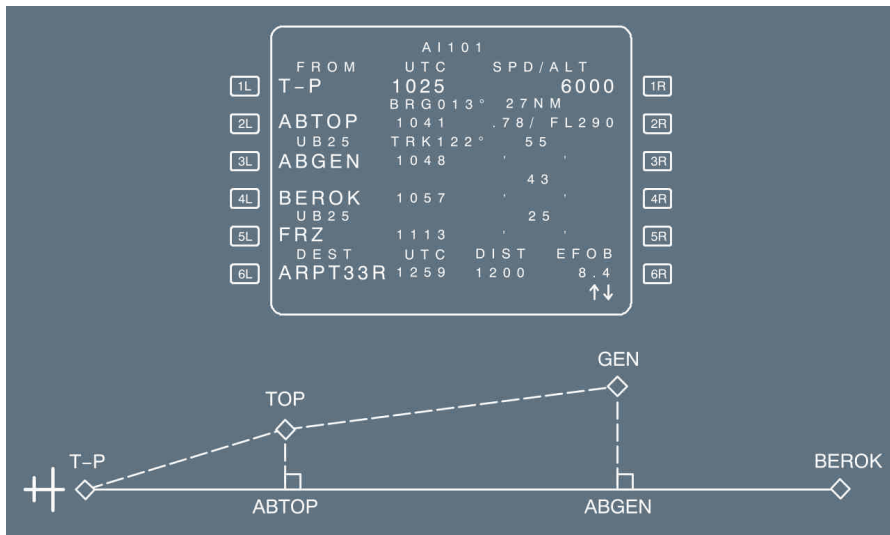
Pressing this key selects the DIRECT TO or INTERCEPT waypoint. The pilot can identify the waypoint to be inserted by using its identifier, its latitude and longitude, place/bearing/distance, or place-bearing/place-bearing.

Note: If the entered DIR TO is a latitude/longitude, the NEW WAYPOINT page is automatically called up.

If the pilot does not select the RADIAL IN (1R) or RADIAL OUT (2R) or ABEAM PTS (2L), the DIR TO function routes the aircraft from the present position to the waypoint inserted in the DIR TO field.
- Line 3 to Line 6

These lines display the active flight plan with time/speed/distance predictions. The display may be slewed ↑ ↓ . Pressing any key activates the DIRECT TO function from the present position to the waypoint adjacent to that key.
- [2L] ABEAM PTS

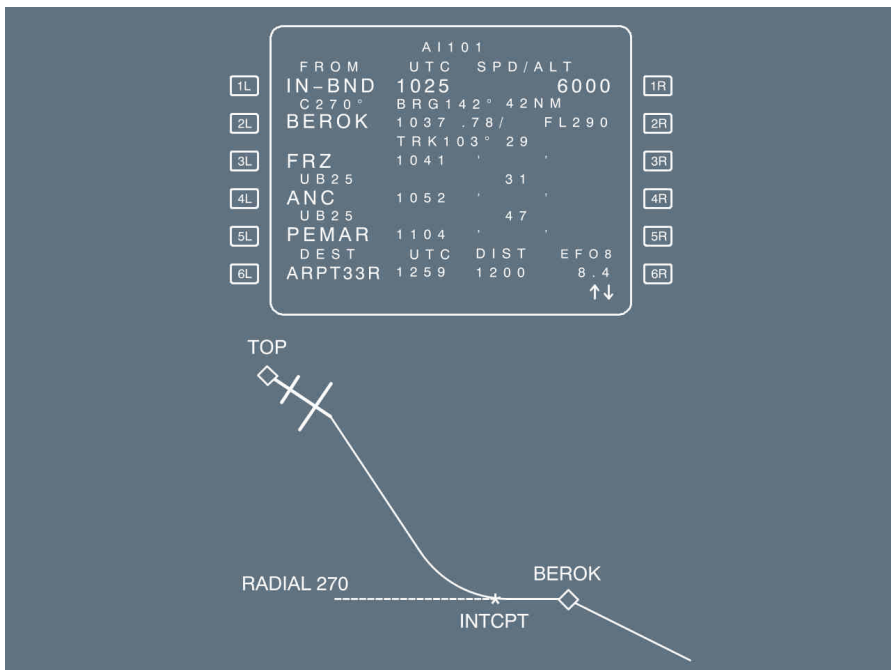
The flight crew presses this key to activate the DIR TO/ABEAM function which projects the flight plan waypoints perpendicular on the DIR TO leg:

EXAMPLE: DIR TO BEROK - ABEAM.


[1R] RADIAL IN and
 [2R] RADIAL OUT

The pilot fills in these fields to define a radial, associated to the waypoint defined in 1L. These keys respectively activate the DIR TO/INTERCEPT TO and DIR TO/INTERCEPT FROM functions. The pilot enters the radial in, or radial out, as : XXX, XXX being the radial.
 The aircraft intercepts from its current position and tracks the selected waypoint and radial to (or from) this waypoint.

EXAMPLE: RADIAL INBND - DIR TO BEROK - RADIAL 270 ° INBOUND



If the DIR TO/INTCPT WPT entry is to a waypoint already in the flight plan, a default RADIAL IN is displayed in small font. However, no radial is displayed on the ND for this default radial. No default radial is provided for the RADIAL OUT field.

Selecting the INTCPT TO (RADIAL IN [1R]) function:

- Activates the intercept radial INTO the WPT.
- Sets the course = radial IN + 180 °.
- Reverts the display to the F-PLN A page.

Selecting the INTCPT FROM (RADIAL OUT [2R]) function:

- Activates the intercept radial FROM the WPT.
- Sets the course = radial OUT.
- Reverts the display to F-PLN A page.

For details, DSC_22_20_30 Flight Planning.

Note: *It is not recommended to use the DIR TO function when the aircraft is on the ground. The use of the DIR TO function when the aircraft is on the ground may result in the loss of all departure data, that includes both of the following:*

- *The takeoff speeds*
- *The derated level, or the flexible temperature.*

ARRIVAL PAGES

Ident.: DSC-22_20-20-10-25-00000570.0017001 / 04 NOV 22

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

These pages enable the flight crew to review arrival procedures (approaches, VIAs, STARs, TRANS) and enter them into the active flight plan.

The flight crew presses the [1R] key from the LAT REV page for the destination to access the ARRIVAL pages.

Three pages, APPR, STAR, and VIA, are available, along with a fourth, TRANS, if there are any transitions.

The flight crew either selects a data item (such as APPR), or presses the NEXT PAGE on the MCDU to access the next pages sequentially.

Line [1L] - [1R] [2R] This line displays the APPR, VIA, STAR, and TRANS in green, if they are inserted in the flight plan, and in yellow, as a temporary flight plan, if they are selected but not yet inserted.

It displays dashes or NONE, if nothing is selected or inserted.

[2L] APPR VIAS The flight crew presses this key to access transitions from the last point of the STAR to the first point of the approach.

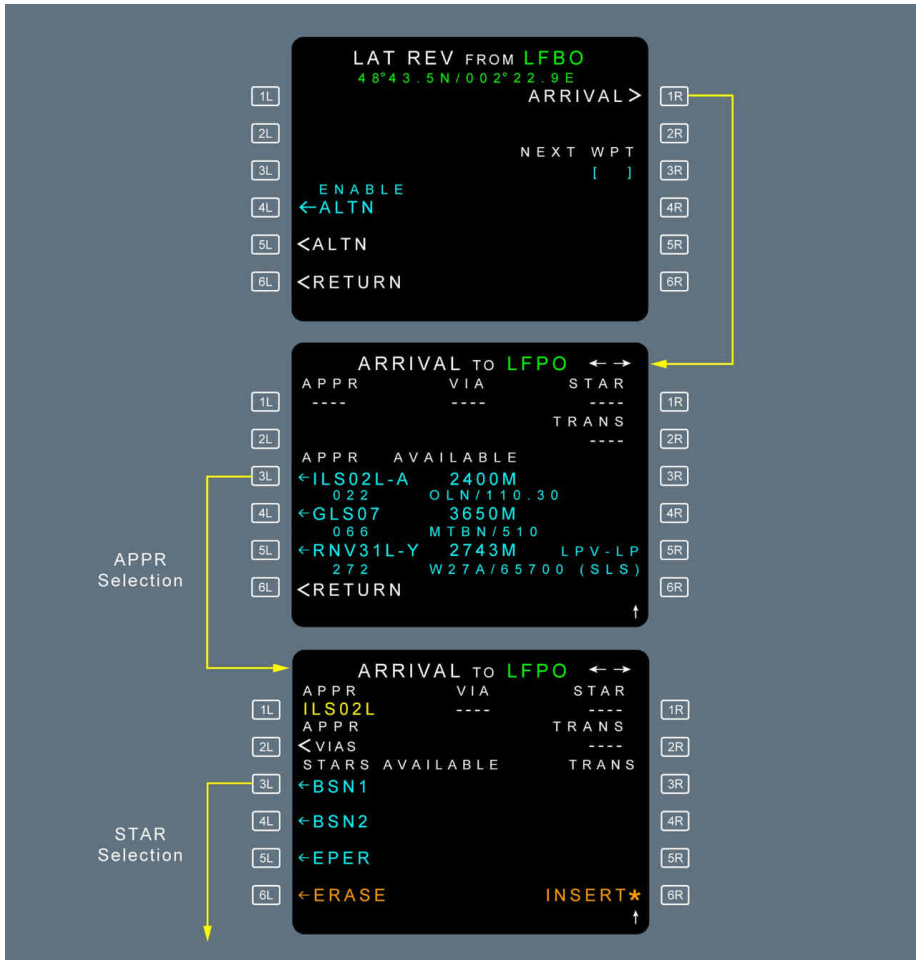
 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
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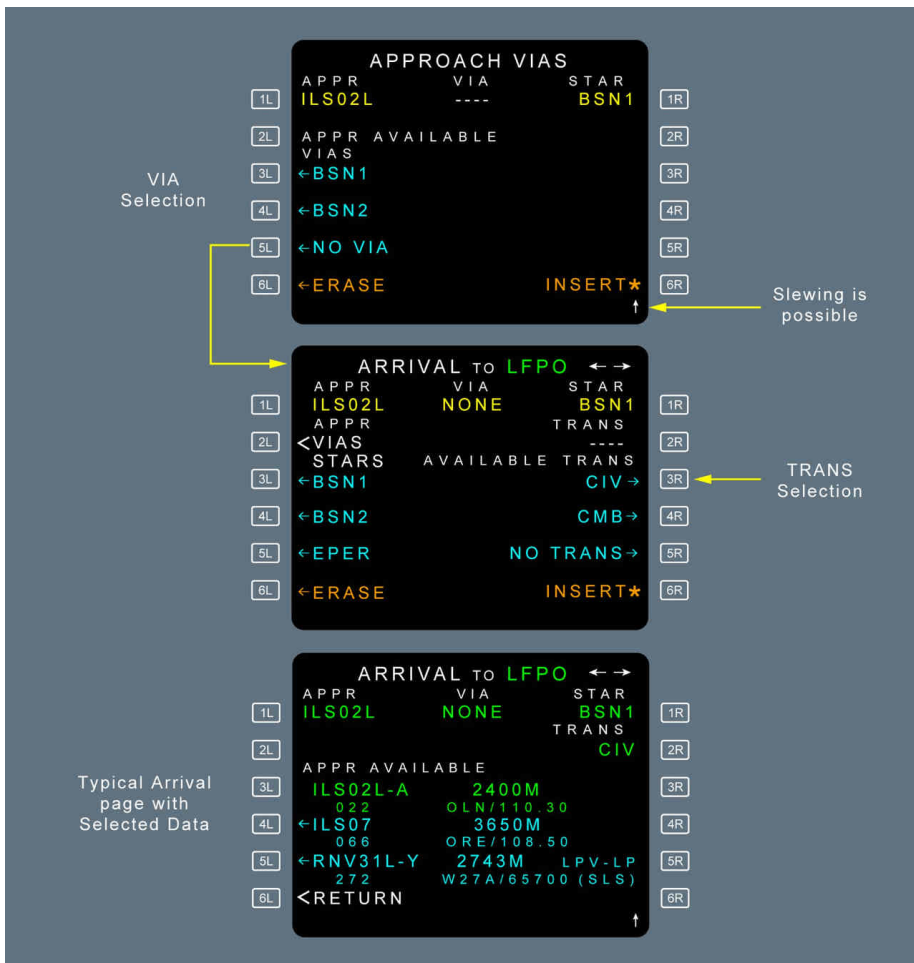
[3L] to [5L]	These fields list selectable and selected APPRs, STARs, and VIAs. The flight crew can slew the pages, when necessary. The FMS displays the APPRs, STARs, and VIAs that are available for selection in blue with an arrow. The arrow disappears when the flight crew selects an APPR, STAR, or VIA. The flight crew inserts into the flight plan the APPR, STAR, or VIA and then the FMS displays the APPR, STAR, or VIA in green on the ARRIVAL page. The list of VIAs available on the APPROACH VIAS page is composed of VIAs compatible with the selected STAR. If only one VIA is compatible with the selected STAR, then the VIA is automatically selected in VIA field on the ARRIVAL page. For each approach, the display shows runway length, heading, and the frequency and identifier of the ILS or the channel and identifier of the GLS when ILS or GLS is available. When SLS is available, for RNAV(GNSS) approach with LPV or LP minima, the LPV-LP tag is added next to the runway length (whether the approach is with LP or with LPV minima), and the SLS tag is added below the LPV-LP tag. SLS ident and channel are displayed on the left of SLS tag. In the case of multiple approaches for the same runway, the approach is identified with the runway plus the multiple indicator (i.e. ILS 33L-S).
[6L] ERASE or RETURN	The flight crew presses this key to erase selected data and to revert to the previous selection. The page reverts to the LAT REV page. The field displays RETURN, instead of ERASE, when the flight crew has not created a temporary flight plan.
[3R] TRANS to [5R]	These fields display selectable and selected enroute transitions (if any). They are blue when selected, and become green when inserted into the active flight plan.
[6R] INSERT	The flight crew presses this key to insert the temporary procedure into the active flight plan. The page reverts to the active flight plan page when this occurs.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION




ALTERNATE PAGE

Ident.: DSC-22_20-20-10-25-00000571.0001001 / 03 NOV 21

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

This page enables the flight crew to review, in the NAV database, the alternate airports that are paired with the destination, and define additional alternates, if needed. (Alternate airports are linked

to the destination). The flight crew calls up this page with the ALTN prompt, from the lateral revision page for the destination.

5L

<ALTN

6L

<RETURN

LAT REV PAGE FOR DESTINATION (LGAT)

ALTERNATES FOR LGAT

ALTN CO RTE

1L

NONE

TRK EXTRA DIST

2L

OTHER ALTN

3L

[]

EXTRA

4L

NO ALTN

2.5

5L

<RETURN

1R

2R

3R

4R

5R

6R

ALTERNATES FOR LGAT

ALTN CO RTE

1L

LGTS

1907

TRK EXTRA DIST

2L

<LGAB

120° 0.5 260

3L

<LGCD

0.75° 0.5 229

4L

[]

OTHER ALTN

5L

<NO ALTN

EXTRA

6L

<RETURN

2.5

1R

2R

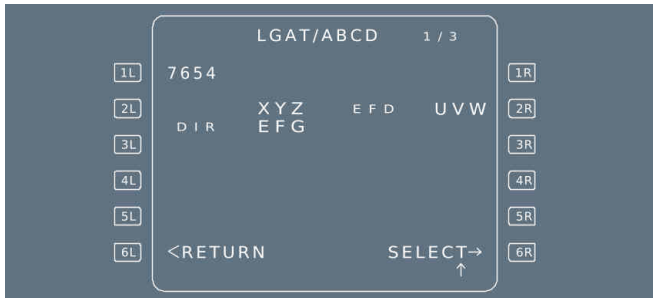
3R

4R

5R

6R

TITLE	The destination airport is displayed large green font.
[1L] ALTN	This field displays the selected alternate: In green, if it is active; in yellow, if it is temporary. "NONE" is displayed, if NO ALTN option is selected, or if the destination has no alternate.
Line 2 to line 5	These lines display the identifications of alternates (up to 6), the extra fuel weight remaining after landing at the alternates, and the great-circle track and distances to them from the destination. If the database contains a company route between the destination and the alternate, the distance shown is an airway distance, not a great-circle distance. When the database defines a preferred alternate, it is displayed on Line 2 (if no scrolling has been performed).



[6 R] SELECT

Pressing this key reverts the display to the alternate page. (The distance between the destination and the alternate is then the airway distance).

VERTICAL REVISION PAGES

Ident.: DSC-22_20-20-10-25-00000573.0001001 / 04 DEC 18

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

These pages contain the menu of available vertical flight plan revisions that can be applied at a selected waypoint.

The pilot calls up these pages from the flight plan A or B pages by pressing the right hand key next to the selected revised waypoint.

The pilot may make several different vertical revisions (although some may not be available at all waypoints): Speed limit, speed constraint, altitude constraint, time constraint, wind page and STEP ALTS page.

VERT REV AT ORIGIN	1L	VERT REV AT LFBO15R EFOB = 13.2 EXTRA = 2.3 CLB SPD LIM 250/FL100 RTA> <WIND STEP ALTS> <RETURN	1R
	2L		2R
	3L		3R
	4L		4R
	5L		5R
	6L		6R
VERT REV at cruise WPT	1L	VERT REV AT MIP EFOB = 12.4 EXTRA = 0.8 SPD CSTR ALT CSTR RTA> *[] [] MACH/START WPT *[]/MIP <WIND STEP ALTS> <RETURN	1R
	2L		2R
	3L		3R
	4L		4R
	5L		5R
	6L		6R
VERT REV at WPT in climb (ALT CSTR entered and predicted missed)	1L	VERT REV AT SBJ EFOB = 14.5 EXTRA = 0.8 CLB SPD LIM RTA> 210/ 7000 SPD CSTR ALT CSTR [] 5000 ALT ERROR -500 <WIND STEP ALTS> <RETURN	1R
	2L		2R
	3L		3R
	4L		4R
	5L		5R
	6L		6R

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION

VERT REV AT DEST	VERT REV EFOB = 8.4 CLB SPD LIM 250/10000 QNH □□□□ <WIND <RETURN AT KLGA EXTRA = 0.8 RTA> G/S INTCP 2000 STEP ALTS>
-----------------------------	--

TITLE

“VERT REV AT [location]”

The second line shows remaining fuel and extra fuel at the waypoint being revised. From FMS2 release 2 the second line does not exist.

[1L] “TOO STEEP
PATH BEYOND”

This message appears if the waypoint is part of a leg with a descent path that is too steep.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
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- [2L] CLB/DES SPD LIM This field displays the speed limit applicable to the climb or descent phase. It displays it in large font when data has been inserted manually, and in small font when data comes from the database.
- [3L] SPD CSTR This field displays any speed constraint assigned to the revised waypoint. It is in large font when inserted manually, and in small font when it comes from the database.
It is not displayed at the origin airport, at a FROM waypoint, a speed limit pseudo waypoint, or the destination airport.
- [4L] QNH This field only functions when the revised waypoint is the primary destination.
It allows the pilot to enter the atmospheric pressure at sea level.
This field is identical to the QNH field of the PERF APPR page.
- [4L] MACH/START WPT This prompt allows the pilot to enter or modify the start point of a constant Mach segment, and its associated Mach. It is not displayed at primary destination and alternate flight plan waypoints. (*Refer to DSC-22_20-10-30-22 Constant Mach Segment - Entering a Constant Mach Segment*).
- [5L] WIND The pilot presses this key to access the wind pages.
The first wind displayed page, corresponds to the selected waypoint (e.g. climb page), if the selected waypoint is a climb phase waypoint.
A CLR action reverts it to brackets.
- [6L] RETURN or CLB The pilot presses this key to return to the last displayed flight plan page.
When displayed, pressing this key assigns the constraint to CLB phase and inserts it into the vertical flight plan. The page reverts to the flight plan page.
- [2R] RTA prompt This prompt gives access to the RTA page. It is not displayed when the VERT REV page is accessed from the alternate F-PLN.
- [3R] ALT CSTR This field displays the altitude constraint assigned to this revised waypoint. It uses large font when the constraint is manually-entered, and small font when it is from the database.
A CLR action reverts it to brackets.

The constraint may be:
 - “At”, entered as XXXXX (Example: FL 180).
 - “At or above”, entered as + XXXXX or XXXXX + (Example: FL +310).
 - “At or below”, entered as – XXXXX or XXXXX – (Example: -5 000).
 - A “window” constraint.
The altitude window consists of two altitudes between which the aircraft should fly. The crew cannot manually enter a “window” constraint.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION

G/S INTCP	This field displays the glide intercept altitude for an ILS approach on the vertical revision page at destination.
[4R] ALT ERROR	When the aircraft misses a predicted altitude constraint, this field displays the difference between the altitude constraint and the predicted altitude. If, for example, “-500” appears in this field in green, the aircraft will reach the waypoint at an altitude 500 ft below the constraint altitude. This only applies to waypoints in the climb and descent phases.
[4R] END WPT	This prompt allows the pilot to enter or modify the endpoint of a constant Mach segment. It is displayed when a pair Mach/start exists in 4L field. This prompt is not displayed on the destination VERT REV page. (<i>Refer to DSC-22_20-10-30-22 Constant Mach Segment - Entering a Constant Mach Segment</i>).
[5R] STEP ALTS	This legend appears for any waypoint, once a cruise altitude has been entered. It is not available in engine-out, descent, approach, and go-around phases. This gives the pilot access to the STEP ALTS page.
[6R] DES	When this field displays “DES”, pressing this key assigns the constraints to the descent phase and inserts them into the vertical flight plan. The page reverts to the F-PLN page. (See note below).

Note: *Altitude and speed constraints may apply to the climb, descent, or approach phase, but never to the cruise phase. Fields 6L/6R display “CLB/DES” when the revised waypoint is a cruise phase waypoint and the FMGS needs to know if the new constraint is to be applied in climb or descent phase. The FMGS will modify the cruise phase accordingly. These 2 prompts also display “CLB/DES” when the predictions are not computed. (Top of climb and top of descent not yet defined).*

STEP ALTS PAGE

Ident.: DSC-22_20-20-10-25-00000574.0009001 / 14 MAY 12

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

This page allows the pilot to insert up to four geographic step points and one optimal step point into the flight plan. This page also displays the fuel/time savings associated with the optional step. The flight crew calls it up either from the vertical revision page.

1L

2L

3L

4L

5L

6L

STEP ALTS FROM FL290

ALT / WPT DIST TIME

[]/[] - - - - -

OPT STEP: ENTER ALT ONLY

<RETURN

1R

2R

3R

4R

5R

6R

1L

2L

3L

4L

5L

6L

STEP ALTS FROM FL290

ALT / WPT DIST TIME

FL330/[]

TO OPT S/C ΔFUEL ΔTIME

1016 NM / 1035 - 3.4 + 022

OPT STEP

<RETURN INSERT*

1R

2R

3R

4R

5R

6R

PAGE FILLED IN
WITH ONE STEP,
BUT NOT INSERTED

TITLE [1L] - [1R] [4L] - STEP ALTS in white followed by the current cruise altitude in green. [4R]

ALT/WPT {blue} : The waypoint identifier, as well as the altitude to step, can be entered in this field. Both are displayed in large font. The waypoint may either be an active (or secondary) flight plan waypoint, or an inserted optimal point (OPT). When an entry is made, a temporary F-PLN is created.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION

DIST / TIME (UTC)
 (small green font)

Displays the distance to go, and time from the present aircraft position along the flight plan to the step point.

Note: The following messages may be displayed in the DIST/TIME field:

- ABOVE MAX, if the step altitude exceeds the MAX altitude.
- "IGNORED", if the step start or end point is less than 50 NM from the top of descent or if the step climb is located prior to the top of climb or after the top of descent.
- "STEP AHEAD", when the aircraft is within 20 NM of the start step point.
- "NO OPTIMAL" if a non inserted optimal step falls in a discontinuity due to a flight plan change, or when no new optimal exists after an UPDATE or when no optimal step point exists for the entered altitude.

Note: If no optimal step point exists for the altitude displayed in [1L], the "NO OPTIMAL" message is displayed in the FUEL/TIME field. This message is also displayed, if the optimal step falls into a discontinuity.

[5L] OPT STEP:
 ENTER ONLY ALT
 (white) TO OPT S/C
 (green small front)

This field displays the distance and time to an uninserted optimal step point, if one exists. It is displayed to guide the flight crew for the entry format of an optional step.

Note: On any flight plan change, an inserted optimal step remains in the flight plan at a fixed distance to destination.

[6L] RETURN
 [5R] SAVINGS

The flight crew presses this key to return to the previous page.

This field displays the fuel and time savings prior to the insertion of the optimal step point.

Fuel savings are displayed in thousand of kilograms (or pounds) (maxi 99.9).

The value is preceded by:

- "-" in case of fuel saving,
- "+" in case of additional fuel cost.

Time savings are displayed in hours and minutes. The value is preceded by

- "-" in case of time saving,
- "+" in case of additional time cost.

[6R] INSERT* (amber) This field displays INSERT*, when an optimal step point exists but is not yet inserted. When INSERT is selected:

- The optimal step point is inserted into the flight plan.
- OPT is displayed in line 1L.
- Optimal step distance and time are deleted in line 5L.
- The UPDATE* blue prompt replaces the INSERT* prompt.

UPDATE* This prompt enables the computation of another optimal step point. The UPDATE* prompt is then replaced by the INSERT* prompt.

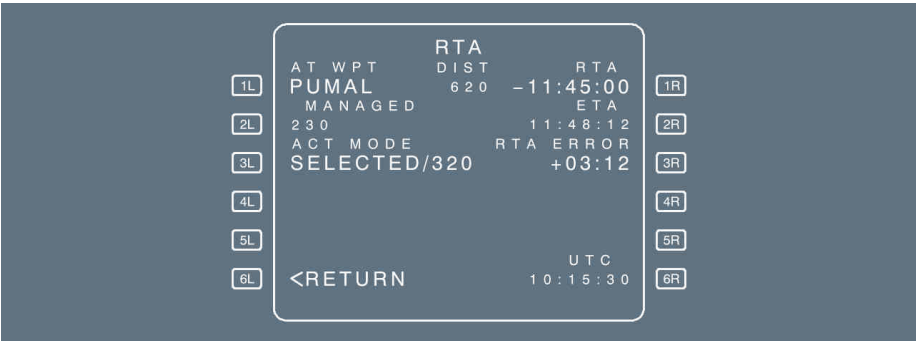
RTA PAGE

Ident.: DSC-22_20-20-10-25-00000575.0009001 / 14 MAY 12
Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

The Required Time of Arrival (RTA) page allows the entry and display of a waypoint identifier, with associated time constraints. The page also displays the entered or computed Estimated Takeoff Time (ETT), as well as the following data:

- Predicted ETA at the time-constrained waypoint;
- Performance adjusted SPD target;
- Time error;
- Distance to time constrained waypoint;
- Active speed mode;

The flight crew calls up this page with the RTA prompt from the vertical revision page.



TITLE RTA (large white font)

line 1	This line displays: - AT WPT, DIST and RTA when a time constraint can be defined. The identifier of the revised waypoint or the first following waypoint at which the time constraint can be defined, is displayed by default in large blue font - AT WPT, DIST and RTA when a time constraint has already been defined. The associated constrained waypoint identifier is displayed by default in large blue font - AT WPT and white dashes when no time constraint can be defined - AT WPT and blue brackets if a time constraint can only be introduced before the waypoint at which the VERT REV has been initiated. Only when the waypoint identifier has been defined (by the flight crew or by default), blue brackets and a blue star are displayed in [1R] field. The flight crew enters the time constraint as "HHMMSS", preceded by: - for at or before; + for at or after; - no sign for at.
[2L] MANAGED	This field displays the FMGS-computed ECON speed/Mach (<i>Refer to DSC-22_20-10-40-10 Optimization</i>)
[3L] ACT MODE	This field displays the active speed mode : MANAGED or SELECTED/NNN (NNN is the selected target speed). The pilot cannot modify it through this field.
[6L] RETURN	The pilot presses this key to revert the display to the VERT REV page.
[2R] ETA	When a required time at arrival has been defined, the 2R field displays the estimated time of arrival as "HHMMSS".
[3R] RTA ERROR	This field is blank when the RTA is predicted as made. If the RTA is predicted as missed, "RTA ERROR" is displayed in small white font, and the time error between ETA and RTA is displayed in small amber font.
[6R] ETT	The Estimated Takeoff Time (ETT) field is available in the preflight phase. If no ETT is available, the 6R field displays blue brackets and a blue star. Once available, the ETT is displayed in magenta.
UTC	Universal time is displayed in green for takeoff, climb, cruise, descent and approach phases.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
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DATA INDEX PAGES

Ident.: DSC-22_20-20-10-25-00000576.0001001 / 17 MAR 11

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

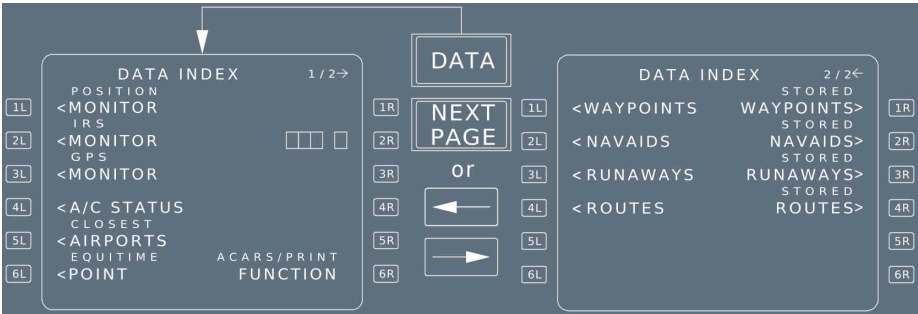
There are two INDEX pages:

The DATA INDEX 1/2 page gives access to various pages devoted to navigation.

The DATA INDEX 2/2 page lists the navigation data, entered in the FMGS.

The pilot enters those items labeled “stored” and can modify them. The pilot can call up the others, but cannot modify them.

The pilot calls up these pages by pressing the DATA key on the MCDU console:



DATA INDEX 1/2 PAGE

[1L] POSITION MONITOR - [2L] IRS MONITOR	When the flight crew presses these keys, the display shows all essential navigation data.
[3L] GPS MONITOR	This key calls up the GPS MONITOR page.
[4L] A/C STATUS	This key calls up the aircraft status page.
[5L] CLOSEST AIRPORTS.	This key calls up the closest airports page.
[6L] EQUITIME POINT	This key calls up the equitime point page.
[6R] ACARS/PRINT	This key calls up the PRINT function pages and the ACARS function pages.

AIRCRAFT SYSTEMS**AUTO FLIGHT - FLIGHT MANAGEMENT****CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION****DATA INDEX 2/2 PAGE**

[1L] WAYPOINTS

[2L] NAVAIDS

[3L] RUNWAYS

[4L] ROUTES

[1R] STORED WAYPOINTS

[2R] STORED NAVAIDS

[3R] STORED RUNWAYS

[4R] STORED ROUTES

These keys call up descriptions of waypoints, NAVAIDs, runways, and routes stored in the database, so that they can be reviewed.

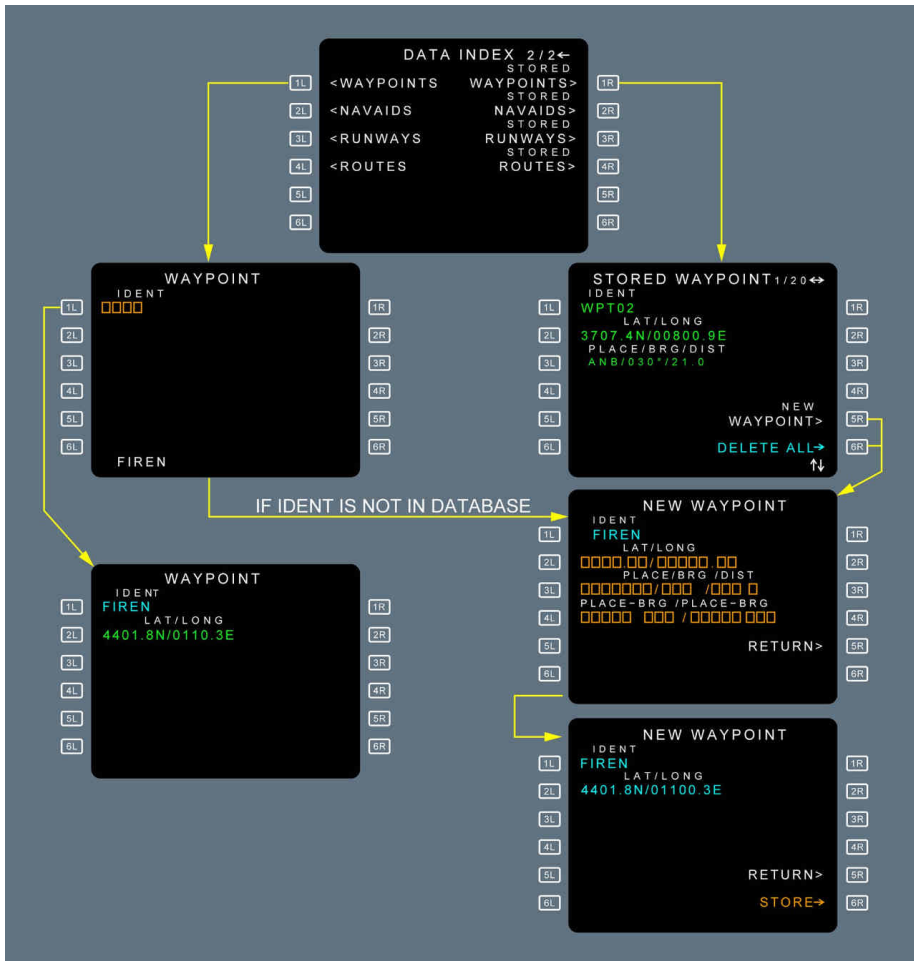
These keys call up waypoints, NAVAIDs, runways, and routes that the pilot has stored, enabling the pilot to review and store them in, or delete them from, the database.

The airline can choose to automatically have all pilot-stored data erased in the done phase.

WAYPOINT/STORED WAYPOINT/NEW WAYPOINT PAGES

Ident.: DSC-22_20-20-10-25-00000577,0001001 / 30 AUG 18

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746



WAYPOINT PAGE

- The pilot can call up this page by pressing the 1L key on the DATA INDEX page. The display then shows waypoint information associated with the identifier the flight crew inserts it in the [1L] field.
- With this page it is possible to call any waypoint not stored in the stored waypoint list, if they belong to the active, temporary, or secondary flight plan.

STORED WAYPOINT PAGE

The pilot calls up this page by pressing the 1R key on the DATA INDEX page.

This page displays waypoints, defined and stored by the pilot. It lists each stored waypoint, along with a number that shows the relative order in which it was inserted in the database. This number is displayed in the upper righthand corner of the page. For example, "1/20" indicates that the waypoint was the first of 20 stored.

Note: Latitude/Longitude crossing points and Abeam/Radial Intercept points are never included in the stored waypoint list.

- | | |
|------------------------|---|
| [1L] IDENT | To delete a waypoint, the pilot clears the 1L ident display. |
| [2L] LAT/LONG | Latitude and longitude of the waypoint are displayed in this field. |
| [3L] | This field either displays PLACE/BRG/DIST or PLACE-BRG/
PLACE-BRG or PLACE/DIST, depending on how the waypoint was defined. |
| [5R] NEW
WAYPOINT | The pilot presses this key to call up the NEW WAYPOINT page. |
| [6R] DELETE ALL | The pilot presses this key and the label changes to amber CONFIRM
DELETE ALL. Pressing this key a second time deletes all the waypoints,
stored by the flight crew, except those currently used in the active or
secondary flight plan. ("F-PLN ELEMENT RETAINED" appears on the
MCDU). |

NEW WAYPOINT PAGE

- The flight crew displays this page by pressing the 5R key on the STORED WAYPOINT page.
- The flight crew uses this page to define and store waypoints. The maximum number of waypoints that it is possible to enter depends on the FMS standard. It is possible for these to be 20 or 99, and appears in the upper right corner of the STORED WAYPOINT page. For example, "1/20" indicates that 20 is the maximum number of waypoints that it is possible to store. If an additional waypoint is entered, then the first one is deleted.

The flight crew defines a waypoint by entering its ident in the data field next to 1L, then by entering its position in the amber boxes.

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
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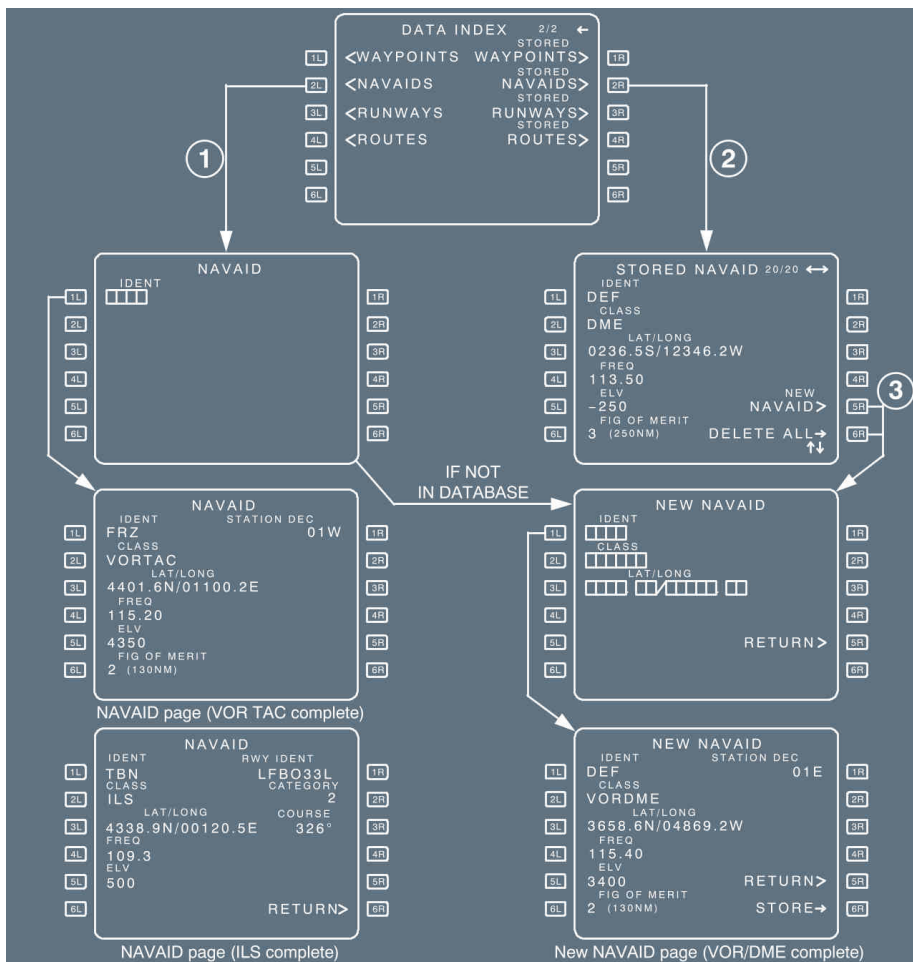
The STORE prompt appears next to 6R when the boxes are filled in, and the pilot presses the key to store the waypoint in the database.

If the pilot enters the waypoint's position as place/bearing/distance, or place-bearing/place-bearing, the FMGC computes its latitude and longitude.

NAVAID/STORED NAVAID/NEW NAVAID PAGES

Ident.: DSC-22_20-20-10-25-00000578.0001001 / 01 OCT 12

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746



NAVAID PAGE

The pilot calls up this page by pressing the 2L key on the DATA INDEX page 2.

This page displays NAVAID information associated with the identifier the pilot inserts in the [1L] field.

NAVAID PAGE (ILS)		NAVAID			
[1L]	IDENT	RWY IDENT		[1R]	
[2L]	TBN	LFBO33L		[2R]	
[3L]	CLASS	CATEGORY	2	[3R]	
[4L]	ILS	LAT/LONG	COURSE	[4R]	
[5L]	4338.9N/00120.5E	326°		[5R]	
[6L]	FREQ			[6R]	
	109.3				
	ELV				
	500				
		RETURN>			

NAVAID PAGE (VOR TAC)		NAVAID			
[1L]	IDENT	STATION DEC	01W	[1R]	
[2L]	FRZ			[2R]	
[3L]	CLASS			[3R]	
[4L]	VORTAC	LAT/LONG		[4R]	
[5L]	4401.6N/01100.2E			[5R]	
[6L]	FREQ			[6R]	
	115.20				
	ELV				
	4350				
	FIG OF MERIT				
	2 (130NM)				

- [2L] CLASS This field identifies the NAVAID as VOR, DME, VOR DME, VORTAC, NDB, LOC, ILS, MLS, ILS/DME, MLS/DME, ILS/TAC or TACAN. It displays NON COLLOCATED, if the NAVAID is uncollocated.
- [4L] FREQ or CHAN CHAN is displayed, if the class of NAVAID is an MLS or an MLS DME.
- [5L] ELV This field gives the NAVAID elevation in feet above sea level. It is not displayed for VOR or NDB.
- [6L] FIG OF MERIT This field shows how far out the FMGS can autotune a VOR, VOR/DME, VORTAC, or DME for display or for computing position.
- 0 : up to 40 NM
 - 1 : up to 70 NM
 - 2 : up to 130 NM
 - 3 : up to 250 NM

AIRCRAFT SYSTEMS

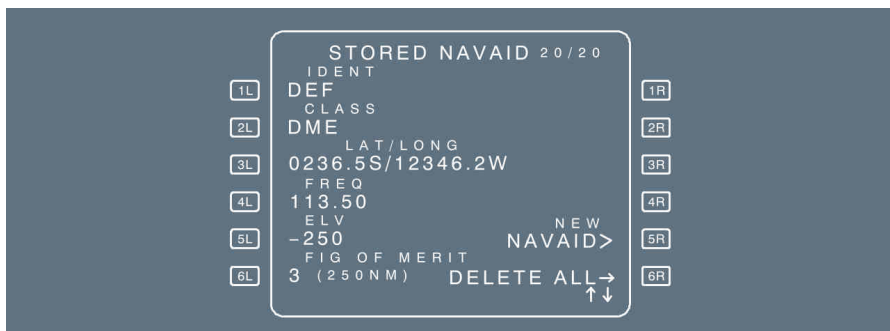
AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION

- [1R] STATION DEC or RWY IDENT This is the magnetic declination in the NAVAID area (used only for VOR, VOR/DME, and VORTAC).
 The field displays RWY IDENT, if the NAVAID is a LOC, ILS, MLS, ILS/DME, MLS/DME or ILS/TAC.
- [2R] CATEGORY This field shows the NAVAID's category, if it is an ILS, ILS/DME, MLS, MLS/DME or ILS/TAC. A LOC DME has a category = 0.
- [3R] COURSE This is the localizer course, if the NAVAID is an ILS or a LOC.
- [6R] RETURN This prompt is displayed, if the page has been accessed from the SELECTED NAVAID page. The pilot presses this key to return to the SELECTED NAVAID page.

STORED NAVAID PAGE

The pilot calls up this page by pressing the 2R key on the DATA INDEX page. This page is used to display or delete defined and stored NAVAIDs.



1L

STORED NAVAID 20/20
 IDENT
 DEF
 CLASS
 DME
 LAT/LONG
 0236.5S/12346.2W
 FREQ
 113.50
 ELV
 -250
 FIG OF MERIT
 3 (250 NM)

1R

2L
2R

3L
3R

4L
4R

5L
5R

6L
6R

NEW
 NAVAID>
 DELETE ALL →
 ↑ ↓

A number in the upper righthand corner of the screen shows the relative order in which the NAVAIDs were stored. (For example, 3/7 means the third out of the seven stored).

Slew keys give the pilot access to the different stored NAVAIDs.

- [1L] IDENT The pilot deletes a stored NAVAID by entering its ident in this field, then by pressing the CLR key at the bottom of the MCDU control panel.
- [6R] DELETE ALL and CONFIRM The pilot presses this key to erase all the stored NAVAIDs, except those currently used in the active or secondary flight plan. (The MCDU displays "F-PLN ELEMENT RETAINED.").
- DELETE ALL

NEW NAVAID PAGE

The pilot calls up this page by pressing the 5R key on the STORED NAVAID page.

EMPTY NEW NAVAID PAGE	NEW NAVAID IDENT CLASS LAT/LONG RETURN >	1R 2R 3R 4R 5R 6R
NEW NAVAID PAGE (VOR/DME)	NEW NAVAID IDENT STATION DEC DEF 01E CLASS VORDME LAT/LONG 3658.6N/04869.2W FREQ 115.40 ELV 3400 FIG OF MERIT 2 (130NM) RETURN > STORE →	1R 2R 3R 4R 5R 6R

It can be used to define and store up to 20 NAVAIDs. Entering an additional waypoint deletes the first one. The NAVAID elements must be entered in two steps:

1. Enter the data in the lines of amber boxes.
2. Enter frequency, elevation, figure of merit, and station declination or ILS category and course, if applicable.

Note: The pilot cannot create an ILS/DME or an uncollocated NAVAID. If the runway associated with the ILS has been entered through the new runway page, the course, IDENT, and runway IDENT are already displayed on the new NAVAID page when it comes up (copied from the new runway page). For details, see the new runway page info below.

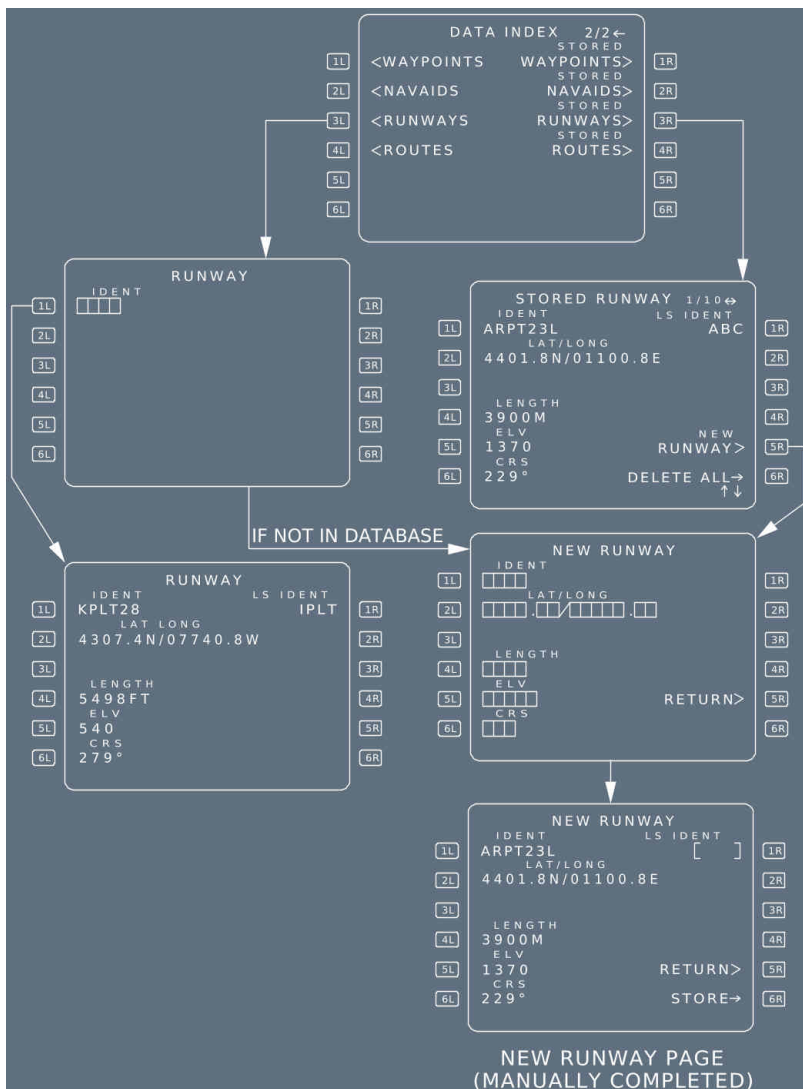
- | | | |
|--------|-------------|--|
| [1R] | STATION DEC | The pilot must enter the magnetic declination, if the prompt is displayed. This prompt is displayed only for VOR, VORTAC or VOR/DME. |
| [3R] | COURSE | If the NAVAID is an ILS, LOC, enter the course. |
| [6R] | STORE | This prompt appears when all the amber boxes are filled in. The pilot presses the key to store the NAVAID. |

A stored NAVAID is never used for position computation.

RUNWAYS/STORED RUNWAYS/NEW RUNWAY PAGES

Ident.: DSC-22_20-20-10-25-00000579.0001001 / 17 MAR 11

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746



 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
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RUNWAY PAGE

This page displays the following information:

[1L] IDENT	The runway IDENT, which comprises the airport identification and the runway direction, uses six or seven digits (Example: CYYZ 24L and LFRJ 08).
[2L] LAT/LONG	The latitude and longitude of the runway threshold.
[4L] LENGTH	The runway length in meters (M) or feet (ft), in five digits (9 999 ft).
[5L] ELV	The elevation of the threshold in feet above sea level.
[6L] CRS	The runway course (degrees magnetic).
[1R] LS IDENT	The LOC or ILS identifier.

STORED RUNWAY PAGE

The pilot uses this page to display or delete the defined and stored runways. The stored runways are listed and numbered in the order in which they were inserted. The number is displayed in the upper righthand corner of the page. (For example, 2/4 means the runway is the second of the four stored runways).

The pilot can delete any stored runway from the database by displaying its IDENT in the 1L field, then by pressing the CLR key on the MCDU control panel.

[6R] DELETE ALL and CONFIRM DELETE ALL	The pilot presses this key to erase all the stored runways, except those used in the active or secondary flight plan. (The MCDU displays "F-PLN ELEMENT RETAINED").
[1L] to [6L]	These fields are similar to the RUNWAY page fields.

NEW RUNWAY PAGE

The pilot can use this page to define and store up to 10 runways.

- **When the pilot enters an ILS/LOC IDENT in the [1R] field the new NAVAID page comes up. When the pilot has entered and stored the necessary data in the new NAVAID page, the new runway page reappears.**

The new runway page and the new NAVAID page (ILS/LOC) are not independent:

- **When the flight crew first defines the ILS/LOC (on the new NAVAID page) the new runway page, when called up, already displays the RWY course, RWY IDENT, and ILS IDENT (copied from the new NAVAID page).**
- **When the flight crew first defines the runway (on the new runway page) the new NAVAID page, when called up, already displays the ILS course, ILS IDENT, and runway IDENT.**

The pilot must enter the two runway directions on two different new runway pages (Example: LFRJ 08 and LFRJ 26) to allow the flight plan to select either one.

AIRCRAFT SYSTEMS**AUTO FLIGHT - FLIGHT MANAGEMENT**

CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION

Note: When 10 runways are stored, entering a new stored runway deletes the first one of the list (1/10).

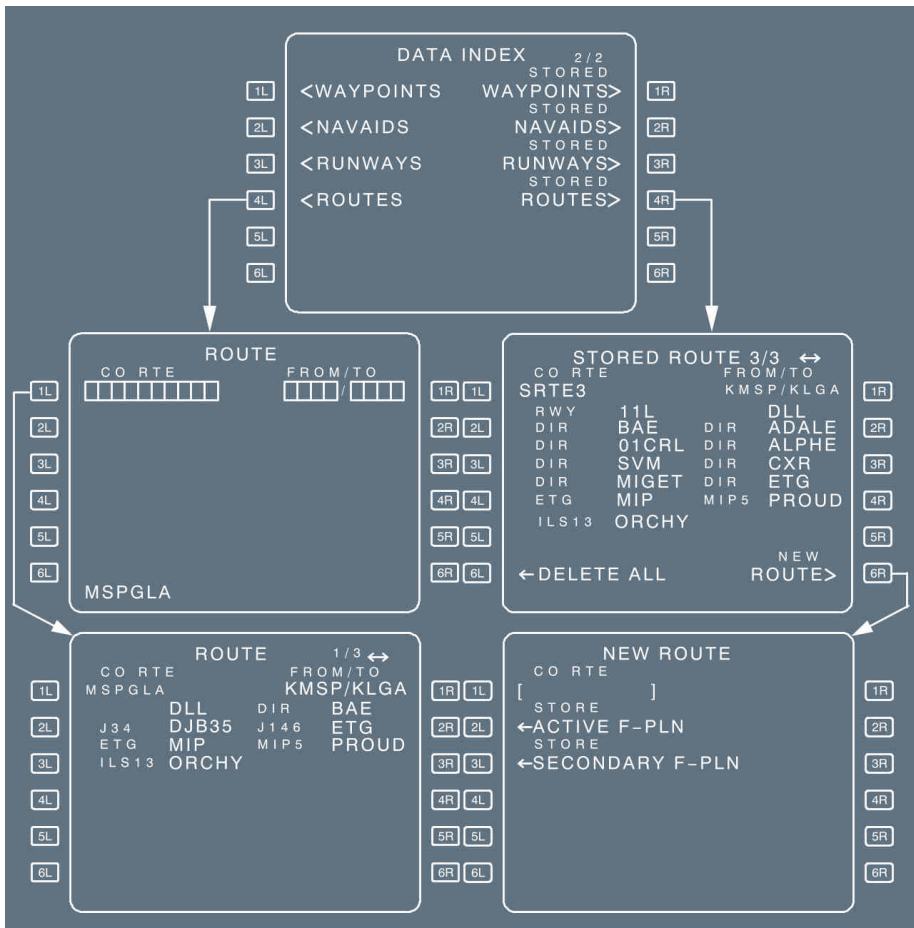
- [1L] to [6L] Enter information about the new runway.
- [1R] LS IDENT Enter the ILS/LOC IDENT. The NEW NAVAID page comes up.
- [5R] RETURN The pilot presses this key to return to the NEW NAVAID page.
- [6R] STORE This prompt only appears when all the amber boxes have been filled in.

Note: The NEW RUNWAY may be used for departure or destination, but no SID or STAR can be associated or stored with this runway. Therefore, the pilot will use it as an “independent” airport.
A new runway is identified by the 4-letter ICAO airport identifier, although all six or seven digits must be entered.

ROUTE/STORED ROUTE/NEW ROUTE PAGES

Ident.: DSC-22_20-20-10-25-00000580.0001001 / 01 OCT 12

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746


ROUTE PAGES

(Not-modifiable)

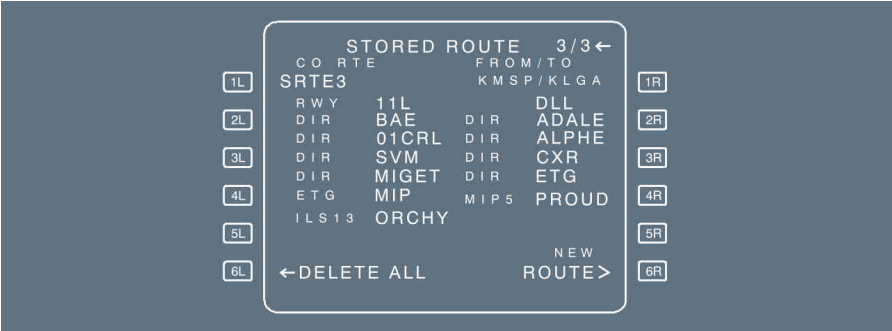
[1L] CO RTE

Any company route IDENT, entered in this field, causes all the elements of the route to be displayed.

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
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Line 2 to Line 6	These lines display the various route elements, including waypoints and airways.
[1R] FROM/TO	This field is automatically filled in, when the pilot enters the IDENT for a company route. When the pilot manually enters a city pair, the MCDU displays "NOT IN DATA BASE" if the city pair is not in the navigation database. If the city pair is in the database, the CO RTE field displays the first route stored (small blue font). If more than one route is stored, the pilot can slew to see the different routes.

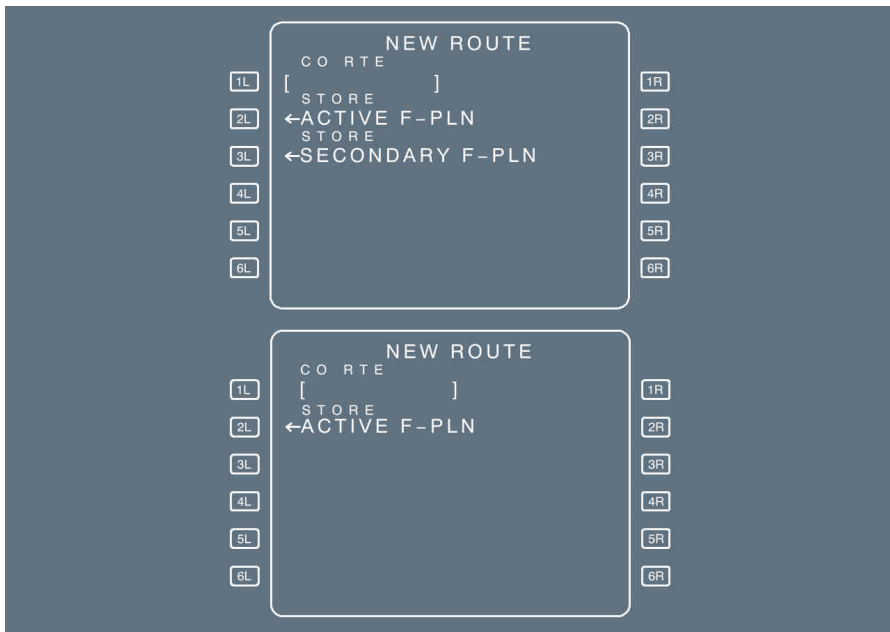
STORED ROUTE PAGE



Line 2 to Line 5	This page displays up to 5 routes, stored by the pilot. The stored routes are listed and numbered in the order of insertion. The number is displayed in the upper right-hand corner of the page.
[1L] CO RTE	This field identifies the stored route. Clearing this field deletes the stored route.
[6L] DELETE ALL	Pressing this key changes the label to amber CONFIRM DELETE ALL. Pressing this key a second time deletes all previously-stored routes.
[1R] FROM/TO	This identifies the city pair of the stored route.
[6R] NEW ROUTE	Pressing this key calls up the new route page.

NEW ROUTE PAGE

The pilot calls up this page by pressing the NEW ROUTE key on the stored route page. It can be used to store up to five new routes that have already been defined in the active or secondary flight plan.



- | | |
|-------------------------------------|---|
| [1L] CO RTE | This field enables the pilot to enter a new company route IDENT. If that IDENT has already been assigned, the entry is rejected. |
| [2L] STORE ACTIVE F-PLN (blue) | Pressing this key stores parameters of the active flight plan as new route. The display shows this prompt when the system contains a FROM/TO, but only during preflight. |
| [3L] STORE SECONDARY F-PLN (blue) | Pressing this key stores parameters of the secondary flight plan as new route. The display shows this prompt when the system contains a FROM/TO and the secondary flight plan has not yet been sequenced. |

- Note:
- If it has not already been named, a stored route is automatically named when stored: SRTE 1 to SRTE 5.
 - When 5 routes are already stored, the pilot cannot insert a new stored route. The "STORED ROUTE FULL" message is displayed, and the pilot must manually delete a route in order to store a new one.
 - Several flight plan elements are not retained when the route is stored:
 - Pilot-entered holds
 - Offset
 - Pilot-entered constraints
 - Modifications to terminal procedures
 - Pseudo-waypoints
 - Step at optimum.
 - Pilot-entered constant Mach segment.
 The MCDU then displays "REVISIONS NOT STORED".

AIRCRAFT STATUS PAGE

Ident.: DSC-22_20-20-10-25-00000581.0001001 / 28 APR 14

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

The system automatically displays this page at power up, but the pilot may also call it up by pressing the DATA key on the MCDU console.

A320-211		
[1L]	ENG CFM56-5A1	[1R]
[2L]	ACTIVE NAV DATA BASE 28 NOV-25DEC AB49012001	[2R]
[3L]	SECOND NAV DATA BASE ← 25 DEC - 22 JAN	[3R]
[4L]	STO R D 02 RTE S00 RWYS	[4R]
[5L]	CHG CODE 11 WPT S00 NAVS [] DELETE ALL->	[5R]
[6L]	IDLE / PERF SOFTWARE + 0.0 / + 0.0 STATUS/XLOAD>	[6R]

TITLE
AIRCRAFT TYPE

[1L] ENGINE TYPE The system uses this to calculate predictions.

Note: When the same performance database is used for various aircraft configurations, the aircraft type displayed may differ from the actual aircraft.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
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- [2L] ACTIVE DATABASE The validity period and part number are displayed in large font.
- [3L] SECOND DATABASE The validity period is displayed in small font. The pilot can press the 3L key to switch to the second database as the active database.

CAUTION	Cycling the database erases the primary and secondary flight plans, as well as the stored data. The flight crew must never do this in flight.
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- [5L] CHG CODE This field allows the entry of a code to change the IDLE and/or PERF factor, displayed in 6L. It is displayed in the PREFLIGHT and DONE phases. The label is displayed in small white font. The brackets, or the entered value, is displayed in large blue font.

- [6L] IDLE/PERF It is only possible to modify these factors when the aircraft is on ground. If no value was entered, the FMS displays default values coded in the Airline Modifiable Information (AMI) file.
Default values are displayed in small font, although manually entered values are displayed in large font.

When it is necessary to modify the IDLE or the PERF factor:

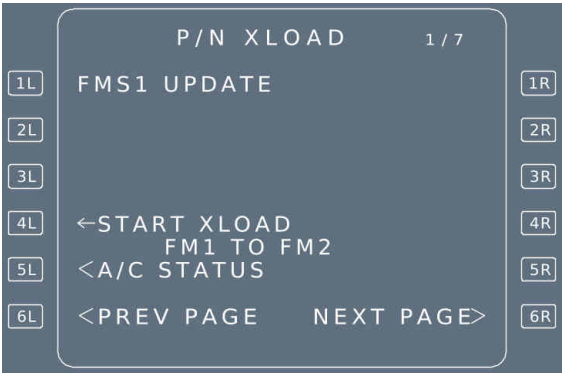
- ENTER the change code in the CHG CODE field [5L].
The default value for this code is "ARM" but it is possible to modify it on airline request (the applicable code is then coded in the Airline Modifiable Information (AMI) file).
When a valid change code is entered, the IDLE and PERF factors are displayed in blue.
- ENTER the new IDLE and/or PERF factor(s) in the scratchpad.
- PRESS the [6L] key to insert the new IDLE and/or PERF factor(s).
The new IDLE and/or PERF factor(s) is (are) displayed in large blue font.

- [4R] STORED This field displays pilot-stored data in a large green font. The field is blank, if no data is stored. (The airline can choose to have this data automatically erased at the done phase).
- [5R] DELETE ALL Pressing this key changes the label to amber CONFIRM DELETE ALL.
Pressing this key a second time deletes all pilot-stored data, except data that is part of the active and secondary flight plans.
- [6R] STATUS/XLOAD This prompt gives access to the P/N STATUS and P/N XLOAD pages.

P/N XLOAD PAGE

Ident.: DSC-22_20-20-10-25-00000582.0001001 / 17 MAR 11
Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

This page allows the crossloading of all databases or configuration files part numbers which are different between both sides. Crossloading from this page avoids reviewing each individual P/N STATUS page.



TITLE	P/N XLOAD
[1L]	FMS 1 UPDATE: FMS 1 can be loaded on the right side MCDU. FMS 2 UPDATE: FMS 2 can be loaded on the left side MCDU
[4L]	START XLOAD: This blue prompt is displayed, only if the system detects a difference between both sides' part numbers. FMS 1/FMS 2 IDENTICAL: Displayed in green, when there is no difference between both sides' part numbers.
Line 5	FM 1 TO FM 2 or FM 2 TO FM 1: Indicates the crossloading direction. This line is not displayed when there is no difference between both side part numbers.
[5L]	A/C STATUS: This white prompt is displayed, when there is no crossloading in process. It gives access to the A/C STATUS page. MM: SS MIN REMAINING: Indicates the time remaining for crossload completion, when a crossload is in process.
[6L] PREV PAGE	The pilot presses this key to return to the A/C STATUS page.
[6R] NEXT PAGE	Pressing this key calls up the next P/N XLOAD page.

P/N STATUS PAGES

Ident.: DSC-22_20-20-10-25-00000583.0001001 / 01 OCT 12
Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

These pages allow reviewing and crossloading the following databases and configuration files between both FMS:

- Page 2 FMS SOFTWARE part numbers
- Page 3 NAV DATA BASE part numbers
- Page 4 FM AIRLINE CONFIG part numbers
- Page 5 FM OPTIONS CONFIG part numbers
- Page 6 PERF DATA BASE part numbers
- Page 7 FLIGHT TEST DATA BASE

1L

2L

3L

4L

5L

6L

P/N STATUS

3 / 7

ELEMENT

NAV DATA BASE

FMS 1 P / N

PS1234567-123

FMS 2 P / N

PS1231565-123

←START XLOAD

FM1 TO FM2

<A/C STATUS

<PREV PAGE NEXT PAGE>

1R

2R

3R

4R

5R

6R

CROSSLOAD NOT
POSSIBLE

P/N STATUS

3 / 7

ELEMENT

NAV DATA BASE

FMS 1 P / N

PS1234567-123

FMS 2 P / N

PS1234564-123

NEED FM1/FM2 SOFTWARE
IDENTICAL TO XLOAD

<A/C STATUS

<PREV PAGE NEXT PAGE>

1R

2R

3R

4R

5R

6R

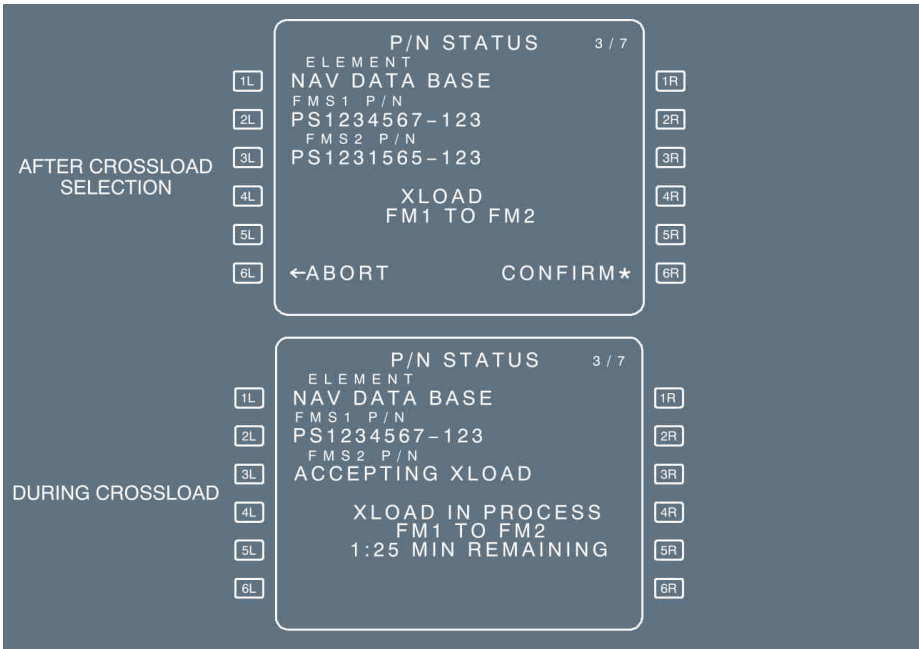
PIA A318/A319/A320/A321 FLEET

AD →

DSC-22_20-20-10-25 P 75/144

FCOM

09 FEB 26



TITLE	P/N STATUS
Line 1 ELEMENT	Indicates the name of the database or configuration file that can be crossloaded: - FMS SOFTWARE on Page 2 - NAV DATA BASE on Page 3 - FM AIRLINE CONFIG on Page 4 - FM OPTIONS CONFIG on Page 5 - PERF DATA BASE on Page 6 - FLIGHT TEST DATABASE on Page 7.
Line 2 FMS1 P/N Line 3 FMS2 P/N	These fields display the part numbers of the database or configuration file (stated on line 1), that are installed on the FMS 1 and 2. Identical part numbers are displayed in green, different ones in amber. During crossload, the updated part number is replaced by the amber “ACCEPTING XLOAD” message.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
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Line 4	This line is empty when the active flight phase is not Preflight or Done. XLOAD FMx TO FMy or START XLOAD FMx TO FMy: This blue prompt is displayed when the database or configuration file (stated on line 1) can be crossloaded. XLOAD ARMED: Displayed in blue on the receiving FM when the crossload has been requested, but not yet confirmed. XLOAD IN PROCESS: Displayed in white when the crossload is ongoing. XLOAD NOT SUPPORTED: Crossloading is unavailable for this element. NO P/N TO XLOAD: The element is missing. NEED FG 1/FG 2 IDENTICAL TO XLOAD: The receiving side's FG software is incompatible with the FG software to be crossloaded. NEED FM 1/FM 2 SOFTWARE IDENTICAL TO XLOAD: The crossloaded element is incompatible with the receiving side's FM software.
[5L] A/C STATUS	This prompt is available, when no crossload is in process. This gives the pilot access to the aircraft status page. MM: SS MIN REMAINING: Displays the time remaining to complete the crossload, when a crossload is in process.
[6L] PREV PAGE ABORT	This key calls up the previous P/N STATUS page. This amber prompt is displayed when a crossload is in process. The pilot uses it to stop the crossload.
[6R] NEXT PAGE CONFIRM*	This key calls up the next P/N STATUS page. This amber prompt is displayed when a crossload has been armed. The pilot presses it to start the crossload.

DUPLICATE NAMES PAGE

Ident.: DSC-22_20-20-10-25-00000584.0001001 / 01 OCT 12
Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

This page, which automatically appears, allows the pilot to select a specific waypoint, airport, or NAVAID when the database holds more than one under the same identifier.

DUPLICATE NAMES					
	15 NM	LAT/LONG			
1L	* ECHO	46N/015E			1R
2L	* ECHO	48N/010W			2R
3L	* ECHO	49N/012W			3R
4L	* ECHO	48N/005E			4R
5L					5R
6L	< RETURN				6R

DUPLICATE NAMES					
	15 NM	LAT/LONG	FREQ		
1L	* ENO	40N/064W	114.80		1R
2L	* ENO	44N/101E	112.40		2R
3L	* ENO	50N/070W	116.60		3R
4L					4R
5L					5R
6L	< RETURN				6R

The pilot presses the key adjacent to a waypoint, NAVAID, or airport to select it as the one to be entered. When the pilot has finished, the page automatically reverts to the previously displayed page.

DISTANCE

The direct distance to the aircraft is displayed in green above each name. If this distance is greater than 9 999 NM, 9 999 NM is displayed.

LAT/LONG COLUMN

This column lists the rounded off latitudes and longitudes of the different points, using the same identifier.

FREQ/CHAN COLUMN

This column lists the NAVAIDs frequencies, if any. It displays CHAN for a MLS.

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
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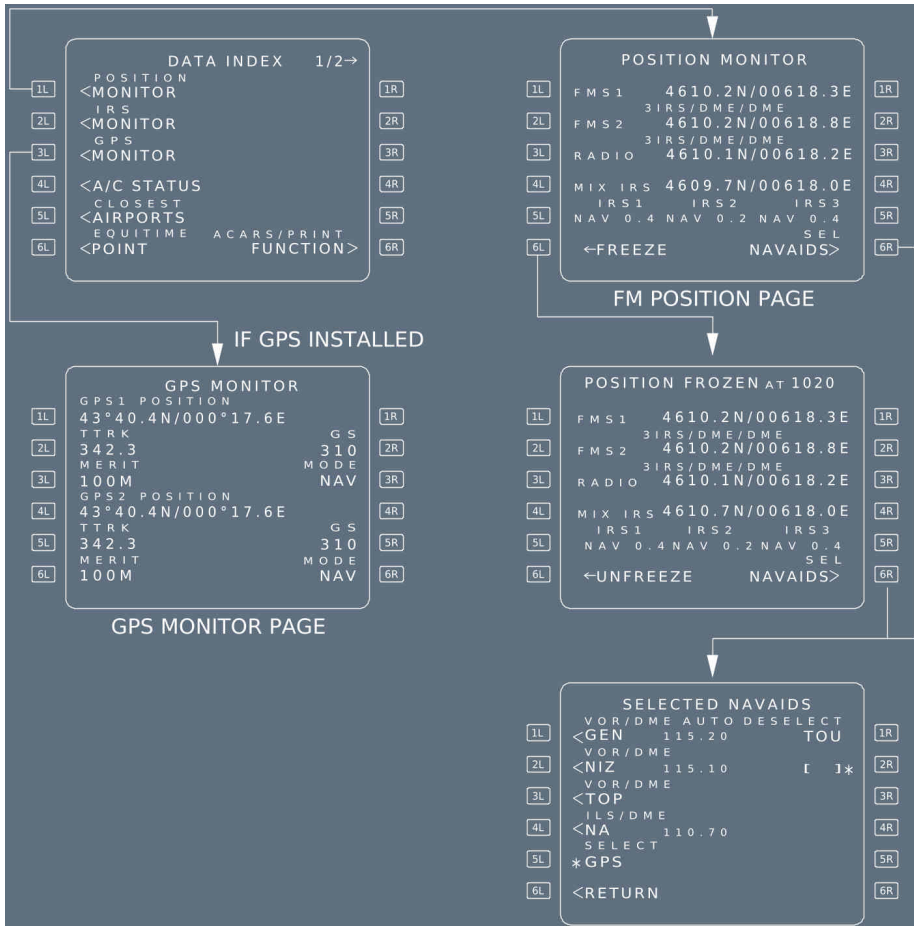
- Note:
- The *DUPLICATE NAMES* page is not displayed when 2 waypoints with the same *IDENT* belong to the same airway. The system selects the first waypoint found in the database.
 - The waypoints or NAVAIDs are ranked by their distance from the aircraft position.
 - When a waypoint is named using ICAO phonetic alpha characters, a minus sign and the ICAO code of the country where the waypoint is located, are displayed. e.g. Alpha in France becomes A-LF; Bravo in England becomes B-EG.

POSITION MONITOR PAGE

Ident.: DSC-22_20-20-10-25-00000585.0001001 / 17 MAR 11 Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

This page displays all the different positions that the FMGC has computed with the various available methods of navigation. It also shows which method obtained each position. (The positions should be almost identical).

The pilot calls up this page by pressing the 1L key on the data index page.



POSITION MONITOR AND POSITION FROZEN PAGE

Ident.: DSC-22_20-20-10-25-00009133.0001001 / 29 MAR 12

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

Line 1 FMGC 1

This line shows the latitude and longitude, as calculated by the FMGC 1, and the navigation method used by the FMGC for that calculation (Example: "3 IRS/DME/DME").

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
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Line 2 FMGC 2	This line shows the latitude and longitude, as calculated by the FMGC 2, and the navigation method used.
Line 3 RADIO or GPS or GPIRS	This line shows the latitude and longitude, calculated by the onside FMGC from selected radio NAVAIDs (Example: DME/DME, VOR/DME, or LOC) or from GPS or GPIRS.
Line 4 MIX IRS	This line shows the latitude and longitude of the weighted mean inertial reference system (IRS) calculated by the onside FMGC from the available IRSs.
Line 5 IRS 1,2,3	This line shows the deviation in nautical miles of each IRS position from the onside FMGC position. It also displays the IRS mode, which can be INVAL, ALIGN, NAV or ATT.
	<i><u>Note:</u> INVAL is displayed when an ADIRS has failed, or the IRS position is not refreshed.</i>
[6L] FREEZE/UNFREEZE	The pilot presses this key to freeze (or unfreeze) all the data displayed on the page. When the data is frozen, the title of the page specifies the time at which it was frozen.
[6R] SEL NAVAIDS	The pilot presses this key to access the selected NAVAIDs page.

SELECTED NAVAIDS PAGE

Ident.: DSC-22_20-20-10-25-00000586.0014001 / 03 APR 13
Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

MODIFIABLE ONLY FOR DESELECTION

Line 1	This field displays the NAVAID tuned for display purposes, and the tuning mode (AUTO, MAN, or RMP).
Line 2 and 3	These fields display the NAVAIDs, if any, tuned for the calculation of radio position by the FMGC.
[4L]	This field displays the tuned ILS, GLS  , MLS  , if any.
[5L] DESELECT/SELECT RADIONAV	The flight crew presses this key to manually select or deselect the NAVAIDs. If the flight crew selects (deselects) the NAVAIDs for position calculation, "RADIONAV SELECTED" ("RADIONAV DESELECTED") is displayed in the label line in blue small font and "DESELECT" ("SELECT") is displayed in white large font. By default NAVAIDs are selected. The deselection of the RADIONAV inhibits use of radio position (either DME/DME or VOR/DME) for position calculation.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT
CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION

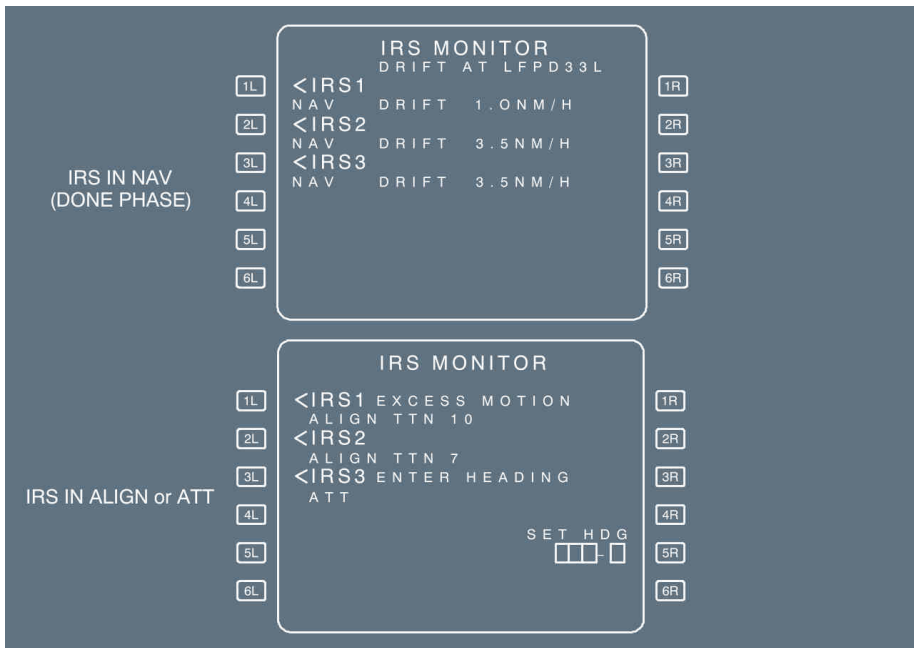
- [6L] DESELECT/SELECT GPS The crew presses this key to manually select or deselect the GPS for position computation. Upon transition to the DONE phase, the prompt returns to DESELECT status.
 If the pilot deselects the GPS, "GPS IS DESELECTED" is displayed when the aircraft is less than 80 NM from the top of descent, or in approach phase.
- [1R] DESELECT to The pilot deselects a NAVAID by entering its identifier in one of these
 [4R] six fields. Once deselected in this way, the NAVAID can no longer be tuned manually through the entry of its IDENT, nor can it be autotuned for display or determination of the position for the rest of the flight.
- The deselection is cleared:
 - Manually, by a CLR action into this field, or
 - Automatically upon transition to the done or preflight phase, or upon activation of the second database.
 The pilot may deselect as many as four stations.
- [6R] RETURN The pilot presses this key to return to the POSITION MONITOR page.

IRS MONITOR PAGE

Ident.: DSC-22_20-20-10-25-00000587.0010001 / 01 OCT 12

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

This page displays the IRS data. The crew calls up this page by pressing the IRS monitor prompt of the DATA INDEX page.



TITLE DRIFT AT XXXX Displays "DRIFT AT" runway identifier, if at least one IRS average drift is displayed.

[1L] to [3L] IRS 1(2) (3) These prompts allow access to the associated IRS pages. Each label line displays the mode (NAV, ALIGN, ATT or INVAL), the average drift (upon transition to DONE phase), and the Time To NAV (if IRS in align) for each IRS.

[1R] to [3R] Displays the status message of the associated IRS in small green font.

List of available messages:

IR FAULT
 CHECK C/B
 DELAYED MAINT
 CDU FAULT
 ENTER PPOS
 ENTER HEADING
 SELECT ATT
 REENTER PPOS
 EXCESS MOTION
 SYS BELOW -15 °
 SWITCH ADR

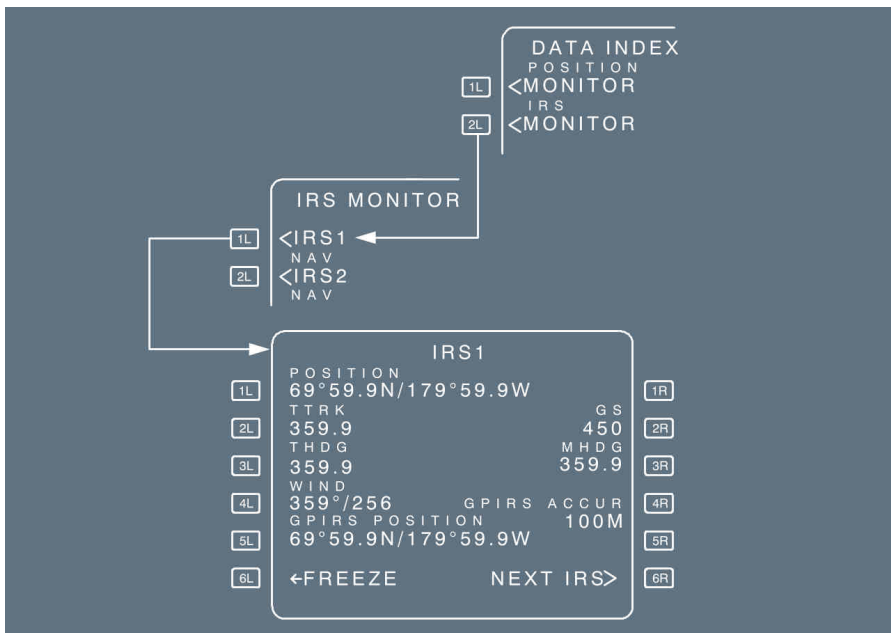
[5R] SET HDG (white) This field is displayed, if at least one IRS is in ATT mode.

This function allows initialization of a heading for IRS in ATT mode:

- If a heading has been entered in this field, or on the ADIRS panel, the value is displayed in blue.
- If not, amber boxes are displayed.

IRS 1 (2)(3) PAGE

This page displays the IRS parameters and GPS/IRS hybrid parameters. The pilot calls up this page by pressing either the 1L key from the IRS MONITOR page, or the NEXT IRS prompt on another IRS page (closed loop).


TITLE

Displays the selected IRS in large white font.

When data is frozen, IRS is replaced by "IRS FROZEN AT", followed by the time at which the pilot has frozen the display.

[1L] POSITION

Displays the latitude/longitude given by the selected IRS.

[2L] TTRK

True track

[3L] THDG

True heading

[4L] WIND

True wind direction/velocity

[5L] GPIRS

GPS/IRS hybrid position of the IRS

[6L]
FREEZE/UNFREEZE

Allows the crew to freeze or unfreeze all data displayed on all three IRS pages. When the data is frozen, the title of the page specifies the time at which it was frozen. It is automatically unfrozen when exiting the page.

[2R] GS

Ground speed

[3R] MHDG

Magnetic heading

[4R] GPIRS ACCUR

GPS/IRS Figure of Merit (meters or feet)

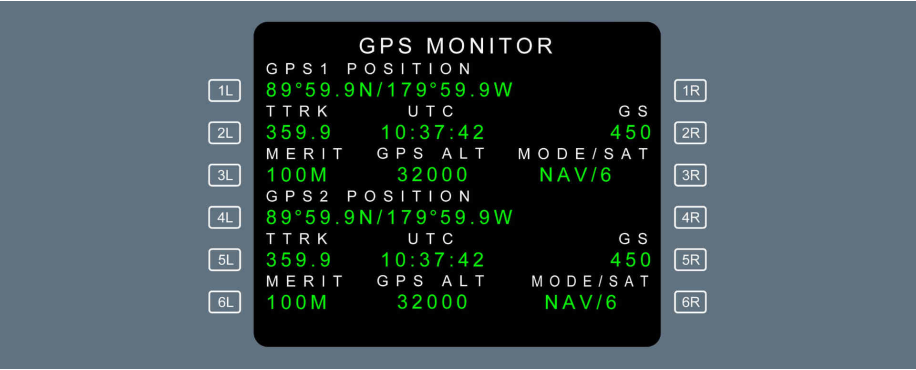
[6R] NEXT IRS

This prompt enables another IRS page (closed loop IRS 1 → 2 → 3 → 1) to be displayed.

1

This page displays the GPS data. The flight crew can access this page via the GPS MONITOR  prompt of the DATA INDEX page.

Note: The absence of GPS data (dashes) indicates that the GPS source is not valid or that the GPS data is rejected by the ADIRS.



[1L] and [4L]

Display the GPS 1 and 2 positions.

[2L] - [2R] and [5L] - [5R]

Display the GPS 1 and 2 true tracks. UTC fields indicate UTC time for each GPS sensor. GS fields indicate the GPS 1 and 2 ground speeds.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
--	--

[3L] - [3R] and [6L]
- [6R] MERIT-GPS
ALT-MODE/SAT

Display the GPS 1 and 2 figures of merit (in meters or feet). GPS ALT is displayed for information purposes. It is not used by the FMGS. MODE/SAT fields indicate the GPS 1 and 2 modes followed by the number of satellites tracked.

The GPS can operate in the following modes:

- INIT : System initialization
- ACQ : Satellite acquisition
- NAV : Normal mode
- TEST : System test
- FAULT : Invalid system
- ALTAID or : Degraded modes. The MMR uses aircraft inputs for computation purposes.
- AIDED
- SBAS  : Satellite Based Augmentation System is being used.

CLOSEST AIRPORTS PAGES

Ident.: DSC-22_20-20-10-25-00000589.0001001 / 17 MAR 11

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

The system automatically selects the closest 4 airports from the current aircraft position, and displays them on these pages. A fifth one can be selected by the pilot.

Page 1 displays the bearing, distance, and time to go to each airport; page 2 displays the EFOB and allows the crew to enter an effective wind to be flown to each airport.

The flight crew accesses the CLOSEST AIRPORTS page 1 by pressing the 5L key from the DATA INDEX A page. They access the CLOSEST AIRPORTS page 2 by pressing the EFOB/WIND prompt (6R key) on page 1.

DATA INDEX PAGE1

CLOSEST AIRPORTS

	BRG	DIST	UTC
[1L] LGTS 325° 161 1040			
[2L] LGKR 298° 197 1046			
[3L] LGRP 113° 230 1052			
[4L] LGTR 305° 257 1059			
[5L] []			
[6L] <FREEZE EFOB/WIND>			

CLOSEST AIRPORTS 1

CLOSEST AIRPORTS

	EFOB	EFF WIND
[1R] LGTS 13.0 [KTS] TL025		
[2R] LGKR 12.9 HD045		
[3R] LGRP 12.9 HD045		
[4R] LGTR 12.8 LIST FROZEN TL025		
[5R] LGAT 12.7 HD070		
[6R] <RETURN		

CLOSEST AIRPORTS 2

[5L] CLOSEST AIRPORTS
[6L] EQUITIME
POINT

[1L] - [1R] to [4L] - [4R] The closest four airports are extracted from the database, and ranked by distance from the aircraft position.

BRG Displays the current bearing from the aircraft's position to the airport.

DIST Displays the current great-circle distance from the aircraft's position to the airport.

TIME or UTC Displays the predicted time to the airport, computed using the current wind or a wind vector entered on page 2, and the speed according to the current mode (managed or selected).

The time is only computed in cruise phase.

[5L] The crew may enter a fifth airport here, using the 4-letter code. The entry may be modified at any time, even when "LIST FROZEN" is displayed.

If the pilot enters an airport that is not in the database, then "NOT IN DATABASE" appears in the scratchpad.

[1L] - [1R] EFOB to [5L] Displays the EFOB at each airport. EFOB is only computed in cruise phase.

- [5R] EFF WIND Used to enter an anticipated headwind or tailwind along the bearing to the airport. If the entry is preceded by +, T, or TL, a tailwind is assumed.

If the entry is preceded by -, H, or HD, a headwind is assumed.

Before pilot entry, a default value may be displayed, based on the current wind.

The effective wind is used to compute the EFOB and time to the airport.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
--	--

[6L] FREEZE/UNFREEZE	This prompt enables the pilot to freeze and unfreeze the list of four airports. The list is automatically frozen when accessing page 2. It will remain frozen upon returning to page 1. The “LIST FROZEN” message is always displayed on page 2.
RETURN	Returns to page 1.
[6R] EFOB/WIND	Gives access to page 2. Pressing this prompt automatically freezes the list of the four closest airports.

Note:

- If the aircraft position becomes invalid, all fields are dashed, FREEZE/UNFREEZE and EFOB/WIND prompts are removed, LIST FROZEN is displayed, and the A/C POSITION INVALID message is displayed in the scratchpad. Page 2 cannot be accessed.
- Predictions (EFOB, TIME) displayed on the page assume:
 - ECON CRZ speed (managed) or current selected speed (selected)
 - CI (for managed speed only) and CRZ FL from primary F-PLN are kept
 - constant wind value
 - In case of engine out, the aircraft altitude is the minimum of (CRZ FL, EO MAX ALT)
 - Downpath steps are not considered
 - Descent fuel burn is a conservative value which only depends on the difference between current CRZ ALT and destination altitude.

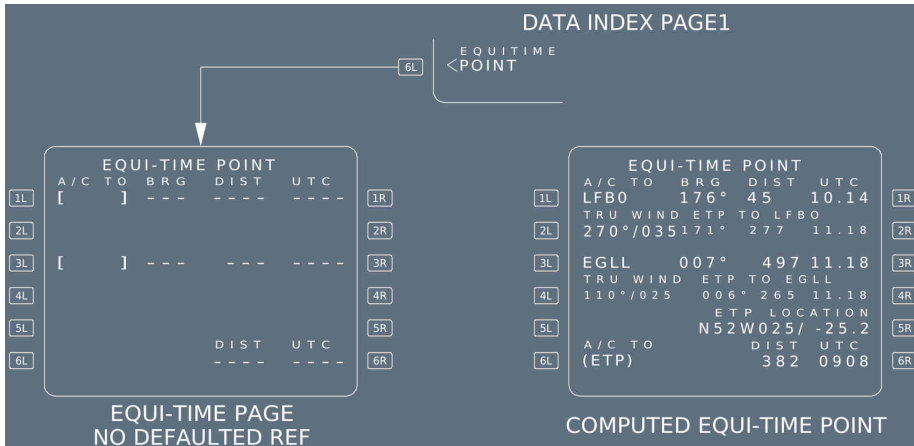
EQUI-TIME POINT PAGE

Ident.: DSC-22_20-20-10-25-00000590.0001001 / 18 DEC 12
Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

The pilot uses this page to require an equitime point computation between two different points (airport, NAVAID, runway, NDB or waypoint). This pseudo-waypoint (ETP) is displayed on the navigation display along the F-PLN. The EQUI-TIME POINT page is accessed by pressing the 6L key from the DATA INDEX page:

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION



[1L] A/C TO and (blue) [3L] Displays reference waypoint 1.
 Displays reference waypoint 2.

Note: Origin and destination airports are used by default for respective reference points 1 and 2, until a pilot entry is made.

[1R] BRG/DIST/UTC and [3R] (green) Displays the bearing, distance, time, from the aircraft's current position to the reference waypoint 1.
 Displays the bearing, distance, time, from the current position of the aircraft to the reference waypoint 2.

BRG : Displays the current great-circle bearing from the position of the aircraft to the reference waypoint.

DIST : Displays the current great-circle distance from the position of the aircraft to the reference waypoint.

UTC : Displays the predicted time of arrival at the reference waypoint (computed using the current wind or a wind vector, entered by the crew).
 The time is only computed in cruise phase. In other phases, it is dashed.

[2L] and [4L] TRU WIND (blue) The pilot may enter the wind (direction/velocity) at the reference waypoint and the CRZ FL:
 This wind is used to compute the time from the aircraft's position to the reference waypoint, and to locate the equitime point.
 If no entry is made, the wind/velocity field will read zero.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
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[2R] and [4R] EPT TO XXX (green)	This field displays the bearing distance and the time from the equitime point position (ETP) to the reference waypoint.
[5R] ETP LOCATION	This field displays the ident of the next waypoint following the equitime point. It provides the distance along the flight plan from the equitime point to the indicated waypoint.
[6L] - [6R] A/C TO (ETP) DIST/UTC (green)	This field displays the distance and time from the aircraft's current position to the equitime point along the flight plan. If at least one reference waypoint exists, but no equitime point exists, the field is blank and NO ETP is displayed in 6L.

Note: The assumptions for the equitime point computation include the cost index, speed managed (with SPD LIM), and winds.
In case of engine-out, the EO LRC speed is considered.

PRINT FUNCTION PAGES
Ident.: DSC-22_20-20-10-25-00000591.0001001 / 01 OCT 12 Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

The PRINT FUNCTION pages enable the crew to print the data relative to the current flight.

This data comes from 2 different sources:

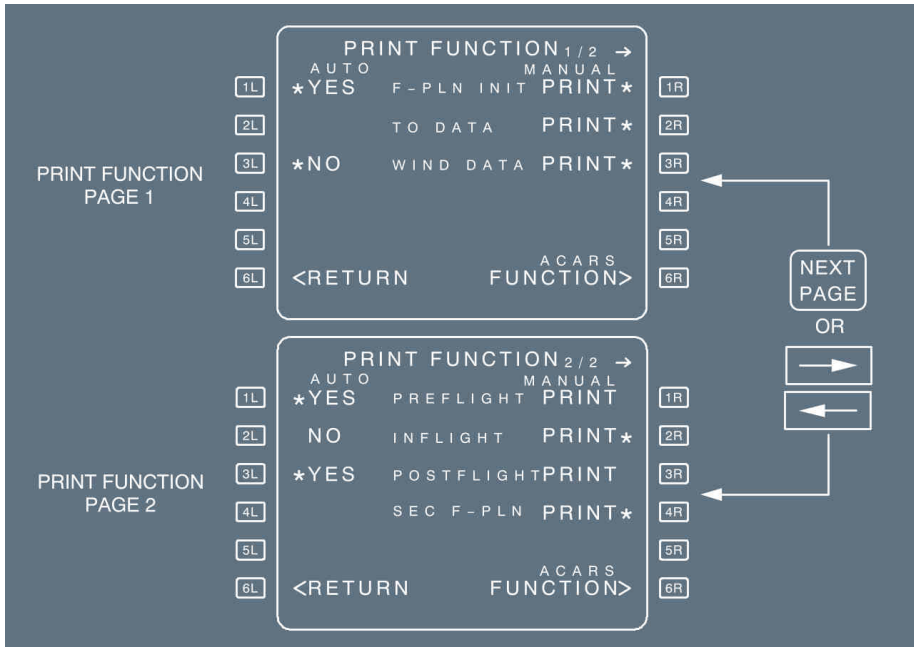
- ACARS uplink messages, and
- Active data from the current flight.

The pilot may access these pages from the "DATA INDEX" page1/2 by pressing the [6R] ACARS/PRINT FUNCTION key.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION



PRINT FUNCTION PAGE 1/2

This page displays the status of the automatic printing capabilities, for the uplink messages (left column), and the status of the manual printing capabilities of the current active data (right column).

LEFT COLUMN

AUTO	
* YES (blue)	Line 1: Uplink messages related to flight plan INIT data are automatically printed when received.
	Line 2: Uplink messages related to takeoff data are automatically printed when received.
	Line 3: Uplink messages related to wind data are automatically printed when received.
* NO (blue)	When "NO", preceded by a star, is displayed in front of a line, automatic printing is deselected. The pilot can reactivate it by pressing the left key of the line.
NO (without a star)	Automatic printing is internally deactivated for the data of the line. The pilot cannot reactivate it manually.
Blank	The ACARS function is not available for this line. Uplink messages can neither be received nor automatically printed.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
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RIGHT COLUMN

MANUAL	Displays the status of the manual printing capability of the active data (and not of the ACARS uplink data).
PRINT * (amber)	Pressing the right keys prints the following active data:
	Line 1: Active flight plan INIT data
	Line 2: Active takeoff data
	Line 3: Active wind data
If the star is not displayed, printing is not possible.	
When the key is pressed, the star is removed until the data is printed.	
[6L] RETURN	Pressing this key reverts the display to the DATA INDEX page.
[6R] ACARS FUNCTION	Pressing this key reverts the display to the ACARS FUNCTION page.

PRINT FUNCTION PAGE 2/2

This page describes the printing capabilities of the reports displayed on lines 1 to 4.

LEFT COLUMN

AUTO (white)	
* YES (blue)	Line 1: The PREFLIGHT report is automatically printed at engine start.
	Line 2: The INFLIGHT report is automatically printed at takeoff.
	Line 3: The POSTFLIGHT report is automatically printed at engine shutdown.
* NO (blue)	The report, displayed on the line, is not printed automatically. The pilot can reactivate the function by pressing the left key of the line.
NO (without a star)	Automatic printing is internally deactivated for the report. The pilot cannot reactivate it.

RIGHT COLUMN

MANUAL	Pressing a right key prints the report displayed on the line.
PRINT *	If the star is not displayed, printing is not possible.
	When the key is pressed, the star is removed until the report is printed.
	For the PREFLIGHT, INFLIGHT and POSTFLIGHT reports, only one type of report is available for printing at any given time, depending on the current flight phase.
	For the SEC F-PLN report, the print selection start is only displayed if a secondary flight plan exists.

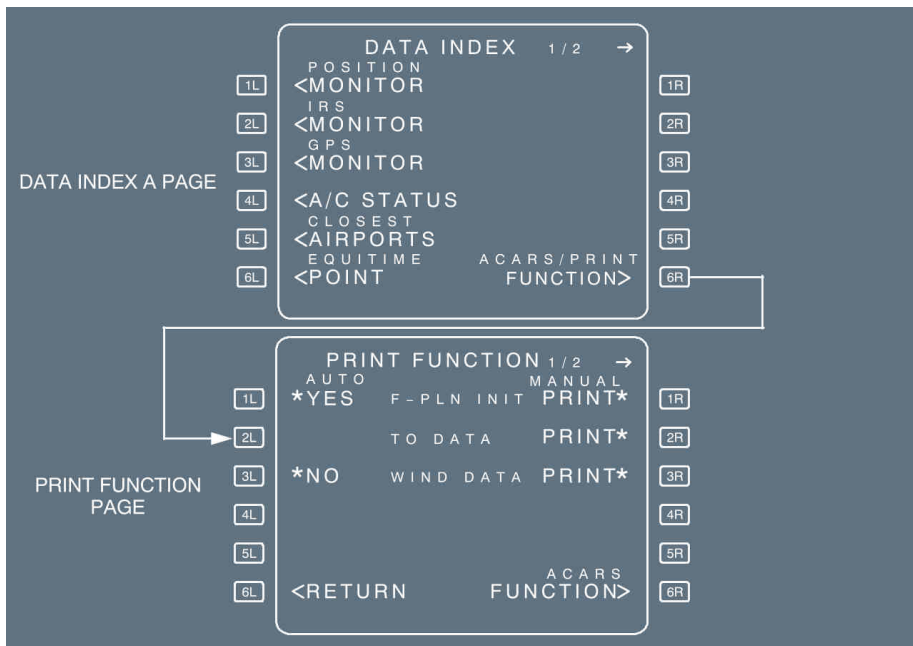
ACARS FUNCTION PAGE

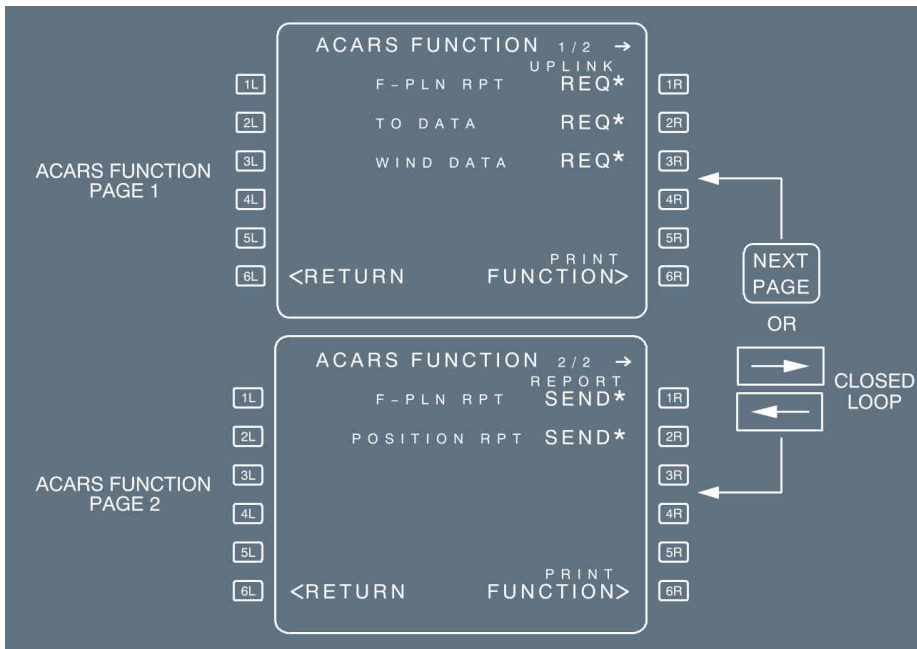
Ident.: DSC-22_20-20-10-25-00000592.0001001 / 01 OCT 12
 Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

The ACARS FUNCTION pages display the functions enabling the crew to send manual requests or reports to the ground.

All functions, displayed on pages 1 and 2, may be inhibited through a pin program.

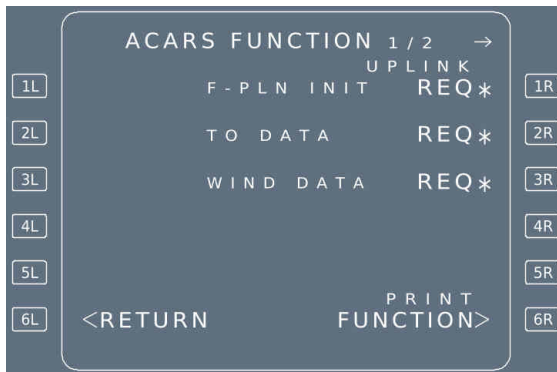
The ACARS/PRINT FUNCTION prompt is displayed on the DATA INDEX page 1/2. Pressing this key displays the PRINT FUNCTION page from which the ACARS FUNCTION page can be accessed.




ACARS FUNCTION PAGE 1

Ident.: DSC-22_20-20-10-25-00000593.0001001 / 01 MAR 18

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746



TITLE

ACARS FUNCTION 1/2 in white

AIRCRAFT SYSTEMS**AUTO FLIGHT - FLIGHT MANAGEMENT****CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION**

- Line 1 F-PLN INIT REQ* Pressing this key sends a request for flight plan to the ground (downlink message)
The INIT REQUEST prompt of the INIT A page provides the same function.
- Line 2 TO DATA REQ* Pressing this key sends a request for takeoff data.
Displayed in the DONE and PREFLIGHT phases.
The TO DATA REQUEST prompt of the UPLINK TO DATA REQ page provides the same function.
- Line 3 WIND DATA REQ* Pressing this key sends a request for wind data.
The WIND REQUEST prompt of the CLIMB, CRUISE, and DESCENT WIND pages provides the same function.

Note: If "REQ" is not followed by a star, the request cannot be sent (downlink message).
When a function (line 1 or 2 or 3) is deactivated internally, the corresponding line is blank.

- [6L] RETURN The pilot presses this key to make the display revert to the DATA INDEX page.
- [6R] PRINT FUNCTION The pilot presses this key to access the PRINT FUNCTION page.

UPLINK TO DATA REQ PAGES

Ident.: DSC-22_20-20-10-25-00000594.0009001 / 14 MAY 12

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

This page allows the flight crew to send a request for takeoff data for up to 2 runways. There is one page for each runway. The page is accessed from the PERF TAKEOFF page, or from the UPLINK XXX (MAX or DRT or FLX) TO DATA page, by pressing the UPLINK TO DATA prompt.

NO RUNWAY DEFINED	[1L]	UPLINK TO DATA REQ 1/2 → TOW / TOCG SHIFT/ RWY ---°/---° ---°/ []		[1R]
	[2L]	TEMP/QNH TO LIMIT ---°/---° ---°		[2R]
	[3L]	MAG WIND FLAPS/THS ---°/---° ---°		[3R]
	[4L]	CONTAM FLEX TO TEMP ---°/---° ---°		[4R]
	[5L]	RECEIVED TO DATA <TO DATA REQUEST*		[5R]
	[6L]			[6R]
RUNWAY DEFINED, DEFAULT VALUES DISPLAYED.	[1L]	UPLINK TO DATA REQ 1/2 → TOW / TOCG SHIFT/ RWY 72.4/25.7 FT []/32L		[1R]
	[2L]	TEMP/QNH TO LIMIT []°/998 FT []		[2R]
	[3L]	MAG WIND FLAPS/THS []°/[] []/[]		[3R]
	[4L]	CONTAM ↑↓ FLEX TO TEMP DRY []°		[4R]
	[5L]	RECEIVED TO DATA <TO DATA REQUEST*		[5R]
	[6L]			[6R]

TITLE

White.

 [1L] TOW/TOCG
 (green)

This field is dashed, until a runway is defined in the [1R] field.
 The TOW/TOCG is defaulted to the values of the INIT B and FUEL PRED pages. If not available, dashes are displayed.
 It cannot be modified by the pilot.

 [2L] TEMP/QNH or
 QFE (green/blue)

This field is dashed, until a runway is defined in the [1R] field. It displays the temperature at origin and baro setting.
 TEMP = If the temperature is not defined, blue brackets are displayed, and the flight crew can modify this field according to the weather information.
 BARO = Defaulted to FCU selection and can be modified by the pilot.

[3L] MAG WIND (blue)

This field is dashed, until a runway is defined in the [1R] field. It displays the wind at the origin.
 If the wind is not defined, blue brackets are displayed.
 The pilot can modify this field.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION

- [4L] **CONTAM** (blue) This field is dashed, until a runway is defined in the [1R] field. The display is defaulted to DRY.
 The scroll keys allow the crew to modify the runway contamination.
 DRY, WET, 1/4 WATER, 1/2 WATER, 1/4 SLUSH, 1/2 SLUSH, COMP SNOW.
- [6L] **RECEIVED TO DATA** This field calls up the UPLINK MAX (or FLX or DRT) TO DATA page that displays the data received by AOC.



UPLINK TO DATA REQ 1/2 →			
1L	TOW / TOCG	SHIFT / RWY	1R
2L	72.4 / 25.7	FT [] / 32L	2R
3L	TEMP / QNH	TO LIMIT	3R
4L	[] ° / 1013	FT []	4R
5L	MAG WIND	FLAPS / THS	5R
6L	[] ° / []	3 / UP2.4	6R
	CONTAM ↑↓	FLEX TO TEMP	
	DRY	+35°	
	RECEIVED	TO DATA	
	< TO DATA	REQUEST	

- [1R] **SHIFT/RWY** (blue) This field is dashed, until a runway is defined in the F-PLN. If a runway is defined in the F-PLN, it is automatically filled in as:
 SHIFT = Value from the PERF TO page, or blue brackets [], if no value is defined.
 RWY = F-PLN departure runway. The pilot can modify this field.
- [2R] **TO LIMIT** (blue) It is dashed, until a runway is defined in the [1R] field.
 It displays blue brackets [], when a runway is defined.
 The pilot may enter a length, considering runway obstacles.
- [3R] **FLAPS/THS** (blue) This field is dashed, until a runway is defined in the [1R] field; it is then defaulted to values from the PERF TO page. Blue brackets are displayed, if the PERF TO page does not have any defined values.
- [4R] **FLEX TO TEMP** (blue) This field is dashed, until a runway is defined in the [1R] field; it is then defaulted to values from the PERF TO page. Blue brackets are displayed, if the PERF TO page does not have any defined values.
 The pilot can modify this field and enter a FLEX TO temperature (FXX).
- [6R] **TO DATA REQUEST*** (amber) Pressing the key sends the takeoff data request message to the ground.
 The asterisk disappears when the request is sent. It reappears when the data is available.

Page 2/2 is a page used for requesting a second runway data.

Note: If the UPLINK TO DATA REQ Page 2 is accessed (Page 1 being filled), the fields of this page are filled with default values after entry of a runway in [1R]. QNH or QFE and wind are common with Page 1.

UPLINK MAX TO DATA PAGES

Ident.: DSC-22_20-20-10-25-00000595.0010001 / 01 OCT 12

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

REQUEST IS PENDING

[1L]

[2L]

[3L]

[4L]

[5L]

[6L]

UPLINK MAX TO DATA 1/4→

TOW / TOCG SHIFT/ RWY

---/-/---FT---/---

TEMP/QNH V1 TO LIMIT

---°/--- -- /---

MAG WIND VR FLAPS/THS

---°/--- -- /---

CONTAM V2

--- FLEX TO>

THR RED/ACC ENG OUT ACC

---/--- --

UPLINK

<TO DATA

[1R]

[2R]

[3R]

[4R]

[5R]

[6R]

[1L]

[2L]

[3L]

[4L]

[5L]

[6L]

UPLINK MAX TO DATA 1/4→

TOW / TOCG SHIFT/ RWY

72.5/24.6 []/33L

TEMP/QFE V1 TO LIMIT

+25°/1023 110 FT 7200

MAG WIND VR FLAPS/THS

310°/015 125 3/UP2.4

CONTAM V2

DRY 140 FLEX TO>

THR RED/ACC ENG OUT ACC

5200

UPLINK INSERT

<TO DATA UPLINK *

[1R]

[2R]

[3R]

[4R]

[5R]

[6R]

This page is accessed from the UPLINK TO DATA REQ page by pressing the RECEIVED TO DATA key.

There is a set of 2 pages (MAX TO DATA and FLEX TO DATA) for each of the 4 uplinked runway data. Uplinked data is displayed in green. (It cannot be modified by the flight crew).

[1L] TOW/TOCG Uplinked reference Takeoff Gross Weight and Takeoff Center of Gravity.

[2L] TEMP/QNH (or QFE) Uplinked assumed temperature and BARO setting.

[3L] MAG WIND Uplinked takeoff runway wind.

[4L] CONTAM Uplinked takeoff runway contamination.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION

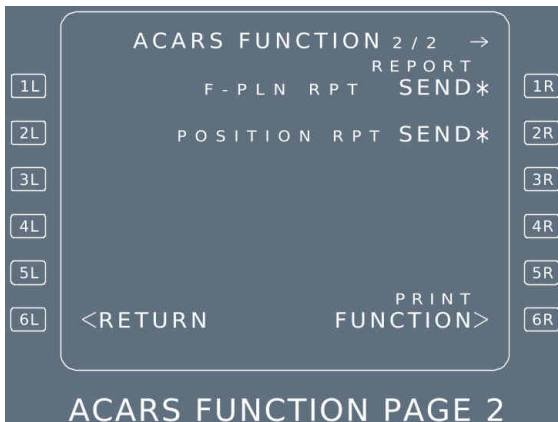
[5L] THR RED/ACC	Uplinked Thrust Reduction and Acceleration altitudes.
[6L] UPLINK TO DATA	Pressing the key calls up the UPLINK TO DATA REQ page.
V1, VR, V2	Uplinked takeoff speeds.
[1R] SHIFT/RWY	Uplinked TO runway IDENT, runway intersection and position shift.
[2R] TO LIMIT	Uplinked runway length remaining.
[3R] FLAPS/THS	Uplinked FLAPS/SLATS CONF and TRIM position.
[4R] FLEX TO	Pressing this key calls up the UPLINK FLEX TO DATA pages.
[5R] ENG OUT ACC	Uplinked engine-out acceleration altitude.
[6R] INSERT UPLINK*	Uplinked takeoff data is available for insertion. Selecting this prompt inserts the following data on the PERF TO page: - V1, VR, V2 - THR RED/ACC, ENG OUT ACC altitudes - FLAPS/THS - SHIFT - FLEX The display reverts to the PERF TO page, the asterisk disappears. This field is not displayed, if the runway does not match the active runway. If the runway matches the active runway but the uplinked TOW differs from the current TOW (the uplinked TOW is 3 t greater or 1 t lower than the TOW estimated by the FMS): - The asterisk disappears and the insertion is not possible - The TOW value is displayed in amber in [1L] field.

Note: All previously-received data is replaced by the new uplinked data.

ACARS FUNCTION PAGE 2

Ident.: DSC-22_20-20-10-25-00000597.0001001 / 17 MAR 11

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746



Line 1 F-PLN RPT Pressing this key sends the flight plan report to the ground.
SEND

Line 2 POSITION RPT Pressing this key sends a Position Report to the ground.
SEND

Note:

- No report can be sent, if "SEND" is not followed by a star
- When a function (line 1 or 2) is deactivated through the navigation database policy file, the corresponding line is blank.

[6L] RETURN The pilot presses this key to revert to the DATA INDEX page.

[6R] PRINT FUNCTION The pilot presses this key to access the PRINT FUNCTION page.

PERF PAGE

Ident.: DSC-22_20-20-10-25-00000598.0001001 / 17 MAR 11

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

The flight plan is divided into the following phases:

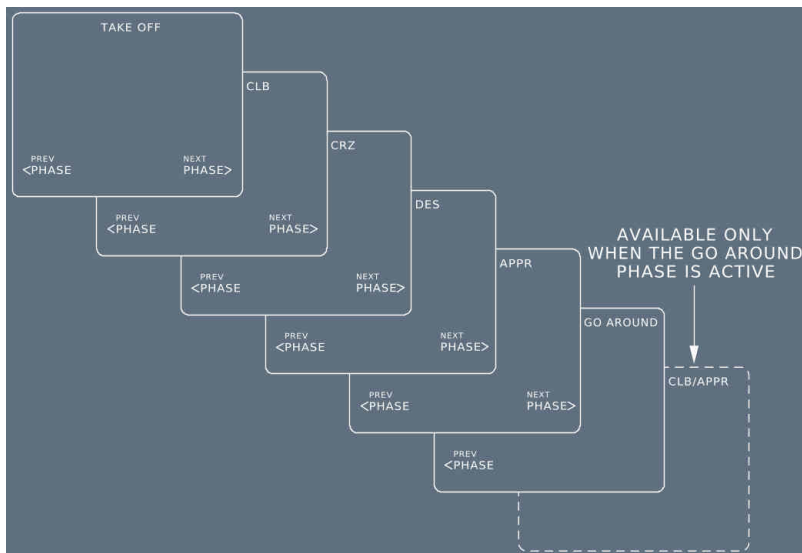
PREFLIGHT, TAKEOFF, CLIMB, CRUISE, DESCENT, APPROACH, GO-AROUND, DONE.

Each phase, except for the preflight and done phases, has a performance (PERF) page. The PERF pages display performance data, speeds related to the various phases, and predictions.

Pressing the PERF key on the MCDU console calls up the performance page for the current active phase. Performance pages, relating to phases already flown, are not available.

In the preflight and done phases, pressing the PERF key brings up the takeoff performance page.

Pressing the PERF key in the done phase makes the phase transition to the preflight phase.



The FMGS flight phases are not related to the FWC flight phases.

Line 6 Fields may display two different prompts, depending upon whether the phase is active or not.

[6L] PREV PHASE To review the performance page for the previous phase. The prompt is unavailable on the takeoff performance page. It is also unavailable for phases already flown.

[6L] ACTIVATE APPR PHASE To activate, then confirm, the APPR phase. Available only on the page corresponding to the active phase.

[6R] NEXT PHASE To review the performance page for the next phase.

Note: Engine-out condition

- When the FMGS detects an engine-out condition, the system automatically calls up the performance page for the current flight phase (except when this occurs before the diversion point during takeoff or no EOSID exists in the flight plan) and displays "EO CLR*" in the [1R] field and EO LRC (engine-out long range cruise) in the [2L] field. On the CLB, CRZ and DES (when the descent phase is not active) PERF pages, the pilot can enter a cost index value and overwrite to "EO LRC". Clearing the cost index reverts to EO LRC.
 If the pilot presses the [1R] key, the system reverts to the normal processing (with no engine failed) and suppresses the EO information. (Refer to DSC-22_20-10-30-12 General).
- If the engine-out condition is detected before the diversion point at takeoff, a temporary flight plan is created.

	ACT MODE		CLB	
	SPD 270		UTC 1220	EO CLR*
[1L]	CI			[1R]
[2L]	EO LRC		PRED TO FL370	[2R]
[3L]	ECON		UTC DIST	[3R]
	300 / .80			
[4L]	SPD / MACH			[4R]
	270 / .76		1110	23
[5L]				[5R]
[6L]	ACTIVATE		NEXT	[6R]
	← APPR PHASE		PHASE →	

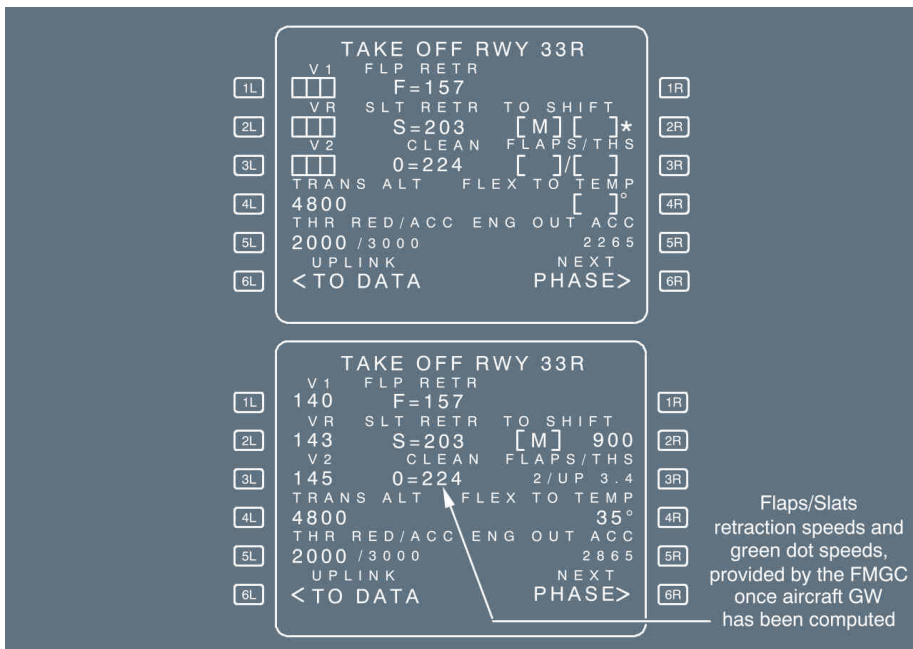
CLIMB PHASE ACTIVE
ENGINE OUT IS DETECTED

PERF TAKEOFF PAGE

Ident.: DSC-22_20-20-10-25-00000599.0010001 / 08 JUL 15

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

During the preflight phase, the pilot presses the PERF key to call up the takeoff performance page.



TITLE

TAKE OFF RWY is in large green font when the takeoff phase is active, and in large white font when it is inactive. The active flight plan selected runway is displayed in large green font.

Note: If the takeoff shift, or the flaps/THS, or the runway is changed after V1, VR or V2 insertion, but the origin airport remains the same, the MCDU “CHECK TAKE OFF DATA” message appears. All takeoff parameters are retained except in case of runway change. In case of runway change, the parameters are invalidated, but still displayed adjacent to each field. The “CONFIRM TO DATA” prompt in [6R] allows reverting to the previous values.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION

[1L] V1 [2L] VR [3L] V2 The boxes remain amber, as long as the pilot does not make entries in them. The pilot can modify any entry, as long as the takeoff phase is not active.

- Note:
1. If the flight crew does not enter V2, the SRS mode will be unavailable at takeoff.
 2. The MCDU "V1/VR/V2 DISAGREE" amber message appears if the inserted V1, VR, V2 speeds do not satisfy the condition: $V1 \leq VR \leq V2$.
 3. The MCDU "TO SPEED TOO LOW" amber message appears if the inserted V1, VR, V2 speeds do not satisfy the existing regulatory conditions regarding VMCG/VMCA and VS1G speeds.

[4L] TRANS ALT This field displays the navigation database default altitude (if defined) once (transion altitude) the origin airport is entered. The pilot can modify it.

[5L] THR RED (thrust reduction altitude) This is the altitude at which the pilot should reduce the thrust from TOGA/FLX to MAX CLIMB (CL detent) with all engines operative ("CLB" or "LVR CLB" flashing on the FMA).

- The thrust reduction altitude defaults to 1 500 ft above the runway elevation, or to the altitude set by the airline
- The pilot can modify this altitude: The minimum is 400 ft above the runway elevation.

ACC (Acceleration altitude) This is the altitude at which the climb phase is triggered.

- The target speed jumps to the initial climb speed
- The default value is 1 500 ft above runway elevation
- The flight crew can modify the value. The minimum value is 400 ft above runway elevation, and it can be higher than, or equal to, or lower than THR RED.

- Note:
- A clearing action reverts both values to the defaulted ones
 - When the flight crew selects an altitude on the FCU that is below THR RED, it brings THR RED and ACC down to this altitude. (The 400 ft minimum still applies).

[6L] UPLINK TO DATA This key calls up the UPLINK TO DATA REQ page. It is only displayed in the preflight and done phases.

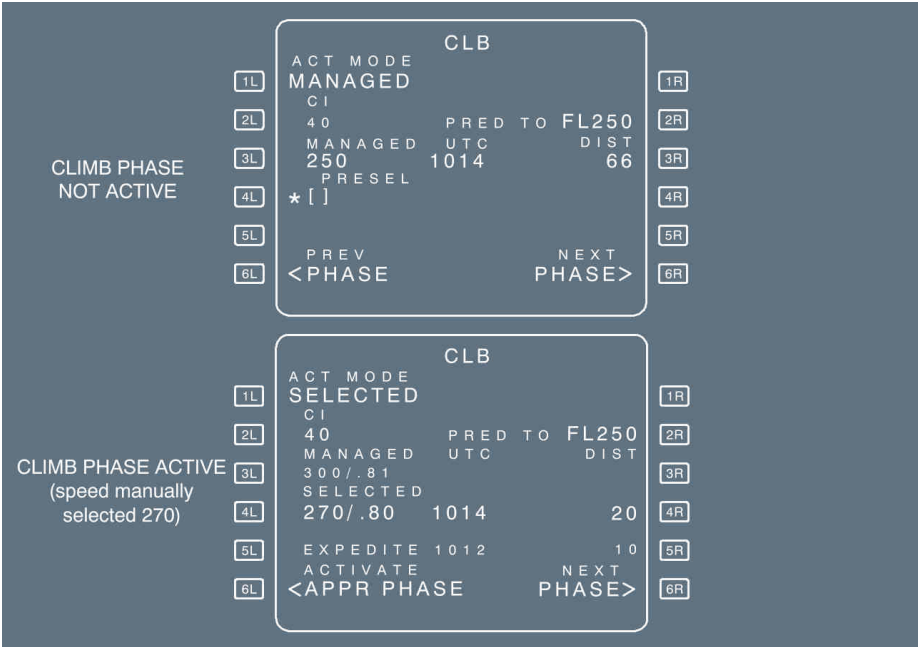
[1R] EO CLR EO CLR is displayed when an engine-out is detected and when active flight phase is takeoff.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
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[2R] TO SHIFT	The takeoff shift is the distance in meters or feet between the beginning of the runway and the aircraft's takeoff position. When taking off from an intersection, the flight crew should insert this value to ensure a correct update of the FM position. The takeoff shift value must be positive, and cannot be greater than the runway length.
[3R] FLAPS/THS	This is a flight crew entry for the positions of the flaps and the trimmable horizontal stabilizer (THS) at takeoff. The flight crew can modify it until takeoff, by entering "UP X.X" or "X.X UP", or "DN X.X" or "X.X DN" for the THS.
[4R] FLX TO TEMP	The flight crew inserts the FLX TO temperature for FLX takeoff setting purposes. The flight crew can only enter it during preflight. The system sends it to the FADEC and displays the entered data on the upper ECAM display. The TEMP value is always entered in degrees Celsius.
[5R] ENG OUT ACC	This field displays the engine-out acceleration altitude, as defined in the database, or is manually entered by the flight crew. This is for display only, as a reminder. It cannot be cleared. The above ACC altitude rules of [5L] apply to this field.
[6R] NEXT PAGE or CONFIRM TO DATA*	This key calls up the climb performance page, or allows the flight crew to revert to the previously-entered T.O. parameters, in case of runway change with the same origin airport.

PERF CLIMB PAGE

Ident.: DSC-22_20-20-10-25-00000600.0001001 / 14 MAY 12
 Applicable to: MSN 02155-02789, 03031-03060, 05152-05746



TITLE	CLB is displayed in large white fonts when the climb phase is inactive, and in large green fonts if it is active.
[1L] ACT MODE	This field displays the preselected or active speed mode: SELECTED or MANAGED. The pilot cannot modify it from this field.
[2L] CI (Cost Index)	This field displays the cost index, as initialized on the INIT A or defaulted from the database, or inserted in this field by the pilot. EO LRC automatically replaces the cost index value in case of engine-out.
[3L] MANAGED	This field displays the FMGS computed ECON speed/Mach (<i>Refer to DSC-22_20-10-40-10 Optimization</i>). Before CLIMB phase is active, if the preselected speed mode is SELECTED, a star is displayed next to the MANAGED speed. Pressing the 3L key in this case preselects MANAGED speed, and 4L reverts to brackets.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
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[4L] PRESEL or SELECTED	<u>If the climb phase is not active:</u> This field displays PRESEL as long as the climb phase is not active. The pilot can enter a preselected speed only. <u>If the climb phase is active:</u> The title of this field becomes SELECTED. This field displays the selected (or preselected) SPD or MACH target. The pilot cannot modify it directly in this field, but can adjust it with the SPD/MACH selection knob on the FCU. If the pilot pushes in the FCU SPD/MACH selection knob to revert to managed speed, the system selects (or reselects) ECON SPD/MACH and [4L] is blank.
[5L] Blank or EXPEDITE	This field is blank as long as the aircraft is in preflight. This field displays this legend when the takeoff or climb phase is active. The flight crew cannot engage EXPEDITE from this field. It indicates the time and distance required to reach the altitude displayed in the 2R field, in case of climb at green dot.
[6L] PREV PHASE	This field displays this legend if climb phase is not active. The pilot presses this key to call up the takeoff page.
[6L] ACTIVATE APPR PHASE	The field displays this legend if the climb phase is active. Pressing this key once displays “CONFIRM APPR PHASE*”. Pressing it again activates the approach phase.
[1R] EO CLR	The system displays the EO CLR prompt in case of engine out in climb.
[2R] PRED TO...	This field displays the target altitude for the predictions shown in 3R, 4R, or 5L. It defaults to FCU altitude, but the pilot can modify it to any altitude below CRZ FL.
[3R] [4R] [5R]	These fields show time and distance predictions for the target altitude selected in [2R], computed for the current vertical mode and speed mode (MANAGED, SELECTED). These fields are displayed only while the takeoff, or climb phase is active.
[6R] NEXT PHASE	The flight crew presses this key to call up the PERF CRZ page.

PERF CRUISE PAGE

Ident.: DSC-22_20-20-10-25-00000601.0009001 / 30 MAR 15

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

CRZ PHASE NOT ACTIVE	1L	CRZ ACT MODE UTC DEST EFOB MANAGED 1220 8.4				1R
	2L	CI 540				2R
	3L	MANAGED .80				3R
	4L	PRESEL DES CABIN RATE * [] -350 FT/MN				4R
	5L	STEP ALTS> PREV NEXT				5R
	6L	<PHASE PHASE>				6R

CRZ PHASE ACTIVE	1L	CRZ ACT MODE UTC DEST EFOB SELECTED 1114 8.4				1R
	2L	CI 540				2R
	3L	MANAGED .80				3R
	4L	DES CABIN RATE -350 FT/MN				4R
	5L	STEP ALTS> ACTIVATE NEXT				5R
	6L	←APPR PHASE PHASE>				6R

PERF CRZ PAGE IN EO CONDITION	[1L]	ACT MODE SELECTED	CRZ UTC DEST EO 1114 CLR *	[1R]
	[2L]	CI EO LRC	DRIFT DOWN TO FL250	[2R]
	[3L]	MANAGED .80	UTC 1100	[3R]
	[4L]		DIST 150	[4R]
	[5L]		DES CABIN RATE -350 FT/MN	[5R]
	[6L]	ACTIVATE ← APPR PHASE	NEXT PHASE →	[6R]

PERF CRZ PAGE WITH PREPLANNED STEP	[1L]	ACT MODE MANAGED	CRZ UTC DEST EFOB 1220 8.4	[1R]
	[2L]	CI 540	AT N47W123 STEP TO FL250	[2R]
	[3L]	MANAGED .78	UTC 1035	[3R]
	[4L]	PRESEL * []	DIST 1123	[4R]
	[5L]		DES CABIN RATE -350 FT/MN	[5R]
	[6L]	PREV < PHASE	STEP ALTS > NEXT PHASE >	[6R]

TITLE	CRZ in white large font, when cruise phase is not active, in green large font, when it is.
[1L] ACT MODE	This field shows the preselected or active speed mode: SELECTED or MANAGED. The pilot cannot modify it through this field.
[2L] CI	This field shows the cost index as initialized on the INIT A page or defaulted from the database, or as inserted in this field by the crew. EO LRC replaces automatically the cost index value in case of engine out.
[3L] MANAGED	This field displays the FMGS computed ECON speed/Mach (<i>Refer to DSC-22_20-10-40-10 Optimization</i>). Before CRUISE phase is active, if the preselected speed mode is SELECTED, a star is displayed next to the MANAGED speed. Pressing the 3L key in this case preselects MANAGED speed, and 4L reverts to brackets.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION

[4L] PRESEL	<u>If cruise phase is not active:</u> The pilot can enter a preselected speed or Mach number. <u>If cruise phase is active:</u> This field is blank. <i><u>Note:</u> If the flight crew enters a value in the PRESEL field during the cruise altitude capture (ALT CRZ*), the FCU selected speed may revert to M 0.01.</i>
[6L] PREV PHASE or	The pilot can press this key to call up the climb page, if the cruise phase is not yet active.
[6L] ACTIVATE APPR PHASE	This field displays this legend if the cruise phase is active. The flight crew presses the key once to change the legend to “CONFIRM APPR PHASE”. A second press activates the approach phase. <i><u>Note:</u> If the pilot activates the approach phase inadvertently, it can reselect the cruise flight level into the progress page to reactivate the cruise phase.</i>
[1R] TIME/UTC DES EFOB	Before takeoff this field displays the flight time to destination and the predicted remaining fuel on board. If the crew enters an estimated takeoff time, the field displays automatically the predicted arrival time (UTC) at destination. After takeoff it displays the predicted arrival time at destination (UTC) and the remaining fuel on board (DEST EFOB) at destination, in green font. The DEST EFOB field will turn to amber, if the EFOB at destination becomes less than the MIN DEST FOB value displayed on the FUEL PRED page. EO CLR is displayed when an engine-out is detected.
[2R] STEP TO FL XX, DRIFT DOWN TO FL XX, or TO T/D	The field, in combination with 3R, displays the predictions for the step point and the step altitude, the drift down altitude, or the Top of Descent.
[3R] TIME/UTC and DIST	This field displays the time and distance to go to the various points identified in 2R.
[4R] DES CABIN RATE	This field displays MAX [computed DES cabin rate, maximum descent cabin rate]. The pilot may modify the value: the FM recomputes then the top of descent in order to match this value. If the FM cannot match the pilot entry, the FM computed value overwrites the pilot entry. A clear action reverts to the default value (-350 ft/min). DES CAB RATE being a negative value, 'minus' is not a necessary entry.
[5R] STEP ALTS	This key calls up the STEP ALTS page (vertical revision <i>Refer to DSC-22_20-20-10-25 VERTICAL REVISION Pages</i>).

[6R] NEXT PHASE This key calls up the DES page.

PERF DESCENT PAGE

Ident.: DSC-22_20-20-10-25-00000602.0011001 / 23 JUN 15
Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

DES phase not active
with managed
SPEED/MACH selected

1L

2L

3L

4L

5L

6L

ACT MODE
MANAGED
CI
540
MANAGED
.78/340

DES
UTC DEST EFOB
1215 8.4

PREV
←PHASE

NEXT
PHASE→

1R

2R

3R

4R

5R

6R

DES phase active with
selected SPEED/MACH

1L

2L

3L

4L

5L

6L

ACT MODE
SELECTED
CI
540
MANAGED
.81/340
SELECTED
.78/280

DES
UTC DEST EFOB
1215 8.4

PRED TO
UTC

FL200
DIST

EXPEDITE 1155
ACTIVATE

15
NEXT
PHASE→

1R

2R

3R

4R

5R

6R

- TITLE

DES is in large white font if the descent phase is not active; it is in large green font, if it is.
- [1L] ACT MODE

This field displays the preselected or active speed mode (MANAGED or SELECTED). The flight crew cannot modify it through this field.
- [2L] CI

This field displays the cost index, as initialized on the INIT A page or defaulted from the database, or inserted in this field by the flight crew. The flight crew cannot modify it when the descent phase is active.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION

[3L] MANAGED

If the descent phase is not active:

Before the flight crew makes any entry. This field displays MANAGED in white, with the associated ECON descent Mach or speed in blue. The crew may overwrite the ECON descent Mach or speed by entering a Mach number or a speed in this field. The system uses the pilot entry to compute the descent profile. The descent may be flown in managed using this new pilot entry.

The entry is modifiable. It can be cleared to revert to ECON speed/Mach.

If the descent phase is active:

The flight crew cannot make an entry in this field.

The field displays the ECON speed/Mach or the speed/Mach value previously entered by the pilot.

[4L] blank or
SELECTED

If the descent phase is not active, or the descent phase is active but the active speed mode is MANAGED:

This field is blank.

If the descent phase is active and the active speed mode is SELECTED:

The field displays the speed or Mach target manually selected by the pilot. "SELECTED" is displayed in the [1L] field.

To modify the field value, the pilot will use the SPD/MACH selector knob of the FCU. [4L] field and FCU window will display the same value.

Pushing in the FCU speed selector knob activates the managed SPD/MACH target displayed in the [3L] field.

[5L] Blank or
EXPEDITE

If the descent phase is not active this field is blank.

Displays this legend if the descent phase is active.

It indicates the time and distance required to reach the altitude displayed in the 2R field at MMO/VMO speed. The pilot cannot select the EXPEDITE mode through this field.

[6L] PREV PHASE
or ACTIVATE APPR
PHASE

This key calls up the cruise phase page if the descent phase is not yet active.

Displayed if the descent phase is active. First press causes "CONFIRM APPR PHASE" to be displayed. Second press activates the approach phase.

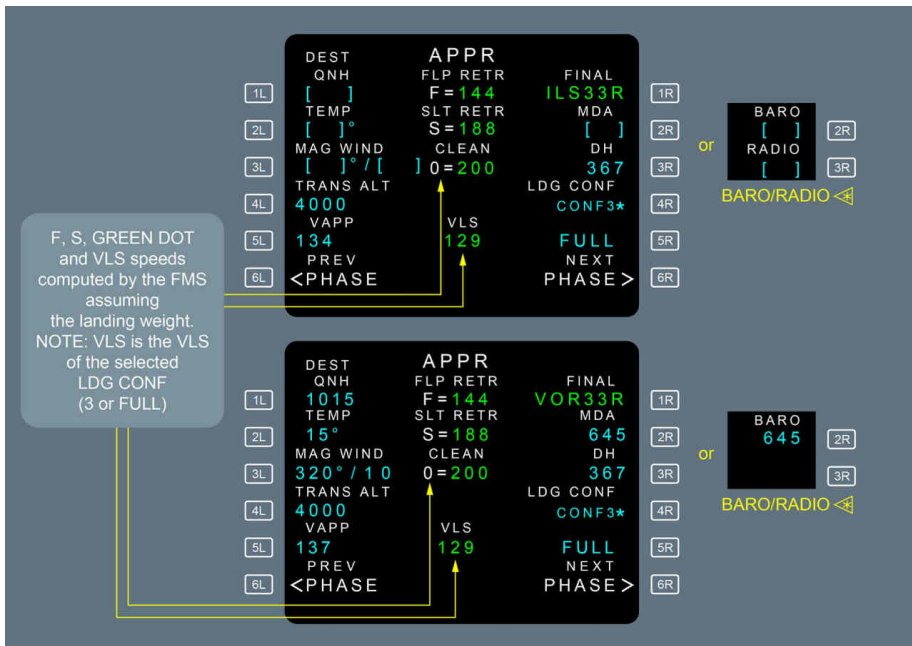
 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
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[1R] TIME/UTC DEST EFOB	Before takeoff, this field displays the flight time to destination and the predicted remaining fuel on board. If the crew enters an estimated takeoff time, the field displays automatically the predicted arrival time (UTC). After takeoff, it displays the predicted arrival time at destination (UTC) and the remaining fuel on board (DEST EFOB) at destination in green font. The DEST EFOB field will turn to amber, if the EFOB at destination becomes less than the MIN DEST FOB value displayed on the FUEL PRED page. EO CLR is displayed when an engine-out is detected.
[2R] PRED TO...	This field displays the target altitude for the predictions in [3R] [4R], or [5R]. The display defaults to the altitude selected on the FCU. The flight crew can modify it to any altitude lower than present altitude.
[3R] [4R] [5R]	These fields display time and distance predictions down to the target altitude selected in [2R], computed for the current vertical mode (DES or OP DES) and the indicated speed mode (MANAGED, SELECTED).
[6R] NEXT PHASE	The pilot presses this key to call up the PERF APPR page.

PERF APPR PAGE

Ident.: DSC-22_20-20-10-25-00016132.0010001 / 12 MAY 25

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746


TITLE

 The page title displays **APPR**, if the Approach phase is not active or **APPR**, if it the Approach phase is active.

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
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[1L] QNH

This field displays brackets, when the aircraft is more than 180 NM from the destination. Inside 180 NM, mandatory amber boxes appear.

The flight crew must enter the QNH in hectopascals (hPa) or in inches of mercury (inHg). The value is either entered in hPa or inHg:

- For hPa, enter three or four digits within the allowable range for hPa, or
- For inHg, enter the two digits of the desired value or two digits followed by a decimal point and two additional digits, within the allowable range for inHg.

The system interprets:

- 1 003 as 1 003 hPa
- 29 as 29.00 inHg
- 29.92 as 29.92 inHg.

The flight crew can modify this entry at any time.

Note: *An erroneous entry of an OAT or BARO minimum in QNH field (e.g. 22 °C or 2 200 ft) is accepted by the system. As a consequence, the CPC computes an erroneous cabin pressurization segment during descent, then may trigger a pressurization ECAM alert.*

[2L] TEMP

This field displays the temperature at destination. Until the flight crew enters the temperature, the field displays brackets. The flight crew can modify this figure.

The system uses this temperature to refine its computation of the descent profile (ISA model).

[3L] MAG WIND

The flight crew enters the magnetic wind in knots at the destination in this field. The system transmits any entry made in this field to the VERTICAL REVISION and FLIGHT PLAN B pages (which display wind direction as true, not magnetic).

[4L] TRANS ALT

This field displays the transition altitude taken from the database (small font) or entered by the flight crew (large font).

The flight crew can modify it at any time.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION

[5L] VAPP

The FMGC computes this approach speed, using the formula:
 $VAPP = VLS + 1/3 \text{ of the headwind components (limited to } VLS + 5 \text{ kt as a minimum and } VLS + 15 \text{ kt as a maximum).}$
 The flight crew can modify VAPP. A clear action reverts VAPP to the computed value.

Note: $VLS = 1.23 \text{ VS1G of the selected landing configuration (FULL or 3).}$

[6L] PREV PAGE

This field displays this legend if the approach phase is not active.
 Pressing this key calls up the PERF DES page.

[1R] FINAL

This field displays the approach specified in the flight plan.
 The flight crew cannot modify it through this field.

[2R] MDA/MDH or
 BARO 

This field displays:

- The MDA with associated brackets, or
- The MDH with associated brackets, if:
 - The aircraft is equipped with QFE  option, or
 - The FCU setting is QFE, if the aircraft is equipped with the BARO  option.

The flight crew inserts the value, which can be modified at any time. If the flight crew makes an entry in [3R] field or changes the approach, it clears this figure.

[3R] DH or RADIO 

If the flight plan includes an ILS, GLS  or MLS  approach, this field displays **DH** or **RADIO**  and empty brackets. For a CAT II or CAT III approach, the flight crew inserts the decision height. The system will accept an entry of **NO**, **NODH** or **NO DH**. If the flight crew inserts an MDA or an MDH (or a BARO  value) in [2R] field, this erases the decision height, and this field reverts to brackets. The DH or RADIO  range is 0 to 700 ft.

[4R] LDG CONF CONF
 3

The flight crew can select CONF 3 by pressing this key.
 This moves the * down to the [5R] field, that displays **FULL**.

[5R] FULL

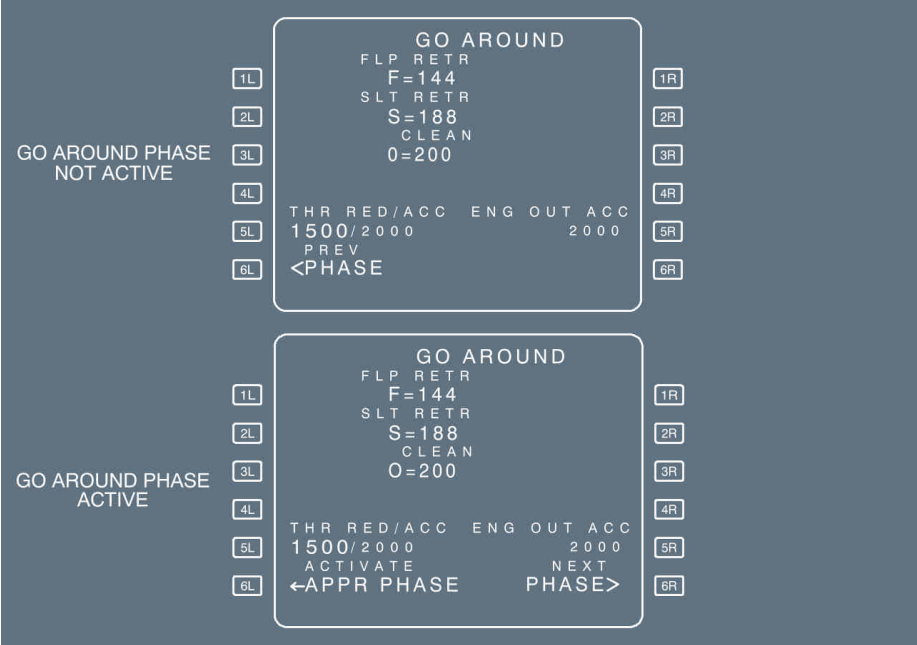
The flight crew can use this key to select CONF FULL when necessary.
 CONF FULL is the default landing configuration.

[6R] NEXT PHASE

Pressing this key calls up the PERF GO AROUND page.

PERF GO AROUND PAGE

Ident.: DSC-22_20-20-10-25-00000604.0002001 / 01 OCT 12
Applicable to: MSN 02155-02789, 03031-03060, 05152-05746



TITLE GO AROUND is in large white font, if the go-around phase is not active; it is in large green font, if it is.

[5L] THR RED ACC This field displays the thrust reduction altitude and the acceleration altitude.

Thrust reduction altitude:

- Altitude at which thrust must be reduced from takeoff/go-around thrust to maximum climb thrust
- “CLB” or “LVR CLB” flashing on flight mode annunciator
- Defaults to 1 500 ft above destination runway elevation, or to the altitude set by the airline
- Can be modified by the crew (minimum 400 ft above destination runway elevation).

Acceleration altitude:

- Altitude at which target speed jumps to green-dot speed (see the note below)
- Defaults to 1 500 ft above destination runway elevation, or to the altitude set by the airline.
- Can be modified by the crew, but is always equal to (or higher than) the thrust reduction altitude.

[6L] PREV PHASE or This field displays this legend if the go-around phase is not active.
 Pressing the key calls up the PERF APPR page.

ACTIVATE APPR This field displays this legend if the go-around phase is active.
 PHASE Pressing it once makes “CONFIRM APPR” appear.
 A second press activates the approach phase.

[5R] ENG OUT ACC This display has the same characteristics as the display beside the 5R key on the takeoff page. It is for display only, and the pilot can modify it.

[6R] NEXT PHASE Pressing this key calls up the PERF APPR page.

[IR] Blank or EO CLR* This field is normally blank.
 EO CLR* is displayed when GO AROUND is the active phase and an engine-out condition is detected.

***Note:** When the go-around phase is active, if the pilot enables ALTN or if the pilot inserts a new destination in the active flight plan and a new cruise flight level on the progress page, the go-around phase shifts automatically into the climb phase. (The target speed jumps from green dot speed to initial climb speed).*

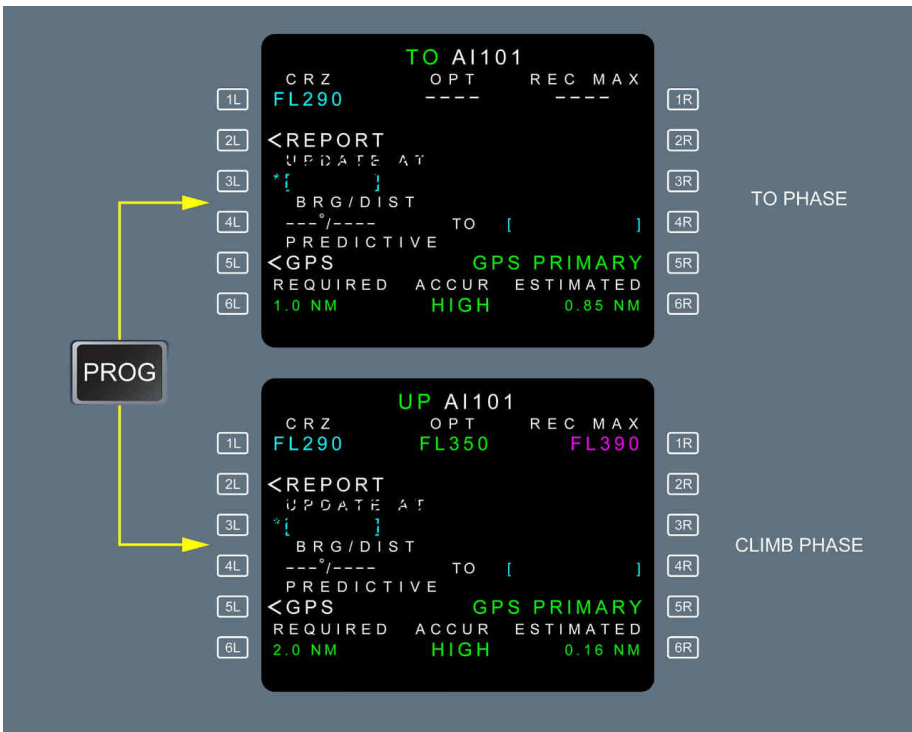
PROG PAGES

Ident.: DSC-22_20-20-10-25-00000605.0051001 / 10 MAY 22

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

The progress page is a multifunction page that enables the pilot to:

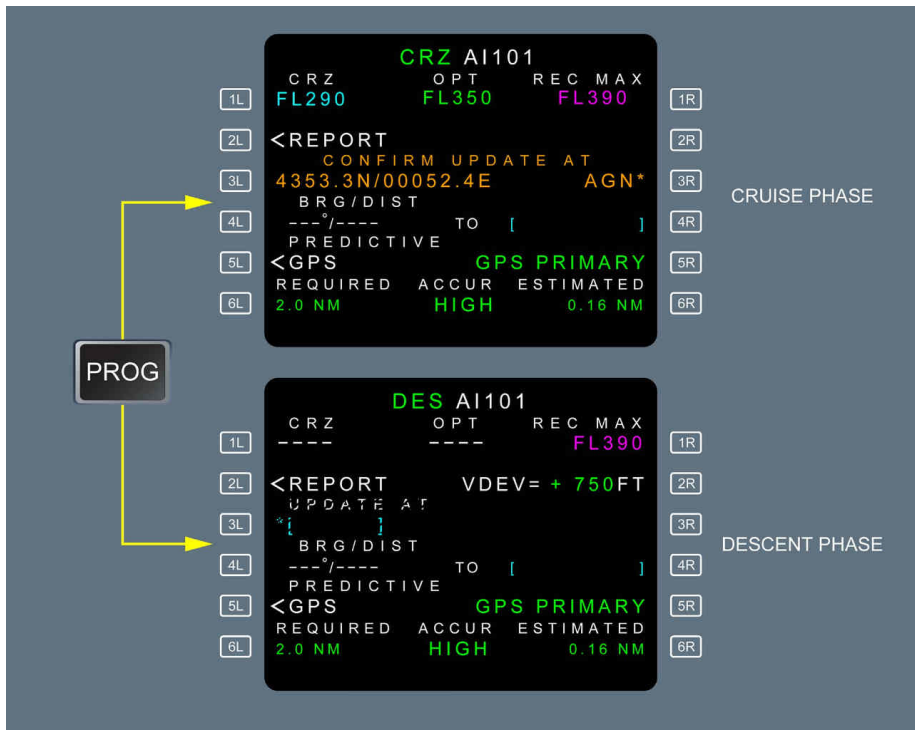
- Select a new cruise flight level
- Crosscheck the navigation accuracy of the Flight Management (FM) system and validate it
- Update the FM position
- Monitor the descent.



AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION



TITLE

Different for each flight phase (see above). The vertical phase is in large green font. The flight number is in large white font. EO is large amber font, if the engine-out condition is detected.

Line 1 CRZ (blue)

This line displays the cruise flight level, inserted on the INIT A page or directly in this field in blue. If the flight crew uses the FCU to select an altitude that is higher than the one displayed in this field, the system changes the number displayed to agree. In this line, the flight crew cannot insert a flight level that is lower than the FCU-selected altitude. This field shows dashes when the descent or approach phase is active.

OPT

This field displays the optimum flight level (in green), that is computed based on the current gross weight, cost index, temperature and wind. This flight level requires a 5 min minimum cruise at a minimum cruise flight level of FL 100. It displays dashes if an engine-out is detected.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
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REC MAX [2L] REPORT [2R] VDEV	This field displays the recommended maximum altitude (in magenta), that is computed based on the current gross weight and temperature, and assuming that the anti-ice is off (if icing conditions are expected, use the performance application of the EFB). It provides the aircraft with a 0.3 g buffet margin, a minimum rate of climb at MAX CL thrust, and level flight at MAX CRZ thrust. This field is limited to FL 398. If one engine is out, this field displays the recommended maximum engine-out altitude, that is computed based on the long-range cruise speed and assuming that anti-ice is off. This key calls up the REPORT PAGE. This field is displayed during the descent and approach phases, when NAV mode is engaged, or in HDG mode, provided that the crosstrack error (XTK) is less than 5 NM. It displays the vertical deviation between the aircraft's current altitude and the FMS-computed vertical profile.
--	---



Line 3 POSITION UPDATE AT 	The flight crew can update the FMS position via this field by entering either the IDENT of a waypoint, a NAVAID, an airport, a latitude and longitude (LL), a place/bearing/distance, or a place-bearing/place-bearing (PBX). When the flight crew has entered this data, this field changes its format to: “CONFIRM UPDATE AT”, followed by the latitude/longitude and IDENT of the inserted position with an asterisk. The flight crew presses the right-hand key adjacent to the asterisk to confirm the update, when the aircraft overflies the inserted position.
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Note: If no IDENT has been inserted, the field displays “ENTRY” instead of an IDENT.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION

1 →

1L	ECON DES AF5612	1R
2L	CRZ OPT REC MAX	2R
3L	FL390	3R
4L	<REPORT VDEV= + 750FT	4R
5L	UPDATE AT	5R
6L	*[]	6R
	BRG/DIST	
	---°/---.--- TO []	
	PREDICTIVE	
	<GPS	
	REQUIRED ACCUR ESTIMATED	
	1.0 NM HIGH 0.28 NM	
	FRZ	

1L	ECON DES AF5612	1R
2L	CRZ OPT REC MAX	2R
3L	FL390	3R
4L	<REPORT VDEV= + 750FT	4R
5L	CONFIRM UPDATE AT	5R
6L	4401.8N/01100.2E FRZ*	6R
	BRG/DIST	
	---°/---.--- TO []	
	PREDICTIVE	
	<GPS	
	REQUIRED ACCUR ESTIMATED	
	1.0 NM HIGH 0.28 NM	

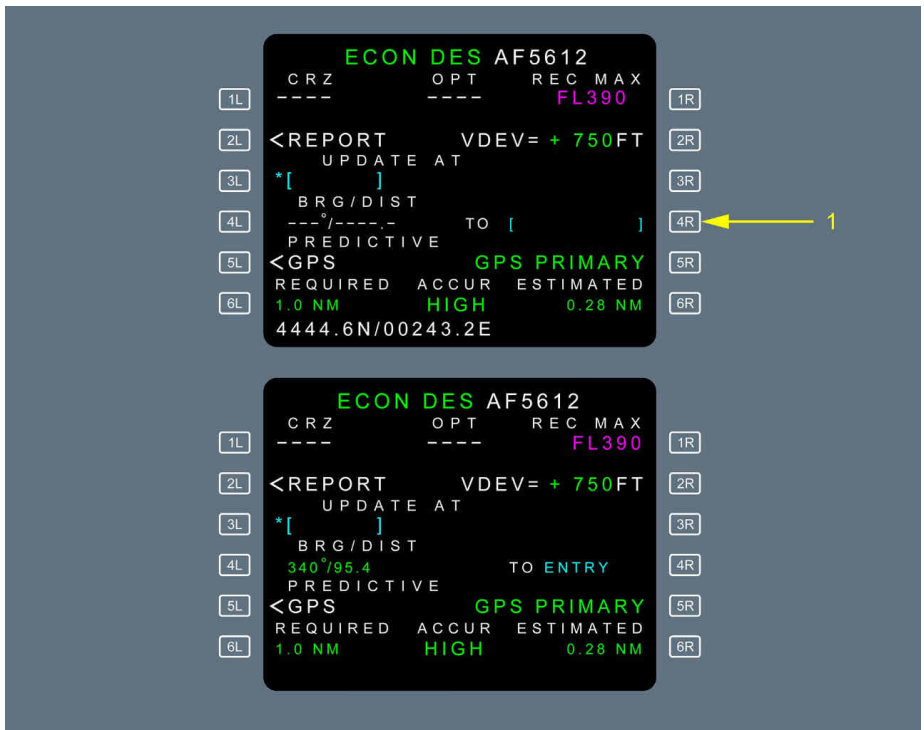
Line 4 BRG/DIST

On this line, the pilot can enter an airport, a waypoint, a NAVAID, or a runway. The pilot may enter each as an IDENT, a latitude/longitude (LL), a place/bearing/distance (PBD), or a place-bearing/place-bearing (PBX). The field then shows the FMGC-computed bearing and distance to the site from the aircraft's present position. The last distance digit is in 1/10 of a NM. If it does not have an IDENT, the point is called "ENTRY".

Example:

BRG/DIST

340 °/95.4 to ENTRY



[5L] PREDICTIVE GPS This prompt gives access to the PREDICTIVE GPS page.

[5R] GPS PRIMARY This prompt is displayed, when the FMS navigation mode is GPS PRIMARY. When GPS PRIMARY is not available, or navigation mode is not GPS/IRS, this field is blank.

The scratchpad displays the relevant “GPS PRIMARY” message when this prompt appears; and “GPS PRIMARY LOST”, when the field turns to blank.

[6L] REQUIRED This field displays the default value for the required navigation accuracy level. The pilot can modify it. Provided no pilot entry has been made, the default value changes according to the actual flight area (En route, terminal, approach).

ACCUR HIGH/LOW This field shows the flight management system's estimate of the navigational accuracy. “HIGH” indicates that the FMS estimates that the navigational accuracy matches the accuracy criteria of the area currently flown. “LOW” indicates that the criteria are not matched.

[6R] ESTIMATED This field displays the current estimated navigation accuracy value (EPE) as computed by the FMS.

PREDICTIVE GPS PAGES

Ident.: DSC-22_20-20-10-25-00009139.0001001 / 31 AUG 17

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

- Note:
1. This page is only operative with Honeywell ADIRS.
 2. This page cannot be used as a substitute to determine pre-flight planning RAIM availability when required by operational regulations. Refer to PRO-NOR-SOP-02 GPS PRIMARY Availability (If Installed).

The pilot accesses this page by pressing the PREDICTIVE GPS prompt of the PROG page. This page displays information relative to theoretical predictive availability of GPS PRIMARY at destination, and at any waypoint selected by the crew.

1L	CRZ AI101 CRZ OPT REC MAX FL290 FL350 FL390										1R
2L	<REPORT CONFIRM UPDATE AT										2R
3L	4353.3N/00052.4E AGN*										3R
4L	BRG/DIST ---°/----- - TO []										4R
5L	PREDICTIVE < GPS GPS PRIMARY										5R
6L	REQUIRED ACCUR ESTIMATED 2.0 NM HIGH 1.13NM										6R

1L	PREDICTIVE GPS DEST PRIMARY ETA EDDF 1450										1R
2L	-15 -10 -5 ETA +5 +10 +15 Y Y Y Y Y Y Y										2R
3L	WPT ETA AGN PRIMARY 1330										3R
4L	-15 -10 -5 ETA +5 +10 +15 Y Y N N N N N										4R
5L	DESELECTED SATELLITES 6 21										5R
6L	[]										6R

[1L] DEST Destination, airport as currently selected in active flight plan. It is not modifiable. This field displays dashes, when no destination airport exists.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
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[1R] ETA	This field is defaulted to the Estimated Arrival Time, as computed by the FMS (small blue font). The pilot may enter a value in this field (large blue font). Amber boxes are displayed, when no prediction exists, or the crew entry has been cleared.
Line 2 PRIMARY Y/N	Predicted primary status at destination airport, at the following times: Estimated time of arrival $\pm 5, 10, 15$ min. Availability of GPS PRIMARY at the corresponding time is indicated by Y, when PRIMARY is predicted to be available; and, by N, when GPS PRIMARY is predicted not to be available. These fields are blanked when the destination [1L] field, or the time [1R] field is not defined.
[3L] WPT	The pilot may enter a reference waypoint in this field. Blue brackets are displayed, when no entry has been made.
[3R] ETA	When a reference waypoint has been entered in the [3L] field, amber boxes are displayed. The crew is requested to enter a reference time in this field.
Line 4 PRIMARY Y/N	Information equivalent to [2L] / [2R] is displayed for any pilot-selected waypoint. The corresponding time of arrival is also displayed.
Line 5 DESELECTED SATELLITES and Line 6 SATELLITES	Enables the pilot to deselect up to four satellites by inserting the corresponding satellite number ; the number is then displayed in large blue font. When deactivated, the satellites are not considered for predictive GPS availability at destination, or at the selected waypoint. The deselection is cancelled when the entry is cleared (blue brackets are displayed), or the field is overwritten by a different satellite number.

REPORT PAGE

Ident.: DSC-22_20-20-10-25-00000606.0009001 / 14 MAY 12
Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

The pilot calls this page by pressing the [2L] key on the PROG page:

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT
CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION

1L		1R	
2L	<REPORT UPDATE AT *{ } BRG/DIST ---°/--- TO PREDICTIVE <GPS REQUIRED ACCUR 0.36 NM HIGH	2R	
3L		3R	
4L		4R	
5L		5R	
6L		6R	
1L	REPORT AI101 OVHD UTC ALT ----- TO AGN 1028 5000 NEXT AUCH 1036 FL145 SAT T.WIND FOB ---° ---°/--- ---	1R	REPORT PAGE IN PREFLIGHT PHASE
2L		2R	
3L		3R	
4L		4R	
5L		5R	
6L		6R	
1L	REPORT AI101 OVHD UTC ALT LMG 1013 FL380 TO AGN 1028 FL380 NEXT AUCH 1036 FL380 SAT T.WIND FOB -42° 145°/063 18.0 T/D UTC DIST AT FL380 1055 302 SEND* DEST UTC DIST EFOB LFBZ 1110 396 2.0	1R	REPORT PAGE IN FLIGHT
2L		2R	
3L		3R	
4L		4R	
5L		5R	
6L		6R	

This page displays information related to the FROM, TO, NEXT and DEST waypoints, as well as the current wind, temperature, distance and time to the next cruise profile change.

TITLE (White) Displays the flight number. This line displays EO in amber, in case an engine-out is detected.

[1L] OVHD (green) Displays the last sequenced waypoint. This field never displays the pseudo-waypoints and the F-PLN markers (T-P, PPOS, IN-BND, OUT-BND).

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
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- [1R] UTC/TIME ALT (green) This field displays the time and altitude recorded at the time of sequence.

- [2L]-[2R] TO (green) This field displays the active waypoint, predicted time of arrival and predicted altitude at this waypoint.

Note: Time and altitude values are identical to those values on the F-PLN pages.

- [3L]-[3R] NEXT (green) Same information for the next waypoint.

- [4L] [4R]
SAT/T.WIND/FOB (green) This field displays the static air temperature, the wind direction and velocity, and the FOB recorded at waypoint sequencing.

- [5L] T/D/UTC/DIST (green) This field displays the estimated time, and the distance to go to the next change of the cruise profile (T/D, S/C, S/D). These data are only displayed when the cruise phase is active.

- [5R] SEND* (blue) The crew uses this prompt to downlink a position report.
This field may be blank, depending on airline policy.

- Line 6 This field displays the estimated time of arrival, the distance along the DEST/UTC/DIST/EFOB F-PLN, and the estimated fuel on board (DEST EFOB) at destination.
The DEST EFOB field will turn to amber, if the EFOB at destination becomes less than the MIN DEST FOB value displayed on the FUEL PRED page..
This display is identical to the information on the F-PLN pages.

Note: No data can be inserted or modified on the REPORT page.

RADIO NAV PAGE

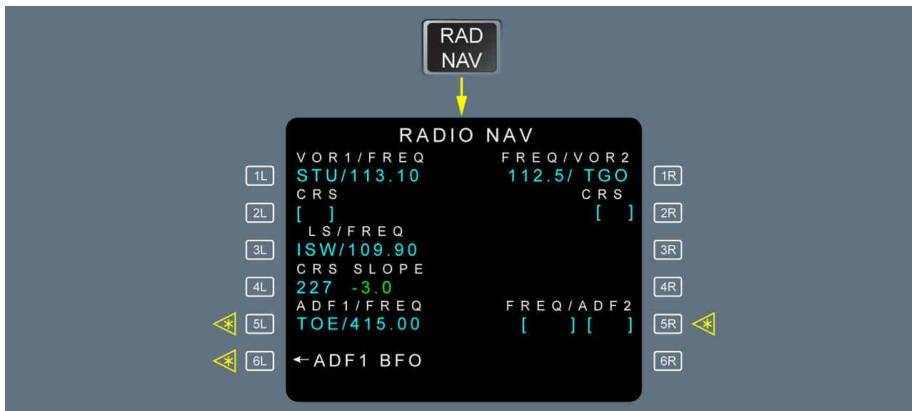
Ident.: DSC-22_20-20-10-25-00000607.0009001 / 14 NOV 24
Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

This page enables the flight crew to select or verify the radio NAVAIDs, tuned for display purposes only.

These NAVAIDs include: VOR, VOR/DME, TAC, VORTAC, ILS, and ADF  .

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION



Line 1 VOR1/FREQ
FREQ/VOR2

This line displays the identifiers and frequencies of VORs 1 and 2, whether they are automatically or manually tuned.
To manually tune a VOR, the flight crew inserts the ident or frequency. If the ident is not in the database, the NEW NAVAID page comes up. A “clear” action reverts the selection to the autotuned NAVAID.

Line 2 CRS

This line displays courses for the NAVAIDs in Line 1.
The flight crew can manually enter the courses through these fields.

[3L] LS/FREQ

This field displays the ident of an ILS and its frequency (for ILS). It is autotuned, if the ILS is associated with the departure runway, or if the flight plan contains an ILS approach. The flight crew may also enter an ILS manually. When the manually entered ILS differs from the ILS that the FMS would autotune, **RWY/LS MISMATCH** appears.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
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[4L] CRS SLOPE

CRS: This field displays the course associated with the LS displayed in Line 3. It comes up automatically if an LS is autotuned, or if an LS has been manually tuned via its ident. Otherwise, the course must be entered manually. The course may be backbeam (Bxxx) or frontbeam (Fxxx).
SLOPE: This field displays the slope associated with the LS displayed in Line 3. It comes up automatically if an LS is autotuned for approach, or if an LS has been manually tuned via its ident.

Note:

1. The slope does not apply to LOC only, LDA, SDF or backbeam approaches.
2. If the flight crew intends to manually tune an ILS that is not in the navigation database or to manually tune an ILS by its frequency (ident not entered), and if they do not enter the course, the flight crew will not be able to arm approach modes.

Line 5 ADF1  /FREQ This line displays the identifiers and frequencies of ADF 1 and ADF 2.
FREQ/ADF2  The flight crew can use the ident or the frequency to manually tune the ADF.
Line 6 ADF1  BFO When an ADF is selected, these fields display an ADF/BFO prompt. The
BFO ADF2  flight crew presses the key once to erase the arrow and put the ADF in BFO mode. A clear action brings the arrow back and cancels BFO.

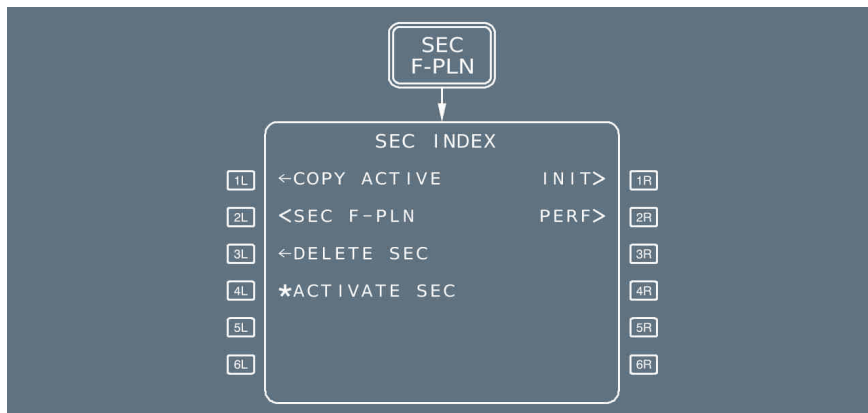
Note:

- The autotune function only works for NAVAIDs stored in the database.
- When tuning manually, the operator should use the ident, rather than the frequency, unless the NAVAID is not in the database.
- Manually-tuned frequencies are displayed in large font.

SECONDARY PAGES

Ident.: DSC-22_20-20-10-25-00000608.0009001 / 12 NOV 24
Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

The SEC F-PLN key on the MCDU console allows the flight crew to call up the secondary index page and the secondary flight plan page. The secondary flight plan is generally for a diversion, for predictable runway changes for takeoff or landing, or for training.
There are two types of secondary index pages. The type selected depends on the presence of a secondary flight plan.

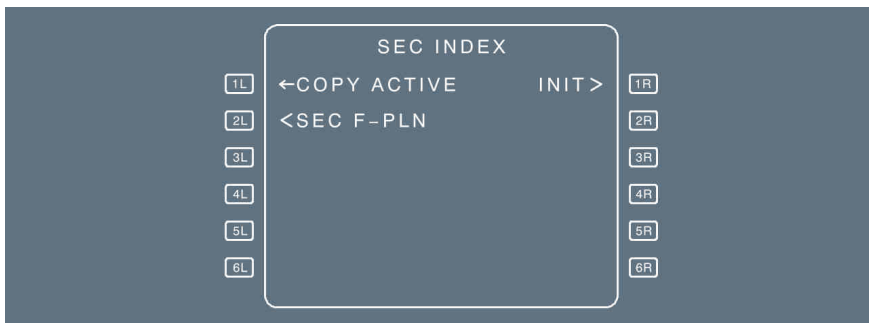
SECONDARY INDEX PAGE
A SECONDARY FLIGHT PLAN IS ALREADY DEFINED


- | | |
|---------------------------|--|
| [1L] COPY ACTIVE (blue) | The flight crew presses this key to copy the active flight plan into the secondary flight plan and delete the previous secondary plan. |
| [2L] SEC F-PLN (white) | The flight crew presses this key to call up the secondary flight plan pages. |
| [3L] DELETE SEC (blue) | The flight crew presses this key to delete the current secondary flight plan. |
| [4L] ACTIVATE SEC (amber) | The flight crew presses this key to activate the secondary flight plan as the active flight plan. |

Note: "ACTIVATE SEC" routinely appears if the HDG/TRK mode is active. If the NAV mode is active, "ACTIVATE SEC" appears only if the active and secondary flight plans have a common active leg.

- | | |
|---------------------------|---|
| [5L] ATC REJ INFO (amber) | This prompt is displayed when the FMS rejects at least one element from a F-PLN uplink. When selected, the MCDU displays the ATC REJ INFO page. |
| [1R] INIT (white) | The flight crew presses this key to call up the SEC INIT A page. |
| [2R] PERF (white) | The flight crew presses this key to call up the performance pages for the secondary flight plan. |

A SECONDARY FLIGHT PLAN IS NOT DEFINED



- | | |
|-------------------------|--|
| [1L] COPY ACTIVE (blue) | The pilot presses this key to copy the primary active flight plan into the secondary flight plan. |
| [2L] SEC F-PLN (white) | The pilot presses this key to call up the secondary flight plan pages. |
| [1R] INIT (white) | The pilot presses this key to call up the secondary INIT page. It is similar to the active INIT page, but blue brackets replace all the amber boxes. |

SECONDARY FLIGHT PLAN PAGES

The secondary flight plan pages A and B are identical to those of the active flight plan, but are automatically sequenced, only when the secondary is copied from the primary and their active legs are identical.

The active and secondary flight plans pages differ from each other as follows:

SECONDARY LATERAL REVISION PAGES:

- ERASE and INSERT are not displayed.
- FIX INFO is not available.
- A lateral revision of the secondary flight plan does not create a temporary flight plan: All revisions are directly applied to the secondary flight plan.

SECONDARY VERTICAL REVISION PAGES:

A vertical revision on the secondary flight plan does not create a temporary flight plan.

SECONDARY INIT A AND B PAGES:

- They use blue brackets, instead of amber boxes.
- They have no align prompt.
- They do not provide for slewing or entering data in the 4L-4R fields (airport reference).

SECONDARY STEP ALTITUDE PAGES:

These pages operate as the primary STEP ALTS page, except that optimal step, savings are not available.

SECONDARY WIND PAGES:

They have no history wind page.

SECONDARY PERFORMANCE PAGES:

- All boxes are replaced by blue brackets.
- They have no engine-out mode, no engine-out long range cruise cost index.
- They have no expedite predictions.
- They have no ACTIVATE/CONFIRM APPROACH PHASE prompt.
- They have no PRED TO ALTN predictions on the PERF CLB and PERF DES pages.
- They have no engine-out drift down, no top of descent, no cabin descent rate information on the PERF CRZ page.

The secondary flight plan has no FUEL PRED page.

SECONDARY INIT A PAGE IS ALSO USED TO REQUEST OR DISPLAY AN UPLINK INIT MESSAGE RECEIVED AFTER ENGINE START.

This uplink INIT message can be cleared or inserted as SECONDARY INIT data.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION

1L		2L		3L		4L		5L		6L		1R		2R		3R		4R		5R		6R											
SEC INIT → CO RTE FROM/TO [][][][][][][][] [][][][][][][][] ALTN/CO RTE INIT ----- REQUEST* FLT NBR [][][][][][][][] LAT LONG ----- COST INDEX WIND> --- TROPO CRZ FL/TEMP 36090 ----- /-----°																																	
SEC INIT → CO RTE FROM/TO [][][][][][][][] [][][][][][][][] ALTN/CO RTE INSERT ----- UPLINK* FLT NBR [][][][][][][][]																																	

[2R] INIT REQUEST* Enable to request init data from the ground or,

[2R] INSERT UPLINK* A downlink message has been received following a request.
 The message can be cleared or entered in the SEC INIT page.

1L		2L		3L		4L		5L		6L		1R		2R		3R		4R		5R		6R	
SECONDARY INIT A PAGE AFTER UPLINK MESSAGE INSERTION.												SEC INIT → CO RTE FROM/TO 20441 LSGG/LGAT ALTN/CO RTE INIT LGTS REQUEST* FLT NBR IT5612 LAT LONG 4512.ON 00727.2E COST INDEX WIND> 100 TROPO CRZ FL/TEMP 36090 FL290 /-42°											

BACK UP NAV PAGES

Ident.: DSC-22_20-20-10-25-00013508.0019001 / 29 JAN 13

Applicable to: MSN 05152-05746

The MCDU features a back up navigation function which provides simplified point-to-point GPIRS and IRS based navigation in case of a dual FM failure.

The backup Navigation mode allows limited lateral flight planning within the MCDU, that can be used to drive the Navigation Display and provides relative path position information and auto-sequencing of the Backup Navigation flight plan. The Backup Navigation flight plan reflects, as much as possible, the active primary FM flight plan upon its initial activation.

During FM normal operation, the F-PLN is continuously downloaded in the MCDU memory: the BACK UP NAV function links the MCDU of the failed FM to its onside IRS. All navigation data related to the MCDU F-PLN are displayed on the associated ND.

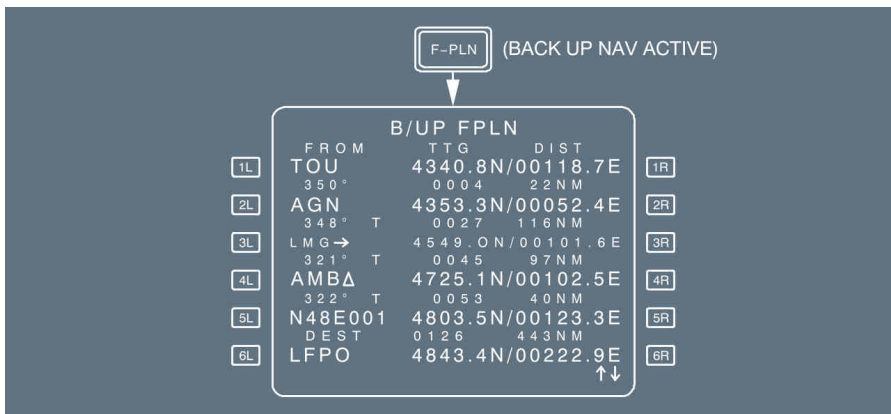
BACK UP NAV function is activated on the MCDU MENU page by pressing the NAV B/UP prompt. The MCDU back-up F-PLN may accept a maximum of 165 legs, including information such as waypoint position/identification, leg type, discontinuity, overfly and turn direction information (radial, pattern, heading leg... cannot be part of the MCDU F-PLN). No secondary or temporary F-PLN exists.

BACK UP NAV pages display the data related to the BACK UP NAV function. There are six pages available while BACK UP NAV is active:

- B/UP F-PLN
- B/UP F-PLN for DIRECT TO
- B/UP PROG
- B/UP IRS for onside IRS (1+2)
- B/UP IRS 3
- B/UP GPS (if the GPS is installed)

B/UP F-PLN PAGE

The B/UP F-PLN page displays the MCDU F-PLN data. The pilot calls up this page by pressing the F-PLN key while B/UP NAV is active.



TITLE line 1 to line 5

B/UP F-PLN is displayed in a white large font

 Display consecutive waypoints with their associated latitude/longitude. If a waypoint is to be overflown, an overfly symbol (Δ) is displayed after the identifier.

If a turn is specified into the next leg, a large font arrow is displayed after the identifier.

Label lines contain the bearing, time to go and distance to the next waypoint displayed in small font.

white bearing

green time to go and distance

 BRG Between FROM and TO waypoints: True or Mag depending on the TRUE pb-sw $\triangleleft$ position. T is displayed when the bearing is true referenced.

 Between other waypoints: out bound true track of the great circle joining the 2 related waypoints, independent of TRUE pb-sw $\triangleleft$.

TTG HHMM limited to 9 959. Time between the 2 related waypoints.

DIST NM limited to 9 999.

line 6 DEST

DEST airport identifier and associated latitude/longitude.

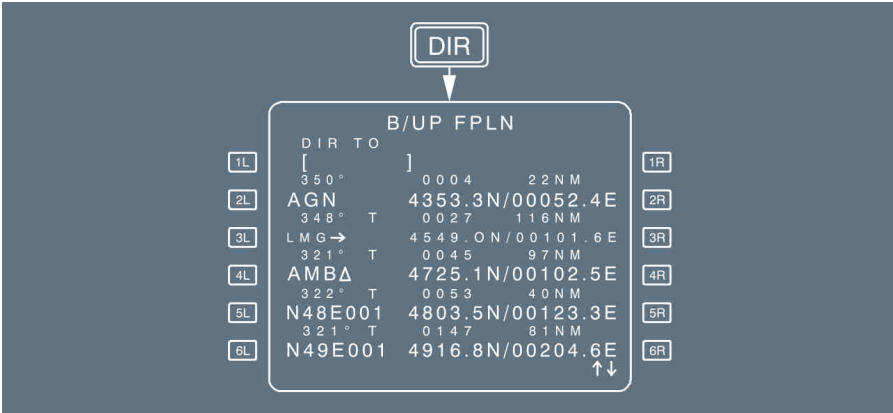
DIST to destination is computed as the direct distance from the aircraft to the active waypoint plus the along flight plan distances.

time to go to destination is computed as distance to destination divided by ground speed.

TTG and DEST are dashed if aircraft position is unavailable.

B/UP F-PLN (DIR TO)PAGE

The pilot calls up this page using the DIR key on MCDU while BACK UP NAV is active and aircraft position is valid.



TITLE [1L] DIR TO

B/UP F-PLN is displayed in a white large font

Allows DIRECT TO selection to the desired waypoint.

This waypoint can be selected from the F-PLN or manually entered through the scratchpad (IDENT/LAT/LONG or LAT/LONG)

line 2 to line 6

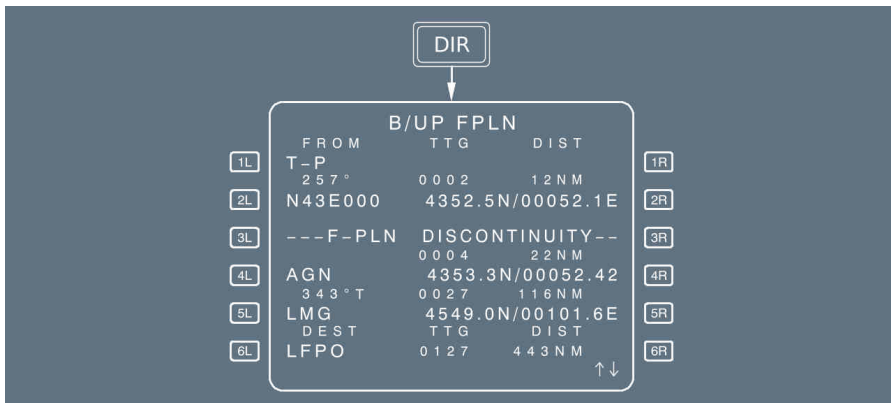
Display consecutive waypoints of the F-PLN.

Same as the B/UP F-PLN page.

The TO WAYPOINT is displayed in [2L].

Vertical slewing function is available.

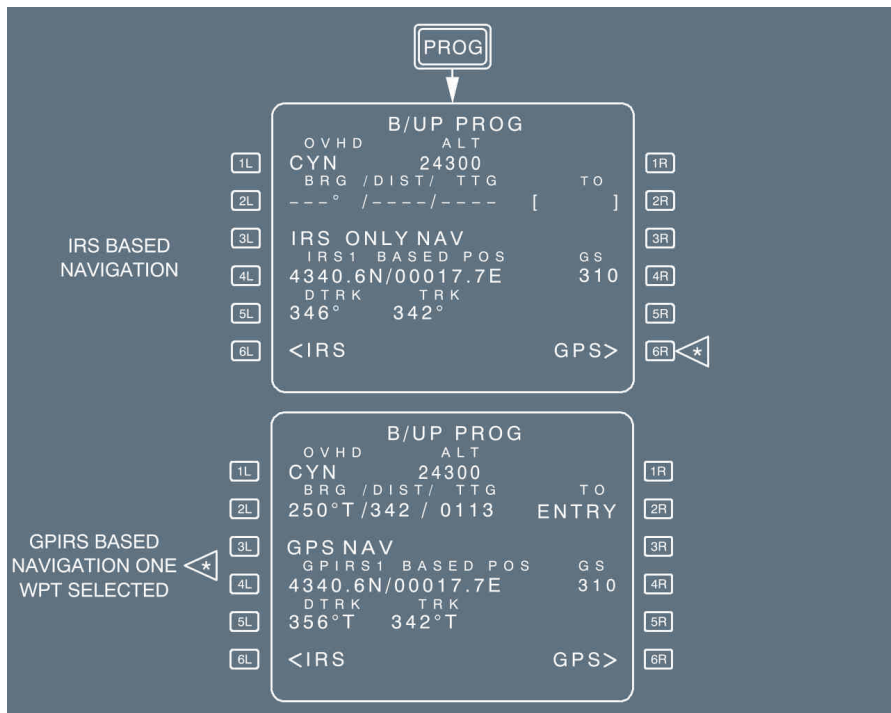
After a DIR TO selection, the B/UP F-PLN page is modified as following:



B/UP PROG PAGE

It displays flight parameters relative to the F-PLN or a selected waypoint.

The flight crew calls up this page by pressing the PROG key on MCDU when BACK UP NAV is active.



TITLE line 1 OVHD/ALT B/UP PROG is displayed in a white large font.

Displays the identifier of the last sequenced waypoint and the altitude at the time of the sequence.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
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- line 2 BRG/DIST/TTG/TO Allows the flight crew to enter an existing MCDU F-PLN waypoint identifier or LAT/LONG or IDENT/LAT/LONG.
MCDU then computes bearing, distance and time to go to that waypoint from the present position.
The pilot may modify or clear this entry (2R field).
- BRG True or magnetic outbound track of the great circle joining aircraft present position to the entered waypoint: dependent on the TRUE pb-sw  position.
- DIST limited to 9 999.
- TTG HHMM limited to 9 959. time to go to the entered position computed assuming current ground speed.
- These fields are displayed in a green small font.
They are dashed if present position is unavailable.
- [3L] Means of navigation used by the Back-Up Navigation. If GPS is fitted and is the navigation source, “GPS NAV” is displayed, otherwise “IRS ONLY NAV” is displayed.
If the GPS is not installed, this field is blank.
- [4L] IRS 1 (2 or 3) Current aircraft position provided by the selected IRS GPIRS
BASED POS GPIRS 1 (2 IRS 1 (or 3 if IRS 1 failed) on MCDU 1
or 3) (green) IRS 2 (or 3 if IRS 2 failed) on MCDU 2
GPIRS 1 (or GPIRS 3) or MCDU 1 
GPIRS 2 (or GPIRS 3) or MCDU 2 
- [4R] GS (green) Current ground speed from the selected IRS or GPS .
- [5L] DTRK/TRK (green) Desired track of the MCDU F-PLN active leg and current aircraft track from the selected IRS/GPS (True or Mag).
These tracks are true or magnetic depending on TRUE pb-sw  position.
- [6L] IRS 1 (2) Gives access to onside B/UP IRS (1 or 2) page
- [6R] GPS Gives access to B/UP GPS page.
This prompt only appears when the GPS is installed.

B/UP IRS 1 OR 2 OR 3 PAGE

- Display IRS 1, 2, 3 navigation data.
The pilot calls up this page from B/UP PROG page, by pressing the corresponding prompt.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION

[6L] <IRS

[1L]

[2L]

[3L]

[4L]

[5L]

[6L]

B/UP IRS1

POSITION
 43°40.4N/000°17.6E

TTRK GS
 342.3 310

THDG MHDG
 342.3 329.8

WIND GPIRS ACCUR
 225°/216 100M

GPIRS POSITION
 43°40.6N/000°18.2E

<RETURNNEXT IRS>

[1R]

[2R]

[3R]

[4R]

[5R]

[6R]

MCDU 1 B/UP
ONSD IRS
GPS AVAILABLE

[1L]

[2L]

[3L]

[4L]

[5L]

[6L]

B/UP IRS3

POSITION
 43°40.6N/000°18.2E

TTRK GS
 341.8 309

THDG MHDG
 341.8 329.3

WIND GPIRS ACCUR
 224°/215 -----

GPIRS POSITION
 -----/-----

<RETURNNEXT IRS>

[1R]

[2R]

[3R]

[4R]

[5R]

[6R]

MCDU B/UP OFFSIDE
IRS PAGE
GPS FITTED GPS
UNAVAILABLE

TITLE

B/UP IRS 1, 2, 3 displayed in a white large font.

[1L] POSITION

Current aircraft position from selected IRS

[2L] T TRK

True track

[2R] GS

Ground speed

[3L] T HDG

True heading

[3R] M HDG

Magnetic heading

Dashed when in polar area.

[4L] WIND

Wind direction and velocity

Wind direction is always true referenced.

[4R] GPIRS ACCUR

GPS accuracy in meters as in the IRS page.

[5R] GPIRS POSITION

If GPS is installed, the GPS IRS position is provided as in the IRS page.

[6L] RETURN

Gives access to B/UP PROG page

[6R] NEXT IRS Gives access to the next IRS page.
(Closed loop 1 → 2 → 3 → 1)

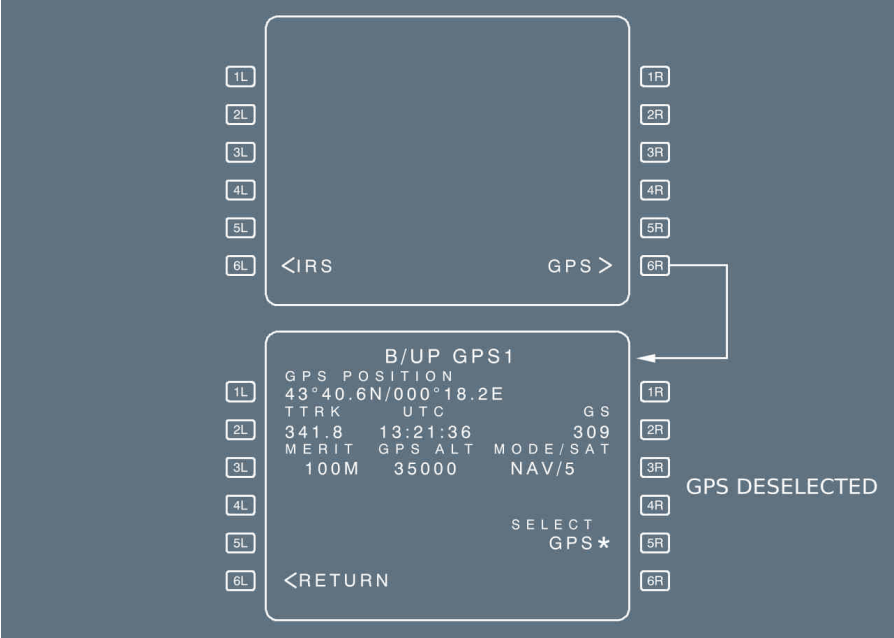
This page is not modifiable by the crew.

Note: The fields [4R] and [5L] are blanked when the GPS is not installed.

B/UP GPS

Display GPS navigation data.

The flight crew calls up this page from B/UP PROG page, by pressing the corresponding prompt.



TITLE B/UP GPS 1, 2 displayed in a white large font.

[1L] GPS POSITION

Line 2: TTRK GPIRS position (latitude/longitude)
UTC: Time
GS: Ground Speed

Line 3: MERIT: GPS figure of merit
GPS ALT: GPS altitude
MODE/SAT: Navigation mode and number of tracked satellites. These values are displayed as in the FM GPS page.

AIRCRAFT SYSTEMS**AUTO FLIGHT - FLIGHT MANAGEMENT**

CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION

[5R]

DESELECT/SELECT GPS: The flight crew may select and deselect the GPS for navigation Backup function. The default configuration is GPS selected.

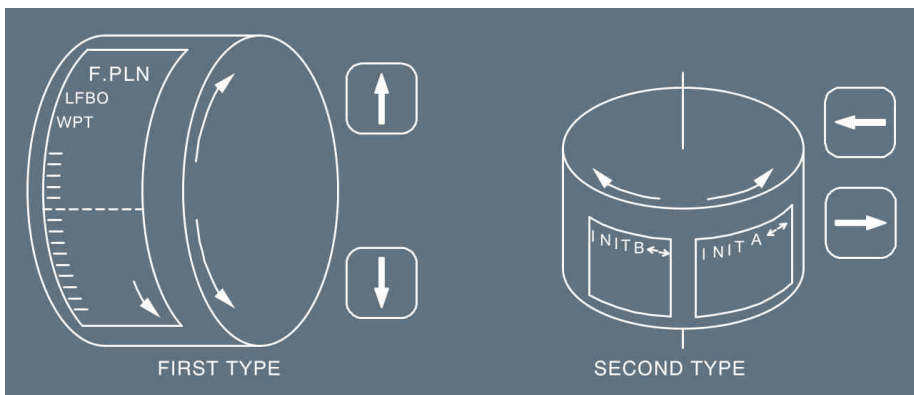
FMS2 Thales

GENERAL

Ident.: DSC-22_20-20-10-28-00000813.0001001 / 14 MAY 12

Applicable to: MSN 02926-02944, 04392, 07784-07792

The Flight Management and Guidance System (FMGS) displays information on several “pages”. When a page cannot display all of the assigned information, it cues the pilot to call up additional information. There are three types of pages, and each type has its particular way of cuing the pilot to call up additional information.



FIRST TYPE

When this page cannot simultaneously display all the information on the screen (more information than the six pairs of lines can hold), the pilot can scroll up or down the page.

In this case, the screen displays a $\uparrow \downarrow$ symbol in the bottom right-hand corner (F-PLN pages, secondary F-PLN page, departure/arrival pages,...).

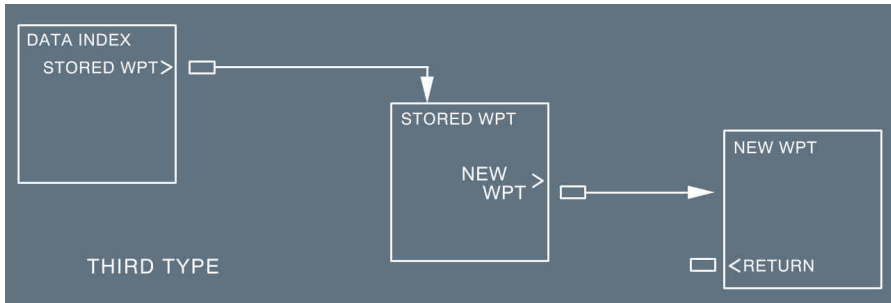
SECOND TYPE

When the information is on successive pages, the pilot presses the “ $\rightarrow$ ” or “ $\leftarrow$ ” keys to sequentially call up these pages.

In this case, an arrow is displayed in the top right-hand corner of the screen (INIT pages).

THIRD TYPE

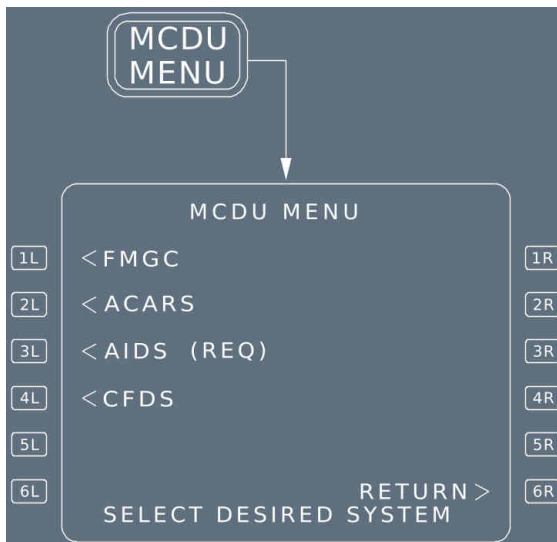
When different types of information are on successive pages, the pilot calls up these pages by pressing the key adjacent to the prompts : $>$, $<$ or $*$.


MCDU MENU PAGE

Ident.: DSC-22_20-20-10-28-00000814.0001001 / 16 MAR 11

Applicable to: MSN 02926-02944

This page lists the various systems which are accessible via the MCDU. The system automatically displays this page at power up.



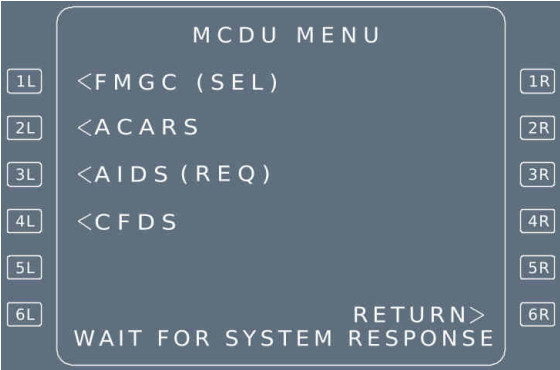
The pilot selects a system by pressing the key adjacent to the name of that system.

- The screen shows the name of the selected system in:
- Green, if communication is established.
 - Blue, associated with the (SEL) indicator, until communication is established. The scratchpad displays “WAIT FOR SYSTEM RESPONSE”.
 - White, associated with the (TIME OUT) indicator, if the MCDU cannot establish communication with the selected system.

When a system calls for the pilot's attention, the MCDU displays “REQ” next to the system's name, and the “MCDU MENU” annunciator lights up.

When the pilot presses the key next to the name of the system that requires attention, the “MCDU MENU” annunciator light goes off.

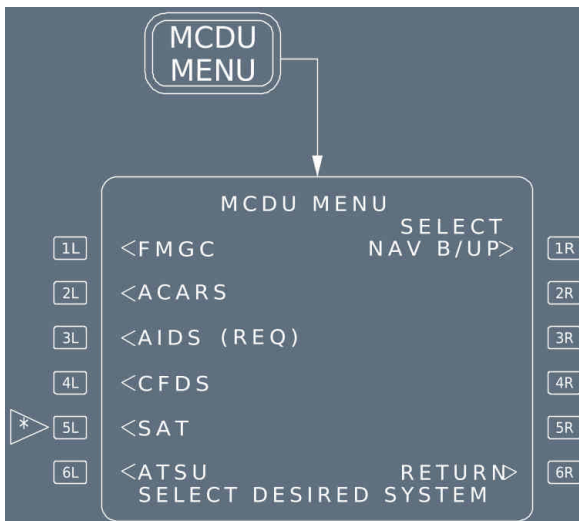
When the MCDU is communicating with a system other than the FMGC, the pilot should use the MCDU MENU page to revert to the FMGC system.



MCDU MENU PAGE

Ident.: DSC-22_20-20-10-28-00000814.0012001 / 16 MAR 11
Applicable to: MSN 04392, 07784-07792

This page lists the various systems which are accessible via the MCDU. The system automatically displays this page at power up.



The flight crew selects a system by pressing the key adjacent to the name of that system.

The screen shows the name of the selected system in:

- Green, if communication is established.
- Blue, associated with the (SEL) indicator, until communication is established. The scratchpad displays "WAIT FOR SYSTEM RESPONSE".
- White, associated with the (TIME OUT) indicator, if the MCDU cannot establish communication with the selected system.

When a system calls for the flight crew's attention, the MCDU displays "REQ" next to the system's name, and the "MCDU MENU" annunciator lights up.

When the flight crew presses the key next to the name of the system that requires attention, the "MCDU MENU" annunciator light goes off.

When the MCDU is communicating with a system other than the FMGC, the pilot should use the MCDU MENU page to revert to the FMGC system.

SELECT NAV B/UP Pressing the [1R] key selects the NAV B/UP function and DESELECT NAV B/UP appears in the [1R] field.
 If the NAV B/UP is inoperative, the field is blank.

RETURN This field is displayed when a function is active.

If the MCDU attempts to communicate with a system, "SEL" is displayed next to the system name.

INIT A PAGE

Ident.: DSC-22_20-20-10-28-00000815.0021001 / 07 NOV 25

Applicable to: MSN 02926-02944, 04392, 07784-07792

1 The flight crew uses the INIT A page in pre-flight phase, to initialize the flight plan and align the inertial reference system.

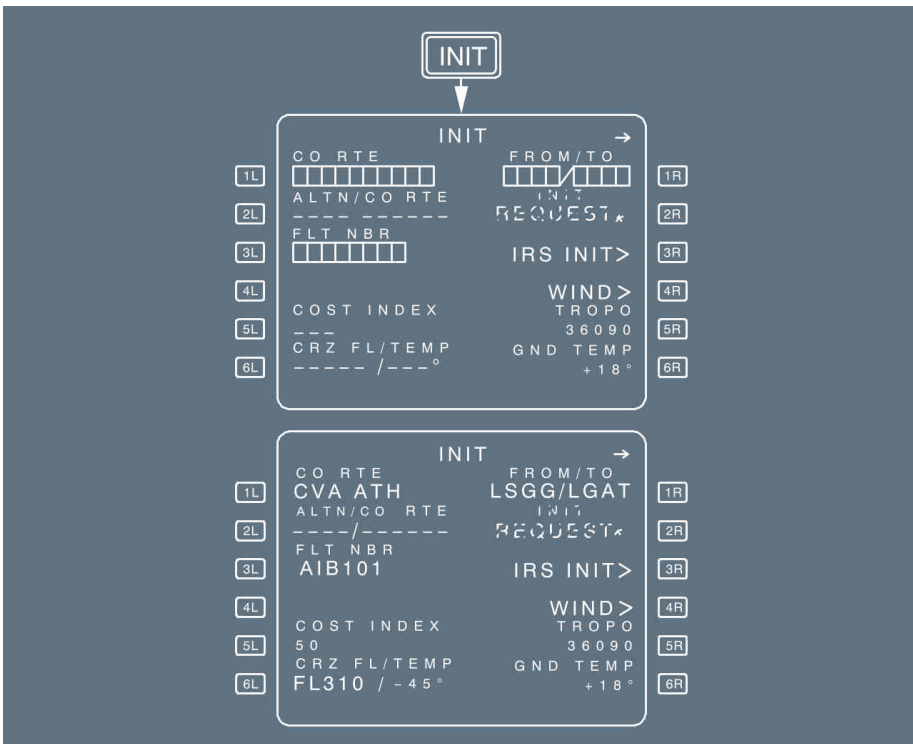
The flight crew accesses this page by pressing the INIT key on the MCDU.

The INIT A page can be accessed on ground or in flight.

When in the done phase, the pilot can press the INIT key to begin the next preflight phase.

Note: The flight crew may also call up this page by pressing:

- The “→” or “←” keys on the MCDU, when on the INIT B page, or
- The key next to “RETURN” or “INSERT” on the ROUTE SELECTION page.



INIT

1L	CO RTE	FROM/TO	1R
2L	ALTN/CO RTE	INIT	2R
3L	FLT NBR	REQUEST*	3R
4L		IRS INIT>	4R
5L	COST INDEX	WIND>	5R
6L	---	TROPO	6R
	CRZ FL/TEMP	36090	
	----- / ---°	GND TEMP	
		+18°	

1L	CO RTE	FROM/TO	1R
2L	CVA ATH	LSGG/LGAT	2R
3L	ALTN/CO RTE	INIT	3R
4L	---	REQUEST*	4R
5L	FLT NBR	IRS INIT>	5R
6L	A1B101	WIND>	6R
	COST INDEX	TROPO	
	50	36090	
	CRZ FL/TEMP	GND TEMP	
	FL310 / -45°	+18°	

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT
CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION

[1L] CO RTE (blue)	If the flight crew enters a company route number, the screen displays all data associated with that route (8 or 10 characters, depending on the pin program). Inserting the CO RTE into the RTE selection page also enters the CO RTE number in this field.
[2L] ALTN/CO RTE (blue)	This field is dashed, until a primary destination is entered in the 1R field. If a preferred alternate is associated with the primary destination in the Navigation Database, it is displayed in this field with the company route identification. The crew may manually enter an alternate and company route. If the preferred alternate is not associated with the primary destination, "NONE" is displayed in this field. When the alternate route and the primary destination do not match, the MCDU scratchpad displays "DEST/ALTN MISMATCH". If the primary destination is changed, this field is modified accordingly.
[3L] FLT NBR (blue)	The flight number automatically appears in this field, if it is stored with the company route. The flight crew may modify it, or enter a new number here.
[5L] COST INDEX (blue)	This is usually stored in the database, along with the company route. The flight crew may modify it, or enter a new value here. It defaults to the last entered value, if a value is not stored in the database.
[6L] CRZ FL/TEMP (cruise flight level and temperature)	The cruise flight level is usually stored in the database, along with the company route. If not, it has to be entered manually. If no cruise flight level is entered, the system will not furnish predictions, while the aircraft is on ground. The flight crew has to enter the temperature at cruise flight level in order to refine the predictions. Otherwise, these are computed for ISA conditions. (If no sign is entered, the system uses a plus).
[1R] FROM/TO (blue)	The flight crew can enter a city pair in this field (ICAO codes for city of origin and destination). This entry automatically deletes any previously-entered company route, and calls up the route selection page (if a company route exists). If one airfield of the pair is not in the database, the display changes to the NEW RWY page.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
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[2R] INIT REQUEST 	This prompt is displayed, if the pilot did not enter an active flight plan, or entered a flight number or a company route that is not in the aircraft database. Selecting this prompt sends the ground a request for active flight plan initialization (downlink message). When the asterisk is not displayed, a downlink message cannot be sent. The uplink flight plan is automatically inserted in the active flight plan, before engine start, provided that an active flight plan does not exist. After engine start, the uplink flight plan is sent to the secondary flight plan, and manually-inserted or rejected (<i>Refer to DSC-22_45 Flight Plan Initialization Function</i>).
[3R] IRS INIT	The flight crew presses this key to access the IRS INIT page.
[4R] WIND	The crew presses this key to access the pages, unless a temporary flight plan exists. In this case, the scratchpad displays “TEMPORARY F-PLN EXISTS”.
[5R] TROPO (blue)	The default tropopause altitude is36 090 ft. The pilot can use this field to modify the tropopause altitude (99 990 ft maximum).
[6R] GND TEMP (blue)	When a CO RTE or a FROM/TO is defined, the ground temperature value corresponds to the standard ISA temperature at the origin airport elevation. The flight crew can modify this value as required on the pre-flight phase.

ROUTE SELECTION PAGE

Ident.: DSC-22_20-20-10-28-00000818.0001001 / 16 MAR 11
Applicable to: MSN 02926-02944, 04392, 07784-07792

- This page displays all the company routes, stored in the database, that are associated with the inserted city pair. They can either be called up manually, or displayed automatically.

 - Manually: The pilot presses the FROM/TO or ALTN key on the INIT A page when a city pair is displayed.
 - Automatically: The system displays it, when the pilot enters a city pair or defines an alternate on the INIT A page of the active or secondary flight plan.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION



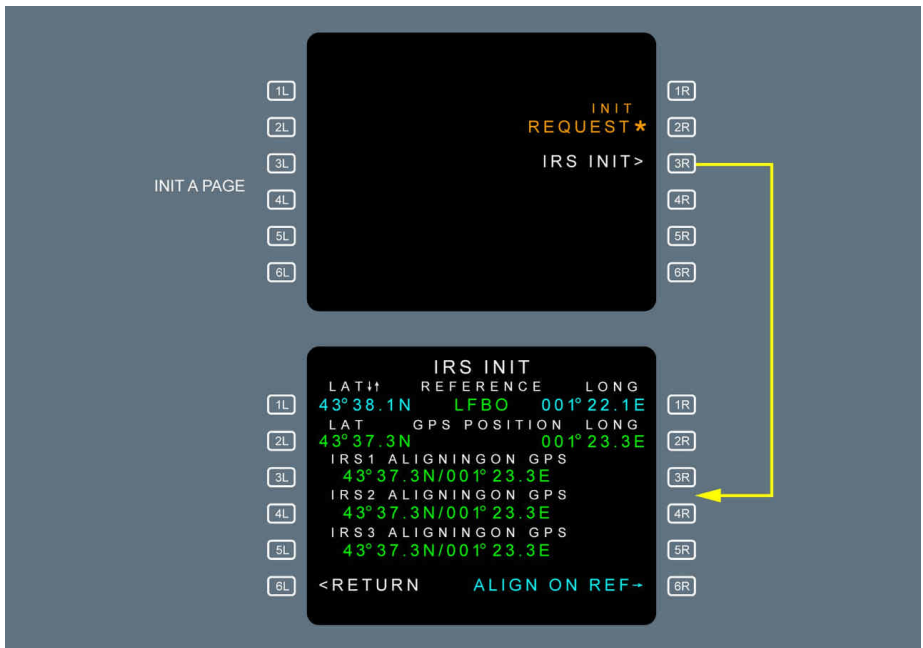
TITLE	Idents for the city pair inserted on the INIT A page. (The numbers in the upper right-hand corner are the total number of company routes from this city pair stored in the database).
[1L]	This field shows the name of the company route. "NONE" appears, if there is no company route for this city pair.
Line 2 to Line 5	These fields display the various elements of the company route : Waypoints appear in large green font, and airways in small white font.
[6L] RETURN	The pilot presses this key to return to the INIT A page.
[6R] INSERT or SELECT	This prompt displays an amber INSERT (blue for the secondary flight plan), if the pilot accessed the page from the INIT A (or secondary INIT A) page. It displays SELECT (blue) if the crew accessed the page from the alternate page. The pilot presses this key to insert the displayed company route in the respective flight plan and to return the display to the accessing page.

Note: The pilot can scroll to display the rest of the route (if one page does not show it all), or other company routes for this city pair.

IRS INIT PAGE

Ident.: DSC-22_20-20-10-28-00009556.0052001 / 02 MAY 24
 Applicable to: MSN 02926-02944, 04392, 07784-07792

The flight crew uses the IRS INIT page to align the inertial reference system. The crew accesses this page, by pressing the IRS INIT key on the INIT A page.



Line 1
LAT-REFERENCE-LONG

This line provides the latitude and longitude of the FM reference position. This reference is extracted from the navigation database. The flight crew can modify this reference. Only when the FM reference position matches the origin airport position, the airport identifier is displayed in green. Otherwise, there are dashes at the place of the airport identifier. Latitude and longitude of the FM reference position are displayed in blue. The flight crew can modify the latitude and longitude values using the scroll keys.

Line 2 LAT-GPS
POSITION-LONG

These lines display the GPS position latitude and longitude.

Line 3 to 5

These lines display the IRS 1-2-3 alignment state, source and latitude/longitude. The alignment status can be ALIGNING ON XXX, or ALIGNED ON XXX or IN ATT. XXX is the alignment source and can be GPS or CDU or REF. It is displayed in white font.

The latitude and longitude values are displayed in green.

[6L] RETURN

This prompt enables the crew to return to the INIT A page.

[6R]

If a reference is available, this field displays ALIGN ON REF → in blue which is replaced by CONFIRM ALIGN * in amber when 6R prompt is pressed. Pressing again the 6R prompt enables the transmission of the FM reference position displayed in line 1.

WIND PAGES

Ident.: DSC-22_20-20-10-28-00009557.0021001 / 07 NOV 25

Applicable to: MSN 02926-02944, 04392, 07784-07792

Winds in climb, cruise, descent, and approach are necessary to provide the pilot with reliable predictions and performance. Wind pages enable the pilot to enter and/or review the winds propagated by the FMGS or sent by ACARS for the various flight phases.

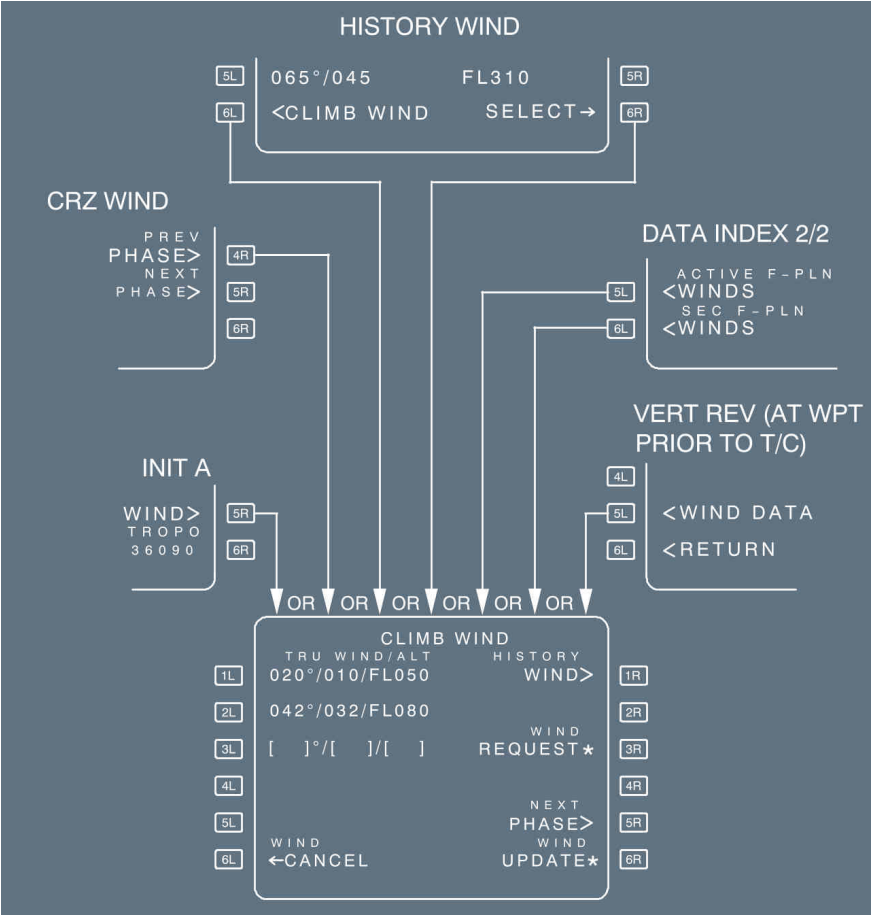
Note:

1. On the WIND pages, wind direction is always true-referenced.
2. On the WIND pages, pending wind data exist as soon as a wind entry or a modification is performed on any of the WIND pages and until WIND UPDATE or WIND CANCEL is selected.

2 CLIMB WIND PAGE

This page enables the pilot to enter and/or review predicted wind vectors (direction and velocity) at up to 5 different levels.

THE CLIMB WIND PAGE IS ACCESSED FROM:



TITLE

"CLIMB WIND" is displayed in large white font.
"DRAFT" is displayed next to "CLIMB WIND", in yellow large font, when pending wind data exist for the active flight plan.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION

[1L] to [5L] TRU
WIND/ALT

This field displays the winds, entered at various climb altitudes: before climb phase, in yellow when pending wind data exist, and blue otherwise. In green, after climb phase activation. This field may also display history winds. Large blue brackets are displayed before any wind entry. Flight crew-entered winds are displayed in large blue font. History wind data is displayed in small green font. Upon sequencing the top of climb, the climb winds are deleted.

[6L] RETURN or WIND
CANCEL

The RETURN prompt is displayed in large white font, when no wind entry is performed. Selecting this prompt reverts to the access page.

The WIND CANCEL prompt appears in amber, as soon as a wind entry is performed. It is used to cancel a wind data update.

Note: *Climb winds are not deleted, when the origin airport is changed.*

[1R] HISTORY WIND

This key calls up the history wind page and is only displayed in the preflight phase. It cannot be modified (white font), but can be inserted into the CLIMB WIND page by using the 6R key and modified accordingly.

[3R] WIND REQUEST 

Pressing this key sends a request for ACARS/AOC winds. (*Refer to DSC-22_20-30-80 Wind Data - Request for Wind Data*).

[5R] NEXT PHASE

Pressing this key calls up the CRZ WIND page, or the DESCENT WIND page, if no cruise waypoint exists. It is displayed in white font.

[6R] WIND UPDATE

This prompt is displayed in amber, as soon as a wind entry or a modification is performed. When it is pressed winds are inserted.

HISTORY WIND PAGE



HISTORY WIND		
[1L]	050°/020 FL050	[1R]
[2L]	070°/030 FL150	[2R]
[3L]	070°/035 FL250	[3R]
[4L]	065°/045 FL350 CRZ FL	[4R]
[5L]	065°/045 FL370	[5R]
[6L]	<CLIMB WIND	[6R]
	SELECT>	

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
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[1L] to [5L]	The history winds are given for the default altitudes of FL 050, FL 150, FL 250 and the CRZ FL of the previous flight. They are displayed in yellow when pending data exist, in blue otherwise.
[6L] CLIMB WIND	This key reverts the display to the CLIMB WIND page. It is displayed in white font.
[6R] SELECT	This key inserts the history wind values into the CLIMB WIND page. This prompt is displayed in amber, if no wind has been inserted yet.

3 **CRZ WIND PAGE**

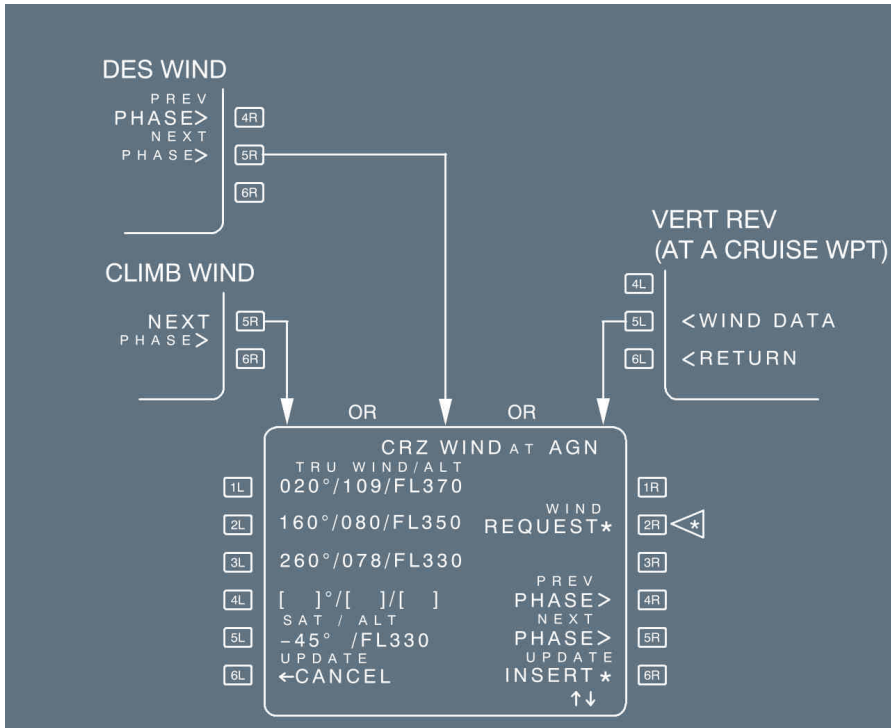
The CRUISE WIND page allows the entry and display of predicted wind data (direction and velocity) for each cruise waypoint.

Until weight data is entered and predictions are computed, cruise winds may be entered at any waypoint that is not part of a SID, STAR or approach.

The CRZ WIND page also enables the definition of a temperature at a given altitude to refine the predicted temperature profile. It is accessed from the CLIMB or DESCENT WIND page, or by pressing the WIND DATA prompt on the VERT REV page of a cruise waypoint. The flight crew can scroll from a cruise waypoint to the next one by using the MCDU scroll keys. Once the last cruise waypoint is reached, the “up arrow”slew key allows access to the first cruise waypoint.

The flight crew can enter wind data for each cruise waypoint at up to four different altitudes.

Note: This set of four altitudes is defined for the whole cruise phase. Entering a new altitude at a cruise waypoint will remove the previous altitude from the computations.


TITLE

"CRZ WIND AT" is displayed in white font. "DRAFT" is displayed next to "CRZ WIND AT", in yellow large font, when pending wind data exist for the active flight plan. The cruise waypoint at which the wind data is defined is displayed in green large font.

[1L] to [4L] TRU WIND/ALT

These fields display the entered winds at various altitudes. The entered winds are propagated at the same altitude to the downpath cruise waypoints, if no other winds are entered. The propagated wind direction and velocity are displayed in small font. Both the uplinked winds and the pilot-entered winds are displayed in large font. Wind data can be modified during cruise. Wind data is displayed in yellow when pending winds exist and in blue when inserted.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
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[5L] SAT/ALT	This field enables the crew to enter a temperature at a given flight level, or it displays a propagated value. The flight crew must enter both temperature and altitude at the first entry. They can then modify the temperature or the altitude independently. SAT and Altitude are displayed in yellow when pending winds exist and in blue otherwise.
[6L] RETURN or WIND CANCEL	The "< RETURN" prompt is displayed when no modification has been performed on any WIND page. Selecting this prompt reverts to the page from which WIND pages have been accessed when modifications have been performed on any WIND page, the "WIND CANCEL" prompt is displayed. Selecting this prompt cancels all modifications to the WIND pages.
[2R] WIND REQUEST 	Pressing this key sends a request for ACARS/AOC winds. (<i>Refer to DSC-22_20-30-80 Wind Data - Request for Wind Data</i>).
[4R] PREV PHASE	This prompt is displayed in white in Preflight, Takeoff, Climb, Done and Go-Around phases. Pressing this prompt calls up the CLIMB WIND page.
[5R] NEXT PHASE	This prompt is displayed in white. Pressing this prompt calls up the DES WIND page.
[6R] WIND UPDATE*	This prompt is displayed when entries or modifications have been performed on any WIND page. Selecting this prompt inserts all the modifications performed on the WIND pages. Predictions are dashed on the F-PLN pages during the recomputation time. CRZ WIND page automatically reverts to F-PLN page, if the secondary flight plan is activated.

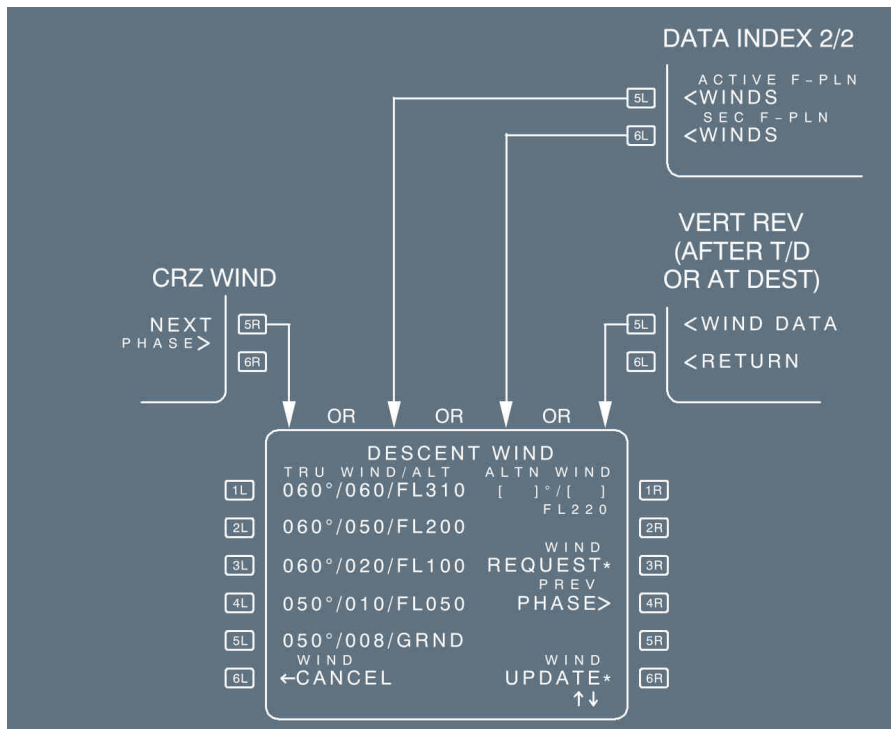
4 **DESCENT WIND PAGE**

This page enables the pilot to define and display the winds used for computing the descent profile at up to 5 descent altitudes.

The pilot calls it up by selecting NEXT PHASE on the CRUISE WIND page, or the WIND prompt on the VERT REV page.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION


TITLE

"DESCENT WIND" is displayed in large white font. "DRAFT" is displayed next to "DESCENT WIND" in yellow large font when pending wind data exist for the active flight plan.

[1L] to [5L] TRU WIND/ALT These lines display inserted winds or uplinked winds: in yellow when pending data exist, and in blue otherwise, prior to activating the descent phase (modifiable values). In green after descent phase activation (not modifiable values).
 An entry of "GRND" in the "ALT" field is seen as the wind at ground level. This wind is copied on to the PERF APPR page (and corrected for the magnetic variation), and used for the computation of the predictions.
 A clear action on one key reverts the line to blue brackets.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
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[6L] RETURN or WIND CANCEL	The RETURN prompt is displayed in white large font, when no wind entry is performed. Selecting this prompt reverts to the access page. The WIND CANCEL prompt appears in amber, as soon as a wind entry is performed. It is used to cancel a wind data update.
<i>Note: Descent and alternate winds are deleted, if the destination airport is changed.</i>	
[1R] ALTN WIND	This field is only displayed when an alternate is defined. The flight crew-entered or uplinked value is displayed in large yellow font when pending data exist, and in blue otherwise. It can always be modified by the pilot.
[2R] FLXXX	This field displays an uplinked alternate cruise altitude in the label line. If no uplink is done, this field displays the FMS alternate cruise flight level in small green font.
[3R] WIND REQUEST	 Pressing this key sends a request for ACARS/AOC winds. (<i>Refer to DSC-22_20-30-80 Wind Data - Request for Wind Data</i>).
[4R] PREV PHASE	Pressing this key calls up the CRZ WIND page. The prompt is erased after the top of descent is sequenced. It is displayed in large white font.
[6R] WIND UPDATE	This prompt is displayed in amber, as soon as a wind entry or a modification is performed. Pressing the up (down) scroll key will display the data at the next (previous) downpath (up path) descent waypoint.

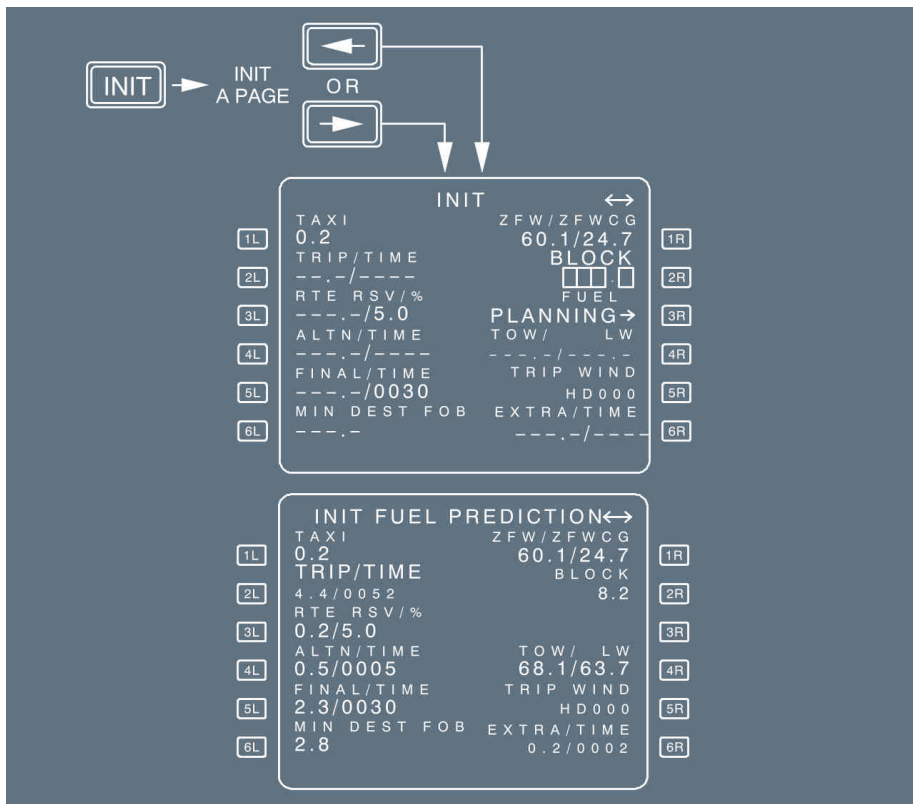
INIT B PAGE
Ident.: DSC-22_20-20-10-28-00000824.0021001 / 14 MAY 12 Applicable to: MSN 02926-02944, 04392, 07784-07792

This page is used to initialize the gross weight and center of gravity values, before starting the engines.

The crew can call it up from the INIT A page, by pressing the “→” or “←” key on the MCDU, as long as the engines have not been started.

This page automatically reverts to the FUEL PRED page after the first engine is started.

The FMGC will stop using the pilot-entered block fuel and will compute its predictions based on the FOB indicated by the FQI computer (or the FAC as backup) from that moment on.



[1L] TAXI (blue)

This is the taxi fuel, that defaults to a preset value, (usually 200 kg or 400 lb in the AMI file). The crew can change the value through this field.

[2L] TRIP/TIME (green)

This field displays the trip fuel and time when predictions are available. The crew cannot modify these values.

[3L] RTE RSV/% (blue)

This field displays the contingency fuel for the route and the corresponding percentage of trip fuel. It may be equal to 0.0, if such is the policy of the operator. The crew can either enter a fuel quantity, a percentage.

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
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- [4L] ALTN/TIME (blue/green) Displays alternate trip fuel and time, assuming that the Cost Index = 0 and that the aircraft flies at the default cruise flight level. (*Refer to DSC-22_20-10-30-13 Alternate Function - Review and Selection of Alternate Airport*). The flight crew can modify the alternate fuel as required. In this case, alternate time will be dashed.
- [5L] FINAL/TIME (blue) Displays the final reserve fuel and time calculated at the alternate airport (or destination airport, if selected in the “airline fuel policy” section of the AMI). Before any crew entry, the FINAL field is dashed and FINAL TIME field is defaulted to the value specified in the AMI file (typically 30 min).
The flight crew may enter a final fuel or time, and the system will compute associated holding time/fuel available. The system assumes a holding pattern at 1 500 ft AGL with the aircraft in CONF 1 at maximum endurance speed (racetrack pattern, altitude and selected airport can be modified through the “airline fuel policy” section of the AMI).
- [6L] MIN DEST FOB (blue) Displays the expected minimum fuel at destination. It is equal to the ALTN + FINAL fuel. This field can be modified by the flight crew, and is also impacted by the modification of ALTN and/or FINAL fuel.
Note: If flight crew entry of MIN DEST FOB is lower than ALTN + FINAL fuel, the message “CHECK MIN DEST FOB” is triggered on the MCDU.
- [1R] ZFWCG/ZFW (blue) Displays the Zero Fuel Weight (ZFW) and Zero Fuel Weight CG (ZFWCG). The flight crew must enter the ZFW/ZFWCG values (as appropriate) to obtain a speed profile and predictions.
Note: If the flight crew enters a ZFW value that exceeds the acceptable range as defined in the performance data base, the “ENTRY OUT OF RANGE” message appears and the value is rejected.
- [2R] BLOCK The block fuel in this field is a mandatory entry.
When the flight crew enters a block fuel, the page title changes to INIT FUEL PREDICTION.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT
CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION

[3R] FUEL PLANNING
(amber)

Initiates an FMGC block fuel computation using current hypothesis and extra = 0. When the pilot selects this function, FUEL PLANNING becomes green, and the BLOCK field is dashed during FMGC computation. The title of the page changes to INIT FUEL PLANNING, and BLOCK CONFIRM* replaces the FUEL PLANNING prompt, when the block fuel is computed by the FMGC. If the pilot modifies the parameters used to compute prediction before confirmation, the computation automatically restarts and FUEL PLANNING is displayed in green.

[4R] TOW/LW (green)

Displays the computed Takeoff Weight (TOW) and Landing Weight (LW) at the primary destination. This cannot be modified.

[5R] TRIP WIND (blue)

This field allows the entry of a mean wind component for the trip from the origin to the destination. Upon entry of a CO RTE or FROM/TO pair, this field defaults to HD 000 in small font.

An entry preceeded by –, H, HD is considered to be headwind, +, T, TL to be tailwind. The entered speed is displayed in large blue font.

When the flight crew inserts a wind on the CLIMB, CRUISE or DESCENT WIND page or on the PERF APP page, the system no longer considers the trip wind, and the corresponding field is dashed.

[6R] EXTRA/TIME (green)

Displays the amount of extra fuel, and the resulting time available for holding over the primary destination.

EXTRA FUEL = BLOCK – (TAXI + TRIP + RSV + MIN DEST FOB).

The field displays its information in small font, and it cannot be modified by the flight crew.

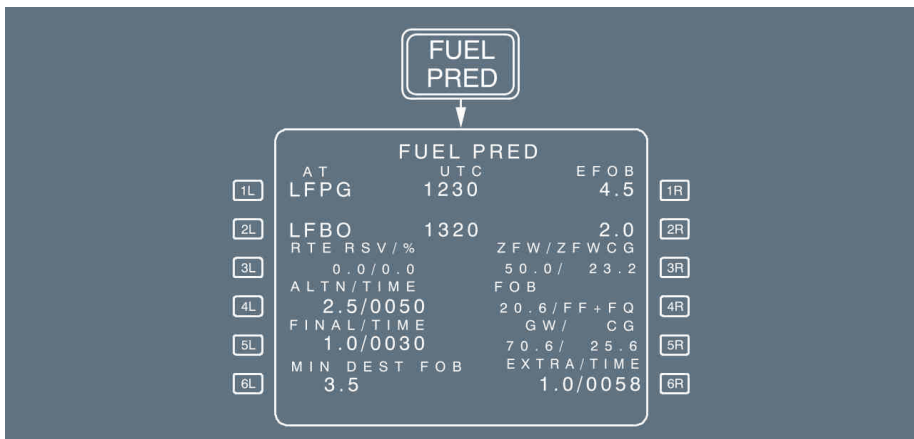
FUEL PREDICTION PAGE

Ident.: DSC-22_20-20-10-28-00000825.0021001 / 01 OCT 12

Applicable to: MSN 02926-02944, 04392, 07784-07792

The FUEL PRED page displays fuel prediction information at destination and alternate, as well as fuel management data after the engines are started. The flight crew accesses the FUEL PRED page, by pressing the FUEL PRED key on the MCDU.

Note: The flight crew can also call up this page by pressing the “→” key on the MCDU when on the INIT A page.



[1L] – [1R]

AT-UTC-TIME/EFOB (green)

Display time and fuel predictions to the primary destination. TIME is displayed before takeoff. UTC predictions are displayed after takeoff. If the flight crew has entered an Estimated Takeoff Time (ETT), the UTC is displayed.

The EFOB at destination will turn to amber, if it becomes less than the MIN DEST FOB value.

Line 2 AT-UTC/TIME-EFOB

These lines display time and fuel predictions to the alternate airport. (Refer to DSC-22_20-10-30-13 Alternate Function - General).

[3L] RTE RSV/% (blue)

Before departure, this field displays the route reserve fuel and the corresponding percentage of trip fuel. It may be equal to 0.0, if such is the policy of the operator. The crew can either enter a fuel quantity or a percentage. After takeoff, it is dashed, and the corresponding fuel is added to the EXTRA fuel.

[4L] ALTN/TIME
(blue/green)

Displays alternate trip fuel and time, assuming that the Cost Index = 0 and that the aircraft flies at the default cruise flight level.

Refer to DSC-22_20-10-30-13 Alternate Function - Review and Selection of Alternate Airport

The flight crew can modify the alternate fuel as required. In this case, alternate time will be dashed.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT
CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION

[5L] FINAL/TIME (blue)	Displays the final reserve fuel and time calculated at the alternate airport (or destination airport, if selected in the “airline fuel policy” section of the AMI). The flight crew may enter a final fuel or time, and the system will compute associated holding time/fuel available. The system assumes a holding pattern at 1 500 ft AGL, with the aircraft in CONF1 at maximum endurance speed (racetrack pattern, altitude and selected airport can be modified through the “airline fuel policy” section of the AMI).
[6L] MIN DEST FOB (blue)	Displays the expected Minimum Fuel at Destination. It is equal to the FINAL + ALTN fuel. The field can be modified directly by the flight crew, and is also impacted by the modification of the ALTN and/or the FINAL fuel.
[3R] ZFW/ZFWCG (blue)	Displays the Zero Fuel Weight (ZFW) and Zero Fuel Weight Center of Gravity (ZFWCG) values, as entered before engine start on the INIT B page. The flight crew can re-enter or modify these values after engine start on the FUEL PRED page. If at engine start, no ZFW or ZFWCG values have been entered, amber boxes are displayed in the corresponding field. The field crew must enter the ZFW/ZFWCG values to obtain a speed profile and predictions.
[4R] FOB (green)	Displays the Fuel On Board (FOB) calculated by the FMGS and/or the following fuel sensors: - Fuel flow and fuel quantity sensors (/FF+FQ) - Fuel flow sensors only (/FF) - Fuel quantity sensors only (/FQ). The flight crew can modify the FOB value in flight, or modify the sensors used by entering “/FF”, “/FQ” or “/FF+FQ”, as required.
[5R] GW/CG (green)	The FMS continuously updates the Gross Weight (GW) and Center of Gravity (CG) during the flight. The field displays dashes, as long as the system is not calculating the Fuel On Board, or ZFW has not been entered by the flight crew. The field cannot be modified.
[6R] EXTRA/TIME (green)	Displays the amount of extra fuel, and the resulting time available for holding over the primary destination. EXTRA FUEL = FOB - (TAXI + TRIP + RSV + MIN DEST FOB). This field displays its information in small green font, and it cannot be modified by the flight crew.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
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Note: All fields, are dashed before engines are started.

FLIGHT PLAN PAGES

Applicable to: MSN 02926-02944, 04392, 07784-07792

Ident.: DSC-22_20-20-10-28-A-00000826.0001001 / 16 MAR 11

These pages display all active and alternate flight plan, waypoints alongwith the associated predictions.

The flight crew can make all revisions to the lateral and vertical flight plans from these pages:

The flight crew presses the left key to revise the lateral flight plan, and the right key to revise the vertical flight plan.

The flight crew presses the F-PLN key on the MCDU console to access page A of the active flight plan.

Ident.: DSC-22_20-20-10-28-A-00000827.0009001 / 06 AUG 19

FLIGHT PLAN A PAGE

Flight Plan A Page displays time, speed, and altitude predictions for each active flight plan waypoint.



TITLE	FLIGHT NUMBER (blank, if no flight number has been entered). This line may display OFST in white, if a lateral offset is flown.
Line 1 to Line 5 WPT, UTC, SPD, ALT	These lines display consecutive waypoints, alongwith associated predictions of time, speed or Mach and altitude for each. TIME is displayed before takeoff, and UTC after takeoff. After the flight crew enters an Estimated Takeoff Time (ETT), UTC is displayed. The time and flight level display at the FROM waypoint (first line of the flight plan) are values that the system memorized at waypoint sequencing.
[1R] SPD/ALT	The field dedicated to SPEED or MACH is blank at the FROM waypoint, except at the departure airport (V1 associated with runway elevation, is displayed).

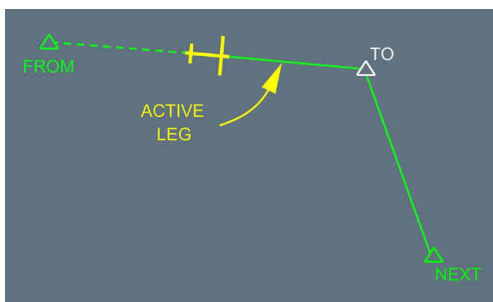
Note: When the HOLD marker is slewed, the HOLD SPD label will overwrite the TIME/UTC title. In addition, the IMM EXIT or RESUME HOLD prompt will replace the SPD/ALT field.

Note: The predicted altitude at a waypoint is related to the QNH below the transition altitude, and is given as a flight level above the transition altitude.

Line 6, DEST UTC/TIME
 DIST, EFOB

DIST is the distance to destination along the displayed flight plan.
 EFOB is the estimated fuel on board at destination. The EFOB at destination will turn to amber, if it becomes less than the MIN DEST FOB value.
 The sixth line is permanent and is displayed in white font, once predictions are available, except when a TMPY F-PLN is displayed, or in some cases when an ALT CSTR is entered (“← CLB or DES →” prompt appears).

The generic flight plan page displays the FROM waypoint (last waypoint to be overflown) on the first line, and the TO waypoint (in white) on the second line. The FROM/TO flight plan leg is called the active leg.



The flight crew can use the scroll keys to review all flight plan legs down to the last point of the alternate flight plan. The AIRPORT key serves as a fast scroll key. The flight crew can press it to call up the next airport (DEST, ALTN, ORIGIN) to be displayed on the flight plan page. In order to return to the beginning of the flight plan page, the flight crew presses the F-PLN key on the MCDU console.

The display shows the name of the leg between two waypoints, and the distance between them on a line between the lines that identify them. During an approach, this in-between line also defines the angle of the final descent path. For example, “2-3 °” indicates that the leg is two nautical miles long, and the flight path angle is -3 °.

The display shows the bearing between FROM and TO waypoints as the bearing from the aircraft position to the TO waypoint. It shows track (TRK) between the waypoints shown in lines 2 and 3. This is the outbound track of the next leg.

If the database contains a published missed approach procedure, or if someone has inserted one manually, the display shows it in blue after the destination runway identification. It turns green when the go-around phase becomes active.

After the last waypoint of the missed approach, the display shows the alternate flight plan.

When NAV mode is engaged, the flight crew can only clear or modify the TO waypoint by using the DIR key on the MCDU console.

PREDICTIONS

The FMS calculates and displays predictions at all F-PLN waypoints.

It uses the current wind and the predicted winds to compute the predictions.

CONSTRAINTS

The database may define an altitude or speed constraint for each waypoint of the climb, descent, and approach phases, or the flight crew may manually insert such constraints (except at origin, destination, FROM, and pseudo-waypoints) or a time constraint (RTA).

The constraints are displayed in magenta, as long as predictions are not completed.

Once predictions are available, constraints are replaced by speed, time and altitude predictions, preceded by stars. If the star is in magenta, the system predicts that the aircraft will match the constraint (altitude within 250 ft, speed not more than 10 kt above the constraints, RTA within the required accuracy). If the star is in amber, the system predicts that the aircraft will miss the constraint and the MCDU displays: **SPD ERROR AT WPTXX** for speed constraint, or **RTA MISSED AT XXX** for time constraint.

Note: *SPD and ALT CSTR may either be entered on the VERT REV page or directly on the F-PLN A page, whereas TIME CSTR may only be entered from the RTA page.*

PSEUDO-WAYPOINTS

Pseudo-waypoints are geographical positions corresponding to an event in the flight plan : T/C (Top of Climb), T/D (Top of Descent), SPD/LIM (Speed Limit), S/C (Step Climb point), S/D (Step Descent point), DECEL (Deceleration for Approach), Time Markers etc.

Pseudo-waypoints are displayed as waypoints in parentheses.

Ident.: DSC-22_20-20-10-28-A-00000828.0001001 / 28 MAY 20

FLIGHT PLAN B PAGE

This page displays fuel predictions and forecast winds at each waypoint.

The flight crew calls it up by pressing the “→” or “←” keys when the FLIGHT PLAN A page is displayed.



TITLE
Line 1 to Line 5
WPT-EFOB-WIND

Line 6
DEST-UTC/DIST-EFOB

FLIGHT NUMBER (blank, if no flight number has been entered).
These lines display consecutive waypoints and associated fuel predictions, and the predicted wind profile.
The direction of forecast winds is relative to true north.
Forecast winds include winds entered by the flight crew (large font) and the propagated winds at intermediate waypoints (small font).
EFOB and WIND at the FROM waypoint are displayed in large font.
At other waypoints, it is displayed in small font, and in the same color as the associated waypoint. No wind entry is allowed on this page.
The flight crew will use the CLIMB, CRUISE, or DESCENT WIND pages, accessed from the INIT A page or the DATA INDEX B page.
Identical to the F-PLN A page.

LATERAL REVISION PAGES

Applicable to: MSN 02926-02944, 04392, 07784-07792

Ident.: DSC-22_20-20-10-28-B-00000829.0021001 / 14 MAY 12

These pages provide a list of the lateral flight plan revisions, that can be used to change the flight plan beyond a selected waypoint.

The crew calls up these pages from the flight plan pages (A or B), by pressing the left key next to the selected waypoint.

Different lateral flight plan revisions are available for different waypoints.

LAT REV AT THE ORIGIN	1L	LAT REV FROM LSGG 45°12.0N/007°27.2E <DEPARTURE FIX INFO> LL XING/INCR/NO <OFFSET []°/[]°/[]> NEXT WPT [] NEW DEST [] <RETURN	1R
	2L		2R
	3L		3R
	4L		4R
	5L		5R
	6L		6R
LAT REV AT THE DESTINATION	1L	LAT REV FROM LGAT 37°53.8N/023°43.7E ARRIVAL> NEXT WPT [] <ALTN ENABLE ←ALTN <RETURN	1R
	2L		2R
	3L		3R
	4L		4R
	5L		5R
	6L		6R

LAT REV AT THE FROM WPT	[1L] [2L] [3L] [4L] [5L] [6L]	LAT REV FROM PPOS <OFFSET [] <HOLD <RETURN FIX INFO> LL XING/INCR/NO]°/[]°/[]	[1R] [2R] [3R] [4R] [5R] [6R]
LAT REV AT A WPT	[1L] [2L] [3L] [4L] [5L] [6L]	LAT REV FROM FRZ 44°01.8N/011°00.2E <HOLD ENABLE <ALTN T M P Y <F-PLN FIX INFO> NEXT WPT NEW DEST [] AIRWAYS> T M P Y INSERT *	[1R] [2R] [3R] [4R] [5R] [6R]

TITLE	The ident of the waypoint or airport selected for revision, alongwith its latitude and longitude. If the selected waypoint is the FROM waypoint, the title omits the aircraft latitude and longitude, and instead displays the "PPOS" (present position) instead.
[1L] DEPARTURE	This prompt gives access to the DEPARTURE pages, where the crew can select and insert runways, SIDs, and TRANSs.
[2L] OFFSET []	This prompt allows the pilot to enter a left or right lateral offset in the flight plan. The offset can be between 1 and 50 NM. When the pilot enters an offset, the OFFSET field becomes yellow, and the 6L and 6R fields display "ERASE" and "INSERT". The pilot can delete an inserted offset by pressing the CLR pb, by entering a zero for the amount of the offset, or by selecting a DIR TO.
[3L] HOLD or [3L] ALTN	HOLD prompt gives access to the hold pages. ALTN prompt is only available if the revised point is the destination airport. It enables the pilot to access the alternate airport page.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT
CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION

[4L] ENABLE ALTN	The crew presses this key to create a temporary flight plan using the alternate flight plan that is defined, but not inserted. This prompt is not displayed at the ORIGIN and FROM waypoints.
[6L] TMPY F-PLN (yellow) or RETURN (white)	Pressing this key gives access to the temporary flight plan (when created). (No temporary flight plan exists). This prompt gives access to the last displayed page.
[1R] ARRIVAL or FIX INFO	ARRIVAL prompt calls up the arrival pages, where APPR, STAR, TRANS and VIA can be selected. FIX INFO prompt gives access to the FIX INFO pages. This prompt is only displayed on the lateral revision at the origin (before take off) or FROM (after take off), and at waypoints of the primary flight plan (except destination).
[2R] LL XING/INCR/NO (blue)	This field allows the crew to create latitude/longitude crossing points. The increment (INCR) ranges from 1 to 20 °, and the number of crossing points (from 1 to 99). This field is in yellow when a temporary flight plan exists and is not displayed for waypoints belonging to the descent procedure.
[3R] NEXT WPT (blue)	The crew presses this key to enter the content of the scratchpad as next waypoint. This prompt is not displayed at the FROM (or PPOS) waypoint. This field is in yellow when a temporary flight plan exists.
[4R] NEW DEST (blue)	The system displays this prompt for the flight crew to enter a new destination. It is not displayed at the FROM (or PPOS) waypoint, at waypoints beyond the destination, or at destination. When the missed approach becomes active, the prompt is available at any point of the missed approach. This field is in yellow when a temporary flight plan exists.
[5R] AIRWAYS	The crew presses this key to insert an airway starting at the revised waypoint and another waypoint. This prompt is not displayed at the FROM waypoint, origin or destination, and on manually-created waypoints.
[6R] TMPY INSERT*	Activates the temporary flight plan.

Ident.: DSC-22_20-20-10-28-B-00000830.0002001 / 14 MAY 12

TEMPORARY REVISION

When the pilot selects a lateral or vertical revision, the system creates a "Temporary F-PLN" and displays it in yellow on the MCDU (except Missed approach and Alternate parts that are displayed in blue) and as a dashed yellow line on the ND to enable the pilot to review the data before

inserting. As long as the temporary flight plan is not inserted, the previous flight plan remains active and the system guides the aircraft along. The pilot can perform multiple revisions in the same temporary flight plan.

The temporary flight plan does not display destination information on 6L, but displays fields to erase or insert the temporary revision:

- UNDO/THEN ERASE: Cancels the last revision in the temporary flight plan.
- TMPY INSERT: Activates the entire temporary flight plan with all the revisions included.
- TMPY ERASE: Deletes the entire temporary flight plan.

Diagram illustrating the MCDU display for the temporary flight plan (TMPY) page. The display shows the current flight plan (LFB033R) and the temporary flight plan (TMPY) with various parameters (TIME, SPD/ALT, C 3 2 6 °, B R G 3 5 5 °, 6 N M). The display is controlled by a 6-line keypad on the left and a 6-line keypad on the right. A 'PRESS' arrow points to the 6L key.

Typical temporary F-PLN A page after several revisions

Note: The destination information is still available by scrolling up to the end of the flight plan or by using the AIRPORT key.

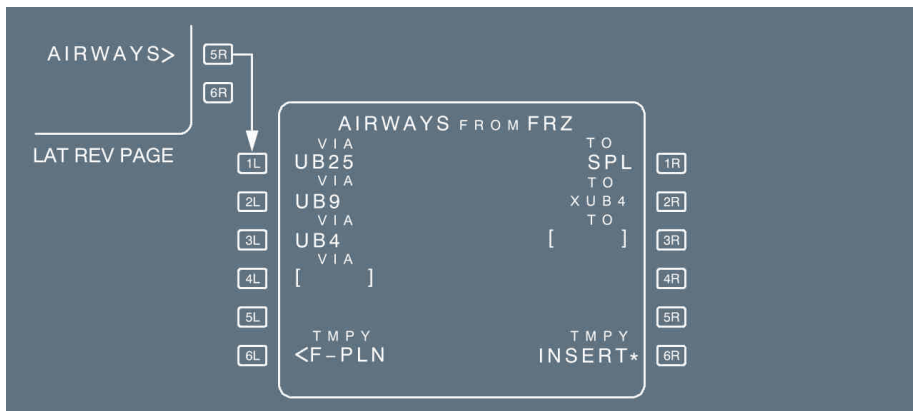
AIRWAYS PAGE

Ident.: DSC-22_20-20-10-28-00000831.0021001 / 14 MAY 12

Applicable to: MSN 02926-02944, 04392, 07784-07792

The flight crew can use the AIRWAYS page to select up to five airways, and string them into the flight plan, after the revised waypoint.

The crew calls up this page, by pressing the AIRWAYS key (5R) on the LAT REV page.



AIRWAYS FROM FRZ

VIA	TO
UB25	SPL
UB9	TO
UB4	XUB4
[]	TO
[]	[]
TMPY <F-PLN	TMPY INSERT*

TITLE	"AIRWAYS from XXX", XXX: Revised waypoint ident (large green font).
[1L] to [5L] VIA	Displays the airways entered by the crew.
[6L] TMPY F-PLN or RETURN	The flight crew presses this key to return to the lateral revision page. This field displays "TMPY F-PLN" when a temporary flight plan is created. It enables the temporary flight plan to be consulted.
[1R] to [5R] TO	Displays the end point of the corresponding airways entered on the [1L] to [5L] entries. The ending point is displayed in large blue font, if manually-entered, in small blue font, if computed by the FMGC.
[6R] TMPY INSERT*	Activates the temporary flight plan.

- Note:**
- If the entered airway contains at least one fixed radius transition waypoint as defined in the navigation database, and the TO waypoint is defined, and the fixed radius transition waypoint is in the flight plan, then, "FIXED TURN RADIUS AWAY" is displayed between the VIA and TO fields.
 - If the condition for display "FIXED TURN RADIUS AWAY" is satisfied for two consecutive airways lines, the second line displays "(" instead of the whole message.

DEPARTURE PAGES

Ident.: DSC-22_20-20-10-28-00000832.0004001 / 01 OCT 12

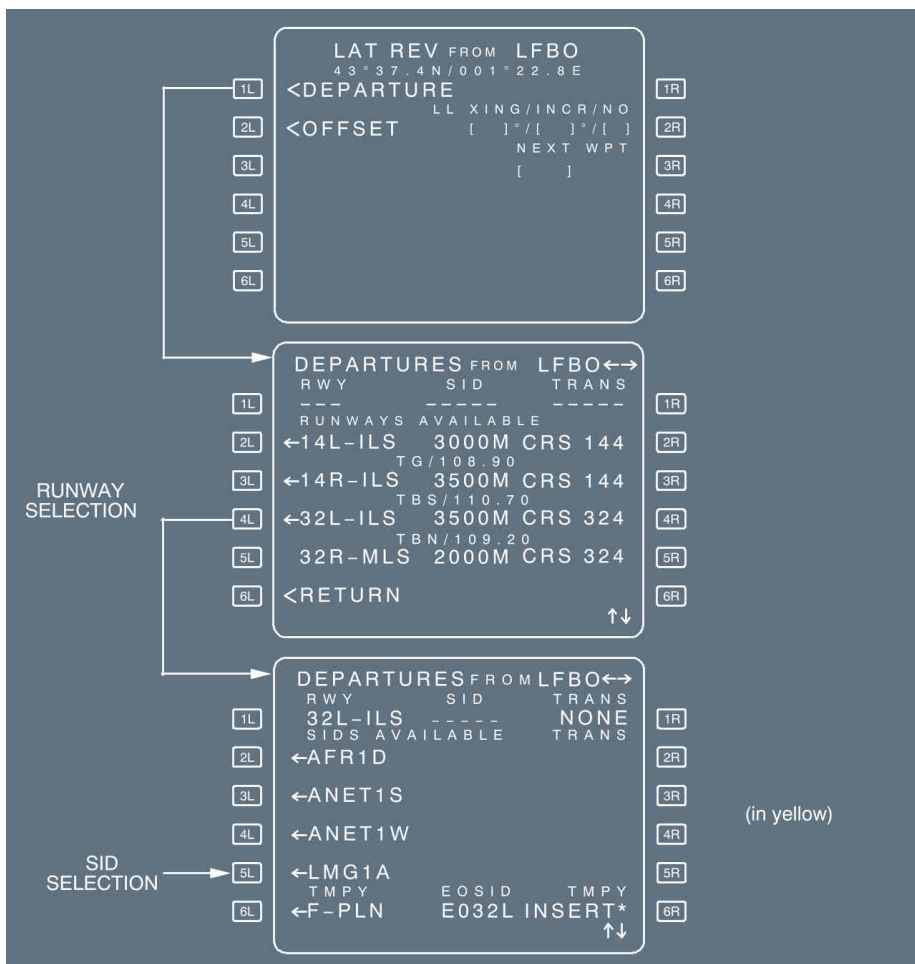
Applicable to: MSN 02926-02944, 04392, 07784-07792

The flight crew can use the DEPARTURE pages to review departure procedures (RWY, SID, TRANS), and enter them into the temporary flight plan.

When the display shows the lateral revision page for the origin, the flight crew calls it up by pressing the 1L key.

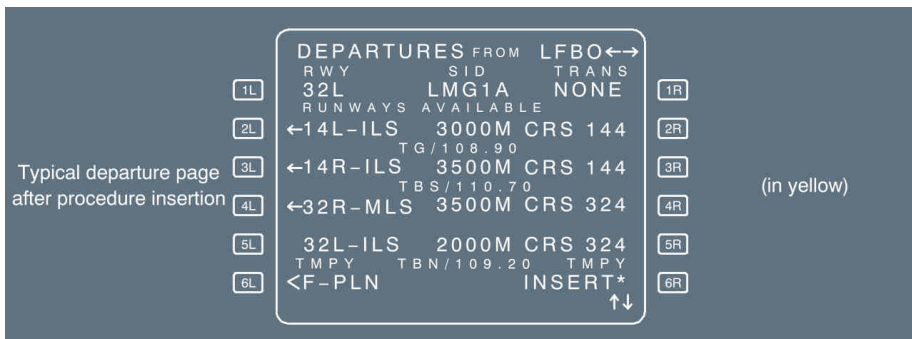
The RWY, and, SIDS/enroute TRANS (if any) pages are available.

The flight crew sequentially calls up the SIDs and TRANS (if any) pages by selecting a runway on the RWY page. The flight crew can also scroll between the RWY, SIDs and TRANS (if any) pages by pressing the "←" or "→" key on the MCDU console.



AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION



Line 1 RWY, SID TRANS

This line displays the RWY, SID, and TRANS in green after they have been inserted into the active flight plan, or in yellow if a temporary is created or updated. If nothing has been selected or inserted, the line displays dashes. "NONE" is displayed in the SID or TRANS field, if no SID or TRANS exists, or NO SID or NO TRANS was selected by the crew.

[2L] to [5L] RWY/SIDs

These fields display selectable and selected RWYs or SIDs. The pilot can scroll each list. Selectable RWYs and SIDs are displayed in blue with an arrow. Once a RWY or SID is selected, the arrow disappears. A RWY or SID, already inserted in the flight plan, is displayed in green. When a runway is selected, a temporary is created or modified, and the DEPARTURE page 2 for SID selection is automatically displayed. The display shows the length, course and, if available, the MLS ident and frequency for each runway.

[6L] TMPY F-PLN or RETURN

The pilot presses this key to return to the temporary flight plan page, if a temporary exists. The display shows RETURN, instead TMPY F-PLN, when the pilot has not created a temporary flight plan. Pressing this key reverts to the LAT REV page.

[2R] to [5R] TRANS

This field displays the selectable and selected enroute transitions in blue and green respectively. They are blank, if there are no transitions. When a TRANS is selected, a temporary is created or updated (if one already exists).

[6M] EOSID

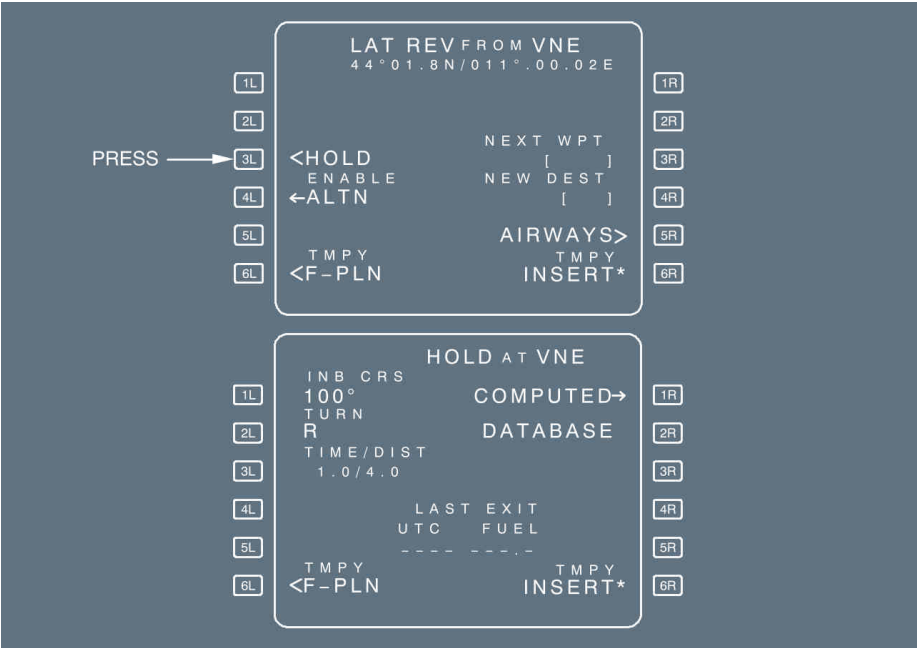
Once a runway is inserted into the flight plan, this field displays any ENG OUT SID for that runway. If a temporary is created or updated, the EOSID is displayed in yellow. Otherwise, it is displayed in green. If there is none, it displays "NONE".

[6R] TMPY INSERT* Activates the temporary flight plan.

HOLD PAGES

Ident.: DSC-22_20-20-10-28-00000833.0021001 / 14 MAY 12
Applicable to: MSN 02926-02944, 04392, 07784-07792

These pages allow the pilot to review and modify the holding pattern parameters at the selected revise waypoint
The pilot calls up these pages by pressing the HOLD key on the LAT REV page for the waypoint.
The flight crew can insert database holds, hold computed by the FMS, or manually defined holds.



The page title is displayed in white, if no temporary flight plan exists, or in yellow if a temporary flight plan is in progress. Hold parameters are displayed in blue if no Temporary exists, or in yellow if a temporary flight plan is in progress.

At first access, the HOLD page is displayed as follows:

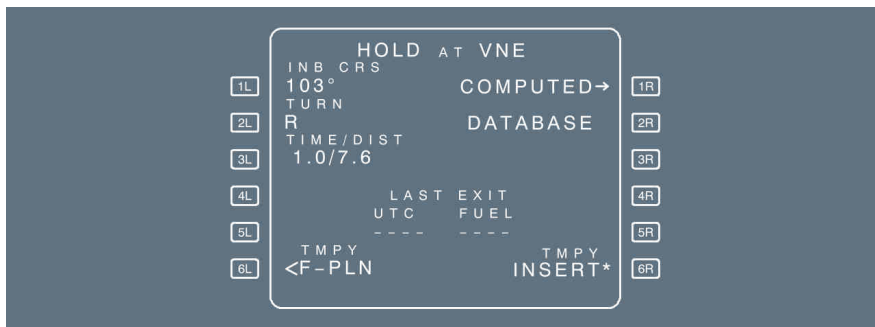
- If a database hold is available at that waypoint, [1L], [2L] and [3L] display in yellow the parameters of the FMS database hold.
 In [2R], DATABASE is displayed in yellow. If any hold parameter is modified, DATABASE is displayed in white with a white arrow.
- In [1R], COMPUTED is displayed in white with a white arrow.
- If no database hold is available at that waypoint, [1L], [2L] and [3L] display in yellow the parameters of the FMS computed hold
 In [1R], COMPUTED is displayed in yellow. If any hold parameter is modified, COMPUTED is displayed in white with a white arrow.

When the HOLD has been inserted, [1L], [2L] and [3L] display in blue the parameters of the already-existing hold.

- If the already-existing hold is a computed hold, COMPUTED is displayed in blue in [1R].
- If the already-existing hold is a database hold, DATABASE is displayed in blue in [2R].
- If the already-existing hold is neither a computed hold nor a database hold, both COMPUTED and DATABASE are displayed in white with a white arrow.

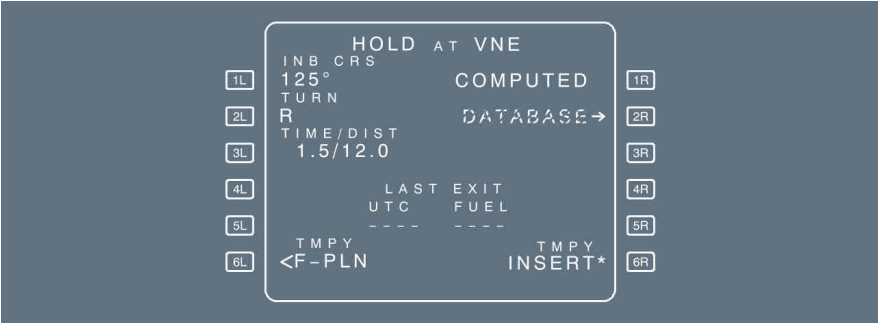
● Database Hold

If a hold is defined in the navigation database for the revised waypoint and can be inserted then the corresponding TMPY F-PLN is automatically created by the FMS and DATABASE is displayed in yellow.



● Computed Hold

If a default hold is computed by the FMS and can be inserted then the corresponding TMPY F-PLN is automatically created by the FMS and COMPUTED is displayed in yellow.

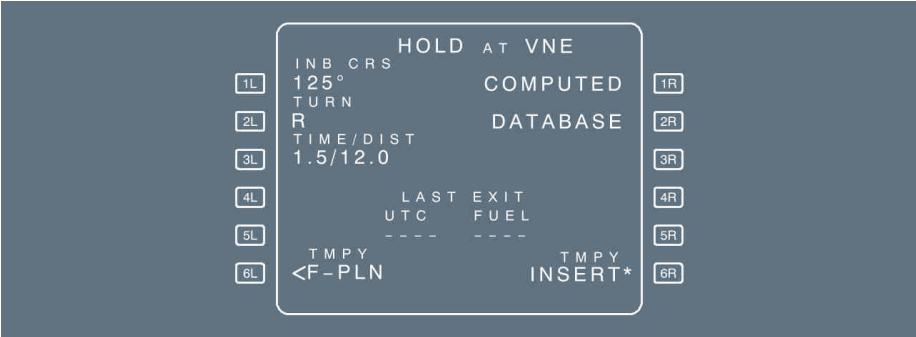


A computer hold has the following default parameters:

INB CRS = INBD TRK of the F-PLN leg leading to the revised waypoint.

TURN = Turn direction right.

TIME on outbound leg is 1.5 min above 14 000 ft, 1 min below 14 000 ft.



- [1L] INB CRS

This field displays the inbound course of the holding pattern. The data may be manually or automatically modified (via COMPUTED or DATABASE prompts).
- [2L] TURN

This field shows the direction to turn in the hold (L or R). The data may be modified.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION

[3L] TIME/DIST	This field shows the time and distance for the outbound leg. The data may be modified, but time and distance cannot be entered simultaneously. Time and distance are dependent values that the system calculates from the predicted ground speed at the revised point, which in turn depends upon the holding speed (speed for maximum endurance, ICAO speed limit, or constraint speed, whichever is lower).
[6L] TMPY F-PLN or RETURN	This prompt gives access to the temporary flight plan page if one is in progress. If not, "RETURN" is displayed and allows a return to the LAT REV page.
[1R] COMPUTED (→)	Pressing this key reverts parameters to the system-computed parameters (1L, 2L, 3L).
[2R] DATABASE (→)	Pressing this key reverts the displayed parameters to the parameters memorized in the database for this waypoint.
LAST EXIT UTC FUEL	This field displays the time at which the aircraft must leave the holding pattern in order to meet fuel policy criteria (extra fuel = 0). The system also displays the estimated fuel on board at that time in thousands of kg or lb. The 1R and 2R fields, as well as the hold parameters (1L, 2L, 3L), are blue when no temporary flight plan exists, and yellow when a temporary flight plan is in progress.
[6R] TMPY INSERT*	Activates the temporary flight plan.

DIRECT TO PAGE

Ident.: DSC-22_20-20-10-28-00000834.0004001 / 01 OCT 12

Applicable to: MSN 02926-02944, 04392, 07784-07792

Pressing the "DIR" key from the MCDU screen calls up the DIR TO page. The pilot presses it to modify the flight plan, by creating a direct leg from the aircraft's present position to any selected waypoint. The pilot cannot call up this page when the aircraft's present position is invalid. The "A/C POSITION INVALID" message is then displayed.

These are four DIRECT TO/INTERCEPT functions: DIRECT TO, ABEAM PTS, RADIAL IN, RADIAL OUT.

Using the DIRECT TO function results in the creation of a DIR TO temporary flight plan. This DIR TO temporary flight plan only reflects the insertion of the direct leg in the active flight plan. Moreover, a DIR TO temporary flight plan and a multi-revision flight plan cannot exist at the same time.

Direct-TO/Intercept page
(after initial selection)

1L

2L

3L

4L

5L

6L

WAYPOINT
 []
 F-PLN WPTS
 ←TOP
 ←GEN
 ←BEROK
 ←FRZ
 150

DIR TO
 UTC
 DIST

 DIRECT TO
 WITH
 ABEAM PTS
 RADIAL IN
 []°
 RADIAL OUT
 []°
 150
 ↑↓

1R
 2R
 3R
 4R
 5R
 6R

Direct-TO/Intercept page
(after entry of a radial
in value)

1L

2L

3L

4L

5L

6L

WAYPOINT
 BEROK
 F-PLN WPTS
 ←TOP
 ←GEN
 BEROK
 ←FRZ
 DIR TO
 ←ERASE

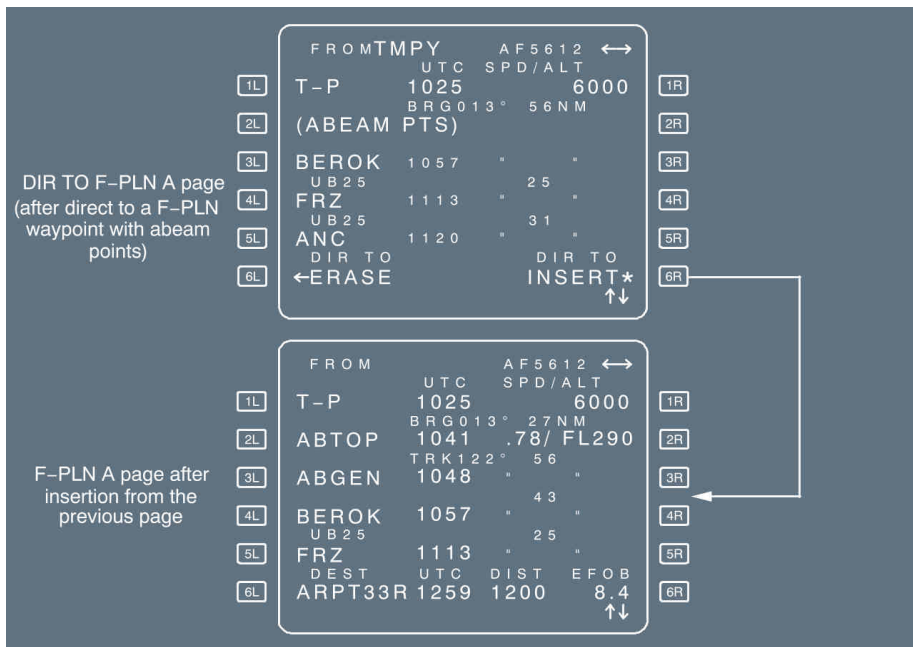
DIR TO
 UTC
 DIST
 1055
 20
 DIRECT TO→
 WITH
 ABEAM PTS→
 RADIAL IN
 150°
 RADIAL OUT
 []°
 DIR TO
 INSERT*
 ↑↓

1R
 2R
 3R
 4R
 5R
 6R

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION



[1L] WAYPOINT

This field gives access to the 'Direct TO' fix waypoint to be selected from a list of waypoints. The 'Direct TO' waypoint may be entered by using its identifier, place/bearing/distance, place-bearing/ place-bearing or latitude/longitude.

[2L] to [5L] F-PLN WPTS

This list provides the waypoints of the active flight plan, except waypoints from the missed approach, pseudo-waypoints F-PLN markers, non fixed waypoints.

The display may be scrolled ↑ ↓

[6L] DIR TO ERASE

Pressing this key deletes the DIR TO temporary F-PLN.

[1R] UTC/DIST

As soon as the DIR TO temporary F-PLN is created, the time and distance to the 'Direct TO' fix waypoint is displayed in yellow.

[2R] DIRECT TO

Selecting this key activates the DIRECT TO function in the DIR TO temporary F-PLN.

[3R] ABEAM PTS

Selecting this key activates the ABEAM PTS function in the DIR TO temporary F-PLN.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION

[4R] RADIAL IN and [5R]
RADIAL OUT

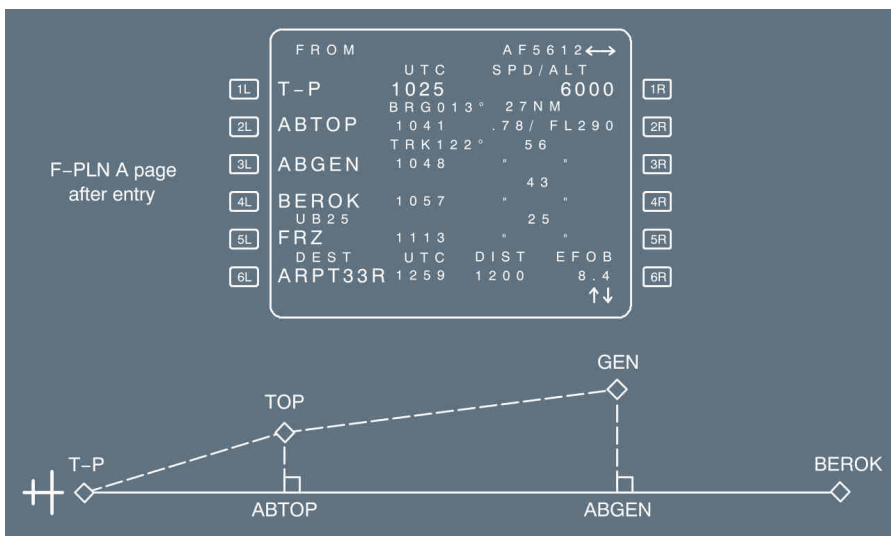
The pilot fills in these fields to define a radial associated to the waypoint. Selecting a radial in (out) will activate the intercept radial into (from) the specified waypoint in the DIR TO temporary F-PLN. The pilot enters the radial in, or radial out, as XXX, XXX being the radial. An M or T may also be entered, referring to a MAG or a True value.

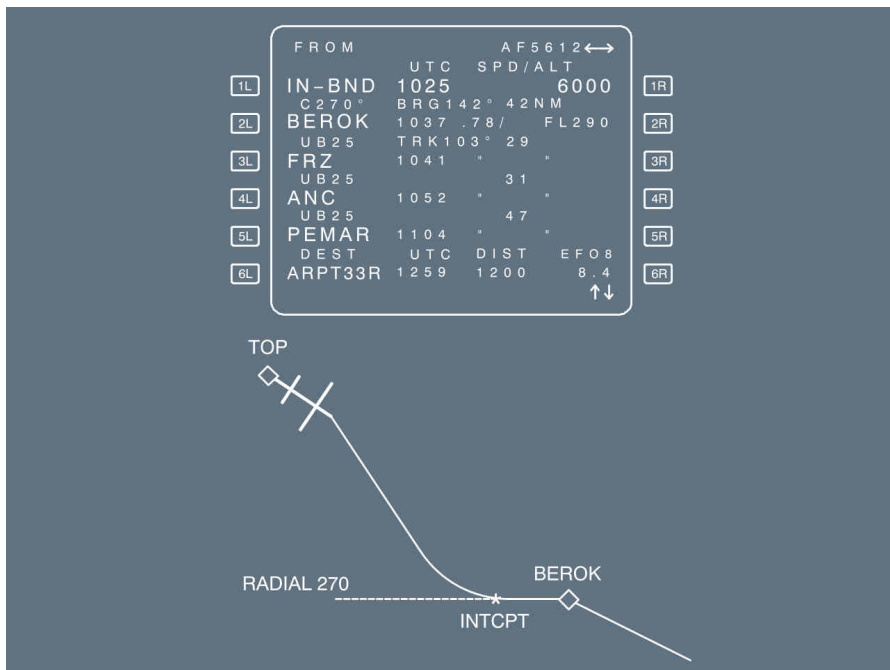
A default radial in is proposed by the FMS if the DIR TO waypoint is part of the F-PLN.

[6R] DIR TO INSERT

Pressing this key enables the DIR TO temporary F-PLN to be inserted. After insertion, the F-PLN A page is displayed.

EXAMPLE 1: DIR TO BEROK - ABEAM



EXAMPLE 2: RADIAL INBND - DIR TO BEROK - RADIAL 270° INBOUND


If the DIR TO/INTCPT WPT entry is to a waypoint already in the flight plan, a default RADIAL IN is displayed in small font. However, no radial is displayed on the ND for this default radial. No default radial is provided for the RADIAL OUT field.

Selecting the INTCPT TO (RADIAL IN [1R]) function:

- Activates the intercept radial IN TO the WPT in the temporary F-PLN.
- Sets the course = radial IN + 180°.

Selecting the INTCPT FROM (RADIAL OUT [2R]) function:

- Activates the intercept radial OUT from the WPT.
- Sets the course = radial OUT.

For details: *Refer to DSC-22_20-10-30-13 DIR Key (DIRECT-TO-FUNCTION) - General.*

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
--	---

ARRIVAL PAGES

Ident.: DSC-22_20-20-10-28-00000835.0025001 / 17 MAY 21
Applicable to: MSN 02926-02944, 04392, 07784-07792

These pages enable the pilot to select a runway with its associated final, and to review arrival procedures (approaches, VIAs, STARs, TRANS) and enter them into the active flight plan. The pilot calls them up from the LAT REV page for the destination. Three lists APPR, STAR, and TRANS are available, along with a fourth, APPROACH VIAS if there are any transitions. The pilot sequentially calls up each page, either by selecting a data item (such as APPR) or by pressing the "→" or "←" keys on the MCDU console. When an approach is selected, it is inserted in a temporary flight plan and the ARRIVAL page 2 or APPROACH VIA page is automatically displayed.

Line [1L]-[1R] [2R]	This line displays the APPR, VIA, STAR, and TRANS in green, if they have been inserted in the flight plan, and in yellow, as a temporary flight plan, if they have been selected but not yet inserted. It displays dashes or "NONE", if nothing has been selected or inserted.
[2L] APPR VIAS	The pilot presses this key to call up transitions from the last point of the STAR to the first point of the approach.
[3L] to [5L]	These fields list selectable and selected APPRs, STARs, and VIAs. The flight crew can scroll the pages, when necessary. Selectable APPRs, STARs, and VIAs are displayed in blue with an arrow. Once the pilot has selected an APPR, STAR, or VIA, a temporary F-PLN is created. After the APPR, STAR, or VIA is inserted into the flight plan, it is displayed in green. For each approach, the display shows runway length, heading, and the frequency and identifier of the ILS when ILS is available. In case there are multiple approaches for the same runway, the ILS is identified with the runway plus the multiple indicator (i.e. ILS33L-S)
[6L] TMPY F-PLN or RETURN	TMPY F-PLN is displayed to access the temporary F-PLN page corresponding to the last revision. The field displays "RETURN", instead of TMPY F-PLN, when the flight crew has not created a temporary flight plan.
[3R] to [5R]	These fields either display: - The identifier and the frequency of the NAVAID specified for the approach, or - The enroute transitions compatible with the selected STAR. The active selected TRANS is in green, the remaining TRANS are in blue.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION

	LAT REV FROM LFBO 48°43.5 N / 002°22.9 E ARRIVAL>	
1L		1R
2L		2R
3L		3R
4L		4R
5L		5R
6L		6R

	ARRIVAL TO LFBO ↔ APPR VIA STAR ILS33L ----- TRANS ----- ----- APPR AVAILABLE ←ILS14L 3500M CRS 144 TBS / 110.70 ILS32L-A 3500M CRS 324 TBN / 109.30 ←RNV14L 3000M CRS 144 <RETURN	
1L		1R
2L		2R
3L		3R
4L		4R
5L		5R
6L		6R

	ARRIVAL TO LFBO ↔ APPR VIA STAR ILS32L ----- TRANS ----- APPR <VIAS STARS AVAILABLE ←TB01B ←TOENB ←TW32L <RETURN ↑↓	
1L		1R
2L		2R
3L		3R
4L		4R
5L		5R
6L		6R

 APPROACH
SELECTION

 APPROACH STAR
SELECTION

APPROACH VIAS SELECTION	[1L]	APPROACH VIAS	[1R]
	[2L]	APPR VIA STAR ILS32L ----- TOENB	[2R]
	[3L]	APP VIAS ←TOE	[3R]
	[4L]	←TOE-L	[4R]
	[5L]	←TOE-R	[5R]
	[6L]	←NO VIA	[6R]
RETURN TO ARRIVAL PAGE →	[6L]	<RETURN	
↑↓			
APPR, STAR, VIA	[1L]	ARRIVAL TO LFBO ↔	[1R]
	[2L]	APPR VIA STAR ILS32L TOE-L TOENB	[2R]
	[3L]	APPR TRANS <VIAS NONE	[3R]
	[4L]	STARS AVAILABLE TRANS ←TB01B GAI13→	[4R]
	[5L]	TOENB GAI18→	[5R]
	[6L]	←TW32L NO TRANS	[6R]
TMPY TMPY INSERT* ↑↓			
TMPY APPR, STAR, VIA, TRANS	[1L]	ARRIVAL TO LFBO ↔	[1R]
	[2L]	APPR VIA STAR ILS32L TOE-L TOENB	[2R]
	[3L]	APPR TRANS <VIAS GAI13	[3R]
	[4L]	STARS AVAILABLE TRANS ←TB01B GAI13	[4R]
	[5L]	TOENB GAI18→	[5R]
	[6L]	←TW32L NO TRANS	[6R]
TMPY TMPY INSERT* ↑↓			

ALTERNATE PAGE

Ident.: DSC-22_20-20-10-28-00000836.0002001 / 03 NOV 21

Applicable to: MSN 02926-02944, 04392, 07784-07792

This page enables the flight crew to review, in the NAV database, the alternate airports that are paired with the destination, and define additional alternates, if needed. The flight crew calls up this page with the ALTN prompt, from the lateral revision page for the destination.

5L

<ALTN

6L

<RETURN

LAT REV PAGE FOR DESTINATION (LGAT)

1L

ALTERNATES FOR LGAT

ALTN

NONE

TRK

EXTRA

DIST

2L

OTHER ALTN

3L

[]

EXTRA

4L

NO ALTN

2.5

5L

<RETURN

1R

2R

3R

4R

5R

6R

1L

ALTERNATES FOR LGAT

ALTN

LGTS

TRK

EXTRA

DIST

2L

<LGAB

120°

0.5

260

3L

<LGCD

0.75°

0.5

229

4L

[]

EXTRA

5L

<NO ALTN

2.5

6L

<FPLN

TMPY

INSERT*

↓

1R

2R

3R

4R

5R

6R

TITLE	The destination airport is displayed in large green font.
[1L] ALTN	This field displays the selected alternate: In green, if it is active; in yellow, if it is temporary. "NONE" is displayed, if NO ALTN option is selected, or if the destination has no alternate.
Line 2 to line 5	These lines display the identifications of alternates (up to 6), the extra fuel weight remaining after landing at the alternates, and the great-circle track and distances to them from the destination. If the database contains a company route between the destination and the alternate, the distance shown is an airway distance, not a great-circle distance. When the database defines a preferred alternate, it is displayed on Line 2 (if no scrolling has been performed).

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
--	---

[4L] OTHER ALTN

The flight crew can enter an airport identifier in the brackets (Line 3). If that airport is not stored in the database, the NEW RUNWAY page appears for the flight crew to use in defining it. If it is stored in the database, the ROUTE SELECTION page appears, and the flight crew can use it to select the best route. The flight crew may enter a distance in the DIST field of the OTHER ALTN prompt, in order to get preliminary fuel predictions. However, once the flight crew has selected the alternate airfield as a temporary alternate and then inserted it, the ALTN distance either reverts to the airway distance, if the flight crew has selected a company route, or to the direct distance to the alternate. The flight crew can use OTHER ALTN to overwrite and replace the previous OTHER ALTN.

NO ALTN

The flight crew uses this key to select the NO ALTN option.

[6L] RETURN or THPY
F-PLN

The flight crew presses this key to revert the display to the LAT REV page. Pressing this key gives access to the TMPY F-PLN page corresponding to the last revised item.

[1R] CO RTE

Pressing this key displays the active company route between the destination and the selected alternate.

[6R] TMPY INSERT*

Activates the temporary flight plan.

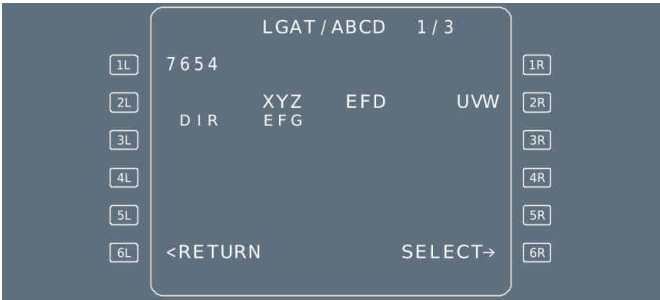
ROUTE SELECTION PAGE FOR ALTERNATE

Ident.: DSC-22_20-20-10-28-00000837.0002001 / 05 JUN 18

Applicable to: MSN 02926-02944, 04392, 07784-07792

This page enables the pilot to review the company route between the destination and the alternate, and to select a different route, if that seems appropriate.

This page comes up automatically, when the flight crew enters an ident in the OTHER ALTN field and if a route is stored in the Navigation database for this ALTN.



[6R] SELECT

Pressing this key reverts the display to the alternate page. (The distance between the destination and the alternate is then the airway distance).

VERTICAL REVISION PAGES

Ident.: DSC-22_20-20-10-28-00000838.0004001 / 16 MAR 11
 Applicable to: MSN 02926-02944, 04392, 07784-07792

These pages contain the menu of available vertical flight plan revisions that can be applied at a selected waypoint.
 The crew calls up these pages from the flight plan A or B pages by pressing the right-hand key next to the selected revised waypoint.
 The crew may make several different vertical revisions although some may not be available at all waypoints.

1L 2L 3L 4L 5L 6L 1R 2R 3R 4R 5R 6R	1L 2L 3L 4L 5L 6L 1R 2R 3R 4R 5R 6R
VERT REV AT LFB015R EFOB=13.2 EXTRA=2.3 CLB SPD LIM 250/FL100 RTA> <CONSTANT MACH <WIND DATA STEP ALTS> <RETURN	VERT REV AT MIP EFOB=12.4 EXTRA=0.8 CLB SPD LIM 250/10000 RTA> SPD CSTR ALT CSTR [] [] * <CONSTANT MACH <WIND DATA STEP ALTS> <RETURN
VERT REV AT ORIGIN	
1L 2L 3L 4L 5L 6L 1R 2R 3R 4R 5R 6R	1L 2L 3L 4L 5L 6L 1R 2R 3R 4R 5R 6R
VERT REV AT SBJ EFOB=14.5 EXTRA=0.8 CLB SPD LIM 210/ 7000 RTA> SPD CSTR ALT CSTR [] 5000 <CONSTANT MACH ALT ERROR <WIND DATA STEP ALTS> TMPY TMPY <F-PLN INSERT*	VERT REV AT KLGA EFOB=14.5 EXTRA=0.8 DES SPD LIM 250/10000 RTA> G/S INTCP 2000 <CONSTANT MACH <WIND DATA STEP ALTS> <RETURN
VERT REV AT WPT IN CLIMB. (ALT CSTR ENTERED AND PREDICTED MISSED)	
1L 2L 3L 4L 5L 6L 1R 2R 3R 4R 5R 6R	1L 2L 3L 4L 5L 6L 1R 2R 3R 4R 5R 6R
VERT REV AT CXR EFOB=--- EXTRA=--- CLB SPD LIM 250/10000 RTA> SPD CSTR ALT CSTR *[] -FL310 <CONSTANT MACH <WIND DATA STEP ALTS> <RETURN OR DES→	VERT REV AT DEST
VERT REV AT WPT (PREDICTIONS NOT AVAILABLE)	

TITLE (white)

“VERT REV AT [location]”

The second line shows the remaining fuel and the extra fuel at the waypoint being revised.

[1L] “TOO STEEP PATH
BEYOND” (amber)

Is displayed, if the waypoint is part of a leg with a descent path too steep.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT
CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION

[2L] CLB/DES SPD LIM (magenta)	Displays the speed limit applicable to the climb or descent phase. It is in large font when entered manually, and in small font when it comes from the database.
[3L] SPD CSTR (magenta)	This field displays any speed constraint assigned to the revised waypoint. It is in large font when entered manually, and in small font when it comes from the database. It is in yellow when a temporary flight plan exists.
[4L] CONSTANT MACH	This prompt provides access to the CONSTANT MACH page.
[5L] WIND DATA (white)	This prompt is only displayed for climb, cruise and descent waypoints, respectively giving access to the CLIMB, CRUISE and DESCENT WIND pages for wind data at the revised point.
[6L] RETURN or TMPY F-PLN or ← CLB	The pilot presses this key to return to the last displayed flight plan page. When a temporary flight plan exists, the TMPY F-PLN prompt appears and provides access to this page. When "← CLB" displayed, pressing this key assigns the constraint to CLB phase and inserts it into the vertical flight plan.
[2R] RTA	This prompt provides access to the Required Time Arrival (RTA) page. It is not displayed when the VERT REV page is accessed from the alternate F-PLN.
[3R] ALT CSTR (magenta)	This field displays the altitude constraint assigned to this revised waypoint. It is in large font when the constraint is manually-entered, and in small font when it comes from the database. A CLR action reverts it to brackets. The constraint may be: • "At", entered as XXXXX (Example: FL 180). • "At or above", entered as + XXXXX or XXXXX + (Example: FL +310). • "At or below", entered as – XXXXX or XXXXX – (Example: -5 000). • A "window" constraint. The altitude window consists of two altitudes within which the aircraft should fly. The crew cannot manually enter a "window" constraint. It is in yellow when a temporary flight plan exists.
G/S INTCP (green)	This field displays the glide intercept altitude for an ILS approach on the vertical revision page at destination. It cannot be modified by the pilot.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
--	---

- [4R] ALT ERROR (green) When the aircraft misses a predicted altitude constraint, this field displays the difference between the altitude constraint and the predicted altitude.
If, for example, “-500” appears in this field in green, the aircraft will reach the waypoint at an altitude 500 ft below the constraint altitude. This only applies to waypoints in the climb and descent phases.
- [5R] STEP ALTS (white) This legend appears for any waypoint, once a cruise altitude has been entered. It is not available in engine-out, descent, approach, and go-around phases.
This gives the pilot access to the STEP ALTS page.
- [6R] DES → When this field displays “DES”, pressing this key assigns the constraints to the descent phase and inserts them into the vertical flight plan. (See note below).
- TMPY INSERT * Activates the temporary flight plan.

Note: *Altitude and speed constraints may apply to the climb, descent, or approach phase, but never to the cruise phase. The 6L/6R fields display “CLB/DES” when the revised waypoint is a cruise phase waypoint, and the FMGS needs to know if the new constraint is to be applied in climb or descent phase. The FMGS will modify the cruise phase accordingly. These 2 prompts also display “CLB/DES” when the predictions are not computed. (Top of climb and top of descent not yet defined).*

STEP ALTS PAGE

Ident.: DSC-22_20-20-10-28-00000839.0004001 / 14 MAY 12
Applicable to: MSN 02926-02944, 04392, 07784-07792

This page enables the pilot to insert up to four geographic step points and one optimal step point into the flight plan. This page also displays the fuel/time savings associated with the optional step. The crew calls it up from the vertical revision page.

1L

2L

3L

4L

5L

6L

STEP ALTS

FROM FL290

ALT / WPT

DIST TIME

[]/[]

OPT STEP:ENTER ALT ONLY

<RETURN

1R

2R

3R

4R

5R

6R

1L

2L

3L

4L

5L

6L

STEP ALTS

FROM FL290

ALT / WPT

DIST TIME

FL330/PD07

167 0844

[]/[]

Δ_{TIME} Δ_{FUEL}

←OPT TO FL330-0003 -1.2

TMPY TMPY

<F-PLN INSERT*

1R

2R

3R

4R

5R

6R

Page filled in with one
step, but not inserted

TITLE

[1L] – [1R] [4L] – [4R]

ALT/WPT (blue)

STEP ALTS followed by the current cruise altitude.

The waypoint identifier, as well as the altitude to step, can be entered in this field. Both are displayed in large font. When an entry is made, a temporary F-PLN is created.

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
--	---

DIST/TIME (UTC) (small green font)

Displays the distance to go, and time from the present aircraft position, along the flight plan to the step point.

Note: The following messages may be displayed in the DIST/TIME field:

- "ABOVE MAX", if the step altitude exceeds the Max altitude.
- "IGNORED", if the end step point is less than 50 NM from the top of descent or if the step climb is located prior to the top of climb or after the top of descent.
- "STEP AHEAD", when the aircraft is within 20 NM of the start step point.
- "NO OPTIMAL STEP" if the FMS is not able to compute an optimal step for the corresponding altitude.
- "NO OPTIMAL" if an inserted optimal step is not optimal any longer.

[5L] OPT STEP: ENTER ONLY ALT (white)

Is displayed to guide the crew for the entry format of an optimal step.

(OPT) FROZEN: RTA EXISTS

Is displayed, if a time constraint exists in the flight plan.

(OPT) TO FLXXX

This prompt allows the selection of the optimal step.

NO OPTIMAL STEP

Is displayed when the system cannot determine the optimal point for the corresponding altitude.

[6L] RETURN or TMPY F-PLN

The flight crew presses this key to return to the previous page. Appears when a temporary flight plan exists. It provides access to the temporary flight plan page.

[5R] ΔTIME/ΔFUEL (green)

Time and fuel savings represent the gain from selecting the optimal step: The difference in flight time and fuel consumption between the F-PLN without the optimal step selected and the F-PLN with the optimal step selected. It is displayed, when an optimal step has been computed.

As soon as the optimum step is selected, the time/fuel savings information is no longer displayed.

[6R] TMPY INSERT *

Activates the temporary flight plan.

DATA INDEX PAGES

Applicable to: MSN 02926-02944, 04392, 07784-07792

Ident.: DSC-22_20-20-10-28-C-00000841.0002001 / 01 OCT 12

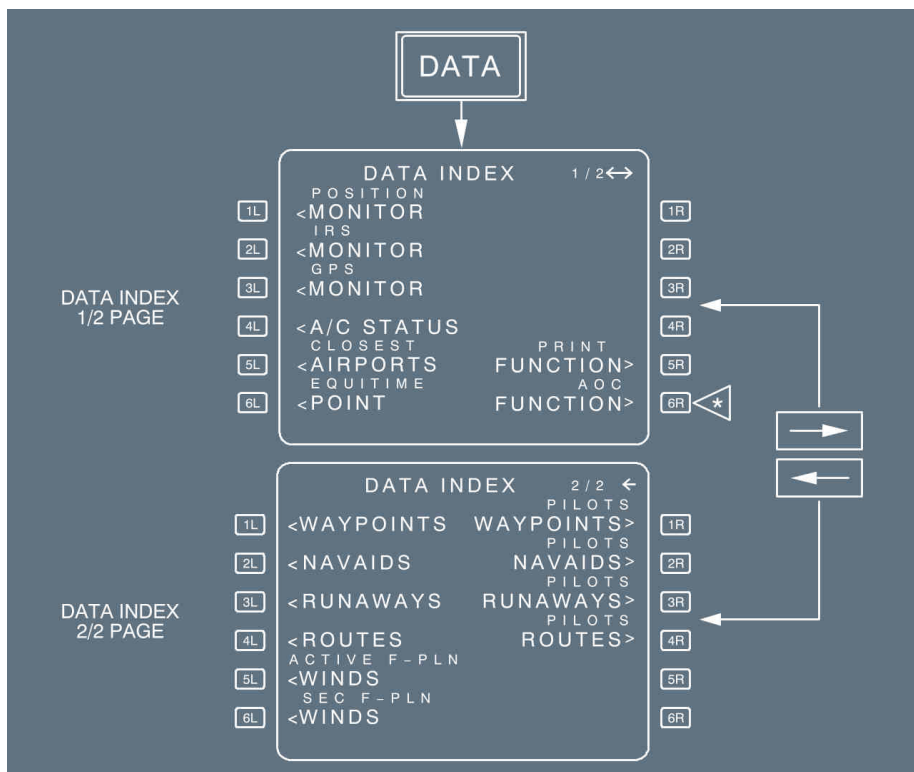
There are two INDEX pages:

The DATA INDEX 1/2 page gives access to various pages assigned to navigation.

The DATA INDEX 2/2 page lists the navigation data, entered in the FMGS.

The crew enters those items labeled “PILOTS” and can modify them. The crew can call up the others, but cannot modify them.

The crew calls up these pages by pressing the DATA key on the MCDU console:



Ident.: DSC-22_20-20-10-28-C-00000842.0002001 / 16 MAR 11

DATA INDEX 1/2 PAGE

- | | |
|--|--|
| [1L] POSITION MONITOR - | When the flight crew presses these keys, the display shows all |
| [2L] IRS MONITOR | essential navigation data. |
| [3L] GPS MONITOR | This key calls up the GPS MONITOR page. |
| [4L] A/C STATUS | This key calls up the aircraft status page. |
| [5L] CLOSEST AIRPORTS. | This key calls up the closest airports page. |
| [6L] EQUI-TIME POINT | This key calls up the equi-time point page. |
| [5R] PRINT  | This key calls up the printer function pages. |
| [6R] AOC  | This key calls up the ACARS function pages. |

Ident.: DSC-22_20-20-10-28-C-00000843.0001001 / 23 JUN 15

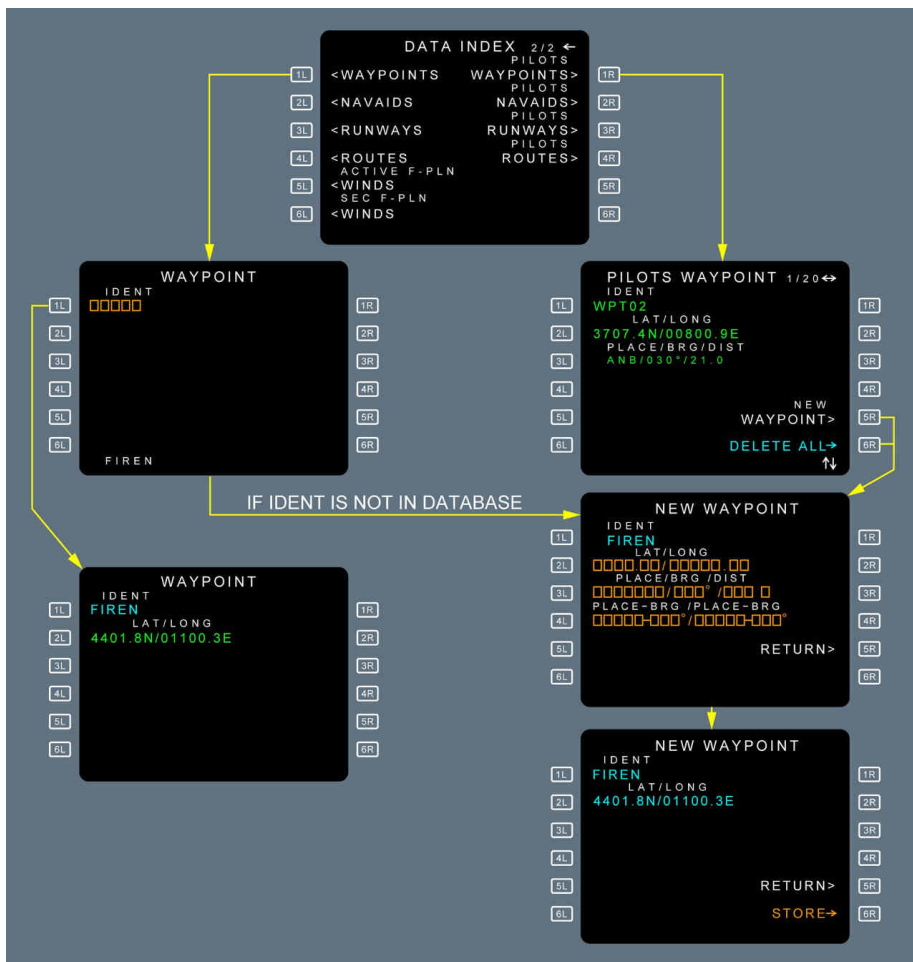
DATA INDEX 2/2 PAGE

- | | |
|---------------------------|--|
| [1L] WAYPOINTS [2L] | These keys call up descriptions of waypoints, NAVAIDs, runways, and routes stored in the database, so that they can be reviewed. |
| NAVAIDs [3L] RUNWAYS | |
| [4L] ROUTES | |
| [5L] ACTIVE F-PLN WINDS | This key calls up the appropriate active F-PLN wind page (CLIMB, CRUISE, or DESCENT). |
| [6L] SEC F-PLN WINDS | This key calls up the appropriate secondary F-PLN page (CLIMB, CRUISE, or DESCENT). |
| [1R] PILOTS WAYPOINTS | These keys call up waypoints, NAVAIDs, runways, and routes that the pilot has stored, enabling the pilot to review and store them in, or delete them from, the database. |
| [2R] PILOTS NAVAIDS | |
| [3R] PILOTS RUNWAYS | |
| [4R] PILOTS ROUTES | |
| | The airline can choose to automatically have all pilot-stored data erased in the done phase. |

WAYPOINT/PILOTS WAYPOINT/NEW WAYPOINT PAGES

Ident.: DSC-22_20-20-10-28-00000844.0002001 / 04 SEP 18

Applicable to: MSN 02926-02944, 04392, 07784-07792



 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
--	---

WAYPOINT PAGE

- The pilot calls up this page by pressing the 1L key on the DATA INDEX page. It displays waypoint information associated with the identifier, which the flight crew inserts in the [1L] field.
- From this page, it is possible to call up any waypoint from the navigation database, or any waypoint not stored in the stored waypoint list, if they belong to the active, temporary, or secondary flight plan.

PILOTS' WAYPOINT PAGE

The pilot calls up this page by pressing the 1R key on the DATA INDEX page. It displays waypoints, defined and stored by the pilot. It lists each stored waypoint, along with a number that shows the relative order in which it was inserted in the database. This number is displayed in the upper right-hand corner of the page. For example, "1/20" indicates that the waypoint was the first of 20 stored.

[1L] IDENT	To delete a waypoint, the pilot clears the 1L IDENT display.
[2L] LAT/LONG	The waypoint latitude and longitude are displayed in this field.
[3L]	This field displays PLACE/BRG/DIST, or PLACE-BRG/ PLACE-BRG, or PLACE/DIST, depending on how the waypoint was defined.
[5R] NEW WAYPOINT	The pilot presses this key to call up the NEW WAYPOINT page.
[6R] DELETE ALL	The pilot presses this key and the label changes to an amber "CONFIRM DELETE ALL". Pressing this key a second time deletes all the waypoints stored by the flight crew, except those currently used in the active or secondary flight plan. ("PILOT ELEMENT RETAINED" appears on the MCDU).

NEW WAYPOINT PAGE

- The pilot displays this page by pressing the 5R key on the PILOTS' WAYPOINT page.
- The flight crew uses this page to define and store waypoints. The maximum number of waypoints that it is possible to enter depends on the FMS standard. The maximum number can be 20 or 99. This number appears in the upper right corner of the STORED WAYPOINT page. For example, "1/20" indicates that it is possible to store up to 20 waypoints. If an additional waypoint is entered, then the first one is deleted.

The flight crew defines a waypoint by entering its IDENT in the data field next to 1L, then by entering its position in the amber boxes.

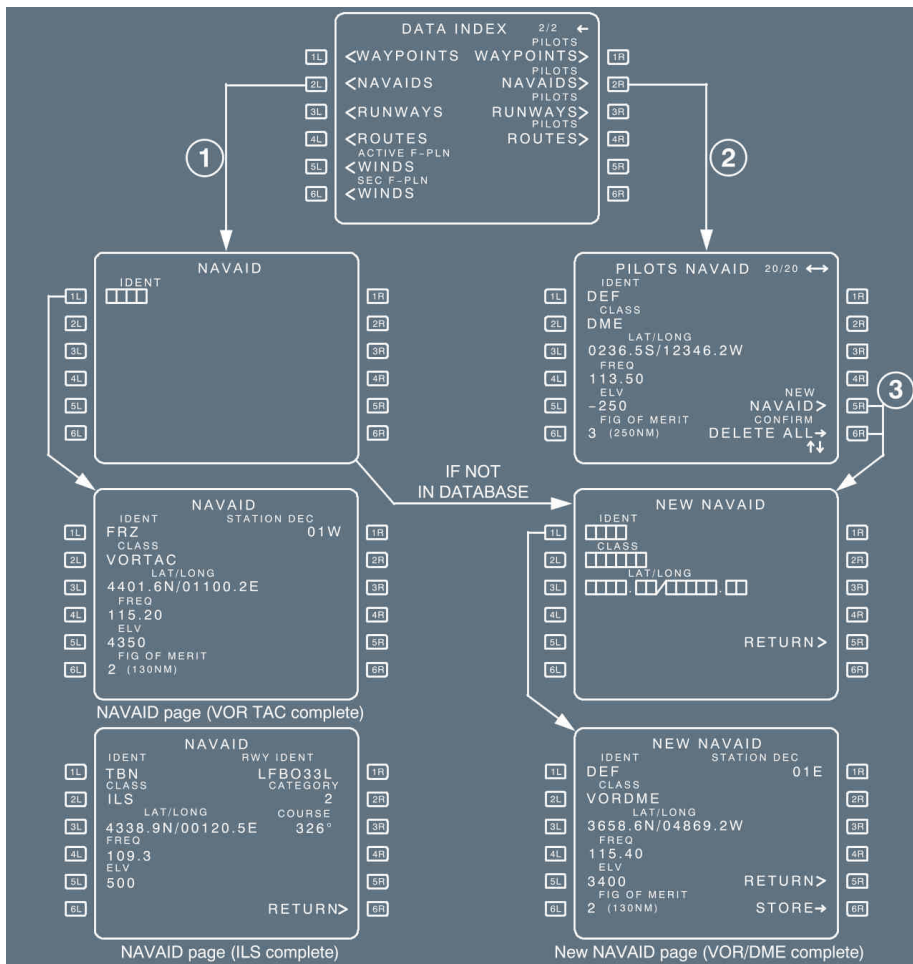
The STORE prompt appears next to 6R when the boxes are filled in, and the pilot presses the key to store the waypoint in the database.

If the pilot enters the waypoint's position as place/bearing/distance, or place-bearing/place-bearing, the FMGC computes its latitude and longitude.

NAVAID/PILOTS' NAVAID/NEW NAVAID PAGES

Ident.: DSC-22_20-20-10-28-00000845.0002001 / 01 OCT 12

Applicable to: MSN 02926-02944, 04392, 07784-07792



NAVAID PAGE

The pilot calls up this page by pressing the 2L key on the DATA INDEX page 2.

This page displays NAVAID information associated with the identifier the pilot inserts in the [1L] field.

NAVAID PAGE (ILS)		NAVAID			
[1L]	IDENT	RWY IDENT	[1R]		
[2L]	TBN	LFBO33L	[2R]		
[3L]	CLASS	CATEGORY	[3R]		
[4L]	ILS	2	[4R]		
[5L]	LAT/LONG	COURSE	[5R]		
[6L]	4338.9N/00120.5E	326°	[6R]		
	FREQ				
	109.3				
	ELV				
	500				
		RETURN>			

NAVAID PAGE (VOR TAC)		NAVAID			
[1L]	IDENT	STATION DEC	[1R]		
[2L]	FRZ	01W	[2R]		
[3L]	CLASS		[3R]		
[4L]	VORTAC		[4R]		
[5L]	LAT/LONG		[5R]		
[6L]	4401.6N/01100.2E		[6R]		
	FREQ				
	115.20				
	ELV				
	4350				
	FIG OF MERIT				
	2 (130NM)				

[2L] CLASS

This field identifies the NAVAID as VOR, DME, VOR DME, VORTAC, NDB, LOC, ILS, MLS, ILS/DME, MLS/DME, ILS/TAC or TACAN. It displays NON COLLOCATED, if the NAVAID is uncollocated.

[3L] LAT/LONG

If an uncollocated VOR DME or VORTAC is displayed, the LAT/LONG is the VOR latitude and longitude. The LAT/LONG displayed for an ILS, ILS DME, ILS TAC is the LAT/LONG of the localizer.

[4L] FREQ or CHAN

CHAN is displayed, if the class of NAVAID is an MLS or an MLS DME.

[5L] ELV

This field gives the NAVAID elevation in feet above sea level. It is not displayed for VOR or NDB.

AIRCRAFT SYSTEMS

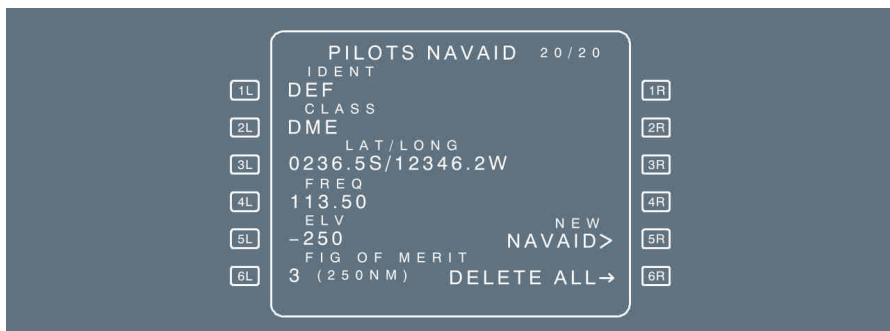
AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION

[6L] FIG OF MERIT	This field shows how far out the FMGS can autotune a VOR, VOR/DME, VORTAC, or DME for display or for computing position. 0 : Up to 40 NM 1 : Up to 70 NM 2 : Up to 130 NM 3 : Up to 250 NM
[1R] STATION DEC or RWY IDENT	This is the magnetic declination in the NAVAID area (used only for VOR, VOR/DME, and VORTAC). The field displays RWY IDENT, if the NAVAID is a LOC, ILS, MLS, ILS/DME, MLS/DME or ILS/TAC.
[2R] CATEGORY	This field shows the NAVAID's category, if it is an ILS, ILS/DME, MLS, MLS/DME or ILS/TAC. A LOC DME has a category = 0.
[3R] COURSE	This is the localizer course, if the NAVAID is an ILS or a LOC, ILS TAC, ILS, MLS or MLS/DME.
[6R] RETURN	This prompt is displayed, if the page is accessed from the SELECTED NAVAID page. The pilot presses this key to return to the SELECTED NAVAID page.

PILOTS' NAVAID PAGE

The pilot calls up this page by pressing the 2R key on the DATA INDEX page. This page is used to display or delete defined and stored navaids.



PILOTS NAVAID
20/20

IDENT

DEF

CLASS

DME

LAT/LONG

0236.5S/12346.2W

FREQ

113.50

ELV

-250

FIG OF MERIT

3 (250 NM)

NEW NAVAID>

DELETE ALL->

A number in the upper right-hand corner of the screen shows the relative order in which the NAVAIDs were stored. (For example, 3/7 means the third of seven stored).

Scroll keys are used to access the different stored NAVAIDs.

[1L] IDENT	The pilot deletes a stored NAVAID by entering its IDENT in this field, then by pressing the CLR key at the bottom of the MCDU control panel.
[2L] - [6L]	Same as the NAVAID page, but data is displayed in green.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
--	--

- [1R] - [4R]

Same as the NAVAID page, but data is displayed in green.
- [5R] NEW NAVAID

This key calls up the NEW NAVAID page to define and store a NAVAID.
- [6R] DELETE ALL and
CONFIRM DELETE ALL

The pilot presses this key to erase all the stored NAVAIDs, except those currently used in the active or secondary flight plan. (The MCDU displays “PILOT ELEMENT RETAINED.”).

NEW NAVAID PAGE

The pilot calls up this page by pressing the 5R key on the STORED NAVAID page.

EMPTY NEW NAVAID PAGE

1L

2L

3L

4L

5L

6L

NEW NAVAID

IDENT

CLASS

LAT/LONG

RETURN>

1R

2R

3R

4R

5R

6R

NEW NAVAID PAGE (VOR/DME)

1L

2L

3L

4L

5L

6L

NEW NAVAID

IDENT

STATION

DEC

DEF

CLASS

VOR/DME

LAT/LONG

FREQ

ELV

3400

FIG OF MERIT

2 (130NM)

RETURN>

STORE→

1R

2R

3R

4R

5R

6R

- It can be used to define and store up to 20 NAVAIDs. Entering an additional waypoint deletes the first one. The NAVAID elements must be entered in two steps:
1. Enter the data in the amber-boxed lines.
 2. Enter frequency, elevation, figure of merit, and station declination or ILS category and course, if applicable.

AIRCRAFT SYSTEMS**AUTO FLIGHT - FLIGHT MANAGEMENT**

CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION

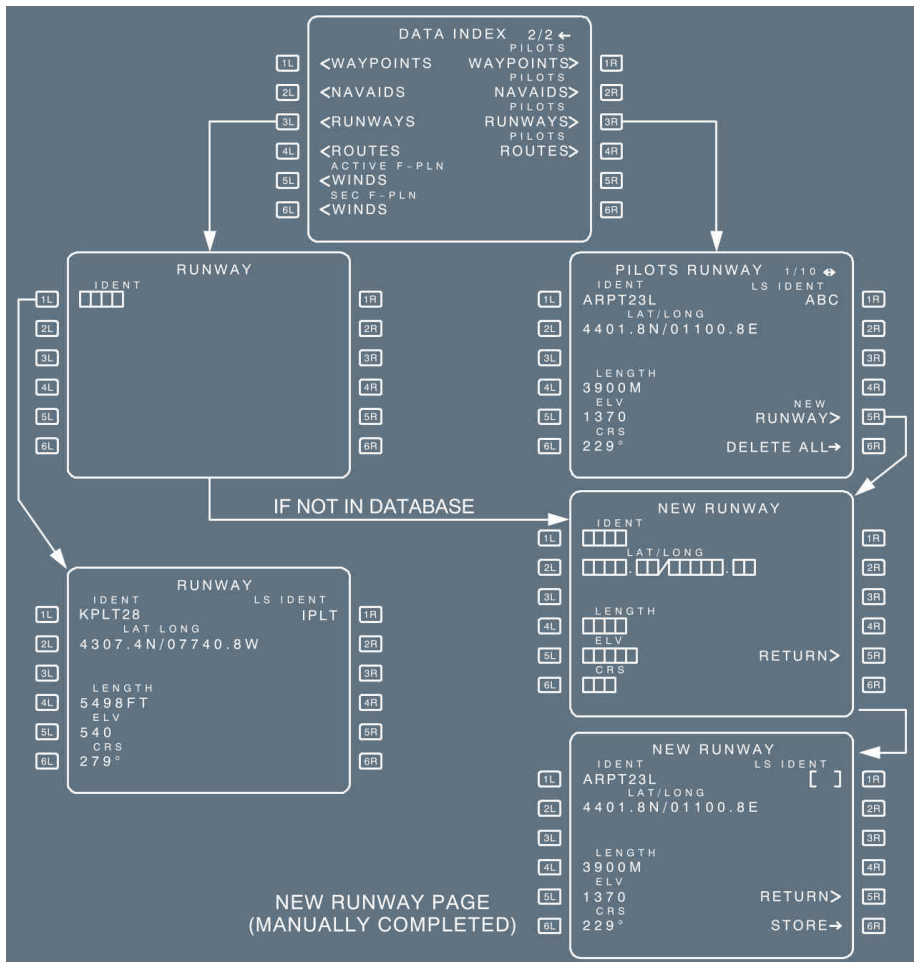
Note: The pilot cannot create an ILS/DME, MLS/DME, or ILS/TAC or an uncollocated NAVAID. If the runway associated with the ILS or MLS has been entered via the new runway page, the course, IDENT, and runway IDENT are already displayed on the new NAVAID page when it comes up (copied from the new runway page). For details: Refer to DSC-22_20-20-10-28 RUNWAYS/PILOTS' RUNWAYS/NEW RUNWAY Pages.

- [1R] STATION DEC The pilot must enter the magnetic declination, if the prompt is displayed. This prompt is only displayed for VOR, VORTAC, or VOR/DME.
- [3R] COURSE If the NAVAID is an ILS, MLS, LOC, enter the course.
- [6R] STORE This prompt appears when all the amber boxes have been filled in.
The pilot presses this key to store the NAVAID.
- A stored NAVAID is never used for position computation.

RUNWAYS/PILOTS' RUNWAYS/NEW RUNWAY PAGES

Ident.: DSC-22_20-20-10-28-00000846.0002001 / 14 MAY 12

Applicable to: MSN 02926-02944, 04392, 07784-07792


RUNWAY PAGE

This page displays the following information :

[1L] IDENT	The runway ident, which comprises the airport identification and the runway direction, uses six or seven digits (Example : CYYZ 24L and LFRJ 08).
[2L] LAT/LONG	The latitude and longitude of the runway threshold.
[4L] LENGTH	The runway length in meters (M) or feet (ft), in four digits (26 300 ft or 8 000 m).
[5L] ELV	The elevation of the threshold in feet above sea level.
[6L] CRS	The runway course (degrees magnetic).
[1R] LS IDENT	The LOC, ILS or MLS identifier.

PILOTS' RUNWAY PAGE

The pilot uses this page to display or delete the defined and stored runways. The stored runways are listed and numbered in the order in which they were inserted. The number is displayed in the upper right-hand corner of the page. (For example, 2/4 means the runway is the second of four stored runways).

The pilot can delete any stored runway from the database by displaying its ident in the 1L field, then by pressing the CLR key on the MCDU control panel.

[6R] DELETE ALL and CONFIRM DELETE ALL The pilot presses this key to erase all the stored runways, except those used in the active or secondary flight plan. (The MCDU displays "PILOT ELEMENT RETAINED").

[1L] to [6L] These fields are similar to the RUNWAY page fields.

NEW RUNWAY PAGE

The pilot can use this page to define and store up to 10 runways.

When the pilot enters an ILS/LOC ident in the [1R] field, the new navaid page comes up. When the pilot has entered and stored the necessary data in the new navaid page, the new runway page reappears.

The new runway page and the new navaid page (ILS/LOC) are not independent :

- When the flight crew first defines the ILS/LOC (on the new navaid page), the new runway page, when called up, already displays the RWY course, RWY ident, and ILS ident (copied from the new navaid page).
- When the flight crew first defines the runway (on the new runway page), the new navaid page, when called up, already displays the ILS course, ILS ident, and runway ident.

The pilot must enter the two runway directions on two different new runway pages (Example: LFRJ 08 and LFRJ 26) to allow the flight plan to select either one.

***Note:** When 10 runways are stored, entering a new stored runway deletes the first one of the list (1/10).*

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
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[1L] to [6L]	These keys are used to enter information about the new runway.
[1R] LS IDENT	This key is used to enter the ILS/MLS/LOC ident. The NEW NAVAID page comes up.
[5R] RETURN	The pilot presses this key to return to the NEW NAVAID page.
[6R] STORE	This prompt only appears when all the amber boxes have been filled in.

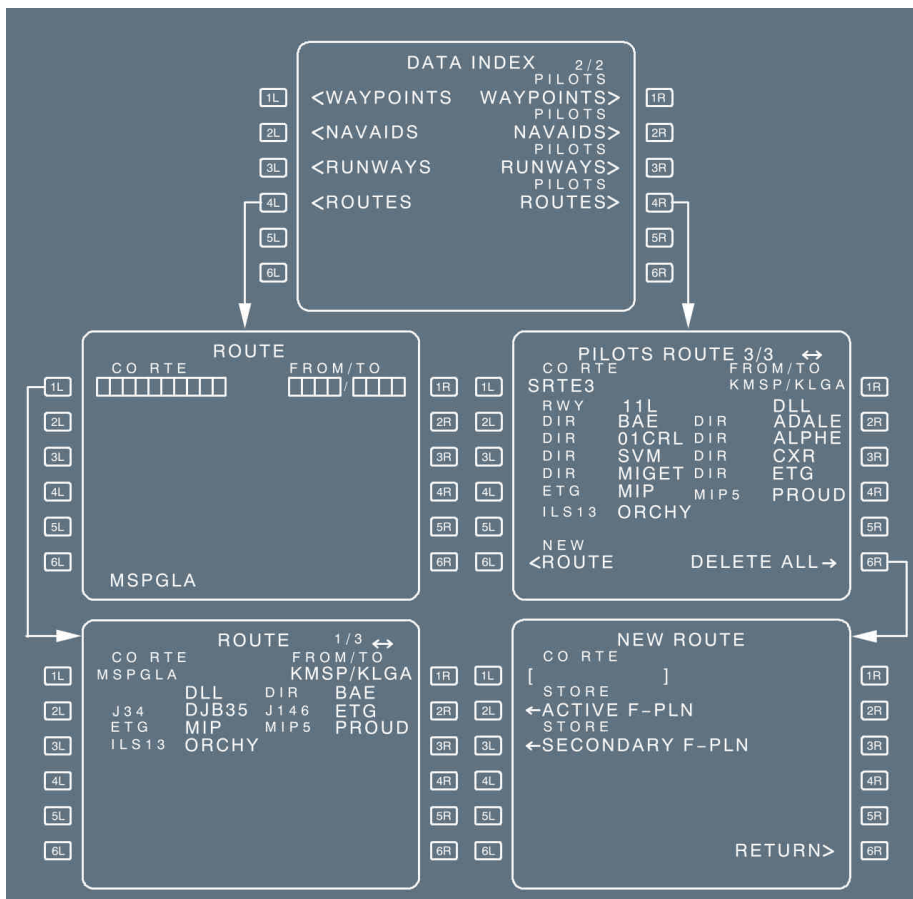
Note: *The NEW RUNWAY may be used for departure or destination, but no SID or STAR can be associated or stored with this runway. Therefore, the pilot will use it as an “independent” airport.*

A new runway is identified by the 4–letter ICAO airport identifier, although all six or seven digits must be entered.

ROUTE/PILOTS' ROUTE/NEW ROUTE PAGES

Ident.: DSC-22_20-20-10-28-00000847.0001001 / 01 OCT 12

Applicable to: MSN 02926-02944, 04392, 07784-07792



ROUTE PAGES

(Not-modifiable)

[1L] CO RTE

Any company route ident, entered in this field, causes all the elements of the route to be displayed.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
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Line 2 to Line 6	These lines display the various route elements, including waypoints and airways.
[1R] FROM/TO	This field is automatically filled in, when the pilot enters the ident for a company route. When the pilot manually enters a city pair, the MCDU displays “NOT IN DATA BASE”, if the city pair is not in the navigation database. If the city pair is in the database, the CO RTE field displays the first route stored in small blue font. If more than one route is stored, the pilot can scroll to see the different routes.

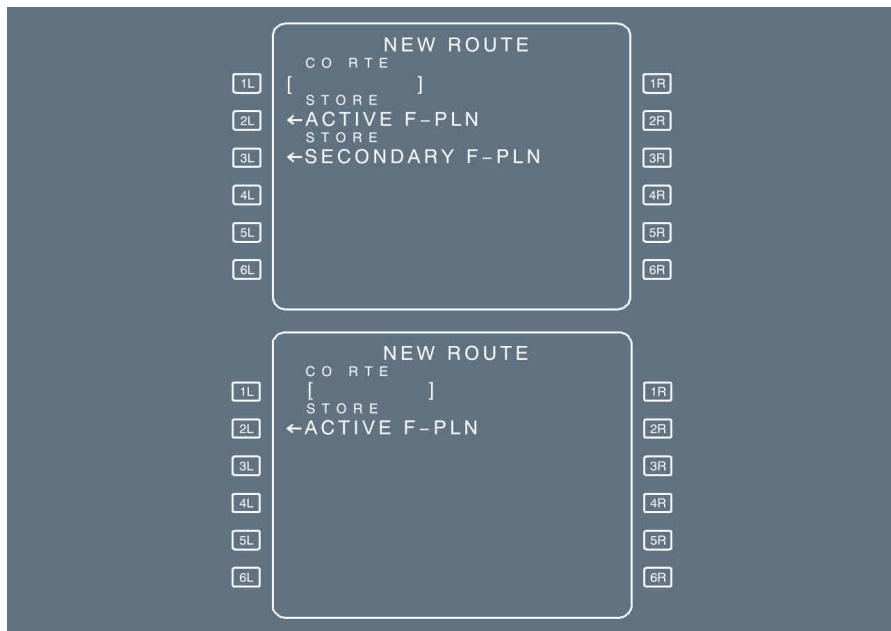
PILOTS' ROUTE PAGE



This page displays up to 5 routes, stored by the pilot. The Pilots' routes are listed and numbered in the order of insertion. The number is displayed in the upper right-hand corner of the page.	
[1L] CO RTE	This field identifies the stored route. Clearing this field deletes the stored route.
Line 2 to Line 5	The fields in these lines are identical to the corresponding fields on the route page.
[6L] NEW ROUTE	Pressing this key calls up the new route page.
[1R] FROM/TO	This identifies the city pair of the stored route.
[6R] DELETE ALL	Pressing this key changes the label "CONFIRM DELETE ALL" which appears in amber. Pressing this key a second time deletes all previously-stored routes.

NEW ROUTE PAGE

The pilot calls up this page by pressing the NEW ROUTE key on the PILOT'S ROUTE page. It can be used to store up to five new routes that have already been defined in the active or secondary flight plan.



[1L] CO RTE

This field allows the pilot to enter a new company route ident. If that ident has already been assigned, the entry is rejected. The message NON UNIQUE ROUTE is then displayed.

[2L] STORE ACTIVE
F-PLN (cyan)

Pressing this key stores parameters of the active flight plan as a new route.
This prompt appears when the system contains a FROM/TO, but only during preflight.

[3L] STORE SECONDARY
F-PLN (cyan)

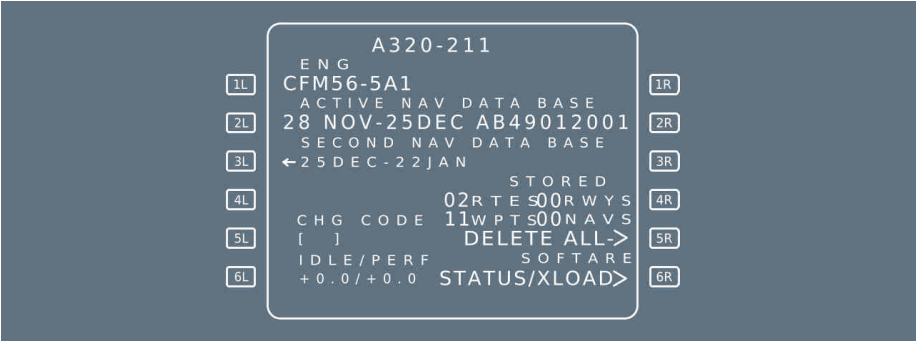
Pressing this key stores parameters of the secondary flight plan as a new route.
This prompt appears when the system contains a FROM/TO, and the secondary flight plan has not yet been sequenced.

- Note:
- If it has not already been named, a stored route is automatically named (SRTE 1 to SRTE 5) when stored.
 - When 5 routes are already stored, the pilot cannot insert a new stored route. The “PILOTS’ ROUTE FULL” message is displayed, and the pilot must manually delete a route, in order to be able to store a new one.
 - The following flight plan elements are not retained when the route is stored :
 - Pilot-entered holds and constraints
 - Offset
 - Modifications to terminal procedures
 - Pseudo waypoints
 - Step at optimum
 - The MCDU then displays “REVISIONS NOT STORED”.

AIRCRAFT STATUS PAGE

Ident.: DSC-22_20-20-10-28-00000848.0001001 / 24 SEP 14
Applicable to: MSN 02926-02944, 04392, 07784-07792

The pilot call this page up by pressing the DATA key on the MCDU console.



- | TITLE | AIRCRAFT TYPE |
|---|--|
| [1L] ENGINE TYPE | The system uses this engine model to calculate predictions. |
| <u>Note:</u> When the same performance database is used for different aircraft configurations, the aircraft or engine type displayed in the [1L] field may differ from the actual aircraft. | |
| [2L] ACTIVE DATABASE | The validity period and part number are displayed in large font. |
| [3L] SECOND DATABASE | The validity period and part number are displayed in small font. The pilot can press the 3L key to switch to the second database as the active database. |

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION

CAUTION Cycling the database erases the primary and secondary flight plans, as well as the stored data. The flight crew must never do this in flight.

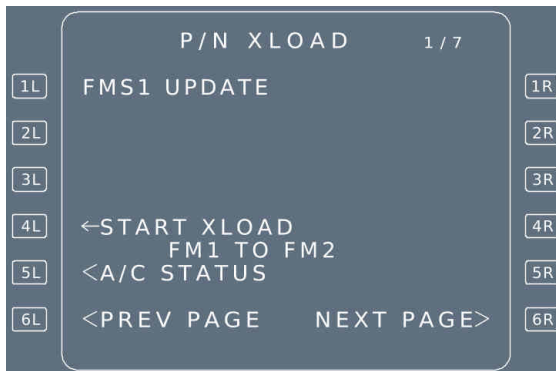
- [5L] CHG CODE This field allows entry of a code which permits modification of the IDLE and/or PERF factor displayed in 6L. It is displayed in the PREFLIGHT and DONE phases. The label is displayed in small white fonts; the brackets, or the entered value, are displayed in large blue fonts.
- [6L] IDLE/PERF It is only possible to modify these factors when the aircraft is on ground. If no value was entered, the FMS displays default values coded in the Airline Modifiable Information (AMI) file.
 Default values are displayed in small font, although manually entered values are displayed in large font.
- When it is necessary to modify the IDLE or the PERF factor:
- ENTER the change code in the CHG CODE field [5L].
 The default value for this code is "ARM" but it is possible to modify it on airline request (the applicable code is then coded in the Airline Modifiable Information (AMI) file).
 When a valid change code is entered, the IDLE and PERF factors are displayed in blue.
 - ENTER the new IDLE and/or PERF factor(s) in the scratchpad.
 - PRESS the [6L] key to insert the new IDLE and/or PERF factor(s).
 The new IDLE and/or PERF factor(s) is (are) displayed in large blue font.
- [4R] STORED This field displays pilot-stored data in a large green font. The field is blank, if no data is stored. (The airline can choose to have this data automatically erased at the done phase).
- [5R] DELETE ALL Pressing this key changes the label to "CONFIRM DELETE ALL" in amber. Pressing this key a second time deletes all pilot-stored data, except data that is part of the active and secondary flight plans.
- [6R] STATUS/XLOAD This prompt gives access to the P/N STATUS and P/N XLOAD pages.

P/N XLOAD PAGE

Ident.: DSC-22_20-20-10-28-00000849.0001001 / 10 DEC 09

Applicable to: MSN 02926-02944, 04392, 07784-07792

This page allows the crossloading of all databases or configuration files' part numbers which are different between both sides. Crossloading from this page avoids reviewing each individual P/N STATUS page.


TITLE
P/N XLOAD

[1L]

FMS1 UPDATE : FMS1 can be loaded on the right side MCDU.
 FMS2 UPDATE : FMS2 can be loaded on the left side MCDU

[4L]

START XLOAD : This blue prompt is displayed, only if the system detects a difference between both sides' part numbers.
 FMS1/FMS2 IDENTICAL : Displayed in green, when there is no difference between both sides' part numbers.

Line 5

FM1 TO FM2 or FM2 TO FM1 : Indicates the crossloading direction.

[5L]

A/C STATUS : This white prompt is displayed, when there is no crossloading in progress. It gives access to the A/C STATUS page.
 MM : SS MIN REMAINING : Indicates the time remaining for crossload completion, when a crossload is in progress.

[6L] PREV PAGE

The pilot presses this key to return to the A/C STATUS page.

[6R] NEXT PAGE

Pressing this key calls up the next P/N XLOAD page.

P/N STATUS PAGES

Ident.: DSC-22_20-20-10-28-00000850.0001001 / 01 OCT 12

Applicable to: MSN 02926-02944, 04392, 07784-07792

These pages enable the following databases and configuration files to be reviewed and crossloaded between both FMS :

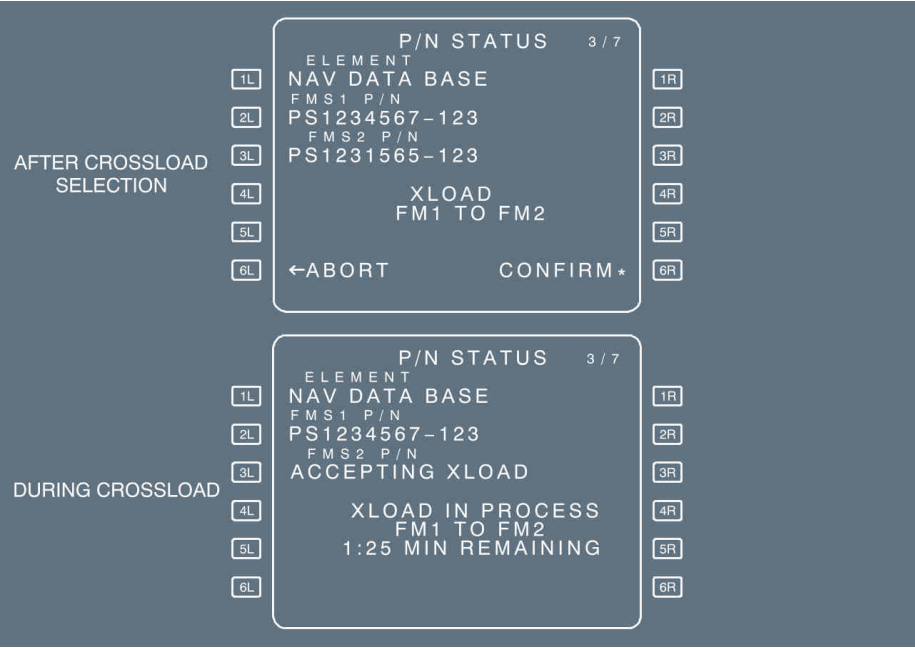
- Page 2 FMS SOFTWARE part numbers
- Page 3 NAV DATA BASE part numbers
- Page 4 FM AIRLINE CONFIG part numbers
- Page 5 FM OPTIONS CONFIG part numbers

- Page 6 PERF DATA BASE part numbers
- Page 7 MAG VAR DATABASE part numbers

P/N STATUS 3 / 7		
1L	ELEMENT NAV DATA BASE	1R
2L	FMS1 P/N PS1234567-123	2R
3L	FMS2 P/N PS1231565-123	3R
4L	←START XLOAD	4R
5L	FM1 TO FM2 <A/C STATUS	5R
6L	<PREV PAGE NEXT PAGE>	6R

P/N STATUS 3 / 7		
1L	ELEMENT NAV DATA BASE	1R
2L	FMS1 P/N PS1234567-123	2R
3L	FMS2 P/N PS1234564-123	3R
4L	NEED FM1/FM2 SOFTWARE IDENTICAL TO XLOAD	4R
5L	<A/C STATUS	5R
6L	<PREV PAGE NEXT PAGE>	6R

CROSSLOAD NOT POSSIBLE



TITLE	P/N STATUS
Line 1 ELEMENT	Indicates the name of the database or configuration file that can be crossloaded : - FMS SOFTWARE on Page 2 - NAV DATA BASE on Page 3 - FM AIRLINE CONFIG on Page 4 - FM OPTIONS CONFIG on Page 5 - PERF DATA BASE on Page 6 - MAG VAR DATABASE on Page 7.
Line 2 FMS1 P/N Line 3 FMS2 P/N	These fields display the part numbers of the database or configuration file (stated on line 1), that are installed on the FMS 1 and 2. Identical part numbers are displayed in green, different ones in amber. During crossload, the updated part number is replaced by the “ACCEPTING XLOAD” amber message.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT
CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION

Line 4

This line is empty when the active flight phase is not Preflight or Done.
 XLOAD FMx TO FMy or START XLOAD FMx TO FMy : This blue prompt is displayed when the database or configuration file (stated on line 1) can be crossloaded.

XLOAD ARMED : Displayed in blue on the receiving FM when the crossload has been requested, but not yet confirmed.

XLOAD IN PROCESS : Displayed in white, when the crossload is ongoing.

A/C ENG NOT SUPPORTED : Related to the Performance Database only. It is displayed when the FMS performance database model is incompatible with the aircraft/engine's pin program.

XLOAD NOT SUPPORTED : Crossloading is unavailable for this element.

NO P/N TO XLOAD : The element is missing.

NEED FG1/FG2 IDENTICAL TO XLOAD : The receiving side's FG software is incompatible with the FG software to be crossloaded.

NEED FM1/FM2 SOFTWARE IDENTICAL TO XLOAD : The crossloaded element is incompatible with the receiving side's FM software.

[5L] A/C STATUS

This prompt is available, when no crossload is in process. This gives the pilot access to the aircraft status page.

MM : SS MIN REMAINING : Displays the time remaining to complete the crossload, when a crossload is in process.

[6L] PREV PAGE ABORT

This key calls up the previous P/N STATUS page.

This amber prompt is displayed when a crossload is in progress. The pilot uses it to stop the crossload.

[6R] NEXT PAGE
 CONFIRM*

This key calls up the next P/N STATUS page.

This amber prompt is displayed when a crossload has been armed. The pilot presses it to start the crossload.

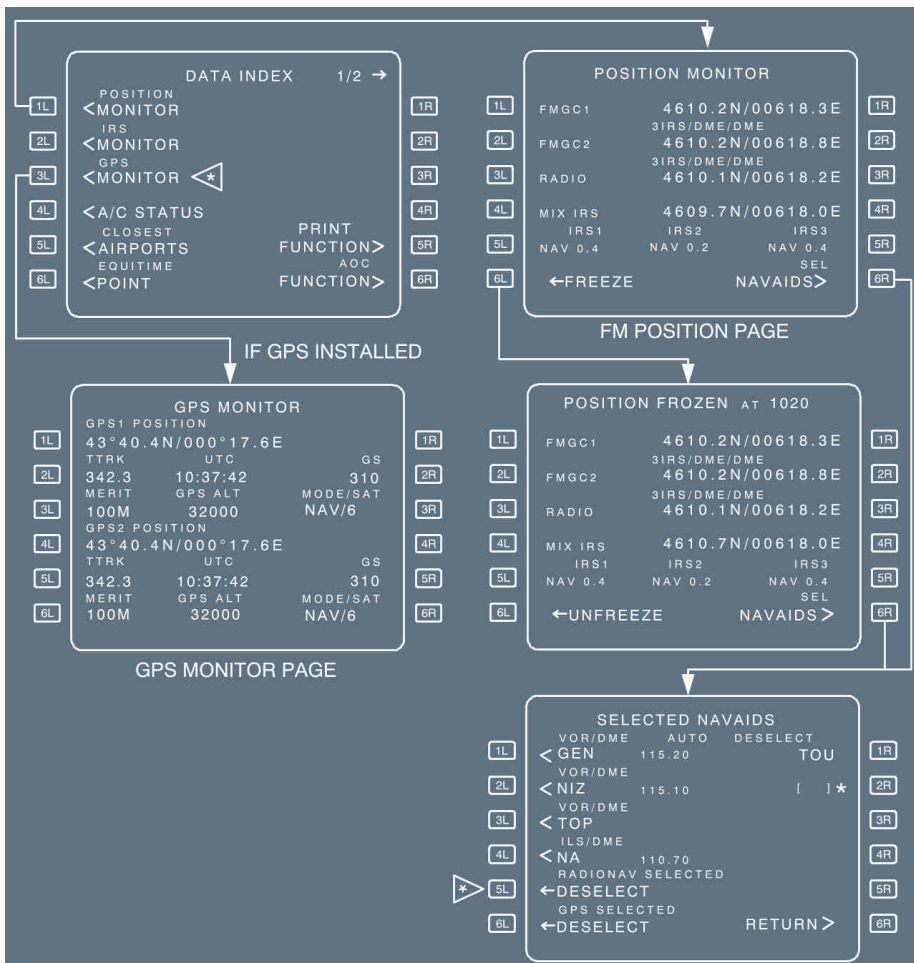
POSITION MONITOR PAGE

Ident.: DSC-22_20-20-10-28-00000853.0008001 / 14 MAY 12

Applicable to: MSN 02926-02944, 04392, 07784-07792

This page displays all the different positions that the FMGC has computed with the various available navigation methods. It also shows which method obtained each position. (The positions should be almost identical).

The pilot calls up this page by pressing the 1L key on the data index page.



POSITION MONITOR AND POSITION FROZEN PAGE

Line 1 FMGC 1

This line displays the latitude and longitude in green, as calculated by the FMGC 1, and the navigation method used by the FMGC for that calculation in white (Example: "3 IRS/DME/DME").

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION

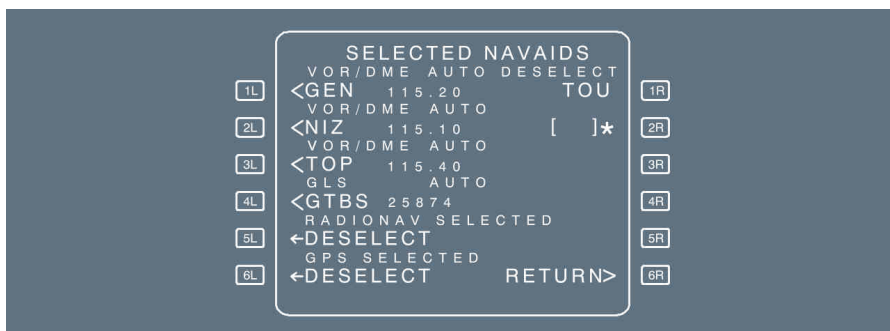
Line 2 FMGC 2	This line displays the latitude and longitude in green, as calculated by the FMGC 2, and the navigation method used, in white.
Line 3 RADIO or GPS or GPIRS or RADIO DESELECTED	This line displays the latitude and longitude in green, calculated by the onside FMGC from selected radio NAVAIDs (Example: DME/DME, VOR/DME, or LOC) or from GPS or GPIRS. The selected radio NAVAIDs are displayed in white.
Line 4 MIX IRS	This line shows the latitude and longitude of the weighted mean inertial reference system (IRS) calculated by the onside FMGC from the available IRSs.
Line 5 IRS 1,2,3	This line shows the deviation in nautical miles of each IRS position from the onside FMGC position. It also displays the IRS mode, which can be INVAL, ALIGN, NAV or ATT.
	<i>Note: INVAL is displayed when an ADIRS has failed, or the IRS position is not refreshed.</i>
[6L] FREEZE/UNFREEZE (blue)	The pilot presses this key to freeze (or unfreeze) all the data displayed on the page. When the data is frozen, the title of the page specifies the time at which it was frozen.
[6R] SEL NAVAIDS	The pilot presses this key to access the selected navaids page.

SELECTED NAVAIDS PAGE

Ident.: DSC-22_20-20-10-28-00000854.0003001 / 14 MAY 12

Applicable to: MSN 02926-02944, 04392, 07784-07792

MODIFIABLE FOR DESELECTION/SELECTION



 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
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- [1L] This field displays the ident of the NAVAID tuned for display purposes, in blue, and the frequency of the NAVAID in green.
- [2L] to [3L] These fields display the ident of the NAVAIDs tuned for the calculation of the radio position by the FMGC, in blue, and the frequency of the NAVAIDs in green.
- [4L] This field displays the ident of the landing system (XLS) in blue, and the frequency (or the channel) of the landing system in green.
- Note: For fields [1L] to [4L] the class of the tuned NAVAID or the landing systems, and the tuning mode (AUTO, MAN, or RMP) are displayed in white in the label field.*
- [5L] The flight crew presses this key to manually select or deselect the NAVAIDs.
If the flight crew selects (deselects) the NAVAIDs for position calculation, “RADIONAV SELECTED” (“RADIONAV DESELECTED”) is displayed in the label line in blue small font and “DESELECT” (“SELECT”) is displayed in white large font. By default NAVAIDS are selected.
The deselection of the RADIONAV inhibits use of radio position (either DME/DME or VOR/DME) for position calculation.
- [6L] The flight crew presses this key to manually select or deselect the GPS.
If the flight crew selects (deselects) the GPS, “GPS SELECTED” (“GPS DESELECTED”) is displayed in the label line in blue small font and “DESELECT” (“SELECT”) is displayed in white large font. By default GPS is selected.
If the flight crew deselects the GPS, “GPS IS DESELECTED”
MCDU message is displayed when the aircraft is less than 80 NM from the top of descent, or in approach phase.

AIRCRAFT SYSTEMS**AUTO FLIGHT - FLIGHT MANAGEMENT****CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION****[1R] to [5R]**

The flight crew deselects a NAVAID by entering the NAVAID identifier in one of these four fields. Once deselected, the flight crew can manually tune the NAVAID by entering the ident of the NAVAID for display purposes.

The deselection can be cleared:

- Manually, by a CLR action in this field, or
- Automatically upon transition to the done or preflight phase, or upon activation of the second database.

The flight crew may deselect as many as four stations.

If the flight crew attempts to deselect a NAVAID that has been previously deselected, the "XXXX IS DESELECTED" MCDU message is displayed.

[6R] RETURN

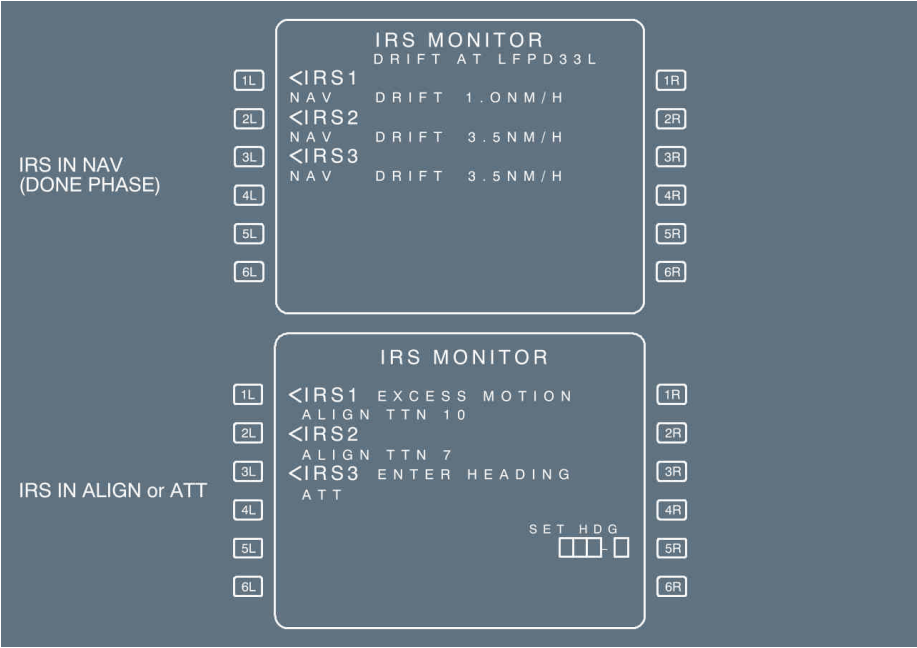
The flight crew presses this key to return to the POSITION MONITOR page.

IRS MONITOR PAGE

Ident.: DSC-22_20-20-10-28-00000856.0003001 / 23 JUN 15

Applicable to: MSN 02926-02944, 04392, 07784-07792

This page displays the IRS data. The crew calls up this page by pressing the IRS monitor prompt of the DATA INDEX 1/2 page.



- TITLE DRIFT AT XXXX (amber)

Displays “DRIFT AT” runway identifier, if at least one IRS average drift is displayed.
- [1L] to [3L] IRS 1(2) (3) (white)

These prompts access the associated IRS pages. Each label line displays the mode (NAV, ALIGN, ATT or INVAL), the average drift (upon transition to DONE phase), and the Time To NAV in minutes (if IRS in align) for each IRS.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT
CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION

[1R] to [3R]

Displays the status message of the associated IRS in small green font.

List of available messages:

IR FAULT
 DELAYED MAINT
 ENTER PPOS
 SELECT ATT
 EXCESS MOTION
 SWITCH ADR
 CHECK C/B
 CDU FAULT
 ENTER HEADING
 REENTER PPOS
 SYS BELOW -15 °

[5R] SET HDG (white)

This field is displayed, if at least one IRS is in ATT mode.

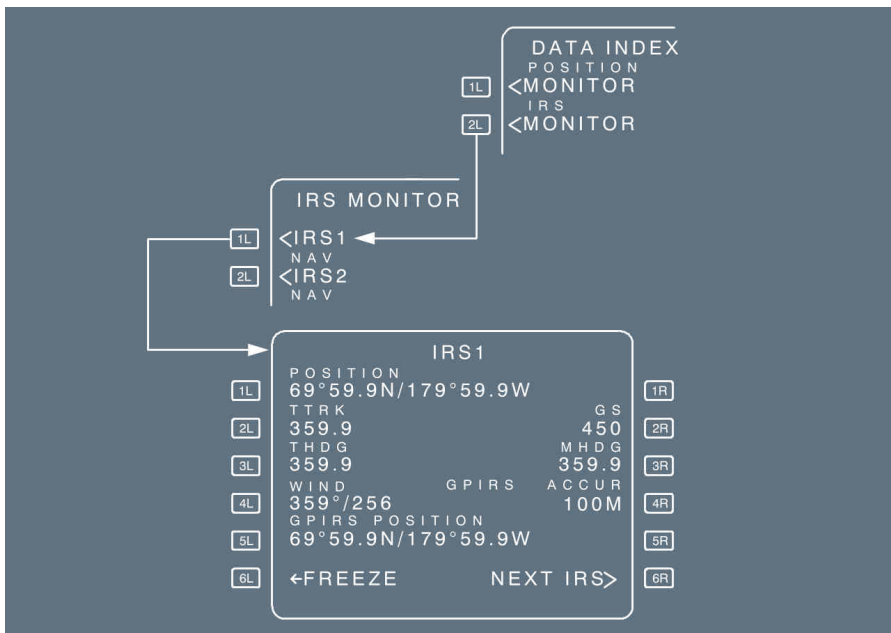
This function allows initialization of a heading for IRS in ATT mode:

- If a heading has been entered in this field, or on the ADIRS panel, the value is displayed in blue.
- If not, amber boxes are displayed.

IRS 1 (2) (3) PAGE

This page displays the IRS parameters and GPS/IRS hybrid parameters.

The pilot calls up this page by pressing either the 1L key from the IRS MONITOR page, or the NEXT IRS prompt on another IRS page (closed loop).


TITLE

Displays the selected IRS in large white font.
 When data is frozen, IRS is replaced by “IRS FROZEN AT”, followed by the time at which the pilot has frozen the display.

[1L] POSITION

Displays the latitude/longitude given by the selected IRS.

[2L] TTRK

True track

[3L] THDG

True heading

[4L] WIND

True wind direction/velocity

[5L] GPIRS

GPS/IRS hybrid position of the IRS

[6L] FREEZE/UNFREEZE

Allows the crew to freeze or unfreeze all data displayed on all three IRS pages. When the data is frozen, the title of the page specifies the time at which it was frozen. It is automatically unfrozen when exiting the page.

[2R] GS

Ground speed

[3R] MHDG

Magnetic heading

[4R] GPIRS ACCUR

GPS/IRS Figure of Merit (meters or feet)

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT
CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION

[6R] NEXT IRS

This prompt enables another IRS page (closed loop IRS 1 → 2 → 3 → 1) to be displayed.

DUPLICATE NAMES PAGE

Ident.: DSC-22_20-20-10-28-00000852.0001001 / 23 JUN 15

Applicable to: MSN 02926-02944, 04392, 07784-07792

This page automatically appears and enables the pilot to select a specific waypoint, airport, or NAVAID, when the database has more than one with the same identifier.

DUPLICATE NAMES					
	15 NM	LAT/LONG			
[1L]	*ECHO	46N/015E		[1R]	
[2L]	*ECHO	48N/010W		[2R]	
[3L]	*ECHO	49N/012W		[3R]	
[4L]	*ECHO	48N/005E		[4R]	
[5L]				[5R]	
[6L]	<RETURN			[6R]	

DUPLICATE NAMES					
	15 NM	LAT/LONG	FREQ		
[1L]	*ENO	40N/064W	114.80	[1R]	
[2L]	*ENO	44N/101E	112.40	[2R]	
[3L]	*ENO	50N/070W	116.60	[3R]	
[4L]				[4R]	
[5L]				[5R]	
[6L]	<RETURN			[6R]	

The pilot presses the key adjacent to a waypoint, NAVAID, or airport, to select it as the one to be entered. When the pilot has finished, the page automatically reverts to the previously displayed page.

DISTANCE

The direct distance to the aircraft is displayed in green above each name. If this distance is greater than 9 999 NM, then +9 999 NM is displayed.

LAT/LONG COLUMN

This column lists the rounded off latitudes and longitudes of the different points, using the same identifier.

FREQ/CHAN COLUMN

This column lists the NAVAIDs frequencies, if any. It displays CHAN for an MLS.

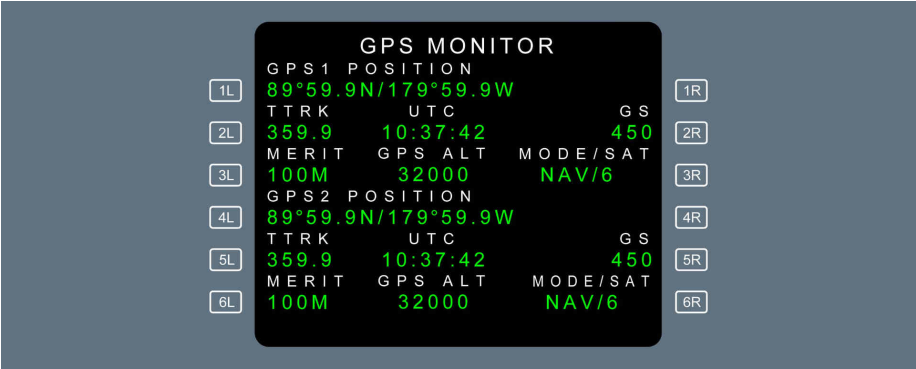
- Note:
- The **DUPLICATE NAMES** page is not displayed, when 2 waypoints with the same ident belong to the same airway. The system selects the first waypoint found in the database.
 - The waypoints or NAVAIDs are ranked according to their distance from the aircraft's position.
 - When a waypoint is named using ICAO phonetic alpha characters, a minus sign and the ICAO code of the country where the waypoint is located, are displayed. e.g. Alpha in France becomes A-LF ; Bravo in England becomes B-EG.

GPS MONITOR PAGE

Ident.: DSC-22_20-20-10-28-00000858.0001001 / 17 NOV 25
 Applicable to: MSN 02926-02944, 04392, 07784-07792

- 5 This page displays the GPS data. The flight crew can access this page by pressing the GPS MONITOR prompt of the DATA INDEX page.

Note: The absence of GPS data (dashes) indicates that the GPS source is not valid or that the GPS data is rejected by the ADIRS.



[1L] and [4L] Display the GPS 1 and 2 positions.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION

[2L] - [2R] and [5L] - [5R]
TTRK-UTC-GS

Display the GPS 1 and 2 true tracks. UTC fields indicate UTC time for each GPS sensor. GS fields indicate the GPS 1 and 2 ground speed.

[3L] - [3R] and [6L]
- [6R] MERIT-GPS
ALT-MODE/SAT

Display the GPS 1 and 2 figures of merit (in meters or feet). GPS ALT is displayed for information purposes. It is not used by the FMGS. MODE/SAT fields indicate the GPS 1 and 2 modes followed by the number of satellites tracked.

The GPS can operate in the following modes:

INIT	System initialization
ACQ	Satellite acquisition
NAV	Normal mode
TEST	System test
FAULT	Invalid system
ALTAID or AIDED	Degraded modes. The MMR uses aircraft inputs for computation purposes.
SBAS 	Use of SBAS.

PRINT FUNCTION PAGES

Ident.: DSC-22_20-20-10-28-00009558.0001001 / 16 MAR 11

Applicable to: MSN 02926-02944, 04392, 07784-07792

The PRINT FUNCTION pages enable the crew to print the data relative to the current flight.

This data comes from 2 different sources:

- ACARS uplink messages, and
- Active data from the current flight.

The pilot may access these pages from the “DATA INDEX” page1/2, by pressing the [6R] ACARS/PRINT FUNCTION key.

PRINT FUNCTION 1 / 2 →				PRINT FUNCTION 2 / 2 →			
AUTO		MANUAL		AUTO		MANUAL	
[1L] *YES	F-PLN INIT PRINT*	[1R] NEXT	[1L] *YES	PREFLIGHT PRINT	[1R]	[2L] NO	INFLIGHT PRINT*
[2L] TO DATA	PRINT*	[2R] PAGE	[2L]	POSTFLIGHT PRINT	[2R]	[3L] *YES	SEC F-PLN PRINT*
[3L] *NO	WIND DATA PRINT*	[3R]	[3L]		[3R]	[4L] <RETURN	AOC FUNCTION>
[4L]		[4R] ←	[4L]		[4R]	[5L]	
[5L]		[5R] →	[5L]		[5R]	[6L]	
[6L]		[6R]	[6L]		[6R]		

PRINT FUNCTION PAGE 1 PRINT FUNCTION PAGE 2

PRINT FUNCTION PAGE 1/2

This page displays the status of the automatic printing capabilities, for the uplink messages (left column), and the status of the manual printing capabilities of the current active data (right column).

LEFT COLUMN

- AUTO
- * YES (blue)

Line 1

:

Uplink messages related to flight plan INIT data are automatically printed when received.

Line 2

:

Uplink messages related to takeoff data are automatically printed when received.

Line 3

:

Uplink messages related to wind data are automatically printed when received.
- NO (without an asterisk)

Automatic printing is internally deactivated for the data of the line. The pilot cannot reactivate it manually.
- Blank

The ACARS function is not available for this line. Uplink messages can neither be received nor automatically printed.

RIGHT COLUMN

- MANUAL

Displays the status of the manual printing capability of the active data (and not of the ACARS uplink data).
- PRINT * (amber)

Pressing the right keys prints the following active data:

Line 1

:

Active flight plan INIT data

Line 2

:

Active takeoff data

Line 3

:

Active wind data
- Printing is only possible, if the asterisk appears.

When the key is pressed, the asterisk disappears until the data is printed.
- [6L] RETURN

Pressing this key reverts the display to the DATA INDEX page.
- [6R] ACARS FUNCTION

Pressing this key reverts the display to the ACARS FUNCTION page.

PRINT FUNCTION PAGE 2/2

This page describes the printing capabilities of the reports displayed on lines 1 to 4.

LEFT COLUMN

- AUTO (white)

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
---	---

* YES (blue)	Line 1 : The PREFLIGHT report is automatically printed at engine start.
	Line 2 : The INFLIGHT report is automatically printed at takeoff.
	Line 3 : The POSTFLIGHT report is automatically printed at engine shutdown.
NO (without an asterisk)	Automatic printing is internally deactivated for the report. The pilot cannot reactivate it.

RIGHT COLUMN

MANUAL	Pressing a right key prints the report displayed on the line.
PRINT *	It is not possible to print, if the asterisk does not appear. When the key is pressed, the asterisk disappears until the report is printed. Regarding the PREFLIGHT, INFLIGHT, and POSTFLIGHT reports: Only one can be printed at a time, depending on the applicable flight phase. For the SEC F-PLN report, the print selection start is only displayed if a secondary flight plan exists.

AOC FUNCTION PAGE (IF INSTALLED)

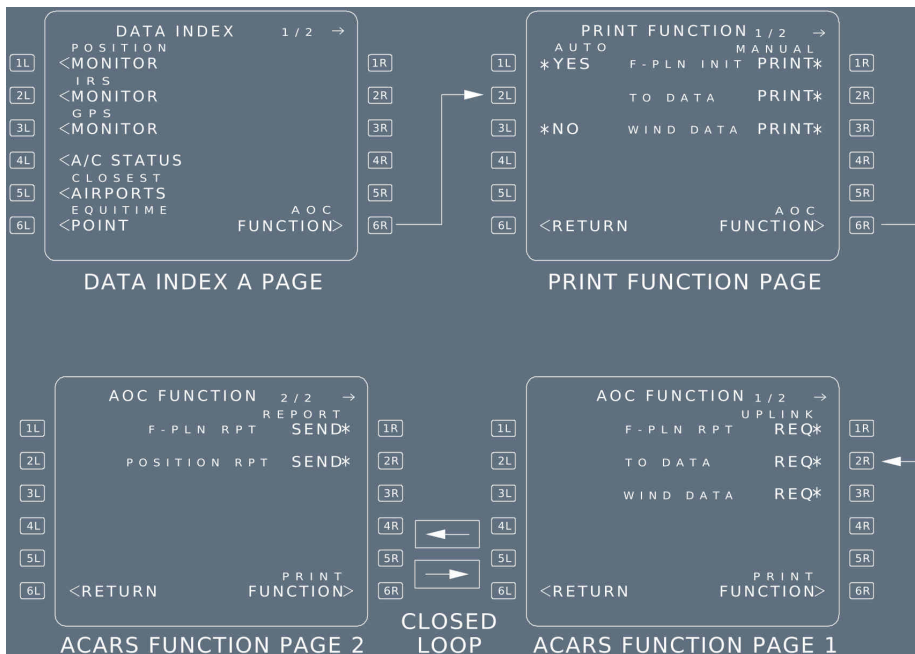
Applicable to: MSN 02926-02944, 04392, 07784-07792

Ident.: DSC-22_20-20-10-28-D-00000896.0001001 / 16 MAR 11

The AOC FUNCTION pages display those functions which enable crews to send manual requests or reports to the ground.

All functions, displayed on pages 1 and 2, may be inhibited via a pin program.

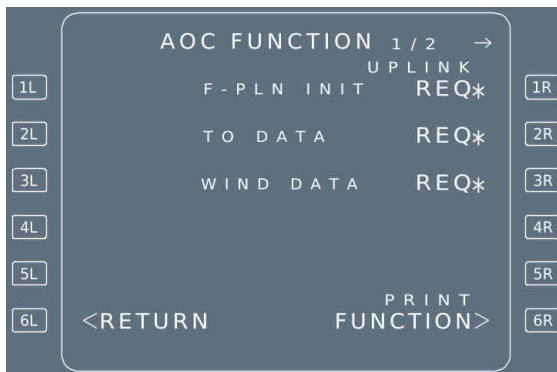
The AOC/PRINT FUNCTION prompt is displayed on the DATA INDEX page 1/2. Pressing this key displays the PRINT FUNCTION page, from which the AOC FUNCTION page can be accessed.



The AOC function page 2 is accessed using the "→" or "←" keys from page 1 and vice versa.

Ident.: DSC-22_20-20-10-28-D-00000897.0001001 / 28 MAR 11

AOC FUNCTION PAGE 1 (IF INSTALLED)



TITLE

AOC FUNCTION 1/2 is in white.

AIRCRAFT SYSTEMS**AUTO FLIGHT - FLIGHT MANAGEMENT****CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION**

- Line 1 F-PLN INIT REQ* Pressing this key sends a flight plan request to the ground (downlink message).
The INIT REQUEST prompt of the INIT A page provides the same function.
- Line 2 TO DATA REQ* Pressing this key sends a request for takeoff data.
Displayed in the DONE and PREFLIGHT phases.
The TO DATA REQUEST prompt of the UPLINK TO DATA REQ page provides the same function.
- Line 3 WIND DATA REQ* Pressing this key sends a request for wind data.
The WIND REQUEST prompt of the CLIMB, CRUISE, and DESCENT WIND pages provides the same function.

Note: If "REQ" is not followed by an asterisk, the request cannot be sent (downlink message).
When a function (line 1 or 2 or 3) is deactivated internally, the corresponding line is blank.

- [6L] RETURN The pilot presses this key to revert the display revert to the DATA INDEX page.
- [6R] PRINT FUNCTION The pilot presses this key to access the PRINT FUNCTION page.
(DSC-22_20 Auto Flight - Flight Management/50 Controls and Indicators/10 MCDU - Page Description/28 FMS2 thales/Print Function Pages).

Ident.: DSC-22_20-20-10-28-D-00000898.0001001 / 14 MAY 12

UPLINK TO DATA REQ PAGES (IF INSTALLED)

This page allows the pilot to send a request for takeoff data for up to 2 runways. There is one page for each runway. The page is accessed from the PERF TAKEOFF page, or from the UPLINK XXX (MAX or DRT or FLX) TO DATA page, by pressing the UPLINK TO DATA prompt.

NO RUNWAY DEFINED	UPLINK TO DATA REQ 1/2 → TOW / TOCG SHIFT/ RWY ----- / ----- [] TEMP / QNH TO LIMIT ----- ° / ----- MAG WIND FLAPS / THS ----- ° / ----- CONTAM FLEX TO TEMP ----- ----- ° RECEIVED TO DATA < TO DATA REQUEST *	[1R] [2R] [3R] [4R] [5R] [6R]
RUNWAY DEFINED, DEFAULT VALUES DISPLAYED.	UPLINK TO DATA REQ 1/2 → TOW / TOCG SHIFT/ RWY 72.4 / 25.7 FT [] / 33 L TEMP / QNH TO LIMIT + 27 ° / 998 FT [] MAG WIND FLAPS / THS 000 ° / 000 [] / [] CONTAM ↑↓ FLEX TO TEMP DRY [] ° RECEIVED TO DATA < TO DATA REQUEST *	[1R] [2R] [3R] [4R] [5R] [6R]

TITLE

White.

[1L] TOW/TOCG (green)

This field is dashed, until a runway is defined in the [1R] field. The TOW/TOCG is defaulted to the values of the INIT B and FUEL PRED pages. If not available, dashes are displayed. It cannot be modified by the pilot.

[2L] TEMP/QNH or QFE (green/blue)

This field is dashed, until a runway is defined in the [1R] field; TEMP = Defaulted to SAT, and cannot be modified by the crew. BARO = Defaulted to FCU selection and can be modified by the pilot.

[3L] MAG WIND (blue)

This field is dashed, until a runway is defined in the [1R] field. It displays the wind at the origin. The pilot can modify this field.

[4L] CONTAM (blue)

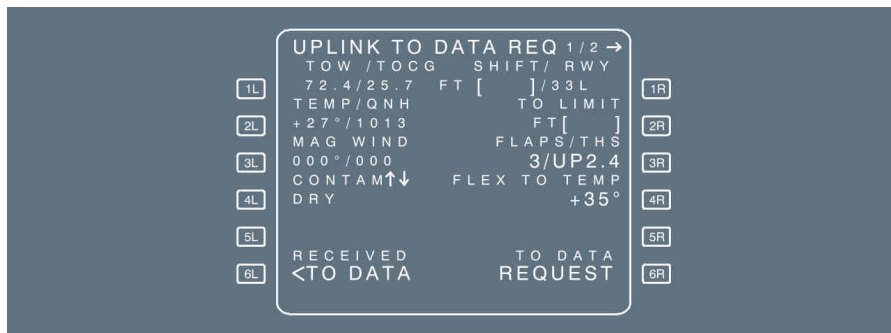
This field is dashed, until a runway is defined in the [1R] field. The display is defaulted to DRY. The scroll keys are used to modify the runway contamination: DRY, WET, 1/4 WATER, 1/2 WATER, 1/4 SLUSH, 1/2 SLUSH, COMP SNOW.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION

[6L] RECEIVED TO DATA This field calls up the UPLINK MAX (or FLX) TO DATA page that displays the data received by ACARS.



- [1R] SHIFT/RWY (blue) This field is dashed, until a runway is defined in the F-PLN. If a runway is defined in the F-PLN, it is automatically filled in as:
 SHIFT = Value from the PERF TO page, or blue brackets [], if no value is defined.
 RWY = F-PLN departure runway. The pilot can modify this field.
- [2R] TO LIMIT (blue) It is dashed, until a runway is defined in the [1R] field.
 It displays blue brackets [], when a runway is defined.
 The pilot may enter a length, considering runway obstacles.
- [3R] FLAPS/THS (blue) This field is dashed, until a runway is defined in the [1R] field; it is then defaulted to values from the PERF TO page. Blue brackets are displayed, if the PERF TO page does not have any defined values.
- [4R] FLEX TO TEMP (blue) This field is dashed, until a runway is defined in the [1R] field; it is then defaulted to values from the PERF TO page. Blue brackets are displayed, if the PERF TO page does not have any defined values.
 The pilot can modify this field and enter a FLEX TO temperature (FXX).
- [6R] TO DATA REQUEST* Pressing this key sends the takeoff data request message to the ground.
 The asterisk disappears when the request is sent. It reappears when the data is available.

Page 2/2 is used for requesting a second runway data.

Note: If the UPLINK TO DATA REQ Page 2 is accessed (Page 1 being filled), the fields on this page are filled in with default values after entering of a runway in the [1R] field. QNH or QFE, and wind are common with Page 1.

Ident.: DSC-22_20-20-10-28-D-00000900.0021001 / 18 MAR 11

UPLINK MAX TO DATA PAGES (IF INSTALLED)

UPLINK MAX TO DATA 1/4 →		UPLINK MAX TO DATA 1/4 →	
TOW / TOCG	SHIFT / RWY	TOW / TOCG	SHIFT / RWY
1L	---	1R	---
2L	---	2R	---
3L	---	3R	---
4L	---	4R	---
5L	---	5R	---
6L	---	6R	---

REQUEST IS PENDING

This page is accessed from the UPLINK TO DATA REQ page by pressing the RECEIVED TO DATA key.

There is a set of 2 pages (MAX TO DATA and FLEX TO DATA) for each of the 4 uplinked runway data. Uplinked data is displayed in green. (It cannot be modified by the pilot).

- | | |
|------------------------|--|
| [1L] TOW/TOCG | Uplinked reference Takeoff Gross Weight and Takeoff Center of Gravity. |
| [2L] TEMP/QNH (or QFE) | Uplinked assumed temperature and baro setting. |
| [3L] MAG WIND | Uplinked takeoff runway wind. |
| [4L] CONTAM | Uplinked takeoff runway contamination. |
| [5L] THR RED/ACC | Uplinked Thrust Reduction and Acceleration altitudes. |
| [6L] UPLINK TO DATA | Pressing the key calls up the UPLINK TO DATA REQ page |
| V1 , VR, V2 | Uplinked takeoff speeds. |
| [1R] SHIFT/RWY | Uplinked TO runway ident, runway intersection, and position shift. |
| [2R] TO LIMIT | Uplinked runway length remaining. |
| [3R] FLAPS/THS | Uplinked FLAPS/SLATS CONF and TRIM position. |
| [4R] FLEX TO | Pressing this key calls up the UPLINK FLEX TO DATA pages. |
| [5R] ENG OUT ACC | Uplinked engine-out acceleration altitude. |

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION

[6R] INSERT UPLINK *

Uplinked Takeoff data is available for insertion.

Selecting this prompt inserts the following data in the PERF TO page:

- V1, VR, V2
- THR RED/ACC, ENG OUT ACC altitudes
- FLAPS/THS
- SHIFT
- FLEX

The display reverts to the PERF TO page, the asterisk disappears.

This field is not displayed, if the runway does not match the active runway. If the runway matches the active runway but the uplinked TOW differs from the current TOW:

- The asterisk disappears and the insertion is not possible (the uplink TOW is 3 t greater or 1 t lower than the TOW estimated by the FMS).
- The TOW value is displayed in amber in [1L] field.

Note: All previously received data is replaced by the new uplinked data.

ident.: DSC-22_20-20-10-28-D-00000901.0001001 / 16 MAR 11

UPLINK FLX TO DATA PAGES (IF INSTALLED)

UPLINK FLX TO DATA			
TOW / TOCG	SHIFT / RWY		
[1L] 152.4/24.6	33LX1	[1R]	
[2L] FLX/QNH V1	TO LIMIT	[2R]	
+45°/1014 110	F T7200	[3R]	
[3L] MAG WIND VR	FLAPS/THS	[4R]	
310°/015 125	3/UP2.4	[5R]	
[4L] CONTAM V2		[6R]	
DRY 140	MAX TO>		
[5L] THR RED/ACC ENG	OUT ACC		
	5200		
[6L] UPLINK	INSERT		
<TO DATA	UPLINK*		

TITLE

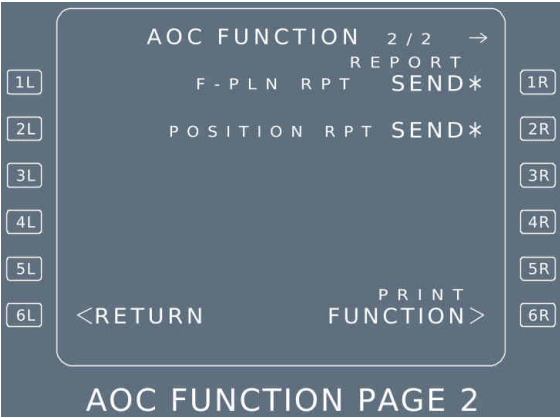
UPLINK FLX TO DATA in white.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
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[2L]	FLX/QNH (or QFE) When the UPLINK FLEX TO DATA page is selected, it displays uplink assumed Flex Temperature and baro setting (QNH or QFE).
[4R] MAX TO	Pressing this key calls up the MAX TO DATA page. For all other fields, refer to MAX TO DATA page.

Ident.: DSC-22_20-20-10-28-D-00000902.0001001 / 16 MAR 11

AOC FUNCTION PAGE 2 (IF INSTALLED)



Line 1 F-PLN RPT SEND	Pressing this key sends the flight plan report to the ground.
Line 2 POSITION RPT SEND	Pressing this key sends a Position Report to the ground.
<u>Note:</u> - No report can be sent, if "SEND" is not followed by an asterisk. - When a function (line 1 or 2) is deactivated via the navigation database policy file, the corresponding line is blank.	
[6L] RETURN	The pilot presses this key to revert to the DATA INDEX page.
[6R] PRINT FUNCTION	The pilot presses this key to access the PRINT FUNCTION page.

PERF PAGE

Ident.: DSC-22_20-20-10-28-E-00000903.0001001 / 01 OCT 12
Applicable to: MSN 02926-02944, 04392, 07784-07792

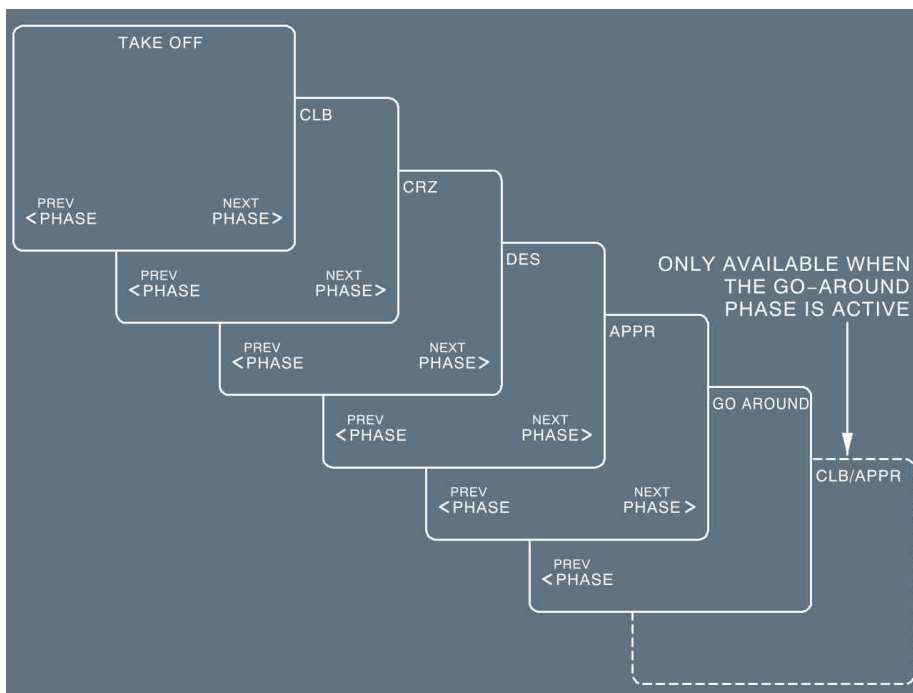
The flight plan is divided into the following phases :
PREFLIGHT, TAKEOFF, CLIMB, CRUISE, DESCENT, APPROACH, GO-AROUND, DONE.

Each phase, except for the preflight and done phases, has a performance (PERF) page. The PERF pages display performance data, speeds related to the various phases, and predictions.

Pressing the PERF key on the MCDU console calls up the performance page for the current active phase. Performance pages, relating to phases already flown, are unavailable.

In the preflight and done phases, pressing the PERF key brings up the takeoff performance page.

Pressing the PERF key in the done phase makes the phase transition to the preflight phase.



The FMGS flight phases are unrelated to the FWC flight phases.

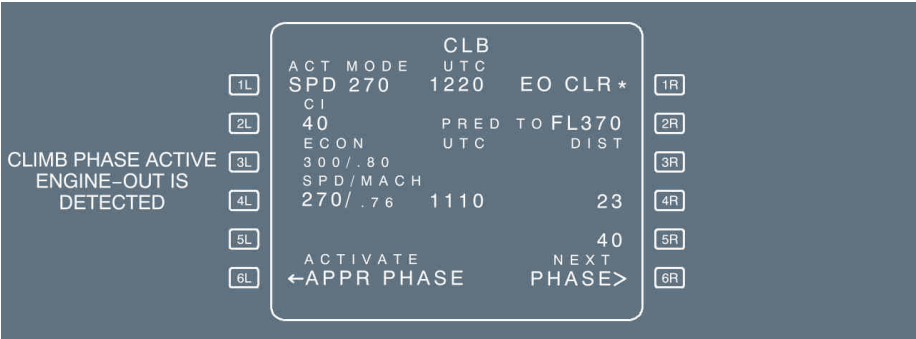
Line 6 Fields may display two different prompts, depending upon whether the phase is active or not.

[6L] PREV PHASE To review the performance page for the previous phase. The prompt is unavailable on the takeoff performance page. It is also unavailable for phases already flown.

[6L] ACTIVATE APPR PHASE To activate, then confirm, the APPR phase. It is only available on the page corresponding to the active phase.

[6R] NEXT PHASE To review the performance page for the next phase.

- Note: **“EO CLR*” prompt**
- When the FMGS detects an engine-out condition, the system automatically calls up the performance page for the current flight phase (except when this occurs before the diversion point during takeoff, or no EOSID exists in the flight plan), and displays “EO CLR*” in the [1R] field.
 - If the pilot presses the [1R] key, the system reverts to the normal processing (with no engine failed) and suppresses the EO information.
 - If the engine-out condition is detected before the diversion point at takeoff, a temporary flight plan is created.



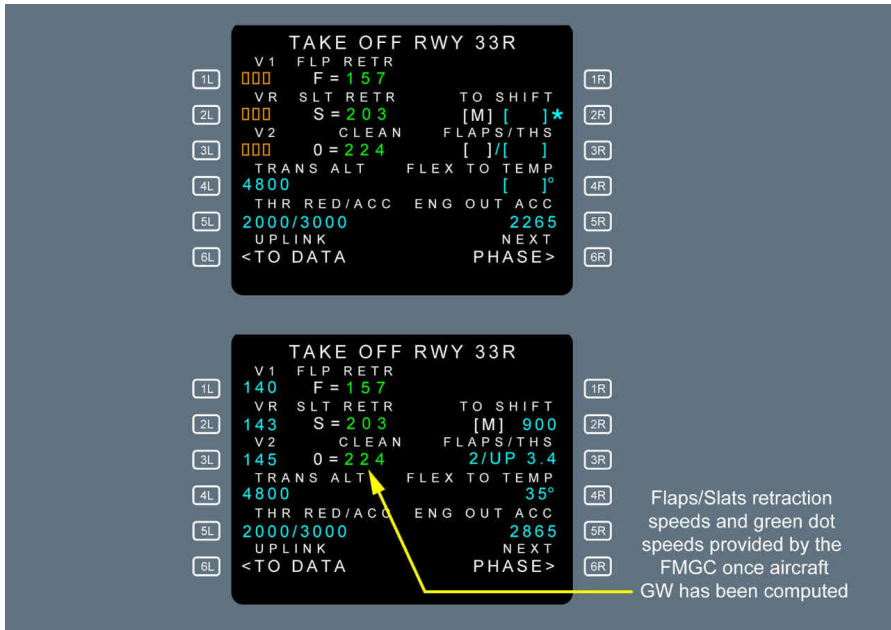
PERF PAGE - PERF TAKEOFF

Ident.: DSC-22_20-20-10-28-E-00000904.0004001 / 30 AUG 18

Applicable to: MSN 02926-02944, 07784-07792

PERF TAKEOFF PAGE

During the preflight phase, the pilot presses the PERF key to call up the takeoff performance page.



TITLE

TAKE OFF RWY is in large green font when the takeoff phase is active, and in large white font when it is inactive. The active flight plan selected runway is displayed in large green font.

Note: If the takeoff shift, or the flaps/THS, or the runway is changed after V1, V2 or VR insertion, but the origin airport remains the same, the MCDU “CHECK TAKEOFF DATA” message appears, but all takeoff parameters are retained (except in case of runway change. They are invalidated, but still displayed adjacent to each field. The “CONFIRM TO DATA” prompt in [6R] allows reverting to the previous values).

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
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[1L] V1 [2L] VR [3L] V2

The boxes remain amber, as long as the pilot does not make entries in them.
The pilot can modify any entry, as long as the takeoff phase is inactive.

Note:

1. If the pilot does not enter V2, the SRS mode will be unavailable at takeoff.
2. The MCDU "V1/VR/V2 DISAGREE" amber message appears if the inserted V1, VR, V2 do not satisfy the condition: $V1 \leq VR \leq V2$
3. The MCDU "TO SPEED TOO LOW" amber message is displayed if the Take-Off Speeds entered by the flight crew are not above the minimum control speeds.

[4L] TRANS ALT (transition altitude)

This field displays the navigation database default altitude (if defined), once the origin airport is entered.
The pilot can modify it.

[5L] THR RED (thrust reduction altitude)

This is the altitude at which the pilot should reduce the thrust from TOGA/FLX to MAX CLIMB (CL detent) with all engines operative ("CLB" or "LVR CLB" flashing on the FMA).

- The thrust reduction altitude defaults to 1 500 ft above the runway elevation, or to the altitude set by the airline.
- The pilot can modify this altitude: The minimum is 400 ft above the runway elevation.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION

ACC (Acceleration altitude)

This is the altitude at which the climb phase is triggered.

- The target speed jumps to the initial climb speed.
- The default value is 1 500 ft above runway elevation.
- The flight crew can modify the value. The minimum value is 400 ft above runway elevation, and it can be higher than, or equal to, or lower than THR RED.

Note:

- A clearing action reverts both values to the defaulted ones.
- When the crew selects an altitude on the FCU that is below THR RED, it brings THR RED and ACC down to this altitude. (The 400 ft minimum still applies).

[6L] UPLINK TO DATA

This key calls up the UPLINK TO DATA REQ page. It is only displayed in the preflight and done phases.

[1R] EO CLR

EO CLR is displayed when an engine-out is detected and when active flight phase is takeoff.

[2R] TO SHIFT

The takeoff shift is the distance in meters or feet between the beginning of the runway and the aircraft's takeoff position. When taking off from an intersection, the flight crew should insert this value to ensure a correct update of the FM position. The takeoff shift value must be positive, and cannot be greater than the runway length.

[3R] FLAPS/THS

This is a flight crew entry for the positions of the flaps and the trimmable horizontal stabilizer (THS) at takeoff.

The flight crew can modify it until takeoff, by entering "UP X.X" or "X.X UP", or "DN X.X" or "X.X DN" for the THS.

[4R] FLX TO TEMP or DRT TO (if installed) or FLX TO

The pilot inserts the FLX TO temperature for FLX takeoff setting purposes, or a derate  level. The pilot can only enter it during preflight. The system sends it to the FADEC and displays the entered data on the upper ECAM display. The TEMP value is always entered in degrees Celsius.

[5R] ENG OUT ACC

This field displays the engine-out acceleration altitude, as defined in the database, or is manually entered by the flight crew. This is for display only, as a reminder. It cannot be cleared.

[6R] NEXT PAGE or CONFIRM TO DATA*

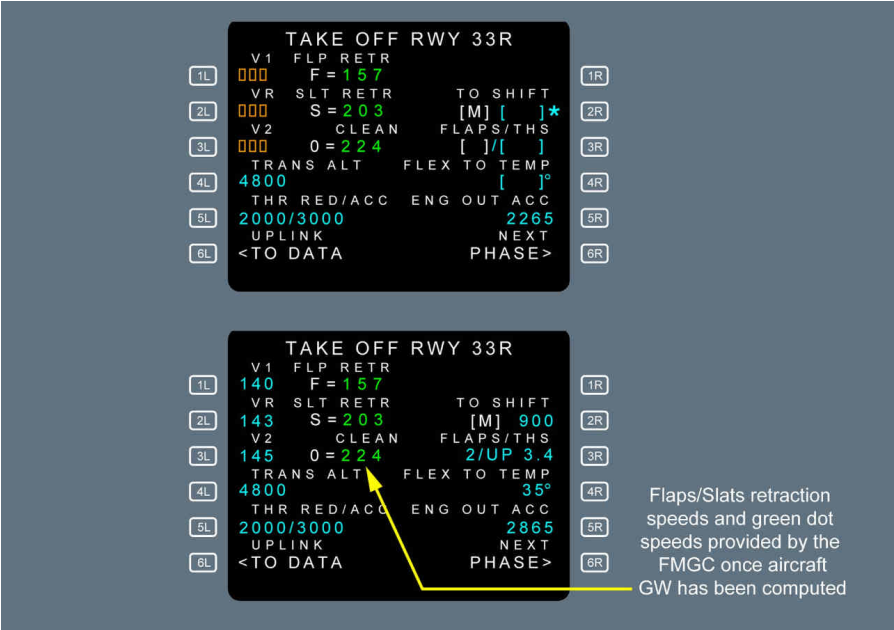
The above ACC altitude rules of [5L] apply to this field.

This key calls up the climb performance page, or allows the pilot to revert to the previously-entered T.O. parameters, in case of runway change with the same origin airport.

Ident.: DSC-22_20-20-10-28-E-00000904.0003001 / 30 AUG 18
Applicable to: MSN 04392

PERF TAKEOFF PAGE

During the preflight phase, the pilot presses the PERF key to call up the takeoff performance page.



AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION

TITLE

TAKE OFF RWY is in large green font when the takeoff phase is active, and in large white font when it is inactive. The active flight plan selected runway is displayed in large green font.

Note: If the takeoff shift, or the flaps/THS, or the runway is changed after V1, V2 or VR insertion, but the origin airport remains the same, the MCDU "CHECK TAKEOFF DATA" message appears, but all takeoff parameters are retained (except in case of runway change. They are invalidated, but still displayed adjacent to each field. The "CONFIRM TO DATA" prompt in [6R] allows reverting to the previous values).

[1L] V1 [2L] VR [3L] V2

The boxes remain amber, as long as the pilot does not make entries in them.

The pilot can modify any entry, as long as the takeoff phase is inactive.

Note:

1. If the pilot does not enter V2, the SRS mode will be unavailable at takeoff.
2. The MCDU "V1/VR/V2 DISAGREE" amber message appears if the inserted V1, VR, V2 do not satisfy the condition: $V1 \leq VR \leq V2$

[4L] TRANS ALT (transition altitude)

This field displays the navigation database default altitude (if defined), once the origin airport is entered. The pilot can modify it.

[5L] THR RED (thrust reduction altitude)

This is the altitude at which the pilot should reduce the thrust from TOGA/FLX to MAX CLIMB (CL detent) with all engines operative ("CLB" or "LVR CLB" flashing on the FMA).

- The thrust reduction altitude defaults to 1 500 ft above the runway elevation, or to the altitude set by the airline.
- The pilot can modify this altitude: The minimum is 400 ft above the runway elevation.

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
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ACC (Acceleration altitude)

This is the altitude at which the climb phase is triggered.

- The target speed jumps to the initial climb speed.
- The default value is 1 500 ft above runway elevation.
- The flight crew can modify the value. The minimum value is 400 ft above runway elevation, and it can be higher than, or equal to, or lower than THR RED.

Note:

- A clearing action reverts both values to the defaulted ones.
- When the crew selects an altitude on the FCU that is below THR RED, it brings THR RED and ACC down to this altitude. (The 400 ft minimum still applies).

[6L] UPLINK TO DATA

This key calls up the UPLINK TO DATA REQ page. It is only displayed in the preflight and done phases.

[1R] EO CLR

EO CLR is displayed when an engine-out is detected and when active flight phase is takeoff.

[2R] TO SHIFT

The takeoff shift is the distance in meters or feet between the beginning of the runway and the aircraft's takeoff position. When taking off from an intersection, the flight crew should insert this value to ensure a correct update of the FM position. The takeoff shift value must be positive, and cannot be greater than the runway length.

[3R] FLAPS/THS

This is a flight crew entry for the positions of the flaps and the trimmable horizontal stabilizer (THS) at takeoff.

The flight crew can modify it until takeoff, by entering "UP X.X" or "X.X UP", or "DN X.X" or "X.X DN" for the THS.

[4R] FLX TO TEMP or DRT TO (if installed) or FLX TO

The pilot inserts the FLX TO temperature for FLX takeoff setting purposes, or a derate  level. The pilot can only enter it during preflight. The system sends it to the FADEC and displays the entered data on the upper ECAM display. The TEMP value is always entered in degrees Celsius.

[5R] ENG OUT ACC

This field displays the engine-out acceleration altitude, as defined in the database, or is manually entered by the flight crew. This is for display only, as a reminder. It cannot be cleared.

The above ACC altitude rules of [5L] apply to this field.

[6R] NEXT PAGE or CONFIRM TO DATA*

This key calls up the climb performance page, or allows the pilot to revert to the previously-entered T.O. parameters, in case of runway change with the same origin airport.

Ident.: DSC-22_20-20-10-28-E-00000905.0021001 / 14 MAY 12
Applicable to: MSN 02926-02944, 04392, 07784-07792

PERF CLIMB PAGE

CLIMB PHASE
NOT ACTIVE

1L

2L

3L

4L

5L

6L

CLB

ACT MODE
MANAGED
CI
RTA CI PRED TO FL250
MANAGED UTC DIST
250 1014 66
PRESEL
*[]
PREV NEXT
<PHASE PHASE>

1R

2R

3R

4R

5R

6R

CLIMB PHASE ACTIVE
(speed manually
selected 270)

1L

2L

3L

4L

5L

6L

CLB

ACT MODE
SELECTED
CI
40 PRED TO FL250
MANAGED UTC DIST
300/.81 66
SELECTED
270/.80 1014 20
EXPEDITE 1012 10
<T/O PHASE
ACTIVATE NEXT
<APPR PHASE PHASE>

1R

2R

3R

4R

5R

6R

TITLE

CLB is displayed in large green font when climb phase is active, and in large white font when it is inactive.

[1L] ACT MODE

This field displays the preselected or active speed mode: SELECTED or MANAGED. The pilot cannot modify it from this field.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
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[2L] CI (Cost Index)	This field displays the cost index, as initialized on the INIT A or defaulted from the database, or inserted in this field by the pilot. RTA CI automatically replaces the cost index value, if a time constraint exists in the F-PLN. <u>Note:</u> <i>In case of an engine-out, EO LRC (engine-out long range cruise) replaces the CI field.</i> <i>You can enter a cost index and overwrite EO LRC. In this case, clearing the cost index reverts to EO LRC.</i>
[3L] MANAGED	This field displays the FMGS computed ECON speed/Mach <i>Refer to DSC-22_20-10-40-10 Optimization.</i> Before the CLIMB phase is active, if the preselected speed mode is SELECTED, an asterisk appears next to the MANAGED speed. In this case, pressing the 3L key preselects MANAGED speed, and 4L reverts to brackets.
[4L] PRESEL or SELECTED	If the climb phase is active: - The title of this field becomes "SELECTED". - This field displays the selected (or preselected) SPD or MACH target. - The flight crew cannot modify this field directly, but can adjust it with the FCU's SPD/MACH selection knob. - If the flight crew pushes in the FCU's SPD/MACH selection knob to revert to managed speed, the system selects (or reselects) ECON SPD/MACH, and [4L] is blank. If the climb phase is inactive: - This field displays PRESEL, as long as the climb phase is inactive. - The flight crew can only enter a preselected speed.
[5L]	EXPEDITE is displayed in green small font in the [5L] label line when the takeoff or climb phase is active. The flight crew cannot engage EXPEDITE from this field. It indicates the time and distance required to reach the altitude displayed in the 2R field, in case of climb at green dot. If the climb phase is active, T/O PHASE is displayed. This field enables the flight crew to access the PERF TAKE OFF page.
[6L] PREV PHASE	This field displays this legend, if the climb phase is inactive. The flight crew presses this key to call up the takeoff page.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION

[6L] ACTIVATE APPR PHASE	The field displays this legend, if the climb phase is active. Pressing this key once displays "CONFIRM APPR PHASE*". Pressing it again activates the approach phase.
[1R] EO CLR	In case of engine-out detection, the [1R] field displays the EO CLR prompt.
[2R] PRED TO...	This field displays the target altitude for the predictions shown in the 3R, 4R, or 5L field. It defaults to the FCU altitude, but the pilot can modify it to any altitude below MAX ALT.
[3R] [4R]	These fields show time and distance predictions for the target altitude selected in [2R], computed for the current vertical mode and speed mode (MANAGED, SELECTED). These fields are only displayed while the takeoff, or climb phase is active.
[6R] NEXT PHASE	The flight crew presses this key to call up the PERF CRZ page.

Ident.: DSC-22_20-20-10-28-E-00000906.0004001 / 03 NOV 21

Applicable to: MSN 02926-02944, 04392, 07784-07792

PERF CRUISE

CRZ PHASE NOT ACTIVE

ACT MODE	CRZ UTC	DEST	EFOB
MANAGED	1220		8.4
CI			
540			
MANAGED			
.80			
PRESEL			
* []			
		DES CABIN RATE	
		-350 FT / MN	
PREV			NEXT
<PHASE			PHASE>

[1R] [2R] [3R] [4R] [5R] [6R]

CRZ PHASE ACTIVE WITH A RTA

ACT MODE	CRZ UTC	DEST	EFOB
SELECTED	1114		8.4
CI			
RTA CI			
MANAGED			
.80			
		DES CABIN RATE	
		-350 FT / MN	
ACTIVATE			NEXT
<APPR PHASE			PHASE>

[1R] [2R] [3R] [4R] [5R] [6R]

**PERF CRZ PAGE IN
EO CONDITION**

[1L] [2L] [3L] [4L] [5L] [6L]

		CRZ			
ACT MODE	UTC	DEST	EO		
SELECTED	----		CLR★		
CI		DRIFT	DOWN		
EO LRC					
MANAGED	UTC		DIST		
.80	----		----		
SELECTED	UTC		DIST		
.78	----		----		
		DES	CABIN RATE		
			-350 FT/MN		
ACTIVATE		NEXT			
<APPR PHASE		PHASE>			

[1R] [2R] [3R] [4R] [5R] [6R]

**PERF CRUISE PAGE
WITH
PREPLANNED STEP**

[1L] [2L] [3L] [4L] [5L] [6L]

		CRZ			
ACT MODE	UTC	DEST	EO	FOB	
MANAGED	1220		8.4		
CI		AT	N47W123		
540		STEP	TO	FL250	
MANAGED	UTC		DIST		
.78	1035		1123		
PRESEL					
★[]					
		DES	CABIN RATE		
			-350 FT/MN		
PREV		NEXT			
<PHASE		PHASE>			

[1R] [2R] [3R] [4R] [5R] [6R]

TITLE

CRZ is in large green font, when the cruise phase is active, and in large white font, when it is inactive.

[1L] ACT MODE

This field shows the preselected or active speed mode : SELECTED or MANAGED.

The flight crew cannot modify it from this field.

[2L] CI

This field shows the cost index, as initialized on the INIT A page or defaulted from the database, or as inserted in this field by the flight crew.

RTA CI automatically replaces the cost index value, if a RTA exists in the F-PLN.

EO LRC automatically replaces the cost index value in case of an engine-out.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION

[3L] MANAGED

This field displays the FMGS-computed ECON speed/Mach *Refer to DSC-22_20-10-40-10 Optimization.*

Before the CRUISE phase is active, if the preselected speed mode is SELECTED, an asterisk appears next to the MANAGED speed. In this case, pressing the 3L key preselects MANAGED speed, and 4L reverts to brackets.

[4L] PRESEL

If the cruise phase is active:

This field is blank.

If the cruise phase is inactive:

The flight crew can enter a preselected speed or Mach number.

Note: *If the flight crew enters a value in the PRESEL field during the cruise altitude capture (ALT CRZ*), the FCU selected speed may revert to M 0.01.*

[6L] PREV PHASE or

The flight crew can press this key to call up the climb page, if the cruise phase is not yet active.

[6L] ACTIVATE APPR
PHASE

This field displays this legend, if the cruise phase is active. The flight crew presses this key once to change the legend to "CONFIRM APPR PHASE**".

A second press activates the approach phase.

Note: *If the flight crew inadvertently activates the approach phase, the flight crew can reselect the cruise flight level from the progress page, in order to reactivate the cruise phase.*

[1R] TIME/UTC DEST
EFOB

Before takeoff, this field displays the flight time to destination and the predicted remaining fuel on board. If the flight crew enters an estimated takeoff time, the field automatically displays the predicted arrival time (UTC) at destination. After takeoff, it displays the predicted arrival time at destination (UTC) and the remaining fuel on board (DEST EFOB) at destination, in green font.

The DEST EFOB field will turn to amber, if the EFOB at destination becomes less than the MIN DEST FOB values displayed on the FUEL PRED page. EO CLR is displayed when an engine-out is detected.

[2R] STEP TO FL XX, TO
T/D, or DRIFT DOWN

This field, in combination with 3R and 4R, displays the predictions for the step point and step altitude, the Top of Descent, or the drift down altitude.

[3R] and [4R] TIME/UTC
and DIST

These fields display the time and distance to go to the various points identified in the 2R field.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
--	--

[5R] DES CABIN RATE	This field displays MAX [computed DES cabin rate, maximum descent cabin rate]. The flight crew may modify the value : The FM then recomputes the top of descent, in order to match this value. If the FM cannot match the flight crew's entry, the FM-computed value overwrites the flight crew's entry. A clear action reverts to the default value (-350 ft/min). DES CAB RATE being a negative value, "minus" is not a necessary entry.
[6R] NEXT PHASE	This key calls up the DES page.

Ident.: DSC-22_20-20-10-28-E-00000907.0025001 / 01 OCT 12
Applicable to: MSN 02926-02944, 04392, 07784-07792

PERF DESCENT PAGE

DES PHASE
NOT ACTIVE WITH
MANAGED SPEED/
MACH SELECTED

1L

2L

3L

4L

5L

6L

DES

ACT MODE

UTC DEST EFOB

MANAGED 1215 8.4

CI

540

MANAGED

.78/340

PREV

←PHASE

NEXT

PHASE>

1R

2R

3R

4R

5R

6R

DES PHASE ACTIVE
WITH SELECTED
SPEED/MACH

1L

2L

3L

4L

5L

6L

DES

ACT MODE

UTC DEST EFOB

SELECTED 1215 8.4

CI

540

MANAGED

.81/340

SELECTED

.78/280 1200 20

EXPEDITE 1206

ACTIVATE

←APPR PHASE

NEXT

PHASE>

1R

2R

3R

4R

5R

6R

PRED TO FL250

UTC DIST

TITLE	DES is in large green font if the descent phase is active, and in large white font if it is inactive.
[1L] ACT MODE	This field displays the preselected or active speed mode (MANAGED or SELECTED). The flight crew cannot modify it from this field.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION

[2L] CI	This field displays the cost index, as initialized on the INIT A page or defaulted from the database, or inserted in this field by the flight crew. RTA CI automatically replaces the cost index value, if a time constraint exists in the F-PLN. The flight crew cannot modify in descent/approach phase below the descent speed limit altitude, or FL 100, whichever is higher.
[3L] MANAGED	Before the flight crew makes any entry, this field displays "MANAGED" in white, with the associated ECON descent Mach or speed, in blue. The crew may overwrite the ECON descent Mach or speed, by entering a Mach number or a speed in this field. The system uses the pilot's entry to compute the descent profile. The descent may be flown in managed, using this new pilot entry. The entry is modifiable. It can be cleared to revert to ECON speed/Mach.
[4L] blank or SELECTED	<u>If the descent phase is inactive, or the descent phase is active but the active speed mode is MANAGED:</u> - This field is blank. <u>If the descent phase is active, and the active speed mode is SELECTED:</u> - The field displays the speed or Mach target manually selected by the pilot. "SELECTED" is displayed in the [1L] field. - To modify the field value, the pilot uses the FCU's SPD/MACH selector knob. The [4L] field and FCU window will display the same value. - Pushing in the FCU speed selector knob activates the managed SPD/MACH target displayed in the [3L] field.
[5L] Blank or EXPEDITE	If the descent phase is inactive, this field is blank. Displays this legend, if the descent phase is active. It indicates the time and distance required to reach the altitude displayed in the 2R field at MMO/VMO speed. The pilot cannot select the EXPEDITE mode from this field.
[6L] PREV PHASE or ACTIVATE APPR PHASE	This key calls up the cruise phase page, if the descent phase is not yet active. Displayed, if the descent phase is active. Pressing this key once makes "CONFIRM APPR PHASE" appear. A second press activates the approach phase.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
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[1R] TIME/UTC DEST
EFOB

Before takeoff, this field displays the flight time to destination and the predicted remaining fuel on board. If the crew enters an estimated takeoff time, the field automatically displays the predicted arrival time (UTC).

After takeoff, it displays the predicted arrival time at destination (UTC) and the remaining fuel on board (DEST EFOB) at destination, in green font.

The DEST EFOB field will turn to amber, if the EFOB at destination becomes less than the MIN DEST FOB value displayed on the FUEL PRED page. EO CLR is displayed when an engine-out is detected.

[2R] PRED TO...

This field displays the target altitude for the predictions in [3R], [4R], or [5L].

The display defaults to the FCU-selected altitude. The flight crew can modify it to any altitude lower than the present altitude.

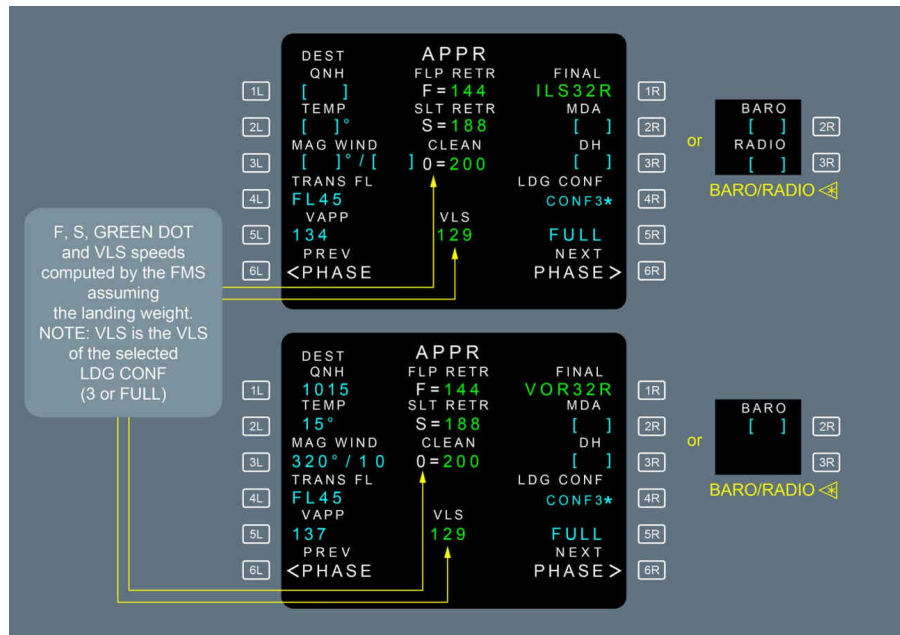
[3R] [4R]

These fields display time and distance predictions down to the target altitude selected in [2R], computed for the current vertical mode (DES or OP DES) and the indicated speed mode (MANAGED or SELECTED).

[6R] NEXT PHASE

The pilot presses this key to call up the PERF APPR page.

PERF APPR PAGE



TITLE

The page title displays **APPR**, if the Approach phase is not active or **APPR**, if it the Approach phase is active.

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
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[1L] QNH

This field displays brackets, when the aircraft is more than 180 NM from the destination. Inside 180 NM, mandatory amber boxes appears.

The flight crew must enter the QNH in hectopascals (hPa) or in inches of mercury (inHg). The value is either entered in hPa or inHg:

- For hPa, enter three or four digits within the allowable range for hPa, or
- For inHg, enter the four digits of the desired value with or without a decimal point, within the allowable range for inHg.

The system interprets:

- 1 003 as 1 003 hPa
- 2900 as 29.00 inHg
- 29.92 as 29.92 inHg.

The flight crew can modify this entry at any time.

Note: *An erroneous entry of an OAT or BARO minimum in QNH field (e.g. 22 °C or 2 200 ft) is accepted by the system. As a consequence, the CPC computes an erroneous cabin pressurization segment during descent, then may trigger a pressurization ECAM alert.*

The FMS uses the QNH:

- To compute the descent profile
- To compute the FLS beam on aircraft equipped with the FLS  option.

[2L] TEMP

This field displays the temperature at destination. Until the flight crew enters the temperature, the field displays brackets. The flight crew can modify this figure.

The system uses this temperature to:

- Refine its computation of the descent profile (ISA model)
- Compute the FLS beam on aircraft equipped with the FLS  option.

[3L] MAG WIND or TRUE WIND

In this field, the flight crew enters the magnetic wind at the destination in knots. The system transmits any entry made in this field to the VERTICAL REVISION and FLIGHT PLAN B pages (which display wind direction as true, not magnetic).

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION

[4L] TRANS FL	This field displays the transition flight level, computed by the FMS based on the transition altitude (extracted from the database) and the QNH value entered in the [1L] field. It is rounded to the upper multiple of 5. By default, it is displayed in small font. The flight crew can modify it (it is then displayed in large font).
[5L] VAPP	The FMGC computes this approach speed, using the formula: $VAPP = VLS + 1/3 \text{ of the headwind components (limited to } VLS + 5 \text{ kt as a minimum and } VLS + 15 \text{ kt as a maximum).}$ The flight crew can modify VAPP. A clear action reverts VAPP to the computed value. <u>Note:</u> <i>VLS = 1.23 VS1G of the selected landing configuration (FULL or 3).</i>
[6L] PREV PAGE	This field displays this legend, if the approach phase is not active. Pressing this key calls up the PERF DES page.
[1R] FINAL	This field displays the approach specified in the flight plan. The flight crew cannot modify it from this field.
[2R] MDA/MDH or BARO ◀▶	This field displays: - The MDA with associated brackets, or - The MDH with associated brackets, if: - The aircraft is equipped with QFE ◀▶ option, or - The FCU setting is QFE, if the aircraft is equipped with the BARO ◀▶ option. The flight crew inserts the value, which can be modified at any time. If the flight crew makes an entry in the [3R] field, or changes the approach, it clears this figure.
[3R] DH or RADIO ◀▶	If the flight plan includes an ILS, GLS ◀▶ or MLS ◀▶ approach, this field displays DH or RADIO ◀▶ and empty brackets. For a CAT II or CAT III approach, the flight crew inserts the decision height. The decision height is a radio altimeter height. The system will accept an entry of NO. If the flight crew inserts an MDA or an MDH (or a BARO ◀▶ value) in [2R] field, this erases the decision height, and the field reverts to brackets. The RADIO ◀▶ range is from 0 to 700 ft.
[4R] LDG CONF CONF 3	The flight crew can select CONF 3 by pressing this key. This moves the * down to the [5R] field, that displays FULL.

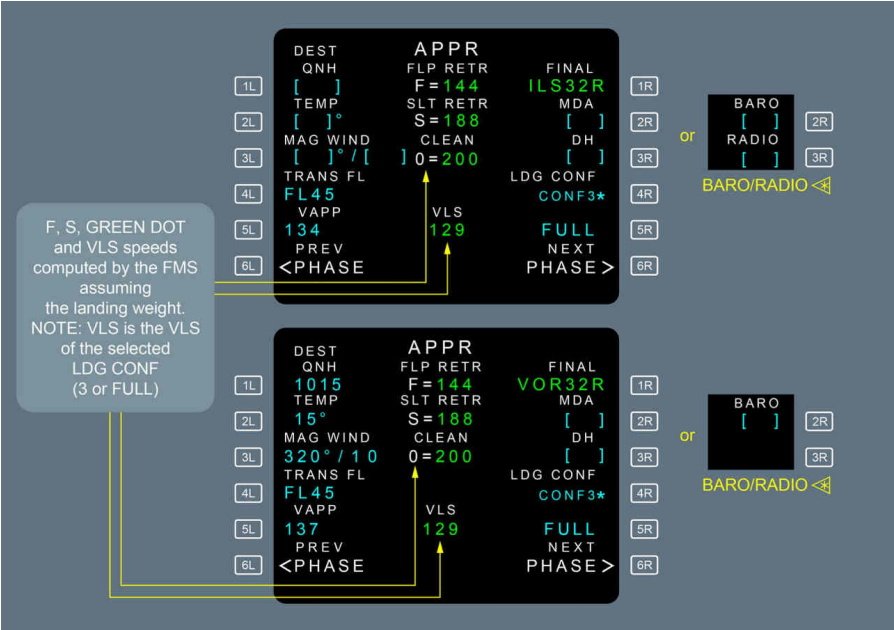
- [5R] FULL

The flight crew can use this key to select CONF FULL when necessary. CONF FULL is the default landing configuration.
- [6R] NEXT PHASE

Pressing this key calls up the PERF GO AROUND page.

Ident.: DSC-22_20-20-10-28-E-00016135.0006001 / 12 MAY 25
Applicable to: MSN 04392

PERF APPR PAGE



- TITLE

The page title displays **APPR**, if the Approach phase is not active or **APPR**, if it the Approach phase is active.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT
CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION

[1L] QNH

This field displays brackets, when the aircraft is more than 180 NM from the destination. Inside 180 NM, mandatory amber boxes appears.

The flight crew must enter the QNH in hectopascals (hPa) or in inches of mercury (inHg). The value is either entered in hPa or inHg:

- For hPa, enter three or four digits within the allowable range for hPa, or
- For inHg, enter the two digits of the desired value or two digits followed by a decimal point and two additional digits, within the allowable range for inHg.

The system interprets:

- 1 003 as 1 003 hPa
- 29 as 29.00 inHg
- 29.92 as 29.92 inHg.

The flight crew can modify this entry at any time.

Note: An erroneous entry of an OAT or BARO minimum in QNH field (e.g. 22 °C or 2 200 ft) is accepted by the system. As a consequence, the CPC computes an erroneous cabin pressurization segment during descent, then may trigger a pressurization ECAM alert.

The FMS uses the QNH:

- To compute the descent profile
- To compute the FLS beam on aircraft equipped with the FLS  option.

[2L] TEMP

This field displays the temperature at destination. Until the flight crew enters the temperature, the field displays brackets. The flight crew can modify this figure.

The system uses this temperature to:

- Refine its computation of the descent profile (ISA model)
- Compute the FLS beam on aircraft equipped with the FLS  option.

[3L] MAG WIND or TRUE WIND

In this field, the flight crew enters the magnetic wind at the destination in knots. The system transmits any entry made in this field to the VERTICAL REVISION and FLIGHT PLAN B pages (which display wind direction as true, not magnetic).

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
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[4L] TRANS FL	This field displays the transition flight level, computed by the FMS based on the transition altitude (extracted from the database) and the QNH value entered in the [1L] field. It is rounded to the upper multiple of 5. By default, it is displayed in small font. The flight crew can modify it (it is then displayed in large font).
[5L] VAPP	The FMGC computes this approach speed, using the formula: $VAPP = VLS + 1/3$ of the headwind components (limited to $VLS + 5$ kt as a minimum and $VLS + 15$ kt as a maximum). The flight crew can modify VAPP. A clear action reverts VAPP to the computed value. <u>Note:</u> <i>VLS = 1.23 VS1G of the selected landing configuration (FULL or 3).</i>
[6L] PREV PAGE	This field displays this legend, if the approach phase is not active. Pressing this key calls up the PERF DES page.
[1R] FINAL	This field displays the approach specified in the flight plan. The flight crew cannot modify it from this field.
[2R] MDA/MDH or BARO 	This field displays: - The MDA with associated brackets, or - The MDH with associated brackets, if: - The aircraft is equipped with QFE  option, or - The FCU setting is QFE, if the aircraft is equipped with the BARO  option.
[3R] DH or RADIO 	The flight crew inserts the value, which can be modified at any time. If the flight crew makes an entry in the [3R] field, or changes the approach, it clears this figure. If the flight plan includes an ILS, GLS  or MLS  approach, this field displays DH or RADIO  and empty brackets. For a CAT II or CAT III approach, the flight crew inserts the decision height. The decision height is a radio altimeter height. The system will accept an entry of NO. If the flight crew inserts an MDA or an MDH (or a BARO  value) in [2R] field, this erases the decision height, and the field reverts to brackets. The RADIO  range is from 0 to 700 ft.
[4R] LDG CONF CONF 3	The flight crew can select CONF 3 by pressing this key. This moves the * down to the [5R] field, that displays FULL.

[5R] FULL

The flight crew can use this key to select CONF FULL when necessary. CONF FULL is the default landing configuration.

[6R] NEXT PHASE

Pressing this key calls up the PERF GO AROUND page.

Ident.: DSC-22_20-20-10-28-E-00000909.0002001 / 16 MAR 11
 Applicable to: MSN 02926-02944, 04392, 07784-07792

PERF GO AROUND

1L 2L 3L 4L 5L 6L GO AROUND FLP RETR F=144 SLT RETR S=188 CLEAN 0=200 THR RED / ACC ENG OUT ACC 1500 / 2000 2000 PREV <PHASE		1R 2R 3R 4R 5R 6R GO AROUND FLP RETR F=144 SLT RETR S=188 CLEAN 0=200 THR RED / ACC ENG OUT ACC 1500 / 2000 2000 ACTIVATE NEXT <APPR PHASE PHASE>	
GO AROUND PHASE NOT ACTIVE		GO AROUND PHASE ACTIVE	

TITLE

GO AROUND is in large white font, if the go-around phase is not active; it is in large green font if it is.

[5L] THR RED ACC

This field displays the thrust reduction altitude and the acceleration altitude.

Thrust reduction altitude:

- Altitude at which thrust must be reduced from takeoff/go-around thrust to maximum climb thrust.
- “CLB” or “LVR CLB” flashing on the flight mode annunciator.
- Defaults to 1 500 ft above destination runway elevation, or to the altitude set by the airline.
- Can be modified by the crew (minimum 400 ft above destination runway elevation).

Acceleration altitude:

- Altitude at which target speed increase to Green Dot speed (See the note below).
- Defaults to 1 500 ft above the destination runway elevation, or to the altitude set by the airline.
- Can be modified by the crew, but is always equal to or higher than the thrust reduction altitude.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
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[6L] PREV PHASE or	This field displays this legend, if the go-around phase is inactive. Pressing the key calls up the PERF APPR page.
ACTIVATE APPR PHASE	This field displays this legend, if the go-around phase is active. Pressing it once makes “CONFIRM APPR” appear. A second press activates the approach phase.
[5R] ENG OUT ACC	This display has the same characteristics as the display beside the 5R key on the takeoff page. It is for display only, and the pilot can modify it.
[6R] NEXT PHASE	Pressing this key calls up the PERF APPR page.
[1R] Blank or EO CLR*	This field is normally blank. EO CLR* is displayed when the GO AROUND phase is active, and an engine-out condition is detected.

Note: When the go-around phase is active, if the pilot enables ALTN or if the pilot inserts a new destination in the active flight plan, the go-around phase automatically shifts into the climb phase. (The target speed jumps from green dot speed to initial climb speed).

PROG PAGES

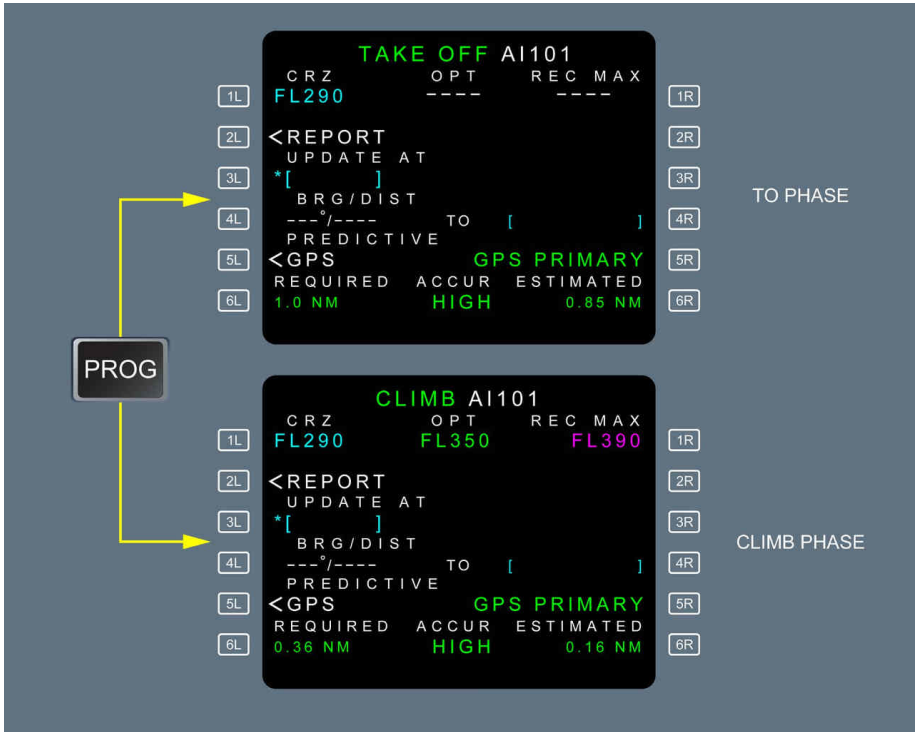
Applicable to: MSN 02926-02944, 04392, 07784-07792

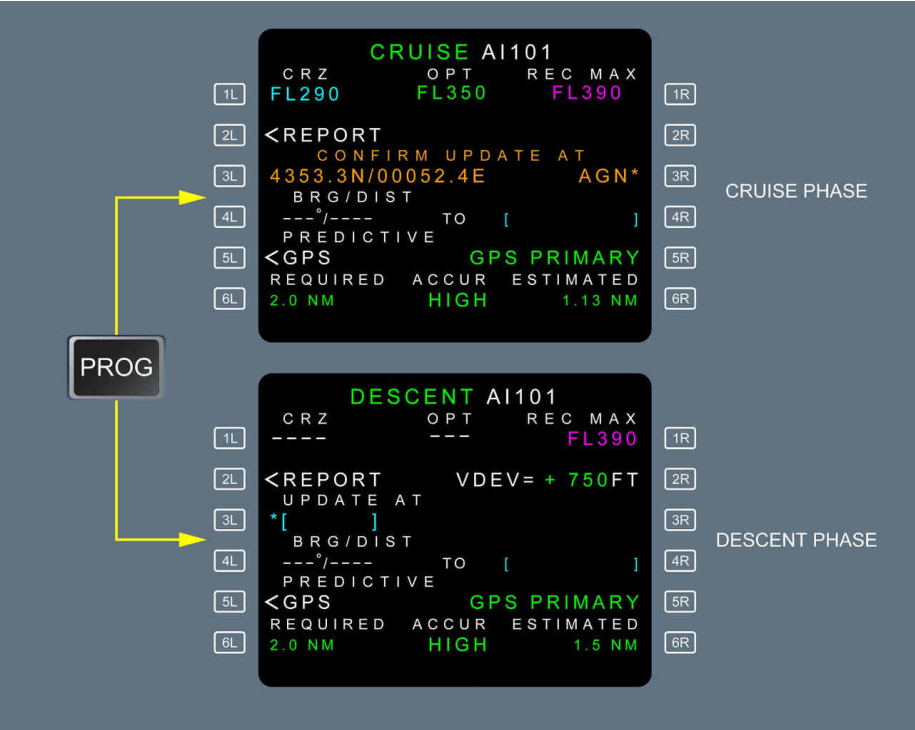
Ident.: DSC-22_20-20-10-28-F-00000910.0030001 / 17 NOV 20

- The progress page is a multifunction page that enables the pilot to:
- Select a new cruise flight level;
 - Crosscheck the navigation accuracy of the Flight Management (FM) system and validate it;
 - Update the FM position;
 - Monitor the descent.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION





TITLE	Different for each flight phase (see above). The vertical phase is in large green font. The flight number is in large white font. EO is large green amber font, if the engine-out condition is detected.
Line 1 CRZ (blue)	This line displays the cruise flight level, inserted on the INIT A page or directly in this field in blue. If the FCU is used to select an altitude that is higher than the one displayed, the system changes the displayed number to match the one selected by the FCU. In this line, the flight crew cannot insert a flight level that is lower than the FCU-selected altitude. This field shows dashes when the descent or approach phase is active.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION

OPT	This field displays the optimum flight level (in green), that is computed based on the current gross weight, cost index, temperature, wind This flight level requires a 5 min minimum cruise time at a minimum cruise flight level of FL 100. It displays dashes if an engine-out is detected:
REC MAX	This field displays the recommended maximum altitude (in magenta), that is computed based on the current gross weight and temperature, and assuming that the anti-ice is off (if icing conditions are expected, use the performance application of the EFB). It provides the aircraft with a 0.3 g buffet margin, a minimum rate of climb at MAX CL thrust, and level flight at MAX CRZ thrust. This field is limited to FL 398. If one engine is out, this field displays the recommended maximum engine-out altitude, that is computed based on the long-range cruise speed and assuming that anti-ice is off.
[2L] REPORT	This key calls up the REPORT PAGE.
[2R] VDEV	This field is displayed during the descent and approach phases, when NAV mode is engaged without crosstrack error limitation, or in HDG mode, provided that the crosstrack error (XTK) is less than 4 NM. In the particular case of a DIR TO RADIAL INBND, this field is displayed while the DIR TO RADIAL INBND is flown without crosstrack error (XTK) limitation. It displays the vertical deviation between the aircraft's current altitude and the FMGC-computed vertical profile.



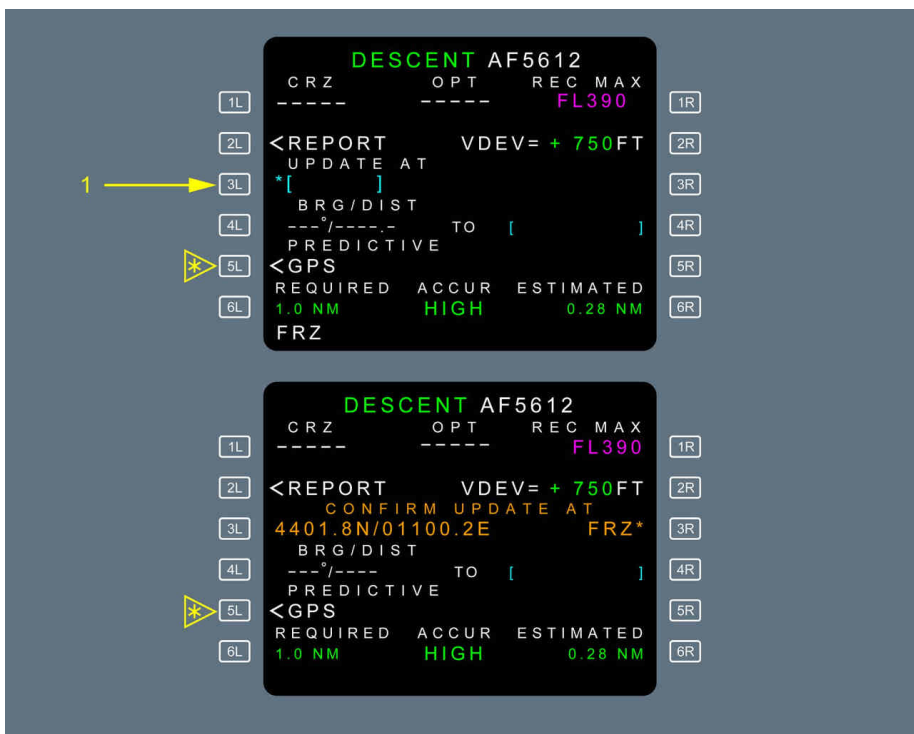
Line 3 UPDATE AT

The flight crew can update the FMGC position via this field by entering either the IDENT of a waypoint, a NAVAID, an airport, a latitude and longitude, or a place/bearing/distance, or a place-bearing/place-bearing.

When the flight crew has entered this data, this field changes its format to: "CONFIRM UPDATE AT", followed by the latitude/longitude and IDENT of the inserted position with an asterisk.

The flight crew presses the right-hand key adjacent to the asterisk to confirm the update, when the aircraft overflies the inserted position.

Note: If no IDENT has been inserted, the field displays "ENTRY", instead of an IDENT.



AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

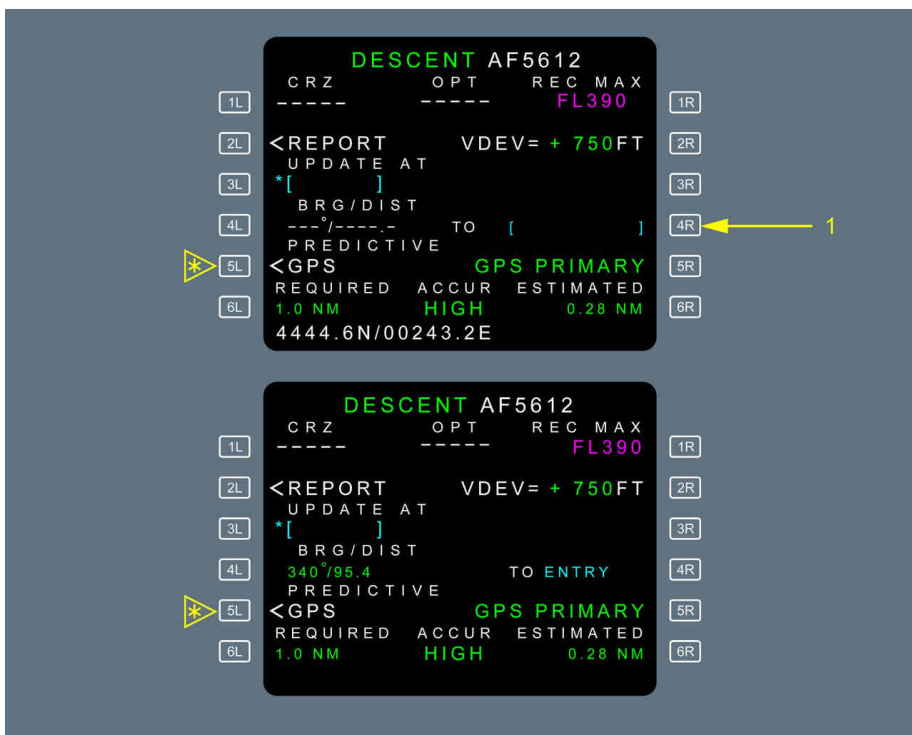
CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION

Line 4 BRG/DIST

On this line, the pilot can enter an airport, a waypoint, a NAVAID, or a runway. The pilot may enter each as an IDENT, a latitude/longitude (LL), a place/bearing/distance (PBD), or a place-bearing/place-bearing (PBX). The field then shows the FMGC-computed bearing and distance from this site to the aircraft's present position. The last distance digit is in 1/10 of a NM. If it does not have an IDENT, the point is called "ENTRY".

Example: BRG/DIST

340 °/95.4 to ENTRY



[5L] PREDICTIVE GPS  This prompt gives access to the PREDICTIVE GPS page.

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
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[5R] GPS PRIMARY 	This prompt is displayed when the FMS navigation mode is GPS PRIMARY. This field is blank, when GPS PRIMARY is unavailable, or the navigation mode is not GPS/IRS. When the GPS PRIMARY function is not embedded, this field displays: - The “REQD DIST TO LAND = ” - The “DIR DIST TO DEST = “ The scratchpad displays the relevant “GPS PRIMARY” message when this prompt appears, and “GPS PRIMARY LOST” when the field goes blank.
[6L] REQUIRED	This field displays the default value for the required navigation accuracy level. The pilot can modify it. Provided no pilot entry has been made, the default value changes according to the actual flight area (enroute, terminal, approach; <i>Refer to DSC-22_20-10-40-10 General</i>).
ACCUR HIGH/LOW	This field shows the flight management system's estimate of navigational accuracy. “HIGH” indicates that the FMS estimates that the navigational accuracy matches the accuracy criteria of the currently flown area. “LOW” indicates the criteria is not matched.
[6R] ESTIMATED	This field displays the current estimated navigation accuracy value (EPE), as computed by the FMS.

Ident.: DSC-22_20-20-10-28-F-00000911.0001001 / 04 DEC 18

PREDICTIVE GPS PAGE (IF INSTALLED)

- Note:
1. This page is only displayed with Honeywell ADIRS.
 2. This page cannot be used as a substitute to determine pre-flight planning RAIM availability when required by operational regulations. *Refer to PRO-NOR-SOP-02 GPS PRIMARY Availability (If Installed).*

The pilot accesses this page by pressing the PREDICTIVE GPS prompt of the PROG page. This page displays information relative to predictive availability of GPS PRIMARY at destination and at any waypoint selected by the crew.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION



[1L] DEST

This field displays the destination airport, as currently selected in the active flight plan. It cannot be modified.

Dashes appear in this field, when no destination airport exists.

[1R] ETA

This field is defaulted to the estimated arrival time, as computed by the FMS (small blue font). The pilot may enter a value in this field (large blue font). Amber boxes are displayed when no prediction exists, or when the crew entry has been cleared.

Line 2 PRIMARY Y/N

This line shows the predicted primary status at the destination airport for the following times:

- Estimated time of arrival $\pm 5, 10, 15$ min.
- Availability of GPS PRIMARY at the corresponding times, is indicated by Y, if PRIMARY is predicted to be available and by N if GPS PRIMARY is predicted to be unavailable.
- These fields are blank, when the destination [1L], or time [1R] field is not defined.

[3L] WPT

The pilot may enter a reference waypoint in this field.

Blue brackets appear, when no entry has been made.

[3R] ETA

When a reference waypoint has been entered in the [3L] field, amber boxes appear. The crew is prompted to enter a reference time in this field.

Line 4 PRIMARY Y/N

Information equivalent to [2L]/[2R] is displayed for any pilot-selected waypoint. The corresponding arrival time is also displayed.

Line 5 DESELECTED SATELLITES and Line 6 SATELLITES

This line enables the pilot to deselect up to four satellites by inserting the corresponding satellite number. This number then appears in large blue font. When deactivated, the satellites are not considered for predictive GPS availability at the destination or at a selected waypoint. The deselection is cancelled when the entry is cleared (blue brackets appears), or when the field is overwritten by a different satellite number.

Ident.: DSC-22_20-20-10-28-F-00000912.0001001 / 16 MAR 11

REPORT PAGE

The pilot calls this page by pressing the [2L] key on the PROG page :

2L

3L

4L

5L

6L

<REPORT
UPDATE AT
*[]
BRG/DIST
---°/--- TO
PREDICTIVE
<GPS
REQUIRED ACCUR
0.36NM HIGH

1L

2L

3L

4L

5L

6L

REPORT AI101

OVHD UTC ALT

TO 1028 5000

NEXT

AUCH 1036 FL145

SAT T.WIND FOB

---° ---°/--- ---

DEST UTC DIST EFOB

LFBZ 1110 396 2.0

1R

2R

3R

4R

5R

6R

REPORT PAGE IN PREFLIGHT PHASE

1L

2L

3L

4L

5L

6L

REPORT AI101

OVHD UTC ALT

LMG 1013 FL380

TO 1028 FL380

NEXT

AUCH 1036 FL380

SAT T.WIND FOB

-42° 145°/063 18.0

T/D UTC DIST

AT FL380 1055 302 SEND*

DEST UTC DIST EFOB

LFBZ 1110 396 2.0

1R

2R

3R

4R

5R

6R

REPORT PAGE IN FLIGHT

This page displays information related to the FROM, TO, NEXT, and DEST waypoints, as well as the current wind, temperature, distance and time to the next cruise profile change.

TITLE (White)

This field indicates the flight number. If an engine-out is detected, this line shows "EO" in amber.

[1L] OVHD (green)

Displays the last sequenced waypoint. This field never displays the pseudo-waypoints and the F-PLN markers (T-P, PPOS, IN-BND, OUT-BND).

[1R] UTC/TIME ALT (green)

Displays the time and altitude recorded at the time of sequence.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT
CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION

- [2L]-[2R] TO (green) Displays the active waypoint, predicted time of arrival, and predicted altitude at this waypoint.
Note: Time and altitude values are identical to those values on the F-PLN pages.
- [3L]-[3R] NEXT (green) Same information for the next waypoint.
- [4L] [4R] SAT/T.WIND/FOB (green) This field displays the static air temperature, the wind direction and velocity, and the FOB recorded at waypoint sequencing.
- [5L] T/D/UTC/DIST (green) This field displays the estimated time, and the distance to go to the next change of the cruise profile (T/D, S/C, S/D). This data is only displayed if the cruise phase is active.
- [5R] SEND* (blue) The crew uses this prompt to downlink a position report.
 This field may be blank, depending on airline policy.
- Line 6 This field displays the estimated time of arrival, the distance along the DEST/UTC/DIST/EFOB F-PLN, and the estimated fuel on board at destination.
 This display is identical to the information on the F-PLN pages.
- Note: No data can be inserted or modified on the REPORT page.*

RADIO NAV PAGE

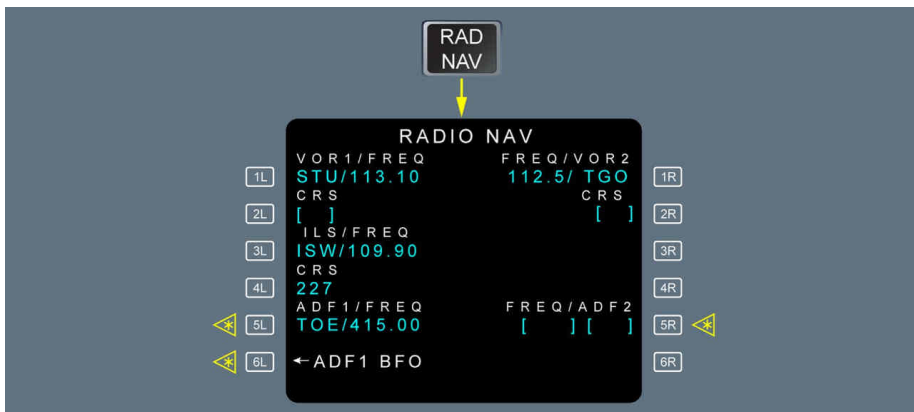
Ident.: DSC-22_20-20-10-28-00000913.0002001 / 14 NOV 24

Applicable to: MSN 02926-02944, 04392, 07784-07792

This page enables the flight crew to select or verify the radio NAVAIDs, tuned for display purposes only.

These NAVAIDs include: VOR, VOR/DME, TAC, VORTAC, ILS, and ADF  .

If either RMP is set on NAV, this page is blank on both MCDUs.



Line 1 VOR1/FREQ
FREQ/VOR2

This line displays the identifiers and frequencies of VORs 1 and 2, whether they are automatically or manually tuned.

To manually tune a VOR, the flight crew inserts the ident or frequency. If the ident is not in the database, the NEW NAVAID page comes up. A “clear” action reverts the selection to the autotuned NAVAID.

Line 2 CRS

This line displays courses for the NAVAIDs in Line 1.

The flight crew can manually enter the courses from these fields.

[3L] ILS/FREQ

This field displays the ident and frequency of an ILS. It is autotuned, if the ILS is associated with the departure runway, or if the flight plan shows an ILS approach selected for the destination. The ILS may also be entered manually. When the manually-entered ILS differs from the ILS that would be autotuned, **RWY/ILS MISMATCH** appears.

[4L] CRS

This field displays the course associated with the ILS in Line 3. It comes up automatically if an ILS is autotuned, or if an ILS has been manually tuned via its ident. Otherwise, the course must be entered manually.

The course may be backbeam (Bxxx) or frontbeam (Fxxx).

[4R] SLOPE CRS 

In this field, the flight crew enters the slope and course of the MLS .

The course may be backbeam (Bxxx) or frontbeam (Fxxx).

Line 5 ADF1  /FREQ
FREQ/ADF2 

This line displays the identifiers and frequencies of ADF 1 and ADF 2.

The flight crew can use the ident or the frequency to manually tune the ADF.

Line 6 ADF1  BFO
BFO ADF2 

When an ADF is selected, these fields display an ADF/BFO prompt. The flight crew presses this key once to erase the arrow and revert ADF to BFO mode. A clear action recalls the arrow, and cancels BFO.

- Note:
- The autotune function only works for NAVAIDs stored in the database.
 - When tuning manually, the Operator should use the ident, rather than the frequency, unless the NAVAID is not in the database.
 - Manually-tuned frequencies are displayed in large font.

SECONDARY PAGES

Ident.: DSC-22_20-20-10-28-00000914.0021001 / 12 NOV 24

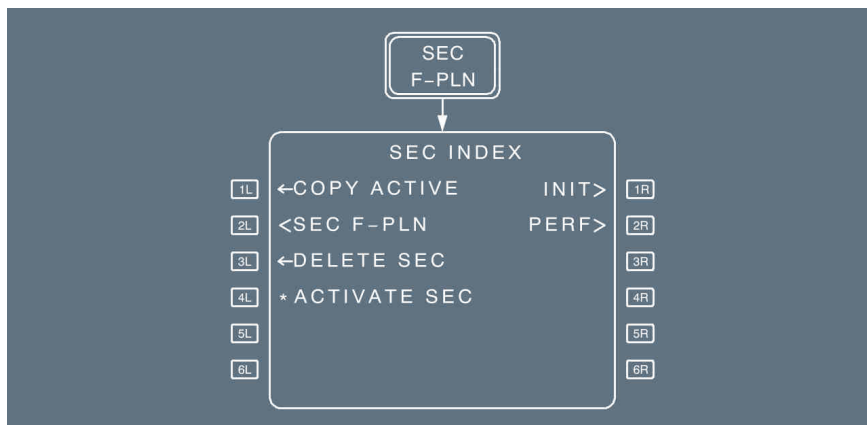
Applicable to: MSN 02926-02944, 04392, 07784-07792

The SEC F-PLN key on the MCDU console allows the flight crew to call up the secondary index page and the secondary flight plan page. The secondary flight plan is generally used to prepare a diversion an alternate routing, for predictable runway changes at takeoff or landing, or for a next flight.

There are two types of secondary index page, depending on whether a secondary flight plan has already been defined.

SECONDARY INDEX PAGE

A SECONDARY FLIGHT PLAN IS ALREADY DEFINED



- [1L] COPY ACTIVE (blue) The pilot presses this key to copy the active flight plan into the secondary flight plan, and to erase the previous secondary plan.

Note: When created with a copy active, the FROM/TO pair of the secondary flight plan is not modifiable on SEC INIT A page. The SEC F-PLN is to be deleted before any FROM/TO modification.

- [2L] SEC F-PLN (white) The pilot presses this key to call up the secondary flight plan pages.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
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- [3L] DELETE SEC (blue)

[4L] ACTIVATE SEC (amber)

Note: When flying in NAV mode, it is not possible to activate the SEC F-PLN, if the first leg of the SEC F-PLN is not compatible with the current active leg: If the crew presses the “ACTIVATE SEC” prompt, the SEC F-PLN activation is rejected and the “SELECT HDG/TRK FIRST” message is displayed in the scratchpad.

 - The SEC F-PLN activation is rejected
 - The “SELECT HDG/TRK FIRST” message is displayed in the scratchpad.

[5L] ATC REJ INFO (amber)

[1R] INIT (white)

[2R] PERF (white)

The pilot presses this key to delete the current secondary flight plan.

The pilot presses this key to activate the secondary flight plan as the active flight plan. With such an action, activation is immediate and no temporary flight plan is created.

This prompt is displayed when the FMS rejects at least one element from a F-PLN uplink. When selected, the MCDU displays the ATC REJ INFO page.

This prompt is always displayed. It gives access to the SEC INIT A and B pages.

The flight crew presses this key to call up the performance pages of the secondary flight plan.

In flight, when the active flight plan has been copied, this prompt only appears if the first lateral leg of the secondary flight plan is identical to the active leg of the primary flight plan. During preflight, this prompt is always displayed.

A SECONDARY FLIGHT PLAN IS NOT DEFINED



- [1L] COPY ACTIVE (blue)

The pilot presses this key to copy the primary active flight plan into the secondary flight plan.

- | | |
|------------------------|---|
| [2L] SEC F-PLN (white) | The pilot presses this key to call up the secondary flight plan pages. |
| [1R] INIT (white) | This prompt allows access to the SEC INIT A and B pages.
It is similar to the active INIT page, but blue brackets replace all the amber boxes. |

SECONDARY FLIGHT PLAN PAGES

The secondary flight plan pages A and B are identical to those of the active flight plan. They are automatically sequenced, only when the secondary flight plan is copied from the primary one and their active legs are identical.

No temporary flight plan is created in a secondary flight plan: the lateral and vertical revisions are directly inserted into the secondary flight plan.

Moreover, the active and secondary flight plan pages differ from one another as follows:

SECONDARY LATERAL REVISION PAGES

- OFFSET and FIX INFO are not available.

SECONDARY INIT A AND B PAGES

- Blue brackets are displayed by default.

SECONDARY STEP ALTITUDE PAGES

These pages operate as the active STEP ALTS page.

SECONDARY WIND PAGES

Do not have a history wind page.

SECONDARY PERFORMANCE PAGES

- All boxes are replaced by blue brackets.
- Have neither an engine-out mode, nor an engine-out long-range cruise cost index.
- Have no expedite predictions.
- Have no ACTIVATE/CONFIRM APPROACH PHASE prompt.
- Have no PRED TO ALTN predictions on the PERF CLB and PERF DES pages.
- Have no top of descent, no cabin descent rate information on the PERF CRZ page.

The secondary flight plan does not have a FUEL PRED page.

THE SECONDARY INIT A PAGE IS ALSO USED TO REQUEST OR DISPLAY AN UPLINK INIT MESSAGE RECEIVED AFTER ENGINE START.

This uplink INIT message can be cleared or inserted as SEC INIT data.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION

1L	SEC INIT		1R
2L	CO RTE	FROM/TO	2R
3L	[]	[]/[]	3R
4L	ALTN/CO RTE	INIT	4R
5L	-----	REQUEST *	5R
6L	FLT NBR		6R
	[]		
	COST INDEX	WIND>	
	---	TROPO	
	CRZ FL/TEMP	36090	
	----- / ---°		

1L	SEC INIT		1R
2L	CO RTE	FROM/TO	2R
3L	[]	[]/[]	3R
4L	ALTN/CO RTE	INSERT	4R
5L	-----	UPLINK *	5R
6L	FLT NBR		6R
	[]		

[2R] INIT REQUEST*

This field enables INIT data to be requested from the ground.

[2R] INSERT UPLINK*

An uplink message has been received following a request.
The message can be cleared or entered on the SEC INIT page.

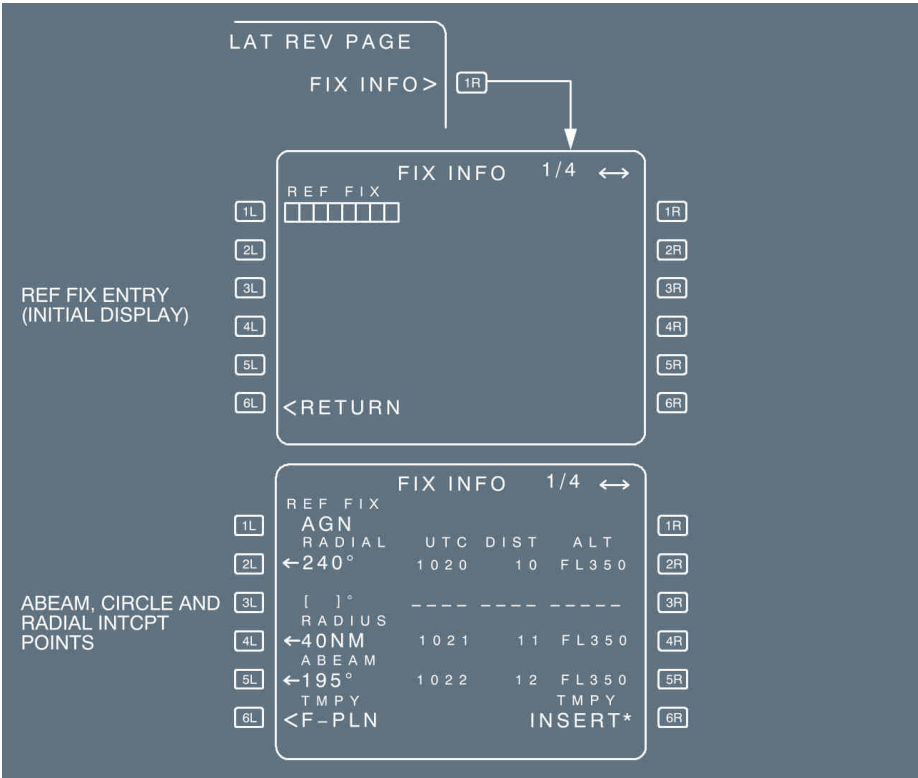
SECONDARY INIT A
PAGE AFTER UPLINK
MESSAGE INSERTION.

1L	SEC INIT		1R
2L	CO RTE	FROM/TO	2R
3L	20441	LFBO/EGLL	3R
4L	ALTN/CO RTE	INIT	4R
5L	EGKK	REQUEST *	5R
6L	FLT NBR		6R
	AIB104		
	COST INDEX	WIND>	
	100	TROPO	
	CRZ FL/TEMP	36090	
	FL340 / -52°		

RADIAL FIX INFO PAGES

Ident.: DSC-22_20-20-10-28-00009559.0021001 / 14 MAY 12
 Applicable to: MSN 02926-02944, 04392, 07784-07792

The FIX INFO pages provides access to the RADIAL, CIRCLE and ABEAM intercept functions. The reference may be a given database fix or a pilot-defined element. If the radial, circle or abeam intercepts the active or temporary flight plan, the intersection point can be converted to a waypoint and inserted into the flight plan. The FIX INFO pages may be accessed from the LAT REV page, after performing a lateral revision at the origin airport, or at FROM or at any F-PLN waypoint of the primary flight plan (except Destination).



- [1L] REF FIX (blue)
- Enables entry of the REF FIX. This reference may be any database element (NAVAID, waypoint, NDB, airport, runway) or a pilot-defined element. Before entry, amber boxes are displayed.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
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[2L] – [2R] RADIAL (blue)
and [3L] – [3R] (blue)

Enables entry of a radial from the REF FIX.

If the radial line intersects the active flight plan, the FMGS will compute the time, the along path DIST (Distance To Go), and the altitude at the intersection point (small green font). A large blue selection arrow is then displayed to insert the intersection waypoint into the temporary flight plan. This waypoint is not part of the pilot-stored elements.

It is automatically labelled:

“XXXNNN” XXX = First 3 letters of the REF FIX ident.
NNN = Value of the radial

[4L] - [4R] RADIUS (blue)

This function enables the flight crew to enter a radius that defines a circle around the REF FIX.

When the circle intercepts the current flight path, the FMGS will compute the time, the along path distance and the altitude at the first intersection point, from the current aircraft position (small green front). A large blue selection arrow is then displayed to insert the intersection waypoint into the temporary flight plan. This waypoint is not part of the pilot stored element.

The waypoint is automatically labelled:

“DNNNXXX” NNN = Value of the radius
XXX = First 3 letters of the REF FIX ident.

[5L] - [5R] ABEAM

This function enables the pilot to create a waypoint in the flight plan (primary or secondary) that is abeam the reference fix (REF FIX).

Once computed, the page displays the radial number in large green font. The FMGS computes the time, the along path distance, and altitude at the abeam point (small green font).

A large blue selection arrow is then displayed to insert the waypoint into the temporary flight plan.

The waypoint is labelled: “AB” + the REF FIX ident, for example, with “TOU” VOR, “ABTOU”.

[6L] TMPY F-PLN or
RETURN

This field displays “TMPY F-PLN” in yellow font, if a temporary flight plan exists. It enables to return to the temporary flight plan page.

Otherwise, the RETURN prompt is displayed and enables to return to the LAT REV page.

[6R] TMPY INSERT*

Activates the temporary flight plan.

Note: Four FIX INFO pages, providing the capability to define four different REF FIX elements, are available.

CLOSEST AIRPORTS PAGES

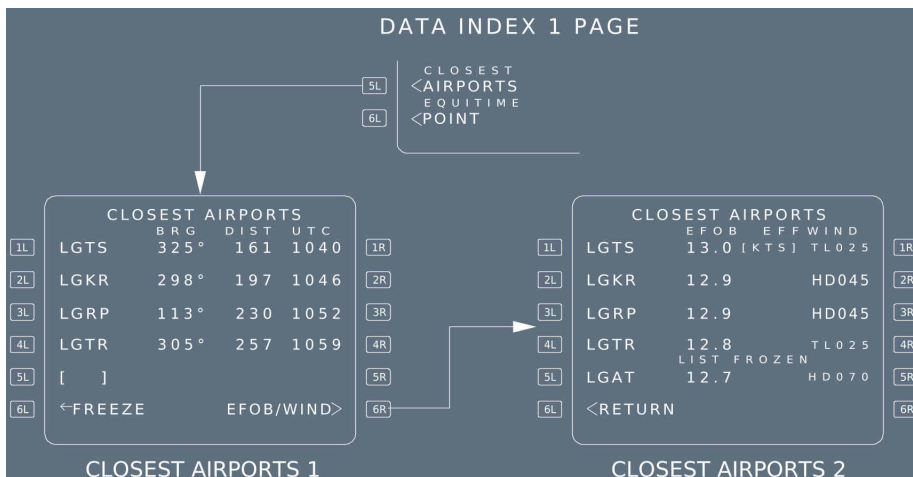
Ident.: DSC-22_20-20-10-28-00009560.0001001 / 16 MAR 11

Applicable to: MSN 02926-02944, 04392, 07784-07792

The FMS automatically selects the four closest airports from the current aircraft position, and displays them on the CLOSEST AIRPORT pages, ranked by distance. The flight crew can select an additional, fifth airport on this page.

- CLOSEST AIRPORTS page 1 displays the bearing, distance, and time to go to each airport
- CLOSEST AIRPORTS page 2 displays the Estimated Fuel On Board (EFOB) and enables the crew to check or modify the effective wind estimated to the corresponding airport.

The flight crew accesses the CLOSEST AIRPORTS page 1 by pressing the [5L] key on the DATA INDEX 1 page. They access the CLOSEST AIRPORTS page 2 by pressing the EFOB/WIND prompt (6R key) on page 1.



 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
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CLOSEST AIRPORTS 1 PAGE

[1L] - [1R] BRG/DIST/UTC (green) to [4L] - [4R]	The closest four airports are extracted from the database, and ranked by distance from the aircraft position.
	BRG Displays the current bearing from the aircraft’s position to the airport.
	DIST Displays the current great-circle distance from the aircraft’s position to the airport.
	UTC Displays the predicted time of arrival at the airport, computed using the current wind or a wind vector entered on page 2, and the speed in accordance with the current mode (managed or selected). The time is only computed in cruise phase.
[5L]	The crew may enter a fifth airport in this field, using the 4–letter ICAO code. The field may be modified at any time, even when “LIST FROZEN” is displayed.
If the crew enters an airport that is not in the database, a “NOT IN DATABASE” message appears in the scratchpad.	
[6L] FREEZE/UNFREEZE (cyan)	This prompt enables the pilot to freeze and unfreeze the list of four airports.
The list is automatically frozen when accessing page 2. It will remain frozen until returning to page 1.	
The “LIST FROZEN” message is always displayed on page 2.	
[6R] EFOB/WIND	Gives access to page 2. Pressing this prompt automatically freezes the list of the four closest airports.

CLOSEST AIRPORTS 2 PAGE:

[1L] - [1R] EFOB (green) to	Displays the EFOB at each airport. The EFOB is only computed in
[5L] - [5R] EFF WIND (cyan)	cruise phase.
Used to enter an estimated effective wind (headwind or tailwind) along the route to the airport. If the entry is preceded by “+”, “T”, or “TL”, a tailwind is assumed.	
If the entry is preceded by “–”, “H”, or “HD”, a headwind is assumed.	
This field displays in small font a default value, based on the current wind experienced by the aircraft. The crew can modify this value, it is then displayed in large font.	
The effective wind is used to compute the EFOB and time to reach the airport.	

[6L] RETURN

Returns to page 1.

- Note:
- If the aircraft position becomes invalid, all BRG, DIST, UTC fields are dashed. The CLOSEST AIRPORTS page still displays the last available list of 4 closest airports and the last crew-defined airport (if any). FREEZE/UNFREEZE and EFOB/WIND prompts are removed, LIST FROZEN is displayed, and the A/C POSITION INVALID message is displayed in the scratchpad. Page 2 cannot be accessed.
 - Predictions (EFOB, TIME) displayed on the CLOSEST AIRPORTS page assume:
 - ECON CRZ speed (managed) or current selected speed (selected) is kept;
 - Cl (for managed speed only) and CRZ FL from the active F-PLN are kept
 - A constant wind value;
 - In case of engine out, the aircraft altitude is the minimum of (CRZ FL, EO MAX ALT);
 - Downpath steps are not considered;
 - Descent fuel burn is a conservative value which only depends on the difference between current CRZ ALT and the destination airport altitude.

EQUI - TIME POINT PAGE

Ident.: DSC-22_20-20-10-28-00009561.0004001 / 18 MAR 11

Applicable to: MSN 02926-02944, 04392, 07784-07792

The flight crew uses this page to request an equi-time point computation between two different points (airport, NAVAIID, runway, NDB or waypoint). This pseudo-waypoint (ETP) is displayed on the navigation display along the F-PLN. The EQUI-TIME POINT page is accessed by pressing the 6L key on the DATA INDEX 1 page:

EQUI-TIME POINT

A/C TO	BRG	DIST	UTC
[1L]	[]	---	----
[2L]	[]	---	----
[3L]	[]	---	----
[4L]	[]	---	----
[5L]			
[6L]			

DIST UTC

EQUI-TIME POINT PAGE
NO DEFAULTED REF

DATA INDEX PAGE1

EQUITIME
<POINT

[6L]

EQUI-TIME POINT

A/C TO	BRG	DIST	UTC
[1L]	LFB0	176° 45	1014
[2L]	TRU WIND	ETP TO LFB0	
	270°/035	171° 277	1118
[3L]	EGLL	007° 497	1118
[4L]	TRU WIND	ETP TO EGLL	
	110°/025	006° 265	1118
[5L]		ETP LOCATION	
		N52W025/ -25.2	
[6L]	A/C TO	DIST	UTC
	(ETP)	382	0908

COMPUTED EQUI-TIME POINT

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
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[1L] A/C TO and [3L] (blue) Displays reference waypoint 1.
Displays reference waypoint 2.

Note: *Origin and destination airports are used by default for respective reference points 1 and 2, until a pilot entry is made.*

[1R] BRG/DIST/UTC and Displays the bearing, distance, time, from the aircraft's current position
[3R] (green) to the reference waypoint 1.
Displays the bearing, distance, time, from the current position of the aircraft to the reference waypoint 2.

- BRG : Displays the current great-circle bearing from the position of the aircraft to the reference waypoint.
- DIST : Displays the current great-circle distance from the position of the aircraft to the reference waypoint.
- UTC : Displays the predicted time of arrival at the reference waypoint (computed using the current wind or a wind vector, entered by the crew).
The time is only computed in cruise phase. In other phases, it is dashed.

[2L] and [4L] TRU WIND The crew may enter the wind (direction/velocity) at the reference
(blue) waypoint and CRZ FL:
This wind value is used to calculate the time from the position of the aircraft to the reference waypoint, and to locate the equitime point.
If no entry is made, the wind/velocity is assumed to be equal to zero.

[2R] and [4R] ETP TO XXXX Displays the bearing distance and the time from the Equi-Time Point
(green) (ETP) position to the reference waypoint.

[5R] ETP LOCATION Displays the ident of the F-PLN waypoint following the equitime point. It provides the distance along the flight plan from the ETP to the indicated waypoint.

[6L] - [6R] A/C TO (ETP) This field displays the distance from the current position of the aircraft
DIST/UTC (green) to the ETP along the flight plan, and the estimated time of arrival at the ETP.
If at least one reference waypoint exists, but no ETP exists, the field is blank and NO ETP is displayed in 6L.

Note: *The ETP computation is based on the cost index, managed speed (with SPD LIM).
In case of engine-out, the EO LRC speed is assumed.
If the ETP fix is an airport, the ETP computation takes into account the descent towards this airport.*

RTA PAGE

Ident.: DSC-22_20-20-10-28-00009562.0021001 / 14 MAY 12

Applicable to: MSN 02926-02944, 04392, 07784-07792

The RTA (Required Time of Arrival) page enables to enter a time constraint on a given waypoint. When an RTA has been defined at a waypoint, the RTA page provides the following information:

- Predicted ETA at the time-constrained waypoint
- Performance adjusted SPD target
- Time error
- Distance to time constrained waypoint
- Active speed mode.

The RTA page also allows to enter an Estimated Takeoff Time (ETT), or may display an FMS-computed ETT.

The flight crew calls up this page with the RTA prompt from the VERT REV page.

ALT CSTR
 []

RTA>
 [2R]
 [3R]



RTA

1L [AT WPT]
 2L [[MANAGED]]
 3L 250/0.82
 4L ACT MODE
 5L MANAGED
 6L <RETURN

1R
 2R
 3R
 4R
 5R [ETT] *
 6R

RTA

1L AT WPT
 2L PUMAL
 3L MANAGED
 4L 230
 5L ACT MODE
 6L SELECTED/320

1R DIST
 2R 620
 3R RTA
 4R -11:45:00
 5R ETA
 6R 11:48:12
 RTA ERROR
 +03:12
 EET
 10:15:30

<RETURN

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION
[1L] – [1R] AT WPT/DIST/RTA [2L] MANAGED (yellow/green) [3L] ACT MODE (green) [6L] TMPY F-PLN (yellow) or RETURN (white) [2R] ETA (yellow/green) [3R] RTA ERROR [5R] ETT UTC	This line displays AT WPT and empty blue brackets, when no waypoint has been specified, or AT WPT, DIST and RTA when a waypoint has been defined. The waypoint identifier is displayed in large blue font. If only the waypoint identifier has been defined and no RTA value, blue brackets and a blue star are displayed facing the 1R prompt. The flight crew enters the time constraint as “HHMMSS”, preceeded by: A “–” sign for “at or before” A “+” sign for “at or after” no sign for “at”. DIST is displayed in yellow if a temporary flight plan exists. This field displays the FMGS-computed ECON speed/Mach (<i>Refer to DSC-22_20-10-40-10 General</i>) used to respect the RTA. Speed and/or Mach are displayed in yellow if a temporary flight plan exists. Otherwise they are displayed in green. Displays the active speed mode: MANAGED or SELECTED/NNN (NNN is the selected target speed). The crew cannot modify the active speed mode via this field. The crew presses this key to revert the display to the VERT REV page. The TMPY F-PLN prompt accesses the temporary F-PLN page. When a required time at arrival has been defined, the 2R field displays the estimated time of arrival as “HHMMSS”. ETA is displayed in yellow if a temporary flight plan exists. Otherwise it is displayed in green. This field is blank when the RTA is predicted as made. The RTA is predicted as missed, if the aircraft is expected to reach the point at RTA +30 s or later. In this case, “RTA ERROR” is displayed in small white font, and the calculated time error between the ETA and the RTA is displayed in small amber font. The Estimated Takeoff Time (ETT) field is available in preflight phase. If no ETT has been entered, the 5R field displays blue brackets and a blue star. When an ETT has been entered, it is displayed in magenta. This field may also display an FMS-computed ETT, when an RTA has been defined. Entry of ETT does not lead to the creation of a temporary flight plan. Universal time is displayed in green for takeoff, climb, cruise, descent and approach phases.

[6R] TMPY INSERT *

Activates the temporary flight plan.

CONSTANT MACH PAGE

Ident.: DSC-22_20-20-10-28-00009563.0004001 / 01 OCT 12

Applicable to: MSN 02926-02944, 04392, 07784-07792

The CONSTANT MACH page allows the crew to specify a constant Mach value to be kept during a given part of the cruise phase. The crew can specify on this page:

- The desired constant Mach value
- The Start and End waypoint of the constant Mach segment.

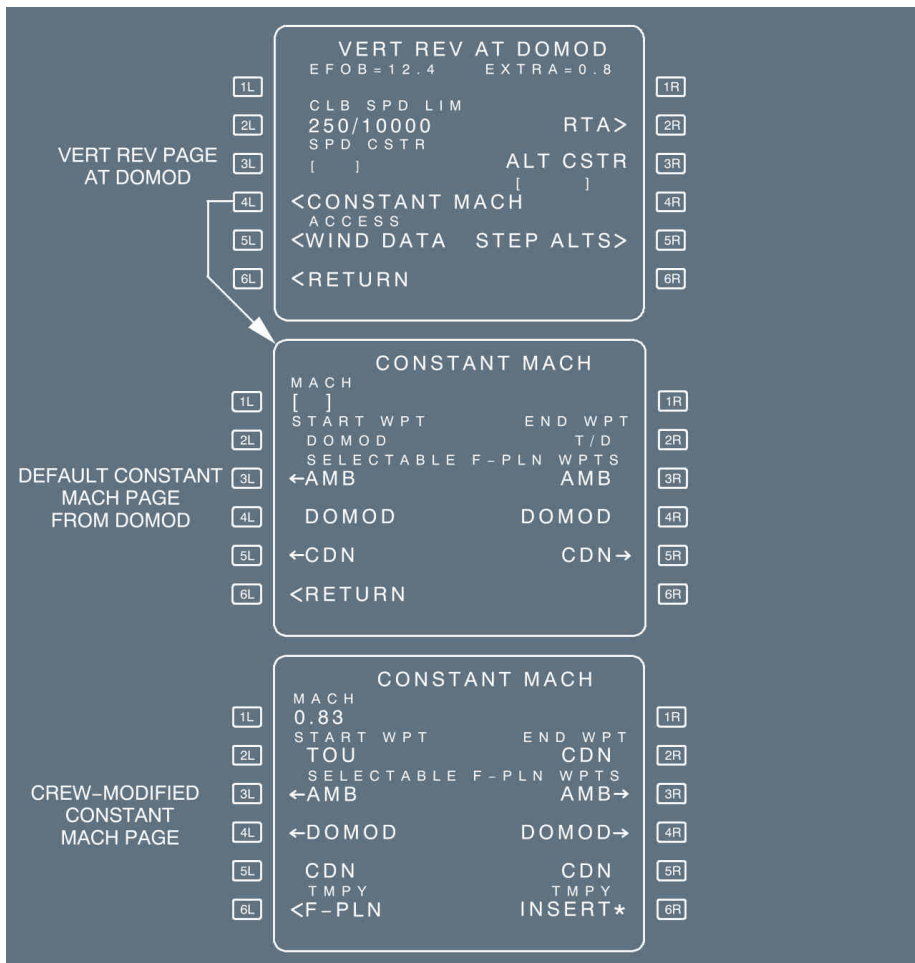
The constant Mach segment is flown in MANAGED speed mode. The FMS takes the crew-entered constant Mach into account to calculate the cruise predictions.

Note: A constant Mach may also be defined in the SEC F-PLN.

The CONSTANT MACH page is accessed by pressing the CONSTANT MACH prompt [4L] on the VERT REV page from any waypoint, including the FROM waypoint.

If the page is accessed from a VERT REV at the FROM, the proposed default start waypoint will be PPOS.

The CONSTANT MACH page is accessible in pre-flight, takeoff, climb and cruise phases. A constant Mach may only be defined cruise segment.



[1L] MACH (blue)

Enables the entry of the desired Mach value waypoint is displayed in large blue font.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION

[2L] START WPT (blue)	Enables the Start waypoint of the constant Mach segment to be specified. The default Start waypoint is the waypoint at which the vertical revision has been performed, if it belongs to the cruise phase. Otherwise, the field is blank. The default Start waypoint (if any) is displayed in small blue font. The crew may select a different Start waypoint in the list of selectable F-PLN waypoints. A crew-selected Start waypoint is displayed in large blue font.
SELECTABLE F-PLN WPTS (blue) [3L] – [3R] [4L] – [4R] [5L] – [5R]	This is the list of the F-PLN waypoints that can be selected as Start or End waypoint of the constant Mach segment. The FMS automatically displays the list of all downpath waypoints belonging to the cruise phase (before the T/D). The crew selects the Start waypoint in the list on the left side, and the End waypoint on the right side.
[6L] <RETURN (white) or <TMPY F-PLN (yellow)	If a temporary F-PLN exists, the prompt <TMPY F-PLN is displayed. This enables the crew to return to the TMPY F-PLN page. If no TMPY F-PLN exists, the <RETURN prompt is displayed. It enables a return to the VERT REV page.
[2R] END WPT (blue)	This field enables the End waypoint of the constant Mach segment to be specified. By default, the End waypoint is the Top of Descent (T/D). The default End waypoint is in small blue font. The crew may select a different End waypoint in the list of selectable F-PLN waypoints. A crew-selected End waypoint is displayed in large blue font.
[6R] TMPY INSERT*	Activates the temporary flight plan.

BACK UP NAV PAGES

Applicable to: MSN 04392, 07784-07792

Ident.: DSC-22_20-20-10-28-G-00013272.0006001 / 16 MAR 11

The MCDU features a back up navigation function which provides simplified point-to-point GPIRS and IRS based navigation in case of a dual FM failure.

The backup Navigation mode allows limited lateral flight planning within the MCDU, that can be used to drive the Navigation Display and provides relative path position information and auto-sequencing of the Backup Navigation flight plan. The Backup Navigation flight plan reflects, as much as possible, the active primary FM flight plan upon its initial activation.

During FM normal operation, the F-PLN is continuously downloaded in the MCDU memory; the BACK UP NAV function links the MCDU of the failed FM to its onside IRS. All navigation data related to the MCDU F-PLN are displayed on the associated ND.

BACK UP NAV function is activated on the MCDU MENU page by pressing the NAV B/UP prompt.

The MCDU back-up F-PLN may accept a maximum of 150 legs, including information such as waypoint position/identification, leg type, discontinuity, overfly and turn direction information (radial, pattern, heading leg... cannot be part of the MCDU F-PLN). No secondary or temporary F-PLN exists.

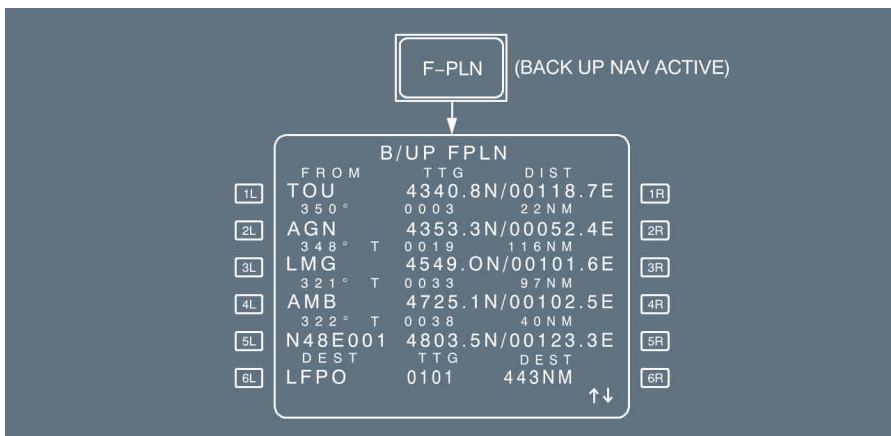
BACK UP NAV pages display the data related to the BACK UP NAV function. These are six pages available while BACK UP NAV is active:

- B/UP F-PLN
- B/UP F-PLN for DIRECT TO
- B/UP PROG
- B/UP IRS for onside IRS (1+2)
- B/UP IRS 3
- B/UP GPS (if the GPS is installed)

Ident.: DSC-22_20-20-10-28-G-00013273.0006001 / 23 JUL 12

B/UP F-PLN PAGE

The B/UP F-PLN page displays the MCDU F-PLN data. The pilot calls up this page by pressing the F-PLN MCDU key while B/UP NAV is active.



TITLE

B/UP F-PLN is displayed in a white large font

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT
CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION

line 1 to line 5 Display consecutive waypoints with their associated latitude/longitude. If a waypoint is to be overflowed, an overfly symbol (Δ) is displayed after the identifier.

If a turn is specified into the next leg, a large font arrow is displayed after the identifier.

Label lines contain the bearing, time to go and distance to the next waypoint displayed in small font.

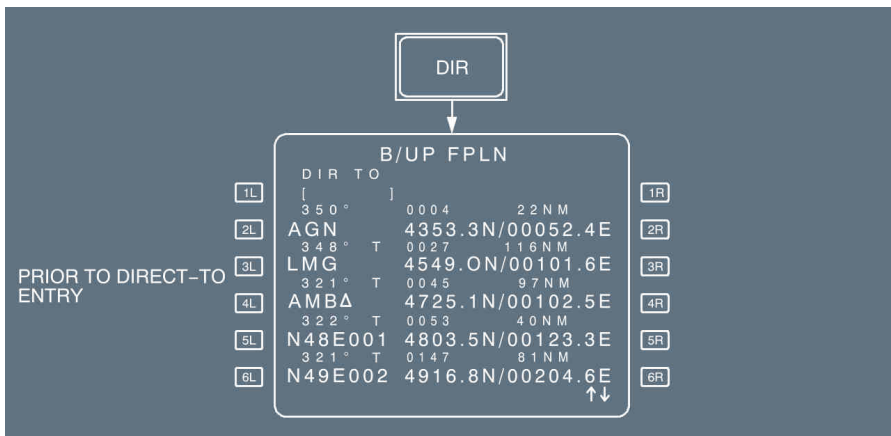
White	bearing
green	time to go and distance
BRG	Between FROM and TO waypoints: True or Mag depending on the TRUE pb-sw  position. T is displayed when the bearing is true referenced.
	Between other waypoints: out bound true track of the great circle joining the 2 related waypoints, independant of TRUE pb-sw  .
TTG	HHMM limited to 9 959. Time between the 2 related waypoints.
DIST	NM limited to 9 999.

line 6 DEST airport identifier and Time To Go (TTG) to that waypoint. DIST to destination
 DEST/TTG is computed as the direct distance from the aircraft to the active waypoint plus the
 DIST along flight plan distances. Time to go to destination is computed as distance to
 destination divided by ground speed.
 TTTG and DEST are dashed if aircraft position is unavailable.

Ident.: DSC-22_20-20-10-28-G-00013275.0006001 / 14 MAY 12

B/UP F-PLN (DIR TO) PAGE

The pilot calls up this page using the DIR key on MCDU while BACK UP NAV is active and aircraft position is valid.



TITLE B/UP F-PLN is displayed in a white large font.

[1L] DIR TO Allows DIRECT TO selection to the desired waypoint. This waypoint can be selected from the F-PLN or manually entered through the scratchpad (IDENT/LAT/LONG or LAT/LONG)

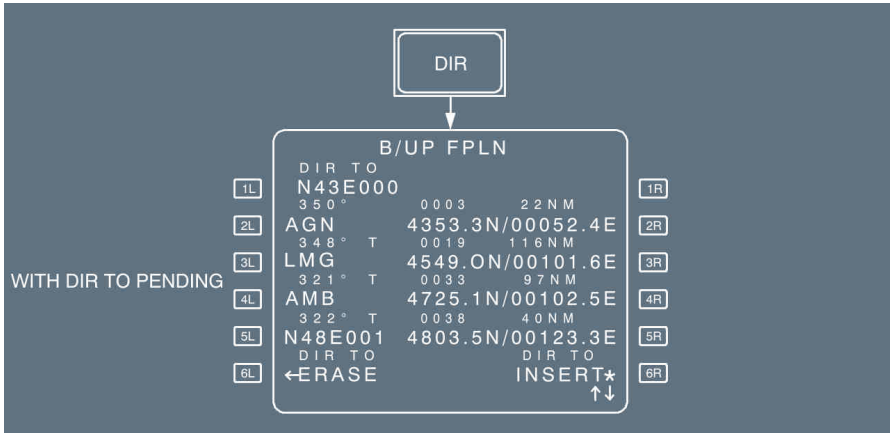
line 2 to line 6 Display consecutive waypoints of the F-PLN.

Same as the B/UP F-PLN page.

The TO WAYPOINT is displayed in [2L].

Vertical slewing function is available

When a DIR TO is pending, the page displays the prompts “DIR TO INSERT” and “DIR TO ERASE” in line 6.

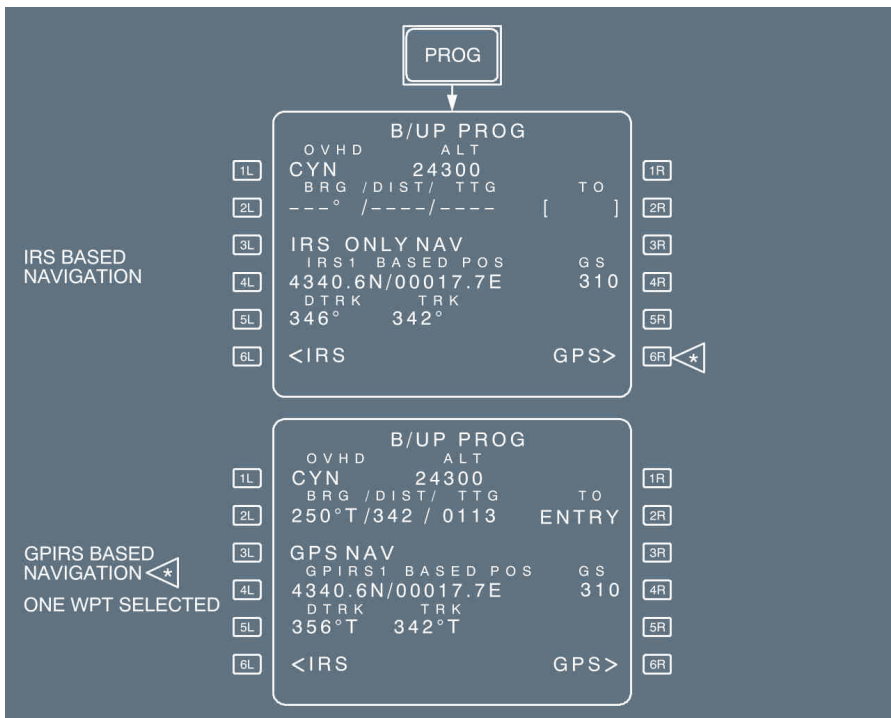


Ident.: DSC-22_20-20-10-28-G-00013276.0006001 / 21 MAR 16

B/UP PROG PAGE

It displays flight parameters relative to the F-PLN or a selected waypoint.

The flight crew calls up this page by pressing the PROG key on MCDU when BACK UP NAV is active.



TITLE

line 1 OVHD/ALT

B/UP PROG is displayed in a white large font.

Displays the identifier of the last sequenced waypoint and the altitude at the time of the sequence.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - PAGE DESCRIPTION

line 2 BRG/DIST/TTG/TO

Allows the flight crew to enter an existing MCDU F-PLN waypoint identifier or LAT/LONG or IDENT/LAT/LONG.

MCDU then computes bearing, distance and time to go to that waypoint from the present position.

 BRG : True or magnetic outbound track of the great circle joining aircraft present position to the entered waypoint: dependent on the TRUE pb-sw  position.

DIST : limited to 9 999.

TTG : HHMM limited to 9 959. time to go to the entered position computed assuming current ground speed.

These fields are displayed in a green small font.

They are dashed if present position is unavailable.

[3L]

Means of navigation used by the Back-Up Navigation. If GPS is fitted and is the navigation source, "GPS NAV" is displayed, otherwise "IRS ONLY NAV" is displayed.

If the GPS is not installed, this field is blank.

 [4L] IRS 1 (2 or 3) BASED
 POS GPIRS 1 (2 or 3)
 (green)

Current aircraft position provided by the selected IRS GPIRS

IRS 1 (or 3 if IRS 1 failed) on MCDU 1

IRS 2 (or 3 if IRS 2 failed) on MCDU 2

 GPIRS 1 (or GPIRS 3) or MCDU 1 

 GPIRS 2 (or GPIRS 3) or MCDU 2 

[4R] GS (green)

 Current ground speed from the selected IRS or GPS 

[5L] DTRK/TRK (green)

Desired track of the MCDU F-PLN active leg and current aircraft track from the selected IRS/GPS (True or Mag).

 These tracks are true or magnetic depending on TRUE pb-sw  position.

[6L] IRS 1 (2)

Gives access to onside B/UP IRS (1 or 2) page

[6R] GPS

Gives access to B/UP GPS page.

This prompt only appears when the GPS is installed.

Ident.: DSC-22_20-20-10-28-G-00013278.0006001 / 14 MAY 12

B/UP IRS 1 OR 2 OR 3 PAGE

Display IRS 1, 2, 3 navigation data.

The pilot calls up this page from B/UP PROG page, by pressing the corresponding prompt.

MCDU 1 B/UP ONSIDE
IRS GPS AVAILABLE

6L <IRS

B/UP IRS1

POSITION
43°40.4N/000°17.6E

TTRK
342.3

THDG
342.3

WIND
225°/216

GPIRS POSITION
43°40.6N/000°18.2E

<RETURN

GS
310

MHDG
329.8

GPIRS ACCUR
100M

NEXT IRS>

1R
2R
3R
4R
5R
6R

MCDU B/UP OFFSIDE
IRS PAGE
GPS FITTED
GPS UNAVAILABLE

6L <IRS

B/UP IRS3

POSITION
43°40.6N/000°18.2E

TTRK
341.8

THDG
341.8

WIND
224°/215

GPIRS POSITION
-----/-----

<RETURN

GS
309

MHDG
329.3

GPIRS ACCUR

NEXT IRS>

1R
2R
3R
4R
5R
6R

TITLE

B/UP IRS 1, 2, 3 displayed in a white large font.

[1L] POSITION

Current aircraft position from selected IRS

[2L] T TRK

True track

[2R] GS

Ground speed

[3L] T HDG

True heading

[3R] M HDG

Magnetic heading

Dashed when in polar area.

[4L] WIND

Wind direction and velocity

Wind direction is always true referenced.

[4R] GPIRS ACCUR

GPS accuracy in meters as in the IRS page.

[5R] GPIRS POSITION

If GPS is installed, the GPS IRS position is provided as in the IRS page.

PIA A318/A319/A320/A321 FLEET
 FCOM

← AR →

DSC-22_20-20-10-28 P 149/150

09 FEB 26

[6L] RETURN Gives access to B/UP PROG page

[6R] NEXT IRS Gives access to the next IRS page.
 (Closed loop 1 → 2 → 3 → 1)

This page is not modifiable by the crew.

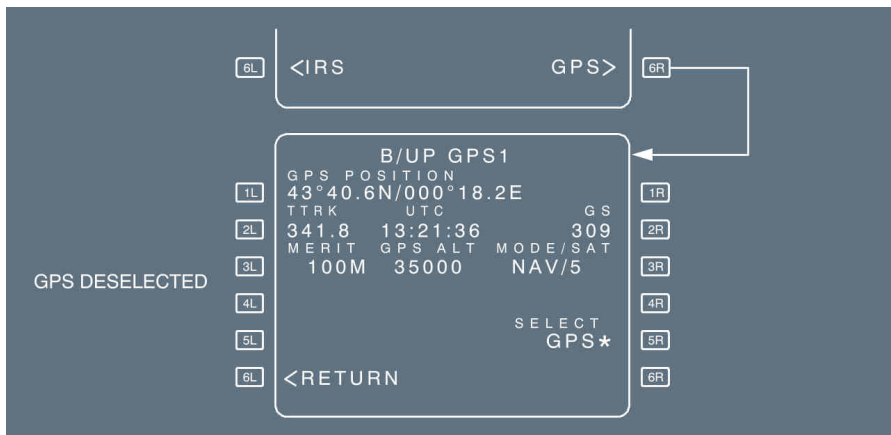
Note: The fields [4R] and [5L] are blanked when the GPS is not installed.

Ident.: DSC-22_20-20-10-28-G-00013279.0006001 / 14 MAY 12

B/UP GPS

Display GPS navigation data.

The flight crew calls up this page from B/UP PROG page, by pressing the corresponding prompt.



The screenshot shows the B/UP GPS1 MCDU page. The page is titled "B/UP GPS1" and "GPS DESELECTED". The main display area shows the following data:

- GPS POSITION: 43°40.6N/000°18.2E
- TTRK: 341.8
- UTC: 13:21:36
- GS: 309
- MERIT: 100M
- GPS ALT: 35000
- MODE/SAT: NAV/5
- SELECT GPS★
- <RETURN

The page is surrounded by a grid of prompts labeled [6L], [6R], [1L], [1R], [2L], [2R], [3L], [3R], [4L], [4R], [5L], [5R], and [6L]. A line connects the [6R] prompt to the [1R] prompt.

TITLE B/UP GPS 1, 2 displayed in a white large font.

[1L] GPS POSITION

Line 2 : TTRK GPIRS position (latitude/longitude)

UTC: Time

GS: Ground Speed

Line 3 : MERIT : GPS figure of merit

GPS ALT: GPS altitude

MODE/SAT: Navigation mode and number of tracked satellites. These values are displayed as in the FM GPS page.

[5R] DESELECT/SELECT GPS: The flight crew may select and deselect the GPS for navigation Backup page. The default configuration is GPS selected.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - MESSAGES
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GENERAL

Ident.: DSC-22_20-20-20-00026691.0001001 / 15 NOV 23

Applicable to: ALL

Two types of MCDU messages exist:

- Type I: Direct result of a flight crew action
- Type II: Information about a situation, or an action request to the flight crew.

Type II messages are stored in a first-in/first-out message queue (5 messages maximum).

They are suppressed, if correct data is entered, or when they no longer apply.

The flight crew can clear all messages by pressing the CLR key on the MCDU console.

A/C POSITION INVALID

Ident.: DSC-22_20-20-20-00026534.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The aircraft position is no longer valid. If the flight crew clears the message, the message appears again if the flight crew displays the HOLD at PPOS or the DIR TO page.

ABEAM POINTS LIST FULL

Ident.: DSC-22_20-20-20-00026535.0002001 / 15 NOV 23

Applicable to: MSN 02926-02944, 04392, 07784-07792

Message Type	II
Display Type	MCDU
Display Conditions	The flight crew-stored elements database is full, and the flight crew tries to store a new abeam point. This message informs the flight crew that the new abeam point cannot be stored.

ALIGN IRS

Ident.: DSC-22_20-20-20-00026536.0002001 / 15 NOV 23

Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	At least one IRS waits for an alignment position. The flight crew should initiate the alignment via the IRS INIT page in the MCDU.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - MESSAGES

ALTN F-PLN DELETED

Ident.: DSC-22_20-20-20-00026539.0001001 / 15 NOV 23

Applicable to: MSN 02926-02944, 04392, 07784-07792

Message Type	II
Display Type	MCDU
Display Conditions	When the F-PLN memory is full, in order to free up some space, the system automatically deletes the alternate F-PLN.

AOC XXX F-PLN UPLINK

Ident.: DSC-22_20-20-20-00027326.0005001 / 15 NOV 23

Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	A F-PLN uplink is inserted in the active or secondary F-PLN. XXX corresponds either to ACT for the active F-PLN, or to SEC for the secondary F-PLN.

AREA RNP IS XX.XX

Ident.: DSC-22_20-20-20-00026540.0002001 / 15 NOV 23

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

Message Type	II
Display Type	MCDU
Display Conditions	The flight crew entered an RNP value on the PROG page, and the following conditions are applicable: - The manually entered value is more than the default RNP value of the current flight phase - There is no RNP value defined in the navigation database for the active flight leg or route. XX.XX is the current RNP value.

AREA RNP IS XX.XX

Ident.: DSC-22_20-20-20-00026540.0001001 / 15 NOV 23

Applicable to: MSN 02926-02944, 04392, 07784-07792

Message Type	II
Display Type	MCDU
Display Conditions	The flight crew entered an RNP value on the PROG page, and the following conditions are applicable: - The manually entered value is more than the default RNP value of the current flight phase - There is no RNP value defined in the navigation database for the active flight leg or route. XX.XX is the current RNP value.

AWY/WPT MISMATCH

Ident.: DSC-22_20-20-20-00026541.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	I
Display Type	MCDU
Display Conditions	The flight crew enters an airway ident in the VIA field on the AIRWAYS page, but it does not contain the revised point. If the flight crew enters a second airway ident, it must contain the first airway ending point.

BLOCK IGNORES RTA

Ident.: DSC-22_20-20-20-00026542.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The fuel planning function ignores one of the following : - A time constraint that exists at initialization of the F-PLN, or - The entry of a time constraint made after the initialization of the F-PLN.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - MESSAGES

CABIN RATE EXCEEDED

Ident.: DSC-22_20-20-20-00026543.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The aircraft is in the cruise phase, at less than 200 NM from the destination, and the cabin rate, that is associated with the theoretical descent profile, is more than the maximum cabin rate. The flight crew can check or change the maximum cabin rate on the PERF CRZ page.

CHECK ALTN WIND

Ident.: DSC-22_20-20-20-00027406.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The FMS receives a wind data uplink associated with an alternate cruise flight level via uplink that is different from the current FMS alternate cruise flight level.

CHECK APPR SELECTION

Ident.: DSC-22_20-20-20-00026546.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	II
Display Type	MCDU and PFD
Display Conditions	The flight crew manually tuned an ILS/GLS  approach on the RADIO NAV page. This manually-tuned landing system does not correspond to the approach that is selected in the F-PLN. The message appears only when the aircraft is: - In cruise, and at less than 100 NM from the T/D, or - In descent, or - In approach, and the altitude is above 800 ft. In approach, pressing the APPR pb arms APP NAV and FINAL modes.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - MESSAGES
--	---

CHECK CO RTE

Ident.: DSC-22_20-20-20-00027342.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The FMS receives a F-PLN uplink with a company route ident that is different from the company route ident specified in the F-PLN request.

CHECK DATA BASE CYCLE

Ident.: DSC-22_20-20-20-00026547.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The current date disagrees with the validity period of the active navigation database. This message appears when the flight crew enters a FROM/TO airport or a company route.

CHECK DEST DATA

Ident.: DSC-22_20-20-20-00027405.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The aircraft is in cruise phase and at less than 180 NM from its destination and one of the following conditions occur: - QNH, TEMP, or WIND data are received via a PERF APPR uplink, or - A descent wind uplink is received and creates a conflict with the QNH, TEMP or WIND data already displayed on the PERF APPR page.

CHECK FLT NBR

Ident.: DSC-22_20-20-20-00027343.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The FMS receives a flight number via uplink that is different from the flight number specified in the F-PLN request.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - MESSAGES

CHECK IRS 1(2)(3)/FM POSITION

Ident.: DSC-22_20-20-20-00026549.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The difference between the ADIRS alignment position and the FMS position is more than a threshold that is a function of time.

CHECK IRS/AIRPORT POS

Ident.: DSC-22_20-20-20-00026548.0002001 / 15 NOV 23

Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The difference between the ADIRS alignment position and the airport position is 5 NM or more.

CHECK MIN DEST FOB

Ident.: DSC-22_20-20-20-00026552.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The flight crew manually enters the MIN DEST FOB value, which is below the ALTN + FINAL value.

CHECK NORTH REF

Ident.: DSC-22_20-20-20-00026553.0002001 / 15 NOV 23

Applicable to: ALL

Message Type	II
Display Type	MCDU and ND
Display Conditions	The position of the NORTH REF pb-sw disagrees with the airport north reference, which is stored in the FMS navigation database. This message appears either for the departure airport (in preflight), or for the destination airport (in arrival or approach).

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - MESSAGES
--	---

CHECK ONSIDE P/N

Ident.: DSC-22_20-20-20-00026554.0002001 / 15 NOV 23 Applicable to: ALL
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Message Type	
Display Type	MCDU
Display Conditions	The part numbers of the FMCs are not compatible. The MCDU automatically displays the P/N STATUS page.

CHECK QFE

Ident.: DSC-22_20-20-20-00026555.0001001 / 15 NOV 23 Applicable to: ALL
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Message Type	
Display Type	MCDU
Display Conditions	The QFE height and the predicted aircraft altitude differ by more than 100 ft. For this computation, the FMS uses the QNH entry of the PERF APPR page, and the destination airport elevation from the navigation database. This message appears, in descent or approach, when the flight crew changes the barometric reference from QNH(STD) to QFE.

CHECK TAKE OFF DATA

Ident.: DSC-22_20-20-20-00026556.0002001 / 15 NOV 23 Applicable to: MSN 02155-02789, 03031-03060, 05152-05746
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Message Type	
Display Type	MCDU
Display Conditions	The flight crew already entered the takeoff speeds, and changes the takeoff runway, the flaps setting, or the takeoff shift, the FLEX TO temperature or the level of the Derated Takeoff  .

CHECK TAKE OFF DATA

Ident.: DSC-22_20-20-20-00026556.0001001 / 15 NOV 23 Applicable to: MSN 02926-02944, 04392, 07784-07792
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Message Type	
Display Type	MCDU
Display Conditions	The flight crew already entered the takeoff speeds, and: - Changes the takeoff runway, the flaps setting, or the takeoff shift, the FLEX TO temperature or the level of the Derated Takeoff , or - Activates the SEC F-PLN in PREFLIGHT or DONE flight phase.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - MESSAGES

CHECK WEIGHT

Ident.: DSC-22_20-20-20-00026551.0001001 / 02 MAY 24

Applicable to: MSN 02926-02944, 04392, 07784-07792

Message Type	II
Display Type	MCDU
Display Conditions	The difference between the FMS GW and the FAC GW is more than 7 t (15 432 lb).

CHECK WEIGHT

Ident.: DSC-22_20-20-20-00026551.0002001 / 02 MAY 24

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

Message Type	II
Display Type	MCDU
Display Conditions	Before engine start: The flight crew activates the SEC F-PLN, and the secondary ZFW/ZFWCG differs from the active ZFW/ZFWCG. After engine start: One of the following conditions occurs: - The difference between the FMS GW and FAC GW is more than 7 t (15 432 lb), or - The flight crew activates the SEC F-PLN, and the difference between the ZFW/ZFWCG from SEC INIT B page and from FUEL PRED page is more than 5 t (11 023 lb).

CLK IS TAKE OFF TIME

Ident.: DSC-22_20-20-20-00026557.0001001 / 15 NOV 23

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

Message Type	II
Display Type	MCDU
Display Conditions	The clock time passed the ETT (either entered by the flight crew or computed by the system).

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - MESSAGES
--	---

CLOCK/GPS TIME DIFF

Ident.: DSC-22_20-20-20-00026559.0002001 / 15 NOV 23

Applicable to: ALL

Message Type	||
Display Type	MCDU
Display Conditions	The difference between the aircraft clock time and the GPS time is more than 3 min.

CLOCK IS TAKE OFF TIME

Ident.: DSC-22_20-20-20-00026558.0001001 / 15 NOV 23

Applicable to: MSN 02926-02944, 04392, 07784-07792

Message Type	||
Display Type	MCDU
Display Conditions	The clock time passed the ETT (either entered by the flight crew or computed by the system).

CLOSE RTE REQ FIRST

Ident.: DSC-22_20-20-20-00027410.0004001 / 15 NOV 23

Applicable to: MSN 02719-02789, 03031-03060, 07784-07792

Message Type	||
Display Type	MCDU
Display Conditions	The flight crew requests an ATC F-PLN for a second time, and the flight crew did not close, nor cancel the first ATC F-PLN request on the DCDU within the two minutes delay period.

CONSTANT MACH DELETED

Ident.: DSC-22_20-20-20-00026783.0001001 / 15 NOV 23

Applicable to: MSN 02926-02944, 04392, 07784-07792

Message Type	||
Display Type	MCDU
Display Conditions	The Constant Mach Segment (CMS) is automatically deleted in the active F-PLN, when one of the following occurs: - The flight crew activates the SEC F-PLN, or - An engine-out is detected, or - The flight phase changes from the cruise phase to another flight phase, or - The flight crew enters a lateral revision of the F-PLN which deletes the CMS.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - MESSAGES

CROSSLOAD ABORTED

Ident.: DSC-22_20-20-20-00026562.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	An error of transmission from one FMS to another occurs.

CROSSLOAD COMPLETE

Ident.: DSC-22_20-20-20-00026563.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The database crossload from one FMS to another is successfully completed.

CRZ FL ABOVE MAX FL

Ident.: DSC-22_20-20-20-00026564.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The flight crew enters a flight level that is above the recommended maximum flight level.

CSTR DEL ABOVE CRZ FL

Ident.: DSC-22_20-20-20-00026565.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	A F-PLN altitude constraint is deleted because it is at or above the cruise altitude or a step altitude. The message is displayed when one of the following conditions occurs: - The flight crew modifies the current cruise altitude or enters a new one, or - The flight crew modifies, deletes or creates a step altitude.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - MESSAGES
--	---

CSTR DEL UP TO XXXXXXX

Ident.: DSC-22_20-20-20-00026566.0001001 / 15 NOV 23
Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

Message Type	||
Display Type	MCDU
Display Conditions	The flight phase changes from the cruise / descent / approach phase to the go-around phase. As a result, all altitude and speed constraints between the aircraft and the destination airport are automatically deleted. XXXXXXX corresponds to the ident of the waypoint that is after the last down-path waypoint with a descent altitude or speed constraint.

DATABASE CODING ERROR

Ident.: DSC-22_20-20-20-00026567.0002001 / 15 NOV 23
Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

Message Type	||
Display Type	MCDU
Display Conditions	The FMS does not recognize an element from the navigation database, nor an element inserted by the flight crew in the F-PLN.

DECELERATE

Ident.: DSC-22_20-20-20-00026784.0001001 / 15 NOV 23
Applicable to: ALL

Message Type	||
Display Type	MCDU and PFD
Display Conditions	The managed speed/Mach control is engaged, the aircraft reaches the T/D, and the FMS does not switch to the descent phase.

DELETING OFFSET

Ident.: DSC-22_20-20-20-00026571.0003001 / 15 NOV 23
Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

Message Type	||
Display Type	MCDU
Display Conditions	The system automatically deletes an offset when: - The distance remaining to the end of the offset is too short to be flown, or - The ALTN F-PLN is activated, or - Both the start and end waypoints of the offset are deleted, or - A DIR TO, DIR TO/ABEAM, or DIR TO/INTCPT is inserted beyond the start waypoint.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - MESSAGES

DELETING SEC OFFSET

Ident.: DSC-22_20-20-20-00026787.0002001 / 15 NOV 23

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

Message Type	II
Display Type	MCDU
Display Conditions	The system automatically deletes a secondary offset when: - The distance remaining to the end of the offset is too short to be flown, or - An ATC F-PLN request is performed.

DEST/ALTN MISMATCH

Ident.: DSC-22_20-20-20-00026574.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	I
Display Type	MCDU
Display Conditions	The flight crew enters a company alternate route, and the departure airport of the company alternate route disagrees with the destination airport of the F-PLN.

DEST EFOB BELOW MIN

Ident.: DSC-22_20-20-20-00026573.0002001 / 15 NOV 23

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

Message Type	II
Display Type	MCDU
Display Conditions	The EFOB at the destination airport of the active F-PLN is below the specified minimum fuel at destination, for more than 2 min. This message appears, only if one of the following applies: - The aircraft is in the takeoff phase and is above 800 ft AGL, or - The aircraft is in the approach phase and is above 800 ft AGL, or - The aircraft is in the go-around phase and is above 800 ft AGL, or - The ALT mode is engaged for more than 10 min, or - The aircraft is in the cruise or descent phase.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - MESSAGES
--	---

DEST EFOB BELOW MIN

Ident.: DSC-22_20-20-20-00026573.0001001 / 15 NOV 23

Applicable to: MSN 02926-02944, 04392, 07784-07792

Message Type	II
Display Type	MCDU
Display Conditions	The EFOB at the destination airport of the active F-PLN is below the specified minimum fuel at destination, for more than 2 min. This message appears, only if one of the following applies: - The aircraft is in the approach phase and is above 800 ft AGL, or - The aircraft is in the go-around phase and is above 800 ft AGL, or - The ALT mode is engaged for more than 10 min, or - The aircraft is in the cruise or descent phase.

DIR TO IN PROCESS

Ident.: DSC-22_20-20-20-00026575.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	I
Display Type	MCDU
Display Conditions	The flight crew requests the display of the vertical or lateral revision page on one MCDU, while the other MCDU displays the DIR TO page.

ENTER DEST DATA

Ident.: DSC-22_20-20-20-00026576.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	All of the following occur: - The flight crew did not enter one or more of the destination data (QNH, OAT, or wind) - The flight phase is: - The cruise phase, and the aircraft is at less than 180 NM from the destination, or - The descent phase, or - The approach phase.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - MESSAGES

ENTRY OUT OF RANGE

Ident.: DSC-22_20-20-20-00026577.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	I
Display Type	MCDU
Display Conditions	The flight crew enters a value that is not within the acceptable range of the data.

F-G/S BASED ON ISA

Ident.: DSC-22_20-20-20-00026578.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The computation of the F-G/S  deviation is based on the ISA temperature at destination, and not corrected with the current temperature at destination. The message appears when all of the following occur: - The FLS  guidance is selected - The flight crew did not enter the temperature at destination (OAT) on the PERF APPR page - The LS pb is pressed on the EFIS control panel - The descent or the approach phase is activated.

F-PLN DATALINK IN PROG

Ident.: DSC-22_20-20-20-00027340.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	I
Display Type	MCDU
Display Conditions	The flight crew attempts to modify the F-PLN before the uplink of a F-PLN INIT is complete.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - MESSAGES
--	--

F-PLN ELEMENT RETAINED

Ident.: DSC-22_20-20-20-00026579.0001001 / 15 NOV 23
Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

Message Type	I
Display Type	MCDU
Display Conditions	The flight crew attempts to delete flight crew-stored navaids, waypoints or runways that are currently used by the FMS. The message informs the flight crew that the elements that are still used by the FMS are not deleted.

F-PLN FULL

Ident.: DSC-22_20-20-20-00026581.0001001 / 15 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The F-PLN data memory is exceeded.

FLS SEL: UPDATE MINIMA
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Ident.: DSC-22_20-20-20-00027190.0001001 / 15 NOV 23
Applicable to: ALL

Message Type	I
Display Type	MCDU
Display Conditions	The flight crew deselects the SLS  in RADIO NAV page and the guidance mode reverts to FLS  . LP or LPV minima can no longer be used. The flight crew should modify the approach minima to LNAV/VNAV or LNAV, if available, or select another adequate approach.

FLT NBR UPLINK

Ident.: DSC-22_20-20-20-00027344.0001001 / 15 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The FMS receives a flight number not requested by the flight crew as part of the F-PLN data uplink.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - MESSAGES

FM DATALINK UNAVAIL

Ident.: DSC-22_20-20-20-00027412.0002001 / 15 NOV 23

Applicable to: MSN 02719-02789, 03031-03060, 07784-07792

Message Type	II
Display Type	MCDU
Display Conditions	The communication between the ATSU and both FMS is not available.

FM PREDICTIONS LOST

Ident.: DSC-22_20-20-20-00026582.0001001 / 15 NOV 23

Applicable to: MSN 02926-02944, 04392, 07784-07792

Message Type	II
Display Type	MCDU
Display Conditions	Due to resets, the predictions of the active F-PLN are not available.

FMS1/FMS2 A/C STS DIFF

Ident.: DSC-22_20-20-20-00026585.0002001 / 15 NOV 23

Applicable to: MSN 02926-02944, 04392, 07784-07792

Message Type	II
Display Type	MCDU
Display Conditions	At power-up, the critical aircraft status data is not identical between FMS1 and FMS2. The critical aircraft status data is: - Navigation database - Performance database - Magnetic variation database - FM operational program - Aircraft and airline program pins.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - MESSAGES
--	---

FMS1/FMS2 A/C STS DIFF

Ident.: DSC-22_20-20-20-00026585.0001001 / 15 NOV 23
Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

Message Type	II
Display Type	MCDU
Display Conditions	At power-up, the critical aircraft status data is not identical between FMS1 and FMS2. The critical aircraft status data is: - Navigation database - Performance database - Magnetic variation database - AMI file - FM operational program - Aircraft and airline program pins.

FMS1/FMS2 GW DIFF

Ident.: DSC-22_20-20-20-00026586.0001001 / 15 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The difference between the FMS1 GW and the FMS2 GW is 1.5 t or more.

FMS1/FMS2 PGM PIN DIFF

Ident.: DSC-22_20-20-20-00026587.0001001 / 15 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The program pins are not identical between FMS1 and FMS2.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - MESSAGES

FMS1/FMS2 POS DIFF

Ident.: DSC-22_20-20-20-00026588.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The difference between the FMS1 position and the FMS2 position is 0.5 NM or more. It is 5 NM when the GPS is not installed.

FMS1/FMS2 SPD TGT DIFF

Ident.: DSC-22_20-20-20-00026589.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The difference between the FMS1 speed target and the FMS2 speed target is 5 kt or more.

FORMAT ERROR

Ident.: DSC-22_20-20-20-00026590.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	I
Display Type	MCDU
Display Conditions	The format of the value, entered by the flight crew, is not correct (<i>Refer to DSC-22_20-20-30 MCDU Data Format List</i>).

GPS IS DESELECTED

Ident.: DSC-22_20-20-20-00026593.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The flight crew manually deselected the GPS, and: - The aircraft is at 80 NM from the T/D, or - The aircraft is in the approach phase.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - MESSAGES
--	---

GPS PRIMARY
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Ident.: DSC-22_20-20-20-00026594.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	II
Display Type	MCDU and ND
Display Conditions	For the computation of the aircraft position, at least one of the following conditions was no longer achieved, and both conditions are now achieved again: - The navigation mode is IRS/GPS - The navigation accuracy is HIGH.

GPS PRIMARY LOST
--

Ident.: DSC-22_20-20-20-00026595.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	II
Display Type	MCDU and ND
Display Conditions	For the computation of the aircraft position, at least one of the following conditions is applicable: - The navigation mode is not IRS/GPS - The navigation accuracy is not HIGH.

INDEPENDENT OPERATION

Ident.: DSC-22_20-20-20-00026596.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	FMS1 and FMS2 operate in independent mode (<i>Refer to DSC-22_10-30 General</i>).

INIT DATA UPLINK

Ident.: DSC-22_20-20-20-00027347.0004001 / 15 NOV 23

Applicable to: MSN 02926-02944, 04392, 07784-07792

Message Type	II
Display Type	MCDU
Display Conditions	The FMS receives performance initialization data, as part of a F-PLN uplink.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - MESSAGES

INITIALIZE WEIGHT/CG

Ident.: DSC-22_20-20-20-00026597.0001001 / 15 NOV 23

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

Message Type	II
Display Type	MCDU
Display Conditions	The flight crew started at least one engine, and the ZFW, ZFWCG or FOB is still not defined.

INITIALIZE WEIGHTS

Ident.: DSC-22_20-20-20-00026797.0001001 / 15 NOV 23

Applicable to: MSN 02926-02944, 04392, 07784-07792

Message Type	II
Display Type	MCDU
Display Conditions	The flight crew started at least one engine, and the ZFW, ZFWCG or FOB is still not defined.

INSRT/ERASE TMPY FIRST

Ident.: DSC-22_20-20-20-00026798.0001001 / 15 NOV 23

Applicable to: MSN 02926-02944, 04392, 07784-07792

Message Type	I
Display Type	MCDU
Display Conditions	A TMPY F-PLN, not created by a DIR TO/INTERCEPT revision, is on standby, and the flight crew tries to access the DIR TO page in order to attempt a DIR TO/INTERCEPT revision.

INVALID ATC UPLINK

Ident.: DSC-22_20-20-20-00027413.0002001 / 15 NOV 23

Applicable to: MSN 02719-02789, 03031-03060, 07784-07792

Message Type	II
Display Type	MCDU
Display Conditions	The FMS rejects an ATC F-PLN uplink because it is invalid.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - MESSAGES
--	---

INVALID F-PLN UPLINK

Ident.: DSC-22_20-20-20-00027339.0002001 / 15 NOV 23

Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The FMS rejects a F-PLN uplink because it is not valid.

INVALID FLT NBR UPLINK

Ident.: DSC-22_20-20-20-00027345.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The FMS rejects a flight number that is part of the F-PLN data uplink because it is not valid.

INVALID INIT UPLINK

Ident.: DSC-22_20-20-20-00027349.0002001 / 15 NOV 23

Applicable to: MSN 02926-02944, 04392, 07784-07792

Message Type	II
Display Type	MCDU
Display Conditions	The FMS rejects a performance initialization uplink because it is not valid.

INVALID PERF UPLINK

Ident.: DSC-22_20-20-20-00027348.0002001 / 15 NOV 23

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

Message Type	II
Display Type	MCDU
Display Conditions	The FMS rejects a performance initialization uplink because it is not valid.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - MESSAGES

INVALID TAKEOFF UPLINK

Ident.: DSC-22_20-20-20-00027365.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The FMS rejects a takeoff data uplink because it is not valid.

INVALID WIND UPLINK

Ident.: DSC-22_20-20-20-00027368.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The FMS rejects a wind data uplink because it is not valid.

IRS ONLY NAVIGATION

Ident.: DSC-22_20-20-20-00026600.0001001 / 15 NOV 23

Applicable to: MSN 02926-02944, 04392, 07784-07792

Message Type	II
Display Type	MCDU
Display Conditions	The aircraft is in enroute or oceanic area and one of the following conditions occurs: - The FMS navigation mode has been IRS only, for more than 10 min, or - The FMS navigation mode is IRS only, and the FMS flight phase becomes the descent phase.

LAT DISCONT AHEAD

Ident.: DSC-22_20-20-20-00026603.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The aircraft is at 30 s or less from flying a F-PLN discontinuity.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - MESSAGES
--	---

LIST OF 10 IN USE

Ident.: DSC-22_20-20-20-00026604.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	I
Display Type	MCDU
Display Conditions	The number of flight crew-stored runways, that are currently used by the FMS (in the F-PLN or in flight crew-stored routes), already reached the limit of 10, and the FMS rejects the attempt to create a new runway in the NEW RUNWAY page.

LIST OF 20 IN USE

Ident.: DSC-22_20-20-20-00026785.0003001 / 15 NOV 23

Applicable to: ALL

Message Type	I
Display Type	MCDU
Display Conditions	The number of flight crew-stored NAVAIDs or the number of flight crew-stored waypoints, that are currently used by the FMS (in the F-PLN or in flight crew-stored routes), already reached the limit of 20, and the FMS rejects the attempt to create a new NAVAID or a new waypoint.

Message Type	II
Display Type	MCDU
Display Conditions	The number of flight crew-stored waypoints, that are currently used by the FMS (in the F-PLN or in flight crew-stored routes), already reached the limit of 20, and the FMS rejects the additional waypoints received via uplink.

MACH SEGMENT DELETED

Ident.: DSC-22_20-20-20-00026561.0002001 / 15 NOV 23

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

Message Type	II
Display Type	MCDU
Display Conditions	The Constant Mach Segment (CMS) is automatically deleted in the active F-PLN, when one of the following occurs: - The flight crew activates the SEC F-PLN, or - An engine-out is detected, or - The flight phase changes from the cruise phase to another flight phase, or - The flight crew enters a lateral revision of the F-PLN which deletes the CMS.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - MESSAGES

MANUAL HOLD DELETED

Ident.: DSC-22_20-20-20-00026607.0002001 / 15 NOV 23

Applicable to: MSN 02926-02944, 04392, 07784-07792

Message Type	II
Display Type	MCDU
Display Conditions	A hold that was manually entered is deleted, due to a change of the arrival procedure.

MCDU OVERHEATED

Ident.: DSC-22_20-20-20-00026608.0002001 / 15 NOV 23

Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The MCDU temperature exceeds the normal operating conditions. The MCDU displays a blank screen when idle, as it is in power saving mode.

MORE DRAG

Ident.: DSC-22_20-20-20-00026609.0003001 / 15 NOV 23

Applicable to: ALL

Message Type	II
Display Type	MCDU and PFD
Display Conditions	DES is engaged or FINAL APP is engaged except in CONF 3 or FULL, and the flight crew should extend the speed brakes to comply with an altitude constraint, a speed limit, or a speed constraint.

NAV ACCUR DOWNGRAD

Ident.: DSC-22_20-20-20-00026610.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	II
Display Type	MCDU and ND
Display Conditions	The navigation accuracy changed from HIGH to LOW. For more information, Refer to DSC-22_20-10-20-20 Estimated Position Uncertainty.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - MESSAGES
--	---

NAV ACCUR UPGRAD

Ident.: DSC-22_20-20-20-00026611.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	||
Display Type	MCDU and ND
Display Conditions	The navigation accuracy changed from LOW to HIGH. For more information, <i>Refer to DSC-22_20-10-20-20 Estimated Position Uncertainty.</i>

NEW ACC ALT - HHHH

Ident.: DSC-22_20-20-20-00026758.0001001 / 15 NOV 23

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

Message Type	||
Display Type	MCDU
Display Conditions	On a climb waypoint, the flight crew enters an AT or AT OR BELOW altitude constraint. As a result, the FMS considers that the aircraft levels off below the acceleration altitude. The constraint altitude becomes the new acceleration altitude. HHHH corresponds to the altitude of the altitude constraint.

NEW ACC ALT HHHHH

Ident.: DSC-22_20-20-20-00026613.0002001 / 15 NOV 23

Applicable to: MSN 02926-02944, 04392, 07784-07792

Message Type	||
Display Type	MCDU
Display Conditions	On a climb waypoint, the flight crew enters an AT or AT OR BELOW altitude constraint. As a result, the FMS considers that the aircraft levels off below the acceleration altitude. The constraint altitude becomes the new acceleration altitude. HHHHH corresponds to the altitude of the altitude constraint.

NEW CRZ ALT - HHHHH

Ident.: DSC-22_20-20-20-00026759.0001001 / 15 NOV 23

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

Message Type	||
Display Type	MCDU
Display Conditions	The cruise flight level (on the INIT page or the PROG page) is automatically updated when the flight crew enters a new cruise altitude. HHHHH corresponds to the new cruise flight level.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - MESSAGES

NEW CRZ ALT HHHHH

Ident.: DSC-22_20-20-20-00026761.0002001 / 15 NOV 23

Applicable to: MSN 02926-02944, 04392, 07784-07792

Message Type	||
Display Type	MCDU
Display Conditions	The cruise flight level (on the INIT page or the PROG page) is automatically updated when the flight crew enters a new cruise altitude. HHHHH corresponds to the new cruise flight level.

NEW THR RED ALT - HHHH

Ident.: DSC-22_20-20-20-00026760.0001001 / 15 NOV 23

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

Message Type	||
Display Type	MCDU
Display Conditions	On a climb waypoint, the flight crew enters an AT or AT OR BELOW altitude constraint. As a result, the FMS considers that the aircraft levels off below the thrust reduction altitude. The constraint altitude becomes the new thrust reduction altitude. HHHH corresponds to the altitude of the altitude constraint.

NEW THR RED ALT HHHHH

Ident.: DSC-22_20-20-20-00026762.0002001 / 15 NOV 23

Applicable to: MSN 02926-02944, 04392, 07784-07792

Message Type	||
Display Type	MCDU
Display Conditions	On a climb waypoint, the flight crew enters an AT or AT OR BELOW altitude constraint. As a result, the FMS considers that the aircraft levels off below the thrust reduction altitude. The constraint altitude becomes the new thrust reduction altitude. HHHHH corresponds to the altitude of the altitude constraint.

NO ANSWER TO REQUEST

Ident.: DSC-22_20-20-20-00027408.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	I
Display Type	MCDU
Display Conditions	The FMS receives no answer to a datalink request that the flight crew sent more than four minutes ago.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - MESSAGES
--	---

NO FLS FOR THIS APPR

Ident.: DSC-22_20-20-20-00026618.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The FMS does not compute the FLS  beam for the approach that the flight crew selected. The FLS  function is not available.

NO INTERSECTION FOUND

Ident.: DSC-22_20-20-20-00026619.0002001 / 15 NOV 23

Applicable to: ALL

Message Type	I
Display Type	MCDU
Display Conditions	The FMS can neither find a shared waypoint nor an intersection during: - The addition of a VIA in the AIRWAYS page, or - The addition of a LAT/LONG crossing waypoint in the LAT REV page (LL XING / INCR/ NO).

NO NAV INTERCEPT

Ident.: DSC-22_20-20-20-00026620.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	HDG(TRK) mode is engaged, and NAV mode is armed. NAV mode cannot engage, because the current aircraft trajectory does not intersect the FMS F-PLN before the TO waypoint.

NO SLS FOR THIS APPR

Ident.: DSC-22_20-20-20-00027191.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	All of the following conditions occur: - SBAS  mode is selected in the SELECTED NAVAIDS page in the MCDU - The MMRs cannot decode the Final Approach Segment data block.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - MESSAGES

NO SLS  **MAN TUNING**

Ident.: DSC-22_20-20-20-00027192.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	I
Display Type	MCDU
Display Conditions	The flight crew tries to tune the SLS  manually.

NO SLS  : SBAS DESELECTED

Ident.: DSC-22_20-20-20-00027193.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The flight crew selects the SLS  in the RADIO NAV page while SBAS  is deselected on the SELECTED NAVAIDS page in the MCDU.

NO VERT PATH INTERCEPT

Ident.: DSC-22_20-20-20-00026621.0001001 / 15 NOV 23

Applicable to: MSN 02926-02944, 04392, 07784-07792

Message Type	II
Display Type	MCDU
Display Conditions	FINAL mode is armed. FINAL APP mode cannot engage, because the current aircraft trajectory does not intersect the FMS vertical profile. The current aircraft level is at more than 250 ft above the FMS vertical profile.

NON UNIQUE ROUTE IDENT

Ident.: DSC-22_20-20-20-00026622.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	I
Display Type	MCDU
Display Conditions	On the NEW ROUTE page, the flight crew attempts to enter a company route ident that already exists in the navigation database or in the flight crew-stored elements database.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - MESSAGES
--	---

NOT ALLOWED

Ident.: DSC-22_20-20-20-00026623.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	I
Display Type	MCDU
Display Conditions	The data entry or the data selection is not permitted.

NOT ALLOWED IN NAV

Ident.: DSC-22_20-20-20-00026624.0001001 / 15 NOV 23

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

Message Type	I
Display Type	MCDU
Display Conditions	NAV mode is engaged and the flight crew attempts to modify the TO waypoint.

NOT IN DATABASE

Ident.: DSC-22_20-20-20-00026625.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	I
Display Type	MCDU
Display Conditions	The flight crew enters the ident of an element that is neither in the navigation database, nor in the flight crew-stored elements database. The entered element can be one of the following: - A company route identifier - A FROM/TO waypoint - A place (airport, runway, waypoint, NAVAID) - A NAVAID frequency.

NOT XMITTED TO ACARS

Ident.: DSC-22_20-20-20-00027407.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The flight crew manually sends a downlink message through an MCDU page and the communication fails during the data transfer.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - MESSAGES

NOT XMITTED TO PRINTER

Ident.: DSC-22_20-20-20-00029063.0001001 / 12 NOV 25

Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The flight crew sends a printing request but the communication with the printer is not established or not acknowledged.

OFST DELETED IN TMPY

Ident.: DSC-22_20-20-20-00026626.0001001 / 15 NOV 23

Applicable to: MSN 02926-02944, 04392, 07784-07792

Message Type	II
Display Type	MCDU
Display Conditions	An offset is automatically deleted in the TMPY F-PLN, when one of the following occurs: - The offset is no longer compatible with the active lateral F-PLN, or - The aircraft is not able to fly the distance, that remains to the end of the offset.

ONLY SPD ENTRY ALLOWED

Ident.: DSC-22_20-20-20-00026627.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	I
Display Type	MCDU
Display Conditions	The aircraft is not in the climb phase, and the flight crew attempts to enter a MACH value in the PRESEL field of the PERF CLB page.

OPP FMGC IN PROCESS

Ident.: DSC-22_20-20-20-00026628.0002001 / 15 NOV 23

Applicable to: MSN 02926-02944, 04392, 07784-07792

Message Type	II
Display Type	MCDU
Display Conditions	The onside FMGC is failed, and the FMS operates in SINGLE mode. The offside FMGC manages the MCDU which displays the message.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - MESSAGES
--	---

OPP FMGC IN PROCESS

Ident.: DSC-22_20-20-20-00026628.0001001 / 15 NOV 23
Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

Message Type	II
Display Type	MCDU
Display Conditions	The onside FMGC is failed, and the FMS operates in SINGLE mode. The offside FMGC manages the MCDU which displays the message.

PAGE UPDATE IN PROCESS

Ident.: DSC-22_20-20-20-00026629.0001001 / 15 NOV 23
Applicable to: ALL

Message Type	I
Display Type	MCDU
Display Conditions	The update of the predictions is in progress, and the flight crew presses a key on the F-PLN page.

PERF DATA UPLINK

Ident.: DSC-22_20-20-20-00027346.0002001 / 15 NOV 23
Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

Message Type	II
Display Type	MCDU
Display Conditions	The FMS receives performance initialization data, as part of a F-PLN uplink.

PILOT ELEMENT RETAINED

Ident.: DSC-22_20-20-20-00026580.0001001 / 15 NOV 23
Applicable to: MSN 02926-02944, 04392, 07784-07792

Message Type	I
Display Type	MCDU
Display Conditions	The flight crew attempts to delete flight crew-stored nav aids, waypoints or runways that are currently used by the FMS. The message informs the flight crew that the elements that are still used by the FMS are not deleted.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - MESSAGES

PILOTS ROUTES FULL

Ident.: DSC-22_20-20-00026630.0002001 / 15 NOV 23

Applicable to: MSN 02926-02944, 04392, 07784-07792

Message Type	I
Display Type	MCDU
Display Conditions	The number of routes, that are currently stored in the FMS (in the flight crew-stored routes), already reached the limit of 5 and the flight crew attempts to create a new route. The new route creation is rejected.

PLACE/D IN TRANSITION

Ident.: DSC-22_20-20-00026632.0002001 / 15 NOV 23

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

Message Type	I
Display Type	MCDU
Display Conditions	The FMS rejects the flight crew entry, defined as a place/distance waypoint within a planned fixed-turn-radius transition between two flight legs.

PLACE/WPT MISMATCH

Ident.: DSC-22_20-20-00026633.0002001 / 15 NOV 23

Applicable to: MSN 02926-02944, 04392, 07784-07792

Message Type	I
Display Type	MCDU
Display Conditions	The flight crew inserts a PLACE/DISTANCE waypoint with a PLACE that differs from the revised waypoint.

PLEASE WAIT

Ident.: DSC-22_20-20-00026634.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	I
Display Type	MCDU
Display Conditions	The synchronization between both FMS is in progress.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - MESSAGES
--	---

PRINT ABORTED

Ident.: DSC-22_20-20-20-00026635.0002001 / 15 NOV 23
Applicable to: MSN 02926-02944, 04392, 07784-07792

Message Type	II
Display Type	MCDU
Display Conditions	The FMS fails to send data to the printer.

PRINT IN PROGRESS

2 Ident.: DSC-22_20-20-20-00029061.0001001 / 12 NOV 25
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	A printing request is sent to the printer.

PRINTER BUSY

3 Ident.: DSC-22_20-20-20-00029062.0001001 / 12 NOV 25
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The printer is currently printing a report.

PRINTER NOT AVAILABLE

Ident.: DSC-22_20-20-20-00027409.0001001 / 15 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	Communication with the printer is interrupted while printing a report.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - MESSAGES

PROCEDURE RNP IS XX.XX

Ident.: DSC-22_20-20-20-00026636.0002001 / 15 NOV 23

Applicable to: MSN 02926-02944, 04392, 07784-07792

Message Type	II
Display Type	MCDU
Display Conditions	The flight crew manually enters an RNP value on the PROG page, and the entered value is more than the RNP value, defined in the navigation database for the active leg or route. XX.XX is the RNP value defined in the navigation database.

PROCEDURE RNP IS XX.XX

Ident.: DSC-22_20-20-20-00026636.0001001 / 15 NOV 23

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

Message Type	II
Display Type	MCDU
Display Conditions	The flight crew manually enters an RNP value on the PROG page, and the entered value is more than or equal to the RNP value, defined in the navigation database for the active leg or route. XX.XX is the RNP value defined in the navigation database.

QUEUED TO PRINT

4 Ident.: DSC-22_20-20-20-00029064.0001001 / 12 NOV 25

Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The flight crew sends a printing request while the previous one is not completed yet.

RADIONAV IS Deselected

Ident.: DSC-22_20-20-20-00026637.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The flight crew manually deselected the radio NAVAIDS on the SELECTED NAVAIDS page, and: - The aircraft is at 80 NM from the T/D, or - The aircraft is in the approach phase.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - MESSAGES
--	--

REF/GPS POS DIFF

Ident.: DSC-22_20-20-20-00026638.0002001 / 15 NOV 23 Applicable to: MSN 02926-02944, 04392, 07784-07792
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Message Type	II
Display Type	MCDU
Display Conditions	The flight crew enters a reference position on the IRS INIT page, which differs with the GPS position.

REF/GPS POS DIFF

Ident.: DSC-22_20-20-20-00026638.0001001 / 15 NOV 23 Applicable to: MSN 02155-02789, 03031-03060, 05152-05746
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Message Type	I
Display Type	MCDU
Display Conditions	The flight crew enters a reference position on the IRS INIT page, which differs with the GPS position.

REF/LAST IRS POS DIFF

Ident.: DSC-22_20-20-20-00026639.0002001 / 15 NOV 23 Applicable to: MSN 02926-02944, 04392, 07784-07792
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Message Type	II
Display Type	MCDU
Display Conditions	The flight crew enters a reference position on the IRS INIT page, which differs with the last stored IRS position.

REF/LAST IRS POS DIFF

Ident.: DSC-22_20-20-20-00026639.0001001 / 15 NOV 23 Applicable to: MSN 02155-02789, 03031-03060, 05152-05746
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Message Type	I
Display Type	MCDU
Display Conditions	The flight crew enters a reference position on the IRS INIT page, which differs with the last stored IRS position.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - MESSAGES

RESET IRS TO NAV

Ident.: DSC-22_20-20-20-00026640.0002001 / 15 NOV 23

Applicable to: MSN 02926-02944, 04392, 07784-07792

Message Type	II
Display Type	MCDU
Display Conditions	The flight crew modified the aircraft position on the IRS INIT page after the IRS alignment. In order to align the IRS with the modified position, the flight crew must reset the IRS to NAV mode.

REVISION IN PROCESS

Ident.: DSC-22_20-20-20-00026641.0002001 / 15 NOV 23

Applicable to: MSN 02926-02944, 04392, 07784-07792

Message Type	I
Display Type	MCDU
Display Conditions	One MCDU displays the AIRWAYS page, and the flight crew attempts to insert a revision on the other MCDU. The system rejects this revision.

REVISIONS NOT STORED

Ident.: DSC-22_20-20-20-00026642.0003001 / 15 NOV 23

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

Message Type	II
Display Type	MCDU
Display Conditions	The flight crew stores an active or a SEC F-PLN as a NEW ROUTE. This message indicates that the following elements of the F-PLN are not stored: - Flight crew-entered holds - Offsets - Modifications to terminal area procedures - Flight crew-entered constraints - Pseudo waypoints - Step at optimum - Flight crew-entered Constant Mach Segment.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - MESSAGES
--	---

REVISIONS NOT STORED

Ident.: DSC-22_20-20-20-00026642.0002001 / 15 NOV 23

Applicable to: MSN 02926-02944, 04392, 07784-07792

Message Type	II
Display Type	MCDU
Display Conditions	The flight crew stores an active or a SEC F-PLN as a NEW ROUTE. This message indicates that the following elements of the F-PLN are not stored: - Flight crew-entered holds - Offsets - Modifications to terminal area procedures - Flight crew-entered constraints - Pseudo waypoints - Step at optimum.

RTA DELETED

Ident.: DSC-22_20-20-20-00026643.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	A time constraint is automatically deleted from the active F-PLN, if one of the following occurs: - The FMGS detects an engine out condition - The aircraft enters a holding pattern - The flight crew inserts a second RTA in the same F-PLN at a different waypoint - The flight crew activates the ALTN F-PLN - The flight crew performs a DIR TO/ABEAM, and the time constrained waypoint is projected as an ABEAM waypoint - The flight phase changes from descent or approach to climb or cruise - The UTC time is no longer valid.

RTA EXISTS

Ident.: DSC-22_20-20-20-00026646.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	I
Display Type	MCDU
Display Conditions	The flight crew attempts to delete the FMS-computed ETT, while an RTA exists.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - MESSAGES

RWY/LS MISMATCH

Ident.: DSC-22_20-20-20-00026651.0002001 / 15 NOV 23

Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	In the preflight or takeoff phase: The flight crew manually tunes an LS frequency in the RADIO NAV page, and this landing system disagrees with the selected takeoff runway in the F-PLN. In the climb, cruise, descent, ILS/GLS  approach or go-around phase: The flight crew manually tunes an LS frequency in the RADIO NAV page, and this landing system disagrees with the selected destination runway in the F-PLN.

SELECT DESIRED SYSTEM

Ident.: DSC-22_20-20-20-00026654.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	I
Display Type	MCDU
Display Conditions	The flight crew can select a system on the displayed MCDU page.

SELECT HDG/TRK FIRST

Ident.: DSC-22_20-20-20-00026655.0002001 / 15 NOV 23

Applicable to: MSN 02926-02944, 04392, 07784-07792

Message Type	I
Display Type	MCDU
Display Conditions	NAV mode is engaged. The flight crew attempts to insert/activate a TMPY F-PLN or a SEC F-PLN, and the first flight leg of the TMPY F-PLN or the SEC F-PLN is different from the active flight leg of the active F-PLN. The flight crew should first disengage the NAV mode, and then insert/activate the TMPY F-PLN or the SEC F-PLN.

SELECT TRUE

Ident.: DSC-22_20-20-20-00026656.0002001 / 15 NOV 23

Applicable to: ALL

Message Type	II
Display Type	MCDU and ND
Display Conditions	The NORTH REF pb-sw is set to MAG, while the IRS can no longer provide magnetic heading.

SENSOR IS INVALID

Ident.: DSC-22_20-20-20-00026657.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	I
Display Type	MCDU
Display Conditions	One of the following occurs: - The flight crew selects the FF or the FQ sensor in the FUEL PRED page, and this sensor is not valid, or - The flight crew selects the FF+FQ or the FQ+FF sensors in the FUEL PRED page, and both sensors are not valid, or - The flight crew enters the FOB only, and the FF sensor is not valid.

SET GREEN DOT SPEED

Ident.: DSC-22_20-20-20-00026659.0002001 / 15 NOV 23

Applicable to: ALL

Message Type	II
Display Type	MCDU and PFD
Display Conditions	All of the following conditions occur: - The FMGS detects an engine out condition - The flight crew selects a speed target which is: - Equal to or above Green Dot +10 kt when ALT* or ALT are not engaged - Equal to or below Green Dot -10 kt.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - MESSAGES

SET HOLD SPEED

Ident.: DSC-22_20-20-20-00026660.0003001 / 15 NOV 23

Applicable to: MSN 02926-02944, 04392, 07784-07792

Message Type	II
Display Type	MCDU and PFD
Display Conditions	The selected speed/Mach control is engaged. The flight crew inserts a hold in the F-PLN, and all of the following occur: - The difference between the selected speed and the hold speed is more than 5 kt - The aircraft enters the deceleration zone.

SET HOLD SPEED

Ident.: DSC-22_20-20-20-00026660.0002001 / 15 NOV 23

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

Message Type	II
Display Type	MCDU and PFD
Display Conditions	The selected speed/Mach control is engaged. The flight crew inserts a hold in the F-PLN, and all of the following occur: - The difference between the selected speed and the hold speed is more than 5 kt - The aircraft is at 30 s or less from the deceleration zone.

SET MANAGED SPEED

Ident.: DSC-22_20-20-20-00026661.0002001 / 15 NOV 23

Applicable to: ALL

Message Type	II
Display Type	MCDU and PFD
Display Conditions	One of the following occurs: - At the transition to the cruise phase, the speed target is selected, and the flight crew did not enter a pre-selected speed, or - At the transition to the descent phase, the speed target is selected.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - MESSAGES
--	---

SETTING SPD/RTA

Ident.: DSC-22_20-20-20-00026584.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	||
Display Type	MCDU
Display Conditions	The system updates the managed speed target to satisfy the RTA constraints. The managed speed target is frozen during the update.

SPD ERROR AT XXXXXXX

Ident.: DSC-22_20-20-20-00026665.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	||
Display Type	MCDU
Display Conditions	In managed lateral guidance, the FMS predicts that the aircraft speed will not satisfy a speed constraint by more than 10 kt. The message disappears when the aircraft speed satisfies the speed constraint by less than 5 kt. XXXXXXX corresponds to the ident of the waypoint for which the speed constraint will not be satisfied.

SPD LIM EXCEEDED

Ident.: DSC-22_20-20-20-00026666.0002001 / 15 NOV 23

Applicable to: ALL

Message Type	||
Display Type	MCDU
Display Conditions	All of the following occur: - The aircraft speed is more than 10 kt over the speed limit or the Green Dot speed whichever is higher - The aircraft altitude is more than 150 ft below the speed limit altitude.

SPECIF NDB UNAVAIL

Ident.: DSC-22_20-20-20-00026667.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	||
Display Type	MCDU
Display Conditions	The NDB (defined for an NDB approach) is deselected or not available.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - MESSAGES

SPECIF VOR-D UNAVAIL

Ident.: DSC-22_20-20-20-00026668.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	II
Display Type	MCDU and ND
Display Conditions	The VOR or VOR/DME (defined for a RNAV or VOR approach) is deselected or not available.

STEP ABOVE MAX FL

Ident.: DSC-22_20-20-20-00026669.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The entered step altitude is above the recommended maximum flight level. For information about the recommended maximum flight level, <i>Refer to DSC-22_20-10-40-30 Other Computations - Recommended Maximum Altitude (REC MAX)</i>

STEP AHEAD

Ident.: DSC-22_20-20-20-00026670.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The aircraft is at less than 20 NM from the start waypoint of a step climb or a step descent.

STEP DELETED

Ident.: DSC-22_20-20-20-00026671.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The FMS deleted or sequenced a step climb or a step descent.

STORED ROUTES FULL

Ident.: DSC-22_20-20-20-00026631.0003001 / 15 NOV 23

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

Message Type	I
Display Type	MCDU
Display Conditions	The number of routes, that are currently stored in the FMS (in the flight crew-stored routes), already reached the limit of 5 and the flight crew attempts to create a new route. The new route creation is rejected.

SYSTEM NOT AVAILABLE

Ident.: DSC-22_20-20-20-00026672.0002001 / 15 NOV 23

Applicable to: MSN 02926-02944, 04392, 07784-07792

Message Type	I
Display Type	MCDU
Display Conditions	The flight crew selects an MCDU function or an MCDU page, and the corresponding function or page is not available.

TAKE OFF DATA UPLINK

Ident.: DSC-22_20-20-20-00027350.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The FMS receives a takeoff data uplink. The flight crew can review the takeoff data and insert it in the active F-PLN via the UPLINK MAX TO DATA or the UPLINK FLX (or DRT) TO DATA pages.

TEMPORARY F-PLN EXISTS

Ident.: DSC-22_20-20-20-00026673.0001001 / 15 NOV 23

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

Message Type	I
Display Type	MCDU
Display Conditions	One MCDU displays a TMPY F-PLN, and the flight crew attempts one of the following: - To select any key (except the ERASE or the INSERT key), or - To activate the SEC F-PLN.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - MESSAGES

TIME ERROR AT XXXXXXXX

Ident.: DSC-22_20-20-20-00026675.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	In managed lateral guidance, the FMS predicts that the aircraft speed will not satisfy a time constraint. XXXXXXX corresponds to the ident of the waypoint for which the time constraint will not be satisfied.

TIME MARKER LIST FULL

Ident.: DSC-22_20-20-20-00026676.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	I
Display Type	MCDU
Display Conditions	The F-PLN time markers already reached the limit of 4, and the flight crew attempt to insert a new time marker.

TIME TO EXIT

Ident.: DSC-22_20-20-20-00026677.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The aircraft must immediately leave the holding pattern in order to comply with the fuel reserve requirements. The fuel reserve requirements consider that the extra fuel is equal to 0 at landing at the destination airport.

TMPY F-PLN EXISTS

Ident.: DSC-22_20-20-20-00026674.0002001 / 15 NOV 23

Applicable to: MSN 02926-02944, 04392, 07784-07792

Message Type	I
Display Type	MCDU
Display Conditions	One MCDU displays a TMPY F-PLN, and the flight crew attempts one of the following: - To select any key (except the ERASE or the INSERT key), or - To activate the SEC F-PLN.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - MESSAGES
--	--

TO SPEED TOO LOW

Ident.: DSC-22_20-20-20-00026790.0001001 / 15 NOV 23 Applicable to: ALL

L12

Message Type	||
Display Type	MCDU
Display Conditions	The flight crew inserts at least one takeoff speed (V1, VR or V2) that is below the corresponding minimum speed determined by the FMS, based on VMCG, VMCA and VS1G. Associated with an ECAM alert.

TOO STEEP PATH AHEAD

Ident.: DSC-22_20-20-20-00026680.0002001 / 15 NOV 23 Applicable to: ALL

Message Type	||
Display Type	MCDU
Display Conditions	In NAV mode, the FMS detects a too steep path in the vertical descent profile, in one of the following flight phases: - The cruise phase at less of 150 NM of the destination, or - The descent phase, or - The approach phase.

TUNE BBB FFF.FF

Ident.: DSC-22_20-20-20-00026682.0001001 / 15 NOV 23 Applicable to: ALL

Message Type	||
Display Type	MCDU
Display Conditions	The flight crew manually selected a NAVAID, and the FMS cannot automatically tune the desired NAVAID. BBB corresponds to the NAVAID ident. FFF.FF corresponds to the associated frequency.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - MESSAGES

TURN AREA EXCEEDANCE

Ident.: DSC-22_20-20-20-00026683.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	In NAV mode, the aircraft is at 1.5 min before the entrance in a procedure turn leg, and the lateral path in the leg exceeds the protection envelope defined in the navigation database.

UPLINK INSERT IN PROG

Ident.: DSC-22_20-20-20-00027341.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	I
Display Type	MCDU
Display Conditions	The FMS displays this message during the insertion of a F-PLN uplink.

UNKNOWN PROGRAM PIN

Ident.: DSC-22_20-20-20-00026684.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The aircraft pin program combination (aircraft type, engine type, VMO/MMO parity) is not compatible or not defined in the FMGC software. The system is then not able to initialize.

USING COST INDEX-NNN

Ident.: DSC-22_20-20-20-00026685.0003001 / 15 NOV 23

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

Message Type	I
Display Type	MCDU
Display Conditions	One of the following occurs: - The FMS uses the CI value entered during the previous flight, because for the current flight, the flight crew entered the ZFW or the GW only, and did not define the new CI previously, or - The flight crew activates the ALTN F-PLN and the current CI is not equal to 0, then the FMS sets the CI of the ACTIVE F-PLN to 0. NNN corresponds to the CI value used by the FMS.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - MESSAGES
--	--

USING COST INDEX NNN

Ident.: DSC-22_20-20-20-00026686.0001001 / 15 NOV 23

Applicable to: MSN 02926-02944, 04392, 07784-07792

Message Type	I
Display Type	MCDU
Display Conditions	The FMS uses the CI value entered during the previous flight, because for the current flight, the flight crew entered the ZFW or the GW only, and did not define the new CI previously. NNN corresponds to the CI value used by the FMS.

V1/VR/V2 DISAGREE

Ident.: DSC-22_20-20-20-00026687.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	V1, VR, and V2 do not satisfy the condition $V1 \leq VR \leq V2$.

WAIT FOR SYSTEM RESPONSE

Ident.: DSC-22_20-20-20-00026688.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	I
Display Type	MCDU
Display Conditions	After a system selection in the MCDU MENU page, the system page is not displayed immediately.

WIND DATA UPLINK

Ident.: DSC-22_20-20-20-00027366.0001001 / 15 NOV 23

Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The FMS receives a wind data uplink. The flight crew may review the wind data in the ACTIVE or the SEC F-PLN page.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - MESSAGES

WIND UPLINK EXISTS

Ident.: DSC-22_20-20-20-00027403.0002001 / 15 NOV 23

Applicable to: MSN 02926-02944, 04392, 07784-07792

Message Type	I
Display Type	MCDU
Display Conditions	The flight crew attempts to modify the winds in the active or secondary F-PLN while a wind data uplink is pending insertion.

WIND UPLINK PENDING

Ident.: DSC-22_20-20-20-00027370.0003001 / 15 NOV 23

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

Message Type	II
Display Type	MCDU
Display Conditions	The FMS receives a wind data uplink while the DIR TO page is displayed or a TMPY F-PLN exists. The flight crew can insert the wind data after the DIR TO is performed or cancelled or after the TMPY F-PLN is inserted or cancelled.

XXXX IS DESELECTED

Ident.: DSC-22_20-20-20-00026689.0003001 / 15 NOV 23

Applicable to: MSN 02926-02944, 04392, 07784-07792

Message Type	I
Display Type	MCDU
Display Conditions	The flight crew attempts one of the following: - To deselect a NAVAID (via the SELECTED NAVAID page) or a satellite (via the PREDICTIVE GPS page) already deselected, or - To manually tune a NAVAID (via the RADIO NAV page) already deselected. XXXX corresponds to the ident of the deselected NAVAID or to the number of the deselected satellite.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - MESSAGES
--	--

XXXX IS DESELECTED

Ident.: DSC-22_20-20-20-00026689.0001001 / 15 NOV 23
Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

Message Type	I
Display Type	MCDU
Display Conditions	The flight crew attempts one of the following: - To deselect a NAVAID (via the SELECTED NAVAID page) already deselected, or - To manually tune a NAVAID (via the RADIO NAV page) already deselected. XXXX corresponds to the ident of the deselected NAVAID.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - MESSAGES

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MCDU DATA FORMAT LIST

Ident.: DSC-22_20-20-30-00000920.0082001 / 21 MAY 24

Applicable to: MSN 02926-02944, 07784-07792

The following chart lists all the data the pilot may enter on the MCDU.

It also shows the acceptable format for the various data items, the acceptable range, the units of entry, and the MCDU pages on which the data can be entered.

The following codes are used to indicate various data formats:

- A : letters
- N : numbers
- X : letters and numbers

DATA NAME	FORMAT	RANGE (X is input)	UNITS	DISPLAY PAGE
ACCEL ALT	See ALT		ft (MSL)	TAKEOFF (ACT/SEC ⁽²⁾) GO AROUND (ACT/SEC ⁽²⁾)
ALT	NNNN or NNNNN (leading zeros must be included)	Max ALT = 39 000 Entry is rounded to the nearest 10 ft	ft (MSL)	PERF CLB PERF DES
ALT CSTR	See ALT	See ALT	ft (MSL)	VERT REV F-PLN A SEC F-PLN A
AIRWAYS (VIA)	XXXX	If not in data base "NOT IN DATA BASE" is displayed	N/A	LAT REV AIRWAYS 
ARPT	AAAA 1 character minimum. 4 maximum.	If AAAA is not in the database airport file, the New Runway page is displayed		INIT A (ACT/SEC ⁽²⁾) LAT REV ALTN F-PLN A-B (ACT/SEC ⁽²⁾) WAYPOINT DIR TO
BARO	Same as ALT	Ldg elevation to Idg elevation + 5000	ft (MSL)	PERF APPR (ACT/SEC)
BLOCK FUEL	NN.N leading zeros may be omitted.	0-80/0-175.2	Thousands of Kg or thousands of Lb	INIT B (ACT/SEC ⁽²⁾)
CABIN RATE	- NNN (- may be omitted)	100 - 999	ft/min	DES FORECAST or CRUISE PERF. PAGE 
CG	NN.N	8.0 - 45.0	% MAC	INIT B. (ACT/SEC ⁽²⁾) FUEL PRED
CHANNEL 	NNN	500 - 699		NEW NAVAID RAD NAV

Continued on the following page

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - DATA FORMAT LIST

Continued from the previous page

DATA NAME	FORMAT	RANGE (X is input)	UNITS	DISPLAY PAGE
CLASS (NAVAID)	AAAAAA (refer to RANGE for exact inputs allowed)	VOR DME VORDME VORTAC LOC, ILS NDB ILSDME MLS  TACAN 	N/A	NEW NAVAID
CO RTE	XXXXXXX 7 or 10 characters (pin program)	If not in the NAVdatabase, a message will be displayed	N/A	INIT A ROUTE SELECTION NEW ROUTE ALTERNATE
COST INDEX	NNN may be entered as 1-3 digits; leading zeros may be omitted	0 to 999	Kg/Min or 100 lb/Hr	INIT A (ACT/SEC ⁽²⁾) PERF CLB (ACT/SEC ⁽²⁾) PERF CRZ (ACT/SEC ⁽²⁾) PERF DES (ALT/SEC ⁽²⁾)
CRS	See INB CRS	See INB CRS	degrees	RADIO NAV NEW NAVAID NEW RUNWAY
CRZ FL	Must be entered as FLIGHT LEVEL	Maximum FL (See FLIGHT LEVEL)	Hundred of ft	INIT A (ACT/SEC ⁽²⁾) PROG
CRZ TEMP	See TEMP	±99	Degrees celsius	INIT A (ACT/SEC ⁽²⁾) FUEL PREDICTION
CRZ WIND	See WIND DIR/MAG	See WIND DIR/MAG	See WIND DIR/MAG	INIT A (ACT/SEC ⁽²⁾) FUEL PREDICTION
DIST	NN.N leading and trailing 0's may be omitted.	0 - 99.9 or 0 - 999 (or 9999 )	NM NM	HOLD ALTN
DRT TO 	"D"NN	Eight possible values		PERF TAKEOFF
EFF WIND 	±NNN " + " may be entered as "T" or "TL" " - " may be entered as "H" or "HD" Leading zeros may be omitted If no sign is input, "+" is taken	0 - 500	kts	CLOSEST AIRPORT EQUI-TIME INIT A SEC INT A

Continued on the following page

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT
CONTROLS AND INDICATORS - MCDU - DATA FORMAT LIST
Continued from the previous page

DATA NAME	FORMAT	RANGE (X is input)	UNITS	DISPLAY PAGE
ELV	±NNNN if no sign, + assumed Leading 0's may be omitted	Entry displayed to nearest 10 ft -400 to 20 470 ft (RWY) (or - 1000 to 20 470 ft <A>) -2 000 to 20 470 (NAVAID)	ft (MSL)	NEW RUNWAY NEW NAVAID
ETT/RTA <A>	HH:MM:SS	00:00:00 to 23:59:59	Hour HH Min MM Sec SS	RTA
FF/FQ Sensors	One or both may be entered, Both - /FF + FQ or - / FQ + FF Fuel flow - /FF Fuel Quantity - / FQ		N/A	FUEL PREDICTION
FIG OF MERIT	N	0 - 3	N/A	NEW NAVAID
FINAL/TIME	Only one may be entered at a time. NN.N or (NNN.N <A>) for FINAL NNNN for TIME	FINAL 0 - 10.0 (or 0 - 100 <A>) or 0 - 22.0 0 - 90 TIME	Thousand of kg or Thousand of lb minutes	FUEL PRED INIT B
FLAPS		0, 1, 2, or 3		TAKEOFF
FLEX TO TEMP	1. If Derated TO option not implemented: same as TEMP 2. If Derated TO option is implemented: F NN		NN in degrees centigrade	TAKEOFF
FLIGHT LEVEL	FLNNN or NNN Leading zeros on NNN may be omitted	Max FL = 390 (or Max FL = 410 <A>)	Hundreds of ft (MSL)	F-PLN A-B, PROG VERT REV INIT A (ACT, SEC ⁽²⁾) PERF CLB PERF DES STEP PRED STEP ALTS <A>

Continued on the following page

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - DATA FORMAT LIST

Continued from the previous page

DATA NAME	FORMAT	RANGE (X is input)	UNITS	DISPLAY PAGE
FLIGHT NUMBER	XXXXXXXX The 8 alphanumeric are not mandatory	N/A	N/A	INIT A F-PLN A-B
FOB	NN.N (leading zeros may be omitted)	See BLOCK	Thousands of kg or Thousands of Lb	FUEL PREDICTION
FREQ	NNN.NN ILS/VOR NNN.N NDB	108.00 - 117.95 190.0 - 1 750.0	MHz KHz	PROG. NEW NAVAID RADIO NAV
FROM/TO	AAAA /AAAA	AAAA must be in data base or message will be displayed	N/A	INIT A (ACT/SEC ⁽²⁾)
GW	NN.N Leading and trailing zeros may be omitted	35 - 99.9 or 77.2 - 218	Thousands of kg or Thousands of Lb	FUEL PREDICTION
GND TEMP	±NN (if no sign, assume +)		See TEMP	INIT A, SEC INIT A
IDLE FACTOR 	± N.N Leading and trailing zeros may be omitted	-9.9. +9.9	%	A/C STATUS
INB CRS	NNN Leading zeros may be omitted. An entry of 360 is displayed as 0.	000 - 359	Degrees	HOLD
LAT	DDMM.MB DD - degrees, MM.M - minutes, B - direction. Leading zeros may be omitted but the direction (B) is necessary.	B: N or S 0 ≤ DD ≤ 90 0 ≤ MM.M ≤ 59.9	Degree minutes tenths of minutes	INIT A IRS INIT
LAT/LONG	LAT/LONG See LAT and See LONG except both must be entered with "/" in between	See LAT and See LONG	See LAT and See LONG	F-PLN A-B (ACT/SEC ⁽²⁾) PROG NEW WAYPOINT NEW NAVAID DIR TO LAT REV NEW RUNWAY IRS INIT
LENGTH	NNNN Leading zeros may be omitted	1 000 - 8 000 m 3 282 - 9 999 ft	Meters or feet	NEW RUNWAY

Continued on the following page

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT
CONTROLS AND INDICATORS - MCDU - DATA FORMAT LIST
Continued from the previous page

DATA NAME	FORMAT	RANGE (X is input)	UNITS	DISPLAY PAGE
LONG	DDMM.MB or DDD - degrees MM.M - minutes B - direction. Leading zeros may be omitted but the direction (B) is necessary	B: E or W $0 \leq DDD \leq 180$ $0 \leq MM.M \leq 59$	Degree minutes tenths of minutes	INIT A IRS INIT
MACH	.NN or 0.NN Trailing zeros are not necessary NN: Entry of two figures is necessary	MAX = .82 MIN = .15	Mach Number	F-PLN A (ACT/SEC ⁽²⁾) PERF CLB PERF CRZ PERF DES
MACH/SPD	MACH and SPD must be entered with "/" between (See MACH and See SPD formats)	See MACH and See SPD	See MACH and See SPD	PERF DES (ACT/SEC ⁽²⁾)
MIN DEST FOB	NNN.N (leading zeros may be omitted)	0 - 80	Thousand of kg or lb (OPC option)	INIT B FUEL PRED (ATC/SEC)
NAVAID	XXXX	Any alphanumeric	N/A	PROG NEW NAVAID NAVAID F-PLN A-B (ACT/SEC ⁽²⁾) LAT REV DIR TO RADIO NAV SELECTED NAVAIDS
OFST	NNB or BNN NN offset distance B direction	B: L or R $1 < NN < 50$	NM	LAT REV
PERF FACTOR	NN.N leading or trailing zeros may be omitted ($\pm$ N.N)	-10.0 to +10.0 (or -9.9 - +9.9 $\triangleleft$)	N/A	A/C STATUS

Continued on the following page

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - DATA FORMAT LIST

Continued from the previous page

DATA NAME	FORMAT	RANGE (X is input)	UNITS	DISPLAY PAGE
PLACE/BRG/DIST	PLACE can be any data base ARPT, NAVAID or WAYPOINT - BRG must be a 3 digit entry without decimal digit. An entry of BRG = 360 is displayed as 0.	PLACE - If not in data base, a message "NOT IN DATA BASE" is displayed BRG - 000 - 360	N/A degrees	LAT REV(ACT/SEC ⁽²⁾) NEW WAYPOINT PROG DIR TO F-PLN-A (ACT/SEC ⁽²⁾) STEP ALTS 
	DIST is NNN.N where leading zeros may be omitted ; all 3 parameters must be entered with "/" between	DIST - 0 - 999.9	NM	
PLACE-BRG/ PLACE-BRG	See PLACE/BRG/DIST A couple PLACE-BRG is entered with a dash in the middle. 2 couples have to be entered with "/" between	See PLACE/BRG/DIST	See PLACE/BRG/ DIST	See PLACE/BRG/DIST
PLACE/DIST 	PLACE: See PLACE/BRG/DIST DIST: See PLACE/BRG/DIST	PLACE: See PLACE/BRG/DIST DIST: 0 - 999.9	N/A NM	F-PLN A and B SEC F-PLN A and B LAT REV NEW WAYPOINT DIR TO STEP ALTS
QNH	NNNN (leading zero may be omitted).	745 - 1 050 (or 745 - 1050 )	Hecto-Pascals (hPa)	PERF APPR (ACT/SEC ⁽²⁾)
	NN.NN or NNNN (four digits are mandatory).	28.06 - 31.01 (or 22.00 - 32.48 )	In.Hg	
RADIAL 	NNN(T) 3 digits entry	000 - 360	Degrees	FIX INFO 1 to 4
RADIAL IN 	NNN(T) 3 digits entry	000 - 360	Degrees	DIR TO
RADIAL OUT 	NNN(T) 3 digits entry	000 - 360	Degrees	DIR TO FIX INFO 1 to 4
RADIO	NNN	0-700 No is accepted if an ILS / GLS  ; APPR is selected	ft	PERF APPR (ACT/SEC)

Continued on the following page

Continued from the previous page

DATA NAME	FORMAT	RANGE (X is input)	UNITS	DISPLAY PAGE
RADIUS 	DNNN 3 digits entry D is the identifiant of the circle radius	000 - 256	NM	FIX INFO 1 to 4
REF FIX 	See WAYPOINT			FIX INFO 1 to 4
RTE RSV	may be entered as fuel or percentage of trip fuel	Fuel 0 - 10.0 0 - 21.7 % : 0 - 15.0	thousands of kg thousands of lb	INIT B (ACT/SEC ⁽²⁾) FUEL PRED
RWY	AAAAANN Where AAAA is same as ARPT (See ARPT). NN is runway number (2 digits) must be entered D is L or R to be included only when there is more than one runway with the same number at ARPT.			RUNWAY NEW RUNWAY F-PLN A-B
SAT/ALT 	TEMP/ALT	See TEMP and See ALT	N/A	CRZ WIND
SET HDG 	NNN/N (leading and trailing zeros may be omitted) will always be displayed as NNN/N	000.0 - 360.0	Degrees	IRS MONITOR
SLOPE 	NN.N	00.0 - 90.0	Degrees	NEW NAVAID
SPD	NNN (must be 3 numerics)	MAX = 350 kt MIN = 90 kt	kt (CAS)	SEC F-PLN A PERF CLB PERF CRZ (ACT, SEC ⁽²⁾) PERF DES
SPD CSTR	See SPD	See SPD	kt (CAS)	F-PLN A (ACT/SEC ⁽²⁾) VERT REV (ACT/SEC ⁽²⁾)
SPD LIM	SSS/NNNN SSS is a speed NNNN is an ALT or FLIGHT LEVEL (See ALT and See FLIGHT LEVEL)	SSS: See SPD	kt/ft (MSL)	VERT REV (ACT/SEC ⁽²⁾)
SPD/MACH	See MACH/SPD	See MACH and See SPD	See MACH and See SPD	PERF DES (ACT/SEC ⁽²⁾)

Continued on the following page

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT
CONTROLS AND INDICATORS - MCDU - DATA FORMAT LIST
Continued from the previous page

DATA NAME	FORMAT	RANGE (X is input)	UNITS	DISPLAY PAGE
STATION DEC	NND Where NN is the declination and D is the direction. Leading zeros may be omitted. D is not required for an entry of zero declination.	NN: 01 - 99 D : E or W	Degrees	NEW NAVAID
STEP ALT 	SNNN or NNNS (where NNN is in Flight Level) or SNNNNN or NNNNNS (where NNNNN is in ALT) Leading zeros may be omitted	See FLIGHT LEVEL or See ALT	See FLIGHT LEVEL or See ALT	F-PLN A
TAXI	N.N Leading or trailing zeros may be omitted	0 - 9.9	Thousands of kg	INIT B (ACT/SEC ⁽²⁾)
TEMP	± NN If no sign, + assumed	±99	Degrees celsius	PERFTAKEOFF PERF APPR UPLINK TODATA REQ
THR RED ALT	See ALT	400 ft AGL mini	ft (MSL)	PERF TAKE OFF
THS	AAN.N or N.NAA where AA is UP or DN	max UP 7.0 max DN 5.0 increment .1	degrees	PERF TAKEOFF
TRANS ALT	See ALT			PERF TAKE OFF PERF GO AROUND
TRANS FL	See FLIGHT LEVEL			PERF APPR
TIME	N.N	0 - 9.9	Minutes	HOLD
TIME MARK. 	HHMM	HH: 0 - 23 MM : 0 - 59	Hours Minutes	F-PLN A and B
T.O SHIFT	NNNN	1-Length of origin runway	m or ft	PERF TAKEOFF
TRIP WIND	See EFF WIND		kts	INIT A SET INIT A
TROPO	See ALT	See ALT (or 60 000 )	ft	INIT A FUEL PREDICTION SEC FUEL PREDICTION

Continued on the following page

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT
CONTROLS AND INDICATORS - MCDU - DATA FORMAT LIST
Continued from the previous page

DATA NAME	FORMAT	RANGE (X is input)	UNITS	DISPLAY PAGE
UTC CSTR	HH MM Where HH are hours and MM are minutes. Leading zeros may be omitted. 1 or 2 digits entry is interpreted as minutes.	HH: 0 - 23 MM : 0 - 59	Hours and minutes	VERT REV
V1	See SPD		kt (CAS)	PERF TAKEOFF (ACT/SEC ⁽²⁾)
V2	See SPD		kt (CAS)	PERF TAKEOFF (ACT/SEC ⁽²⁾)
VR	See SPD		kt (CAS)	PERF TAKEOFF (ACT/SEC ⁽²⁾)
WIND	See WIND DIR/ VELOCITY	See WIND DIR/ VELOCITY	See WIND DIR/ VELOCITY	F-PLN B (ACT/SEC ⁽²⁾) FUEL PREDICTION
WAYPOINT	XXXXX - may be from . 1-5 (1-7 )) characters for waypoint. Acceptable as waypoint IDENT : ARPT NAVAID WAYPOINT LAT/LONG, PLACE BRG/ PLACE BRG and PLACE/BRG/ DIST PLACE / DIST  may be entered to define a waypoint			WAYPOINT NEW WAYPOINT F-PLN A and B (ACT/SEC ⁽²⁾) LAT REV PROG DIR TO FIX INFO  1 AND 2 EQUI-TIME POINT  STEP ALTS  PREDICTIVE GPS 
WIND DIR/WIND MAG	NNN/NNN Both must be entered ; leading zeros may be omitted. An entry of WIND DIR = 360 is displayed as 0.	WIND DIRECTION 0 - 360	Degrees	INIT A PERF APPR (ACT/SEC ⁽²⁾) STEP PRED
		WIND MAG 0 - 200	Kt	WIND F-PLN B VERT REV
WIND DIRECTION/ MAG/ALT	NNN/NNN/FL NNN or NNN/NNN/NN NNN	Direction and Velocity as above Minimum ALT 1 000	FL in hundred of ft, ALT in ft	DES FORECAST WIND PAGES 

Continued on the following page

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - DATA FORMAT LIST

Continued from the previous page

DATA NAME	FORMAT	RANGE (X is input)	UNITS	DISPLAY PAGE
ZFW	NN.N OR NNN.N Leading and trailing zeros may be omitted	Min ZFW ⁽¹⁾ – Max ZFW ⁽¹⁾	Thousands of kg or thousands of Lb	INIT B (ACT/SEC ⁽²⁾)
ZFWCG	See CG	See CG	See CG	INIT B

⁽¹⁾ As defined in the Performance Data Base.

⁽²⁾ ACT/SEC = Active or Secondary

MCDU DATA FORMAT LIST

Ident.: DSC-22_20-20-30-00000920.0051001 / 06 NOV 23

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

The following chart lists all the data the pilot may enter on the MCDU.
 It also shows the acceptable format for the various data items, the acceptable range, the units of entry, and the MCDU pages on which the data can be entered.

The following codes are used to indicate various data formats:

A : letters

N : numbers

X : letters and numbers

DATA NAME	FORMAT	RANGE (X is input)	UNITS	DISPLAY PAGE
ACCEL ALT	See ALT		ft (MSL)	TAKEOFF (ACT/SEC ⁽²⁾) GO AROUND (ACT/SEC ⁽²⁾)
ALT	NNNN or NNNNN (leading zeros must be included)	Max ALT = 39 000 Entry is rounded to the nearest 10 ft	ft (MSL)	PERF CLB PERF DES
ALT CSTR	See ALT	See ALT	ft (MSL)	VERT REV F-PLN A SEC F-PLN A
AIRWAYS (VIA)	XXXX	If not in data base "NOT IN DATA BASE" is displayed	N/A	LAT REV AIRWAYS 
ARPT	AAAA 1 character minimum. 4 maximum.	If AAAA is not in the database airport file, the New Runway page is displayed		INIT A (ACT/SEC ⁽²⁾) LAT REV ALTN F-PLN A-B (ACT/SEC ⁽²⁾) WAYPOINT DIR TO

Continued on the following page

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT
CONTROLS AND INDICATORS - MCDU - DATA FORMAT LIST
Continued from the previous page

DATA NAME	FORMAT	RANGE (X is input)	UNITS	DISPLAY PAGE
BARO	Same as ALT	Ldg elevation to ldg elevation + 5000	ft (MSL)	PERF APPR (ACT/SEC ⁽²⁾)
BLOCK FUEL	NN.N leading zeros may be omitted.	0-80/0-175.2	Thousands of Kg or thousands of Lb	INIT B (ACT/SEC ⁽²⁾)
CABIN RATE	- NNN (- may be omitted)	100 - 999	ft/min	DES FORECAST or CRUISE PERF PAGE 
CG	NN.N	8.0 - 45.0	% MAC	INIT B. (ACT/SEC ⁽²⁾) FUEL PRED
CHANNEL 	NNN	500 - 699		NEW NAVAID RAD NAV
CLASS (NAVAID)	AAAAAA (refer to RANGE for exact inputs allowed)	VOR DME VORDME VORTAC LOC, ILS NDB ILSDME MLS  TACAN 	N/A	NEW NAVAID
CO RTE	XXXXXXX 7 or 10 characters (pin program)	If not in the NAVdatabase, a message will be displayed	N/A	INIT A ROUTE SELECTION NEW ROUTE ALTERNATE
COST INDEX	NNN may be entered as 1-3 digits; leading zeros may be omitted	0 to 999	Kg/Min or 100 lb/Hr	INIT A (ACT/SEC ⁽²⁾) PERF CLB (ACT/SEC ⁽²⁾) PERF CRZ (ACT/SEC ⁽²⁾) PERF DES (ALT/SEC ⁽²⁾)
CRS	See INB CRS	See INB CRS	degrees	RADIO NAV NEW NAVAID NEW RUNWAY
CRZ FL	Must be entered as FLIGHT LEVEL	Maximum FL (See FLIGHT LEVEL)	Hundred of ft	INIT A (ACT/SEC ⁽²⁾) PROG
CRZ TEMP	See TEMP		See TEMP	INIT A (ACT/SEC ⁽²⁾) FUEL PREDICTION
CRZ WIND	See WIND DIR/MAG	See WIND DIR/MAG	See WIND DIR/MAG	INIT A (ACT/SEC ⁽²⁾) FUEL PREDICTION
DIST	NN.N leading and trailing 0's may be omitted.	0 - 99.9 or 0 - 999 (or 9999 )	NM NM	HOLD ALTN
DRT TO 	"D"NN	Eight possible values		PERF TAKEOFF

Continued on the following page

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT
CONTROLS AND INDICATORS - MCDU - DATA FORMAT LIST
Continued from the previous page

DATA NAME	FORMAT	RANGE (X is input)	UNITS	DISPLAY PAGE
EFF WIND 	± NNN "+" may be entered as "T" or "TL" ".." may be entered as "H" or "HD" Leading zeros may be omitted If no sign is input, "+" is taken	0 - 500	kts	CLOSEST AIRPORT EQUI-TIME INIT A SEC INT A
ELV	± NNNN if no sign, + assumed Leading 0's may be omitted	Entry displayed to nearest 10 ft -400 to 20 470 ft (RWY) (or - 1000 to 20 470 ft ) -2 000 to 20 470 (NAVAID)	ft (MSL)	NEW RUNWAY NEW NAVAID
ETT/RTA 	HH:MM:SS	00:00:00 to 23:59:59	Hour HH Min MM Sec SS	RTA
FF/FQ Sensors	One or both may be entered, Both - /FF + FQ or - / FQ + FF Fuel flow - /FF Fuel Quantity - / FQ		N/A	FUEL PREDICTION
FIG OF MERIT	N	0 - 3	N/A	NEW NAVAID
FINAL/TIME	Only one may be entered at a time. NN.N or (NNN.N ) for FINAL NNNN for TIME	FINAL 0 - 10.0 (or 0 - 100 ) or 0 - 22.0 0 - 90 TIME	Thousand of kg or Thousand of lb minutes	FUEL PRED INIT B
FLAPS		0, 1, 2, or 3		TAKEOFF

Continued on the following page

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT
CONTROLS AND INDICATORS - MCDU - DATA FORMAT LIST
Continued from the previous page

DATA NAME	FORMAT	RANGE (X is input)	UNITS	DISPLAY PAGE
FLEX TO TEMP	1. If Derated TO option not implemented: same as TEMP 2. If Derated TO option is implemented: F NN		NN in degrees centigrade	TAKEOFF
FLIGHT LEVEL	FLNNN or NNN Leading zeros on NNN may be omitted	Max FL = 390 (or Max FL = 410 )	Hundreds of ft (MSL)	F-PLN A-B, PROG VERT REV INIT A (ACT, SEC ⁽²⁾) PERF CLB PERF DES STEP PRED STEP ALTS 
FLIGHT NUMBER	XXXXXXXX The 8 alphanumeric are not mandatory	N/A	N/A	INIT A F-PLN A-B
FOB	NN.N (leading zeros may be omitted)	See BLOCK	Thousands of kg or Thousands of Lb	FUEL PREDICTION
FREQ	NNN.NN ILS/VOR NNN.N NDB	108.00 - 117.95 190.0 - 1 750.0	MHz KHz	PROG. NEW NAVAID RADIO NAV
FROM/TO	AAAA /AAAA	AAAA must be in data base or message will be displayed	N/A	INIT A (ACT/SEC ⁽²⁾)
GW	NN.N Leading and trailing zeros may be omitted	35 - 99.9 or 77.2 - 218	Thousands of kg or Thousands of Lb	FUEL PREDICTION
IDLE FACTOR 	± N.N Leading and trailing zeros may be omitted	-9.9. +9.9	%	A/C STATUS
INB CRS	NNN Leading zeros may be omitted. An entry of 360 is displayed as 0.	000 - 359	Degrees	HOLD

Continued on the following page

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT
CONTROLS AND INDICATORS - MCDU - DATA FORMAT LIST
Continued from the previous page

DATA NAME	FORMAT	RANGE (X is input)	UNITS	DISPLAY PAGE
LAT	DDMM.MB or BDDMM.M DD - degrees, MM.M - minutes, B - direction. Leading zeros may be omitted but the direction (B) is necessary. Latitude is displayed as DDMM.MB	B: N or S $0 \leq DD \leq 90$ $0 \leq MM.M \leq 59.9$	Degree minutes tenths of minutes	INIT A (ACT/SEC ⁽²⁾)
LAT/LONG	LAT/LONG See LAT and See LONG except both must be entered with "/" in between	See LAT and See LONG	See LAT and See LONG	F-PLN A-B (ACT/SEC ⁽²⁾) PROG NEW WAYPOINT NEW NAVAID DIR TO LAT REV NEW RUNWAY
LENGTH	NNNN Leading zeros may be omitted	1 000 - 8 000 m 3 282 - 9 999 ft	Meters or feet	NEW RUNWAY
LONG	DDDMM.MB or BDDDMM.M DDD - degrees MM.M - minutes B - direction. Leading zeros may be omitted but the direction (B) is necessary	B: E or W $0 \leq DDD \leq 180$ $0 \leq MM.M \leq 59$	Degree minutes tenths of minutes	INIT A
MACH	.NN The decimal point is necessary. Trailing zeros are not necessary	MAX = 0.82 MIN = 0.15	Mach Number	F-PLN A (ACT/SEC ⁽²⁾) PERF CLB PERF CRZ PERF DES
MACH/SPD	MACH and SPD must be entered with "/" between (See MACH and See SPD formats)	See MACH and See SPD	See MACH and See SPD	PERF DES (ACT/SEC ⁽²⁾)

Continued on the following page

Continued from the previous page

DATA NAME	FORMAT	RANGE (X is input)	UNITS	DISPLAY PAGE
NAVAID	XXXX	Any alphanumeric	N/A	PROG NEW NAVAID NAVAID F-PLN A-B (ACT/SEC ⁽²⁾) LAT REV DIR TO RADIO NAV SELECTED NAVAIDS
OFST	NNB or BNN NN offset distance B direction	B: L or R 1 < NN < 50	NM	LAT REV
PERF FACTOR	NN.N leading or trailing zeros may be omitted (± N.N)	-10.0 to +10.0 (or -9.9 - +9.9 $\triangleleft \triangle$)	N/A	A/C STATUS
PLACE/BRG/DIST	PLACE can be any data base ARPT, NAVAID or WAYPOINT - BRG must be a 3 digit entry without decimal digit. An entry of BRG = 360 is displayed as 0.	PLACE - If not in data base, a message "NOT IN DATA BASE" is displayed BRG - 000 - 360	N/A degrees	LAT REV (ACT/SEC ⁽²⁾) NEW WAYPOINT PROG DIR TO F-PLN A-B (ACT/SEC ⁽²⁾) STEP ALTS $\triangleleft \triangle$
	DIST is NNN.N where leading zeros may be omitted ; all 3 parameters must be entered with "/" between	DIST - 0 - 999.9	NM	
PLACE-BRG/ PLACE-BRG	See PLACE/BRG/ DIST A couple PLACE- BRG is entered with a dash in the middle. 2 couples have to be entered with "/" between	See PLACE/BRG/DIST	See PLACE/BRG/DIST	See PLACE/BRG/DIST

Continued on the following page

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - DATA FORMAT LIST

Continued from the previous page

DATA NAME	FORMAT	RANGE (X is input)	UNITS	DISPLAY PAGE
PLACE/DIST 	PLACE: See PLACE/ BRG/DIST DIST: See PLACE/ BRG/DIST	PLACE: See PLACE/ BRG/DIST DIST: 0 - 999.9	N/A NM	F-PLN A and B SEC F-PLN A and B LAT REV NEW WAYPOINT DIR TO STEP ALTS
QNH	NNNN (leading zero may be omitted).	950 - 1 050 (or 745 - 1050 )	Hecto-Pascals (hPa)	PERF APPR (ACT/SEC ⁽²⁾)
	NN.NN (leading and trailing zeros may be omitted).	28.06 - 31.01 (or 22.00 - 31.00 )	In.Hg	
RADIAL 	NNN(T) 3 digits entry	000 - 360	Degrees	FIX INFO 1 to 4
RADIAL IN 	NNN(T) 3 digits entry	000 - 360	Degrees	DIR TO
RADIAL OUT 	NNN(T) 3 digits entry	000 - 360	Degrees	DIR TO FIX INFO 1 to 4
RADIO	NNN	0-700 No is accepted if an ILS / GLS  ; APPR is selected	ft	PERF APPR (ACT/SEC ⁽²⁾)
RADIUS 	DNNN 3 digits entry D is the identifiant of the circle radius	000 - 256	NM	FIX INFO 1 to 4
REF FIX 	See waypoint			FIX INFO 1 to 4
RTE RSV	may be entered as fuel or percentage of trip fuel	Fuel 0 - 10.0 0 - 21.7 % : 0 - 15.0	thousands of kg thousands of lb	INIT B (ACT/SEC ⁽²⁾) FUEL PRED
RWY	AAAANND Where AAAA is See ARPT. NN is runway number (2 digits) must be entered D is L or R to be included only when there is more than one runway with the same number at ARPT.			RUNWAY NEW RUNWAY F-PLN A-B
SAT/ALT 	TEMP/ALT	See TEMP and See ALT	N/A	CRUISE WIND

Continued on the following page

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT
CONTROLS AND INDICATORS - MCDU - DATA FORMAT LIST
Continued from the previous page

DATA NAME	FORMAT	RANGE (X is input)	UNITS	DISPLAY PAGE
SET HDG 	NNN/N (leading and trailing zeros may be omitted) will always be displayed as NNN/N	000.0 - 360.0	Degrees	IRS MONITOR
SLOPE 	NN.N	00.0 -90.0	Degrees	NEW NAVAID
SPD	NNN (leading zero may be omitted)	MAX = 350 kt MIN = 90 kt	kt (CAS)	SEC F-PLN A PERF CLB PERF CRZ (ACT, SEC ⁽²⁾) PERF DES
SPD CSTR	See SPD	See SPD	kt (CAS)	F-PLN A (ACT/SEC ⁽²⁾) VERT REV (ACT/SEC ⁽²⁾)
SPD LIM	SSS/NNNNN SSS is a speed NNNNN is an ALT or FLIGHT LEVEL (See ALT and See FLIGHT LEVEL)	SSS: See SPD	kt/ft (MSL)	VERT REV (ACT/SEC ⁽²⁾)
SPD/MACH	See MACH/SPD	See MACH and See SPD	See MACH and See SPD	PERF DES (ACT/SEC ⁽²⁾)
STATION DEC	NND Where NN is the declination and D is the direction. Leading zeros may be omitted. D is not required for an entry of zero declination.	NN: 01 - 99 D: E or W	Degrees	NEW NAVAID
STEP ALT 	SNNN or NNNS (where NNN is in Flight Level) or SNNNNN or NNNNNS (where NNNNN is in ALT) Leading zeros may be omitted	See FLIGHT LEVEL or See ALT	See FLIGHT LEVEL or See ALT	F-PLN A
TAXI	N.N Leading or trailing zeros may be omitted	0 - 9.9	Thousands of kg	INIT B (ACT/SEC ⁽²⁾)

Continued on the following page

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT
CONTROLS AND INDICATORS - MCDU - DATA FORMAT LIST
Continued from the previous page

DATA NAME	FORMAT	RANGE (X is input)	UNITS	DISPLAY PAGE
TEMP	± NN If no sign, + assumed	± 99	Degrees celsius	INIT A (ACT/SEC ⁽²⁾) FUEL PRED PERF APPR
THR RED ALT	See ALT	400 ft AGL mini	ft (MSL)	PERF TAKE OFF
THS	AAN.N or N.NAA where AA is UP or DN	max UP 7.0 max DN 5.0 increment 0.1	degrees	PERF TAKEOFF
TRANS ALT	See ALT			PERF GO AROUND
TIME	N.N	0 - 9.9	Minutes	HOLD
TIME MARK. 	HHMM	HH: 0 - 23 MM: 0 - 59	Hours Minutes	F-PLN A and B
T.O SHIFT	NNNN	1-Length of origin runway	m or ft	PERF TAKEOFF
TRIP WIND	See EFF WIND		kts	INIT A SET INIT A
TROPO	See ALT	See ALT (or 60 000 )	ft	INIT A FUEL PREDICTION SEC FUEL PREDICTION
UTC CSTR	HH MM Where HH are hours and MM are minutes. Leading zeros may be omitted 1 or 2 digit entry is interpreted as minutes	HH: 0 - 23 MM: 0 - 59	Hours and minutes	VERT REV
V1	See SPD		kt (CAS)	PERF TAKEOFF (ACT/SEC ⁽²⁾)
V2	See SPD		kt (CAS)	PERF TAKEOFF (ACT/SEC ⁽²⁾)
VR	See SPD		kt (CAS)	PERF TAKEOFF (ACT/SEC ⁽²⁾)
WIND	See WIND DIR/ VELOCITY	See WIND DIR/ VELOCITY	See WIND DIR/ VELOCITY	F-PLN B (ACT/SEC ⁽²⁾) FUEL PREDICTION

Continued on the following page

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - DATA FORMAT LIST
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Continued from the previous page

DATA NAME	FORMAT	RANGE (X is input)	UNITS	DISPLAY PAGE
WAYPOINT	XXXXX - may be from . 1-5 (1-7 ) characters for waypoint. Acceptable as waypoint IDENT: ARPT NAVAID WAYPOINT LAT/LONG, PLACE BRG/ PLACE BRG and PLACE/BRG/ DIST PLACE/DIST  may be entered to define a waypoint			WAYPOINT NEW WAYPOINT F-PLN A and B (ACT/SEC ⁽²⁾) LAT REV PROG DIR TO FIX INFO  1 AND 2 EQUI-TIME POINT  STEP ALTS  PREDICTIVE GPS 
WIND DIR/WIND MAG	NNN/NNN Both must be entered ; leading zeros may be omitted. An entry of WIND DIR = 360 is displayed as 0.	WIND DIRECTION 0 - 360	Degrees	INIT A PERF APPR (ACT/SEC ⁽²⁾) STEP PRED
		WIND MAG 0 - 200 (or 0 - 500 )	Kt	WIND F-PLN B VERT REV
WIND DIRECTION/ MAG/ALT	NNN/NNN/FL NNN or NNN/NNN/NN NNN	Direction and Velocity as above Minimum ALT 1 000	FL in hundred of ft, ALT in ft	DES FORECAST WIND PAGES 
ZFW	NN.N OR NNN.N Leading and trailing zeros may be omitted	MIN ZFW See – Max ZFW See	Thousands of kg or thousands of Lb	INIT B (ACT/SEC ⁽²⁾)
ZFWCG	See CG	See CG	See CG	INIT B

(1) As defined in the Performance Data Base.

(2) ACT/SEC = Active or Secondary

MCDU DATA FORMAT LIST
Ident.: DSC-22_20-20-30-00000920.0078001 / 06 NOV 23 Applicable to: MSN 04392

The following chart lists all the data the pilot may enter on the MCDU.

It also shows the acceptable format for the various data items, the acceptable range, the units of entry, and the MCDU pages on which the data can be entered.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - DATA FORMAT LIST

The following codes are used to indicate various data formats:

- A : letters
 N : numbers
 X : letters and numbers

DATA NAME	FORMAT	RANGE (X is input)	UNITS	DISPLAY PAGE
ACCEL ALT	See ALT		ft (MSL)	TAKEOFF (ACT/SEC ⁽²⁾) GO AROUND (ACT/SEC ⁽²⁾)
ALT	NNNN or NNNNN (leading zeros must be included)	Max ALT = 39 000 Entry is rounded to the nearest 10 ft	ft (MSL)	PERF CLB PERF DES
ALT CSTR	See ALT	See ALT	ft (MSL)	VERT REV F-PLN A SEC F-PLN A
AIRWAYS (VIA)	XXXX	If not in data base "NOT IN DATA BASE" is displayed	N/A	LAT REV AIRWAYS 
ARPT	AAAA 1 character minimum. 4 maximum.	If AAAA is not in the database airport file, the New Runway page is displayed		INIT A (ACT/SEC ⁽²⁾) LAT REV ALTN F-PLN A-B (ACT/SEC ⁽²⁾) WAYPOINT DIR TO
BARO	Same as ALT	Ldg elevation to ldg elevation + 5000	ft (MSL)	PERF APPR (ACT/SEC)
BLOCK FUEL	NN.N leading zeros may be omitted.	0-80/0-175.2	Thousands of Kg or thousands of Lb	INIT B (ACT/SEC ⁽²⁾)
CABIN RATE	- NNN (- may be omitted)	100 - 999	ft/min	DES FORECAST or CRUISE PERF. PAGE 
CG	NN.N	8.0 - 45.0	% MAC	INIT B. (ACT/SEC ⁽²⁾) FUEL PRED
CHANNEL 	NNN	500 - 699		NEW NAVAID RAD NAV

Continued on the following page

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT
CONTROLS AND INDICATORS - MCDU - DATA FORMAT LIST
Continued from the previous page

DATA NAME	FORMAT	RANGE (X is input)	UNITS	DISPLAY PAGE
CLASS (NAVAID)	AAAAAA (refer to RANGE for exact inputs allowed)	VOR DME VORDME VORTAC LOC, ILS NDB ILSDME MLS  TACAN 	N/A	NEW NAVAID
CO RTE	XXXXXXX 7 or 10 characters (pin program)	If not in the NAVdatabase, a message will be displayed	N/A	INIT A ROUTE SELECTION NEW ROUTE ALTERNATE
COST INDEX	NNN may be entered as 1-3 digits; leading zeros may be omitted	0 to 999	Kg/Min or 100 lb/Hr	INIT A (ACT/SEC ⁽²⁾) PERF CLB (ACT/SEC ⁽²⁾) PERF CRZ (ACT/SEC ⁽²⁾) PERF DES (ALT/SEC ⁽²⁾)
CRS	See INB CRS	See INB CRS	degrees	RADIO NAV NEW NAVAID NEW RUNWAY
CRZ FL	Must be entered as FLIGHT LEVEL	Maximum FL (See FLIGHT LEVEL)	Hundred of ft	INIT A (ACT/SEC ⁽²⁾) PROG
CRZ TEMP	See TEMP	±99	Degrees celsius	INIT A (ACT/SEC ⁽²⁾) FUEL PREDICTION
CRZ WIND	See WIND DIR/MAG	See WIND DIR/MAG	See WIND DIR/MAG	INIT A (ACT/SEC ⁽²⁾) FUEL PREDICTION
DIST	NN.N leading and trailing 0's may be omitted.	0 - 99.9 or 0 - 999 (or 9999 )	NM NM	HOLD ALTN
DRT TO 	"D"NN	Eight possible values		PERF TAKEOFF
EFF WIND 	±NNN "+" may be entered as "T" or "TL" "- " may be entered as "H" or "HD" Leading zeros may be omitted If no sign is input, "+" is taken	0 - 500	kts	CLOSEST AIRPORT EQUI-TIME INIT A SEC INT A

Continued on the following page

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - DATA FORMAT LIST

Continued from the previous page

DATA NAME	FORMAT	RANGE (X is input)	UNITS	DISPLAY PAGE
ELV	±NNNN if no sign, + assumed Leading 0's may be omitted	Entry displayed to nearest 10 ft -400 to 20 470 ft (RWY) (or - 1000 to 20 470 ft) -2 000 to 20 470 (NAVAID)	ft (MSL)	NEW RUNWAY NEW NAVAID
ETT/RTA 	HH:MM:SS	00:00:00 to 23:59:59	Hour HH Min MM Sec SS	RTA
FF/FQ Sensors	One or both may be entered, Both - /FF + FQ or - / FQ + FF Fuel flow - /FF Fuel Quantity - / FQ		N/A	FUEL PREDICTION
FIG OF MERIT	N	0 - 3	N/A	NEW NAVAID
FINAL/TIME	Only one may be entered at a time. NN.N or (NNN.N) for FINAL NNNN for TIME	FINAL 0 - 10.0 (or 0 - 100) or 0 - 22.0 0 - 90 TIME	Thousand of kg or Thousand of lb minutes	FUEL PRED INIT B
FLAPS		0, 1, 2, or 3		TAKEOFF
FLEX TO TEMP	1. If Derated TO option not implemented: same as TEMP 2. If Derated TO option is implemented: F NN		NN in degrees centigrade	TAKEOFF
FLIGHT LEVEL	FLNNN or NNN Leading zeros on NNN may be omitted	Max FL = 390 (or Max FL = 410)	Hundreds of ft (MSL)	F-PLN A-B, PROG VERT REV INIT A (ACT, SEC ⁽²⁾) PERF CLB PERF DES STEP PRED STEP ALTS

Continued on the following page

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT
CONTROLS AND INDICATORS - MCDU - DATA FORMAT LIST
Continued from the previous page

DATA NAME	FORMAT	RANGE (X is input)	UNITS	DISPLAY PAGE
FLIGHT NUMBER	XXXXXXX The 8 alphanumeric are not mandatory	N/A	N/A	INIT A F-PLN A-B
FOB	NN.N (leading zeros may be omitted)	See BLOCK	Thousands of kg or Thousands of Lb	FUEL PREDICTION
FREQ	NNN.NN ILS/VOR NNN.N NDB	108.00 - 117.95 190.0 - 1 750.0	MHz KHz	PROG. NEW NAVAID RADIO NAV
FROM/TO	AAAA /AAAA	AAAA must be in data base or message will be displayed	N/A	INIT A (ACT/SEC ⁽²⁾)
GW	NN.N Leading and trailing zeros may be omitted	35 - 99.9 or 77.2 - 218	Thousands of kg or Thousands of Lb	FUEL PREDICTION
GND TEMP	±NN (if no sign, assume +)		See TEMP	INIT A, SEC INIT A
IDLE FACTOR 	± N.N Leading and trailing zeros may be omitted	-9.9. +9.9	%	A/C STATUS
INB CRS	NNN Leading zeros may be omitted. An entry of 360 is displayed as 0.	000 - 359	Degrees	HOLD
LAT	DDMM.MB DD - degrees, MM.M - minutes, B - direction. Leading zeros may be omitted but the direction (B) is necessary.	B: N or S 0 ≤ DD ≤ 90 0 ≤ MM.M ≤ 59.9	Degree minutes tenths of minutes	INIT A IRS INIT
LAT/LONG	LAT/LONG See LAT and See LONG except both must be entered with "/" in between	See LAT and See LONG	See LAT and See LONG	F-PLN A-B (ACT/SEC ⁽²⁾) PROG NEW WAYPOINT NEW NAVAID DIR TO LAT REV NEW RUNWAY IRS INIT
LENGTH	NNNN Leading zeros may be omitted	1 000 - 8 000 m 3 282 - 9 999 ft	Meters or feet	NEW RUNWAY

Continued on the following page

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT
CONTROLS AND INDICATORS - MCDU - DATA FORMAT LIST
Continued from the previous page

DATA NAME	FORMAT	RANGE (X is input)	UNITS	DISPLAY PAGE
LONG	DDMM.MB or DDD - degrees MM.M - minutes B - direction. Leading zeros may be omitted but the direction (B) is necessary	B: E or W $0 \leq DDD \leq 180$ $0 \leq MM.M \leq 59$	Degree minutes tenths of minutes	INIT A IRS INIT
MACH	.NN or 0.NN Trailing zeros are not necessary NN: Entry of two figures is necessary	MAX = .82 MIN = .15	Mach Number	F-PLN A (ACT/SEC ⁽²⁾) PERF CLB PERF CRZ PERF DES
MACH/SPD	MACH and SPD must be entered with "/" between (See MACH and See SPD formats)	See MACH and See SPD	See MACH and See SPD	PERF DES (ACT/SEC ⁽²⁾)
MIN DEST FOB	NNN.N (leading zeros may be omitted)	0 - 80	Thousand of kg or lb (OPC option)	INIT B FUEL PRED (ATC/SEC)
NAVAID	XXXX	Any alphanumeric	N/A	PROG NEW NAVAID NAVAID F-PLN A-B (ACT/SEC ⁽²⁾) LAT REV DIR TO RADIO NAV SELECTED NAVAIDS
OFST	NNB or BNN NN offset distance B direction	B: L or R $1 < NN < 50$	NM	LAT REV
PERF FACTOR	NN.N leading or trailing zeros may be omitted ($\pm$ N.N)	-10.0 to +10.0 (or -9.9 - +9.9 $\leq$)	N/A	A/C STATUS

Continued on the following page

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT
CONTROLS AND INDICATORS - MCDU - DATA FORMAT LIST
Continued from the previous page

DATA NAME	FORMAT	RANGE (X is input)	UNITS	DISPLAY PAGE
PLACE/BRG/DIST	PLACE can be any data base ARPT, NAVAID or WAYPOINT - BRG must be a 3 digit entry without decimal digit. An entry of BRG = 360 is displayed as 0.	PLACE - If not in data base, a message "NOT IN DATA BASE" is displayed BRG - 000 - 360	N/A degrees	LAT REV(ACT/SEC ⁽²⁾) NEW WAYPOINT PROG DIR TO F-PLN-A (ACT/SEC ⁽²⁾) STEP ALTS 
	DIST is NNN.N where leading zeros may be omitted ; all 3 parameters must be entered with "/" between	DIST - 0 - 999.9	NM	
PLACE-BRG/ PLACE-BRG	See PLACE/BRG/DIST A couple PLACE-BRG is entered with a dash in the middle. 2 couples have to be entered with "/" between	See PLACE/BRG/DIST	See PLACE/BRG/DIST	See PLACE/BRG/DIST
PLACE/DIST 	PLACE: See PLACE/BRG/DIST DIST: See PLACE/BRG/DIST	PLACE: See PLACE/BRG/DIST DIST: 0 - 999.9	N/A NM	F-PLN A and B SEC F-PLN A and B LAT REV NEW WAYPOINT DIR TO STEP ALTS
QNH	NNNN (leading zero may be omitted).	745 - 1 050 (or 745 - 1050 )	Hecto-Pascals (hPa)	PERF APPR (ACT/SEC ⁽²⁾)
	NN.NN (leading and trailing zeros may be omitted).	28.06 - 31.01 (or 22.00 - 32.48 )	In.Hg	
RADIAL 	NNN(T) 3 digits entry	000 - 360	Degrees	FIX INFO 1 to 4
RADIAL IN 	NNN(T) 3 digits entry	000 - 360	Degrees	DIR TO
RADIAL OUT 	NNN(T) 3 digits entry	000 - 360	Degrees	DIR TO FIX INFO 1 to 4
RADIO	NNN	0-700 No is accepted if an ILS / GLS  ; APPR is selected	ft	PERF APPR (ACT/SEC)

Continued on the following page

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT
CONTROLS AND INDICATORS - MCDU - DATA FORMAT LIST
Continued from the previous page

DATA NAME	FORMAT	RANGE (X is input)	UNITS	DISPLAY PAGE
RADIUS 	DNNN 3 digits entry D is the identifiant of the circle radius	000 - 256	NM	FIX INFO 1 to 4
REF FIX 	See waypoint			FIX INFO 1 to 4
RTE RSV	may be entered as fuel or percentage of trip fuel	Fuel 0 - 10.0 0 - 21.7 % : 0 - 15.0	thousands of kg thousands of lb	INIT B (ACT/SEC ⁽²⁾) FUEL PRED
RWY	AAAAAND Where AAAA is same as ARPT (See ARPT). NN is runway number (2 digits) must be entered D is L or R to be included only when there is more than one runway with the same number at ARPT.			RUNWAY NEW RUNWAY F-PLN A-B
SAT/ALT 	TEMP/ALT	See TEMP and See ALT	N/A	CRZ WIND
SET HDG 	NNN/N (leading and trailing zeros may be omitted) will always be displayed as NNN/N	000.0 - 360.0	Degrees	IRS MONITOR
SLOPE 	NN.N	00.0 -90.0	Degrees	NEW NAVAID
SPD	NNN (must be 3 numerics)	MAX = 350 kt MIN = 90 kt	kt (CAS)	SEC F-PLN A PERF CLB PERF CRZ (ACT, SEC ⁽²⁾) PERF DES
SPD CSTR	See SPD	See SPD	kt (CAS)	F-PLN A (ACT/SEC ⁽²⁾) VERT REV (ACT/SEC ⁽²⁾)
SPD LIM	SSS/NNNNN SSS is a speed NNNNN is an ALT or FLIGHT LEVEL (See ALT and See FLIGHT LEVEL)	SSS: See SPD	kt/ft (MSL)	VERT REV (ACT/SEC3 ⁽²⁾)
SPD/MACH	See MACH/SPD	See MACH and See SPD	See MACH and See SPD	PERF DES (ACT/SEC ⁽²⁾)

Continued on the following page

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT
CONTROLS AND INDICATORS - MCDU - DATA FORMAT LIST
Continued from the previous page

DATA NAME	FORMAT	RANGE (X is input)	UNITS	DISPLAY PAGE
STATION DEC	NND Where NN is the declination and D is the direction. Leading zeros may be omitted. D is not required for an entry of zero declination.	NN: 01 - 99 D : E or W	Degrees	NEW NAVAID
STEP ALT 	SNNN or NNNS (where NNN is in Flight Level) or SNNNNN or NNNNNS (where NNNNN is in ALT) Leading zeros may be omitted	See FLIGHT LEVEL or See ALT	See FLIGHT LEVEL or See ALT	F-PLN A
TAXI	N.N Leading or trailing zeros may be omitted	0 - 9.9	Thousands of kg	INIT B (ACT/SEC ⁽²⁾)
TEMP	± NN If no sign, + assumed	±99	Degrees celsius	PERFTAKEOFF PERF APPR UPLINK TODATA REQ
THR RED ALT	See ALT	400 ft AGL mini	ft (MSL)	PERF TAKE OFF
THS	AAN.N or N.NAA where AA is UP or DN	max UP 7.0 max DN 5.0 increment .1	degrees	PERF TAKEOFF
TRANS ALT	See ALT			PERF TAKE OFF PERF GO AROUND
TRANS FL	See FLIGHT LEVEL			PERF APPR
TIME	N.N	0 - 9.9	Minutes	HOLD
TIME MARK. 	HHMM	HH: 0 - 23 MM : 0 - 59	Hours Minutes	F-PLN A and B
T.O SHIFT	NNNN	1-Length of origin runway	m or ft	PERF TAKEOFF
TRIP WIND	See EFF WIND		kts	INIT A SET INIT A
TROPO	See ALT	See ALT (or 60 000 )	ft	INIT A FUEL PREDICTION SEC FUEL PREDICTION

Continued on the following page

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT
CONTROLS AND INDICATORS - MCDU - DATA FORMAT LIST
Continued from the previous page

DATA NAME	FORMAT	RANGE (X is input)	UNITS	DISPLAY PAGE
UTC CSTR	HH MM Where HH are hours and MM are minutes. Leading zeros may be omitted 1 or 2 digit entry is interpreted as minutes	HH: 0 - 23 MM : 0 - 59	Hours and minutes	VERT REV
V1	See SPD		kt (CAS)	PERF TAKEOFF (ACT/SEC ⁽²⁾)
V2	See SPD		kt (CAS)	PERF TAKEOFF (ACT/SEC ⁽²⁾)
VR	See SPD		kt (CAS)	PERF TAKEOFF (ACT/SEC ⁽²⁾)
WIND	See WIND DIR/ VELOCITY	See WIND DIR/ VELOCITY	See WIND DIR/ VELOCITY	F-PLN B (ACT/SEC ⁽²⁾) FUEL PREDICTION
WAYPOINT	XXXXX - may be from . 1-5 (1-7 )) characters for waypoint. Acceptable as waypoint IDENT : ARPT NAVAID WAYPOINT LAT/LONG, PLACE BRG/ PLACE BRG and PLACE/BRG/ DIST PLACE / DIST  may be entered to define a waypoint			WAYPOINT NEW WAYPOINT F-PLN A and B (ACT/SEC ⁽²⁾) LAT REV PROG DIR TO FIX INFO  1 AND 2 EQUI-TIME POINT  STEP ALTS  PREDICTIVE GPS 
WIND DIR/WIND MAG	NNN/NNN Both must be entered ; leading zeros may be omitted. An entry of WIND DIR = 360 is displayed as 0.	WIND DIRECTION 0 - 360	Degrees	INIT A PERF APPR (ACT/SEC ⁽²⁾) STEP PRED
		WIND MAG 0 - 200	Kt	WIND F-PLN B VERT REV
WIND DIRECTION/ MAG/ALT	NNN/NNN/FL NNN or NNN/NNN/NN NNN	Direction and Velocity as above Minimum ALT 1 000	FL in hundred of ft, ALT in ft	DES FORECAST WIND PAGES 

Continued on the following page

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT CONTROLS AND INDICATORS - MCDU - DATA FORMAT LIST
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Continued from the previous page

DATA NAME	FORMAT	RANGE (X is input)	UNITS	DISPLAY PAGE
ZFW	NN.N OR NNN.N Leading and trailing zeros may be omitted	Min ZFW See – Max ZFW See	Thousands of kg or thousands of Lb	INIT B (ACT/SEC ⁽²⁾)
ZFWCG	See CG	See CG	See CG	INIT B

(1) As defined in the Performance Data Base.

(2) ACT/SEC = Active or Secondary

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

CONTROLS AND INDICATORS - MCDU - DATA FORMAT LIST

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HOW TO CHANGE T.O DATA OR DEPARTURE RUNWAY AFTER REJECTED TAKEOFF

Ident.: DSC-22_20-30-10-00023074.0001001 / 04 NOV 20

Applicable to: ALL

GENERAL

This chapter provides an operational recommendation to the flight crew, on how to modify the FMS T.O DATA or departure runway after a rejected takeoff.

DESCRIPTION

In case of rejected takeoff (with an aircraft speed above 90 kt or with sufficient thrust), the FMS remains in TAKEOFF phase and the flight crew cannot modify the FMS departure T.O DATA or departure runway in the active flight plan.

OPERATIONAL RECOMMENDATION

In that case, if the flight crew has to change the FMS T.O DATA in the active flight plan, the flight crew should proceed as follows:

- Delete the SEC F-PLN
- Initialize the SEC F-PLN with the new T.O DATA and/or new departure runway
- Activate the SEC F-PLN.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT

HOW TO - REJECTED TAKEOFF

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT HOW TO - INSERTION OF APPROACH MINIMA
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QNH USE FOR AIRCRAFT NOT EQUIPPED WITH QFE OPTION

Ident.: DSC-22_20-30-20-00015220.0011001 / 12 NOV 24
Applicable to: MSN 02719-07792

QNH USE FOR AIRCRAFT NOT EQUIPPED WITH QFE OPTION

This table explains how the flight crew must insert the approach minimum on the MCDU PERF APPR page.

		Guidance Modes			
		LOC G/S CAT II & CAT III approaches	LOC G/S CAT I approaches	FINAL APP	NAV FPA LOC FPA LOC B/C ◁ FPA TRK FPA
MCDU PERF APPR page	BARO field	---	DA	DA or MDA	MDA
	RADIO field	DH or RA	---		
FMA display		"RADIO XXX"	"BARO XXXX"		

QNH USE FOR AIRCRAFT EQUIPPED WITH QFE OPTION

Ident.: DSC-22_20-30-20-00015221.0020001 / 12 NOV 24
Applicable to: MSN 02155-02212

QNH USE FOR AIRCRAFT EQUIPPED WITH QFE OPTION

This table explains how the flight crew must insert the approach minimum on the MCDU PERF APPR page.

		Guidance Modes			
		LOC G/S CAT II & CAT III approaches	LOC G/S CAT I approaches	FINAL APP	NAV FPA LOC FPA LOC B/C ◁ FPA TRK FPA
MCDU PERF APPR page	BARO field	---	DA	DA or MDA	MDA
	RADIO field	DH or RA	---		
FMA display		"RADIO XXX"	"BARO XXXX"		

QFE USE FOR AIRCRAFT NOT EQUIPPED WITH QFE OPTION

Ident.: DSC-22_20-30-20-00015222.0001001 / 07 NOV 25
Applicable to: MSN 02719-07792

QFE USE FOR AIRCRAFT NOT EQUIPPED WITH QFE OPTION

Refer to LIM-NAV Operations with QFE Barometric Reference.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

HOW TO - INSERTION OF APPROACH MINIMA

QFE USE FOR AIRCRAFT EQUIPPED WITH QFE OPTION

Ident.: DSC-22_20-30-20-00015223.0020001 / 12 NOV 24

Applicable to: MSN 02155-02212

QFE USE FOR AIRCRAFT EQUIPPED WITH QFE OPTION

This table explains how the flight crew must insert the approach minimum on the MCDU PERF APPR page.

		Guidance Modes			
		LOC G/S CAT II & CAT III approaches	LOC G/S CAT I approaches	FINAL APP	NAV FPA LOC FPA LOC B/C ◁ FPA TRK FPA
MCDU PERF APPR page	BARO field	---	DH	DH or MDH	MDH
	RADIO field	DH or RA	---		
FMA display		"RADIO XXX"	"BARO XXXX"		

GENERAL

Ident.: DSC-22_20-30-30-00000921.0001001 / 10 DEC 09

Applicable to: ALL

The baro reference selector of the EIS (Electronic Instrument System) allows the pilot to use the standard barometric reference (STD), sea level atmospheric pressure (QNH), or atmospheric pressure at airfield elevation (QFE option) for the barometer setting.

The selected value is displayed in the baro reference display window of the EFIS control panel and on the Primary Flight Display (PFD) below the altitude scale.

The barometer setting is used as a reference for the altimeter of the PFD and for the PFD target altitude. In flight, it affects the predicted altitudes on the MCDU and the descent path computation.

MCDU ALTITUDE PREDICTIONS

Ident.: DSC-22_20-30-30-A-00000922.0001001 / 10 DEC 09

Applicable to: ALL

GENERAL

The FMGS predicts at each waypoint of the flight plan an altitude that is a function of all data in the lateral and vertical flight plans.

Ident.: DSC-22_20-30-30-A-00000927.0001001 / 10 DEC 09

Applicable to: ALL

ON THE GROUND

The altitude predicted at each waypoint is displayed as altitude in feet above mean sea level (AMSL) when it is below the transition altitude and as flight level when it is above the transition altitude. The altitude constraints are also displayed, and they follow the same rule (feet or flight level).

The predicted altitude is equal to the airport elevation plus the height you must attain in order to reach the waypoint in the applicable mode (climb or descent).

TAKE OFF				FROM AI101			
V1	FLP	RETR	RWY	PAS30	1011	2500	
		F=157	33R	TOP9C	BRG136°	9NM	
VR	SLT	RETR	TO SHIFT	TOP	1022	250 / 3000	
		S=203	[M] [] *	TRK138	43		
V2	CLEAN	FLAPS/THS		BEROK	1038	0.78 / FL210	
		0=224	[] / []		69		
TRANS	ALT	FLEX	TO TEMP	(T/C)	1047	' / FL330	
4800				TOP9C		37	
THR	RED/ACC	ENG	OUT ACC	BACHI	1053	.	
2000/3000		2265		DEST	UTC	DIST	EFOB
		NEXT		LGAT33R	1220	994	8.4
		PHASE>					

PERF TAKEOFF page

F-PLN A page

MCDU ALTITUDE PREDICTIONS - IN FLIGHT

Ident.: DSC-22_20-30-30-A-00000924.0001001 / 12 MAY 23

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

IN FLIGHT

The predicted altitude is equal to the aircraft altitude (as a function of the barometer setting), plus or minus the height you must attain to reach the waypoint in the applicable mode (climb or descent).

- In climb:

Altitude predictions and constraints are displayed as altitude in feet above mean sea level (AMSL) at, or below, the transition altitude, and as the flight level above it.

For example : If the transition altitude is 5 000 ft and you insert an altitude constraint as 8 000 ft, the F-PLN A page displays it as FL 80.

- In descent:

If "STD" is selected on the EIS control panel, altitude predictions and constraints above the transition level are displayed as flight levels, and those below the transition level are displayed as altitude AMSL.

If sea level standard pressure (QNH), or field elevation pressure (QFE option), is selected on the EIS control panel, altitude predictions and constraints are displayed as altitudes AMSL, regardless of the transition altitude.

For example: If the transition level is FL 50 and you insert an altitude constraint of 8 000 ft into the MCDU, the F-PLN A page will display it as FL 80, if "STD" is selected, and as 8 000 ft, if the "QNH" or "QFE" option is selected.

Ident.: DSC-22_20-30-30-A-00000924.0002001 / 16 FEB 11

Applicable to: MSN 02926-02944, 04392, 07784-07792

IN FLIGHT

The predicted altitude is equal to the aircraft altitude (as a function of the barometer setting), plus or minus the height you must attain to reach the waypoint in the applicable mode (climb or descent).

- In climb:

Altitude predictions and constraints are displayed as altitude in feet above mean sea level (AMSL) at, or below, the transition altitude, and as the flight level above it.

For example : If the transition altitude is 5 000 ft and you insert an altitude constraint as 8 000 ft, the MCDU F-PLN A page displays it as FL 80

- In descent:

If “STD” is selected on the EIS control panel, altitude predictions and constraints above the transition level are displayed as flight levels, and those below the transition level are displayed as altitude AMSL.

If sea level standard pressure (QNH), or field elevation pressure (QFE option), is selected on the EIS control panel, altitude predictions and constraints are displayed as altitudes AMSL, regardless of the transition altitude.

For example: If the transition level is FL 50 and you insert an altitude constraint of 8 000 ft into the MCDU, the MCDU F-PLN A page will display it as FL 80, if “STD” is selected. If “QNH” (or “QFE” option) is selected, the MCDU F-PLN A page will display the barometric corrected altitude constraint.

TARGET ALTITUDE ON PFD

Ident.: DSC-22_20-30-30-00000925.0001001 / 01 OCT 12

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

The PFD target altitude may either be:

- The altitude selected on the FCU, or
- A flight management altitude constraint, if the climb mode or descent mode is engaged and the system predicts a level-off at a constraint that comes before reaching the FCU altitude.

The PFD target altitude depends on the barometer setting:

- If “STD” is selected, the target is a flight level
- If “QNH” or “QFE” is selected, the target is an altitude or height.

The aircraft will level off accordingly.

AIRCRAFT SYSTEMS**AUTO FLIGHT - FLIGHT MANAGEMENT**

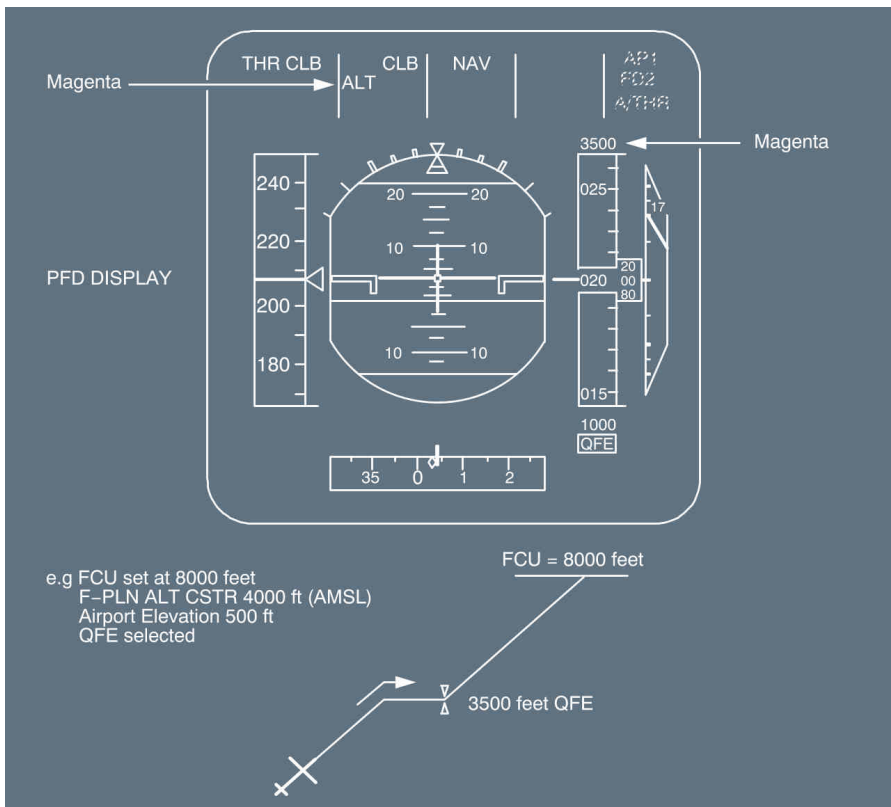
HOW TO - EFFECT OF BARO REFERENCE SETTING

- Note:
- If the pilot changes the barometer setting during ALT* or ALT CST*, the aircraft may overshoot the target altitude, because the current value has been changed. However, the ALT* and ALT CST* modes allow the aircraft to regain the FCU altitude. As a general rule, avoid changing the barometer setting when in ALT* or ALT CST*
 - In aircraft equipped to use field elevation pressure (QFE option), switching from STD to QFE (or vice versa) in ALT CST* green changes the target value and may revert the vertical mode into V/S mode.

NOTE FOR AIRCRAFT WITH QFE (FIELD ELEVATION PRESSURE) PIN PROGRAM

If you select "QFE" on the EFIS control panel:

- The MCDU predictions follow the basic rules (altitudes are AMSL below the transition level, flight levels above it)
- The altitude constraints on the MCDU follow the basic rules
- The target altitude on the PFD is QFE related:
 - If the target altitude has been selected by the FCU, the aircraft will level off there.
 - If the target altitude is an altitude constraint, the PFD automatically shows that constraint as corrected by the airport elevation.



TARGET ALTITUDE ON PFD

Ident.: DSC-22_20-30-30-00000925.0002001 / 01 OCT 12

Applicable to: MSN 02926-02944, 04392, 07784-07792

The PFD target altitude may either be:

- The altitude selected on the FCU, or
- A flight management altitude constraint, if the climb mode or descent mode is engaged and the system predicts a level-off at a constraint that comes before reaching the FCU altitude.

The PFD target altitude depends on the barometer setting:

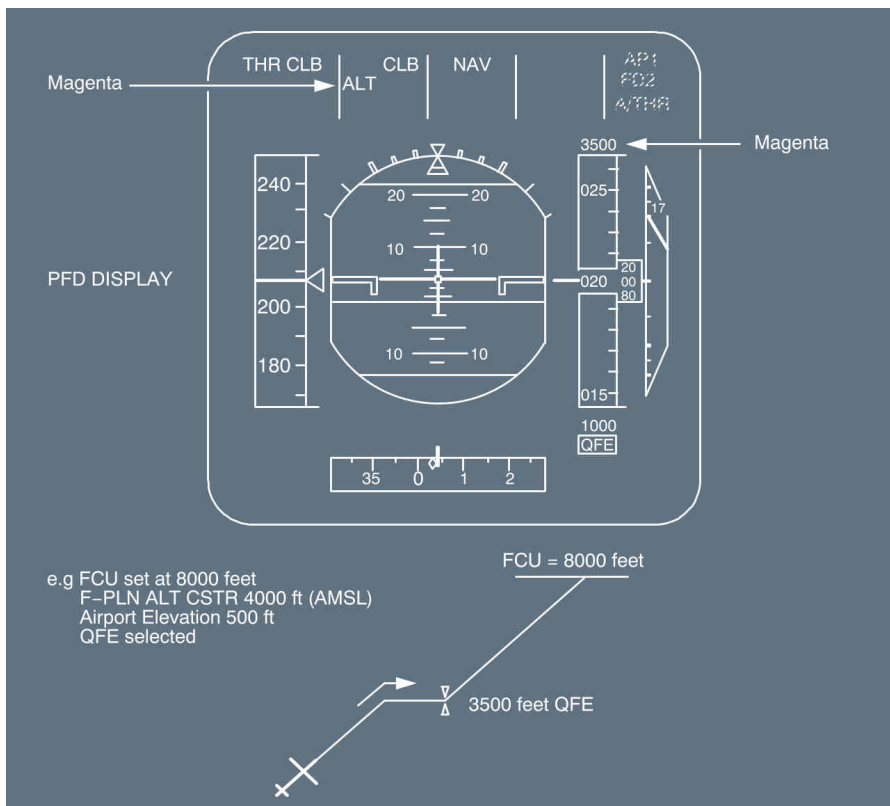
- If "STD" is selected, the target is a flight level
- If "QNH" or "QFE" is selected, the target is an altitude or height.

The aircraft will level off accordingly.

NOTE FOR AIRCRAFT WITH QFE (FIELD ELEVATION PRESSURE) PIN PROGRAM

If you select "QFE" on the EFIS control panel:

- The MCDU predictions follow the basic rules (altitudes are AMSL below the transition level, flight levels above it)
- The altitude constraints on the MCDU follow the basic rules
- The target altitude on the PFD is QFE related:
 - If the target altitude has been selected by the FCU, the aircraft will level off there.
 - If the target altitude is an altitude constraint, the PFD automatically shows that constraint as corrected by the airport elevation.



PROCEDURES

Ident.: DSC-22_20-30-30-00000928.0001001 / 06 NOV 23

Applicable to: ALL

- a. The altitude constraints in departure and arrival procedures should be defined in the navigation database or by the pilot on the MCDU:

- In terms of altitude AMSL below the transition altitude
- In terms of flight level above the transition altitude.

If a departure procedure defines an altitude constraint as an AMSL altitude above the transition altitude, you must convert it to STD, because the system and guidance will treat it as a flight level whenever you select the standard barometer setting.

- b. In climb you should switch from QNH (or QFE) to STD on both EFIS control panels simultaneously when you reach the transition altitude.

All MCDU altitude predictions and altitude constraints and all PFD altitude targets will be displayed as flight levels.

- c. In descent, when ATC clears you to an altitude below the transition altitude, you can select QNH (or QFE) on both EFIS control panels simultaneously.

All MCDU altitude predictions and constraints are displayed as altitude AMSL. Targets and constraints displayed on the PFD depend on baro selection (QNH or QFE).

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

HOW TO - EFFECT OF BARO REFERENCE SETTING

Intentionally left blank

CLEARING THE SCRATCHPAD OF DATA OR MESSAGES

Ident.: DSC-22_20-30-40-00000929.0001001 / 16 FEB 11

Applicable to: ALL

Press the “CLR” key with a single brief touch to erase the last alphanumeric character inserted in the scratchpad.

Press the key for more than three seconds to erase all the data inserted in the scratchpad. If the scratchpad is empty, it displays “CLR”.

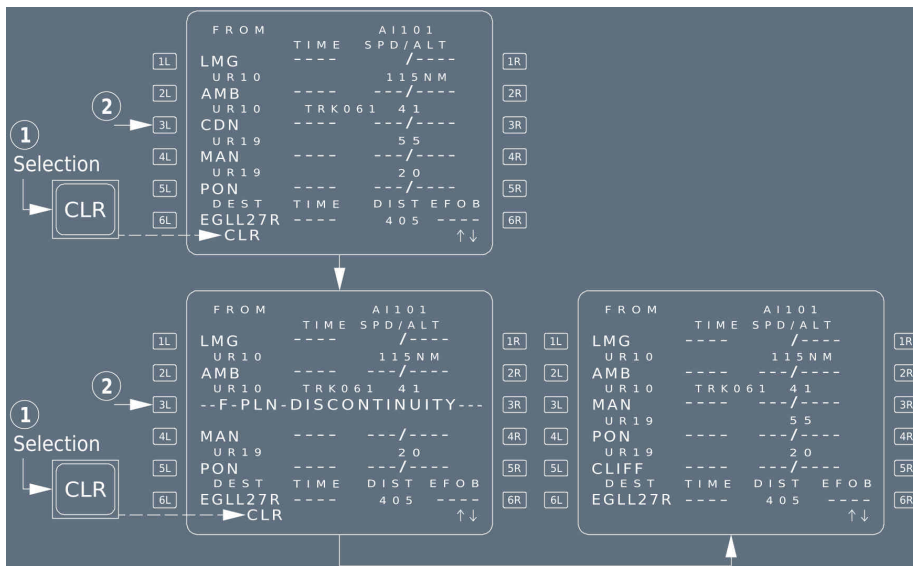
CLEARING DATA FIELDS

Ident.: DSC-22_20-30-40-00000930.0001001 / 16 FEB 11

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

Clear a data field by pressing the “CLR” key, the scratchpad displays CLR, then select the prompt for the field you want to clear (3L for example).

- You cannot clear all data fields:
 - If the field contains data that has a default value or a value computed by the FMGC, the data reverts to this value.
 - Any attempt to clear the defaulted value has no effect.
- Clearing a constraint on the F-PLN page deletes both the speed constraint and the altitude constraint associated with the waypoint
- If you clear a data field that is a waypoint in the flight plan (primary or secondary), you delete this waypoint from the flight plan and create a discontinuity. The discontinuity can also be cleared in a similar way.



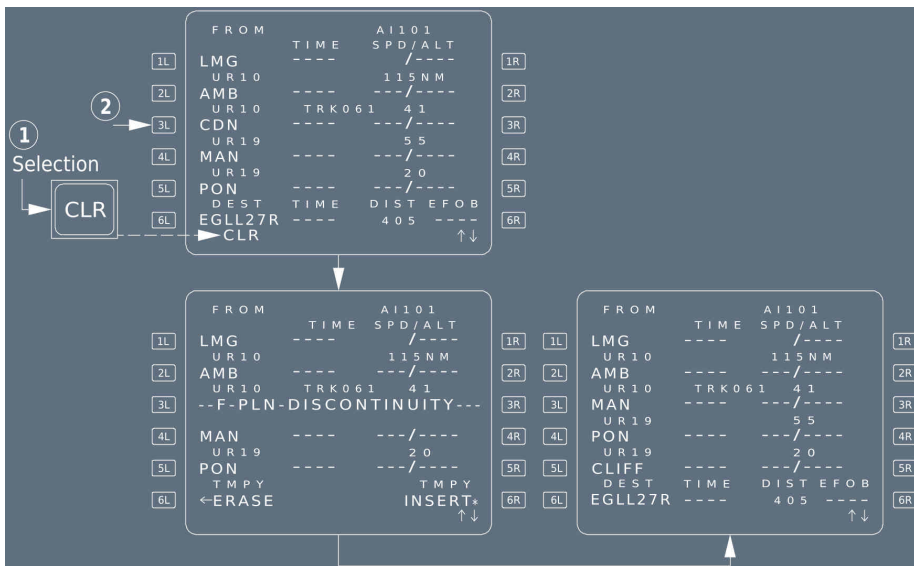
CLEARING DATA FIELDS

Ident.: DSC-22_20-30-40-00000930.0002001 / 16 FEB 11

Applicable to: MSN 02926-02944, 04392, 07784-07792

Clear a data field by pressing the “CLR” key, the scratchpad displays CLR, then select the prompt for the field you want to clear (3L for example). This results in the creation of a temporary F-PLN. The function has no effect on the active F-PLN until the temporary is inserted.

- You cannot clear all data fields:
 - If the field contains data that has a default value or a value computed by the FMGC, the data reverts to this value.
 - Any attempt to clear the defaulted value has no effect.
- Clearing a constraint on the F-PLN page deletes both the speed constraint and the altitude constraint associated with the waypoint.
- If you clear a data field that is a waypoint in the flight plan (primary or secondary), you delete this waypoint from the flight plan and create a discontinuity. The discontinuity can also be cleared in a similar way.



AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

HOW TO - CLEAR KEY (CLEARING FUNCTION)

Intentionally left blank

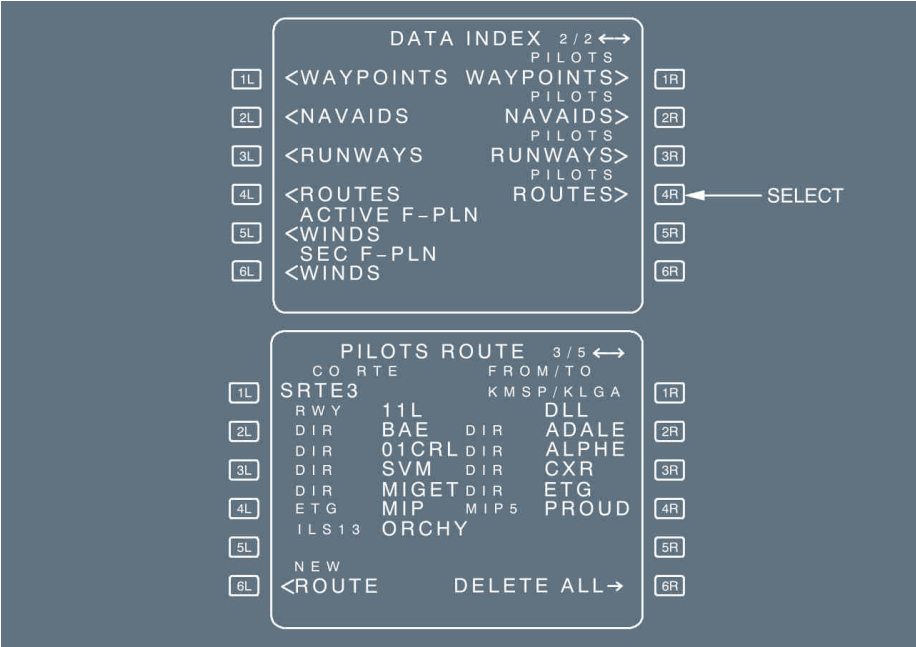
PILOTS ROUTE FUNCTION

Ident.: DSC-22_20-30-50-00000955.0003001 / 01 OCT 12
Applicable to: MSN 02926-02944, 04392, 07784-07792

The pilot's route function allows the pilot to store or review as many as five different routes defined in an active or secondary flight plan.

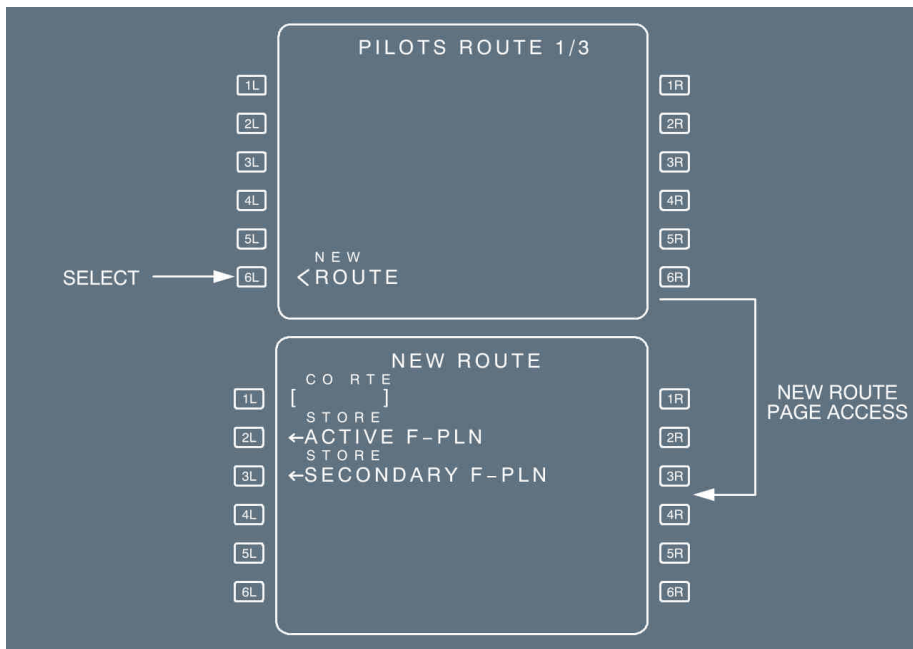
This also allows the pilot to store a company route that is not yet in the database, but is expected to be flown several times (a charter route, for example).

Access the PILOTS ROUTES page from the DATA INDEX page.



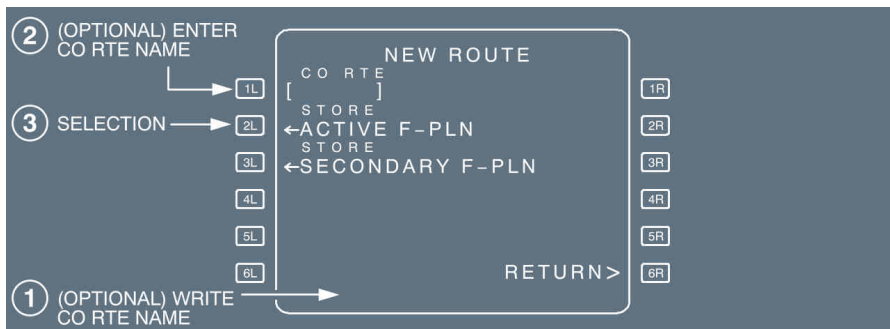
A stored route can be reviewed by using the slew key.

In order to store a new route, first define the route through the active flight plan (on the ground only) or the secondary flight plan (on the ground or in flight) then proceed as described below.



HOW TO STORE THE ACTIVE FLIGHT PLAN (DURING PREFLIGHT ONLY)

SELECT the DATA key on MCDU
PRESS the "PILOTS ROUTES" key
PRESS the "NEW ROUTE" key
ENTER the name of the company route (optional).
PRESS the "STORE ACTIVE F-PLN" key



HOW TO STORE THE SECONDARY FLIGHT PLAN

SELECT the DATA key on MCDU
PRESS the "PILOTS ROUTES" key
PRESS the "NEW ROUTE" key
ENTER the company route name (optional)
PRESS the "STORE SECONDARY F-PLN" key

- Note:**
1. In either case, you may only store a company route if the active or secondary flight plan is complete from origin to destination.
 2. If you do not enter a name, the FMGS automatically names the stored route as "SRTE 1 (or 2, ...)" when it is stored.
 3. The system does not retain several elements of the flight plans, when they are stored:
 - Pilot-entered holds
 - Offsets
 - Pilot-entered constraints
 - Modifications to a terminal procedure
 - Pseudo waypointsWhen this happens, it displays "REVISIONS NOT STORED".
 4. If five routes are already stored the system will reject a new entry and display "PILOTS ROUTES FULL" on the MCDU. Delete one stored route by clearing the CO RTE name before inserting a new one.

STORED ROUTE FUNCTION

Ident.: DSC-22_20-30-50-00000955.0002001 / 01 OCT 12

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

The stored route function allows the pilot to store or review as many as five different routes defined in an active or secondary flight plan.

This also allows the pilot to store a company route that is not yet in the database, but is expected to be flown several times (a charter route, for example).

Access the STORED ROUTES page from the DATA INDEX page.

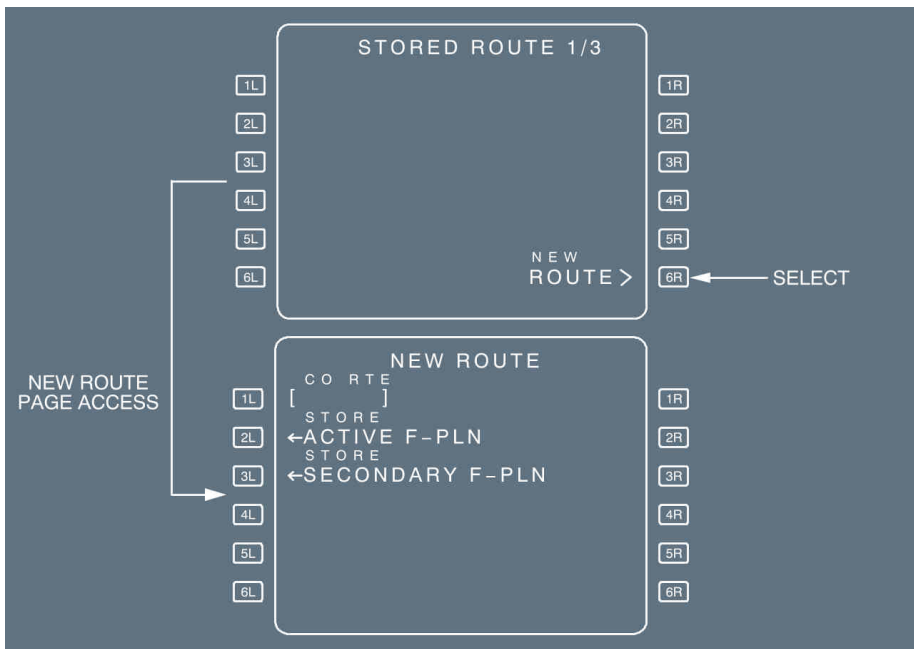
AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT
HOW TO - PILOTS/STORED ROUTE FUNCTION

DATA INDEX 2 / 2 ←			
1L	<WAYPOINTS WAYPOINTS>	1R	
2L	<NAVAIDS NAVAIDS>	2R	
3L	<RUNWAYS RUNWAYS>	3R	
4L	<ROUTES ROUTES>	4R	← SELECT
5L		5R	
6L		6R	

STORED ROUTE 3 / 5 ↔			
CO RTE	FROM / TO		
1L SRTE3	KMSP / KLGA	1R	
2L RWY 11L	DLL	2R	
3L DIR BAE	ADALE	3R	
4L DIR 01CRL	ALPHE	4R	
5L DIR SVM	CXR	5R	
6L DIR MIGET	ETG	6R	
	MIP MIP5		
	PROUD		
	ILS 13 ORCHY		
	NEW		
←DELETE ALL	ROUTE>		

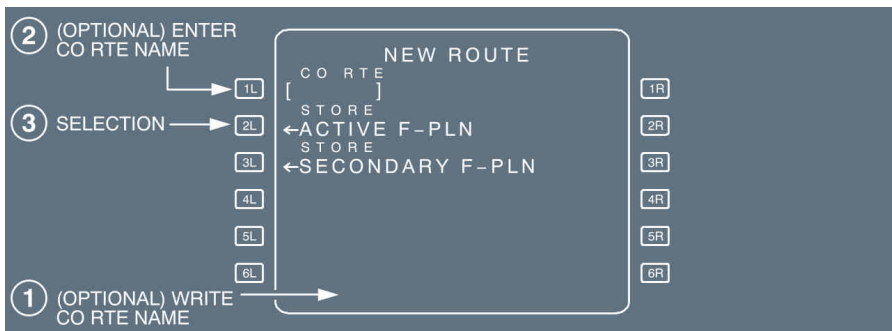
A stored route can be reviewed by using the slew key.

In order to store a new route, first define the route through the active flight plan (on the ground only) or the secondary flight plan (on the ground or in flight) then proceed as described below.



HOW TO STORE THE ACTIVE FLIGHT PLAN (DURING PREFLIGHT ONLY)

- SELECT the DATA key on MCDU
- PRESS the “STORED ROUTES” key
- PRESS the “NEW ROUTE” key
- ENTER the name of the company route (optional).
- PRESS the “STORE ACTIVE F-PLN” key



HOW TO STORE THE SECONDARY FLIGHT PLAN

SELECT the DATA key on MCDU

PRESS the "STORED ROUTES" key

PRESS the "NEW ROUTE" key

ENTER the company route name (optional)

PRESS the "STORE SECONDARY F-PLN" key

- Note:
1. In either case, you may only store a company route if the active or secondary flight plan is complete from origin to destination.
 2. If you do not enter a name, the FMGS automatically names the stored route as "SRTE 1 (or 2 ...)" when it is stored.
 3. The system does not retain several elements of the flight plans, when they are stored:
 - Pilot-entered holds
 - Offsets
 - Pilot-entered constraints
 - Modifications to a terminal procedure
 - Pseudo waypointsWhen this happens, it displays "REVISIONS NOT STORED".
 4. If five routes are already stored the system will reject a new entry and display "STORED ROUTES FULL" on the MCDU. Delete one stored route by clearing the CO RTE name before inserting a new one.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT HOW TO - REPORT PAGE
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GENERAL

Ident.: DSC-22_20-30-60-00006017.0001001 / 16 FEB 11

Applicable to: ALL

The REPORT page allows the crew to achieve the position reporting.

REPORT PAGE ACCESS

Ident.: DSC-22_20-30-60-00009524.0008001 / 29 SEP 15

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

The report page is accessed from the PROG PAGE.

AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT

HOW TO - REPORT PAGE

1L	<REPORT UPDATE AT *{ BRG/DIST --°/-- PREDICTIVE <GPS REQUIRED 2.0 NM
----	--

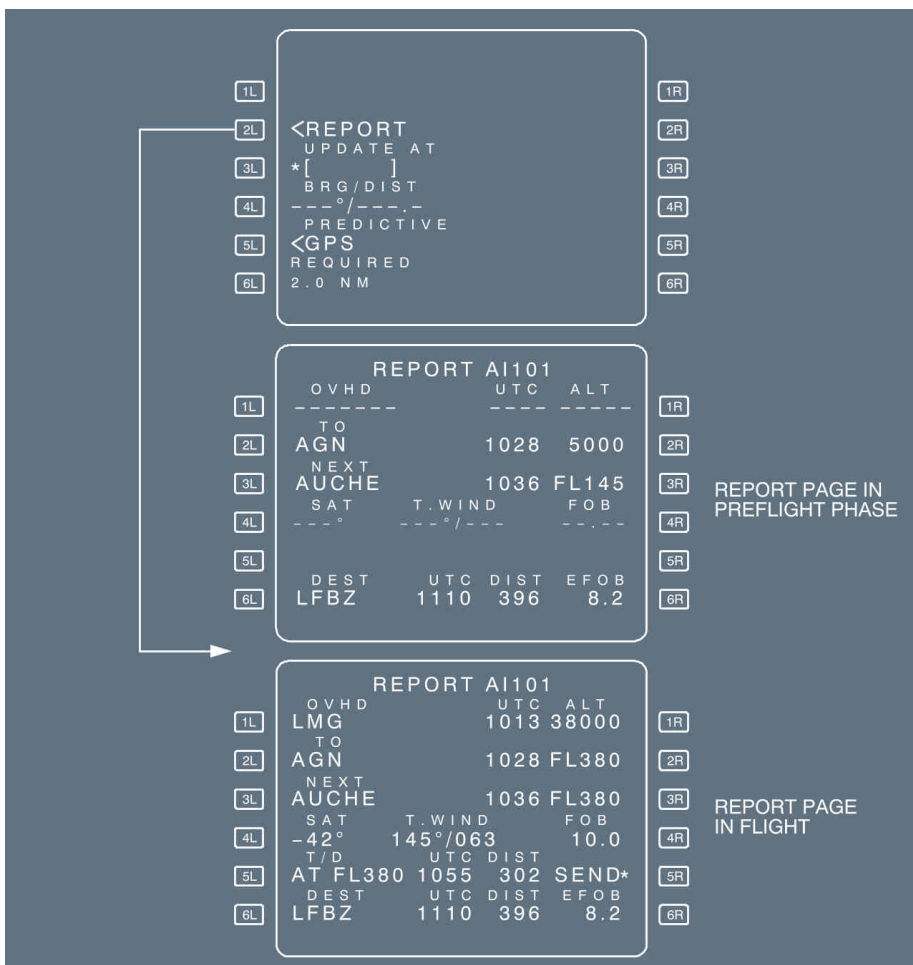
Note: In case a DIR TO with ABEAM WPTs is achieved, or in case a FIX INFO with ABEAM or RADIAL/CIRCLE intersection is inserted in the F-PLN, the TO WPT (provided on the REPORT page) will be the ABEAM WPT or the RADIAL/CIRCLE intersect waypoint, if any, as on the F-PLN page.

REPORT PAGE ACCES

Ident.: DSC-22_20-30-60-00009524.0010001 / 14 MAY 12

Applicable to: MSN 02926-02944, 04392, 07784-07792

The report page is accessed from the PROG PAGE.



Note: In case a DIR TO with ABEAM WPTs is achieved, the TO WPT (provided on the REPORT page) will be the ABEAM WPT if any, as on the F-PLN page.
Or in case a FIX INFO with ABEAM or RADIAL/CIRCLE intersection is inserted in the F-PLN, the TO WPT (provided on the REPORT page) will be the ABEAM WPT or the RADIAL/CIRCLE intersect waypoint, if any, as on the F-PLN page.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT HOW TO - TIME MARKER
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GENERAL

Ident.: DSC-22_20-30-70-00006019.0001001 / 16 FEB 11

Applicable to: ALL

The crew can enter a time marker in the F-PLN A or B page. Once entered, the FMGS displays a pseudo waypoint along the flight plan on the MCDU and on the Navigation Display. This pseudo waypoint shows the predicted location of the aircraft at the entered time.

HOW TO INSERT A TIME MARKER

Ident.: DSC_22_20-30-70-00009522.0001001 / 01 OCT 12

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

WRITE the time marker in the scratchpad. The entry format is HHMM.
SELECT any left key of the F-PLN A or B page, to insert the time marker in the active flight plan.
The time marker is inserted in the flight plan according to time criteria, irrespective of the key chosen for entry.

2 ENTER →

1 WRITE TIME MARKER →

TIME MARKER PSEUDO-WAYPOINT →

FROM	UTC	SPD / ALT	AI101 →
1L AGN	1149	/ * FL120	1R
	BRG 006 °	24 NM	
2L LACOU	1152	280 / * FL205	2R
	TRK 005	49	
3L (T/C)	1159	.78 / FL330	3R
		43	
4L LMG	1205	" / "	4R
	URIO	96	
5L AMB	1217	" / "	5R
	DEST UTC	DIST EFOB	
6L EGLL27R	1300	352 6.3	6R
	1210	↑↓	

FROM	UTC	SPD / ALT	AI101 →
1L AGN	1149	/ * FL120	1R
	BRG 006 °	24 NM	
2L LACOU	1152	280 / * FL205	2R
	TRK 005	49	
3L (T/C)	1159	.78 / FL330	3R
		43	
4L LMG	1205	" / "	4R
	(UTC)	40	
5L (1210)	1210	" / "	5R
	DEST UTC	DIST EFOB	
6L EGLL27R	1300	352 6.3	6R
		↑↓	

Prediction are recomputed. Time marker pseudo-waypoint is inserted along the active F-PLN (MCDU and ND)

Up to four time markers may exist at a time. An attempt to enter a fifth time marker will cause the "TIME MARKER LIST FULL" message to appear on the scratchpad.

The FMGS updates the time marker position with the predictions.

When the current clock time equals or exceeds the time marker entry, the FMGS sequences the time marker (even in preflight).

HOW TO INSERT A TIME MARKER

Ident.: DSC-22_20-30-70-00009522.0002001 / 01 OCT 12

Applicable to: MSN 02926-02944, 04392, 07784-07792

WRITE the time marker in the scratchpad. The entry format is HHMM.

SELECT any left key of the F-PLN A or B page, to insert the time marker in the active flight plan.

The time marker is inserted in the flight plan according to time criteria, irrespective of the key chosen for entry.

Initial State (Top Screenshot):

FROM	UTC	SPD / ALT
AGN	1149	/* FL120
	BRG 006°	24 NM
LACOU	1152	280 / *FL205
	TRK 005	49
(T/C)	1159	.78 / FL330
		43
LMG	1205	" / "
	URIO	96
AMB	1217	" / "
DEST	UTC	DIST EFOB
EGLL27R	1300	352 6.3
1210		↑↓

Final State (Bottom Screenshot):

FROM	UTC	SPD / ALT
AGN	1149	/* FL120
	BRG 006°	24 NM
LACOU	1152	280 / *FL205
	TRK 005	49
(T/C)	1159	.78 / FL330
		43
LMG	1205	" / "
(UTC)	1210	40
		" / "
DEST	UTC	DIST EFOB
EGLL27R	1300	352 6.3
		↑↓

Annotations:

- 2 ENTER** points to the 2L key.
- 1 WRITE TIME MARKER** points to the 5L key.
- TIME MARKER PSEUDO-WAYPOINT** points to the 5L key.
- Prediction are recomputed. Time marker pseudo-waypoint is inserted along the active F-PLN (MCDU and ND)** is shown next to the bottom screenshot.

Up to four time markers may exist in the F-PLN at a time. An attempt to enter a fifth time marker will cause the "TIME MARKER LIST FULL" message to appear on the scratchpad.

The FMGS updates the time marker position with the predictions.

When the current clock time equals or exceeds the time marker entry, the FMGS sequences the time marker (even in preflight).

FLIGHT PLAN INITIALIZATION THROUGH ACARS

Ident.: DSC-22_20-30-80-00000956.0007001 / 17 MAY 21

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

REQUEST FOR ACTIVE FLIGHT PLAN INITIALIZATION BEFORE ENGINE START

Before engine start, the crew may request a route for the active flight plan. When the route is received, "AOC ACT F-PLN UPLINK" message is displayed on the MCDU indicating that the flight plan has been received and automatically inserted.

After engine start, it is not possible to initialize directly the active flight plan since the received flight plan is automatically routed into the secondary, and the MDCU displays "AOC SEC F-PLN UPLINK".

PROCEDURE

PRESS the INIT REQUEST * prompt.

The star () disappears, all data fields are dashed except:*

- CO RTE, FLT NBR if previously displayed and
- Default values.

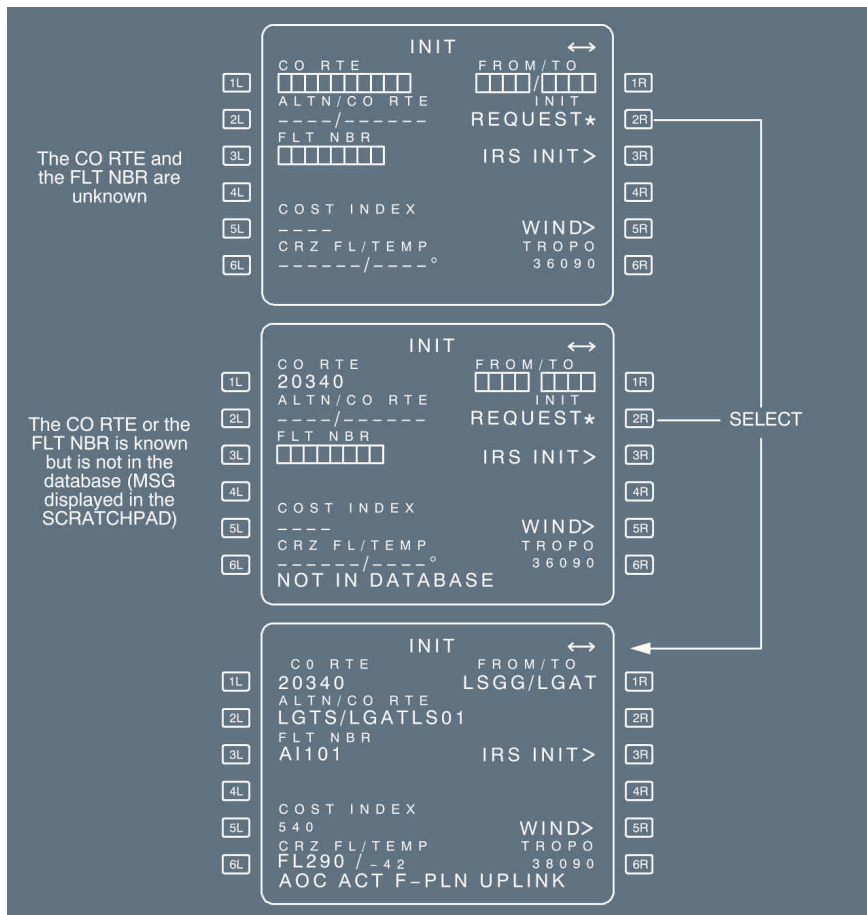
The star is not displayed when the FMGS cannot communicate with the ACARS. No request can be sent.

When an active flight plan exists, INIT REQUEST prompt is removed from the active INIT page and no request can be sent for the active flight plan. If a flight plan is entered manually after the request, the uplink message is routed to the secondary.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

HOW TO - AOC FUNCTIONS



REQUEST FOR SECONDARY FLIGHT PLAN

A request for a secondary flight plan can be initiated anytime. Any flight plan received after engine start is automatically routed into the secondary flight plan.

When the flight plan is received, a message "AOC SEC F-PLN UPLINK" is displayed on the MCDU scratchpad.

Before engine start, and if the SEC F-PLN is empty, any uplinked flight plan is automatically inserted into the secondary flight plan, and no flight crew action is required.

After engine start, or if the SEC F-PLN is not empty, the flight crew must manually insert the uplinked flight plan via INSERT UPLINK prompt.

PROCEDURE TO INSERT OR REJECT A SECONDARY FLIGHT PLAN

When the uplink message is received, the INIT REQUEST prompt of the INIT A page is replaced by INSERT UPLINK (2R field). Pressing the 2R key will insert the flight plan into the secondary. Clearing the prompt will reject it.

If a temporary flight plan or a DIR TO is in progress, the uplink insertion is not accepted until the temporary flight plan or the DIR TO is completed.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

HOW TO - AOC FUNCTIONS

SEC INIT →					
1L	CO RTE	FROM/TO	1R		
	[][][][][][][][]	[][][][][][][][]			
2L	ALTN/CO RTE	INIT	2R	← PRESS ①	
	-----/-----	RESQUEST*			
3L	FLT NBR		3R		
	[][][][][][][][]				
4L	LAT	LONG	4R		
	-----,--	-----,--			
5L	COST INDEX		5R		
	---	WIND>			
6L	CRZ FL/TEMP	TROPO	6R		
	-----/-----°	3 6 0 9 0			
AOC SEC F-PLN UPLINK					

SEC INIT →					
1L	CO RTE	FROM/TO	1R		
	[][][][][][][][]	[][][][][][][][]			
2L	ALTN/CO RTE	INSERT	2R	← PRESS ②	
	-----/-----	UPLINK*			
3L	FLT NBR		3R		
	[][][][][][][][]				
4L	LAT	LONG	4R		
	-----,--	-----,--			
5L	COST INDEX		5R		
	---	WIND>			
6L	CRZ FL/TEMP	TROPO	6R		
	-----/-----°	3 6 0 9 0			
UPLINK INSERT IN PROG					

SEC INIT →					
1L	CO RTE	FROM/TO	1R		
	20441	LSGG/LGAT			
2L	ALTN/CO RTE	INIT	2R		
	LGTS	REQUEST*			
3L	FLT NBR		3R		
	A1101				
4L	LAT	LONG	4R		
	4512.ON	00727.2E			
5L	COST INDEX		5R		
	540	WIND>			
6L	CRZ FL/TEMP	TROPO	6R		
	FL290/-42°	3 6 0 9 0			

FLIGHT PLAN INITIALIZATION THROUGH ACARS (IF INSTALLED)

Ident.: DSC-22_20-30-80-00000956.0014001 / 01 OCT 12

Applicable to: MSN 02926-02944, 04392, 07784-07792

REQUEST FOR ACTIVE FLIGHT PLAN INITIALIZATION BEFORE ENGINE START

Before engine start, the crew may request a route for the active flight plan. When the route is received, "AOC ACT F-PLN UPLINK" message is displayed on the MCDU indicating that the flight plan has been received and automatically inserted.

After engine start, it is not possible to initialize directly the active flight plan since the received flight plan is automatically routed into the secondary, and the MDCU displays "AOC SEC F-PLN UPLINK".

PROCEDURE

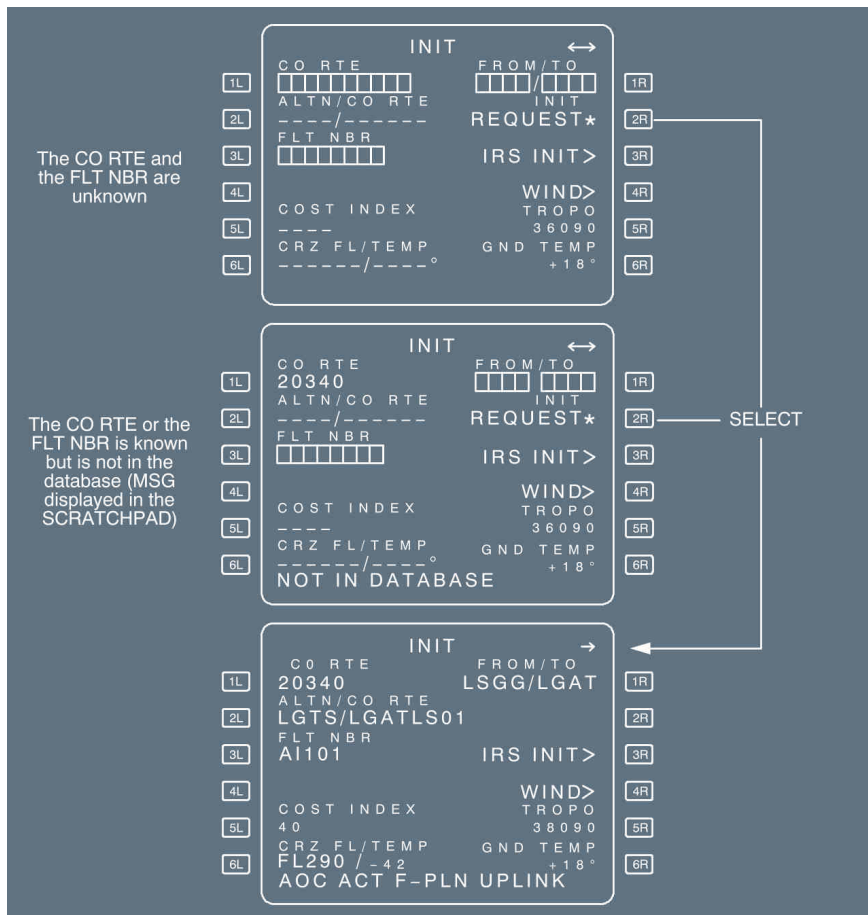
PRESS the INIT REQUEST * prompt.

The star () disappears, all data fields are dashed except:*

- CO RTE, FLT NBR if previously displayed and
- Ddefault values.

The star is not displayed when the FMGS cannot communicate with the ACARS. No request can be sent.

When an active flight plan exists, INIT REQUEST prompt is removed from the active INIT page and no request can be sent for the active flight plan. If a flight plan is entered manually after the request, the uplink message is routed to the secondary.



REQUEST FOR SECONDARY FLIGHT PLAN

A request for a secondary flight plan can be initiated anytime. Any flight plan received after engine start is automatically routed into the secondary flight plan.

When the flight plan is received, a message “AOC SEC F-PLN UPLINK” is displayed on the MCDU scratchpad.

Before engine start, and if the SEC F-PLN is empty, any uplinked flight plan is automatically inserted into the secondary flight plan, and no flight crew action is required.

After engine start, or if the SEC F-PLN is not empty, the flight crew must manually insert the uplinked flight plan via INSERT UPLINK prompt.

PROCEDURE TO INSERT OR REJECT A SECONDARY FLIGHT PLAN

When the uplink message is received, the INIT REQUEST prompt of the INIT A page is replaced by INSERT UPLINK (2R field). Pressing the 2R key will insert the flight plan into the secondary. Clearing the prompt will reject it.

If a temporary flight plan or a DIR TO is in progress, the uplink insertion is not accepted until the temporary flight plan or the DIR TO is completed.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

HOW TO - AOC FUNCTIONS

SEC INIT ← → CO RTE FROM/TO ALTN/CO RTE INIT FLT NBR COST INDEX CRZ FL/TEMP AOC SEC F-PLN UPLINK WIND> TROPO 36090											
1L	2L	3L	4L	5L	6L	1R	2R	3R	4R	5R	6R
						PRESS ①					
SEC INIT ← → CO RTE FROM/TO ALTN/CO RTE INIT FLT NBR COST INDEX CRZ FL/TEMP UPLINK INSERT IN PROG WIND> TROPO 36090											
1L	2L	3L	4L	5L	6L	1R	2R	3R	4R	5R	6R
						PRESS ②					
SEC INIT ← → CO RTE FROM/TO ALTN/CO RTE INIT LGTS REQUEST* FLT NBR A1101 COST INDEX 40 CRZ FL/TEMP FL290/-42° LSGG/LGAT INIT WIND> TROPO 36090											
1L	2L	3L	4L	5L	6L	1R	2R	3R	4R	5R	6R

TAKEOFF DATA

Ident.: DSC-22_20-30-80-A-00000957.0001001 / 15 FEB 11

Applicable to: ALL

GENERAL

The takeoff data may be requested in preflight or done phase for the active flight plan only.
It is always associated with the active flight plan message.

Ident.: DSC-22_20-30-80-A-00000958.0006001 / 15 FEB 11

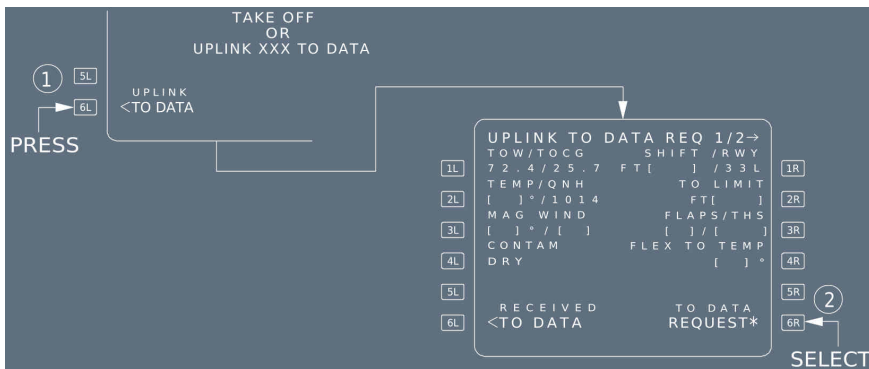
Applicable to: MSN 02926-02944, 04392, 07784-07792

REQUEST FOR TAKEOFF DATA

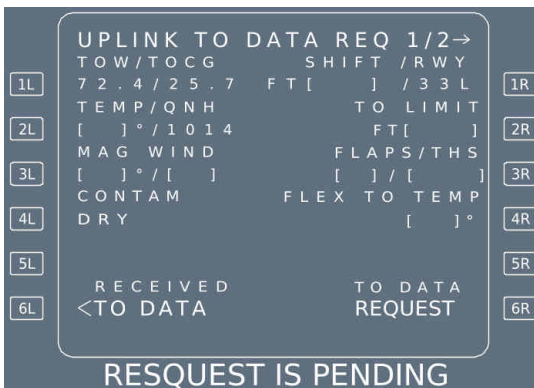
In order to obtain takeoff data from the ground station:

SELECT UPLINK TO DATA [6L] key.

SEND the request by pressing the "TO DATA REQUEST" [6R] key.



When TO DATA REQUEST is sent, data of the TO DATA REQ page are locked in and the star displayed in the 6R field is removed.



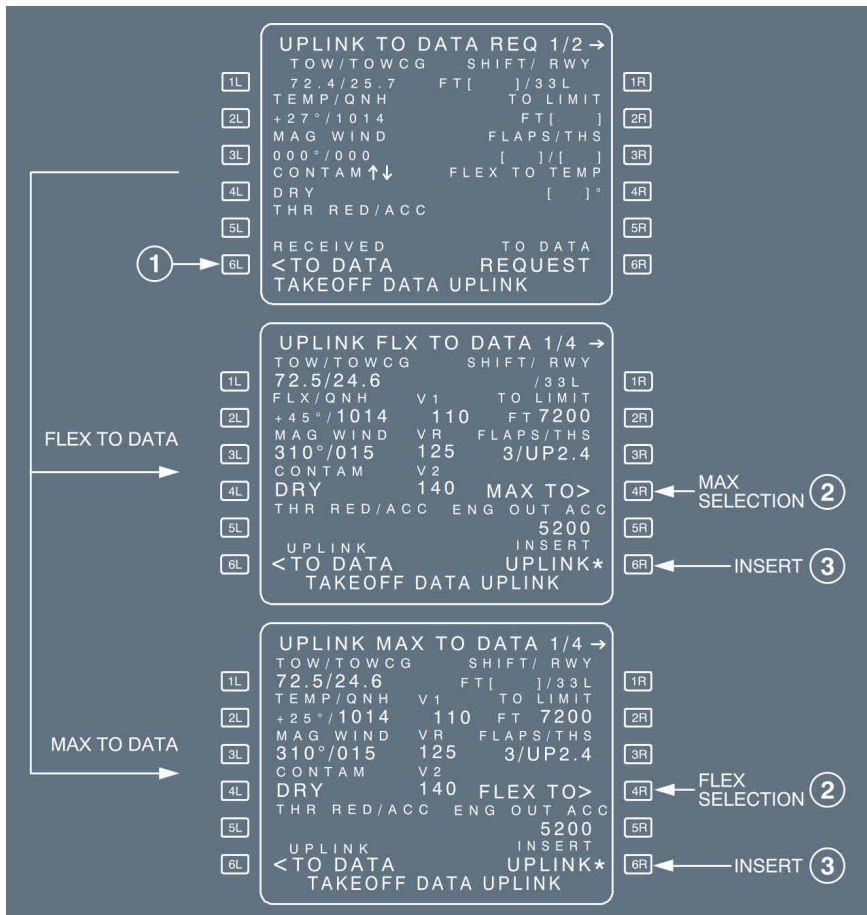
TAKEOFF DATA - PROCEDURE TO INSERT UPLINK TAKEOFF DATA

Ident.: DSC-22_20-30-80-A-00000959.0005001 / 23 JUN 15

Applicable to: MSN 02926-02944, 04392, 07784-07792

PROCEDURE TO INSERT UPLINK TAKEOFF DATA

PRESS the 6L key "RECEIVED TO DATA" when the message TAKEOFF DATA UPLINK is displayed.



This displays the uplink data on 2 different pages:

UPLINK MAX TO DATA
UPLINK FLX TO DATA

SELECT the data corresponding to the thrust to be used (MAX or FLEX) by pressing [4R].

SELECT the active runway data by slewing the pages (1/4... 4/4).

PRESS the [6R] key "INSERT UPLINK".

UPLINK MAX TO DATA and UPLINK FLX TO DATA pages are not modifiable.

Note: The "INSERT UPLINK" prompt is not displayed:

- If the uplinked runway is different from the active runway
- If the uplinked TOW differs from the FMS-estimated TOW by more than 1 t
- If the uplinked TOCG differs from the FMS-estimated TOCG by more than 0.5 %
- If the uplink is incomplete.

● When the takeoff data have been inserted

, the PERF TO page is amended of the new data.

TAKE OFF			
[1L]	V1	FLP RETR	RWY
	110	F=165	33L
[2L]	VR	SLT RETR	TO SHIFT
	125	S=196	FT[]*
[3L]	V2	CLEAN	FLAPS/THS
	140	0=236	3/UP2.4
[4L]	TRANS	ALT	FLEX TO TEMP
	5000	[]°	
[5L]	THR	RED/ACC	ENG OUT ACC
	2500/3500		5200
[6L]	UPLINK	NEXT	
	<TO DATA	PHASE>	

Ident.: DSC-22_20-30-80-A-00000959.0001001 / 10 MAY 21

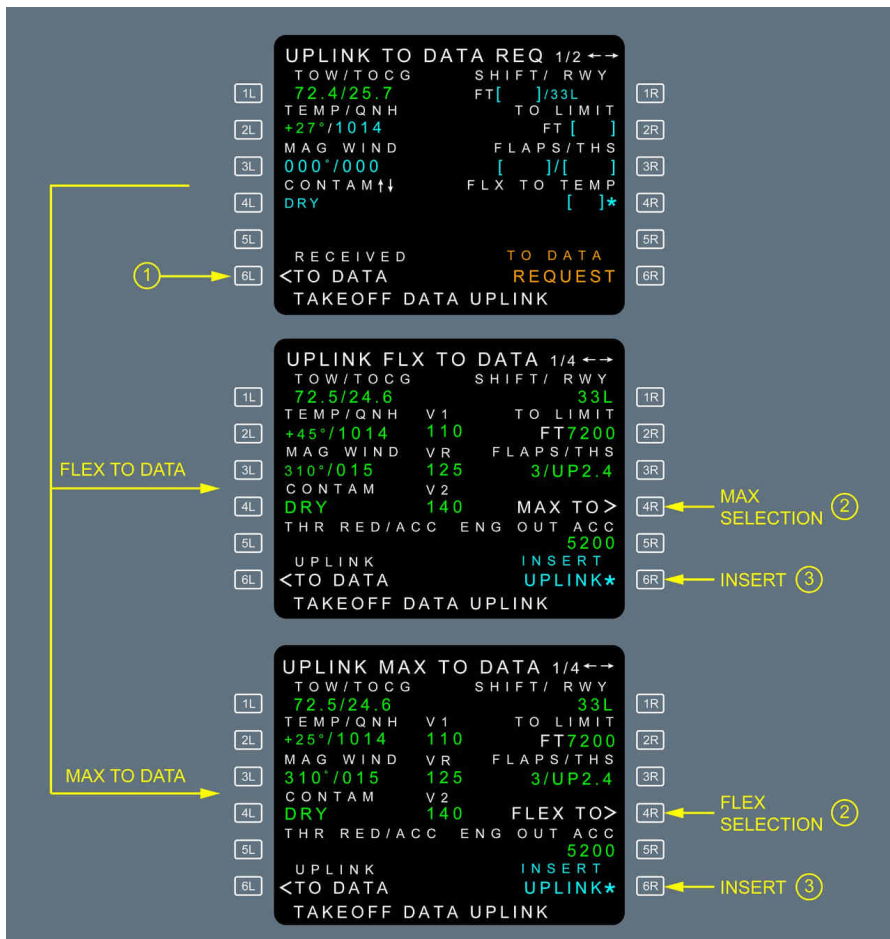
Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

PROCEDURE TO INSERT UPLINK TAKEOFF DATA

PRESS the [6L] key **RECEIVED TO DATA** when the message **TAKEOFF DATA UPLINK** is displayed.

AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT

HOW TO - AOC FUNCTIONS



UPLINK TO DATA REQ 1/2 ↔

1L	TOW/TOCG	72.4/25.7	SHIFT/ RWY	3/33L	1R
2L	TEMP/QNH	+27°/1014	TO LIMIT	FT []	2R
3L	MAG WIND	000°/000	FLAPS/THS	[]/[]	3R
4L	CONTAM↑↓	DRY	FLX TO TEMP	[]*	4R
5L					5R
6L	RECEIVED	TO DATA	REQUEST		6R

UPLINK FLX TO DATA 1/4 ↔

1L	TOW/TOCG	72.5/24.6	SHIFT/ RWY	33L	1R
2L	TEMP/QNH	+45°/1014	V1	TO LIMIT	2R
3L	MAG WIND	310°/015	VR	FLAPS/THS	3R
4L	CONTAM	DRY	V2	3/UP2.4	4R
5L	THR RED/ACC	ENG OUT ACC	5200		5R
6L	UPLINK	INSERT	UPLINK*		6R

UPLINK MAX TO DATA 1/4 ↔

1L	TOW/TOCG	72.5/24.6	SHIFT/ RWY	33L	1R
2L	TEMP/QNH	+25°/1014	V1	TO LIMIT	2R
3L	MAG WIND	310°/015	VR	FLAPS/THS	3R
4L	CONTAM	DRY	V2	3/UP2.4	4R
5L	THR RED/ACC	ENG OUT ACC	5200		5R
6L	UPLINK	INSERT	UPLINK*		6R

Note: This displays the uplink data on two different pages:

- UPLINK MAX TO DATA
- UPLINK FLX TO DATA.

SELECT the data corresponding to the thrust to be used (MAX or FLEX) by pressing [4R] key.

SELECT the active runway data by scrolling the pages (1/4... 4/4).

PRESS the [6R] key **INSERT UPLINK**.

Note: UPLINK MAX TO DATA and UPLINK FLX TO DATA pages are not modifiable.

- If the takeoff data displayed on this page are not relevant to the active runway entered in the flight plan, the **INSERT UPLINK** prompt is not displayed.
- When the takeoff data are inserted, the PERF TO page is updated with the new data.

TAKE OFF			
V1	FLP RETR	RWY	
110	F=165	33L	
VR	SLT RETR	TO SHIFT	
125	S=196	FT[]	
V2	CLEAN	FLAPS/THS	
140	O=236	3/UP2.4	
TRANS ALT	FLEX TO TEMP		
5000	[]°		
THR RED/ACC	ENG OUT ACC		
2500 /3500	5200		
UPLINK	NEXT		
<TO DATA	PHASE>		

WIND DATA

WIND DATA - REQUEST FOR WIND DATA

Ident.: DSC-22_20-30-80-B-00000961.0001001 / 01 OCT 12

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

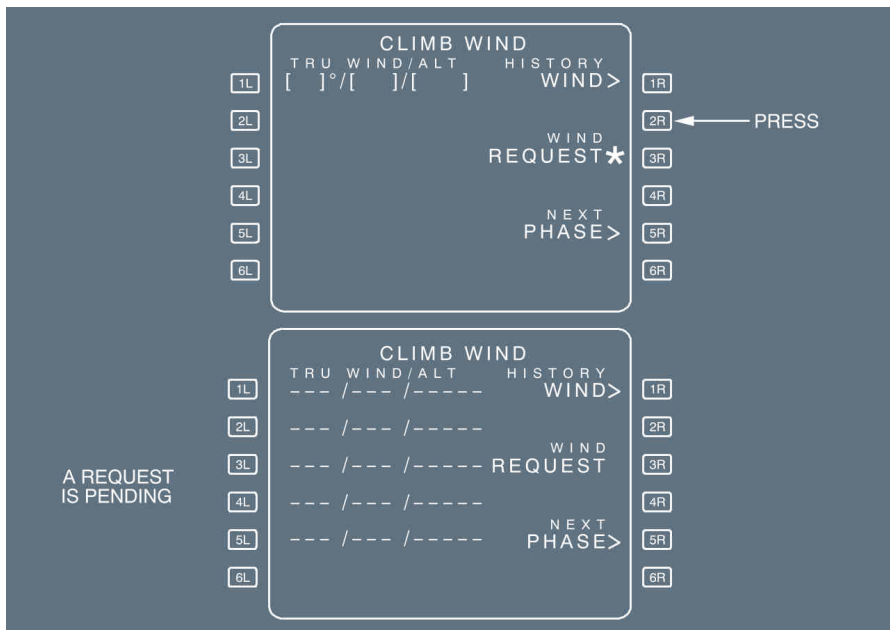
REQUEST FOR WIND DATA

To send a wind request, press the “WIND REQUEST” selection key of any wind pages. This request is automatically sent to the ground for one or more flight phases and for the selected flight plan (primary or secondary). The content of the wind request message is not dependent on the selected wind page (CLIMB, CRUISE or DESCENT) but on the flight phase in progress.

- For active flight plan or secondary flight plan that is a “COPY ACTIVE”, a wind request sent by the crew:
 - during preflight or takeoff phase, initiates a demand for climb, cruise, descent and alternate winds.
 - during climb and cruise phase, initiates a demand for cruise, descent and alternate winds.
 - during descent/approach and go around, no wind request is possible.
- For secondary flight plan that is not a “COPY ACTIVE” there is no restriction linked to flight phase.

Before engine start, and if data has not been entered in any WIND page for the flight plan, the uplinked wind data is automatically inserted into the flight plan, and no flight crew action is required.

If the uplinked wind message is received after engine start, or if data has been entered in any WIND page of the flight plan, the flight crew must manually insert the uplinked wind data via the INSERT UPLINK prompt.



When the amber star following the “WIND REQUEST” is not displayed, the FM is not able to communicate with the ACARS and the pilot cannot send any request.

Ident.: DSC-22_20-30-80-B-00000961.0006001 / 01 OCT 12

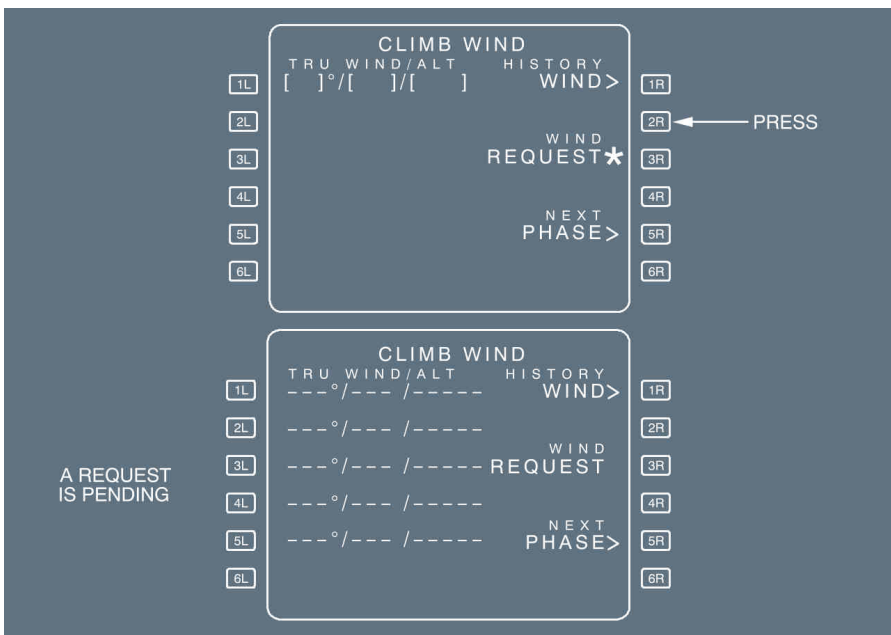
Applicable to: MSN 02926-02944, 04392, 07784-07792

REQUEST FOR WIND DATA

To send a wind request, press the “WIND REQUEST” selection key of any wind pages. This request is automatically sent to the ground for one or more flight phases and for the selected flight plan (primary or secondary). The content of the wind request message is not dependent on the selected wind page (CLIMB, CRUISE or DESCENT) but on the flight phase in progress.

- For active flight plan or secondary flight plan that is a “COPY ACTIVE”, a wind request sent by the crew:
 - during preflight or takeoff phase, initiates a demand for climb, cruise, descent and alternate winds.
 - during climb and cruise phase, initiates a demand for cruise, descent and alternate winds.
 - during descent/approach and go around, no wind request is possible.
- For secondary flight plan that is not a “COPY ACTIVE” there is no restriction linked to flight phase.

If the uplinked wind message is received after engine start, or if data has been entered in any WIND page of the flight plan, the flight crew must manually insert the uplinked wind data via the INSERT UPLINK prompt.



The diagram illustrates the CLIMB WIND HISTORY WIND REQUEST screen in two states: active and pending.

Active State (Top):

- Left side buttons: 1L, 2L, 3L, 4L, 5L, 6L.
- Right side buttons: 1R, 2R, 3R, 4R, 5R, 6R.
- Center display:
 - CLIMB WIND
 - TRU WIND/ALT HISTORY WIND>
 - []°/[]/[]
 - WIND REQUEST*
 - NEXT PHASE>
- An arrow labeled "PRESS" points to the 2R button.

Pending State (Bottom):

- Left side buttons: 1L, 2L, 3L, 4L, 5L, 6L.
- Right side buttons: 1R, 2R, 3R, 4R, 5R, 6R.
- Center display:
 - CLIMB WIND
 - TRU WIND/ALT HISTORY WIND>
 - °/---/-----
 - WIND REQUEST
 - NEXT PHASE>
- Text on the left: "A REQUEST IS PENDING".

When the amber star following the “WIND REQUEST” is not displayed, the FM is not able to communicate with the ACARS and the pilot cannot send any request.

WIND DATA - PROCEDURE TO INSERT WIND DATA

Ident.: DSC-22_20-30-80-B-00000962.0020001 / 14 MAY 12

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

PROCEDURE TO INSERT WIND DATA

When the uplink message is received, the 2R field is modified, the amber "WIND REQUEST" is replaced by the blue "INSERT UPLINK". This prompt, when pressed, enables the flight crew to insert the uplink wind data, phase by phase.

To access, review, insert or delete the uplink wind data of other phases, the crew uses "NEXT PHASE" or "PREV PHASE" key.

If the crew is not satisfied with the uplink winds, the flight crew will delete the winds, phase by phase clearing the "INSERT UPLINK" prompt. This will delete all the uplinked winds of the selected flight phase.

UPLINKED CLIMB WINDS ARE STORED	1L	CLIMB WIND TRU WIND/ALT HISTORY 030°/025/FL030 WIND> 042°/032/FL080 INSERT UPLINK★ NEXT PHASE> WIND DATA UPLINK	1R	2R ← PRESS 3R 4R 5R 6R
	2L			
	3L			
	4L			
	5L			
	6L			
NEW WINDS ARE INSERTED	1L	CLIMB WIND TRU WIND/ALT HISTORY 030°/025/FL030 WIND> 042°/032/FL080 REQUEST★ []°/[]/[] NEXT PHASE>	1R	2R 3R 4R 5R 6R
	2L			
	3L			
	4L			
	5L			
	6L			

CLIMB WIND PAGE

When a request is pending, the history WIND page cannot be accessed.

When the climb phase is active, the crew cannot request neither modify the climb winds of the active flight plan or secondary flight plan if it is a copy active.

CRUISE WIND PAGE

CRUISE WIND					
1L	TRU WIND/WPT	CRZ FL	1R		
2L	---°/---/TOP	FL330	2R		
3L	---°/---/KEBT	WIND	3R		
4L	---°/---/BTIE	REQUEST	4R		
5L	STEP FL370	PREV	5R		
6L	---°/---/COVT	PHASE>	6R		
	---°/---/KUABE	NEXT			
	---°/---/CAT	PHASE>			
		↑↓			

CRUISE WIND PAGE
REQUEST IS PENDING

CRUISE WIND					
1L	TRU WIND/WPT	CRZ FL	1R		
2L	260°/109/TOP	FL330	2R		
3L	258°/080/KEBT	INSERT	3R		
4L	265°/096/BTIE	UPLINK*	4R		
5L	STEP FL370	PREV	5R		
6L	240°/060/COVT	PHASE>	6R		
	245°/085/KUABE	NEXT			
	250°/105/CAT	PHASE>			
	WIND DATA UPLINK	↑↓			

UPLINKED DATA
PRIOR TO
INSERTION

A wind request sent during cruise phase will apply for downpath waypoints of the cruise, descent, approach and alternate phases.

- If the uplink message contains more data and waypoints than the flight plan, the winds at extra waypoints are not considered and automatically discarded. This is transparent to the pilot
- Clearing the INSERT UPLINK* prompt deletes all uplink wind data of the cruise phase. Cruise page reverts to the previous data.

Note: During cruise, whenever uplink wind data is received and not inserted or cancelled on the CRUISE WIND page, access to the DIR TO function is not possible. The "WIND UPLINK EXISTS" message is displayed on the MCDU scratchpad. Insert or cancel the uplinked wind message first and then access the DIR TO function.

DESCENT WIND PAGE

The procedures to insert, review or delete descent winds during preflight, climb or cruise phase are described in the above wind general procedure.

DESCENT WIND PAGE REQUEST IS PENDING	1L	DESCENT WIND		1R
	2L	TRU WIND/ALT	WIND	2R
	3L	---°/---/-----	REQUEST	3R
	4L	---°/---/-----	PREV	4R
	5L	---°/---/-----	PHASE>	5R
	6L	ALTERNATE	---	6R

UPLINKED DATA PRIOR TO INSERTION	1L	DESCENT WIND		1R
	2L	TRU WIND/ALT	INSERT	2R
	3L	060°/060/FL310	UPLINK★	3R
	4L	060°/050/FL200	PREV	4R
	5L	060°/020/FL100	PHASE>	5R
	6L	050°/010/FL050	ALTN CRZ	6R
		ALTERNATE	FL220	
		WIND DATA UPLINK		

If the alternate wind is not available, dashes are displayed in the field.

In descent, approach or go around phases, the pilot cannot request or modify the descent winds of the active flight plan or secondary flight plan if it is a "COPY ACTIVE".

Ident.: DSC-22_20-30-80-B-00000962.0022001 / 03 NOV 21

Applicable to: MSN 02926-02944, 04392, 07784-07792

PROCEDURE TO INSERT WIND DATA

When the uplink message is received, "WIND REQUEST" disappears from the 3R field and "UPLINK" is displayed in large yellow font next to the title.

To access, review, insert or delete the uplink wind data of other phases, the flight crew uses "NEXT PHASE" or "PREV PHASE" key.

If the flight crew is not satisfied with the uplink winds, the flight crew can delete them using the "UPLINK CANCEL" prompt (6L field). This will delete all unlinked winds

UPLINKED CLIMB
WINDS ARE STORED

CLIMB WIND

TRU WIND/ALT	HISTORY	
030°/025/FL030	WIND>	
042°/032/FL080		

UPLINK
←CANCEL

NEXT
PHASE>
UPLINK
INSERT*

PRESS

NEW WINDS ARE
INSERTED

CLIMB WIND

TRU WIND/ALT	HISTORY	
030°/025/FL030	WIND>	
042°/032/FL080		

WIND
[]°/[]/[] REQUEST*

NEXT
PHASE>

CLIMB WIND PAGE

When a request is pending, the history WIND page cannot be accessed.

When the climb phase is active, the flight crew cannot request neither modify the climb winds of the active flight plan or secondary flight plan if it is a copy active.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

HOW TO - AOC FUNCTIONS

CRUISE WIND PAGE

CRZ WIND PAGE
REQUEST IS PENDING

UPLINKED DATA
PRIOR TO INSERTION

CRZ WIND AT AGN

TRU WIND/ALT

1L ---°/---/-----

2L ---°/---/-----

3L ---°/---/-----

4L ---°/---/-----

5L SAT/ALT

6L ---°/---/-----

<RETURN

WIND

REQUEST

PREV

PHASE>

NEXT

PHASE>

↑↓

UPLNK CRZ WIND AT AGN

TRU WIND/ALT

1L 260°/109/FL370

2L 258°/080/FL350

3L 265°/096/FL330

4L 245°/085/FL290

5L SAT/ALT

6L -45°/FL330

UPLINK

<CANCEL

PREV

PHASE>

NEXT

PHASE>

UPLINK

INSERT*

↑↓

1R

2R

3R

4R

5R

6R

A wind request sent during cruise phase will apply for downpath waypoints of the cruise, descent, approach and alternate phases.

- If the uplink message contains more data and waypoints than the flight plan, the winds at extra waypoints are not considered and automatically discarded. This is transparent to the flight crew
- Clearing the INSERT UPLINK* prompt deletes all uplink wind data of the cruise phase. Cruise page reverts to the previous data.

DESCENT WIND PAGE

The procedures to insert, review or delete descent winds during preflight, climb or cruise phase are described in the above wind general procedure.

DESCENT WIND PAGE
REQUEST IS PENDING

DESCENT WIND	
TRU WIND/ALT	ALTN WIND
1L --- /---/-----	1R --- /---
2L --- /---/-----	2R
3L --- /---/-----	3R WIND REQUEST
4L --- /---/-----	4R PREV
5L --- /---/-----	5R PHASE>
6L	6R

UPLINKED DATA
PRIOR TO INSERTION

DESCENT WIND	
TRU WIND/ALT	ALTN WIND
1L 060 /060/FL310	1R []/[]
2L 060 /050/FL200	2R FL 2 2 0
3L 060 /020/FL100	3R
4L 050 /010/FL050	4R PREV
5L 050 /008/GRND	5R PHASE>
6L UPLINK	6R UPLINK
←CANCEL	INSERT* ↑↓

If the alternate wind is not available, dashes are displayed in the field.

In descent, approach or go around phases, the flight crew cannot request or modify the descent winds of the active flight plan or secondary flight plan if it is a “COPY ACTIVE”.

Intentionally left blank

AUTOMATIC FMGC RESET AND RESYNCHRONIZATION

AUTOMATIC FMGC RESET AND RESYNCHRONIZATION - FM RESET

Ident.: DSC-22_20-40-10-A-00012661.0001001 / 04 NOV 20

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

FM RESET

When the FM software cannot work properly or receives instructions to perform impossible operations, it automatically resets itself. A resynchronization with the other FM always follows. When the reset is a minor one, the system will recover by itself. One single reset lasts 2 to 3 s maximum followed by 25 s of resynchronization.

When the reset is a major one:

- Resets recur at short intervals (several in 2 or 3 min)
- The memories are cleared, leading to the loss of F-PLN, GW, CI, CRZ FL, MCDU-entered speeds and NAVAIDs and to database switching.

CAUTION

If three dual FM resets occur in 2 min, pilot-entered data is lost. If a dual reset is identified, it is recommended that the flight crew does not perform again the last MCDU actions for 1 min (in order to avoid a potential second dual reset, leading to the loss of pilot-entered data).

Ident.: DSC-22_20-40-10-A-00012661.0003001 / 04 NOV 20

Applicable to: MSN 02926-02944, 04392, 07784-07792

FM RESET

When the FM software cannot work properly or receives instructions to perform impossible operations, it automatically resets itself. A resynchronization with the other FM always follows. When the reset is a minor one, the system will recover by itself. One single reset lasts 2 to 3 s maximum followed by a resynchronization.

When the reset is a major one:

- Resets recur at short intervals (several in 1 min)
- The memories are cleared, leading to the loss of F-PLN, GW, CI, CRZ FL, MCDU-entered speeds and NAVAIDs.

CAUTION

If four dual FM resets occur in 3 min, pilot-entered data is lost. If a dual reset is identified, it is recommended that the flight crew does not perform again the last MCDU actions for 1 min (in order to avoid a potential second dual reset, leading to the loss of pilot-entered data).

AUTOMATIC FMGC RESET AND RESYNCHRONIZATION - FM RESYNCHRONIZATION

Ident.: DSC-22_20-40-10-A-00012662.0001001 / 10 JAN 11

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

FM RESYNCHRONIZATION

An FM resynchronization automatically occurs after an FM reset but it may occur independently each time self comparisons between FM1 and FM2 reveal discrepancies.

One single resynchronization lasts approximately 25 s.

If 5 several resynchronizations occur within 5 min, independent mode commences.

Ident.: DSC-22_20-40-10-A-00012662.0002001 / 19 AUG 10

Applicable to: MSN 02926-02944, 04392, 07784-07792

FM RESYNCHRONIZATION

An FM resynchronization automatically occurs after an FM reset. But, it may occur independently each time self-comparisons between the FM1 and FM2 reveal discrepancies.

If three successive resynchronizations fail, independent mode commences.

AUTOMATIC FMGC RESET AND RESYNCHRONIZATION - FMGC STATUS DURING A RESET/RESYNCHRONIZATION

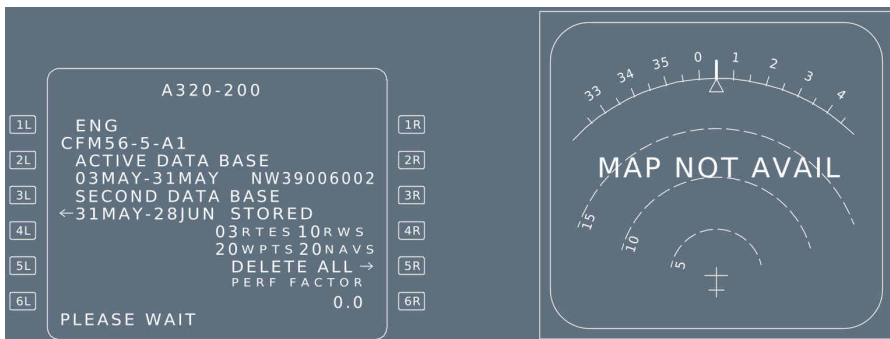
Ident.: DSC-22_20-40-10-A-00012663.0001001 / 14 NOV 24

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

FMGC STATUS DURING A RESET/RESYNCHRONIZATION

While a RESET/RESYNCH occurs:

- The ND shows **MAP NOT AVAIL**
- The MCDU reverts to the A/C STATUS page, with **PLEASE WAIT** displayed in the scratchpad
- Autotuning of NAVAIDs (VOR, DME, ADF ) are lost on the failed side
- AP and managed modes may be transiently lost (reversion to **HDG/V/S** or **TRK/FPA**)
- If the flight crew presses a key while the scratchpad is showing **PLEASE WAIT**, there is no change at MCDU level. This is normal, and the crew should not respond by pulling the MCDU circuit breaker.



Ident.: DSC-22_20-40-10-A-00012663.0002001 / 14 NOV 24

Applicable to: MSN 02926-02944, 04392, 07784-07792

FMGC STATUS DURING A RESET/RESYNCHRONIZATION

While a RESET/RESYNCH occurs:

- The ND shows **MAP NOT AVAIL**
- The MCDU may revert to the MENU page
- Autotuning of NAVAID (VOR, DME, ADF ) are lost on the failed side
- AP / FD / A/THR modes may be transiently lost
- A reversion to basic modes (**HDG / V/S** or **TRK / FPA**) occurs if the FM1 (FM2) resets while AP1 (AP2) is engaged.



AUTOMATIC FMGC RESET AND RESYNCHRONIZATION - SINGLE RESET OR DUAL RESET WITH AUTORECOVERY

Ident.: DSC-22_20-40-10-A-00012664.0002001 / 10 JAN 11

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

SINGLE RESET OR DUAL RESET WITH AUTORECOVERY

If the RESET/RESYNCH succeeds, all functions are recovered.

Note: When an FMGC is recovered, its FD if previously engaged, is also recovered and its status is displayed on the FMA.

PROCEDURE

RESELECT the convenient MCDU page.
REENGAGE managed modes and the AP.

WAIT 1 min after the "PLEASE-WAIT" message has disappeared, before engaging the AP/FD of the failed FMGC.

If both "MAP NOT AVAIL" and "SET OFFSIDE RNG/MODE" remain displayed on one ND, or if "OFFSIDE FM CONTROL" remains displayed, temporarily SELECT a different mode or range on the corresponding EIS control panel.

Ident.: DSC-22_20-40-10-A-00012664.0019001 / 10 JAN 11

Applicable to: MSN 02926-02944, 04392, 07784-07792

SINGLE RESET OR DUAL RESET WITH AUTORECOVERY

If the RESET/RESYNCH succeeds, all functions are recovered.

Note: When an FMGC is recovered, its FD if previously engaged, is also recovered and its status is displayed on the FMA.

PROCEDURE

RESELECT the convenient MCDU page.
REENGAGE managed modes, and the AP and A/THR, if necessary.

If both "MAP NOT AVAIL" and "SET OFFSIDE RNG/MODE" remain displayed on one ND, or if "OFFSIDE FM CONTROL" remains displayed, temporarily SELECT a different mode or range on the corresponding EIS control panel.

AUTOMATIC FMGC RESET AND RESYNCHRONIZATION - SINGLE LATCH

Ident.: DSC-22_20-40-10-A-00012665.0002001 / 16 NOV 11

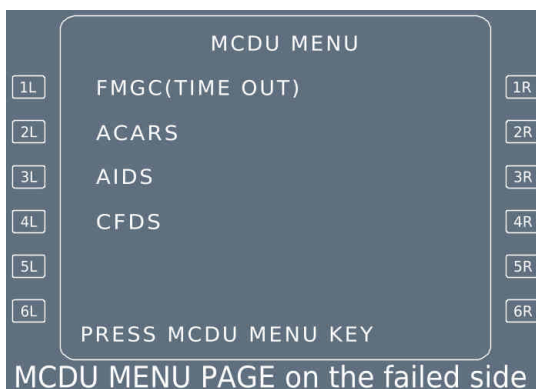
Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

SINGLE LATCH

If five successive resets occur, the failing FMGC will latch, and single mode operation will start.

While failed, the following occurs:

- On the ND usually associated with the failed FMGC:
 If the NDs are not both in the same mode or range, the associated ND displays “MAP NOT AVAILABLE” and “SET OFFSIDE RNG/MODE”. If the NDs are in the same mode and range, the associated ND displays the “OFFSIDE FM CONTROL” amber message
- The MCDU reverts to the MENU PAGE and shows an “FMGC TIME OUT” prompt
- If the AP and FD were previously engaged on the failed side, the AP and FD disengage and the right-hand column of the FMA shows that the operating FD is offside. The ECAM displays the “AP OFF” warning, and the master warning light and audio remind the pilot of the AP disengagement.
- All functions are restored on the operative side.



PROCEDURE

Select the same range and mode on both NDs to give the failed ND side something to display. Select any function key on the affected FMGC MCDU. (The page will display “OPP FMGC IN PROGRESS”).

Both MCDUs are now driven by the other FMGC, and only one AP/FD is available. The system works in SINGLE Mode.

Perform a manual reset of the failed FMGC, when convenient.

Ident.: DSC-22_20-40-10-A-00012665.0033001 / 10 JAN 11

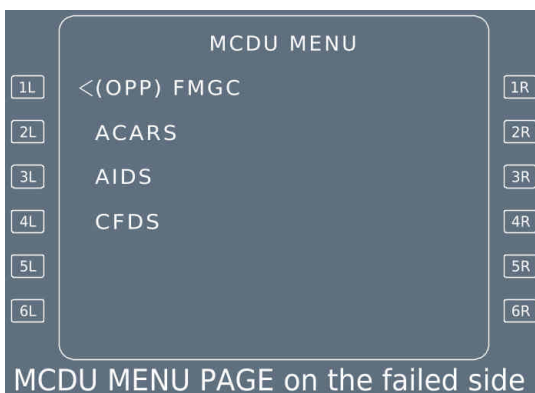
Applicable to: MSN 02926-02944, 04392, 07784-07792

SINGLE LATCH

If five successive resets occur in 4 min, the failing FMGC will latch, and single mode operation will start.

While failed, the following occurs:

- On the ND usually associated with the failed FMGC:
 If the NDs are not both in the same mode or range, the associated ND displays “MAP NOT AVAIL” and “SET OFFSIDE RNG/MODE”. If the NDs are in the same mode and range, the associated ND displays the “OFFSIDE FM CONTROL” amber message
- The MCDU reverts to the MENU PAGE and shows an “(OPP) FMGC” prompt
- If the AP and FD were previously engaged on the failed side, the AP and FD disengage and the right-hand column of the FMA shows that the operating FD is offside. The ECAM displays the “AP OFF” warning, and the master warning light and audio remind the pilot of the AP disengagement
- All functions are restored on the operative side.



PROCEDURE

Select the same range and mode on both NDs to give the failed ND side something to display. Select any function key on the affected FMGC MCDU. (The page will display “OPP FMGC IN PROCESS”).

Both MCDUs are now driven by the other FMGC, and only one AP/FD is available. The system works in SINGLE Mode.

Perform a manual reset of the failed FMGC, when convenient.

Ident.: DSC-22_20-40-10-A-00014936.0001001 / 21 MAR 17

Applicable to: MSN 02926-02944, 04392, 07784-07792

SINGLE LATCH WITH AP AND FD STILL AVAILABLE IN MANAGED MODES ON BOTH SIDES

In some cases, one FMS may fail and latch (no auto-recovery), but the FMS may continue to send valid but frozen guidance targets to the FG. These frozen guidance targets correspond to the last valid targets sent by the FMS before the failure.

In that case, the FG does not see the FMS failure.

Both AP and FD may remain available. If the AP is engaged on the affected side, the failed FMGC continues to guide the aircraft in managed mode (speed, vertical and lateral) with the frozen targets.

When the FMGC fails, the cockpit effects are as follows:

PFD

- There is no change on the FMA:
 - No mode reversion, no automatic AP disconnection, and no automatic A/THR disconnection
 - "1FD2" may remain displayed on both FMA
- The FD orders are erroneous on the side of the failed FMGC, since based on the frozen guidance targets
- The FD orders are still available and correct on the opposite side.

ND

The flight crew may encounter one of the following two situations:

- Situation 1: The ND associated to the failed FMGC displays "MAP NOT AVAIL" in red, and "GPS PRIMARY LOST"  in amber
- Situation 2: The ND associated to the failed FMGC displays either:
 - The map coming from the opposite FMS and "OFFSIDE FM CONTROL" in amber, if both NDs are in the same range and mode, or
 - "MAP NOT AVAIL" in red and "SET OFFSIDE RNG/MODE" in amber, if both NDs are not in the same range and mode.

MCDU

- The MCDU of the failed FMGC is frozen
- The other MCDU displays "INDEPENDENT OPERATION" in amber.

ECAM

- The FWS may trigger the ECAM alert "CAB PR LDG ELEV FAULT".

PROCEDURE

DISREGARD the information coming from the failed side

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

ABNORMAL OPERATIONS - FMGC RESET

DO NOT USE the AP on the affected side

- **If the AP is engaged on the affected side:**

FLY the aircraft back on the intended path

ENGAGE the AP on the operative side, according to the Recommended Practice for Autopilot Engagement (*Refer to FCTM/AS-FG-10-1 Recommended Practice for Autopilot (AP) Engagement*)

- **If time permits:**

PERFORM a long reset of the failed FMGC

- **If the failure affects FMGC1, and if the FMGC1 is still failed and latched before the approach:**

DO NOT USE AP1 for the approach

- **Before disconnecting AP2:**

REVERT to selected speed

DISCONNECT A/THR

Note: It prevents the A/THR from switching to the frozen speed target of the failed FMGC1 when the flight crew disconnects the AP2 for landing.

AUTOMATIC FMGC RESET AND RESYNCHRONIZATION - DUAL RESET WITH LOSS OF DATA AND AUTORECOVERY

Ident.: DSC-22_20-40-10-A-00012666.0088001 / 13 MAY 25

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

DUAL RESET WITH LOSS OF DATA AND AUTORECOVERY

Three successive dual resets without result erases all flight crew-entered data (F-PLN, ZFW, CRZ FL, CI, etc.).

When FMGS recovery is obtained:

- Database cycle may have switched
- The FM position bias is lost. The FM position returns to the MIX IRS position.
- Autotuning the VOR/DME is restored, based on the aircraft's IRS position
- FMGS tuning of the ILS/GLS  /MLS  and ADF  is not possible
- Lateral and vertical managed mode cannot reengage
- The **CAB PR LDG ELEV FAULT** alert is triggered
- A map display may be lost on one ND.

PROCEDURE

When the system recovers:

If the FMGC remains in Takeoff phase, CHANGE the vertical mode in order to recover the next flight phase.

SELECT the initial database.

SELECT DIR TO the required downpath waypoint.

SELECT LAT REV at the downpath waypoint, and REDEFINE the DESTINATION.

SELECT the FUEL PRED page, and ENTER the ZFW and ZFWCG values.

SELECT the PROG page, and ENTER the CRZ FL.

SELECT the PERF page, and ENTER the CI.

CHECK or REENGAGE (as appropriate) the relevant speed/Mach target and vertical mode.

L2 *Redefine the flight plan for the remainder of the flight.*

L1 If both **MAP NOT AVAILABLE** and **SET OFFSIDE RNG/MODE** remain displayed on one ND, or if **OFFSIDE FM CONTROL** remains displayed, temporarily SELECT a different mode or range on the corresponding EFIS control panel.

PERFORM a NAV accuracy check, when possible.

L2 *The flight crew should consider a manual FM position update, if MIX IRS and actual positions differ by more than 20 NM.*

Ident.: DSC-22_20-40-10-A-00012666.0059001 / 14 NOV 24

Applicable to: MSN 02926-02944, 04392, 07784-07792

DUAL RESET WITH LOSS OF DATA AND AUTORECOVERY

Four successive dual resets in 3 min erases all flight crew-entered data (F-PLN, GW, CRZ FL, CI, etc.).

When FMGS recovery is obtained:

- The FM position bias is lost. The FM position returns to the MIX IRS position.
- Autotuning the VOR/DME is restored, based on the aircraft's IRS position
- FMGS tuning of the ILS and ADF  is not possible
- Lateral and vertical managed mode cannot reengage
- The **CAB PR LDG ELEV FAULT** alert is triggered
- A map display may be lost on one ND.

PROCEDURE

When the system recovers:

If the FMGC remains in Takeoff phase, CHANGE the vertical mode in order to recover the next flight phase.

SELECT DIR TO the required downpath waypoint.

SELECT LAT REV at the downpath waypoint and redefine the DESTINATION.

SELECT the FUEL PRED page, and ENTER the ZFW and ZFWCG values.

SELECT the PROG page, and enter CRZ FL.

SELECT the PERF page, and enter CI.

AIRCRAFT SYSTEMS**AUTO FLIGHT - FLIGHT MANAGEMENT****ABNORMAL OPERATIONS - FMGC RESET**

CHECK or REENGAGE (as appropriate) the relevant speed/Mach target and vertical mode.

L2 *Redefine the flight plan for the remainder of the flight.*

L1 If both **MAP NOT AVAIL** and **SET OFFSIDE RNG/MODE** remain displayed on one ND, or if **OFFSIDE FM CONTROL** remains displayed, temporarily SELECT a different mode or range on the corresponding EFIS control panel.

PERFORM a NAV accuracy check, when possible.

L2 *The flight crew should consider a manual FM position update, if MIX IRS and actual positions differ by more than 20 NM.*

Ident.: DSC-22_20-40-10-A-00012667.0001001 / 10 JAN 11

Applicable to: MSN 02926-02944, 04392, 07784-07792

FMS DEGRADED MODE

In some remote cases (several automatic resets in a row on one or both FMS), the affected FMS(s) may enter a “degraded mode”, with no predictions.

The intent of this degraded mode is to keep maximum use of the FMS and related functions.

The characteristics of this FMS degraded mode are the following:

- The predictions are lost on the affected FMS(s). All predictions are replaced by dashes on MCDU pages
- The vertical profile and managed speed computations are lost on the affected FM(s) (in Approach phase, VAPP is correctly computed and managed speed is available)
- Managed vertical guidance and managed speed (if previously used) are lost and revert to selected mode
- Lateral path computation and guidance remain available
- The MCDU displays the “FM PREDICTIONS LOST” message.

Note: 1. *If predictions are lost on one FMS only, all managed modes are available when using the other side AP.*

2. *The Approach phase must be activated manually.*

PROCEDURE**● If the message “FM PREDICTIONS LOST” is displayed:**

- If vertical managed guidance and/or prediction are not deemed necessary, keep using the FMS as needed for Lateral navigation only. Use selected modes for vertical and speed guidance.

Note: If only one FMS has entered the degraded mode, consider using the other AP.

- If vertical managed guidance and/or predictions are required, RE-ENTER a Cost Index (CI) value on INIT A or PERF page (predictions for the active flight plan are then recomputed).

Note: In approach phase, a direct CI entry is not allowed : it is then not possible to recover predictions. However, entry of the current altitude in the CRZ FL field will force the CRZ phase and thus, allow to reenter the CI. The approach phase may then be re-activated again.

AUTOMATIC FMGC RESET AND RESYNCHRONIZATION - DUAL LATCH

Ident.: DSC-22_20-40-10-A-00012668.0001001 / 17 MAR 17

Applicable to: MSN 02155-03060

DUAL LATCH

- Both FMGCs are inoperative. FM and FG capability are lost
- Both NDs display “MAP NOT AVAILABLE”. NAVAID tuning is not performed
- AP/FD, A/THR are lost
- FMGC (TIME OUT) subsystem page is displayed on both MCDUs
- The following messages are displayed on the ECAM:
 - “CAB PR LDG ELEV FAULT”
 - “AUTO FLT AP OFF”, if AP was engaged
 - “AUTO FLT A/THR OFF”, if A/THR was engaged.

PROCEDURE

FLY raw data.

TUNE necessary NAVAIDs using the RMPs.

PERFORM a manual reset of both FMGCs.

Note: A recovery will result in the loss of all pilot-entered data.

Note for all FMGC automatic resets

- A single or double FM auto-reset does not affect an ILS approach below 700 ft AGL. ILS frequency is locked and AP/FDs remain engaged
- Above 700 ft, the loss of ILS tuning due to a dual reset will cause a loss of LOC and G/S, and the disengagement of APs and FDs
- During a non ILS approach, if the master FMGC fails, AP/FD and managed modes are lost and FDs engage in basic modes.

Ident.: DSC-22_20-40-10-A-00012668.0013001 / 17 MAR 17

Applicable to: MSN 04392-07792

DUAL LATCH

- Both FMGCs are inoperative. FM and FG capability are lost
- Both NDs display "MAP NOT AVAILABLE". NAVAID tuning is not performed
- AP/FD, A/THR are lost
- FMGC (TIME OUT) subsystem page is displayed on both MCDUs
- The following messages are displayed on the ECAM:
 - "CAB PR LDG ELEV FAULT"
 - "AUTO FLT AP OFF", if AP was engaged
 - "AUTO FLT A/THR OFF", if A/THR was engaged.

PROCEDURE

FLY raw data.

TUNE necessary NAVAIDs using the RMPs.

PERFORM a manual reset of both FMGCs.

■ If successful, refer to dual reset with loss of data and auto recovery:*Note: A recovery will result in the loss of all pilot-entered data.***■ If unsuccessful:**

FLY raw data.

Select the NAV B/UP prompt on both MCDU DATA pages.

(Refer to DSC-22_20-40-30 General HOW TO USE, concerning navigation backup operation).

SET the landing elevation of the destination on the overhead panel.

Note for all FMGC automatic resets

- A single or double FM auto-reset does not affect an ILS approach below 700 ft AGL. ILS frequency is locked and AP/FDs remain engaged
- Above 700 ft, the loss of ILS tuning due to a dual reset will cause a loss of LOC and G/S, and the disengagement of APs and FDs
- During a non ILS approach, if the master FMGC fails, AP/FD and managed modes are lost and FDs engage in basic modes.

MANUAL FMGC RESET**MANUAL FMGC RESET - GENERAL**

Ident.: DSC-22_20-40-10-B-00012669.0001001 / 10 JAN 11

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

On rare occasions, the FMGC may require manual resetting.
If this occurs in flight, reset one FMGC at a time.

Ident.: DSC-22_20-40-10-B-00012669.0002001 / 01 APR 14

Applicable to: MSN 02926-02944, 04392, 07784-07792

On rare occasions, the FMGC may require manual resetting.
If this occurs in flight, reset one FMGC at a time.

The flight crew can perform two types of FMGC reset:

- A short FMGC reset of 10 s
The FMS re-initializes data processing. However the data entered by the flight crew are memorized (F-PLN, INIT and PERF data)
- A long FMGC reset of 15 min
All the memory is cleared and the FMS re-initializes all data and processing.

Ident.: DSC-22_20-40-10-B-00020857.0001001 / 12 NOV 24

Applicable to: ALL

Refer to QRH/System Reset Procedure - AUTO FLT for the manual reset procedure of the FMGC.

Ident.: DSC-22_20-40-10-B-00012671.0001001 / 13 MAY 25

Applicable to: ALL**MANUAL RESET OF BOTH FMGC**

When the aircraft is on ground with the engines stopped, the flight crew may attempt a double and simultaneous C/B reset when a single C/B reset has failed.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

ABNORMAL OPERATIONS - FMGC RESET

Intentionally left blank

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT ABNORMAL OPERATIONS - "CHECK GW" OR "CHECK WEIGHT" MESSAGE
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"CHECK WEIGHT" MESSAGE

Ident.: DSC-22_20-40-20-00012677.0001001 / 04 JUN 19
Applicable to: ALL

DESCRIPTION

The “CHECK WEIGHT” message appears on the MCDU when the Gross Weight (GW) computed by the FMGC and the GW computed by the FAC disagree by more than 7 t (15 432 lb).

PROCEDURE

When this message appears:

FMS FOB.....CHECK
CALL UP the MCDU FUEL PRED page and compare the FOB to the FOB from the Computerized F-PLN. Correct it if necessary.

FMS ZFW value..... CHECK
CALL UP the MCDU FUEL PRED page and compare the ZFW to the ZFW on the loadsheet.

- If the FMS ZFW on the MCDU is not correct**
FMS ZFW..... CORRECT/RE-INSERT
The entry of a correct ZFW will clear the MCDU message.
- If the FMS ZFW on the MCDU is correct**
VLS, F, S, GREEN DOT (PFD)..... DISREGARD
If the FMS GW is correct, the characteristic speeds computed by the FAC (displayed on PFD) may not be correct.
QRH OPERATING SPEEDS..... USE
Refer to QRH/OPS Operating Speeds

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

ABNORMAL OPERATIONS - "CHECK
GW" OR "CHECK WEIGHT" MESSAGE

Intentionally left blank

GENERAL

Ident.: DSC-22_20-40-30-00012906.0011001 / 24 FEB 14

Applicable to: MSN 04392-07792

The MCDU NAV B/UP allows to link a MCDU to its associated IRS in order to allow the flight crew to monitor the navigation and to be provided with some basic flight planning functions in case of FM 1 + 2 failure.

CAUTION

The MCDU NAV B/UP is to be used only in case of FM 1 + 2 failure. It can be selected temporarily in case of FM1 or 2 only failure, in order to ensure that the function is available on the failed side.

When in MCDU NAV B/UP on both sides, one FG at least must be available to engage AP and A/THR.

The MCDU NAV B/UP function provides:

- Aircraft position using inside IRS or IRS 3
- Aircraft position using GPIRS  position
- F-PLN as memorized in the MCDU
- F-PLN display on ND
- F-PLN automatic sequencing
- Limited lateral revisions
- Mag (True) bearing depending on the pilot selection, from aircraft position to the TO WPT and associated distance
- True track between waypoints
- Time estimates computed with current GS from inside IRS
- Total time and distance to destination

The following features are not provided:

- No DATA BASE available:
 - No autotuning, NAVAIDS must be selected on RMP
 - No radio position
 - No EFIS CTL PANEL options
 - No LDG ELEV (must be manually selected on overhead panel).
- No performance data:
 - No CLB/DES/APP NAV/FINAL modes
 - No SPEED MANAGED
 - No automatic SPD/MACH change over.
- Most of predictions are lost:
 - No EFOB
 - No XTRA
 - No ETA at DEST.
- No multiple lateral F-PLN

AIRCRAFT SYSTEMS**AUTO FLIGHT - FLIGHT MANAGEMENT****ABNORMAL OPERATIONS - MCDU BACK UP NAVIGATION**

- No AP/FD managed modes
- No crosstalk between MCDUs: F-PLN revisions have to be achieved on both MCDUs.

BACK UP NAV SELECTION**Applicable to: MSN 04392-07792**

Ident.: DSC-22_20-40-30-A-00012907.0011001 / 16 FEB 11

FM F-PLN DOWNLOAD IN MCDU

While BACK UP NAV is not active, the FM downloads permanently a condensed form of the F-PLN in the MCDU.

Downloaded information include:

- Waypoint position
- Waypoint identifier
- Leg type
- Discontinuity
- Overfly
- Turn direction.

Heading legs, course to fix legs, ..., computed INTCPT positions, pseudo waypoints, ..., cannot be downloaded.

They are replaced by discontinuities.

Maximum of 150 waypoints are downloaded.

Ident.: DSC-22_20-40-30-A-00012908.0011001 / 14 MAY 12

EXAMPLE OF DOWNLOADED F-PLN

F-PLN before FM failure	1L	FROM	A1101 →		1R
		BIGAR	UTC	SPD/ALT	
	2L	BIG	117	/ 4888	2R
		C335°		9NM	
	3L	BIG09Δ	116	250 / *2700	3R
			TRK275°	1	
	4L	(DECEL)	117	/ 2500	4R
		C275°		6	
	5L	AMB	118	*2500	5R
		C275°		4 3.0°	
	6L	OM27R	120	*136 / *1310	6R
		DEST	TIME	DIST	EFOB
		EGLL27R	121	518	36.9
				↑↓	

Download B/UP F-PLN -CF legs are preceded by a discontinuity -PSEUDO WPT are not downloaded	1L	B/UP FPLN			1R
		FROM	TTG	DIST	
	2L	BIG	5119.8N/00002.2E		2R
		--F-PLN DISCONTINUITY--			
	3L	BIG09Δ	5127.0N/00004.6W		3R
		--F-PLN DISCONTINUITY--			
	4L	AMB	5128.6N/00014.1W		4R
		DEST	TTG	DIST	
	5L	EGLL27R	---	518NM	5R
				↑↓	

In that procedure, all the legs are coded as CF (Course to Fix) legs. This explains all the discontinuities resulting in the B/UP F-PLN.

These discontinuities may be cleared.

When the second FM fails

REENGAGE and SELECT the required AP and A/THR modes (if disconnected).

SELECT the NAV B/UP prompt on both MCDU.

SELECT NAV on both RMP

Tune the required navaids

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

ABNORMAL OPERATIONS - MCDU BACK UP NAVIGATION

B/UP F-PLN PAGE

MCDU MENU

SELECT
NAV B/UP>

1L	<FM1	1R
2L	<ACARS	2R
3L	<ACMS	3R
4L	<CMS	4R
5L		5R
6L	RETURN>	6R

B/UP F-PLN PAGE

B/UP FPLN

FROM	TTG	DIST	
TOU	4340.8N/00118.7E		1R
350°	0004	22NM	
AGN	4353.3N/00052.4E		2R
348°	0045	116NM	
LMG	4549.0N/00101.6E		3R
321° T	0045	97NM	
AMBA	4725.1N/00102.5E		4R
322° T	0053	40NM	
N48E001	4803.5N/00123.3E		5R
DEST	0126	443NM	
LFPO	4843.4N/00222.9E		6R
	↑↓		

B/UP PROG PAGE

1L 2L 3L 4L 5L 6L

B/UP PROG

OVHD ALT
 CYN . 24300
 BRG / DIST / TTG [TO
 ---° / --- / ---

IRS1 BASED POS GS
 4340.6N/00017.7E 310
 DTRK TRK
 346° 342°

<IRS GPS>

1R 2R 3R 4R 5R 6R

B/UP IRS PAGE

1L 2L 3L 4L 5L 6L

B/UP IRS1

POSITION
 43°40.4N/000°17.6E
 TTRK GS
 342.3 310
 THDG MHDG
 342.3 329.8
 WIND
 225°/216

<RETURN NEXT IRS>

1R 2R 3R 4R 5R 6R

- Only MCDU MENU
 - F-PLN key
 - PROG key
 - DIR key
- B/UP F-PLN page
 - B/UP PROG page
 - B/UP IRS 1, 2, 3 pages are available when BACK UP NAV is selected.
- B/U GPS (if GPS  is installed).

BACK UP NAV OPERATION

Ident.: DSC-22_20-40-30-B-00012909.0011001 / 16 FEB 11

Applicable to: MSN 04392-07792

AP AND A/THR

One FG at least must be available to allow the engagement of AP/FD and A/THR. All FM managed modes are lost as well as managed speed.

As a consequence:

- LAT F-PLN is flown in HDG/TRK modes
- VERT F-PLN is flown in OPEN/V/S/FPA modes
- SPD TARGET is manually SELECTED on the FCU
- SPD/MACH crossover is manually SELECTED on the FCU.

It is recommended to use the TRK/FPA modes:

SELECT the required TRK on FCU at waypoint sequencing (as no AP/FD coupling exists in NAV B/UP). F-PLN sequencing is automatic.

MONITOR the track of the next leg prior reaching the TO waypoint (track between TO and next waypoints is true track).

ADJUST the track to follow the F-PLN with X-TRK = 0

USE OP DES or FPA to descend as suitable.

FPA allows easy altitudes predictions:

$$DNM = \Delta(FL)/FPA^\circ$$

Ident.: DSC-22_20-40-30-B-00012910.0011001 / 16 FEB 11

Applicable to: MSN 04392-07792

NAVIGATION MONITORING

The navigation accuracy check must be achieved periodically using the same principle as with FM navigation:

COMPARE computed data with raw data

SELECT ON RMP the applicable navaid

PRESS the [PROG] key

B/UP PROG page is displayed

WRITE in the scratchpad then ENTER the navaid LAT/LONG

SELECT associated navaid needle on the EFIS control panel.

COMPARE computed BRG/DIST with RAW DATA on ND

- If the crosscheck is POSITIVE the ND may be used in ROSE NAV/MAP modes with raw data
- If the crosscheck is NEGATIVE the ND must be used in ROSE VOR/ROSE ILS modes.

Note: B/UP IRS  and B/UP GPS  pages may also be used to check the position.

Ident.: DSC-22_20-40-30-B-00012911.0011001 / 16 FEB 11

Applicable to: MSN 04392-07792

FLIGHT PLANNING

The following revisions may be achieved:

- WPT insertion/deletion
- OVERFLY insertion/deletion

- DIR TO a waypoint
- CLR waypoints/discontinuities.

Waypoint identifiers are either published waypoint identifiers if present in the MCDU active F-PLN, or coded LAT/LONG identifiers resulting from flight crew entries.

All flight planning functions are directly applied on active F-PLN without LAT REV page.

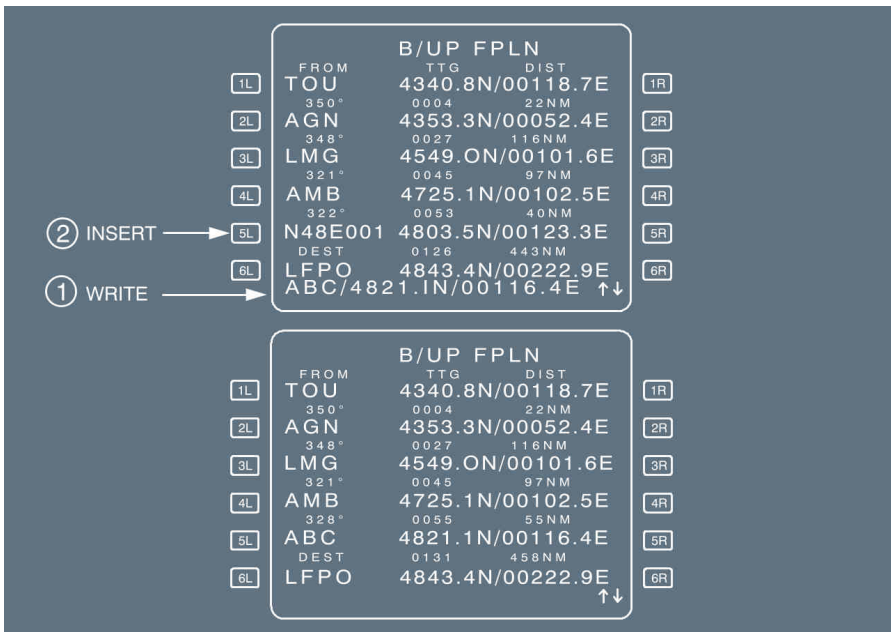
Ident.: DSC-22_20-40-30-B-00012912.0011001 / 23 JUN 15

Applicable to: MSN 04392-07792

WAYPOINT INSERTION

Waypoint insertion into the F-PLN is performed via the B/UP F-PLN page by selecting the line key adjacent to the desired point of insertion, whenever a pre-existing waypoint identifier or valid IDENT/LAT/LONG or LAT/LONG entry is displayed in the scratchpad.

Any waypoint entry which causes the number of legs in the route to exceed the maximum allowed results in the "F-PLN FULL" message.



B/UP FPLN

FROM	TTG	DIST
TOU 350°	4340.8N/00118.7E	0004 22 NM
AGN 348°	4353.3N/00052.4E	0027 116 NM
LMG 321°	4549.0N/00101.6E	0045 97 NM
AMB 322°	4725.1N/00102.5E	0053 40 NM
N48E001	4803.5N/00123.3E	0126 443 NM
DEST LFPO	4843.4N/00222.9E	

② INSERT → ⑤L

① WRITE → ⑥L

B/UP FPLN

FROM	TTG	DIST
TOU 350°	4340.8N/00118.7E	0004 22 NM
AGN 348°	4353.3N/00052.4E	0027 116 NM
LMG 321°	4549.0N/00101.6E	0045 97 NM
AMB 328°	4725.1N/00102.5E	0055 55 NM
ABC	4821.1N/00116.4E	0131 458 NM
DEST LFPO	4843.4N/00222.9E	

- Note:
- If the inserted waypoint is entered only with LAT/LONG, its identifier would be : N48E001
 - If the flight crew writes a waypoint IDENT/LAT/LONG with an IDENT already used in the F-PLN, a message "NOT ALLOWED" is displayed.

Ident.: DSC-22_20-40-30-B-00012913.0011001 / 16 FEB 11

Applicable to: MSN 04392-07792

WAYPOINT DELETION

Waypoint and discontinuity may be deleted from the B/UP F-PLN page by using the CLR key.

Ident.: DSC-22_20-40-30-B-00012914.0011001 / 16 FEB 11

Applicable to: MSN 04392-07792

OVERFLY INSERTION/DELETION

Same as for the FM F-PLN.

BACK UP NAV OPERATION - DIRECT TO A WAYPOINT

Ident.: DSC-22_20-40-30-B-00012915.0006001 / 23 JUN 15

Applicable to: MSN 04392, 07784-07792

DIRECT TO A WAYPOINT

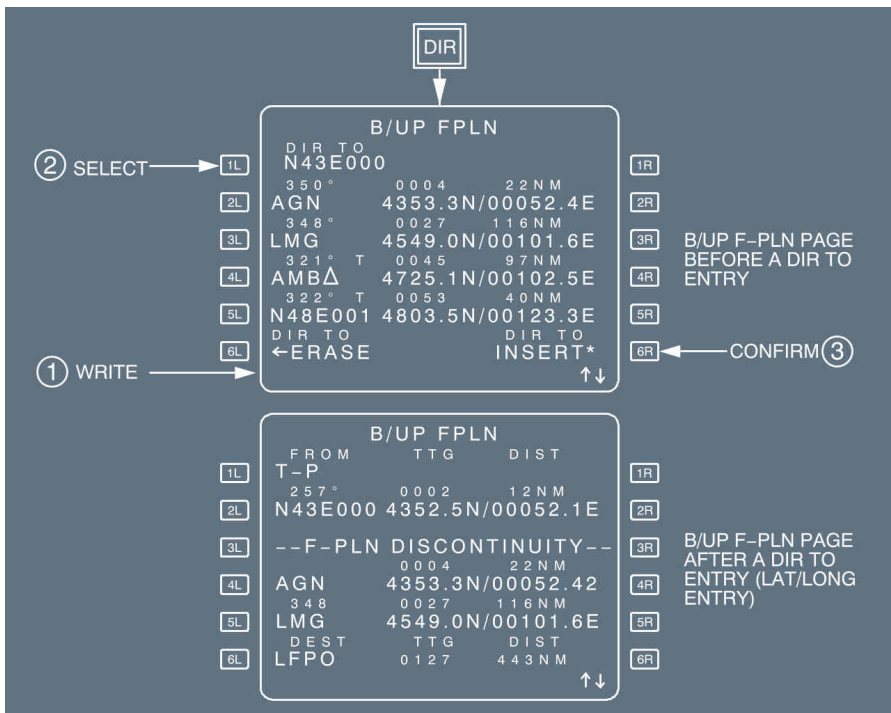
The DIR TO function operates as for the normal F-PLN, except that RADIAL INTERCEPT and ABEAM functions are not available.

PRESS the DIR key, then SELECT the downpath waypoint

WRITE LAT/LONG (or IDENT/LAT/LONG) on the scratchpad then INSERT in [1L].

Confirm the DIR TO [6R].

SELECT the correct track on the FCU in order for the aircraft to turn toward the new TO waypoint.



In this example, the entered DIR TO waypoint is a LAT/LONG waypoint.

Due to the fact that this new waypoint is not identical to any waypoint in the F-PLN, a direct leg to that waypoint is created and followed by a discontinuity.

When the DIR TO function is completed, the B/UP F-PLN page is displayed with the DIR TO waypoint as the TO waypoint and the T-P waypoint as the FROM waypoint.

If a DIR TO function is achieved for a waypoint that belongs to the B/UP F-PLN, no F-PLN discontinuity is created.

Note: - In case of a DIR TO waypoint associated with an OVERFLY condition, the OVERFLY is kept.

Ident.: DSC-22_20-40-30-B-00012915.0011001 / 23 JUN 15

Applicable to: MSN 05152-05746

DIRECT TO A WAYPOINT

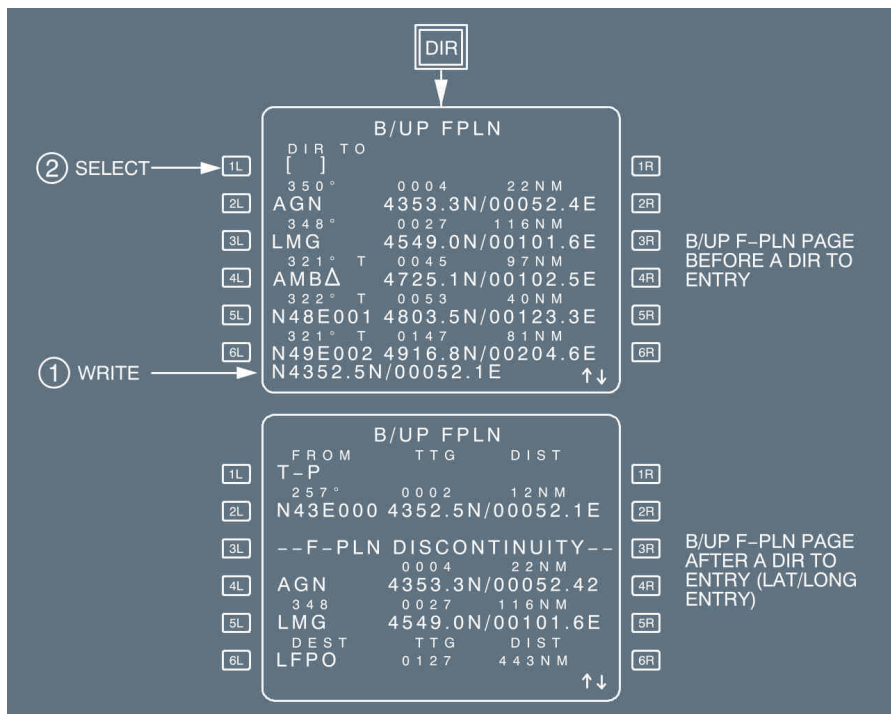
The DIR TO function operates as for the normal F-PLN, except that RADIAL INTERCEPT and ABEAM functions are not available.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT
ABNORMAL OPERATIONS - MCDU BACK UP NAVIGATION

PRESS the DIR key.

WRITE LAT/LONG (or IDENT/LAT/LONG) on the scratchpad then INSERT in [1L].

SELECT the correct track on the FCU in order for the aircraft to turn toward the new TO waypoint.



In this example, the entered DIR TO waypoint is a LAT/LONG waypoint.

Due to the fact that this new waypoint is not identical to any waypoint in the F-PLN, a direct leg to that waypoint is created and followed by a discontinuity.

When the DIR TO function is completed, the B/UP F-PLN page is displayed with the DIR TO waypoint as the TO waypoint and the T-P waypoint as the FROM waypoint.

If a DIR TO function is achieved for a waypoint that belongs to the B/UP F-PLN, no F-PLN discontinuity is created.

Note: - In case of a DIR TO waypoint associated with an OVERFLY condition, the OVERFLY is kept.

Ident.: DSC-22_20-40-30-B-00012916.0011001 / 14 MAY 12
 Applicable to: MSN 04392-07792

② ENTER →

① CLR KEY →

B/UP FPLN

FROM	TTG	DIST
TOU	4340.8N/00118.7E	
3 5 0 °	0 0 0 4	2 2 NM
AGN	4353.3N/00052.4E	
3 4 8 ° T	0 0 2 7	1 1 6 NM
LMG	4549.ON/00101.6E	
3 2 1 ° T	0 0 4 5	9 7 NM
AMBA	4725.1N/00102.5E	
3 2 2 ° T	0 0 5 3	4 0 NM
N48E001	4803.5N/00123.3E	
DEST	0 1 2 6	4 4 3 NM
LFPO	4843.4N/00222.9E	
CLR		↑↓

1R

2R

3R

4R

5R

6R

B/UP F-PLN PAGE

1L

2L

3L

4L

5L

6L

B/UP FPLN

FROM	TTG	DIST
TOU	4340.8N/00118.7E	
3 5 0 °	0 0 0 4	2 2 NM
AGN	4353.3N/00052.4E	
---F-PLN DISCONTINUITY---		
AMBA	4725.1N/00102.5E	
3 2 2 ° T	0 0 5 3	4 0 NM
N48E001	4803.5N/00123.3E	
DEST	0 1 2 6	4 4 3 NM
LFPO	4843.4N/00222.9E	
		↑↓

1R

2R

3R

4R

5R

6R

B/UP F-PLN PAGE

Ident.: DSC-22_20-40-30-B-00012917.0011001 / 23 DEC 14
 Applicable to: MSN 04392-07792

APPROACHES

- ND display selection rule

As per normal operation, it depends upon the result of NAV ACCY CROSS CHECK.

Furthermore it depends also whether the F-PLN is complete, including the approach.

F-PLN	NAV ACCY CHECK	ND	
		PF	PM

Continued on the following page

Continued from the previous page

Complete with appropriate approach	Positive	ARC or ROSE NAV Ref navaid Raw data	
	Negative	ROSE VOR/ILS	ARC or ROSE NAV or ROSE VOR/ILS Ref Navaid Raw Data
Incomplete	Positive or Negative	ROSE VOR/ILS	

Ident.: DSC-22_20-40-30-B-00012918.0011001 / 16 FEB 11

Applicable to: MSN 04392-07792

END OF DESCENT

ADJUST manually the landing elevation on the overhead panel.

SET the MDA on the standby altimeter.

Ident.: DSC-22_20-40-30-B-00012919.0011001 / 23 JUN 15

Applicable to: MSN 04392-07792

NON ILS APPROACHES

SELECT on RMP the approach reference nav aids.

The autopilot and flight director available modes are TRK-FPA and HDG/VS
The autothrust available speed target is selected speed.

Ident.: DSC-22_20-40-30-B-00012920.0011001 / 06 NOV 23

Applicable to: MSN 04392-07792

ILS APPROACHES

Only CAT I approaches may be flown since the DH indication is not available.

CHECK the ILS frequency and course on the RMP.

PUSH the LS pb on the EFIS control panel.

L2 *The autopilot and flight director available modes are APP (LOC – G/S – LAND).*
The autothrust available speed target is selected speed.
L1 *CHECK VAPP in EFB.*

ERRONEOUS PREDICTIONS

Ident.: DSC-22_20-40-50-00012672.0001001 / 28 MAY 20

Applicable to: ALL

DESCRIPTION

The FMGS may display temporary erroneous predictions that can affect such data as ECON speed/Mach, optimum flight level, fuel or time predictions.

OPERATIONAL RECOMMENDATION

The flight crew should not perform a reset of the FMS.

FOR MISSING PREDICTIONS OR OBVIOUS ERRONEOUS PREDICTIONS

To recover the FMS predictions:

1. On the WIND page, the flight crew should verify for each flight level:

- The temperature value for each cruise waypoint
- The wind data for each cruise waypoint.

If some temperature or wind data are erroneous or missing the flight crew should:

- Update data
- Check if correct predictions are recovered.

2. In the legs of the Flight Plan, the flight crew should verify:

- If there is one Flight Plan leg with erroneous predicted distance, or erroneous predicted time or erroneous predicted fuel consumption, and
- If one Flight Plan leg with erroneous predictions exists, then the flight crew should:
 - Insert an intermediate waypoint
 - Check if correct predictions are recovered.

3. In the arrival procedure of the Flight Plan, the flight crew should verify:

- If there are two successive waypoints separated by a distance of 3 NM or less, and
- If one of these two waypoints contains an AT OR BELOW altitude constraint the flight crew should:
 - Insert the same altitude constraint to the lowest waypoint
 - Check if correct predictions are recovered.

FOR SUSPECTED ERRONEOUS PREDICTIONS OR TO FORCE A F-PLN RE-COMPUTATION

If the flight crew suspects that the FMS predictions are erroneous (slow computations, slightly erroneous values, etc.) and if the previous actions remain not successful, in order to recover the FMS predictions, the flight crew should:

- Copy of the ACTIVE F-PLN into a SEC F-PLN
- Remove the STAR procedure of the ACTIVE F-PLN

Note: *The STAR usually contains a lot of constraints which may disturb FMS predictions computations.*

- Insert again the STAR in the ACTIVE F-PLN, later during the flight.

SPURIOUS ENGINE OUT INDICATION

Ident.: DSC-22_20-40-50-00012673.0001001 / 17 MAR 17

Applicable to: ALL

PROCEDURE

If a spurious engine-out is detected:

PRESS the EO CLR prompt of the MCDU PERF page

RE-ENGAGE previous vertical mode

RE-ENTER preselected speeds (if any). No other consequences are to be expected.

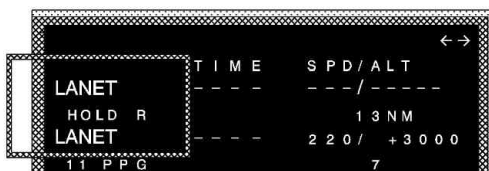
INCORRECT MANAGEMENT OF SPD CSTR FOR ARRIVAL PROCEDURE HOLDS

Ident.: DSC-22_20-100-20-00013647.0001001 / 16 MAR 11

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

A procedure Holding Pattern (HOLD) is part of a navigation database procedure. The flight crew cannot manually insert it in the flight plan.

The aircraft flies the HOLD one time, and exits it automatically at the HOLD fix.



Procedure HOLD on the F-PLN MCDU page

The FMS computes procedure HOLDS based on the predicted speed of the aircraft at the pattern entry. For an arrival procedure HOLD, the FMS-predicted speed takes into account:

- The ICAO-fixed speed limit for the hold,
- Any speed constraint coded at the hold entry fix.

Some operators reported the following misbehaviour : if charts indicate a speed constraint for a procedure HOLD, the FMS erroneously applies this speed constraint only at the exit fix, instead of the entry fix. As a consequence, the FMS-predicted HOLD speed does not take the speed constraint into account.

As a result, the FMS may compute the HOLD based on a speed that is higher than required. In such a case, the HOLD will have a size larger than expected.

Note: If the flight crew reverts to selected speed to reduce the speed at the HOLD entry, the FMS will not re-compute the size of the HOLD.

OPERATIONAL RECOMMENDATION

During descent preparation :

- Use the charts to CHECK if the arrival procedure includes a HOLD that has a speed constraint.
- If the arrival procedure includes a HOLD that has a speed constraint : ENTER MANUALLY the speed constraint at the hold entry fix.

AIRCRAFT SYSTEMS**AUTO FLIGHT - FLIGHT MANAGEMENT**TEMPORARY ABNORMAL BEHAVIORS - FMS2
HONEYWELL TEMPORARY ABNORMAL BEHAVIORS**MISALIGNMENT OF FMS F-PLN LEGS FOR ILS APPROACHES**

Ident.: DSC-22_20-100-20-00013652.0001001 / 23 JUN 15

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

For the F-PLN legs belonging to an ILS approach, the FMS incorrectly uses its own Magnetic Variation table instead of the Magnetic Variation of the ILS associated to the approach (coded in the Navigation Data Base). This misbehaviour occurs when the Navaid used for the ILS approach is a DME.

In some cases, it may happen that magnetic variation of the airport differs by a few degrees from the ILS navaid. Thus, the FMS F-PLN does not match with the actual beam of the ILS beam.

When the ILS approach is coded with successive legs, these legs may also appear as not matching with intermediate approach waypoint.

For all approaches affected by this behaviour, the FMS will display an incorrect trajectory on ND for the LS approach. The guidance would also be wrong if the approach legs are flown in NAV instead of LOC mode.

INCORRECT MANAGEMENT OF ETA ENTRY ON PREDICTIVE GPS PAGE

Ident.: DSC-22_20-100-20-00013652.0001001 / 22 MAY 12

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

During pre-flight, when a destination airport exists but the FMS does not compute predictions, amber boxes are displayed in the MCDU field ETA of the predictive GPS page. When the flight crew manually enters an ETA, the value should be displayed in large cyan font.

With the current H2 standard, the FMS does not take into account the manual entry of an ETA (field 1R) for the destination (DEST, field 1L).

The FMS validates the manual entry only when an ETA is already computed by the FMS, when predictions are available (necessary conditions to have some predictions are : entry of a GW, CRZ FL, CI and F-PLN).

This anomaly does not impact the ETA of the WPT field (3L and 3R). An ETA can be entered in the field 3L even if no predictions are computed.

PREDICTIVE GPS									
DEST	EDDF					PRIMARY	ETA	1450	
1L	-15	-10	-5	ETA	+5	+10	-15	1R	
2L	Y	Y	Y	Y	Y	Y	Y	2R	
3L	WPT	AGN					PRIMARY	FTA	
4L	-15	-10	-5	ETA	+5	+10	-15	3R	
5L	Y	Y	N	N	N	N	N	4R	
6L	DESELECTED SATELLITES								5R
	5							21	6R
	[]								

FLIGHT NUMBER ERASED UPON AOC FLIGHT PLAN UPLINK

Ident.: DSC-22_20-100-20-00013653.0001001 / 16 MAR 11

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

When a Flight Plan (F-PLN) uplink is performed, if the uplinked F-PLN is inserted as the active F-PLN but does not contain a Flight Number, the previously entered Flight Number is erased. In such a case, the flight crew needs to re-enter the correct Flight Number on the INIT A page.

ERRONEOUS FUEL PREDICTION IN THE CASE OF DESCENT WITH TWO ALTITUDE CONSTRAINTS

Ident.: DSC-22_20-100-20-00013655.0001001 / 16 MAR 11

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

DESCRIPTION:

If the flight plan has two altitude constraints for the descent, the flight crew may notice erroneous FMS fuel predictions.

EXPLANATION

If the flight plan has two altitude constraints for the descent, the FMS may define a geometric segment between both altitude constraints. If there is a deceleration required within the geometric segment, the FMS may consider that the geometric segment is too steep to fly without speedbrakes. In this case, the FMS tags the entire geometric segment as a speedbrake segment. The FMS assumes that during the entire segment half of the speedbrakes are extended, even for the parts where no deceleration is planned. As a consequence, the FMS will predict an increased thrust for the entire geometric segment. This may lead to erroneous fuel predictions. (a long geometric segment (e.g. above 100 NM) may lead to an error of 1.5 t for the fuel prediction at destination).

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

TEMPORARY ABNORMAL BEHAVIORS - FMS2
 HONEYWELL TEMPORARY ABNORMAL BEHAVIORS

Note: When flying the geometric segment, the predictions become better as the aircraft approaches the end of the geometric segment, and turn back to normal when the aircraft has sequenced the second altitude constraint.

PROCEDURE:

If the flight crew suspects this behavior in preflight, or during the flight, they can delete and enter again one altitude constraint in descent and compare the fuel predictions of the flight plan with and without the geometric segment. This allows the flight crew to evaluate the impact of the geometric segment on the fuel predictions.

It is not recommended to permanently delete altitude constraints that are stored in the navigation database.

UNEXPECTED SWITCH OF SPEED TARGET WHEN RTA IS USED

Ident.: DSC-22_20-100-20-00013659.0001001 / 16 NOV 11

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

An anomaly could be experienced when the RTA (Requested Time of Arrival) function is used. The MCDU and the PFD could suddenly display an erroneous speed target at the transition altitude when a RTA is entered and if the flight crew performs an action (Vapp entry or altitude constraint modification) that causes a F-PLN profile recomputation.

This scenario could also occur if the flight crew has inserted a RTA and then deleted this RTA (the FMS may erroneously retain the RTA target).

Some cases could happen while the aircraft is in descent (DES mode) in managed speed. This speed target change is significant at high altitude if the RTA speed target is lower than the speed target used before the beginning of the descent.

PROCEDURE

If an erroneous speed target is displayed at high altitude, the flight crew can manually select a speed to continue the descent.

VOR/DME AND VOR/TACAN NOT AUTOMATICALLY TUNED

Ident.: DSC-22_20-100-20-00014440.0001001 / 04 MAY 12

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

In case there is no NAVAID in the flight plan, nor any recommended NAVAID coded in the inserted procedure, the FMS may not automatically tune the expected Terminal or Low Altitude VOR/DME or VOR/TACAN.

The FMS may not automatically tune the expected NAVAID, if the aircraft is above 12 000 ft for a Terminal VOR/DME or VOR/TACAN, and above 18 000 ft for a Low Altitude NAVAID.

As a consequence, the ND and the MCDU RAD NAV page may not display the NAVAID information.

OPERATIONAL RECOMMENDATIONS

If the flight crew encounters the misbehavior during the flight, the flight crew can manually tune the expected VOR/DME or VOR/TACAN to recover the display on the ND.

As a manual tuning overrides any automatic tuning, the flight crew must clear the manual tuning, when the NAVAID is no longer required, in order to revert to the automatic NAVAID tuning.

**OPTIMUM TARGET SPEEDS NOT UPDATED FOLLOWING
THE AUTOMATIC DELETION OF A STEP CLIMB**

Ident.: DSC-22_20-100-20-00014756.0001001 / 04 NOV 20

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

DESCRIPTION

During the FMS climb phase, if the flight crew selects an altitude on the FCU that is above the CRZ FL displayed on the PROG page, the altitude selected on the FCU becomes the new CRZ FL.

If this new CRZ FL is at or above the altitude of a Step Climb of the flight plan, the FMS automatically deletes the Step Climb. The FMS displays the **STEP DELETED** message.

As the optimum target speeds (ECON CLIMB speed/Mach and ECON CRUISE speed/Mach) depend on the CRZ FL, the FMS should immediately update the ECON CLIMB speed/Mach and the ECON CRUISE speed/Mach.

Due to a FMS misbehavior, the FMS may not correctly manage the automatic deletion of the Step Climb when the CRZ FL is automatically set to the altitude selected on the FCU. The FMS may not update the ECON CLIMB speed/Mach and the ECON CRUISE speed/Mach accordingly.

If the ECON CRUISE speed/Mach was not correctly updated, the FMS updates the ECON CRUISE speed/Mach when the aircraft reaches the new CRZ FL. However, the FMS updates the ECON CRUISE speed/Mach with a rate of 0.01 Mach/min, in order to avoid sudden increase of the target speed. Therefore, the aircraft may take several minutes to reach the new ECON CRUISE speed/Mach.

OPERATIONAL RECOMMENDATIONS

- **If the flight crew suspects this misbehavior during the flight and the FMS is in CLIMB phase:**

CHANGE the CI or the CRZ FL on the PROG page, the optimum target speed is updated when the aircraft reaches the CRZ FL.

AIRCRAFT SYSTEMS**AUTO FLIGHT - FLIGHT MANAGEMENT**TEMPORARY ABNORMAL BEHAVIORS - FMS2
HONEYWELL TEMPORARY ABNORMAL BEHAVIORS

- **If the flight crew suspects this misbehavior during the flight and the FMS is in CRUISE phase:**

The optimum target speed is updated with a rate of 0.01 Mach/min when the aircraft reaches the FCU altitude.

**ERRONEOUS LATERAL GUIDANCE IN NAV MODE
WITH LOC MODE ARMED DURING APPROACH**

Ident.: DSC-22_20-100-20-00015035.0001001 / 18 MAY 22

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

During approach, the FMS may guide the aircraft along a specific track instead of along the F-PLN with NAV mode green on the FMA, because of the LOC Convergence function (*Refer to DSC-22_30-40-80-10 LOC* Engagement Conditions - LOC Convergence Function*).

The logics of the LOC Convergence function is as follows:

- **If NAV mode is engaged, and LOC mode is armed,**
and
The aircraft is within 20 NM of the destination runway,
and
The difference between the aircraft track and the QFU is less than 20 °.
The aircraft is guided with a converging track of 20 ° from the LOC axis.
The NAV mode remains engaged. However the aircraft no longer follows the F-PLN, but converges towards the LOC axis.
- **If the difference between the aircraft track and the QFU becomes more than 20 ° when the LOC Convergence function is active:**

The FMS deactivates the LOC Convergence function, and the aircraft follows back the F-PLN. It may lead to slight oscillations, since the FMS may successively activate and deactivate the LOC Convergence function.

OPERATIONAL RECOMMENDATIONS

- **If the flight crew considers that the LOC Convergence function may affect the guidance along the F-PLN trajectory in NAV mode:**

On the intercept trajectory for the LOC axis, the flight crew should push the APPR pb (or the LOC pb-sw) when appropriate.

- **If the flight crew detects that the aircraft does not follow the intended trajectory:**

The flight crew should revert to HDG/TRK mode, and intercept the LOC axis with the HDG/TRK mode engaged and the LOC mode armed.

**UNDUE REDUCTION OF THE SPEED TARGET IN CASE OF DIR
TO/ABEAM WHILE FLYING A CONSTANT MACH SEGMENT**

Ident.: DSC-22_20-100-20-00015532.0003001 / 18 MAR 14

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

The FMS may erroneously command a Mach target of 0, when the following conditions are met:

- The aircraft is flying a Constant Mach Segment (CMS), and
- The TO waypoint is the end of the CMS, and
- The aircraft is close to the TO waypoint, i.e. about 1 NM, and
- The flight crew performs a DIR TO/ABEAM to a waypoint that is not part of the CMS.

In that case, the FMS does not create the abeam of the TO waypoint (end of the CMS), since it is too close from the aircraft.

In addition, the FMS erroneously keeps the CMS until the abeam of the next waypoint, and defines 0 as Mach target on the CMS. The FMS correctly computes the speed target once the abeam of the next waypoint is sequenced.

OPERATIONAL RECOMMENDATIONS

The flight crew should manually clear the CMS on the MCDU VERT REV page.

LOSS OF FUEL AND TIME PREDICTIONS DURING TAKEOFF DATA INSERTION

Ident.: DSC-22_20-100-20-00015602.0001001 / 05 AUG 14

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

The flight crew may lose fuel and time prediction when the altitude of the first constraint is less than 50 ft below either the THR RED ALT or the ACC ALT, the update of fuel and time computation predictions may last a long time. The flight crew may think that the predictions are lost (the DEST EFOB and TRIP FUEL are also dashed on the FUEL PRED page).

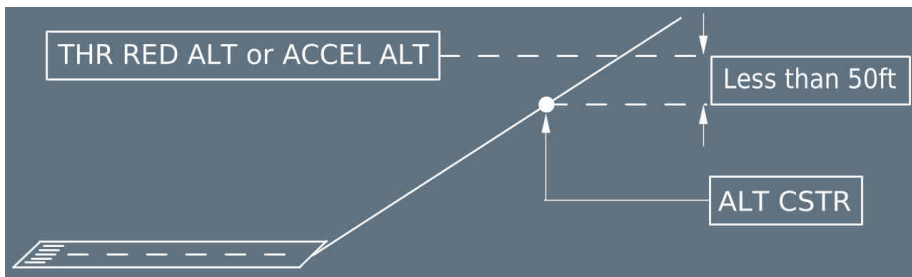
The flight crew may encounter the situation described above, if one of the following occurs:

- The first altitude constraint of the SID is less than 50 ft below either the THR RED ALT or the ACC ALT.
- The flight crew inserts a THR RED ALT or an ACC ALT less than 50 ft above the first altitude constraint of the F-PLN.
- The flight crew modifies the F-PLN to insert an AT or an AT OR BELOW altitude constraint less than 50 ft below the THR RED ALT or the ACC ALT.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

TEMPORARY ABNORMAL BEHAVIORS - FMS2
 HONEYWELL TEMPORARY ABNORMAL BEHAVIORS



OPERATIONAL RECOMMENDATION:

The flight crew can recover the fuel and time predictions if the flight crew sets the THR RED ALT or ACC ALT value on the PERF TAKEOFF page to the same value as the first altitude constraint of the F-PLN.

ERRONEOUS TRAJECTORY DURING PROCEDURES WITH A TURN DIRECTION ON A LEG WITH AN ALTITUDE TERMINATION

Ident.: DSC-22_20-100-20-00015748.0001001 / 09 SEP 14

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

In some very specific operational conditions that depend on the coding in the Navigation Database of the procedure, and on various performance conditions (aircraft weight, flaps, thrust setting, temperature, wind...), the FMS may compute an erroneous trajectory on some Standard Instrument Departures (SID), and on some Missed Approach procedures.

The SIDs and the Missed Approach procedures that may be affected are coded in the Navigation Database with a leg that has a turn direction and an altitude termination. The leg can be one of the following:

- A Course-to-an-Altitude (CA) leg that defines a course to follow to an altitude
- A Fix-to-an-Altitude (FA) leg that defines a track to follow from a waypoint to an altitude
- A Heading-to-an-Altitude (VA) leg that defines a heading to follow to an altitude
- A Holding-to-an-Altitude (HA) leg that defines a holding pattern to an altitude

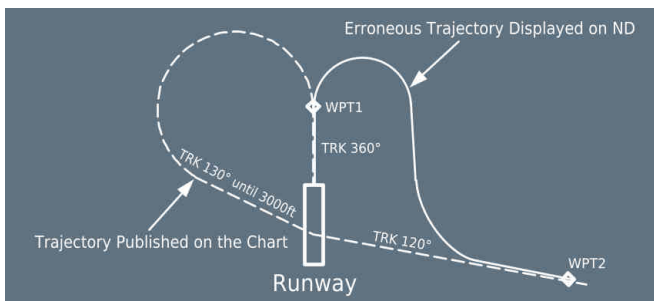
The turn direction (left or right) that is coded on a leg indicates that the aircraft has to execute a turn in the specified direction to intercept the leg.

In some very specific operational conditions (aircraft weight, wind...), the FMS may predict that the aircraft will reach the altitude that terminates the leg, before the initiation of the leg. In that case, the FMS ignores the leg, and the associated turn direction.

The FMS computes a new trajectory to directly join the next leg. The trajectory may not be consistent with the published trajectory.

Example:

- Leg 1: a Course-to-Fix (CF) leg that defines a track (360 °) to a waypoint (WPT1)
- Leg 2: a Course-to-an-Altitude (CA) leg that defines a track (130 °) to intercept an altitude (3 000 ft). The leg is coded in the Navigation Database with a turn direction (left). The end of the leg depends on the aircraft performance. The turn direction is indicated by an arrow on the line of leg 1 on the MCDU
- Leg 3: a CF leg that defines a track (120 °) to a waypoint (WPT2)



Depending on the aircraft performance, the FMS may predict that the aircraft will reach 3 000 ft before WPT1. In that case, the FMS ignores the leg 2 (CA leg) because the aircraft is already above the altitude that ends leg 2, before the beginning of leg 2. The FMS also ignores the turn direction that is coded on the leg.

As a result, the FMS computes again the trajectory from the end of leg 1, directly to leg 3. As shown on the above illustration, this trajectory includes a right turn, instead of a left turn, because it induces the shortest course change to intercept leg 3 (CF leg).

If the NAV mode is engaged, the aircraft follows this erroneous trajectory.

OPERATIONAL RECOMMENDATIONS

The flight crew should pay particular attention to the check of the flight plan during the Cockpit Preparation, and during the Descent Preparation.

CAUTION

Even if the flight plan is correct during the Cockpit Preparation or during the Descent Preparation, the FMS may compute and display an erroneous trajectory when the FMS updates its predictions after takeoff or after go-around initiation.

If the flight crew detects that the lateral flight plan does not agree with the published trajectory, the flight crew should revert to the HDG/TRK mode, and monitor NAVAID raw data as appropriate.

The flight crew should reengage the NAV mode when the lateral flight plan is consistent with the published trajectory.

**ERRONEOUS VERTICAL PROFILE DURING LOC B/C APPROACHES
 WITH A MAP LOCATED BEFORE THE RUNWAY THRESHOLD**

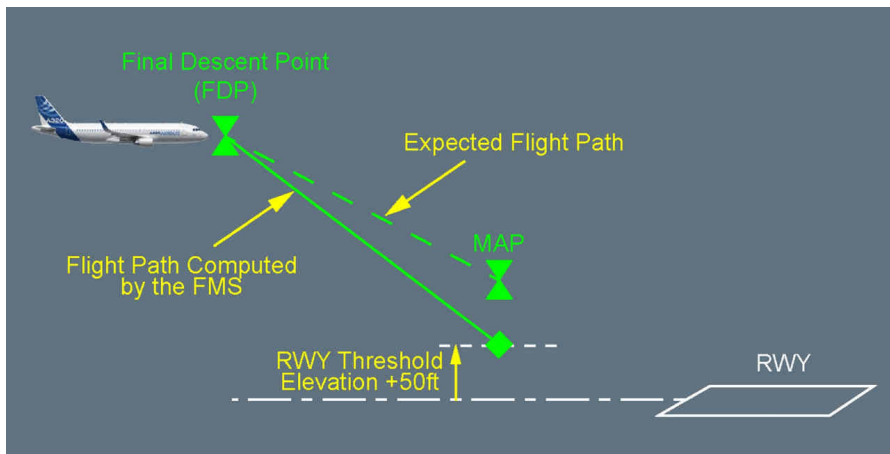
Ident.: DSC-22_20-100-20-00019782.0001001 / 25 JUL 16

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

DESCRIPTION

When the flight crew selects a LOC Back Course (LOC B/C) approach in the arrival page of the MCDU, if the Missed Approach Point (MAP) is located before the runway threshold, the FMS builds the final approach vertical flight path assuming that there is an altitude constraint at the MAP, equal to the runway (RWY) threshold elevation plus 50 ft, disregarding the actual coded MAP altitude.

As a result, the FMS computes an erroneous vertical flight path for the final approach, an erroneous crossing altitude at the MAP, and displays an erroneous vertical deviation indication (V/DEV symbol on the PFD and V/DEV value on MCDU PROG page), when flying the approach.



Therefore, the flight crew must fly the LOC B/C approaches in selected vertical guidance mode (FPA or V/S mode), and they must disregard the V/DEV displayed on the PFD and MCDU PROG page.

PROCEDURE

For LOC B/C approaches, check the position of the MAP on the approach chart:

■ If the MAP is located at the runway threshold:

V/DEV symbol can be used to assist the flight crew in flying the vertical flight path in selected mode. Crosscheck the final descent with the published chart using altitude versus distance, as per Standard Operating Procedures (SOPs).

■ If the MAP is located before the runway threshold:

DISREGARD the V/DEV symbol, and crosscheck the final descent using the altitude versus the distance to the MAP.

**ERRONEOUS VERTICAL GUIDANCE IN APPROACH SUBSEQUENT
TO A DIR TO PERFORMED WHEN NEAR THE TOP OF DESCENT**

Ident.: DSC-22_20-100-20-00022771.0001001 / 05 MAR 19

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

DESCRIPTION

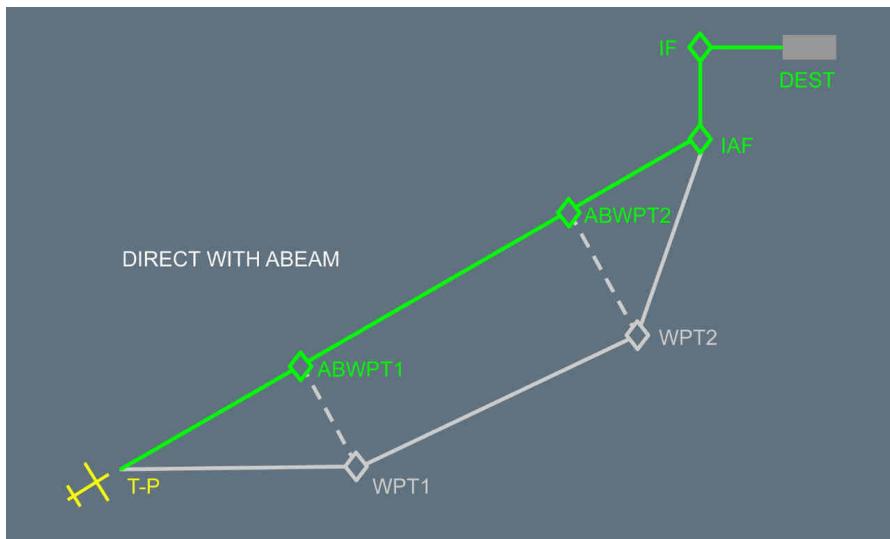
When the flight crew inserts a DIR TO waypoint, the FMS computes the horizontal path to the destination. When near the top of descent, if the flight crew inserts a DIR TO waypoint that is at, or after the IAF, the FMS computation may be erroneous for all of the following:

- The distance of the legs after the DIR TO waypoint.
- The vertical deviation on the legs after the DIR TO waypoint.
- The vertical guidance in DES and FINAL APP modes.

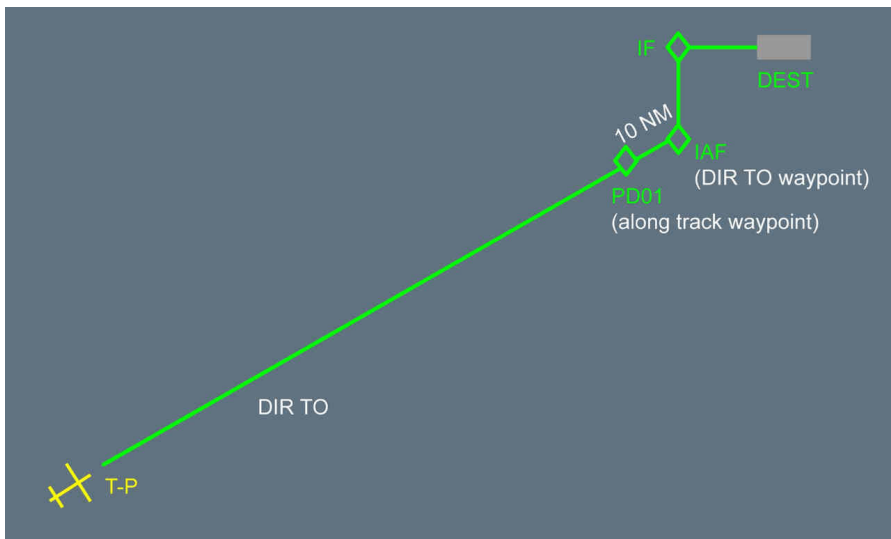
In order to compute the turn radius of the horizontal path, the FMS uses the current TAS at the time of the DIR TO insertion. This is the cause to the erroneous calculation. Instead, the FMS should use the TAS that is predicted at the DIR TO waypoint.

PROCEDURE

When near the top of descent, to insert a DIR TO waypoint that is at or after the IAF, the flight crew should use the DIRECT WITH ABEAM (ABEAM PTS) function. The flight crew must then check that at least one abeam waypoint is computed ahead of the position of the aircraft. For more information on the DIRECT WITH ABEAM function, *Refer to DSC-22_20-10-30-12 DIR Key (Direct-to-Function) - Procedure for DIR TO/ABEAM.*



If there is no abeam waypoint computed, the flight crew must insert a Place Distance waypoint 10 NM before the DIR TO waypoint. (Refer to DSC-22_20-10-30-12 Inserting a Waypoint - Along Track Waypoint Insertion)



NO ENGAGEMENT OF THE PRESEL SPD TARGET IN CLIMB

Ident.: DSC-22_20-100-20-00023539.0002001 / 26 NOV 19

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

DESCRIPTION

This misbehavior is experienced if the flight crew entered a PRESEL SPD TARGET in the FMS PERF CLIMB page and when the following occurs simultaneously:

- FMS transition from TAKEOFF to CLIMB phase, and
- A F-PLN leg is sequenced by the FMS.

EXPLANATION

The FMS transition from TAKEOFF to CLIMB phase occurs in the following cases:

- The aircraft reaches the ACCEL ALT entered in the FMS PERF TAKEOFF page, or
- The **SRS** mode disengages and another vertical mode such as **ALT*** engages.

At the activation of the CLIMB phase, when a PRESEL SPD TARGET is set in the FMS PERF CLIMB page and A/THR is active, the FMS orders to synchronize the FCU SPD target to the preselected value and go to selected SPD mode automatically.

When a F-PLN leg is sequenced at the same time than the activation of the CLIMB phase, the FMS gives the priority to the leg sequencing process. Then, the PRESEL SPD TARGET is not taken into account. In such condition the PRESEL SPD TARGET entered in the FMS PERF

AIRCRAFT SYSTEMS**AUTO FLIGHT - FLIGHT MANAGEMENT**TEMPORARY ABNORMAL BEHAVIORS - FMS2
HONEYWELL TEMPORARY ABNORMAL BEHAVIORS

CLIMB page is disregarded and the aircraft accelerates to reach the MANAGED SPD TARGET displayed on the FMS PERF CLIMB page.

OPERATIONAL RECOMMENDATION

If the PRESEL SPD TARGET is not taken into account after the FMS transition from TAKEOFF to CLIMB phase, the flight crew should revert to selected speed mode and select the SPD TARGET on the FCU.

**ERRONEOUS CF LEG COMPUTATION FOLLOWING
FMS NEW RUNWAY WITH LS IDENT CREATION**

Ident.: DSC-22_20-100-20-00023647.0001001 / 26 NOV 19

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

DESCRIPTION

The flight crew may experience this abnormal behavior if a runway and its associated LS IDENT is created via the FMS NEW RUNWAY page.

If the flight crew creates a runway and its associated LS (LS IDENT of the FMS NEW RUNWAY page), the FMS considers this NAVAID as the recommended NAVAID for the newly created runway.

This created NAVAID does not have an associated magnetic variation in the FMS. Thus, the FMS may apply an erroneous magnetic variation and may compute an erroneous course for the CF leg.

OPERATIONAL RECOMMENDATION

In the case of runway creation, the flight crew should not insert an LS IDENT on the FMS NEW RUNWAY page.

If the flight crew plans to perform an ILS approach on the newly created runway, the ILS should be tuned via either of the following:

- The FMS RADIO NAV page, or
- The RMP.

UNEXPECTED ILS AUTO-TUNING

Ident.: DSC-22_20-100-20-00024029.0001001 / 09 MAY 23

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

DESCRIPTION

The FMS may erroneously automatically tune an ILS frequency in the following two cases:

- After selection of an ILS approach, the flight crew changes the approach and selects a RWY-only or Visual approach that is not associated with an ILS frequency, or
- The flight crew selects a RWY-only approach that is associated with an ILS frequency.

OPERATIONAL RECOMMENDATIONS

If the flight crew identifies an unexpected tuning of an ILS frequency by the FMS, the flight crew should insert the ILS frequency 108.00 in the FMS RADIO NAV page.

WARNING Do not insert or clear ILS FREQ or CRS on both FMS sides simultaneously.

- Note:*
1. 108.00 is the default value of ILS frequency that is not associated with an ILS approach.
 2. Inserting the CRS on one FMS side while the LS FREQ is cleared on the other FMS side results in dual FMS latch.

ERRONEOUS MANAGED APPROACH SPEED AFTER DESCENT WIND UPLINK

Ident.: DSC-22_20-100-20-00024052.0003001 / 28 MAY 20

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

DESCRIPTION

This misbehaviour is encountered in the following conditions:

- The flight crew inserts the uplink of an AOC DESCENT WIND that contains wind at destination (GRND wind appears on the DESCENT WIND page)
- The flight crew does not manually reinsert the wind at destination on the PERF APPR page.

In the case of the uplink of an AOC DESCENT WIND that contains wind at destination (GRND wind appears on the DESCENT WIND page), all of the following apply:

- The FMS correctly receives and uses the wind at destination
- The wind at destination correctly appears on the PERF APPR page
- The FMS erroneously transmits the wind at destination to the Flight Guidance Computer for GSmini computation.

As a result, the managed approach speed that appears on PFD and which is used for guidance by the Flight Guidance Computer may be erroneously increased, depending on the current headwind that the flight crew encounters.

OPERATIONAL RECOMMENDATION

Starting from the DESCENT PREPARATION phase of the Standard Operating Procedures, the flight crew should manually reenter the wind at destination on the PERF APPR page, each time an uplink of an AOC DESCENT WIND that contains wind at destination (GRND wind appears on DESCENT WIND page) is performed. And this recommendation applies whatever the value of the wind at destination, which appears on the PERF APPR page, subsequent to the uplink. This applies even if the value to reenter on the PERF APPR page is exactly the same value.

AIRCRAFT SYSTEMS**AUTO FLIGHT - FLIGHT MANAGEMENT**TEMPORARY ABNORMAL BEHAVIORS - FMS2
HONEYWELL TEMPORARY ABNORMAL BEHAVIORS**INADVERTENT T.O. DATA REVERSION UPON RWY CHANGE**

Ident.: DSC-22_20-100-20-00027760.0001001 / 13 NOV 24

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

DESCRIPTION

In the case of a runway change, the FMS may erroneously revert to the previous takeoff speeds and takeoff thrust (FLX TO or DRT TO ) when all the following occurs:

- Both MCDUs display the PERF TAKEOFF page,
- V1, VR and V2 associated with the previous runway are already entered,
- The new runway is entered in one MCDU,
- V1, VR and V2 associated with the new runway are entered by one flight crew member,
- The other flight crew member presses the 6R prompt (NEXT PHASE or CONFIRM TO DATA) of the PERF TAKEOFF page.

OPERATIONAL RECOMMENDATIONS

If the PERF TAKEOFF page is displayed on both MCDUs, when the new takeoff speeds are entered on one MCDU, the flight crew should not press the 6R prompt (NEXT PHASE or CONFIRM TO DATA) on the other MCDU.

The flight crew should apply the DEPARTURE CHANGE SOP and complete the DEPARTURE CHANGE checklist to ensure that correct speeds and thrust are set for the takeoff.

AIRCRAFT SYSTEMS**AUTO FLIGHT - FLIGHT MANAGEMENT**TEMPORARY ABNORMAL BEHAVIORS - FMS2
THALES TEMPORARY ABNORMAL BEHAVIORS**MCDU FROZEN AFTER THE FLIGHT CREW ACCESSES
THE "DIR TO", "HOLD" OR "OFFSET" FUNCTION**

Ident.: DSC-22_20-100-30-00012686.0001001 / 21 MAR 17

Applicable to: MSN 02926-02944, 04392, 07784-07792

When the flight crew attempts to access the "DIR TO" function (via the DIR), the "HOLD" function (via the HOLD prompt on the LAT REV MCDU page) or the "OFFSET" function (via the OFFSET prompt on the LAT REV MCDU page), the corresponding MCDU may remain frozen.

In such a case, the MCDU simultaneously displays an "A/C POSITION INVALID" scratchpad message, in white (note that in other cases of display, the "A/C POSITION INVALID" message is amber).

PROCEDURE

If the MCDU is frozen after the flight crew accesses the "DIR TO", "HOLD" or "OFFSET" function: APPLY the manual reset procedure provided (*Refer to procedure*) to successively reset both FMGCs.

**ERRONEOUS CROSS TRACK ERROR/FD DISPLAY
ORDERS AFTER A DIR TO ON ALIGNED WAYPOINT**

Ident.: DSC-22_20-100-30-00013636.0002001 / 26 NOV 19

Applicable to: MSN 02926-02944, 04392, 07784-07792

DESCRIPTION

Erroneous cross track errors (XTK) and FD orders fluctuations have been reported when a DIR TO is performed to a waypoint ahead, with no heading change.

In these conditions, some time after the DIR TO, the FMS not in control ("slave FMS") may compute an erroneous XTK using as the reference the next leg after the DIR TO waypoint (the corresponding FD order being based on this erroneous cross track).

However, the XTK and FD of the FMS in control remain correct.

If later, the flight crew switches the autopilot to the affected FMS side, the aircraft guidance will become erroneous.



DIR TO BEROK
performed by the
flight crew

Erroneous XTK
error computed
by the FMS not
in control

OPERATIONAL RECOMMENDATION:

The flight crew should perform a new DIR TO to recover a correct XTK/FD behaviour.

ERRONEOUS OFFSET

Ident.: DSC-22_20-100-30-00013637.0001001 / 23 JUN 15

Applicable to: MSN 04392

In some cases, the FMS does not compute correctly the offset path when the flight crew enters an offset in the flight plan. In such case, the offset path does not remain parallel to the parent path, but diverges at a certain point. After the point at which this erroneous diversion starts, the offset path is very different from the intended parallel path and the flight crew must therefore not follow this diverging path.

The Estimated Fuel On Board (EFOB) will also be erroneous, because the EFOB computation will be based on this erroneous (and often longer) offset path. When the offset is cancelled, the EFOB becomes again correct.

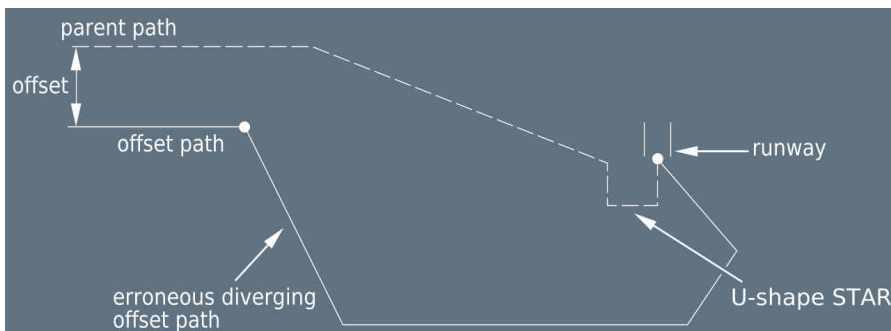
This anomaly can occur when the flight plan contains a succession of legs with important change in course (e.g. U-Shape, Step-shape,...). These shapes are mainly found in STARs and VIAs.

However, the point at which the diversion start may be well before this U-shape/Step-shape (e.g. 100 NM).

Note: For a given flight plan, the correctness of the offset path depends on the value of offset:

- with a smaller offset value, the FMS computes a correct offset path
- with a bigger offset value the FMS computes an erroneous offset path.

FIGURE:



PROCEDURE:

When the offset trajectory becomes unsatisfactory, the flight crew should cancel the offset in the FMS. If the offset is still needed, the flight crew can fly the offset in lateral selected guidance.

**ERRONEOUS FUEL PREDICTIONS IN THE CASE
OF DESCENT WITH TWO ALTITUDE CONSTRAINTS**

Ident.: DSC-22_20-100-30-00013638.0001001 / 16 MAR 11

Applicable to: MSN 02926-02944, 04392, 07784-07792

DESCRIPTION:

If the flight plan has two altitude constraints for the descent, the flight crew may notice erroneous FMS fuel predictions.

EXPLANATION:

If the flight plan has two altitude constraints for the descent, the FMS may define a geometric segment between both altitude constraints. If there is a deceleration required within the geometric segment, the FMS may consider that the geometric segment is too steep to fly without speedbrakes. In this case, the FMS tags the entire geometric segment as a speedbrake segment. The FMS assumes that during the entire segment half of the speedbrakes are extended, even for the parts where no deceleration is planned. As a consequence, the FMS will predict an increased thrust for the entire geometric segment. This may lead to erroneous fuel predictions. (a long

AIRCRAFT SYSTEMS**AUTO FLIGHT - FLIGHT MANAGEMENT**TEMPORARY ABNORMAL BEHAVIORS - FMS2
THALES TEMPORARY ABNORMAL BEHAVIORS

geometric segment (e.g. above 100 NM) may lead to an error of 1.5 t for the fuel prediction at destination).

Note: When flying the geometric segment, the predictions become better as the aircraft approaches the end of the geometric segment, and turn back to normal when the aircraft has sequenced the second altitude constraint.

PROCEDURE:

If the flight crew suspects this behavior in preflight, or during the flight, they can delete and enter again one altitude constraint in descent and compare the fuel predictions of the flight plan with and without the geometric segment. This allows the flight crew to evaluate the impact of the geometric segment on the fuel predictions. It is not recommended to permanently delete altitude constraints that are stored in the navigation database.

"FM PREDICTIONS LOST" MESSAGE WHEN USING THE FUEL PLANNING FUNCTION

Ident.: DSC-22_20-100-30-00013663.0001001 / 16 MAR 11

Applicable to: MSN 04392

In some cases, in particular when several altitude steps have been entered in the F-PLN, the FUEL PLANNING function may be unable to compute the required BLOCK fuel. When this happens, the system stops computing the predictions and the "FM PREDICTIONS LOST" amber message appears in the scratchpad.

PROCEDURE

- If the "FM PREDICTIONS LOST" message appears after using the FUEL PLANNING function:

DO NOT RE-USE the FUEL PLANNING function

ENTER the planned BLOCK fuel in the [2R] field on INIT B page

RE-ENTER the Cost Index (CI) on INIT A page.

This will re-start the computation of the FMS predictions.

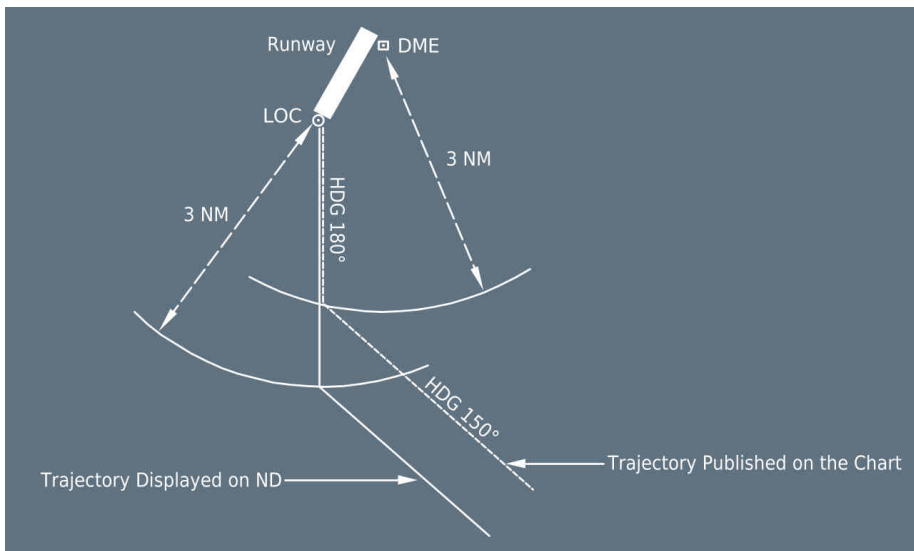
ERRONEOUS LATERAL GUIDANCE IN NAV MODE DURING PROCEDURES THAT USE NOT COLLOCATED NAVAIDS

Ident.: DSC-22_20-100-30-00014439.0001001 / 04 MAY 12

Applicable to: MSN 04392

The FMS may compute an erroneous trajectory when the expected procedure is built on ILS/DME distance or ILS/DME arc leg. In that case, the FMS computes the distances using the position of the localizer instead of the position of the DME.

See the following example that illustrates the misbehavior with a SID that uses not collocated ILS/DME:



- Note:
1. This misbehavior may also impact procedures that use not collocated ILS/TACAN, VOR/DME, VOR/TACAN and MLS/DME
 2. This misbehavior does not impact RNAV procedures.

OPERATIONAL RECOMMENDATIONS

The flight crew should pay particular attention to the check of the flight plan during the Cockpit Preparation and the Descent Preparation.

In the case of an erroneous trajectory, the flight crew should revert to the HDG/TRK mode and use NAVAID raw data.

The flight crew should reengage the NAV mode when the lateral flight plan is consistent with the published trajectory.

ERRONEOUS TRAJECTORY DURING DEPARTURE PROCEDURES WITH A COURSE-TO-FIX LEG AND AN ARC LEG

Ident.: DSC-22_20-100-30-00014820.0001001 / 21 DEC 12

Applicable to: MSN 04392

In some very specific operational conditions, the FMS may compute an erroneous trajectory on some Standard Instrument Departures (SID).

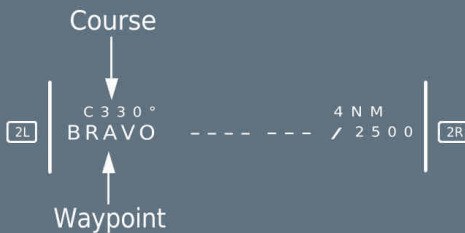
AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT

 TEMPORARY ABNORMAL BEHAVIORS - FMS2
 THALES TEMPORARY ABNORMAL BEHAVIORS

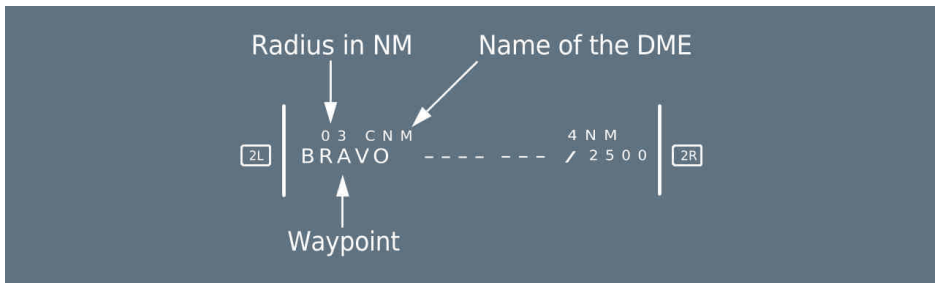
The SIDs that may be affected are coded in the Navigation Database with the following sequence of legs:

- Leg 1: any type of leg
- Leg 2: a Course-to-Fix (CF) leg that defines a course to a waypoint.

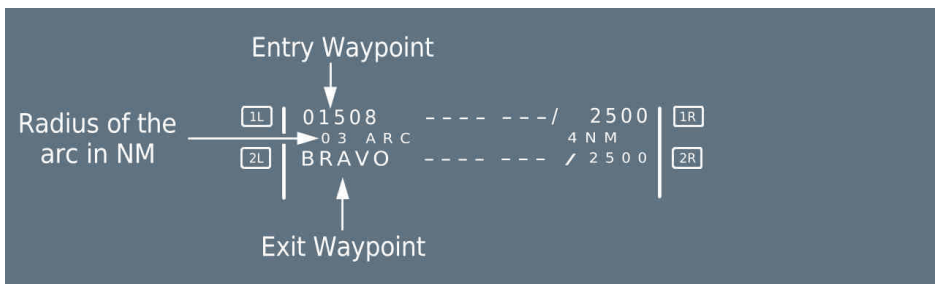
On the MCDU F-PLN page, a CF leg is represented as follows:



- Leg 3: an Arc leg that can be either
 - An Arc-to-Fix (AF) leg that is defined by a constant distance from a DME to a waypoint.
On the MCDU F-PLN page, an AF leg is represented as follows:



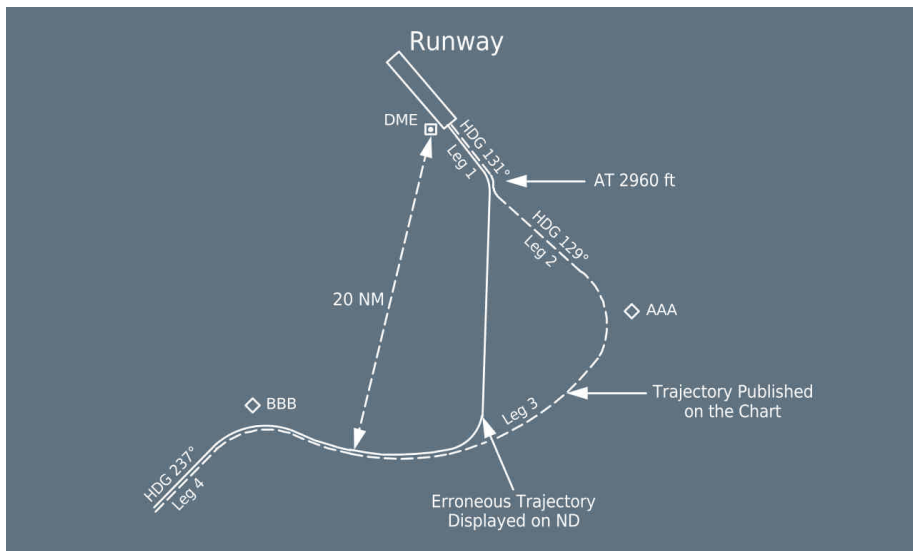
- Or a Constant Radius Arc (RF leg) that is defined by two waypoints (entry point and exit point), a center and a radius.
On the MCDU F-PLN page, a RF leg is represented as follows:



***Note:** This misbehavior is not expected on procedures with RF legs since the previous leg is usually at a tangent to the inbound course of the RF leg. This prevents the misbehavior from occurring.*

The following example illustrates the behavior with the following sequence of legs:

- Leg 1: a Fix-to-Altitude (FA) leg that defines a track (131 °) from the runway to 2 960 ft. The end of the leg depends on the aircraft performance
- Leg 2: a CF leg that defines a course (129 °) to AAA
- Leg 3: an AF leg that defines an arc at 20 NM from the DME to BBB
- Leg 4: a CF leg that defines a course (237 °) to a waypoint.



When the distance between the end of leg 1, that depends on the aircraft performance, and the beginning of leg 2 is larger than 800 ft, the course of leg 1 is kept until the intersection with leg 2. Then, as leg 1 converges slowly toward leg 2, the end of the transition between leg 1 and leg 2 may be located beyond the beginning of the transition between leg 2 and leg 3. The trajectory is not continuous. Therefore, the FMS computes again the trajectory. In this case, the FMS may compute the trajectory from the end of leg 1, directly to the beginning of leg 3 (bypass transition). However when the FMS computes the transition between leg 1 and leg 3, the FMS limits the course change to capture leg 3.

In order to comply with this limitation of course change, the FMS may delay the transition to leg 3 as shown on the above illustration. In some other cases, the FMS may compute another bypass transition, directly from leg 1 to leg 4.

If the NAV mode is engaged, the aircraft follows this erroneous trajectory.

This FMS misbehavior may occur in some very specific conditions that depend on the configuration and coding in the Navigation Database of the procedure, and on various performance conditions (takeoff weight, flaps, thrust setting, temperature, wind...).

OPERATIONAL RECOMMENDATIONS

The flight crew should pay particular attention to the check of the flight plan during the Cockpit Preparation.

CAUTION

Even if the flight plan is correct during the Cockpit Preparation, the FMS may compute and display an erroneous trajectory when the FMS updates its predictions after takeoff.

If the flight crew detects that the lateral flight plan does not agree with the published trajectory, the flight crew should revert to the HDG/TRK mode, and monitor NAVAID raw data as appropriate. The flight crew should reengage the NAV mode when the lateral flight plan is consistent with the published trajectory.

**ERRONEOUS LATERAL GUIDANCE IN NAV MODE
WITH LOC MODE ARMED DURING APPROACH**

Ident.: DSC-22_20-100-30-00015036.0001001 / 05 JUN 18

Applicable to: MSN 02926-02944, 04392, 07784-07792

During approach, the FMS may guide the aircraft along a specific track instead of along the F-PLN with NAV mode green on the FMA, because of the LOC Convergence function.

The logics of the LOC Convergence function is as follows:

- **If NAV mode is engaged, and LOC mode is armed,**
and
The aircraft is within 20 NM of the destination runway,
and
The difference between the aircraft track and the QFU is less than 20 °.

The aircraft is guided with a converging track of 20 ° from the LOC axis.

The NAV mode remains engaged. However the aircraft no longer follows the F-PLN, but converges towards the LOC axis.

OPERATIONAL RECOMMENDATIONS

- **If the flight crew considers that the LOC Convergence function may affect the guidance along the F-PLN trajectory in NAV mode:**

On the intercept trajectory for the LOC axis, the flight crew should push the APPR pb (or the LOC pb-sw) when appropriate.

- **If the flight crew detects that the aircraft does not follow the intended trajectory:**

The flight crew should revert to HDG/TRK mode, and intercept the LOC axis with the HDG/TRK mode engaged and the LOC mode armed.

AIRCRAFT SYSTEMS**AUTO FLIGHT - FLIGHT MANAGEMENT**TEMPORARY ABNORMAL BEHAVIORS - FMS2
THALES TEMPORARY ABNORMAL BEHAVIORS**ERRONEOUS TRAJECTORY COMPUTATION WHILE IN HDG/TRK MODE DURING
PROCEDURES WITH A TURN DIRECTION ON A LEG WITH AN ALTITUDE TERMINATION**

Ident.: DSC-22_20-100-30-00019778.0001001 / 08 JUL 16

Applicable to: MSN 02926-02944, 04392, 07784-07792

In some specific conditions that depend on the coding in the Navigation Database of the procedure, and on climb performance of the aircraft, the FMS may compute an erroneous trajectory on some Standard Instrument Departures (SID), and on some Missed Approach procedures, when the aircraft is in HDG/TRK mode.

The SIDs and the Missed Approach procedures that may be affected are coded in the Navigation Database with a leg that has both a turn direction and an altitude termination. The leg can be one of the following:

- A Course-to-an-Altitude (CA) leg that defines a course to follow to an altitude
- A Fix-to-an-Altitude (FA) leg that defines a track to follow from a waypoint to an altitude
- A Heading-to-an-Altitude (VA) leg that defines a heading to follow to an altitude

The turn direction (left or right) that is coded on a leg indicates that the aircraft has to execute a turn in the specified direction to intercept the leg.

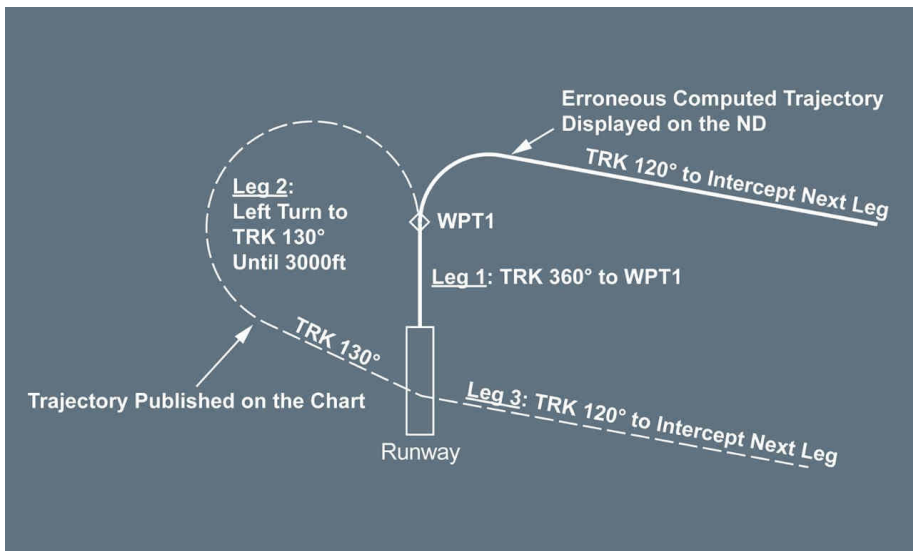
In some specific operational conditions (light aircraft weight, strong headwind...), the FMS may predict that the aircraft will reach the altitude that terminates the leg, before the initiation of the leg. In that case, if the aircraft is in HDG/TRK selected mode, the FMS ignores the leg and the associated turn direction, and computes a new trajectory to join the next leg.

The trajectory may therefore not be consistent with the published trajectory.

Note: *The erroneous computation may happen only if the aircraft is in HDG/TRK mode. The erroneous computation does not happen as long as the aircraft stays in NAV mode.*

Example:

- Leg 1: a Course-to-Fix (CF) leg that defines a track (360 °) to a waypoint (WPT1)
- Leg 2: a Course-to-an-Altitude (CA) leg that defines a track (130 °) to intercept an altitude (3 000 ft). The leg is coded in the Navigation Database with a turn direction (left). The end of the leg depends on the aircraft performance. The turn direction is indicated by an arrow on the line of leg 1 on the MCDU
- Leg 3: a Course-to-Intercept (CI) leg that defines a track of 120 ° to follow until the interception of the next leg.



Depending on the aircraft performance and the external conditions, the FMS may predict that the aircraft will reach 3 000 ft before WPT1. In that case, if the HDG/TRK mode is engaged, the FMS ignores the leg 2 (CA leg) because the aircraft is already above the altitude that ends leg 2, before the beginning of leg 2. The FMS also ignores the turn direction that is coded on the leg. As a result, the FMS re-computes the trajectory from the end of leg 1, directly to leg 3. As shown on the above illustration, this trajectory includes a right turn, instead of a left turn, because it induces the shortest course change to intercept leg 3 (CI leg). If the NAV mode is re-engaged after the new computation, the aircraft follows an erroneous trajectory.

OPERATIONAL RECOMMENDATIONS

The flight crew should pay particular attention to the check of the flight plan during the Cockpit Preparation, and during the Descent Preparation.

CAUTION

Even if the flight plan is correct during the Cockpit Preparation or during the Descent Preparation, the FMS may compute and display an erroneous trajectory when the FMS updates its predictions after takeoff or after go-around initiation.

When in HDG/TRK mode after takeoff or go around initiation, if the flight crew detects that the lateral flight plan does not agree with the published trajectory, the flight crew should stay in HDG/TRK selected mode, and monitor NAVAID raw data as appropriate.

The flight crew should only reengage the NAV mode when the lateral flight plan is consistent with the published trajectory.

ERRONEOUS VERTICAL PROFILE IN FINAL APPROACH

Ident.: DSC-22_20-100-30-00020387.0001001 / 20 SEP 16
 Applicable to: MSN 02926-02944, 07784-07792

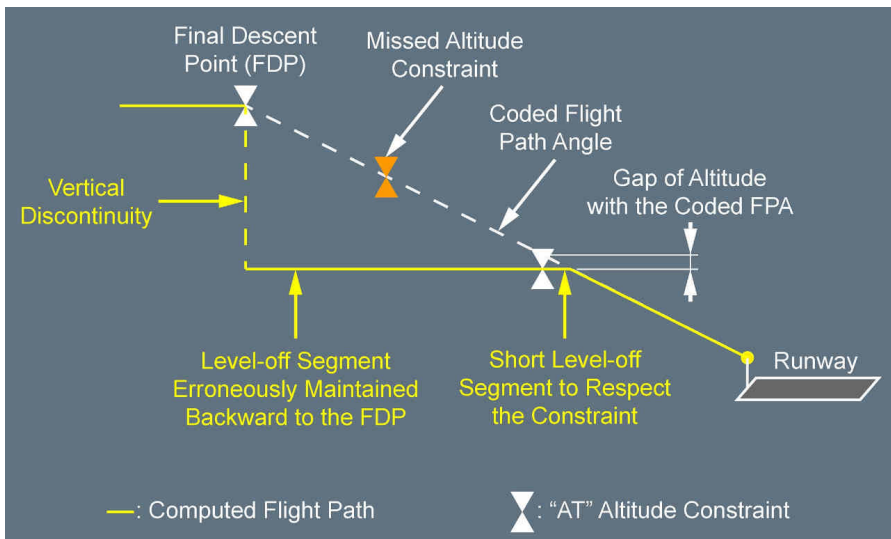
BACKGROUND

The FMS builds the vertical profile of the final approach backward from an anchor point that may be the Missed Approach Point (MAP) or the Runway threshold (RWY), up to the Final Descent Point (FDP).

In the Final Approach path, if there is a conflict between an "AT" altitude constraint and the flight path angle coded in the Navigation Database at a step-down fix, the FMS inserts a short level-off segment to comply with the altitude constraint (refer to the following illustration).

On affected approaches, the FMS erroneously maintains the level-off segment backwards to the FDP.

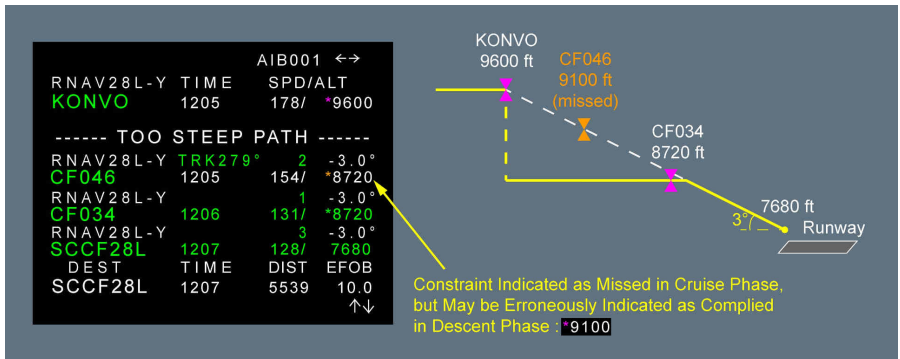
For Non Precision Approaches (NPAs), the level-off may be maintained either to the FDP or to the Final Approach Fix (FAF), when the FAF is not located at the FDP. Altitude constraints along the erroneous level-off may be missed, even if they are erroneously indicated as complied on the MCDU/ND during descent or approach phase.



The misbehavior does not appear when the altitude constraints coded at the step-down fixes are "AT OR ABOVE" constraints.

EFFECTS FOR ALL APPROACHES

As soon as the flight crew selects an affected approach, the MCDU F-PLN page displays a "----- TOO STEEP PATH -----" message after the FDP.



When the aircraft reaches the vertical discontinuity, the vertical deviation (V/DEV) or the yoyo (linear deviation) jumps down and follows the erroneous profile.

EFFECTS FOR NON PRECISION APPROACHES (VOR, NDB, RNAV, LOC ONLY)

FINAL APP GUIDANCE

If FINAL APP is used, at FINAL APP mode engagement, the AP commands a steep pitch down towards the erroneous level-off segment, with possible missed constraints.

FLS GUIDANCE

For aircraft equipped with the FLS  option, the FLS  beam computation is not affected by the misbehavior. Therefore, the aircraft follows the correct FLS  beam.

EFFECTS FOR PRECISION APPROCHES (ILS, MLS OR GLS)

LOC G/S GUIDANCE

ILS, MLS  and GLS  beams are not affected by the issue.
 The aircraft correctly captures and follows the G/S beam.

RECOMMENDATIONS

MODIFICATION OF THE NAVIGATION DATABASE

To solve this misbehavior for affected NPAs Airbus recommends, when possible, to replace the "AT" altitude constraints coded at the step down fixes in the navigation database, by "AT OR ABOVE" altitude constraints.

When the coding of an affected approach cannot be modified, Airbus recommends that the operators ensure that the flight crew will not fly the approach with FINAL APP guidance mode, or remove the approach from the navigation database.

DISPATCH CONSIDERATIONS

Operators must provide information to their flight crews during dispatch about NPAs in their navigation database that are affected by the misbehavior. Operators must not authorize the use FINAL APP guidance for these approaches.

Due to the fact that FINAL APP guidance is not available, RNAV approaches with LNAV/VNAV minima are no longer available.

FLIGHT CREW RECOMMENDATIONS

As per SOP the FINAL APP mode must not be used in a NPA, when the MCDU F-PLN page displays a "----- TOO STEEP PATH -----" in the final segment (between the FDP and the MAP). If this message appears, the flight crew must perform the approach with selected vertical guidance, and disregard the FMS V/DEV or linear deviation (yoyo) information on the PFD.

UNCOMMANDED CLIMB NEAR THE TOP OF DESCENT (T/D)

Ident.: DSC-22_20-100-30-00021871.0001001 / 28 MAY 20

Applicable to: MSN 02926-02944, 04392, 07784-07792

DESCRIPTION

When the inserted tropopause altitude is equal to the final FMS cruise flight level, the FMS can erroneously compute a very steep segment in the FMS vertical profile. A guidance anomaly can then order a pitch up to capture this steep segment while in **DES** mode.

In this case, an unexpected climb may occur when the following conditions are satisfied:

- Tropopause altitude is equal to final FMS cruise flight level (tropopause altitude can be manually entered on MCDU/INIT A page or received via an AOC uplink)
- **DES** mode is engaged before the T/D.

If this unexpected climb occurs, the aircraft pitches up and A/THR commands a thrust increase but speed may decrease.

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OPERATIONAL RECOMMENDATION

■ How to avoid unexpected climb at top of descent:

The tropopause altitude entered or uplinked on MCDU/INIT A page must be different from the final FMS cruise flight level by at least 10 ft. The altitude of the final FMS cruise flight level is the flight plan altitude at the T/D. As the flight level may be selected on MCDU or FCU with an accuracy of 100 ft, tropopause altitude must be set to a value that is not a multiple of 100 ft.

For example, if the tropopause altitude is 37 000 ft, then the value 37 010 ft or 36 990 ft must be entered or uplinked on MCDU/INIT A page.

■ How to manage an unexpected climb near the T/D:

If the aircraft unexpectedly climbs near the T/D, the flight crew must disengage the **DES** mode or disconnect the AP/FD. **DES** mode can then be re-engaged once the T/D is sequenced and the aircraft is back on the FMS descent profile.

ERRONEOUS ALTITUDE CONSTRAINT AFTER SID OR STAR SELECTION CHANGE

Ident.: DSC-22_20-100-30-00022414.0001001 / 24 AUG 18

Applicable to: MSN 02926-02944, 04392, 07784-07792

DESCRIPTION

When the flight crew changes the SID or the STAR procedure, the FMS may keep a constraint of the previous procedure after the change.

The condition of occurrence is that both SID(STAR) procedures have the same last(first) waypoint but with different associated altitude constraints.

At the first SID(STAR) selection, the waypoint is linked to the en-route flight plan and the FMS considers this waypoint as the first(last) en-route waypoint.

When the SID(STAR) is changed, the FMS may keep the constraint of the first(last) en-route waypoint rather than the constraint of the new selected SID(STAR).

***Note:** The issue may also appear if the altitude constraint was inserted manually in the previous SID(STAR).*

PROCEDURE

As per SOP, the flight crew must compare the inserted SID(STAR), including constraints, with the charts and make corrections if necessary.

WAYPOINT NOT SEQUENCED AFTER DIR TO RADIAL IN

Ident.: DSC-22_20-100-30-00022530.0001001 / 18 SEP 18

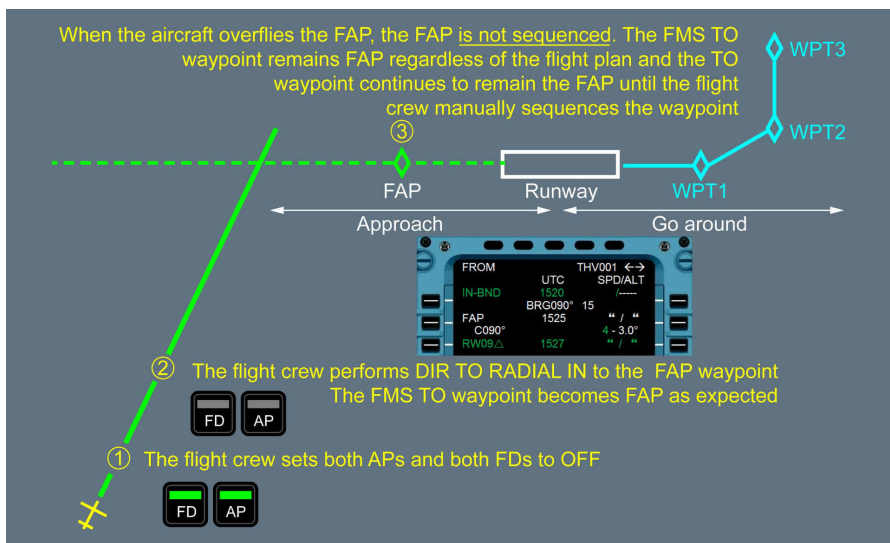
Applicable to: MSN 02926-02944, 04392, 07784-07792

DESCRIPTION

If the flight crew performs a DIR TO RADIAL IN with both APs and both FDs set to OFF, the FMS correctly computes the "DIR TO RADIAL IN waypoint" as the TO waypoint. The correct computation is confirmed by correct display on Navigation Display (ND) and Multipurpose Control and Display Unit (MCDU). However, the FMS will not sequence the newly-created TO waypoint when the aircraft overflies it. The FMS keeps it as the TO waypoint until the flight crew performs a manual sequencing.

Note: If the flight crew performs the DIR TO RADIAL IN before they set both APs and both FDs to OFF, the FMS will correctly sequence the waypoint.

The illustration below provides a typical example of the abnormal behavior:



 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT MANAGEMENT TEMPORARY ABNORMAL BEHAVIORS - FMS2 THALES TEMPORARY ABNORMAL BEHAVIORS
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UNUSABLE MIN DEST FOB VALUE IN THE SECONDARY FLIGHT PLAN

Ident.: DSC-22_20-100-30-00022951.0001001 / 26 NOV 19

Applicable to: MSN 02926-02944, 07784-07792

In some specific conditions the flight crew may observe that the EXTRA fuel value displayed on the FMS FUEL PRED page may not be equal to the difference between the “Predicted DEST EFOB value” and the “MIN DEST FOB value”. This misbehavior may occur in either of the following cases:

● **If an ATC uplink is performed**

DESCRIPTION

This misbehavior may occur in the following case:

- The MIN DEST FOB value of the active F-PLN is not the computed value by the FMS, and
- A SEC F-PLN is created from an ATC uplink.

In this situation the MIN DEST FOB may not be copied in the SEC F-PLN.

RECOMMENDATION

Subsequent to the uplink of a new SEC F-PLN, the flight crew can detect this misbehavior if the MIN DEST FOB value is not copied in the SEC F-PLN. The EXTRA fuel value displayed on the FMS FUEL PRED page may no longer be equal to the difference between the “Predicted DEST EFOB value” and the “MIN DEST FOB value”.

In this case, the flight crew should enter a MIN DEST FOB value in the SEC F-PLN.

● **If an AOC uplink is performed**

DESCRIPTION

This misbehavior may occur when all of the following conditions are satisfied:

- A SEC F-PLN is created by COPY ACTIVE or from an ATC uplink before the AOC uplink is loaded, and
- The MIN DEST FOB value of this SEC F-PLN is not the computed value by the FMS, and
- An AOC message is loaded:
 - Either in flight, or
 - On ground.

When an AOC flight plan uplink is loaded in the SEC F-PLN, the previous MIN DEST FOB value of the SEC F-PLN may not be clearable and fuel prediction computations are not consistent. The EXTRA fuel value displayed on the FMS FUEL PRED page may no longer be equal to the difference between the “Predicted DEST EFOB value” and the “MIN DEST FOB value”.

EXPLANATION

In the SEC Flight Plan:

AIRCRAFT SYSTEMS**AUTO FLIGHT - FLIGHT MANAGEMENT**TEMPORARY ABNORMAL BEHAVIORS - FMS2
THALES TEMPORARY ABNORMAL BEHAVIORS

When the AOC message is loaded with a new flight plan, the displayed MIN DEST FOB value of the SEC flight plan is not correct because the value applicable to the previous flight plan remains displayed.

In addition, this MIN DEST FOB value cannot be cleared.

The MIN DEST FOB value used by the FMS to perform the fuel computations (in particular for EXTRA fuel computation) is the default FMS computed value. Therefore, there is a difference between the displayed MIN DEST FOB value and the other fuel data (i.e. EXTRA differs from FOB at destination minus MIN DEST FOB).

In the Active Flight Plan:

If the uploaded SEC flight plan is activated, this abnormal behavior is transferred to the active flight plan. The MIN DEST FOB value cannot be cleared and the value that is displayed on the INIT B page or the FUEL PRED page is not correct and not consistent with the other fuel data that are correctly computed and displayed.

RECOMMENDATION

Subsequent to the uplink of a new SEC flight plan, the flight crew can detect this misbehavior if the EXTRA fuel value is no longer equal to the "Predicted DEST EFOB value minus MIN DEST FOB value".

The flight crew cannot clear the MIN DEST FOB value. In order to continue, the flight crew should enter a MIN DEST FOB value again in the SEC flight plan to recover nominal fuel computations. To do this, the flight crew can perform one of the following:

- To obtain the FMS computed value, enter any value other than "CLR" then clear it, or
- Directly enter the desired MIN DEST FOB value.

Then, the flight crew can activate the SEC flight plan.

**UNEXPECTED DECELERATE DISPLAYED ON MCDU
(AND "T/D REACHED" ON PFD) DURING CLIMB**

Ident.: DSC-22_20-100-30-00023137.0001001 / 04 JUN 19

Applicable to: MSN 02926-02944, 04392, 07784-07792

DESCRIPTION

In some cases, both of the following spurious messages are simultaneously displayed:

- DECELERATE on the MCDU scratchpad
- T/D REACHED on the PFD.

The messages are displayed:

- During climb, or
- At acceleration altitude.

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This misbehavior has no impact on the guidance of the aircraft.

OCCURRENCE CONDITIONS

This misbehavior occurs when, during cockpit preparation, all the following conditions apply:

- The FMS is fully initialized with predictions and FMS position is available, and
- A dual FMS reset (more than 5 s and less than 10 min) is performed and IRS are switched OFF, and
- FMS restarts while IRS are still OFF.

RECOMMENDATION

ON GROUND:

After FMS restart, enter any data in order to initiate a new profile computation (V2 speed, Cost Index, CRZ FL, ZFW, etc). This new profile computation restores normal FMS behavior.

IN FLIGHT:

During CLIMB or at acceleration altitude, disregard both of the following spurious messages: DECELERATE and T/D REACHED. Perform a DIR TO to the next waypoint, in order to force a new computation of the vertical path and restore normal FMS behavior.

MISSING OR INCORRECT INSERT UPLINK PROMPT ON UPLINK T.O DATA PAGE

Ident.: DSC-22_20-100-30-00023494.0001001 / 26 NOV 19

Applicable to: MSN 02926-02944, 04392, 07784-07792

DESCRIPTION

This misbehavior may occur when all of the following conditions are satisfied:

- The flight crew sends a T.O DATA REQUEST on MCDU UPLINK TO DATA page
- The AOC uplink provides the T.O DATA for multiple runways. The T.O DATA are inserted for the DEPARTURE RWY in the active FMS F-PLN
- A SEC F-PLN is created by pressing COPY ACTIVE on the SEC INDEX page
- The DEPARTURE RWY is modified in the SEC F-PLN and SEC F-PLN is activated.

In such situation either of the following may occur:

- The INSERT UPLINK* prompt is displayed on all UPLINK TO DATA pages, or
- The INSERT UPLINK* prompt is only displayed on the UPLINK TO DATA page for previous DEPARTURE RWY.

OPERATIONAL RECOMMENDATION

Subsequent to an AOC T.O DATA REQUEST, the flight crew must crosscheck the T.O DATA to be inserted. The flight crew must check that the T.O DATA is consistent with the T.O RWY before they select the prompt INSERT UPLINK*.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT MANAGEMENT

 TEMPORARY ABNORMAL BEHAVIORS - FMS2
 THALES TEMPORARY ABNORMAL BEHAVIORS

If the prompt INSERT UPLINK* is not displayed on the UPLINK T.O DATA page of the selected T.O RWY (received by AOC), the flight crew must initiate a new T.O DATA REQUEST.

FMS RESET UPON CROSSING THE 180TH MERIDIAN

Ident.: DSC-22_20-100-30-00023697.0001001 / 26 NOV 19

Applicable to: MSN 02926-02944, 04392, 07784-07792

DESCRIPTION

A single or a dual FMS reset with automatic recovery may occur when the aircraft crosses the 180th meridian (longitude 180 °).

- A reversion to basic modes (HDG/V/S or TRK/FPA) occurs if the FM1 (FM2) resets while AP1 (AP2) is engaged.

While the reset occurs:

- The ND of the resetting side displays "MAP NOT AVAIL"
- The FMS of the resetting side reverts to the MCDU MENU page
- The Autotuning of Nav aids (VOR, DME, ADF ) is lost on the resetting side

OPERATIONAL RECOMMENDATION

In order to anticipate a possible FMS reset, the flight crew should monitor the crossing of the 180th meridian, using for example the FIX INFO page of the FMS.

**DUAL FMS RESET WITH LOSS OF DATA UPON
DIR TO/ABEAM INSERTION WITH 3 STEP ALTS**

Ident.: DSC-22_20-100-30-00023710.0001001 / 26 NOV 19

Applicable to: MSN 02926-02944, 04392, 07784-07792

DESCRIPTION

A dual FMS reset with automatic recovery may occur at DIR TO/ABEAM insertion when all the following conditions are met:

- The TO waypoint of the DIR TO/ABEAM does not belong to the flight plan
- There are at least 3 STEP ALTS defined in the flight plan
- The direct leg contains at least one waypoint with a STEP ALT.

The insertion is unsuccessful. After the reset, the DIR TO TMPY F-PLN remains displayed on FMS and ND.

If the DIR TO/ABEAM insertion is attempted 4 times within 3 min, all the FMS data are lost (*Refer to DSC-22_20-40-10 Automatic FMGC Reset and Resynchronization - Dual Reset with Loss of Data and Autorecovery*).

OPERATIONAL RECOMMENDATION

When there are 3 step altitudes in the STEP ALTS page of the FMS, do not use the DIR TO/ABEAM to a waypoint located outside of the flight plan. Instead, use the DIR TO or the DIR TO/INCPT.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

TEMPORARY ABNORMAL BEHAVIORS - FMS2

THALES TEMPORARY ABNORMAL BEHAVIORS

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AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT GUIDANCE

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DSC-22_30-10 General

General.....	A
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DSC-22_30-20 Flight Director
DSC-22_30-20-10 General

General.....	A
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DSC-22_30-20-20 FD Engagement

Manual Engagement.....	A
Automatic Engagement.....	B
Engagement Annunciation.....	C

DSC-22_30-20-30 FD Symbology - Display

FD Symbology - Display.....	A
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DSC-22_30-20-40 FD Symbology - Non Display

FD Symbology - Non Display.....	A
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DSC-22_30-20-50 FD Disengagement

General.....	A
Manual Disengagement.....	B
Automatic Disengagement.....	C
Disengagement Annunciation.....	D

DSC-22_30-20-60 FD Warnings

FD Bars Flashing.....	A
FD Flag.....	B

DSC-22_30-30 Autopilot
DSC-22_30-30-10 General

General.....	A
--------------	---

DSC-22_30-30-20 AP Engagement

Introduction.....	A
Engagement Conditions.....	B
Engagement Annunciation.....	C

DSC-22_30-30-30 AP Disengagement

Manual Disengagement.....	A
Automatic Disengagement.....	B
Disengagement Annunciations and Warnings.....	C

Continued on the following page

Continued from the previous page

DSC-22_30-40 AP/FD Modes

DSC-22_30-40-10 General

Introduction.....	A
AP/FD Lateral Modes.....	B
AP/FD Vertical Modes.....	C
AP/FD Common Modes.....	D
AP/FD Mode Status and Display.....	E

DSC-22_30-40-20 Takeoff

DSC-22_30-40-20-10 General

General.....	A
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DSC-22_30-40-20-20 SRS TO Mode

General.....	A
Engagement Conditions.....	B
Disengagement Conditions.....	C

DSC-22_30-40-20-30 RWY Mode

General.....	A
Engagement Conditions.....	B
Disengagement Conditions.....	C

DSC-22_30-40-20-40 RWY TRK Mode

General.....	A
Engagement Conditions.....	B
Disengagement Conditions.....	C

DSC-22_30-40-30 Lateral Guidance from Takeoff to Descent

DSC-22_30-40-30-10 HDG/TRACK Mode

General.....	A
Engagement Conditions.....	B
HDG-V/S / TRK-FPA Selection.....	C
HDG/TRK Preset.....	D
Disengagement Conditions.....	E
Synchronize the HDG/TRK Window of the FCU.....	F

Continued on the following page

Continued from the previous page

DSC-22_30-40-30-20 NAV Mode

General.....	A
Arming Conditions.....	B
Disarming Conditions.....	C
Engagement Conditions.....	D
Disengagement Conditions.....	E
Interactions with Vertical Modes.....	F

DSC-22_30-40-40 Climb

DSC-22_30-40-40-10 OP CLB Mode

General.....	A
Arming Conditions.....	B
Disarming Conditions.....	C
Engagement Conditions.....	D
OP CLB Association with Altitude Modes.....	E
Disengagement Conditions.....	F

DSC-22_30-40-40-20 CLB Mode

General.....	A
Arming Conditions.....	B
Disarming Conditions.....	C
Engagement Conditions.....	D
CLB Association with Altitude Modes.....	E
Disengagement Conditions.....	F

DSC-22_30-40-40-30 EXP CLB Mode

General.....	A
Engagement Conditions.....	B
Disengagement Conditions.....	C

DSC-22_30-40-50 Altitude

DSC-22_30-40-50-10 ALT

General.....	A
ALT Arming Conditions.....	B
ALT Disarming Conditions.....	C
ALT* Engagement Conditions.....	D
ALT* Disengagement Conditions.....	E
ALT Engagement Conditions.....	F
ALT Disengagement Conditions.....	G

Continued on the following page

Continued from the previous page

DSC-22_30-40-50-20 ALT CST

General.....	A
ALT CST Arming Conditions.....	B
ALT CST Disarming Conditions.....	C
ALT CST* Engagement Conditions.....	D
ALT CST* Disengagement Conditions.....	E
ALT CST Engagement Conditions.....	F
ALT CST Disengagement Conditions.....	G

DSC-22_30-40-50-30 ALT CRZ

General.....	A
ALT CRZ Arming conditions.....	B
ALT CRZ Disarming Conditions.....	C
ALT CRZ* Engagement Conditions.....	D
ALT CRZ* Disengagement Conditions.....	E
ALT CRZ Engagement Conditions.....	F
ALT CRZ Disengagement Conditions.....	G

DSC-22_30-40-60 Descent

DSC-22_30-40-60-10 General

General.....	A
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DSC-22_30-40-60-20 OP DES Mode

General.....	A
Engagement Conditions.....	B
Disengagement Conditions.....	C

DSC-22_30-40-60-30 DES Mode

General.....	A
Arming Conditions.....	B
Disarming Conditions.....	C
Engagement Conditions.....	D
Disengagement Conditions.....	E
Guidance in DES Mode.....	F
DES Mode Profile.....	G

DSC-22_30-40-60-40 EXP DES Mode

General.....	A
Engagement Conditions.....	B
Disengagement Conditions.....	C

Continued on the following page

Continued from the previous page

DSC-22_30-40-70 V/S / FPA Mode

General.....	A
Engagement Conditions.....	B
Disengagement Conditions.....	C

DSC-22_30-40-80 Approach Modes and Landing Modes

DSC-22_30-40-80-00 General

General.....	A
ILS/GLS (If Installed)/SLS (If Installed) Guidance Mode.....	B
FINAL APP Guidance Mode.....	C

DSC-22_30-40-80-10 LOC Mode

General.....	A
LOC Arming Conditions.....	B
LOC Disarming Conditions.....	C
LOC* Engagement Conditions.....	D
LOC* Disengagement Conditions.....	E
LOC Engagement Conditions.....	F
LOC Disengagement Conditions.....	G

DSC-22_30-40-80-20 G/S Mode

General.....	A
G/S Arming Conditions.....	B
G/S Disarming Conditions.....	C
G/S* Engagement Conditions.....	D
G/S* Disengagement Conditions.....	E
G/S Engagement Conditions.....	F
G/S Disengagement Conditions.....	G

DSC-22_30-40-80-30 LAND Mode

General.....	A
Engagement Conditions.....	B
Disengagement Conditions.....	C

DSC-22_30-40-80-40 FLARE Mode

General.....	A
Engagement Conditions.....	B
Disengagement Conditions.....	C

Continued on the following page

Continued from the previous page

DSC-22_30-40-80-50 ROLL OUT Mode

General.....	A
Engagement Conditions.....	B
Disengagement Conditions.....	C

DSC-22_30-40-80-80 LOC B/C Mode

General.....	A
LOC B/C Arming Conditions.....	B
LOC B/C Disarming Conditions.....	C
LOC B/C* Engagement Conditions.....	D
LOC B/C* Disengagement Conditions.....	E
LOC B/C Engagement Conditions.....	F
LOC B/C Disengagement Conditions.....	G

DSC-22_30-40-80-90 FINAL APP Mode

General.....	A
APP NAV and FINAL Arming Conditions.....	B
APP NAV and FINAL Disarming Conditions.....	C
APP NAV Engagement Conditions.....	D
APP NAV Disengagement Conditions.....	E
FINAL APP Engagement Conditions.....	F
FINAL APP Disengagement Conditions.....	G

DSC-22_30-40-90 Go-Around

DSC-22_30-40-90-10 General

General.....	A
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DSC-22_30-40-90-20 SRS GA Mode

General.....	A
Engagement Conditions.....	B
Disengagement Conditions.....	C

DSC-22_30-40-90-30 GA TRK Mode

General.....	A
Engagement Conditions.....	B
Disengagement Conditions.....	C

Continued on the following page

Continued from the previous page
DSC-22_30-40-100 AP/FD TCAS Mode

General.....	A
AP/FD TCAS Mode Availability.....	B
Arming Conditions.....	C
Disarming Conditions.....	D
Engagement Conditions.....	E
Disengagement Conditions.....	F
Normal Operations - When a TA is triggered.....	G
Normal Operations - When a RA is triggered.....	H
Normal Operations - When Clear of Conflict.....	I

DSC-22_30-40-110 AP/FD Mode Reversions

AP/FD Mode Reversions.....	A
----------------------------	---

DSC-22_30-40-120 Scenario Examples
DSC-22_30-40-120-20 Takeoff

Takeoff with NAV.....	A
Takeoff with HDG/TRK Preset.....	B

DSC-22_30-40-120-30 Climb with OP CLB Mode

At the Acceleration Altitude.....	A
The Flight Crew Pulls the ALT Knob.....	B
NAV Disengages.....	C

DSC-22_30-40-120-40 Climb with CLB Mode

At the Acceleration Altitude.....	A
Climbing toward an Altitude Constraint.....	B

DSC-22_30-40-120-50 Altitude with ALT

CLB and ALT - Example 1.....	A
CLB and ALT - Example 2.....	B
OP CLB and ALT.....	C
ALT in Descent with TCAS TA.....	D

DSC-22_30-40-120-60 Altitude with ALT CST

CLB and ALT CST.....	A
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DSC-22_30-40-120-70 Altitude with ALT CRZ

CLB and ALT CRZ.....	A
OP CLB and ALT CRZ.....	B
ALT CRZ with TCAS TA.....	C

Continued on the following page

*Continued from the previous page***DSC-22_30-40-120-80 Approach and Landing**

ILS Approach and Autoland	A
VOR Approach Flown with FINAL APP Guidance Mode.....	B

DSC-22_30-50 Autothrust**DSC-22_30-50-10 General**

General.....	A
--------------	---

DSC-22_30-50-20 Thrust Levers

Thrust Levers.....	A
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DSC-22_30-50-30 A/THR Arming and Activation

Preliminary Conditions required for A/THR Arming and Activation.....	A
A/THR Arming.....	B
A/THR Activation.....	C

DSC-22_30-50-40 A/THR Disconnection

A/THR Disconnection.....	A
A/THR Annunciation and Warnings.....	B

DSC-22_30-50-50 A/THR Modes

General.....	A
THRUST mode.....	B
Speed/Mach Mode.....	C
RETARD mode.....	D
A/THR Mode Reversions.....	E
ALPHA FLOOR.....	F

DSC-22_30-50-60 Scenario Examples

From Takeoff to Thrust Reduction Altitude.....	A
--	---

DSC-22_30-60 Speed/MACH Control**DSC-22_30-60-10 General**

General.....	A
--------------	---

DSC-22_30-60-20 Managed Speed/Mach

General.....	A
Engagement Conditions.....	B
Managed Speed/Mach Target.....	C
Ground Speed Mini Function.....	D
Disengagement Conditions.....	E

Continued on the following page

Continued from the previous page

DSC-22_30-60-30 Selected Speed/Mach

General.....	A
Engagement Conditions.....	B
Disengagement Conditions.....	C

DSC-22_30-60-40 Speed/MACH FCU Window Synchronization

Speed/MACH FCU Window Synchronization.....	A
--	---

DSC-22_30-60-50 Speed/Mach Switching

Speed/MACH Switching.....	A
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DSC-22_30-70 Approach and Landing Capability

General.....	A
Fail Concept.....	B
Display.....	C

DSC-22_30-80 Controls and Indicators

¹ DSC-22_30-80-10 Autoland Light

Autoland Warning Light.....	A
-----------------------------	---

DSC-22_30-80-20 FMA

FMA Display.....	A
-FD2.....	B
1FD-.....	C
1FD2.....	D
A.FLOOR.....	E
ALT (armed).....	F
ALT (engaged).....	G
ALT*.....	H
ALT CRZ (armed).....	I
ALT CRZ (engaged).....	J
ALT CRZ*.....	K
ALT CST (armed).....	L
ALT CST (engaged).....	M
ALT CST*.....	N
AP1.....	O
AP1+2.....	P
AP2.....	Q
APP NAV (armed).....	R
APP NAV (engaged).....	S
APPR1 (SLS ).....	T

Continued on the following page

Continued from the previous page

A/THR (activated).....	U
A/THR (armed).....	V
AUTO LAND (GLS ).....	W
BARO XXXXX.....	X
BRK LO (armed).....	Y
BRK LO (activated).....	Z
BRK MAX (activated).....	AA
BRK MAX (armed) on Line 3.....	AB
BRK MED (armed).....	AC
BRK MED (activated).....	AD
CAT1.....	AE
CAT2.....	AF
CAT3 DUAL.....	AG
CAT3 SINGLE.....	AH
CHECK APPR SELECTION.....	AI
CHECK SPEED MODE.....	AJ
CLB (armed)	AK
CLB (engaged).....	AL
DES (armed).....	AM
DES (engaged).....	AN
DISCONNECT AP FOR LDG.....	AO
EXP CLB.....	AP
EXP DES.....	AQ
FINAL (armed)	AR
FINAL APP.....	AS
FLARE.....	AT
FOR GA: SET TOGA.....	AU
FPA.....	AV
GA TRK.....	AW
G/S (armed)	AX
G/S (engaged).....	AY
G/S*	AZ
HDG.....	BA
LAND.....	BB
LOC (armed).....	BC
LOC (engaged).....	BD
LOC*.....	BE
LOC B/C (armed).....	BF
LOC B/C (engaged).....	BG
LOC B/C*.....	BH

Continued on the following page

Continued from the previous page

LVR ASYM.....	BI
LVR CLB.....	BJ
LVR MCT.....	BK
LVR TOGA.....	BL
MACH.....	BM
MACH SEL: XX.....	BN
MANFLX XX.....	BO
MANMCT.....	BP
MAN PITCH TRIM ONLY.....	BQ
MANTHR.....	BR
MANTOGA.....	BS
MORE DRAG.....	BT
NAV (armed).....	BU
NAV (engaged).....	BV
NO DH.....	BW
OP CLB (armed).....	BX
OP CLB (engaged).....	BY
OP DES.....	BZ
RADIO XXX	CA
ROLL OUT.....	CB
RWY.....	CC
RWY TRK.....	CD
SET GREEN DOT SPEED.....	CE
SET HOLD SPEED.....	CF
SPEED.....	CG
SPEED SEL:XXX.....	CH
SRS.....	CI
TCAS (armed).....	CJ
TCAS (engaged).....	CK
TCAS RA INHIBITED.....	CL
T/D REACHED.....	CM
THR CLB.....	CN
THR IDLE.....	CO
THR LK.....	CP
THR LVR.....	CQ

Continued on the following page

Continued from the previous page

THR MCT.....	CR
TOGA LK.....	CS
TRACK.....	CT
TRK FPA DESELECTED.....	CU
USE MAN PITCH TRIM.....	CV
V/S.....	CW

DSC-22_30-110 Temporary Abnormal Behaviors

Misbehaviour of the Enhanced LOC Capture Function.....	A
Unexpected G/S mode armed.....	B
Left Turn Not Expected while in HDG or TRK Mode.....	C
Spurious CAT 2 INOP.....	D

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT GUIDANCE PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS
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Localization Title	Toc Index	ID	Reason
DSC-22_30-PLP-TOC Autoland Light		1	Documentation update: Deletion of "Autoland Warning Light (00012386.0003001)".
DSC-22_30-30-20 Engagement of both APs	B	1	Update of the content to clarify the engagement condition of the second AP.
DSC-22_30-40-80-20 G/S Disengagement Conditions	G	1	Addition of a disengagement condition for the case of the approach and landing capability APPR1
DSC-22_30-40-110 Speed Protection when FD Orders not followed	A	1	Correction of the lower speed threshold for FD bars disappearance with speedbrakes to reflect the behavior of the system.
DSC-22_30-60-20 Managed Speed/Mach Target	C	1	DU link updated. No technical change.
DSC-22_30-80-10 Autoland Warning Light	A	1	Documentation update: Addition of "Autoland Warning Light" documentary unit
DSC-22_30-80-20 MANTHR	BR	1	Removal of the "All thrust levers are below CL detent" condition to be in accordance with the system behavior.
			Documentation update: Deletion of text.
			Layout modification. No technical change.

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GENERAL

Ident.: DSC-22_30-10-00025187.0001001 / 18 MAY 22

Applicable to: ALL

The Flight Guidance (FG) provides the following functions:

- The Flight Director (FD)
- The Autopilot (AP)
- The Autothrust (A/THR).

The FG operates by using the following modes:

- AP/FD lateral modes to control the lateral trajectory
- AP/FD vertical modes to control the vertical trajectory, or the speed or Mach
- A/THR modes to control the speed or Mach, or the thrust.

Speed or Mach cannot be simultaneously controlled by the AP/FD and the A/THR.

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT GUIDANCE FLIGHT DIRECTOR - GENERAL
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GENERAL

Ident.: DSC-22_30-20-10-00025400.0001001 / 18 MAY 22

Applicable to: ALL

The FD displays guidance orders on the PFD:

- If no AP is engaged, the flight crew can manually fly the aircraft by following FD orders, or
- If at least one AP is engaged, the flight crew can use the FD to monitor the FG.

There are two FDs referred to as FD1 and FD2. In normal operation:

- PFD1 displays FD1 guidance orders, computed by FMGC1
- PFD2 displays FD2 guidance orders, computed by FMGC2.

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AIRCRAFT SYSTEMS**AUTO FLIGHT - FLIGHT GUIDANCE**

FLIGHT DIRECTOR - FD ENGAGEMENT

MANUAL ENGAGEMENT

Ident.: DSC-22_30-20-20-00025401.0001001 / 04 MAY 23

Applicable to: ALL

The flight crew manually engages the onside FD by pressing the onside FD pb.

Note: If the flight crew did not previously engage any AP or FD, then **HDG** or **TRACK**, and **V/S** or **FPA** engage. The FD symbol flashes for 10 s.

AUTOMATIC ENGAGEMENT**Applicable to: ALL**

Ident.: DSC-22_30-20-20-A-00025402.0001001 / 18 MAY 22

ON GROUND

FD1 and FD2 automatically engage at aircraft power-up.

IN FLIGHT

FD1 and FD2 automatically engage in flight, if:

- The flight crew engages the **SRS** GA mode, or
- The AP/FD **TCAS**  mode engages upon a RA.

Ident.: DSC-22_30-20-20-A-00025403.0001001 / 18 MAY 22

Note: On **SRS** engagement, if the flight crew previously selected the FPV/FPD display, the FD symbol reverts to vertical and horizontal bars.

ENGAGEMENT ANNUNCIATION

Ident.: DSC-22_30-20-20-00025404.0001001 / 18 MAY 22

Applicable to: ALL

If FD1 and/or FD2 engages, all the following events occur:

- The associated FD pb on the FCU comes on
- The **xFDy** message appears in the "AP, FD, A/THR Engagement Status" column of both FMAs.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT GUIDANCE

FLIGHT DIRECTOR - FD ENGAGEMENT

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FD SYMBOLOGY - DISPLAY

Ident.: DSC-22_30-20-30-00025405.0001001 / 18 MAY 22

Applicable to: ALL

The pitch, roll, and yaw bars respectively indicate the pitch, roll, and yaw FD guidance orders.

Note: *Independently from FD display, the FPV can be displayed on the PFDs. The FPV does not indicate guidance orders.*

For definition and display conditions of the FPV, Refer to DSC-31-40 Flight Path Vector

When the FDs are engaged, the PFDs can display the pitch, roll, and yaw symbologies.

Refer to DSC-31-40 Guidance

DISPLAY CONDITIONS OF THE GUIDANCE SYMBOLOGY, WHEN THE FDS ARE ENGAGED:**FOR LATERAL GUIDANCE**

The PFD displays the roll bar when a lateral mode is engaged.

The PFD displays a yaw bar that replaces the roll bar in green below 30 ft radio height if a localizer signal is available during:

- Takeoff in **RWY** mode, or
- Landing in **FLARE** and **ROLL OUT** modes.

FOR VERTICAL GUIDANCE

The PFD displays the pitch bar after liftoff, when a vertical mode is engaged.

IN FLIGHT, IN TRK-FPA MODE

The FPD replaces both FD bars.

The FPD symbol shows the flight crew how to intercept and fly the vertical and lateral flight trajectory.

For more information about the FPD, *Refer to DSC-31-40 Guidance*

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT GUIDANCE

FLIGHT DIRECTOR - FD SYMBOLOGY - DISPLAY

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FD SYMBOLOGY - NON DISPLAY

Ident.: DSC-22_30-20-40-00025406.0001001 / 18 MAY 22

Applicable to: ALL

If the FDs are not engaged, the PFDs do not display the FD symbology.

The FD bars disappear, when one of the following occurs:

- The aircraft bank angle exceeds 45 °, or
- The aircraft pitch exceeds 25 ° up or 13 ° down.

The pitch bar disappears in **ROLL OUT**.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT GUIDANCE

FLIGHT DIRECTOR - FD SYMBOLOGY - NON DISPLAY

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GENERAL

Ident.: DSC-22_30-20-50-00025359.0001001 / 18 MAY 22

Applicable to: ALL

If all FDs disengage while no AP is engaged, all the following occur:

- The lateral and vertical modes disengage, and
- If engaged, the A/THR reverts to (or remains in) **SPEED** or **MACH** mode.

If all FDs disengage while at least one AP is engaged, all the following occur:

- The lateral and vertical modes remain engaged, and
- If engaged, the A/THR remains engaged in the current mode.

MANUAL DISENGAGEMENT

Ident.: DSC-22_30-20-50-00025360.0001001 / 18 MAY 22

Applicable to: ALL

The flight crew can manually press the onside FD pb to disengage the onside FD.

AUTOMATIC DISENGAGEMENT**Applicable to: ALL**

Ident.: DSC-22_30-20-50-A-00025362.0001001 / 18 MAY 22

The FD disengages if, in **ROLL OUT**, the difference between the aircraft track and the runway track is more than 20 °.

DUE TO FAILURES

The FD disengages if one of the following occurs:

- The FD becomes inoperative, or
- The FCU is not available, or
- All the engines fail.

Ident.: DSC-22_30-20-50-A-00025362.0001001 / 18 MAY 22

DUE TO SPEED PROTECTION

The FD disengages if no AP is engaged and the aircraft speed is either:

- below VLS in **DES** or **OP DES**, or
- above VMAX in **CLB** or **OP CLB**.

Note: After the FD disengages, the A/THR reverts to **SPEED** or **MACH** mode and adjusts the thrust to recover the target speed or keep the speed within the range from VLS to VMAX, if the target speed is out of this range.

AIRCRAFT SYSTEMS**AUTO FLIGHT - FLIGHT GUIDANCE**

FLIGHT DIRECTOR - FD DISENGAGEMENT

DISENGAGEMENT ANNUNCIATION

Ident.: DSC-22_30-20-50-00025363.0001001 / 18 MAY 22

Applicable to: ALL

If the flight crew disengages one FD, all the following occur:

- The corresponding FD pb goes off,
- The FD symbol no longer appears on the associated PFD,
- **1FD-** appears on the FMA if FD2 is disengaged or **-FD2** if FD1 is disengaged.

If one FD fails, all the following occur:

- All FD pb remain on,
- Both PFDs display the guidance orders from the remaining FD,
- **1FD1** appears on the FMA if FD2 fails, or **2FD2** if FD1 fails.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT GUIDANCE FLIGHT DIRECTOR - FD WARNINGS
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FD BARS FLASHING

Ident.: DSC-22_30-20-60-00025365.0001001 / 04 MAY 23

Applicable to: ALL

PITCH BAR

The pitch bar (or FPV) flashes for 10 s and remains steady, if one of the following occurs:

- An automatic reversion to **V/S** (or **FPA**) mode occurs, or
- All APs and FDs are previously disengaged and the flight crew engages the FD.

The pitch bar (or FPV) flashes, if, during approach, the MMR is not able to compute the vertical deviation above 100 ft RA.

ROLL BAR

The roll bar (or FPV) flashes for 10 s and remains steady, if one of the following occurs:

- An automatic reversion to **HDG** (or **TRACK**) mode occurs, or
- All APs and FDs are previously disengaged and the flight crew engages the FD.

The roll bar (or FPV) flashes if, during approach, the MMR is not able to compute the lateral deviation above 15 ft RA.

FD FLAG

Ident.: DSC-22_30-20-60-00025366.0001001 / 18 MAY 22

Applicable to: ALL

If the guidance orders are not available while the FD is engaged, a **FD** flag appears on the PFD and the FD bars disappear.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT GUIDANCE

FLIGHT DIRECTOR - FD WARNINGS

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT GUIDANCE AUTOPILOT - GENERAL
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GENERAL

Ident.: DSC-22_30-30-10-00025195.0001001 / 18 MAY 22

Applicable to: ALL

The AP:

- Stabilizes the aircraft around its center of gravity
- Controls the lateral trajectory
- Controls the vertical trajectory, or speed/Mach
- Coordinates with the A/THR
- Performs the automatic landing, or the go-around.

The AP generates:

- Pitch, roll, and yaw orders
- The nosewheel angle.

There are two APs: AP1 and AP2.

AP1 uses system data displayed on PFD1, and AP2 uses system data displayed on PFD2.

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INTRODUCTION

Ident.: DSC-22_30-30-20-00025196.0001001 / 04 MAY 23

Applicable to: ALL

When an AP engages, the sidesticks are locked in the neutral position, and the force to move the rudder pedals increases. However, the flight crew can always disengage the APs and the locking devices.

The APs engage with the same guidance mode previously used by the FD.

If the FDs were not previously engaged, the AP engages in **HDG** or **TRACK**, and **V/S** or **FPA**.

L2 The APs are available in normal and alternate law, only.

ENGAGEMENT CONDITIONS**Applicable to: ALL**

Ident.: DSC-22_30-30-20-A-00025197.0001001 / 18 MAY 22

ENGAGEMENT OF ONE AP

One AP engages when the flight crew presses the AP1 pb or the AP2 pb on the FCU, and the aircraft is in flight for more than 5 s.

In BACK-UP NAV, the AP engages in selected modes if the FG part is available.

The AP engages only if the aircraft pitch, bank angle, and speed are within an acceptable range.

Ident.: DSC-22_30-30-20-A-00025198.0001001 / 06 NOV 25

1 ENGAGEMENT OF BOTH APS

When one AP is engaged, the flight crew can press the second AP pb to engage the second AP.

However, the second AP can engage only when one of the following conditions is applicable:

- The following approach modes are armed or engaged:
 - **LOC** is armed, or **LOC*** or **LOC** is engaged, and
 - **G/S** is armed, or **G/S*** or **G/S** is engaged
- Go-around is engaged.

When both APs are engaged, AP1 is active, and AP2 is on standby, regardless of the order of AP engagement.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT GUIDANCE

AUTOPILOT - AP ENGAGEMENT**ENGAGEMENT ANNUNCIATION**

Ident.: DSC-22_30-30-20-00025199.0001001 / 18 MAY 22

Applicable to: ALL

When AP1(2) engages, all the following events occur:

- The associated AP1(2) pb on the FCU comes on
- Both FMAs display:
 - AP1 (AP2)
 - AP1+2, if both APs are engaged.

MANUAL DISENGAGEMENT**Applicable to: ALL**

Ident.: DSC-22_30-30-30-A-00025200.0001001 / 18 MAY 22

The APs disengages if one of the following occurs:

- The flight crew presses the takeover pb on the sidestick, or
- The flight crew presses the AP1(2) pb on the FCU, or
- The flight crew moves the pitch trim wheel beyond a certain threshold, or
- The flight crew moves a sidestick above a specific threshold, or

Ident.: DSC-22_30-30-30-A-00025201.0001001 / 18 MAY 22

- The flight crew moves the rudder pedals above a specific threshold, or

Ident.: DSC-22_30-30-30-A-00025202.0001001 / 18 MAY 22

- On ground, the flight crew sets all the thrust levers above the MCT detent.

Airbus recommends to press the sidestick pb two times to disengage both APs.

 One time to disengage the APs, the second time to clear the associated **AP OFF** alert.

 The other ways of disengagement are to be avoided. In particular, the disengagement of the APs with the sidestick, or the rudder pedal deflection is very uncomfortable for passengers.

AUTOMATIC DISENGAGEMENT

AUTOMATIC DISENGAGEMENT 1

Ident.: DSC-22_30-30-30-B-00025203.0002001 / 06 NOV 23

Applicable to: MSN 02155-03060, 05152-07792

The APs automatically disengage if one of the engagement conditions is lost.

Ident.: DSC-22_30-30-30-B-00025203.0001001 / 18 MAY 22

Applicable to: MSN 04392

The APs automatically disengage, if one of the following occurs:

- One of the engagement conditions is lost, or

Ident.: DSC-22_30-30-30-B-00025204.0002001 / 06 NOV 23

Applicable to: MSN 04392

- During an approach with **FINAL APP** mode engaged, the aircraft reaches the MAP.

Ident.: DSC-22_30-30-30-B-00025205.0001001 / 13 MAY 25

Applicable to: ALL

In addition, in normal law with all protections available, the APs will disengage when:

- High speed protection activates, or
- Angle-of-attack protection activates, or
- Pitch attitude exceeds 25 ° up, or 13 ° down, or bank angle exceeds 45 °.

When the AP is OFF, the associated FCU pb goes off, and **AP1** (**AP2**) disappears from the FMA.

DISENGAGEMENT ANNUNCIATIONS AND WARNINGS

Ident.: DSC-22_30-30-30-00025206.0001001 / 04 MAY 23

Applicable to: ALL

When AP1(2) disengages, all the following events occur:

- The associated AP1(2) pb on the FCU goes off
- On both FMAs, the **AP 1** (**AP 2**) message disappears.

DISCONNECTION VIA THE takeover pb

The normal way to disconnect the AP is to press the takeover pb two times.

When the flight crew presses the takeover pb for the first time, the following warnings are triggered, and will continue, until the flight crew presses the takeover pb a second time:

- The **AP OFF** memo appears on the E/WD
- A cavalry charge audio indicator sounds
- The MASTER WARN light comes on.

When the flight crew presses the takeover pb the second time or the MASTER WARN light, all the above warnings are cleared.

If the flight crew does not quickly press the takeover pb a second time, the following additional warnings will trigger:

- The cavalry charge audio indicators sounds
- The **AUTO FLT AP OFF** alert is displayed on the E/WD.

When the flight crew presses the MASTER WARN light, or the takeover pb a second time, the cavalry charge audio indicator stops and the memos disappear, but the **AUTO FLT AP OFF** remains displayed.

OTHER WAYS OF DISCONNECTION

If the AP disengages, without any flight crew action on the takeover pb, the following warnings will trigger:

- A cavalry charge audio indicator sounds
- The **AUTO FLT AP OFF** alert is displayed on the E/WD.

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT GUIDANCE AUTOPILOT - AP DISENGAGEMENT
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When the flight crew presses the MASTER WARN light, or the takeover pb (one time), the cavalry charge stops and the memo disappears, but the alert remains displayed.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT GUIDANCE

AUTOPILOT - AP DISENGAGEMENT

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT GUIDANCE AP/FD MODES - GENERAL
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INTRODUCTION

Ident.: DSC-22_30-40-10-00025207.0001001 / 18 MAY 22

Applicable to: ALL

The AP/FD modes are either lateral, vertical, or common.

Two types of AP/FD modes are available in order to guide the aircraft:

- Managed modes: when the aircraft is using managed targets, the FMGS guides the aircraft along lateral and vertical flight paths and speed profiles computed by the FM from data in the MCDU. FM manages the guidance targets.
- Selected modes: when the flight crew is using selected targets, the FMGS guides the aircraft along lateral and vertical flight paths and speed profiles to meet targets that the flight crew has selected manually on the FCU. The flight crew selects the guidance targets.

AP/FD LATERAL MODES

Applicable to: ALL

MODE	TYPE	GUIDANCE	REMARK
RWY	MANAGED	Runway mode Mode used at takeoff to guide the aircraft along the runway center line using LOC.	Triggered by the thrust levers at FLX or TOGA position.
RWY TRK	MANAGED	Runway Track mode Mode used to guide the aircraft along the track the aircraft was following at the mode engagement.	
HDG, TRACK	SELECTED	Heading mode, Track mode Mode used to guide the aircraft on a heading or a track selected by the flight crew. The target value is displayed in the FCU window.	<u>Note:</u> HDG, TRACK are called "basic modes" because they are back up modes for certain situations: - F-PLN discontinuity entry - AP engagement with no FD - Loss of F-PLN - MCDU BACK UP NAV 
NAV	MANAGED	Navigation mode Mode used to guide the aircraft along the lateral F-PLN. Available above 30 ft after takeoff.	Automatically armed at takeoff unless HDG, TRK is preset. In that case RWY TRK engages after takeoff.
LOC* LOC	MANAGED	Localizer capture mode Localizer track mode Mode used to guide the aircraft on the lateral approach path (LOC approach path).	Selected by pressing APPR pb or LOC pb on the FCU.
F-LOC*  F-LOC 	MANAGED	Flight Management Landing System Localizer capture mode Localizer track mode Mode used to guide the aircraft on the lateral approach path (F-PLN approach path).	Selected by pressing APPR pb or LOC pb on the FCU.
LOC B/C*  LOC B/C 	MANAGED	Localizer Back Course capture mode Localizer Back Course track mode Mode used to guide the aircraft on the back beam of a localizer.	Selected by LAT REV at destination. Activated by pressing the LOC pb on the FCU.
GA TRK	MANAGED	Go-Around track mode Mode used to guide the aircraft along the track the aircraft was following at the mode engagement.	Triggered by the thrust levers at TOGA with Slats/Flaps in at least CONF 1.

Continued on the following page

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT GUIDANCE AP/FD MODES - GENERAL
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Continued from the previous page

MODE	TYPE	GUIDANCE	REMARK
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Ident.: DSC-22_30-40-10-A-00025215.0001001 / 18 MAY 22

APP NAV	MANAGED	Approach Nav mode Mode used to guide the aircraft on the lateral approach path.	Selected by pressing APPR pb on the FCU; the mode that engages depends upon the selected approach in the F-PLN.
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AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT GUIDANCE

AP/FD MODES - GENERAL

AP/FD VERTICAL MODES

Applicable to: ALL

MODE	TYPE	GUIDANCE	REMARK
SRS	MANAGED	Speed Reference System mode Mode used at takeoff, or go-around to maintain SRS speed (V2, V2+10, VAPP...).	Triggered by the thrust levers at FLX or TOGA position. Automatically disengages at ACCEL ALT, or when another VERT mode is engaged.
OP CLB	SELECTED	Open Climb mode Mode used to climb directly to the FCU selected altitude. These modes disregard all ALT CST. The A/THR is in THRUST mode (CLB).	The speed target may either be selected or managed. ALT mode is systematically armed. Altitude target is blue on the PFD.
CLB	MANAGED	Climb mode Mode used to climb towards FCU selected altitude along VERT F-PLN taking into account ALT CST. Available, only if NAV mode engaged. The A/THR is in THRUST mode (CLB).	The speed target may either be selected or managed. If managed, SPD CST, SPD LIM, and HOLD SPD are taken into account. ALT mode is always armed, and the FMA displays: - ALT CST if the next level off is predicted at an ALT CST, or - ALT if the next level off is predicted at the FCU selected altitude.
EXP CLB 	SELECTED	This mode is used to increase the vertical speed by selecting Green Dot speed in climb.	Used to expedite a climb towards a specific flight level.
ALT* ALT	SELECTED	Altitude acquire mode Altitude hold mode Mode used to maintain a level flight at the FCU selected altitude.	
ALT CST* ALT CST	MANAGED	Altitude Constraint capture mode Altitude Constraint hold mode Mode automatically engaged when reaching an ALT CST before the FCU selected altitude.	CLB/DES mode are systematically armed.
ALT CRZ* ALT CRZ	SELECTED	Altitude capture of the cruise flight level Altitude hold of the cruise flight level Mode used to maintain the cruise level flight.	Soft ALT mode engages when FCU selected altitude = CRZ FL. Soft ALT mode is part of the managed guidance.

Continued on the following page

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT GUIDANCE AP/FD MODES - GENERAL
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Continued from the previous page

MODE	TYPE	GUIDANCE	REMARK
OP DES	SELECTED	Open Descent mode Mode used to descend directly to the FCU selected altitude. These modes disregard all ALT CST. The A/THR is in THRUST mode (IDLE).	The speed target may either be selected or managed. ALT mode is systematically armed. Altitude target is blue on the PFD.
DES	MANAGED	Descent mode Mode used to descend towards FCU selected altitude along the computed descent path, taking into account ALT CST. Available, only if NAV mode engaged. The A/THR may be in THRUST, or SPD mode.	The speed target may either be selected or managed. If managed, SPD CST, SPD LIM, and HOLD SPD are taken into account. ALT mode is always armed, and the FMA displays: - ALT CST if the next level off is predicted at an ALT CST, or - ALT if the next level off is predicted at the FCU selected altitude.
EXP DES 	SELECTED	This mode is used to increase the vertical speed by selecting 0.80/340 kt in descent.	Used to expedite a descent towards a specific flight level.
V/S, FPA	SELECTED	Vertical Speed mode, Flight Path Angle mode Mode used to guide the aircraft by a vertical speed, or a selected flight path angle.	Altitude target is blue on PFD. V/S-FPA is a basic mode.
G/S* G/S	MANAGED	Glide Slope capture mode Glide Slope track mode Mode used to guide the aircraft along the final approach path (ILS/GLS  /SLS  (RNAV(GNSS) approach with LPV minima guidance mode).	Selected by pressing APPR pb on the FCU.
F-G/S*  F-G/S 	MANAGED	Flight Landing System Glide Slope capture mode Flight Landing System Glide Slope track mode Mode used to guide the aircraft along the final approach path (FLS  approach).	Selected by pressing APPR pb on the FCU.

Continued on the following page

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT GUIDANCE

AP/FD MODES - GENERAL

Continued from the previous page

MODE	TYPE	GUIDANCE	REMARK
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Ident.: DSC-22_30-40-10-B-00025224.0001001 / 18 MAY 22

FINAL	MANAGED	Final mode Mode used to guide the aircraft along the final approach path (non precision approach)	Selected by pressing the FCU's APPR pb. The mode engaged depends upon the selected approach in the F-PLN. Linked to APPR common mode (APPR pb).
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Ident.: DSC-22_30-40-10-B-00025225.0001001 / 18 MAY 22

AP/FD TCAS 	MANAGED	Mode used to guide the A/C in the case of TCAS RA	Automatically engaged when a RA is triggered.
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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT GUIDANCE AP/FD MODES - GENERAL
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AP/FD COMMON MODES

Applicable to: ALL

MODE	TYPE	GUIDANCE	REMARK
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Ident.: DSC-22_30-40-10-C-00025227.0001001 / 18 MAY 22

LAND	MANAGED	Land mode Common mode engaged below 400 ft RA during an automatic ILS/GLS S /SLS S (RNAV(GNSS) approach with LPV minima guidance mode) approach.	Engaged only if LOC mode and G/S mode are already engaged.
FLARE	MANAGED	Flare mode Common mode which provides alignment to the runway centerline on the yaw axis, and flare on the pitch axis.	Engaged below 60 ft RA, based on the current vertical speed.
ROLL OUT	MANAGED	Roll Out mode Mode used to guide the aircraft on the runway following an automatic landing.	FD roll out symbol is displayed on PFD at touch down.

Ident.: DSC-22_30-40-10-C-00025237.0001001 / 18 MAY 22

FINAL APP	MANAGED	Final Approach mode Common mode including APP NAV and FINAL modes during non-precision approach.	Engaged only if APP- NAV mode and FINAL mode are already armed.
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AP/FD MODE STATUS AND DISPLAY

Ident.: DSC-22_30-40-10-00025226.0001001 / 18 MAY 22

Applicable to: ALL

AP/FD MODE STATUS

An AP/FD lateral or vertical mode can be armed, engaged, or disengaged.

An AP/FD common mode can either be engaged or disengaged.

When all APs and FDs disengage, all AP/FD modes disengage.

AP/FD MODE DISPLAY

The FMA displays the AP/FD modes (*Refer to DSC-22_30-80-20 FMA Display*).

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT GUIDANCE AP/FD MODES - TAKEOFF
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General

GENERAL

Ident.: DSC-22_30-40-20-10-00025902.0001001 / 18 MAY 22
Applicable to: ALL

At takeoff, **SRS** vertical mode, and **RWY** lateral mode simultaneously engage. They disengage at different moment.
In some cases, when airborne, **RWY** mode can change to another lateral takeoff mode such as **RWY TRK** mode.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT GUIDANCE

AP/FD MODES - TAKEOFF

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SRS TO Mode**GENERAL****Applicable to: ALL**

Ident.: DSC-22_30-40-20-20-A-00025335.0001001 / 18 MAY 22

The **SRS** mode is a managed vertical mode, used during takeoff and during go-around. This chapter only describes the **SRS** mode during takeoff, also referred to as the **SRS TO** mode. The FMA announces the **SRS TO** mode with the **SRS** indication. The **SRS TO** controls the speed via the elevators, in order to steer the aircraft along a vertical path.

The guidance law also includes:

- A flight path angle protection, that ensures a minimum vertical speed of 120 ft/min

Ident.: DSC-22_30-40-20-20-A-00025341.0001001 / 18 MAY 22

- A pitch angle protection to reduce the aircraft nose-up (18° of maximum pitch attitude or 22.5° maximum in case of windshear).

Ident.: DSC-22_30-40-20-20-A-00025342.0001001 / 18 MAY 22

- A speed protection limiting the target speed to V_2+15 kt.

Ident.: DSC-22_30-40-20-20-A-00025344.0001001 / 18 MAY 22

When the aircraft is on ground, V_2 is the speed target.

When the aircraft is airborne, V_2+10 kt becomes the speed target.

If one engine fails, the speed target is the current aircraft speed at the engine failure detection.

However, the speed target is limited by V_2 and V_2+15 kt.

For more information on the speed target, *Refer to DSC-22_20-10-50 Flight Guidance Part.*

For more information on the speed target, *Refer to DSC-22_30-60-20 General.*

ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-20-20-00025337.0001001 / 18 MAY 22

Applicable to: ALL

SRS TO engages, when all of the following conditions are applicable:

- The aircraft is on ground
- The slats or the flaps are extended

- V2 is inserted in the PERF TAKEOFF page
-  If V2 has not been inserted, V/S mode engages 5 s after lift-off on the current V/S value.
-  The flight crew sets at least one thrust lever:
 - To the TOGA detent, or
 - To the FLX-MCT detent, when a FLX TO temperature or a Derated Takeoff  is entered in the PERF TAKEOFF page.

Note: When V2 is inserted, or **SRS TO** is engaged, the speed automatically becomes managed.
For more information about engagement conditions of managed speed, Refer to
DSC-22_30-60-20 Engagement Conditions.

DISENGAGEMENT CONDITIONS

Applicable to: ALL

Ident.: DSC-22_30-40-20-20-B-00025338.0001001 / 04 MAY 23

SRS TO mode disengages, when one of the following occurs:

- Automatically, at the ACCEL ALT, or if **ALT*** or **ALT CST*** mode engages (above 400 ft RA), or
- Another vertical mode engages.

Note: In Engine Out conditions, the **SRS** mode does not automatically disengage at EO ACCEL ALT.

Ident.: DSC-22_30-40-20-20-B-00025339.0001001 / 18 MAY 22

REVERSIONS

SRS TO reverts to **OP CLB**, when the FCU selected altitude is above the aircraft altitude, and the flight crew pulls the SPD/MACH knob.

Ident.: DSC-22_30-40-20-20-B-00025340.0001001 / 18 MAY 22

When the reversion occurs:

- The triple click sounds
- The new guidance mode is boxed for 10 s
- The FD bars flash for 10 s.

RWY Mode

GENERAL

Ident.: DSC-22_30-40-20-30-00025240.0001001 / 18 MAY 22

Applicable to: ALL

The **RWY** mode is a managed lateral mode.

When the LOC signal is available, the RWY mode gives lateral guidance orders during takeoff, and initial climb.

- L2** The RWY guidance law aims to maintain the aircraft on the runway centerline during the takeoff run. When the aircraft is airborne, the RWY guidance law aims to maintain the sideslip indicator centered. To follow the guidance, the FD displays the conventional guidance bar.

ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-20-30-00025241.0001001 / 18 MAY 22

Applicable to: ALL

RWY engages, if all of the following conditions are applicable:

- L2** - V2 is inserted in the PERF TAKEOFF page, and
 - The aircraft is on ground, and
 - The slats are extended, and
 - The LOC is valid, and
 - The LOC deviation is below 1/2 dot, and
 - The aircraft heading is within 20 ° of the ILS (GLS ) (SLS ) course, and
 - An ILS (GLS )(SLS ) is set, associated to the takeoff runway, and the difference between the LS course and the runway heading, as inserted in the flight plan is less than 2 °, and
 - No lateral mode is already engaged, and
- L1** - The flight crew sets a thrust lever to:
 - The TOGA detent, if TOGA is selected on the PERF TAKEOFF page, or
 - The FLX-MCT detent, if a FLX TO temperature or a Derated Takeoff  level is entered on the PERF TAKEOFF page.

DISENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-20-30-00025242.0001001 / 04 MAY 23

Applicable to: ALL

RWY disengages, when one of the following occurs:

- The LOC is lost below 30 ft RA
- **NAV** is armed, and the aircraft reaches 30 ft RA: **NAV** engages
- L2** - **NAV** is not armed, and the aircraft reaches 30 ft RA: **RWY TRK** engages

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT GUIDANCE

AP/FD MODES - TAKEOFF

- L1** - Another lateral mode engages
- L2** - The aircraft heading deviates from more than 20 ° from the ILS (GLS )(SLS ) course.

RWY TRK Mode**GENERAL**

Ident.: DSC-22_30-40-20-40-00025243.0001001 / 18 MAY 22

Applicable to: ALL

RWY TRK mode is a managed lateral mode.

The RWY TRK mode guides the aircraft along a constant track target. The track target is the aircraft track at RWY TRK engagement.

 To follow the guidance, the FD displays the conventional guidance bar.

ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-20-40-00025244.0001001 / 18 MAY 22

Applicable to: ALL

The **RWY TRK** automatically engages at 30 ft RA, if all of the following conditions are applicable:

- The FMS flight phase is takeoff, and
- **NAV** is not engaged.

DISENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-20-40-00025245.0001001 / 04 MAY 23

Applicable to: ALL

RWY TRK disengages, when one of the following occurs:

- The flight crew pulls the HDG/TRK knob: **HDG/TRACK** engages
- **NAV** is armed, and the aircraft reaches the capture zone of the active leg: **NAV** engages
- The flight crew inserts a DIRECT TO waypoint: **NAV** engages.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT GUIDANCE

AP/FD MODES - TAKEOFF

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HDG/TRACK Mode

GENERAL

Ident.: DSC-22_30-40-30-10-00025898.0001001 / 18 MAY 22

Applicable to: ALL

HDG and TRK are selected lateral modes. They are the basic modes of lateral guidance.

HDG/TRK guides the aircraft laterally along the heading/track target, that appears in the HDG/TRK window on the FCU. For more information on the HDG/TRK window, *Refer to DSC-22_10-40-20 Lateral Control Area.*

ENGAGEMENT CONDITIONS

Applicable to: ALL

Ident.: DSC-22_30-40-30-10-A-00025881.0001001 / 04 MAY 23

HDG or **TRACK** engages when one of the following conditions occurs:

Ident.: DSC-22_30-40-30-10-A-00025882.0001001 / 18 MAY 22

- The flight crew pulls the HDG/TRK knob on the FCU in flight, or

L2 This is applicable if:

- The aircraft is in flight, for at least 5 s after liftoff, or
- Not in **LAND**, **FLARE**, or **ROLL OUT**, or
- Not in **GA TRK** below 100 ft RA.

Ident.: DSC-22_30-40-30-10-A-00025883.0001001 / 18 MAY 22

- **NAV** is engaged and the flight crew inserts a **DIRECT TO RADIAL IN** or **DIRECT TO RADIAL OUT**, or

Ident.: DSC-22_30-40-30-10-A-00025884.0001001 / 04 MAY 23

- **FINAL** mode (armed or engaged) is lost when the aircraft is in **APP NAV** mode, or

Ident.: DSC-22_30-40-30-10-A-00025885.0001001 / 04 MAY 23

- All AP and FDs were previously off, and the flight crew engages the AP or the FDs

Note: 1. The AP or FDs engage in basic modes: **HDG** or **TRACK**, and **V/S** or **FPA**.
 2. If the FD engages, the FD bars flash for 10 s.

Ident.: DSC-22_30-40-30-10-A-00025886.0001001 / 18 MAY 22

- **LOC** mode is armed when **FINAL APP** was previously engaged, or

Ident.: DSC-22_30-40-30-10-A-00025887.0001001 / 04 MAY 23

- The flight crew presses the APPR pb (above 400 ft RA) or the LOC pb to off, when the approach is armed, or

Ident.: DSC-22_30-40-30-10-A-00025888.0001001 / 18 MAY 22

- **LOC***, **LOC**, **LOC B/C*** , **LOC B/C** , **F-LOC***  or **F-LOC**  is engaged in a LOC only approach, and the flight crew presses the LOC pb to off.

Ident.: DSC-22_30-40-30-10-A-00025889.0001001 / 04 MAY 23

REVERSIONS TO HDG/TRK

The **HDG/TRACK** also engages when one of the following reversion occurs:

- **NAV** disengages:
 - The aircraft reaches a flight plan discontinuity
 - The **NAV** mode fails.
 - The approach is modified in the flight plan, when **LOC***, **LOC**, **F-LOC*** , **F-LOC** , **LOC B/C*** , or **LOC B/C**  is engaged
 - **LOC***, **LOC**, **F-LOC*** , **F-LOC** , **LOC B/C*** , or **LOC B/C**  is lost after a failure occurs in approach.
- All AP(s) disengage. The FDs reverts to **HDG** or **TRACK** and **V/S** or **FPA**.

Note: If a managed vertical mode was previously engaged, a selected vertical mode engages:

- If **CLB** was engaged, **OP CLB** engages
- If **ALT CST***, **ALT CRZ***, or **DES** was engaged, **V/S/FPA** engages
- If **ALT CST** was engaged, **ALT** engages.

Ident.: DSC-22_30-40-30-10-A-00025890.0001001 / 18 MAY 22

When the reversion occurs:

- The triple click sounds
- The new guidance mode is boxed for 10s
- The FD bars flash for 10s.

HDG-V/S / TRK-FPA SELECTION

Ident.: DSC-22_30-40-30-10-00025891.0001001 / 04 MAY 23

Applicable to: ALL

The flight crew can press the HDG-V/S / TRK-FPA pb on the FCU to change from one selection to another.

At the aircraft power-up, the HDG-V/S / TRK-FPA selection is set to HDG-V/S by default.

When HDG-V/S is selected:

- HDG appears on the HDG/TRK window of the FCU
- V/S appears on the V/S / FPA window of the FCU
- **HDG** and/or **V/S** mode(s) can be engaged
- **TRACK** and **FPA** modes cannot be engaged.

When TRK-FPA is selected:

- TRK appears on the HDG/TRK window of the FCU
- FPA appears on the V/S / FPA window of the FCU
- **HDG** and **V/S** mode(s) cannot be engaged
- **TRACK** and/or **FPA** modes can be engaged
- Both PFDs display the FPV in green.

HDG/TRK PRESET

Ident.: DSC-22_30-40-30-10-B-00025892.0001001 / 04 MAY 23

Applicable to: **ALL**

GENERAL

The system has a HDG/TRK preset function for takeoff and go-around.

If the flight crew decides not to fly the flight plan after takeoff or go-around, the flight crew can turn the HDG/TRK knob on the FCU to preset a heading or a track. The set value remains displayed in the FCU HDG/TRK window until the flight crew pulls the knob.

AT TAKEOFF

If the flight crew presets the HDG/TRK before takeoff and up to 30 ft RA, **NAV** disarms. The preset value remains displayed in the HDG/TRK window (even when **RWY TRK** engages at 30 ft RA).

When the flight crew pulls the HDG/TRK knob (at least 5 s after liftoff), **HDG** or **TRACK** mode engages.

The aircraft follows the preset target.

Ident.: DSC-22_30-40-30-10-B-00025893.0002001 / 04 MAY 23

Applicable to: **ALL**

AT GO-AROUND

If the flight crew presets the HDG/TRK when **LOC***, **LOC**, **LOC B/C**, **LOC B/C***, **F-LOC*** , **F-LOC** , **LAND**, **FLARE**, **ROLL OUT** or **GA TRK** mode is engaged, the preset value remains displayed in the HDG/TRK window, as long as one of these modes is engaged.

After go-around engagement, **HDG/TRACK** will engage, when the flight crew pulls the HDG/TRK knob.

When the **HDG** or **TRACK** engages, the heading/track target is the HDG/TRK preset.

Ident.: DSC-22_30-40-30-10-B-00025894.0001001 / 18 MAY 22

Applicable to: MSN 02155-02789, 03031-07792

When overflying the MAP, HDG/TRK will synchronize with the current aircraft heading / track. The HDG/TRK preset function is no longer available.

Ident.: DSC-22_30-40-30-10-B-00025895.0001001 / 18 MAY 22

Applicable to: ALL

CANCELLATION

The flight crew can cancel a HDG/TRK preset with one of the following action:

- The HDG/TRK knob is pushed, or
- A DIR TO is selected in the FMS, or
- The AP and FDs are disengaged.

DISENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-30-10-00025896.0001001 / 04 MAY 23

Applicable to: ALL

The engagement of any other lateral mode disengages HDG or TRACK.

SYNCHRONIZE THE HDG/TRK WINDOW OF THE FCU

Ident.: DSC-22_30-40-30-10-00025897.0001001 / 04 MAY 23

Applicable to: ALL

The lateral window of the FCU displays heading or a track value when:

- The HDG/TRACK mode is engaged. The displayed value is the current HDG/TRK or the manually selected value of the target
- The flight crew turns the HDG/TRK knob. The value in the window first synchronizes with the current HDG/TRK, then displays the manual selection. It remains displayed for 10 s or 45 s depending upon FCU standard, then vanishes if the flight crew does not pull the knob (except in HDG preset)
- A HDG/TRK is preset
- AP/FD is lost. The value becomes that of the aircraft current heading or track.

***Note:** If HDG is switched to TRK (or vice versa), the value displayed in the window switches from heading to track (or vice versa).*

NAV Mode

GENERAL

Ident.: DSC-22_30-40-30-20-00025463.0001001 / 18 MAY 22

Applicable to: ALL

The NAV mode is a managed lateral mode, that guides the aircraft laterally along the FMS flight plan. It is designed to have a zero crosstrack error. NAV usually arms before engaging.

ARMING CONDITIONS

Ident.: DSC-22_30-40-30-20-00025464.0002001 / 18 MAY 22

Applicable to: MSN 02155-02789, 03031-07792

For NAV arming, the lateral flight plan must be available.

NAV arms, when one of the following occurs:

- The aircraft is on ground, and the flight crew does not preset a HDG/TRK for takeoff, or
- The flight crew pushes the HDG/TRK knob on the FCU, or
- The flight crew activates a DIRECT TO RADIAL IN or DIRECT TO RADIAL OUT when in HDG/TRK mode, or
- The flight crew presses the APPR pb and the conditions to arm the FINAL APP mode are applicable, or
- The flight crew initiates a go-around.

 This is not applicable if HDG/ TRK is preset.

 However, NAV cannot arm, if one of the following modes is engaged: LOC*, LOC, F-LOC* , F-LOC , LOC B/C* , LOC B/C , LAND, FLARE, ROLL OUT.

ARMING CONDITIONS

Ident.: DSC-22_30-40-30-20-00025464.0001001 / 18 MAY 22

Applicable to: MSN 02926-02944

For NAV arming, the lateral flight plan must be available.

NAV arms, when one of the following occurs:

- The aircraft is on ground, and the flight crew does not preset a HDG/TRK for takeoff, or
- The flight crew pushes the HDG/TRK knob on the FCU, or
- The flight crew activates a DIRECT TO RADIAL IN or DIRECT TO RADIAL OUT when in HDG or TRK mode, or
- The flight crew presses the APPR pb and the conditions to arm the FINAL APP mode are applicable.

However, **NAV** cannot arm, if one of the following modes is engaged: **LOC***, **LOC**, **F-LOC*** , **F-LOC** , **LOC B/C*** , **LOC B/C** , **LAND**, **FLARE**, **ROLL OUT**.

DISARMING CONDITIONS

Ident.: DSC-22_30-40-30-20-00025465.0001001 / 18 MAY 22

Applicable to: MSN 02926-02944

NAV mode disarms, when one of the following occurs:

- The flight crew presets a HDG/TRK for takeoff, or go-around, or
- **NAV** mode engages, or
- The flight crew pulls out the HDG/TRK knob, or
- The flight crew arms or engages an approach mode, except if the **APP NAV** can be armed, or
- The flight crew engages a go-around, or
- **LAND** mode engages.

DISARMING CONDITIONS

Ident.: DSC-22_30-40-30-20-00025465.0003001 / 18 MAY 22

Applicable to: MSN 02155-02789, 03031-07792

NAV mode disarms, when one of the following occurs:

- The flight crew presets a HDG/TRK for takeoff, or go-around, or
- **NAV** mode engages, or
- The flight crew pulls out the HDG/TRK knob, or
- The flight crew arms or engages an approach mode, except if the **APP NAV** can be armed, or
- **LAND** mode engages.

ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-30-20-00025466.0001001 / 18 MAY 22

Applicable to: MSN 02926-02944

For **NAV** engagement, the lateral flight plan must be available.

NAV engages, if one of the following occurs:

- **NAV** is armed, and the aircraft reaches 30 ft RA after takeoff, or
- **NAV** is armed, and the aircraft reaches the capture zone of the flight plan active leg, or
- The flight crew activates a DIR TO on the MCDU, or

 This is not applicable, if **LOC***, **LOC**, **F-LOC*** , **F-LOC** , **LOC B/C*** , **LOC B/C** , **LAND**, **FLARE**, **ROLL OUT** is engaged below 700 ft RA.

- The flight crew selects the HDG/TRK when the aircraft is close to (within ~1 NM of) the active flight plan leg.

When **NAV** is engaged, the HDG/TRK window on the FCU displays dashes.

CAPTURE ZONE OF THE FLIGHT PLAN ACTIVE LEG

When **NAV** is armed, it automatically engages, if:

- The aircraft track line intercepts the flight plan between the FROM and the TO waypoints, and
- The intercept waypoint (INTCPT) is displayed on the ND, and
- The aircraft reaches the capture zone of the flight plan active leg.

The following is an example:



ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-30-20-00025466.0002001 / 18 MAY 22

Applicable to: MSN 02155-02789, 03031-07792

For **NAV** engagement, the lateral flight plan must be available.

NAV engages, if one of the following occurs:

- **NAV** is armed, and the aircraft reaches 30 ft RA after takeoff, or
 - **NAV** is armed, and the aircraft reaches the capture zone of the flight plan active leg, or
 - The flight crew activates a DIR TO on the MCDU, or
- L2** This is not applicable, if **LOC***, **LOC**, **F-LOC*** , **F-LOC** , **LOC B/C*** , **LOC B/C** , **LAND**, **FLARE**, **ROLL OUT** is engaged below 700 ft RA.
- L1** - The flight crew selects the HDG/TRK when the aircraft is close to (within ~1 NM of) the active flight plan leg, or
- The flight crew initiates a go-around above 100 ft RA, and the aircraft reaches the capture zone of the flight plan active leg.
- L2** This is not applicable if a HDG/TRK was preset.
- L1** When **NAV** is engaged, the HDG/TRK window on the FCU displays dashes.

CAPTURE ZONE OF THE FLIGHT PLAN ACTIVE LEG

When **NAV** is armed, it automatically engages, if:

- The aircraft track line intercepts the flight plan between the FROM and the TO waypoints, and
- The intercept waypoint (INTCPT) is displayed on the ND, and
- The aircraft reaches the capture zone of the flight plan active leg.

The following is an example:



DISENGAGEMENT CONDITIONS

Applicable to: **ALL**

Ident.: DSC-22_30-40-30-20-A-00025467.0001001 / 04 MAY 23

NAV disengages, when **HDG**, **TRACK**, **LOC***, **F-LOC*** , **LOC B/C*** , or **GA TRK** engages.

REVERSIONS

NAV disengages, and reverts to the **HDG/TRACK** mode when:

- The aircraft reaches a flight plan discontinuity
- The flight plan becomes invalid.

Note: When the lateral mode reverts to **HDG/TRACK**, the vertical mode also reverts to a vertical selected mode.

For more information about the reversion to **HDG/TRACK**, Refer to DSC-22_30-40-30-10 Engagement Conditions 1.

Ident.: DSC-22_30-40-30-20-A-00025468.0001001 / 18 MAY 22

When the reversion occurs:

- The triple click sounds
- The new guidance mode is boxed for 10s
- The FD bars flash for 10s.

INTERACTIONS WITH VERTICAL MODES

Ident.: DSC-22_30-40-30-20-00025469.0001001 / 18 MAY 22

Applicable to: ALL

When **NAV** is engaged with the managed vertical modes **CLB** or **DES** or **FINAL APP**, the guidance takes into account the altitude and speed constraints, linked to waypoints on the lateral flight plan.

When **NAV** disengages, the managed vertical modes are not available and the altitude constraints are disregarded.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT GUIDANCE

AP/FD MODES - LATERAL GUIDANCE FROM TAKEOFF TO DESCENT

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OP CLB Mode**GENERAL**

Ident.: DSC-22_30-40-40-10-00025470.0001001 / 02 MAY 24

Applicable to: ALL

OP CLB mode is a selected vertical mode.

OP CLB guides the aircraft vertically to the FCU selected altitude. All altitude constraints are disregarded.

When OP CLB is engaged:

- OP CLB controls the speed/Mach target (selected or managed)
- If the A/THR is active, the A/THR will control the thrust.

OP CLB usually arms before it engages.

Note: If the altitude change is less than 1 200 ft, the aircraft responds with a rate of climb of 1 000 ft/min.

ARMING CONDITIONS

Ident.: DSC-22_30-40-40-10-00025471.0001001 / 18 MAY 22

Applicable to: ALL

OP CLB arms, when all of the following conditions are applicable:

- The aircraft is on ground, or SRS is engaged (TO or GA), and
- NAV is neither armed nor engaged, or the vertical flight plan is not available, and
- The ACCEL altitude is available and below the FCU selected altitude.

DISARMING CONDITIONS

Ident.: DSC-22_30-40-40-10-00025472.0001001 / 18 MAY 22

Applicable to: ALL

OP CLB disarms, when one of the following occurs:

- V/S/FPA or OP CLB engages, or
- The ACCEL altitude becomes equal to, or above the FCU selected altitude, or
- CLB arms.

ENGAGEMENT CONDITIONSApplicable to: **ALL**

Ident.: DSC-22_30-40-40-10-A-00025473.0001001 / 18 MAY 22

L2 The **OP CLB** mode can only engage, when all of the following are applicable:

- **LAND** or **FLARE** is not engaged, and
- If **SRS GA** is engaged, the aircraft is above 100 ft RA, and
- The aircraft is airborne for at least 5 s.

L1 **OP CLB** mode engages, when one of the following are applicable:

- The FCU selected altitude is above the aircraft altitude, and the flight crew pulls the ALT knob, or
- **SRS TO** or **SRS GA** is engaged with **OP CLB** armed, and the aircraft reaches the ACCEL altitude.

Ident.: DSC-22_30-40-40-10-A-00025475.0001001 / 18 MAY 22

REVERSIONS TO OP CLB**OP CLB** also engages, when one of the following reversions occurs:

- **CLB** and **NAV** are engaged, and **NAV** disengages, or
- L2** - **CLB** is engaged, and the vertical flight plan becomes invalid, or
- **CLB** is engaged, and the FMS flight phase changes to the descent or approach phase, or
- **EXP CLB**  is engaged and the flight crew pulls the SPD/MACH knob, or
- L1** - **SRS TO**, or **SRS GA** is engaged, the FCU selected altitude is above the aircraft altitude, and the flight crew pulls the SPD/MACH knob.

Ident.: DSC-22_30-40-40-10-A-00025476.0001001 / 18 MAY 22

When the reversion occurs:

- The triple click sounds
- The new guidance mode is boxed for 10 s
- The FD bars flash for 10 s.

OP CLB ASSOCIATION WITH ALTITUDE MODES

Ident.: DSC-22_30-40-40-10-00025474.0001001 / 18 MAY 22

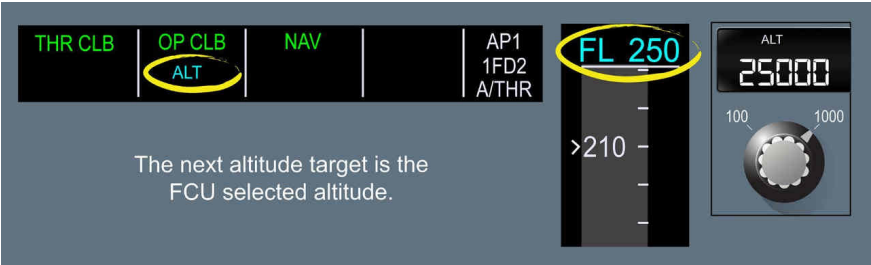
Applicable to: **ALL****OP CLB ASSOCIATION WITH ALTITUDE MODES****OP CLB** is always associated to an altitude mode.When **OP CLB** is engaged:

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT GUIDANCE AP/FD MODES - CLIMB
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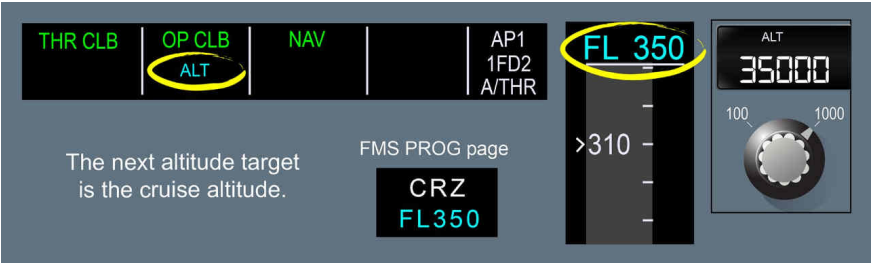
Conditions	The FMA displays the following message on Line 2 of the "AP/FD Vertical Modes" column:
The next altitude target is the FCU selected altitude. In addition, the FCU selected altitude is not set to the cruise altitude.	ALT is armed
The next altitude target is the cruise altitude. In this case, the FCU selected altitude is equal to the cruise altitude. <u>Note:</u> <i>The cruise altitude is defined on the PERF CRUISE page.</i>	ALT CRZ is armed

The following are examples:

OP CLB and ALT armed



OP CLB and ALT CRZ armed



DISENGAGEMENT CONDITIONS

Applicable to: ALL

Ident.: DSC-22_30-40-40-10-B-00025477.0001001 / 18 MAY 22

OP CLB disengages, when another vertical mode engages.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT GUIDANCE

AP/FD MODES - CLIMB

L2 **OP CLB** disengages, when one of the following occurs:

- **ALT** is armed, and the aircraft reaches the capture zone of the FCU selected altitude: **ALT *** engages
- **ALT CRZ** is armed, and the aircraft reaches the capture zone of the cruise altitude: **ALT CRZ*** engages.
- The flight crew pushes the ALT knob, when:
 - **NAV** is engaged
 - The vertical flight plan is available
 - The FMS flight phase is neither the descent, nor the approach phase.**CLB** engages
- The flight crew pulls or pushes the V/S/FPA knob to engage **V/S/FPA**
- The flight crew pushes the EXPED pb  to engage **EXP CLB** .

Ident.: DSC-22_30-40-40-10-B-00025478.0001001 / 18 MAY 22

REVERSIONS

OP CLB reverts to **V/S/FPA**, when the flight crew sets the FCU selected altitude below the aircraft altitude.

Ident.: DSC-22_30-40-40-10-B-00025479.0001001 / 18 MAY 22

When the reversion occurs:

- The triple click sounds
- The new guidance mode is boxed for 10 s
- The FD bars flash for 10 s.

CLB Mode**GENERAL**

Ident.: DSC-22_30-40-40-20-00025582.0001001 / 18 MAY 22

Applicable to: ALL

CLB mode is a managed vertical mode.

CLB guides the aircraft vertically along the FMS flight plan, to the FCU selected altitude or to the next altitude constraint, whichever comes first. Therefore, altitude constraints, associated with applicable waypoints, are taken into account.

CLB can only be engaged, when NAV is engaged.

When CLB is engaged:

- AP/FDs controls the speed/Mach target (selected or managed) through the elevators

Note: The FG system does not adjust the speed/Mach target to match the altitude constraints.

- If the A/THR is active, the A/THR will control the thrust.

CLB usually arms before it engages.

ARMING CONDITIONS

Ident.: DSC-22_30-40-40-20-00025583.0001001 / 18 MAY 22

Applicable to: ALL

CLB arms, when all of the following conditions are applicable:

- The aircraft is on ground, or SRS TO or SRS GA is engaged, and
- NAV is armed or engaged, or the vertical flight plan is available, and
- L2** - The altitude set on the FCU is above the current altitude, and
- L1** - The ACCEL altitude is available, and is below:
 - the FCU selected altitude, and
 - the next altitude constraint.

L2 CLB also arms, when CLB was previously engaged, and ALT CST* engages. This scenario is possible, when the selected altitude set on the FCU is above the altitude constraint.

L1 The flight crew can display and modify the ACCEL altitude on the PERF TAKEOFF and PERF GO AROUND pages.

DISARMING CONDITIONS

Ident.: DSC-22_30-40-40-20-00025584.0001001 / 18 MAY 22

Applicable to: ALL

CLB disarms, when one of the following occurs:

- Another vertical mode engages, or
- **NAV** disarms, or **NAV** disengages, or
- L2** - The flight crew sets the FCU target altitude at or below the altitude constraint, when **ALT CST*** or **ALT CST** is engaged, or
- The ACCEL altitude becomes equal to, or above the subsequent target altitude, when the aircraft is on ground, or when **SRS TO** or **SRS GA** is engaged, or
- L1** - The FCU selected altitude is set to be below the aircraft altitude, or
- The FMS flight phase changes to DES or APPR phase.

ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-40-20-00025585.0001001 / 18 MAY 22

Applicable to: ALL

CLB engages, when all of the following are applicable:

- **NAV** is engaged, and
- The FMS flight phase is neither DES, APPR, nor go-around phase, and
- The vertical flight plan is valid, and
- The aircraft is airborne for at least 5 s.

CLB mode engages, when one of the following is applicable:

- **SRS TO** or **SRS GA** is engaged with **CLB** armed, and the aircraft reaches the ACCEL altitude, or
- **ALT CST** is engaged with **CLB** armed, and the aircraft sequences the altitude constraint, or
- The FCU selected altitude is set to be above the aircraft altitude, and the flight crew pushes the ALT knob.

This scenario is applicable if **CLB** is not yet armed.

Note: If the aircraft altitude is within the capture zone of the FCU selected altitude, **CLB** will immediately disengage, and **ALT*** will engage.

CLB ASSOCIATION WITH ALTITUDE MODES

Ident.: DSC-22_30-40-40-20-00025586.0001001 / 04 MAY 23

Applicable to: ALL

CLB is always associated to an altitude mode.

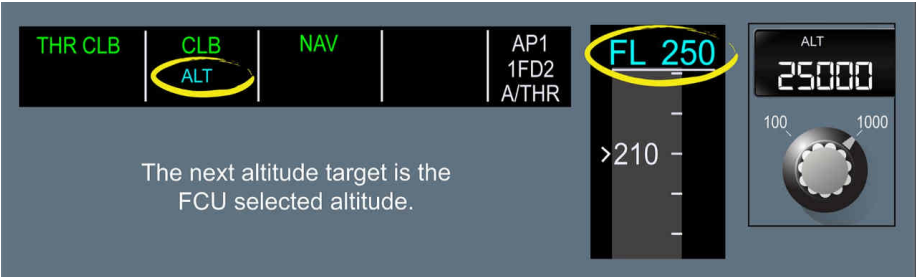
When **CLB** is engaged:

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT GUIDANCE AP/FD MODES - CLIMB
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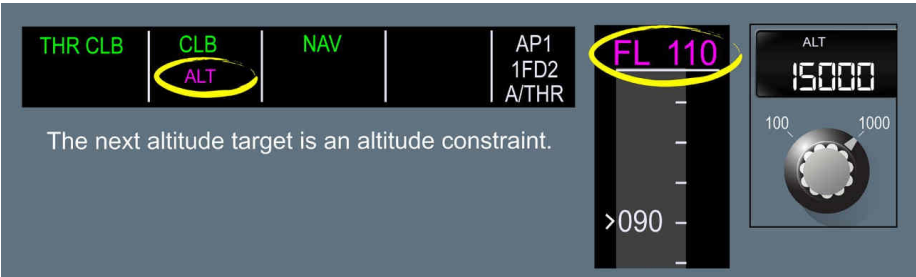
Conditions	The FMA displays the following message on Line 2 of the "AP/FD Vertical Modes" column:
The next altitude target is the FCU selected altitude. In addition, the FCU selected altitude is not set to the cruise altitude. However, the FCU selected altitude can be equal to an altitude constraint.	ALT is armed
The next altitude target is an altitude constraint, and the FCU selected altitude is above the altitude constraint.	ALT CST is armed
The next altitude target is the cruise altitude. In this case, the FCU selected altitude is equal to the cruise altitude. <i>Note: The cruise altitude is defined in the FMS PROG page.</i>	ALT CRZ is armed

The following are examples:

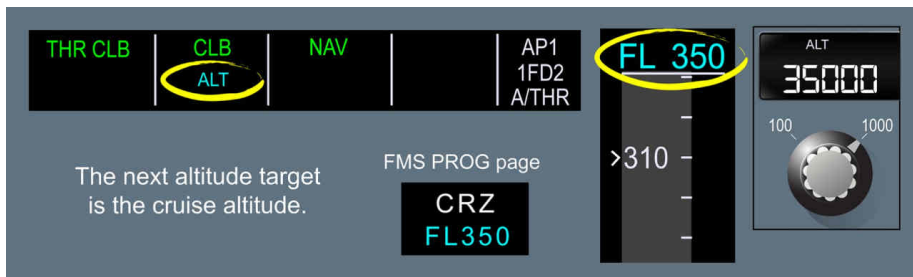
ALT arms



ALT CST arms



ALT CRZ arms



DISENGAGEMENT CONDITIONS

Applicable to: **ALL**

Ident.: DSC-22_30-40-40-20-A-00025587.0001001 / 18 MAY 22

CLB disengages, when another vertical mode engages.

Ident.: DSC-22_30-40-40-20-A-00025588.0001001 / 04 MAY 23

REVERSIONS

CLB also disengages, when one of the following reversions occurs:

- **NAV** disengages when:
 - The aircraft reaches a flight plan discontinuity, or
 - The next altitude target is an altitude constraint, and the flight crew engaged the **HDG/TRACK** mode
- **OP CLB** engages
 - The flight crew sets the FCU selected altitude below the aircraft altitude: **V/S/FPA** engages
 - The vertical flight plan becomes invalid: **OP CLB** engages
 - The FMS flight phase changes to DES or APPR phase: **OP CLB** engages.

Ident.: DSC-22_30-40-40-20-A-00025589.0001001 / 18 MAY 22

When the reversion occurs:

- The triple click sounds
- The new guidance mode is boxed for 10 s
- The FD bars flash for 10 s.

EXP CLB Mode**GENERAL**

Ident.: DSC-22_30-40-40-30-00025501.0001001 / 18 MAY 22

Applicable to: MSN 02155-04392, 07784-07792

EXP CLB is a vertical selected mode.

EXP CLB guides the aircraft vertically to the FCU selected altitude.

When EXP CLB is engaged:

- The speed target is Green Dot
- The AP/FD adjusts the pitch in order to maintain the speed target
- If the A/THR is active, the A/THR controls the thrust, THR CLB engages
- All the altitude constraints, the speed constraints and the SPD LIM are disregarded.

ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-40-30-00025502.0001001 / 18 MAY 22

Applicable to: MSN 02155-04392, 07784-07792

EXP CLB engages, when all of the following are applicable:

- The aircraft is airborne for at least 5 s, and
- The managed speed is available, and
- The FCU selected altitude is above than the aircraft altitude, and the flight crew pushes the EXPED pb.

DISENGAGEMENT CONDITIONS

Applicable to: MSN 02155-04392, 07784-07792

Ident.: DSC-22_30-40-40-30-A-00025503.0001001 / 18 MAY 22

MANUAL DISENGAGEMENT

EXP CLB disengages manually, when one of the following condition occurs:

- The flight crew pulls the V/S / FPA knob, V/S / FPA engages, or
- The flight crew pulls the ALT knob, OP CLB engages, or
- The flight crew pushes the ALT knob, CLB engages provided that the engagement conditions are met.

AUTOMATIC DISENGAGEMENT

EXP CLB disengages automatically when ALT* engages.

Ident.: DSC-22_30-40-40-30-A-00025504.0001001 / 18 MAY 22

REVERSIONS

EXP CLB reverts to **V/S** / **FPA**, when one the following condition occurs:

- AP ON and FD ON, the aircraft exceeds VLS or VMAX, or
- AP OFF and FD ON, the flight crew not does not follow the FD orders and the aircraft speed reaches VMAX + 4 kt, or
- The flight crew selects an altitude below the aircraft altitude.

EXP CLB reverts to **OP CLB**, when the flight crew pulls the SPD / MACH knob.

Ident.: DSC-22_30-40-40-30-A-00025505.0001001 / 18 MAY 22

When the reversion occurs:

- The triple click sounds
- The new guidance mode is boxed for 10 s
- The FD bars flashes for 10 s.

ALT

GENERAL

Applicable to: ALL

Ident.: DSC-22_30-40-50-10-A-00025809.0001001 / 18 MAY 22

ALT* mode guides the aircraft to acquire the selected FCU altitude.

ALT mode maintains the selected FCU altitude.

The **ALT*** mode:

- Has an internal V/S guidance that is a direct function of the difference between present altitude and the altitude target

Ident.: DSC-22_30-40-50-10-A-00025864.0001001 / 18 MAY 22

- Has an internal protection that decreases the vertical speed when VLS or VMAX is reached (VLS or VMAX becomes the priority target)

Ident.: DSC-22_30-40-50-10-A-00025858.0001001 / 18 MAY 22

The system switches automatically to **ALT** mode when the altitude deviation becomes less than 20 ft.

Note: If the baro setting is changed during **ALT*** mode, this may lead to an FCU target overshoot due to the change of the current value of the altitude. However **ALT*** mode will enable the FCU altitude to be regained.

ALT ARMING CONDITIONS

Ident.: DSC-22_30-40-50-10-00025812.0001001 / 04 MAY 23

Applicable to: ALL

ALT arms, with FD/AP engaged, when the aircraft climbs or descends toward the FCU selected altitude.

However, **ALT** does not arm, when one of the following modes is engaged: **G/S***, **G/S**, **F-G/S*** , **F-G/S** , **FINAL APP**, **LAND**, **FLARE**, **ROLL OUT**.

 **ALT** arms, if one of the following conditions occurs:

- The flight crew changes the altitude target on the FCU, or
- The flight crew changes the barometric reference (QNH, QFE, or STD) on the EFIS CP, or
- The AP/FD **TCAS**  mode engages, or
- The difference between the aircraft altitude and the altitude set on the FCU is more than 250 ft.

 **ALT** arms, when one of the following occurs:

- **OP CLB** engages, and the FCU selected altitude is not set to the cruise altitude, or
- **OP DES** engages, or

- **CLB** engages, when the next altitude target is:
 - Equal to the FCU selected altitude
 - Not equal to the cruise altitude.
- **DES** engages, and the next altitude target is the FCU selected altitude, or
- **V/S / FPA** engages, and the next altitude target is the FCU selected altitude, or
- **SRS TO** or **SRS GA** engages, and the altitude target set on the FCU is above the current aircraft altitude.

ALT DISARMING CONDITIONS

Ident.: DSC-22_30-40-50-10-00025816.0001001 / 18 MAY 22

Applicable to: ALL**ALT** disarms when one of the following occurs:

- **ALT*** engages, or
- **G/S***, **F-G/S*** , or **FINAL APP** engages, or
- **ALT** CST arms.

ALT* ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-50-10-00025818.0001001 / 18 MAY 22

Applicable to: ALL**ALT*** engages, when **ALT** is armed, and the aircraft reaches the capture zone of the altitude target. **ALT*** engagement is inhibited during 3 s after the selected altitude is changed on the FCU.**ALT* DISENGAGEMENT CONDITIONS****Applicable to: ALL**

Ident.: DSC-22_30-40-50-10-B-00025821.0001001 / 18 MAY 22

ALT* disengages when another vertical mode engages.

Ident.: DSC-22_30-40-50-10-B-00025823.0001001 / 18 MAY 22

REVERSIONS**ALT*** reverts to **V/S / FPA** when the flight crew changes the FCU selected altitude by more than 250 ft.

Ident.: DSC-22_30-40-50-10-B-00025825.0001001 / 18 MAY 22

If within 5 s after reversion to **V/S** / **FPA**, to confirm the altitude target change, the flight crew does not:

- Pull the ALT knob, or
- Set a new **V/S** / **FPA** target, or
- Push the ALT pb on the FCU.

Then:

- The triple click sounds
- The new guidance mode is boxed for 10 s
- The FD bars flash for 10 s.

ALT ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-50-10-00025830.0001001 / 04 MAY 23

Applicable to: ALL

ALT engages, when **ALT*** is engaged, and the aircraft reaches the altitude target.

L2 The aircraft is at the altitude target when the difference between the aircraft altitude and the altitude target is less than 20 ft for more than two seconds.

ALT engages, when one of the following occurs:

- **ALT CST** is engaged, and the flight crew sets the FCU selected altitude to the altitude constraint, or
- **ALT CST** is engaged, and **NAV** disengages.

ALT DISENGAGEMENT CONDITIONS

Applicable to: ALL

Ident.: DSC-22_30-40-50-10-C-00025841.0001001 / 18 MAY 22

ALT disengages, when any other vertical mode engages.

Ident.: DSC-22_30-40-50-10-C-00025842.0001001 / 18 MAY 22

MANUAL DISENGAGEMENT

ALT manually disengages, when one of the following occurs:

- The flight crew pulls the ALT knob: **OP CLB** or **OP DES** engages
 - The flight crew pushes the ALT knob, and all of the following conditions are applicable:
 - The FCU selected altitude is above the aircraft altitude
 - **NAV** is engaged
 - The FMS flight phase is neither descent, nor approach
- CLB** engages

- The flight crew pushes the ALT knob, and all of the following conditions are applicable:
 - The FCU selected altitude is below the aircraft altitude
 - One of the following mode is engaged : **NAV**, **LOC ***, **LOC**, **LOC B/C*** , **LOC B/C** 
 - The FMS flight phase is not one of the following: takeoff, climb, go-around**DES** engages
-  - The flight crew pushes the ALT knob, and all of the following conditions are applicable:
 - The aircraft altitude is equal to the altitude constraint
 - The FCU selected altitude is set above the aircraft altitude
 - The FCU selected altitude is at least 250 ft above the aircraft altitude
 - **NAV** is engaged
 - The FMS flight phase is neither descent, nor approach**ALT CST** engages
- The flight crew pushes the ALT knob, and all of the following conditions are applicable:
 - The aircraft altitude is equal to the altitude constraint
 - The FCU selected altitude is set below the aircraft altitude
 - The FCU selected altitude is at least 250 ft below the aircraft altitude
 - One of the following mode is engaged : **NAV**, **LOC ***, **LOC**, **LOC B/C*** , **LOC B/C** 
 - The FMS flight phase is not one of the following: takeoff, climb, go-around**ALT CST** engages
- The aircraft altitude is equal to the FCU selected altitude, and the flight crew sets the cruise altitude to the aircraft altitude: **ALT CRZ** engages
-  - The flight crew pulls or pushes the V/S / FPA knob: **V/S** / **FPA** engages
- The flight crew engages go-around: **SRS GA** engages.

Ident.: DSC-22_30-40-50-10-C-00025903.0001001 / 18 MAY 22

AUTOMATIC DISENGAGEMENT

ALT automatically disengages, when one of the following occurs:

Ident.: DSC-22_30-40-50-10-C-00025843.0001001 / 18 MAY 22

- The aircraft reaches the G/S capture zone when:
 - **LOC*** or **LOC** is engaged
 - **G/S** is armed**G/S*** engages

Ident.: DSC-22_30-40-50-10-C-00025844.0001001 / 18 MAY 22

- The aircraft reaches the F-G/S  capture zone when:
 - **LOC***, **LOC**, **F-LOC**  * or **F-LOC**  is engaged, and
 - **F-G/S**  is armed
- F-G/S***  engages

Ident.: DSC-22_30-40-50-10-C-00025845.0001001 / 18 MAY 22

- The aircraft reaches the FINAL capture zone, when:
 - **APP NAV** is engaged
 - **FINAL** is armed
- FINAL APP** engages.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT GUIDANCE

AP/FD MODES - ALTITUDE

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ALT CST

GENERAL

Applicable to: ALL

Ident.: DSC-22_30-40-50-20-A-00025810.0001001 / 18 MAY 22

ALT CST* guides the aircraft to acquire an altitude constraint.

ALT CST maintains the altitude constraint delivered by the FMS.

The **ALT CST*** mode:

- Has an internal V/S guidance that is a direct function of the difference between present altitude and the altitude target

Ident.: DSC-22_30-40-50-20-A-00025865.0001001 / 18 MAY 22

- Has an internal protection that decreases the vertical speed when VLS or VMAX is reached (VLS or VMAX becomes the priority target)

Ident.: DSC-22_30-40-50-20-A-00025862.0001001 / 18 MAY 22

The system switches automatically to **ALT CST** mode when the altitude deviation becomes less than 20 ft.

Note: For aircraft equipped with QFE option, a switching from STD to QFE (or QFE to STD) in **ALT CST*** mode, will change the target value and a reversion to V/S may occur if the target value is modified by 250 ft or more.

ALT CST ARMING CONDITIONS

Ident.: DSC-22_30-40-50-20-00025814.0001001 / 18 MAY 22

Applicable to: ALL

ALT CST arms, with FD/AP engaged, when the aircraft climbs or descends toward an altitude constraint delivered by the FMS.

However, **ALT** CST does not arm, when one of the following mode is engaged: **G/S***, **G/S**, **F-G/S***, **F-G/S**, **FINAL APP**, **LAND**, **FLARE**, **ROLL OUT**.

 **ALT** CST arms, if one of the following condition occurs:

- The flight crew changes the barometric reference (QNH, QFE, or STD) on the EFIS CP, or
- The AP/FD **TCAS**  mode engages, or
- The difference between the aircraft altitude and the altitude constraint delivered by the FMS is more than 250 ft.

L1 **ALT** CST arms, when **CLB** (**DES**) engages, and:

- The next altitude target is an altitude constraint delivered by the FMS, and
- The FCU selected altitude is above (below) the altitude constraint.

ALT CST DISARMING CONDITIONS

Ident.: DSC-22_30-40-50-20-00025817.0001001 / 18 MAY 22

Applicable to: **ALL**

ALT CST disarms when one of the following occurs:

- **ALT CST*** engages, or
- **G/S***, **F-G/S*** , or **FINAL APP** engages, or
- **CLB** is engaged, and one of the following occurs:
 - The FCU selected altitude becomes the next altitude target, or
 - **OP CLB** or **V/S / FPA** engages.
- **DES** is engaged, and one of the following occurs:
 - The FCU selected altitude becomes the next altitude target, or
 - **OP DES** or **V/S / FPA** engages, or
 - **SRS** GA engages.

ALT CST* ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-50-20-00025820.0001001 / 18 MAY 22

Applicable to: **ALL**

ALT CST* engages, when **ALT** CST is armed, and the aircraft reaches the capture zone of the altitude target.

L2 **ALT CST*** engagement is inhibited during 3 s after the selected altitude is changed on the FCU.

ALT CST* DISENGAGEMENT CONDITIONS

Applicable to: **ALL**

Ident.: DSC-22_30-40-50-20-B-00025827.0001001 / 18 MAY 22

ALT CST* disengages when another vertical mode engages.

Ident.: DSC-22_30-40-50-20-B-00025828.0001001 / 18 MAY 22

REVERSIONS

ALT CST* reverts to **V/S / FPA** if **NAV** disengages.

Ident.: DSC-22_30-40-50-20-B-00025829.0001001 / 18 MAY 22

If within 5 s after reversion to **V/S** / **FPA**, to confirm the altitude target change, the flight crew does not:

- Pull the ALT knob, or
- Set a new **V/S** / **FPA** target, or
- Push the ALT pb on the FCU.

Then:

- The triple click sounds
- The new guidance mode is boxed for 10 s
- The FD bars flash for 10 s.

ALT CST ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-50-20-00025831.0001001 / 18 MAY 22

 Applicable to: **ALL**

ALT CST engages, when **ALT CST*** is engaged, and the aircraft reaches the altitude target.

2 **ALT CST** engages, when one of the following occurs:

- The flight crew pushes the ALT knob, and all the following conditions are applicable:
 - **ALT** is engaged, and
 - The aircraft altitude is equal to the altitude constraint, and
 - The FCU selected altitude is set above the aircraft altitude
The FCU selected altitude is at least 250 ft above the aircraft altitude
 - **NAV** is engaged, and
 - The FMS flight phase is neither descent, nor approach, and
 - The vertical flight plan is valid
 - CLB** arms, or
 - The flight crew pushes the ALT knob, and all the following conditions are applicable:
 - **ALT** is engaged, and
 - The aircraft altitude is equal to the altitude constraint, and
 - The FCU selected altitude is set below the aircraft altitude, and
The FCU selected altitude is at least 250 ft below the aircraft altitude
 - One of the following modes is engaged: **NAV**, **LOC***, **LOC**, **LOC B/C***, **LOC B/C**, **F-LOC***, **F-LOC**
and
 - The FMS flight phase is not one of the following: takeoff, climb, go-around
- DES** arms.

ALT CST DISENGAGEMENT CONDITIONS

Applicable to: ALL

Ident.: DSC-22_30-40-50-20-C-00025853.0001001 / 18 MAY 22

ALT CST disengages, when any other vertical modes engages.

Ident.: DSC-22_30-40-50-20-C-00025854.0001001 / 18 MAY 22

MANUAL DISENGAGEMENT

ALT CST manually disengages, when one of the following occurs:

- The flight crew pulls the ALT knob: **OP CLB** or **OP DES** engages
- The flight crew pulls or pushes the V/S / FPA knob: **V/S** / **FPA** engages
- The flight crew sets the altitude target on the FCU to the altitude constraint: **ALT** engages
- The flight crew removes the altitude constraint: **CLB** or **DES** engages
- The flight crew engages go-around: **SRS GA** engages.

Ident.: DSC-22_30-40-50-20-C-00025855.0001001 / 18 MAY 22

AUTOMATIC DISENGAGEMENT

ALT CST automatically disengages, when one of the following occurs:

- The aircraft sequences the waypoint, for which the altitude constraint is associated
- **NAV** disengages: **ALT** engages

Ident.: DSC-22_30-40-50-20-C-00025857.0001001 / 18 MAY 22

- The aircraft reaches the G/S capture zone when:
 - **LOC*** or **LOC** is engaged
 - **G/S** is armed**G/S*** engages

Ident.: DSC-22_30-40-50-20-C-00025859.0001001 / 18 MAY 22

- The aircraft reaches the F-G/S  capture zone when:
 - **LOC***, **LOC**, **F-LOC**  * or **F-LOC**  is engaged, and
 - **F-G/S**  is armed**F-G/S***  engages

Ident.: DSC-22_30-40-50-20-C-00025860.0001001 / 18 MAY 22

- The aircraft reaches the FINAL capture zone, when:
 - **APP NAV** is engaged
 - **FINAL** is armed**FINAL APP** engages.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT GUIDANCE

AP/FD MODES - ALTITUDE

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ALT CRZ**GENERAL**

Applicable to: ALL

Ident.: DSC-22_30-40-50-30-A-00025808.0001001 / 18 MAY 22

ALT CRZ* mode guides the aircraft to acquire the cruise altitude, as selected on the FMS PROG page and on the FCU.

ALT CRZ mode maintains the cruise altitude, as selected on the FMS PROG page and on the FCU.

The **ALT CRZ*** mode:

- Has an internal V/S guidance that is a direct function of the difference between present altitude and the altitude target

Ident.: DSC-22_30-40-50-30-A-00025866.0001001 / 18 MAY 22

- Has an internal protection that decreases the vertical speed when VLS or VMAX is reached (VLS or VMAX becomes the priority target).

Ident.: DSC-22_30-40-50-30-A-00025868.0001001 / 18 MAY 22

The system switches automatically to **ALT CRZ** mode when the altitude deviation becomes less than 20 ft. Once **ALT CRZ** engages, the Altitude SOFT mode engages.

The Altitude SOFT mode corrects minor deviations from the Mach target by allowing a ± 50 ft variation from the CRZ FL. This feature enhance fuel efficiency, passenger comfort and minimizes the changes in thrust.

Note: If the baro setting is changed during **ALT CRZ*** mode, this may lead to an FCU target overshoot due to the change of the current value of the altitude. However **ALT CRZ*** mode will enable the FCU altitude to be regained.

ALT CRZ ARMING CONDITIONS

Ident.: DSC-22_30-40-50-30-00025811.0001001 / 18 MAY 22

Applicable to: ALL

ALT CRZ arms, with FD/AP engaged, when the aircraft climbs or descends toward the cruise altitude, as selected on the FMS PROG page and on the FCU.

However, **ALT CRZ** does not arm, when one of the following modes is engaged: **G/S***, **G/S**, **F-G/S***, **F-G/S**, **FINAL APP**, **LAND**, **FLARE** or **ROLL OUT**.

ALT CRZ arms, if one of the following condition occurs:

- The flight crew changes the altitude target on the FCU to the cruise altitude, as selected on the FMS PROG page, or
- **ALT CRZ** is engaged and the flight crew changes the altitude target on the FCU, or
- The flight crew changes the barometric reference (QNH, QFE, or STD) on the EFIS CP, or
- The AP/FD **TCAS**  mode engages.

ALT CRZ DISARMING CONDITIONS

Ident.: DSC-22_30-40-50-30-00025815.0001001 / 18 MAY 22

Applicable to: **ALL**

ALT CRZ disarms when one of the following occurs:

- **ALT CRZ*** engages, or
- The altitude target on the FCU is set below the cruise altitude: **ALT** arms.

ALT CRZ* ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-50-30-00025819.0001001 / 18 MAY 22

Applicable to: **ALL**

ALT CRZ* engages, when one of the following occurs:

- **ALT CRZ** is armed, and the aircraft reaches the capture zone of the altitude target, or
- **ALT CRZ** is engaged and the flight crew selects another FCU target altitude within the capture zone.

ALT CRZ* DISENGAGEMENT CONDITIONS

Applicable to: **ALL**

Ident.: DSC-22_30-40-50-30-B-00025822.0001001 / 18 MAY 22

ALT CRZ* disengages when another vertical mode engages.

Ident.: DSC-22_30-40-50-30-B-00025824.0001001 / 18 MAY 22

REVERSIONS

ALT CRZ* reverts to **V/S** / **FPA** if **NAV** disengages.

Ident.: DSC-22_30-40-50-30-B-00025826.0001001 / 18 MAY 22

If within 5 s after reversion to **V/S** / **FPA**, to confirm the altitude target change, the flight crew does not:

- Pull the ALT knob, or
- Set a new **V/S** / **FPA** target, or
- Push the ALT pb on the FCU.

Then:

- The triple click sounds
- The new guidance mode is boxed for 10 s
- The FD bars flash for 10 s.

ALT CRZ ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-50-30-00025832.0001001 / 18 MAY 22

Applicable to: ALL

ALT CRZ engages, when **ALT CRZ*** is engaged, and the aircraft reaches the altitude target.

L2 **ALT CRZ** engages, when all of the following occur:

- **ALT** is engaged, and
- The aircraft altitude is equal to the FCU selected altitude, and
- The flight crew sets the cruise altitude to the aircraft altitude.

ALT CRZ DISENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-50-30-00025863.0001001 / 18 MAY 22

Applicable to: ALL

ALT CRZ disengages, when any other vertical mode engages.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT GUIDANCE

AP/FD MODES - ALTITUDE

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General

GENERAL

Ident.: DSC-22_30-40-60-10-00025590.0001001 / 18 MAY 22
Applicable to: ALL

During descent, OP DES or DES guides the aircraft vertically to an altitude target, or to a G/S or F-G/S  capture zone.

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OP DES Mode

GENERAL

Ident.: DSC-22_30-40-60-20-00025591.0001001 / 18 MAY 22

Applicable to: ALL

OP DES is a vertical selected mode.

When **OP DES** is engaged, the AP/FD adjusts the pitch in order to maintain a Speed/Mach target (selected or managed). The A/THR then maintains idle thrust.

All the altitude constraints are disregarded.

ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-60-20-00025592.0001001 / 18 MAY 22

Applicable to: ALL

OP DES engages, if the FCU selected altitude is below the aircraft altitude and if one of the following occurs:

- The flight crew pulls the ALT knob, or
- **EXP DES** is engaged, and the flight crew pulls the SPD/MACH knob.

DISENGAGEMENT CONDITIONS

Applicable to: ALL

Ident.: DSC-22_30-40-60-20-A-00025593.0001001 / 18 MAY 22

MANUAL DISENGAGEMENT

OP DES disengages manually, when one of the following occurs:

- The flight crew pushes the EXPED pb  to engage **EXP DES** .
- The flight crew pushes the ALT knob, and all the following conditions are applicable:
 - One of the following modes is engaged: **NAV**, **LOC***, **LOC**, **F-LOC** , **F-LOC** , **LOC B/C*** , **LOC B/C** 
 - The FCU selected altitude is below the aircraft altitude
 - The FMS flight phase is cruise, or descent
 - The vertical flight plan is valid
- **DES** engages, or
- The flight crew pulls or pushes the V/S/FPA knob: **V/S/FPA** engages, or
- The flight crew engages go-around: **SRS** GA engages.

Ident.: DSC-22_30-40-60-20-A-00025594.0001001 / 18 MAY 22

AUTOMATIC DISENGAGEMENT

OP DES disengages automatically, when one of the following occurs:

- **ALT** is armed, the aircraft reaches the capture zone of the FCU selected altitude: **ALT*** engages
- **ALT CRZ** is armed, and the aircraft reaches the capture zone of the cruise altitude: **ALT CRZ*** engages

Ident.: DSC-22_30-40-60-20-A-00025595.0001001 / 18 MAY 22

- The aircraft reaches the G/S capture zone when:
 - **LOC*** or **LOC** is engaged
 - **G/S** is armed
 - G/S*** engages

Ident.: DSC-22_30-40-60-20-A-00025596.0001001 / 18 MAY 22

- The aircraft reaches the F-G/S  capture zone when:
 - **LOC***, **LOC**, **F-LOC**  * or **F-LOC**  is engaged
 - **F-G/S**  is armed
 - F-G/S**  * engages

Ident.: DSC-22_30-40-60-20-A-00025597.0001001 / 18 MAY 22

- The aircraft reaches the FINAL capture zone when:
 - **APP NAV** is engaged
 - **FINAL** is armed
 - FINAL APP** engages

Ident.: DSC-22_30-40-60-20-A-00025598.0001001 / 18 MAY 22

- AP/FD **TCAS**  mode engages.

Ident.: DSC-22_30-40-60-20-A-00025599.0001001 / 18 MAY 22

REVERSION

OP DES reverts to **V/S/FPA**, if the flight crew sets the FCU selected altitude above the aircraft altitude.

Ident.: DSC-22_30-40-60-20-A-00025600.0001001 / 18 MAY 22

If within 5 s after reversion to **V/S/FPA**, the flight crew does not confirm the altitude target change by another expected action, then:

- The triple click sounds
- The new guidance mode is boxed for 10 s
- The FD bars flash for 10 s.

Intentionally left blank

DES Mode

GENERAL

Ident.: DSC-22_30-40-60-30-00025601.0001001 / 18 MAY 22

Applicable to: ALL

DES is a managed vertical mode.

DES guides the aircraft vertically along the vertical flight plan. All the altitude constraints associated to waypoints are taken into account.

When DES is engaged in idle path, the AP/FD adjusts the pitch in order to maintain a speed/Mach target. The A/THR then maintains the idle thrust.

When DES is engaged in geometric path, the AP/FD controls the vertical trajectory. The A/THR is then in SPEED/MACH.

ARMING CONDITIONS

Ident.: DSC-22_30-40-60-30-00025602.0001001 / 18 MAY 22

Applicable to: ALL

DES can only arm when:

- The altitude on the FCU is below the aircraft altitude
- NAV is armed, or engaged
- The FMS flight phase is cruise, descent, or approach
- The vertical flight plan path is valid.

DES arms, when one of the following occurs:

- DES is previously engaged with ALTK CST armed, and ALTK CST* engages, or
- ALTK CST* or ALTK CST is engaged, the flight crew pushes the ALT knob and the FMS authorizes DES to arm in accordance with the flight plan.

DISARMING CONDITIONS

Ident.: DSC-22_30-40-60-30-00025603.0001001 / 18 MAY 22

Applicable to: ALL

DES disarms, when one of the following occurs:

- NAV, LOC*, LOC, F-LOC* , F-LOC , LOC B/C* , LOC B/C  mode disengages, or
- Another vertical mode engages, or
- ALTK CST* or ALTK CST is engaged, and the flight crew sets the FCU selected altitude to the altitude constraint, or
- The flight crew sets an altitude on the FCU above the aircraft altitude, or
- The vertical flight plan is lost.

ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-60-30-00025604.0001001 / 18 MAY 22

Applicable to: ALL

DES engages, when one of the following occurs:

- **ALT CST** is engaged with **DES** armed, and the aircraft sequences an ALT CST waypoint, or
- The flight crew pushes the ALT knob, and all the following conditions are applicable:
 - The FCU selected altitude is below the aircraft altitude
 - One of the following lateral modes is engaged: **NAV**, **LOC***, **LOC**, **F-LOC*** , **F-LOC** , **LOC B/C*** , **LOC B/C** 
 - One of the following vertical modes is engaged: **OP DES**, **V/S/FPA**, **ALT***, **ALT**, **ALT CRZ***, **ALT CRZ**, **AP/FD TCAS** 
 - The FMS flight phase is cruise, descent or approach
 - The vertical flight plan is valid.

Note: **DES** will not engage if one of the following modes is engaged: **G/S***, **G/S**, **F-G/S** , **G-G/S** , **FINAL APP**, **LAND**.

DISENGAGEMENT CONDITIONS

Applicable to: ALL

Ident.: DSC-22_30-40-60-30-A-00025605.0001001 / 18 MAY 22

MANUAL DISENGAGEMENT

DES disengages manually, when one of the following occurs:

- The flight crew pushes the EXPED pb  to engage **EXP DES** 
- The flight crew pulls the ALT knob: **OP DES** engages
- The flight crew pulls or pushes the V/S/FPA knob: **V/S/FPA** engages
- The flight crew engages go-around: **SRS GA** engages.

Ident.: DSC-22_30-40-60-30-A-00025606.0001001 / 18 MAY 22

AUTOMATIC DISENGAGEMENT

DES disengages automatically, when one of the following occurs:

- The aircraft reaches the capture zone of the FCU selected altitude: **ALT*** engages
- The aircraft reaches the capture zone of the altitude constraint: **ALT CST*** engages

Ident.: DSC-22_30-40-60-30-A-00025607.0001001 / 18 MAY 22

- The aircraft reaches the G/S capture zone when:
 - **LOC*** or **LOC** is engaged
 - **G/S** is armed
 - G/S*** engages

Ident.: DSC-22_30-40-60-30-A-00025608.0001001 / 18 MAY 22

- The aircraft reaches the F-G/S  capture zone when:
 - **LOC***, **LOC**, **F-LOC**  * or **F-LOC**  is engaged, and
 - **F-G/S**  is armed
 - F-G/S***  engages

Ident.: DSC-22_30-40-60-30-A-00025609.0001001 / 18 MAY 22

- The aircraft reaches the FINAL capture zone, when:
 - **APP NAV** is engaged
 - **FINAL** is armed
 - FINAL APP** engages

Ident.: DSC-22_30-40-60-30-A-00025610.0001001 / 18 MAY 22

- AP/FD **TCAS**  mode engages.

Ident.: DSC-22_30-40-60-30-A-00025611.0001001 / 18 MAY 22

REVERSIONS

DES reverts to **V/S/FPA**, when one the following occurs:

- The flight crew sets the FCU selected altitude above the aircraft altitude
- One of the following modes was engaged, and disengages: **NAV**, **LOC***, **LOC**, **F-LOC***  , **F-LOC**  , **LOC B/C***  , **LOC B/C** 
- The vertical flight plan is lost.

Ident.: DSC-22_30-40-60-30-A-00025612.0001001 / 18 MAY 22

When the reversion occurs:

- The triple click sounds
- The new guidance mode is boxed for 10 s
- The FD bars flash for 10 s.

GUIDANCE IN DES MODEApplicable to: **ALL**

Ident.: DSC-22_30-40-60-30-B-00010575.0001001 / 17 AUG 10

DESCENT INITIATION

The aircraft will not start its descent automatically when reaching the top of descent (T/D). In order to initiate the descent, the flight crew sets the clearance altitude by turning the ALT knob then pushes the ALT knob.

The aircraft will descend immediately:

- If the top of descent is not reached, the aircraft descends at a constant V/S converging on the descent path
- If the aircraft is at or beyond the T/D, it descends at idle thrust.

Ident.: DSC-22_30-40-60-30-B-00010563.0005001 / 15 MAY 23

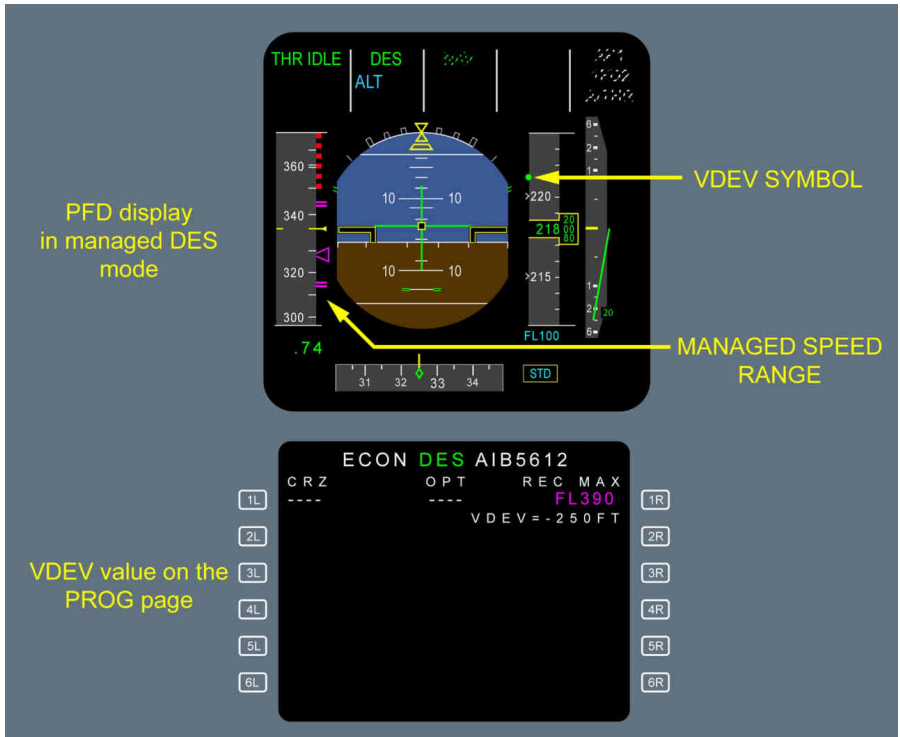
DURING THE DESCENT

In order to monitor the vertical position of the aircraft, the flight crew will see the following on the PFD:

- Vertical deviation symbol (VDEV) along the ALT scale, and
- VDEV value on the FMS PROG page.

The aircraft may deviate from the DES profile while **DES** mode is engaged if:

- Unexpected wind conditions are encountered
- Anti-icing is turned on
- The flight crew modifies the lateral flight plan.



When the speed is managed, a target speed range appears on the PFD. It defines acceptable speed variations around the nominal descent speed target.

Ident.: DSC-22_30-40-60-30-B-00010565.0001001 / 15 MAY 23

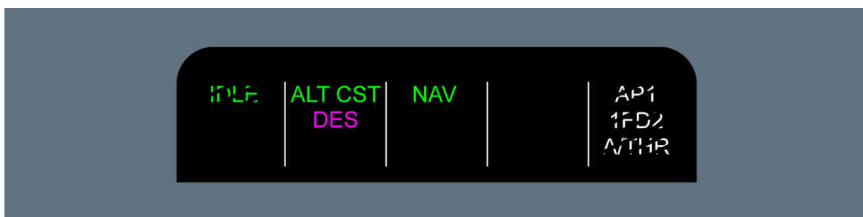
FMA DISPLAY

When **DES** mode is engaged, the FMGS arms **ALT** and displays the applicable target altitude on the altitude scale of the PFD.

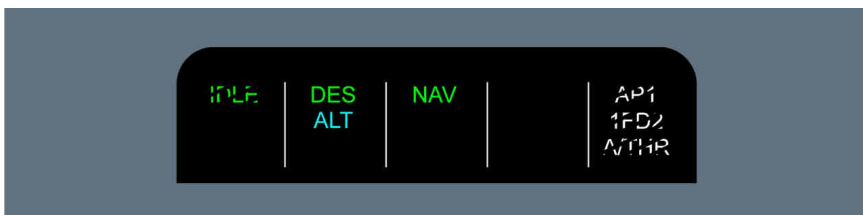
Depending on the situation, the FMA may display one of the following cases:

THE NEXT PREDICTED LEVEL-OFF IS AN ALTITUDE CONSTRAINT


The PFD displays the altitude constraint in magenta, on or below the altitude scale.

THE AIRCRAFT FLIES AN ALTITUDE CONSTRAINT


When the FMS sequences the waypoint that holds the altitude constraint, **DES** engages again automatically.

THE NEXT PREDICTED LEVEL-OFF IS THE FCU ALTITUDE


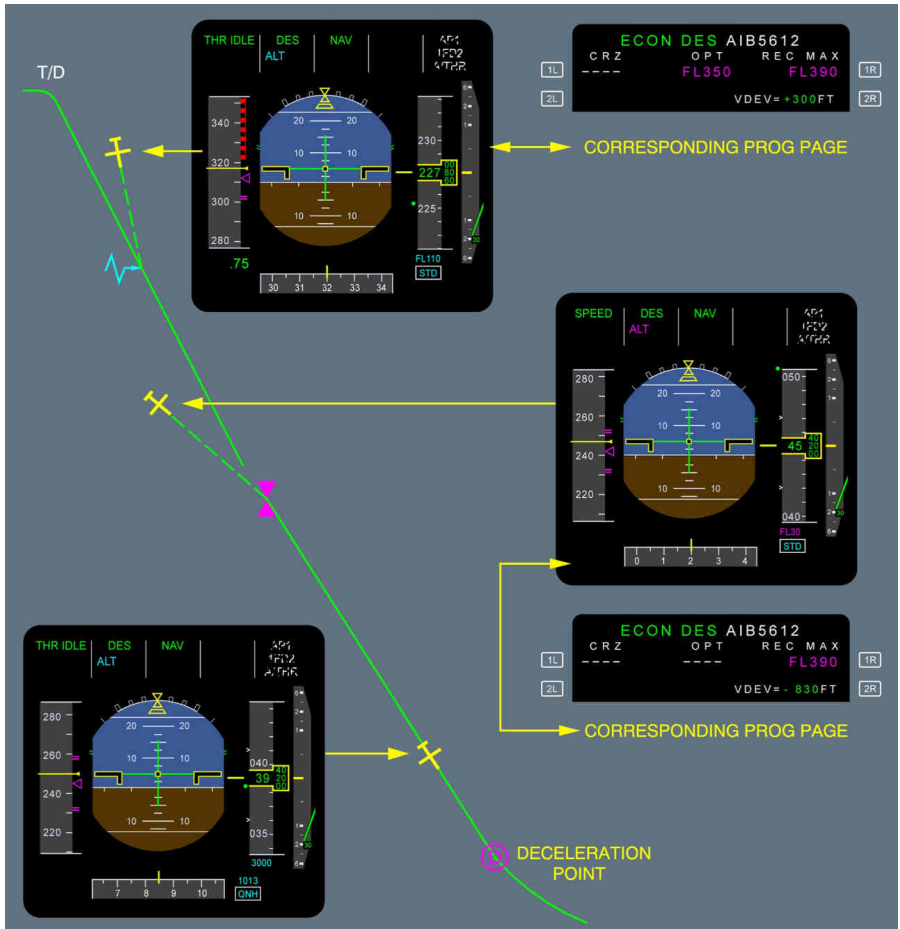
The PFD displays the FCU selected altitude in blue, on or below the altitude scale.

DES MODE PROFILE

Ident.: DSC-22_30-40-60-30-C-00010567.0005001 / 15 MAY 23

Applicable to: ALL

GENERAL



Ident.: DSC-22_30-40-60-30-C-00010568.0001001 / 15 MAY 23

Applicable to: ALL

INTERCEPT POINT

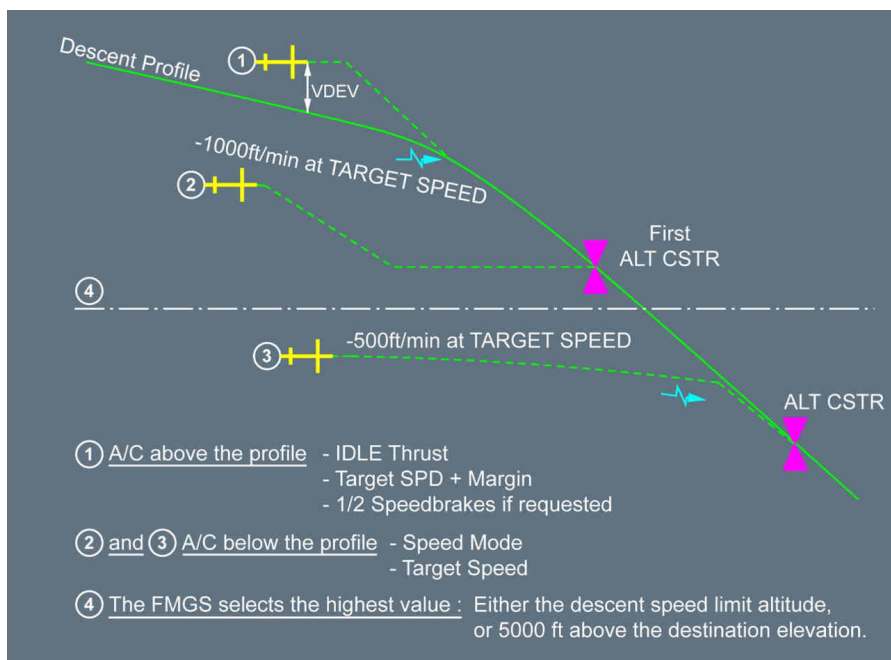
Associated with the VDEV displayed on PFD, the ND shows an intercept point (V₊) on the flight plan. It indicates the position where the system predicts that the aircraft will intercept the descent profile.

Ident.: DSC-22_30-40-60-30-C-00010569.0002001 / 15 MAY 23

Applicable to: ALL

INTERCEPTION OF THE DESCENT VERTICAL PROFILE

The different cases of interception of the vertical profile are described as follows.



AIRCRAFT ABOVE THE DESCENT PROFILE

If the aircraft is above the descent profile, the speed will increase toward the upper limit of the managed speed range. If the speed reaches the upper limit, the aircraft will maintain the speed but will deviate from the profile (autothrust at idle).

The pseudo waypoint  (intercept point) appears on the ND along the flight plan. The FMS assumes that the aircraft will return to the profile using:

- Idle thrust
- Half speedbrakes extension
- ECON speed plus a margin (until intercepting the profile).

If necessary, the message "**MORE DRAG**" comes up on the FMA and the MCDU scratchpad, and remains there as long as more drag (speedbrakes) is still required. The flight crew should respond to this message by extending half speedbrakes.

Whenever the intercept point is predicted to be close to a constrained waypoint, the FMA and the MCDU scratchpad display the message "**MORE DRAG**".

***Note:** With **DES** mode engaged, the speedbrakes extension will not necessarily increase the descent rate. It increases only if the aircraft is above path.*

AIRCRAFT BELOW THE DESCENT PROFILE

If the aircraft is below the descent profile, its speed will be maintained at target speed until it reaches the descent profile. The lower margin becomes effective when the aircraft is on the descent profile but has to loose speed in order to stay on it.

The intercept point on the navigation display is based on the following assumptions:

- **If the aircraft is flying at an altitude that is higher than both the descent speed limit altitude and the destination elevation +5 000 ft:**
The FMGS maintains a V/S of -1 000 ft/min and the target speed, until the aircraft reaches the altitude constraint, or intercepts the descent profile.
- **If the aircraft is flying at an altitude that is lower than either the descent speed limit altitude, or the destination elevation +5 000 ft:**
The FMGS maintains a V/S of -500 ft/min and the target speed, until the aircraft reaches the altitude constraint or intercepts the descent profile.

Ident.: DSC-22_30-40-60-30-C-00010571.0003001 / 15 MAY 23

Applicable to: MSN 02926-02944, 04392, 07784-07792

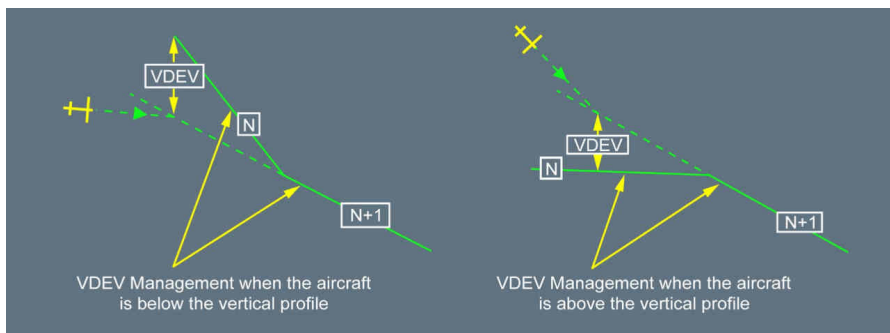
VERTICAL DEVIATION (VDEV) MANAGEMENT CHARACTERISTIC

In some cases, when the aircraft is above or below the vertical profile, the ND may not display any intercept point (pseudo waypoint), even if the VDEV appears on both the MCDUs and PFDs. In addition, the FMS guidance may not immediately attempt to decrease this VDEV (contrary to flight crew expectations).

This is due to the fact that the FMS guides the aircraft along the extension of the subsequent segment (N+1), when all of the following conditions are met:

- The aircraft is above or below the descent profile
- The DES mode is active, or the FINAL APP mode is armed
- The aircraft intercepts the extension of the subsequent segment (N+1) of the vertical profile, before the aircraft reaches the initially expected segment (N), as illustrated below.

The VDEV will gradually decrease until the aircraft reaches the beginning of the subsequent segment.



Note: For the particular case of FINAL APP mode armed, the FMS guides the aircraft along the extension of the subsequent segment only if the VDEV is less than 150 ft.

Ident.: DSC-22_30-40-60-30-C-00010572.0001001 / 15 MAY 23

Applicable to: ALL

LEVELLING OFF AT A CONSTRAINT

If the aircraft levels off at an altitude constraint, the **DES** mode arms. **DES** remains armed until the FMS sequences the waypoint that holds the altitude constraint. Then **DES** mode engages again (if the FCU altitude is set below the altitude of the constraint).

If the FCU selected altitude is an altitude constraint, the flight crew may continue the descent below that altitude by turning and then pushing the ALT knob. This arms the **DES** mode. When the FMS sequences the waypoint that holds the altitude constraint, the **DES** mode engages again.

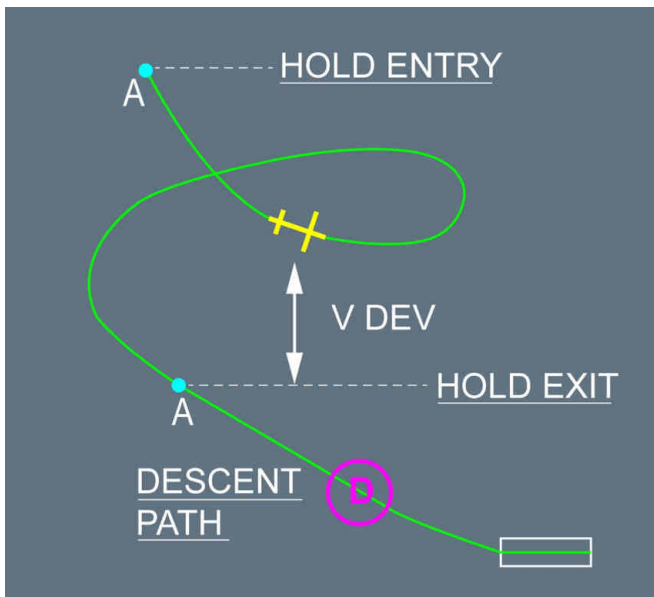
Ident.: DSC-22_30-40-60-30-C-00010573.0002001 / 15 MAY 23

Applicable to: ALL

GUIDANCE IN A HOLD

Just before the aircraft enters a holding pattern, the speed target becomes the holding speed. In the holding pattern, the **DES** mode commands a V/S of -1 000 ft/min while A/THR maintains the holding speed. The aircraft levels off at the next altitude constraint if it is reached during the hold.

The FMS predicts the altitude at which the aircraft must cross the exit fix in order to be positioned on the descent profile. The current vertical deviation VDEV is based on this altitude. Until the aircraft exits the hold, the **DES** mode maintains a V/S of -1 000 ft/min considering downpath vertical constraints. This ensures that the aircraft will not descend below the next altitude constraint, neither below the FCU selected altitude. If the aircraft reaches the next altitude constraint, the aircraft levels off and **ALT CST** mode engages.

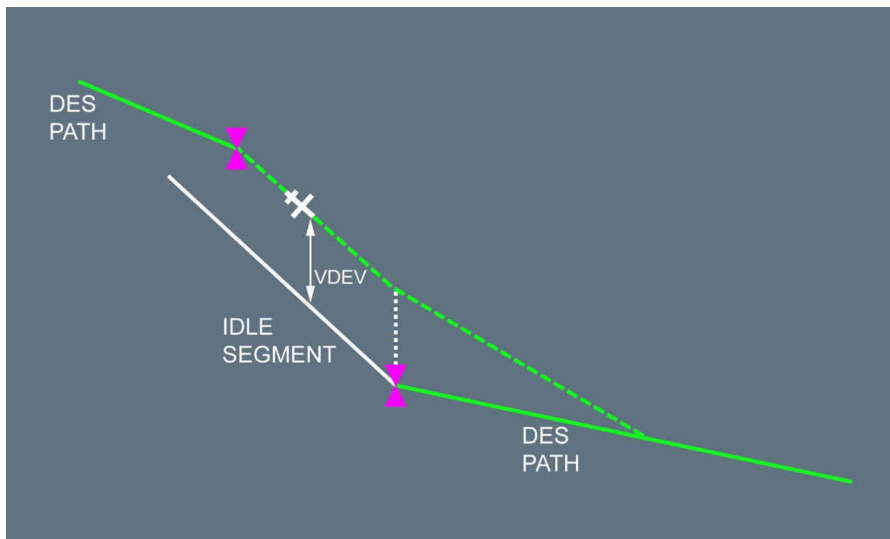


Ident.: DSC-22_30-40-60-30-C-00010574.0001001 / 15 MAY 23

Applicable to: ALL

TOO STEEP PATH

A descent segment is called “too steep path” when the FMS predicts that the descent segment between two constraint waypoints is impossible to fly at the planned descent speed with half speedbrakes extended.



When this occurs, the MCDU does not display any prediction between the upper and the lower points of the too steep path. The message "**TOO STEEP PATH AHEAD**" appears on the MCDU scratchpad, and the marker "**TOO STEEP PATH**" appears on the flight plan.



When the aircraft reaches the beginning of the too steep path segment, the FMS computes again the VDEV. An Idle segment is built starting from the end of the too steep path segment. The VDEV computation uses the Idle segment.

EXP DES Mode**GENERAL**

Ident.: DSC-22_30-40-60-40-00025538.0001001 / 18 MAY 22

Applicable to: MSN 02155-04392, 07784-07792

EXP DES is a vertical selected mode.

EXP DES guides the aircraft vertically to the FCU selected altitude.

When EXP DES is engaged:

- The speed target is 340 kt or M 0.8
- The AP/FD adjusts the pitch in order to maintain the speed target
- If the A/THR is active, the A/THR controls the thrust, THR IDLE engages
- All the altitude constraints, the speed constraints and the SPD LIM are disregarded.

ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-60-40-00025540.0001001 / 18 MAY 22

Applicable to: MSN 02155-04392, 07784-07792

EXP DES engages, when all of the following are applicable:

- The aircraft is airborne for at least 5 s, and
- The managed speed is available, and
- The FCU selected altitude is below the aircraft altitude, and the flight crew pushes the EXPD pb.

DISENGAGEMENT CONDITIONS

Applicable to: MSN 02155-04392, 07784-07792

Ident.: DSC-22_30-40-60-40-A-00025543.0001001 / 18 MAY 22

MANUAL DISENGAGEMENT

EXP DES disengages manually, when one of the following condition occurs:

- The flight crew pulls the V/S / FPA knob, V/S / FPA engages, or
- The flight crew pulls the ALT knob, OP DES engages, or
- The flight crew pushes the ALT knob, DES engages provided that the engagement conditions are met.

AUTOMATIC DISENGAGEMENT

EXP DES disengages automatically when ALT* engages.

REVERSIONS

EXP DES reverts to **V/S** / **FPA**, when one the following condition occurs:

- AP ON and FD ON, the aircraft exceeds VLS or VMAX, or
- AP OFF and FD ON, the flight crew not does not follow the FD orders and the aircraft speed reaches VLS - 2 kt if the speed brakes are retracted or VLS - 17 kt if the speed brakes are extended, or
- The flight crew selects an altitude above the aircraft altitude.

EXP DES reverts to **OP DES**, when the flight crew pulls the SPD / MACH knob.

GENERAL

Ident.: DSC-22_30-40-70-00025759.0001001 / 18 MAY 22

Applicable to: ALL

V/S and FPA are selected vertical modes. They are the basic modes of vertical guidance.

V/S/FPA acquires and holds the vertical speed or the flight path angle, that is displayed in the V/S/FPA window of the FCU.

When **V/S/FPA** engages following a reversion, the V/S/FPA target synchronizes on the current V/S/FPA of the aircraft, or the preselected V/S/FPA that is displayed in the V/S/FPA window of the FCU.

ENGAGEMENT CONDITIONS

Applicable to: ALL

Ident.: DSC-22_30-40-70-A-00025760.0001001 / 04 MAY 23

V/S/FPA engages, when one of the following occurs:

- The flight crew pushes or pulls the V/S/FPA knob
- L2** **V/S/FPA** will not engage if **LAND** is engaged, or **SRS** GA is engaged below 100 ft RA
- L1** - The APs and FDs are disengaged, and the flight crew engages the FDs or the AP
HDG/TRACK also engages
- The aircraft is airborne for at least 5 s, with no other vertical mode engaged.

V/S/FPA engages, in accordance with the HDG-V/S/TRK-FPA selection.

Ident.: DSC-22_30-40-70-A-00025761.0001001 / 18 MAY 22

REVERSIONS TO V/S / FPA

A vertical mode reverts to **V/S/FPA**, when one of the following occurs:

- **OP DES**, or **DES** is engaged and the FCU selected altitude is set above the aircraft altitude
- **OP CLB**, or **CLB** is engaged and the FCU selected altitude is set below the aircraft altitude
- **DES** is engaged and one of the following mode disengages: **NAV**, **LOC***, **LOC**, **F-LOC*** , **F-LOC** , **LOC B/C*** , **LOC B/C** 
- **FINAL APP** is engaged and **NAV** disengages
- L2** - The vertical flight plan is lost, when one of the following modes is engaged: **DES**, **FINAL APP**
- L1** - **G/S*** or **G/S** is engaged, and **LOC*** or **LOC** disengages
- **F-G/S***  or **F-G/S**  is engaged, and **F-LOC***  or **F-LOC**  disengages
- The flight crew presses the LOC pb, or the APPR pb, when **G/S***, **G/S**, **F-G/S***  or **F-G/S**  is engaged

L2

- **ALT*** is engaged, and the flight crew modifies the FCU selected altitude
- The flight crew changes the approach, when one of the following vertical approach mode is engaged:
 - **FINAL APP** is engaged
 - **G/S*** or **G/S** is engaged, and the aircraft is below 700 ft RA
 - **F-G/S***  or **F-G/S**  is engaged.

L1

Note: The aircraft will target the **V/S/FPA** value displayed on the FCU instead of the current value, if the reversion occurs within 45 s after the preselection of a **V/S/FPA** value. As a consequence, this new **V/S/FPA** value may lead the aircraft to a path opposite to the current one, or to a steeper one.

The AP/FD **TCAS**  mode can also disengaged to revert to V/S mode.

Ident.: DSC-22_30-40-70-A-00025762.0001001 / 18 MAY 22

When the reversion occurs:

- The triple click sounds
- The new guidance mode is boxed for 10 s
- The FD bars flash for 10 s.

DISENGAGEMENT CONDITIONS

Applicable to: **ALL**

Ident.: DSC-22_30-40-70-B-00025763.0001001 / 18 MAY 22

MANUAL DISENGAGEMENT

V/S/FPA disengages manually, when one of the following occurs:

- The flight crew pulls the ALT knob: **OP CLB** or **OP DES** engages
- The flight crew pushes the ALT knob
 - **NAV** engages.
 - The FCU selected altitude is above the aircraft altitude
 - The FMS flight phase is neither descent, nor approach
 - The vertical flight plan is valid

CLB engages

- The flight crew pushes the ALT knob
 - One of the following modes is engaged: **NAV**, **LOC***, **LOC**, **LOC B/C*** , **LOC B/C** , **F-LOC*** , **F-LOC** 
 - The FCU selected altitude is below the aircraft altitude
 - The FMS flight phase is cruise, or descent
 - The vertical flight plan is valid

DES engages

- The flight crew pushes the EXPED pb  : **EXP CLB** or **EXP DES** engages
- The flight crew engages go-around: **SRS GA** engages.

Ident.: DSC-22_30-40-70-B-00025764.0001001 / 18 MAY 22

AUTOMATIC DISENGAGEMENT

V/S/FPA disengages automatically, when one of the following occurs:

- The aircraft reaches the capture zone of the FCU selected altitude: **ALT*** engages
- **ALT CRZ** is armed, and the aircraft reaches the capture zone of the cruise altitude: **ALT CRZ*** engages

Ident.: DSC-22_30-40-70-B-00025765.0001001 / 18 MAY 22

- The aircraft reaches the G/S capture zone when:
 - **LOC*** or **LOC** is engaged
 - **G/S** is armed**G/S*** engages

Ident.: DSC-22_30-40-70-B-00025766.0001001 / 18 MAY 22

- The aircraft reaches the F-G/S  capture zone when:
 - **LOC***, **LOC**, **F-LOC***  or **F-LOC**  is engaged
 - **F-G/S**  is armed**F-G/S***  engages

Ident.: DSC-22_30-40-70-B-00025768.0001001 / 18 MAY 22

- The aircraft reaches the FINAL capture zone, when:
 - **APP NAV** is engaged
 - **FINAL** is armed**FINAL APP** engages

Ident.: DSC-22_30-40-70-B-00025769.0001001 / 18 MAY 22

- AP/FD **TCAS**  mode engages.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT GUIDANCE

AP/FD MODES - V/S / FPA MODE

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General

GENERAL

Applicable to: ALL

Ident.: DSC-22_30-40-80-00-A-00025795.0001001 / 03 MAY 23

Flight guidance can perform different types of approaches. *Refer to PRO-NOR-SOP-18-A Cross-Reference Table.*

Ident.: DSC-22_30-40-80-00-A-00025796.0001001 / 18 MAY 22

APPROACH SELECTION

STANDARD SELECTION

The flight crew selects the approach via the ARRIVAL page.

Ident.: DSC-22_30-40-80-00-A-00025797.0001001 / 18 MAY 22

MANUAL TUNING ON THE FMS

If the flight crew manually-tunes an LS approach on the RADIO NAV page, the flight guidance system will disregard the manual tuning and guide the aircraft on the approach selected on the ARRIVAL page.

L2

If the approach selected on the ARRIVAL page and the LS approach set on the RADIO NAV page are different:

- The manually-tuned LS approach on the RADIO NAV page is disregarded, and the **CHECK APPR SEL** message is displayed on the FMA, and on the MCDU Scratchpad.
- The aircraft will fly the approach selected on the ARRIVAL page.

Ident.: DSC-22_30-40-80-00-A-00025798.0001001 / 18 MAY 22

MANUAL TUNING ON THE RMP (BACKUP)

If all the FMCs are fault, the flight crew selects the NAV key on the RMP 1 or 2, in order to manually-tune the frequency, or select a GLS  approach, or an ILS approach.

Ident.: DSC-22_30-40-80-00-A-00025799.0001001 / 18 MAY 22

SELECTION IN THE MMRS

When an approach is selected on the ARRIVAL page, or manually-tuned on RADIO NAV page, or via the RMP, the approach frequency and course are sent to both MMRS.

In case of discrepancy between both MMRS the **NAV LS TUNING DISAGREE** alert triggers.

Note: Below 700 ft RA, when an approach mode is engaged, the flight guidance system freezes the LS selection in the MMR. As a result, the MMR does not take into account any change of the LS selection.

ILS/GLS (IF INSTALLED)/SLS (IF INSTALLED) GUIDANCE MODE

Applicable to: ALL

Ident.: DSC-22_30-40-80-00-B-00025800.0001001 / 18 MAY 22

ILS GUIDANCE MODE

An ILS guidance mode uses the Localizer and Glideslope signals from localizer antennas and a glideslope antenna on ground.

L2 The MMR computes the ILS lateral and vertical angular deviations.

L1 The ILS lateral deviation is referred to as the LOC deviation, and the ILS vertical deviation is referred to as the G/S deviation.

The FG uses the LOC and G/S deviations in order to fly the aircraft along the LOC and G/S beams.

APPROACH MODES

The ILS guidance modes are:

	Lateral Guidance	Vertical Guidance
Above 400 ft RA	LOC* : Capture of the LOC beam LOC : Track of the LOC beam	G/S* : Capture of the G/S beam G/S : Track of the G/S beam
Below 400 ft RA, and until end of roll out	LAND : Track of LOC and G/S beams FLARE : Alignment of the yaw axis on the runway centerline, and flare on the pitch axis ROLL OUT : Track of the runway centerline, and nose down	

APPROACH AND LANDING CAPABILITY

In accordance with the approach minima and the landing technique, minimum approach and landing capabilities are required.

Ident.: DSC-22_30-40-80-00-B-00025801.0001001 / 18 MAY 22

GLS GUIDANCE MODE

The GLS guidance mode uses the GNSS position with a correction and integrity signal from a ground station also known as GBAS.

L2 The MMR computes the GLS deviations.

L1 The GLS lateral deviation is referred to as the LOC deviation, and the GLS vertical deviation is referred to as the G/S deviation.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT GUIDANCE AP/FD MODES - APPROACH MODES AND LANDING MODES
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Note: The computed lateral and vertical deviations are available up to 20 NM from the runway threshold.

The FG uses the LOC and G/S deviations in order to fly the aircraft along the LOC and G/S approach path, like ILS.

APPROACH MODES

The GLS guidance modes are:

	Lateral Guidance	Vertical Guidance
Above 400 ft RA	LOC* : Capture of the LOC beam LOC : Track of the LOC beam	G/S* : Capture of the G/S beam G/S : Track of the G/S beam
Below 400 ft RA, and until end of roll out	LAND : Track of LOC and G/S beams FLARE : Alignment of the yaw axis on the runway centerline, and flare on the pitch axis ROLL OUT : Track of the runway centerline, and nose down	

APPROACH AND LANDING CAPABILITY

In accordance with the approach minima and the landing technique, minimum approach and landing capabilities are required.

Ident.: DSC-22_30-40-80-00-B-00025802.0001001 / 18 MAY 22

SLS GUIDANCE MODE

The SLS guidance mode uses the GNSS position with a correction and integrity signal from satellite constellations also known as SBAS.

The SLS guidance mode enables the flight crew to fly an RNAV (GNSS) straight-in approach with LPV minima, or LP minima with the LOC guidance mode only.

 L2

The MMR computes the SLS deviations.

 L1

The SLS lateral deviation is referred to as the LOC deviation, and the SLS vertical deviation is referred to as the G/S deviation.

The FG uses the LOC and G/S deviations in order to fly the aircraft along the LOC and G/S approach path, like ILS.

APPROACH MODES

The SLS guidance modes are:

	Lateral Guidance	Vertical Guidance
Above 400 ft RA	LOC* : Capture of the LOC beam LOC : Track of the LOC beam	G/S* : Capture of the G/S beam G/S : Track of the G/S beam
Below 400 ft RA	LAND : Track of LOC and G/S beams FLARE : Alignment of the yaw axis on the runway centerline, and flare on the pitch axis ROLL OUT : Track of the runway centerline, and nose down	

APPROACH AND LANDING CAPABILITY

In accordance with the approach minima and the landing technique, minimum approach and landing capabilities are required.

FINAL APP GUIDANCE MODE

Ident.: DSC-22_30-40-80-00-00025906.0001001 / 18 MAY 22

Applicable to: ALL

APPROACH WITH FINAL APP GUIDANCE

The flight crew can use the FINAL APP mode in order to guide the aircraft laterally and vertically down to the Minimum, along the final descent profile computed by the FMS.

APPROACH MODES

The approach modes are:

Lateral Guidance	Vertical Guidance
APP NAV	FINAL
FINAL APP	

LOC Mode

GENERAL

Ident.: DSC-22_30-40-80-10-00025415.0001001 / 18 MAY 22

Applicable to: ALL

 The **LOC*** mode captures the localizer beam of the ILS/GLS  /SLS  .

 The **LOC** mode tracks the localizer beam of the ILS/GLS  /SLS  .

LOC ARMING CONDITIONS

Ident.: DSC-22_30-40-80-10-00025416.0001001 / 04 MAY 23

Applicable to: ALL

LOC arms, when the flight crew presses the APPR pb, or the LOC pb, and one of the following conditions is applicable:

- An ILS, GLS  , or RNAV(GNSS) with LPV(LP) minima (with SLS  option) approach is set on the ARRIVAL page
- An ILS, GLS  is manually-tuned on the RADIO NAV page

 **Note:** If the flight crew sets a different ILS approach on the ARRIVAL page:

- The aircraft will fly the manually-tuned LS
- The MCDU displays the **RWY/LS MISMATCH** message.

- At least one LS receiver must be operative. If both receivers are operative, the LS parameters must be the same in both LS receivers

 - A LOC only approach is set on the ARRIVAL page

 **Note:** On aircraft equipped with the FLS  function , the flight crew can also deselect the G/S of an ILS approach on the RADIO NAV page.

 - The ILS frequency/GLS  channel and course are manually-tuned on the RMP.

 **LOC** can only arm when all of the following are applicable:

- **HDG/TRACK** or **NAV** is engaged, and
- The vertical mode is not **SRS TO**, nor **SRS GA**, and
- The aircraft is above 400 ft RA.

LOC DISARMING CONDITIONS

Ident.: DSC-22_30-40-80-10-00025417.0002001 / 18 MAY 22

Applicable to: MSN 02155-03060, 05152-07792

LOC disarms, when **LOC*** engages.

L2 **LOC** also disarms, when one of the following occurs:

- **G/S** or **F-G/S**  is armed, and the flight crew presses the APPR pb, or
- Neither **G/S**, nor **F-G/S**  is armed, and the flight crew presses the LOC pb, or
- **NAV** arms, or
- The flight crew engages go-around, or
- The flight crew modifies the approach selection, or

Note: The flight crew can change the approach selection, only when the aircraft is above 700 ft RA.

- The LS parameters are different in both LS receivers.

LOC DISARMING CONDITIONS

Ident.: DSC-22_30-40-80-10-00025417.0001001 / 18 MAY 22

Applicable to: MSN 04392

LOC disarms, when **LOC*** engages.

L2 **LOC** also disarms, when one of the following occurs:

- **G/S** or **F-G/S**  is armed, and the flight crew presses the APPR pb, or
- Neither **G/S**, nor **F-G/S**  is armed, and the flight crew presses the LOC pb, or
- **NAV** arms, or
- The flight crew engages go-around, or
- The LS parameters are different in both LS receivers.

LOC* ENGAGEMENT CONDITIONS

Applicable to: ALL

Ident.: DSC-22_30-40-80-10-A-00025418.0002001 / 18 MAY 22

LOC* engages, when **LOC** is armed, and the aircraft reaches the capture zone, or the pre-capture zone of the LOC beam.

PRE-CAPTURE ZONE OF THE LOC BEAM (ENHANCED LOC CAPTURE FUNCTION)

The pre-capture zone of the LOC beam is introduced through the Enhanced LOC Capture function. With the enhanced LOC Capture function, the aircraft uses the aircraft position and the FMS trajectory to provide guidance in order to pre-capture the LOC beam.

The pre-capture of the LOC beam allows to:

- Enhance the performance of the LOC capture
- Avoid a false capture
- Capture the LOC beam without overshoot.

The pre-capture zone is available, when all of the following conditions are applicable:

- The LOC deviation is more than 2.3 dots, and
- The FMS is in GPS PRIMARY , and
- L2 - The difference between the track and the LOC course is between 25 ° and 115 °, and
- The roll order is such that **LOC*** will capture the LOC beam with a single turn.
- L1 **Note:** *On the PFD and on the ND, the flight crew observes movement of the LOC deviation toward the center of the scale, only when the LOC deviation is less than 2 dots. This occurs when the aircraft is in the capture zone.*

Ident.: DSC-22_30-40-80-10-A-00025420.0001001 / 18 MAY 22

CAPTURE ZONE OF THE LOC BEAM

The aircraft reaches the capture zone of the LOC beam, when one of the following occurs:

- The LOC deviation is less than 2.3 dots, and:
- L2
 - The difference between the track and the LOC course is between 25 ° and 115 °, and
 - The roll order is such that **LOC*** will capture the LOC beam with a single turn.
- L1 - The LOC deviation is less than 1.3 dot, and the difference between the track and the LOC course is less than 15 °.
- L2 If the approach is an ILS, the **LOC*** mode uses the ILS LOC deviation to perform the capture.
- L1 **Note:** *During the LOC capture, the LOC deviation starts to move toward the center of the LS scale, on the PFD and ND, when the LOC deviation is less than 2 dots.*

Ident.: DSC-22_30-40-80-10-A-00025421.0001001 / 18 MAY 22

LOC CONVERGENCE FUNCTION

The purpose of the LOC convergence function is to help to intercept and capture the LOC axis.

The flight guidance intercepts the LOC axis with a 20 ° track convergence, when all the following conditions are applicable:

- The **LOC** mode is armed, and
- The **NAV** mode is engaged, and
- The aircraft is within 20 NM of the destination runway, and
- The difference between the aircraft track and the runway course is less than 20 °.

LOC* DISENGAGEMENT CONDITIONS

Applicable to: ALL

Ident.: DSC-22_30-40-80-10-B-00025422.0001001 / 04 MAY 23

LOC* disengages, when another lateral mode engages.

L2 **LOC*** disengages, when one of the following occurs:

- The aircraft becomes established on the LOC beam: **LOC** engages, or
- The flight crew presses the LOC pb, and there is no vertical managed mode of approach armed or engaged: **HDG/TRACK** engages, or
- The flight crew pulls the HDG/TRK knob: **HDG/TRACK** engages, or
- The aircraft is above 700 ft RA, and the flight crew inserts a DIRECT TO: **NAV** engages, or
- The flight crew performs a go-around.

Ident.: DSC-22_30-40-80-10-B-00025423.0001001 / 04 MAY 22

REVERSIONS

LOC* reverts to **HDG/TRACK**, when one of the following occurs:

- The flight crew presses the APPR pb, and one of the following conditions is applicable:
 - **G/S** is armed, or
 - **G/S*** is engaged, or
 - **G/S** is engaged, or
 - **F-G/S**  is armed, or
 - **F-G/S***  is engaged, or
 - **F-G/S**  is engaged.
- The flight crew inserts a DIRECT TO RADIAL IN or DIRECT TO RADIAL OUT in the active flight plan
- L2** - The flight crew changes the approach on the ARRIVAL page, the frequency, the identification, or the course of the LS station on the RADIO NAV page
- The FG detects a difference between both MMRs.

L1 When **LOC*** reverts to **HDG/TRACK**, the vertical mode also reverts to **V/S / FPA**.

Ident.: DSC-22_30-40-80-10-B-00025424.0001001 / 18 MAY 22

When the reversion occurs:

- The triple click sounds
- The new guidance mode is boxed for 10 s
- The FD bars flash for 10 s.

LOC ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-80-10-00025425.0001001 / 18 MAY 22

Applicable to: **ALL**

LOC engages, when **LOC*** is engaged, and the aircraft becomes established on the LOC beam.

LOC DISENGAGEMENT CONDITIONS

Applicable to: **ALL**

Ident.: DSC-22_30-40-80-10-C-00025426.0001001 / 04 MAY 23

LOC disengages, when another lateral mode engages.

L2 **LOC** disengages, when one of the following occurs:

- **G/S** is engaged, and **LAND** engages, or
- The flight crew presses the LOC pb, and there is no vertical managed mode of approach, armed or engaged, **HDG/TRACK** engages, or
- The flight crew pulls the HDG/TRK knob, **HDG/TRACK** engages, or
- The aircraft is above 700 ft RA, and the flight crew inserts a DIRECT TO, **NAV** engages, or
- The flight crew performs a go-around.

Ident.: DSC-22_30-40-80-10-C-00025427.0001001 / 04 MAY 23

REVERSIONS

LOC reverts to **HDG/TRACK**, when one of the following occurs:

- The flight crew presses the APPR pb, and one of the following conditions is applicable:
 - **G/S** is armed, or
 - **G/S*** is engaged, or
 - **G/S** is engaged, or
 - **F-G/S**  is armed, or
 - **F-G/S***  is engaged, or
 - **F-G/S**  is engaged.
- The flight crew inserts a DIRECT TO RADIAL IN or DIRECT TO RADIAL OUT in the active flight plan
- **L2** The flight crew changes the approach on the ARRIVAL page, the frequency, the identification, or the course of the LS station on the RADIO NAV page
- The FG detects a difference between both MMRs.
- **L1** When **LOC** reverts to **HDG/TRACK**, the vertical mode also reverts to **V/S / FPA**.

Ident.: DSC-22_30-40-80-10-C-00025428.0001001 / 18 MAY 22

When the reversion occurs:

- The triple click sounds
- The new guidance mode is boxed for 10 s
- The FD bars flash for 10 s.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT GUIDANCE

AP/FD MODES - APPROACH MODES AND LANDING MODES

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G/S Mode
GENERAL

Ident.: DSC-22_30-40-80-20-00025429.0001001 / 18 MAY 22

Applicable to: ALL

 The **G/S*** mode captures the glide slope beam of the ILS / GLS  / SLS  .

 The **G/S** mode tracks the glide slope beam of the ILS / GLS  / SLS  .

Note: In accordance with the below **G/S** and **G/S*** engagement conditions, **G/S** or **G/S*** modes may engage at altitudes that are above the radio altimeter validity (8 000 ft for TRT, and 5 000 ft for Collins and Honeywell radio altimeters). In that case, the landing capability displayed on the FMA (**CAT1**) reflects the lack of radio altimeter validity until the radio altimeter becomes active. If the radio altimeters fail, or if the FGs don't receive any radio altimeter data, then **LOC**, **G/S** and both AP/FDs disengage and FDs re-engage on basic modes.

G/S ARMING CONDITIONS

Ident.: DSC-22_30-40-80-20-00025430.0001001 / 18 MAY 22

Applicable to: ALL

G/S arms, when the flight crew presses the APPR pb, and one of the following conditions is applicable:

- An ILS, GLS  , or RNAV(GNSS) with LPV minima (with SLS  option) approach is set on the ARRIVAL page
- An ILS, or GLS  approach is manually tuned on the RADIO NAV page

Note: If the flight crew sets a different LS approach on the ARRIVAL page:

- The aircraft will fly the manually-tuned LS
- The MCDU displays the RWY/LS MISMATCH message.

-  - At least one LS receiver must be operative. If both receivers are operative, the LS parameters must be the same in both LS receivers
-  - The ILS frequency / GLS  channel and course are manually-tuned on the RMP .

 **G/S** can only arm when all of the following are applicable:

- The mode is not **SRS**, **RWY**, **RWY TRK**, **GA TRK**
- The aircraft is above 400 ft RA.

AIRCRAFT SYSTEMS**AUTO FLIGHT - FLIGHT GUIDANCE**

AP/FD MODES - APPROACH MODES AND LANDING MODES

G/S DISARMING CONDITIONS

Ident.: DSC-22_30-40-80-20-00025431.0002001 / 18 MAY 22

Applicable to: MSN 02155-03060, 05152-07792

G/S disarms, when **G/S*** engages. **G/S** also disarms, when one of the following occurs:

- The flight crew presses the APPR pb, or the LOC pb, or
- **LOC** disarms, or
- **LOC***, or **LOC** is lost, or
- The AP/FD **TCAS**  mode engages upon a RA, or
- The flight crew modifies the approach selection, or

Note: The flight crew can change the approach selection, only when the aircraft is above 700 ft RA.

- The flight crew performs a go around, **SRS GA** and **GA TRK** engage.

G/S DISARMING CONDITIONS

Ident.: DSC-22_30-40-80-20-00025431.0001001 / 18 MAY 22

Applicable to: MSN 04392

G/S disarms, when **G/S*** engages. **G/S** also disarms, when one of the following occurs:

- The flight crew presses the APPR pb, or the LOC pb, or
- **LOC** disarms, or
- **LOC***, or **LOC** is lost, or
- The AP/FD **TCAS**  mode engages upon a RA, or
- The flight crew performs a go around, **SRS GA** and **GA TRK** engage.

G/S* ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-80-20-00025432.0001001 / 04 MAY 23

Applicable to: ALL

G/S* engages when the aircraft reaches the capture zone of the G/S beam, and all of the following conditions are applicable:

- **G/S** is armed, and
- **LOC*** or **LOC** is engaged.

- L2** The aircraft reaches the capture zone of the G/S beam, when one of the following occurs:
- Passage far from the G/S beam:
 - The G/S deviation is less than 2 dots, and
 - The pitch order is such that **G/S*** will capture the G/S beam with a single maneuver.
 - Passage near the G/S beam: The G/S deviation is less than a threshold depending on the radio altitude.
This threshold is between 0.1 and 1/3 dot.

G/S* DISENGAGEMENT CONDITIONS

Applicable to: ALL

Ident.: DSC-22_30-40-80-20-A-00025433.0001001 / 18 MAY 22

G/S* disengages, when another vertical mode engages.

- L2** **G/S*** disengages, when one of the following occurs:
- The aircraft becomes established on the G/S beam: **G/S** engages
G/S* is engaged for more than 15 s, and the G/S deviation becomes less than 1/3 dot
 - The flight crew pushes or pulls the V/S / FPA knob: **V/S / FPA** engages
 - The flight crew pulls the ALT knob: **OP CLB** or **OP DES** engages
 - The flight crew presses the ALT knob: **ALT** engages
 - The AP/FD **TCAS** <=> mode engages upon a RA (if LOC is engaged, LOC remains engaged, APPR pb comes off and the LOC pb comes on)
 - The flight crew performs a go-around.

Ident.: DSC-22_30-40-80-20-A-00025434.0001001 / 04 MAY 23

REVERSIONS

G/S* reverts to **V/S / FPA**, when one of the following occurs:

- **LOC** disengages: The lateral mode also reverts to **HDG/TRACK**
- The flight crew presses the APPR pb: The lateral mode also reverts to **HDG/TRACK**
- The flight crew pulls the HDG/TRK knob: The lateral mode also reverts to **HDG/TRACK**
- The flight crew presses the LOC pb
- L2** - The aircraft is above 700 ft RA, and the flight crew changes the approach on the FMS ARRIVAL page, the frequency, the identification, or the course of the LS station on the RADIO NAV page.
The lateral mode also reverts to **HDG/TRACK**
- The FG detects a difference between both MMRs.

Ident.: DSC-22_30-40-80-20-A-00025435.0001001 / 18 MAY 22

When the reversion occurs:

- The triple click sounds
- The new guidance mode is boxed for 10 s
- The FD bars flash for 10 s.

G/S ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-80-20-00025436.0001001 / 18 MAY 22

 Applicable to: **ALL**

G/S engages, when G/S* is engaged, and the aircraft becomes established on the G/S beam.

G/S DISENGAGEMENT CONDITIONS

 Applicable to: **ALL**

Ident.: DSC-22_30-40-80-20-B-00025437.0001001 / 06 NOV 25

¹ G/S disengages, when another vertical mode engages.

^{L2} G/S disengages, when one of the following occurs:

- **LAND** engages at 400 ft RA, if the approach and landing capability is **CAT1**, **CAT2** or **CAT3**, or
- **FLARE** engages at approximately 40 ft RA, if the approach and landing capability is **APPR1** (with SLS ), or
- The flight crew pushes or pulls the V/S / FPA knob, **V/S** / **FPA** engages, or
- The flight crew pulls the ALT knob, **OP CLB** or **OP DES** engages, or
- The flight crew presses the ALT knob, **ALT** engages, or
- The AP/FD **TCAS**  mode engages upon a RA (if LOC is engaged, LOC remains engaged, APPR pb comes off and the LOC pb comes on), or
- The flight crew performs a go-around.

Ident.: DSC-22_30-40-80-20-B-00025438.0001001 / 04 MAY 23

REVERSIONS

 G/S reverts to **V/S** / **FPA**, when one of the following occurs:

- **LOC** disengages: The lateral mode also reverts to **HDG/TRACK**
- The flight crew presses the APPR pb: The lateral mode also reverts to **HDG/TRACK**
- The flight crew presses the LOC pb
- The flight crew pulls the HDG/TRK knob: The lateral mode also reverts to **HDG/TRACK**

- L2**
- The aircraft is above 700 ft RA, and the flight crew changes the approach on the ARRIVAL page, the frequency, the identification, or the course of the LS station on the RADIO NAV page. The lateral mode also reverts to **HDG/TRACK**
 - The FG detects a difference between both MMRs.

Ident.: DSC-22_30-40-80-20-B-00025439.0001001 / 18 MAY 22

When the reversion occurs:

- The triple click sounds
- The new guidance mode is boxed for 10 s
- The FD bars flash for 10 s.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT GUIDANCE

AP/FD MODES - APPROACH MODES AND LANDING MODES

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AIRCRAFT SYSTEMS**AUTO FLIGHT - FLIGHT GUIDANCE**

AP/FD MODES - APPROACH MODES AND LANDING MODES

LAND Mode**GENERAL**

Ident.: DSC-22_30-40-80-30-00025440.0001001 / 18 MAY 22

Applicable to: ALL

The **LAND** mode is a common vertical and lateral mode.

The **LAND** mode tracks the LOC and G/S beams from 400 ft RA to approximately 40 ft RA.

ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-80-30-00025441.0001001 / 18 MAY 22

Applicable to: ALL

LAND automatically engages, when all the following conditions are applicable:

- The approach and landing capability is **CAT1**, **CAT2** or **CAT3**, and
- **LOC** and **G/S** are engaged, and
- The aircraft is below 400 ft RA.

DISENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-80-30-00025442.0002001 / 18 MAY 22

Applicable to: ALL

LAND automatically disengages:

- When the aircraft approximately reaches 40 ft RA: **FLARE** engages, or
- When the flight crew disengages both AP/FD, or
- When the flight crew performs a go-around.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT GUIDANCE

AP/FD MODES - APPROACH MODES AND LANDING MODES

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FLARE Mode

GENERAL

Ident.: DSC-22_30-40-80-40-00025443.0001001 / 04 MAY 23

Applicable to: ALL

 The **FLARE** mode is a common lateral and vertical mode:

- Lateral guidance: The **FLARE** mode reduces the sideslip angle, such that the aircraft will be aligned with the runway centerline at the aircraft touchdown
- Vertical guidance: The **FLARE** mode decreases the descent rate, in order to ensure a comfortable transition between the glide tracking, and the aircraft touchdown
- If the A/THR is active, the thrust is automatically reduced to IDLE.

ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-80-40-00025445.0001001 / 18 MAY 22

Applicable to: ALL

FLARE engages, if all the following conditions are applicable:

- The aircraft approximately reaches 40 ft RA
- The approach that the flight crew selects is either an ILS approach, a GLS  approach, or an RNAV(GNSS) approach with LPV minima (with SLS ).

 **FLARE** engages only if the following conditions are applicable:

- The slats/flaps are extended, or the landing gears are extended
- One valid RA.

DISENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-80-40-00025446.0002001 / 18 MAY 22

Applicable to: ALL

FLARE automatically disengages:

- When the aircraft touches down: **ROLL OUT** engages, or
- When the flight crew disengages both AP/FD, or
- When the flight crew perform a go-around.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT GUIDANCE

AP/FD MODES - APPROACH MODES AND LANDING MODES

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AIRCRAFT SYSTEMS**AUTO FLIGHT - FLIGHT GUIDANCE**

AP/FD MODES - APPROACH MODES AND LANDING MODES

ROLL OUT Mode**GENERAL**

Ident.: DSC-22_30-40-80-50-00025447.0001001 / 18 MAY 22

Applicable to: ALL

The **ROLL OUT** mode is a common lateral and vertical mode:

- Lateral guidance: The **ROLL OUT** mode guides the aircraft along the runway centerline
- Vertical guidance: The **ROLL OUT** mode lands the nose landing gear.

ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-80-50-00025448.0001001 / 18 MAY 22

Applicable to: ALL

The **FLARE** mode changes to the **ROLL OUT** mode when the aircraft touches down.

DISENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-80-50-00025449.0001001 / 18 MAY 22

Applicable to: ALL

ROLL OUT disengages, when one of the following occurs:

- The aircraft exits the runway, or

L2 Note: When the difference between the aircraft track and the runway track is more than 20°, the **ROLL OUT** disengages due to the APs and FDs disengagement.

L1 - The flight crew engages a go-around.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT GUIDANCE

AP/FD MODES - APPROACH MODES AND LANDING MODES

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LOC B/C Mode

GENERAL

Ident.: DSC-22_30-40-80-80-00025452.0001001 / 18 MAY 22

Applicable to: MSN 02719-03060

The **LOC B/C*** mode captures the localizer back beam of the ILS.
The **LOC B/C** mode tracks the localizer back course beam of the ILS.

LOC B/C ARMING CONDITIONS

Ident.: DSC-22_30-40-80-80-00025454.0001001 / 04 MAY 23

Applicable to: MSN 02719-03060

L2 **LOC B/C** can only arm when all of the following are applicable:

- At least one LS receiver must be operative. If both receivers are operative, the LS parameters must be the same in both LS receivers
- **HDG/TRACK** or **NAV** is engaged, and
- The aircraft is above 400 ft RA.

L1 **LOC B/C** arms, when:

- The flight crew selected a LOC B/C approach on the ARRIVAL page, and
- The flight crew presses the LOC pb.

LOC B/C DISARMING CONDITIONS

Ident.: DSC-22_30-40-80-80-00025454.0001001 / 18 MAY 22

Applicable to: MSN 02719-03060

LOC B/C disarms, when **LOC B/C*** engages.

L2 **LOC B/C** also disarms, when one of the following occurs:

- **F-G/S**  is armed, and the flight crew presses the APPR pb, or
- **F-G/S**  is not armed, and the flight crew presses the LOC pb, or
- **NAV** arms, or
- The flight crew engages go-around, or
- The flight crew modifies the approach selection, or
- The LS parameters are different in both LS receivers.

LOC B/C* ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-80-80-00025455.0001001 / 18 MAY 22

Applicable to: MSN 02719-03060

LOC B/C* engages, when **LOC B/C** is armed, and the aircraft reaches the capture zone of the LOC B/C beam.

CAPTURE ZONE OF THE LOC BEAM

The aircraft reaches the capture zone of the LOC B/C beam, when one of the following occurs:

- The LOC B/C deviation is less than 2.3 dots, and

- L2**
 - The difference between the track and the LOC B/C course is between 25 ° and 115 °, and
 - The roll order is such that **LOC B/C*** will capture the LOC B/C beam with a single turn.

- L1**
 - The LOC B/C deviation is less than 1.3 dot, and the difference between the track and the LOC B/C course is less than 15 °.

LOC B/C* DISENGAGEMENT CONDITIONS

Applicable to: MSN 02719-03060

Ident.: DSC-22_30-40-80-A-00025462.0001001 / 04 MAY 23

LOC B/C* disengages, when another lateral mode engages.

- L2** **LOC B/C*** disengages, when one of the following occurs:
 - The aircraft becomes established on the LOC B/C beam: **LOC B/C** engages, or
 - The flight crew presses the LOC pb, and there is no vertical managed mode of approach armed or engaged: **HDG/TRACK** engages, or

Note: If a vertical managed mode of approach was previously engaged: **LOC B/C*** remains engaged, and a vertical mode reversion occurs.

- The flight crew pulls the HDG/TRK knob: **HDG/TRACK** engages, or
- The aircraft is above 700 ft RA, and the flight crew inserts a DIRECT TO: **NAV** engages, or
- The flight crew performs a go-around: **SRS GA** and **GA TRK** engage.

Ident.: DSC-22_30-40-80-80-A-00025456.0001001 / 04 MAY 23

REVERSIONS

LOC B/C* reverts to **HDG/TRACK**, when one of the following occurs:

- The flight crew presses the APPR pb, and one of the following conditions is applicable:
 - **F-G/S**  is armed, or
 - **F-G/S***  is engaged, or
 - **F-G/S**  is engaged.
- The flight crew inserts a DIRECT TO RADIAL IN or DIRECT TO RADIAL OUT in the active flight plan
-  - The flight crew changes the approach on the ARRIVAL page, the frequency, the identification, or the course of the LS station on the RADIO NAV page
- The FG detects a difference between both MMRs.
-  When **LOC B/C*** reverts to **HDG/TRACK**, the vertical mode also reverts to **V/S/FPA**.

Ident.: DSC-22_30-40-80-80-A-00025457.0001001 / 18 MAY 22

When the reversion occurs:

- The triple click sounds
- The new guidance mode is boxed for 10 s
- The FD bars flash for 10 s.

LOC B/C ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-80-80-00025458.0001001 / 18 MAY 22

Applicable to: MSN 02719-03060

LOC B/C engages, when **LOC B/C*** is engaged, and the aircraft becomes established on the LOC B/C beam.

LOC B/C DISENGAGEMENT CONDITIONS

Applicable to: MSN 02719-03060

Ident.: DSC-22_30-40-80-80-B-00025459.0001001 / 04 MAY 23

LOC B/C disengages, when another lateral mode engages.

-  **LOC B/C** disengages, when one of the following occurs:
 - The flight crew presses the LOC pb, and there is no vertical managed mode of approach armed or engaged: **HDG/TRACK** engages, or
 - The flight crew pulls the HDG/TRK knob: **HDG/TRACK** engages, or
 - The aircraft is above 700 ft RA, and the flight crew inserts a DIRECT TO: **NAV** engages, or
 - The flight crew performs a go-around: **SRS GA** and **GA TRK** engage.

Ident.: DSC-22_30-40-80-B-00025460.0001001 / 04 MAY 23

REVERSIONS

LOC B/C reverts to **HDG/TRACK**, when one of the following occurs:

- The flight crew presses the APPR pb, and one of the following conditions is applicable:
 - **F-G/S**  is armed, or
 - **F-G/S***  is engaged, or
 - **F-G/S**  is engaged.
- The flight crew inserts a DIRECT TO RADIAL IN or DIRECT TO RADIAL OUT in the active flight plan
-  - The flight crew changes the approach on the ARRIVAL page, the frequency, the identification, or the course of the LS station on the RADIO NAV page
- The FG detects a difference between both MMRs.

 When **LOC B/C** reverts to **HDG/TRACK**, the vertical mode also reverts to **V/S/FPA**.

Ident.: DSC-22_30-40-80-B-00025461.0001001 / 18 MAY 22

When the reversion occurs:

- The triple click sounds
- The new guidance mode is boxed for 10s
- The FD bars flash for 10s.

FINAL APP Mode**GENERAL**

Ident.: DSC-22_30-40-80-90-00025519.0001001 / 18 MAY 22

Applicable to: **ALL**

FINAL APP is a lateral and vertical managed guidance approach mode that guides the aircraft during the final approach.

The **FINAL APP** mode includes the following modes:

- **APP NAV** mode for lateral guidance
- **FINAL** mode for vertical guidance.

APP NAV AND FINAL ARMING CONDITIONS

Ident.: DSC-22_30-40-80-90-00025520.0001001 / 18 MAY 22

Applicable to: **ALL**

APP NAV and **FINAL** modes arms, when all the following conditions are applicable:

- The flight crew presses the APPR pb
- The active flight plan is valid (lateral and vertical profile)
- The approach selected in the ARRIVAL page is compatible with the FINAL APP function (*Refer to PRO-NOR-SOP-18-A Cross-Reference Table*).

Note: If an RNAV visual approach is selected, the flight crew must deselect the FLS  mode via the PERF APPR page.

APP NAV AND FINAL DISARMING CONDITIONS

Ident.: DSC-22_30-40-80-90-00025521.0001001 / 18 MAY 22

Applicable to: **MSN 04392**

APP NAV and **FINAL** modes disarms, when one of the following conditions occurs:

- The flight crew presses the APPR pb: **NAV** remains armed or **NAV** remains engaged
- The flight crew presses the LOC pb arming LOC mode
- **NAV** disarms, or **NAV** engages
- The flight crew performs a go around
- The FMS vertical profile is lost
- AP/FD **TCAS**  mode engages. In this case, **FINAL** disengages and **NAV** remains engaged.

APP NAV AND FINAL DISARMING CONDITIONS

Ident.: DSC-22_30-40-80-90-00025521.0002001 / 18 MAY 22

Applicable to: MSN 02155-03060, 05152-07792

APP NAV and **FINAL** modes disarms, when one of the following conditions occurs:

- The flight crew presses the APPR pb: **NAV** remains armed or **NAV** remains engaged
- The flight crew presses the LOC pb arming LOC mode
- **NAV** disarms, or **NAV** engages
- The flight crew performs a go around
- The flight crew selects another approach than the one currently flown
- The FMS vertical profile is lost
- AP/FD **TCAS**  mode engages. In this case, **FINAL** disengages and **NAV** remains engaged.

APP NAV ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-80-90-00025522.0001001 / 04 MAY 23

Applicable to: ALL

APP NAV and **NAV** modes engage under the same conditions:

- If **NAV** is engaged, **APP NAV** engages immediately
- If **HDG/TRACK** is engaged, **APP NAV** engages when the intercept conditions are met (the aircraft track line must intercept the flight plan active leg).

APP NAV DISENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-80-90-00025523.0001001 / 18 MAY 22

Applicable to: ALL

APP NAV and **NAV** modes disengage under the same conditions (*Refer to DSC-22_30-40-30-20 Disengagement Conditions*).

FINAL APP ENGAGEMENT CONDITIONS

Applicable to: ALL

Ident.: DSC-22_30-40-80-90-A-00025524.0002001 / 18 MAY 22

FINAL APP mode engages when all the following conditions are applicable:

- The aircraft is in the capture zone of the vertical FMS profile

 The vertical capture zone above and below the vertical FMS profile is defined as follow:

- Laterally: ± 1.5 NM from the Final Descent Point
- Vertically: +250 ft above the Final Descent Point.

Ident.: DSC-22_30-40-80-90-A-00025525.0002001 / 18 MAY 22

- NAV or APP NAV is engaged
- FINAL is armed
- Predictions are available in FMS
- APPROACH phase is active

Note: APPROACH phase may have to be manually activated on PERF APPR page if the approach starts at high altitude above aerodrome level (i.e. RNAV(RNP) approaches).

- The aircraft intercepts a descending leg of the vertical flight path.

Note: If APPR pb is pressed earlier, FINAL APP mode may engage. As a consequence, resulting speed and altitude management in the FINAL APP may be inappropriate before FDP.

A blue arrow is displayed on NDs to indicate where the FINAL APP engagement conditions are met and where the final descent will begin automatically.

If the same arrow is displayed in white, at least one engagement condition is not fulfilled, FINAL APP will not engage and the aircraft will not descend automatically.

Ident.: DSC-22_30-40-80-90-A-00025526.0001001 / 18 MAY 22

DEFINITION OF THE FINAL DESCENT POINT (ALSO CALLED VERTICAL INTERSECTION POINT "VIP" FOR RNAV (RNP) APPROACHES)

The FDP is the waypoint from which starts the FMS segment with coded FPA. For RNAV(RNP) approaches, this point may be indicated on the chart as FDP or "VIP".

This point is defined in the Navigation Database by:

- A constant vertical flight path beyond this point,
- A coded altitude constraint that may be "at" or "at or above" (e.g. +3 000 ft). This constraint is displayed on ND (in magenta), next to the corresponding waypoint, when the CSTR key is selected on the EFIS Control Panel. It is also shown on the F-PLN page at this WPT.

Note: The FAF is the position from where the obstacle clearance is defined relative to an OCS. Obstacle clearance is only ensured if the aircraft is flying on the defined vertical flight path. Before the FAF, minimum altitudes are published with fixed MOC. The FDP is the point in the procedure at or before the FAF from which a constant vertical flight path is defined.

FINAL APP DISENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-80-90-B-00025527.0001001 / 18 MAY 22

Applicable to: ALL

The **FINAL APP** mode disengages:

- When the AP/FD **TCAS**  mode engages upon a RA, the FINAL mode disengages and the lateral **NAV** mode remains engaged. The APPR pb comes off

Ident.: DSC-22_30-40-80-90-B-00025528.0002001 / 18 MAY 22

Applicable to: ALL

- The flight crew pushes, or pulls out the V/S / FPA knob: **V/S / FPA** engages, **NAV** remains engaged

Ident.: DSC-22_30-40-80-90-B-00025529.0002001 / 18 MAY 22

Applicable to: ALL

- Automatically at MAP
- The flight crew performs a go-around.

REVERSIONS

Ident.: DSC-22_30-40-80-90-B-00025530.0001001 / 04 MAY 23

Applicable to: MSN 04392**REVERSIONS**

FINAL APP reverts to **V/S/FPA**, when one of the following occurs:

- **NAV** disengages: The lateral mode also reverts to **HDG/TRACK**, or
- If the flight crew pulls out the HDG/TRK knob: The lateral mode also reverts to **HDG/TRACK**, or
- The flight crew presses the APPR pb: The lateral mode remains engaged in NAV, or
- If the flight crew presses the LOC pb: The lateral mode also reverts to **HDG-V/S** and **LOC** arms if an ILS/GLS  approach is selected, or
- The FMS flight phase is no longer cruise (CRZ), descent (DES) or approach (APPR).

Ident.: DSC-22_30-40-80-90-B-00025530.0002001 / 04 MAY 23

Applicable to: MSN 02155-03060, 05152-07792**REVERSIONS**

FINAL APP reverts to **V/S/FPA**, when one of the following occurs:

- **NAV** disengages: The lateral mode also reverts to **HDG/TRACK**, or
- If the flight crew pulls out the HDG/TRK knob: The lateral mode also reverts to **HDG/TRACK**, or
- The flight crew presses the APPR pb: The lateral mode remains engaged in NAV, or
- If the flight crew presses the LOC pb: The lateral mode also reverts to **HDG-V/S** and **LOC** arms if an ILS/GLS  approach is selected, or

- The FMS flight phase is no longer cruise (CRZ), descent (DES) or approach (APPR), or
- L2 - The flight crew changes the approach on the ARRIVAL page, the frequency, the identification, or the course of the LS station on the RADIO NAV page.
The lateral mode also reverts to **HDG/TRACK**.

Ident.: DSC-22_30-40-80-90-B-00025531.0001001 / 18 MAY 22

Applicable to: ALL

When the reversion occurs:

- The triple click sounds
- The new guidance mode is boxed for 10 s
- The FD bars flash for 10 s.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT GUIDANCE

AP/FD MODES - APPROACH MODES AND LANDING MODES

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT GUIDANCE AP/FD MODES - GO-AROUND
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General

GENERAL

Ident.: DSC-22_30-40-90-10-00025614.0002001 / 18 MAY 22

Applicable to: MSN 02926-02944

Go-around combines **SRS** GA vertical mode, and **GA TRK** lateral mode.
SRS GA and **GA TRK** engage at the same time. They disengage at different moment.

At go-around engagement (i.e. **SRS** GA and **GA TRK** engage):

- The FMS flight phase becomes go-around
- If not previously engaged, the FDs automatically engage
- If FPD/FPV was previously displayed, it reverts to FD bars.

GENERAL

Ident.: DSC-22_30-40-90-10-00025614.0004001 / 04 MAY 23

Applicable to: MSN 02155-02789, 03031-07792

When the flight crew initiates a go-around, the **SRS** GA vertical mode engages. In addition, one of the following occurs:

- If a lateral managed mode is engaged (except **NAV** mode), **GA TRK** engages, and **NAV** mode arms
NAV automatically engages as soon as the aircraft reaches the capture zone of the flight plan active leg.

Note: If a HDG/TRK was preset, **NAV** mode does not arm. **GA TRK** engages, until the flight crew pulls the HDG/TRK knob to follow the preset target.

Example: Go-around during an ILS approach

①

SPEED	ALT G/S	LOC *	CAT3 DUAL BARO 200	AP1+2 1FD2 A/THR
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The flight crew performs an ILS approach.

②

MAN TOGA	SRS CLB	GA TRK NAV	AP1+2 1FD2 A/THR
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The flight crew initiates a go-around.

- If **NAV** mode is engaged, it remains engaged

Example: Go-around during an approach in NAV/FPA

①

SPEED	FPA -3.0 °	NAV	BARO 800	AP2 1FD2 A/THR
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The flight crew performs an approach in NAV/FPA.

②

MAN TOGA	SRS CLB	NAV	AP2 1FD2 A/THR
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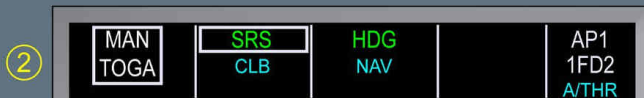
The flight crew initiates a go-around.

- If **HDG/TRACK** mode is engaged, it remains engaged, and **NAV** mode arms
NAV automatically engages as soon as the aircraft reaches the capture zone of the flight plan active leg.

Example: Go-around during an approach in HDG / V/S



The flight crew performs an approach in HDG / V/S.

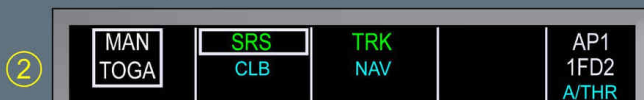


The flight crew initiates a go-around.

Example: Go-around during an approach in TRK/FPA



The flight crew performs an approach in TRK/FPA.



The flight crew initiates a go-around.

In addition, at go-around engagement:

- The FMS flight phase becomes go-around
- If not previously engaged, the FDs automatically engage
- If FPD/FPV was previously displayed, it reverts to FD bars.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT GUIDANCE

AP/FD MODES - GO-AROUND

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SRS GA Mode**GENERAL****Applicable to: ALL**

Ident.: DSC-22_30-40-90-20-A-00025615.0002001 / 18 MAY 22

The SRS mode is a managed vertical mode. This mode is applicable during takeoff and go-around. This chapter is only about the SRS mode during go-around, also referred to as **SRS** GA mode. The FMA displays **SRS**, when the **SRS** GA mode engages. The **SRS** GA controls the speed target via the elevators.

L2 The guidance law also includes:

- A flight path angle protection, that ensures a positive climb
- A pitch angle protection to reduce the aircraft nose-up (18 ° of maximum pitch altitude or 22.5 ° maximum in case of windshear)
- A speed protection, that ensures the aircraft does not exceed VFE.

L1 The speed target is the memorized aircraft speed at **SRS** GA engagement or VAPP, whichever is higher.

L2 The higher limit of the target is the lowest value between:

- 25 kt above VLS (or 15 kt above VLS when one engine is inoperative)
- 5 kt below VMAX.

L1 Note: At **SRS** GA engagement, the speed becomes managed.

Ident.: DSC-22_30-40-90-20-A-00025622.0002001 / 18 MAY 22

When the **SRS** GA mode disengages, the speed target becomes the smaller of Green Dot Speed or the speed constraints.

Note: If the FMS flight phase is cruise, the SPD LIM or the SPD CSTR are still respected.

ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-90-20-00025616.0001001 / 04 MAY 23

Applicable to: ALL

SRS GA engages when all of the following conditions are applicable:

- The flight crew sets at least one thrust lever to the TOGA detent
- The flaps lever is at least in position 1
- The aircraft is airborne, or on ground for less than 30 s.

SRS GA mode can be engaged regardless of the vertical mode (except **SRS** TO).

DISENGAGEMENT CONDITIONS**Applicable to: ALL**

Ident.: DSC-22_30-40-90-20-B-00025617.0001001 / 18 MAY 22

The **SRS** GA mode disengages when one of the following occur:

- At the go-around acceleration altitude (GA ACC ALT), or if **ALT*** or **ALT CST*** engages (above 400 ft RA)
- If the flight crew engages another vertical mode
- If the selected target altitude is above the aircraft altitude and the flight crew selects a speed: **SRS** GA reverts to **OP CLB**
- If the AP/FD **TCAS**  mode engages upon a RA.

- Note:
1. In Engine Out conditions, the **SRS** GA mode does not automatically disengage at **EO ACC ALT**.
 2. In dual AP configuration, disengagement of the go-around mode, on either axis, causes AP 2 to disconnect.

Ident.: DSC-22_30-40-90-20-B-00025618.0001001 / 18 MAY 22

REVERSIONS

When **SRS** GA reverts to **OP CLB**, the following occurs:

- The triple click sounds
- The new guidance mode is boxed for 10 s.

GA TRK Mode**GENERAL**

Ident.: DSC-22_30-40-90-30-00025619.0001001 / 18 MAY 22

Applicable to: ALL

The **GA TRK** mode is a managed lateral mode that is applicable during go-around.
The **GA TRK** mode maintains the track of the aircraft, when the mode engages.

ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-90-30-00025620.0002001 / 04 MAY 23

Applicable to: MSN 02155-02789, 03031-07792

GA TRK engages when all of the following conditions are applicable:

- The flight crew sets at least one thrust lever to the TOGA detent
- The slats or the flaps are extended
- The aircraft is airborne, or on ground for less than 30 s
- **NAV**, **HDG**, or **TRACK** is not engaged.

GA TRK simultaneously engages with **SRS** GA.

ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-90-30-00025620.0001001 / 18 MAY 22

Applicable to: MSN 02926-02944

GA TRK engages, when all of the following conditions are applicable:

- The flight crew sets at least one thrust lever to the TOGA detent
- The slats or the flaps are extended
- The aircraft is airborne, or on ground for less than 30 s.

GA TRK simultaneously engages with **SRS** GA.

DISENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-90-30-00025621.0001001 / 18 MAY 22

Applicable to: ALL

GA TRK disengages when another lateral mode engages.

 **GA TRK** cannot be disengaged below 100 ft RA.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT GUIDANCE

AP/FD MODES - GO-AROUND

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AIRCRAFT SYSTEMS**AUTO FLIGHT - FLIGHT GUIDANCE**

AP/FD MODES - AP/FD TCAS MODE

GENERAL

Ident.: DSC-22_30-40-100-00025773.0001001 / 18 MAY 22

Applicable to: MSN 07784-07792

The AP/FD **TCAS** mode is an AP/FD vertical mode, that provides vertical guidance in the case of a RA alert, generated by the TCAS.

When a TA is triggered, the AP/FD **TCAS** mode arms.

When an RA is triggered, the AP/FD **TCAS** mode engages to provide guidance in accordance with the RA order:

- The AP status does not change: Remains engaged or disengaged
- If not previously engaged, the FDs automatically engage.

When the "CLEAR OF CONFLICT" aural alert sounds, the AP/FD **TCAS** mode disengages. The AP/FD provides guidance toward the latest target altitude set on the FCU.

AP/FD TCAS MODE AVAILABILITY

Ident.: DSC-22_30-40-100-00025774.0001001 / 02 MAY 24

Applicable to: MSN 07784-07792

The AP/FD TCAS mode is available, when all of the following conditions are met:

- The aircraft is above 900 ft RA
- The TCAS is not failed (i.e. the ECAM did not trigger the **NAV TCAS FAULT** alert)
- TCAS is in TA/RA mode
- At least one AP and one FD are available
- The AP/FD TCAS mode is not failed (i.e. the ECAM did not trigger the **AUTO FLT TCAS MODE FAULT** alert)
- EGPWS, WINDSHEAR, or STALL warning is not triggered.

To arm or engage, the AP/FD TCAS mode must be available.

ARMING CONDITIONS

Ident.: DSC-22_30-40-100-00025775.0001001 / 18 MAY 22

Applicable to: MSN 07784-07792

The AP/FD **TCAS** mode arms, when a TA alert is triggered.

The AP/FD **TCAS** mode arms, even if both APs, and both FDs are disengaged. In this case, the APs and FDs remain disengaged.

Note: The arming of the AP/FD **TCAS** mode is inhibited when one of the following is applicable:

- The TA ONLY mode of the TCAS is selected, or
- The STANDBY mode of the TCAS is selected.

AIRCRAFT SYSTEMS**AUTO FLIGHT - FLIGHT GUIDANCE**

AP/FD MODES - AP/FD TCAS MODE

DISARMING CONDITIONS

Ident.: DSC-22_30-40-100-00025776.0001001 / 18 MAY 22

Applicable to: MSN 07784-07792

The AP/FD **TCAS** mode disarms, when one of the following occurs:

- The intruder becomes white on the ND, or
- The AP/FD **TCAS** mode engages upon a RA alert, or
- The TA ONLY mode of the TCAS is selected, or
- The STANDBY mode of the TCAS is selected, or
- The AP/FD **TCAS** mode fails (i.e the ECAM triggers the **AUTO FLT TCAS MODE FAULT** alert).

ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-100-00025777.0001001 / 18 MAY 22

Applicable to: MSN 07784-07792

The AP/FD **TCAS** mode engages, when a RA is triggered.

The AP/FD **TCAS** mode engages, even if both APs, and both FDs are disengaged. In this case, the FDs automatically engage.

- Note:***
- *When the AP/FD **TCAS** mode engages, the triple click audio indicator does not sound, and the FD pitch bar does not flash*
 - *The engagement of the AP/FD **TCAS** mode is inhibited when one of the following is applicable:*
 - *The TA ONLY mode of the TCAS is selected, or*
 - *The STANDBY mode of the TCAS is selected.*

DISENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-100-00025778.0001001 / 18 MAY 22

Applicable to: MSN 07784-07792

The AP/FD **TCAS** mode automatically disengages, when the "CLEAR OF CONFLICT" aural alert sounds.

Then the AP/FD engages in a vertical mode that leads the aircraft toward the target altitude set on the FCU.

The AP/FD **TCAS** mode also automatically disengages, if one of the following occurs:

- The TA ONLY mode of the TCAS is selected.

The FMA then displays the **TCAS RA INHIBITED** message on Line 3 of the "Special Messages" column

- The STANDBY mode of the TCAS is selected.

The FMA then displays the **TCAS RA INHIBITED** message on Line 3 of the "Special Messages" column

- The ECAM triggers the AP/FD **AUTO FLT TCAS MODE FAULT** alert, or
- The flight crew engages another AP/FD vertical mode (e.g. in the case of go-around).

Note: If the AP/FD **TCAS** mode is lost while engaged, the vertical mode reverts to **V/S**. The vertical speed target is:

- 0 ft/min if the RA order was to descend
- The TCAS vertical speed target at the time of the failure, if the RA order was to climb.

NORMAL OPERATIONS - WHEN A TA IS TRIGGERED

Ident.: DSC-22_30-40-100-00025779.0001001 / 18 MAY 22

Applicable to: MSN 07784-07792

When a TA alert is triggered, the AP/FD **TCAS** mode arms.

CONSEQUENCE ON AP AND FD

When the AP/FD **TCAS** mode arms, the AP and FDs engagement status does not change.

CONSEQUENCE ON AP/FD LATERAL MODE

When the AP/FD **TCAS** mode arms, any engaged (armed) AP/FD lateral mode remains engaged (armed).

CONSEQUENCE ON AP/FD VERTICAL MODE

When the AP/FD **TCAS** mode arms, any armed (engaged) AP/FD vertical mode remains armed (engaged).

The FMA displays **TCAS** on Line 3 of the "AP/FD Vertical Modes" column. Therefore, if another AP/FD vertical mode is armed, the FMA displays both modes.

NORMAL OPERATIONS - WHEN A RA IS TRIGGERED

Applicable to: MSN 07784-07792

Ident.: DSC-22_30-40-100-A-00025780.0001001 / 18 MAY 22

At occurrence of any preventive or corrective RA, the AP/FD **TCAS** mode engages. It provides vertical guidance in accordance with the TCAS vertical speed orders.

Ident.: DSC-22_30-40-100-A-00025781.0001001 / 18 MAY 22

CONSEQUENCE ON AP AND FD

When the AP/FD **TCAS** mode engages:

- The AP engagement status does not change
- If not previously engaged, the FDs automatically engage.

Ident.: DSC-22_30-40-100-A-00025782.0001001 / 18 MAY 22

CONSEQUENCE ON AP/FD LATERAL MODE

When the AP/FD **TCAS** mode engages, any engaged (armed) AP/FD lateral mode remains engaged (armed).

If both APs and both FDs are disengaged, when the AP/FD **TCAS** mode engages, **HDG** automatically engages. The heading target is the aircraft heading at **HDG** engagement.

*Note: When the AP/FD **TCAS** mode disengages (e.g. at the CLEAR OF CONFLICT), the FMA displays the **TRK FPA DESELECTED** message for 10 s on Line 3 of the "Special Messages" column, if the flying reference was TRK-FPA before the AP/FD **TCAS** mode engagement.*

Ident.: DSC-22_30-40-100-A-00025783.0001001 / 18 MAY 22

CONSEQUENCE ON AP/FD VERTICAL MODE

GUIDANCE

Depending on the RA and the FCU selected altitude, the AP/FD **TCAS** mode uses the guidance law of one of the following modes: **V/S**, **ALT***, **ALT**, **ALT CRZ***, **ALT CRZ**.

V/S Guidance

The AP/FD **TCAS** mode uses the guidance law of the V/S mode if:

- **ALT/ALT** CRZ is not armed, or
- The FCU selected altitude of **ALT***, **ALT**, **ALT CRZ*** or **ALT CRZ** is not compatible with the RA order.

The vertical speed target is one of the following values:

- The aircraft vertical speed at the engagement of the AP/FD **TCAS** mode, if a preventive RA is triggered, or
- The limit between the green and red area of the vertical speed scale, ± 200 ft/min if the aircraft should climb (descend).

The AP/FD **TCAS** mode ensures that the aircraft speed remains between VLS - 5 kt (VLS - 2 kt in landing configuration) and VMAX.

Note: In order to ensure a rapid response to the RA, the initial vertical speed may temporarily exceed the vertical speed target of the TCAS. The peak of the vertical speed is reached in less than 5 s after the vertical speed enters the TCAS green area.

If the RA order changes, the AP/FD **TCAS** mode follows the new target.

ALT*, ALT, ALT CRZ* or ALT CRZ Guidance

The AP/FD **TCAS** mode uses the guidance law of the **ALT / ALT CRZ / ALT* / ALT CRZ*** mode if:

- **ALT / ALT CRZ** is armed, and
- The FCU selected altitude of **ALT***, **ALT, ALT CRZ*** or **ALT CRZ** is compatible with the RA order.

Ident.: DSC-22_30-40-100-A-00025784.0001001 / 18 MAY 22

AP/FD VERTICAL MODE ENGAGED AT OCCURRENCE OF THE RA

When the AP/FD **TCAS** mode engages, any engaged AP/FD vertical mode disengages.

- Note:
- If **G/S / F-G/S**  is engaged, when the AP/FD **TCAS** mode engages:
 - **G/S / F-G/S**  disengages
 - **LOC / F-LOC**  remains engaged
 - The APPR pb comes off, and the LOC pb comes on.
 - If **FINAL APP** is engaged, when the AP/FD **TCAS** mode engages:
 - **FINAL APP** disengages
 - Managed lateral guidance remains engaged with **NAV** engaged
 - The APPR pb comes off.

Ident.: DSC-22_30-40-100-A-00025785.0001001 / 18 MAY 22

AP/FD VERTICAL MODE ARMED AT OCCURRENCE OF THE RA

When the AP/FD **TCAS** mode engages, any armed AP/FD vertical mode disarms, except **ALT / ALT CRZ** if the altitude capture is compatible with the RA order.

- Note:
- If **G/S / F-G/S**  is armed, when the AP/FD **TCAS** mode engages:
 - **G/S / F-G/S**  disarms
 - The APPR pb comes off, and the LOC pb comes on.
 - If **FINAL** is armed, when the AP/FD **TCAS** mode engages:
 - **FINAL** disarms
 - Managed lateral guidance remains engaged with **NAV** engaged
 - The APPR pb comes off.

Note: If the approach is re-armed and if the capture conditions are fulfilled, the corresponding approach mode engages. The AP/FD **TCAS** mode disengages (even if it is not **CLEAR OF CONFLICT**). A RA may be triggered again.

CAPTURE OF THE SELECTED ALTITUDE IN AP/FD **TCAS MODE**

If **ALT / ALT CRZ** is armed, when the AP/FD **TCAS** mode engages:

L2

- **ALT / ALT** CRZ remains armed if the capture of the FCU selected altitude is compatible with the RA order, and if the selected level is reached before the CLEAR OF CONFLICT.

If **ALT / ALT** CRZ is armed, and ALT capture conditions occur during the RA, the AP/FD **TCAS** mode captures the FCU selected altitude (without **ALT*** indicated on the FMA).

This can occur when the TCAS triggers a preventive RA "MONITOR VERTICAL SPEED", or a corrective RA "ADJUST VERTICAL SPEED, ADJUST" aural alert.

However, if the vertical speed order of the RA is zero, **ALT / ALT** CRZ disarms.

L1

- **ALT / ALT** CRZ disarms, if the capture of the FCU selected altitude is not compatible with the RA order.

WHITE BOX ON FMA

When a vertical mode disarms at AP/FD **TCAS** mode engagement, the FMA displays a white box for 10 s.

Ident.: DSC-22_30-40-100-A-00025786.0001001 / 18 MAY 22

CONSEQUENCE ON A/THR AND SPEED/MACH CONTROL

When the AP/FD **TCAS** mode engages:

- If the A/THR is disconnected, it becomes armed or active, depending on the thrust lever position
- If the **A/THR** is armed, it remains armed
- If the **A/THR** is active, it remains active.

A/THR ACTIVE

When the AP/FD **TCAS** mode engages, if the **A/THR** becomes / remains active, the **SPEED/MACH** mode engages.

The speed/Mach control becomes selected, and the speed/Mach target becomes the aircraft speed/Mach at the occurrence of the RA.

L2

If a new RA order occurs, the speed/Mach target changes, and becomes the aircraft speed/Mach at the occurrence of the new RA.

L1

A/THR ARMED

When the AP/FD **TCAS** mode engages, if the **A/THR** becomes / remains armed, the thrust target does not change.

The FMA displays the A/THR message, in accordance with the thrust lever position (e.g. **MAN THR**, **MAN TOGA**).

L2

Note: If the flight crew sets the thrust levers to the CL detent, the **A/THR** activates. The **SPEED/MACH** mode engages. The speed/Mach control becomes selected, and the speed/Mach target becomes the aircraft speed/Mach at the **A/THR** activation.

L1

LVR CLB Message on the FMA

In the case of AP/FD **TCAS** mode engagement when the **A/THR** is armed (e.g. RA order triggers below the THR RED ALT):

- If the vertical speed order of the RA is above 500 ft/min, the **LVR CLB** message is inhibited.

However, if the speed becomes greater than VFE - 20 kt, the **LVR CLB** message flashes on the FMA.

- If the vertical speed order of the RA is equal to, or below 500 ft/min, the **LVR CLB** message flashes on the FMA even when below the THR RED ALT.

Ident.: DSC-22_30-40-100-A-00025787.0001001 / 18 MAY 22

CONSEQUENCE ON ALPHA FLOOR

When AP/FD **TCAS** mode is engaged, ALPHA FLOOR is temporarily inhibited:

- If all thrust levers are set to CLB detent when the RA is triggered, ALPHA FLOOR is inhibited while AP/FD **TCAS** mode is engaged.
- If at least one thrust lever is below the CLB detent when the RA is triggered, **LVR CLB** flashes on the FMA and ALPHA FLOOR is inhibited during 5 s, then:
 - If all thrust levers are set to the CLB detent, ALPHA FLOOR inhibition is maintained while AP/FD **TCAS** mode is engaged
 - If at least one thrust lever remains below the CLB detent, ALPHA FLOOR is reactivated.

NORMAL OPERATIONS - WHEN CLEAR OF CONFLICT

Ident.: DSC-22_30-40-100-00025788.0001001 / 18 MAY 22

Applicable to: MSN 07784-07792

When the "CLEAR OF CONFLICT" aural alert sounds, the AP/FD **TCAS** mode automatically disengages. The AP/FD provides guidance toward the previous FCU selected altitude.

CONSEQUENCE ON AP/FD LATERAL MODE

When the AP/FD **TCAS** mode disengages, any engaged/armed AP/FD lateral mode remains engaged/armed.

CONSEQUENCE ON AP/FD VERTICAL MODE

When the AP/FD **TCAS** mode disengages, one of the following modes engages: **V/S**, **ALT***, **ALT**, **ALT CRZ***, or **ALT CRZ**.

AIRCRAFT SYSTEMS**AUTO FLIGHT - FLIGHT GUIDANCE**

AP/FD MODES - AP/FD TCAS MODE

AP/FD TCAS MODE REVERSION TO ALT / ALT CRZ / ALT* / ALT CRZ*

If ALT / ALT CRZ is armed, when the AP/FD TCAS mode disengages:

- ALT*/ALT CRZ* engages, if the aircraft is within the capture zone of the FCU selected altitude
- ALT/ALT CRZ engages, if the aircraft altitude is equal to the FCU selected altitude
- In all other cases, V/S engages.

AP/FD TCAS MODE REVERSION TO V/S

When the AP/FD TCAS mode reverts to V/S when clear of conflict, all of the following occurs:

- ALT or ALT CRZ arms
- A triple click audio indicator sounds, and the pitch bar flashes for 10 s
- The vertical speed target depends on whether a preventive RA occurred, or a corrective RA occurred.

Vertical Speed Target - A Preventive RA Occurred

The vertical speed target remains the vertical speed target at the triggering of the RA.

Vertical Speed Target - A Corrective RA Occurred

The vertical speed target becomes:

- 500 ft/min, if the aircraft is at, or above 30 000 ft, and the FCU selected altitude is above the aircraft
- $\pm 1\,000$ ft/min, in all other cases.

V/S leads the aircraft toward the FCU selected altitude.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT GUIDANCE AP/FD MODES - AP/FD MODE REVERSIONS
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AP/FD MODE REVERSIONS

Ident.: DSC-22_30-40-110-A-00025789.0001001 / 18 MAY 22

Applicable to: ALL

REVERSION DUE TO FCU ALTITUDE CHANGES

Conditions	Event	Consequence
OP CLB engaged CLB engaged EXP CLB  engaged	FCU selected altitude set below A/C altitude	V/S-FPA engages <i>(Refer to DSC-22_30-40-70 Reversions to V/S / FPA)</i>
OP DES engaged DES engaged EXP DES  engaged	FCU selected altitude set above A/C altitude	
ALT* active	FCU selected altitude modification (greater than 250 ft)	

Ident.: DSC-22_30-40-110-A-00025790.0001001 / 18 MAY 22

Applicable to: ALL

REVERSION DUE TO THE LOSS OF NAV MODE

Conditions	Event	Consequence
CLB engaged DES engaged	Loss of lateral managed mode: NAV	OP CLB engages V/S engages <i>(Refer to DSC-22_30-40-70 Reversions to V/S / FPA)</i>

Ident.: DSC-22_30-40-110-A-00025791.0002001 / 06 NOV 25

Applicable to: ALL

1 **SPEED PROTECTION WHEN FD ORDERS ARE NOT FOLLOWED BY THE FLIGHT CREW (AP NOT ENGAGED)**

Conditions	Event	Consequence
FD engaged with: - AP OFF, and - OP DES, DES or EXP DES  engaged, and - A/THR active (IDLE thrust).	IAS = VLS-2 kt (between VLS-2 kt and VLS-17 kt depending on the position of the speedbrakes)	FD bars disappear. If A/THR active, automatic engagement of SPEED mode on the A/THR. Thrust increases to recover the speed target.
FD is engaged with: - AP off, and - OP CLB, CLB or EXP CLB  engaged, and - A/THR active (CLIMB thrust).	IAS = VMAX+4 kt	FD bars disappear. If A/THR active, automatic engagement of SPEED mode on the A/THR. Thrust decreases to recover the speed target.

Ident.: DSC-22_30-40-110-A-00025792.0004001 / 18 MAY 22

Applicable to: ALL

SPEED PROTECTION DUE TO EXCESSIVE V/S

Conditions	Event	Consequence
Excessive V/S or FPA selected in climb	IAS = VLS (or VLS-5 kt if target is VLS)	The selected V/S (or FPA) target is temporarily disregarded to maintain VLS in climb, or VMAX in descent.
Excessive V/S or FPA selected in descent	IAS = VMAX	

Note: When flying with FD bars only (AP OFF), the FMGS adjusts the pitch so that VLS in climb, or VMAX in descent is maintained. However, no triple click is generated and the V/S target displayed on the FMA remains unchanged.

Ident.: DSC-22_30-40-110-A-00025793.0001001 / 18 MAY 22

Applicable to: MSN 07784-07792

SPEED PROTECTION DUE TO EXCESSIVE V/S TARGET (AP/FD TCAS MODE ENGAGED)

Conditions	Event	Consequence
Excessive V/S target in climb	IAS reaching VLS (or VLS - 5 kt if target is VLS or VLS - 2 kt if target is VLS in landing configuration)	The TCAS RA V/S target is temporarily disregarded to maintain VLS in climb, or VMAX in descent.
Excessive V/S target in descent	IAS reaching VMAX	

Note: When flying with FD bars only (AP OFF), the FMGS adjusts the pitch so that VLS in climb, or VMAX in descent is maintained. However, no triple click is generated and the V/S target displayed on the FMA remains unchanged.

Takeoff

TAKEOFF WITH NAV

Ident.: DSC-22_30-40-120-20-00025278.0001001 / 18 MAY 22

Applicable to: ALL

NAV and **CLB** arm when the aircraft is on ground, and:

- The FDs are engaged
- A runway and a SID are selected in the flight plan
- V2 is inserted in the PERF TAKE OFF page
- No FLX TO temperature, nor DRT TO level (Derated Takeoff ) is entered in the PERF TAKEOFF page
- The FCU selected altitude is set above the acceleration altitude
- The slats are extended.

When the aircraft is at the runway threshold, and the flight crew sets the thrust levers to TOGA, **SRS** and **RWY** engage, and **MAN TOGA** appears on the FMA.

At least 5 s after liftoff, the flight crew can engage one AP.

At 30 ft RA, **RWY** disengages, and **NAV** engages.

When the aircraft reaches the thrust reduction altitude, **LVR CLB** flashes. The flight crew sets the thrust levers to the CL detent, **MAN TOGA** disappears, and **THR CLB** engages.

At the acceleration altitude, **SRS** disengages, and **CLB** engages.

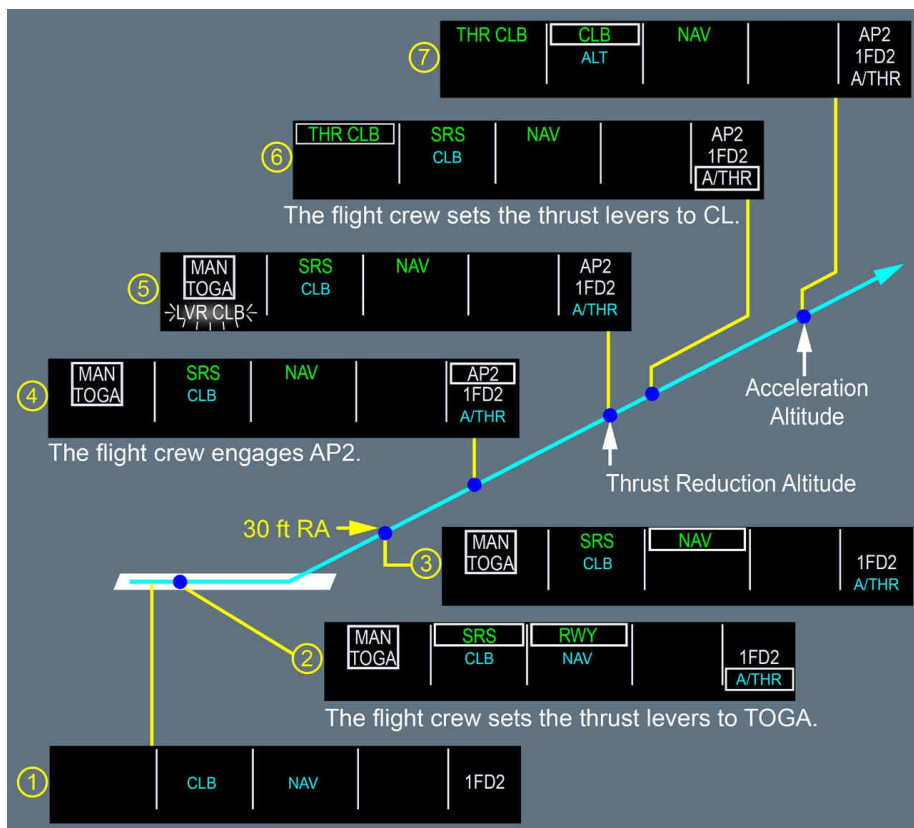
From liftoff to the acceleration altitude, the managed speed target is V2+10 kt. At the acceleration altitude, the managed speed target becomes the applicable FMS speed target (e.g. CLB SPD LIM, ECON speed).

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT GUIDANCE

AP/FD MODES - SCENARIO EXAMPLES

Takeoff with NAV



TAKEOFF WITH HDG/TRK PRESET

Ident.: DSC-22_30-40-120-20-00025280.0001001 / 04 MAY 23

Applicable to: ALL

OP CLB arms when the aircraft is on ground, and:

- The FDs are engaged
- A runway is selected in the flight plan
- V2 is inserted in the PERF TAKEOFF page
- No FLX TO temperature, nor DRT TO level (Derated Takeoff $\leq \frac{1}{2}$) is entered in the PERF TAKEOFF page
- The FCU selected altitude is set above the acceleration altitude

- The flight crew turned the HDG/TRK knob on the FCU to select a heading (or track) preset. The HDG/TRK window displays the heading (or track). The display remains, as long as **RWY**, **RWY TRK**, and **HDG** (or **TRACK**) are engaged.
- The slats are extended.

When the aircraft is at the runway threshold, and the flight crew sets the thrust levers to TOGA, **SRS** and **RWY** engage, and **MAN TOGA** appears on the FMA.

At least 5 s after liftoff, the flight crew can engage one AP.

At 30 ft RA, **RWY** disengages, and **RWY TRK** engages.

When the flight crew pulls the HDG/TRK knob, **HDG** engages (HDG-V/S is selected).

At the thrust reduction altitude, **THR CLB** engages.

At the acceleration altitude, **OP CLB** engages.

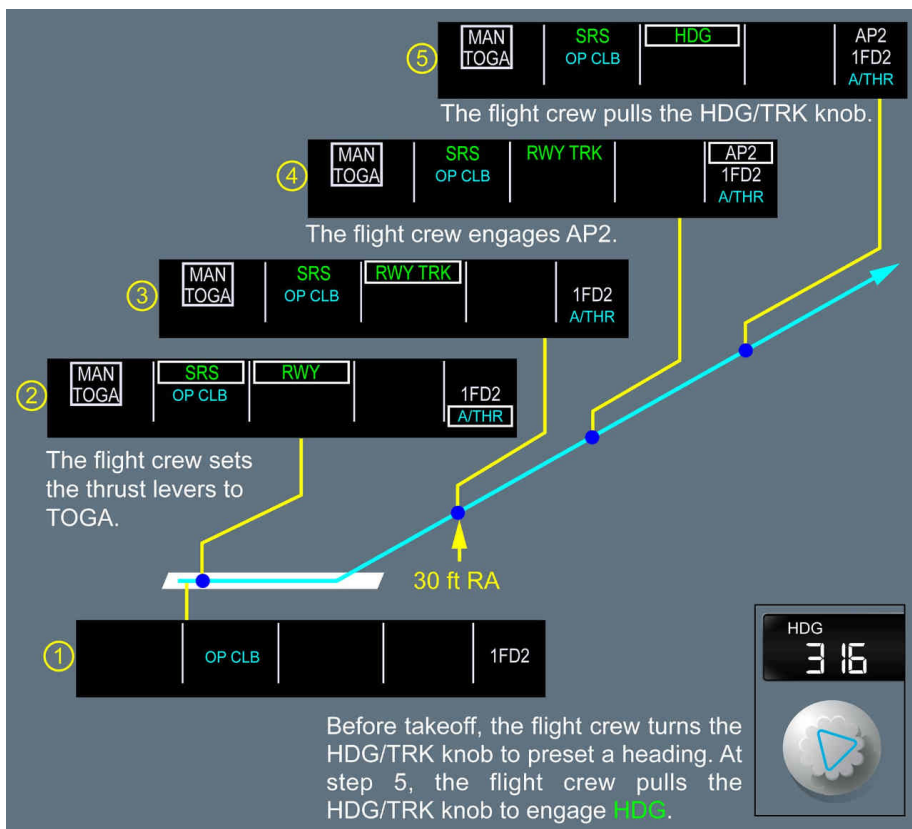
From liftoff to the acceleration altitude, the managed speed target is V_2+10 kt. At the acceleration altitude, the managed speed target becomes the applicable FMS speed target (e.g. CLB SPD LIM, ECON speed).

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT GUIDANCE

AP/FD MODES - SCENARIO EXAMPLES

Takeoff with HDG/TRK Preset



Climb with OP CLB Mode

AT THE ACCELERATION ALTITUDE

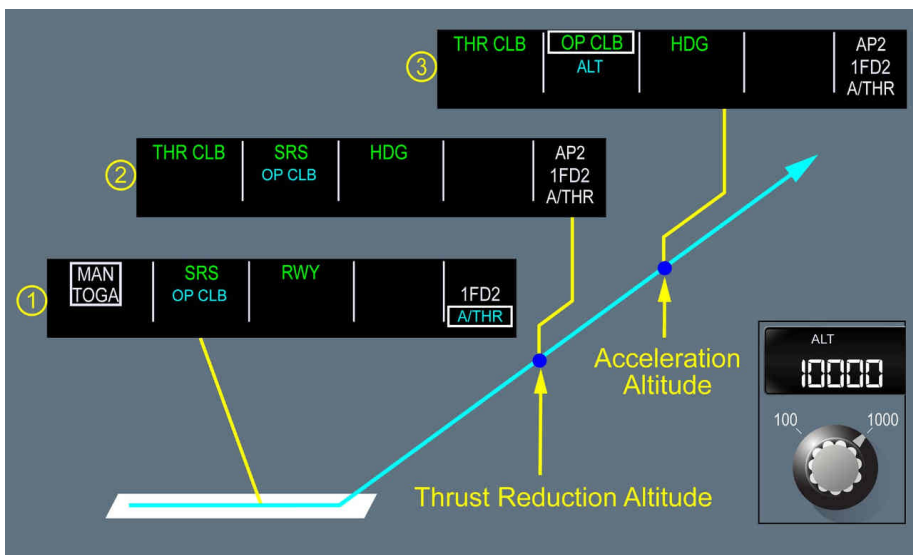
Ident.: DSC-22_30-40-120-30-00025281.0001001 / 18 MAY 22

Applicable to: ALL

On ground, **OP CLB** arms, if **NAV** is not armed.

OP CLB automatically engages at the acceleration altitude.

At the Acceleration Altitude



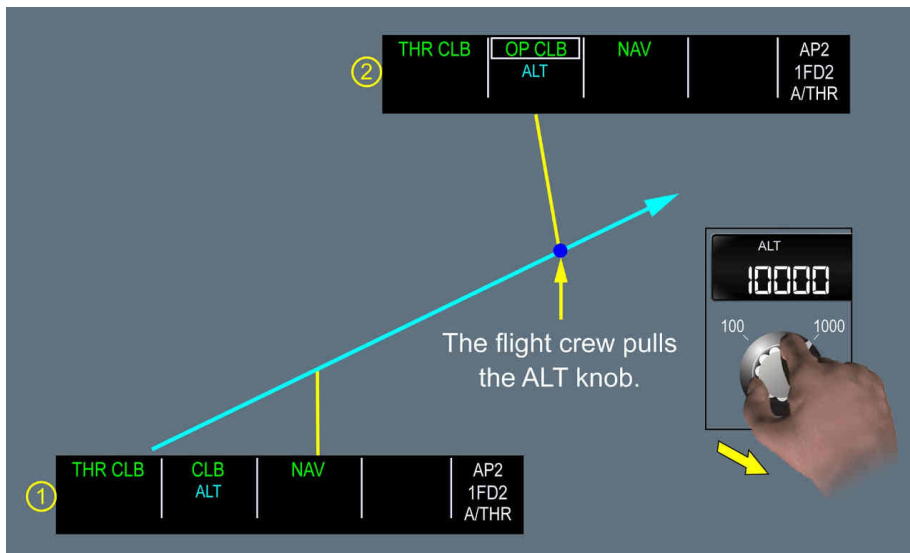
THE FLIGHT CREW PULLS THE ALT KNOB

Ident.: DSC-22_30-40-120-30-00025282.0001001 / 18 MAY 22

Applicable to: ALL

If **CLB** is engaged, and the flight crew pulls the ALT knob, **OP CLB** engages.

The Flight Crew Pulls the ALT Knob



NAV DISENGAGES

Ident.: DSC-22_30-40-120-30-00025283.0001001 / 04 MAY 23

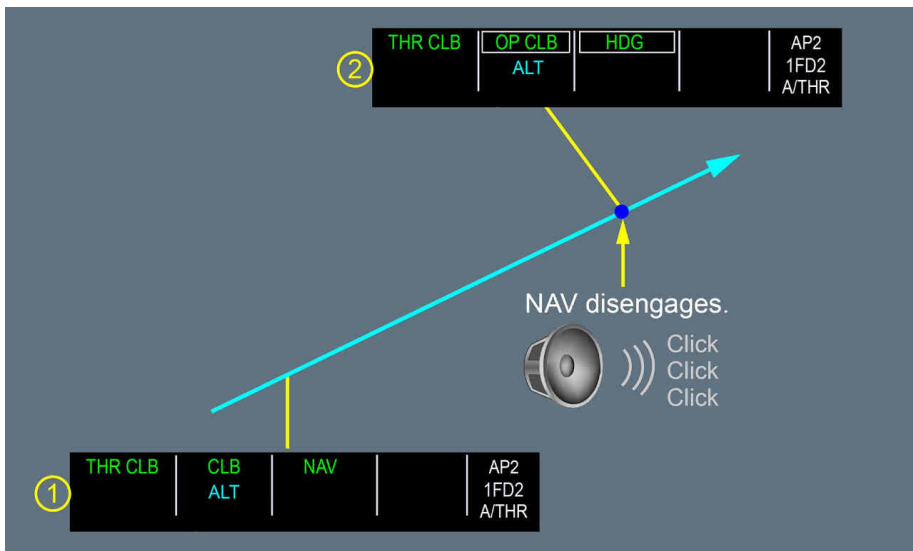
Applicable to: ALL

If CLB and NAV are engaged and NAV disengages, CLB disengages, and OP CLB engages.

The transition from CLB to OP CLB is a reversion with a triple click, if NAV disengages due to one of the following conditions:

- The aircraft reaches a flight plan discontinuity
- The next altitude target is an altitude constraint, and the flight crew engages HDG/TRACK mode.

NAV Disengages



AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT GUIDANCE

AP/FD MODES - SCENARIO EXAMPLES

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Climb with CLB Mode

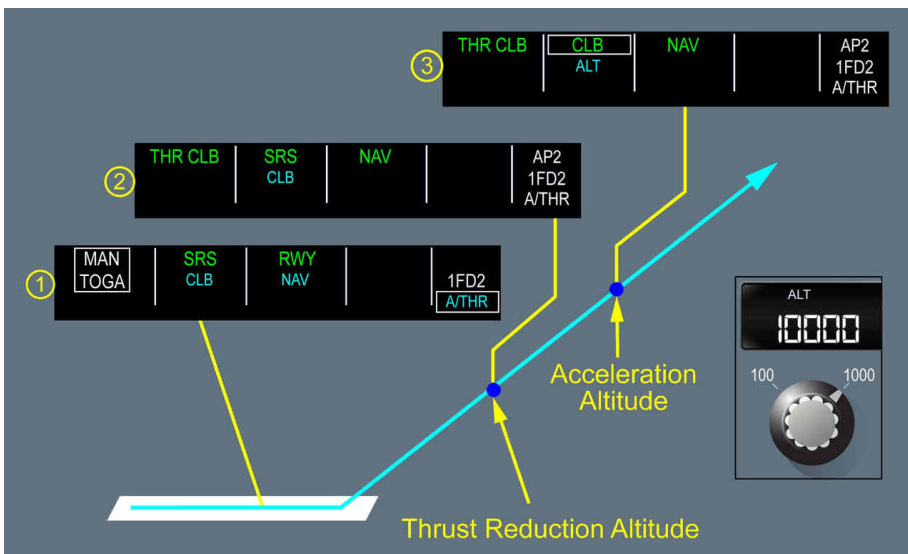
AT THE ACCELERATION ALTITUDE

Ident.: DSC-22_30-40-120-40-00025284.0001001 / 18 MAY 22

Applicable to: ALL

On ground, with **NAV** armed, **CLB** arms. **CLB** automatically engages at the acceleration altitude.

At the Acceleration Altitude



CLIMBING TOWARD AN ALTITUDE CONSTRAINT

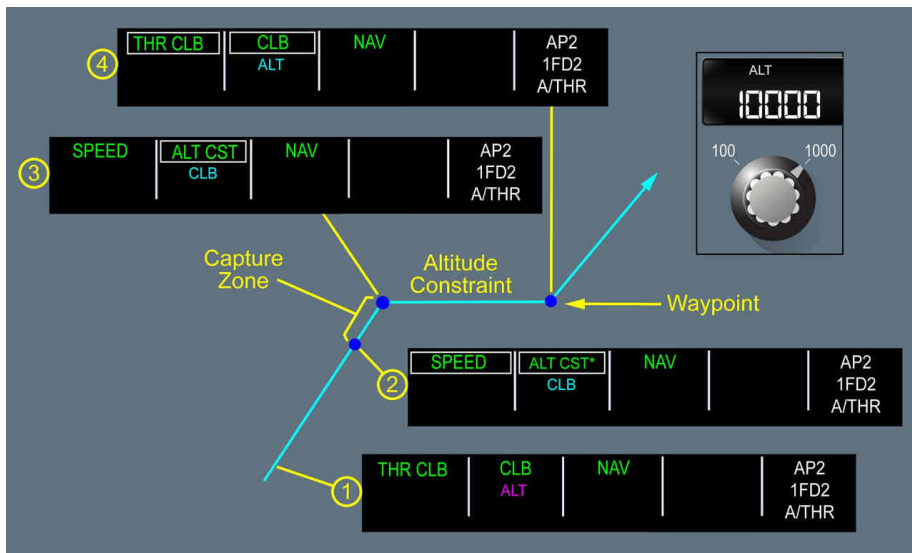
Ident.: DSC-22_30-40-120-40-00025285.0001001 / 18 MAY 22

Applicable to: ALL

If the aircraft reaches an altitude constraint when **CLB** is engaged, the **ALT CST** mode engages and **CLB** becomes arms.

When the aircraft sequences the waypoint that defines the end of the altitude constraint of the FMS flight plan, **CLB** recovers.

Climbing toward an Altitude Constraint



Altitude with ALT

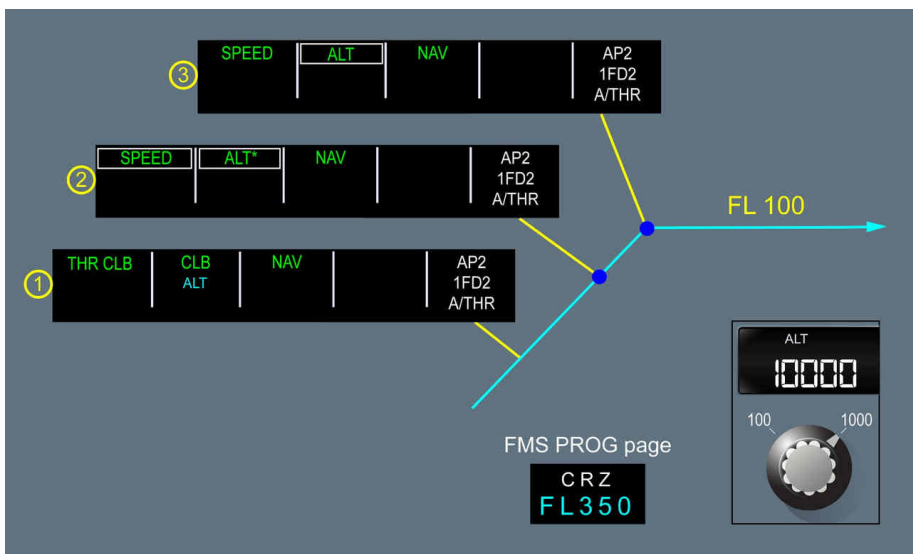
CLB AND ALT - EXAMPLE 1

Ident.: DSC-22_30-40-120-50-00025286.0001001 / 18 MAY 22

Applicable to: ALL

The vertical guidance is managed, and the aircraft climbs toward the FCU selected altitude (e.g. FL 100), with no altitude constraint.

CLB and ALT - Example 1



CLB AND ALT - EXAMPLE 2

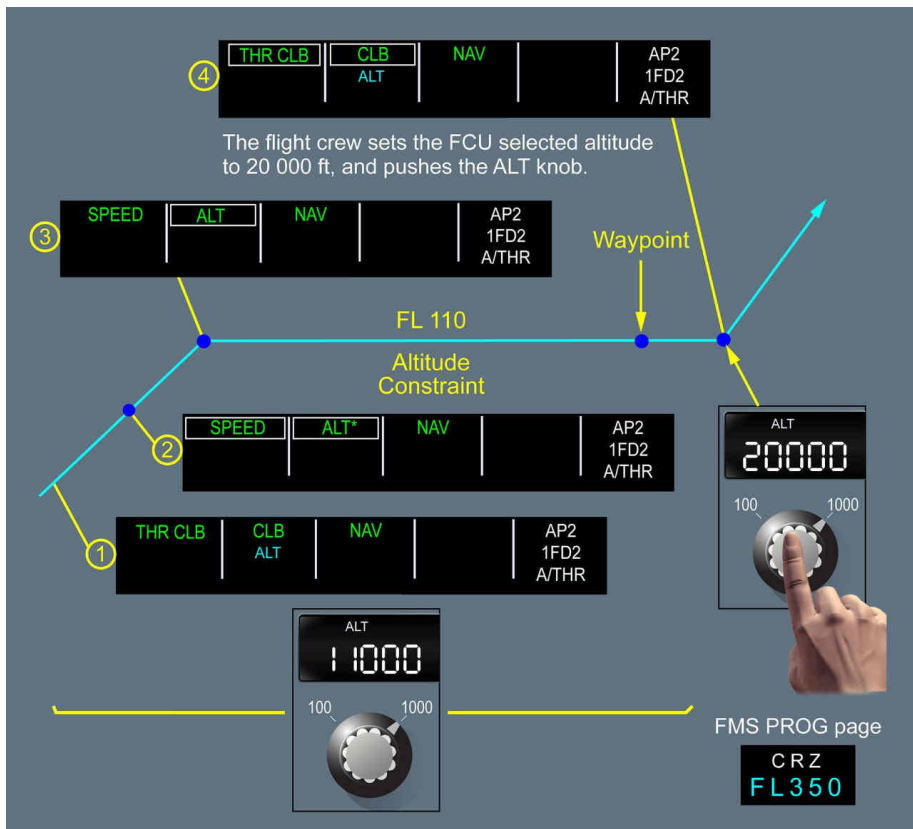
Ident.: DSC-22_30-40-120-50-00025287.0001001 / 18 MAY 22

Applicable to: ALL

The vertical guidance is managed, and:

- The FCU selected altitude (e.g. FL 110) is equal to the altitude constraint (e.g. FL 110)
- The aircraft climbs toward the altitude constraint.

CLB and ALT - Example 2



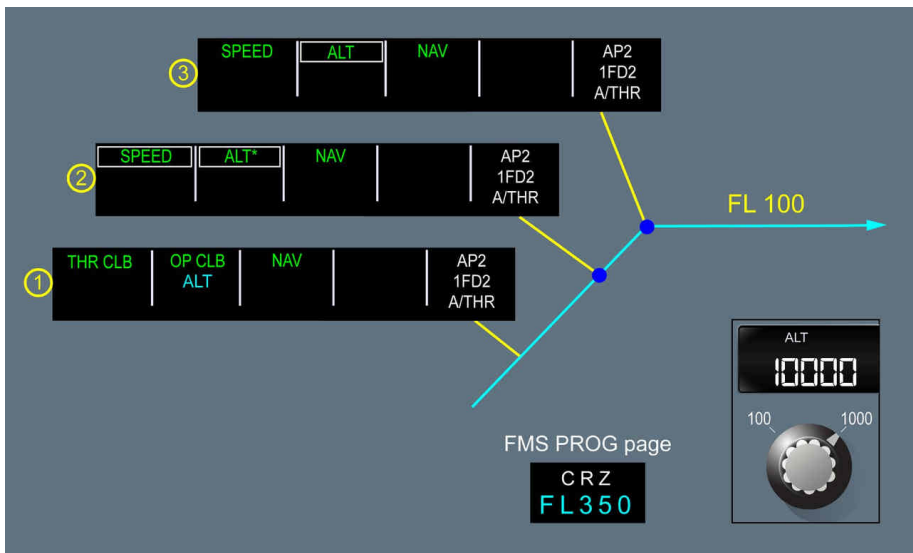
OP CLB AND ALT

Ident.: DSC-22_30-40-120-50-00025288.0001001 / 18 MAY 22

Applicable to: ALL

OP CLB is engaged, and the aircraft climbs toward the FCU selected altitude (e.g. FL 100).

OP CLB and ALT

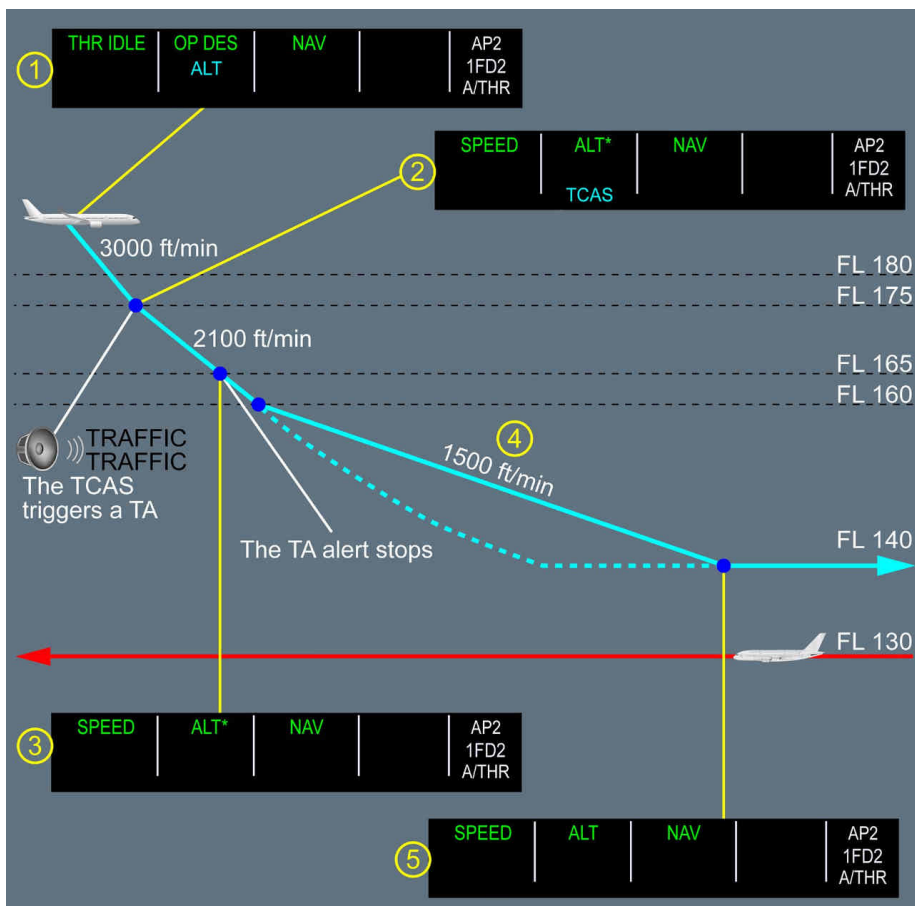


ALT IN DESCENT WITH TCAS TA

Ident.: DSC-22_30-40-120-50-00025290.0001001 / 18 MAY 22

Applicable to: MSN 07784-07792

The aircraft levels off in descent with a TCAS Traffic Advisory (TA).

ALT in Descent with TCAS TA


Altitude with ALT CST

CLB AND ALT CST

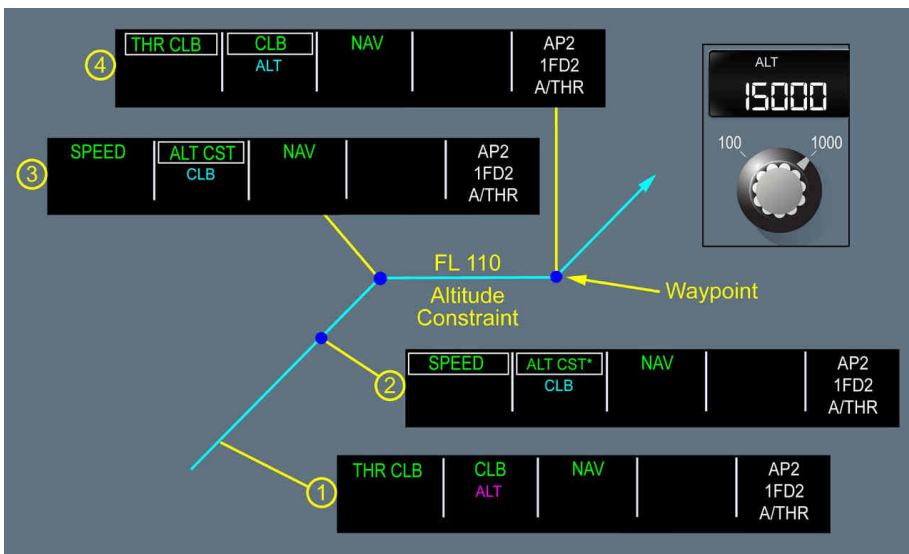
Ident.: DSC-22_30-40-120-60-00025291.0001001 / 18 MAY 22

Applicable to: ALL

The vertical guidance is managed, and:

- The FCU selected altitude (e.g. FL 150) is above an altitude constraint (e.g. FL 110)
- The aircraft climbs toward the altitude constraint.

CLB and ALT CST



AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT GUIDANCE

AP/FD MODES - SCENARIO EXAMPLES

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Altitude with ALT CRZ

CLB AND ALT CRZ

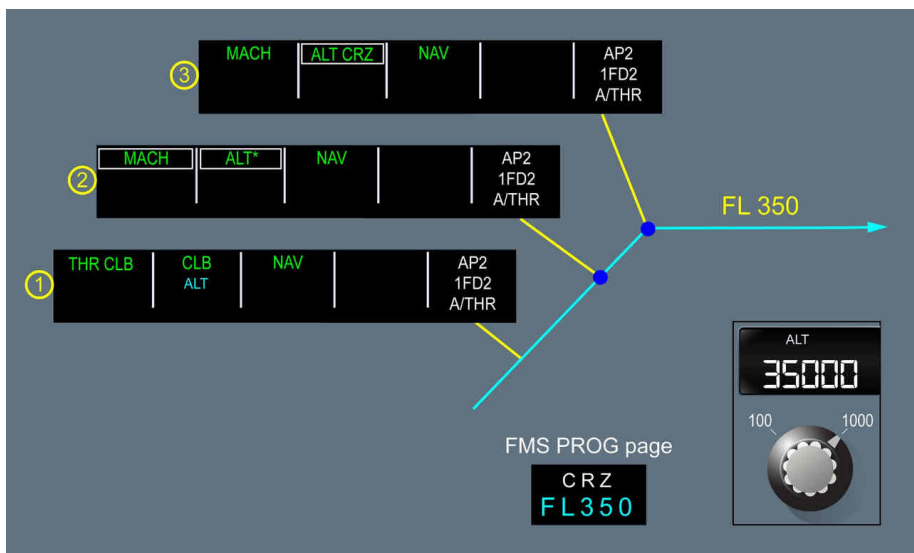
Ident.: DSC-22_30-40-120-70-00025292.0001001 / 18 MAY 22

Applicable to: ALL

The vertical guidance is managed, and:

- The FCU selected altitude is equal to the cruise altitude (e.g. FL 350)
- The aircraft climbs toward the cruise altitude.

CLB and ALT CRZ



OP CLB AND ALT CRZ

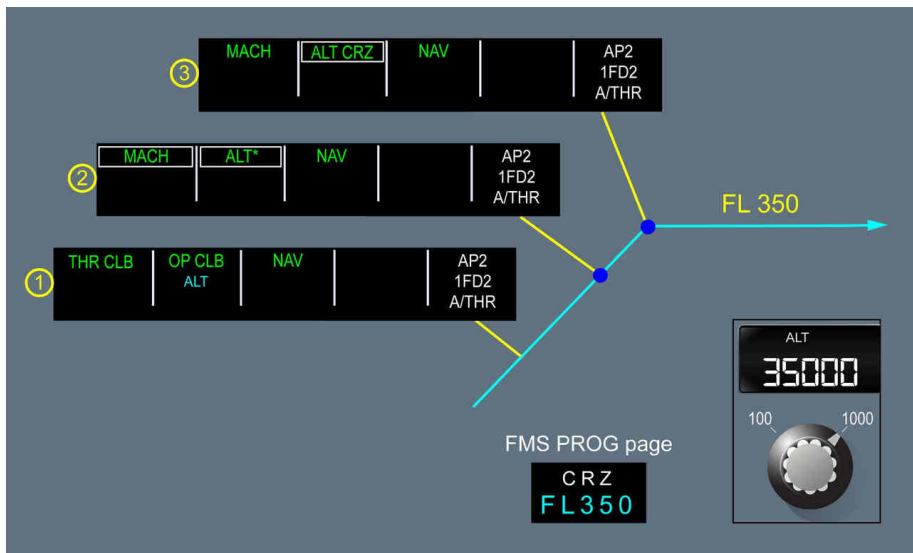
Ident.: DSC-22_30-40-120-70-00025293.0001001 / 18 MAY 22

Applicable to: ALL

OP CLB is engaged, and:

- The FCU selected altitude is equal to the cruise altitude (e.g. FL 350)
- The aircraft climbs toward the cruise altitude (e.g. FL 350).

OP CLB and ALT CRZ



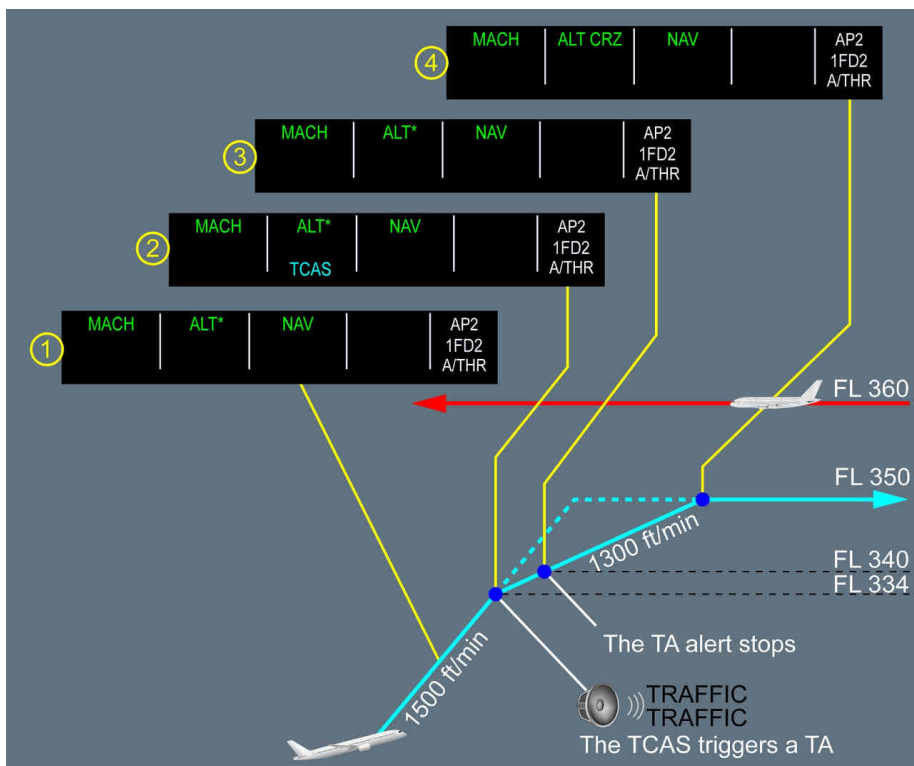
ALT CRZ WITH TCAS TA

Ident.: DSC-22_30-40-120-70-00025294.0001001 / 18 MAY 22

Applicable to: MSN 07784-07792

The aircraft levels off at the cruise altitude, with a TCAS Traffic Advisory (TA).

ALT CRZ with TCAS TA



Note: The same principle applies, if the aircraft levels off at the cruise altitude with the **ALT** mode.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT GUIDANCE

AP/FD MODES - SCENARIO EXAMPLES

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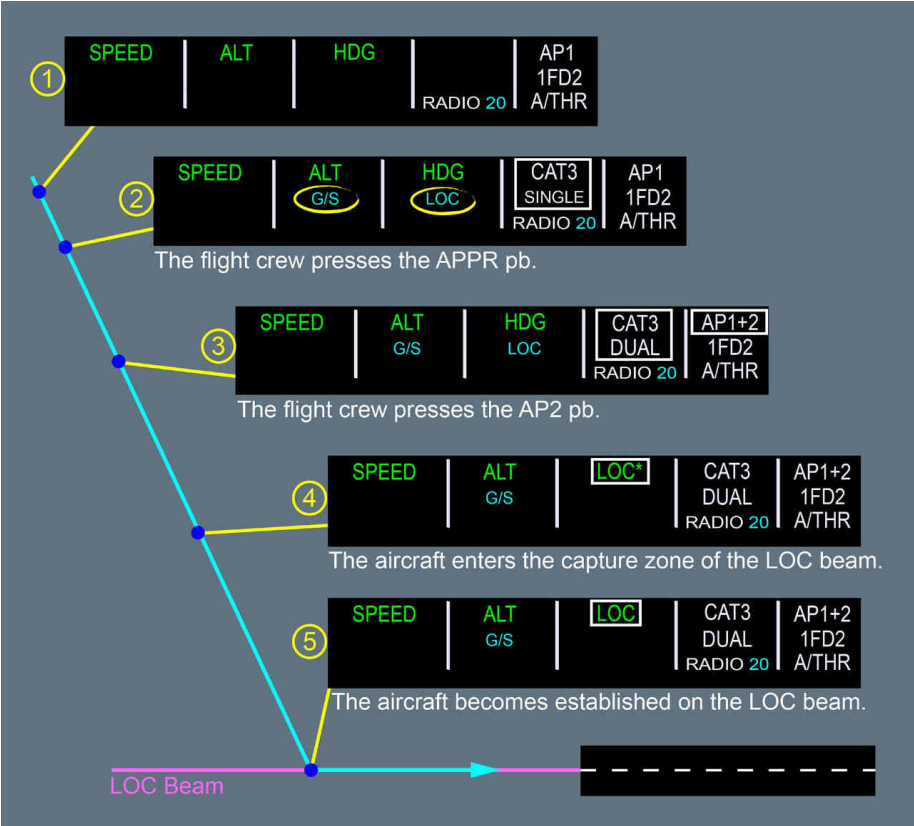
Approach and Landing

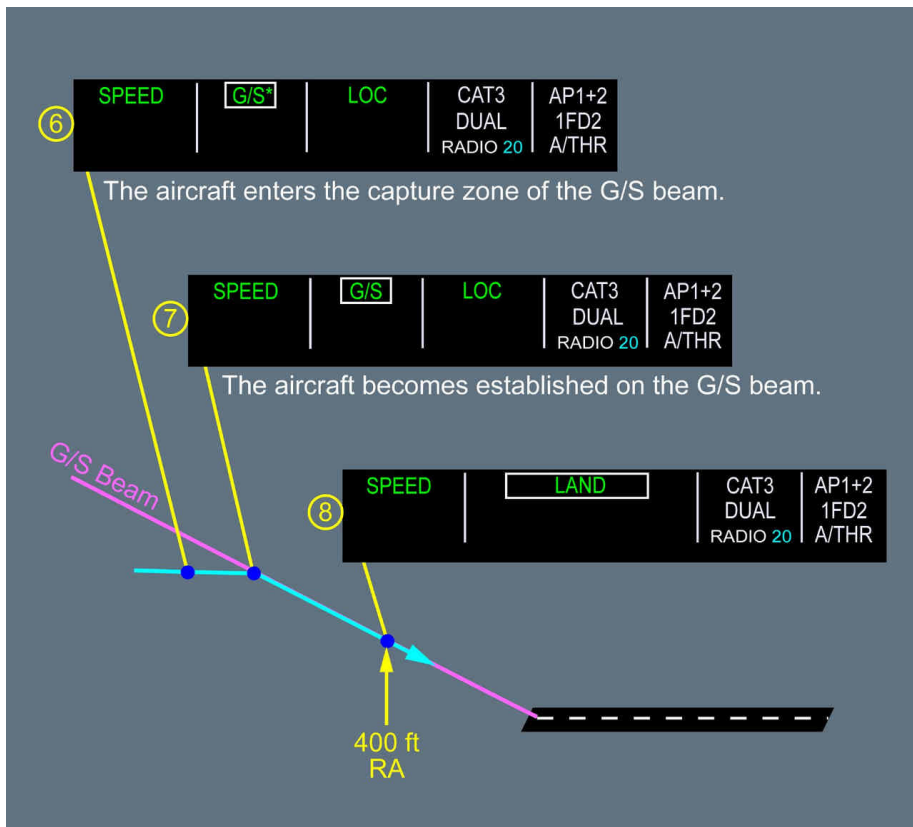
ILS APPROACH AND AUTOLAND

Ident.: DSC-22_30-40-120-80-00025296.0001001 / 18 MAY 22
Applicable to: ALL

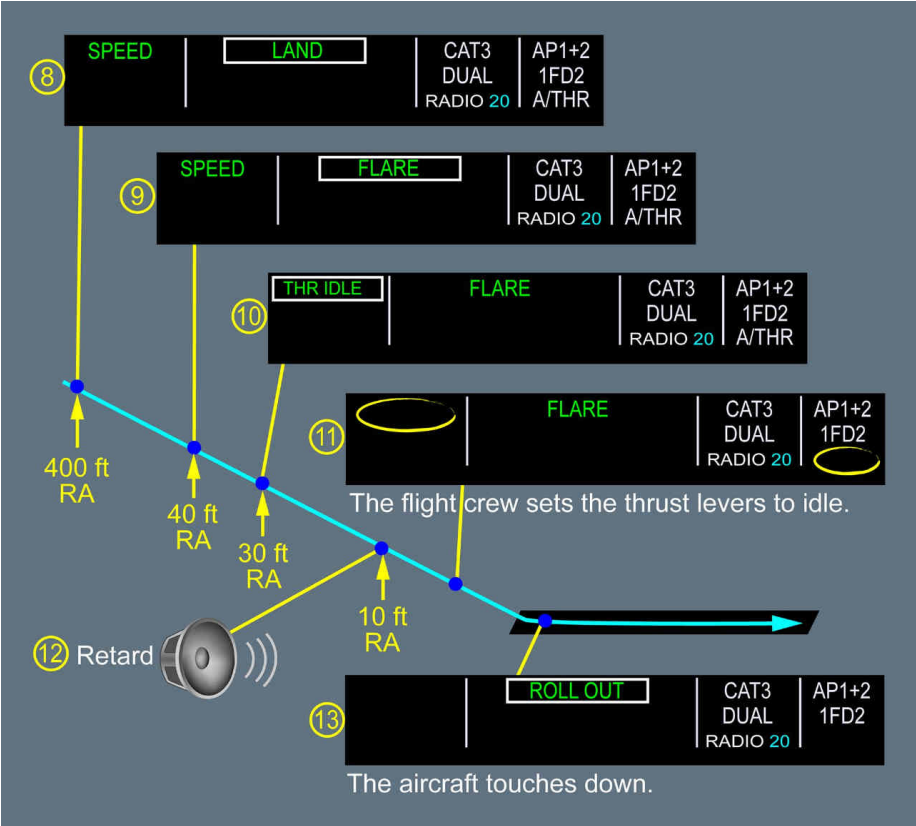
The flight crew selected an ILS approach on the ARRIVAL page.
AP1 is engaged, and a heading is selected to fly toward the LOC beam.

ILS Approach and Autoland - Step 1 to 5



ILS Approach and Autoland - Step 6 to 8


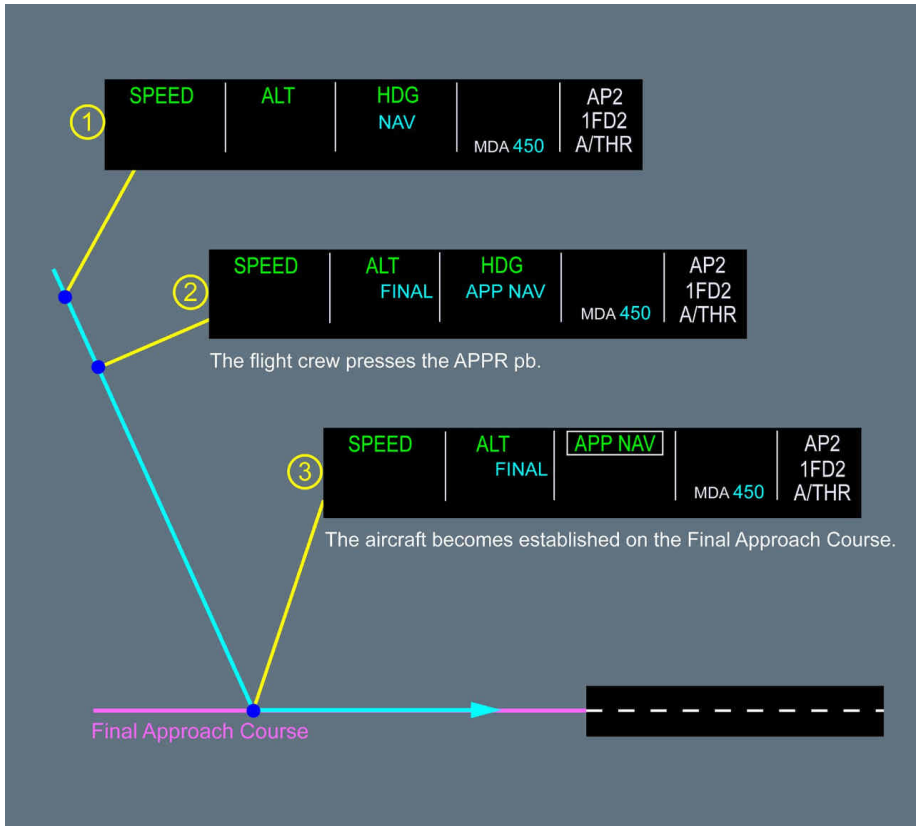
ILS Approach and Autoland - Step 8 to 13



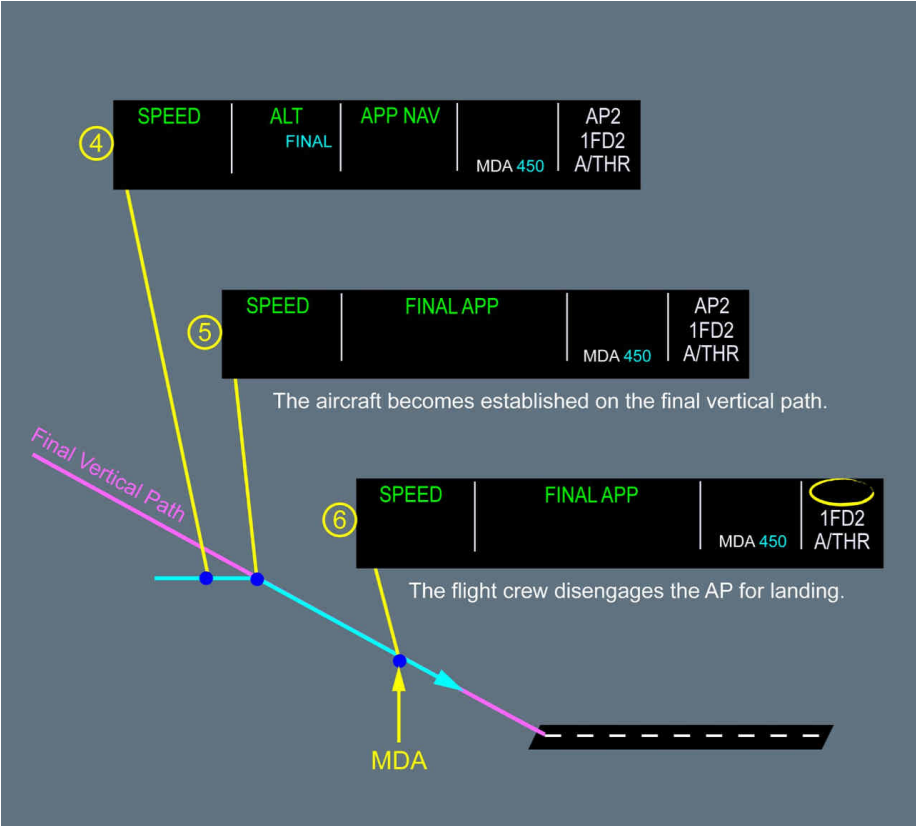
VOR APPROACH FLOWN WITH FINAL APP GUIDANCE MODE

Ident.: DSC-22_30-40-120-80-00025299.0001001 / 02 MAY 24
Applicable to: ALL

The flight crew selected a VOR approach on the ARRIVAL page. The FMS approach phase is activated.
AP2 is engaged, and a heading is selected to fly toward the Final Approach Course.

VOR Approach Flown with FINAL APP Guidance Mode - Step 1 to 3


VOR Approach Flown with FINAL APP Guidance Mode - Step 4 to 6



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GENERAL

Ident.: DSC-22_30-50-10-00025367.0001001 / 18 MAY 22

Applicable to: ALL

The A/THR manages the engine thrust.

The A/THR is either armed, active, or disconnected.

When active, two different types of A/THR modes are available:

- The **SPEED/MACH** mode:
The A/THR continuously adjusts the thrust in order to maintain a Speed/Mach target (e.g. during cruise, and approach).
- The THRUST modes:
The A/THR controls a fixed thrust, in accordance with the engaged THRUST mode.

The A/THR modes are automatically linked to the AP/FD vertical modes:

- When an AP/FD vertical mode controls the trajectory (e.g. altitude acquire modes, altitude hold modes, **V/S/FPA**, **G/S**, **F-G/S** ), the A/THR is in **SPEED/MACH** mode.
- When an AP/FD vertical mode adjusts the aircraft pitch in order to maintain a speed/Mach target (e.g. climb, descent), the A/THR is in THRUST mode.

When the **A/THR** is active, the A/THR thrust target is sent to the FADECs. The FADECs computes thrust commands, in accordance with the aircraft environment and status. The thrust commands are then sent to the engines.

When the **A/THR** is armed, the FADECs compute the thrust commands in accordance with the thrust lever positions, and the selection of PERF TAKEOFF page.

When the A/THR is disconnected, the FADECs compute the thrust commands in accordance with the thrust lever positions.

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THRUST LEVERS

Ident.: DSC-22_30-50-20-00025369.0001001 / 18 MAY 22

Applicable to: ALL

The position of the thrust levers determines the A/THR status: active, armed or disconnected.

The thrust levers have:

- Four detents: IDLE, CL, FLX-MCT, TOGA
- Two instinctive disconnect pushbuttons.

The flight crew uses the thrust levers to:

- Arm, activate, or disconnect the A/THR
- Engage the takeoff and go-around modes
- Manually control the thrust of each engine, when the A/THR is disconnected
- Engage reverse thrust.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT GUIDANCE

AUTOTHRUST - THRUST LEVERS

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PRELIMINARY CONDITIONS REQUIRED FOR A/THR ARMING AND ACTIVATION

Applicable to: ALL

Ident.: DSC-22_30-50-30-A-00025370.0001001 / 18 MAY 22

A/THR can only arm when all of the following are applicable:

- At least one FMGC is available, and
- At least one FAC is available, and
- Two ADIRUs are available, and
- Two FADECs are available, and
- At least one channel of the FCU is available, and
- At least one LGCIU is available, and
- The A/THR is not manually disabled (Instinctive Disconnect pb has not been pressed for more than 15 s).

A/THR ARMING

Applicable to: ALL

Ident.: DSC-22_30-50-30-B-00025374.0001001 / 12 NOV 24

ARMING CONDITIONS

The A/THR arms, if one of the following occurs:

- At takeoff, the flight crew sets at least one thrust lever:
 - To the TOGA detent, or
 - To the FLX-MCT detent, when a FLX TO temperature or a DRT TO level (Derated Takeoff $\leq$) is entered in the PERF TAKEOFF page

SRS TO engages

- By engaging a go-around (MAN TOGA), the flight crew sets the thrust levers to the TOGA detent: SRS GA engages
- By engaging a Soft Go-Around (MAN GA SOFT), the flight crew sets the thrust levers to the TOGA detent, then to the FLX/MCT detent: SRS GA engages
- The flight crew presses the A/THR pb on the FCU, when the A/THR is disconnected, provided that all the following occur:
 - The thrust levers are outside of the A/THR active range:
 - Above CL detent (AEO), or
 - Above FLX-MCT detent (OEI)
 - The aircraft is above 100 ft RA, or all RAs are failed
 - LAND or FLARE is not engaged.
- AP/FD TCAS engages due to a RA, when the A/THR is disconnected and the thrust levers are outside of the A/THR active range.

Ident.: DSC-22_30-50-30-B-00025632.0001001 / 18 MAY 22

In addition, **A/THR** can be armed by a flight crew action on the thrust levers, when the **A/THR** is active.

Ident.: DSC-22_30-50-30-B-00025376.0001001 / 18 MAY 22

ANNUNCIATION

When the **A/THR** is armed:

- The A/THR pb light of the FCU is on
- The FMA displays:
 - **A/THR** on Line 3 of the "AP, FD, and A/THR Engagement Status" column
 - One of the following A/THR modes in the "A/THR messages and modes" column:
MAN TOGA, **MAN FLEX +XX**, **MAN DTO**, **MAN GA SOFT** , **MAN MCT**, or **MAN THR**

As long as the A/THR is not active, the A/THR messages on the FMA displays the manual thrust as follows:

Conditions		Thrust lever position	FMA Message⁽¹⁾
From takeoff, and until the thrust reduction altitude	The flight crew performs a takeoff with no selected FLX TO temperature, or DRT TO level (Derated Takeoff )	TOGA (2) (3)	MAN TOGA
	The flight crew entered a FLX TO temperature in the FMS PERF TAKEOFF page	FLX-MCT (3)	MAN FLX +XX
	The flight crew entered a DRT TO level (Derated Takeoff ) in the PERF TAKEOFF page	FLX-MCT (3)	MAN DTO

Continued on the following page

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT GUIDANCE AUTOTHURST - A/THR ARMING AND ACTIVATION
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Continued from the previous page

Conditions		Thrust lever position	FMA Message ⁽¹⁾
In descent, or approach	The flight crew performs a go-around	TOGA (3) (4)	MAN TOGA
	The flight crew performs a soft go-around 	TOGA then FLX-MCT (3) (4)	MAN GA SOFT

- (1) The FMA message appears in a white box, on the first and second lines of the "A/THR messages and modes" column.
- (2) If the flight crew sets the thrust levers to FLX-MCT, **MAN MCT** will appear on FMA.
- (3) If the flight crew sets the thrust levers between CL and TOGA, but not at the CL, FLX-MCT, or TOGA detent, **MAN THR** will appear on FMA.
- (4) If the flight crew sets the thrust levers directly to FLX-MCT and not TOGA then FLX-MCT, the **MAN THR** will appear on the FMA.

A/THR ACTIVATION

Applicable to: ALL

Ident.: DSC-22_30-50-30-C-00025377.0001001 / 18 MAY 22

GENERAL

When active, the **A/THR** controls:

- The thrust, when an A/THR THRUST mode is engaged, or
- The speed/Mach, when the A/THR **SPEED/MACH** mode is engaged.

The thrust lever positions determine the maximum thrust that the A/THR can command (except in **A.FLOOR**).

The normal position of the thrust levers is with A/THR active is:

- The CL detent (AEO)
- The FLX-MCT detent for the operative engine (OEI).

Note: The thrust lever of a failed engine should be in the IDLE detent.

Ident.: DSC-22_30-50-30-C-00025378.0001001 / 18 MAY 22

ACTIVATION CONDITIONS

 The **A/THR** activates, if one of the following occurs:

- The **A/THR** is armed, and the flight crew sets the thrust levers in the active range:

L12

Engine Condition	Active Range
AEO	Both thrust levers are above idle, and at or below the CL detent. The A/THR also activates when: - One thrust lever is above the idle detent, and at or below the CL detent, and - The other thrust lever is • At the idle detent, or • Above the CL detent, and at or below the FLX-MCT detent. <i>Note:</i> In the case of takeoff with FLEX or <i>Derated Takeoff</i>  selection, the thrust lever must be below the FLX-MCT detent.
OEI⁽¹⁾	One thrust levers is above the idle detent, and at or below FLX-MCT detent. If the engine-out occurs during a FLEX or <i>Derated Takeoff</i> , the flight crew activates the A/THR by: 1. Setting the thrust lever of the operative engine below FLX-MCT, 2. Then, settings the thrust lever of the operative engines back to FLX-MCT.

⁽¹⁾ The thrust lever of the failed engine should be at the idle detent.

- The flight crew presses the **A/THR** pb on the FCU when the **A/THR** is disconnected, provided that:

L2

- The thrust levers are in the active range
- The aircraft is above 100 ft RA, or all RAs are failed
- **LAND** or **FLARE** is not engaged.

L1

- **A.FLOOR** engages

Note: **A.FLOOR** engages regardless of the initial **A/THR** status, and the position of the thrust levers.

- **AP/FD TCAS**  engages, upon a RA, when the **A/THR** is disconnected and the thrust levers are in the active range.

Ident.: DSC-22_30-50-30-C-00025379.0001001 / 18 MAY 22

ANNUNCIATION

 When the **A/THR** is active:

- The A/THR pb light is illuminated on the FCU
- The EWD displays the thrust target
- The FMA displays:
 - **A/THR** on Line 3 of the "AP, FD, and A/THR Engagement Status" column
 - **A/THR** mode on Line 1 of the "A/THR messages and modes" column.

Ident.: DSC-22_30-50-30-C-00025380.0001001 / 18 MAY 22

EFFECT OF THRUST LEVER MOVEMENT WHEN THE A/THR IS ACTIVE

A/THR TRANSITION FROM ACTIVE TO ARMED

 When the **A/THR** is active, the **A/THR** becomes armed as described in the following table:

L12

Engine Condition	Thrust Lever Position
AEO	All the thrust levers are above the CL detent. Or at least one thrust lever is above the FLX-MCT detent.
OEI	The thrust lever of the operative engine is above the FLX-MCT detent.

 When the **A/THR** becomes armed, the thrust immediately increases, in accordance with the thrust lever position (above CL detent (AEO) or above FLX-MCT detent (OEI)).

 The FMA displays **MAN THR** on Line 1 of the "A/THR Modes and Messages" column.

A/THR LIMITED

The A/THR limits the engine thrust at the thrust levers position when:

- All the thrust levers are set below the CL detent (AEO), or
- The thrust lever of all operative engines are set below FLX-MCT detent (OEI).

 When the thrust is limited, the **AUTO FLT A/THR LIMITED** alert triggers.

L2

 The **AUTO FLT A/THR LIMITED** alert is repeated every 5 s, until the flight crew moves the thrust levers to the CL detent (AEO) or FLX-MCT detent (OEI).

L1

 The FMA displays **THR LVR** on Line 1 of the "A/THR Modes and Messages" column.

LVR CLB or **LVR MCT** flashes on Line 3 in the "A/THR Modes and Messages" of the FMA.

 This reminds the flight crew that the normal position of the thrust levers, when **A/THR** is active, is the CL detent (AEO) or the FLX-MCT detent (OEI).

L2

LVR CLB flashes on the FMA, when all the following conditions are applicable:

- All engines are operative (AEO)
- The position of the thrust levers are not appropriate:
 - Both thrust levers are below the CL detent, or
 - One thrust lever is above CL detent
- The aircraft is above 100 ft
- No windshear is detected.

LVR MCT flashes on the FMA, when all the following conditions are applicable:

- One engine is inoperative (OEI)
- The position of the thrust lever of the operative engines is not appropriate:
 - The thrust lever is below the FLX-MCT detent, or
 - The aircraft is above the thrust reduction altitude, and the thrust lever is above FLX-MCT
- The aircraft is above 100 ft
- No windshear is detected.

L1

ASYMMETRIC THRUST LEVERS**LVR ASYM** flashes on the FMA if all the following conditions are satisfied:

- The A/THR is armed or active, and
- At least one thrust lever is set to CL detent or FLX-MCT detent , and
- One thrust lever is not in the same position, and
- The aircraft is above 100 ft RA.

L2

L1

Note: **LVR ASYM** flashes until the flight crew sets all thrust levers to the CL detent or the FLX-MCT detent.

LVR ASYM will not be displayed in the case of OEI or if the flight crew sets one thrust lever to the IDLE detent.

A/THR DISCONNECTIONApplicable to: **ALL**

Ident.: DSC-22_30-50-40-A-00025381.0001001 / 18 MAY 22

GENERAL**STANDARD DISCONNECTION**

The A/THR disconnects if one of the following occurs:

- The flight crew presses an A/THR instinctive disconnect pb, or

Note: *In normal operation, if the flight crew presses the A/THR instinctive disconnect pb, the engine thrust target is set to the thrust lever position.*

- The flight crew sets all the thrust levers to the IDLE detent.

NON-STANDARD DISCONNECTION

The A/THR disconnects if one of the following occurs:

- The flight crew presses the A/THR pb on the FCU
- The A/THR becomes inoperative

- L2** One of the preliminary conditions required for A/THR arming or activation is no longer applicable.

Ident.: DSC-22_30-50-40-A-00025635.0001001 / 18 MAY 22

- L2** For more information on how to set the autothrust to off, *Refer to FCTM/AS-FG-10-2 To Set Autothrust To Off.*

- L1** **CAUTION** If the flight crew presses, and holds one A/THR instinctive disconnect pb for more than 15 s, the A/THR will disconnect for the remainder of the flight. All A/THR modes, including **A.FLOOR**, will be lost. The A/THR will be recovered at the next FMGC power-up on the ground.

Ident.: DSC-22_30-50-40-A-00025382.0002001 / 18 MAY 22

THRUST LOCK FUNCTION

The thrust lock function activates if an A/THR non-standard disconnection occurs.

As long as the thrust lock function is active, all the following are applicable:

- The engines maintain the thrust at the value set before the A/THR disconnection
- The FMA displays the flashing **THR LK** message on the third line of the first column
- The ECAM alert **ENG THRUST LOCKED** appears every 5 s.

The thrust lock deactivates as soon as the flight crew moves the thrust levers.

A/THR ANNUNCIATION AND WARNINGS**Applicable to: ALL**

Ident.: DSC-22_30-50-40-B-00025383.0001001 / 06 NOV 23

STANDARD DISCONNECTION

In the case of a standard disconnection (*Refer to DSC-22_30-50-40 A/THR Disconnection*), all the following occur:

- The Memo amber message **A/THR OFF** appears

L2 The maximum duration is 9 s

- L1** - The **MASTER CAUT** light comes on

L2 The maximum duration is 3 s

- L1** - The single chime sounds.

The flight crew can press the A/THR instinctive disconnect pb, or the **MASTER CAUT** light to clear all the associated indicators.

Note: *If the aircraft is below 50 ft RA, and the flight crew sets all thrust levers to IDLE, no alert appears.*

Ident.: DSC-22_30-50-40-B-00025384.0001001 / 18 MAY 22

NON-STANDARD DISCONNECTION

In the case of a non-standard disconnection (*Refer to DSC-22_30-50-40 A/THR Disconnection*), all the following occur:

- The ECAM alert **AUTO FLT A/THR OFF** appears
- The **MASTER CAUT** light comes on
- The single chime sounds.

The alerts disappear if the flight crew:

- Presses the A/THR instinctive disconnect pb, or
- Presses the **MASTER CAUT** pb, or
- Arms or activates the A/THR.

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GENERAL

Ident.: DSC-22_30-50-50-00025386.0001001 / 18 MAY 22

Applicable to: ALL

When the A/THR is active, an A/THR mode is engaged.
The A/THR modes are: THRUST, **SPEED/MACH**, RETARD and ALPHA FLOOR.

THRUST MODE

Ident.: DSC-22_30-50-50-00025387.0001001 / 13 MAY 25

Applicable to: ALL

The A/THR is in THRUST mode if the engaged vertical AP/FD modes is **SRS TO**, **OP CLB**, **CLB**, **OP DES**, **DES** (in idle path), or **SRS GA**. The target thrust depends on the engaged THRUST mode and can be limited by the thrust lever position, if the thrust levers are below the CL detent (AEO) or the FLX-MCT detent (OEI).

The following table shows the engagement conditions of the THRUST mode with the associated target thrust:

THRUST mode (Displayed on FMA)	Engagement Conditions ⁽¹⁾	Target Thrust
THR CLB	All of the following conditions are applicable: - SRS TO , CLB , OP CLB , EXP CLB <⏏> or SRS GA is engaged, and - The most forward thrust lever is set to CL detent.	CLB
THR MCT	All of the following conditions are applicable: - SRS TO , CLB , OP CLB , EXP CLB <⏏> or SRS GA is engaged, and - The most forward thrust lever is set to MCT detent, and - One engine is inoperative.	MCT
THR IDLE	DES , OP DES , EXP DES <⏏> or the A/THR RETARD mode is engaged.	IDLE
THR LVR	One of the following conditions is applicable: - All thrust levers are below CL detent, and SRS TO , CLB , OP CLB , EXP CLB <⏏> or SRS GA is engaged, or - The most forward thrust lever is between CL and MCT detents, and SRS TO , CLB , OP CLB , EXP CLB <⏏> or SRS GA is engaged.	Thrust corresponding to thrust levers position

⁽¹⁾ The thrust lever position refers to the thrust lever of operative engines. The thrust lever of an inoperative engine should be at the IDLE detent.

SPEED/MACH MODEApplicable to: **ALL**

Ident.: DSC-22_30-50-50-A-00025388.0001001 / 18 MAY 22

The **SPEED** or **MACH** mode of the A/THR adjusts the thrust to acquire and maintain a target speed or Mach.

The A/THR is in **SPEED** or **MACH** mode if one of the following AP/FD vertical modes is engaged:

- **V/S** / **FPA**, or
- Altitude capture and hold modes: **ALT***, **ALT**, **ALT CST***, **ALT CST**, **ALT CRZ***, **ALT CRZ**, or
- **DES** in geometric path, or
- Approach modes: **G/S***, **G/S**, **F-G/S*** , **F-G/S** , **FINAL APP**, or
- AP/FD **TCAS** .

If all APs and all FDs are disengaged and the **A/THR** is active, the A/THR is in **SPEED/MACH** mode.

Ident.: DSC-22_30-50-50-A-00025389.0001001 / 18 MAY 22

The speed/Mach target is:

- **Selected** if the target comes from the SPD/MACH value that the flight crew selects on the FCU
- **Managed** if the target comes from the FMS.

When in **SPEED** or **MACH** mode, the A/THR does not allow speed excursions beyond the following limits, regardless of the target speed or Mach number:

- As a maximum speed VMAX in high lift configuration, VMAX - 5 kt in clean configuration
- As a minimum speed:
 - For a selected speed target, VLS
 - For a managed speed target, the maneuvering speed of the current slats/flaps configuration (VAPP, F, S, GD).

Ident.: DSC-22_30-50-50-A-00025390.0001001 / 18 MAY 22

Note: The changeover from **SPEED** to **MACH** or vice versa can be done automatically by the FMGC or manually by the flight crew by pressing the SPD/MACH pb on the FCU.

Ident.: DSC-22_30-50-50-A-00025391.0001001 / 18 MAY 22

A/THR APPROACH MODE

Below 3 200 ft RA, with at least CONF 1, the A/THR behavior is optimized:

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- Above 150 ft RA, to be more responsive to speed variations
- Below 150 ft RA, to be less responsive to speed variations. This logic exists to avoid large thrust increases during the lower segment of the approach that may lead to destabilization and possible long flare.

RETARD MODE

Ident.: DSC-22_30-50-50-00025393.0001001 / 18 MAY 22

Applicable to: ALL

The A/THR RETARD mode is only available during an automatic landing.

The RETARD mode engagement occurs as follows:

1. At least one AP is engaged. LAND and A/THR SPEED mode are engaged
2. FLARE engages
3. When the aircraft reaches approximately 30 ft RA, the A/THR RETARD mode automatically engages. The FMA displays THR IDLE and the A/THR sets the thrust to idle
4. A RETARD callout triggers at 10 ft RA, asking the flight crew to set the thrust levers to the IDLE detent
5. The flight crew sets the thrust levers to IDLE detent: The A/THR disconnects, and the RETARD mode disengages.

If the last AP disengages when RETARD is engaged, RETARD disengages, and SPEED engages.

Note: In manual landing, the RETARD callout triggers at 20 ft RA.

In manual or automatic landing, the RETARD callout triggers, independently of the thrust levers position (*Refer to DSC-22_30-40-120-80 ILS Approach and Autoland*).

A/THR MODE REVERSIONS

Ident.: DSC-22_30-50-50-00025368.0001001 / 18 MAY 22

Applicable to: ALL

The following table presents the A/THR mode reversions:

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT GUIDANCE

AUTOTHRUST - A/THR MODES

Initial A/THR Mode	A/THR Mode after Reversion	Conditions Leading to A/THR Mode Reversion	Warning
THRUST	SPEED/MACH	The aircraft does not follow the speed target: - The aircraft speed is below VLS - 2 kt when DES, OP DES or EXP DES  is engaged, or - The aircraft speed is above VMAX + 4 kt when CLB, OP CLB or EXP CLB  is engaged. <i>Note: If the FD is engaged, the FD also disengages.</i>	A triple click audio indicator sounds. If the aircraft speed goes above VMAX + 4 kt, the OVERSPEED alert triggers.
Whatever A/THR mode. The A/THR can be armed, active, or disconnected.	A.FLOOR	Refer to DSC-27-20-10-20 Protections - High Angle of Attack Protection	Refer to DSC-22_30-50-50 ALPHA FLOOR

ALPHA FLOOR

Ident.: DSC-22_30-50-50-00025394.0001001 / 18 MAY 22

Applicable to: ALL

ALPHA FLOOR is a protection that commands TOGA thrust, regardless of the position of the thrust levers. This protection is available from lift-off to 100 ft RA on approach.

When ALPHA FLOOR conditions are met, the FMA displays **A.FLOOR** surrounded by a flashing amber box and the EWD displays **A.FLOOR**.

When ALPHA FLOOR conditions are no longer applicable and the speed is above VLS:

- The FMA displays **TOGA LK** surrounded by a flashing amber box,
- The TOGA thrust is frozen.

To cancel **A.FLOOR** or **TOGA LK**, the flight crew must disconnect the autothrust.

For more information on the ALPHA FLOOR activation and inhibition conditions, *Refer to DSC-27-20-10-20 Protections - General.*

FROM TAKEOFF TO THRUST REDUCTION ALTITUDE

Ident.: DSC-22_30-50-60-00025349.0001001 / 18 MAY 22

Applicable to: ALL

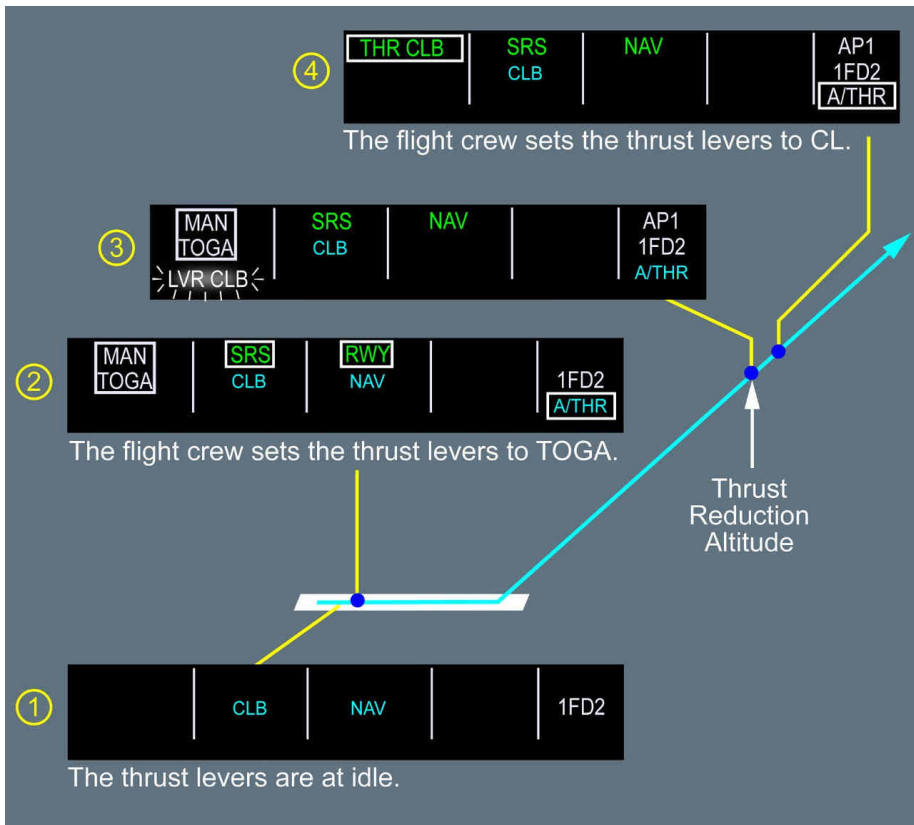
The aircraft is on ground, and the flight crew performs a takeoff with no selected FLX TO temperature, or DRT TO level (Derated Takeoff ) in the PERF TAKEOFF page:

1. The thrust levers are in the IDLE detent
2. The flight crew sets the thrust levers to TOGA:
 - **A/THR** arms
 - The engines thrust increases to TOGA
 - **MAN TOGA** appears on the FMA
 - **SRS** TO engages.
3. When the aircraft reaches the thrust reduction altitude, **LVR CLB** flashes
4. The flight crew sets the thrust levers to the CL detent:
 - **A/THR** activates
 - **THRCLB** appears on the FMA.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT GUIDANCE

AUTOTHRUST - SCENARIO EXAMPLES



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GENERAL

Ident.: DSC-22_30-60-10-00025742.0001001 / 18 MAY 22

Applicable to: ALL

The speed/Mach control is:

- Managed, when the target comes from the FMS
- Selected, when the target comes from the SPD/MACH FCU window.

In flight, either the AP/FD pitch control or the A/THR may acquire and hold a target speed or Mach number, according to the engaged modes.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT GUIDANCE

SPEED/MACH CONTROL - GENERAL

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GENERAL

Ident.: DSC-22_30-60-20-00025743.0001001 / 18 MAY 22

Applicable to: ALL

When the speed target is managed, the SPD/MACH window of the FCU shows dashes, and the corresponding dot is lighted. The PFD speed scale shows the speed target in magenta.

For more information on the Speed/Mach Control Area, *Refer to DSC-22_10-40-20 Speed/Mach Control Area.*

For more information on the PFD Airspeed Indications, *Refer to DSC-31-40 Airspeed.*

ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-60-20-00025744.0001001 / 18 MAY 22

Applicable to: ALL

The SPD target is managed whenever AP or FD is engaged and one of the following occurs:

- On ground, when V2 is inserted in the PERF TAKEOFF page, or

Note: At takeoff, **SRS TO** will not engage if V2 is not available.

- The **SRS TO** or **SRS GA** is engaged, or
- The flight crew pushes the SPD/MACH knob on the FCU, and a managed speed/Mach target is available, or
- The **EXP CLB**  or **EXP DES**  is engaged, or
- The AP/FD **TCAS**  mode is engaged.

- Note:*
1. If all the APs and FDs are off, the managed speed/Mach is only available when the flight phase of the FMS is the approach phase. The A/THR is then in **SPEED** mode.
 2. The flight crew may insert a speed/Mach in the PERF DES page to replace the ECON DES SPD.

In this case, although the value is entered by the flight crew, this speed target is still managed and is taken into account to compute the top of descent and the descent profile.

MANAGED SPEED/MACH TARGET**Applicable to: ALL**

Ident.: DSC-22_30-60-20-A-00025745.0002001 / 06 NOV 25

¹ For managed speed/Mach, the lowest target is VLS, and the highest target is:

- VMAX in the case VMAX is equal to VFE, or
- VMAX - 5 kt in the case VMAX is equal to VMO/MMO.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT GUIDANCE

SPEED/MACH CONTROL - MANAGED SPEED/MACH

Note: The AFS will not guide the aircraft below the maneuvering speed, even if the managed speed displayed on PFD (magenta triangle) is lower.

Refer to PRO-NOR-SRP-01-40 Monitoring the Climb Phase

When speed/Mach is managed, the target is defined as follows:

L123

AP/FD Engaged Mode or FMS Flight Phase	Managed Speed/Mach Target
SRS TO is engaged, and the aircraft is on ground.	V2
SRS TO is engaged, and the aircraft is airborne.	V2 + 10 kt <u>Note:</u> However, the magenta triangle appears on the V2 value, on the PFDs.
SRS TO is engaged, and one engine is out.	Memorized aircraft speed at engine-out detection. The target value is limited by V2 and V2 + 15 kt.
SRS GA is engaged.	Memorized aircraft speed at SRS GA engagement. The lower limit of the target is the VAPP memorized at 700 ft RA. The higher limit of the target is the lowest value between: - VLS + 25 kt (or VLS + 15 kt OEI) - VMAX - 5 kt.

Continued on the following page

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT GUIDANCE SPEED/MACH CONTROL - MANAGED SPEED/MACH
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Continued from the previous page

- The FMS flight phase is the approach phase In this case, the APs and/or FDs may be on or off Or - F-G/S  , G/S, LAND, FLARE or ROLL OUT is engaged	VAPP, corrected by the Ground Speed Mini function (<i>Refer to DSC-22_30-60-20 Ground Speed Mini Function</i>). Before reaching the landing configuration, the speed will not go below: - Green Dot, in clean configuration - S, in CONF 1 - F, in CONF 2 - F, in CONF 3, when CONF FULL is the landing configuration (as defined in the PERF APPR page). VAPP is memorized at 700 ft RA, so if the FMS loses the VAPP below 700 ft RA, the managed speed target will still be computed. The lower limit of the managed speed target is the VAPP that is computed by the FMS, and displayed on the MCDU. If the VAPP computed by the FMS is not available, the VAPP is VLS + 5 kt. The higher limit of the managed speed target is the VFE NEXT (or VFE - 5 kt in full configuration) of the landing configuration.
For all other cases	The managed speed/Mach target is provided by the FMS: - If NAV is engaged, the managed speed/Mach target will be defined by the speed/Mach profile of the FMS flight plan. All the speed/Mach constraints are taken into account. - If NAV is not engaged, the managed speed/Mach target will be defined by the speed/Mach profile of the FMS flight plan. But the speed/Mach constraints are not taken into account. For information on the speed/Mach profile, <i>Refer to DSC-22_20-10-30-20 Flight Phases - Introduction</i>.

Ident.: DSC-22_30-60-20-A-00025746.0001001 / 18 MAY 22

MANAGED SPEED TARGET MEMORIZATION

A dual FM failure has different consequences when it occurs in different phases of the flight.

The system handles target speed and SPD mode as follows:

- During approach with **LOC** and **G/S**, or **F-LOC**  and **F-G/S**  , or **LOC** and **F-G/S**  , or **LOC B/C**  and **F-G/S**  engaged, and radio height <700 ft, the target speed is set to VAPP as previously memorized, and managed SPD target is maintained
- At go-around, the target speed becomes the memorized go-around speed, which is the higher of VAPP or the speed when go-around was initiated. Managed SPD target is maintained
- In all other cases, managed target speed reverts to selected, the value being the speed at the moment of the failure.

AIRCRAFT SYSTEMS**AUTO FLIGHT - FLIGHT GUIDANCE**

SPEED/MACH CONTROL - MANAGED SPEED/MACH

GROUND SPEED MINI FUNCTION**Applicable to: ALL**

Ident.: DSC-22_30-60-20-B-00025747.0001001 / 18 MAY 22

GENERAL

When the aircraft flies an approach in managed speed, the managed speed target, displayed by the magenta triangle on the PFDs, is variable. This managed speed target is the VAPP, displayed on the PERF APPR page, corrected by the Ground Speed Mini function.

ACTIVATION CONDITIONS

The Ground Speed Mini function is active when:

- The speed is managed
- The FMS flight phase is the approach phase.

The Ground Speed Mini function does not correct Green Dot, S and F speeds.

PRINCIPLE

The Ground Speed Mini function takes advantage of the aircraft inertia when the wind varies during the approach in order to provide an appropriate indicated target speed (i.e. the managed target speed represented by the magenta triangle on the PFD). When the flight crew flies this indicated target speed, the energy of the aircraft is maintained above a minimum level that ensures standard aerodynamic margins versus the stall.

The minimum energy level is the energy level the aircraft will have at touchdown with an indicated airspeed equal to VAPP, and with the wind equal to the tower reported wind as inserted in the PERF APPR page. The ground speed then equals the Ground Speed Mini.

The Ground Speed Mini is not displayed to the flight crew.

During the approach, the FMGS continuously computes the managed target speed in order to keep the ground speed at or above the Ground Speed Mini.

Ident.: DSC-22_30-60-20-B-00025748.0001001 / 18 MAY 22

MANAGED SPEED TARGET COMPUTATION

The computation of the managed speed target uses the tower headwind component, the current headwind component, and the VAPP.

TOWER HEADWIND COMPONENT

The tower wind is the average wind provided by the ATIS or the tower. The flight crew enters the tower wind in the MAG WIND field in the PERF APPR page.

The tower headwind component is the projection of the MAG WIND on the runway axis. This computation is based on the runway inserted in the FMS active F-PLN.

CURRENT HEADWIND COMPONENT

The projection of the current wind measured by the ADIRS on the aircraft longitudinal axis is the current headwind component (instantaneous headwind).

Ident.: DSC-22_30-60-20-B-00025749.0002001 / 18 MAY 22

VAPP COMPUTATION

The FMS computes the VAPP, and displays it on the PERF APPR page. The VAPP computation takes into account the tower headwind component. VAPP is the highest of the following computations:

- $VAPP = VLS + 1/3 \times \text{TWR HEADWIND COMPONENT}$, or
- $VAPP = VLS + 5 \text{ kt}$.

Note: “1/3 of the TWR HEADWIND COMPONENT” has 2 limits:

- 0 kt as the minimum value (no wind or tailwind)
- +15 kt as the maximum value.

The flight crew can manually modify the VAPP and the MAG WIND values on the PERF APPR page.

Ident.: DSC-22_30-60-20-B-00025750.0002001 / 18 MAY 22

MANAGED SPEED TARGET COMPUTATION

The FG continuously computes the managed speed target that is equal to VAPP plus an additional increment. This increment takes into account the headwind variation during the final approach.

Managed speed target = $VAPP + (\text{CURRENT HEADWIND COMPONENT} - \text{TWR HEADWIND COMPONENT})$.

The managed speed target has the following limits:

- VAPP, as the minimum value
- VFE next, in CONF 0, 1, 2, 3, VFE - 5 kt in CONF FULL, as the maximum value.

DISENGAGEMENT CONDITIONS

Ident.: DSC-22_30-60-20-00025751.0001001 / 18 MAY 22

Applicable to: ALL

Managed speed disengages any time the flight crew selects a speed target on the FCU, or if the speed was preselected.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT GUIDANCE

SPEED/MACH CONTROL - MANAGED SPEED/MACH

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GENERAL

Ident.: DSC-22_30-60-30-00025752.0001001 / 18 MAY 22

Applicable to: ALL

When the speed target is selected, the SPD/MACH window of the FCU displays this speed target. The PFD displays the associated speed target on the airspeed scale. The flight crew uses the knob on the FCU to set this speed target.

For more information on the Speed/Mach Control Area, *Refer to DSC-22_10-40-20 Speed/Mach Control Area.*

For more information on the PFD Airspeed Indications, *Refer to DSC-31-40 Airspeed.*

Note: If the selected speed/Mach target is set below VLS or above VMAX, with the autothrust active, the FMGS automatically limits the speed to:

- VLS, or
- VMAX in the case VMAX is equal to VFE, or
- VMAX - 5 kt in the case VMAX is equal to VMO/MMO.

Selected speed has priority over managed speed. The only automatic change-over from selected to managed speed target may occur at go-around mode engagement.

In flight, if the situation calls for managed speed, both the PFD and the MCDU display a message proposing a manual change to managed speed (for example **SET MANAGED SPEED**, **CHECK SPEED MODE**, **SET HOLD SPEED**).

ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-60-30-00025753.0001001 / 18 MAY 22

Applicable to: ALL

The speed/Mach target becomes selected, if one of the following occurs:

- The flight crew pulls out the SPD/MACH knob (earliest 5 s after lift-off), or
- Both AP/FDs are OFF (except in APPR phase), or
- The FM speed target is lost except in **SRS**, **G/S**, **LAND**, or go-around or,
- The MCDU has a preselected speed for the next phase, and the aircraft transitions into that phase, or
- The FMGC is powered up in flight, or
- The AP/FD **TCAS**  mode due to a RA.

AIRCRAFT SYSTEMS**AUTO FLIGHT - FLIGHT GUIDANCE**

SPEED/MACH CONTROL - SELECTED SPEED/MACH

DISENGAGEMENT CONDITIONS

Ident.: DSC-22_30-60-30-00025754.0001001 / 18 MAY 22

Applicable to: ALL

The selected speed target disengages when:

- The managed speed target engages, or
- On ground at engine start.

Note: *It is not possible to activate selected speed mode on ground with engines running and FD ON until after takeoff.*

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SPEED/MACH FCU WINDOW SYNCHRONIZATION
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Ident.: DSC-22_30-60-40-00025755.0001001 / 18 MAY 22

Applicable to: ALL

However, the window of the FCU displays the target speed or MACH in the following situations:

- The flight crew turns the SPD/MACH knob.
The value in the window first synchronizes with the current SPD/MACH, then displays the manual selection. It remains displayed for 10 s depending upon FCU standard, then reverts to dashes if the flight crew does not pull the knob
- The flight crew manually engages a selected SPD target
- If the flight crew has manually preselected that speed or Mach value for the next phase on the PERF page:
 - That preselected speed or Mach value engages when the aircraft enters that phase, and
 - The FCU window then displays this preselected speed or Mach as the target
- If the FMGS is powered up in flight, the synchronized speed/Mach value is the current aircraft speed or Mach
- If no V2 is entered at takeoff, the V/S mode engages 5 s after lift-off (no **SRS** TO). The FCU speed target is the speed at V/S mode engagement. (A/THR becomes active when the thrust levers are set in the active range).

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT GUIDANCE

SPEED/MACH CONTROL - SPEED/MACH
FCU WINDOW SYNCHRONIZATION

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 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT GUIDANCE SPEED/MACH CONTROL - SPEED/MACH SWITCHING
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SPEED/MACH SWITCHING

Ident.: DSC-22_30-60-50-00025756.0001001 / 13 MAY 25

Applicable to: ALL

Speed/Mach switching can be automatic, or manual.

The speed/Mach target (selected or managed) is displayed on the FCU.

The flight crew may check the speed/Mach target computed by the FMS at the crossover altitude in the PERF page.

AUTOMATIC SWITCHING

During climb, at the crossover altitude, the speed target (selected or managed) automatically changes to the associated Mach target.

During descent, at the crossover altitude, the Mach target (selected or managed) automatically changes to the associated speed target.

Note: The flight crew may enter a speed target in the PERF CLB page, or a speed/Mach target in the PERF DES page. Even if it has been entered by the flight crew, this entry is still considered as a managed speed.

MANUAL SWITCHING

When the speed/Mach mode is selected, the flight crew can perform the switching, by pressing the SPD/MACH pb on the FCU (*Refer to DSC-22_10-40-20 Speed/Mach Control Area*).

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT GUIDANCE

SPEED/MACH CONTROL - SPEED/MACH SWITCHING

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT GUIDANCE APPROACH AND LANDING CAPABILITY
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GENERAL

Applicable to: ALL

Ident.: DSC-22_30-70-A-00025834.0001001 / 18 MAY 22

The approach and landing capability provides the flight crew with the aircraft capability to perform an approach, and land the aircraft.

The FMA displays this capability.

The approach and landing capability depends on:

- The availability of aircraft systems,
- The type of approach selected on the ARRIVAL page.

For more information about the minimum required equipment to compute approach and landing capabilities, *Refer to QRH/OPS Required Equipment for CAT2 and CAT3.*

The approach and landing capability enables the flight crew to determine:

- The available minima of the approach
- The available landing technique.

Ident.: DSC-22_30-70-A-00025835.0001001 / 18 MAY 22

APPROACH AND LANDING CAPABILITY WITH ILS/GLS /SLS

Approach and Landing Capability	Type of Approach Selected	Available FMA Guidance	Lowest Available Minima	Aircraft Landing Capability
 CAT3 DUAL	ILS CAT I, II, III	LOC - G/S	Down to CAT III B	Autoland ⁽¹⁾
 CAT3 SINGLE	ILS CAT I, II, III	LOC - G/S	Down to CAT III A	Autoland ⁽¹⁾
 CAT2	ILS CAT I, II	LOC - G/S	Down to CAT II	Autoland ⁽¹⁾
 AUTO LAND	GLS 	LOC - G/S	Down to CAT I	Autoland ⁽¹⁾
 CAT1	ILS CAT I	LOC - G/S	Down to CAT I	Manual landing
	GLS 			
 APPR1	RNAV(GNSS) with LPV minima (with SLS ).	LOC - G/S	Down to LPV	Manual landing

⁽¹⁾ The flight crew shall refer to the QRH to establish the actual landing capability, if some equipments not monitored by the FMGS are inoperative. *Refer to QRH/OPS Required Equipment for CAT2 and CAT3.*

Note: No approach and landing capability is displayed on FMA for RNAV(GNSS) with LP minima (with SLS ).

Ident.: DSC-22_30-70-A-00025838.0001001 / 18 MAY 22

Note: If the autoland capability is not available, the **DISCONNECT AP FOR LDG** message appears on the FMA when the aircraft is below 150 ft.

FAIL CONCEPT

Ident.: DSC-22_30-70-00025839.0001001 / 18 MAY 22

 Applicable to: **ALL**

FAIL-OPERATIONAL AUTOMATIC LANDING SYSTEM

An automatic landing system is fail-operational if, in the event of a failure below alert height, the remaining part of the automatic landing system allows the aircraft to complete the approach, flare, and landing.

The **CAT3 DUAL** approach and landing capability is fail-operational automatic landing system.

Note: In the event of a failure, the automatic landing system operates as a fail-passive system.

FAIL-PASSIVE AUTOMATIC LANDING SYSTEM

An automatic landing system is fail-passive if, in the event of a failure, there is no significant out-of-trim condition, or deviation of flight path or attitude, but the landing is not completed automatically.

The following approach and landing capabilities are fail-passive automatic landing system.

- **CAT3 SINGLE**
- **CAT2**
- **CAT1**

Note: With a fail-passive automatic landing system, the flight crew controls the aircraft after a failure.

DISPLAY

Ident.: DSC-22_30-70-00025840.0001001 / 13 MAY 25

 Applicable to: **ALL**

The approach and landing capability is displayed in the "Approach and Landing Capability" column of the FMA and of the HUD , when:

- An LS approach is manually or automatically selected on the ARRIVAL page
- The flight crew presses one of the following pushbutton on the FCU:
 - The LS pb, or
 - The LOC pb, or
 - The APPR pb.

The FMAs displays the approach and landing capability in accordance with the state of the aircraft systems, and the flight guidance systems that are engaged.

Note: No approach and landing capability is displayed when an RNAV (RNP) approach is selected in the FMS.

- L2** If the FMGC is not able to compute the approach and landing capability, **CAT 1** capability is displayed on the FMA, regardless of the FMS flight phase.

L1 **APPROACH WITHOUT FLS** **FUNCTION**

Depending on the approach selected, the **CAT 1** approach and landing capability appears as soon as the flight crew presses one of the LS pb.

The computation of the **CAT 1**, **CAT 2**, **CAT 3 SINGLE** or **CAT 3 DUAL** approach and landing capability depends on the AP engagement. Therefore, when the flight crew presses the APPR pb to arm or engage the final approach mode, and one or both AP(s) is engaged then **CAT 1**, **CAT 2**, **CAT 3 SINGLE** or **CAT 3 DUAL** approach and landing capability can be displayed (both APs are necessary for **CAT 3 DUAL**).

However, if the North reference is TRUE, the **CAT 1** is the only available capability.

- L2** **CAT 1**, **CAT 2**, **CAT 3 SINGLE** or **CAT 3 DUAL** approach and landing capability is computed only if the aircraft is above 400 ft RA when the flight crew arms the approach modes.

Below 200 ft RA, **CAT 3 SINGLE**, or **CAT 3 DUAL** is memorized and remains displayed as long as:

- At least one AP is engaged, and
- **LAND**, **FLARE**, or **ROLL OUT** is engaged.

L1 **APPROACH WITH FLS** **FUNCTION**

If the flight crew selects an approach with the FLS  function, and the active FMS flight phase is DES or APPR, the approach and landing capability appears as soon as the flight crew presses the LS pb.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT GUIDANCE

APPROACH AND LANDING CAPABILITY

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AUTOLAND WARNING LIGHT¹ Ident.: DSC-22_30-80-10-00012386.0005001 / 04 MAY 23

Applicable to: MSN 02155-03060, 05152-07792

The AUTOLAND warning flashes when:

- At least one AP is engaged below 200 ft with **LOC** and **G/S** armed, or with **LOC**, **G/S**, **LAND** or **FLARE** mode on the FMA and the difference between both RA indications is more than 15 ft RA, or
- At least one AP is engaged below 200 ft with **LAND** or **FLARE** mode on the FMA and one of the following conditions occurs:
 - The LOC deviation exceeds 1/4 dot and the aircraft is above 15 ft RA (the LOC scale flashes on the PFD), or
 - The GLIDE deviation exceeds 1 dot and the aircraft is above 100 ft RA (the GLIDE scale flashes on the PFD), or
 - Loss of LOC signal above 15 ft RA (the FD vertical bar flashes on the PFD), or
 - Loss of GLIDE signal above 100 ft RA (the FD horizontal bar flashes on the PFD), or
 - The last AP disengages, or
 - The FMGS detects a long flare, or
 - The FMGS detects an untimely flare condition.

L2 The FMGS detects an untimely flare condition when the time between **LAND** engagement (below 400 ft RA) and **FLARE** condition (below 50 ft RA) is less than 2 s.

AUTOLAND WARNING LIGHT

Ident.: DSC-22_30-80-10-00012386.0001001 / 03 JUN 14

Applicable to: MSN 04392

The following situations, when occurring below 200 ft RA with the aircraft in **LAND** mode, trigger the flashing Autoland red warning:

- Both APs OFF below 200 ft RA.
- Excessive deviation in **LOC** (1/4 dot above 15 ft RA) or **GLIDE** (1 dot above 100 ft RA). In addition, **LOC** and **GLIDE** scales flash on the PFD.
- Loss of **LOC** signal above 15 ft, or loss of **GLIDE** signal above 100 ft. The FD bars flash on the PFD. The **LAND** mode remains engaged.
- The difference between both radio altimeter indications is greater than 15 ft.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT GUIDANCE

CONTROLS AND INDICATORS - AUTOLAND LIGHT

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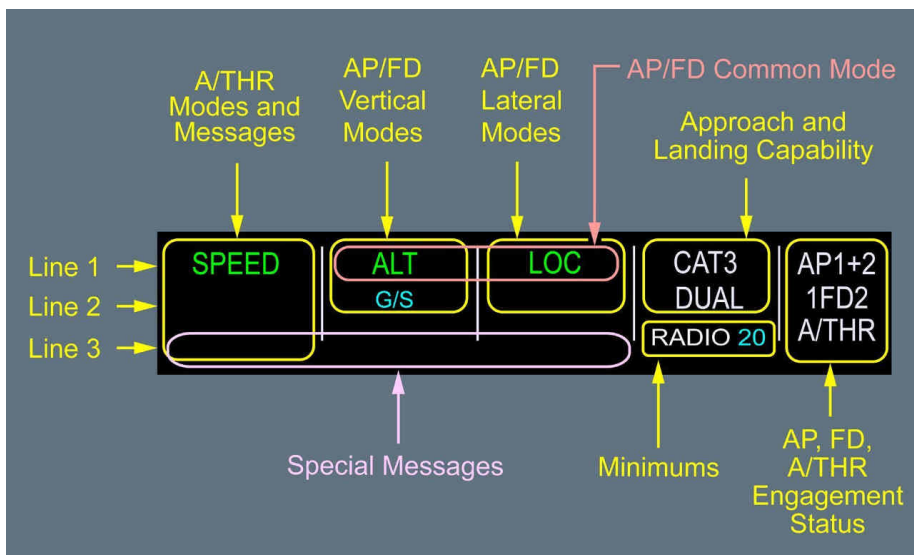
FMA DISPLAY

Ident.: DSC-22_30-80-20-00025412.0001001 / 18 MAY 22

Applicable to: MSN 04392

The FMA is located on the upper part of the PFD, and displays the following information, associated to flight guidance:

- A/THR messages and modes
- AP/FD modes (Vertical, Lateral, Common)
- Approach and landing capability
- AP, FD, and A/THR engagement status
- Special Messages.



A white box appears for 10 s around the annunciation of:

- An A/THR mode engagement
- An AP/FD mode engagement
- The approach and landing capability (or the change of the approach and landing capability)
- An AP, FD, or A/THR engagement status change.

Special Messages displays three types of messages by the following priority:

- First priority is given to F/CTL messages
- Then vertical FMS messages
- Then EFIS reconfiguration messages.

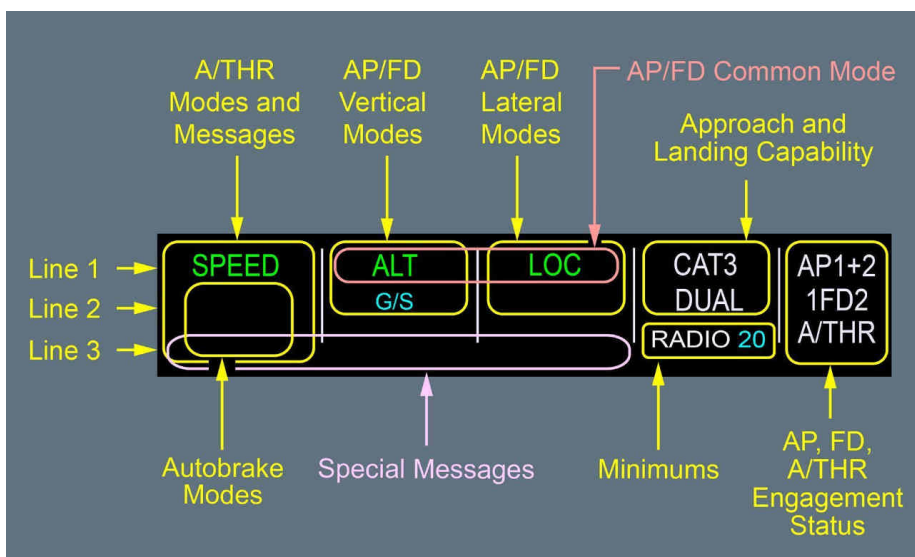
FMA DISPLAY

Ident.: DSC-22_30-80-20-00025412.0002001 / 18 MAY 22

Applicable to: MSN 02155-03060, 05152-07792

The FMA is located on the upper part of the PFD, and displays the following information, associated to flight guidance:

- A/THR modes and modes
- AP/FD modes (Vertical, Lateral, Common)
- Approach and landing capability
- AP, FD, and A/THR engagement status
- Special Messages
- Autobrake modes.



A white box appears for 10 s around the annunciation of:

- An A/THR mode engagement
- An AP/FD mode engagement
- The approach and landing capability (or the change of the approach and landing capability)
- An AP, FD, or A/THR engagement status change.

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Special Messages displays three types of messages by the following priority:

- First priority is given to F/CTL messages
- Then vertical FMS messages
- Then EFIS reconfiguration messages.

- FD 2

Ident.: DSC-22_30-80-20-00025514.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	- FD 2
Column	AP, FD, and A/THR Engagement Status - Column 5 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Line	Line 2 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Display Conditions	FD2 is engaged.

1 FD -

Ident.: DSC-22_30-80-20-00025740.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	1 FD -
Column	AP, FD, and A/THR Engagement Status - Column 5 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Line	Line 2 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Display Conditions	FD1 is engaged.

1 FD 2

Ident.: DSC-22_30-80-20-00025518.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	1 FD 2
Column	AP, FD, and A/THR Engagement Status - Column 5 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Line	Line 2 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Display Conditions	FD1 and FD2 are engaged.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT GUIDANCE

CONTROLS AND INDICATORS - FMA

A.FLOOR

Ident.: DSC-22_30-80-20-00025533.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	A.FLOOR with a flashing amber box
Column	A/THR Messages and Modes - Column 1 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Line	Line 1 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Display Conditions	A/THR is active and the engines apply maximum thrust, while A.FLOOR conditions are applicable.

ALT (ARMED)

Ident.: DSC-22_30-80-20-00025534.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	ALT
Column	AP/FD Vertical Modes - Column 2 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Line	Line 2 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Display Conditions	Altitude mode is armed. The target altitude is the FCU selected altitude. If the FCU selected altitude is equal to the cruise altitude, <i>Refer to DSC-22_30-80-20 ALT CRZ (Armed)</i> . <i>Note:</i> G/S, F-G/S  or FINAL can be simultaneously displayed with ALT, ALT CST or DES.

ALT (ENGAGED)

Ident.: DSC-22_30-80-20-00025535.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	ALT
Column	AP/FD Vertical Modes - Column 2 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Line	Line 1 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Display Conditions	The aircraft maintains the FCU selected altitude.

ALT*

Ident.: DSC-22_30-80-20-00025536.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	ALT*
Column	AP/FD Vertical Modes - Column 2 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)

Continued on the following page

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT GUIDANCE CONTROLS AND INDICATORS - FMA
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Continued from the previous page

Line	Line 1 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Display Conditions	The altitude capture mode is engaged, and acquires the FCU selected altitude. If the FCU selected altitude is equal to the cruise altitude, <i>Refer to DSC-22_30-80-20 ALT CRZ*</i> .

ALT CRZ (ARMED)

Ident.: DSC-22_30-80-20-00025539.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	ALT CRZ
Column	AP/FD Vertical Modes - Column 2 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Line	Line 2 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Display Conditions	The altitude mode is armed. The target altitude is the CRZ FL.

ALT CRZ (ENGAGED)

Ident.: DSC-22_30-80-20-00025541.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	ALT CRZ
Column	AP/FD Vertical Modes - Column 2 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Line	Line 1 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Display Conditions	The aircraft maintains the cruise altitude. The SOFT ALT mode is engaged.

ALT CRZ*

Ident.: DSC-22_30-80-20-00025542.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	ALT CRZ*
Column	AP/FD Vertical Modes - Column 2 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Line	Line 1 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Display Conditions	The altitude capture mode is engaged, and acquires the cruise altitude.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT GUIDANCE

CONTROLS AND INDICATORS - FMA

ALT CST (ARMED)

Ident.: DSC-22_30-80-20-00025544.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	ALT CST
Column	AP/FD Vertical Modes - Column 2 (Refer to DSC-22_30-80-20 FMA Display)
Line	Line 2 (Refer to DSC-22_30-80-20 FMA Display)
Display Conditions	Altitude mode is armed. The target altitude is an altitude constraint. Note: G/S, F-G/S  or FINAL can be simultaneously displayed with ALT, ALT CST or DES.

ALT CST (ENGAGED)

Ident.: DSC-22_30-80-20-00025545.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	ALT CST
Column	AP/FD Vertical Modes - Column 2 (Refer to DSC-22_30-80-20 FMA Display)
Line	Line 1 (Refer to DSC-22_30-80-20 FMA Display)
Display Conditions	The aircraft maintains the altitude constraint.

ALT CST*

Ident.: DSC-22_30-80-20-00025547.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	ALT CST*
Column	AP/FD Vertical Modes - Column 2 (Refer to DSC-22_30-80-20 FMA Display)
Line	Line 1 (Refer to DSC-22_30-80-20 FMA Display)
Display Conditions	The altitude capture mode is engaged, and acquires an altitude constraint.

AP1

Ident.: DSC-22_30-80-20-00025549.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	AP 1
Column	AP, FD, and A/THR Engagement Status - Column 5 (Refer to DSC-22_30-80-20 FMA Display)
Line	Line 1 (Refer to DSC-22_30-80-20 FMA Display)
Display Conditions	AP1 is engaged.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT GUIDANCE CONTROLS AND INDICATORS - FMA
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AP1+2

Ident.: DSC-22_30-80-20-00025550.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	AP 1+2
Column	AP, FD, and A/THR Engagement Status - Column 5 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Line	Line 1 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Display Conditions	AP1 and AP2 are engaged.

AP2

Ident.: DSC-22_30-80-20-00025551.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	AP 2
Column	AP, FD, and A/THR Engagement Status - Column 5 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Line	Line 1 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Display Conditions	AP2 is engaged.

APP NAV (ARMED)

Ident.: DSC-22_30-80-20-00025553.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	APP NAV
Column	AP/FD Lateral Modes - Column 3 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Line	Line 2 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Display Conditions	The Navigation mode is armed for a non precision approach.

APP NAV (ENGAGED)

Ident.: DSC-22_30-80-20-00025554.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	APP NAV
Column	AP/FD Lateral Modes - Column 3 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Line	Line 1 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Display Conditions	The Navigation mode is engaged during a non precision approach.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT GUIDANCE
CONTROLS AND INDICATORS - FMA
APPR1 (SLS)

Ident.: DSC-22_30-80-20-00025741.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	APPR 1 (SLS )
Column	Approach and Landing Capability - Column 4 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Line	Line 1 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Display Conditions	SLS function is available for LPV approach. The type of the guidance for the selected approach is LOC and G/S.

A/THR (ACTIVATED)

Ident.: DSC-22_30-80-20-00025555.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	A/THR
Column	AP, FD, and A/THR Engagement Status - Column 5 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Line	Line 3 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Display Conditions	The A/THR is active.

A/THR (ARMED)

Ident.: DSC-22_30-80-20-00025556.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	A/THR
Column	AP, FD, and A/THR Engagement Status - Column 5 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Line	Line 3 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Display Conditions	The A/THR is armed and not active.

AUTO LAND (GLS)

Ident.: DSC-22_30-80-20-00025557.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	AUTO LAND (GLS )
Column	Approach and Landing Capability - Column 4 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Line	Line 1 and 2 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Display Conditions	A GLS  approach is selected and the GLS  automatic landing capability is available.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT GUIDANCE CONTROLS AND INDICATORS - FMA
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BARO XXXXX

Ident.: DSC-22_30-80-20-00025734.0002001 / 18 MAY 22

Applicable to: ALL

FMA Display	BARO XXXXX
Column	Approach and Landing Capability - Column 4 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Line	Line 3 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Display Conditions	Minimum Descent Altitude or Minimum Descent Height as inserted by the flight crew on the PERF APPR page.

BRK LO (ARMED)

Ident.: DSC-22_30-80-20-00025677.0001001 / 18 MAY 22

Applicable to: MSN 02155-03060, 05152-07792

FMA Display	BRK LO
Column	Autobrake Modes - Column 1 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Line	Line 2 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Display Conditions	A/BRK is armed in LO mode.

BRK LO (ACTIVATED)

Ident.: DSC-22_30-80-20-00025678.0001001 / 18 MAY 22

Applicable to: MSN 02155-03060, 05152-07792

FMA Display	BRK LO with permanent white box
Column	Autobrake Modes - Column 1 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Line	Line 1 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Display Conditions	A/BRK is active in LO mode.

BRK MAX (ACTIVATED)

Ident.: DSC-22_30-80-20-00025680.0001001 / 18 MAY 22

Applicable to: MSN 02155-03060, 05152-07792

FMA Display	BRK MAX whit permanent white box
Column	Autobrake Modes - Column 1 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Line	Line 1 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Display Conditions	A/BRK is active in MAX mode.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT GUIDANCE

CONTROLS AND INDICATORS - FMA

BRK MAX (ARMED) ON LINE 3

Ident.: DSC-22_30-80-20-00025682.0001001 / 04 MAY 23

Applicable to: MSN 02155-03060, 05152-07792

FMA Display	BRK MAX
Column	Autobrake Modes - Column 1 (Refer to DSC-22_30-80-20 FMA Display)
Line	Line 3 (Refer to DSC-22_30-80-20 FMA Display)
Display Conditions	A/BRK is armed in MAX mode.

BRK MED (ARMED)

Ident.: DSC-22_30-80-20-00025683.0001001 / 18 MAY 22

Applicable to: MSN 02155-03060, 05152-07792

FMA Display	BRK MED
Column	Autobrake Modes - Column 1 (Refer to DSC-22_30-80-20 FMA Display)
Line	Line 2 (Refer to DSC-22_30-80-20 FMA Display)
Display Conditions	A/BRK is armed in MED mode.

BRK MED (ACTIVATED)

Ident.: DSC-22_30-80-20-00025684.0001001 / 18 MAY 22

Applicable to: MSN 02155-03060, 05152-07792

FMA Display	BRK MED with permanent white box
Column	Autobrake Modes - Column 1 (Refer to DSC-22_30-80-20 FMA Display)
Line	Line 1 (Refer to DSC-22_30-80-20 FMA Display)
Display Conditions	A/BRK is active in MED mode.

CAT1

Ident.: DSC-22_30-80-20-00025559.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	CAT 1
Column	Approach and Landing Capability - Column 4 (Refer to DSC-22_30-80-20 FMA Display)
Line	Line 1 (Refer to DSC-22_30-80-20 FMA Display)
Display Conditions	CAT1 approach capability is available. The type of guidance for the selected approach is LOC and G/S.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT GUIDANCE CONTROLS AND INDICATORS - FMA
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CAT2

Ident.: DSC-22_30-80-20-00025558.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	CAT 2
Column	Approach and Landing Capability - Column 4 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Line	Line 1 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Display Conditions	CAT2 approach capability is available. The type of guidance for the selected approach is LOC and G/S.

CAT3 DUAL

Ident.: DSC-22_30-80-20-00025560.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	CAT3 DUAL
Column	Approach and Landing Capability - Column 4 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Line	Line 1 and 2 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Display Conditions	CAT3 approach capability is available, with FAIL OPERATIONAL condition. The type of guidance for the selected approach is LOC and G/S.

CAT3 SINGLE

Ident.: DSC-22_30-80-20-00025561.0001001 / 04 MAY 23

Applicable to: ALL

FMA Display	CAT 3 SINGLE
Column	Approach and Landing Capability - Column 4 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Line	Line 1 and 2 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Display Conditions	CAT3 approach capability is available, with FAIL PASSIVE condition. The type of the guidance for the selected approach is LOC and G/S.

CHECK APPR SELECTION

Ident.: DSC-22_30-80-20-00025723.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	CHECK APPR SELECTION
Column	Special Messages- Column 2 and 3 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)

Continued on the following page

Continued from the previous page

Line	Line 3 (Refer to DSC-22_30-80-20 FMA Display)
Display Conditions	The flight crew manually tuned an ILS / GLS  on the FMS RADIO NAV page. This manually-tuned landing system does not correspond to the approach that is selected in the flight plan. The message is displayed when the aircraft is in cruise at less than 100 NM from the Top of Descent or in descent or in approach. In approach, pressing the APPR pb arms LOC and G/S modes on the manually-tuned landing system.

CHECK SPEED MODE

Ident.: DSC-22_30-80-20-00025686.0002001 / 02 MAY 24

Applicable to: ALL

FMA Display	CHECK SPEED MODE
Column	Special Messages - Column 2 and 3 (Refer to DSC-22_30-80-20 FMA Display)
Line	Line 3 (Refer to DSC-22_30-80-20 FMA Display)
Display Conditions	The speed target is selected and the situation requires managed speed mode (for example, flight phase transition or CMS entry).

CLB (ARMED)

Ident.: DSC-22_30-80-20-00025562.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	CLB
Column	AP/FD Vertical Modes - Column 2 (Refer to DSC-22_30-80-20 FMA Display)
Line	Line 2 (Refer to DSC-22_30-80-20 FMA Display)
Display Conditions	Climb mode is armed.

CLB (ENGAGED)

Ident.: DSC-22_30-80-20-00025563.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	CLB
Column	AP/FD Vertical Modes - Column 2 (Refer to DSC-22_30-80-20 FMA Display)
Line	Line 1 (Refer to DSC-22_30-80-20 FMA Display)
Display Conditions	Climb mode is engaged. The selected target altitude is higher than the actual altitude. Altitude constraints are taken into account.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT GUIDANCE CONTROLS AND INDICATORS - FMA
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DES (ARMED)

Ident.: DSC-22_30-80-20-00025564.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	DES
Column	AP/FD Vertical Modes - Column 2 (Refer to DSC-22_30-80-20 FMA Display)
Line	Line 2 (Refer to DSC-22_30-80-20 FMA Display)
Display Conditions	The descent mode is armed. <u>Note:</u> G/S, F-G/S  or FINAL can be simultaneously displayed with ALT, ALT CST or DES.

DES (ENGAGED)

Ident.: DSC-22_30-80-20-00025565.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	DES
Column	AP/FD Vertical Modes - Column 2 (Refer to DSC-22_30-80-20 FMA Display)
Line	Line 1 (Refer to DSC-22_30-80-20 FMA Display)
Display Conditions	Descent mode is engaged. The selected target altitude is lower than the actual altitude. Altitude constraints are taken into account.

DISCONNECT AP FOR LDG

Ident.: DSC-22_30-80-20-00025690.0002001 / 18 MAY 22

Applicable to: ALL

FMA Display	DISCONNECT AP FOR LDG
Column	Special Messages - Column 2 and 3 (Refer to DSC-22_30-80-20 FMA Display)
Line	Line 3 (Refer to DSC-22_30-80-20 FMA Display)
Display Conditions	The flight crew must disconnect the AP for landing. This message is displayed when the AP/FD remains engaged at: - 150 ft RA during a non-precision approach, or - 150 ft RA during an ILS/GLS  approach when the CAT 1 approach capability is displayed on the FMA, or - 150 ft RA during an LPV approach (with SLS ) when APPR1 approach capability is displayed on the FMA.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT GUIDANCE

CONTROLS AND INDICATORS - FMA

EXP CLB

Ident.: DSC-22_30-80-20-00025691.0001001 / 18 MAY 22

Applicable to: MSN 02155-04392, 07784-07792

FMA Display	EXP CLB
Column	AP/FD Vertical Modes - Column 2 (Refer to DSC-22_30-80-20 FMA Display)
Line	Line 1 (Refer to DSC-22_30-80-20 FMA Display)
Display Conditions	The Expedite Climb mode is engaged. The selected target altitude is higher than the actual altitude. Green Dot is maintained, altitude constraints are disregarded.

EXP DES

Ident.: DSC-22_30-80-20-00025692.0001001 / 18 MAY 22

Applicable to: MSN 02155-04392, 07784-07792

FMA Display	EXP DES
Column	AP/FD Vertical Modes - Column 2 (Refer to DSC-22_30-80-20 FMA Display)
Line	Line 1 (Refer to DSC-22_30-80-20 FMA Display)
Display Conditions	The Expedite Descent mode is engaged. The selected target altitude is lower than the actual altitude. M 0.80/340 kt is maintained, altitude constraints are disregarded.

FINAL (ARMED)

Ident.: DSC-22_30-80-20-00025699.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	FINAL
Column	AP/FD Vertical Modes - Column 2 (Refer to DSC-22_30-80-20 FMA Display)
Line	Line 2 (Refer to DSC-22_30-80-20 FMA Display)
Display Conditions	The FINAL descent mode is armed. <i>Note:</i> G/S, F-G/S  or FINAL can be simultaneously displayed with ALT, ALT CST or DES.

FINAL APP

Ident.: DSC-22_30-80-20-00025700.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	FINAL APP
Column	AP/FD Vertical Modes - Column 2 and 3 (Refer to DSC-22_30-80-20 FMA Display)

Continued on the following page

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT GUIDANCE CONTROLS AND INDICATORS - FMA
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Continued from the previous page

Line	Line 1 (Refer to DSC-22_30-80-20 FMA Display)
Display Conditions	APP NAV and FINAL modes are engaged during a non precision approach.

FLARE

Ident.: DSC-22_30-80-20-00025702.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	FLARE
Column	AP/FD Common Modes - Column 2 and 3 (Refer to DSC-22_30-80-20 FMA Display)
Line	Line 1 (Refer to DSC-22_30-80-20 FMA Display)
Display Conditions	The Flare mode is engaged.

FOR GA: SET TOGA

Ident.: DSC-22_30-80-20-00025726.0002001 / 18 MAY 22

Applicable to: MSN 02155-03060, 05152-07792

FMA Display	FOR GA: SET TOGA
Column	Special Messages - Column 2 and 3 (Refer to DSC-22_30-80-20 FMA Display)
Line	Line 3 (Refer to DSC-22_30-80-20 FMA Display)
Display Conditions	The flight crew must set the thrust levers to the TOGA detent to perform a go-around. During approach, the flight crew sets the thrust levers to or above the FLX/ MCT detent (but below TOGA), and: - The aircraft is below 1 000 ft RA - The AP and/or the FD are engaged.

FPA

Ident.: DSC-22_30-80-20-00025707.0002001 / 18 MAY 22

Applicable to: ALL

FMA Display	FPA+/-X.X°
Column	AP/FD Vertical Modes - Column 2 (Refer to DSC-22_30-80-20 FMA Display)
Line	Line 1 (Refer to DSC-22_30-80-20 FMA Display)
Display Conditions	Flight Path Angle mode is engaged to acquire and maintain the FPA selected on the FCU. The target is displayed in blue. If the aircraft reaches VLS or VMAX and cannot maintain the target, the indication is boxed amber and flashes, and the target pulses.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT GUIDANCE

CONTROLS AND INDICATORS - FMA

GA TRK

Ident.: DSC-22_30-80-20-00025566.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	GA TRK
Column	AP/FD Lateral Modes - Column 3 (Refer to DSC-22_30-80-20 FMA Display)
Line	Line 1 (Refer to DSC-22_30-80-20 FMA Display)
Display Conditions	The Go-Around Track mode is engaged.

G/S (ARMED)

Ident.: DSC-22_30-80-20-00025567.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	G/S
Column	AP/FD Vertical Modes - Column 2 (Refer to DSC-22_30-80-20 FMA Display)
Line	Line 2 (Refer to DSC-22_30-80-20 FMA Display)
Display Conditions	The Glide Slope mode is armed. <i>Note:</i> G/S, F-G/S  or FINAL can be simultaneously displayed with ALT, ALT CST or DES.

G/S (ENGAGED)

Ident.: DSC-22_30-80-20-00025568.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	G/S
Column	AP/FD Vertical Modes - Column 2 (Refer to DSC-22_30-80-20 FMA Display)
Line	Line 1 (Refer to DSC-22_30-80-20 FMA Display)
Display Conditions	The Glide Slope track mode is engaged.

G/S*

Ident.: DSC-22_30-80-20-00025569.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	G/S*
Column	AP/FD Vertical Modes - Column 2 (Refer to DSC-22_30-80-20 FMA Display)
Line	Line 1 (Refer to DSC-22_30-80-20 FMA Display)
Display Conditions	Glide Slope capture mode is engaged.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT GUIDANCE CONTROLS AND INDICATORS - FMA
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HDG

Ident.: DSC-22_30-80-20-00025570.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	HDG
Column	AP/FD Lateral Modes - Column 3 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Line	Line 1 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Display Conditions	The Heading mode is engaged.

LAND

Ident.: DSC-22_30-80-20-00025571.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	LAND
Column	AP/FD Common Modes - Column 2 and 3 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Line	Line 1 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Display Conditions	The Land mode is engaged below 400 ft RA.

LOC (ARMED)

Ident.: DSC-22_30-80-20-00025572.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	LOC
Column	AP/FD Lateral Modes - Column 3 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Line	Line 2 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Display Conditions	The Localizer mode is armed.

LOC (ENGAGED)

Ident.: DSC-22_30-80-20-00025573.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	LOC
Column	AP/FD Lateral Modes - Column 3 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Line	Line 1 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Display Conditions	The Localizer track mode is engaged.



A318/A319/A320/A321
FLIGHT CREW
OPERATING MANUAL

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT GUIDANCE

CONTROLS AND INDICATORS - FMA

LOC*

Ident.: DSC-22_30-80-20-00025574.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	LOC*
Column	AP/FD Lateral Modes - Column 3 (Refer to DSC-22_30-80-20 FMA Display)
Line	Line 1 (Refer to DSC-22_30-80-20 FMA Display)
Display Conditions	The Localizer capture mode is engaged.

LOC B/C (ARMED)

Ident.: DSC-22_30-80-20-00025709.0001001 / 18 MAY 22

Applicable to: MSN 02719-03060

FMA Display	LOC B/C
Column	AP/FD Lateral Modes - Column 3 (Refer to DSC-22_30-80-20 FMA Display)
Line	Line 2 (Refer to DSC-22_30-80-20 FMA Display)
Display Conditions	The Localizer Back Course mode is armed.

LOC B/C (ENGAGED)

Ident.: DSC-22_30-80-20-00025710.0001001 / 18 MAY 22

Applicable to: MSN 02719-03060

FMA Display	LOC B/C
Column	AP/FD Lateral Modes - Column 3 (Refer to DSC-22_30-80-20 FMA Display)
Line	Line 1 (Refer to DSC-22_30-80-20 FMA Display)
Display Conditions	The Localizer Back Course track mode is engaged.

LOC B/C*

Ident.: DSC-22_30-80-20-00025711.0001001 / 18 MAY 22

Applicable to: MSN 02719-03060

FMA Display	LOC B/C*
Column	AP/FD Lateral Modes - Column 3 (Refer to DSC-22_30-80-20 FMA Display)
Line	Line 1 (Refer to DSC-22_30-80-20 FMA Display)
Display Conditions	The Localizer Back Course capture mode is engaged.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT GUIDANCE CONTROLS AND INDICATORS - FMA
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LVR ASYM

Ident.: DSC-22_30-80-20-00025575.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	LVR ASYM
Column	A/THR Messages and Modes - Column 1 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Line	Line 3 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Display Conditions	One thrust lever is in a detent (CLB or MCT) while all others are not in this detent.

LVR CLB

Ident.: DSC-22_30-80-20-00025712.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	LVR CLB (flashing)
Column	A/THR Messages and Modes - Column 1 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Line	Line 3 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Display Conditions	Request to set the thrust levers in CL detent. LVR CLB flashes and a single chime sounds every 5 s, as long as the flight crew does not take action. <i>Note:</i> If the thrust levers are below the CL detent, the MASTER CAUT light flashes and a single chime sounds every 5 s until the flight crew takes appropriate action.

LVR MCT

Ident.: DSC-22_30-80-20-00025727.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	LVR MCT (flashing)
Column	A/THR Messages and Modes - Column 1 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Line	Line 3 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Display Conditions	Request to set the thrust levers in MCT detent. LVR MCT flashes and a single chime sounds every 5 s, as long as the flight crew does not take action. <i>Note:</i> If the thrust levers are below the FLX/MCT detent, the MASTER CAUT light flashes and a single chime sounds every 5 s until the flight crew takes appropriate action.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT GUIDANCE

CONTROLS AND INDICATORS - FMA

LVR TOGA

Ident.: DSC-22_30-80-20-00025398.0003001 / 15 NOV 22

Applicable to: MSN 07784-07792

FMA Display	LVR TOGA (flashing)
Column	A/THR Messages and Modes - Column 1 (Refer to DSC-22_30-80-20 FMA Display)
Line	Line 3 (Refer to DSC-22_30-80-20 FMA Display)
Display Conditions	Request to set the thrust levers to the TOGA detent, if during a go-around, one of the following occur: - Upon a go-around performed with one engine inoperative (engine failed or corresponding thrust levers is set to idle), and the flight crew reduces the thrust lever of operative engine to FLX/MCT detent before reaching the thrust reduction altitude. - Upon a Soft Go-Around  : - One engine fails, or - One thrust lever is set to idle position, or - One engine is not in soft go-around thrust mode, or - The soft go-around function is lost. <u>Note:</u> If the thrust levers are below the TOGA detent, the MASTER CAUT light comes on and a single chime sounds.

LVR TOGA

Ident.: DSC-22_30-80-20-00025398.0001001 / 15 NOV 22

Applicable to: MSN 02155-05746

FMA Display	LVR TOGA (flashing) (Soft Go-Around )
Column	A/THR Messages and Modes - Column 1 (Refer to DSC-22_30-80-20 FMA Display)
Line	Line 3 (Refer to DSC-22_30-80-20 FMA Display)
Display Conditions	Request to set the thrust levers to the TOGA detent, if during a Soft Go-Around  , one of the following occur: - One engine fails, or - One thrust lever is set to idle position, or - One engine is not in soft go-around thrust mode, or - The soft go-around function is lost. <u>Note:</u> If the thrust levers are below the TOGA detent, the MASTER CAUT light comes on and a single chime sounds.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT GUIDANCE CONTROLS AND INDICATORS - FMA
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MACH

Ident.: DSC-22_30-80-20-00025714.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	MACH
Column	A/THR Messages and Modes - Column 1 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Line	Line 1 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Display Conditions	A/THR is active and controls a MACH target.

MACH SEL:XX

Ident.: DSC-22_30-80-20-00025640.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	MACH SEL:XX
Column	Special Messages - Column 1 and 2 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Line	Line 3 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Display Conditions	Indicates a preset Mach associated with the cruise, climb or descent phase.

MAN FLX XX

Ident.: DSC-22_30-80-20-00025771.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	MAN FLX XX with a permanent white box
Column	A/THR Messages and Modes - Column 1 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Line	Line 1 and 2 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Display Conditions	A/THR is armed, at least one thrust lever is in FLX/MCT detent, with FLX TO temperature (displayed in blue), set by the flight crew in the PERF TAKEOFF page. The related engine apply flexible thrust, with FLX TO temperature set by the flight crew. The other thrust lever is at, or below the FLX/MCT detent.

MAN MCT

Ident.: DSC-22_30-80-20-00025642.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	MAN MCT with a permanent white box
Column	A/THR Messages and Modes - Column 1 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)

Continued on the following page

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT GUIDANCE

CONTROLS AND INDICATORS - FMA

Continued from the previous page

Line	Line 1 and 2 - (Refer to DSC-22_30-80-20 FMA Display)
Display Conditions	A/THR is armed, at least one thrust lever is in FLX/MCT detent. The other thrust levers are at, or below this detent and no FLX TO temperature, nor a Derated Takeoff  level is entered.

MAN PITCH TRIM ONLY

Ident.: DSC-22_30-80-20-00025643.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	MAN PITCH TRIM ONLY
Column	Special Messages - Column 2 and 3 (Refer to DSC-22_30-80-20 FMA Display)
Line	Line 3 (Refer to DSC-22_30-80-20 FMA Display)
Display Conditions	Displayed in case of loss of L + R elevators.

MAN THR

Ident.: DSC-22_30-80-20-00025644.0001001 / 06 NOV 25

Applicable to: ALL

FMA Display	MAN THR with a permanent amber box
Column	A/THR Messages and Modes - Column 1 (Refer to DSC-22_30-80-20 FMA Display)
Line	Line 1 and 2 (Refer to DSC-22_30-80-20 FMA Display)
Display Conditions	A/THR is armed, and: - The most advanced thrust lever is between FLX/MCT and TOGA detent, or - All thrust levers are above CL detent (AEO) but not in FLX/MCT or TOGA detent, or - The most advanced thrust lever is between CL and FLX/MCT detent. <u>Note:</u> In the case of OEI, corresponding thrust lever is not taken into account. The operative engines apply a thrust defined by the thrust lever position. <u>Note:</u> In the case of a Soft Go-Around , if the flight crew sets the thrust levers directly to FLX/MCT and not to TOGA then FLX/MCT, MAN THR will appear.

MAN TOGA

Ident.: DSC-22_30-80-20-00025645.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	MAN TOGA with a permanent white box
Column	A/THR Messages and Modes - Column 1 (Refer to DSC-22_30-80-20 FMA Display)

Continued on the following page

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT GUIDANCE CONTROLS AND INDICATORS - FMA
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Continued from the previous page

Line	Line 1 and 2 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Display Conditions	A/THR is armed, at least one thrust lever is in TOGA detent. The related engine applies maximum thrust.

MORE DRAG

Ident.: DSC-22_30-80-20-00025717.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	MORE DRAG
Column	Special Messages - Column 2 and 3 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Line	Line 3(<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Display Conditions	DES is engaged, idle is selected, and either: - The aircraft is above the vertical profile and the predicted intercept point of the theoretical profile is less than 2 NM from the next altitude constraint, or - The aircraft enters a speedbrake decelerating segment.

NAV (ARMED)

Ident.: DSC-22_30-80-20-00025647.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	NAV
Column	AP/FD Lateral Modes - Column 3 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Line	Line 2 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Display Conditions	The Navigation mode is armed.

NAV (ENGAGED)

Ident.: DSC-22_30-80-20-00025648.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	NAV
Column	AP/FD Lateral Modes - Column 3 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Line	Line 1 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Display Conditions	The Navigation mode is engaged to guide the aircraft along the lateral flight plan.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT GUIDANCE

CONTROLS AND INDICATORS - FMA

NO DH

Ident.: DSC-22_30-80-20-00025649.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	NO DH
Column	Minimums - Column 4 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Line	Line 3 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Display Conditions	When NO is inserted in the PERF APPR page.

OP CLB (ARMED)

Ident.: DSC-22_30-80-20-00025652.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	OP CLB
Column	AP/FD Vertical Modes - Column 2 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Line	Line 2 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Display Conditions	Open Climb mode is armed.

OP CLB (ENGAGED)

Ident.: DSC-22_30-80-20-00025653.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	OP CLB
Column	AP/FD Vertical Modes - Column 2 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Line	Line 1 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Display Conditions	Open Climb mode is engaged. The selected target altitude is higher than the actual altitude.

OP DES

Ident.: DSC-22_30-80-20-00025654.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	OP DES
Column	AP/FD Vertical Modes - Column 2 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Line	Line 1 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Display Conditions	Open Descent mode is engaged. The selected target altitude is lower than the actual altitude.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT GUIDANCE CONTROLS AND INDICATORS - FMA
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RADIO XXX

Ident.: DSC-22_30-80-20-00025738.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	RADIO XXX
Column	Minimums - Column 4 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Line	Line 3 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Display Conditions	Decision Height as inserted by the flight crew in the PERF APPR page.

ROLL OUT

Ident.: DSC-22_30-80-20-00025655.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	ROLL OUT
Column	AP/FD Common Modes - Column 2 and 3 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Line	Line 1 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Display Conditions	The Roll Out mode is engaged.

RWY

Ident.: DSC-22_30-80-20-00025656.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	RWY
Column	AP/FD Lateral Modes - Column 3 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Line	Line 1 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Display Conditions	The Runway mode is engaged.

RWY TRK

Ident.: DSC-22_30-80-20-00025657.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	RWY TRK
Column	AP/FD Lateral Modes - Column 3 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Line	Line 1 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Display Conditions	The Runway Track mode is engaged once airborne at, or above 30 ft.

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT GUIDANCE

CONTROLS AND INDICATORS - FMA

SET GREEN DOT SPEED

Ident.: DSC-22_30-80-20-00025658.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	SET GREEN DOT SPEED
Column	Special Messages - Column 2 and 3 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Line	Line 3 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Display Conditions	The aircraft is in Engine-Out mode and the SPEED target is selected. This message is displayed if the FCU selected speed is: - Equal to or less than Green Dot -10 kt, or - Equal to or greater than Green Dot +10 kt except in ALT* and ALT mode.

SET HOLD SPEED

Ident.: DSC-22_30-80-20-00025659.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	SET HOLD SPEED
Column	Special Messages - Column 2 and 3 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Line	Line 3 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Display Conditions	The aircraft is in selected SPEED control, an HM leg is inserted in the F-PLN and the aircraft is 30 s before the deceleration point to the precomputed HOLD SPEED.

SPEED

Ident.: DSC-22_30-80-20-00025661.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	SPEED
Column	A/THR Messages and Modes - Column 1 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Line	Line 1 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Display Conditions	A/THR is active and controls a speed target target.

SPEED SEL:XXX

Ident.: DSC-22_30-80-20-00025662.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	SPEED SEL:XXX
Column	Special Messages - Column 1 and 2 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)

Continued on the following page

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT GUIDANCE CONTROLS AND INDICATORS - FMA
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Continued from the previous page

Line	Line 3 (Refer to DSC-22_30-80-20 FMA Display)
Display Conditions	Indicates a preset speed associated with the cruise, climb or descent phase.

SRS

Ident.: DSC-22_30-80-20-00025663.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	SRS
Column	AP/FD Vertical Modes - Column 2 (Refer to DSC-22_30-80-20 FMA Display)
Line	Line 1 (Refer to DSC-22_30-80-20 FMA Display)
Display Conditions	The speed reference system mode is engaged during takeoff or go-around.

TCAS (ARMED)

Ident.: DSC-22_30-80-20-00025664.0001001 / 18 MAY 22

Applicable to: MSN 07784-07792

FMA Display	TCAS
Column	AP/FD Vertical Modes - Column 2 (Refer to DSC-22_30-80-20 FMA Display)
Line	Line 3 (Refer to DSC-22_30-80-20 FMA Display)
Display Conditions	The AP/FD TCAS mode is armed.

TCAS (ENGAGED)

Ident.: DSC-22_30-80-20-00025665.0001001 / 18 MAY 22

Applicable to: MSN 07784-07792

FMA Display	TCAS
Column	AP/FD Vertical Modes - Column 2 (Refer to DSC-22_30-80-20 FMA Display)
Line	Line 1 (Refer to DSC-22_30-80-20 FMA Display)
Display Conditions	The AP/FD TCAS mode is engaged. The FG provides a vertical guidance in the case of a RA alert, generated by the TCAS.

TCAS RA INHIBITED

Ident.: DSC-22_30-80-20-00025666.0004001 / 18 MAY 22

Applicable to: MSN 07784-07792

FMA Display	TCAS RA INHIBITED
Column	Special Messages - Column 2 and 3 (Refer to DSC-22_30-80-20 FMA Display)

Continued on the following page

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT GUIDANCE

CONTROLS AND INDICATORS - FMA

Continued from the previous page

Line	Line 3 (Refer to DSC-22_30-80-20 FMA Display)
Display Conditions	The AP/FD TCAS mode disengages because the TA only or the STBY mode of the TCAS is selected (Refer to DSC-22_30-80-20 FMA Display).

T/D REACHED

Ident.: DSC-22_30-80-20-00025667.0002001 / 18 MAY 22

Applicable to: ALL

FMA Display	T/D REACHED
Column	Special Messages - Column 2 and 3 (Refer to DSC-22_30-80-20 FMA Display)
Line	Line 3 (Refer to DSC-22_30-80-20 FMA Display)
Display Conditions	The thrust is not reduced when passing the Top of Descent, and the aircraft is above the flight profile.

THR CLB

Ident.: DSC-22_30-80-20-00025668.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	THR CLB
Column	A/THR Messages and Modes - Column 1 (Refer to DSC-22_30-80-20 FMA Display)
Line	Line 1 (Refer to DSC-22_30-80-20 FMA Display)
Display Conditions	A/THR is active in thrust mode and the most advanced thrust lever is in the CL detent.

THR IDLE

Ident.: DSC-22_30-80-20-00025669.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	THR IDLE
Column	A/THR Messages and Modes - Column 1 (Refer to DSC-22_30-80-20 FMA Display)
Line	Line 1 (Refer to DSC-22_30-80-20 FMA Display)
Display Conditions	A/THR is active in thrust mode and the engines apply idle thrust.

THR LK

Ident.: DSC-22_30-80-20-00025670.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	THR LK (flashing)
Column	A/THR Messages and Modes - Column 1 (Refer to DSC-22_30-80-20 FMA Display)

Continued on the following page

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT GUIDANCE CONTROLS AND INDICATORS - FMA
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Continued from the previous page

Line	Line 3 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Display Conditions	The thrust is frozen due to a non-standard A/THR disconnection (FCU disconnection or failure). MASTER CAUT light flashes and a single chime sounds every 5 s, as long as the flight crew does not take action.

THR LVR

Ident.: DSC-22_30-80-20-00025671.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	THR LVR
Column	A/THR Messages and Modes - Column 1 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Line	Line 1 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Display Conditions	A/THR is active in thrust mode, all thrust levers are below CL detent, or the most advanced thrust lever(s) is between CL and MCT detent with at least one thrust lever in CL detent.

THR MCT

Ident.: DSC-22_30-80-20-00025672.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	THR MCT
Column	A/THR Messages and Modes - Column 1 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Line	Line 1 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Display Conditions	A/THR is active in thrust mode and the most advanced thrust lever is in the MCT detent (OEI). The operative engines apply maximum continuous thrust.

TOGA LK

Ident.: DSC-22_30-80-20-00025721.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	TOGA LK with a flashing amber box
Column	A/THR Messages and Modes - Column 1 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Line	Line 1 (<i>Refer to DSC-22_30-80-20 FMA Display</i>)
Display Conditions	A/THR is active and TOGA thrust is frozen (A.FLOOR conditions are no longer applicable).

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT GUIDANCE

CONTROLS AND INDICATORS - FMA

TRACK

Ident.: DSC-22_30-80-20-00025673.0001001 / 04 MAY 23

Applicable to: ALL

FMA Display	TRACK
Column	AP/FD Lateral Modes - Column 3 (Refer to DSC-22_30-80-20 FMA Display)
Line	Line 1 (Refer to DSC-22_30-80-20 FMA Display)
Display Conditions	The Track mode is engaged.

TRK FPA DESELECTED

Ident.: DSC-22_30-80-20-00025722.0001001 / 18 MAY 22

Applicable to: MSN 07784-07792

FMA Display	TRK FPA DESELECTED
Column	Special Messages - Column 2 and 3 (Refer to DSC-22_30-80-20 FMA Display)
Line	Line 3 (Refer to DSC-22_30-80-20 FMA Display)
Display Conditions	At clear of conflict, informs that the flight reference TRK/FPA changed to HDG / V/S following AP/FD engagement.

USE MAN PITCH TRIM

Ident.: DSC-22_30-80-20-00025674.0001001 / 18 MAY 22

Applicable to: ALL

FMA Display	USE MAN PITCH TRIM
Column	Special Messages - Column 2 and 3 (Refer to DSC-22_30-80-20 FMA Display)
Line	Line 3 (Refer to DSC-22_30-80-20 FMA Display)
Display Conditions	F/CTL are in direct law or in flare law with dual RA failure.

V/S

Ident.: DSC-22_30-80-20-00025675.0002001 / 18 MAY 22

Applicable to: ALL

FMA Display	V/S±XXXX
Column	AP/FD Vertical Modes - Column 2 (Refer to DSC-22_30-80-20 FMA Display)
Line	Line 1 (Refer to DSC-22_30-80-20 FMA Display)
Display Conditions	The Vertical Speed mode is engaged to acquire and maintain the V/S selected on the FCU. The target is displayed in blue. If the aircraft reaches VLS or VMAX and cannot maintain the target, the indication is boxed amber and flashes, and the target pulses.

MISBEHAVIOUR OF THE ENHANCED LOC CAPTURE FUNCTION

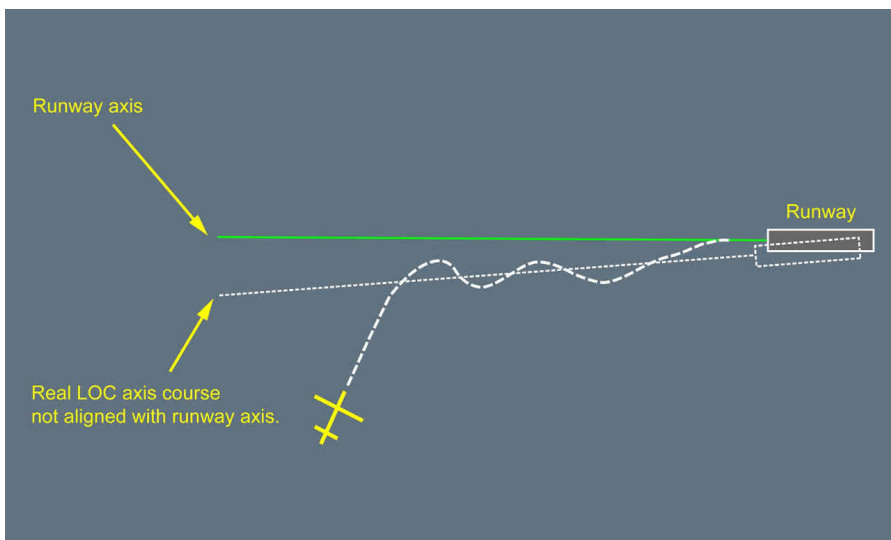
Ident.: DSC-22_30-110-00023202.0001001 / 10 MAY 21

Applicable to: ALL

DESCRIPTION

With the Enhanced LOC capture function, the aircraft may oscillate on one side of the LOC axis when one of the following occurs:

- The LOC ground antenna position is unusual (ahead of runway threshold or not aligned with runway axis), or
- The LOC course is not aligned with runway axis.


OPERATIONAL RECOMMENDATION

On runway with unusual LOC position or with LOC course not aligned with runway axis, in case of roll oscillations during LOC capture, the flight crew shall consider to discontinue the approach. On the next approach, the flight crew must manually tune the ILS via the RMP before arming the APPR mode (or the **LOC** mode).

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT GUIDANCE

TEMPORARY ABNORMAL BEHAVIORS

UNEXPECTED G/S MODE ARMED

Ident.: DSC-22_30-110-00022028.0001001 / 12 JUL 18

Applicable to: ALL

During the approach phase with Glide Slope (G/S) mode armed (displayed blue on Flight Mode Annunciator (FMA)), the Flight Guidance may not disarm the G/S mode if the following conditions are satisfied in a time frame of less than 1.5 s:

- AP1+2 set to OFF
- FD1+2 set to OFF
- A/THR set to OFF.

As expected, AP/FDs are OFF and G/S mode is correctly disarmed (G/S mode no longer displayed on FMA). However, regardless of the subsequent flight phases (go-around, new approach, take-off, etc), the G/S mode will arm again as soon as the FDs are back to ON. G/S mode armed is displayed in addition to the current vertical mode armed.

The following three illustrations provide non exhaustive examples of unexpected G/S mode armed:

Example of FMA During Cockpit Preparation:

	CLB G/S	NAV		1 FD 2
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Example of FMA during Cruise:

MACH	ALT CRZ G/S	NAV		AP1 1 FD 2 A/THR
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Example of FMA During Descent:

THR IDIE	DES ALT G/S	NAV	BARO 240	AP1 1 FD 2 A/THR
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On ground, misbehavior cancel sequence:

With FDs ON, if G/S is armed, the flight crew shall perform an aircraft power OFF.

In flight, misbehavior cancel sequence:

- Push the FCU APPR push-button to arm the approach modes, confirmed by both LOC and G/S displayed blue on FMA. To do so the arming conditions for approach modes must be satisfied.
- Push again the FCU APPR push-button to disarm the approach modes, confirmed by both LOC and G/S no longer displayed on FMA.

OPERATIONAL RECOMMENDATIONS:

If the misbehavior occurs during the flight, and an approach with FCU LOC push-button is required (LOC only procedure or ILS approach with early LOC interception requested by Air Traffic Control (ATC)), **first perform** the above-mentioned **In flight misbehavior cancel sequence** to remove the G/S mode armed. Then the approach can be flown as usual.

LEFT TURN NOT EXPECTED WHILE IN HDG OR TRK MODE

Ident.: DSC-22_30-110-00015029.0001001 / 08 AUG 13

Applicable to: MSN 04392

The AP/FD may erroneously order a left turn if the following conditions are fulfilled:

- The aircraft is in a right turn in HDG or TRK mode
- Within 180 ms, the difference between the target selected on the FCU and the current aircraft heading/track, initially above 85 °:
 1. First goes below 85 °
 2. Then goes above 95 °.

The flight crew may encounter this misbehavior in two different situations:

- The flight crew requests a right turn, then rapidly reduces and increases again the target selected on the FCU
- The flight crew increases the target selected on the FCU according to the above conditions, while the aircraft is already in a right turn.

The misbehavior may affect either one AP/FD or both AP/FD.

OPERATIONAL RECOMMENDATIONS:

The flight crew must immediately take appropriate actions:

- The flight crew must disconnect the AP and the FD, and manually turn.
- When established on the intended trajectory, the flight crew can reengage the FD first, and then the AP.

SPURIOUS CAT 2 INOP

Ident.: DSC-22_30-110-00022057.0001001 / 15 MAY 23

Applicable to: MSN 07784-07792

DESCRIPTION:

A spurious **CAT 2** INOP SYS may occur on ground or in flight.

- On ground, a **CAT 2** INOP SYS may be displayed without additional ECAM alert
- In flight, a **CAT 2** INOP SYS may be displayed with the **NAV LS TUNING DISAGREE** alert, while there is no real landing system tuning disagree.

Note: The case of spurious **CAT 2** INOP SYS in flight may occur at the recovery from an FMGC reset, or when the flight crew uses the RMP to tune an ILS frequency/ILS course.

A spurious **CAT 2** INOP SYS is caused by the erroneous detection of a difference in ILS tuning between FMGC1 and FMGC2.

OPERATIONAL RECOMMENDATIONS:

If a **CAT 2** INOP SYS is displayed on ground or in flight as indicated in the description above, the flight crew shall perform all of the following:

- On RADIO NAV page of any FMS, insert the following ILS frequency/ILS course: 108.0/0 °
- Check that **CAT 2** no longer appears on the ECAM INOP SYS
- Clear the ILS frequency/ILS course insertions from RADIO NAV page.

Note: 1. 108.0/0 ° is the default value of ILS frequency/ILS course for the FMS.
2. Clearing ILS insertions on RADIO NAV page restores the automatic NAVAID tuning.

SPURIOUS CAT 2 INOP

Ident.: DSC-22_30-110-00022057.0003001 / 15 MAY 23

Applicable to: MSN 02155-03060, 05152-05746

DESCRIPTION:

A spurious **CAT 2** INOP SYS may occur on ground or in flight.

- On ground, a **CAT 2** INOP SYS may be displayed without additional ECAM alert
- In flight, a **CAT 2** INOP SYS may be displayed with the **NAV LS TUNING DISAGREE** alert, while there is no real landing system tuning disagree.

Note: The case of spurious **CAT 2** INOP SYS in flight may occur at the recovery from an FMGC reset, or when the flight crew uses the RMP to tune an ILS frequency/ILS course.

A spurious **CAT 2** INOP SYS is caused by the erroneous detection of a difference in ILS tuning between FMGC1 and FMGC2.

OPERATIONAL RECOMMENDATIONS:

If a **CAT 2** INOP SYS is displayed on ground or in flight as indicated in the description above, the flight crew shall perform all of the following:

- On RADIO NAV page of any FMS, insert the following ILS frequency/ILS course: 108.0/0 °
- Check that **CAT 2** no longer appears on the ECAM INOP SYS
- Clear the ILS frequency/ILS course insertions from RADIO NAV page.

WARNING	Do not insert or clear ILS FREQ or CRS on both FMS sides simultaneously.
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- Note:
1. 108.0/0 ° is the default value of ILS frequency/ILS course for the FMS.
 2. Clearing ILS insertions on RADIO NAV page restores the automatic NAVAID tuning.
 3. Inserting the CRS on one FMS side while the LS FREQ is cleared on the other FMS side results in dual FMS latch.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT GUIDANCE

TEMPORARY ABNORMAL BEHAVIORS

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AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT AUGMENTATION

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DSC-22_40-10 General
GENERAL..... A

DSC-22_40-20 Yaw Functions
YAW DAMPING..... A
RUDDER TRIM..... B
RUDDER TRAVEL LIMITATION..... C

DSC-22_40-30 Flight Envelope Function
GENERAL..... A
PFD Speed Scale Management..... B
Alpha-Floor Protection..... C
Low - Energy Aural Alert..... D

DSC-22_40-40 Windshear Detection Function
Windshear Detection Function..... A
WINDSHEAR DETECTION PRINCIPLES..... B

DSC-22_40-50 Controls and Indicators
FAC ENGAGEMENT..... A
RUDDER TRIM OPERATION..... B

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - FLIGHT AUGMENTATION GENERAL
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GENERAL

Ident.: DSC-22_40-10-00000840.0001001 / 24 FEB 15

Applicable to: ALL

The aircraft has two flight augmentation computers (FACs) that perform four main functions:

- Yaw function
 - Yaw damping and turn coordination
 - Rudder trim
 - Rudder travel limitation
- Flight envelope function
 - PFD speed scale management
 - Minimum/maximum speed computation
 - Maneuvering speed computation
 - Alpha-floor protection
- Low-Energy Aural Alert function
- Windshear detection function

In performing these functions the FAC uses independent channels :

Yaw damper
Rudder trim
Rudder travel limit
Flight envelope

Each FAC interfaces with the elevator aileron computers (ELACs) when the APs are disengaged, or with the FMGS when at least one AP is engaged.

Both FACs engage automatically at power-up.

The pilot can disengage or reset each FAC (in case of failure) by means of a pushbutton on the flight control overhead panel.

When a FAC is disengaged (FAC pushbutton set off) but still valid, the flight envelope function of the FAC remains active.

If both FACs are valid, FAC1 controls the yaw damper, turn coordination, rudder trim, and rudder travel limit, and FAC2 is in standby.

FAC1 keeps the aircraft within the flight envelope through FD1 ; FAC2 performs this function through FD2.

If a failure is detected on any channel of FAC1, FAC2 takes over the corresponding channel.

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AIRCRAFT SYSTEMS**AUTO FLIGHT - FLIGHT AUGMENTATION****YAW FUNCTIONS****YAW DAMPING**

Ident.: DSC-22_40-20-00000851.0001001 / 18 MAR 11

Applicable to: ALL

Yaw damping stabilizes the aircraft in yaw and coordinates its turns.

In automatic flight (AP engaged) during takeoff and go around, it assists rudder application after an engine failure (short-term yaw compensation).

Note: When the AP is engaged, the FMGS sends orders to the FAC to give :

- Yaw damping during approach
- Yaw control for runway alignment in ROLL OUT mode

RUDDER TRIM

Ident.: DSC-22_40-20-00000855.0001001 / 09 DEC 09

Applicable to: ALL

The rudder trim function :

- Executes trim orders, entered by the pilot by using the manual trim knob.
- When AP is engaged
 - executes trim orders from the FMGS.
 - Assists the system in recovering from engine failure (long-term yaw compensation) in all flight guidance modes.
 - If the pilot pushes the rudder more than 10 ° out of trim, it disengages the AP.

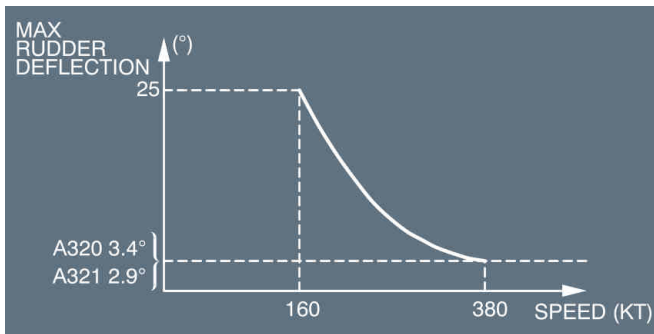
Note: When the AP is engaged, the rudder trim knob is inoperative : the master FMGC sends rudder trim orders to the FAC.

RUDDER TRAVEL LIMITATION

Ident.: DSC-22_40-20-00000857.0001001 / 01 OCT 12

Applicable to: ALL

This function limits rudder deflection is based on speed in order to avoid high structural loads. It is governed by the following law :



If both FACs lose the rudder travel limitation function, the value of the rudder deflection limit is locked at the time of the second failure.

When the slats are extended, the FACs automatically set the rudder deflection limit at the low-speed setting (maximum authorized deflection).

AIRCRAFT SYSTEMS**AUTO FLIGHT - FLIGHT AUGMENTATION**

FLIGHT ENVELOPE FUNCTION

GENERAL

Ident.: DSC-22_40-30-00000859.0001001 / 09 DEC 09

Applicable to: ALL

As long as one Flight Augmentation Computer (FAC) is valid, it governs the flight envelope function, the rudder position display, and the rudder trim indication regardless of what the flight crew does with the FAC pushbutton.

PFD SPEED SCALE MANAGEMENT

Ident.: DSC-22_40-30-00000860.0001001 / 10 MAY 21

Applicable to: MSN 02155-05253

The FAC controls the speed scale on the PFD (*Refer to DSC-31-40 Attitude Data*).
When both FACs are operative, FAC1 supplies data to PFD1 and FAC2 supplies it to PFD2.

The FAC computes:

- The minimum and maximum speeds:
 - VSW
 - VLS
 - VFE and VFE for the next configuration
 - VLE
 - VMO/MMO.
- The maneuvering speeds:
 - Green Dot Speed
 - S speed
 - F speed.

The FAC also computes the speed trend and displays it as an arrow on the PFD speed scale.
The PFD displays these various speeds as appropriate, and they also go to the FMGC to be used as limits for various guidance modes.

Note: The principle of the speed computation is as follows:

- The FAC computes VS1G. From VS1G it computes the FAC GW which is also sent to the ELAC:
 - When the aircraft is below 14 625 ft and 250 kt, it computes this from current angle of attack, speed/Mach, altitude, thrust, and CG
 - When the aircraft is above 14 625 ft or 250 kt, it computes this out of the GW, which it has memorized and updated with a fuel consumption model set in the FAC.
- The FAC computes the various minimum and maneuvering speeds, $V_{\alpha prot}$ and VSW
- The accuracies of the various minimum and maximum speeds are functions of the accuracy with which the FAC computes aircraft gross weight. Normal accuracy for VLS in CONF FULL is about ± 3 kt.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT AUGMENTATION

FLIGHT ENVELOPE FUNCTION

PFD SPEED SCALE MANAGEMENT

Ident.: DSC-22_40-30-00000860.0002001 / 10 MAY 21

Applicable to: MSN 05746-07792

The FAC controls the speed scale on the PFD (*Refer to DSC-31-40 Attitude Data*).

When both FACs are operative, FAC1 supplies data to PFD1 and FAC2 supplies it to PFD2.

The FAC computes:

- The minimum and maximum speeds:
 - VSW
 - VLS
 - VFE and VFE for the next configuration
 - VLE
 - VMO/MMO.
- The maneuvering speeds:
 - Green Dot Speed
 - S speed
 - F speed.

The FAC also computes the speed trend and displays it as an arrow on the PFD speed scale.

The PFD displays these various speeds as appropriate, and they also go to the FMGC to be used as limits for various guidance modes.

- Note:** *The FAC computes the operating speeds based on the FMS gross weight. This allows to have consistent and accurate operating speeds between the PFD and the MCDU. In parallel, the FAC also computes its own GW and CG, based on aerodynamic data, which is used by the ELAC and the FMS for gross weight crosscheck (CHECK GW MCDU message), and as a backup for speeds computation in the case of dual FMS failure. The principle of the FAC GW/CG computation based on aerodynamic data is as follows:*
- *The FAC computes VS1G. From VS1G it computes the FAC GW which is also sent to the ELAC:*
 - *When the aircraft is below 14 625 ft and 250 kt, it computes this from current angle of attack, speed/Mach, altitude, thrust, and CG*
 - *When the aircraft is above 14 625 ft or 250 kt, it computes this out of the GW, which it has memorized and updated with a fuel consumption model set in the FAC.*

ALPHA-FLOOR PROTECTION

Ident.: DSC-22_40-30-A-00025190.0001001 / 18 MAY 22

Applicable to: ALL

GENERAL

The Alpha-floor function automatically applies TOGA thrust, when the angle of attack exceeds the Alpha-floor threshold (between α PROT and α MAX). TOGA thrust is applied regardless of the thrust lever position and the A/THR engagement status.

The A/THR engages in **A.FLOOR** mode. For more information on **A.FLOOR** A/THR mode, *Refer to DSC-22_30-50-50 ALPHA FLOOR.*

ALPHA-FLOOR PROTECTION ACTIVATION

The Alpha-floor function activates when one of the following conditions occurs:

- The angle of attack is above Alpha-floor (Alpha-floor depends on the aircraft configuration, and the aircraft deceleration rate), or
- The side stick deflection is close to full back stick, with either:
 - The pitch attitude protection active (*Refer to DSC-27-20-10-20 Protections - Pitch Attitude Protection*), or
 - The angle of attack protection active (*Refer to DSC-27-20-10-20 Protections - High Angle of Attack Protection*).

Ident.: DSC-22_40-30-A-00025194.0001001 / 05 MAY 22

Applicable to: ALL

ALPHA-FLOOR PROTECTION INHIBITION

The Alpha-floor protection is inhibited when one of the following conditions occurs:

- The AP/FD **TCAS**  mode is engaged, or

Ident.: DSC-22_40-30-A-00025191.0001001 / 05 MAY 22

Applicable to: MSN 02155-03060, 05152-07792

- The aircraft airspeed is above M 0.6, or

Ident.: DSC-22_40-30-A-00025193.0001001 / 05 MAY 22

Applicable to: ALL

- One engine is inoperative with slats/flaps extended, or
- One EIU is failed, or
- Both SFCC1 and FMGC2 are failed, or
- Both SFCC2 and FMGC1 are failed, or
- Both FCU channels are failed, or

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT AUGMENTATION
FLIGHT ENVELOPE FUNCTION

- Both FMGCs are failed, or
- Alternate or direct law is active.

LOW - ENERGY AURAL ALERT

Ident.: DSC-22_40-30-00006197.0001001 / 03 NOV 21

Applicable to: ALL

An aural low-energy “SPEED SPEED SPEED” alert, repeated every 5 s, warns the flight crew that the aircraft’s energy level is going below a threshold under which the flight crew has to increase thrust, in order to regain a positive flight path angle through pitch control.

It is available in Configuration 2, 3, and FULL. The FAC computes the energy level with the following inputs:

- Aircraft configuration
- Horizontal deceleration rate
- Flight path angle.

The aural alert is inhibited when:

- TOGA is selected, or
- Below 100 ft RA, or
- Above 2 000 ft RA, or
- Alpha-floor, or the ground proximity warning system alert is triggered, or
- In alternate or direct law, or
- If both radio altimeters fail.

During deceleration, the low-energy aural alert is triggered before alpha floor (unless alpha floor is triggered by stick deflection). The amount of time between the two alerts depends on the deceleration rate.

AIRCRAFT SYSTEMS**AUTO FLIGHT - FLIGHT AUGMENTATION****WINDSHEAR DETECTION FUNCTION****WINDSHEAR DETECTION FUNCTION**

Ident.: DSC-22_40-40-00006194.0001001 / 13 MAY 25

Applicable to: ALL

The windshear detection function is provided by the Flight Augmentation Computer (FAC) in takeoff and approach phase in the following conditions:

- At takeoff, 3 s after liftoff, up to 1 300 ft RA
- At landing, from 1 300 ft RA to 50 ft RA
- With at least CONF 1 selected.

The warning consists of:

- A visual "**WINDSHEAR**" message displayed on one or both PFDs for a minimum of 15 s.
- An aural synthetic voice announcing "WINDSHEAR" three times.

WINDSHEAR DETECTION PRINCIPLES

Ident.: DSC-22_40-40-00006195.0001001 / 23 JUN 15

Applicable to: ALL

The FACs generate the windshear warning whenever the predicted energy level for the aircraft falls below a predetermined threshold.

In computing this energy level prediction, the FACs use data from different sources. From ADIRS comes data such as vertical speed, air and ground speeds and slope ; from other sources come such derived parameters as total slope, longitudinal wind gradient, and vertical wind.

The FACs express this energy level as an angle of attack and compare it with an angle-of-attack threshold above which windshear conditions are most likely and pilot action is required.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT AUGMENTATION

WINDSHEAR DETECTION FUNCTION

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A318/A319/A320/A321
FLIGHT CREW
OPERATING MANUAL

AIRCRAFT SYSTEMS
AUTO FLIGHT - FLIGHT AUGMENTATION
CONTROLS AND INDICATORS

FAC ENGAGEMENT

Ident.: DSC-22_40-50-00000861.0001001 / 09 DEC 09

Applicable to: ALL

Refer to DSC-27-10-20 Yaw Control - General

RUDDER TRIM OPERATION

Ident.: DSC-22_40-50-00000862.0001001 / 09 DEC 09

Applicable to: ALL

Refer to DSC-27-10-20 Yaw Control - General

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AIRCRAFT SYSTEMS

AUTO FLIGHT - AOC FUNCTIONS

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General.....	A
Flight Plan Initialization Function.....	B
Takeoff Data Function.....	C
Wind Data Function.....	D
Flight Reports.....	E

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GENERAL

Ident.: DSC-22_45-00000864.0001001 / 18 MAR 11

Applicable to: ALL

The FMS AOC function gives an interface between a ground station and one onboard FMGC, allowing data transmission between these two computers via the ACARS Management Unit or the ATSU.

Two different sets of message can be exchanged:

UPLINK messages from the ground station. They consist in reception of data requested or directly sent to the crew.

DOWNLINK messages from the FMGC (master). They consist in reports or requests sent to the ground station.

The FMGS/ACARS or FMGS/ATSU interface enables the following AOC capabilities.

- F-PLN initialization (flight plan and performance data)
- Takeoff data
- Wind data
- Flight reports
- Broadcast data

Crews can send message using ACARS FUNCTION pages or relevant MCDU pages.

Only one FMGC talks to the ground station. This FMGC is called FMGC "master".

GENERAL SCRATCHPAD MESSAGES

NOT XMITTED TO ACARS: A crew request or report was sent to the ground but the communication was not established or not acknowledged.

NO ANSWER TO REQUEST : A crew request was previously sent to the ground and no answer (uplink message) was received within 4 min.

FLIGHT PLAN INITIALIZATION FUNCTION
--

Ident.: DSC-22_45-00000865.0001001 / 18 MAR 11

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

This function enables lateral and vertical flight plan data as well as initialization data to be exchanged between the aircraft and a ground station. The aircraft may send flight plan requests for active and secondary flight plan. (downlink messages). The ground station may send flight plan and initialization data (uplink messages) either under aircraft request or automatically without any request.

Each uplink message concerns either the active or secondary flight plan but never both flight plans at the same time. The data sent to the aircraft are checked for flight plan consistency.

A MCDU message comes up when an uplink message is received. "ACT (or SEC) RTE UPLINK".

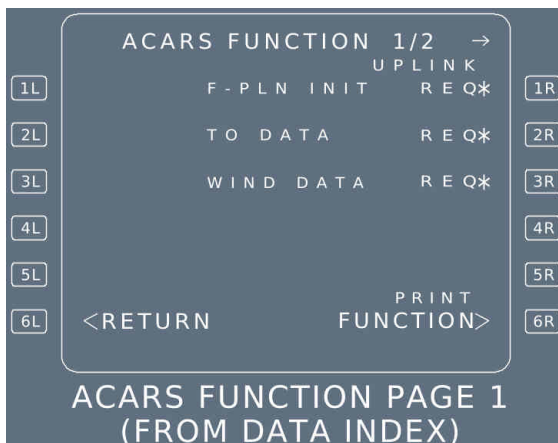
AIRCRAFT SYSTEMS

AUTO FLIGHT - AOC FUNCTIONS

If an error prevents the decoding process of the message, “INVALID RTE UPLINK” is displayed on MCDUs.

An uplink message can be routed to the active flight plan if no engine is started and no active flight plan exists. Otherwise, it is routed to the secondary. The crew will insert it into the secondary flight plan or will reject it using the CLR key.

Note: The flight plan may also be initialized using the ACARS FUNCTION page selected from DATA INDEX page.



ACARS FUNCTION 1/2 →
UPLINK

1L	F - PLN INIT	REQ*	1R
2L	TO DATA	REQ*	2R
3L	WIND DATA	REQ*	3R
4L			4R
5L			5R
6L	<RETURN	PRINT FUNCTION>	6R

**ACARS FUNCTION PAGE 1
(FROM DATA INDEX)**

PERFORMANCE DATA

On ground and before engine start, the ground station may also send performance data to the aircraft.

Performance data are always associated with the uplink flight plan. It is either automatically inserted with the active flight plan data, or stored in the secondary with the corresponding flight plan.

This message contains part or all of the following data:

ZFW, ZFWCG, taxi fuel, block fuel, cruise flight level, tropopause altitude, cruise temperature, transition altitude, cost index, performance factor.

Note: After engine start an uplink performance data message is rejected automatically without any scratchpad message.

SCRATCHPAD MESSAGES RELATED TO FLIGHT PLAN AND PERFORMANCE

INVALID RTE UPLINK An error is detected, the uplink message is rejected.

ACT or SEC RTE UPLINK A F-PLN is stored in the active or secondary flight plan.

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - AOC FUNCTIONS
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FLT NUMBER UPLINK	FLT NBR has been initialized within a F-PLN message without previous request.
CHECK FLT NUMBER	The uplinked FLT NBR differs from the one specified in the request.
CHECK CO RTE	The uplinked CO RTE ident differs from the one specified in the request.
INVALID FLT NBR UPLINK	The uplink contains a valid F-PLN but the FLT NBR is invalid.
PERF DATA UPLINK	Performance data is received
INVALID PERF UPLINK	Performance uplink message has been rejected
RTE DATALINK IN PROG	A flight plan modification is performed after a F-PLN INIT request has been sent; this message is displayed until the uplink is received.
UPLINK INSERT IN PROG	This message is displayed during insertion of a Flight Plan.

FLIGHT PLAN INITIALIZATION FUNCTION

Ident.: DSC-22_45-00000865.0010001 / 18 MAR 11
Applicable to: MSN 02926-02944, 04392, 07784-07792

This function enables lateral and vertical flight plan data as well as initialization data to be exchanged between the aircraft and a ground station. The aircraft may send flight plan requests for active and secondary flight plan. (downlink messages). The ground station may send flight plan and initialization data (uplink messages) either under aircraft request or automatically without any request. Each uplink message concerns either the active or secondary flight plan but never both flight plans at the same time. The data sent to the aircraft are checked for flight plan consistency.

An MCDU message comes up when an uplink message is received. “ACT (or SEC) RTE UPLINK”. If an error prevents the decoding process of the message, “INVALID RTE UPLINK” is displayed on the MCDUs.

An uplink message can be routed to the active flight plan if no engine is started and no active flight plan exists. Otherwise, it is routed to the secondary flight plan. The flight crew will insert it into the secondary flight plan or will reject it using the CLR key.

Note: The flight plan may also be initialized using the AOC FUNCTION page selected from DATA INDEX page.

AIRCRAFT SYSTEMS

AUTO FLIGHT - AOC FUNCTIONS

1L

2L

3L

4L

5L

6L

AOC FUNCTION 1/2 →

F-PLN INIT

UPLINK
REQ*

TO DATA

REQ*

WIND DATA

REQ*

<RETURN

PRINT
FUNCTION >

1R

2R

3R

4R

5R

6R

AOC FUNCTION PAGE 1
(FROM DATA INDEX)

INITIALIZATION DATA

On ground and before engine start, the ground station may also send data to initialize the F-PLN. This data is always associated with the uplink flight plan. It is either automatically inserted with the active flight plan data, or stored in the secondary with the corresponding flight plan. Initialization data is made of part or all of the following elements:
 ZFW, ZFWCG, taxi fuel, block fuel, cruise flight level, tropopause altitude, cruise temperature, transition altitude, cost index, performance factor.

Note: After engine start an uplink initialization data message is rejected automatically without any scratchpad message.

SCRATCHPAD MESSAGES RELATED TO FLIGHT PLAN AND INITIALIZATION DATA

INVALID RTE UPLINK	An error is detected, the uplink message is rejected.
ACT or SEC RTE UPLINK	A F-PLN is stored in the active or secondary flight plan.
FLT NUMBER UPLINK	FLT NBR has been initialized within a F-PLN message without previous request.
CHECK FLT NUMBER	The uplinked FLT NBR differs from the one specified in the request.
CHECK CO RTE	The uplinked CO RTE ident differs from the one specified in the request.
INVALID FLT NBR UPLINK	The uplink contains a valid F-PLN but the FLT NBR is invalid.
INIT DATA UPLINK	Initialization data is received
INVALID INIT UPLINK	Initialization uplink message has been rejected

RTE DATALINK IN PROG A flight plan modification is performed after a F-PLN INIT request has been sent; this message is displayed until the uplink is received.

UPLINK INSERT IN PROG This message is displayed during insertion of a Flight Plan.

TAKEOFF DATA FUNCTION

Ident.: DSC-22_45-00000866.0001001 / 03 NOV 21

Applicable to: ALL

The takeoff data function is available for the active flight plan only. It is used to request to the ground station, information data for up to 2 runways and to receive this data for up to 4 runways.

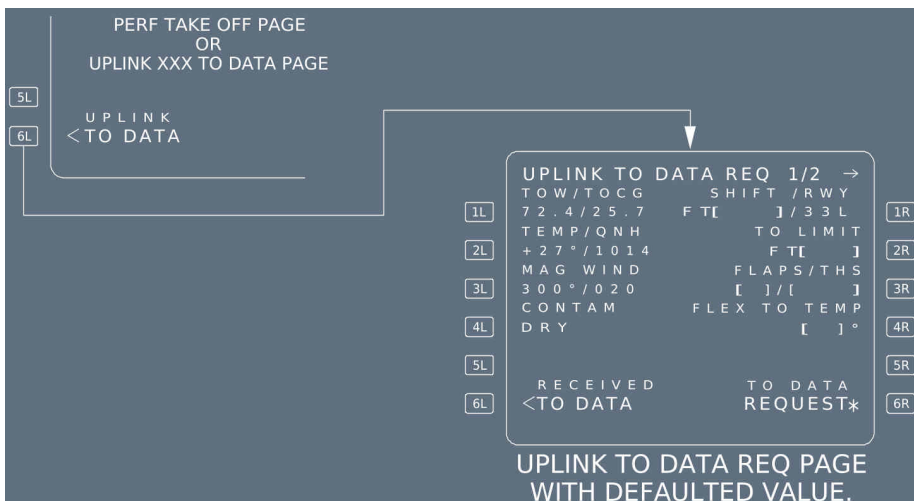
The flight crew sends a request indicating the departure airport, runway idents, CG, GW and weather conditions (such as BARO setting wind, temperature...). In response the flight crew receives the takeoff speeds for up to 4 runways but only one set of data may be inserted in the active flight plan for the selected active runway.

Takeoff speeds are computed for max and flex takeoff.

The takeoff data function has required the modification of the standard PERF TAKEOFF page and the addition of 2 new pages:

- UPLINK TO DAT REQ page that enables the flight crew to specify a request to the ground.
- UPLINK XXX TO DATA page (XXX for MAX or FLEX)

These 2 pages are accessed from the PERF TAKEOFF page in PREFLIGHT and DONE phase only.



SCRATCHPAD MESSAGES RELATED TO TAKEOFF DATA

TAKEOFF DATA UPLINK : Takeoff data uplink message is received

INVALID TAKEOFF UPLINK : The UPLINK message is rejected

WIND DATA FUNCTION

Ident.: DSC-22_45-00000867.0001001 / 17 MAY 21

Applicable to: ALL

This function enables the crew to request and to receive forecasted winds associated to the active or secondary flight plan.

The uplink message (ground station to aircraft) may be received upon crew request or automatically without crew request.

The request is initiated from WIND pages or from ACARS FUNCTION page (*Refer to DSC-22_20-30-80 Wind Data - Request for Wind Data*).

The uplink wind data when received are directly displayed on the wind pages but not inserted in the flight plan, one set for each flight phase: CLIMB, CRUISE, DESCENT. The alternate wind at alternate cruise flight level is displayed on DESCENT page.

- Winds are associated to altitude for climb and descent phases
- Winds are associated to waypoint for cruise phase and step level. One wind per waypoint.
 - On ground and without entered winds, an uplink message is directly inserted in the flight plan.
 - In flight, winds are temporary stored until the crew inserts it phase per phase. Phase of flight is indicated in the WIND title page.
 - Clearing the INSERT UPLINK* prompt using the CLR key deletes the uplink wind data for the selected phase.

When uplink winds are deleted, the wind page reverts to the previous status.

The flight plan B page is modified of the uplink wind only after it is inserted by the crew. AOC uplink winds are then considered as crew manual entries (large font).

SCRATCHPAD MESSAGES RELATED TO WIND DATA

INVALID WIND UPLINK : An error is detected, the uplink is rejected.

WIND DATA UPLINK : Uplinked winds are received.

WIND UPLINK PENDING : A temporary flight plan exists or a DIR TO page is displayed when a wind uplink is received. The message is stored.

WIND UPLINK EXISTS : A F-PLN modification (active or secondary) is attempted when uplink winds are not inserted. This message disappears automatically when the wind uplink is inserted or deleted.

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CHECK DEST DATA

The aircraft is at 180 NM from destination, and the destination QNH, TEMP or WIND displayed on the PERF APPR page was received by AOC uplink or, if following insertion of a descent wind uplink, a conflict concerning the above parameters exists.

CHECK ALTN WIND

The uplinked alternate cruise flight level differs from the default alternate cruise flight level.

FLIGHT REPORTS

Ident.: DSC-22_45-00000868.0001001 / 10 MAY 22

Applicable to: ALL

Flight reports provide real time information to the ground concerning the aircraft current situation and position.

Several types of flight reports are available:

- The Position report : provides current aircraft position
- the Progress report : provides data relative to the destination
- The Flight-Plan report : provides the active route
- the Performance Data report : provides performance data currently used by FMS.

These reports may be manually initiated via a dedicated prompt or automatically sent in response to a ground request or upon specific conditions.

POSITION REPORT

This report is sent:

- manually via a MCDU prompt or
- following a ground request or
- automatically upon sequencing a designated reporting fix (designated by the ground in a uplink message).

The manual POSITION REPORT downlink prompt is displayed on the PROG page. (SEND POS prompt).

PROGRESS PAGE
(STANDARD)

ECON CRZ AF5612
 CRZ OPT REC MAX
FL290 FL350 FL390

1L

2L

3L

4L

5L

6L

***SEND POS**

BRG / DIST TO []

CONFIRM UPDATE AT

4353.3N/00052.4E AGN*

VOR1/FREQ **HIGH** FREQ/VOR2

ATH/114.40 117.20 /DDM

1R

2R

3R

4R

5R

6R

PROGRESS PAGE
WITH GPS STANDARD

PROGRESS PAGE
WITH GPS STANDARD

ECON DES AF5612
 CRZ OPT REC MAX
FL290 FL350 FL390

1L

2L

3L

4L

5L

6L

***SEND POS VDEV=+750FT**

CONFIRM UPDATE AT

4401.8N/01100.2E FRZ*

BRG / DIST TO []

PREDICTIVE

<GPS GPS PRIMARY

REQUIRED ACCUR ESTIMATED

1.0 NM HIGH 0.16 NM

1R

2R

3R

4R

5R

6R

PROGRESS PAGE
WITH GPS STANDARD

Note: Position report are initiated from active flight plan only.

POSITION REPORT CONTENT

- Aircraft position
- Overfly reporting waypoint
- Time of report (UTC)
- Aircraft altitude
- Next reporting waypoint
- ETA at next reporting waypoint
- Reporting waypoint following next report
- SAT
- Current wind
- Remaining fuel

PROGRESS REPORT

A progress report contains data relative to the aircraft arrival time and EFOB at destination for the active F-PLN.

This downlink message is automatically sent following:

- a ground request or
- a change of destination or
- a change of runway or
- a specific event. The possible events that can be selected in the navigation database policy file are :
 - X minutes to Top of Descent
 - Z minutes to Destination
 - ETA changes more than W minutes from the previous report.X, Z and W are minutes of time set in the navigation database policy file.

The progress report cannot be manually sent by the crew via a dedicated MCDU prompt.

PROGRESS REPORT CONTENT

- Flight Number
- Arrival Airport Ident
- Destination Runway Ident
- Predicted remaining fuel
- ETA at destination
- Reason for report (specific event, ground request...).

FLIGHT PLAN REPORT

The F-PLN report broadcasts flight plan data to the ground. Only data from the active flight plan can be sent.

This downlink message is sent to the ground:

- automatically following a ground request
- manually by the crew using a prompt displayed on the ACARS FUNCTION page (DSC-22_20 Auto Flight - Flight Management/50 Controls and Indicators/10 MCDU - Page Description/25 FMS2 Honeywell/ACARS Function Page). This prompt may be invalidated through the navigation database policy file.

The Flight Plan report can be downlinked either while on ground or in flight during any flight phase.

FLIGHT PLAN REPORT CONTENT

The report contains the active and alternate flight plan.

PERFORMANCE DATA REPORT

The Performance Data report is a downlink message that allows the transmission of performance data (CG, FUEL, and etc.) relative to the active F-PLN.

This message is automatically sent following a ground request. Manual sending is not possible.

PERFORMANCE DATA REPORT CONTENT

Sends to the ground:

- Current GW
- Cruise Altitude
- Current CG
- Fuel on Board
- Block Fuel
- Reserve Fuel
- Cost Index
- Top of Climb Temperature
- Climb Transition Altitude
- Tropopause Altitude
- Taxi Fuel
- ZFW
- ZFWCG

AIRCRAFT SYSTEMS

AUTO FLIGHT - PRINT INTERFACE

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - PRINT INTERFACE PRELIMINARY PAGES - TABLE OF CONTENTS
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I	Print Function.....A
	AOC/Printer Programming Options.....B

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Localization Title	Toc Index	ID	Reason
DSC-22_46 AOC/Printer Programming Options	B	1	Documentation update: Deletion of text.
			Layout modification. No technical change.

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PRINT FUNCTION

Ident.: DSC-22_46-00000869.0003001 / 01 APR 11

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

The print function enables several types of data and report to be printed :

- Flight plan initialization data
- Takeoff data
- Wind data
- Preflight report
- In flight report
- Post flight report

The 3 first reports may differ when automatically or manually printed for the following reason :

The automatic process prints the uplink message although the manual process prints the current active data as displayed on the relevant MCDU pages.

The last 3 reports being processed from the same sources are identical in automatic or manual printing.

Note: ACARS is not necessary linked to printing process. The printing function may be activated within the FMGS and selected independently from the ACARS.

- One or several print functions may be deactivated *Refer to DSC-22_20-20-10-25 Print Function Pages.*
- If an ACARS function is not active, (not selected in the nav database policy file) the printing process is invalidated for this specific ACARS function.

PRINT FUNCTION

Ident.: DSC-22_46-00000869.0004001 / 01 APR 11

Applicable to: MSN 02926-02944, 04392, 07784-07792

The print function enables several types of data and report to be printed :

- Flight plan initialization data
- Takeoff data
- Wind data
- Preflight report
- In flight report
- Post flight report

The 3 first reports may differ when automatically or manually printed for the following reason :

The automatic process prints the uplink message although the manual process prints the current active data as displayed on the relevant MCDU pages.

The last 3 reports being processed from the same sources are identical in automatic or manual printing.

Note: ACARS is not necessary linked to printing process. The printing function may be activated within the FMGS and selected independently from the ACARS.

- One or several print functions may be deactivated *Refer to DSC-22_20-20-10-28 PRINT FUNCTION Pages.*
- If an ACARS function is not active, (not selected in the nav database policy file) the printing process is invalidated for this specific ACARS function.

AOC/PRINTER PROGRAMMING OPTIONS

Ident.: DSC-22_46-00000870.0002001 / 07 NOV 25

Applicable to: ALL

Option programming for the AOC/PRINTER functions is obtained through the Navigation Data Base policy file or the Airline Modifiable Information (AMI) file.

The list summarizes the possible options:

Data Link (ACARS or AOC) Inhibit	Disables AOC function
F-PLN Data Request Inhibit	Disables uplink and downlink requests of F-PLN initialization data
Performance Data Request Inhibit	Disables uplink and downlink requests of Performance Initialization data
Takeoff Data Request Inhibit	Disables uplink and downlink request of Takeoff Initialization data
Wind Data Request Inhibit	Disables uplink and downlink request of predicted wind data
Flight Number Enable	Flight Number is included within the F-PLN Request or Progress Report downlinks
Position Report Inhibit	Disables a manual Position Report downlink
Progress Report Triggers	Defines the triggers for the automatic downlink of the Progress Report
F-PLN Report Inhibit	Disables the manual downlink of the F-PLN Report

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS AUTO FLIGHT - PRINT INTERFACE
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Auto Print of ACARS or AOC uplinks	Selects/Deselects the automatic printing of the F-PLN, INIT, TO and wind data uplinks. If Autoprint is selected, the crew can deselect it manually. If auto printing is deselected, the crew cannot manually reselect it.
Auto Print of Flight Reports	Selects/Deselects the automatic printing of the Preflight, Inflight, Postflight reports. If selected, the crew can deselect it manually. If autoprint is deselected, the crew cannot manually preselected it.

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AIRCRAFT SYSTEMS

COMMUNICATIONS

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DSC-23-10 General**DSC-23-10-10 Introduction**

Introduction.....	A
Communication System Architecture.....	B

DSC-23-10-20 Radio Tuning

Description.....	A
Radio Management Panel.....	B

DSC-23-10-30 Intercommunication Systems

Audio Management System.....	A
Cabin Intercommunication Data System.....	B

DSC-23-10-40 Cockpit Voice Recorder

Description.....	A
Controls and Indicators.....	B

DSC-23-10-50 Controls

Audio Control Panel.....	A
Side Stick Radio Selector.....	B
Loudspeaker Volume Knob.....	C
Audio Switching.....	D

DSC-23-20 Internal Communication**DSC-23-20-10 Flight Crew Interphone System**

Flight Interphone.....	A
------------------------	---

DSC-23-20-20 Cabin Interphone System

Introduction.....	A
Cabin Call System.....	B

DSC-23-20-30 Service Interphone System

Introduction.....	A
Ground Mechanic Call System.....	B

DSC-23-20-40 Passenger Address

Description.....	A
Controls and Indicators.....	B

DSC-23-20-50 Landscape Camera

Landscape Camera.....	A
Controls and Indicators On Overhead Panel.....	B

Continued on the following page

Continued from the previous page
DSC-23-30 External Communication
DSC-23-30-10 Radio Communication

Description.....	A
VHF.....	B
HF 	C
SELCAL (Selective calling).....	D

DSC-23-30-20 SATCOM
DSC-23-30-20-10 General

General.....	A
--------------	---

DSC-23-30-20-20 Controls and Indicators

MCDU Interface.....	A
---------------------	---

DSC-23-40 Emergency Communication
DSC-23-40-10 Emergency Evacuation

Controls and Indicators.....	A
------------------------------	---

¹ **DSC-23-40-20 Emergency Cockpit Alerting System**

Cabin to Cockpit Alert.....	A
Cockpit to Cabin Alert.....	B

DSC-23-40-30 Emergency Locator Transmitter

Controls and Indicators.....	A
------------------------------	---

² **DSC-23-50 Memo Display**

CIDS.....	A
ACARS 	B
ATSU 	C
AUDIO 3 XFRD.....	D
SATCOM 	E

DSC-23-60 How to

VHF, HF Utilization.....	A
--------------------------	---

Localization Title	Toc Index	ID	Reason
DSC-23-PLP-TOC Emergency Cockpit Alerting System		1	Documentation update: Deletion of "Cabin to Cockpit Alert (00018470.0001001)".
DSC-23-PLP-TOC Memo Display		2	Documentation update: Deletion of "SATCOM (If Installed) (00018508.0001001)".
DSC-23-30-10 VHF	B	1	Addition of the minimum recommended separation between two VHF frequencies.
			Wording enhancement. No technical change.
			Layout modification. No technical change.
			Addition of the link. No technical change.
DSC-23-40-20 Cabin to Cockpit Alert	A	1	Documentation update: Addition of "Cabin to Cockpit Alert" documentary unit
DSC-23-50 SATCOM <اف>	E	1	Documentation update: Addition of "SATCOM (If Installed)" documentary unit
DSC-23-60 VHF, HF Utilization - Transmission and Reception	A	1	Removal from the note of the minimum recommended separation between two VHF frequencies. It is now described in the description section.
			Documentation update: Deletion of text.
DSC-23-60 VHF, HF Utilization - Transmission and Reception	A	2	Removal of point 2 of the note, now described in the VHF description section.
			Documentation update: Deletion of text.

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INTRODUCTION

Ident.: DSC-23-10-10-00022672.0001001 / 25 MAY 20

Applicable to: ALL

The communication system enables:

- Internal communication between the:
 - Flight crew and additional cockpit occupant(s)
 - Cabin crew
 - Ground crew
 - Passengers (i.e. for flight or cabin crew announcements).

Internal communication is possible via the flight, cabin, and service interphones, and via the Passenger Address (PA).

- External communication via radio communication (HF  or VHF) or Satellite Communication (SATCOM ), either in voice mode or data mode.

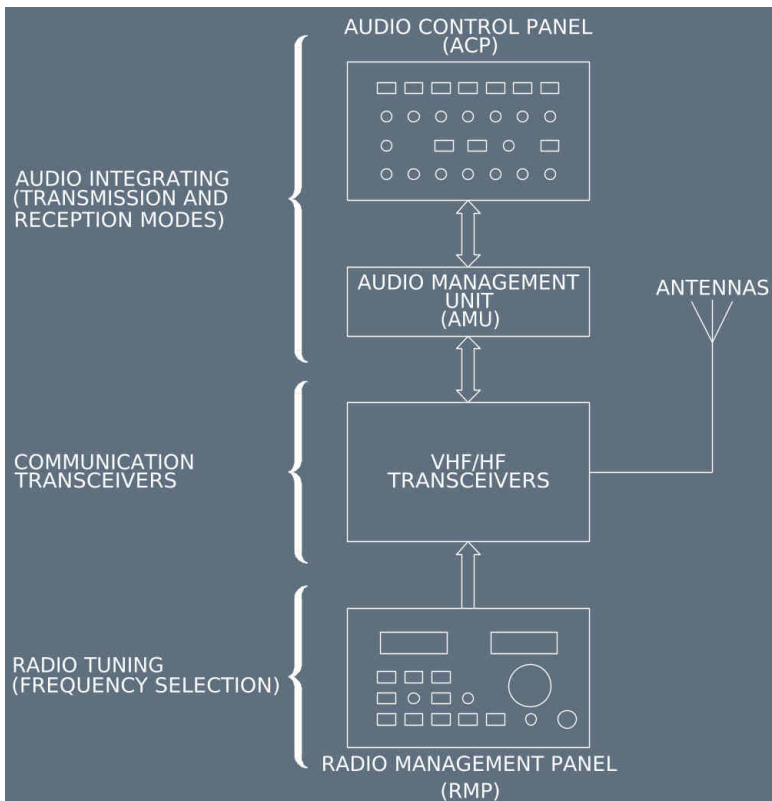
COMMUNICATION SYSTEM ARCHITECTURE

Ident.: DSC-23-10-10-00018503.0001001 / 18 MAY 21

Applicable to: ALL

The communications system comprises the following subsystems :

- VHF/HF transceivers
- Radio tuning systems (Radio Management Panels).
- Audio integrating system (Audio Management Unit, Audio Control Panels).



DESCRIPTION

Ident.: DSC-23-10-20-00018494.0001001 / 15 MAY 25

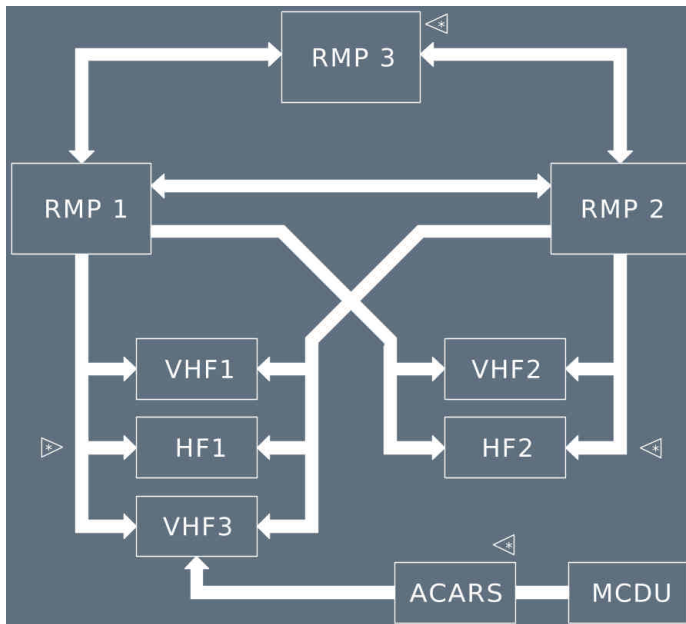
Applicable to: ALL

Identical Radio Management Panels (RMPs):

- Give the flight crew control of all VHF radio communication systems (HF systems .
- Provide backup to the FMGCs for controlling radio navigation systems (*Refer to DSC-34-NAV-30-10 General*).

 The two RMPs are on the center pedestal (and RMP3  is on the overhead panel).

Each RMP can control any VHF (HF ) transceiver. RMP1 and RMP2 are connected directly to all VHF (HF ) transceivers, (whereas RMP3  is connected to them via RMP1 and RMP2). RMPs are connected together so that each RMP is updated to the selections made on the other RMPs. Only RMP1 functions in EMER ELEC CONFIG.

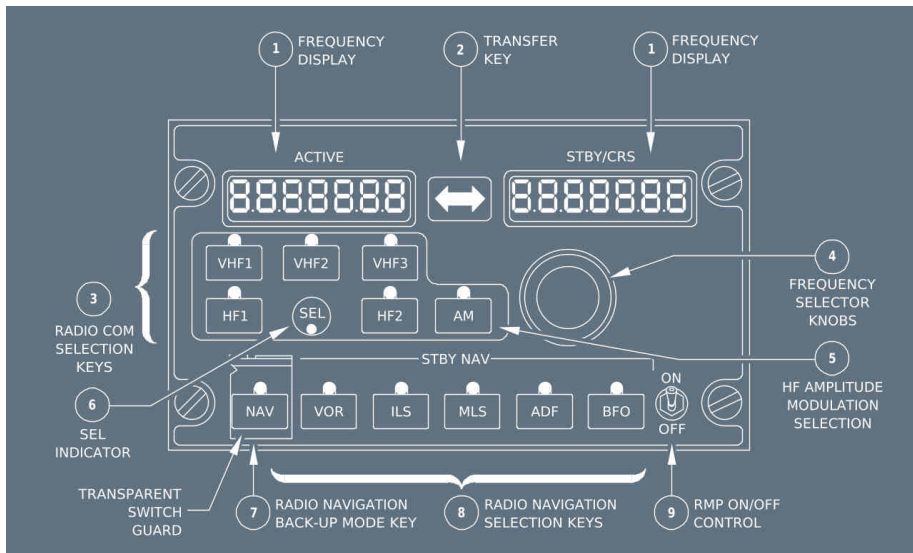


If one RMP fails, the remaining one controls all the VHF (HF ) transceivers except if RMP3 is not installed and ACARS is connected to VHF3. In such case, the VHF3 can only be tuned in data by the ACARS.

RADIO MANAGEMENT PANEL

Ident.: DSC-23-10-20-00018495.0001001 / 12 MAY 25

Applicable to: MSN 02155-04392, 07784-07792



(1) Frequency displays

The ACTIVE display window shows the active frequency of the selected radio, which is identified by a green light on the selection key.

The STBY/CRS (standby/course) display window shows a standby frequency that the pilot can activate by pressing the transfer key or change by rotating the tuning knobs. (For a description of the CRS function *Refer to DSC-34-NAV-30-30 Radio Management Panel (RMP)*).

(2) Transfer key

Pressing this key moves the active frequency to the standby window and the standby frequency to the active window.

This tunes the selected receiver to the new active frequency.

(3) Radio com selection keys

When the pilot presses one of these keys:

- The ACTIVE window displays the frequency set on that radio.
- The STBY/CRS window displays the selected standby frequency or course.
- The selected key displays a green monitor light.

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(4) Frequency selector knobs

The pilot uses these concentric knobs to select the STBY frequency or CRS.
The outer knob controls whole numbers; the inner knob controls decimal fractions.

(5) AM pushbutton

If the aircraft has HF radios and the flight crew has selected an HF transceiver, this switch selects the AM mode. (The default mode is the SSB, or single side-band mode).
This key displays a green monitor light when the AM mode is active.

(6) SEL indicator

The SEL indicator on both RMPs comes on amber when a transceiver, normally associated with one RMP, is tuned by another:

- If 2 RMP installed:
 - VHF1 (VHF3  , HF1 ), tuned by RMP2,
 - VHF2 (HF2 ), tuned by RMP1.
- If 3 RMP installed:
 - VHF1 tuned by RMP2 or RMP3,
 - VHF2 tuned by RMP1 or RMP3,
 - VHF3, HF1, (HF2 ) tuned by RMP1 or RMP2.

(7) NAV pushbutton (with transparent switchguard)

The pilot presses this key to select navigation receivers and courses through the RMP.
It does not affect the selection of communication radios and their frequencies. (*Refer to DSC-34-NAV-30-30 Radio Management Panel (RMP), for additional information*).

(8) Radio navigation selection keys

The pilot presses one of these keys to select a navigation radio to control through this RMP.
This turns on the key's green monitor light.
Refer to DSC-34-NAV-30-30 Radio Management Panel (RMP), for additional information.

(9) ON/OFF switch

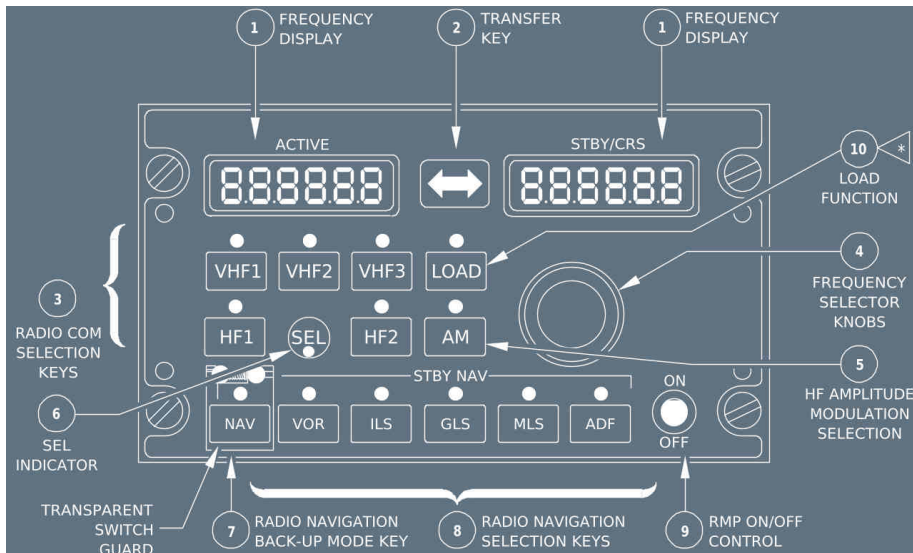
This switch controls the RMP power supply.

Note: RMP3 is able to control VHF and HF transceivers through RMP1 and RMP2 even when either of the latter is OFF.

RADIO MANAGEMENT PANEL

Ident.: DSC-23-10-20-00018495.0002001 / 12 NOV 24

Applicable to: MSN 05152-05746



(1) Frequency displays

The ACTIVE display window shows the active frequency of the selected radio, which is identified by a green light on the selection key.

The STBY/CRS (standby/course) display window shows a standby frequency that the pilot can activate by pressing the transfer key or change by rotating the tuning knobs. (For a description of the CRS function *Refer to DSC-34-NAV-30-30 Radio Management Panel (RMP)*).

(2) Transfer key

Pressing this key moves the active frequency to the standby window and the standby frequency to the active window.

This tunes the selected receiver to the new active frequency.

(3) Radio com selection keys

When the pilot presses one of these keys:

- The ACTIVE window displays the frequency set on that radio.
- The STBY/CRS window displays the selected standby frequency or course.
- The selected key displays a green monitor light.

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- (4) Frequency selector knobs
The pilot uses these concentric knobs to select the STBY frequency or CRS.
The outer knob controls whole numbers; the inner knob controls decimal fractions.
- (5) AM pb-sw
If the aircraft has HF radios and the flight crew has selected an HF transceiver, this switch selects the AM mode. (The default mode is the SSB, or single side-band, mode).
This key displays a green monitor light when the AM mode is active.
- (6) SEL indicator
The SEL indicator on both RMPs comes on amber when a transceiver normally associated with one RMP is tuned by another:
 - VHF 1 tuned by RMP 2 or RMP 3,
 - VHF 2 tuned by RMP 1 or RMP 3.
 - VHF 3, HF 1, (HF 2 ) tuned by RMP 1 or RMP 2.
- (7) NAV pb sw (with transparent switchguard)
The pilot presses this key to be able to select navigation receivers and courses through the RMP. It does not affect the selection of communication radios and their frequencies. (*Refer to DSC-34-NAV-30-30 Radio Management Panel (RMP), for additional information*).
- (8) Radio navigation selection keys
The pilot presses one of these keys to select a navigation radio to control through this RMP. This turns on the green monitor light in the key.
Refer to DSC-34-NAV-30-30 Radio Management Panel (RMP), for additional information.
- (9) ON/OFF sw
This switch controls the power supply to the RMP.
Note: *RMP 3 is able to control VHF and HF transceivers through RMP 1 and RMP 2 even when they are OFF.*
- (10) LOAD FUNCTION 
When the ATC sends (CONTACT or MONITOR) CPDLC messages to the flight crew, a white light above the LOAD key comes on to indicate that the sent frequency is available to be loaded.
Press on this LOAD key before closing the CONTACT/MONITOR messages to load this VHF frequency to the STBY/CRS window.

AIRCRAFT SYSTEMS**COMMUNICATIONS**

GENERAL - RADIO TUNING

Note: When a frequency from the ATC services (sent label via datalink) has been received, the ATSU validates the frequency and simultaneously sends the information to all the RMP in order to activate the LOAD function.
When the LOAD function is activated, the flight crew can repeatedly load the frequency on each RMP as often as necessary; except if DATA is present on standby window.

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AUDIO MANAGEMENT SYSTEM

Ident.: DSC-23-10-30-00018496.0002001 / 12 MAY 25

Applicable to: MSN 02155-02212

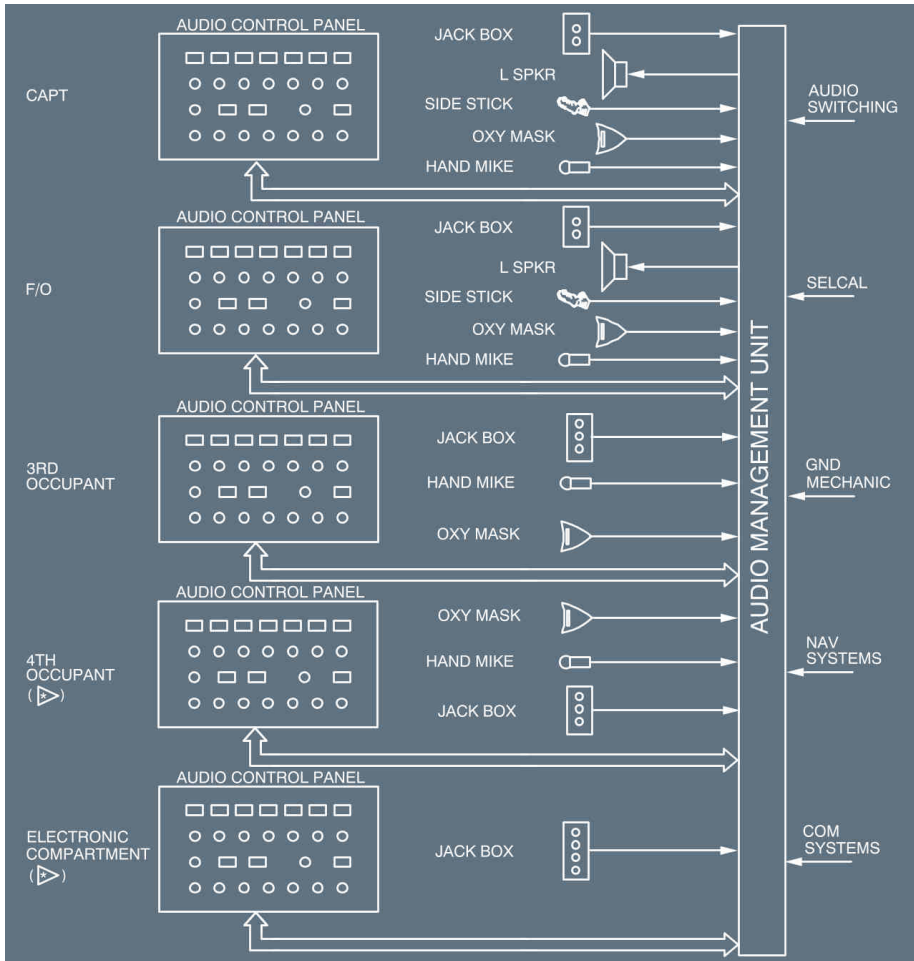
The audio management system allows the flight crew to use :

- All the radio communication and radio navigation facilities installed on the aircraft in transmission and reception mode.
- The interphone systems.
- The call systems.
- The passenger address system.

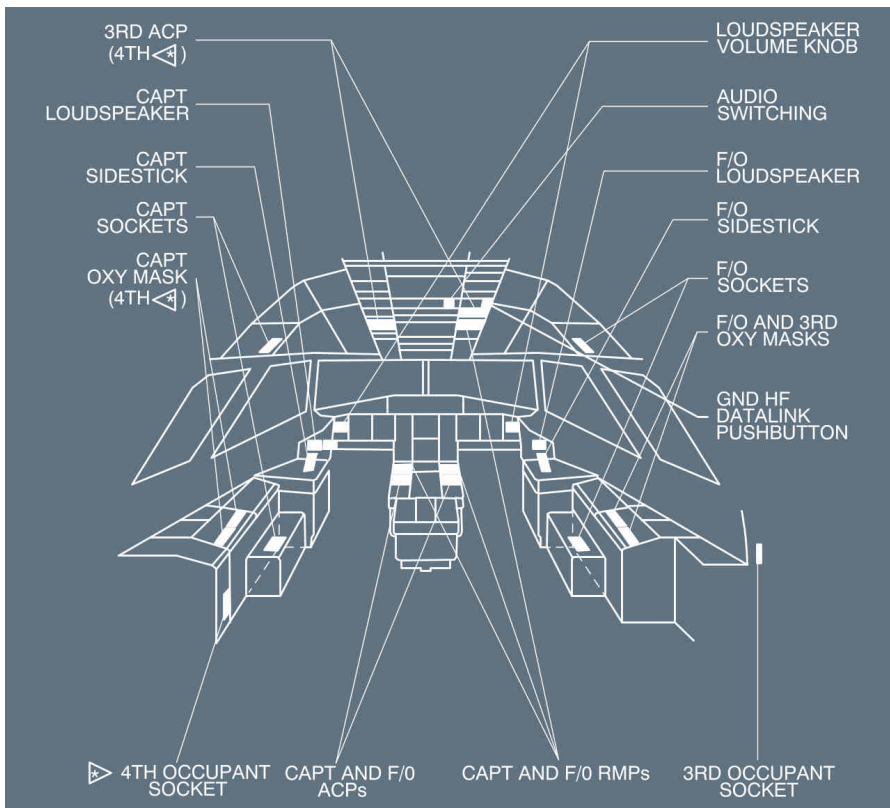
The audio management system includes :

- An audio management unit (AMU).
- Three audio control panels (ACPs) (fourth and fifth optional).
- Sockets at each station:
 - Headset jack and boomset connector (hand microphone connector) for pilot, copilot, and third occupant.
 - Headset jack for fourth occupant.
- One interphone jack at the ground power receptacle.
- Boomsets for the pilot, copilot, and third occupant, and three hand microphones (fourth ).
- Three cockpit oxygen mask microphones.
- One radio press-to-talk switch on each sidestick.
- One SELCAL code selection panel (avionics compartment).
- Two cockpit loudspeakers with separate volume controls.
- If installed, a jack panel in the electronic compartment that groups the headset jack, service interphone jack, hand mike connector, and boomset.
- An audio switching facility.

If audio channel 1 or 2 fails due to a failure either in an ACP or the corresponding AMU, the crew can use the AUDIO SWITCHING selector to select the third audio channel.



LOCATION OF COMPONENTS (PILOT'S STATION)



AUDIO MANAGEMENT SYSTEM

Ident.: DSC-23-10-30-00018496.0001001 / 12 MAY 25

Applicable to: MSN 02719-07792

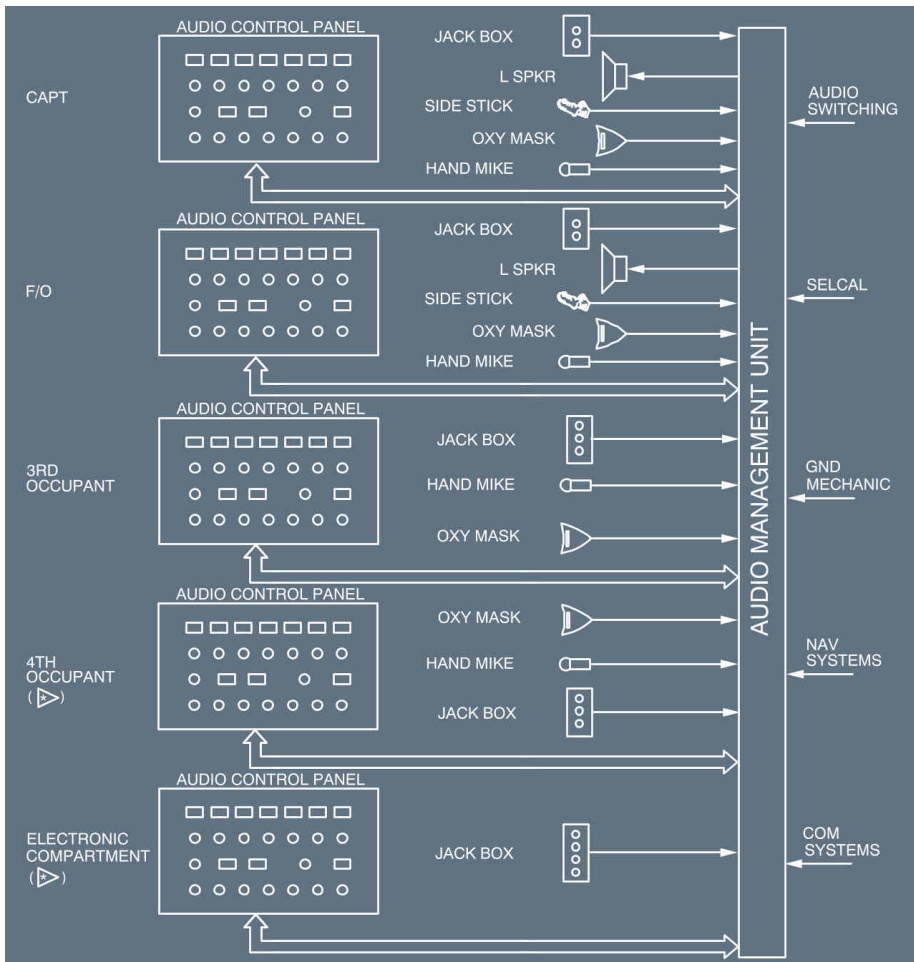
The audio management system allows the flight crew to use :

- All the radio communication and radio navigation facilities installed on the aircraft in transmission and reception mode.
- The interphone systems
- The call systems
- The passenger address system

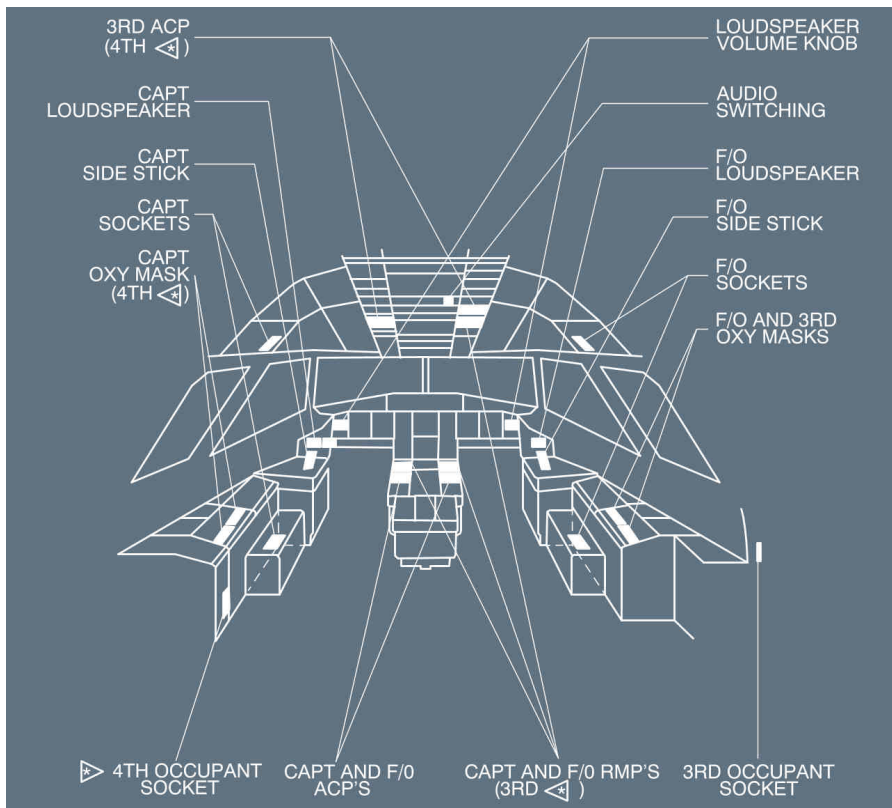
The audio management system includes :

- An audio management unit (AMU)
- Three audio control panels (ACPs) (fourth and fifth optional)
- Sockets at each station
 - Headset jack and boomset connector (hand microphone connector) for pilot, copilot, and third occupant
 - Headset jack for fourth occupant
- One interphone jack at the ground power receptacle
- Boomsets for the pilot, copilot, and third occupant, and three hand microphones (fourth )
- Three cockpit oxygen mask microphones
- One radio press-to-talk switch on each sidestick
- One SELCAL code selection panel (avionics compartment)
- Two cockpit loudspeakers with separate volume controls
- If installed, a jack panel in the electronic compartment that groups the headset jack, service interphone jack, hand mike connector, and boomset
- An audio switching facility

If audio channel 1 or 2 fails due to a failure either in an ACP or the corresponding AMU, the crew can use the AUDIO SWITCHING selector to select the third audio channel.



LOCATION OF COMPONENTS (PILOT'S STATION)



CABIN INTERCOMMUNICATION DATA SYSTEM

Ident.: DSC-23-10-30-00018497.0001001 / 03 OCT 17

Applicable to: MSN 02155-02212

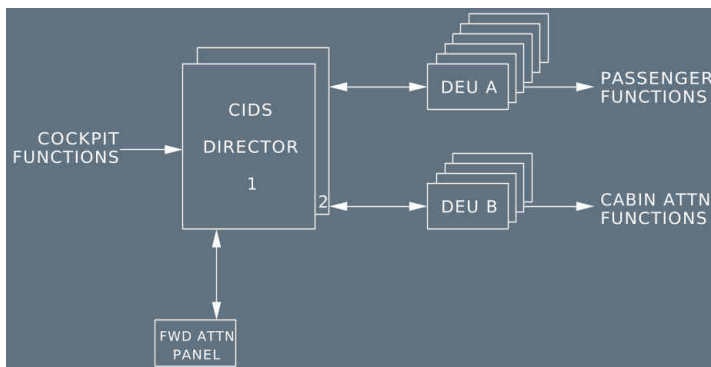
The Cabin Intercommunication Data System (CIDS) transmits, controls, and processes signals for the following cabin systems:

- Cabin and service interphone
- Passenger address
- Passenger lighted signs
- Reading light
- General cabin illumination

- Emergency evacuation signalling
- Lavatory smoke indication
- Passenger entertainment system 
- Escape slide bottle pressure monitoring  .

The CIDS has the following main components:

- Two CIDS directors connected in parallel, one active, and the other on standby
- Forward attendant panel for control of the cabin systems
- Programming and test module that allows the system to be reprogrammed after changes are made in the cabin configuration.



Decoder/Encoder Units (DEUs) linked to the two directors:

- Type A units (for passengers) installed along each side of the passenger cabin. The loudspeakers, lighted signs, call buttons, call lights and general illumination ballast units are divided into small groups, each connected to a type A DEU
- Type B units (for attendants) installed near the exit doors. The Area Call panels, attendant handsets, slide and door pressure sensors, and attendant indicator panels, are connected to type B DEUs.

CABIN INTERCOMMUNICATION DATA SYSTEM

Ident.: DSC-23-10-30-00018497.0002001 / 13 MAY 25

Applicable to: MSN 02719-07792

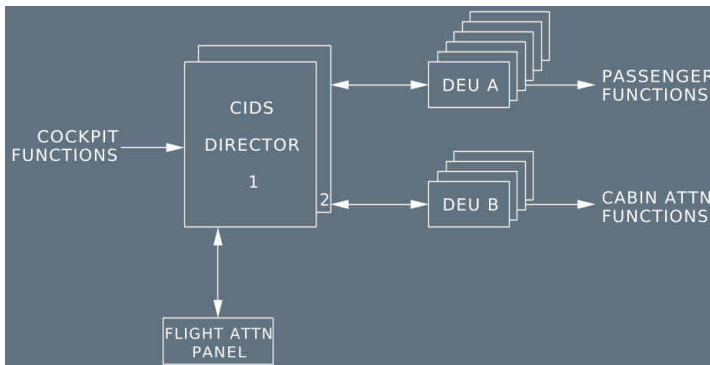
The Cabin Intercommunication Data System (CIDS) transmits, controls, and processes signals for the following cabin systems :

- Cabin and service interphone
- Passenger address
- Passenger lighted signs
- Reading lights (LED technology)

- General cabin illumination
- Emergency evacuation signalling
- Lavatory smoke detectors and indicators
- Passenger entertainment system
- Escape slide bottle pressure monitoring
- Vacuum system control function
- Cargo and lavatory smoke detection function.

The CIDS has the following main components :

- Two CIDS directors connected in parallel ; one active, and the other on standby
- Flight Attendant Panel (FAP) to monitor and control the cabin systems
- Attendant Indication Panels (AIP), Additional Attendant Panels (AAP) and Area Call Panels (ACP)
- Decoder/Encoder Units (DEUs) linked to the two directors:
 - Type A units (for passengers) installed along the cabin.
The loudspeakers, lighted signs, call buttons, call lights and general illumination ballast units are divided into small groups, each connected to a type A DEU
 - Type B units (for attendants) installed near the exit doors. The Area Call panels, smoke detectors, attendant handsets, slide and door pressure sensors, and attendant indicator panels, are connected to type B DEUs.



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DESCRIPTION

Ident.: DSC-23-10-40-00018569.0005001 / 10 MAY 21

Applicable to: MSN 07784-07792

The CVR records:

- Direct conversations between crew members in the cockpit
- All aural warnings sounded in the cockpit
- Audio communications received and transmitted
- Datalink communications received and transmitted
- Intercommunications conversations between crew members
- Announcements transmitted over the PA system, if PA reception is selected on at least one audio control panel.

Only the last 2 h of recording are retained.

The CVR system consists of:

- A remote microphone behind the overhead panel
- A "hot mike" function, which records the crew members voice directly from their microphone, even if the push to talk switch is not activated
- A crashproof four-track recorder, equipped with an underwater locating beacon, in the aft section of the aircraft
- A control panel on the overhead panel.

The CVR is recording automatically:

- On ground during the first 5 min after the aircraft electrical network is energized
- On ground with one engine running
- In flight
- On ground until 5 min after the last engine shutdown provided the CVR jack is not used.

On ground, when GND CTL pb-sw is pressed, the CVR is recording.

DESCRIPTION

Ident.: DSC-23-10-40-00018569.0002001 / 10 MAY 21

Applicable to: MSN 02155-05746

The CVR records:

- Direct conversations between crew members in the cockpit
- All aural warnings sounded in the cockpit
- Audio communications received and transmitted
- Intercommunications conversations between crew members
- Announcements transmitted over the PA system, if PA reception is selected on at least one audio control panel.

Only the last 2 h of recording are retained.

The CVR system consists of:

- A remote microphone behind the overhead panel
- A “hot mike” function, which records the crew members voice directly from their microphone, even if the push to talk switch is not activated
- A crashproof four-track recorder, equipped with an underwater locating beacon, in the aft section of the aircraft
- A control panel on the overhead panel.

The CVR is recording automatically:

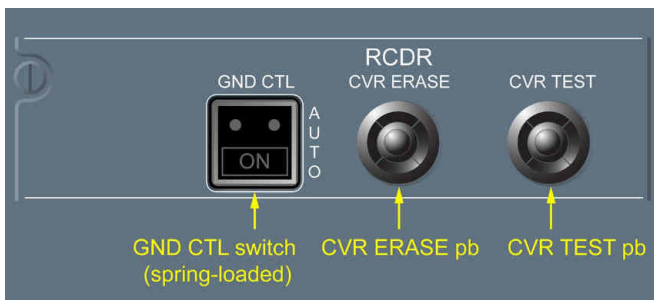
- On ground during the first 5 min after the aircraft electrical network is energized
- On ground with one engine running
- In flight
- On ground until 5 min after the last engine shutdown provided the CVR jack is not used.

On ground, when GND CTL pb-sw is pressed, the CVR is recording.

CONTROLS AND INDICATORS

Ident.: DSC-23-10-40-00018570.0001001 / 04 SEP 18

Applicable to: **ALL**



GND CTL pb-sw



The CVR, DFDR and QAR  automatically operate (AUTO), according to the logic (*Refer to DSC-23-10-40 Description*).



The flight crew manually starts the CVR, DFDR, and QAR  .
After engine start, the **ON** light goes off and the recorders automatically operate.

Note: *The GND CTL pb-sw may revert to AUTO (active or inactive, according to the logic) during an electrical transient.*

CVR ERASE pb



When pressed for 2 s, the CVR ERASE function  erases the CVR full recording, if:

- The aircraft is on the ground, and
- The parking brake is on.

CVR TEST pb



When pressed and held:

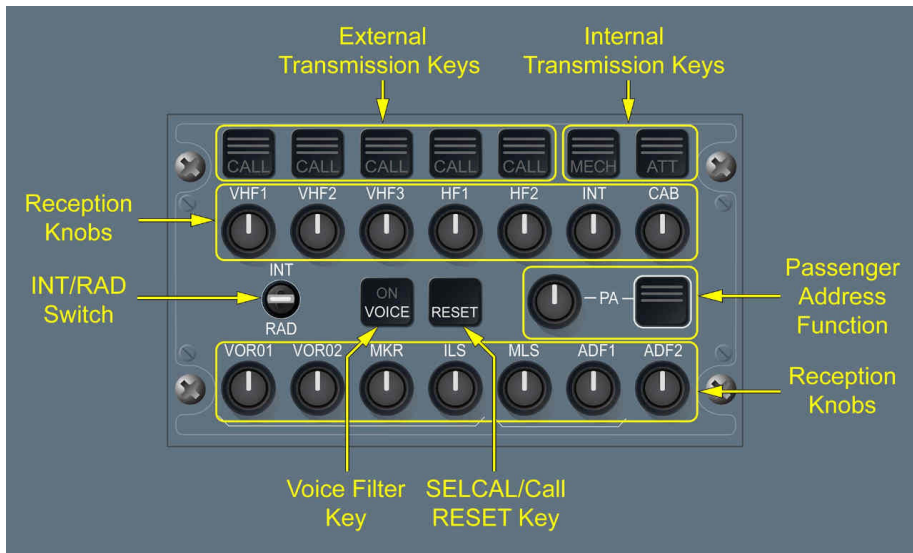
This activates the test, if the CVR is on (the GND CTL pb-sw pressed, or during the first 5 min after energization of the aircraft electrical network), and the parking brake is on.

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AUDIO CONTROL PANEL

Ident.: DSC-23-10-50-00018498.0001001 / 14 NOV 24

Applicable to: MSN 02155-03060, 05152-07792


EXTERNAL TRANSMISSION KEYS


The associated communication means (i.e. VHF 1(2)(3), HF $\triangleleft$ 1(2)) is in transmission mode. When pressed, the transmission key turns off the transmission mode of the associated channel.



The associated communication means (i.e. VHF 1(2)(3), HF $\triangleleft$ 1(2)) is not in transmission mode. When pressed, the transmission key turns on the transmission mode of the associated channel.



Flashes to indicate an incoming SELCAL.

When a SELCAL is received, a buzzer sounds in the cockpit until it is reset, via SELCAL/Call RESET Key.

INTERNAL TRANSMISSION KEYS (INT/CAB)


The INT interphone is in transmission mode. When pressed, the transmission key turns off the transmission mode of the associated interphone.



The INT interphone is not in transmission mode. When pressed, the transmission key turns on the transmission mode of the associated interphone.



Flashes to indicate an incoming call from the ground crew.
The MECH light goes off after 60 s, if it is not reset.



The CAB interphone is in transmission mode. When pressed, the transmission key turns off the transmission mode of the associated interphone.



The CAB interphone is not in transmission mode. When pressed, the transmission key turns on the transmission mode of the associated interphone.



Flashes to indicate an incoming call from the cabin crew.
The ATT light goes off after 60 s, if it is not reset.

PASSENGER ADDRESS (PA) FUNCTION

Refer to DSC-23-20-40 Description.

RECEPTION KNOBS



The associated communication means or interphone (i.e. VHF 1(2)(3), HF , 1(2), INT, or CAB) is not in reception mode.

When pressed and released in the out position, the reception knob turns on the reception mode.



The associated communication means or interphone (i.e. VHF 1(2)(3), HF , 1(2), INT, or CAB) is in reception mode.

***Note:** For the reception of DME audio navigation signals associated with an ILS station, the LS pb on the FCU must also be selected.*

The INTEG LT knob or the ANN LT knob controls the brightness of the reception knob.

SELCAL/CALL RESET KEY



When pressed, the buzzer sound is cancelled.

VOICE FILTER KEY

VOICE filter key allows the flight crew to inhibit the most commonly used audio navigation signals (VOR, ADF ).



Audio filter is not active. When pressed, the VOICE filter key turns on the ident signals filter.



Audio filter is active. When pressed, the VOICE filter key turns off the ident signals filter.

INT/RAD SWITCH

The flight crew uses the interphone/radio Push-To-Talk switch (INT/RAD sw) to activate the boomset, or oxygen mask microphones.



The INT/RAD sw is in the off position.



When set to RAD, the INT/RAD sw activates the boomset or the oxygen mask microphone. However, the appropriate key should be selected first, in order to transmit the message.

When released, the INT/RAD sw returns to the off position.



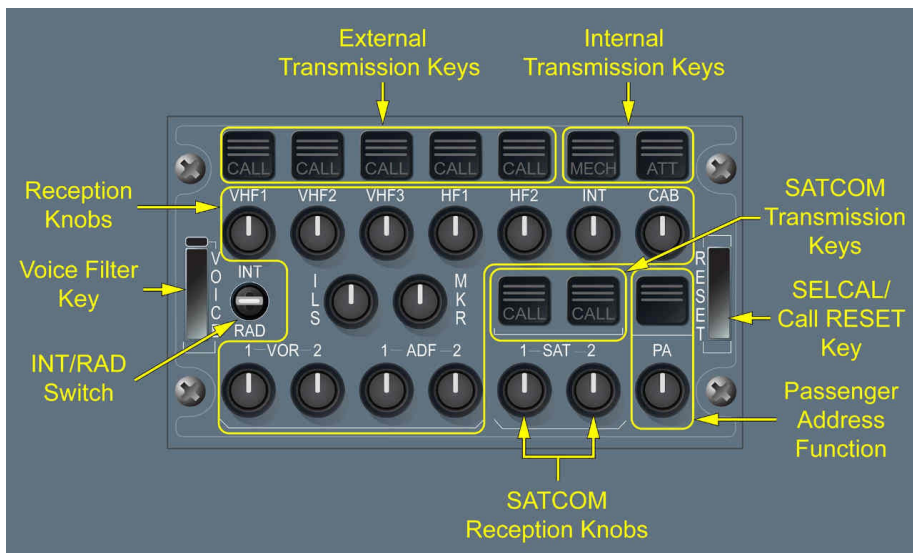
When set to INT, the INT/RAD sw activates the boomset or the oxygen mask microphone.

When released, the INT/RAD sw remains in the INT position, until the flight crew selects another switch position.

AUDIO CONTROL PANEL

Ident.: DSC-23-10-50-00018498.0002001 / 14 NOV 24

Applicable to: MSN 04392


EXTERNAL TRANSMISSION KEYS


The associated communication means (i.e. VHF 1(2)(3), HF  1(2)) is in transmission mode. When pressed, the transmission key turns off the transmission mode of the associated channel.



The associated communication means (i.e. VHF 1(2)(3), HF  1(2)) is not in transmission mode. When pressed, the transmission key turns on the transmission mode of the associated channel.



Flashes to indicate an incoming SELCAL.

When a SELCAL is received, a buzzer sounds in the cockpit until it is reset, via SELCAL/Call RESET Key.

INTERNAL TRANSMISSION KEYS (INT/CAB)


The INT interphone is in transmission mode. When pressed, the transmission key turns off the transmission mode of the associated interphone.



The INT interphone is not in transmission mode. When pressed, the transmission key turns on the transmission mode of the associated interphone.



Flashes to indicate an incoming call from the ground crew.
The MECH light goes off after 60 s, if it is not reset.



The CAB interphone is in transmission mode. When pressed, the transmission key turns off the transmission mode of the associated interphone.



The CAB interphone is not in transmission mode. When pressed, the transmission key turns on the transmission mode of the associated interphone.



Flashes to indicate an incoming call from the cabin crew.
The ATT light goes off after 60 s, if it is not reset.

SATCOM TRANSMISSION KEYS



Steady green light indicates when the associated SATCOM channel is in transmission mode. When pressed, the transmission key turns off the transmission mode of the associated SATCOM channel.

Flashing green light indicates the establishment of air to ground call of the associated SATCOM channel or the associated SATCOM call is on hold.



The associated SATCOM channel is not in transmission mode. When pressed, the transmission key turns on the transmission mode of the associated SATCOM channel.



Flashes to indicate an incoming call from ground via SATCOM channel.

SELCAL/CALL RESET KEY



When pressed, the buzzer sound is cancelled.

PASSENGER ADDRESS (PA) FUNCTION

Refer to DSC-23-20-40 Description.

SATCOM RECEPTION KNOBS



The associated SATCOM channel is not in reception mode. When pressed and released in the out position, the reception knob turns on the reception mode.



The associated SATCOM channel is in reception mode. When pressed and released in the in position, the reception knob turns off the reception mode. When turned, the reception knob adjusts the volume of the headset.

Note: The INTEG LT knob or ANN LT knob controls the brightness of the reception knob.

INT/RAD SWITCH

The flight crew uses the interphone/radio Push-To-Talk switch (INT/RAD sw) to activate the boomset, or oxygen mask microphones.



The INT/RAD sw is in the off position.



When set to RAD, the INT/RAD sw activates the boomset or the oxygen mask microphone. However, the appropriate key should be selected first, in order to transmit the message.

When released, the INT/RAD sw returns to the off position.



When set to INT, the INT/RAD sw activates the boomset or the oxygen mask microphone.

When released, the INT/RAD sw remains in the INT position, until the flight crew selects another switch position.

VOICE FILTER KEY

VOICE filter key allows the flight crew to inhibit the most commonly used audio navigation signals (VOR, ADF ).



Audio filter is not active. When pressed, the VOICE filter key turns on the ident signals filter.



Audio filter is active. When pressed, the VOICE filter key turns off the ident signals filter.

RECEPTION KNOBS



The associated communication means or interphone (i.e. VHF 1(2)(3), HF 1(2), INT, or CAB) is not in reception mode.

When pressed and released in the out position, the reception knob turns on the reception mode.



The associated communication means or interphone (i.e. VHF 1(2)(3), HF 1(2), INT, or CAB) is in reception mode.

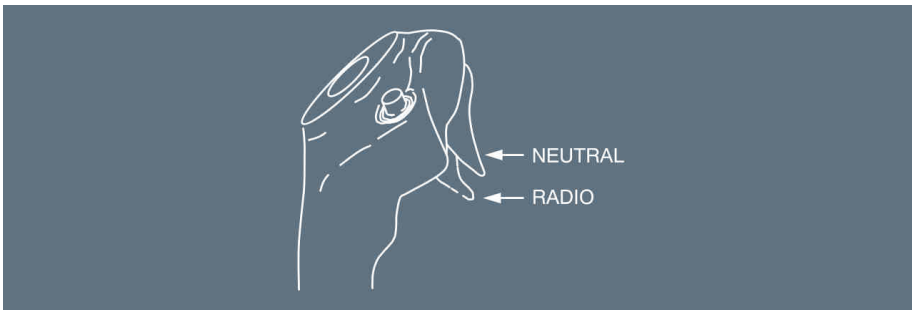
Note: For the reception of DME audio navigation signals associated with an ILS station, the LS pb on the FCU must also be selected.

The INTEG LT knob or ANN LT knob controls the brightness of the reception knob.

SIDE STICK RADIO SELECTOR

Ident.: DSC-23-10-50-00018499.0001001 / 17 MAR 17

Applicable to: ALL



This selector has the same function as the INT/RAD switch on the ACP.

NEUTRAL (spring-loaded) : Boom and mask mikes are dead.
Reception is normal.

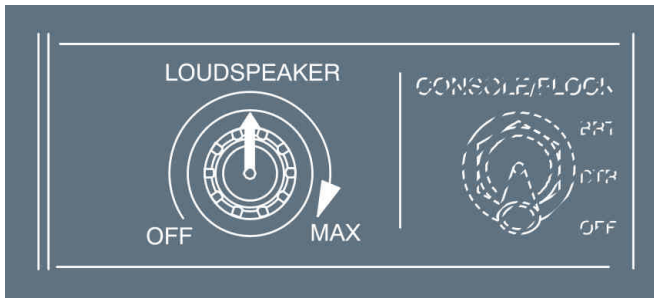
RADIO (squeezed) : Boom and mask mikes transmit through the equipment selected by the transmission key on the ACP.

Note: If RADIO is selected on the side stick when the INT/RAD switch is on INT, the radio function has priority over the interphone function.

LOUDSPEAKER VOLUME KNOB

Ident.: DSC-23-10-50-00018500.0001001 / 17 MAR 17

Applicable to: ALL



This knob adjusts the volume of the loudspeaker for radio communication.

OFF : Loudspeaker does not respond to signals from the aircraft's radio equipment.

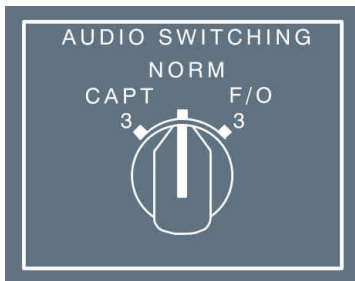
Clockwise rotation : Loudspeaker broadcasts signals from the aircraft's radio equipment at increasing volume.

Note: This knob does not control the loudness of aural alert and voice messages.
In the case of acoustic feedback (i.e. Larsen effect) from the cockpit loudspeaker, the flight crew should reduce the volume of the cockpit loudspeaker. However, the flight crew should ensure that the volume of the cockpit loudspeaker is sufficient to hear radio communication.

AUDIO SWITCHING

Ident.: DSC-23-10-50-00018501.0001001 / 17 MAR 17

Applicable to: ALL



The crew can switch to the third ACP if ACP1 or ACP2 fails.

When the crew does this, it takes away the third occupant's access to the acoustic equipment. AUDIO 3 XFRD appears in green on the ECAM MEMO display.

NORM : Each crew member uses his dedicated communication equipment.

CAPT 3: The pilot uses his acoustic equipment and the third occupant's ACP.

F/O 3 : The copilot uses his acoustic equipment and the third occupant's ACP.



A318/A319/A320/A321
FLIGHT CREW
OPERATING MANUAL

AIRCRAFT SYSTEMS

COMMUNICATIONS

GENERAL - CONTROLS

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS COMMUNICATIONS INTERNAL COMMUNICATION - FLIGHT CREW INTERPHONE SYSTEM
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FLIGHT INTERPHONE

Ident.: DSC-23-20-10-00019716.0001001 / 18 MAY 21

Applicable to: ALL

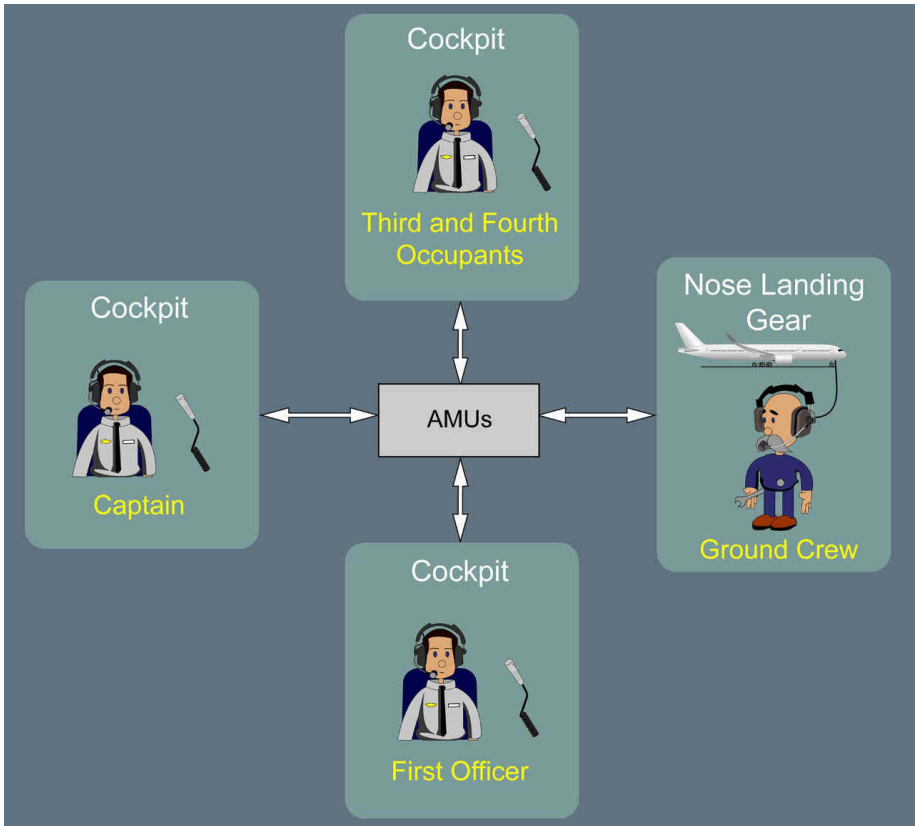
AMUs hosts the flight interphone.

Flight crewmembers use the flight interphone to communicate with each other and with the ground crew via:

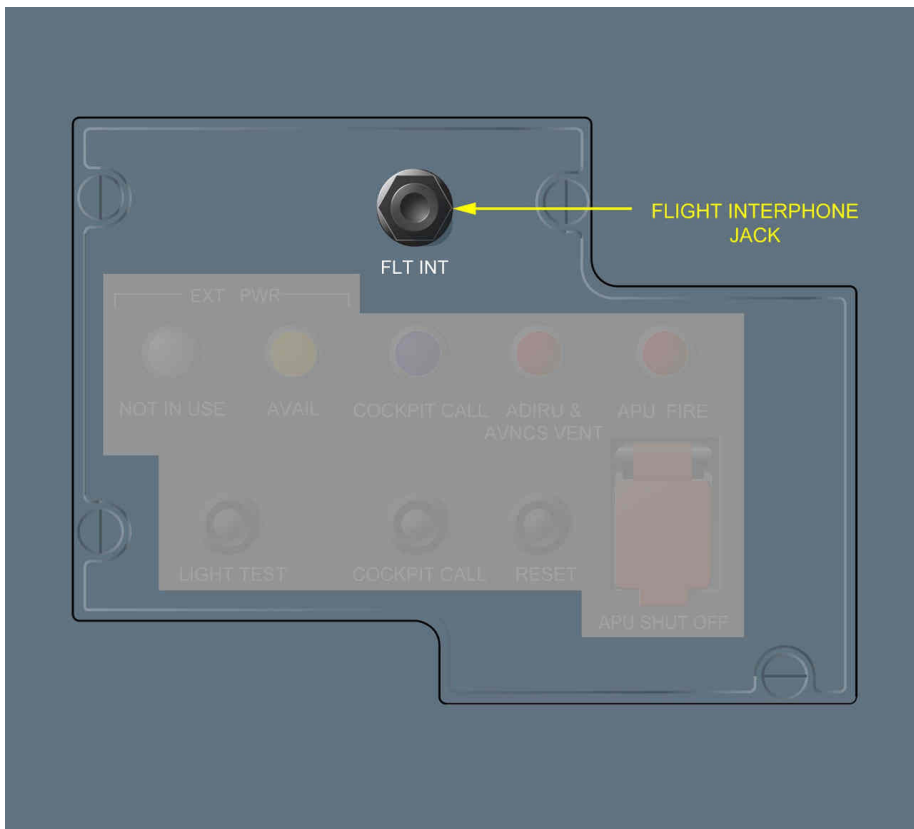
- Boomsets/headsets
- Hand microphones
- Microphones on the oxygen masks.

Ground crew can communicate with flight crew via the FLT INT jack on the maintenance nose landing gear panel (FWD of the nose L/G bay).

Flight Interphone



EXTERNAL POWER PANEL (FORWARD OF THE NOSE L/G BAY)



Before transmitting via the flight interphone, on the RMP the flight crewmember must:

- Press and release the INT reception knob to the out position
- Press the INT transmission key
- Press a PTT sw or set the INT/RAD sw to RAD to transmit.

AIRCRAFT SYSTEMS

COMMUNICATIONS

INTERNAL COMMUNICATION - FLIGHT CREW INTERPHONE SYSTEM

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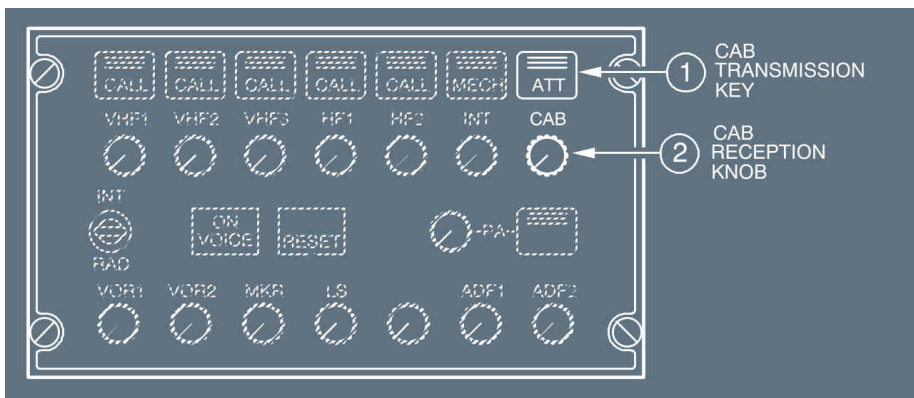
INTRODUCTION

Ident.: DSC-23-20-20-00018481.0001001 / 20 JUL 17

Applicable to: ALL

The system allows the flight crew to communicate with the flight attendants, and the flight attendants to communicate among themselves.

Note: Cabin interphone monitoring may be deactivated in flight depending on CIDS customization.



(1) CAB transmission key

Pressed: Three green lines come on.

Boom, mask, and hand mikes may be used for cabin interphone.

(2) CAB reception knob

Pressed and released : The integral white light comes on.

(knob out) The station receives audio signals from the cabin.
Rotating the knob adjusts the volume.

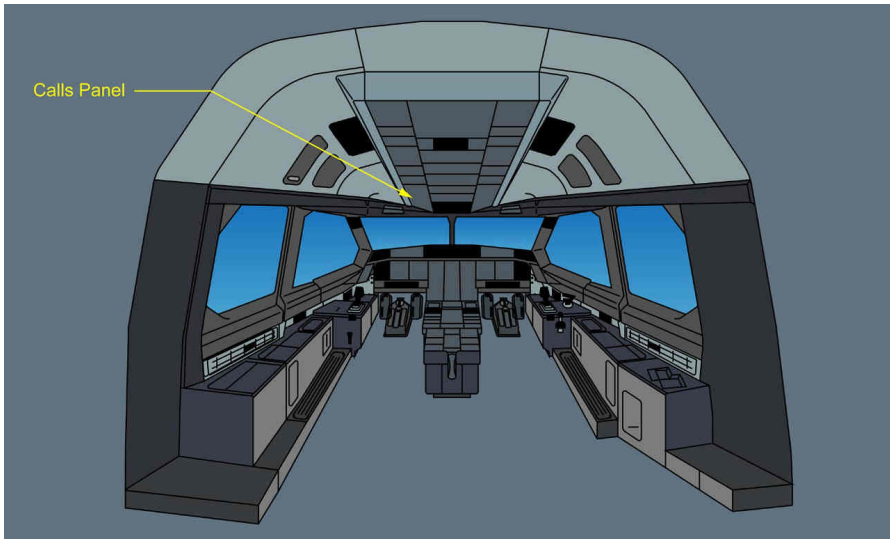
Pressed (knob in) : The white light goes out.
The cabin interphone is disconnected.

CABIN CALL SYSTEM

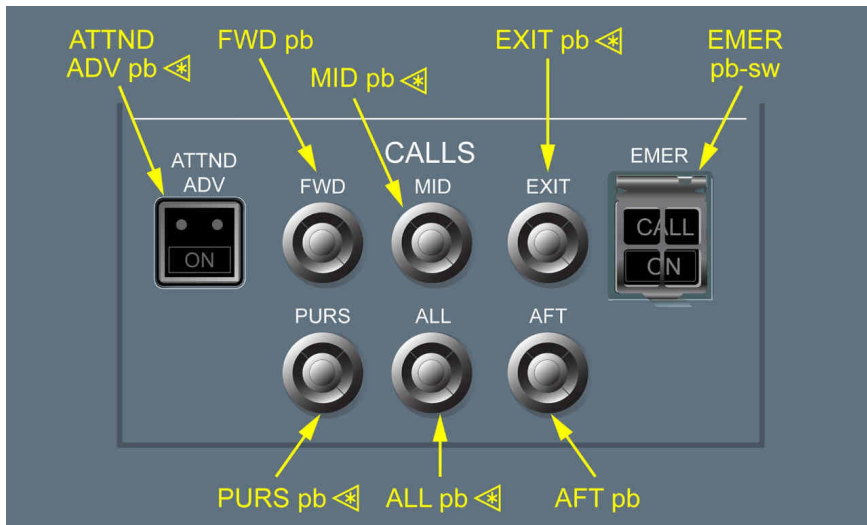
Ident.: DSC-23-20-20-10-00018482.0001001 / 13 MAY 25

Applicable to: ALL
CALLS FROM THE COCKPIT

The pushbuttons described here below are installed on the CALLS panel in the overhead panel.



CALLS PANEL



PURS  /FWD/MID  /EXIT  /AFT pb



When pressed:

- Two steady pink lights come on, on the corresponding area call panel
- “CAPTAIN CALL” message appears on the corresponding AIP, and a green light comes on
- A high-low chime sounds through corresponding loudspeaker.

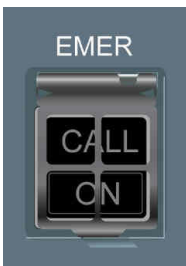
Note: To establish a communication with all cabin stations, press FWD pb and AFT pb simultaneously or one after another.

ALL pb



When pressed, all stations respond as indicated above.

EMER pb-sw (GUARDED)



When pressed:

- Two pink lights flash on all area call panels
- “EMERGENCY CALL” message appears on all AIPs
- A high-low chime is repeated three times through all loudspeakers
- Depending on the aircraft configuration, the **ON** light and the **CALL** light comes on.

For an emergency call from the cabin to the cockpit:

- The **CALL** light flashes
- The **ATT** light flashes on all ACPs
- The buzzer is repeated three times in the cockpit (for approximately three seconds each).

The cabin call system resets when a cabin crewmember hangs up the associated handset.

ATTND adv pb



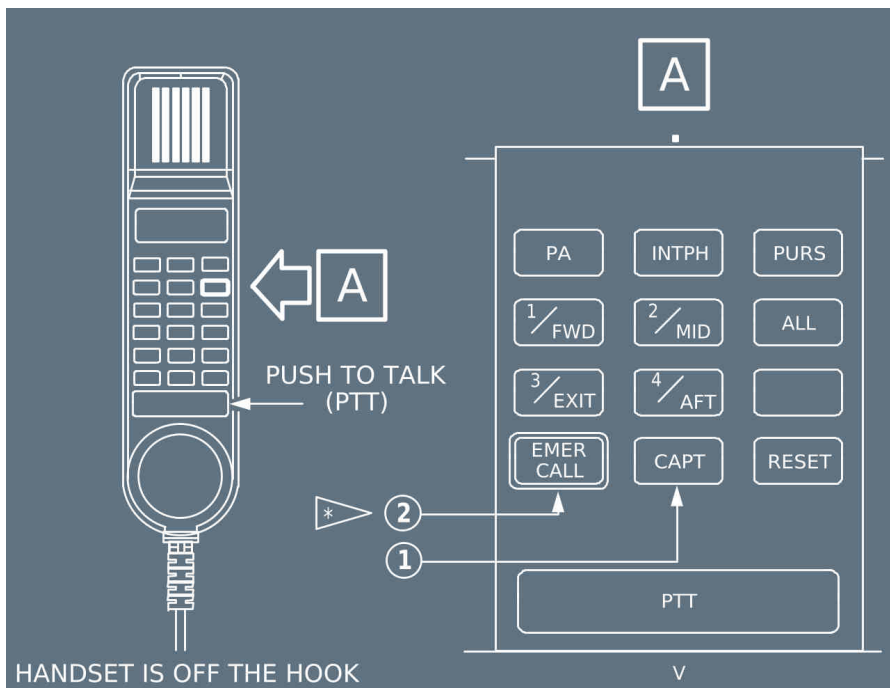
When pressed, the **ON** light comes on. A green light on the attendant area call panel comes on. This pushbutton is used to inform cabin crew in the case of imminent takeoff or landing.

CALLS FROM THE CABIN

Ident.: DSC-23-20-20-10-00018483.0003001 / 21 MAY 24

Applicable to: MSN 04392-07792

CALLS FROM THE CABIN



(1) CAPT key

When pressed, the following aural and visual alerts will trigger in the cockpit:

- The ATT lights will flash on all Audio Control Panels (ACPs).
- A buzzer (inhibited during takeoff and landing) will sound.

In the cabin, the “CAPTAIN” message will appear on the Attendant Indication Panel (AIP) for which the CAPT key was pressed.

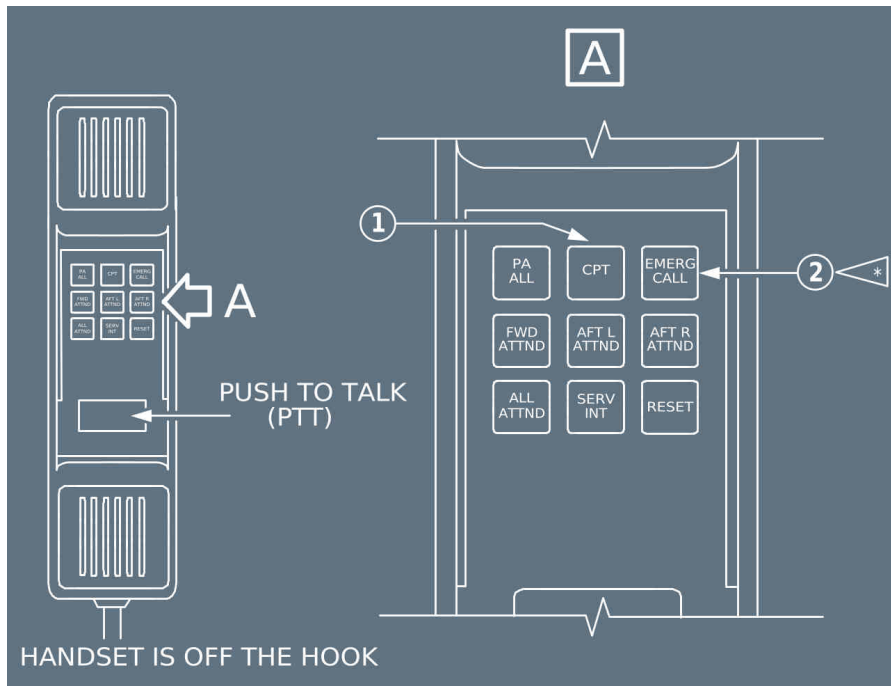
(2) EMER CALL key

When pressed, the following aural and visual alerts will trigger in the cockpit:

- On the EMER pb-sw: The ON light flashes in white, and the CALL light flashes in amber.
- The ATT lights will flash on all ACPs.
- Three buzzers (inhibited during takeoff and landing) will sound consecutively.

In the cabin, the “EMERGENCY CALL” message will appear on all AIPs or on the AIP of the originating station based on its customization.

CALLS FROM THE CABIN



(1) CPT key

When pressed, the following aural and visual alerts will trigger in the cockpit:

- The ATT lights will flash on all Audio Control Panels (ACPs).
- A buzzer (inhibited during takeoff and landing) will sound.

In the cabin, the “CAPTAIN” message will appear on the Attendant Indication Panel (AIP) for which the CPT key was pressed.

(2) EMER CALL key

When pressed, the following aural and visual alerts will trigger in the cockpit:

- On the EMER pb-sw: The ON light flashes in white, and the CALL light flashes in amber.
- The ATT lights will flash on all ACPs.
- Three buzzers (inhibited during takeoff and landing) will sound consecutively.

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In the cabin, the “EMERGENCY CALL” message will appear on all AIPs or on the AIP of the originating station based on its customization.

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INTRODUCTION

Ident.: DSC-23-20-30-00018485.0001001 / 13 MAY 25

Applicable to: ALL**L2** CIDS hosts the service interphone.**L1** The service interphone system enables the communication between:

- Flight crew and service interphone jacks
- Flight attendant stations and service interphone jacks
- The different service interphone jacks.

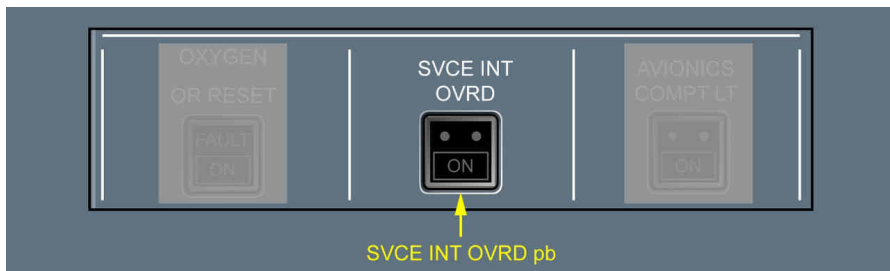
The service interphone system includes:

- 7 interphone jacks
- An OVRD sw located on the overhead panel.

LOCATION OF INTERPHONE JACKS



CONTROLS AND INDICATORS AT OVERHEAD PANEL



SVCE INT OVRD PB



The ground personnel can communicate with the flight crew by using of the service interphone jacks 10 s after the aircraft has landed. The landing gear must be locked down.



If the landing gear is not locked down, communication is still possible by pressing the SVCE INT OVRD pb.

Before transmitting via any other appropriate equipment, the flight crew should do the following on the ACP:

- Press and release the CAB reception knob in the out position
- Press the CAB transmission key
- Press a PTT sw or set the INT/RAD sw to RAD to transmit.

GROUND MECHANIC CALL SYSTEM

Applicable to: ALL

Ident.: DSC-23-20-30-10-00018486.0001001 / 03 MAY 23

CONTROLS AND INDICATORS ON OVERHEAD PANEL



MECH pb

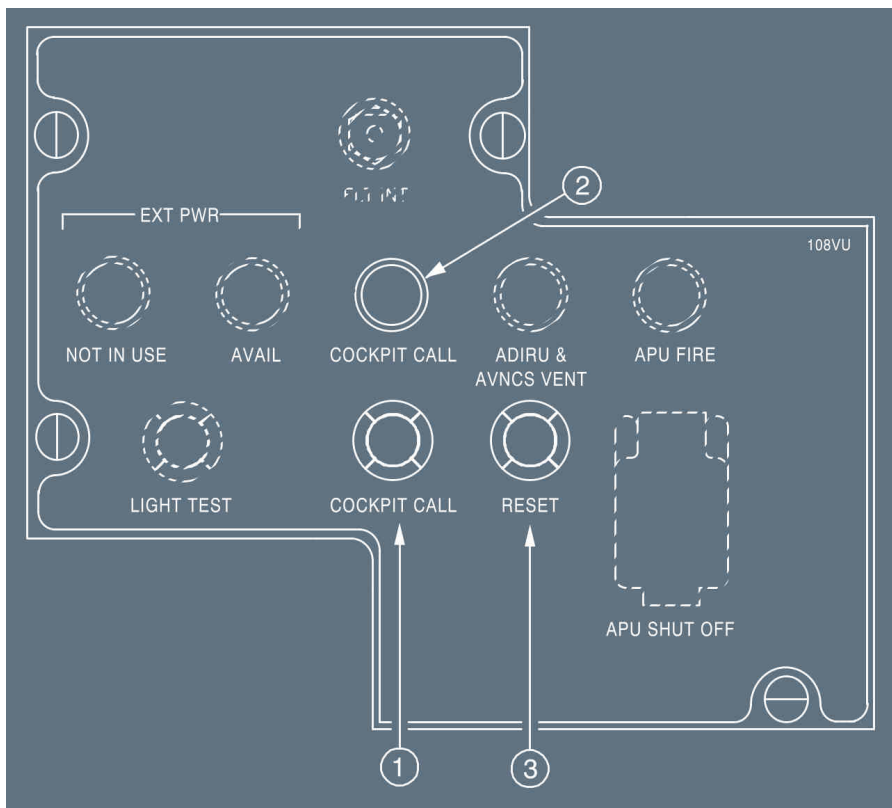


When the flight crew presses (and holds), the COCKPIT CALL light comes on blue on the external power panel in the nose L/G bay and an external horn sounds.

When the flight crew releases, the COCKPIT CALL light remains. The ground mechanic can extinguish it by pressing the RESET pb on the external power panel. The external horn stops sounding.

Ident.: DSC-23-20-30-10-00018487.0001001 / 17 MAR 17

CONTROLS AND INDICATORS ON THE EXTERNAL POWER PANEL



(1) COCKPIT CALL pushbutton

Pressed : This calls the cockpit.

The MECH lights flash amber on the ACPs and a buzzer sounds.

Released : The MECH lights go out after 60 s if they are not reset on the ACPs.

The buzzer stops.

(2) COCKPIT CALL light

The blue light appears when cockpit calls the ground mechanic. An external horn also sounds.

(3) RESET pushbutton

Pressed The COCKPIT CALL light goes out.

AIRCRAFT SYSTEMS

COMMUNICATIONS

INTERNAL COMMUNICATION - SERVICE INTERPHONE SYSTEM

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DESCRIPTION

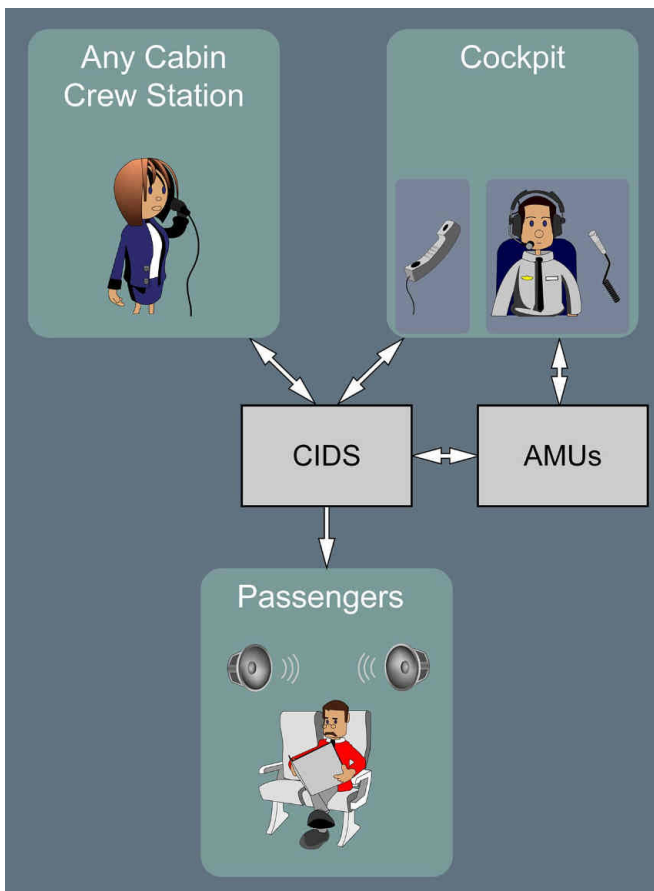
Ident.: DSC-23-20-40-00018685.0001001 / 05 MAY 22

Applicable to: ALL

 CIDS hosts the PA.

 Flight crew and cabin crew can use the PA to make announcements to passengers via:

- Boomsets/headsets
- Hand microphones
- Microphones on the oxygen masks
- Cockpit handset.



Before making an announcement via any other appropriate equipment, on the ACP the flight crewmember should:

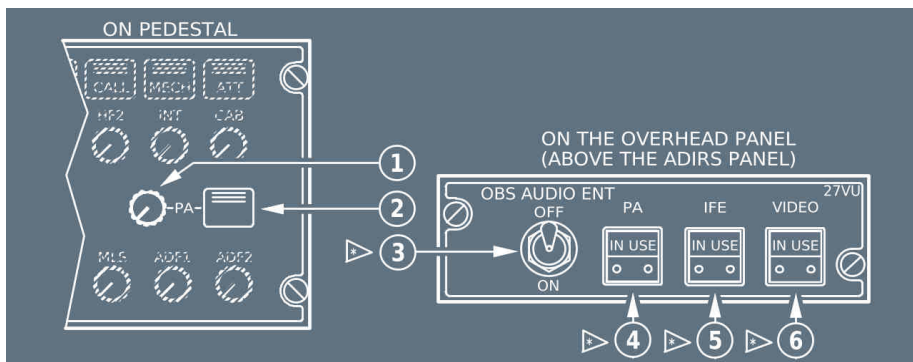
- Press and release the PA reception knob to the out position
- Press and hold the PA transmission key on the ACP to make the announcement.

Note: It is not necessary to use a PTT sw.

CONTROLS AND INDICATORS

Ident.: DSC-23-20-40-00018686.0001001 / 20 JUL 17

Applicable to: ALL



(1) PA reception knob

Pressed and released : The message goes to the loudspeakers, and the integral white light comes on.

The flight crew can turn the knob to adjust the volume.

Pressed (knob in) : The PA reception to the loudspeakers is disconnected.

The white light goes out.

(2) PA transmission key

Pressed and held : The flight crew may use a boom, mask, or hand mike to make an announcement.

Three green lines come on.

Note: The flight crew may use a cockpit handset to make PA announcements without action on the ACPs.

(3) OBS AUDIO ENT sw

ON : Announcement from the cockpit can be heard through channel 9 of Passenger Entertainment System (PES).

OFF : Normal functioning of PES is restored.

(4) PA IN USE light

The light comes on when the PA is activated from the cockpit or from the cabin (cabin attendant or prerecorded announcement).

(5) IFE IN USE light

The light comes on when the IFE system is in use.

(6) VIDEO IN USE light

The light comes on when the video system is in use.

The flight crew can also use the cockpit handset, located at the bottom of the pedestal, for PA announcements.



Note: Due to numerous customizations of the handset and keypad, their functions are not described in detail.

AIRCRAFT SYSTEMS

COMMUNICATIONS

INTERNAL COMMUNICATION - PASSENGER ADDRESS

Intentionally left blank

LANDSCAPE CAMERA

Ident.: DSC-23-20-50-00028456.0001001 / 13 MAY 25

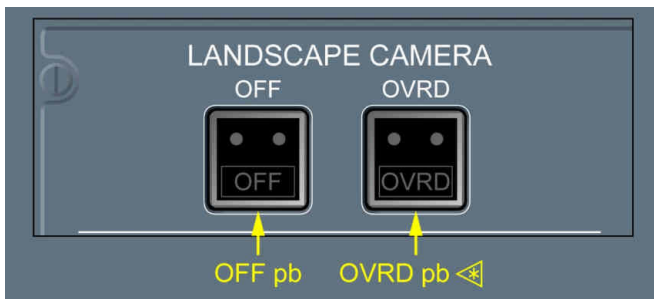
Applicable to: MSN 07784-07792

The landscape camera system consists of two cameras installed forward of the nose landing gear. These cameras provide images that are displayed on the passenger entertainment system. There is one forward-looking camera, and one down-looking camera. By default, the forward-looking camera is used on ground, and the down-looking camera is used in flight. However, the cabin crew is able to manually select the camera.

CONTROLS AND INDICATORS ON OVERHEAD PANEL

Ident.: DSC-23-20-50-00028456.0001001 / 13 MAY 25

Applicable to: MSN 07784-07792


OFF pb


The landscape camera is not active.



The landscape camera is active.

- Note:**
- On ground, the landscape pictures are provided by the forward-looking camera.
 - In flight, the landscape pictures are provided by the down-looking camera, when the landing gear is up and locked.

OVRD PB



The OVRD function is not active.



The OVRD function is active. The passenger video program is paused and replaced by the active landscape camera signal.

Note: The OVRD function can be activated only if the landscape camera is on.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS COMMUNICATIONS EXTERNAL COMMUNICATION - RADIO COMMUNICATION
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DESCRIPTION

Ident.: DSC-23-30-10-00018475.0001001 / 12 MAY 25

Applicable to: ALL

Either of the two Radio Management Panels (RMPs) (RMP 3 ) can be used to tune each transceiver.

To transmit, the flight crew uses the Audio Control Panel (ACP) to select a VHF or HF system. The ACP works through the Audio Management Unit (AMU). Each system is connected to the RMPs, for frequency selection, and to the AMU for connection to the audio integrating and SELCAL (selective calling) systems.

VHF

Ident.: DSC-23-30-10-00018472.0001001 / 06 NOV 25

Applicable to: ALL

- 1

The communication system has two VHF (VHF3 ) channels, and each channel has its own antenna.

For antenna locations, *Refer to DSC-20-20 Antenna Locations.*

Each VHF transceiver operates within a frequency band that ranges from 118.000 MHz to 136.975 MHz.

Only VHF 1 operates in EMER ELEC CONFIG.

 Some interference may occur if the frequencies tuned on the VHF radios are too close. The minimum recommended separation is:

 - 2 MHz between VHF1 and VHF2 or between VHF2 and VHF3 
 - 6 MHz between VHF1 and VHF3 .

HF

Ident.: DSC-23-30-10-00018473.0001001 / 16 MAY 24

Applicable to: MSN 02926-07792

Two identical HF communication systems are optional. Each has a transceiver in the avionics compartment, and a coupler (located in AFT fuselage) and antenna in the vertical stabilizer. Its range is from 2.8 to 24 MHz.

If the HF is used on ground, it is important to check that nobody stays in the direct vicinity of the antenna. HF must not be used during refueling or transfer operation.

The HF VOICE MODE is not inhibited on ground but the use of HF on ground must be limited to operational needs.

HF

Ident.: DSC-23-30-10-00018473.0003001 / 16 MAY 24

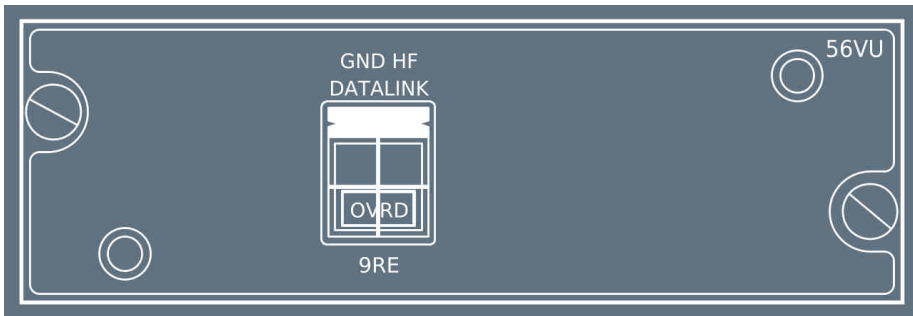
Applicable to: **MSN 02155-02789**

Two identical HF communication systems are optional. Each has a transceiver in the avionics compartment, and a coupler (located in AFT fuselage) and antenna in the vertical stabilizer. Its range is from 2.8 to 24 MHz.

If the HF is used on ground, it is important to check that nobody stays in the direct vicinity of the antenna. HF must not be used during refueling or transfer operation.

The HF DATA transmission is inhibited on ground. A GND HF DATALINK pb, located on the overhead panel, enables to override the inhibition. .

The HF VOICE MODE is not inhibited on ground but the use of HF on ground must be limited to operational needs.



SELCAL (SELECTIVE CALLING)

Ident.: DSC-23-30-10-00018476.0001001 / 17 MAR 17

Applicable to: **ALL**

Upon receiving a call code corresponding to that of the aircraft, the SELCAL system aurally and visually advises the flight crew that a ground station is calling the aircraft.

The aural warning is inhibited during takeoff and landing.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS COMMUNICATIONS EXTERNAL COMMUNICATION - SATCOM
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General

GENERAL

Ident.: DSC-23-30-20-10-00019717.0001001 / 17 MAR 17

Applicable to: MSN 04392

The Satellite Communication (SATCOM) system allows the exchange of information between the aircraft and a ground network.

It provides both voice and data channels:

- One or several channels are used for voice transmissions (cockpit or cabin voice). The cockpit voice function must be activated, in order to be available. The cabin telephone system must be installed, to be able to use cabin voice function.
- One channel is used for data transmissions (ATSU or ACARS).

The ATSU or ACARS normally transmit via VHF3. They automatically switch to SATCOM when VHF3 is not available.

The cockpit voice interface is controlled by the Audio Control Panels (ACPs) for call set-up and call termination, and by the MCDU for the call number selection. It allows the crew:

- To initiate air to ground calls and to receive ground to air calls
- To select the call priority, in case of air to ground calls
- To use manual dial or pre-recorded phone numbers.

If a SATCOM telephone handset is installed in the cockpit, the crew can set up a call without the use of the MCDU.

SATCOM functions are programmed through the Owner Requirement Table (ORT), according to airline needs.

Due to the highly customized programming, the SATCOM functions may vary for different airlines and are, therefore, not described in detail.

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Controls and Indicators

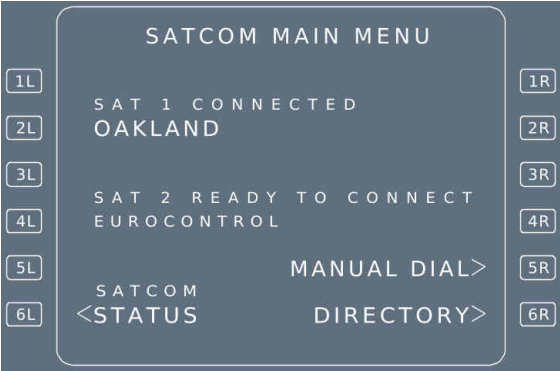
MCDU INTERFACE

Applicable to: MSN 04392

Ident.: DSC-23-30-20-20-A-00019719.0003001 / 17 MAR 17

SATCOM MAIN MENU PAGE

The crew accesses this page by selecting SAT on the MCDU MAIN page.



- 2L : This field displays the SATCOM  Channel 1 (2) status:
- (4L) - READY TO : The channel is ready to support a call
- (Label CONNECT
- line) - NOT AVAILABLE : The channel is not available (failed or not logged)
- DIALING : Cockpit call in progress
- INCOMING CALL : Advises of an incoming ground to air call
- CONNECTED : The circuit is connected
- CALL FAILED : The transmission is interrupted.
- 2L : This field displays:
- (4L) - The title of the selected phone number, in case of an air to ground call
- (Data - The number, if the MANUAL DIAL option is used
- line) - GRND-AIR CALL, in case of a ground to air call.
- 5R : This key provides access to the Manual Dial page. This page allows the dialing of a phone number.
- 6L : This key provides access to the SATCOM STATUS page, which contains LOG ON and channel status information.

6R : This key provides access to the SATCOM DIRECTORY PAGE.

Ident.: DSC-23-30-20-A-00019720.0001001 / 17 MAR 17

SATCOM DIRECTORY PAGE

This page provides access to 4 phone number lists, where phone numbers can be memorized, according to their priority.



- 1L : EMERGENCY for Priority 1 - Reserved for emergency and distress phone numbers only.
- 2L : SAFETY for Priority 2 - Reserved for regulatory and flight safety phone numbers only.
- 3L : NON-SAFETY for Priority 3 - Reserved for non flight safety phone numbers.
- 4L : PUBLIC for Priority 4 - Reserved for personal phone numbers.
- 6L : This key is used to return to the SATCOM MAIN MENU page.

Ident.: DSC-23-30-20-A-00019721.0001001 / 17 MAR 17

SATCOM CATEGORY NUMBERS PAGE

The CATEGORY NUMBERS page provides access to the pre-recorded phone numbers. As an example, the following figure shows the SAFETY CATEGORY NUMBER page.



1L, 2L, 3L, 4L, 5L: These fields display the phone numbers and their titles. When pressed, they dial the corresponding phone number.

There are two types of numbers:

- Protected : Displayed in green
- Unprotected : Displayed in blue brackets.

- 1R : This field displays the selected SATCOM channel.
- 4R : This function alphabetically sorts the phone numbers, within the category, by title.
- 5R : This function automatically searches for a phone number from the beginning of this category, by entering up to the first three letters of the title into the scratchpad, and by pressing 5R.
- 6L : This key is used to return to the SATCOM DIRECTORY page.

Ident.: DSC-23-30-20-20-A-00019722.0001001 / 17 MAR 17

SATCOM MANUAL DIAL PAGE

The MANUAL DIAL PAGE enables the crew to initiate an air to ground call by manually entering a phone number.

SATCOM MANUAL DIAL

1L

2L

3L

4L

5L

6L

PHONE NUMBER
 [0 0 3 3 5 4 6 4 5 4 3 7 3 4 3 2]

SAT1/2
 2
PRIORITY ↑↓
NON-SAFETY

<RETURN

PRE-SELECT*

1R

2R

3R

4R

5R

6R

- 2L (data line) : This field displays the phone number in blue brackets, after having been entered in the scratchpad.
- 4L : If two channels are available, this field displays the selected SATCOM channel. If only one channel is available, this field is blank.
- 5L : This field displays the priority for the manual dial number. The priority can be changed by pressing the slew up or down keys on the MCDU keyboard.
- 6L : This key is used to return to the SATCOM MAIN MENU page.

Ident.: DSC-23-30-20-20-A-00021870.0001001 / 03 AUG 17

SATCOM STATUS PAGE

The crew accesses this page by selecting SATCOM STATUS on the SATCOM MAIN MENU page.

SATCOM STATUS

1L

2L

3L

4L

5L

6L

LOG - ON STATE
LOGGED-ON

SAT1 LEVEL
HIGH

DATA LEVEL
HIGH

<RETURN

1R

2R

3R

4R

5R

6R

BITE OK>

CONFIG>

PIA A318/A319/A320/A321 FLEET
 FCOM

← A →

DSC-23-30-20-20 P 4/6
 24 FEB 20

- 1L Provides the current LOG-ON status:
- LOGGED-ON
 - LOGGED-OFF
 - SATCOM INOP.
- 3L (4L) (5L)
(Data Line) Provides the signal level (HIGH or LOW) for:
- The voice channel 1 (SAT 1)
 - The voice channel 2 (SAT 2) 
 - The data link channel (DATA).
- 4R Displays the status of the SATCOM BITE:
- BITE OK : The BITE status of all SATCOM items is OK
 - BITE FAIL : At least the BITE status of one SATCOM items is failed.
Gives access to the SATCOM BITE STATUS page.
- 5R Displays the SATCOM CONFIG page.
- 6L Displays the SATCOM MAIN MENU page.

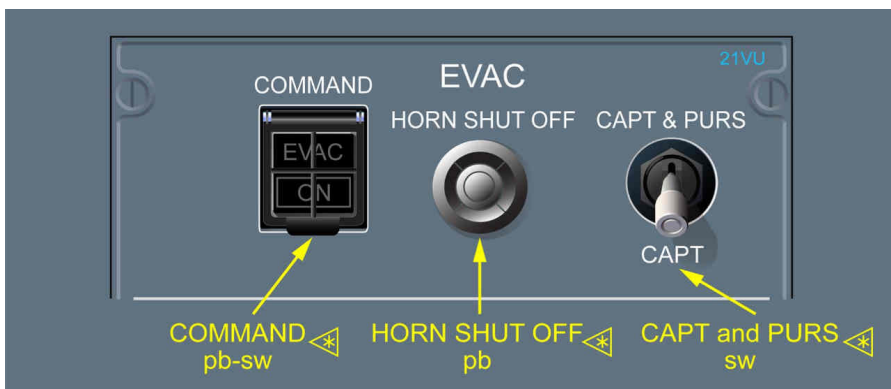
Intentionally left blank

CONTROLS AND INDICATORS

Ident.: DSC-23-40-10-00018468.0001001 / 02 MAY 24

Applicable to: ALL

EVAC PANEL



COMMAND pb-sw



Normal Operation. Neither the flight crew nor the cabin crew order an evacuation.



The evacuation is initiated from the cabin.

In the cockpit:

- The EVAC light flashes
- A horn sounds continuously if CAPT & PURS is selected or for 3 s if CAPT is selected.

In the cabin:

- The EVAC light flashes at FWD and AFT attendant panels
- An evacuation tone sounds continuously.



The evacuation is initiated from the cockpit (regardless of the position of the CAPT and PURS sw ).

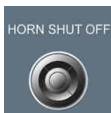
In the cockpit:

- The ON light and EVAC light flash.

In the cabin:

- The EVAC light flashes at FWD and AFT attendant panels
- An evacuation tone sounds continuously.

HORN SHUT OFF



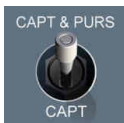
Silences the cockpit horn (generated when evacuation is activated from the cabin).

CAPT and PURS sw



The alert may only be activated from the cockpit.

If one of the cabin EVAC CMD key is pressed, only the cockpit horn sounds for 3 s.



The alert may either be activated from the cockpit or from the cabin.

CABIN TO COCKPIT ALERT

1 Ident.: DSC-23-40-20-00018470.0008001 / 06 NOV 25

Applicable to: MSN 05152-05746

This function enables the cabin crew to rapidly and discretely alert the flight crew of any threat in the cabin, for example, imminent intrusion.

The cabin crew activates the alert by pressing one of the pushbuttons located in each attendant's area for a minimum of one second.

When the cabin crew activates the alert, the buzzer sounds continuously in the cockpit, and the CAB ALERT pb on the cockpit center pedestal comes on.


CAB ALERT pb


When the cabin crew initiates the alert, the **ALERT** light comes on and a buzzer sounds in the cockpit.



When the flight crew presses the CAB ALERT pb, the buzzer stops and the **ALERT** light goes off.

COCKPIT TO CABIN ALERT

Ident.: DSC-23-40-20-00018471.0001001 / 05 MAY 22

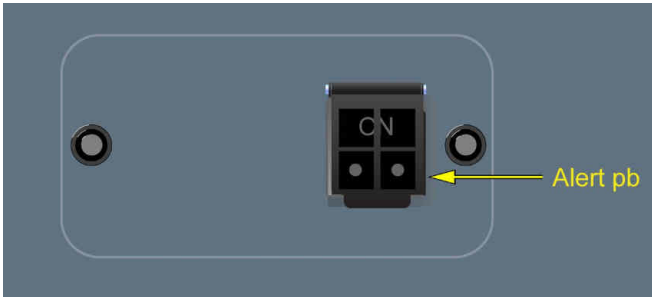
Applicable to: MSN 05152-05746

This function enables the flight crew to inform the cabin crew, via the CIDS network, of any threat in the cockpit. The flight crew activates this alert by pressing one of the two pushbuttons installed in the cockpit.

AIRCRAFT SYSTEMS

COMMUNICATIONS

EMERGENCY COMMUNICATION - EMERGENCY COCKPIT ALERTING SYSTEM



COCKPIT TO CABIN ALERT PB



The alert buzzer sounds in the cabin, and the alert lights come on, in each cabin crew station.



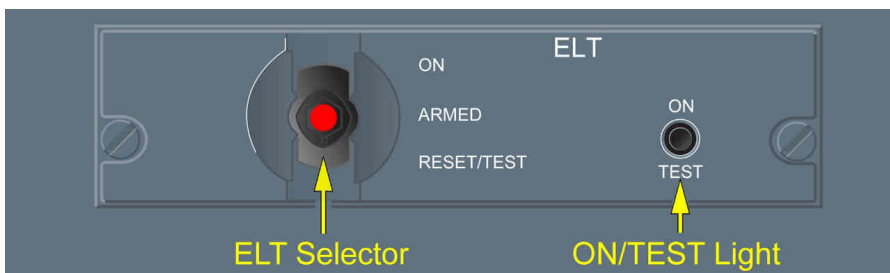
The cockpit to cabin alert is not active.

CONTROLS AND INDICATORS

Ident.: DSC-23-40-30-00018516.0007001 / 08 NOV 22

Applicable to: MSN 04392, 07784-07792

OVERHEAD PANEL



ELT selector



The ELT transmits an emergency signal.



The ELT transmits an emergency signal, in the case of impact.



If held for 2 s, the ELT stops transmitting.
If held for 10 s, the ELT starts an automatic test.

Note: If the ELT is unduly triggered while in ARMED mode (e.g due to a hard landing), hold the RESET/TEST position for 2 s to reset the ELT and stop the signal.

ON/TEST light

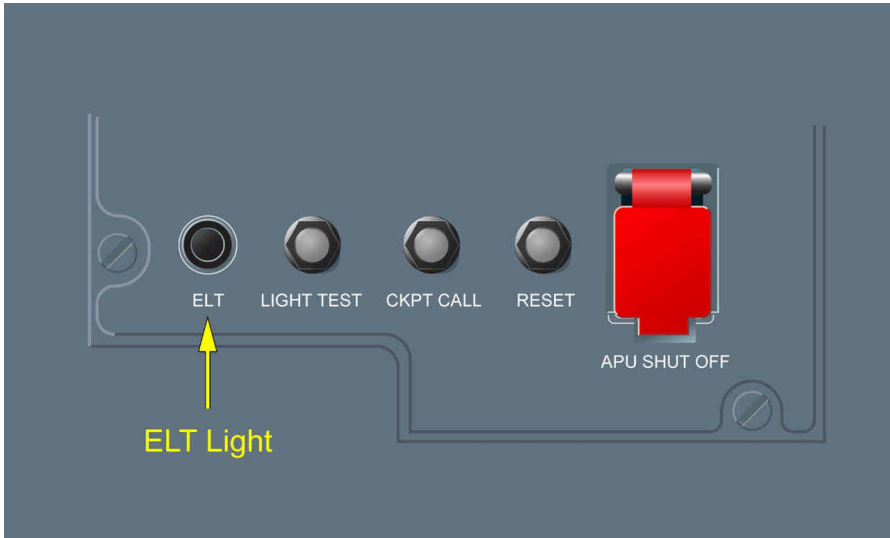


The ELT is not transmitting.



The ELT is transmitting or is in automatic test.
If the ELT is transmitting when the aircraft is on ground, the external horn sounds.
When the ELT is transmitting, the light flashes every 5 s. After a RESET, the light flashes every second before stopping.

EXTERNAL POWER PANEL



ELT light



The ELT is not transmitting.



The ELT is transmitting or is in automatic test.

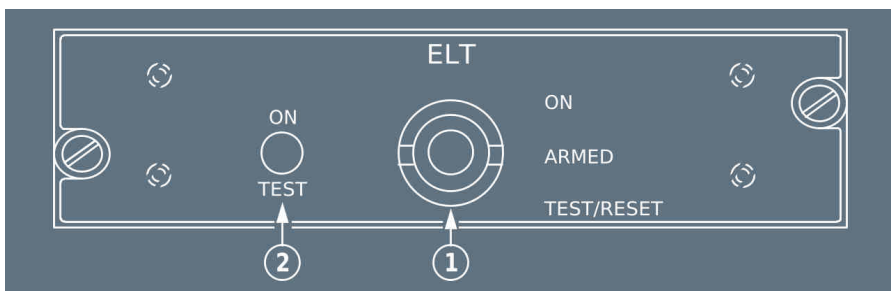
If the ELT is transmitting when the aircraft is on ground, the external horn sounds.

CONTROLS AND INDICATORS

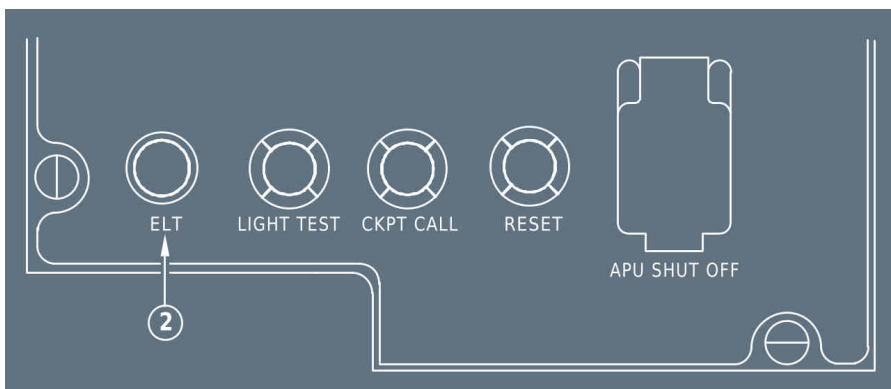
Ident.: DSC-23-40-30-00018516.0004001 / 17 MAR 17

Applicable to: MSN 02155-02212, 02926-02944

OVERHEAD PANEL



EXTERNAL POWER PANEL



(1) **ELT selector**

- ON** : The Emergency Locator Transmitter (ELT) transmits an emergency signal.
- ARMED** : In the case of impact, the ELT transmits an emergency signal (on 121.5, 243 and 406.025 MHz).
- TEST/RESET**: Starts the ELT autotest.

Note: If the ELT is unduly triggered in ARMED mode (by an external impact, hard landing, etc.), select the TEST/RESET position to reset the ELT and stop signal transmission.

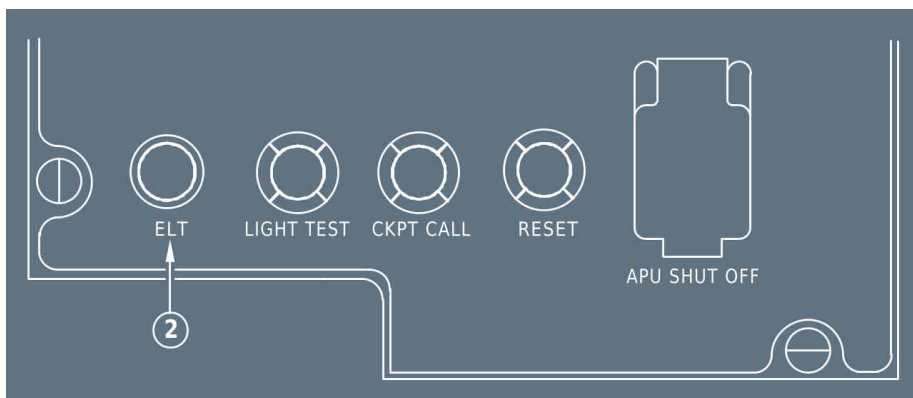
(2) ON TEST light and ELT light

These lights come on amber either when the emergency signal is transmitted, or during ELT autotest.

CONTROLS AND INDICATORS

Ident.: DSC-23-40-30-00018516.0002001 / 17 MAR 17

Applicable to: MSN 02719-02789, 03031-03060, 05152-05746



(1) ELT selector

- ON** : The Emergency Locator Transmitter (ELT) transmits an emergency signal.
- ARMED** : In case of impact, the ELT transmits an emergency signal (on 121.5, 243 and 406 MHz).
- TEST/RESET** : Starts the ELT autotest.

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS COMMUNICATIONS EMERGENCY COMMUNICATION - EMERGENCY LOCATOR TRANSMITTER
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Note: If the ELT is unduly triggered in ARMED mode (by an external impact, hard landing, etc.), select the TEST/RESET position to reset the ELT and stop signal transmission.

(2) ON light and ELT light

These lights come on amber either when the emergency signal is transmitted, or during ELT autotest.

AIRCRAFT SYSTEMS

COMMUNICATIONS

EMERGENCY COMMUNICATION -
EMERGENCY LOCATOR TRANSMITTER

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 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS COMMUNICATIONS MEMO DISPLAY
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CIDS

Ident.: DSC-23-50-00026892.0001001 / 06 NOV 23

Applicable to: ALL

CABIN READY  : This memo indicates to the flight crew that the cabin is ready for take-off or for landing. This memo appears when the cabin crew presses the 'CABIN READY' key on the FAP.

Note: The **CABIN READY** memo is displayed on the right side of the memos area or in the T/O and LDG memos checklist depending on the CIDS standard and customisation.

CABIN...CHECK  : This memo appears in the T/O and LDG memos checklist and indicates that the cabin is not ready for take-off or for landing ('CABIN READY' key not selected on the FAP).

ACARS
--

Ident.: DSC-23-50-00018505.0001001 / 31 AUG 17

Applicable to: ALL

ACARS CALL : This memo appears in green when ACARS has received a message from the ground requesting a voice communication on VHF. This message is pulsing green during 60 s then steady.

VHF 3 VOICE : This memo appears in green when VHF 3 is operating in voice mode and ACARS communication is interrupted.

ACARS MSG : This memo appears in green when ACARS has received a message from the ground. This message is pulsing green during 60 s then steady.

ACARS STBY : This memo appears in green when ACARS communications between the aircraft and the ground are lost, or when a failure occurs at ATSU initialization to indicate to the crew to enter some initialization parameters.

ATSU

Ident.: DSC-23-50-00018506.0001001 / 12 MAY 25

Applicable to: ALL

VHF 3 VOICE : This memo appears in green, if VHF 3 is operating in voice mode and ACARS communication is interrupted.

HF VOICE : This memo appears in green, if both HFs are operating in voice mode. This message flashes for 10 s and then steady.



A318/A319/A320/A321
FLIGHT CREW
OPERATING MANUAL

AIRCRAFT SYSTEMS
COMMUNICATIONS
MEMO DISPLAY

AUDIO 3 XFRD

Ident.: DSC-23-50-00018507.0001001 / 17 MAR 17

Applicable to: ALL

AUDIO 3 XFRD : This memo appears in green, if the AUDIO SWITCHING selector is not on NORM.

SATCOM

Ident.: DSC-23-50-00018508.0002001 / 03 APR 18

Applicable to: ALL

SATCOM ALERT : This memo appears in green when a message with priority level below 4 is received from the ground.

L12

TEL EMER(ATC)(CPNY) CALL : This memo appears in green when the flight crew receives an EMERGENCY(ATC)(COMPANY) telephone call via the SATCOM.
Appears on the E/WD.

VHF, HF UTILIZATION

Ident.: DSC-23-60-A-00002211.0004001 / 13 MAY 25

Applicable to: ALL

TUNING

The flight crew should normally use his/her outside RMP to tune any one of the VHF or HF radios. If a frequency is tuned on the RMP not dedicated to its associated VHF (e.g. VHF 1 tuned on RMP 2), the SEL lights come on (on the 3 RMPs) to remind the flight crew that at least one radio system is not selected on its associated RMP. After each tuning, in order to be able to read VHF 1 and VHF 2 frequencies, the flight crew should select the radio system associated with his/her RMP. This will extinguish the SEL lights.



ON/OFF switch..... CHECK ON
 VHF or HF key..... PRESS

The green light comes on.
ACTIVE and STBY/CRS windows display active and preset frequencies, respectively.

HOW TO CHANGE FREQUENCY

Rotating knob..... TURN
Select the new frequency in the STBY/CRS window.
Outer knob is for units, inner knob for decimals.

Note: To tune a VHF frequency of 136 MHz, the flight crew should set the decimals to a value lower or equal to 975.

Transfer key.....PRESS

This interchanges the ACTIVE and STBY frequencies.

The receiver is now tuned to the new ACTIVE frequency.

AM key (if necessary).....PRESS

Green light comes on.

FAILURE CASES

When an RMP fails :

- The affected RMP no longer controls the selected receiver.
- The frequency displays disappear and the green VHF or HF lights go out.

Affected RMP..... SWITCH OFF

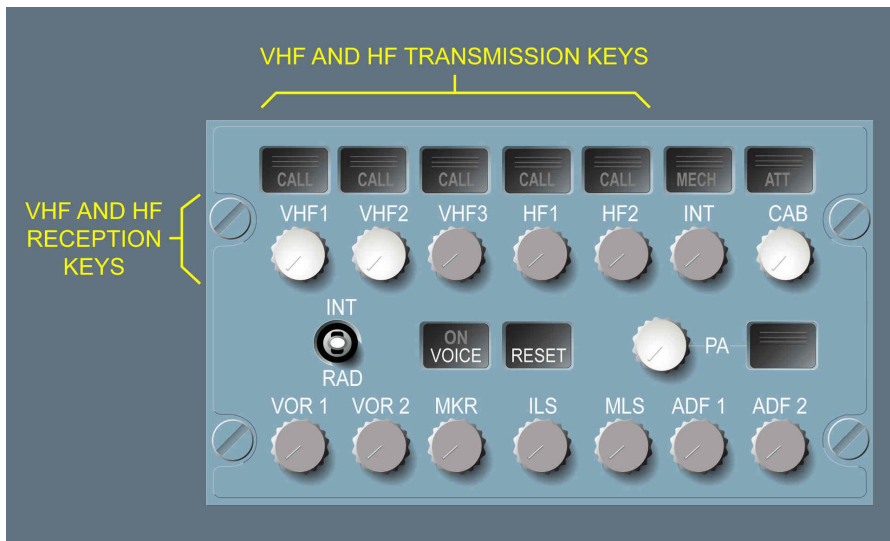
One RMP can control all receivers.

VHF, HF UTILIZATION - TRANSMISSION AND RECEPTION

Ident.: DSC-23-60-A-00002212.0003001 / 06 NOV 25

Applicable to: MSN 02926-02944

TRANSMISSION AND RECEPTION



VHF or HF reception key..... PRESS

The integrated white light comes on.
The receiver brings in the selected system.
To adjust the volume, turn the key.

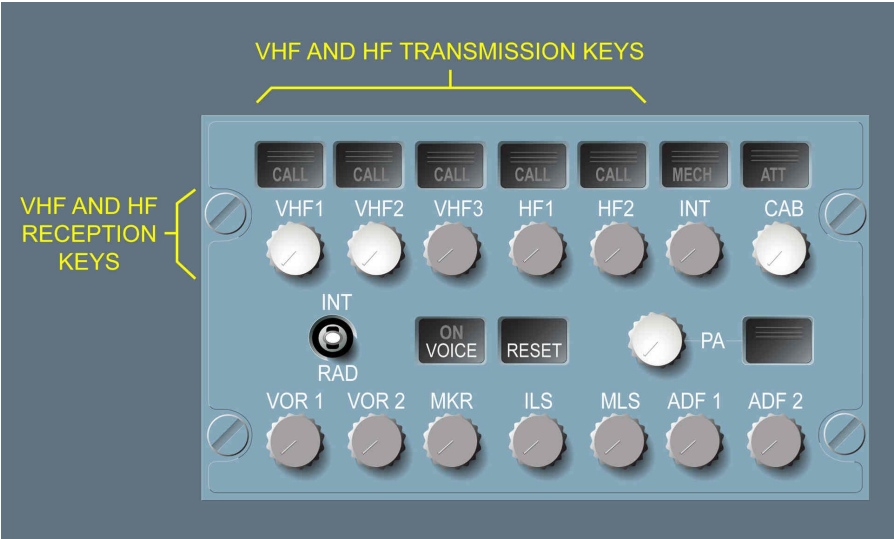
VHF or HF transmission key..... PRESS

Green bars on the selected system key light up.
Microphones and PTT command are connected to the selected system.

- Note:
- If the VHF 3 VOICE DIRECTORY page is customized with user frequencies:
 - Use it as a pure directory
 - Do not press the key adjacent to the desired frequency for direct tuning
 - VHF 3 in VOICE mode should either be tuned using the MANUAL FREQ field, or using the RMP.
 - If interference occurs, use VHF 2 for voice communication with ATC. The flight crew can also switch VHF 3 to VOICE.

Ident.: DSC-23-60-A-00002212.0004001 / 06 NOV 25
 Applicable to: MSN 02155-02789, 03031-07792

2 **TRANSMISSION AND RECEPTION**



VHF or HF reception key..... PRESS

The integrated white light comes on.

The receiver brings in the selected system.

To adjust the volume, turn the key.

VHF or HF transmission key..... PRESS

Green bars on the selected system key light up.

Microphones and PTT command are connected to the selected system.

L12

Note: 1. If ACARS is installed, do not use VHF 3 for voice communications, unless VHF 1 and VHF 2 are inoperative.

The datalink connection with the ATC is temporarily lost when VHF 3 is set to voice mode. The flight crew may encounter sudden disconnections from the ATC if they switch VHF 3 to voice mode too frequently.

2. If the VHF 3 VOICE DIRECTORY page is customized with user frequencies:

- Use it as a pure directory
- Do not press the key adjacent to the desired frequency for direct tuning
- VHF 3 in VOICE mode should either be tuned using the MANUAL FREQ field, or using the RMP.

3. If interference occurs, use VHF 2 for voice communication with ATC. The flight crew can also switch VHF 3 to VOICE.

AIRCRAFT SYSTEMS

ELECTRICAL

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DSC-24-10 Description**DSC-24-10-10 General**

General.....	A
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DSC-24-10-20 Generation of Electrical Power

AC Generators.....	A
DC Generation.....	B
Circuit Breakers (C/Bs).....	C

DSC-24-10-30 Operations**DSC-24-10-30-10 General**

General.....	A
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DSC-24-10-30-20 Normal Configuration

In Flight.....	A
On Ground.....	B

DSC-24-10-30-30 Abnormal Configurations

Failure of One Engine Generator.....	A
Failure of AC BUS 1.....	B
Failure of One TR.....	C
Failure of TR 1 and TR 2.....	D
Emergency Generation after Loss of All Main Generators.....	E
EMER GEN Running.....	F
EMER GEN Running (Cont'd).....	G
Flight with Batteries Only.....	H
On Ground, Batteries Only (Speed < 50 kt).....	I
Smoke Configuration.....	J

DSC-24-10-30-40 Distribution Table

Distribution Table.....	A
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DSC-24-20 Controls and Indicators

Overhead Panel.....	A
Overhead Panel (Cont'd).....	B
External Power Panel.....	C
Forward Cabin.....	D
ECAM ELEC Page.....	E
Memo Display.....	F

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS ELECTRICAL DESCRIPTION - GENERAL
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GENERAL

Ident.: DSC-24-10-10-00017750.0001001 / 21 MAR 16

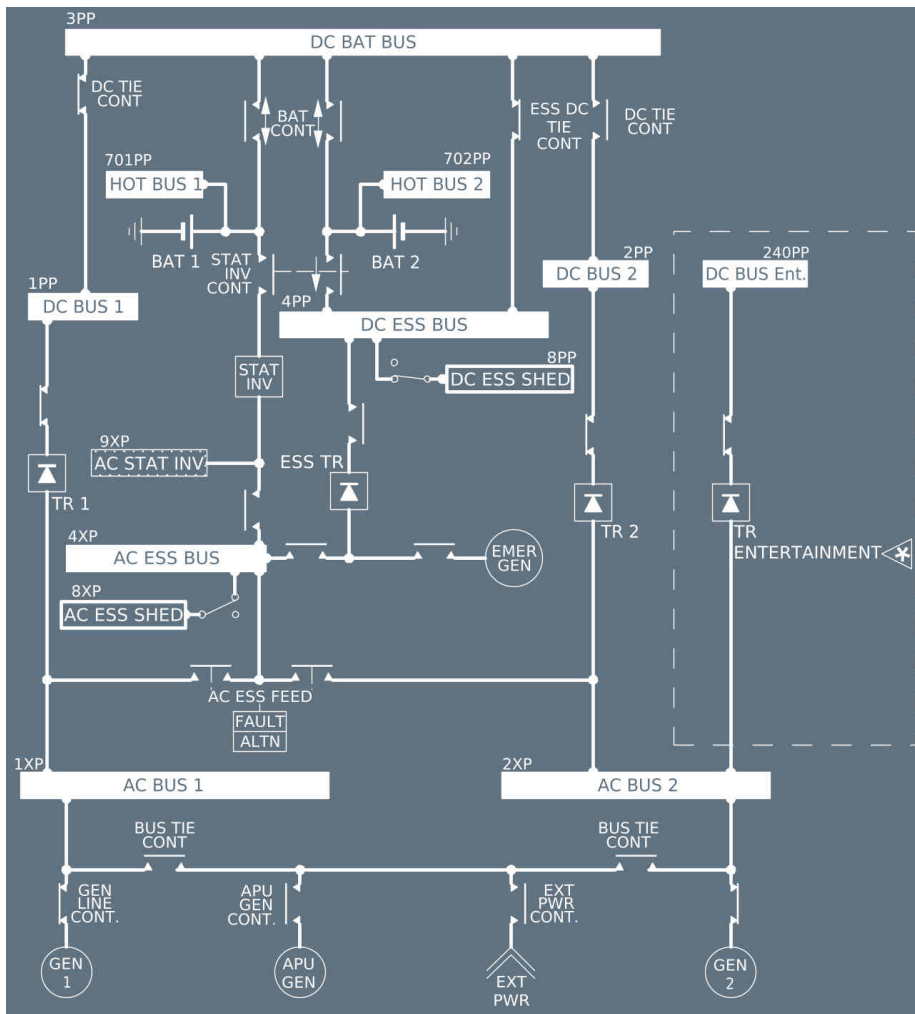
Applicable to: ALL

The electrical power system consists of a three-phase 115/200 V 400 Hz constant-frequency AC system and a 28 V DC system. Electrical transients are acceptable for equipment. Commercial supply has secondary priority.

In normal configuration, the electrical power system provides AC power. The electrical power system is constituted of 2 engine generators and 1 APU generator. Each generator can provide AC power to all electrical bus bars. A part of this AC power is converted into DC power for certain applications.

In the event that normal AC power is not available, an emergency generator can provide AC power.

In the event that all AC power is not available, the electrical power system can invert DC power from the batteries into AC power.



 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS ELECTRICAL DESCRIPTION - GENERATION OF ELECTRICAL POWER
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AC GENERATORS

Ident.: DSC-24-10-20-00017751.0001001 / 21 MAR 16

Applicable to: ALL

ENGINE – DRIVEN GENERATORS

Two AC generators (GEN 1, GEN 2), one driven by each main engine through an integrated drive, supply aircraft electrical power. Each generator can supply up to 90 KVA of three phase 115/200 V 400 Hz power.

Two Generators Control Units (GCU) control the output of their respective generator. The main functions of each GCU are :

- Control the frequency and voltage of the generator output.
- Protect the network by controlling the associated generator line contactor.

APU GENERATOR AND EXTERNAL POWER

A third generator (APU GEN), driven directly by the APU and producing the same output as each main engine generator, can replace either or both main engine generators at any time. A ground power connector near the nosewheel allows ground power to be supplied to all busbars.

A Ground Power Control Unit (GPCU) :

- Protects the network by controlling the external power contactor, or

A Ground and Auxiliary Power Control Unit (GAPCU)  :

- Regulates, via the APU Electronic Control Box, the frequency and voltage of the APU generator.
- Protects the network by controlling the external power contactor and the APU generator line contactor.

EMERGENCY GENERATOR

The blue hydraulic circuit drives an emergency generator that automatically supplies emergency AC power to the aircraft electrical system, if all main generators fail. This generator supplies 5 KVA of three-phase 115 and 200 V 400 Hz power.

A Generator Control Unit (GCU) :

- Keeps the emergency generator at a constant speed,
- Controls the generator's output voltage,
- Protects the network by the controlling the emergency generator line contactor, and
- Controls the emergency generator start-up.

STATIC INVERTER

A static inverter transforms DC power from Battery 1 into one KVA of single-phase 115 V 400 Hz AC power, which is then supplied to part of the AC essential bus. When the aircraft speed is above

AIRCRAFT SYSTEMS**ELECTRICAL**

DESCRIPTION - GENERATION OF ELECTRICAL POWER

50 kt, the inverter is automatically activated, if only the batteries are supplying electrical power to the aircraft, regardless of the BAT 1 and BAT 2 pushbutton positions.

When the aircraft speed is below 50 kt, the inverter is activated, if only the batteries are supplying electrical power to the aircraft, and both BAT 1 and BAT 2 pushbuttons are on.

DC GENERATION

Ident.: DSC-24-10-20-00017752.0001001 / 21 MAR 16

Applicable to: ALL

TRANSFORMER RECTIFIERS (TRS)

Two main transformer rectifiers, TR 1 and TR 2, supply the aircraft's electrical system, with up to 200 A of DC current.

A third (identical) Transformer Rectifier, the ESS TR, can power the essential DC circuit from the emergency generator, if the engine and APU generators all fail, or if TR 1 or TR 2 fails.

Each TR controls its contactor by internal logic.

A fourth Transformer Rectifier (TR Entertainment ) powers the DC Entertainment bus bar dedicated to the In-Flight Entertainment system (IFE) in order to take into account IFE needs.

BATTERIES

Two main batteries, each with a normal capacity of 23 Ah, are permanently connected to the two hot buses.

Each battery has an associated Battery Charge Limiter (BCL).

The BCL monitors battery charging and controls its battery contactor.

CIRCUIT BREAKERS (C/BS)

Ident.: DSC-24-10-20-00000874.0002001 / 15 FEB 11

Applicable to: ALL

The aircraft has two types of C/Bs:

- Monitored (green): When out for more than 1 min, the C/B TRIPPED warning is triggered on the ECAM.
- Non-monitored (black).

The Wing Tip Brake (WTB) C/Bs have red caps on them to prevent them from being reset.

The C/B TRIPPED warning on the ECAM indicates the location of the affected C/B. The following panels are monitored: OVHD PNL, L(R) ELEC BAY, REAR PNL J-M or N-R or S-V or W-Z.

AIRCRAFT SYSTEMS**ELECTRICAL**

DESCRIPTION - GENERATION OF ELECTRICAL POWER

Note: The flight crew can clear the ECAM C/B TRIPPED caution by pressing:

- The EMER CANC pb: When pressed, this pushbutton clears and inhibits the ECAM C/B TRIPPED caution for the remainder of the flight, or
- The CLR pb: When pressed, this pushbutton only clears the ECAM C/B TRIPPED caution. If the C/B remains pulled, any additional tripped circuit breakers on the same panel will not be detected, and the ECAM will not trigger the caution. However, if the C/B is pushed, any additional tripped circuit breakers will be detected, and the ECAM will trigger the caution again.

AIRCRAFT SYSTEMS

ELECTRICAL

DESCRIPTION - GENERATION OF ELECTRICAL POWER

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS ELECTRICAL DESCRIPTION - OPERATIONS
--	--

General

GENERAL

Ident.: DSC-24-10-30-10-00017759.0001001 / 21 MAR 16
Applicable to: ALL

GEN 1 and 2 when operating have priority over the APU generator and over external power.
External power has priority over the APU generator when the EXT PWR pb switch is ON.
The APU generator or external power can supply the entire network.
One engine generator can supply the entire network, except the DC BUS Entertainment.
The generators cannot be connected in parallel.

Note: *Two generators are needed to supply the DC BUS Entertainment ✖ , except on ground, where the APU generator (if not overloaded) or the external power is sufficient.*

AIRCRAFT SYSTEMS

ELECTRICAL

DESCRIPTION - OPERATIONS

Intentionally left blank

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS ELECTRICAL DESCRIPTION - OPERATIONS
--	--

Normal Configuration

IN FLIGHT

Ident.: DSC-24-10-30-20-00000876.0002001 / 09 OCT 12
Applicable to: ALL

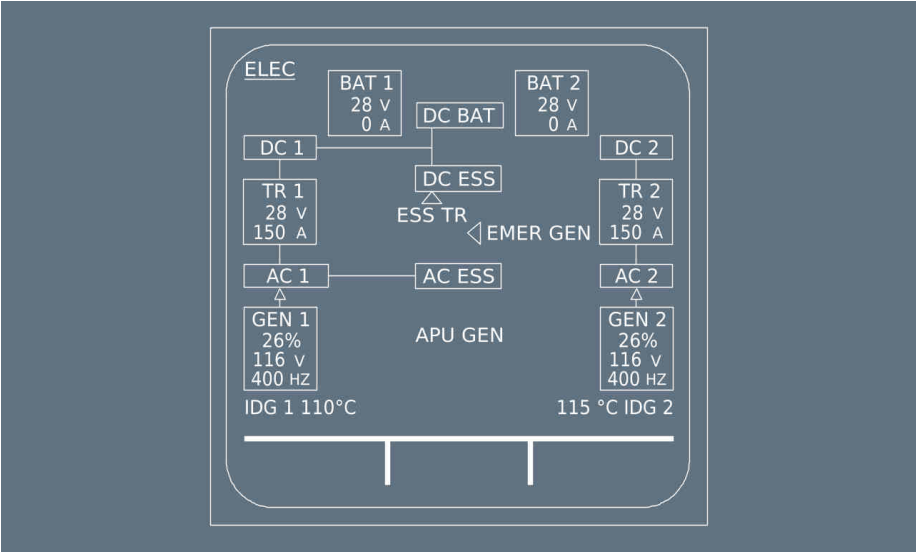
Each engine-driven generator supplies its associated AC BUS (1 and 2) via its generator line contactor (GLC 1 and GLC 2).

AC BUS 1 normally supplies the AC ESS BUS via a contactor.

TR 1 normally supplies DC BUS 1, DC BAT BUS, and DC ESS BUS.

TR 2 normally supplies DC BUS 2.

The two batteries are connected to the DC BAT BUS, if they need charging. When they are fully charged, the battery charge limiter disconnects them.



ON GROUND

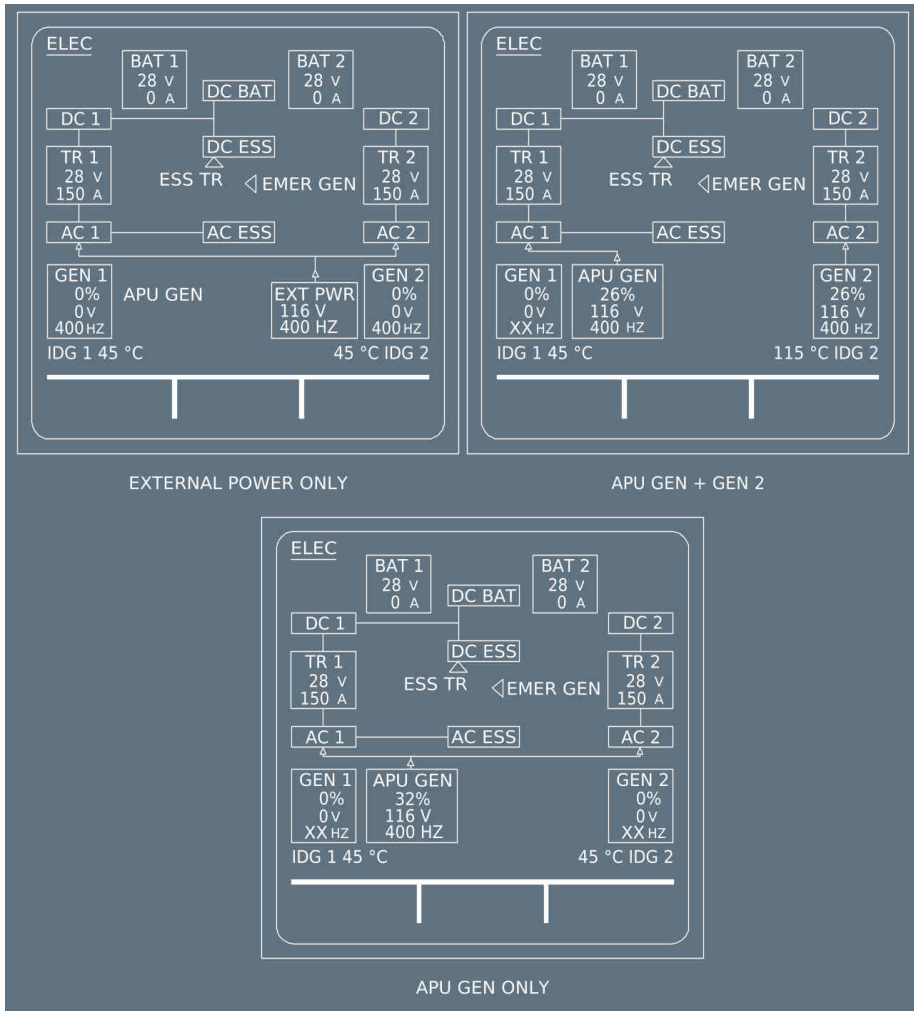
Ident.: DSC-24-10-30-20-00000877.0002001 / 22 MAY 12
Applicable to: ALL

Either the APU generator, or external power, may supply the complete system.

AIRCRAFT SYSTEMS

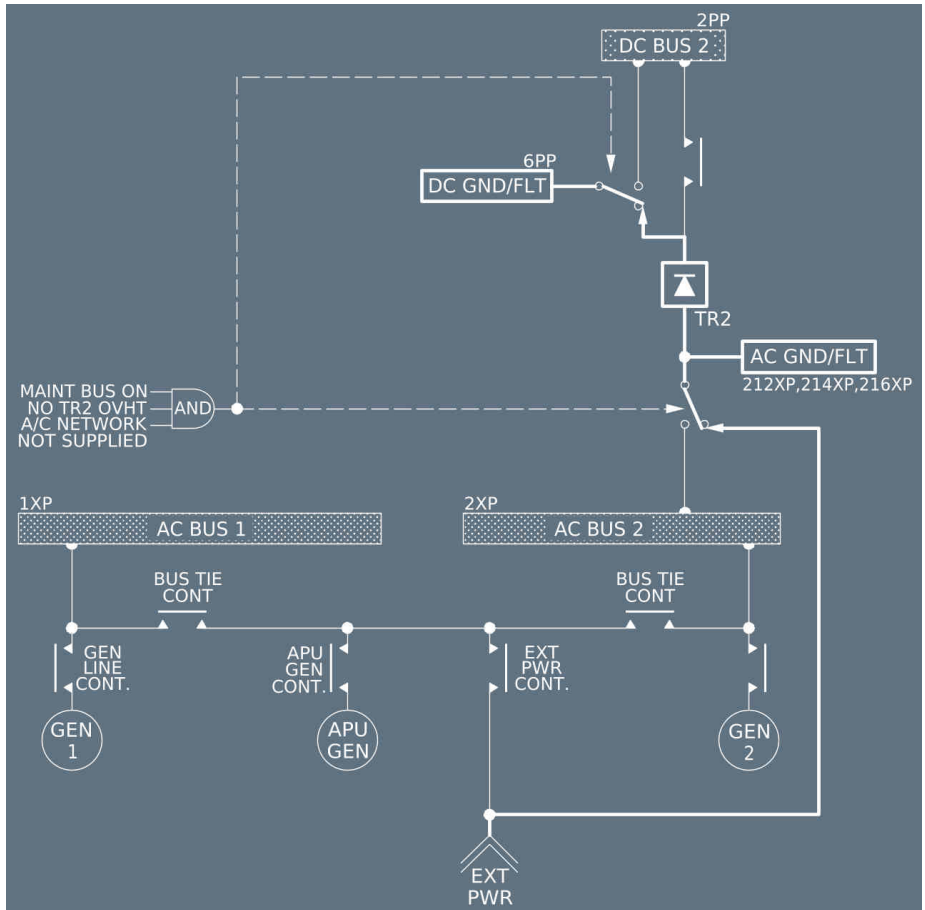
ELECTRICAL

DESCRIPTION - OPERATIONS



On ground, when only ground services are required, external power can supply the AC and DC GND/FLT BUSES directly without supplying the entire aircraft network.

Personnel select this configuration with the MAINT BUS switch in the forward entrance area.



AIRCRAFT SYSTEMS

ELECTRICAL

DESCRIPTION - OPERATIONS

Intentionally left blank

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS ELECTRICAL DESCRIPTION - OPERATIONS
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Abnormal Configurations

FAILURE OF ONE ENGINE GENERATOR

Ident.: DSC-24-10-30-30-00017760.0002001 / 21 MAR 16

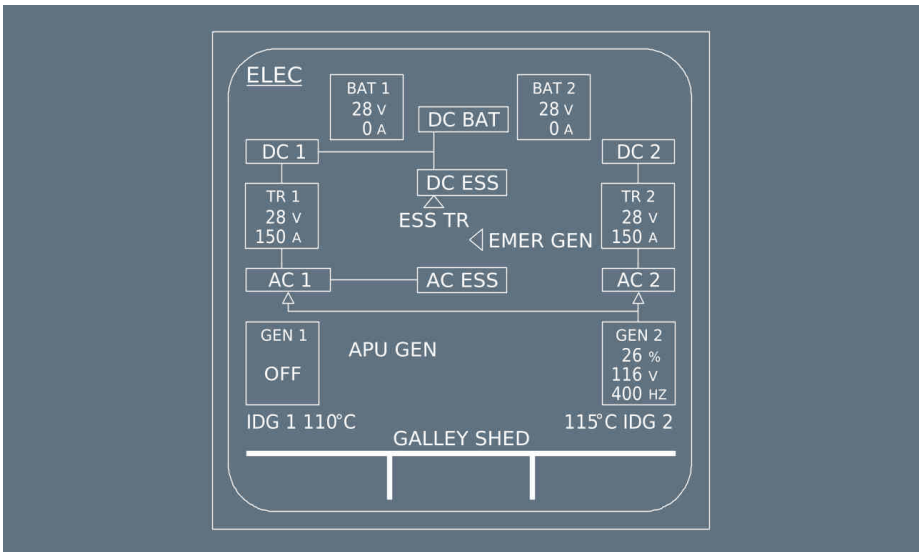
Applicable to: ALL

The system automatically replaces the failed generator, with the :

- APU GEN, if available, or
- Other engine generator.

Part of the galley load and the DC BUS Ent  are automatically shed.

Note: The Galley Load Automatic Shedding  allows all the galley load to be automatically shed.

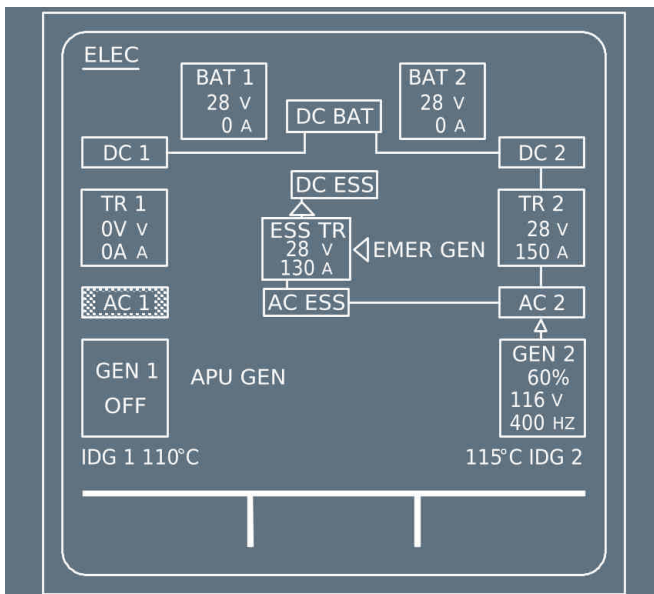


FAILURE OF AC BUS 1

Ident.: DSC-24-10-30-30-00017761.0002001 / 21 MAR 16

Applicable to: ALL

- AC BUS 2 can supply AC ESS BUS, and ESS TR can supply DC ESS BUS, both via the AC ESS FEED pb. This is done automatically with the AC ESS FEED Auto Switching .
- DC BUS 2 supplies DC BUS 1 and DC BAT BUS automatically after 5 s.



FAILURE OF ONE TR

Ident.: DSC-24-10-30-30-00000880.0002001 / 21 MAR 16

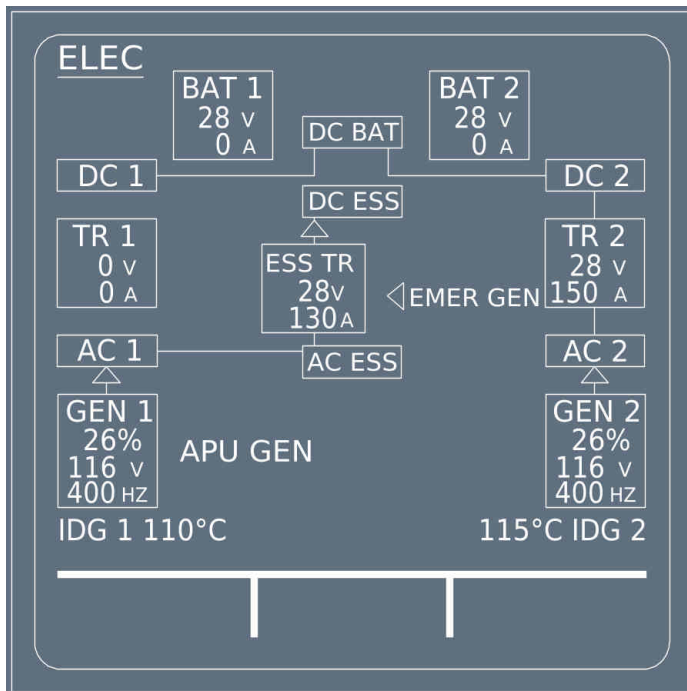
Applicable to: ALL

The contactor of each TR opens automatically, in case of :

- Overheat
- Minimum current

The other TR automatically replaces the faulty one.

The ESS TR supplies the DC ESS BUS.

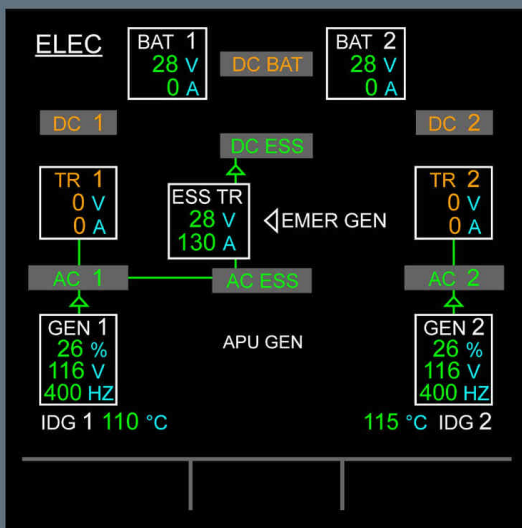


FAILURE OF TR 1 AND TR 2

Ident.: DSC-24-10-30-00000881.0002001 / 04 JUN 19

Applicable to: ALL

If TR 1 and TR 2 are lost, DC BUS 1, DC BUS 2, and DC BAT BUS are lost. The DC ESS BUS is supplied by the ESS TR.



EMERGENCY GENERATION AFTER LOSS OF ALL MAIN GENERATORS

Ident.: DSC-24-10-30-30-00000882.0002001 / 09 MAY 23

Applicable to: ALL

If both AC BUS 1 and AC BUS 2 are lost and the aircraft speed is above 100 kt, the RAT extends automatically. This powers the blue hydraulic system, which drives the emergency generator by the means of a hydraulic motor. This generator supplies the AC ESS BUS, and the DC ESS BUS via the ESS TR.

When the RAT stalls, the blue hydraulic system is no longer pressurized and the emergency generator no longer supplies the AC ESS BUS and the DC ESS BUS.

The emergency generation network automatically transfers to the batteries and static inverter, and the system automatically sheds the AC SHED ESS and DC SHED ESS buses.

When the aircraft is on ground:

- Below 100 kt, the DC BAT BUS is automatically connected to the batteries
- Below 50 kt, the AC ESS BUS is automatically shed, leading to the loss of all display units.

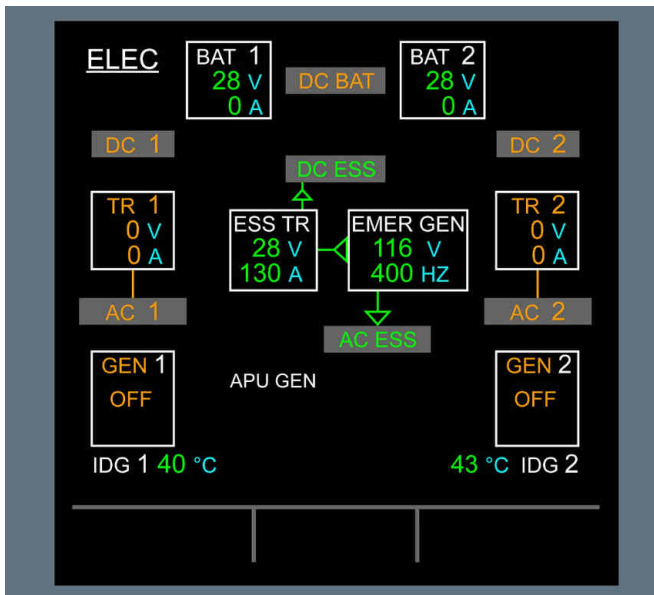
Note:

1. During RAT extension and emergency generator coupling (about 8 s), the batteries power the emergency generation network.
2. On ground, if only the batteries are powering the emergency generation network, APU start is only available when the speed is below 100 kt.

EMER GEN RUNNING

Ident.: DSC-24-10-30-30-00000883.0002001 / 04 JUN 19

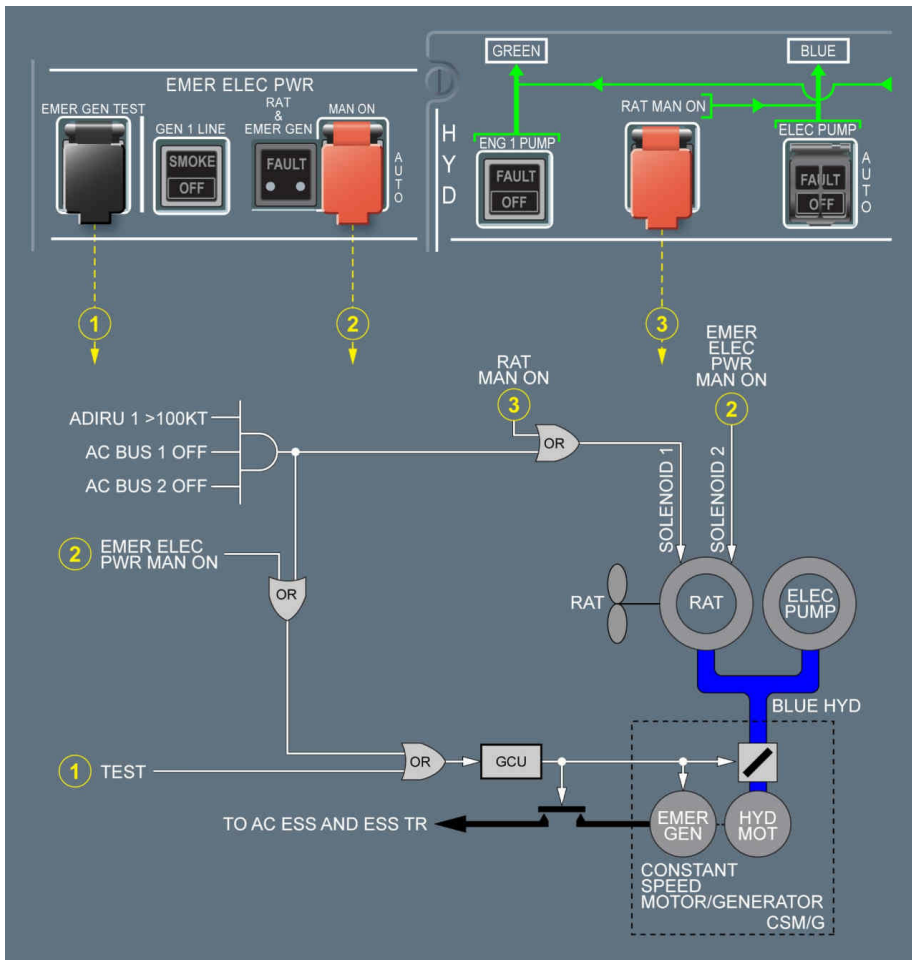
Applicable to: ALL



EMER GEN RUNNING (CONT'D)

Ident.: DSC-24-10-30-30-00000884.0002001 / 13 MAY 25

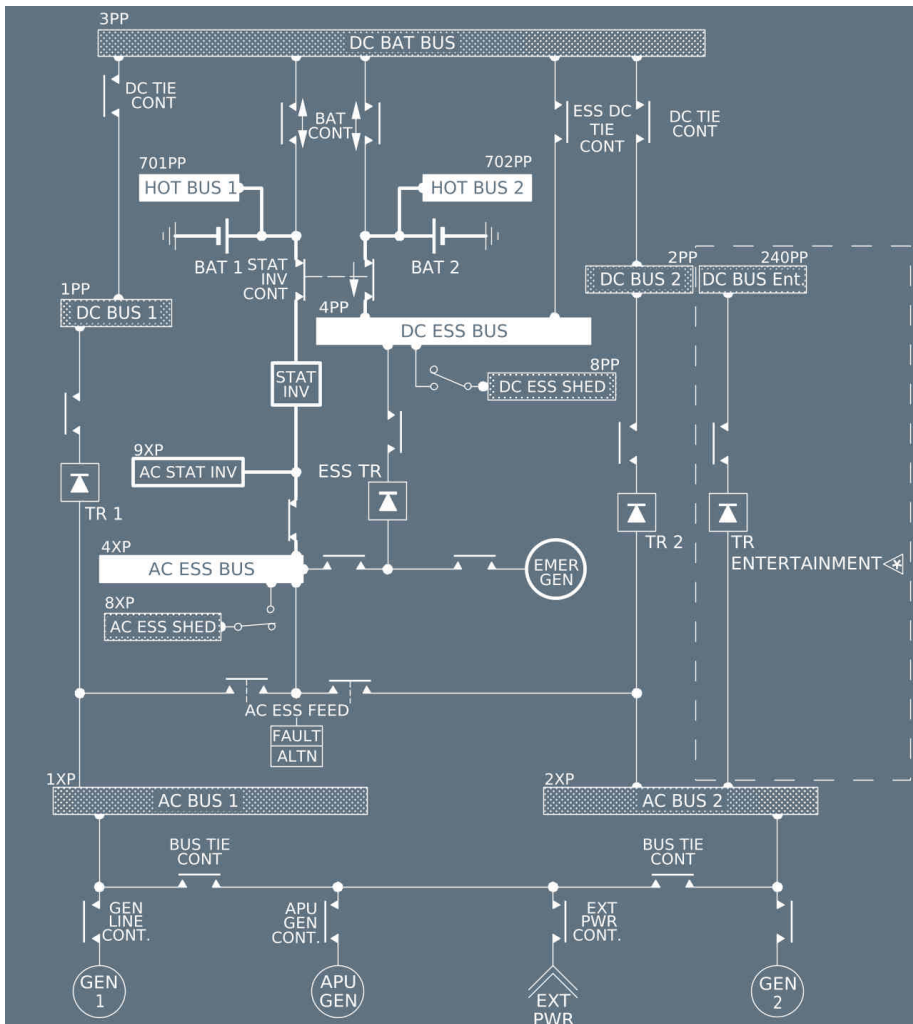
Applicable to: ALL



FLIGHT WITH BATTERIES ONLY

Ident.: DSC-24-10-30-30-00017762.0001001 / 21 MAR 16

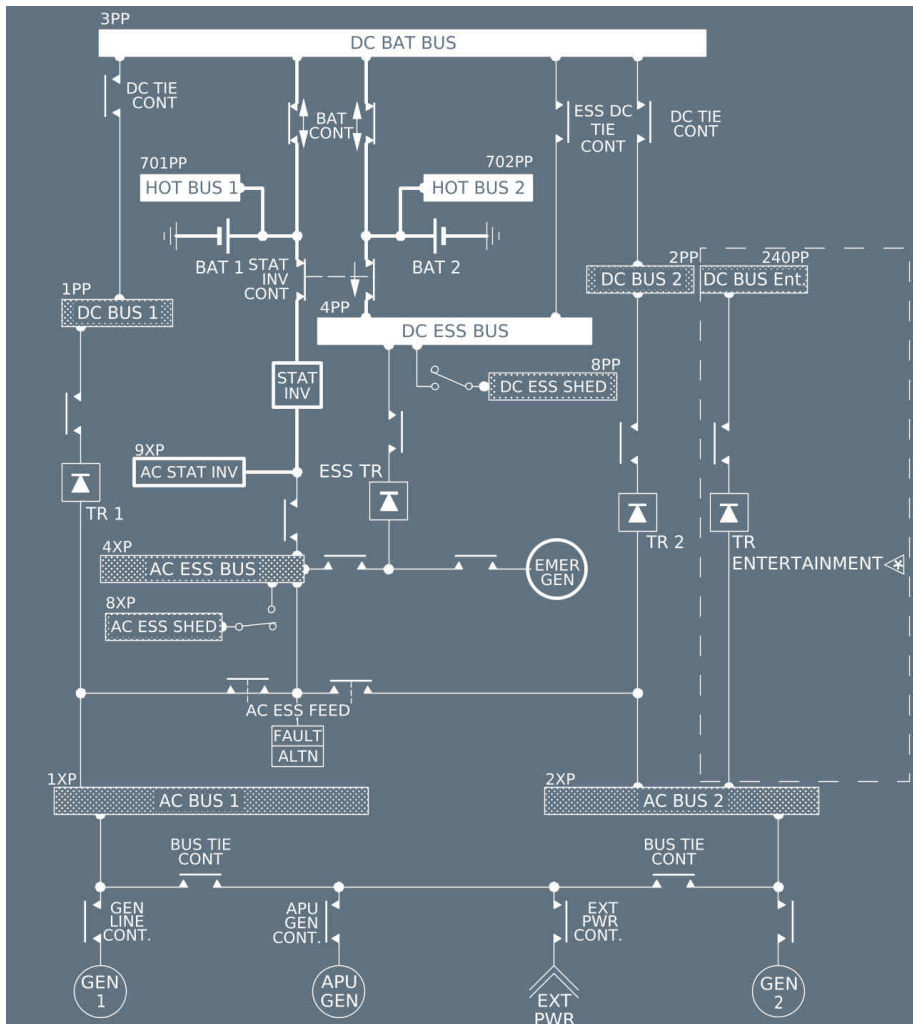
Applicable to: ALL



ON GROUND, BATTERIES ONLY (SPEED < 50 KT)

Ident.: DSC-24-10-30-30-00017763.0001001 / 21 MAR 16

Applicable to: ALL

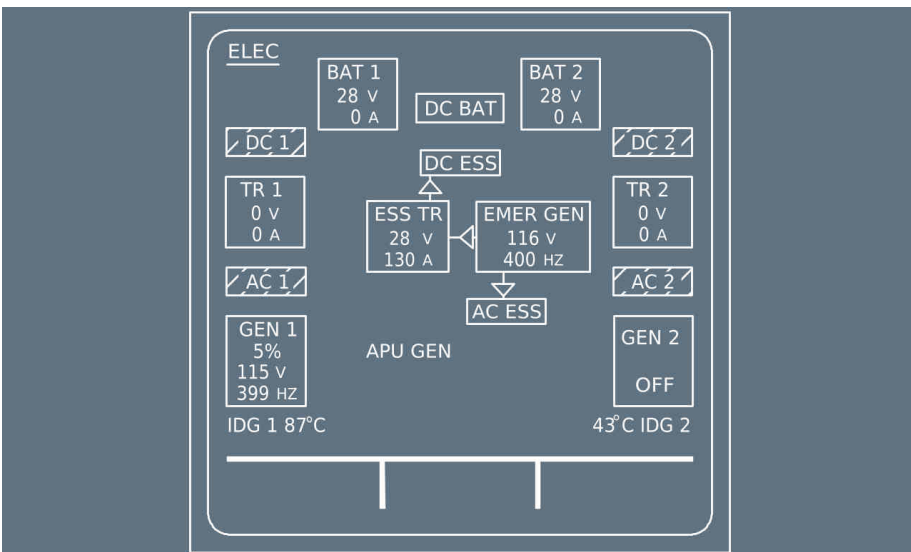


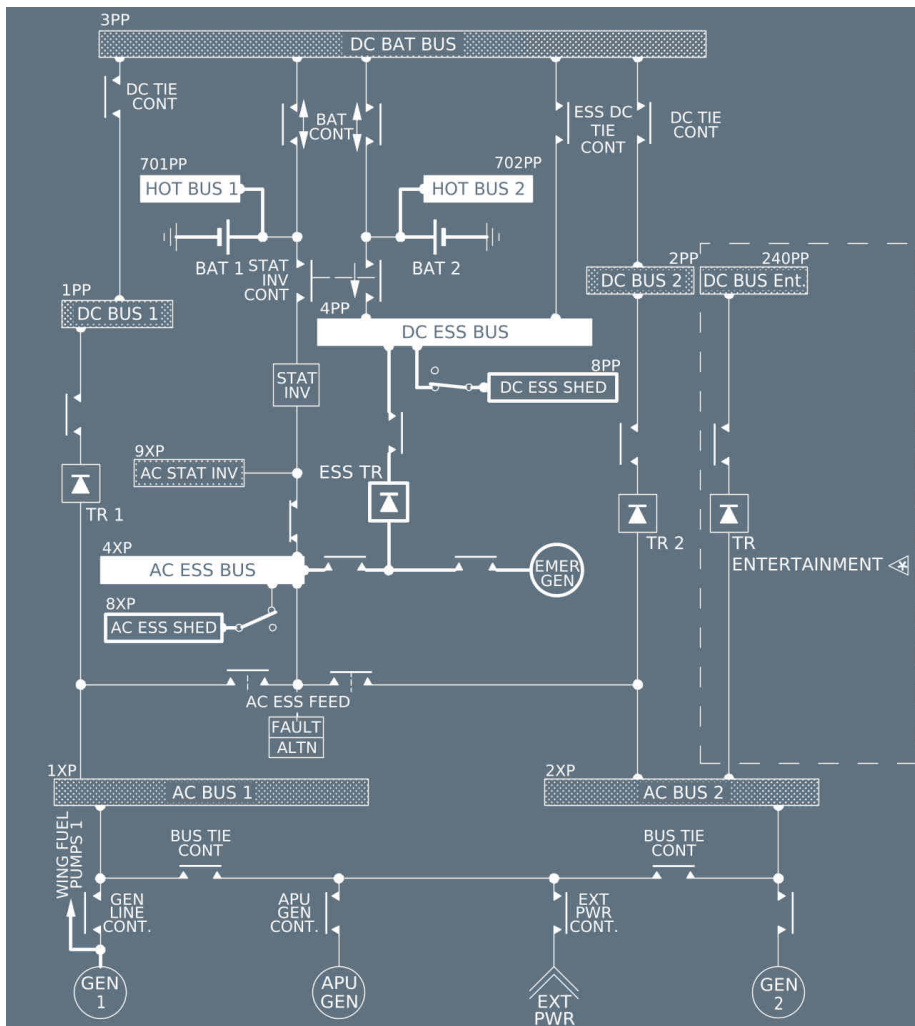
SMOKE CONFIGURATION

Ident.: DSC-24-10-30-30-00017764.0002001 / 21 MAR 16

Applicable to: ALL

In this configuration the main busbars are shed. The electrical distribution is the same as it is in the emergency electrical configuration (loss of main generators), except the fact that in smoke configuration the fuel pumps are connected upstream of the GEN 1 line connector. The procedure sheds approximately 75 % of electrical equipment. All equipment that remains powered is supplied via the circuit breakers on the overhead panel (except for equipment supplied by hot buses).





Note: ECAM ELEC page is identical to that for emergency generator running.

Distribution Table
DISTRIBUTION TABLE

Ident.: DSC-24-10-30-40-00017765.0002001 / 12 MAY 23

Applicable to: ALL

	AC BUS 1	AC BUS 2	AC ESS BUS	AC SHED ESS	AC STAT INV	TR 1	TR 2	ESS TR	TR Ent.  (1)	DC BUS 1	DC BUS 2	DC BUS Ent. (1)	DC BAT BUS	DC ESS BUS	DC SHED ESS	HOT BUS 1	HOT BUS 2
NORM CONF	GEN 1	GEN 2	GEN 1	GEN 1	-	GEN 1	GEN 2	-	GEN 2	TR 1 GEN 1	TR 2 GEN 2	TR 1 GEN 2	TR 1 GEN 1	TR 1 GEN 1	TR 1 GEN 1	BAT 1	BAT 2
ONE GEN INOP AVAIL-X- (1, 2 or APU)	GEN X	GEN X	GEN X	GEN X	-	GEN X	GEN X	-	GEN X	TR 1 GEN X	TR 2 GEN X	TR 1 GEN X	TR 1 GEN X	TR 1 GEN X	TR 1 GEN X	BAT 1	BAT 2
EMER CONF • BEFORE EMER GEN AVAILABILITY (about 8 s)	-	-	ST INV BAT1	-	ST INV BAT1	-	-	-	-	-	-	-	-	BAT 2	-	BAT 1	BAT 2
• EMER GEN RUNNING	-	-	EMER GEN	EMER GEN	-	-	-	EMER GEN	-	-	-	-	-	ESS TR EMER GEN	ESS TR EMER GEN	BAT 1	BAT 2
TR 1 FAULT	GEN 1	GEN 2	GEN 1	GEN 1	-	-	GEN 2	GEN 1	-	TR 2 GEN 2	TR 2 GEN 2	-	TR 2 GEN 2	ESS TR GEN 1	ESS TR GEN 1	BAT 1	BAT 2
TR 2 FAULT	GEN 1	GEN 2	GEN 1	GEN 1	-	GEN 1	-	GEN 1	-	TR 1 GEN 1	TR 1 GEN 1	-	TR 1 GEN 1	ESS TR GEN 1	ESS TR GEN 1	BAT 1	BAT 2
TR 1 + 2 FAULT	GEN 1	GEN 2	GEN 1	GEN 1	-	-	-	GEN 1	-	-	-	-	-	ESS TR -GEN 1	ESS TR -GEN 1	BAT 1	BAT 2

(1) Two generators are needed to supply the DC BUS Entertainment  , except on ground, where the APU generator (if not overloaded) or the external power is sufficient.

AIRCRAFT SYSTEMS
ELECTRICAL

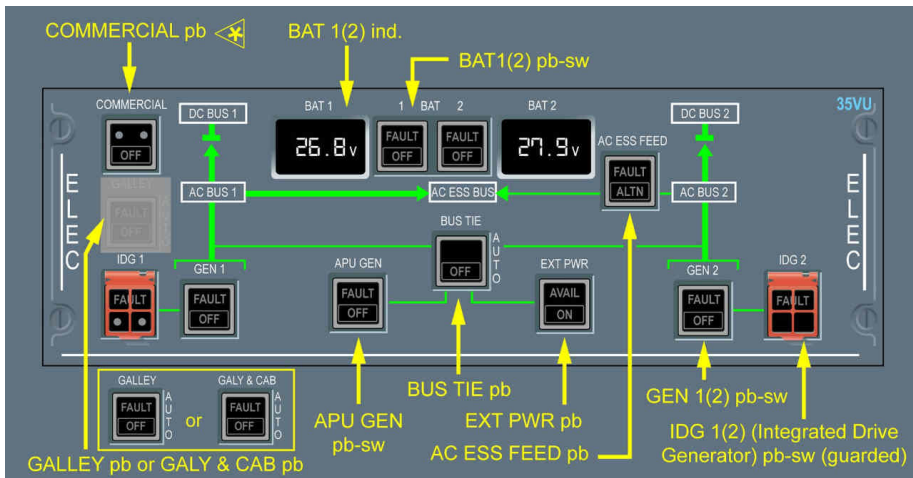
DESCRIPTION - OPERATIONS

ON GROUND BAT ONLY	AC BUS 1	AC BUS 2	AC ESS BUS	AC SHED ESS	AC STAT INV	TR 1	TR 2	ESS TR	TR Ent.	DC BUS 1	DC BUS 2	DC BUS Ent.	DC BAT BUS	DC ESS BUS	DC SHED ESS	HOT BUS 1	HOT BUS 2
Speed > 100 kt	-	-	EMER GEN	EMER GEN	-	-	-	EMER GEN	-	-	-	-	-	ESSE TR EMER GEN	ESSE TR EMER GEN	BAT 1	BAT 2
Rat stall or 50 kt < speed ≤ 100 kt	-	-	ST INV BAT1	-	ST INV BAT1	-	-	-	-	-	-	-	BAT 1-2	BAT 2	-	BAT 1	BAT 2
Speed ≤ 50 kt	-	-	-	-	ST INV BAT1	-	-	-	-	-	-	-	BAT 1-2	BAT 2	-	BAT 1	BAT 2

OVERHEAD PANEL

Ident.: DSC-24-20-00017766.0004001 / 15 MAY 25

Applicable to: ALL



BAT 1(2) IND.



Shows battery voltage.

BAT 1(2) pb-sw


Controls the operation of the corresponding battery charge limiter.

The battery charge limiter controls automatically the connection and the disconnection of the corresponding battery to the DC BAT BUS (3 PP) by closing and opening of the battery line contactor.

- The batteries are connected to the DC BAT BUS in the following cases:
 - APU starting (MASTER SW pb-sw at ON and N less than 95 %)

Note: *The connection is limited to 3 min when the emergency generator is running.*

- Battery voltage below 26.5 V (battery charge). The charging cycle ends when battery charge current goes below 4 A.
 - On ground, immediately
 - In flight, after a time delay of 30 min.
- Loss of AC BUS 1 and 2 when below 100 kt (EMER GEN not supplying).
- If AC BUS 1 and 2 are not energized and the EMER GEN is not supplying:
 - Battery 1 supplies the AC STAT INV BUS, and, if speed is greater than 50 kt, the AC ESS BUS
 - Battery 2 supplies the DC ESS BUS.

Note: *In normal configuration the batteries are disconnected most of the time.*

Note: *A battery automatic cut-off logic prevents the batteries from discharging completely when the aircraft is on the ground (parking).*

Automatic battery contactors open when:

- The aircraft is on the ground
- The BAT pb switches are at AUTO
- The main power supply (EXT PWR + GEN) is cut off
- Battery voltage is low.

The flight crew can reset the contactors by switching the BAT pb-sw to OFF then to AUTO.



The battery charge limiter is not operating: the battery line contactor is open. The DC BAT BUS is supplied. Hot buses remain supplied.



The battery charge limiter is in fault. It is accompanied by an ECAM alert, when the charging current for the corresponding battery is outside limits. In this case the battery contactor opens.

IDG 1(2) (Integrated Drive Generator) pb-sw (GUARDED)



CAUTION

1. Maintaining the IDG pb-sw during more than 3 s may damage the IDG disconnection mechanism.
2. Disconnect the IDG only when the engine is running or windmilling. If not, the IDG will be damaged when starting the engine.

The IDG switches are normally springloaded out.

Pressing this switch disconnects the IDG from its driveshaft: only maintenance personnel can reconnect it.



The FAULT light comes on, if:

- IDG oil outlet overheats (above 180 °C), or
 - IDG oil pressure is low (inhibited at low engine speed: N2 below 14 %).
- It extinguishes when the IDG is disconnected.

Note: An automatic thermal disconnection of the IDG will occur if the temperature reaches 200 °C.

GEN 1 (2) pb-sw



The generator field is energized and the line contactor closes if electrical parameters are normal.



The generator field is de-energized and the line contactors opens. The fault circuit is reset.



The FAULT light comes on, if:

- The associated generator control unit (GCU) trips it

Note: If a differential fault trips the protection, reset action has no effect after two attempts.

- Opening of the line contactor (except if the GEN pb-sw is selected OFF).

APU GEN pb-sw



The APU generator field is energized and the line contactor closes if parameters are normal and the EXT PWR line contactor is open. The bus tie contactor 1(2) closes automatically if GEN 1(2) is not operating.



The generator field is de-energized and the line contactor opens. The fault circuit is reset.

L12



Same as GEN 1 or GEN 2 FAULT.

Associated with the following ECAM alert: **ELEC APU GEN FAULT** (*Refer to procedure*).

The APU GEN FAULT light is inhibited when:

- APU speed is too low, or
- The APU GEN line contactor opens after EXT PWR or ENG GEN takes over.

BUS TIE pb



The bus tie contactors (BTCs) automatically open or close to maintain power supply to both AC BUS 1 and 2.

- One contactor is closed, when:
 - One engine generator supplies the associated AC BUS, and
 - The APU generator, or external power supplies the other side.
- Both contactors are closed during single-engine operation, or operation on the APU generator, or external power supply.



Both bus tie contactors open.

AC ESS FEED pb



The AC ESS BUS is supplied by AC BUS 1.



The AC ESS BUS is supplied by AC BUS 2. Comes on when manually selected.

Note: With the AC ESS FEED Auto Switching , AC BUS 2 will automatically supply AC ESS BUS when AC BUS 1 is lost.



The FAULT light come on, when the AC ESS BUS is not electrically-supplied.

Note: In case of a total loss of the main generators, the AC ESS BUS is automatically supplied by the emergency generator, or by the static inverter, if the emergency generator is not available.

GALLEY pb OR GALY & CAB pb



Main galley, secondary galley, in-seat power supply  and IFE  system (prerecorded announcement, telephone system, video/airshow, music...), are supplied.

The main galley, the in-seat power supply  and the IFE  systems are automatically shed:

- In flight: When only one generator is operating
- On ground: When only one engine generator is operating. (All galleys are available when the APU GEN or EXT PWR is supplying power.)

Note: With the Galley Load Automatic Shedding  the secondary galley is also automatically shed.



The main galley, secondary galley, in-seat power supply  and IFE  system (prerecorded announcement, telephone system, video/airshow, music) are not supplied.

The electrical supply of the heating floor panels is shed.



The FAULT light comes on, when the load on any generator is more than 100 % of rated output.

EXT PWR pb



- External power is plugged in, and
- External power parameters are normal.

When pressed:



- The external power line contactor closes.



- The external power line contactor opens.

AIRCRAFT SYSTEMS

ELECTRICAL

CONTROLS AND INDICATORS

- Note:**
1. External power has priority over the APU generator. The engine generators have priority over external power.
 2. The ON light stays on, even when the engine generators supply the aircraft.

COMMERCIAL pb



All aircraft commercial electrical loads are supplied:

- Cabin and cargo lights
- Water and toilet system
- Drain mast ice protection
- Galley
- Passenger entertainment system
- Semi-automatic cargo loading.

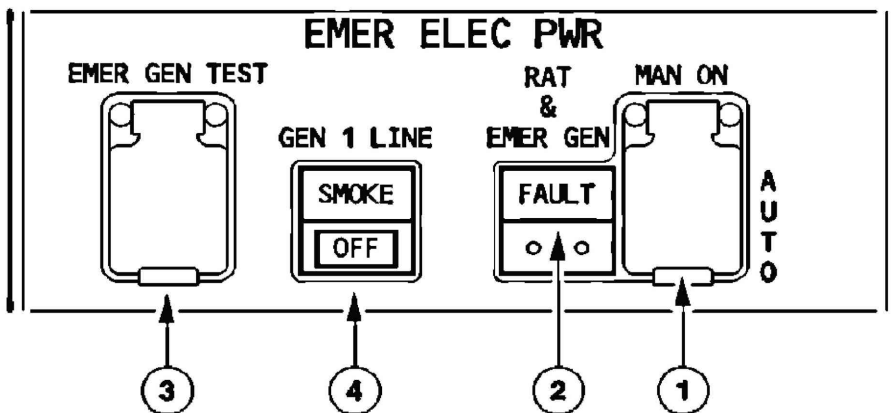


Switches off all aircraft commercial electrical loads.

OVERHEAD PANEL (CONT'D)

Ident.: DSC-24-20-00017778.0002001 / 21 MAR 17

Applicable to: ALL



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(1) MAN ON pb (guarded)

AUTO : When the following conditions are met:

- AC BUS 1 is not electrically supplied, and
- AC BUS 2 is not electrically supplied, and
- Aircraft speed is greater than 100 kt.

- The RAT extends, and
- The blue hydraulic system drives the emergency generator.

As soon as the emergency generator electrical parameters are within tolerance the emergency generator is connected to the aircraft network.

Pressed : This selects manual RAT extension.

Emergency generator coupling occurs 3 s after the RAT supplies the emergency generator.

(2) FAULT light

This light comes on red if the emergency generator is not supplying power when AC BUS 1 and AC BUS 2 are not powered.

(3) EMER GEN TEST pb (guarded)

Pressed and held:

- If AC NORMAL BUSES are supplied:
 - The EMER GEN is driven hydraulically if the blue electric pump is running.
The AC ESS BUS and the DC ESS BUS are connected to the emergency generator.
(The DC ESS SHED and AC ESS SHED buses are not powered.)
 - ECAM displays the ELEC page automatically (only on the ground).
- If only the batteries supply the aircraft:
 - The static inverter powers the AC ESS BUS.

(4) GEN 1 LINE pb-sw

OFF : GEN 1 line contactor opens.

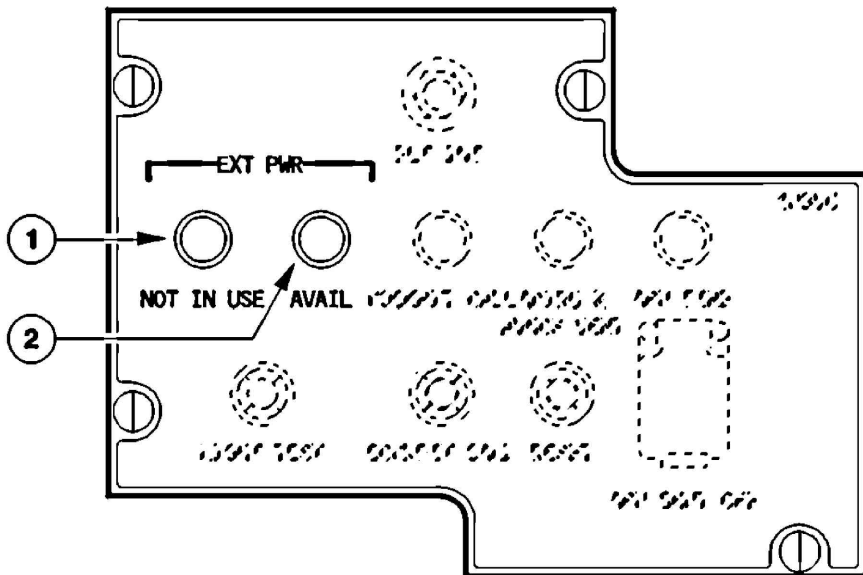
The AC BUS 1 channel is supplied from GEN 2 through bus tie contactors. This is used for smoked drill.

SMOKE : *Refer to DSC-26-30-20 GEN 1 LINE pb-sw.*
light

EXTERNAL POWER PANEL

Ident.: DSC-24-20-00000891.0001001 / 21 MAR 16

Applicable to: ALL



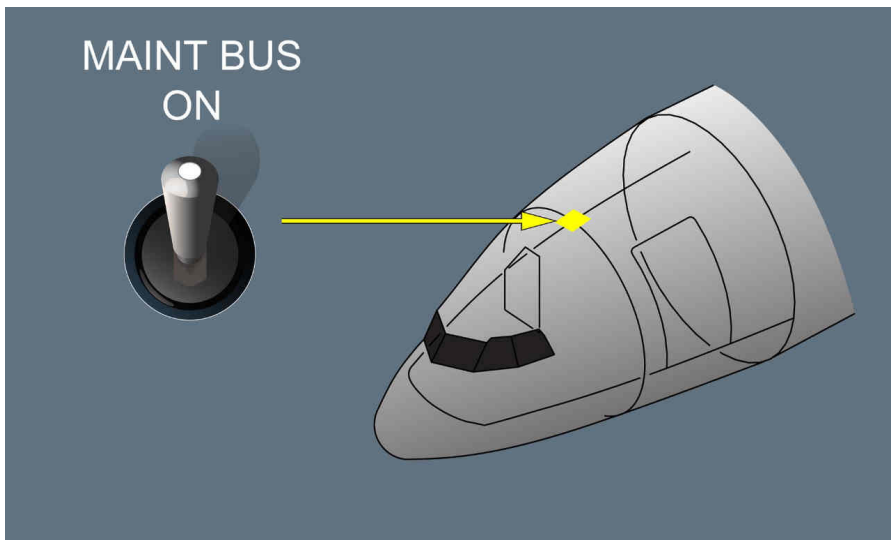
- (1) EXT PWR NOT IN USE
This white light comes on to inform ground personnel that the ground power unit is not supplying the aircraft network and can be removed.
- (2) EXT PWR AVAIL
This amber light comes on to indicate that external power is available and the voltage is correct.

FORWARD CABIN

Ident.: DSC-24-20-00000892.0001001 / 10 MAY 21

Applicable to: ALL

MAINT BUS SW:



This switch allows personnel to energize electrical circuits for ground servicing without energizing the entire aircraft electrical system.

AIRCRAFT SYSTEMS
ELECTRICAL
CONTROLS AND INDICATORS

 MAINT BUS
ON


The switch latches magnetically if external power is connected and normal (AVAIL light on).

The AC and DC GND/FLT buses have power and the following loads can be energized:

- Passenger compartment lighting
- Galley lighting
- Entrance area lights
- Lavatory lighting and service
- Vacuum cleaner sockets
- Flight compartment service outlets
- Hydraulic pump (yellow system)
- Flight compartment flood lighting
- Fuel quantity indications
- Refueling
- Cargo hold lighting
- Main and nose landing gear compartment lighting
- Belly fairing panel service outlets
- Ground call
- Equipment compartment lights and service outlets
- Navigation lights
- Passenger address
- Interphone.

The switch trips when the external source is removed.

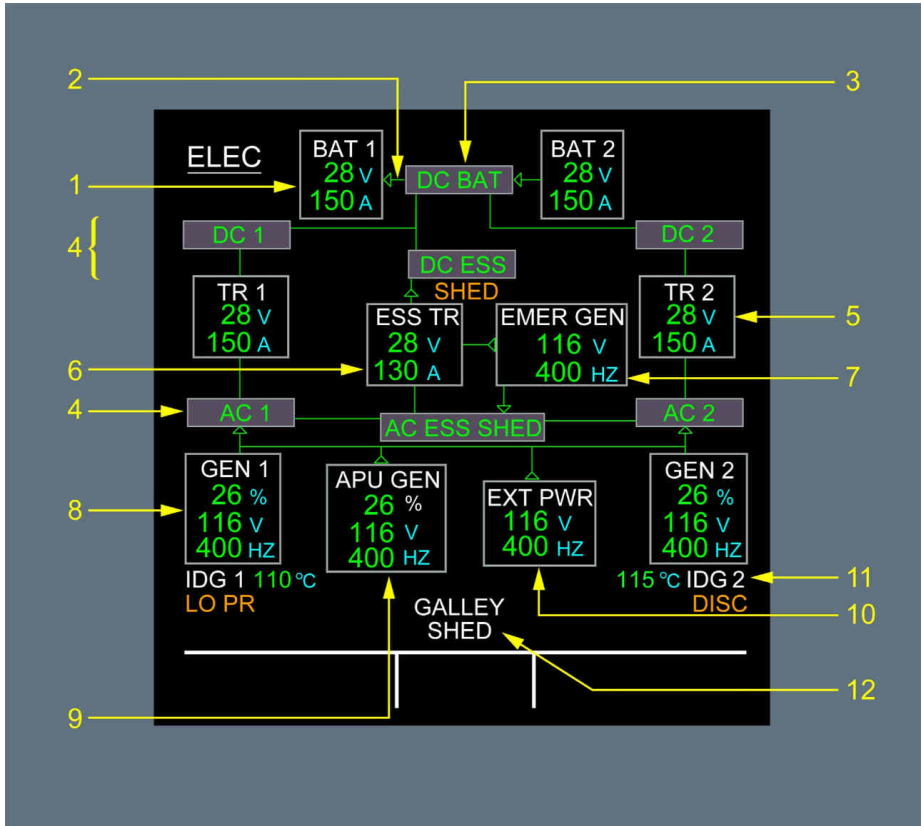
 MAINT BUS
ON


The AC and DC GND/FLT buses are connected to AC BUS 2 and DC BUS 2.

ECAM ELEC PAGE

Ident.: DSC-24-20-00017780.0002001 / 13 MAY 25

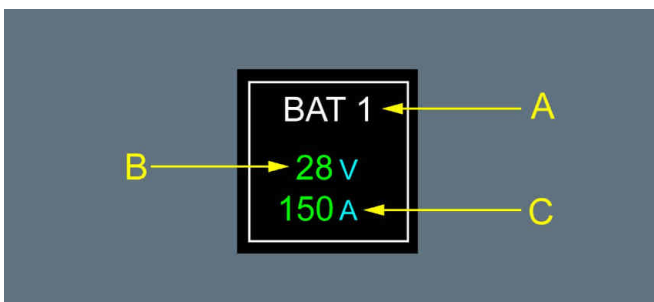
Applicable to: ALL



- (1) Battery indications
BAT pb-sw at OFF:



BAT pb-sw at Auto:



(A) BAT 1(2) Indication

BAT 1

Normal operation.

BAT 1

This indication is displayed when:

- Battery voltage and battery current indications become amber,
- or
- In case of a BAT FAULT alert.

(B) Battery voltage indication

28 V

The battery voltage is normal.

19 V

The battery voltage is below 25 V, or above 31 V.

(C) Battery current indication

1 A

The battery current is normal.

10 A

The battery discharge current is above 5 A.

(2) Battery charge/discharge indication



Battery contactor closed. Battery charging current is above 1 A.



Battery contactor closed. Battery discharge current is above 1 A.



Battery contactor closed. Battery current is less than 1 A.



Battery contactor open.

(3) DC BAT indication



The DC battery is normal.



The DC battery voltage is equal to, or less than 25 V.

(4) Bus bar indication



The bus bar is normal.

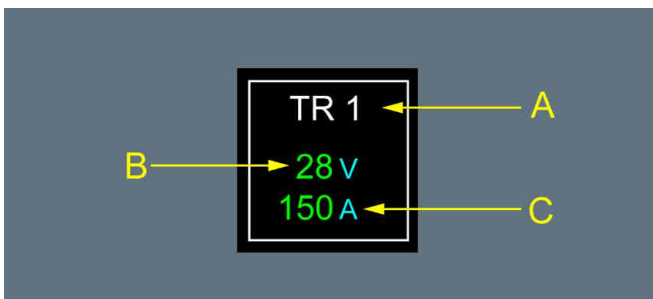


The corresponding bus bar is not powered.



SHED appears when AC or DC SHED ESS BUS is shed.

(5) TR 1(2) indication



AIRCRAFT SYSTEMS
ELECTRICAL

CONTROLS AND INDICATORS

 (A) TR legend indication


The TR is powered.



This indication is displayed when:

- The TR voltage indication becomes amber, and
- The TR current indication becomes amber.

 (B) TR voltage indication


The TR voltage is normal.



The TR voltage is below 25 V, or above 31 V.

 (C) TR current indication

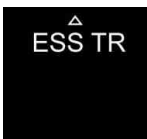

The TR current is normal.



The TR current is equal to, or below 5 A.

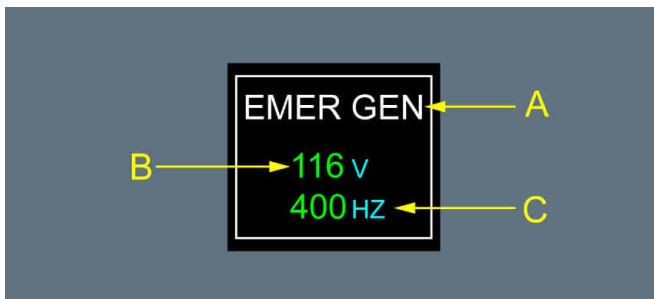
 (6) ESS TR indication


The ESS TR is normal. This legend follows the logic of the above-noted TR 1(2) legend.



The ESS TR contactor is open.

(7) EMER GEN indication



(A) EMER GEN legend indication

EMER GEN

Normal operation.

EMER GEN

This indication is displayed when:

- The EMER GEN voltage indication becomes amber, or
- The EMER GEN frequency indication becomes amber.

(B) EMER GEN voltage indication

116 v

The EMER GEN voltage is normal.

135 v

The EMER GEN voltage is below 110 V, or above 120 V.

(C) EMER GEN frequency indication

400 HZ

The EMER GEN frequency is normal.

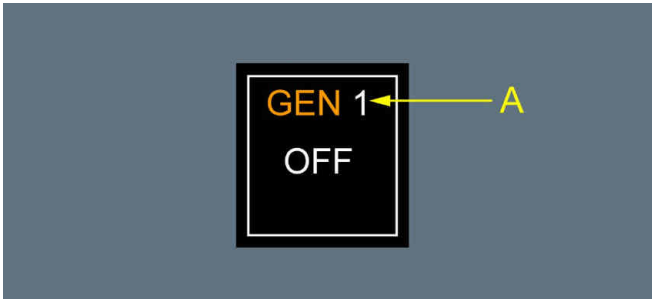
425 HZ

The EMER GEN frequency is below 390 Hz, or above 410 Hz.

Note: The voltage and frequency indications are not displayed, when the EMER GEN line contactor is open.

(8) GEN 1(2) indications

When the GEN pb-sw is OFF:



(A) GEN number indication

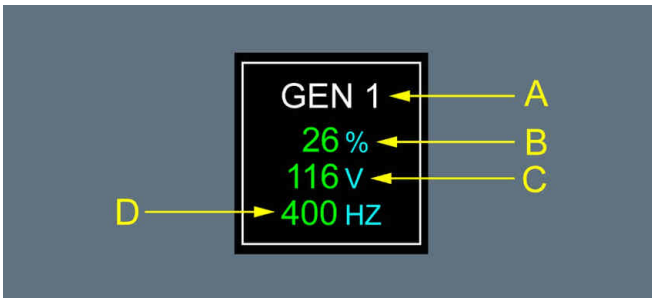
1

The associated engine is running.

1

The associated engine is not running.

When the GEN pb-sw is ON:



(A) GEN legend indication

GEN 1

Normal operation.

GEN 1

The GEN operation becomes amber, if:

- The GEN load indication becomes amber, or
- The GEN voltage indication becomes amber, or
- The GEN frequency indication becomes amber.

(B) GEN load indication

42 %

Normal operation.

110 %

The engine generator load is above 100 %.

(C) GEN voltage indication

115 v

The engine generator voltage is normal.

125 v

The engine generator voltage is below 110 V, or above 120 V.

(D) GEN frequency indication

400 HZ

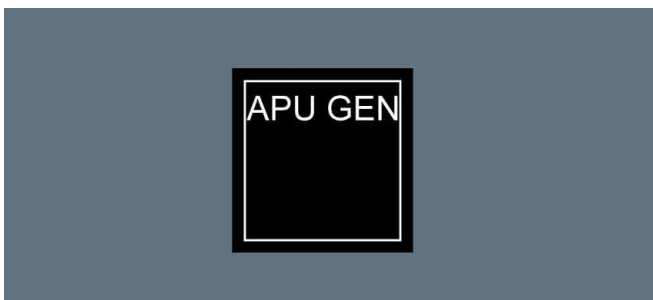
The engine generator frequency is normal.

413 HZ

The engine generator frequency is below 390 Hz, or above 410 Hz.

(9) APU GEN indications

When the APU MASTER SW is OFF regardless of the position of the APU GEN pb-sw:

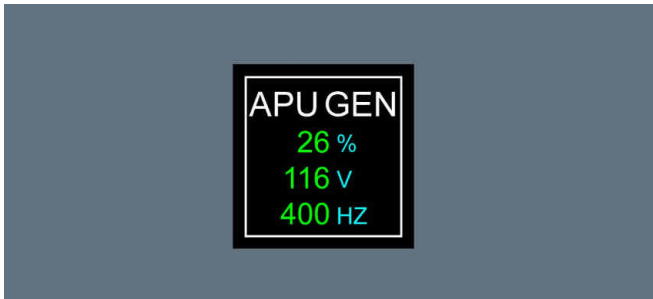


When the APU MASTER SW is ON, and the APU GEN pb-sw is OFF:



When the APU MASTER SW is ON, and the APU GEN pb-sw is ON:

The indications are the same as for GEN 1(2).

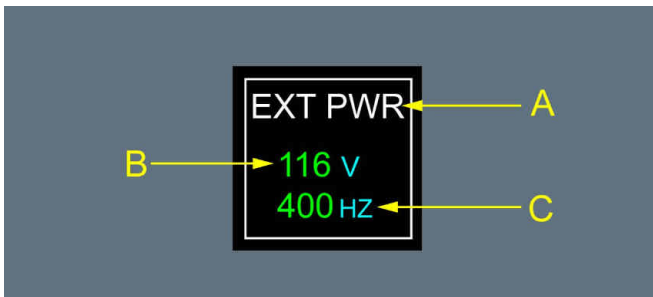


(10) EXT PWR indications

When external power is not available:



When external power is available:



(A) EXT PWR legend indication



Normal operation.



The external power operation becomes amber, if:

- The external power voltage indication becomes amber, or
- The external power frequency indication becomes amber.

(B) EXT PWR voltage indication



The external power voltage is normal.



The external power voltage is below 110 V, or above 120 V.

(C) EXT PWR frequency indication

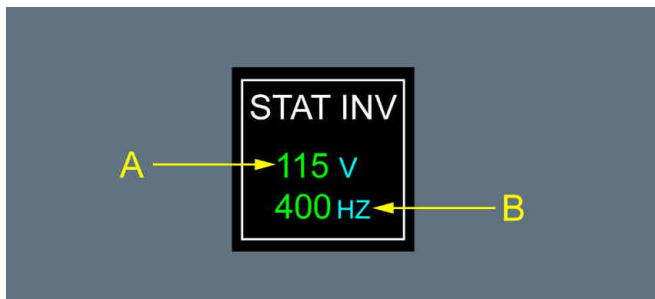


The external power frequency is normal.



The external power frequency is below 390 Hz, or above 410 Hz.

During the static inverter test, and when pressing the ELEC pb on the ECAM control panel while ESS BUSES are supplied by the batteries:



(A) STAT INV voltage indication



The static inverter voltage is normal.



The static inverter voltage is below 110 V, or above 120 V.

(B) STAT INV frequency indication

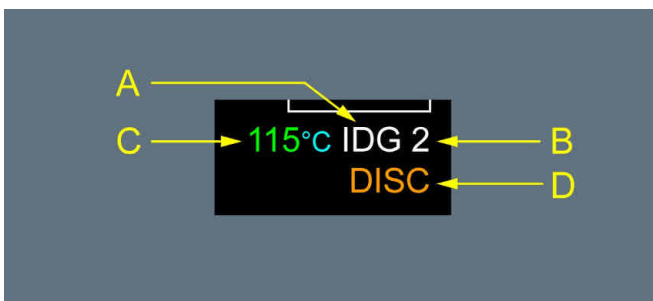
400 HZ

The static inverter frequency is normal.

413 HZ

The static inverter frequency is below 390 Hz, or above 410 Hz.

(11) IDG indications



(A) IDG legend indication

IDG

Normal operation.

IDG

This indication is displayed, when:

- IDG oil outlet temperature overheat (above 180 °C), or
- IDG oil pressure gets too low, or
- IDG disconnection.

(B) IDG number indication

2

The associated engine is running.

2

The associated engine is not running and the FADEC is powered.

(C) IDG oil outlet temperature indication

72 °C

Normal operation.

153 °C

It pulses in case of advisory (when the temperature is above 147 °C and when it is at or below 180 °C).

187 °C

There is an overheat on the IDG (above 180 °C).

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(D) DISC/LO PR indication

DISC

The IDG is disconnected.

LO PR

This legend appears when IDG low pressure is detected and the associated engine is running.

(12) GALLEY SHED indication

**GALLEY
SHED**

This legend appears when:

- The GALLEY pb-sw is OFF, or
- The main galleys are shed, meaning:
 - In flight, only one generator is operating.
 - On ground, the aircraft is being supplied by one engine generator only.

MEMO DISPLAY

Ident.: DSC-24-20-00016808.0001001 / 21 MAR 16

Applicable to: ALL

EMER GEN : This memo appears in green, when the emergency generator is running.

AIRCRAFT SYSTEMS

ELECTRICAL

CONTROLS AND INDICATORS

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AIRCRAFT SYSTEMS

EQUIPMENT

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DSC-25-10 Flight Deck

DSC-25-10-10 General

General.....	A
Principles For Pushbuttons With Integrated Indications.....	B
General Arrangement.....	C

DSC-25-10-20 Cockpit Plan

General.....	A
Right Rear Corner.....	B
Left Rear Corner.....	C

DSC-25-10-30 Seats

Pilot Seats.....	A
Pilot Seat Mechanical Adjustment.....	B
Pilot Seat Electrical Adjustment.....	C
Head Rest Adjustment 	D
Armrest Adjustment.....	E
Observer Seat.....	F
Observer Seat Adjustment.....	G
Pilot Seat Outboard Armrest Adjustment.....	H

DSC-25-10-40 Main Instrument Panels

Main Instrument Panel - Captain Side.....	A
Main Instrument Panel - First Officer Side.....	B

DSC-25-10-50 Pedestal

Pedestal.....	A
---------------	---

DSC-25-10-60 Overhead Panel

Overhead Panel.....	A
---------------------	---

DSC-25-10-70 C/B Panels

C/B Panels.....	A
-----------------	---

DSC-25-10-80 Foot Warmer (If Installed)

General.....	A
Controls.....	B

DSC-25-20 Emergency Equipment

Emergency Equipment.....	A
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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS EQUIPMENT PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS
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Localization Title	Toc Index	ID	Reason
DSC-25-10-20 Right Rear Corner	B	1	Documentation update: Deletion of information.
DSC-25-10-20 Right Rear Corner	B	2	Documentation update: Information "N.00000986.0001001.004" moved from "N.00000986.0001001.001" to "N.00000986.0001001.010"
DSC-25-10-30 Observer Seat	F	1	Addition of information about the use of the cockpit power outlets. Correction of typo from "Headset" to "Headrest and "Headset Unlock" to "Headrest Unlock", and the enhancement of the illustration.
			Documentation update: Deletion of information.

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 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS EQUIPMENT FLIGHT DECK - GENERAL
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GENERAL

Ident.: DSC-25-10-10-00020853.0001001 / 17 MAR 17

Applicable to: ALL

The aircraft and system controls, required for piloting the aircraft, are arranged in such a way that the crew faces forward and all crewmembers can monitor instruments and systems.

The designers concentrated system controls on the overhead panel by making extensive use of pushbuttons, directly installed in the system synoptic.

Note: *This chapter describes the panels and equipment of the basic aircraft configuration, and may not correspond to the customized configuration of a specific aircraft. For more information on the installed equipment or panels, refer to the relevant chapter's system description.*

PRINCIPLES FOR PUSHBUTTONS WITH INTEGRATED INDICATIONS

Ident.: DSC-25-10-10-00000983.0001001 / 21 MAR 16

Applicable to: ALL

Whenever possible, pushbuttons used for corrective actions, have integrated status and failure indications.

The pushbutton positions, and their illuminated indications, follow the "lights out" principle.

- While corresponding to particular aircraft configurations, indications also have the following color codes :

- Warnings

RED : A failure requiring immediate action.

- Cautions

AMBER : A failure, of which the flight crew should be aware, but does not call for immediate action.

- Indications

GREEN : For normal system operation.

BLUE : For normal operation of a system used temporarily

WHITE : - For an abnormal pushbutton position.

- For a test result or maintenance information.

When the aircraft is in a normal configuration, only green lights can be permanently lit, whereas blue lights can be intermittently.

- Pushbutton positions :

POSITION	BASIC FUNCTION
Pressed In	ON, AUTO, OVRD, OPEN
Released Out	OFF, MAN, ALTN, SHUT

Note: 1. Certain pushbutton lights have two dots, indicating that the corresponding part of the pushbutton is not used.

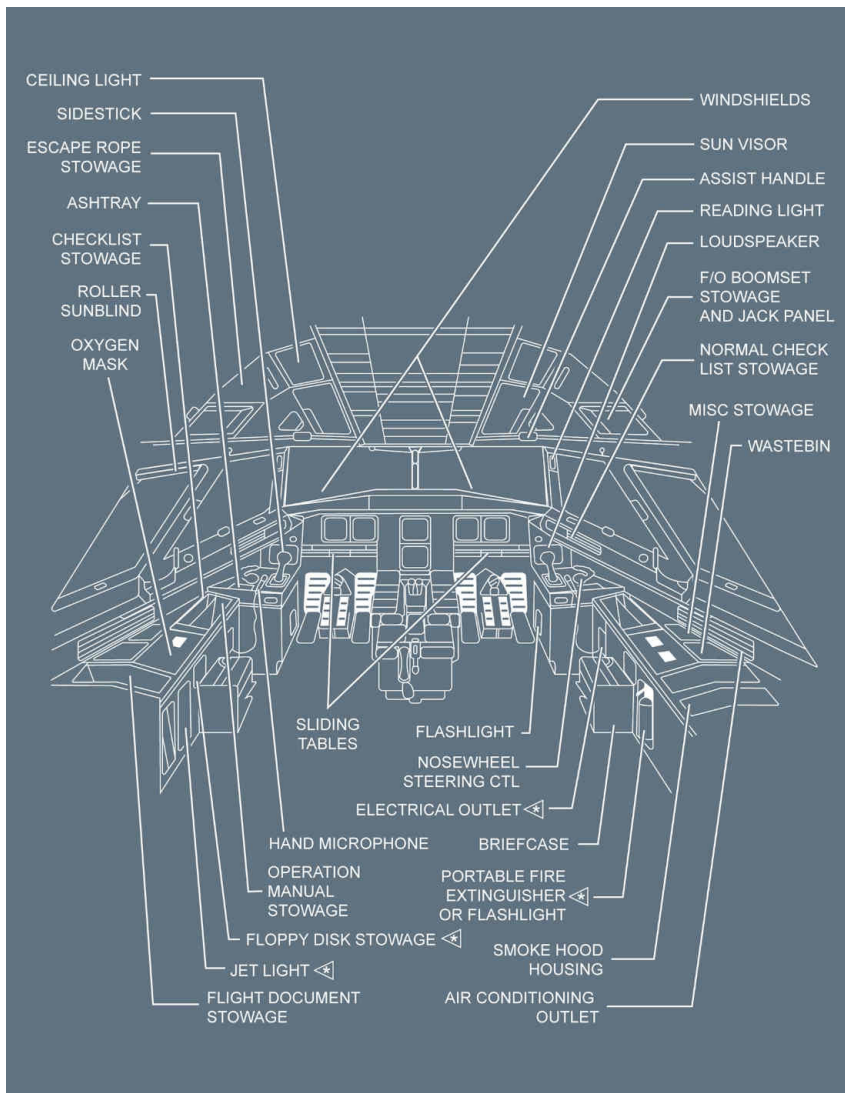
2. Certain pushbuttons do not remain pressed in. These are referred to as "Momentary Action" pushbuttons.

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS EQUIPMENT FLIGHT DECK - GENERAL
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GENERAL ARRANGEMENT

Ident.: DSC-25-10-10-00018419.0001001 / 17 MAR 17

Applicable to: ALL



GENERAL

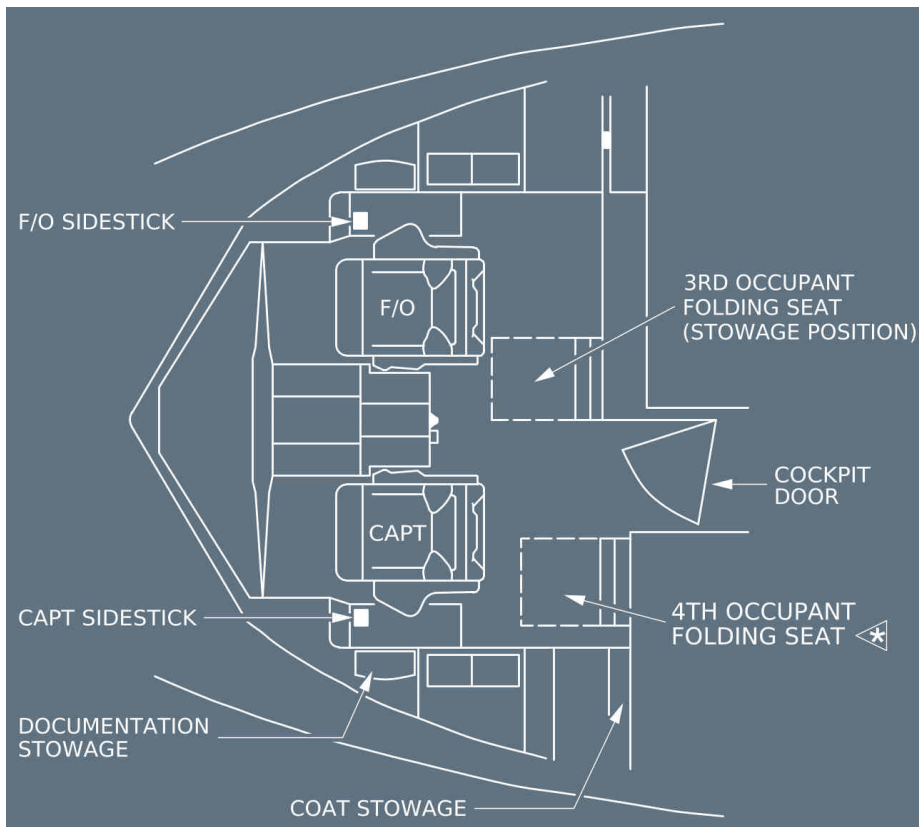
Ident.: DSC-25-10-20-00017002.0001001 / 17 MAR 17

Applicable to: ALL

The cockpit can accommodate two crewmembers, plus a third and fourth occupant  .

The two pilot seats are mounted on columns.

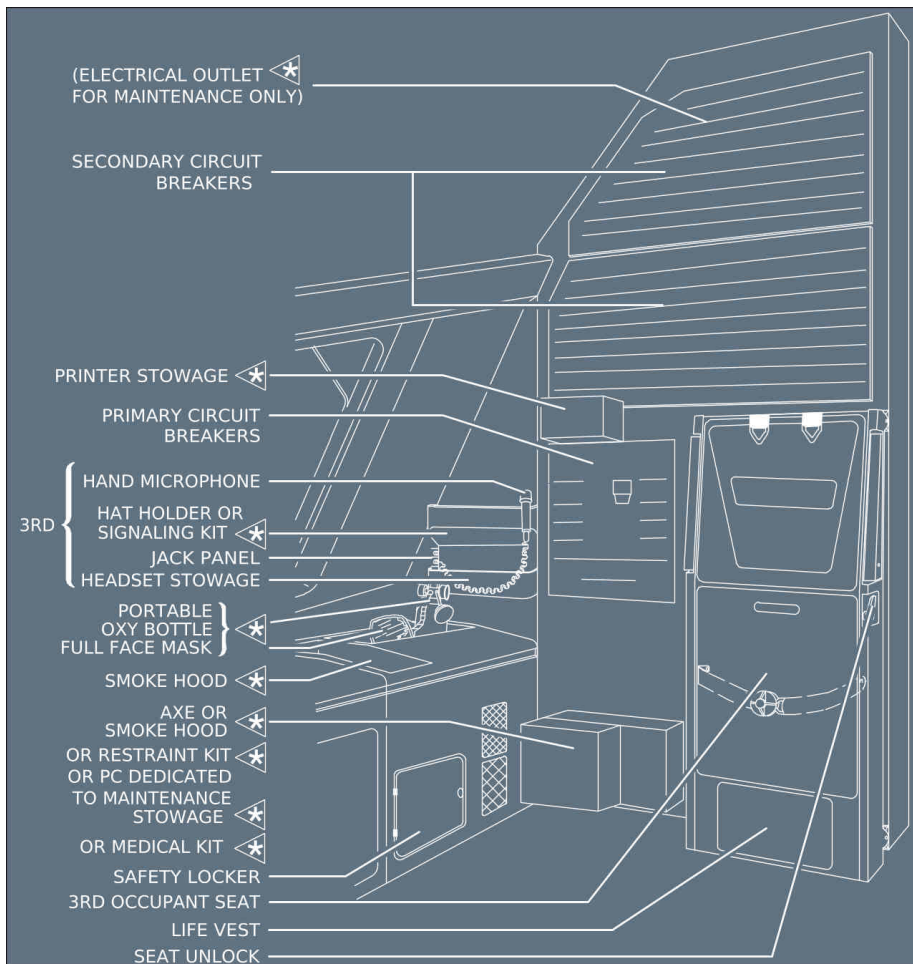
The third and fourth occupant seats are folding seats.



RIGHT REAR CORNER

Ident.: DSC-25-10-20-00000986.0001001 / 06 NOV 25

Applicable to: ALL



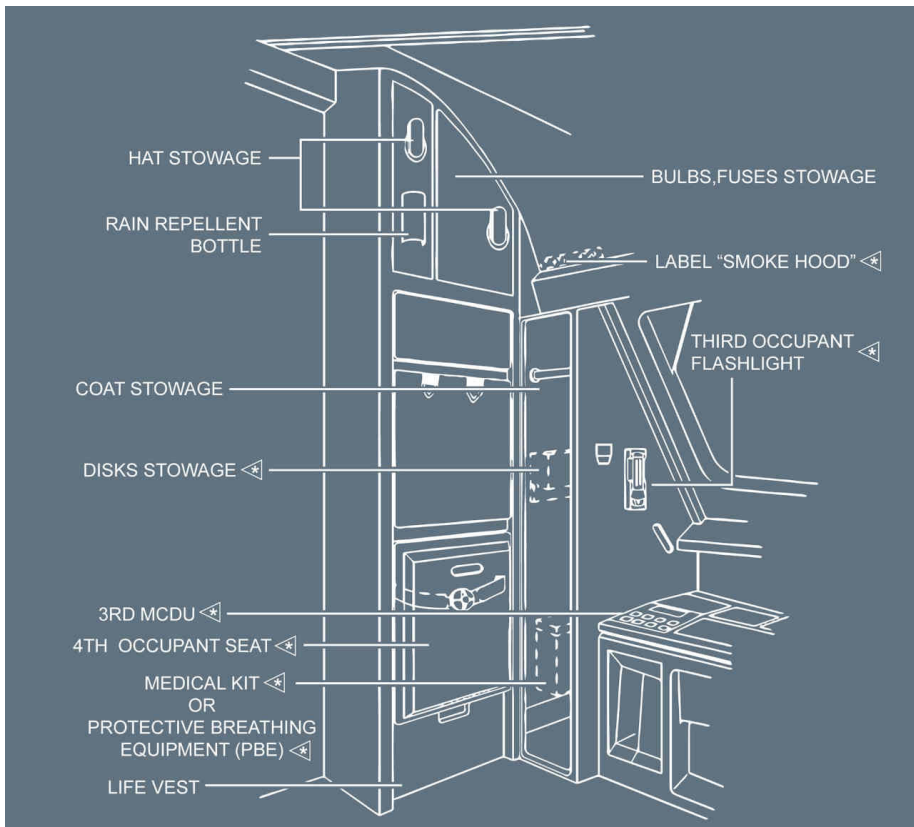
The electrical outlet  (115 VAC / 400 Hz) on the rear of the cockpit is for maintenance use only.

Note: The flight crew can use the power outlet (115 VAC / 60 Hz) installed on the lateral console to power their Portable Equipment Device (PED).

LEFT REAR CORNER

Ident.: DSC-25-10-20-00018428.0001001 / 17 MAR 17

Applicable to: ALL



AIRCRAFT SYSTEMS

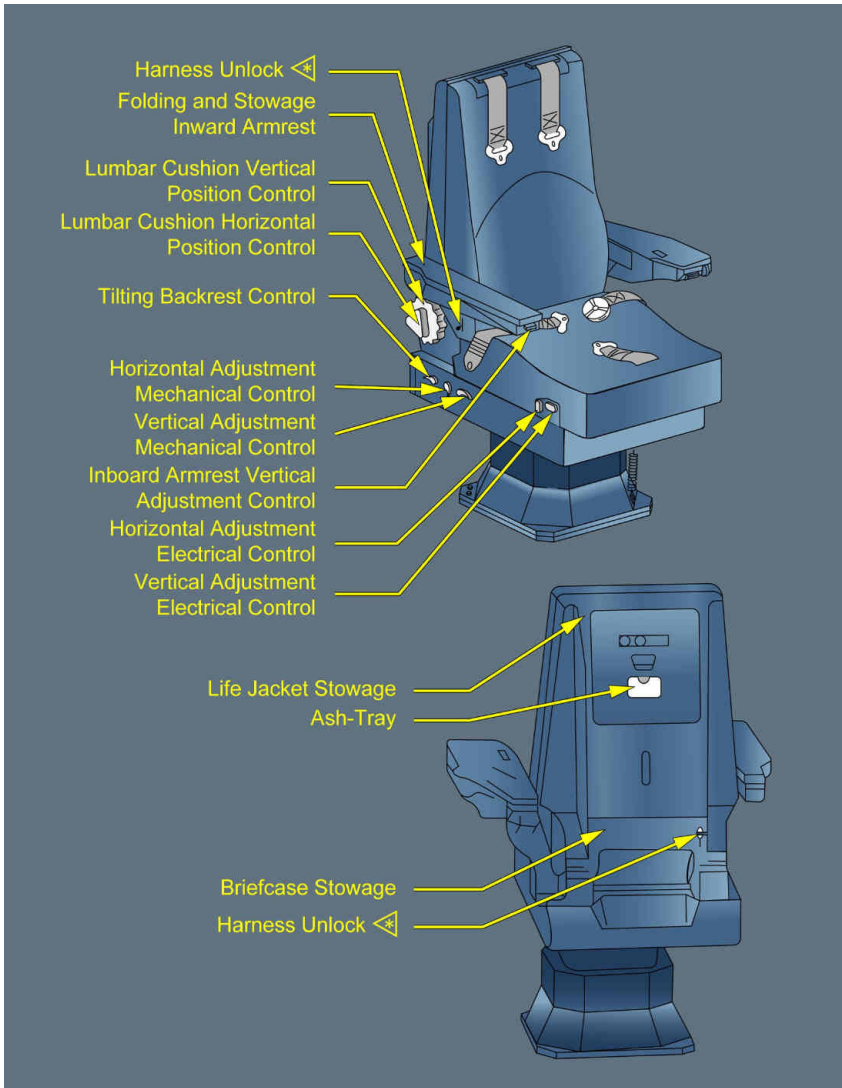
EQUIPMENT

FLIGHT DECK - COCKPIT PLAN

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 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS EQUIPMENT FLIGHT DECK - SEATS
PILOT SEATS	
Ident.: DSC-25-10-30-00018429.0002001 / 26 NOV 19	

Applicable to: ALL



 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS EQUIPMENT FLIGHT DECK - SEATS
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PILOT SEAT MECHANICAL ADJUSTMENT

Ident.: DSC-25-10-30-00000989.0001001 / 17 MAY 24 Applicable to: ALL
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WARNING	For the mechanical adjustment of the pilot seat: - Carefully select the applicable control handle, and place the hand on that handle only - Keep the other hand away from any other areas under the seat.
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To mechanically adjust a seat, the occupant must lift the appropriate control handle. This unlocks the seat so that it may be moved. To return the seat to its spring-loaded locked position, release the control handle. On electrically-powered seats, the mechanical adjustment is a backup: Electrically adjust the seat.

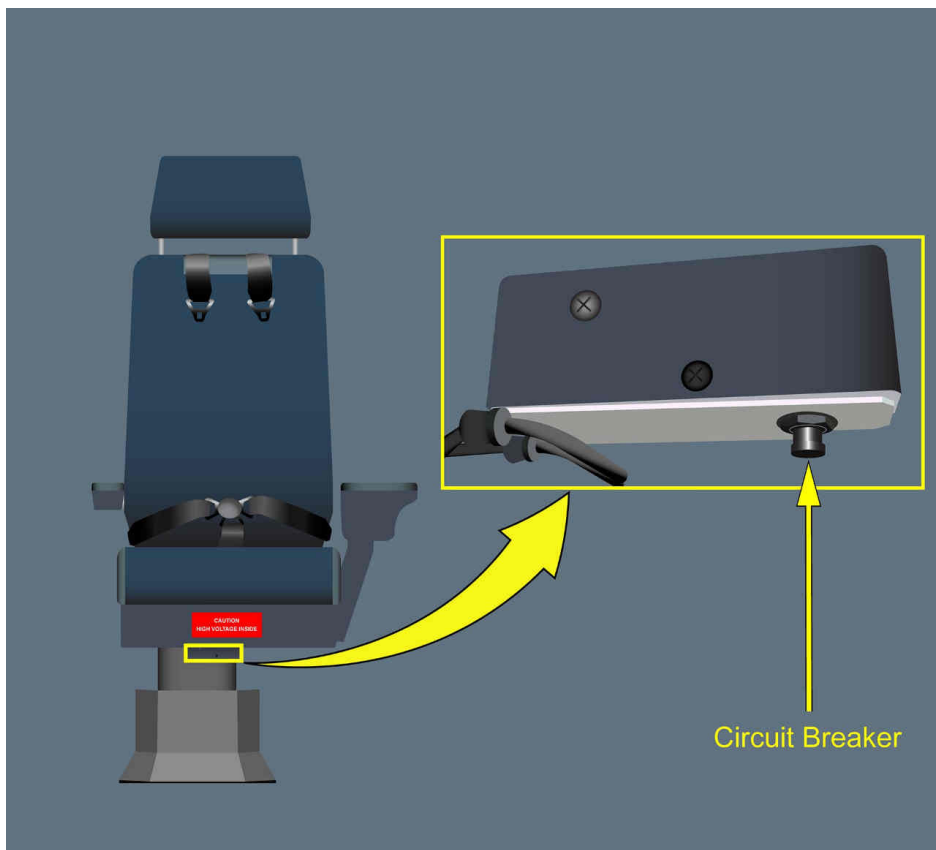
- To adjust the vertical position of the lumbar cushion, the occupant must perform all of the following:
- Pull the control handle to the unlocked position
 - Turn the control handle, in order to adjust the position of the cushion
 - Push the control handle to the locked position.

PILOT SEAT ELECTRICAL ADJUSTMENT

Ident.: DSC-25-10-30-00018405.0001001 / 15 MAY 25 Applicable to: ALL
--

To electrically adjust a seat, the occupant must press the appropriate control switch in the desired direction. When the seat reaches the desired position, the occupant must release the control switch. The control switch then returns to the spring-loaded neutral position.

Note: A circuit breaker is under the seat. When this circuit breaker is pulled, it stops the electrical power to the seat.


HEAD REST ADJUSTMENT

Ident.: DSC-25-10-30-00018406.0001001 / 17 MAR 17

Applicable to: ALL

To adjust the headrest in inclination, the occupant presses the inclination control button, and releases it to lock the position.

To control the height of the headrest, the occupant must push it horizontally, adjust the height, and release it to lock the position.

ARMREST ADJUSTMENT

Ident.: DSC-25-10-30-00000993.0001001 / 21 MAR 17

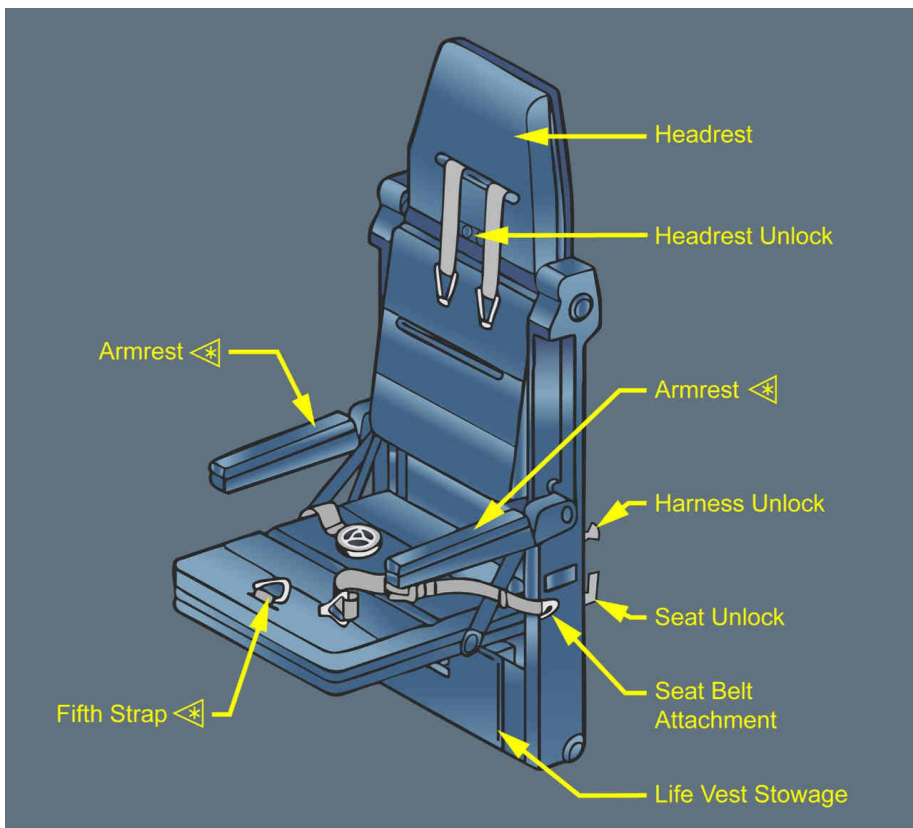
Applicable to: ALL

To adjust the inboard armrest, the occupant must turn the knurled knob, located on the bottom surface of the armrest.

OBSERVER SEAT

Ident.: DSC-25-10-30-00018430.0001001 / 06 NOV 25

Applicable to: ALL



OBSERVER SEAT ADJUSTMENT

Ident.: DSC-25-10-30-00000995.0001001 / 13 MAY 25

Applicable to: ALL

This seat has three positions :

- Normal : Centered on aircraft axis.
- Intermediate : Clear of the cockpit entrance.
- Stowed : Seat vertical and headrest folded back. The seat is not usable in this position, and does not impede access to the documents and equipment on the right side of the cockpit.

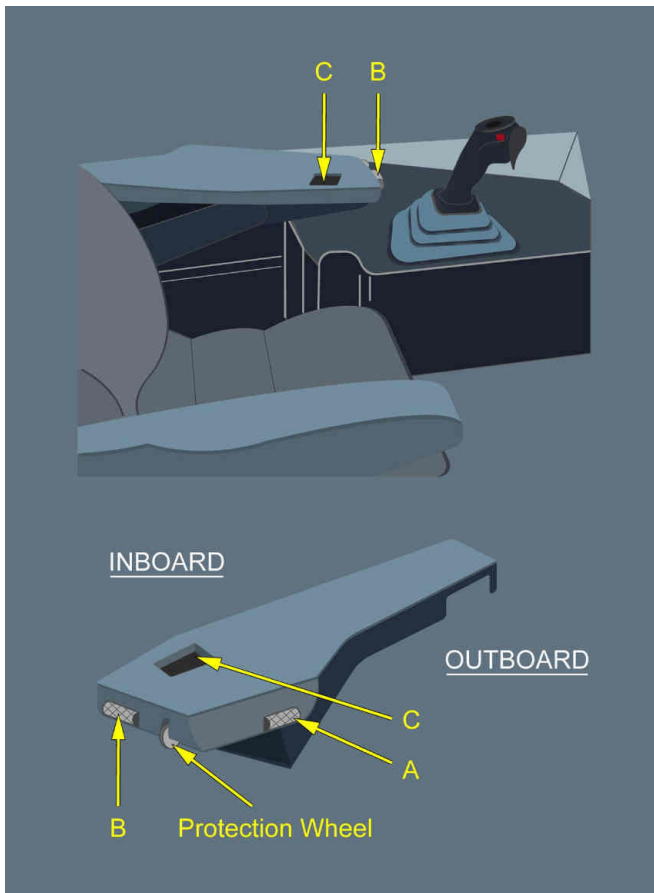
WARNING

After the headrest is unfolded, check that the shoulder harness is correctly installed through the slot in the headrest and not below the headrest unlock, as illustrated. *Refer to DSC-25-10-30 Observer Seat*

PILOT SEAT OUTBOARD ARMREST ADJUSTMENT

Ident.: DSC-25-10-30-00018431.0001001 / 26 NOV 19

Applicable to: ALL



The position of the armrest adjusts as follows:

- A. Height adjustment
- B. Pitch adjustment

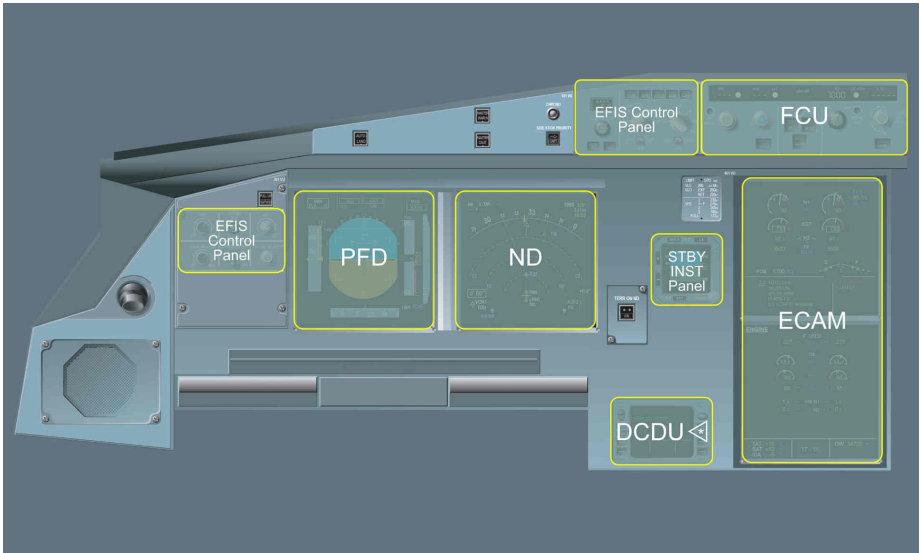
The armrest also has a memory display (C) that displays pitch and height.

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MAIN INSTRUMENT PANEL - CAPTAIN SIDE

Ident.: DSC-25-10-40-00020851.0001001 / 21 MAR 17

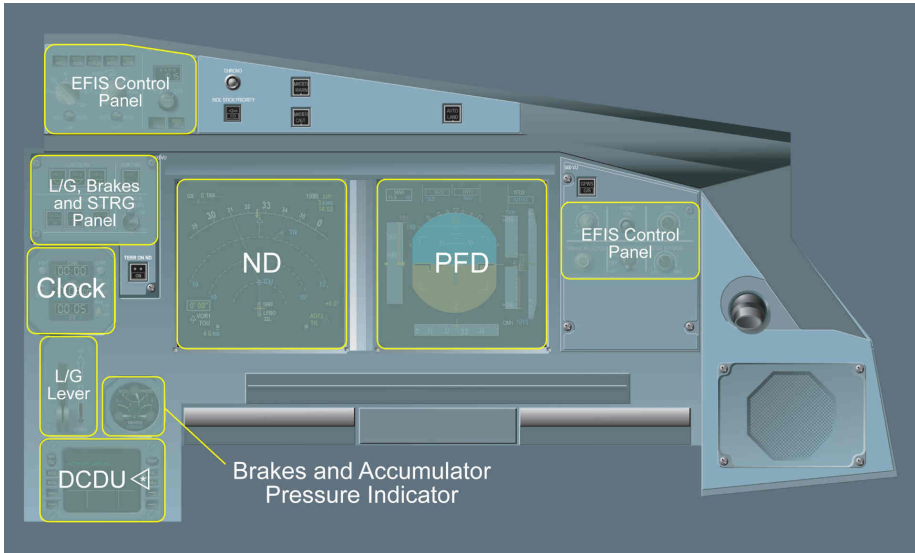
Applicable to: ALL



MAIN INSTRUMENT PANEL - FIRST OFFICER SIDE

Ident.: DSC-25-10-40-00020852.0001001 / 25 MAR 20

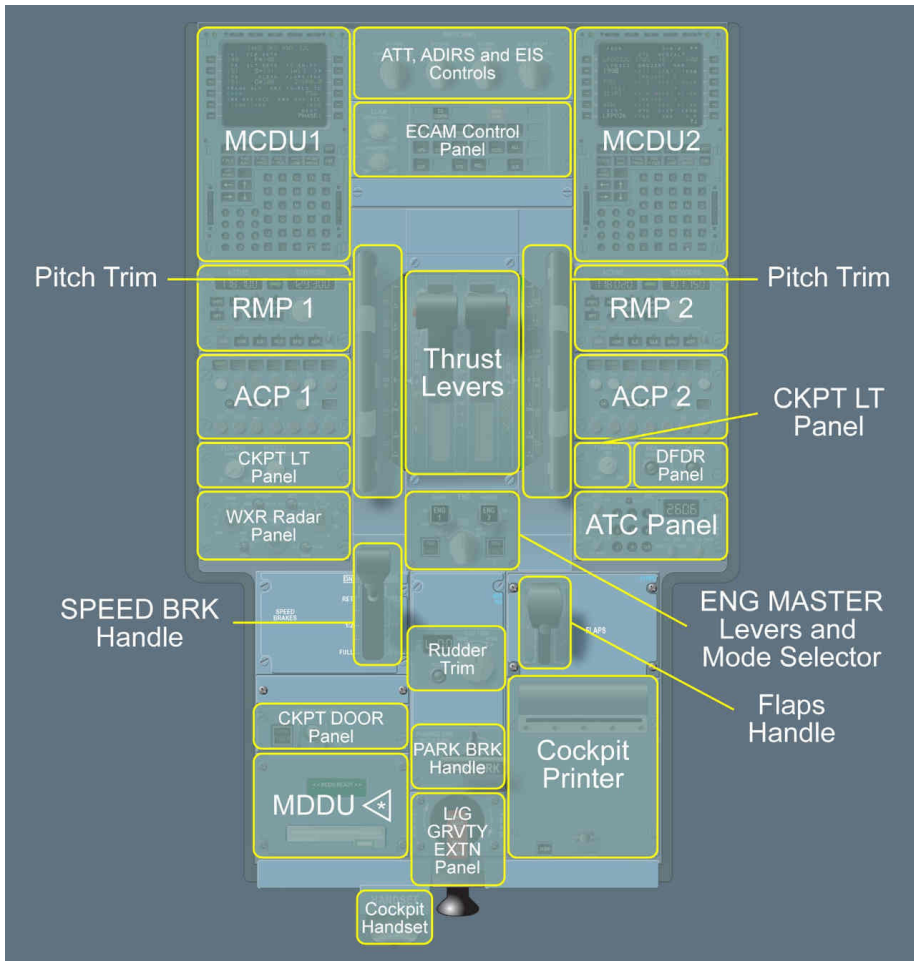
Applicable to: ALL



PEDESTAL

Ident.: DSC-25-10-50-00020854.0001001 / 17 MAR 17

Applicable to: ALL



AIRCRAFT SYSTEMS

EQUIPMENT

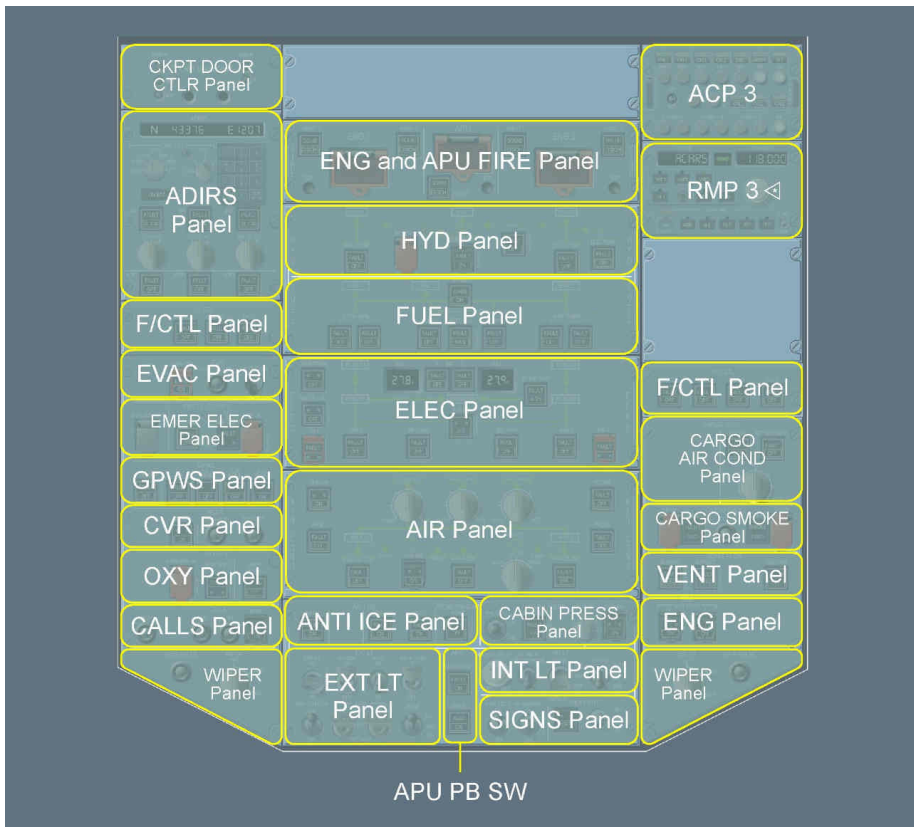
FLIGHT DECK - PEDESTAL

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OVERHEAD PANEL

Ident.: DSC-25-10-60-00020855.0001001 / 03 NOV 22

Applicable to: ALL



AIRCRAFT SYSTEMS

EQUIPMENT

FLIGHT DECK - OVERHEAD PANEL

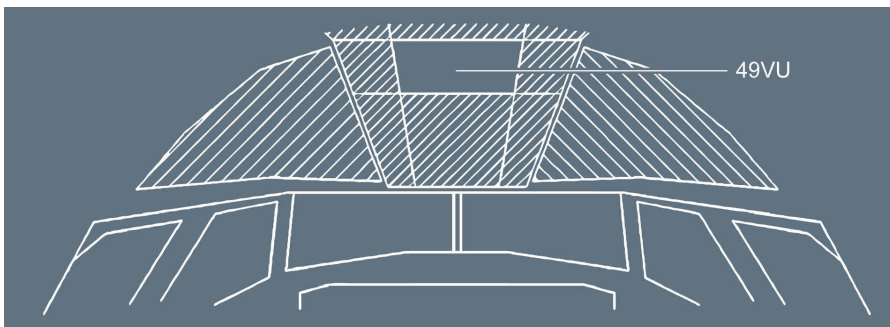


C/B PANELS

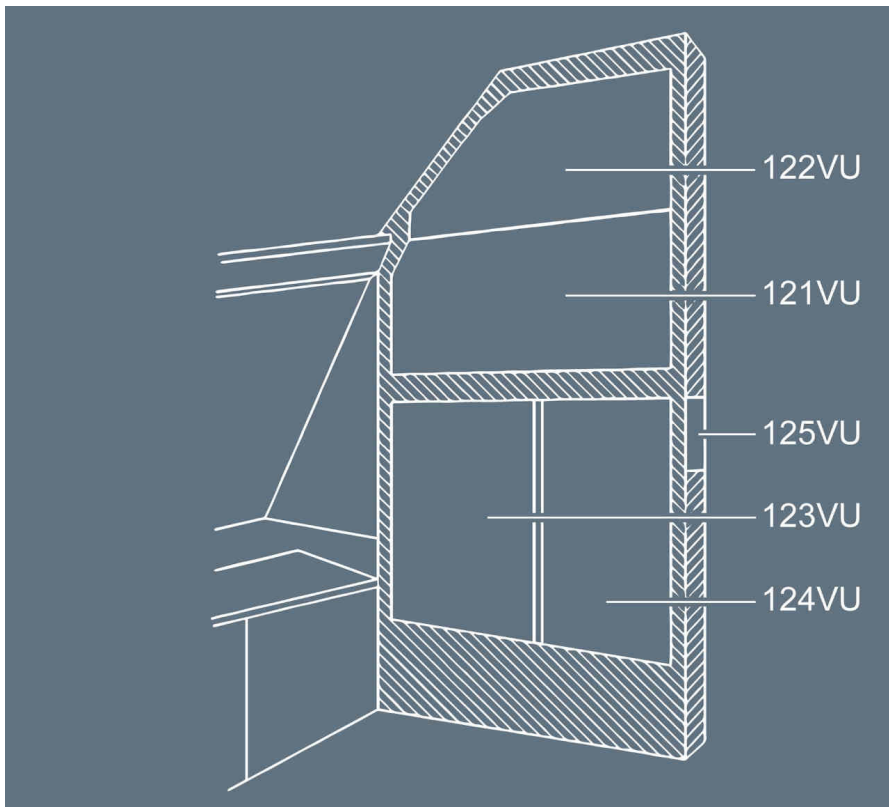
Ident.: DSC-25-10-70-00018436.0001001 / 17 MAR 17

Applicable to: ALL

OVERHEAD PANEL



RIGHT REAR PANEL



 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS EQUIPMENT FLIGHT DECK - FOOT WARMER (IF INSTALLED)
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GENERAL

Ident.: DSC-25-10-80-00017009.0001001 / 17 MAR 17
Applicable to: ALL

The foot warmer system  has a heating panel attached to each pedal. The temperature of the panels is about 20 °C (68 °F).

CONTROLS

Ident.: DSC-25-10-80-00017008.0001001 / 17 MAR 17
Applicable to: ALL

The Foot Warmer ON/OFF control switch  is located on the main instrument panel, on the captain's and first officer's side.



FOOT WARMER sw

Operation of the associated heating panel on captain's pedals or first officer's pedals.

AIRCRAFT SYSTEMS

EQUIPMENT

FLIGHT DECK - FOOT WARMER (IF INSTALLED)

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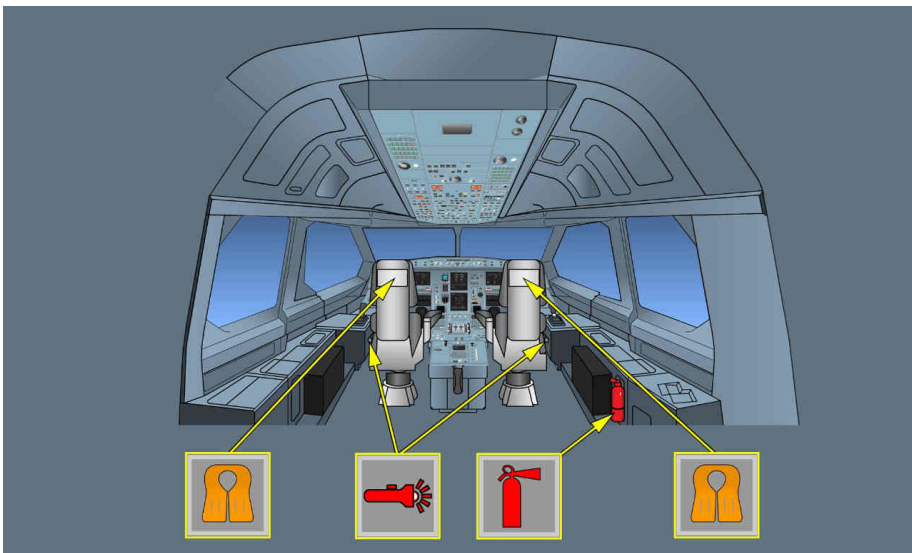
EMERGENCY EQUIPMENT

 Applicable to: **ALL**

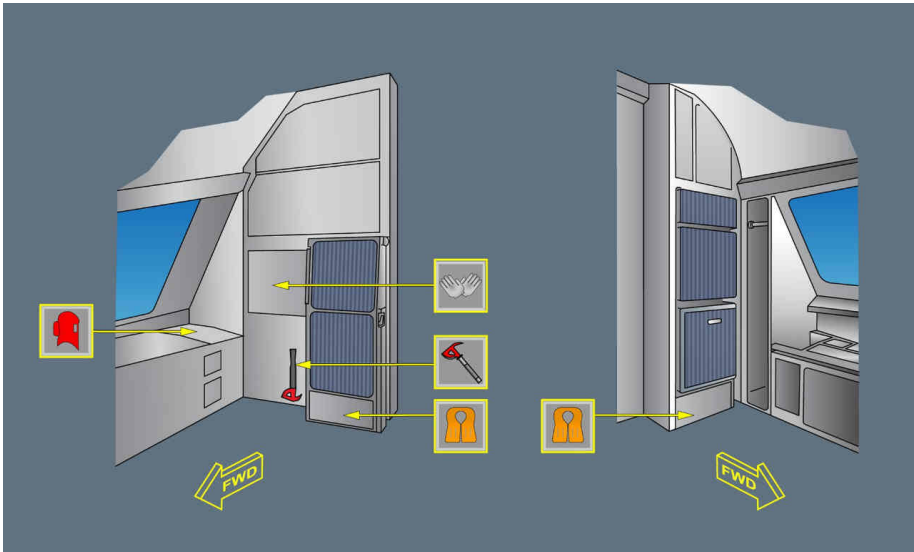
Ident.: DSC-25-20-10-00022066.0001001 / 04 DEC 17

Placards indicate the location of emergency equipment on board the aircraft. To consult the list of symbols, *Refer to CCOM/11-010 Symbol List.*

Ident.: DSC-25-20-10-00022067.0001001 / 04 DEC 18

Cockpit Front View


Cockpit Rear View



Note: The illustration shows the typical emergency equipment in this area. The location and the type of emergency equipment may vary. Placards indicate the location and the type.

Ident.: DSC-25-20-10-00022068.0001001 / 04 DEC 17

For the description of the cabin emergency equipment, Refer to CCOM/EMERGENCY EQUIPMENT/PORTABLE EMERGENCY EQUIPMENT.

AIRCRAFT SYSTEMS

FIRE PROTECTION

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DSC-26-10 General	
Description.....	A

DSC-26-20 Engines and APU	
DSC-26-20-10 System Description	
Fire Detection.....	A
Extinguishing.....	B
Fire Detection and Detection Fault Logic.....	C
DSC-26-20-20 Controls and Indicators	
FIRE Panel.....	A
ENG MASTER Panel.....	B
EXTERNAL POWER Panel.....	C
MAINTENANCE Panel.....	D

DSC-26-30 Avionics Bay	
DSC-26-30-10 System Description	
Smoke Detection.....	A
DSC-26-30-20 Controls and Indicators	
EMER ELEC PWR Panel.....	A
VENTILATION Panel.....	B

DSC-26-40 Lavatory	
DSC-26-40-10 System Description	
Smoke Detection.....	A
Wastebin Fire Extinguishing.....	B

DSC-26-50 Cargo Compartments	
DSC-26-50-10 System Description	
Smoke Detection.....	A
Fire Extinguishing.....	B
DSC-26-50-20 Controls and Indicators	
CARGO SMOKE Panel.....	A

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS FIRE PROTECTION GENERAL
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DESCRIPTION

Ident.: DSC-26-10-00021387.0006001 / 17 MAR 17

Applicable to: ALL

The fire and smoke protection system includes:

- Fire and overheat detection for the engines and APU
- Smoke detection for the cargo compartments, the lavatories, and the avionics bay
- Fire extinguishing for the cargo compartments, the engines, the APU, and the lavatories.

In addition, the aircraft includes portable fire extinguishers in the cockpit and in the cabin areas.

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FIRE DETECTION

Ident.: DSC-26-20-10-00021393.0001001 / 17 MAR 17

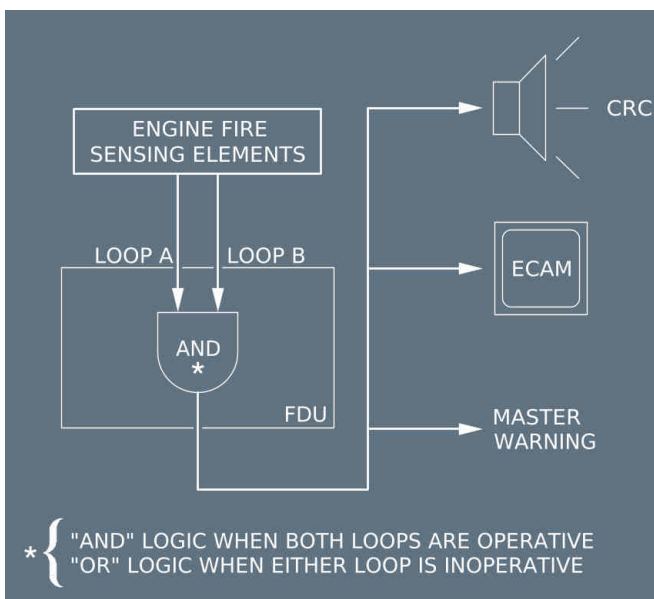
Applicable to: ALL

The engines and the APU each have a fire and overheat detection system consisting of:

- Two identical detection loops (A and B) mounted in parallel
- A Fire Detection Unit (FDU).

The fire detection loops consist of:

- Three or four (as installed) engine fire sensing elements, in the pylon nacelle, in the engine core, and in the engine fan section
- One fire sensing element in the APU compartment.



When a sensing element is subjected to heat, it sends a signal to the FDU. As soon as loops A and B detect temperature above a preset level, the fire warning system is triggered.

A fault in one loop (break or loss of electrical supply) does not affect the warning system and the unaffected loop still protects the aircraft.

AIRCRAFT SYSTEMS**FIRE PROTECTION****ENGINES AND APU - SYSTEM DESCRIPTION****EXTINGUISHING**

Ident.: DSC-26-20-10-00021395.0001001 / 04 JUL 17

Applicable to: ALL**ENGINES**

Each engine has two fire extinguisher bottles, with electrically-operated squibs to discharge their agents. Each squib has a dual electric supply. The flight crew controls the discharge of the fire extinguisher bottles from the FIRE panel in the cockpit.

APU

The APU has one fire extinguisher bottle, with two electrically-operated squibs to discharge its agent. The flight crew controls the discharge of the fire extinguisher bottle from the FIRE panel in the cockpit. When an APU fire is detected on the ground, the APU automatically shuts down, and the extinguisher bottle discharges automatically.

FIRE DETECTION AND DETECTION FAULT LOGIC

Ident.: DSC-26-20-10-00021394.0001001 / 03 NOV 21

Applicable to: ALL

The FDUs process all the warnings and cautions originating in the sensing elements.

A fire warning appears, if:

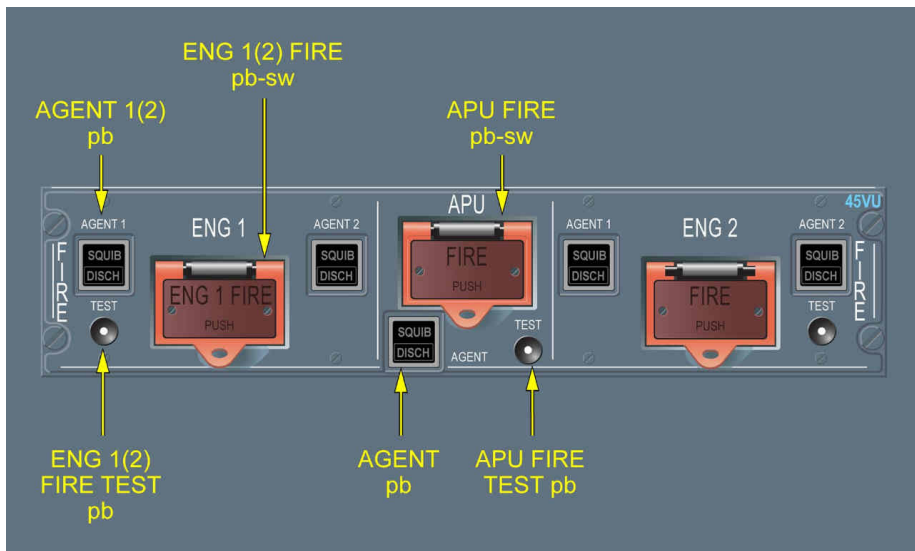
- Both loops A and B send a fire signal, or
- One loop sends a fire signal and the other one is failed, or
- Breaks occur in both loops within 5 s of each other (flame effect), or
- A test is performed on the FIRE panel

A loop-fault caution appears, if the associated loop is failed.

FIRE PANEL

Applicable to: **ALL**

Ident.: DSC-26-20-20-10-00021396.0002001 / 05 MAY 22



Ident.: DSC-26-20-20-10-00021415.0001001 / 10 MAY 22

ENG 1(2) FIRE PB-SW

The PB-SW normal position is in, and guarded. When the flight crew pushes it, the PB-SW is released and sends an electrical signal that performs the following for the corresponding engine:

- Silences the aural fire warning
- Arms the fire extinguisher squibs
- Closes the low-pressure fuel valve
- Closes the hydraulic fire shut off valve
- Closes the engine bleed valve
- Closes the pack flow control valve
- Cuts off the FADEC power supply
- Deactivates the IDG.

The red lights come on, regardless of the PB-SW position, whenever the fire warning for the corresponding engine is activated.

Ident.: DSC-26-20-20-10-00021420.0001001 / 10 MAY 22

AGENT 1(2) PB

Both AGENT pbs of an affected engine become active when the flight crew releases the ENG 1(2) FIRE pb-sw.

A brief push on the PB discharges the corresponding fire agent.

- “SQUIB” comes on white when the flight crew releases the ENG 1(2) FIRE pb-sw to help the flight crew identify the AGENT pb to be activated.
- “DISCH” comes on amber when the corresponding fire extinguisher bottle has lost pressure.

Ident.: DSC-26-20-20-10-00021421.0001001 / 10 MAY 22

ENG 1(2) FIRE TEST PB

This PB tests the operation of the fire detection and extinguishing system for ENG 1(2).

When pressed:

- A CRC sounds
- The MASTER WARNING lights flash
- ENG FIRE warning appears on ECAM.
- On the FIRE panel:
 - The ENG 1(2) FIRE pb-sw lights up red
 - The SQUIB lights come on white if discharge supplies are available
 - The DISCH lights come on amber.
- On the ENG MASTER panel (pedestal):
 - The FIRE lights come on red.

Note: *The FIRE lights do not illuminate in case of Engine Fire Detection Loop A fault on the Engine 1 or Engine Fire Detection Loop B fault on the Engine 2.*

Ident.: DSC-26-20-20-10-00021423.0001001 / 10 MAY 22

APU FIRE PB-SW

The PB-SW normal position is in, and guarded. When the flight crew pushes it, the PB-SW is released and sends an electrical signal that performs the following for the APU:

- Shuts down the APU
- Silences the aural warning
- Arms the squib on the APU fire extinguisher
- Closes the low-pressure fuel valve
- Shuts off the APU fuel pump
- Closes the APU bleed valve and X bleed valve and deactivates the APU generator.

The red lights come on, regardless of the PB-SW position, whenever an APU fire warning is activated.

Ident.: DSC-26-20-20-10-00021424.0001001 / 10 MAY 22

AGENT PB

The APU AGENT pb becomes active when the flight crew releases the APU FIRE pb-sw. A brief push on the pushbutton discharges the corresponding fire agent.

- "SQUIB" comes on white when the pilot releases the APU FIRE pb-sw.
- "DISCH" comes on amber when the fire extinguisher bottle has lost pressure.

Note: *A red disk, which is outside at the rear of the fuselage, signals that the agent is not discharged overboard due to bottle overpressure.*

Ident.: DSC-26-20-20-10-00021425.0001001 / 10 MAY 22

APU FIRE TEST PB

This PB tests the operation of the APU fire detection and extinguishing system.

When pressed:

- A CRC sounds
- The MASTER WARN light flash
- APU FIRE warning appears on ECAM.
- On the FIRE panel:
 - The APU FIRE pb-sw lights up red
 - The SQUIB light comes on white if discharge supplies are available
 - The DISCH light comes on amber.

Note: *The automatic shutdown of the APU on ground may occur if the flight crew performs this test for more than 3 seconds.*

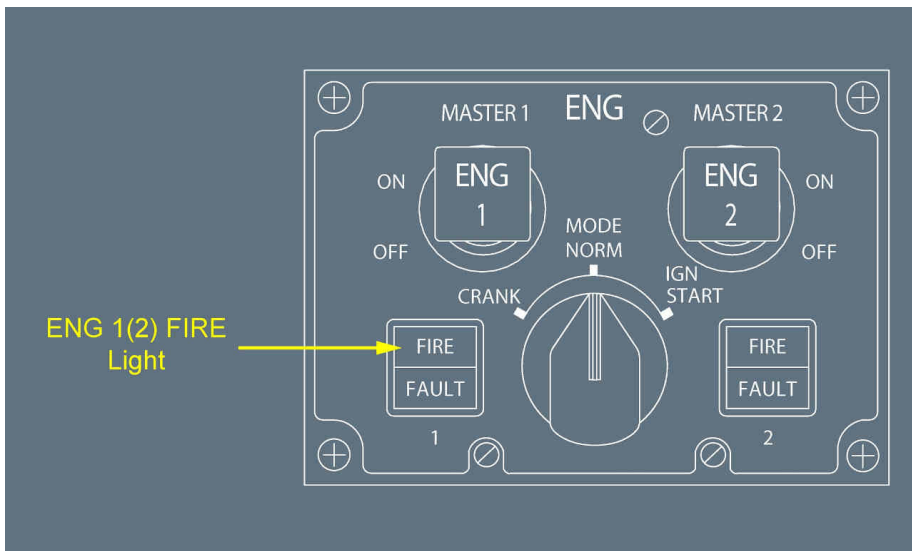
Note: *If the fire test is performed on ground with only batteries to supply the electrical network, both of the following apply:*

- *The SQUIB light and DISCH light come on, without ECAM warnings*
- *The red APU FIRE pb-sw light partially comes on, as one of the sets of bulbs is not electrically available.*

ENG MASTER PANEL

Applicable to: ALL

Ident.: DSC-26-20-20-00021427.0001001 / 17 MAR 17



Ident.: DSC-26-20-20-00021428.0001001 / 17 MAR 17

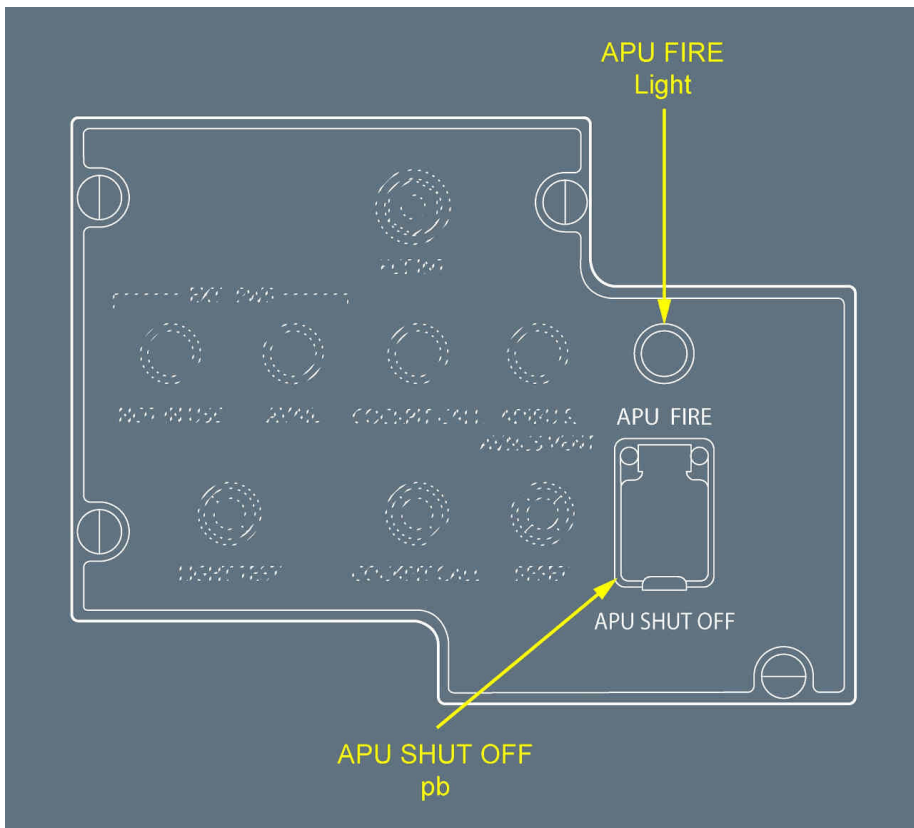
ENG 1(2) FIRE LIGHT

This light identifies the engine to be shutdown in the case of fire.
The light comes on red when an engine fire warning is triggered.

EXTERNAL POWER PANEL

Applicable to: **ALL**

Ident.: DSC-26-20-20-30-00021429.0001001 / 17 MAR 17



Ident.: DSC-26-20-20-30-00021430.0001001 / 17 MAR 17

APU FIRE LIGHT

The red APU FIRE light comes on and an external warning horn sounds when the system detects an APU fire.

The APU fire extinguisher discharges automatically 3 s after the appearance of the fire warning.

The light goes out when the fire has been extinguished.

Ident.: DSC-26-20-20-30-00021431.0001001 / 17 MAR 17

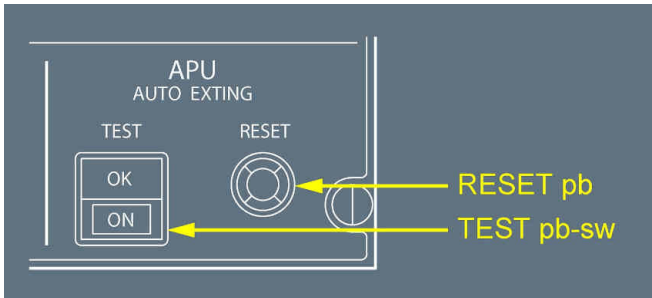
APU SHUT OFF PB

This pushbutton is used for manual APU emergency shutdown, if an emergency situation is detected on ground by the ground crew. When this pushbutton is pressed, the APU low pressure fuel shutoff valve closes, and the ECB receives a signal that starts the shutdown sequence. The shutdown sequence is the same as the APU automatic shutdown sequence, except that there is no cool down cycle. Pressing this pushbutton also silences the external warning horn.

MAINTENANCE PANEL

 Applicable to: **ALL**

Ident.: DSC-26-20-20-40-00021432.0001001 / 17 MAR 17



Ident.: DSC-26-20-20-40-00021435.0001001 / 17 MAR 17

TEST PB-SW

When pressed, tests the following APU circuits:

- Fire warning
- Auto extinguishing
- Shutdown.

During the test sequence, the APU MASTER sw must be ON.

If all circuits are operating correctly, the OK light comes on.

Note: If the APU was running, it shuts down.

Ident.: DSC-26-20-20-40-00021436.0001001 / 17 MAR 17

RESET PB

When pressed, resets the test circuit.

SMOKE DETECTION

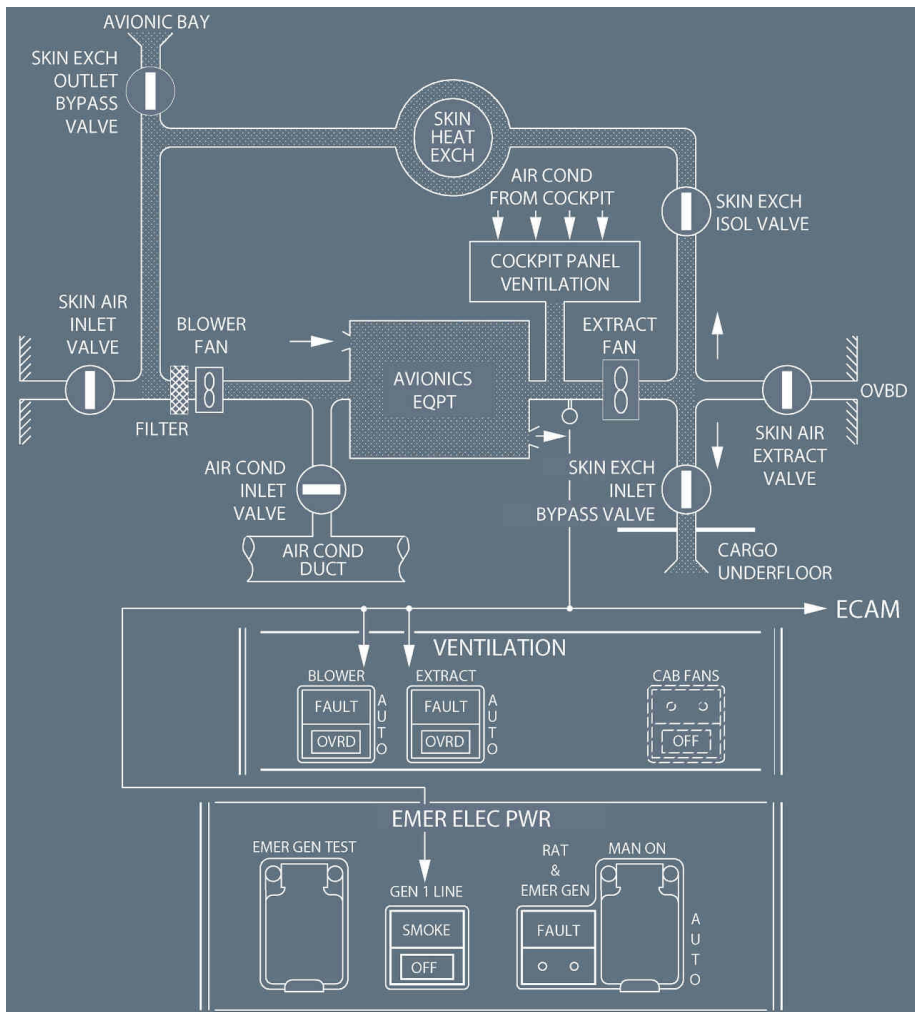
Ident.: DSC-26-30-10-00021401.0001001 / 17 MAR 17

Applicable to: ALL

The air extraction duct of the avionics ventilation system has one smoke detector.

When smoke is detected for more than 5 s:

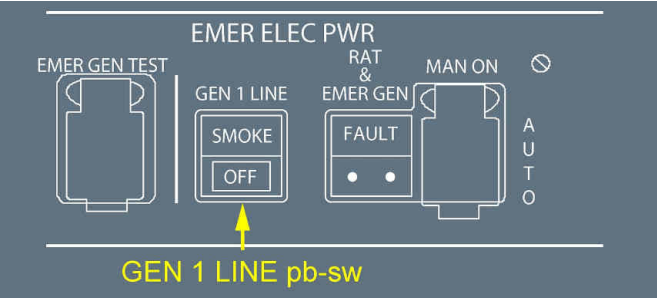
- The Single Chime (SC) sounds
- The MASTER CAUTION lights flash
- The ECAM **AVIONICS SMOKE** alert triggers
- On the EMER ELEC PWR panel, the SMOKE light of the GEN 1 LINE pb-sw comes on
- On the VENTILATION panel, the FAULT lights of the BLOWER pb-sw and the EXTRACT pb-sw come on.



EMER ELEC PWR PANEL

Applicable to: ALL

Ident.: DSC-26-30-20-A-00021439.0001001 / 17 MAR 17



Ident.: DSC-26-30-20-A-00021440.0001001 / 17 MAR 17

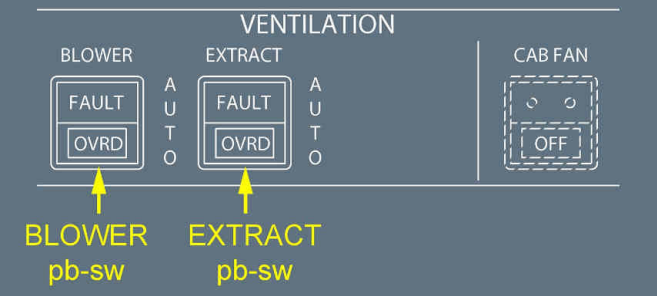
GEN 1 LINE PB-SW

SMOKE light on : The amber light comes on when smoke is detected in the avionics ventilation duct.

VENTILATION PANEL

Applicable to: ALL

Ident.: DSC-26-30-20-B-00021402.0001001 / 17 MAR 17



Ident.: DSC-26-30-20-B-00021437.0001001 / 17 MAR 17

BLOWER PB-SW

FAULT light on : The amber light comes on when smoke is detected in the avionics ventilation duct.

Ident.: DSC-26-30-20-B-00021438.0001001 / 17 MAR 17

EXTRACT PB-SW

FAULT light on : The amber light comes on when smoke is detected in the avionics ventilation duct.

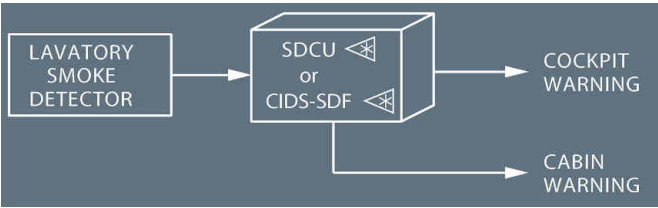
 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS FIRE PROTECTION LAVATORY - SYSTEM DESCRIPTION
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SMOKE DETECTION

Ident.: DSC-26-40-10-00021441.0001001 / 17 MAR 17
Applicable to: ALL

- The lavatory smoke detection system consists of:
- One smoke detector, in the air extraction duct of the lavatory
 - A double channel Smoke Detection Control Unit (SDCU) or a Cabin Intercommunication Data Systems (CIDS) with a Smoke Detection Function (SDF) that triggers the applicable alerts (cockpit and cabin).

In the case of smoke in a lavatory, the detector sends a signal to the SDCU or CIDS, which transmits it to the Flight Warning Computer (FWC) for warning in the cockpit and in the cabin.



WASTEBIN FIRE EXTINGUISHING

Ident.: DSC-26-40-10-00001034.0001001 / 21 MAR 16
Applicable to: ALL

Each lavatory wastebin has an automatic fire extinguishing system.

AIRCRAFT SYSTEMS

FIRE PROTECTION

LAVATORY - SYSTEM DESCRIPTION

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS FIRE PROTECTION CARGO COMPARTMENTS - SYSTEM DESCRIPTION
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SMOKE DETECTION

Ident.: DSC-26-50-10-00021442.0003001 / 12 NOV 24

Applicable to: ALL

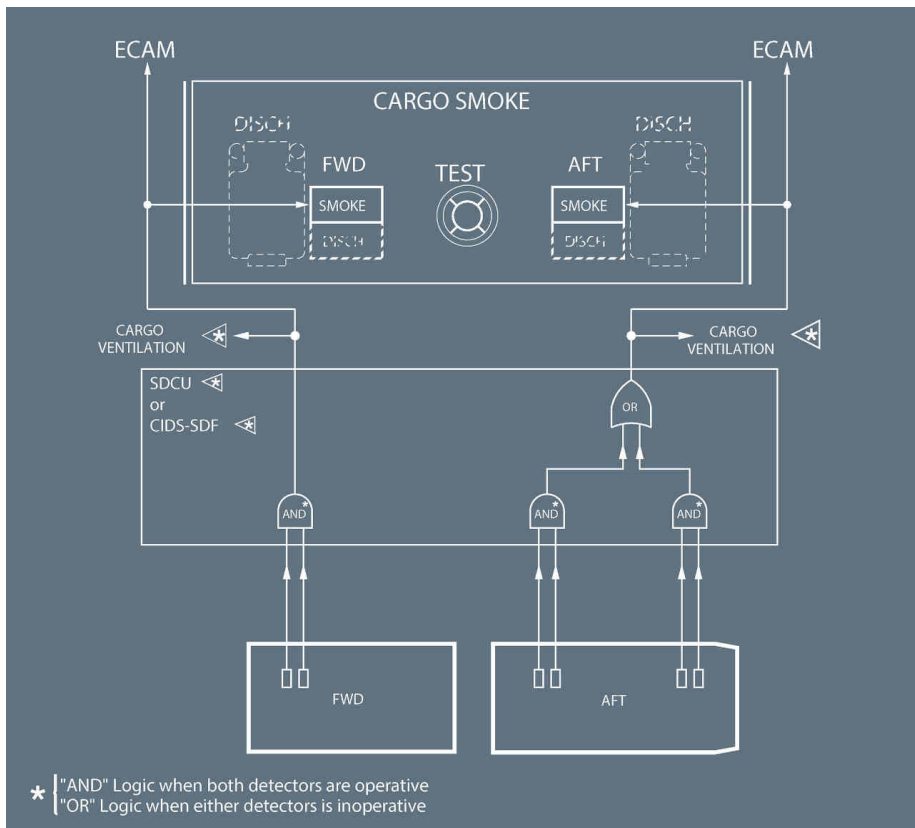
The forward and aft cargo compartments smoke detection system consists of:

- Two smoke detectors that are in the forward cargo compartment ceiling panel cavities. Each detector is linked to one of the two detection loops (dual loop principle).
- Four smoke detectors that are in the aft cargo compartment ceiling panel cavities. Each detector is linked to one of the two detection loops (dual loop principle).
- A Smoke Detection Control Unit (SDCU)  with two identical channels, or a Cabin Intercommunication Data Systems with a Smoke Detection Function (CIDS-SDF) , that receives signals from the smoke detectors, and transmits it to the ECAM.

Smoke in one cavity activates the cargo smoke warning if:

- Both smoke detectors detect smoke, or
- One smoke detector detects smoke and the other is inoperative.

Cargo isolation valves  close automatically, and the extraction fan  stops when the cargo smoke warning is activated.



FIRE EXTINGUISHING

Ident.: DSC-26-50-10-00021443.0005001 / 02 MAY 24

Applicable to: ALL

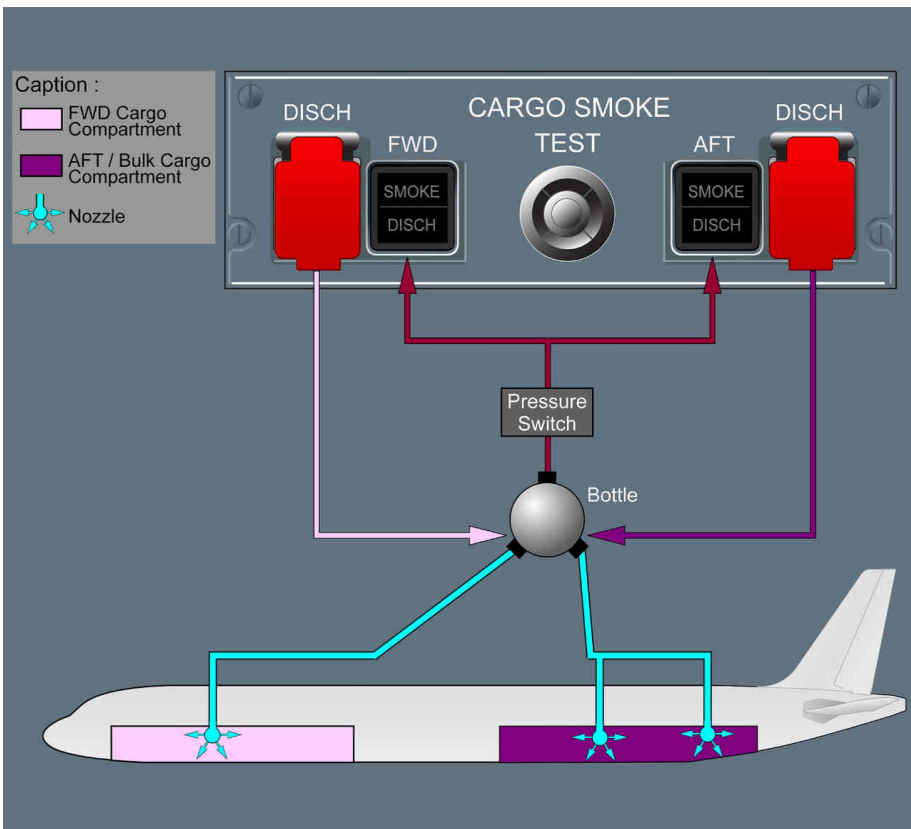
A fire extinguishing system protects the forward and aft cargo compartments.

One fire bottle with two discharge heads, one for each compartment, supplies three nozzles:

- One nozzle in the forward cargo compartment
- Two nozzles in the aft cargo compartment.

When the flight crew presses the FWD(AFT) DISCH pb, the action ignites the corresponding squib on the fire bottle, which then discharges the extinguisher agent into the affected compartment in approximately 60 s. This ensures a sufficient agent concentration for 60 min.

When the bottle is empty, the DISCH light comes on amber.



AIRCRAFT SYSTEMS

FIRE PROTECTION

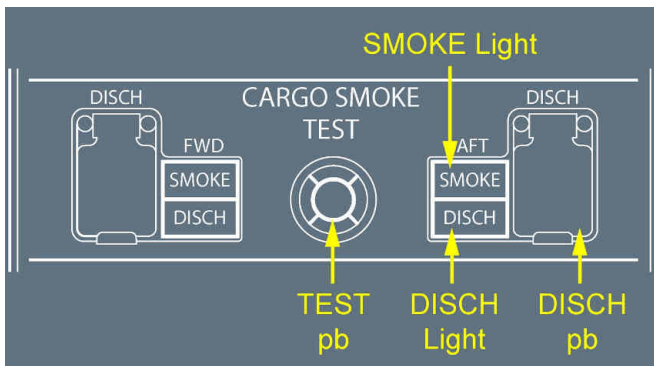
CARGO COMPARTMENTS - SYSTEM DESCRIPTION

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CARGO SMOKE PANEL

Applicable to: **ALL**

Ident.: DSC-26-50-20-10-00021446.0005001 / 17 MAR 17



Ident.: DSC-26-50-20-10-00021450.0001001 / 17 MAR 17

SMOKE LIGHT

This red light, and the associated ECAM warning, come on when the system detects smoke in the indicated cargo compartment. This light comes on, if:

- Both channels detect smoke, or
- One channel detects smoke and the other channel is faulty.

Ident.: DSC-26-50-20-10-00021451.0002001 / 17 MAR 17

TEST PB

Tests the operation of the cargo smoke detection system.

When pressed for at least 3 s, and until released:

- Tests the smoke detectors in sequence
- Turns on the red SMOKE lights twice, and displays the ECAM warning
- Closes the isolation valves of the cargo ventilation system 
- The DISCH lights come on in amber.

Ident.: DSC-26-50-20-10-00021452.0001001 / 17 MAR 17

DISCH LIGHT

Within 60 s after pressing the discharge pushbutton, the amber DISCH light comes on when the associated bottle is fully discharged.

Ident.: DSC-26-50-20-10-00021454.0001001 / 17 MAR 17

DISCH PB

The DISCH pb ignites the squib, thereby discharging the extinguishing agent in the affected cargo compartment.

AIRCRAFT SYSTEMS

FLIGHT CONTROLS

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DSC-27-10 General

DSC-27-10-10 General

General.....	A
Basic Principle.....	B
Control Surfaces.....	C
Cockpit Controls.....	D
Computers.....	E

DSC-27-10-20 Architecture

General Architecture.....	A
Pitch Control.....	B
Roll Control.....	C
Speed Brakes and Ground Spoilers.....	D
Yaw Control.....	E

DSC-27-20 Flight Control System

DSC-27-20-10 Normal Law

DSC-27-20-10-10 General

General.....	A
--------------	---

DSC-27-20-10-20 Pitch Control

Ground Mode.....	A
Flight Mode.....	B
Flare Mode.....	C
Protections.....	D

DSC-27-20-10-30 Lateral Control

Normal Law.....	A
Bank Angle Protection.....	B

DSC-27-20-10-40 Load Alleviation Function

Load Alleviation Function (LAF).....	A
--------------------------------------	---

DSC-27-20-10-50 Sideslip Target

Sideslip Target.....	A
----------------------	---

DSC-27-20-10-70 Aircraft Trimming

Aircraft Trimming.....	A
------------------------	---

Continued on the following page

*Continued from the previous page***DSC-27-20-20 Reconfiguration Control Laws**

General.....	A
Flight Controls Law Reconfiguration.....	B
Alternate Law.....	C
Alternate Law Without Reduced Protection.....	D
Direct Law.....	E
Abnormal Attitude Laws.....	F
Mechanical Back-Up.....	G

DSC-27-30-30 Controls and Indicators

Pedestal.....	A
Lateral Consoles.....	B
Glareshield.....	C
Overhead Panel.....	D
Side Stick Indications On PFD.....	E
ECAM F/CTL Page.....	F
ECAM Wheel Page.....	G
Memo Display.....	H

DSC-27-30 Flaps and Slats**DSC-27-30-10 Description**

General.....	A
Architecture.....	B
Configurations.....	C
Alpha/Speed Lock Function (Slats).....	D

DSC-27-30-20 Controls and Indicators

Pedestal.....	A
ECAM Upper Display.....	B

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS FLIGHT CONTROLS PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS
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Localization Title	Toc Index	ID	Reason
DSC-27-PLP-TOC Reconfiguration Control Laws		1	Documentation update: Deletion of "Alternate Law (00001084.0003001)".
DSC-27-20-10-20 Protections - High Speed Protection - Procedures	D	1	Removal of the paragraph about Bank Angle Protection. This is described in the Bank Angle Protection chapter.
DSC-27-20-20 Alternate Law	C	1	Documentation update: Deletion of text. Documentation update: Addition of "Alternate Law" documentary unit

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GENERAL

Ident.: DSC-27-10-10-00001043.0001001 / 21 MAR 16

Applicable to: ALL

The fly-by-wire system was designed and certified to render the new generation of aircraft even more safe, cost effective, and pleasant to fly.

BASIC PRINCIPLE

Ident.: DSC-27-10-10-00001044.0001001 / 17 MAY 21

Applicable to: ALL

Flight control surfaces are all :

- Electrically-controlled, and
- Hydraulically-actuated.

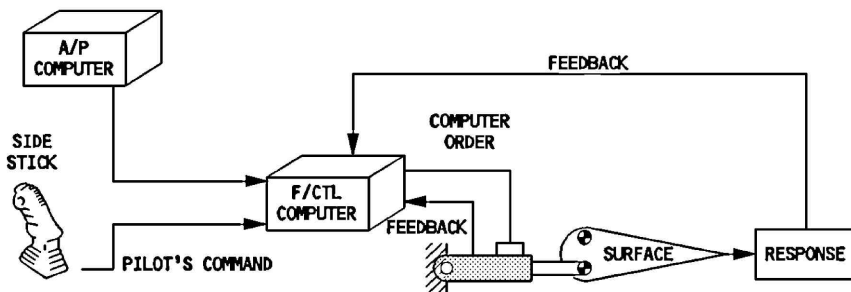
The stabilizer and rudder can also be mechanically-controlled.

Pilots use sidesticks to fly the aircraft in pitch and roll (and in yaw, indirectly, through turn coordination).

Computers interpret pilot input and move the flight control surfaces, as necessary, to follow their orders.

However, when in normal law, regardless of the pilot's input, the computers will prevent excessive maneuvers and exceedance of the safe envelope in pitch and roll axis.

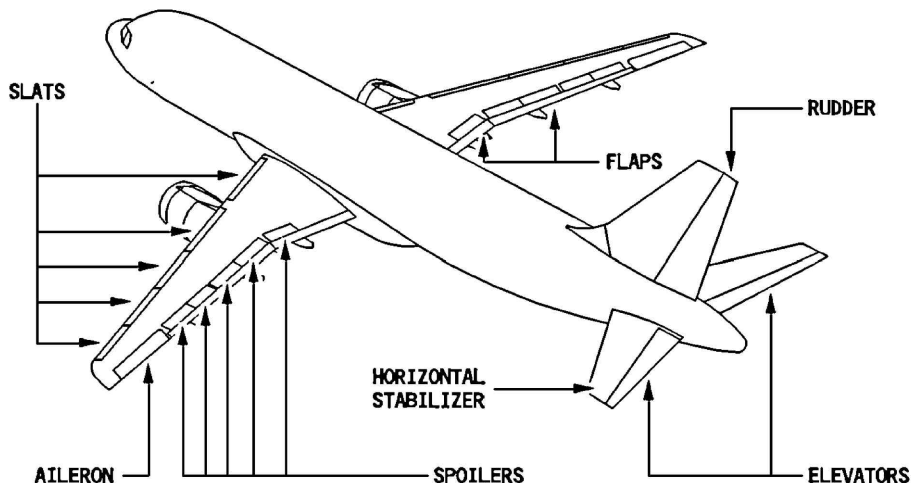
However, as on conventional aircraft, the rudder has no such protection.



CONTROL SURFACES

Ident.: DSC-27-10-10-00001045.0001001 / 21 MAR 16

Applicable to: ALL



The flight controls are electrically or mechanically controlled as follows :

PITCH AXIS

- Elevator = Electrical
- Stabilizer = Electrical for normal or alternate control. Mechanical for manual trim control

ROLL AXIS

- Ailerons = Electrical
- Spoilers = Electrical

YAW AXIS

- Rudder = Mechanical, however control for yaw damping, turn coordination and trim is electrical.

SPEED BRAKES

- Speed brakes = Electrical

Note: All surfaces are hydraulically actuated.

COCKPIT CONTROLS

Ident.: DSC-27-10-10-00001046.0001001 / 21 MAR 16

Applicable to: ALL

- Each pilot has a sidestick controller with which to exercise manual control of pitch and roll. These are on their respective lateral consoles.
The two sidestick controllers are not coupled mechanically, and they send separate sets of signals to the flight control computers.
- Two pairs of pedals, which are rigidly interconnected, give the pilot mechanical control of the rudder.
- The pilots control speed brakes with a lever on the center pedestal.
- The pilots use mechanically interconnected handwheels on each side of the center pedestal to control the trimmable horizontal stabilizer.
- The pilots use a single switch on the center pedestal to set the rudder trim.
- There is no manual switch for trimming the ailerons.

COMPUTERS

Ident.: DSC-27-10-10-00001047.0001001 / 21 MAR 16

Applicable to: ALL

Seven flight control computers process pilot and autopilot inputs according to normal, alternate, or direct flight control laws.

The computers are :

2 ELACs

(Elevator Aileron Computer)

For : Normal elevator and stabilizer control.
Aileron control.

3 SECs

(Spoilers Elevator Computer)

For : Spoilers control.
Standby elevator and stabilizer control.

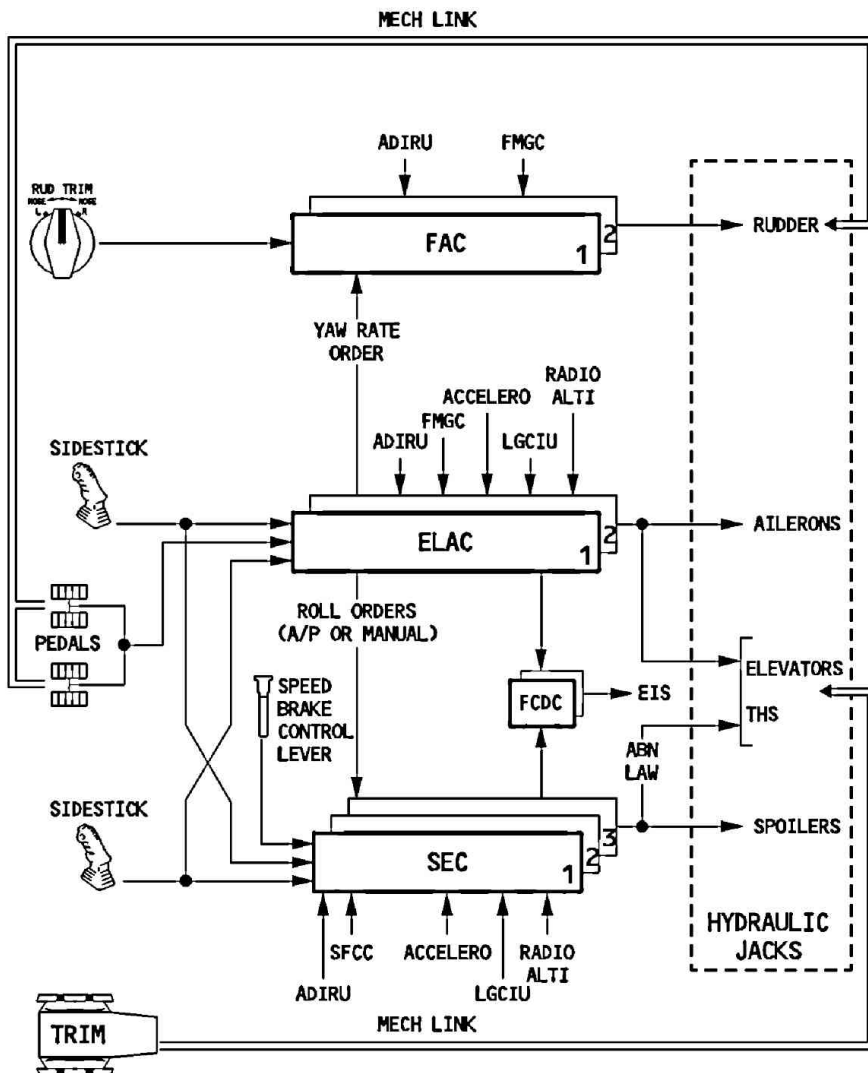
2 FACs

(Flight Augmentation Computer)

For : Electrical rudder control.

IN ADDITION 2 FCDC

Flight Control Data Concentrators (FCDC) acquire data from the ELACs and SECs and send it to the electronic instrument system (EIS) and the centralized fault display system (CFDS).

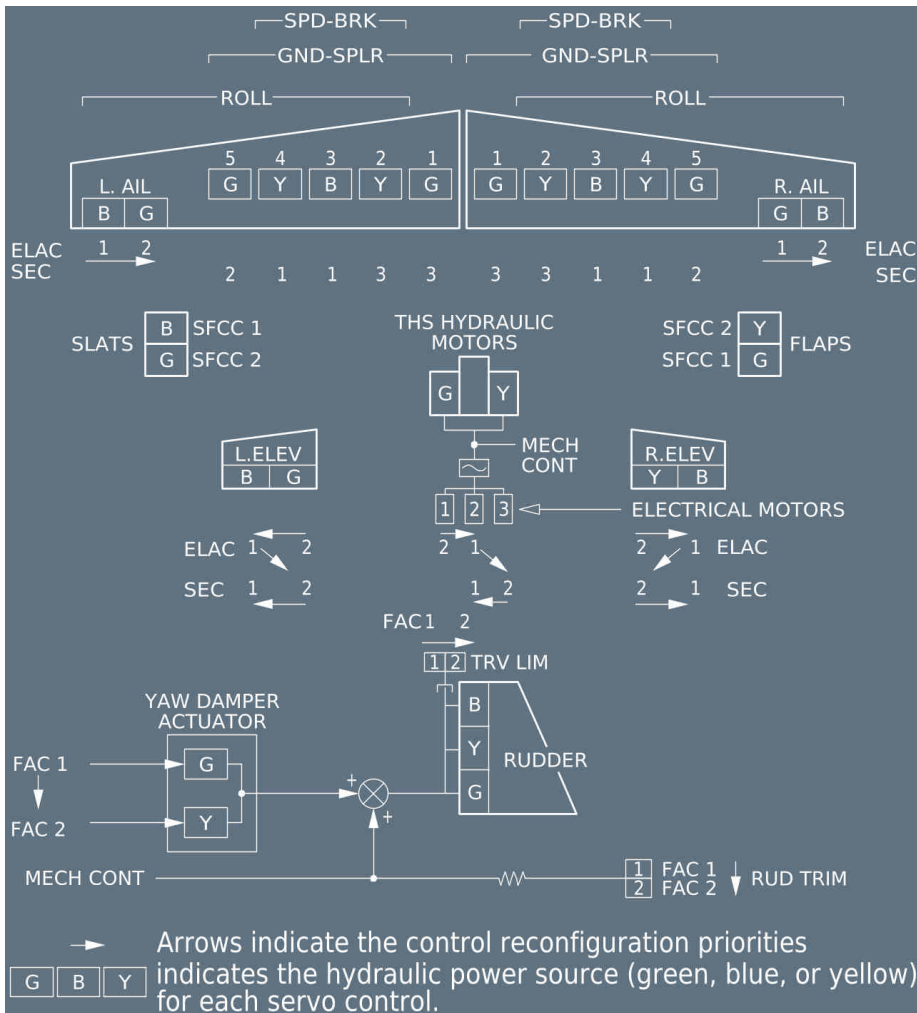


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GENERAL ARCHITECTURE

Ident.: DSC-27-10-20-00001048.0002001 / 13 JAN 14

Applicable to: ALL

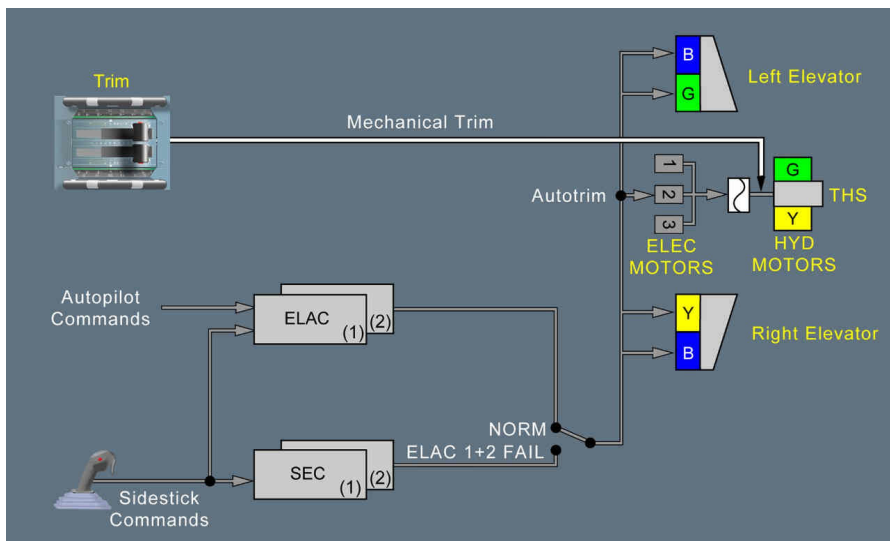


PITCH CONTROL

Applicable to: **ALL**

Ident.: DSC-27-10-20-A-00001049.0001001 / 06 NOV 23

GENERAL



Two elevators and the THS control the aircraft in pitch. The maximum elevator deflection is 30 ° nose up, and 17 ° nose down. The maximum THS deflection is 13.5 ° nose up, and 4 ° nose down.

Ident.: DSC-27-10-20-A-00001050.0001001 / 21 MAR 16

ELECTRICAL CONTROL

- In normal operations, ELAC2 controls the elevators and the horizontal stabilizer, and the green and yellow hydraulic jacks drive the left and right elevator surfaces respectively. The THS is driven by N° 1 of three electric motors.
- If a failure occurs in ELAC2, or in the associated hydraulic systems, or with the hydraulic jacks, the system shifts pitch control to ELAC1. ELAC1 then controls the elevators via the blue hydraulic jacks and controls the THS via the N° 2 electric motor.
- If neither ELAC1 nor ELAC2 is available, the system shifts pitch control either to SEC1 or to SEC2, (depending on the status of the associated circuits), and to THS motor N° 2 or N° 3.

In case of failure, the actuators are reconfigured, *Refer to DSC-27-10-20 Pitch Control - Schematic.*

Ident.: DSC-27-10-20-A-00001051.0001001 / 21 MAR 16

MECHANICAL CONTROL

Mechanical control of the THS is available from the pitch trim wheel at any time, if either the green or yellow hydraulic system is functioning.

Mechanical control from the pitch trim wheel has priority over electrical control.

Ident.: DSC-27-10-20-A-00001053.0002001 / 21 MAR 16

ACTUATION**ELEVATORS**

- Two electrically-controlled hydraulic servojacks drive each elevator.

Each servojack has three control modes :

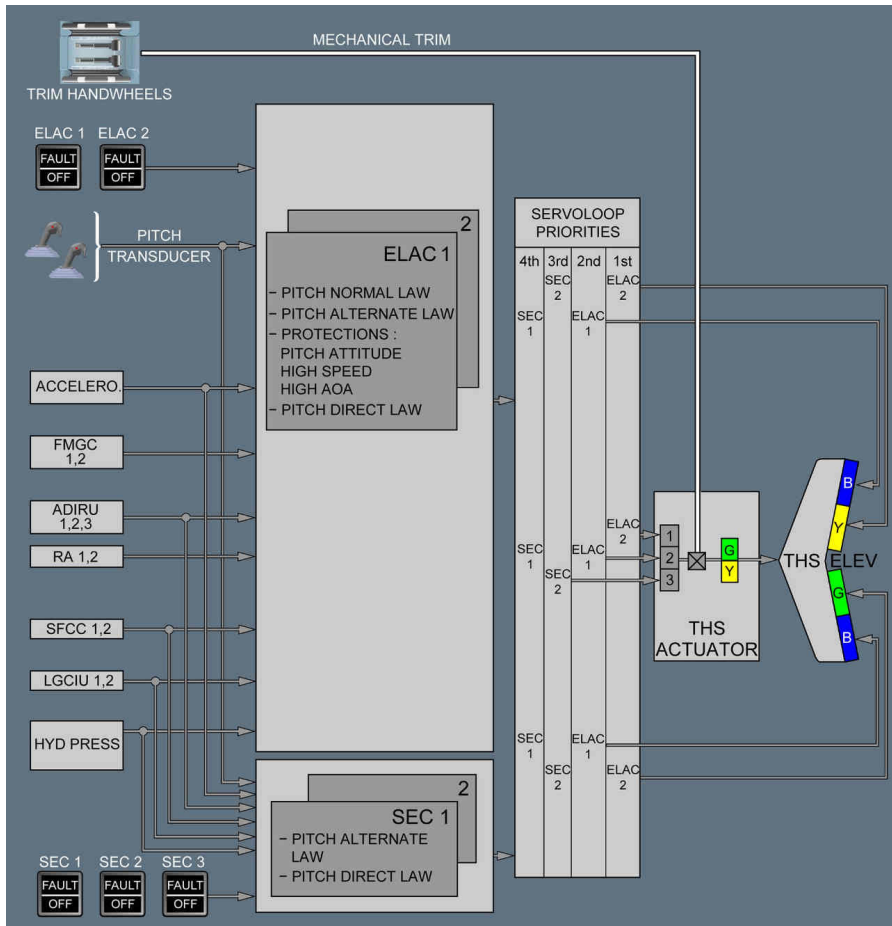
- Active : The jack position is electrically-controlled.
 - Damping : The jack follows surface movement.
 - Centering : The jack is hydraulically retained in the neutral position.
- In normal operation :
 - One jack is in active mode.
 - The other jack is in damping mode.
 - Some maneuvers cause the second jack to become active.
 - If the active servojack fails, the damped one becomes active, and the failed jack is automatically switched to damping mode.
 - If neither jack is being controlled electrically, both are automatically switched to the centering mode.
 - If neither jack is being controlled hydraulically, both are automatically switched to damping mode.
 - If one elevator fails, the deflection of the remaining elevator is limited in order to avoid putting excessive asymmetric loads on the horizontal tailplane or rear fuselage.

STABILIZER

- A screwjack driven by two hydraulic motors drives the stabilizer.
- The two hydraulic motors are controlled by :
 - One of three electric motors, or
 - The mechanical trim wheel.

Ident.: DSC-27-10-20-A-00001054.0001001 / 28 MAY 20

SCHEMATIC

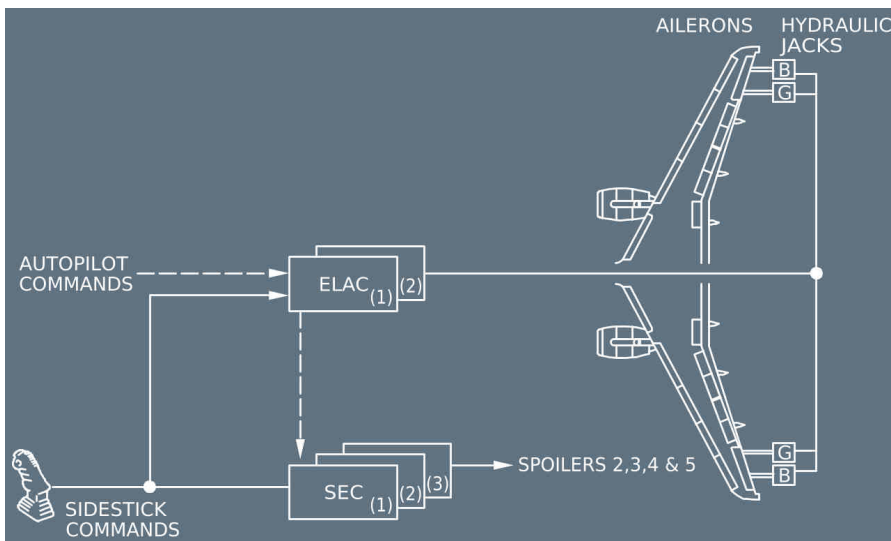


ROLL CONTROL

Applicable to: ALL

Ident.: DSC-27-10-20-B-00001055.0003001 / 09 OCT 12

GENERAL



One aileron and four spoilers on each wing control the aircraft about the roll axis.

The maximum deflection of the ailerons is 25 °.

The ailerons extend 5 ° down when the flaps are extended (aileron droop).

The maximum deflection of the spoilers is 35 °.

Ident.: DSC-27-10-20-B-00001056.0001001 / 21 MAR 16

ELECTRIC CONTROL

- The ELAC 1 normally controls the ailerons.
If ELAC1 fails, the system automatically transfers aileron control to ELAC2.
If both ELACs fail, the ailerons revert to the damping mode.
- SEC3 controls the N° 2 spoilers, SEC1 the N° 3 and 4 spoilers, and SEC2 the N° 5 spoilers.
If a SEC fails, the spoilers it controls are automatically retracted.

Ident.: DSC-27-10-20-B-00001057.0001001 / 21 MAR 16

ACTUATION**AILERONS**

Each aileron has two electrically controlled hydraulic servojacks.
One of these servojacks per aileron operates at a time.

Each servojack has two control modes :

- Active : Jack position is controlled electrically
- Damping : Jack follows surface movement.

The system automatically selects damping mode, if both ELACs fail or in the event of blue and green hydraulic low pressure.

SPOILERS

A servojack positions each spoiler. Each servojack receives hydraulic power from either the green, yellow, or blue hydraulic system, controlled by the SEC1, 2 or 3 (*Refer to DSC-27-10-20 General Architecture diagram*).

The system automatically retracts the spoilers to their zero position, if it detects a fault or loses electrical control.

If the system loses hydraulic pressure, the spoiler retains the deflection it had at the time of the loss, or a lesser deflection if aerodynamic forces push it down.

When a spoiler surface on one wing fails, the symmetric one on the other wing is inhibited.

SPEED BRAKES AND GROUND SPOILERS**SPEED BRAKES AND GROUND SPOILERS - SPEED BRAKE CONTROL**

Ident.: DSC-27-10-20-C-00001058.0017001 / 28 NOV 19

Applicable to: MSN 04392-05253

SPEED BRAKE CONTROL

The pilot controls the speedbrakes with the speed brake lever.
The speedbrakes are actually spoilers 2, 3 and 4.

Speedbrake extension is inhibited, if:

- SEC 1 and SEC 3 both have faults, or
- An elevator (L or R) has a fault, or
- Angle-of-attack protection is active, or
- Flaps are in configuration FULL, or
- Thrust levers above MCT position, or
- Alpha Floor activation.

If an inhibition occurs when the speedbrakes are extended, they retract automatically and stay retracted until the inhibition condition disappears and the flight crews reset the lever. (The speedbrakes can be extended again 10 s or more after the lever is reset).
When a speedbrake surface on one wing fails, the symmetric one on the other wing is inhibited.

Note:

1. For maintenance purposes, the speedbrake lever will extend the N° 1 surfaces when the aircraft is stopped on ground, whatever the slat/flap configuration
2. When the aircraft is flying faster than 315 kt or M 0.75 with the autopilot engaged, the speedbrake retraction rate is reduced (retraction from FULL to CLEAN takes about 25 s).

- L2** The maximum speedbrake deflection in manual flight is:
- 40 ° for spoilers 3 and 4 (reduced to 25 ° in CONF 0 when $GW > MLW + 2\text{ t}$)
 - 20 ° for spoiler 2 (reduced to 12.5 ° in CONF 0 when $GW > MLW + 2\text{ t}$).

The maximum speedbrake deflection with the autopilot engaged is:

- 25 ° for spoilers 3 and 4
- 12.5 ° for spoiler 2.

The maximum speedbrake deflection achievable with the autopilot engaged is obtained by setting the speedbrake lever to the half way position. On setting the position of the speedbrake lever from half to full, no increase in speedbrake deflection will be achieved.

For these surfaces (which perform both roll and speedbrake functions) the roll function has priority. When the sum of a roll order and a simultaneous speedbrake order on one surface is greater than the maximum deflection available in flight, the same surface on the other wing is retracted until the difference between the two surfaces is equal to the roll order.

Ident.: DSC-27-10-20-C-00001058.0011001 / 10 MAY 21

Applicable to: MSN 02155-03060, 05746-07792

SPEED BRAKE CONTROL

The flight crew controls the speedbrakes with the speed brake lever.
The speedbrakes are spoilers 2, 3 and 4.

Speedbrake extension is inhibited, if one of the following occurs:

- SEC1 and SEC3 both are faulty, or
- An elevator (L or R) is faulty, or
- Angle-of-attack protection is active, or
- Flaps are in configuration FULL, or
- Thrust levers are above MCT position, or
- Alpha Floor is activated.

If an inhibition occurs when the speedbrakes are extended, they retract automatically and stay retracted until the inhibition condition disappears and the flight crew resets the lever (the speedbrakes can be extended again 10 s or more after the lever is reset).

When a speedbrake surface on one wing fails, the symmetric speedbrake surface on the other wing is inhibited.

- Note:
1. For maintenance purposes, the speedbrake lever will extend the N° 1 surfaces when the aircraft is stopped on ground, whatever the slat/flap configuration.
 2. When the aircraft is flying faster than 315 kt or M 0.75 with the autopilot engaged, the speedbrake retraction rate is reduced (retraction from FULL to CLEAN takes about 25 s).

☐ The maximum speedbrake deflection in manual flight is:

- 40 ° for spoilers 3 and 4
- 20 ° for spoiler 2.

The maximum speedbrake deflection with the autopilot engaged is:

- 25 ° for spoilers 3 and 4
- 12.5 ° for spoiler 2.

The maximum speedbrake deflection achievable with the autopilot engaged is obtained by setting the speedbrake lever to the half way position. On setting the position of the speedbrake lever from half to full, no increase in speedbrake deflection will be achieved.

For these surfaces (which perform both roll and speedbrake functions) the roll function has priority: When the sum of a roll order and a simultaneous speedbrake order on one surface is more than the maximum deflection available in flight, the symmetric speedbrake on the other wing is retracted until the difference between the two surfaces is equal to the roll order.

Ident.: DSC-27-10-20-C-00017787.0002001 / 03 NOV 21

Applicable to: ALL

GROUND SPOILER CONTROL

The ground spoiler function involves all spoilers (full extension) and ailerons (Aileron Anti Droop ☞).

When a ground spoiler surface on one wing fails, the symmetric ground spoiler surface on the other wing is inhibited.

ARMING

The pilot arms the ground spoilers by pulling the speedbrake control lever up into the armed position.

FULL EXTENSION – REJECTED TAKEOFF PHASE

- If the ground spoilers are armed and the wheel speed exceeds 72 kt, the ground spoilers will automatically extend as soon as both thrust levers are reset to idle.
- If the ground spoilers are not armed and the wheel speed exceeds 72 kt, the ground spoilers will automatically extend as soon as reverse is selected on one engine (the other thrust lever remains at idle).

FULL EXTENSION - LANDING PHASE

The ground spoilers will automatically extend when the following conditions are met:

- Speed brake lever not in the retracted position or ground spoilers armed and:
 - Both main landing gears on ground,
 - Both thrust levers at or below Idle position, or Reverse selected on at least one engine (and the other thrust lever below MCT position).
- Speed brake lever in the retracted position but ground spoilers not armed and:
 - Both main landing gears on ground,
 - Reverse selected on at least one engine (and the other thrust lever below MCT position).

The ailerons are fully-extended (Aileron Anti Droop ) , provided one aileron servocontrol is available on each side, when:

- The ground spoilers are fully extended
- Flaps are not in clean CONF
- Pitch attitude is lower than 2.5 °
- Flying manually
- In normal law only.

PARTIAL EXTENSION

In order to accelerate the full spoiler extension, the Phased Lift Dumping (PLD) function allows the ground spoilers to deploy with a reduced deflection when the following conditions are met:

- Speed brake lever not in the retracted position or ground spoilers armed and:
 - One main landing gear on ground,
 - Both thrust levers at or below Idle position.
- Speed brake lever in the retracted position but ground spoilers not armed and:
 - One main landing gear on ground,
 - Reverse selected on at least one engine (and the other thrust lever below MCT position).

In order to reduce the bounce severity at landing in the case of an inappropriate thrust lever handling during flare, ground spoilers are also partially deployed when the following conditions are met:

- Ground spoilers armed,
- Both main landing gears on ground,
- Both thrust levers at or below the Climb position.

RETRACTION

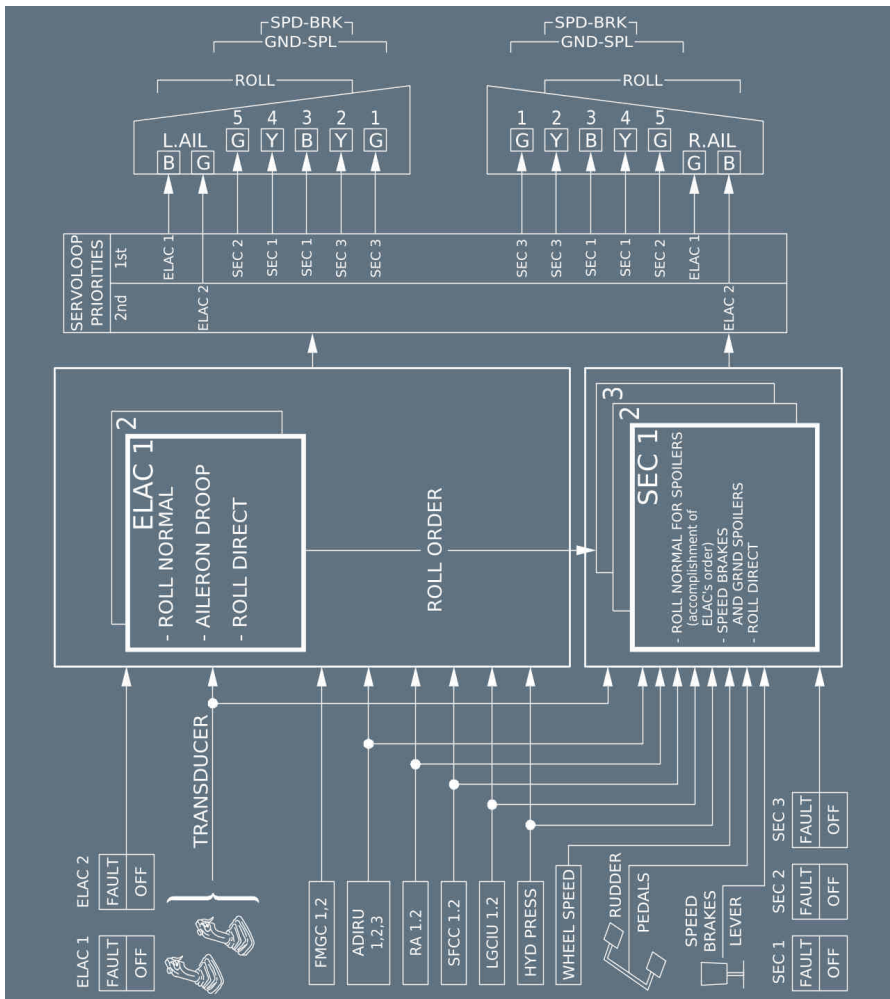
The ground spoilers retract:

- After landing, when the ground spoilers are disarmed
- After a rejected takeoff, when the ground spoilers are disarmed
- During a touch and go, when at least one thrust lever is advanced above 20 °.

Ident.: DSC-27-10-20-C-00001060.0002001 / 22 MAY 12

Applicable to: **ALL**

ROLL CONTROL - SCHEMATIC

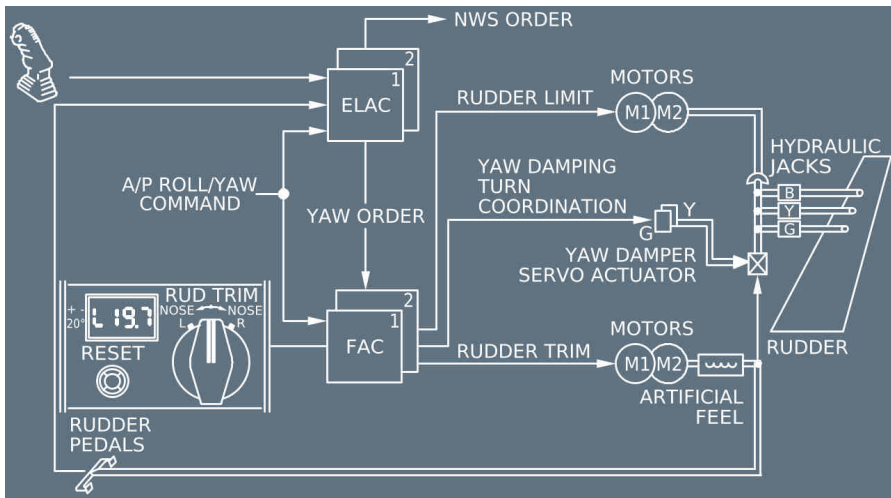


YAW CONTROL

Applicable to: ALL

Ident.: DSC-27-10-20-D-00001061.0001001 / 09 OCT 12

GENERAL



One rudder surface controls yaw.

Ident.: DSC-27-10-20-D-00001062.0001001 / 21 MAR 16

ELECTRICAL RUDDER CONTROL

The yaw damping and turn coordination functions are automatic.

The ELACs compute yaw orders for coordinating turns and damping yaw oscillations, and transmit them to the FACs.

Ident.: DSC-27-10-20-D-00001063.0001001 / 21 MAR 16

MECHANICAL RUDDER CONTROL

The pilots can use conventional rudder pedals to control the rudder.

Ident.: DSC-27-10-20-D-00001064.0001001 / 21 MAR 16

RUDDER ACTUATION

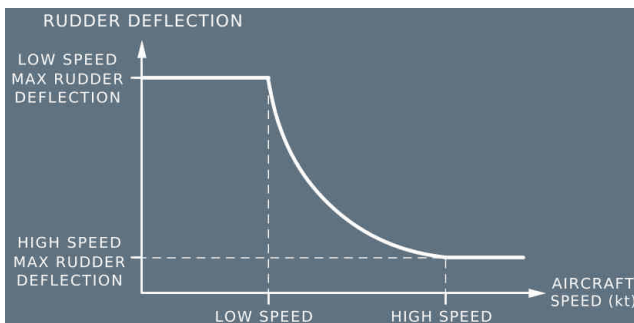
Three independent hydraulic servojacks, operating in parallel, actuate the rudder. In automatic operation (yaw damping, turn coordination) a green servo actuator drives all three servojacks. A yellow servo actuator remains synchronized and takes over if there is a failure.

There is no feedback to the rudder pedals from the yaw damping and turn coordination functions.

Ident.: DSC-27-10-20-D-00001065.0003001 / 21 MAR 16

RUDDER TRAVEL LIMIT

The maximum rudder travel deflection gradually reduces as the speed increases, to avoid structural loads:



In the case of a failure that causes loss of the Rudder Travel limit system, the rudder deflection limit stops at the last value reached. At slats extension, full rudder travel authority is recovered. In all cases, the available rudder deflection provides sufficient yaw control within the entire flight envelope. This includes the case of maximum asymmetric thrust.

Ident.: DSC-27-10-20-D-00015506.0001001 / 21 MAR 16

RELATIONSHIP BETWEEN SIDESLIP/RUDDER DEFLECTION/RUDDER PEDAL TRAVEL

Regardless of the aircraft speed, therefore the maximum rudder deflection, full rudder pedal travel remains available. However, except at low speed, maximum rudder deflection is achieved before reaching maximum rudder pedal travel.

Ident.: DSC-27-10-20-D-00001066.0002001 / 21 MAR 16

RUDDER TRIM

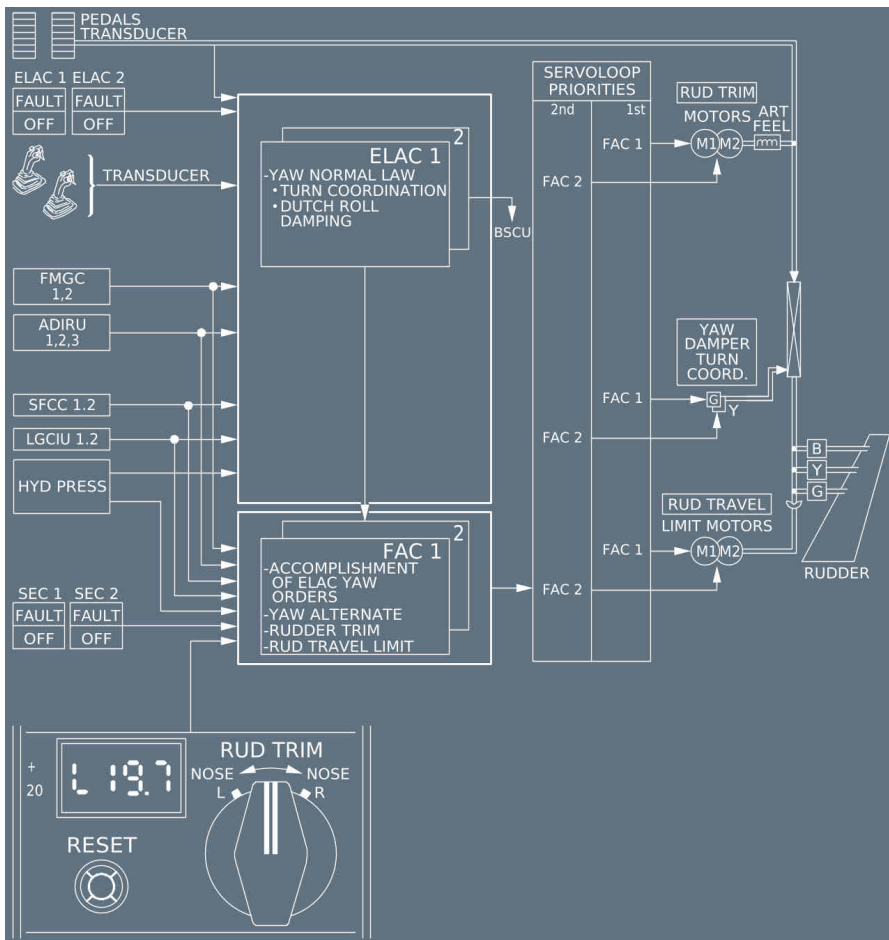
The two electric motors that position the artificial feel unit also trim the rudder. In normal operation, motor N° 1 (controlled by FAC1), powers the trim, and FAC2 with motor N° 2 remains synchronized as a backup.

In manual flight, the pilot can apply rudder trim via the rotary RUD TRIM switch on the pedestal. The pilot can use a button on the RUD TRIM panel to reset the rudder trim to zero.

Note: With the autopilot engaged, the FMGC computes the rudder trim orders. The rudder trim rotary switch and the rudder trim reset pushbutton are not active.

Ident.: DSC-27-10-20-D-00001067.0001001 / 21 MAR 16

SCHEMATIC



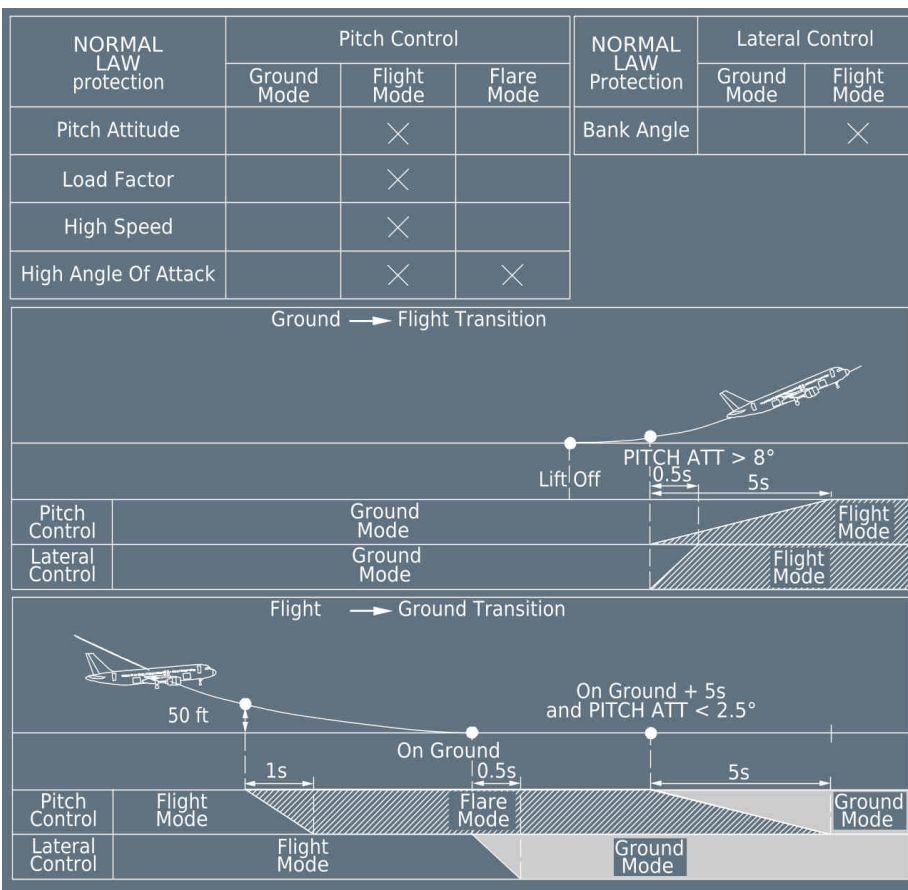
General
GENERAL

Ident.: DSC-27-20-10-10-00001068.0001001 / 17 MAR 17

 Applicable to: **ALL**

Flight control normal law covers:

- three-axis control
- flight envelope protection
- alleviation of maneuver loads



AIRCRAFT SYSTEMS**FLIGHT CONTROLS****FLIGHT CONTROL SYSTEM - NORMAL LAW**

One of the PF's primary tasks is to maintain the aircraft within the limits of the normal flight envelope. However, some circumstances, due to extreme situations or aircraft mishandling, may provoke the violation of these limits.

Despite system protections, the PF must not exceed deliberately the normal flight envelope. In addition, these protections are not designed to be structural limit protections (e.g. opposite rudder pedal inputs). Rather, they are designed to assist the PF in emergency and stressful situations, where only instinctive and rapid reactions will be effective.

Protections are intended to:

- Provide full authority to the PF to consistently achieve the best possible aircraft performance in extreme conditions
- Reduce the risks of overcontrolling, or overstressing the aircraft
- Provide PF with an instinctive and immediate procedure to ensure that the PF achieves the best possible result.

Pitch Control**GROUND MODE**

Ident.: DSC-27-20-10-20-00001069.0001001 / 10 MAY 21

Applicable to: ALL

Ground mode is a direct relationship between sidestick deflection and elevator deflection. There is no auto trim. The THS is automatically set at 0 ° (inside the green band). However, when the flight crew enters manually a THS setting to adjust the CG, this one has priority for the take off. During the take off roll, the system reduces the maximum up elevator deflection from 30 ° to 20 °.

FLIGHT MODE

Ident.: DSC-27-20-10-20-00001070.0004001 / 28 MAY 20

Applicable to: MSN 04392-07792

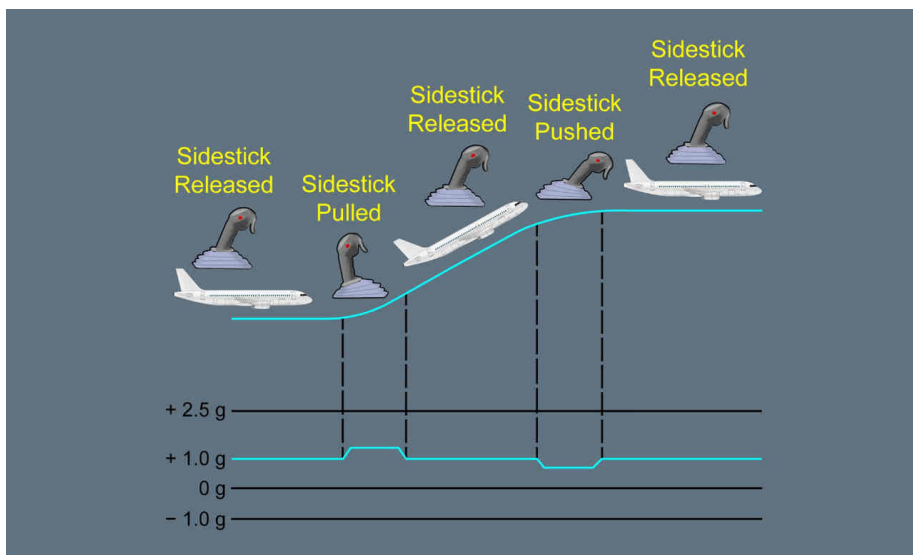
The normal-law flight mode is a load-factor-demand mode with automatic trim and protection throughout the flight envelope. Based on normal law, the sidestick controllers set the elevator and THS to maintain the load factor proportional to sidestick deflection and independent of speed. With the sidestick at neutral, wings level, the system maintains 1 g in pitch (corrected for pitch attitude), and there is no need for the flight crew to trim by changing speed or configuration. Therefore, if the aircraft deviates from the intended flight path, the flight crew only needs to perform small corrections on the sidestick. If the flight crew senses an overcontrol, the sidestick should be released.

AIRCRAFT SYSTEMS

FLIGHT CONTROLS

FLIGHT CONTROL SYSTEM - NORMAL LAW

Airbus Pitch Characteristic



Pitch trim is automatic both in manual mode and when the autopilot is engaged. In normal turns (up to 33 ° of bank) the flight crew must not make any pitch corrections when the turn is established. The flight mode is active from takeoff to landing, and follows the logic shown schematically (*Refer to DSC-27-20-10-10 General*).

Automatic pitch trim freezes in the following situations:

- The flight crew enters a manual trim order
- The radio height is below 50 ft (100 ft with autopilot engaged)
- The load factor goes below 0.5 g
- The aircraft is in high-speed or high-Mach protection.

When angle-of-attack protection is active, the THS setting is limited between the setting at entry of the aircraft into this protection and 4 ° nose down. Neither the flight crew nor the system can apply additional nose-up trim.

Similarly, when the load factor is higher than 1.25 g or when the aircraft exceeds 33 ° of bank, the THS setting is limited to values between the current setting and 3.5 ° nose down.

CONTROL WITH AUTOPILOT ENGAGED

- The ELACs and SECs limit what the autopilot can order.
- The flight crew must overcome a restraining force to move the sidestick when the autopilot is engaged. If they overcome this force and move the sidestick, they disconnect the autopilot.

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS FLIGHT CONTROLS FLIGHT CONTROL SYSTEM - NORMAL LAW
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- The flight crew can also disconnect the autopilot when they push the rudder pedals (10 ° out of trim), or they move the pitch trim wheel beyond a certain threshold.
- All protections of normal laws remain effective except pitch attitude protection.

FLIGHT MODE
Ident.: DSC-27-20-10-20-00001070.0003001 / 03 NOV 21 Applicable to: MSN 02155-03060

The normal-law flight mode is a load-factor-demand mode with automatic trim and protection throughout the flight envelope.

Following normal law, the sidestick controllers set the elevator and THS to maintain load factor proportional to stick deflection and independent of speed.

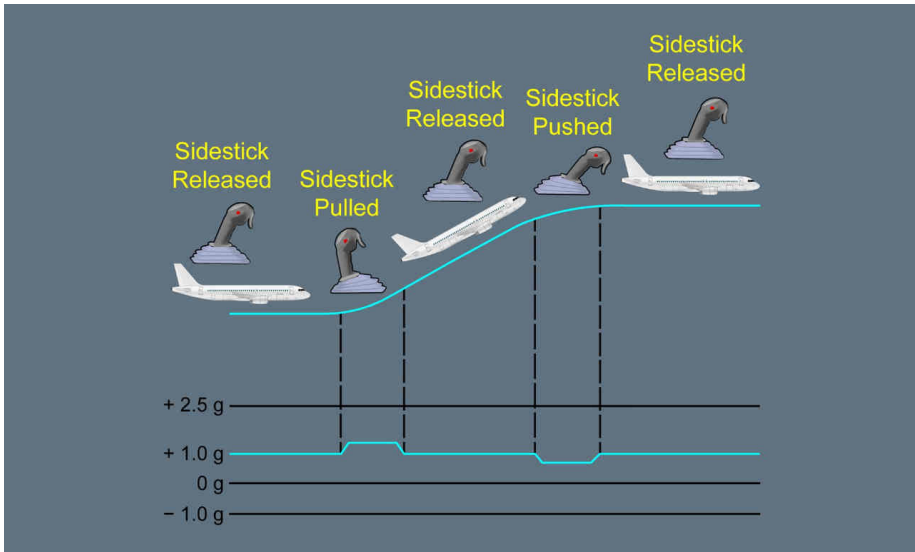
With the sidestick at neutral, wings level, the system maintains 1 g in pitch (corrected for pitch attitude), and there is no need for the flight crew to trim by changing speed or configuration.

Therefore the flight crew only need to perform minor corrections on the sidestick, if the aircraft deviates from its intended flight path. If the flight crew senses an overcontrol, the sidestick should be released.

Pitch trim is automatic both in manual mode and when the autopilot is engaged. In normal turns (up to 33 ° of bank) the flight crew does not have to make any pitch corrections once the turn is established.

The flight mode is active from takeoff to landing, and follows the logic shown schematically (*Refer to DSC-27-20-10-10 General*).

Airbus Pitch Characteristic



Automatic pitch trim freezes in the following situations:

- The flight crew enters a manual trim order.
- The radio height is below 50 ft (100 ft with autopilot engaged).
- The load factor goes below 0.5 g.

When angle-of-attack protection is active, the THS setting is limited between the setting at the aircraft's entry into this protection and 3.5 ° nose down. (Neither the flight crew nor the system can apply additional nose-up trim).

Similarly, when the load factor is higher than 1.25 g or when the aircraft exceeds 33 ° of bank, the THS setting is limited to values between the actual setting and 3.5 ° nose down.

When High Speed or High Mach Protection is active, the THS Setting is limited between the setting at the aircraft's entry into this protection and 11 ° nose-up.

CONTROL WITH AUTOPILOT ENGAGED

- The ELACs and SECs limit what the autopilot can order.
- The flight crew has to overcome a restraining force in order to move the sidestick when the autopilot is engaged. If the flight crew overcomes this force, the flight crew disconnects the autopilot.

- The flight crew can also disconnect the autopilot by pushing on the rudder pedals (10 ° out of trim), or by moving the pitch trim wheel beyond a certain threshold.
- All protections of normal laws remain effective except pitch attitude protection.

FLARE MODE

Ident.: DSC-27-20-10-20-00001071.0001001 / 21 MAR 16

Applicable to: ALL

When the aircraft passes 50 ft RA, the THS is frozen and the normal flight mode changes to flare mode as the aircraft descends to land. Flare mode is essentially a direct stick-to-elevator relationship (with some damping provided by the load factor and the pitch rate feedbacks).

The system memorizes the aircraft's attitude at 50 ft, and it becomes the initial reference for pitch attitude control.

As the aircraft descends through 30 ft, the system begins to reduce the pitch attitude to -2 ° nose down over a period of 8 s. Consequently, to flare the aircraft, a gentle nose-up action by the pilot is required.

PROTECTIONS

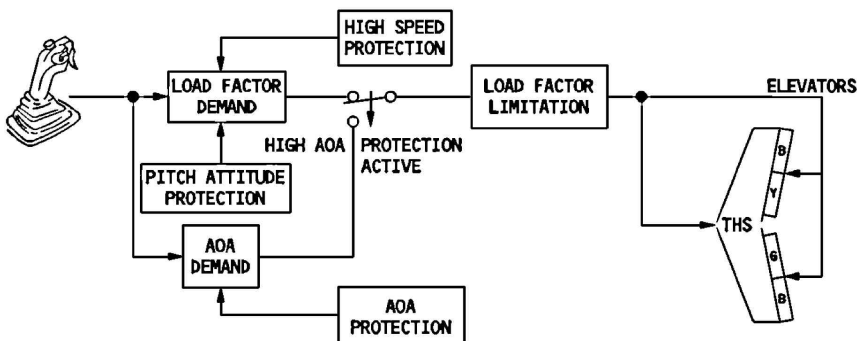
Applicable to: ALL

Ident.: DSC-27-20-10-20-A-00001072.0001001 / 21 MAR 16

GENERAL

The normal law protects the aircraft throughout the flight envelope, as follows :

- load factor limitation
- pitch attitude protection
- high-angle-of-attack (AOA) protection
- high-speed protection.



LOAD FACTOR PROTECTION

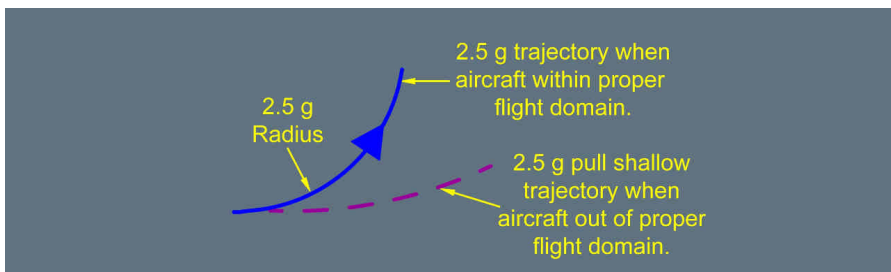
High load factors can be encountered during evasive maneuvers due to potential collisions, or CFIT ...

Pulling "g" is efficient, if the resulting maneuver is really flown with this "g" number. If the aircraft is not able to fly this trajectory, or to perform this maneuver, pulling "g" will be detrimental.

The load factor is automatically limited to:

- +2.5 g to -1 g for clean configuration.
- +2 g to 0 for other configurations.

Airbus LOAD FACTOR PROTECTION AND SAFETY



On most commercial aircraft, the potential for an efficient 2.5 g maneuver is very remote. Furthermore, as G Load information is not continuously provided in the cockpit, airline pilots are not used to controlling this parameter. This is further evidenced by inflight experience, which reveals that: In emergency situations, initial PF reaction on a yoke or sidestick is hesitant, then aggressive.

With load factor protection, the PF may immediately and instinctively pull the sidestick full aft: The aircraft will initially fly a 2.5 g maneuver without losing time. Then, if the PF still needs to maintain the sidestick full aft stick, because the danger still exists, then the high AOA protection will take over. Load factor protection enhances this high AOA protection.

Load factor protection enables immediate PF reaction, without any risk of overstressing the aircraft.

Flight experience has also revealed that an immediate 2.5 g reaction provides larger obstacle clearance, than a hesitant and delayed high G Load maneuver (two-second delay).

Ident.: DSC-27-20-10-20-A-00001074.0001001 / 17 MAR 17

PITCH ATTITUDE PROTECTION

Excessive pitch attitudes, caused by upsets or inappropriate maneuvers, lead to hazardous situations:

- Too high a nose-up ► Very rapid energy loss
- Too low a nose-down ► Very rapid energy gain

Furthermore, there is no emergency situation that requires flying at excessive attitudes. For these reasons, pitch attitude protection limits pitch attitude:

- 30 ° nose up in conf 0 to 3 (progressively reduced to 25 ° at low speed).
- 25 ° nose up in conf FULL (progressively reduced to 20 ° at low speed).
- 15 ° nose down (indicated by green symbols “=” on the PFD's pitch scale).

The flight director bars disappear from the PFD when the pitch attitude exceeds 25 ° up or 13 ° down. They return to the display when the pitch angle returns to the region between 22 ° up and 10 ° down.

Pitch attitude protection enhances high speed protection, high load factor protection, and high AOA protection.

Ident.: DSC-27-20-10-20-A-00024137.0001001 / 05 MAY 22

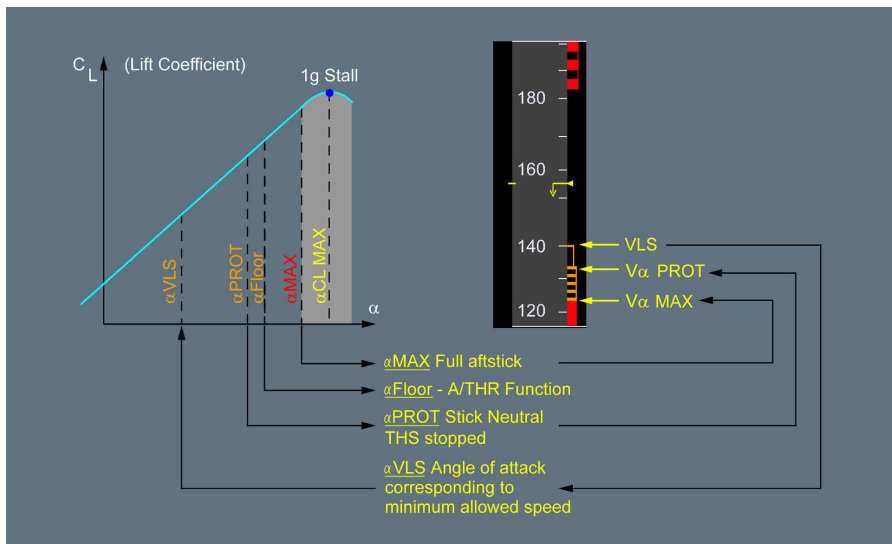
HIGH ANGLE-OF-ATTACK PROTECTION

In normal law, the aircraft is protected against stall. This protection is also effective in dynamic maneuvers or gusts. When the current AOA becomes greater than α_{PROT} , the high AOA protection activates.

Without flight crew input, the F/CTL computers maintain the AOA equal to α_{PROT} . The AOA can be further increased by flight crew input, up to a maximum value equal to α_{MAX} . When the High AOA protection is activated, the normal law demand is modified and the sidestick input is an AOA demand, instead of a load factor demand.

The flight crew must not deliberately fly the aircraft with a High AOA, except for short periods of time, when maximum High Lift coefficient is required (like during windshear or GPWS maneuvers).

AOA Protection



$V\alpha$ PROT, $V\alpha$ Floor, $V\alpha$ MAX are mainly computed based on the AOA, and therefore they vary with configuration, weight and load factor (Refer to DSC-22_10-50-20 Characteristic Speeds). The AOA will not exceed α MAX, even if the flight crew gently pulls the sidestick all the way back. The flight crew can hold full back sidestick, if it is needed, and the aircraft stabilizes at an AOA close to but less than the 1 g stall. When flying at α MAX, the flight crew can make gentle turns, if necessary. If the flight crew releases the sidestick, the AOA returns to α PROT and stays there. As the aircraft enters protection at the amber and black strip (α PROT), the system inhibits further nose-up trim beyond the point already reached. The nose-down trim remains available.

Note: At takeoff, the α PROT is equal to the α MAX for 5 s.

This High AOA protection has priority over all other protections.

The aircraft can also enter α PROT at a high flight level, where it protects the aircraft from the buffet boundary. Like in low speed or low flight level, if the sidestick is simply released to neutral, the aircraft maintains the alpha for α PROT. Therefore, when leaving a turn after entering α PROT, the aircraft may climb with the sidestick free.

Alpha for α PROT is reduced as a function of Mach.

If the flight crew flies into α PROT, they should leave it as soon as other considerations allow.

This is achieved by easing forward on the sidestick to reduce alpha below the value of α PROT.

The flight crew should also simultaneously add thrust (if the α Floor has not yet been activated, or cancelled).

Between the α PROT and α MAX, α Floor protection may automatically set the go-around thrust. The α Floor will usually be triggered just after entering α PROT, and the go-around thrust will automatically be applied. Therefore, if the sidestick is held aft, either inadvertently or deliberately, the aircraft will start to climb at a relatively constant low airspeed. To recover a normal flight condition, the α PROT should be exited by easing forward on the sidestick, as described above, and the α Floor should be cancelled by using the instinctive disconnect pushbutton on either thrust lever as soon as a safe speed is regained (*Refer to DSC-22_40-30 Alpha-Floor Protection - General and Activation Conditions*).

Ident.: DSC-27-20-10-20-A-00024649.0001001 / 03 MAY 21

HIGH SPEED PROTECTION

The aircraft automatically recovers, following a high speed upset. Depending on the flight conditions (high acceleration, low pitch attitude), high speed protection is activated at/or above VMO/MMO.

Ident.: DSC-27-20-10-20-A-00024650.0002001 / 03 MAY 21

When high speed protection is activated, the THS setting is limited between the setting at the aircraft's entry into this protection and 11 ° nose-up.

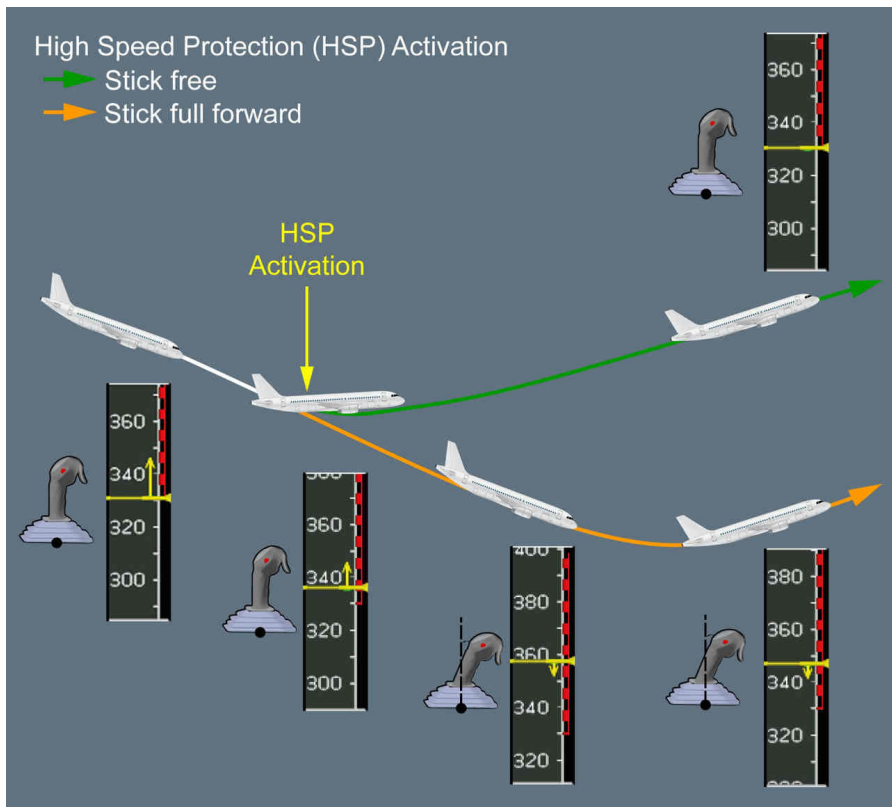
Ident.: DSC-27-20-10-20-A-00024651.0001001 / 06 NOV 25

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As the speed increases above VMO/MMO, the sidestick nose-down authority is progressively reduced, and a permanent nose-up order is applied to aid recovery to normal flight conditions.

Therefore, in a dive situation:

- If there is no sidestick input on the sidestick, the aircraft will slightly overshoot VMO/MMO and fly back towards the envelope
- If the sidestick is maintained full forward, the aircraft will significantly overshoot VMO/MMO. At approximately VMO + 16 kt / MMO + 0.04, the pitch nose-down authority smoothly reduces to zero (which does not mean that the aircraft stabilizes at that speed).

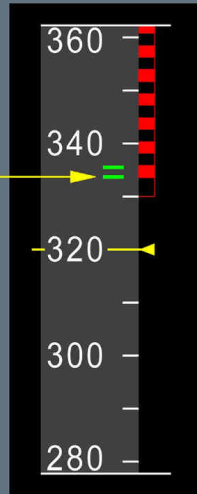


The PF, therefore, has full authority to perform a high speed/steep dive escape maneuver, when required, via a reflex action on the sidestick.

The high speed protection is deactivated, when the aircraft speed decreases below VMO/MMO, where the usual normal control laws are recovered.

The autopilot disconnects at VMO + 15 kt and MMO + 0.04.

High speed protection symbol:
 Two green bars at VMO + 6 Kt



- Note:
1. The ECAM displays an overspeed warning at VMO + 4 kt and MMO + 0.006.
 2. At high altitude, this may result in activation of the angle of attack protection.
Depending on the ELAC standard, the crew may have to push on the stick to get out of this protection law.

Ident.: DSC-27-20-10-20-A-00001077.0001001 / 21 MAR 16

LOW ENERGY AURAL ALERT (IF INSTALLED)

The low energy aural alert is computed by the FAC (*Refer to DSC-22_40-10 General*).

AIRCRAFT SYSTEMS

FLIGHT CONTROLS

FLIGHT CONTROL SYSTEM - NORMAL LAW

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Lateral Control**NORMAL LAW**

Ident.: DSC-27-20-10-30-00001078.0001001 / 17 MAR 17

Applicable to: ALL

When the aircraft is on the ground (in “on ground” mode), the sidestick commands the aileron and roll spoiler surface deflection. The amount of control surface deflection that results from a given amount of sidestick deflection depends upon aircraft speed. The pedals control rudder deflection through a direct mechanical linkage. The aircraft smoothly transitions to “in flight” mode shortly after liftoff. When the aircraft is in the “in flight” mode, normal law combines control of the ailerons, spoilers (except N° 1 spoilers), and rudder (for turn coordination) in the sidestick. The pilot does not need to use the rudder for turn coordination. While the system thereby gives the pilot control of the roll and heading, it also limits the roll rate and bank angle, coordinates the turns, and damps the dutch roll. The roll rate requested by the pilot during flight is proportional to the sidestick deflection, with a maximum rate of 15 °/s when the sidestick is at the stop.

When the aircraft is in “flare” mode, the lateral control is the same as in “in flight” mode.

After touchdown, the aircraft smoothly transitions from “in flight” mode to “ground” mode.

BANK ANGLE PROTECTION

Ident.: DSC-27-20-10-30-00001079.0001001 / 17 MAR 17

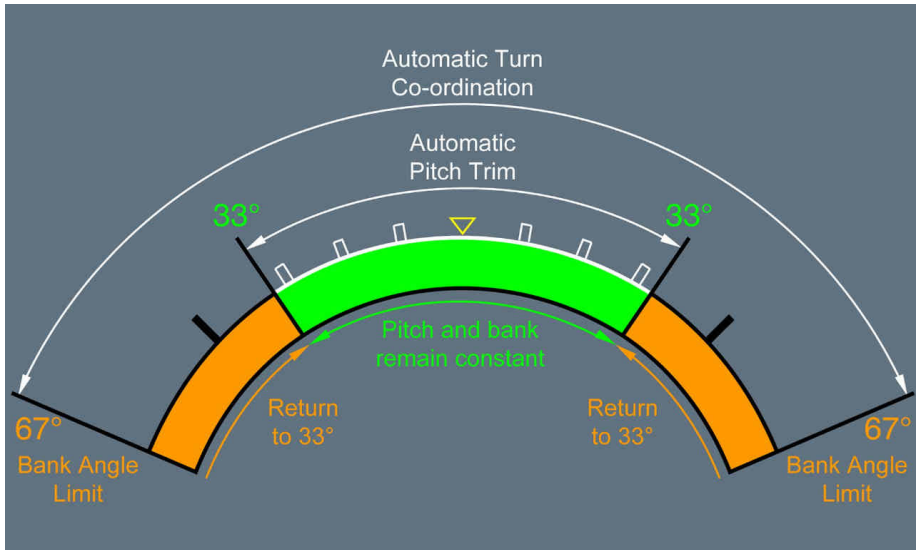
Applicable to: ALL

Inside the normal flight envelope, the system maintains positive spiral static stability for bank angles above 33 °. If the pilot releases the sidestick at a bank angle greater than 33 °, the bank angle automatically reduces to 33 °. Up to 33 °, the system holds the roll attitude constant when the sidestick is at neutral. If the pilot holds full lateral sidestick deflection, the bank angle goes to 67 ° and no further.

If Angle-of-Attack protection is active, and the pilot maintains full lateral deflection on the sidestick, the bank angle will not go beyond 45 °. If High Speed Protection is active, and the pilot maintains full lateral deflection on the sidestick, the bank angle will not go beyond 40 °. If high speed protection is operative, the system maintains positive spiral static stability from a bank angle of 0 °, so that with the sidestick released, the aircraft always returns to a bank angle of 0 °.

When bank angle protection is active, auto trim is inoperative.

If the bank angle exceeds 45 °, the autopilot disconnects and the FD bars disappear. The FD bars return when the bank angle decreases to less than 40 °.



During a normal turn (bank angle less than 33 °), in level flight:

- The PF moves the sidestick laterally (the more the sidestick is moved laterally, the greater the resulting roll rate - e.g. 15 °/s at max deflection)
- It is not necessary to make a pitch correction
- It is not necessary to use the rudder.

In the case of steep turns (bank angle greater than 33 °), the PF must apply:

- Lateral pressure on the sidestick to maintain bank
- Aft pressure on the sidestick to maintain level flight.

Load Alleviation Function**LOAD ALLEVIATION FUNCTION (LAF)**

Ident.: DSC-27-20-10-40-00001080.0006001 / 27 NOV 12

Applicable to: MSN 05746-07792

The load alleviation function permits to alleviate the wing structure loads.

The function is achieved through the upward deflection of:

- The two ailerons only, or
- The two ailerons associated to the spoilers 4 and 5.

The LAF has 2 sub-functions:

- A sub-function activated in case of stable maneuver (ailerons deflections only)
- A sub-function activated in case of gust detection (ailerons and spoilers deflections)

In case of continuous turbulences, the two LAF sub-functions can be activated independently (the highest alleviation is taken into account).

The LAF is available when the aircraft is in clean configuration and in Normal law. The LAF orders are added to those generated by the normal law.

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Sideslip Target

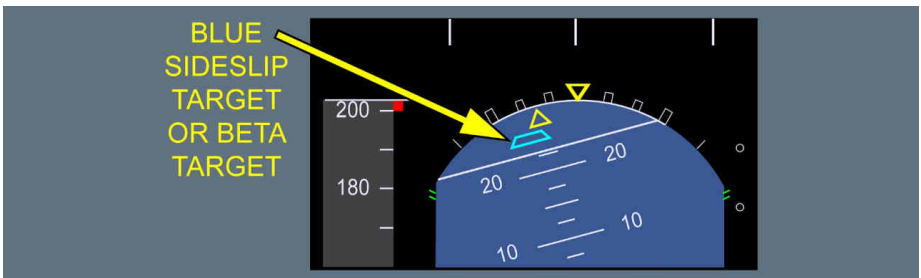
SIDESLIP TARGET

Ident.: DSC-27-20-10-50-00001081.0001001 / 17 MAR 17

Applicable to: ALL

If one engine fails, the FAC modifies the sideslip indication slightly to show the pilot how much rudder to use to get the best climb performance (ailerons to neutral and spoilers retracted).

In the case of an engine failure at takeoff, or at go-around, the sideslip index on the PFD changes from yellow to blue (to provide the conditions for the blue display of the sideslip target, *Refer to DSC-31-40 Attitude Data*).



In flight, the lateral normal law commands some rudder surface deflection to minimize the sideslip. The pilot's response is normal and instinctive: zero the slip indication by applying the right amount of rudder to get the best climb performance.

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Aircraft Trimming**AIRCRAFT TRIMMING**

Ident.: DSC-27-20-10-70-00002179.0001001 / 13 MAY 25

Applicable to: ALL

When the aircraft is :

- In normal cruise range (around M .77),
- In straight flight,
- With the autopilot engaged,
- With symmetrical engine thrust, and
- With fuel in the wing tanks distributed symmetrically,

the rudder trim should stay between 1 ° right and 2.3 ° left.

Note: This indication corresponds to a true rudder deflection within $\pm 1.5^\circ$, taking into account the permanent offset of rudder trim indication, when the aircraft is in cruise conditions. (average 0.5° right, 0.8° left).

An indicated, rudder trim above 1° right or 2.3° left is acceptable, if maintenance personnel establishes that the corresponding real rudder position is within 1.5° left, and 1.5° right.

AIRCRAFT SYSTEMS

FLIGHT CONTROLS

FLIGHT CONTROL SYSTEM - NORMAL LAW

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GENERAL

Ident.: DSC-27-20-20-00001082.0001001 / 17 MAR 17

Applicable to: ALL

Depending on the failures occurring to the flight control system, or on its peripherals, there are 3 levels of reconfiguration :

- Alternate law

They are two levels of alternate law : with and without reduced protections.

- Direct law
- Mechanical

The ECAM and PFD indicate any control law degradation.

ON THE ECAM

- **In ALTN Law:**

FLT CTL ALTN LAW (PROT LOST)

MAX SPEED 320 kt (320 kt/M 0.77 on A318)

- **In Direct Law:**

FLT CTL DIRECT LAW (PROT LOST)

MAX SPEED 320 kt/M 0.77

MAN PITCH TRIM USE

ON THE PFD

The PFD enhances the PF's awareness of the status of flight controls.

Specific symbols (= in green), and specific formatting of low speed information on the speed scale in normal law, indicate which protections are available.

When protections are lost, amber crosses (X) appear, instead of the green protection symbols (=).

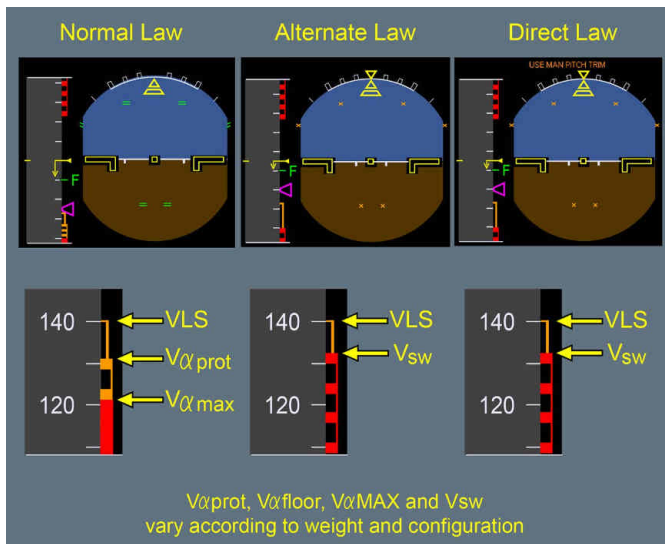
When automatic pitch trim is no longer available, the PFD indicates this with an amber "USE MAN PITCH TRIM" message below the FMA.

AIRCRAFT SYSTEMS

FLIGHT CONTROLS

FLIGHT CONTROL SYSTEM - RECONFIGURATION CONTROL LAWS

Fly-by-Wire Status Awareness via the PFD



Therefore, by simply looking at this main instrument (PFD), the flight crew is immediately aware of the status of flight controls, and the operational consequences.

FLIGHT CONTROLS LAW RECONFIGURATION

Ident.: DSC-27-20-20-00024057.0005001 / 13 MAY 25

Applicable to: MSN 02155-05253

ACTIVE LAW ►		PITCH		ROLL	YAW
SYS FAILED▼		LAW	PROTEC		
AUTO FLT	2 FAC	ALTN	REDUCED	DIRECT	MECH
	Yaw damper	ALTN	REDUCED	DIRECT	MECH
AUTO FLT and HYD	FAC 1 + HYD Y	ALTN	REDUCED	DIRECT	MECH
	FAC 2 + HYD G	ALTN	REDUCED	DIRECT	MECH
ELEC	BAT ONLY	ALTN	REDUCED	DIRECT	MECH
	EMER GEN	ALTN	REDUCED	DIRECT	MECH ----- ALTN ⁽¹⁾

Continued on the following page

Continued from the previous page

ACTIVE LAW ▶		PITCH		ROLL	YAW
SYS FAILED▼		LAW	PROTEC		
F/CTL	ELAC 1 and 2 or both ailerons	ALTN	REDUCED	DIRECT	ALTN
	ELAC 1 PITCH and ELAC 2 PITCH	ALTN	REDUCED	DIRECT	ALTN
	3 SEC	ALTN	REDUCED	DIRECT	ALTN
	2 SFCC (slat channel)	ALTN	NO	DIRECT	ALTN
	All spoilers	ALTN	REDUCED	DIRECT	ALTN
	1 Elevator	ALTN	REDUCED	DIRECT	ALTN
	THS (jammed) with the alert F/CTL STABILIZER JAM	ALTN	REDUCED	DIRECT	ALTN
F/CTL and HYD	CAPT or F/O sidestick	ALTN	REDUCED	DIRECT	ALTN
	ELAC 2 + HYD B	ALTN	REDUCED	DIRECT	ALTN
	ELAC 1 + HYD G	ALTN	REDUCED	DIRECT	ALTN
HYD	ELAC 1 + HYD Y	ALTN	REDUCED	DIRECT	ALTN
	HYD G + Y	ALTN	REDUCED	DIRECT	MECH
NAV	HYD G + B	ALTN	NO	DIRECT	ALTN
	2 ADR or 2 IR (2nd self detected failed)	ALTN	REDUCED	DIRECT	ALTN
	2 ADR (2nd not self detected failed)	ALTN	NO ----- REDUCED ⁽²⁾	DIRECT	ALTN
	2 IR (2nd not self detected failed)	DIRECT ----- ALTN ⁽³⁾	NO ----- REDUCED ⁽³⁾	DIRECT	MECH ----- ALTN ⁽³⁾
	3 ADR	ALTN	NO	DIRECT	MECH
	3 IR	DIRECT	NO	DIRECT	MECH
	2 Radio Altimeters at L/G EXTN (or CONF 2 if both LGCIU faulty)	DIRECT	NO	DIRECT	ALTN

⁽¹⁾ After FAC 1 is reset.

⁽²⁾ If AOA disagree.

⁽³⁾ After the faulty IR is set to OFF and ELAC 1 and 2 are reset.

AIRCRAFT SYSTEMS
FLIGHT CONTROLS
FLIGHT CONTROL SYSTEM - RECONFIGURATION CONTROL LAWS
FLIGHT CONTROLS LAW RECONFIGURATION

Ident.: DSC-27-20-20-00024057.0047001 / 13 MAY 25

Applicable to: MSN 05746-07792

	ACTIVE LAW ▶	PITCH		ROLL	YAW
		LAW	PROTEC		
AUTO FLT	2 FAC <i>Note:</i> ALTN LAW is indicated. No reversion to DIRECT LAW at L/G EXTN.	NORM	NORM	NORM	MECH
	Yaw damper <i>Note:</i> ALTN LAW is indicated. No reversion to DIRECT LAW at L/G EXTN.	NORM	NORM	NORM	MECH
AUTO FLT and HYD	FAC 1 + HYD Y <i>Note:</i> ALTN LAW is indicated. No reversion to DIRECT LAW at L/G EXTN.	NORM	NORM	NORM	MECH
	FAC 2 + HYD G <i>Note:</i> ALTN LAW is indicated. No reversion to DIRECT LAW at L/G EXTN.	NORM	NORM	NORM	MECH
ELEC	BAT ONLY	ALTN	REDUCED	DIRECT	MECH
	EMER GEN	ALTN	REDUCED	DIRECT	MECH ----- ALTN ⁽¹⁾
F/CTL	ELAC 1 and 2 or both ailerons	ALTN	REDUCED	DIRECT	ALTN
	ELAC 1 PITCH and ELAC 2 PITCH	ALTN	REDUCED	DIRECT	ALTN
	3 SEC	ALTN	REDUCED	DIRECT	ALTN
	2 SFCC (slat channel)	ALTN	NO	DIRECT	ALTN
	All spoilers	ALTN	REDUCED	DIRECT	ALTN
	1 Elevator	ALTN	REDUCED	DIRECT	ALTN
	THS (jammed) with the alert F/CTL STABILIZER JAM	ALTN	REDUCED	DIRECT	ALTN
	CAPT or F/O sidestick	ALTN	REDUCED	DIRECT	ALTN

Continued on the following page

Continued from the previous page

ACTIVE LAW ▶		PITCH		ROLL	YAW
SYS FAILED▼		LAW	PROTEC		
<u>F/CTL</u> and <u>HYD</u>	ELAC 2 + HYD B	ALTN	REDUCED	DIRECT	ALTN
	ELAC 1 + HYD G	ALTN	REDUCED	DIRECT	ALTN
	ELAC 1 + HYD Y	ALTN	REDUCED	DIRECT	ALTN
<u>HYD</u>	HYD G + Y	ALTN	REDUCED	DIRECT	MECH
	HYD G + B	ALTN	NO	DIRECT	ALTN
<u>NAV</u>	2 ADR or 2 IR (2nd self detected failed)	ALTN	REDUCED	DIRECT	ALTN
	2 ADR (2nd not self detected failed)	ALTN	NO ----- REDUCED ⁽²⁾	DIRECT	ALTN
	2 IR (2nd not self detected failed)	DIRECT ----- ALTN ⁽³⁾	NO ----- REDUCED ⁽³⁾	DIRECT	MECH ----- ALTN ⁽³⁾
	3 ADR	ALTN	NO	DIRECT	MECH
	3 IR	DIRECT	NO	DIRECT	MECH
	2 Radio Altimeters at L/G EXTN (or CONF 2 if both LGCIU faulty)	DIRECT	NO	DIRECT	ALTN

⁽¹⁾ After FAC 1 is reset.

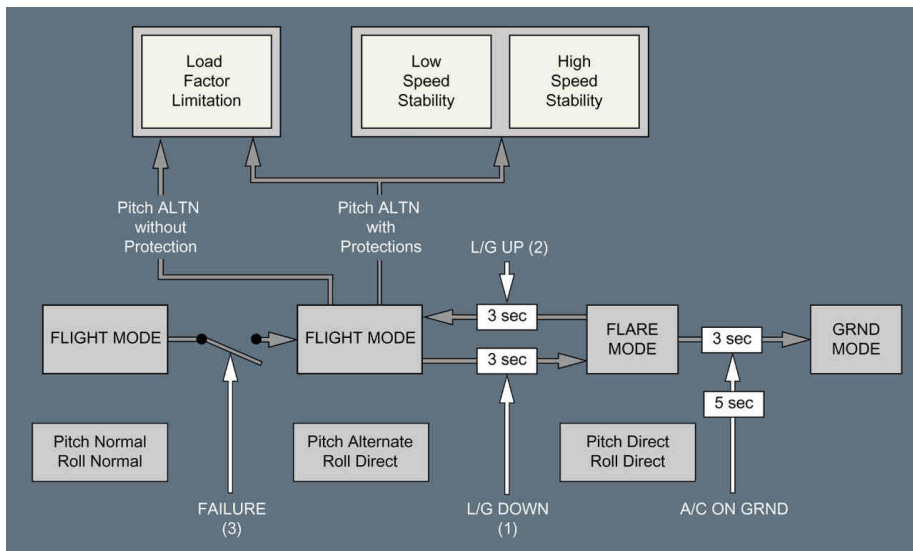
⁽²⁾ If AOA disagree.

⁽³⁾ After the faulty IR is set to OFF and ELAC 1 and 2 are reset.

ALTERNATE LAW

¹ Ident.: DSC-27-20-20-00001084.0005001 / 18 NOV 21

Applicable to: MSN 07784-07792



- (1) Or slats or flaps ≥ 2 if L/G information is no longer available (LGCIU 1+2 FAULT OR SEC 1+2+3 FAULT)
- (2) Or slats or flaps < 2 if L/G information is no longer available (LGCIU 1+2 FAULT OR SEC 1+2+3 FAULT)
- (3) Refer to DSC-27-20-20 Flight Controls Law Reconfiguration.

PITCH CONTROL

GROUND MODE

Under alternate law, the ground mode becomes active on the ground 5 s after touchdown. It is identical to the ground mode of the normal law.

FLIGHT MODE

In flight, the pitch alternate law is similar to the normal law and is based on load factor demand. The flight envelope protections are degraded. The basic high speed protection, pitch attitude protection and angle-of-attack protection are not available.

FLARE MODE

In pitch alternate law, the flight mode changes to the flare mode when the flight crew selects landing gear down. The flare mode is a direct stick-to-elevator relationship (*Refer to DSC-27-20-20 Direct Law*).

LATERAL CONTROL

In alternate law, the lateral control is ensured through a roll direct law and an alternate fly-by-wire or mechanical law.

ROLL DIRECT LAW

Refer to DSC-27-20-20 Direct Law.

YAW ALTERNATE LAW

Only the yaw damping function is available. Damper authority is limited to $\pm 5^\circ$ of rudder deflection.

REDUCED PROTECTIONS

LOAD FACTOR LIMITATION

The load factor limitation is similar to the load factor limitation in normal law.

PITCH ATTITUDE PROTECTION

There is no pitch attitude protection. X replaces = on the PFD.

LOW SPEED STABILITY

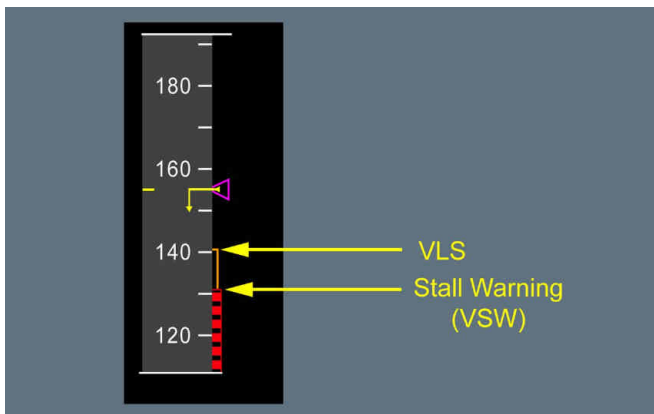
An artificial low speed stability replaces the normal angle-of-attack protection. It is available for all slat/flap configurations, and the low speed stability is active from about 5 kt up to about 10 kt above stall warning speed, depending on the aircraft's gross weight and slat/flap configuration. A gentle progressive nose down signal is introduced, that tends to keep the speed from falling below these values. The flight crew can override this demand.

The system also injects bank-angle compensation, so that operation effectively maintains a constant angle of attack.

In addition, stall warnings (crickets + STALL synthetic voice message and STALL STALL message on PFD) are activated at an appropriate margin from the stall condition.

The PFD speed scale is modified to show a black/red barber pole below the stall warning.

The α floor protection is inoperative.



HIGH SPEED STABILITY

Above VMO or MMO, a nose up demand is introduced to avoid an excessive increase in speed. The flight crew can override this demand.

In addition, the aural overspeed warning ($VMO + 4$ or $MMO + 0.006$) remains available.

BANK ANGLE PROTECTION

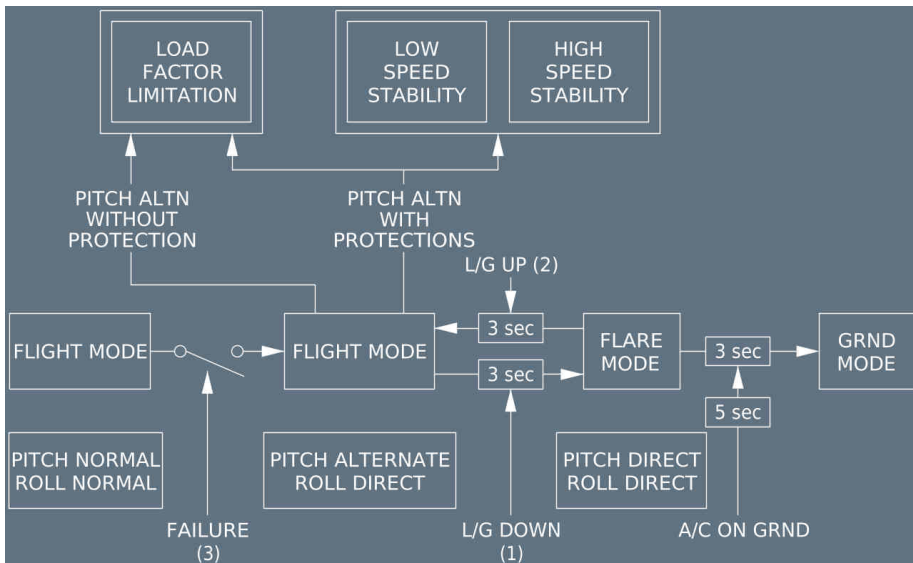
No bank angle protection is provided. However, both PFDs display the message **BANK BANK** and "BANK BANK" aural alert is triggered, when the bank angle exceeds 45° .

Note: The AP will disconnect, if speed exceeds VMO/MMO, or if the bank angle exceeds 45° .

ALTERNATE LAW

Ident.: DSC-27-20-20-00001084.0002001 / 29 MAY 20

Applicable to: MSN 02155-05746



- (1) OR SLATS OR FLAPS ≥ 2 IF L/G INFORMATION NO LONGER AVAILABLE (LGCIU 1+2 FAULT OR SEC 1+2+3 FAULT)
- (2) OR SLATS OR FLAPS < 2 IF L/G INFORMATION NO LONGER AVAILABLE (LGCIU 1+2 FAULT OR SEC 1+2+3 FAULT)
- (3) Refer to DSC-27-20-20 Flight Controls Law Reconfiguration.

PITCH CONTROL
GROUND MODE

Under alternate law the ground mode becomes active on the ground 5 s after touchdown. It is identical to the ground mode of the normal law.

FLIGHT MODE

In flight, the alternate law pitch mode follows a load-factor demand law much as the normal law pitch mode does, but it has less built-in protection (reduced protections).

FLARE MODE

In pitch alternate law the flight mode changes to the flare mode when the pilot selects landing gear down. The flare mode is a direct stick-to-elevator relationship. (*Refer to DSC-27-20-20 Direct Law*).

LATERAL CONTROL

When the aircraft flying in pitch alternate law, lateral control follows the roll direct law associated with yaw alternate or mechanical.

ROLL DIRECT LAW

Refer to DSC-27-20-20 Direct Law.

YAW ALTERNATE LAW

Only the yaw damping function is available. Damper authority is limited to $\pm 5^\circ$ of rudder deflection.

REDUCED PROTECTIONS**LOAD FACTOR LIMITATION**

The load factor limitation is similar to that under normal law.

PITCH ATTITUDE PROTECTION

There is no pitch attitude protection. Amber Xs replace the green double bars “=” on the PFD.

LOW SPEED STABILITY

An artificial low speed stability replaces the normal angle-of-attack protection. It is available for all slat/flap configurations, and the low speed stability is active from about 5 kt up to about 10 kt above stall warning speed, depending on the aircraft's gross weight and slats/flaps configuration.

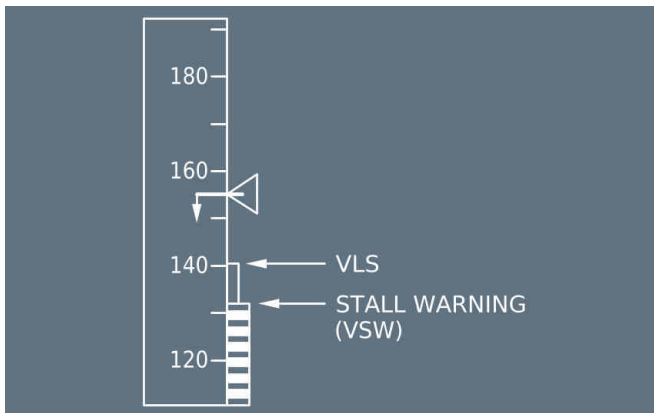
A gentle progressive nose down signal is introduced, which tends to keep the speed from falling below these values. The pilot can override this demand.

The system also injects bank-angle compensation, so that operation effectively maintains a constant angle of attack.

In addition, stall warnings (crickets + “STALL” synthetic voice message and “STALL STALL” red message on PFD) are activated at an appropriate margin from the stall condition.

The PFD speed scale is modified to show a black/red barber pole below the stall warning.

The α floor protection is inoperative.



HIGH SPEED STABILITY

Above VMO or MMO, a nose up demand is introduced to avoid an excessive increase in speed. The pilot can override this demand.

In addition, the aural overspeed warning ($VMO + 4$ or $MMO + 0.006$) remains available.

BANK ANGLE PROTECTION

Not provided.

Note: The AP will disconnect, if speed exceeds VMO/MMO, or if the bank angle exceeds 45° .

ALTERNATE LAW WITHOUT REDUCED PROTECTION

Ident.: DSC-27-20-20-00001085.0001001 / 21 MAR 16

Applicable to: ALL

This is identical to alternate law except that it does not include the low-speed stability or the high-speed stability. It includes only the load factor limitation.

DIRECT LAW

Ident.: DSC-27-20-20-00001086.0001001 / 21 MAR 16

Applicable to: ALL

PITCH CONTROL

The pitch direct law is a direct stick-to-elevator relationship (elevator deflection is proportional to stick deflection).

In all configurations the maximum elevator deflection varies as a function of CG.

It is a compromise between adequate controllability with the CG forward, and not-too-sensitive control with the CG aft.

There is no automatic trim : the pilot must trim manually.

The PFD displays in amber the message "USE MAN PITCH TRIM".

No protections are operative.

The α floor function is inoperative.

Overspeed and stall warnings are available as for alternate law.

LATERAL CONTROL

When flying in "direct law", the roll direct law associated with mechanical yaw control governs lateral control.

ROLL DIRECT LAW

The roll direct law is a direct stick-to-surface-position relationship. System gains are set automatically to correspond to slat/flap configuration.

With the aircraft in the clean configuration, the maximum roll rate is about 30 °/s.

With slats extended, it is about 25 °/s.

To limit roll rate, the roll direct law uses only ailerons and spoilers N° 4 and 5.

If spoiler N° 4 has failed, spoiler N° 3 replaces it.

If the ailerons have failed, all roll spoilers become active.

YAW MECHANICAL CONTROL

The pilot controls yaw with the rudder pedals.

The yaw damping and turn coordination functions are lost.

ABNORMAL ATTITUDE LAWS

Ident.: DSC-27-20-20-00001087.0004001 / 16 MAY 22

Applicable to: **ALL**

If for any reason the aircraft goes far outside the normal flight envelope and reaches an extreme attitude, the flight control law will be modified.

The abnormal attitude law will engage and will provide the PF with maximum efficiency to recover normal attitude.

The abnormal attitude law engages when one of the following values is reached:

- Bank angle above 125 °
- Pitch attitude:
 - If at least 2 ADC are valid and consistent: Pitch attitude above 50 ° nose up or below 30 ° nose down
 - In all other cases: Pitch attitude above 40 ° nose up or below 20 ° nose down

- Speed below 70 to 90 kt (depending on the aircraft pitch attitude), or above 440 kt
- Mach above 0.91
- Angle of attack above 40 °.

When the abnormal attitude law engages:

- The pitch alternate law with no protection is active (no load factor limitation)
- The roll direct law is active
- The yaw mechanical law is active
- Autotrim is not available. Therefore, **USE MAN PITCH TRIM** is displayed on the PFDs
- **F/CTL DIRECT LAW** is displayed on the ECAM.

When the aircraft returns within the normal flight envelope, the abnormal attitude law disengages and the following conditions remain for the remainder of the flight:

- The pitch alternate law without reduced protection is active, *Refer to DSC-27-20-20 Alternate Law Without Reduced Protection*
- The roll direct law is active
- The yaw alternate law is active
- **F/CTL ALTN LAW** is displayed on the ECAM.

MECHANICAL BACK-UP

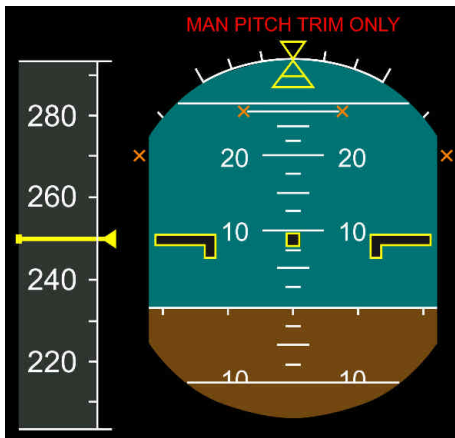
Ident.: DSC-27-20-20-00001088.0001001 / 17 MAR 17

Applicable to: ALL

The purpose of the mechanical backup is to achieve all safety objectives in MMEL dispatch condition: to manage a temporary and total electrical loss, the temporary loss of five fly-by-wire computers, the loss of both elevators, or the total loss of ailerons and spoilers.

PITCH

The pilot manually applies trim to the THS to control the aircraft in pitch.
The PFDs display “MAN PITCH TRIM ONLY” in red.



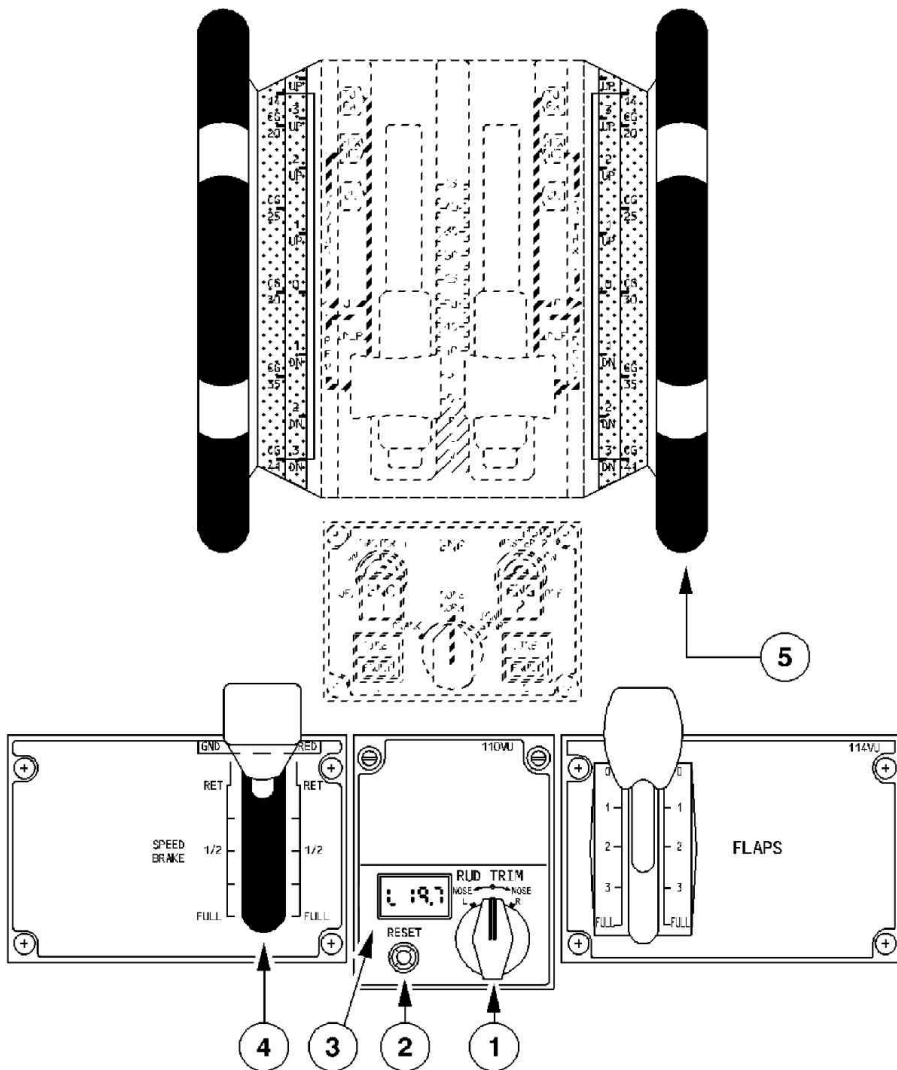
LATERAL

The pilot uses the rudder pedals as the mechanical backup to laterally control the aircraft .

PEDESTAL

Ident.: DSC-27-20-30-00001090.0002001 / 08 JUL 15

Applicable to: ALL



AIRCRAFT SYSTEMS**FLIGHT CONTROLS**

FLIGHT CONTROL SYSTEM - CONTROLS AND INDICATORS

(1) RUD TRIM rotary selector

Controls the rudder trim actuator, which moves the neutral point of the artificial feel by the equivalent of one degree of rudder travel per second.

Note: The rudder trim rotary selector has no effect, when the autopilot is engaged.

(2) RESET pb

By pushing the RESET pb, the zero trim position is ordered at 1.5 °/s.

After the reset, an indication of up to 0.3° (L or R) may be observed in the rudder trim position indication.

Note: The RESET pb is not active, when the autopilot is engaged.

(3) Position Indicator

Displays the rudder trim direction (L or R) and value.

(4) SPEEDBRAKE lever

The lever controls:

- The position of the speedbrake surfaces.

To set speedbrake surfaces to a required position, the lever has to be pushed down and set to the required position. A “hardpoint” is provided at “½” SPEEDBRAKE position.

- The manual preselection of the ground spoilers.

To arm the ground spoilers, the lever must be pulled up when in the RET position.

When the lever is armed (or reverse thrust is selected), all spoiler's surfaces will automatically extend at landing, or in case of a rejected takeoff.

(5) PITCH TRIM Wheel

Both pitch trim wheels provide mechanical control of the THS and have priority over electrical control. A pilot action on the pitch trim wheel disconnects the autopilot.

Note: Crew action on the pitch trim wheel does not disconnect the ELACs (micro-switches, actuated by the override mechanism, ensure that the computers remain synchronized with the manually-selected position).

The THS is manually-controlled on ground for the THS setting, before takeoff and in flight, when in direct law.

- Before takeoff, the pilot sets the THS to the angular value, determined as a function of the aircraft CG, using the CG scale on the wheel. The relationship between the aircraft CG and the THS setting shown on the trim wheel is only applicable for takeoff. The limits of the THS normal setting range for takeoff are indicated by a green band on the pitch trim wheel.
- In flight, when in direct law, the pilot uses the THS conventionally to fly in trim. In flight, the aircraft pitch trim setting depends on aircraft CG, weight, altitude and speed. Consequently, the relation between the aircraft CG, and the THS setting displayed on the pitch trim wheel, does not apply in flight.

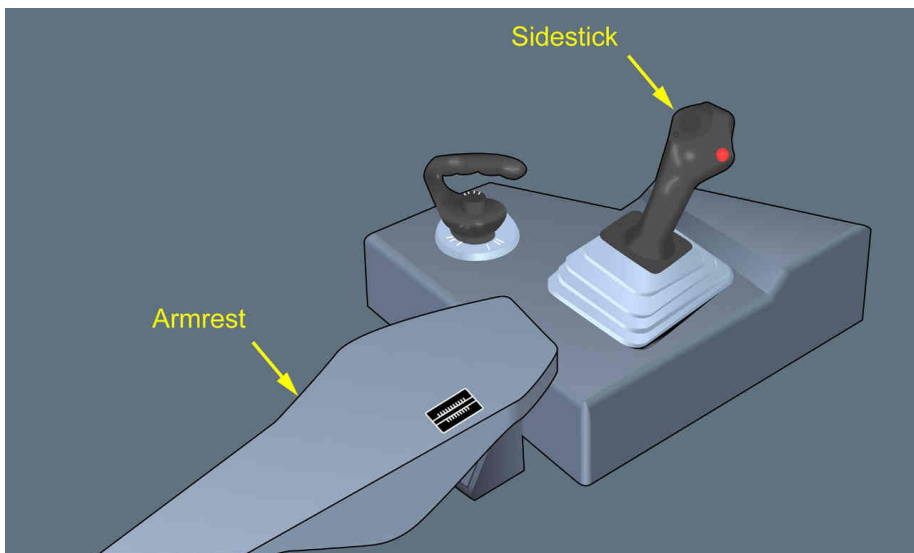
Following nosewheel touchdown, as the pitch attitude becomes less than 2.5° for more than 5 s, pitch trim is automatically reset to zero.

Note: This function is inoperative, when the green or yellow hydraulic system is not pressurized.

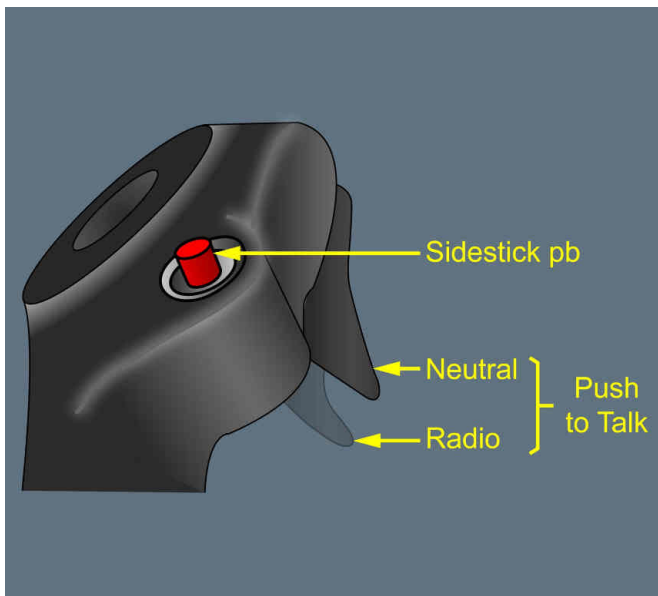
LATERAL CONSOLES

Ident.: DSC-27-20-30-00001091.0004001 / 18 MAY 22

Applicable to: ALL



SIDESTICKS



The sidestick are springloaded to neutral. They are not mechanically linked, and do not receive feedback from the flight control surfaces.

When the autopilot is engaged, the sidesticks are locked in the neutral position.

If a flight crewmember applies a force above a given threshold:

- The sidesticks unlock
- The autopilot disengages
- The AUTO FLT AP OFF alert triggers.

L3 The autopilot disengages when a pilot applies a force of more than 5 daN in pitch, or 3.5 daN in roll.

L1 Note: *This is not the recommended method for autopilot disengagement. For more information, Refer to DSC-22_30-30-30 Manual Disengagement 1 and Refer to DSC-22_30-30-30 Automatic Disengagement 1.*

Each sidestick has two controls:

- The Radio Push To Talk switch
- The sidestick pb, for autopilot disengagement, or sidestick priority.

SIDESTICK PRIORITY LOGIC

At all times, only one flight crewmember should fly the aircraft.

However, if both flight crewmembers use their sidesticks simultaneously, their orders are algebraically added.

L2 The flight control laws limit the combined order to the equivalent of the full deflection of one sidestick.

L1 In this case the two green SIDE STICK PRIORITY lights on the glareshield come on and "DUAL INPUT" voice message is activated.

A flight crewmember can deactivate the other sidestick and take full control, by pressing and keeping pressed the sidestick pb.

To deactivate the other sidestick, the flight crewmember must press their sidestick pb for 40s.

The other sidestick is permanently deactivated, until any flight crewmember presses their sidestick pb.

If both flight crew members press their sidestick pb, the last pilot to press gets the priority.

L2 If one sidestick was deactivated on ground, the CONFIG L(R) SIDESTICK FAULT alert is triggered at takeoff power application, or during the TO CONFIG test.

L1 For more information: *Refer to DSC-27-20-30 Glareshield*

ARMREST

The armrest on the sidestick side of the Captain and F/O seats are adjustable.

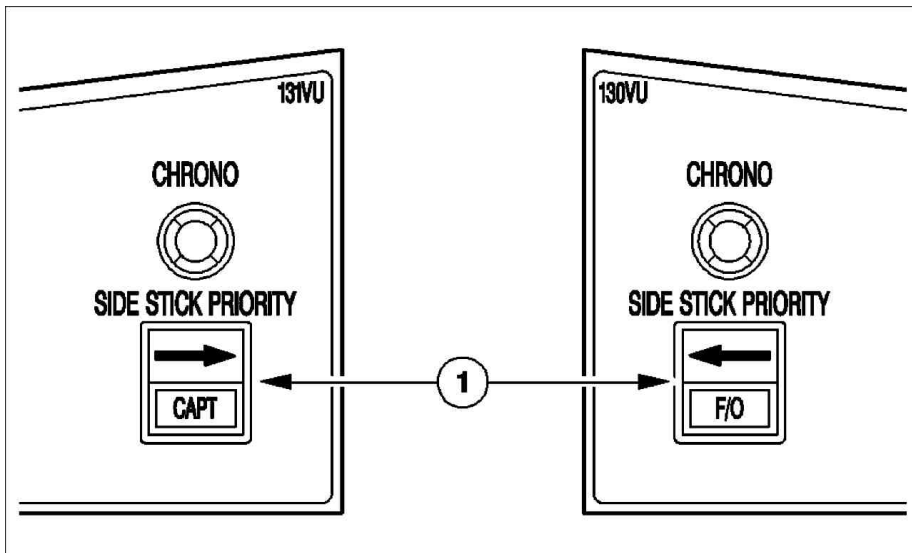
Correctly adjusting the seat eases the handling of the sidestick.

For information on how to adjust the armrest: *Refer to DSC-25-10-30 Armrest*

GLARESHIELD

Ident.: DSC-27-20-30-00001092.0002001 / 03 NOV 21

Applicable to: ALL



(1) SIDE STICK PRIORITY It

- Red arrow light :
- comes on in front of the flight crew losing authority.
 - goes out if the flight crew has recovered their authority
 - if the other flight crew releases their TAKEOVER pushbutton prior the priority condition is latched.
 - or
 - If the flight crew has used their takeover push button to cancel a latched priority situation.
- Sidestick priority audio : A "PRIORITY LEFT" or "PRIORITY RIGHT" audio voice message is given each time priority is taken.

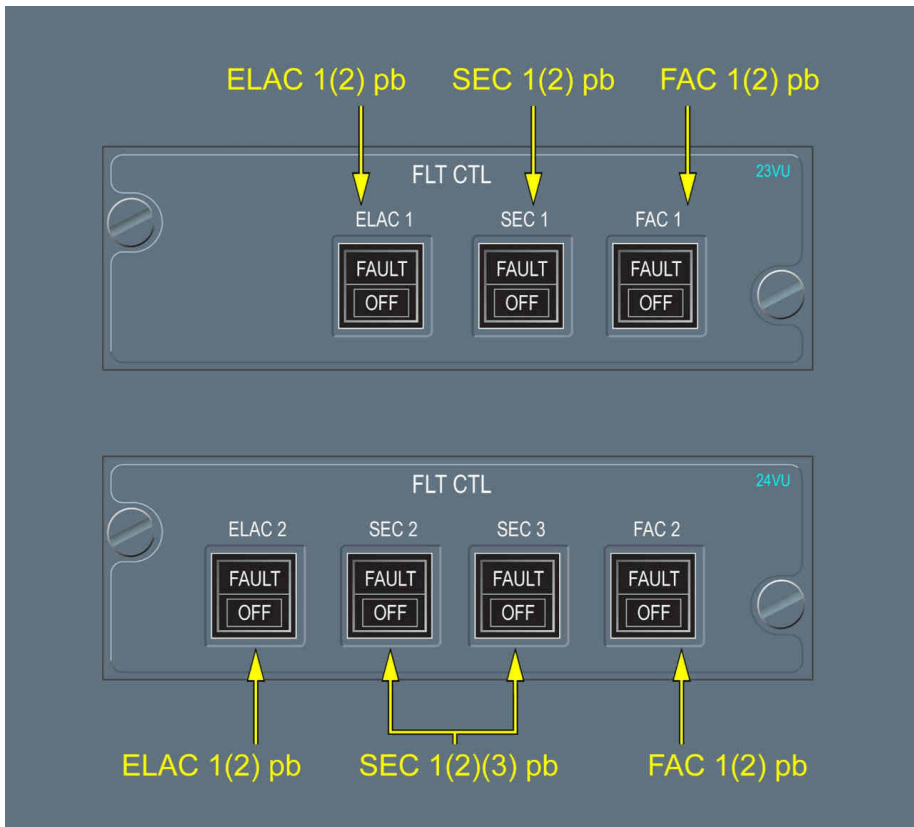
Green CAPT and F/O lights :

- Both lights flash when the flight crew move both sidesticks simultaneously and neither takes priority.
- When the flight crew has taken priority by pressing the takeover pushbutton and the other flight crew's sidestick is not at neutral, the light in front of the flight crew with priority lights up. It goes out when the other flight crew returns their stick to the neutral position.

OVERHEAD PANEL

Ident.: DSC-27-20-30-00017869.0005001 / 03 MAY 23

Applicable to: MSN 05746-07792



ELAC 1(2) pb

Controls the ELAC 1(2).



ELAC 1(2) performs the following functions:

- Normal pitch and roll, normal LAF 
- Alternate pitch
- Direct pitch and roll
- Abnormal attitude
- Aileron droop
- Acquisition of autopilot orders.



The corresponding computer is not active. To reset, switch it OFF, then ON.



The **FAULT** light comes on, along with an ECAM caution:

- When a failure is detected
- During ELAC power-up test (8 s).

Note: The ELAC power-up test occurs when electrical power is turned on, or after the occurrence of an electrical transient lasting longer than 25 ms.

The **FAULT** light goes off, when flight crew selects OFF, or at the end of the ELAC power-up test, if its results are acceptable.

SEC 1(2)(3) pb

Controls the SEC 1(2)(3).



SEC 1(2)(3) performs the following functions:

- Normal roll (by controlling the spoilers)
- Speed brakes and ground spoilers
- Alternate pitch (SEC 1 and SEC 2 only)
- Direct pitch (SEC 1 and SEC 2 only)
- Direct roll
- Abnormal attitude.



The corresponding computer is not active. To reset, switch it OFF, then ON.



The corresponding computer is failed.

Associated ECAM alert comes on when a failure is detected.

The **FAULT** light goes off when flight crew selects OFF.

FAC 1(2) pb

Controls the FAC 1(2).

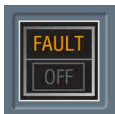


Both FACs perform the following functions:

- Normal roll (coordinating turns and damping dutch roll)
- Rudder trim
- Rudder travel limit
- Alternate yaw.



The corresponding computer is not active. To reset, switch it OFF, then ON.



The corresponding computer is failed.

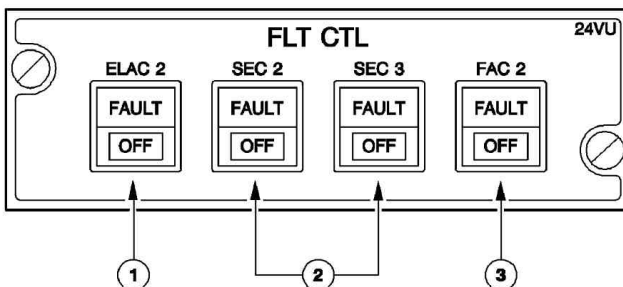
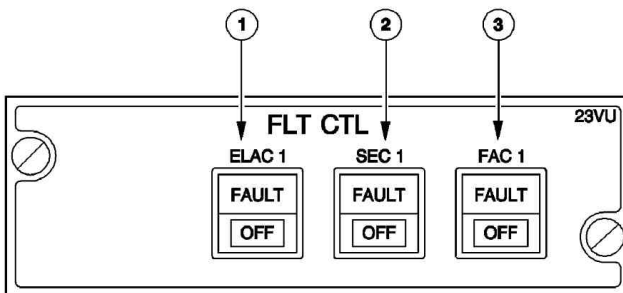
Associated ECAM alert comes on when a failure is detected.

The **FAULT** light goes off when flight crew selects OFF.

OVERHEAD PANEL

Ident.: DSC-27-20-30-00017869.0001001 / 19 SEP 16

Applicable to: MSN 02155-05253



- (1) ELAC 1(2) pushbutton
Controls the Elevator and Aileron Computer (ELAC) 1(2).

- ON :** ELAC 1(2) performs the following functions :
- Normal pitch and roll, normal LAF 
 - Alternate pitch, alternate LAF 
 - Direct pitch and roll
 - Abnormal attitude
 - Aileron droop
 - Acquisition of autopilot orders.
- OFF :** The corresponding computer is not active. Switching it OFF, then ON, resets the computer.
- FAULT :** Comes on amber, along with an ECAM caution:
- When a failure is detected
 - During ELAC power-up test (eight seconds).

Note: The ELAC power-up test occurs when electrical power is turned on, or after the occurrence of an electrical transient lasting longer than 25 ms.

The FAULT light goes off, when the pilot selects OFF, or at the end of the ELAC power-up test, if its results are satisfactory.

(2) SEC 1(2)(3) pushbutton

Controls the Spoiler and Elevator Computer (SEC) 1(2)(3).

- ON :** SEC 1(2)(3) performs the following functions:
- Normal roll (by controlling the spoilers)
 - Speed brakes and ground spoilers
 - Alternate pitch (SEC 1 and SEC 2 only)
 - Direct pitch (SEC 1 and SEC 2 only)
 - Direct roll
 - Alternate LAF 
 - Abnormal attitude.
- OFF :** The corresponding computer is not active. Switching it OFF, then ON, resets the computer.
- FAULT :** Comes on amber, along with an ECAM caution, when a failure is detected.
The FAULT light goes off, when the pilot selects OFF.

(3) FAC 1(2) pushbutton

Controls the Flight Augmentation Computer (FAC) 1(2).

AIRCRAFT SYSTEMS

FLIGHT CONTROLS

FLIGHT CONTROL SYSTEM - CONTROLS AND INDICATORS

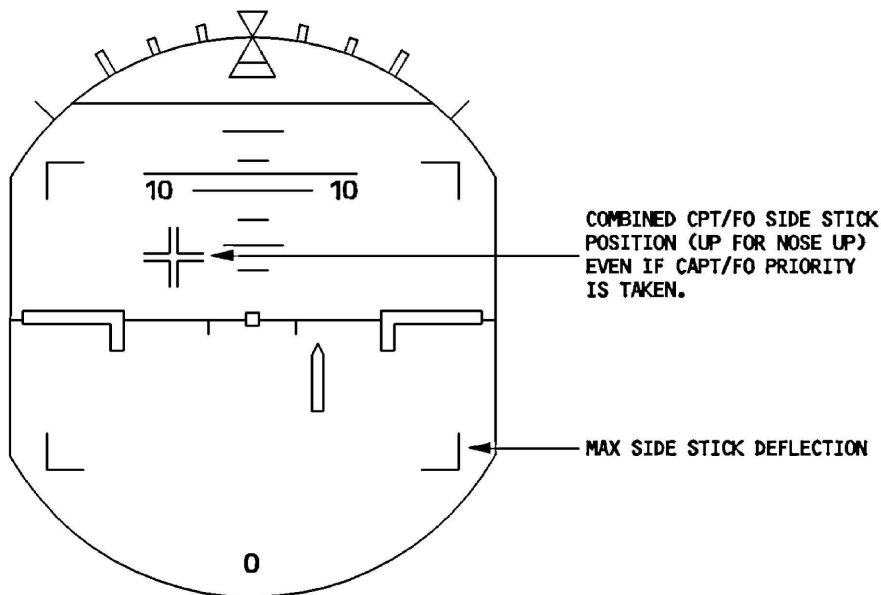
- ON** : Both FACs perform the following functions:
- Normal roll (coordinating turns and damping dutch roll)
 - Rudder trim
 - Rudder travel limit
 - Alternate yaw
- OFF** : The corresponding computer is not active. Switching it OFF, and then ON, resets the computer.
- FAULT** : Comes on amber, along with an ECAM caution, when a failure is detected. The FAULT light goes off, when the pilot selects OFF.

SIDE STICK INDICATIONS ON PFD

Ident.: DSC-27-20-30-00001094.0001001 / 21 MAR 16

Applicable to: ALL

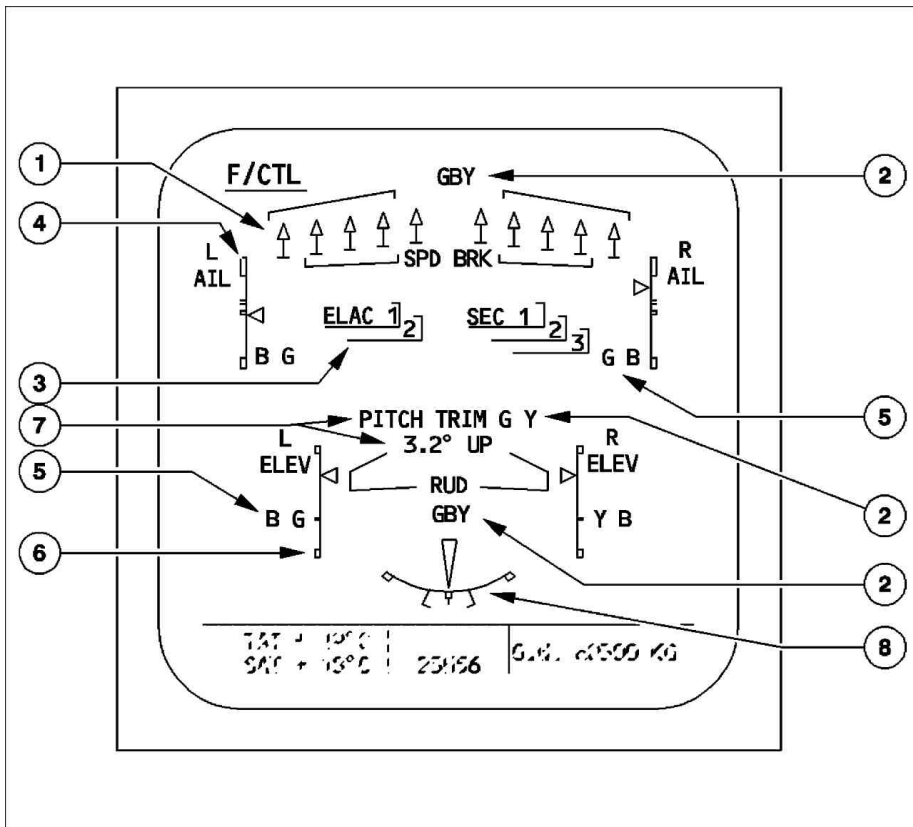
On the ground, after the first engine start, sidestick position indications appear white on both PFDs. The indications disappear when the aircraft goes from the ground into flight.



ECAM F/CTL PAGE

Ident.: DSC-27-20-30-00001095.0004001 / 13 MAY 25

Applicable to: ALL



(1) Spoilers/Speedbrakes' Indication

- Δ : Spoiler deflected by more than 2.5 ° (green)
- : Spoiler retracted (green)
- Δ : Spoiler fault deflected (amber)
- 1 : Spoiler fault retracted (amber)
- × : Spoiler position not valid (amber)

(2) Hydraulic System Pressure Indication

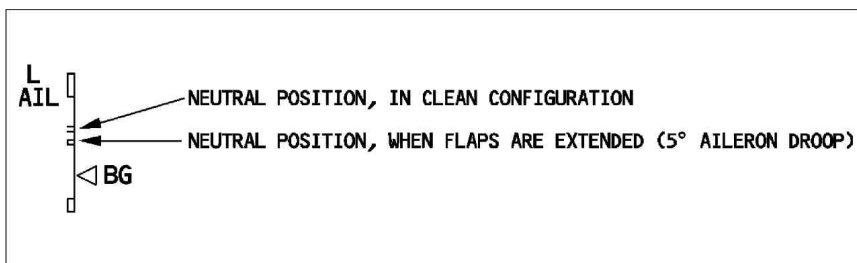
It is normally green. It becomes amber, if the hydraulic system's pressure decreases.

(3) ELAC/SEC Indication

- ELAC and SEC labels are always displayed in white
- The computer number is normally in green, and boxed in grey.
The number and box become amber, if the computer fails, or is switched OFF.

(4) Aileron position indication

It is indicated with a white scale and green index. It changes to amber, when neither (green nor blue) servojack is available.



Note: The white boxes located at each end of the primary flight control surfaces indicate acceptable range for the flight control check. The full travel is shown when the index is in the box, or on the edge of the box.

(5) Aileron and elevator actuator indication

"G" and "B" are normally displayed in green.

They become amber, in the case of a green or blue hydraulic system low pressure. The partial box also becomes amber, if the associated computer or actuator fails.

(6) Elevator position indication

It is indicated with a white scale and green index. The index becomes amber, when both associated actuators are not available.

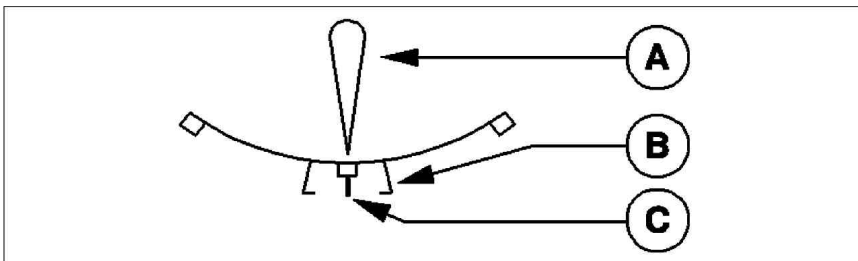
Note: The white boxes located at each end of the primary flight control surfaces indicate acceptable range for the flight control check. The full travel is shown when the index is in the box, or on the edge of the box.

(7) Pitch trim position indication

The pitch trim numbers are in green. They become amber, if green and yellow hydraulic system pressure decreases.

The "PITCH TRIM" legend is in white. It becomes amber, if the pitch trim jams.

(8) Yaw control indications



(A) Rudder position indication

It is normally in green. The rudder symbol becomes amber, if the blue, green, and yellow hydraulic pressures are low.

(B) Rudder travel limiter

It is normally in green. It becomes amber when travel limiter 1 and 2 are faulty. Two TLU messages are displayed in amber when the TLU indexes are suppressed.

(C) Rudder trim position

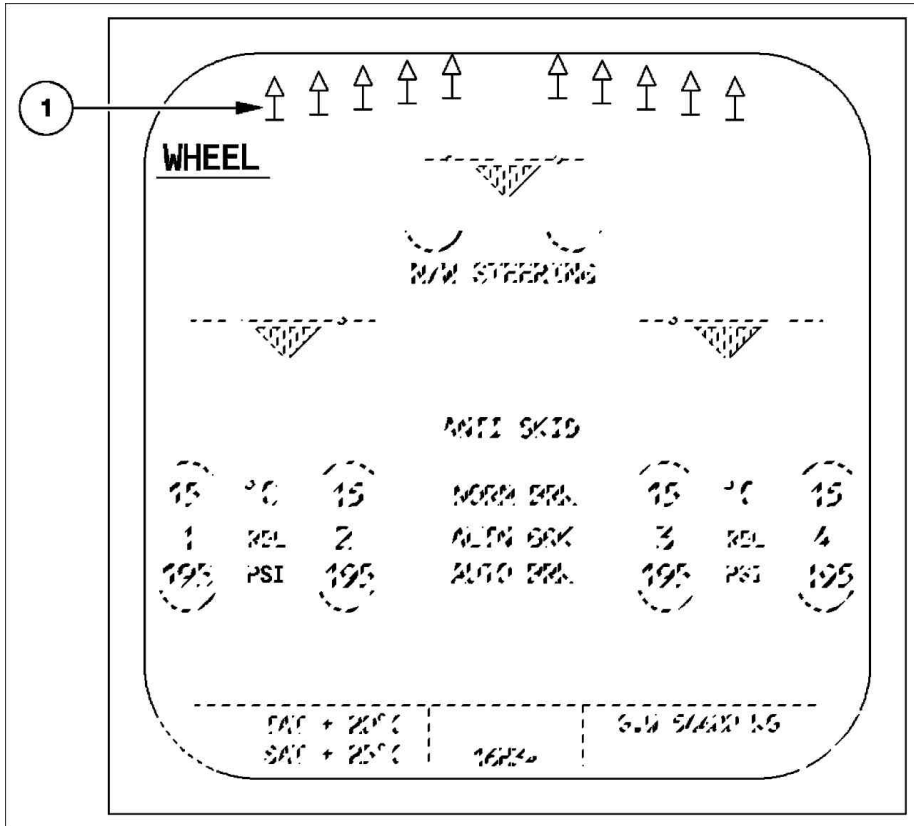
It is normally in blue. It becomes amber, if the rudder trim reset fails.

Note: The white boxes located at each end of the primary flight control surfaces indicate acceptable range for the flight control check. The full travel is shown when the index is in the box, or on the edge of the box.

ECAM WHEEL PAGE

Ident.: DSC-27-20-30-00001096.0002001 / 15 FEB 11

Applicable to: ALL



(1) Spoilers/Speedbrakes' Indication

These indications are identical to those displayed on the FLT CTL page.

MEMO DISPLAY

Applicable to: ALL

Ident.: DSC-27-20-30-A-00016860.0001001 / 21 MAR 16

GND SPLRS ARMED : This memo appears in green when the ground spoilers are armed.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS FLIGHT CONTROLS FLIGHT CONTROL SYSTEM - CONTROLS AND INDICATORS
--	--

Ident.: DSC-27-20-30-A-00016859.0001001 / 21 MAR 16

- SPEED BRK** : This memo appears in green when the speedbrakes are extended.
- SPEED BRK** : This memo appears in amber when the speedbrakes should be retracted.

AIRCRAFT SYSTEMS

FLIGHT CONTROLS

FLIGHT CONTROL SYSTEM - CONTROLS AND INDICATORS

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS FLIGHT CONTROLS FLAPS AND SLATS - DESCRIPTION
--	--

GENERAL

Applicable to: ALL

Ident.: DSC-27-30-10-A-00024875.0001001 / 04 NOV 21

The slat and flap system includes all of the following main components:

Ident.: DSC-27-30-10-A-00024876.0001001 / 04 NOV 21

- Five slat surfaces and two flap surfaces per wing. These surfaces are electrically controlled and hydraulically operated. The flight crew extends the slats and flaps by moving the flaps lever on the center pedestal. It has five positions.

Ident.: DSC-27-30-10-A-00024877.0001001 / 04 NOV 21

- Two SFCCs, each containing one slat channel and one flap channel
- A PCU which is made of two independent hydraulic motors coupled by a differential gearbox. The motors use green and blue hydraulic power for the slats, and yellow and green power for the flaps. The POB locks the transmission when the slat or flap surfaces have reached the selected position or if hydraulic power fails.
- An APPU that measures the asymmetry between the left and right wings
- A flap disconnect detection system, which detects attachment failure and inhibits the flap operation in order to prevent further damage. A sensor detects the failure by measuring excessive differential movement between the inner and the outer flaps.
- The WTBs which activate in the case of an uncommanded movement of the surfaces, such as runaway, asymmetry or over speed. They cannot be released in flight. They use blue and green hydraulic power for the slats and for the right wing flaps, and blue and yellow hydraulic power for the left wing flaps.
- The FPPUs that feedback position information to the SFCCs
- An IPPU that sends position data to the ECAM.

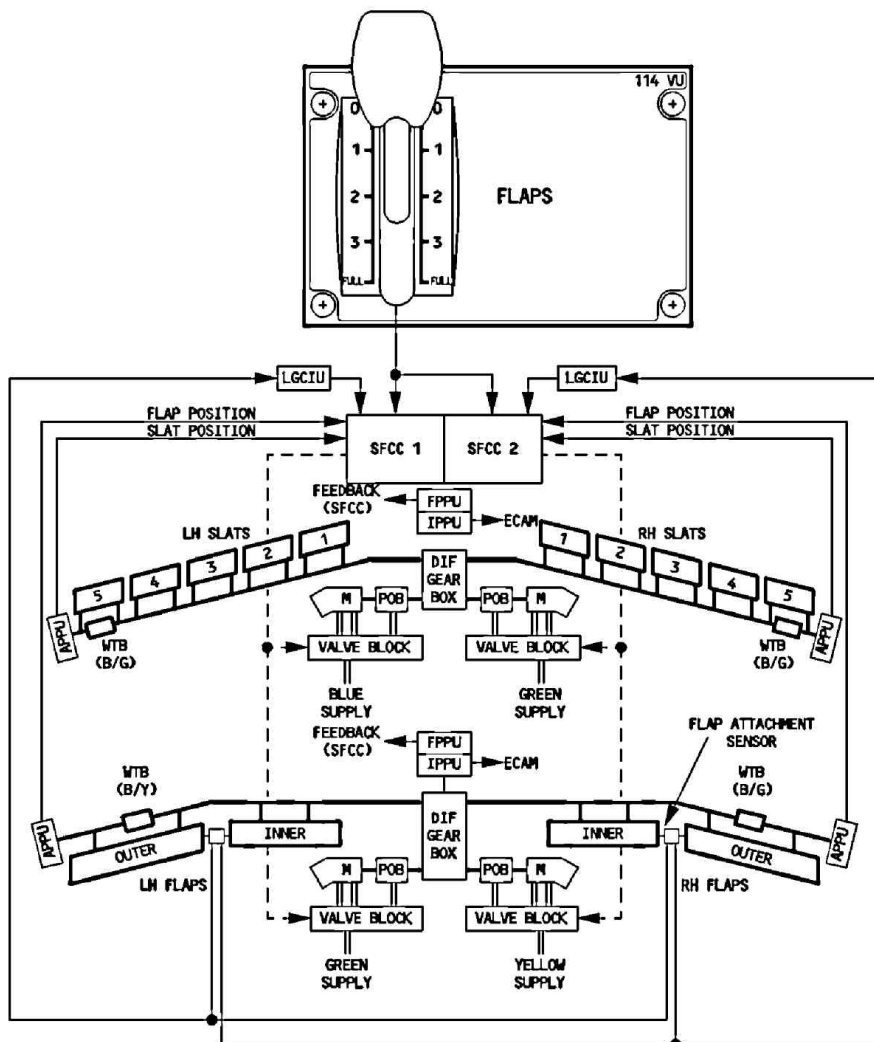
Note:

- *If the flap WTB is on, the flight crew can still operate the slats, and if the slat WTB is on, the flight crew can still operate the flaps*
- *If one SFCC is inoperative, both slats and flaps operate at half speed*
- *If one hydraulic system is inoperative, the corresponding surfaces (slats or flaps) operate at half speed.*

ARCHITECTURE

Ident.: DSC-27-30-10-00001099.0001001 / 21 MAR 16

Applicable to: ALL



CONFIGURATIONS

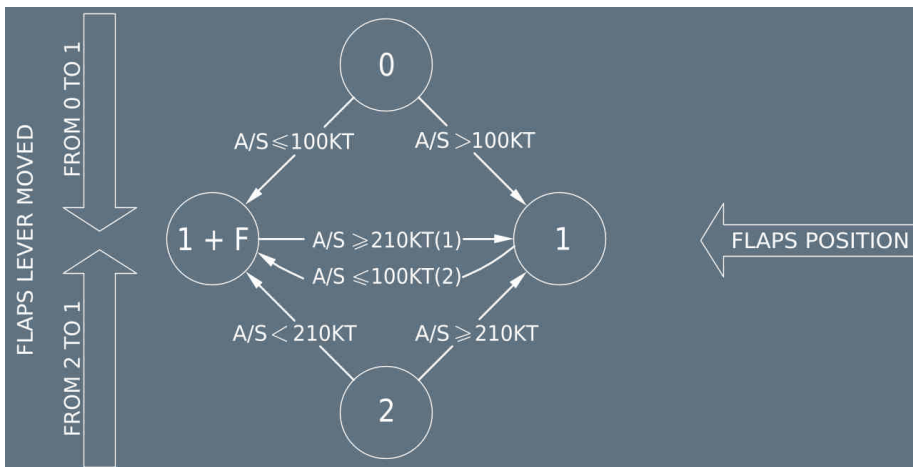
Ident.: DSC-27-30-10-00001100.0001001 / 09 OCT 12

Applicable to: ALL

The FLAPS lever has five positions: 0, 1, 2, 3 and FULL.

Two configurations correspond to position 1: Configuration 1 and Configuration 1 + F.

The pilot selects these as follows:



- (1) When in Configuration 1 + F, the flaps retract to 0 ° automatically at 210 kt (before the airspeed reaches VFE).
- (2) When in configuration 1, the flaps extend to 10 ° automatically at 100 kt.

ALPHA/SPEED LOCK FUNCTION (SLATS)

Ident.: DSC-27-30-10-00001101.0001001 / 13 SEP 16

Applicable to: ALL

This function inhibits slat retraction at high angles-of-attack and low speeds.

The SFCCs use corrected angle-of-attack (alpha) or airspeed information from the ADIRUs to inhibit slat retraction.

When the FLAPS lever is set to 0, the slats alpha/speed lock function activates and inhibits slats retraction, if:

- The AOA is above 8.5 °, or
- The speed is less than 148 kt.

AIRCRAFT SYSTEMS**FLIGHT CONTROLS**

FLAPS AND SLATS - DESCRIPTION

Note: If the FLAPS lever is already set to 0, when either of the above conditions occurs, the function will not activate therefore the slats will continue to retract or will remain at 0.

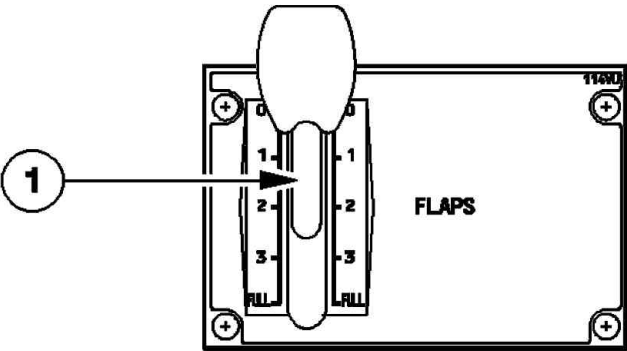
Once the slats alpha/speed lock function is active, the slats retract to 0 when:

- The AOA is less than 7.6 ° and
- The speed is above 154 kt.

Note: When the aircraft is on ground and its speed is less than 60 kt, then the function will not activate.

PEDESTAL

Ident.: DSC-27-30-20-00001102.0001001 / 03 NOV 21
 Applicable to: ALL



The five lever positions correspond to the following surface positions :

Position	SLATS	FLAPS	Indications on ECAM			
0	0	0		TAKEOFF	CRUISE	HOLD
1	18	0	1		LDG	APPR
		10	1 + F			
2	22	15	2			
3	22	20	3			
FULL	27	35	FULL			

Before selecting any position, the flight crew must pull the lever out of the detent. Balks at positions 1 and 3 prevent the flight crew from calling for excessive flap/slat travel with a single action.

Note: *The flight crew cannot select an intermediate lever position.*

TAKEOFF IN CONFIGURATION 1

1 + F (18 °/10 °) is selected. If the flight crew does not select configuration 0 after takeoff, the flaps retract automatically at 210 kt.

TAKEOFF OR GO-AROUND IN CONFIGURATION 2 OR 3

If the flight crew selects configuration 1, the flight crew gets 1 + F (18 °/10 °) if airspeed is under 210 kt.

If the flight crew does not select configuration 0 after takeoff, the flaps retract automatically at 210 kt.

CONFIGURATION 0 TO CONFIGURATION 1 IN FLIGHT

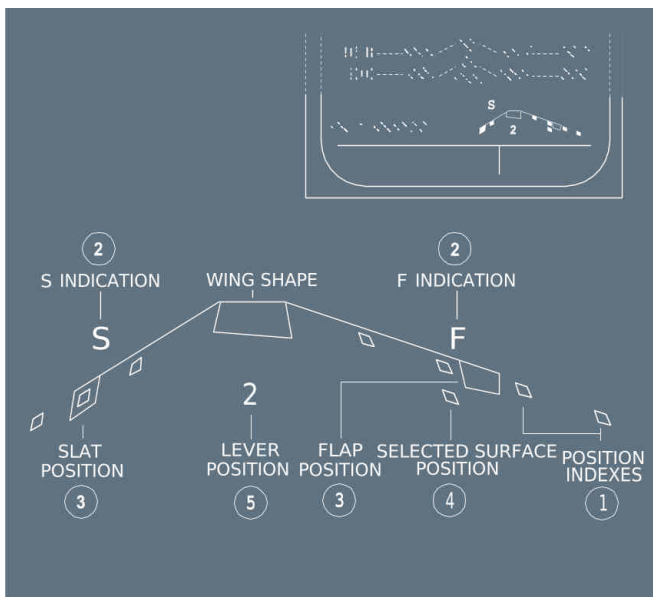
Configuration 1 (18 °/0 °) is selected.

Note: After flap retraction, configuration 1 + F is no longer available until the airspeed is 100 kt or less, unless configuration 2, 3, or FULL has been selected previously.

ECAM UPPER DISPLAY

Ident.: DSC-27-30-20-00001103.0002001 / 14 NOV 11

Applicable to: ALL



(1) Position indexes

These white points indicate that the slats and flaps are in a selectable position. They do not appear, when the aircraft is in clean configuration.

(2) F and S

“F” and “S” normally appear in white. They become amber, if:

- Both relevant hydraulic systems fail, unless the aircraft is on ground with both engines stopped.
- The wingtip brakes are on.
- There is a slats or flaps fault.

“S (F) LOCKED” legend, appears in amber, in association with an ECAM caution, when the wingtip brakes are applied, or when the system detects a non-alignment between two flaps.

The “A-LOCK” legend pulses in green, when the slat alpha/speedlock function is active.

(3) Flaps/Slats’ actual position

These green boxes indicate the actual flaps/slats position.

They become amber, if:

- Both relevant hydraulic systems fail, unless the aircraft is on ground with both engines stopped.
- The wingtip brakes are on.
- There is a slats or flaps fault.

(4) Selected position

It is in blue, when the surfaces are in transit.

It disappears, when the selected position is reached.

(5) Flap lever position

The “0”, “1 + F”, “1”, “2”, “3”, or “FULL” legend appears.

- It is green, when the slats and flaps are in the selected position. “0” is not displayed, when the aircraft attains clean configuration.
- It becomes cyan, when the slats and flaps are in transit.

AIRCRAFT SYSTEMS**FLIGHT CONTROLS**

FLAPS AND SLATS - CONTROLS AND INDICATORS

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AIRCRAFT SYSTEMS

FUEL

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DSC-28-10 Description
DSC-28-10-10 General

GENERAL.....	A
General.....	B

DSC-28-10-20 Tanks

Tanks.....	A
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DSC-28-10-30 Engine Feed

GENERAL.....	A
Main Components.....	B
Engine Feed.....	C
Fuel Feed Sequence.....	D

DSC-28-10-50 APU Feed

APU FEED.....	A
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DSC-28-10-60 Fuel Recirculation System

Fuel Recirculation System.....	A
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DSC-28-10-70 Refueling and Defueling

Refueling - Defueling.....	A
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DSC-28-10-80 Fuel Quantity Indication and Level Sensing

Fuel Quantity Indication (FQI) System.....	A
FUEL QUANTITY INDICATION (FQI) SYSTEM.....	B
FUEL LEVEL SENSING CONTROL UNIT (FLSCU).....	C
Fuel System Architecture.....	D

DSC-28-10-90 Fuel Tank Inerting System

Fuel Tank Inerting System.....	A
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DSC-28-20 Controls and Indicators

I Overhead Panel.....	A
External Refuel Panel.....	B
Refuel Panel.....	C
I ECAM Fuel Page.....	D
ECAM Upper Display.....	E
Memo Display.....	F

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS FUEL PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS
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Localization Title	Toc Index	ID	Reason
DSC-28-20 Overhead Panel	A	1	Update of the fuel transfer indications to be in accordance with the system behavior.
DSC-28-20 CTR Tanks Valves Indications	D	2	Update of the description to be in accordance with the ECAM display.

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS FUEL DESCRIPTION - GENERAL
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GENERAL

Ident.: DSC-28-10-10-00001107.0001001 / 13 NOV 13

Applicable to: MSN 02155-05746

The fuel system :

- Stores fuel in the tanks.
- Supplies fuel, in the correct quantities, to the fuel tanks during refueling.
- Supplies fuel to the engines and the Auxiliary Power Unit (APU).
- Circulates fuel to cool the Integrated Drive Generator (IDG).
- Keeps fuel in the outer tanks for wing bending and flutter relief.

GENERAL

Ident.: DSC-28-10-10-00001107.0003001 / 13 NOV 13

Applicable to: MSN 07784-07792

The fuel system :

- Stores fuel in the tanks
- Supplies fuel, in the correct quantities, to the fuel tanks during refueling
- Supplies fuel to the engines and the Auxiliary Power Unit (APU)
- Circulates fuel to cool the Integrated Drive Generator (IDG)
- Controls the transfer of fuel from the center tank to the inner tanks
- Keeps fuel in the outer tanks for wing bending and flutter relief.

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TANKS

Ident.: DSC-28-10-20-A-00020195.0001001 / 17 MAR 17

Applicable to: ALL

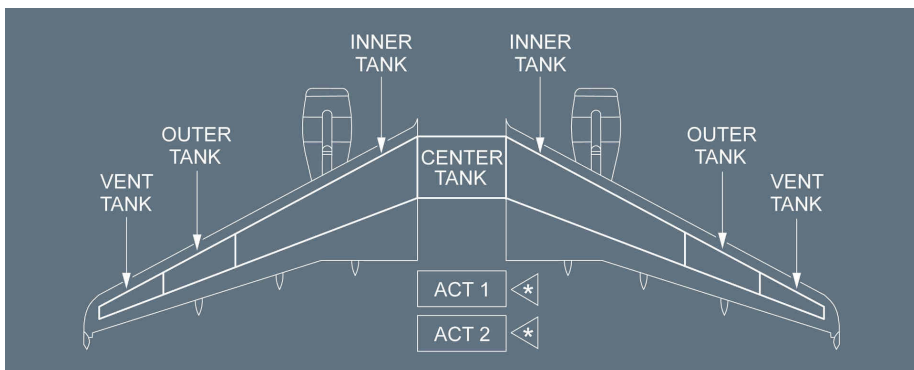
The fuel is stored in the wings, in the center tank, and in the Additional Center Tank (ACT ).

The wings have inner and outer tanks.

There is a vent surge tank outboard of the outer tank in each wing.

When the aircraft has been refueled to maximum capacity, the fuel can expand by 2 % (20 °C temperature rise) without spilling.

There is an overpressure protector in each vent, outer and inner tank and between the center tank and the left inner tank.


USABLE FUEL

Ident.: DSC-28-10-20-A-00020196.0008001 / 17 MAR 17

Applicable to: MSN 05746-07792

USABLE FUEL								
		OUTER TANKS	INNER TANKS	CENTER TANK	ACT	TOTAL WITH		
						NO ACT	1 ACT	2 ACTs
VOLUME	(liters)	867 x 2	7 092 x 2	8 248	2 992	24 166	27 158	30 150
	(US gallons)	229 x 2	1 873 x 2	2 179	790	6 383	7 173	7 963
WEIGHT ⁽¹⁾	(KG)	680 x 2	5 567 x 2	6 474	2 349	18 968	21 317	23 666
	(LB)	1 500 x 2	12 270 x 2	14 274	5 175	41 814	46 989	52 164

⁽¹⁾ Fuel density : 0.785 kg/l or 6.551 lb/US Gal.

AIRCRAFT SYSTEMS
FUEL

DESCRIPTION - TANKS

Ident.: DSC-28-10-20-A-00020196.0003001 / 17 MAR 17

Applicable to: MSN 04392-05253

USABLE FUEL								
		OUTER TANKS	INNER TANKS	CENTER TANK	ACT	TOTAL WITH		
						NO ACT	1 ACT	2 ACTs
VOLUME	(liters)	880 x 2	7 099 x 2	8 250	2 992	24 209	27 201	30 193
	(US gallons)	232 x 2	1 875 x 2	2 179	790	6 395	7 185	7 975
WEIGHT⁽¹⁾	(KG)	691 x 2	5 573 x 2	6 476	2 349	19 004	21 353	23 702
	(LB)	1 523 x 2	12 286 x 2	14 278	5 175	41 893	47 068	52 243

⁽¹⁾ Fuel density : 0.785 kg/l or 6.551 lb/US Gal.

Ident.: DSC-28-10-20-A-00020196.0001001 / 17 MAR 17

Applicable to: MSN 02155-03060

USABLE FUEL								
		OUTER TANKS	INNER TANKS	CENTER TANK	ACT	TOTAL WITH		
						NO ACT	1 ACT	2 ACTs
VOLUME	(liters)	880 x 2	6 924 x 2	8 250	2 992	23 859	26 851	29 843
	(US gallons)	232 x 2	1 829 x 2	2 179	790	6 303	7 093	7 883
WEIGHT⁽¹⁾	(KG)	691 x 2	5 435 x 2	6 476	2 349	18 729	21 078	23 427
	(LB)	1 523 x 2	11 983 x 2	14 278	5 175	41 289	46 464	51 639

⁽¹⁾ Fuel density : 0.785 kg/l or 6.551 lb/US Gal.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS FUEL DESCRIPTION - ENGINE FEED
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GENERAL

Ident.: DSC-28-10-30-00001109.0001001 / 13 NOV 13

Applicable to: MSN 07784-07792

The main fuel pump system supplies fuel from the inner tanks to the engines. The system has four main fuel pumps.

GENERAL

Ident.: DSC-28-10-30-00001109.0002001 / 10 DEC 09

Applicable to: MSN 02155-05746

The main fuel pump system supplies fuel from the center tank or the inner wing tanks to the engines. The system has six main fuel pumps.

MAIN COMPONENTS

MAIN COMPONENTS - TANK PUMPS

Ident.: DSC-28-10-30-A-00001110.0002001 / 01 FEB 13

Applicable to: MSN 02155-05746

TANK PUMPS

In normal operation each engine is supplied by one pump in the center tank or two pumps in its own side inner tank.

All wing tank pumps remain on throughout the flight. They are fitted with pressure relief sequence valves which ensure that, when all pumps are running, the center tank pumps will deliver fuel preferentially.

Ident.: DSC-28-10-30-A-00001110.0003001 / 13 NOV 13

Applicable to: MSN 07784-07792

TANK PUMPS

In normal operation, each engine is supplied from two pumps in its own side inner tank.

Ident.: DSC-28-10-30-A-00001111.0001001 / 31 JAN 13

Applicable to: ALL

INTERTANK TRANSFER VALVES

Two electrical transfer valves are mounted in each wing to permit fuel transfer from outer to inner tank.

Ident.: DSC-28-10-30-A-00001112.0001001 / 10 DEC 09

Applicable to: ALL

CROSS FEED VALVE

A cross feed valve controlled by a double motor allows both engines to be fed from one side or one engine to be fed from both sides.

Ident.: DSC-28-10-30-A-00001113.0001001 / 16 MAY 24

Applicable to: ALL

ENGINE LP VALVES

Each engine has an LP valve, that is used to stop the fuel flow to the engine.

The ENG MASTER lever controls the LP valve.

The LP valve automatically closes when the associated ENG FIRE pb is pushed.

MAIN COMPONENTS - SUCTION VALVES

Ident.: DSC-28-10-30-A-00001114.0001001 / 13 NOV 13

Applicable to: MSN 07784-07792

SUCTION VALVES

Closed by pumps pressure in normal operation, they allow engines to be fed by gravity if the inner tank pumps fail.

Ident.: DSC-28-10-30-A-00001114.0002001 / 29 MAR 12

Applicable to: MSN 02155-05746

SUCTION VALVES

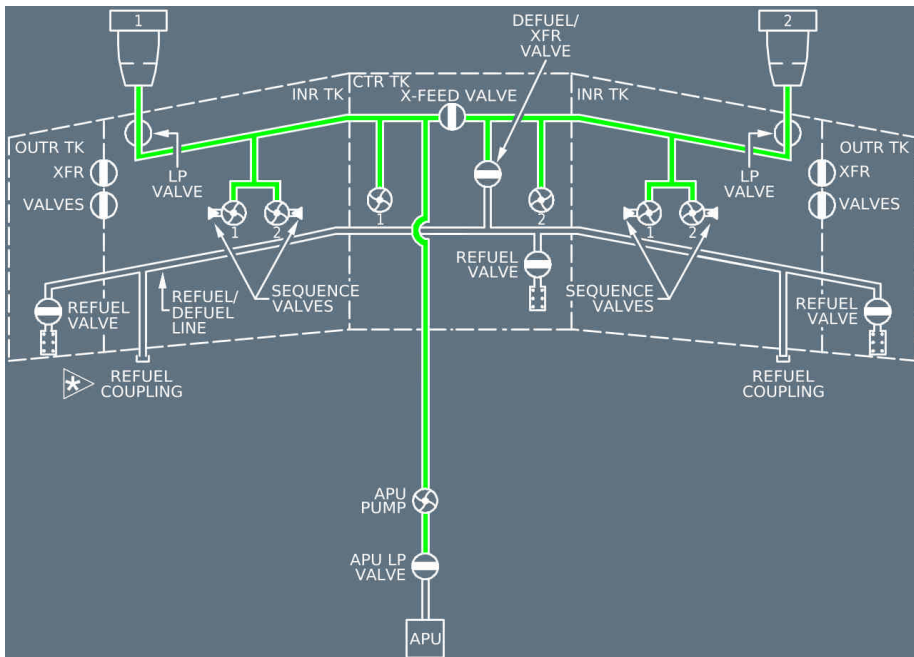
Closed by pumps pressure in normal operation, they allow engines to be fed by gravity if the inner tank pumps fail.

Note: Center tank pumps are not fitted with suction valves. Therefore, gravity feeding is not possible from the center tank.

ENGINE FEED

Ident.: DSC-28-10-30-00001115.0002001 / 18 MAR 14

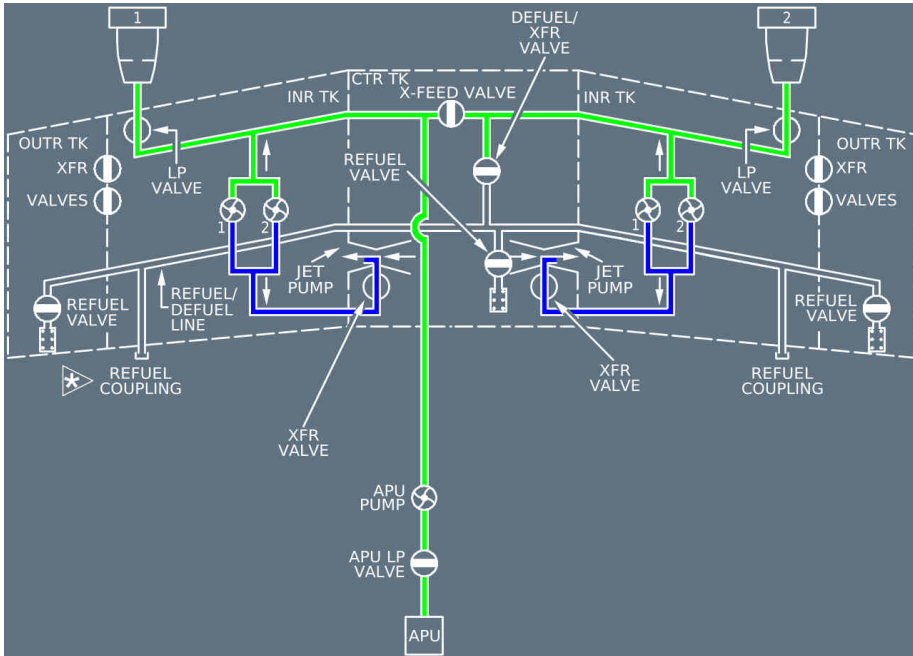
Applicable to: MSN 02155-05746



ENGINE FEED

Ident.: DSC-28-10-30-00001115.0013001 / 18 MAR 14

Applicable to: MSN 07784-07792



FUEL FEED SEQUENCE

Ident.: DSC-28-10-30-00021263.0001001 / 28 MAY 20

Applicable to: MSN 02155-05746

The tanks empty in the following sequence :

1. The ACT2 : Fuel transfers into the center tank.
2. The ACT1 : Fuel transfers into the center tank.
3. The center tank.
4. The inner tanks: Each inner tank empties down to 750 kg (1 650 lb).
5. The outer tanks: Fuel transfers into the inner tanks.

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS FUEL DESCRIPTION - ENGINE FEED
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CENTER TANK FUEL TRANSFER

The center tank feeds fuel to the engines, when the center tank pumps are not stopped by the control logic described below. The inner tanks feed the engines when the center tank pumps are stopped.

CENTER TANK PUMPS CONTROL LOGIC

Each center tank pump stops, until approximately 500 kg (1 100 lb) of the fuel in its associated inner tank fuel has been used (when the fuel level reaches the underfull sensors).

With the MODE SEL in the MAN position, the center tank pumps will run. In manual mode, the CTR TK PUMP pb-sw must be selected OFF, when the center tank is empty.

FUEL TRANSFER FROM OUTER TO INNER TANKS

The transfer valves automatically open, when the inner tank fuel reaches the low level (about 750 kg/1 650 lb), thus enabling the fuel to drain from the outer to inner tanks.

When open, the valves are latched open. They will automatically close at the next refueling operation.

- Note:
1. Two level sensors are installed in each inner tank. Each sensor controls two transfer valves, one in each wing, ensuring simultaneous transfer to both wings.
 2. The 750 kg/1 650 lb value is based on a level aircraft attitude, with no acceleration. During steep descent or accelerations/decelerations, the transfer valves may open with more than 750 kg/1 650 lb of fuel in each inner tank, and the low level warning may be triggered.

IF THE AIRCRAFT HAS ONE ACT : ACT TO CENTER TANK TRANSFER

ACT transfer automatically starts after takeoff at slats' retraction, if the center tank high-level sensor has been dry for 10 min, and the ACT is not empty.

Fuel transfers from the ACT to the center tank via pressurization of the tank, by closing the ACT vent valve and opening the air shutoff valve.

When the ACT is empty, the ACT transfer valve, the air shutoff valve and inlet valve close, and the ACT vent valve opens.

- Note: ACT transfer stops, if the center tank high level becomes wet, by closing the ACTs transfer valve. The transfer valve reopens when the center tank high-level sensor becomes dry for 10 min.

Selecting the ACT pb-sw to FWD opens the ACT transfer valve, the ACT inlet valve, and starts the ACT transfer pump. It must be returned to AUTO, when the ACT is empty.

Center tank overflow is prevented, by returning the ACT pb-sw to AUTO, when the center tank is full.

IF THE AIRCRAFT HAS TWO ACTS : ACT 1 + 2 TO CENTER TANK TRANSFER

ACT transfer automatically starts after takeoff at slats' retraction, if the center tank high-level sensor has been dry for 10 min, and the ACT is not empty.

Fuel transfers from the ACT to the center tank via pressurization of the tank, by closing the ACT vent valve and opening the air shutoff valve.

ACT2 transfers first, via the ACT transfer valve and the ACT2 inlet valve.

When ACT2 is empty, the ACT2 inlet valve shuts, and the ACT1 inlet valve opens.

When ACT1 is empty, the ACT transfer valve and ACT1 inlet valve close.

When the aircraft is on ground after landing, the air shutoff valve closes and both ACT vent valves open, depressurizing the ACTs.

***Note:** ACT transfer stop, if the center tank high level becomes wet, by closing the ACT transfer valve. The transfer valve reopens when the center tank high-level sensor becomes dry for 10 min.*

Selecting the ACT pb-sw to FWD opens the ACT transfer valve and starts the ACT transfer pump.

ACT2 empties first, then ACT1. It must be returned to AUTO, when the ACT is empty.

Center tank overflow is prevented, by returning the ACT pb-sw to AUTO, when the center tank is full.

FUEL FEED SEQUENCE

Ident.: DSC-28-10-30-00021263.0004001 / 21 MAR 17

Applicable to: MSN 07784-07792

The inner tanks feed fuel to the engines. The tanks empty in the following sequence :

1. The ACT2  : Fuel transfers into the center tank.
2. The ACT1  : Fuel transfers into the center tank.
3. The center tank : Fuel transfers into the inner tanks.
4. The inner tanks : Each inner tank empties down to 750 kg (1 650 lb).
5. The outer tanks : Fuel transfers into the inner tanks.

CENTER TANK FUEL TRANSFER

The transfer system controls the flow of fuel from the center tank to the inner tanks. The Fuel Level Sensing Control Unit (FLSCU) has automatic control of the transfer valve. When the transfer valve is open, fuel from the inner tank pumps flows through the jet pump and creates a suction in it. This suction moves the fuel from the center tank to the related inner tank.

CENTER TANK TRANSFER VALVE CONTROL LOGIC:

The FLSCU automatically closes the associated center tank transfer valve when the inner tank is full. The FLSCU then reopens the center tank transfer valve when the engines have used 500 kg (1 100 lb) of inner tank fuel (when the fuel level reaches the underfull sensors).

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS FUEL DESCRIPTION - ENGINE FEED
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With the MODE SEL in MAN position, the center tank transfer valves will open. Inner tank overflow must be prevented by selecting the CTR TK XFR pb-sw OFF when the inner tanks are full. They must also be selected OFF when the center tank is empty.

FUEL TRANSFER FROM OUTER TO INNER TANKS

The transfer valves automatically open, when the inner tank fuel reaches the low level (about 750 kg/1 650 lb), thus enabling the fuel to drain from the outer to inner tanks.

When open, the valves are latched open. They will automatically close at the next refueling operation.

- Note:
1. Two level sensors are installed in each inner tank. Each sensor controls two transfer valves, one in each wing, ensuring simultaneous transfer to both wings.
 2. The 750 kg/1 650 lb value is based on a level aircraft attitude, with no acceleration. During steep descent or accelerations/decelerations, the transfer valves may open with more than 750 kg/1 650 lb of fuel in each inner tank, and the low level warning may be triggered.

IF THE AIRCRAFT HAS ONE ACT : ACT TO CENTER TANK TRANSFER

ACT transfer automatically starts after takeoff at slats' retraction, if the center tank high-level sensor has been dry for 10 min, and the ACT is not empty.

Fuel transfers from the ACT to the center tank via pressurization of the tank, by closing the ACT vent valve and opening the air shutoff valve.

When the ACT is empty, the ACT transfer valve, the air shutoff valve and inlet valve close, and the ACT vent valve opens.

- Note: ACT transfer stops, if the center tank high level becomes wet, by closing the ACTs transfer valve. The transfer valve reopens when the center tank high-level sensor becomes dry for 10 min.

Selecting the ACT pb-sw to FWD opens the ACT transfer valve, the ACT inlet valve, and starts the ACT transfer pump. It must be returned to AUTO, when the ACT is empty.

Center tank overflow is prevented, by returning the ACT pb-sw to AUTO, when the center tank is full.

IF THE AIRCRAFT HAS TWO ACTS : ACT 1 + 2 TO CENTER TANK TRANSFER

ACT transfer automatically starts after takeoff at slats' retraction, if the center tank high-level sensor has been dry for 10 min, and the ACT is not empty.

Fuel transfers from the ACT to the center tank via pressurization of the tank, by closing the ACT vent valve and opening the air shutoff valve.

ACT2 transfers first, via the ACT transfer valve and the ACT2 inlet valve.

When ACT2 is empty, the ACT2 inlet valve shuts, and the ACT1 inlet valve opens.

When ACT1 is empty, the ACT transfer valve and ACT1 inlet valve close.

AIRCRAFT SYSTEMS**FUEL**

DESCRIPTION - ENGINE FEED

When the aircraft is on ground after landing, the air shutoff valve closes and both ACT vent valves open, depressurizing the ACTs.

Note: ACT transfer stop, if the center tank high level becomes wet, by closing the ACT transfer valve. The transfer valve reopens when the center tank high-level sensor becomes dry for 10 min.

Selecting the ACT pb-sw to FWD opens the ACT transfer valve and starts the ACT transfer pump. ACT2 empties first, then ACT1. It must be returned to AUTO, when the ACT is empty.

Center tank overflow is prevented, by returning the ACT pb-sw to AUTO, when the center tank is full.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS FUEL DESCRIPTION - APU FEED
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APU FEED

Ident.: DSC-28-10-50-00001120.0001001 / 10 DEC 09 Applicable to: ALL
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A special fuel pump supplies fuel for APU startup when fuel feed pressure is low (due to loss of tank pumps or loss of normal AC electrical supply). This pump normally runs off the AC ESS SHED, but runs off the AC STAT INV BUS if the AC ESS SHED fails.

AIRCRAFT SYSTEMS

FUEL

DESCRIPTION - APU FEED

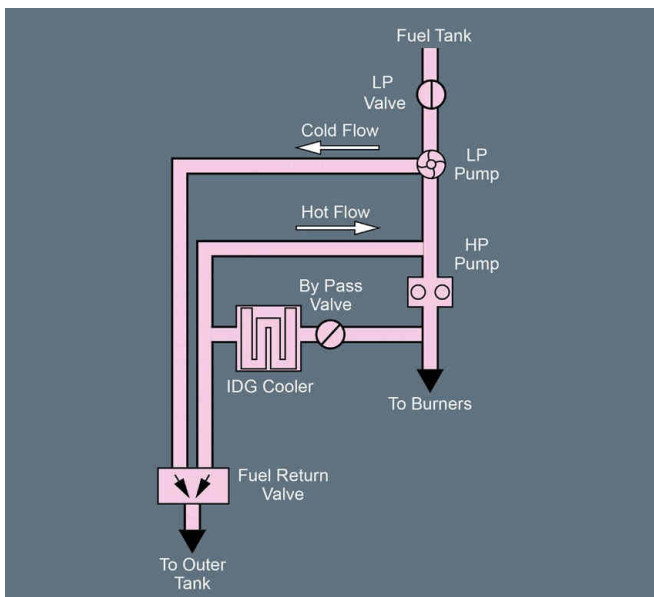
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FUEL RECIRCULATION SYSTEM

Ident.: DSC-28-10-60-B-00020316.0002001 / 05 MAY 22

Applicable to: ALL

Illustration - For information only



FUEL RECIRCULATION SYSTEM - DESCRIPTION

Ident.: DSC-28-10-60-B-00020317.0004001 / 17 MAY 24

Applicable to: MSN 02155-05746

Refer to DSC-70-40 IDG Cooling System.

Some of the fuel supplied to each engine goes from the high-pressure fuel line in that engine, through the integrated drive generator (IDG) heat exchanger (where it absorbs heat), to the fuel return valve and back to the outer fuel tank.

This operation ensures the IDG cooling when the oil temperature is high or when at low engine power.

The FADEC controls the fuel return valve.

If the outer tank is already full, the fuel overflows to the inner tank through a spill pipe. On ground, the fuel recirculation is not inhibited if there is an overflow in the surge tanks (*Refer to DSC-70-40 IDG Cooling System*).

AIRCRAFT SYSTEMS**FUEL**

DESCRIPTION - FUEL RECIRCULATION SYSTEM

■ If the FUEL CTR TK MODE SEL pb-sw is in AUTO mode:

If center tank is feeding, the wing tank will tend to overfill and the system automatically selects the CTR TK PUMP off when the inner tank is full. The wing tank pumps will feed until the engine have used approximately 500 kg (1 100 lb) of fuel when the fuel level reaches the underfull sensors. The logic circuits then restart the center tank pumps.

■ If the FUEL CTR TK MODE SEL pb-sw is in MAN mode:

If center tank is feeding, the wing tanks will tend to overfill but the system does not automatically select the CTR TK PUMPS OFF when the inner tank is full. Therefore, an overflow of the wing tanks can occur on ground if the CTR TK PUMPS are not switched OFF.

Ident.: DSC-28-10-60-B-00020317.0007001 / 28 NOV 17

Applicable to: MSN 07784-07792

Refer to DSC-70-40 IDG Cooling System.

Some of the fuel supplied to each engine goes from the high-pressure fuel line in that engine, through the integrated drive generator (IDG) heat exchanger (where it absorbs heat), to the fuel return valve and back to the outer fuel tank.

This operation ensures the IDG cooling when the oil temperature is high or when at low engine power.

The FADEC controls the fuel return valve.

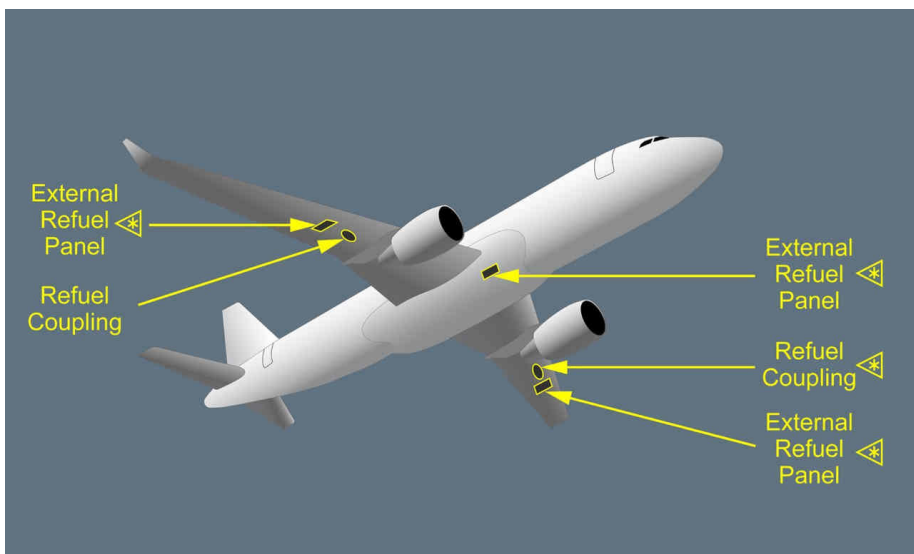
If the outer tank is already full, the fuel overflows to the inner tank through a spill pipe. On ground, the fuel recirculation is not inhibited if there is an overflow in the surge tanks.

REFUELING - DEFUELING

Ident.: DSC-28-10-70-00021235.0001001 / 03 MAY 24

Applicable to: MSN 02155-02212, 02926-02944, 04392

- During automatic refueling, fuel goes into the ACTs , the center tank and the outer cell of the wing tanks simultaneously. When the outer cell of the wing tank is full, fuel overflows into the inner cell. During manual refueling, fill the wing tanks first, then the center tank, then the ACTs .
- Electrical transients (caused by switching among the APU, the external and the engine electrical supply) during automatic refueling may stop the process. If the automatic refueling process is stopped, it is necessary to re-enter the Preselected Fuel Quantity.
- One refuel coupling is installed under the right wing. A second refuel coupling may be installed under the left wing.
- An external refuel panel can be located:
 - On the fuselage below the leading edge of the right wing, or
 - Under the right or left wing near the refuel coupling.



A gallery connects the refuel coupling to each tank's refuel valve.

Refueling is normally automatic, the required fuel load being set on the preselector.

Manual control is also available.

Automatic refueling starts with the outer tanks. If the selected fuel load exceeds the wing tank capacity, the center tank is simultaneously refueled.

AIRCRAFT SYSTEMS

FUEL

DESCRIPTION - REFUELING AND DEFUELING

When an outer tank is full, the fuel overflows into the inner tank through a spill pipe.

Refuel valves close automatically, when the tanks contain the preselected load, or when sensors detect a high fuel level.

The aircraft can be refueled, when only battery power is available.

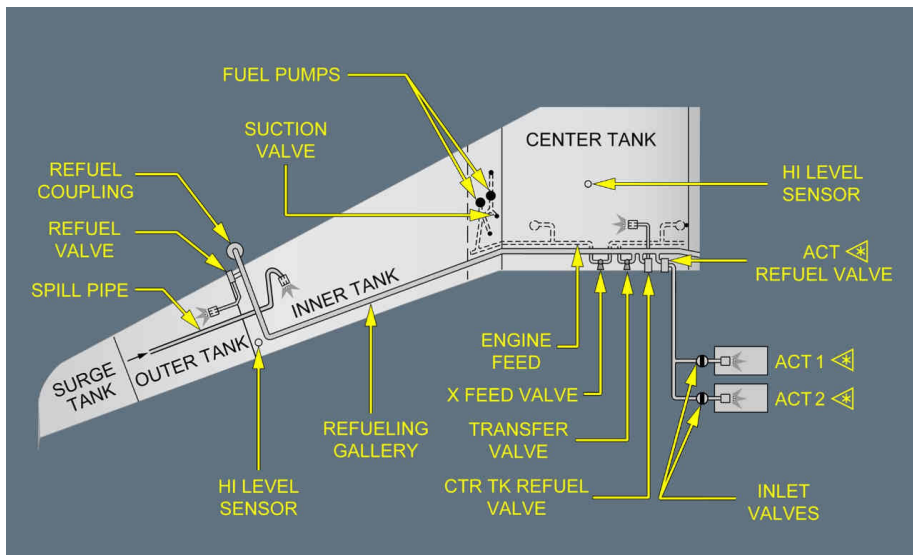
The wing tanks can be refueled by gravity, through refueling points on top of the wings.

A transfer valve, between the engine feed system and the refueling gallery, allows :

- The tank pumps to transfer fuel from one tank to another
- Defueling through the refuel coupling.

Approximate refueling time at nominal pressure is:

- 17 min for wing tanks
- 20 min for all tanks (without ACT )
- 25 min for all tanks (with one ACT )
- 27 min for all tanks (with two ACTs )

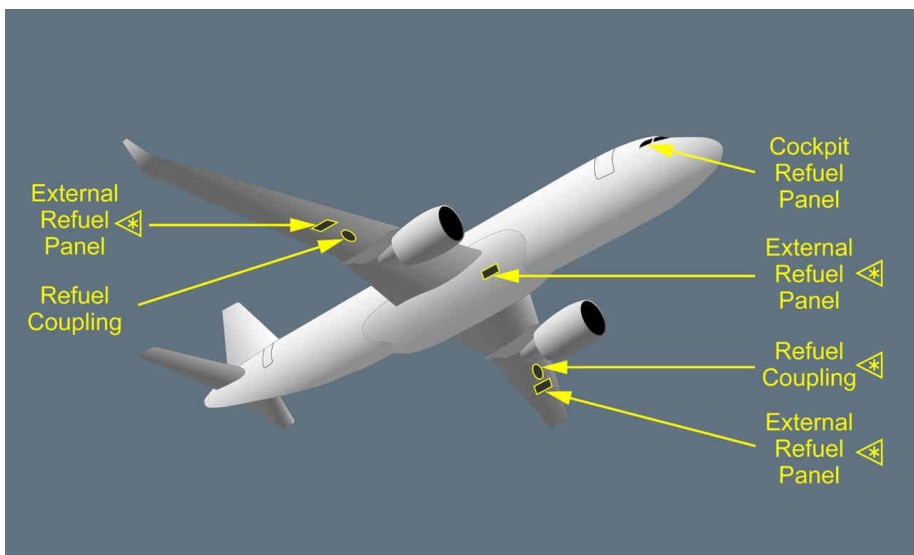


REFUELING - DEFUELING

Ident.: DSC-28-10-70-00021235.0002001 / 03 MAY 24

Applicable to: MSN 02719-02789, 03031-03060, 05152-05746

- During automatic refueling, fuel goes into the ACTs , the center tank and the outer cell of the wing tanks simultaneously. When the outer cell of the wing tank is full, fuel overflows into the inner cell. During manual refueling, fill the wing tanks first, then the center tank, then the ACTs .
- Electrical transients (caused by switching among the APU, the external and the engine electrical supply) during automatic refueling may stop the process. If the automatic refueling process is stopped, it is necessary to re-enter the Preselected Fuel Quantity.
- One refuel coupling is installed under the right wing. A second refuel coupling may be installed under the left wing.
- An external refuel panel can be located:
 - On the fuselage below the leading edge of the right wing, or
 - Under the right or left wing near the refuel coupling.
- A cockpit refuel panel is located in the cockpit overhead panel.
- A "READY FOR FUELING" green light is installed adjacent to the refuel coupling.



A gallery connects the refuel coupling to each tank's refuel valve.

Refueling is normally automatic, the required fuel load being set on the preselector.

Manual control is also available.

AIRCRAFT SYSTEMS

FUEL

DESCRIPTION - REFUELING AND DEFUELING

Automatic refueling starts with the outer tanks. If the selected fuel load exceeds the wing tank capacity, the center tank is simultaneously refueled.

When an outer tank is full, the fuel overflows into the inner tank through a spill pipe.

Refuel valves close automatically, when the tanks contain the preselected load, or when sensors detect a high fuel level.

The aircraft can be refueled, when only battery power is available.

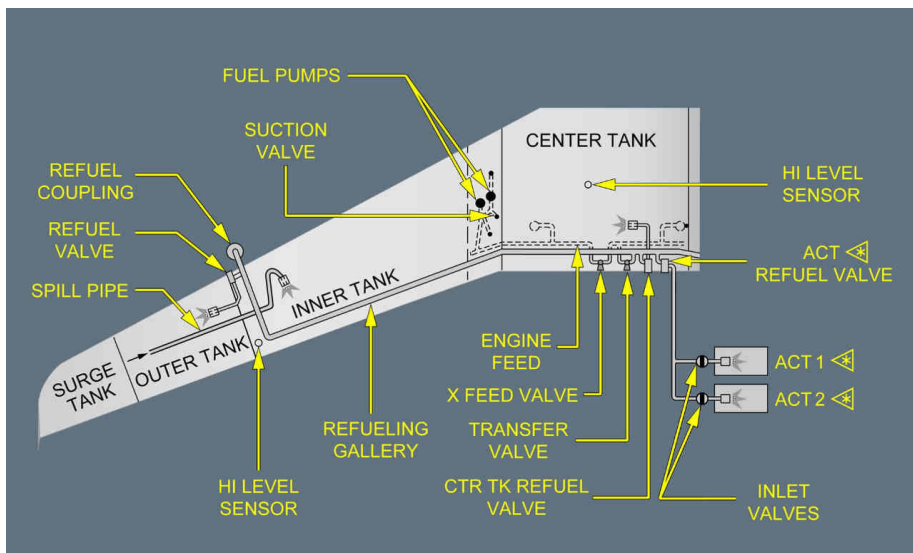
The wing tanks can be refueled by gravity, through refueling points on top of the wings.

A transfer valve, between the engine feed system and the refueling gallery, allows :

- The tank pumps to transfer fuel from one tank to another
- Defueling through the refuel coupling.

Approximate refueling time at nominal pressure is:

- 17 min for wing tanks
- 20 min for all tanks (without ACT )
- 25 min for all tanks (with one ACT )
- 27 min for all tanks (with two ACTs )

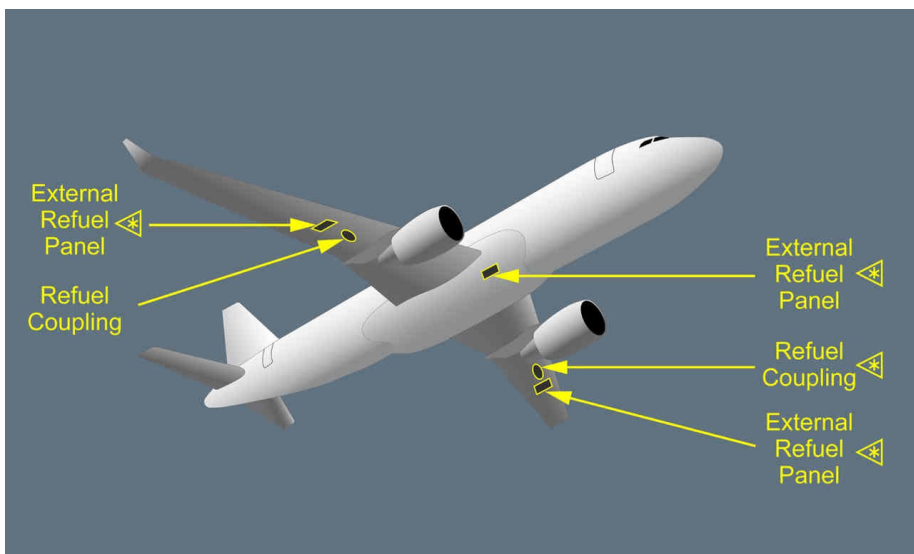


REFUELING - DEFUELING

Ident.: DSC-28-10-70-00021235.0005001 / 03 MAY 24

Applicable to: MSN 07784-07792

- During automatic refueling, fuel goes into the ACTs , the center tank and the outer cell of the wing tanks simultaneously. When the outer cell of the wing tank is full, fuel overflows into the inner cell. During manual refueling, fill the wing tanks first, then the center tank, then the ACTs .
- Electrical transients (caused by switching among the APU, the external and the engine electrical supply) during automatic refueling may stop the process. If the automatic refueling process is stopped, it is necessary to re-enter the Preselected Fuel Quantity.
- One refuel coupling is installed under the right wing. A second refuel coupling may be installed under the left wing.
- An external refuel panel can be located:
 - On the fuselage below the leading edge of the right wing, or
 - Under the right or left wing near the refuel coupling.



A gallery connects the refuel coupling to each tank's refuel valve.

Refueling is normally automatic, the required fuel load being set on the preselector.

Manual control is also available.

Automatic refueling starts with the outer tanks. If the selected fuel load exceeds the wing tank capacity, the center tank is simultaneously refueled.

AIRCRAFT SYSTEMS

FUEL

DESCRIPTION - REFUELING AND DEFUELING

When an outer tank is full, the fuel overflows into the inner tank through a spill pipe.

Refuel valves close automatically, when the tanks contain the preselected load, or when sensors detect a high fuel level.

The aircraft can be refueled, when only battery power is available.

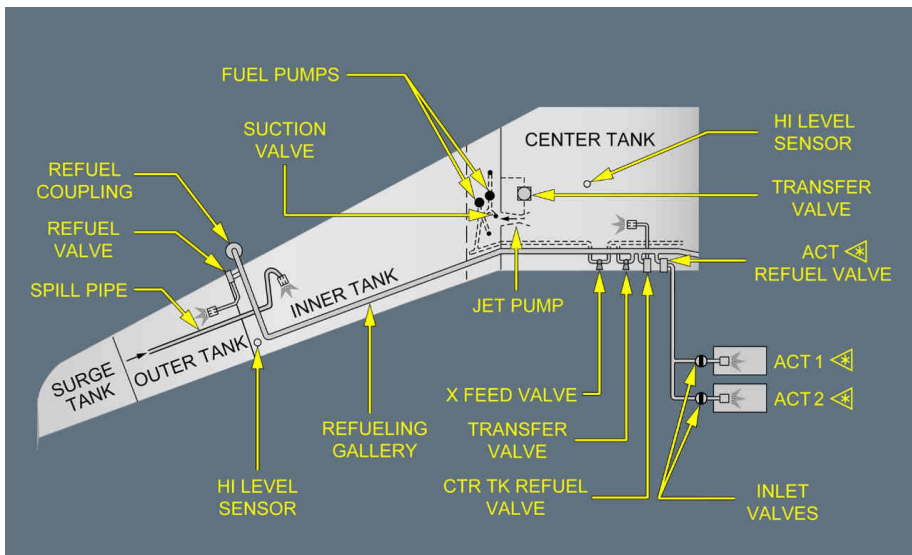
The wing tanks can be refueled by gravity, through refueling points on top of the wings.

A transfer valve, between the engine feed system and the refueling gallery, allows:

- The tank pumps to transfer fuel from one tank to another
- Defueling through the refuel coupling.

Approximate refueling time at nominal pressure is:

- 17 min for wing tanks
- 20 min for all tanks (without ACT )
- 25 min for all tanks (with one ACT )
- 27 min for all tanks (with two ACTs )



 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS FUEL DESCRIPTION - FUEL QUANTITY INDICATION AND LEVEL SENSING
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FUEL QUANTITY INDICATION (FQI) SYSTEM
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Ident.: DSC-28-10-80-00001123.0007001 / 14 JAN 16

Applicable to: MSN 07784

The FQI is a computerized system that :

- transmits the actual total fuel mass, as well as the quantity and temperature of fuel in the tanks, to the ECAM.
- controls automatic refueling.

Two channels perform fuel computations : channel 2 activates automatically if channel 1 fails.

The FQI system has :

- an FQI computer.
- a set of capacitance probes in each tank to measure fuel level and temperature.
- one densitometer (cadensicon) sensor in each wing inner tank permitting the calculation of the fuel quantity.
- one Capacitance Index Compensator (CIC) in each inner tank giving the dielectric constant of the fuel in case of cadensicon failure.
- a quantity indicator for each tank installed on the refuel/defuel panel.
- a preselector on the refuel/defuel panel that shows the preselected and actual total fuel quantity.

Note: For low fuel quantities, up to 7 tons (15400 lbs), a fluctuation of the inner tank fuel quantity indications occurs after takeoff. Due to acceleration and high pitch angle, the fuel moves in the tank and the FOB indication will reduce for 2 minutes, then increase and come back to accurate values about 6 minutes later during the climb. The maximum fluctuation may reach 400kg (880lbs). The EFOB indication may turn amber on the MCDU during this phase. In case of go-around, the fluctuation will not be more than 300kg (660lbs). For higher fuel loads, a FOB increase up to a maximum of 1 ton (2200lbs) may occur after takeoff. The FOB indication will come back to its accurate value within a maximum of 6 minutes.

FUEL QUANTITY INDICATION (FQI) SYSTEM
--

Ident.: DSC-28-10-80-00001123.0001001 / 10 DEC 09

Applicable to: MSN 02155-05746, 07792

The FQI is a computerized system that :

- transmits the actual total fuel mass, as well as the quantity and temperature of fuel in the tanks, to the ECAM.
- controls automatic refueling.

Two channels perform fuel computations : channel 2 activates automatically if channel 1 fails.

The FQI system has :

- an FQI computer.
- a set of capacitance probes in each tank to measure fuel level and temperature.

AIRCRAFT SYSTEMS**FUEL****DESCRIPTION - FUEL QUANTITY INDICATION AND LEVEL SENSING**

- one densitometer (cadensicon) sensor in each wing inner tank permitting the calculation of the fuel quantity.
- one Capacitance Index Compensator (CIC) in each inner tank giving the dielectric constant of the fuel in case of cadensicon failure.
- a quantity indicator for each tank installed on the refuel/defuel panel.
- a preselector on the refuel/defuel panel that shows the preselected and actual total fuel quantity.

FUEL LEVEL SENSING CONTROL UNIT (FLSCU)

Ident.: DSC-28-10-80-00001124.0001001 / 16 MAR 15

Applicable to: **ALL**

The fuel level system generates fuel-level and fuel-temperature signals in order to operate the appropriate switching functions for refueling and defueling and control the IDG cooling recirculation system and the center-tank-to-wing-tank fuel transfer system.

The FLSCU comprises :

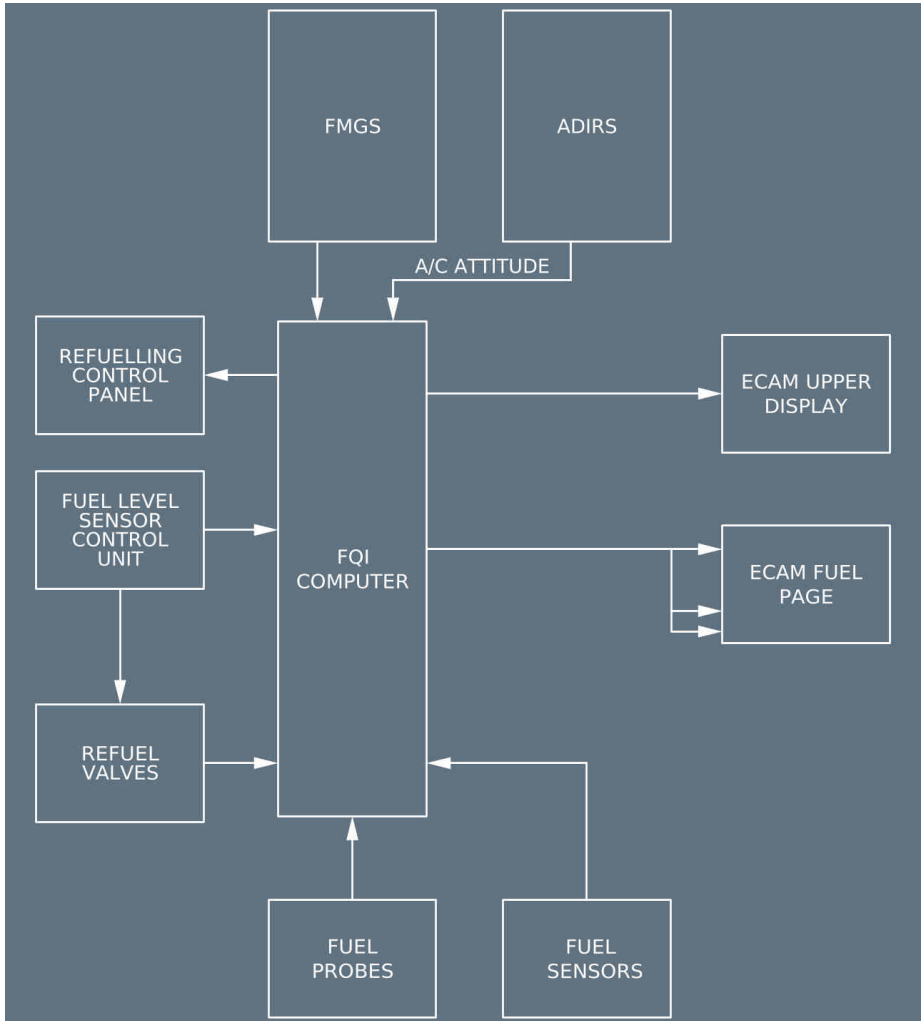
- fuel level sensors in the tanks to sense high, low, and overflow levels.
- a fuel temperature sensor to control the IDG cooling recirculation.

When fuel quantity in one wing tank goes below 750 kg (1 650 lb), the low-level sensor triggers the LO LVL warning on ECAM. The LO LVL warning is totally independent from the displayed fuel quantity indication of the tank.

FUEL SYSTEM ARCHITECTURE

Ident.: DSC-28-10-80-00001125.0001001 / 22 MAY 12

Applicable to: ALL



AIRCRAFT SYSTEMS

FUEL

DESCRIPTION - FUEL QUANTITY INDICATION AND LEVEL SENSING

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS FUEL DESCRIPTION - FUEL TANK INERTING SYSTEM
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FUEL TANK INERTING SYSTEM

Ident.: DSC-28-10-90-00013692.0001001 / 18 MAR 11

Applicable to: MSN 04392-07792

The A318, A319, A320 and A321 aircraft are equipped with a Fuel Tank Inerting System.

The aim of this system is to reduce the flammability in the fuel tanks that have a high flammability exposure.

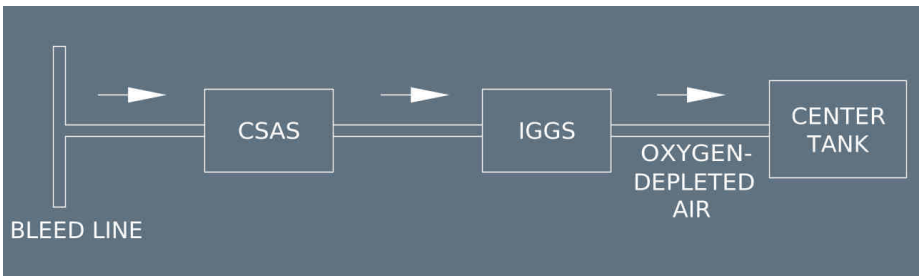
The fuel center tank is the only one that has a high flammability exposure. Therefore, the Fuel Tank Inerting System only needs to be installed for the center tank. All other tanks do not need Fuel Tank Inerting System installation.

To reduce the flammability in the center tank, the Fuel Tank Inerting System produces an oxygen-depleted air that goes in the center tank to replace the ambient air.

The system is installed in the belly fairing of the aircraft, and is composed by:

- A conditioned Service Air System (CSAS)
- An Inert Gas Generation System (IGGS).

The CSAS extracts and conditions some engine bleed air to adequate pressure and temperature. Then, the air goes through the IGGS where an Air Separation Module taps the nitrogen molecules. Therefore, an oxygen-depleted air is produced (with less than 12 % of oxygen) and replaces the ambient air of the center tank.



The Fuel Tank Inerting System does not require any flight crew action. It works independently as soon as the engines start and until they stop.

AIRCRAFT SYSTEMS

FUEL

DESCRIPTION - FUEL TANK INERTING SYSTEM

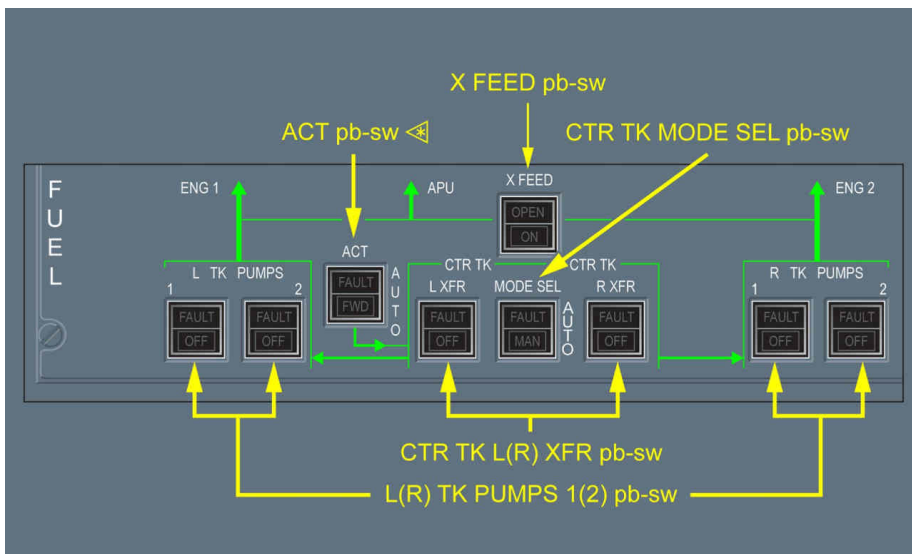
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OVERHEAD PANEL

OVERHEAD PANEL

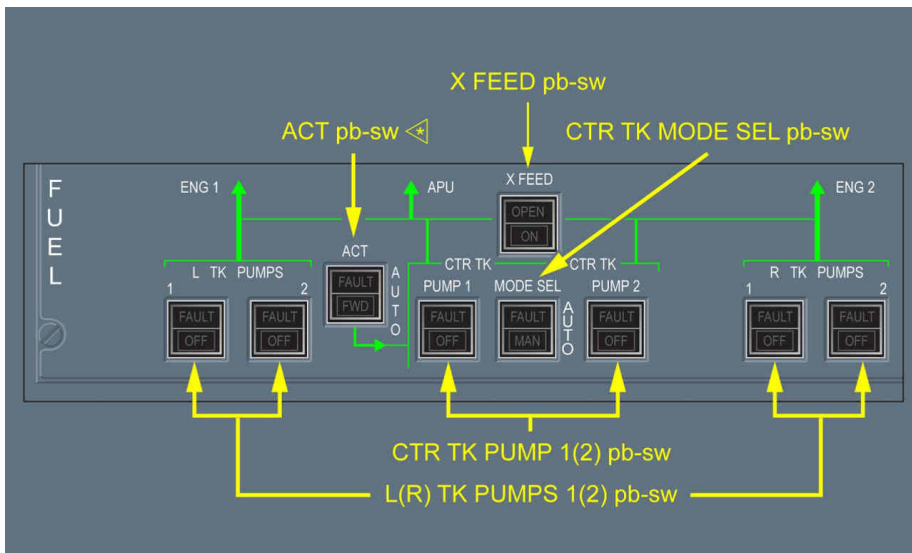
Ident.: DSC-28-20-G-00020183.0002001 / 06 NOV 25

Applicable to: MSN 07784-07792



Ident.: DSC-28-20-G-00020183.0001001 / 17 MAY 24

Applicable to: MSN 02155-05746



L(R) TK PUMPS 1(2) PB-SW

Ident.: DSC-28-20-G-00020239.0002001 / 17 MAY 24

Applicable to: MSN 07784-07792

L(R) TK PUMPS 1(2) pb-sw



Pump is on.



Pump is OFF.



The FAULT light and ECAM caution come on, when the pump runs at low pressure. The FAULT light goes off, when the flight crew sets the L(R) TK PUMPS 1(2) pb-sw to OFF.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS FUEL CONTROLS AND INDICATORS
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Ident.: DSC-28-20-G-00020239.0001001 / 17 MAR 17

Applicable to: MSN 02155-05746

L(R) TK PUMPS 1(2) pb-sw

- On : Pump is on (but only fuel feeds) when the delivery pressure of the center tank pumps drops below the threshold.
- OFF : Pump is off, and the OFF button comes on white.
- FAULT light : Amber light and ECAM caution come on, when the delivery pressure drops. It does not come on when OFF is selected.

CTR TK MODE SEL PB-SW

Ident.: DSC-28-20-G-00020240.0003001 / 13 MAY 25

Applicable to: MSN 07784-07792

CTR TK MODE SEL pb-sw



Control of center tank transfer valves is automatic:

- They open if the associated inner tank is not full
- They stop automatically 5 min after center tank low level is reached.



Flight crew manually controls the center tank transfer valves with the CTR TK L(R) XFR pb-sw.



FAULT light and ECAM alert come on when all of the following occur:

- The center tank has more than 250 kg (550 lb) of fuel
- The left or right wing tank has less than 5 000 kg (11 000 lb) of fuel
- The CTR TK MODE SEL pb-sw is at AUTO.

Ident.: DSC-28-20-G-00020240.0001001 / 13 MAY 25

Applicable to: MSN 02155-05746

CTR TK MODE SEL pb-sw



Control of center tank pumps is automatic:

- They run at engine start for 2 min
- Before or after the engine start sequence, the pumps run if the slats are retracted
- They stop automatically 5 min after center tank low level is reached.



Flight crew manually controls the center tank pumps with the CTR TK PUMP 1(2) pb-sw.



FAULT light and ECAM alert come on when all of the following occur:

- The center tank has more than 250 kg (550 lb) of fuel
- The left or right wing tank has less than 5 000 kg (11 000 lb) of fuel
- The CTR TK MODE SEL pb-sw is at AUTO.

Ident.: DSC-28-20-G-00020256.0001001 / 17 MAR 17

Applicable to: MSN 02155-05746

CTR TK PUMP 1(2) pb-sw

- On** : Pump runs, if MAN mode is selected on the MODE SEL pb-sw.
Pump is automatically controlled when AUTO mode is selected.
- OFF** : Pump is off and OFF button comes on white.
- FAULT light** : Amber light and associated ECAM caution come on, when the pump is in operation and the delivery pressure drops.

Ident.: DSC-28-20-G-00028039.0001001 / 17 MAY 24

Applicable to: MSN 07784-07792

CTR TK L(R) XFR pb-sw



The transfer valve is automatically controlled when AUTO mode is selected.
The transfer valve opens, if MAN mode is selected on the CTR TK MODE SEL pb-sw.



The transfer valve is closed.



The associated wing tank overflows.

Ident.: DSC-28-20-G-00020257.0001001 / 17 MAY 24

Applicable to: ALL

X FEED pb-sw



The valve opens, and the ON pushbutton comes on.



The valve closes, and the pushbutton does not come on.



OPEN light comes on, when the valve is fully open.

Ident.: DSC-28-20-G-00020258.0001001 / 17 MAR 17

Applicable to: ALL

ACT pb-sw

- AUTO** : Control of the ACT transfer is automatic.
- The automatic forward transfer occurs, if:
 - The aircraft is in flight, and
 - The slats are retracted, and
 - At least one ACT low-level sensor is wet, and
 - The center tank high-level sensor has been dry for at least 10 min.
 - The automatic forward transfer stops, as soon as one of the above conditions is not met.
- FWD** : The manual transfer to the center tank is initiated by opening:
- The ACT transfer valve,
 - The ACT 1 or ACT 2 (if available) inlet valve.
- The ACT transfer pump is then commanded on.
- FAULT light** : Amber light and associated ECAM caution come on, when:
- The center tank has less than 3 000 kg (6 614 lb) of fuel, and 1 ACT has more than 250 kg (550 lb) of fuel, and
 - The ACT pb-sw is on AUTO.

Note: When no ACT is installed, the pushbutton is inoperative.

AIRCRAFT SYSTEMS

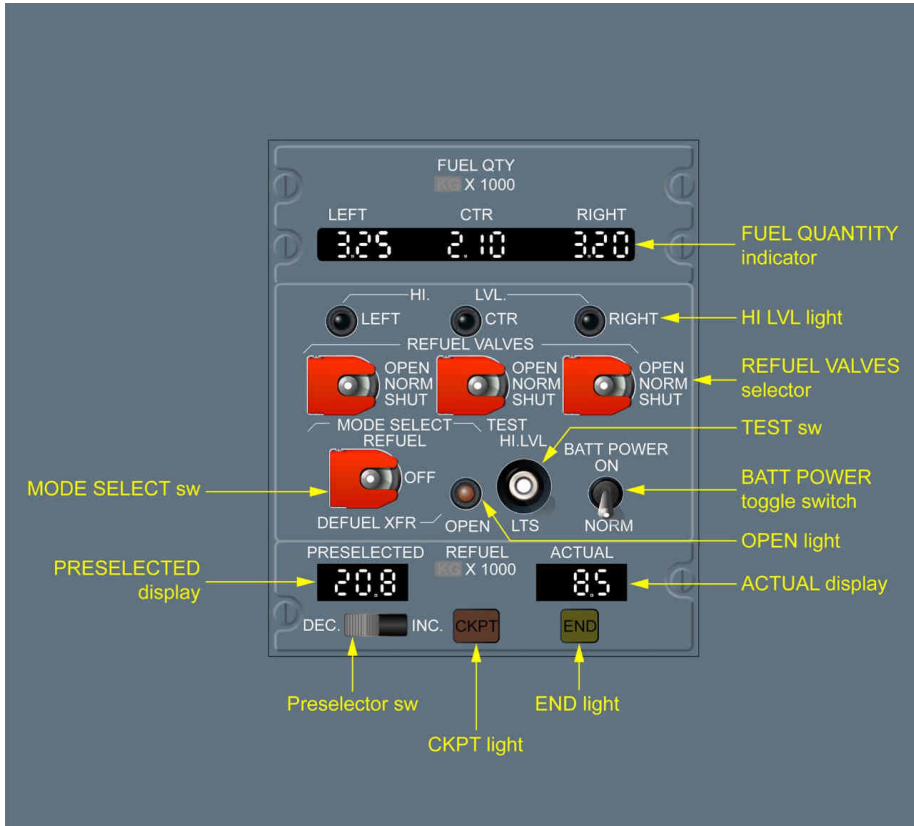
FUEL

CONTROLS AND INDICATORS

EXTERNAL REFUEL PANEL

Ident.: DSC-28-20-C-00020185.0001001 / 02 MAY 24

Applicable to: ALL



Ident.: DSC-28-20-C-00020265.0001001 / 21 MAR 17

Applicable to: ALL

FUEL QUANTITY INDICATOR

The number shows the quantity of fuel in each tank.

Units may either be in kg x 1 000 or lb x 1 000 depending on the aircraft configuration.

Ident.: DSC-28-20-C-00020266.0001001 / 21 MAR 17

Applicable to: ALL**HI LVL light**

This blue light comes on, when the system detects a high fuel level.

The corresponding refuel valve closes automatically.

Ident.: DSC-28-20-C-00020267.0001001 / 21 MAR 17

Applicable to: ALL**REFUEL VALVES selector (GUARDED IN NORM)**

NORM : Automatic refueling logic controls the refuel valves.

OPEN : Valves open when the MODE SELECT sw is set to the REFUEL or DEFUEL XFR position. Each refuel valve closes, when the system detects a high level in the associated tank.

SHUT : Valves close.

Ident.: DSC-28-20-C-00020268.0001001 / 17 MAR 17

Applicable to: ALL**MODE SELECT sw (GUARDED AT OFF)**

OFF : Refuel system is de-energized. Refuel valves are closed.

REFUEL : Refuel valves operate in automatic or in manual mode depending on the position of REFUEL VALVES sw.

DEFUEL XFR : Refuel/Defuel transfer valve opens.

Refuel valve opens if the associated REFUEL VALVE sw is at OPEN.

Ident.: DSC-28-20-C-00020270.0001001 / 21 MAR 17

Applicable to: ALL**OPEN light**

This amber light comes on when the defuel transfer valve is open.

Ident.: DSC-28-20-C-00020271.0001001 / 17 MAR 17

Applicable to: ALL**TEST sw**

HI LVL : The HI LVL lights come on if high level sensors and associated circuits are serviceable.

Note: If tanks are full (HI LVL lights on) during this test, the HI LVL lights go out if high level sensors and associated circuits are serviceable.

LTS : Lights on panel and all 8's on FQI and preselector come on.

AIRCRAFT SYSTEMS**FUEL****CONTROLS AND INDICATORS**

Ident.: DSC-28-20-C-00020272.0001001 / 21 MAR 17

Applicable to: ALL**PRESELECTED DISPLAY**

This display shows the preselected total fuel quantity in kg (lb) × 1 000 (multiply by 1 000 to get actual amount).

Ident.: DSC-28-20-C-00020273.0001001 / 17 MAR 17

Applicable to: ALL**Preselector sw**

Pressing the left or right side of the switch decreases or increases the preselected quantity.

Ident.: DSC-28-20-C-00020274.0001001 / 21 MAR 17

Applicable to: ALL**ACTUAL DISPLAY**

This display shows the total fuel on board.

Ident.: DSC-28-20-C-00020275.0001001 / 21 MAR 17

Applicable to: ALL**END light**

This green light comes on steady when automatic refueling is completed.
It flashes green if refueling is aborted.

CKPT LIGHT

Ident.: DSC-28-20-C-00020276.0002001 / 21 MAR 17

Applicable to: MSN 02719-02789, 03031-03060, 05152-05746**CKPT light**

Indicates that cockpit refuel panel has priority.
Illuminates when electrical PWR pb-sw on cockpit refuel is pressed.

Ident.: DSC-28-20-C-00020276.0001001 / 21 MAR 17

Applicable to: MSN 02155-02212, 02926-02944, 04392, 07784-07792**CKPT light**

Not used.

Ident.: DSC-28-20-C-00020277.0001001 / 16 MAY 24

Applicable to: **ALL**

BATT POWER TOGGLE SWITCH

ON : When the flight crew momentarily switches this to ON position and releases it, HOT BUS 1 supplies the FQI.
After completion of the FQI tests (about 40 s), the fuel quantity indications appear and refuel operation can be selected.

The electrical supply is automatically cut off:

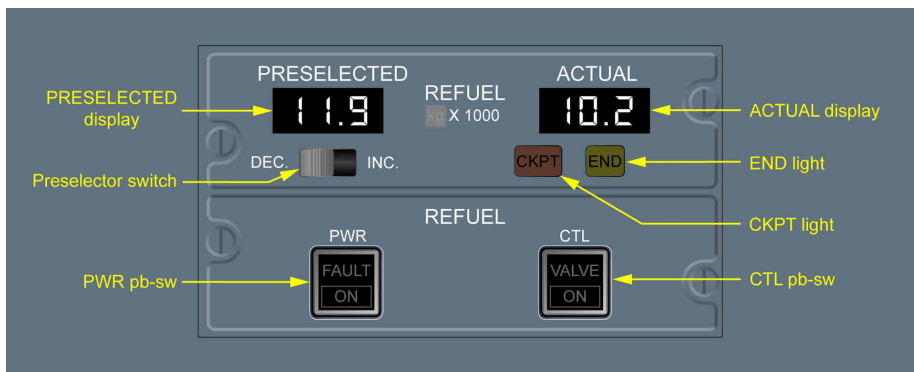
- After 10 min, if no refuel operation is selected, or
- At the end of refueling.

NORM : The FQI is not supplied by batteries.

REFUEL PANEL

Applicable to: MSN 02719-02789, 03031-03060, 05152-05746

Ident.: DSC-28-20-D-00020187.0007001 / 13 MAY 25



Ident.: DSC-28-20-D-00020286.0001001 / 21 MAR 17

PRESELECTED DISPLAY

This display shows the preselected total fuel quantity in KG (or in LB depending on aircraft configuration) × 1 000 (multiply by 1 000 to get actual amount).

Ident.: DSC-28-20-D-00020287.0001001 / 21 MAR 17

ACTUAL DISPLAY

This display shows the total fuel on board.

AIRCRAFT SYSTEMS**FUEL****CONTROLS AND INDICATORS**

Ident.: DSC-28-20-D-00020288.0001001 / 17 MAR 17

Preselector sw

Pressing the left or the right side of the switch decreases or increases the preselected quantity.

Ident.: DSC-28-20-D-00020289.0001001 / 17 JUN 24

END light

This green light comes on steady when automatic refueling is complete (associated with the green refuel light on wing extinguishing).
It flashes green if refueling is aborted.

Ident.: DSC-28-20-D-00020290.0001001 / 17 MAR 17

PWR pb-sw

- ON : - Refuel system is energized
- Cockpit refuel control/preselector panels takes priority (cockpit lights illuminate on cockpit and external refuel control panels)
- Automatic high level test
- REFUEL caption is displayed on ECAM.
- OFF : - Refuel system is deenergized
- ECAM "REFUEL" caption is cleared
- Priority is cleared.
- FAULT : This amber light comes on when auto high level test not satisfied.

Ident.: DSC-28-20-D-00020291.0001001 / 17 JUN 24

CTL pb-sw

- ON : - Start of refuel, (associated with refuel green light illumination on wing)
- Auto shut off occurs when the fuel quantity reaches the preselected quantity or in the case of HI level detection
- VALVE light comes amber if REFUEL VALVE CTL switch are not at NORM position (on refueling control panel).
- OFF : Refuel stops. The selected load can be reset.

Ident.: DSC-28-20-D-00020294.0001001 / 21 MAR 17

CKPT light

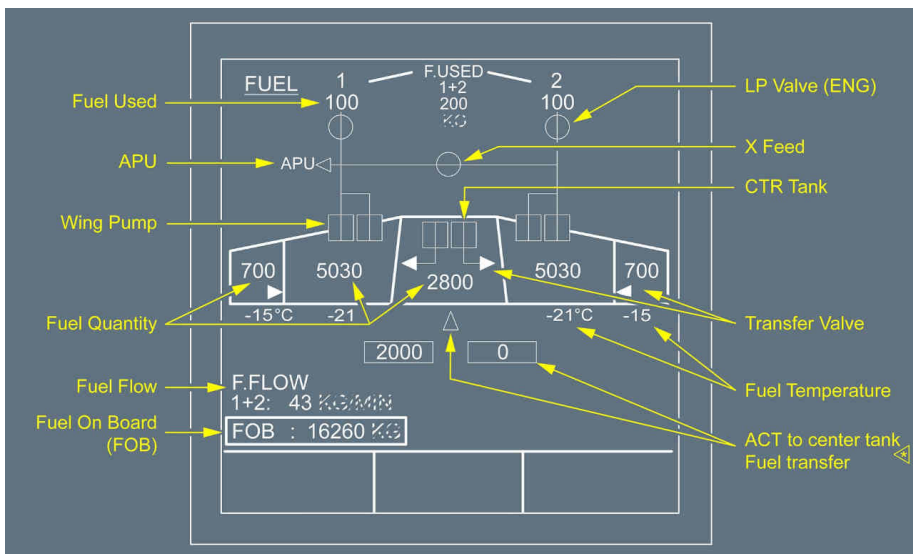
Comes on when PWR pb-sw switch is ON associated with the CKPT light on the external refuel control panel.

ECAM FUEL PAGE

ECAM FUEL PAGE

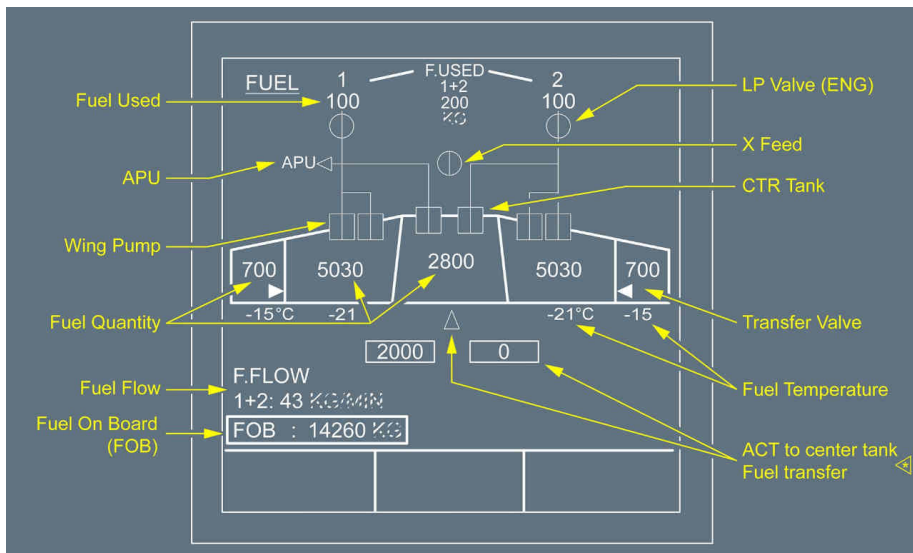
Ident.: DSC-28-20-F-00020188.0008001 / 17 MAR 17

Applicable to: MSN 07784-07792



Ident.: DSC-28-20-F-00020188.0004001 / 17 MAR 17

Applicable to: MSN 02155-05746



CTR TANKS VALVES INDICATIONS

Ident.: DSC-28-20-F-00020214.0002001 / 13 MAY 25

Applicable to: MSN 02155-05746

CTR TANKS PUMPS INDICATIONS



Pump pressure is normal (pump contactor on).



Pump pressure is low (pump contactor on).



Pump contactor is off, and auto shut-off is required.



Pump contactor is off, and auto shut-off is not required.



Pump status is not valid.

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Ident.: DSC-28-20-F-00020214.0001001 / 06 NOV 25
Applicable to: MSN 07784-07792

2 CTR TANKS VALVES INDICATIONS

		Transfer valve is open.
		Transfer valve is abnormally open in automatic or manual mode.
		Transfer valve is closed in automatic mode.
		Transfer valve is: - Abnormally closed in automatic mode, or - Closed in manual mode.
		Transfer valve position is not valid.

Ident.: DSC-28-20-F-00020216.0001001 / 16 MAY 24
Applicable to: ALL

LP VALVE (ENG) INDICATIONS

		The valve is open.
		The valve is open, with the ENG MASTER lever OFF.
		The valve is fully closed.
		The valve is in transit.
		The valve position is not valid.

Ident.: DSC-28-20-F-00020213.0001001 / 13 MAY 25

Applicable to: ALL

WING PUMP INDICATIONS



The pump is running.



The pump pressure is low.



The pump is failed or is turned off by the flight crew.



The pump status is not valid.

Ident.: DSC-28-20-F-00020217.0001001 / 16 MAY 24

Applicable to: ALL

X FEED INDICATIONS



The valve is open.



The valve is open, with X FEED pb-sw is off.



The valve is closed.



The valve is closed with X FEED pb-sw is ON.



The valve is in transit.



The valve position is not valid.

Ident.: DSC-28-20-F-00020219.0001001 / 16 MAY 24

Applicable to: ALL

APU INDICATIONS



The APU valve is open

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The APU valve is open, with the APU FIRE pb-sw out, or the APU MASTER SW pb-sw is off.



The APU valve is closed and APU FIRE pb-sw out, or APU MASTER SW pb-sw is ON.



The APU valve is closed.



The APU valve is in transit.



The APU valve position is not valid.

Ident.: DSC-28-20-F-00026412.0001001 / 16 MAY 24

Applicable to: ALL

ENGINE IDENTIFICATION NUMBER



The engine is running.



The engine is not running.

Ident.: DSC-28-20-F-00020351.0001001 / 16 MAY 24

Applicable to: ALL

FUEL FLOW INDICATION



The total fuel flow is displayed in KG/MIN or LB/MIN depending on the aircraft configuration.



The total fuel flow is not displayed when there is no valid data.

Ident.: DSC-28-20-F-00020220.0001001 / 17 MAR 17

Applicable to: ALL

FUEL TEMPERATURE INDICATION

This appears when its associated temperature sensor is wet. It is normally in green.

An advisory only appears in phases 2 and 6, when the fuel temperature is:

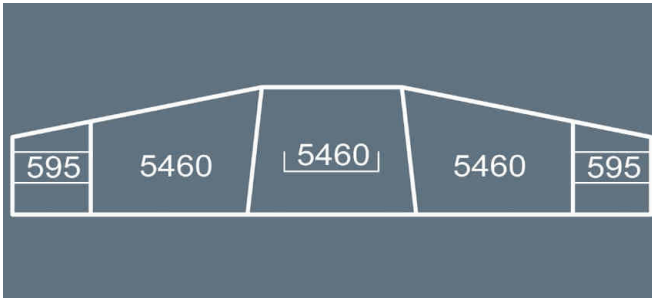
- Above 45 °C for the inner cell, or 55 °C for the outer cell.
- Below -40 °C.

It becomes amber, and the ECAM displays a caution, if the temperature goes above the high limit or below the low limit.

Ident.: DSC-28-20-F-00020221.0002001 / 17 MAR 17

Applicable to: **ALL**

FUEL QUANTITY INDICATION



- It is normally in green.
- The units may either be in KG or LB, depending on the DMC pin program.
- Two dashes appear across the last two digits when the FQI is inaccurate (*Refer to DSC-28-20 Total Fuel Indication*).

FUEL QUANTITY - BOXED INDICATIONS

Ident.: DSC-28-20-F-00020340.0003001 / 17 MAR 17

Applicable to: **MSN 07784-07792**

FUEL QUANTITY - BOXED INDICATIONS

- The outer indication is boxed amber, if both transfer valves fail to open when the inner is at low level.
- The center tank indication is boxed amber, if both center tank transfer valves fail in the closed position.

Ident.: DSC-28-20-F-00020340.0001001 / 17 MAR 17

Applicable to: **MSN 02155-05746**

FUEL QUANTITY - BOXED INDICATIONS

- The outer indication is boxed amber, if both transfer valves fail to open when the inner is at low level.
- The center tank indication is boxed amber, if both center tank pumps are failed, or are switched OFF.

Ident.: DSC-28-20-F-00020341.0002001 / 17 MAR 17

Applicable to: ALL

FUEL QUANTITY - OVERFLOW INDICATION

In the case of wing overflow, the associated inner tank quantity indication turns amber.

Ident.: DSC-28-20-F-00020345.0001001 / 17 MAR 17

Applicable to: ALL

FUEL QUANTITY - ADVISORY

An advisory appears in flight phases 2 and 6, when the difference between the fuel quantities in the two wings is greater than 1 500 kg (3 300 lb). The wing inner and outer tank indications pulse with the highest fuel level.

Ident.: DSC-28-20-F-00020346.0003001 / 17 MAR 17

Applicable to: ALL

FUEL ON BOARD (FOB) INDICATION

It is normally in green. It indicates the total of all tanks (Including the ACTs ).

Two dashes appear across the last two digits when the FQI is inaccurate (*Refer to DSC-28-20 Total Fuel Indication*).

Units may either be in KG or LB, depending on the DMC pin program.

The indication is half-boxed in amber, if:

- Center tank pumps fail, or are switched OFF.
- Both transfer valves fail to open, when the inner tank is at low level.
- Any ACT  is not usable.

Ident.: DSC-28-20-F-00020347.0001001 / 16 MAY 24

Applicable to: ALL

FUEL USED INDICATION

The units may either be in KG or LB, depending on the aircraft configuration.



The fuel used indication is displayed from flight phase 2, until electrical power is cut off at the end of the flight. The value is automatically reset, when the engine is started on ground.



There is power supply interruption to the DMC for more than 5 s in flight.



EEC indication of fuel flow is not valid in flight.

Ident.: DSC-28-20-F-00020348.0002001 / 17 MAR 17

Applicable to: ALL

ACT TO CENTER TANK FUEL TRANSFER INDICATION

- It is normally in green.
- The ACT quantity is displayed in a grey box.
- This box becomes amber in case of a transfer fault.
- ACT 1 is indicated on the left and ACT 2 is indicated on the right.
- Units may either be in KG or LB, depending on the DMC pin program.
- A triangle indicates that the fuel transfer to the center tank has started:
 - △ : Green, when the automatic transfer begins.
 - ▲ : Fully green, when the manual transfer begins.

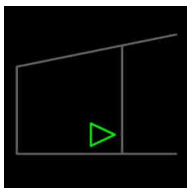
TRANSFER VALVE INDICATIONS

Ident.: DSC-28-20-F-00020218.0005001 / 12 NOV 24

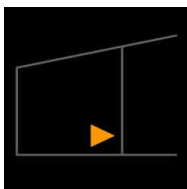
Applicable to: MSN 07784-07792

TRANSFER VALVE INDICATIONS

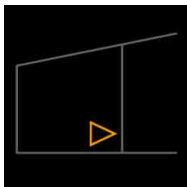
OUTER TO INNER TRANSFER



At least one valve is normally open, and fuel is transferred from the outer tank to the inner tank.



At least one valve is abnormally open, while commanded closed.

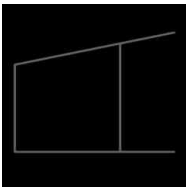


Indicates that:

- One valve is in transit, when the indication is temporary and associated with fuel transfer, or
- The signal associated with the position of one valve is lost, when the indication is permanent.



The valve position data is not valid.



Both valves are closed.

CENTER TO INNER TRANSFER



The fuel is transferred from the center tank to the inner tank.



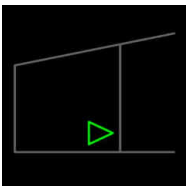
The fuel is abnormally transferred from the center tank to the inner tank (the transfer valve is abnormally open, while commanded closed in automatic or manual mode).

Ident.: DSC-28-20-F-00020218.0002001 / 12 NOV 24

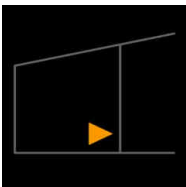
Applicable to: MSN 02155-05746

TRANSFER VALVE INDICATIONS

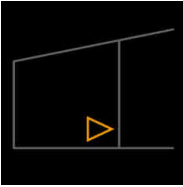
OUTER TO INNER TRANSFER



At least one valve is normally open, and fuel is transferred from the outer tank to the inner tank.

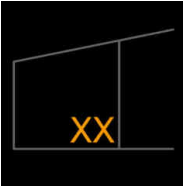


At least one valve is abnormally open, while commanded closed.

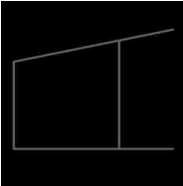
AIRCRAFT SYSTEMS**FUEL****CONTROLS AND INDICATORS**

Indicates that:

- One valve is in transit, when the indication is temporary and associated with fuel transfer, or
- The signal associated with the position of one valve is lost, when the indication is permanent.



The valve position data is not valid.

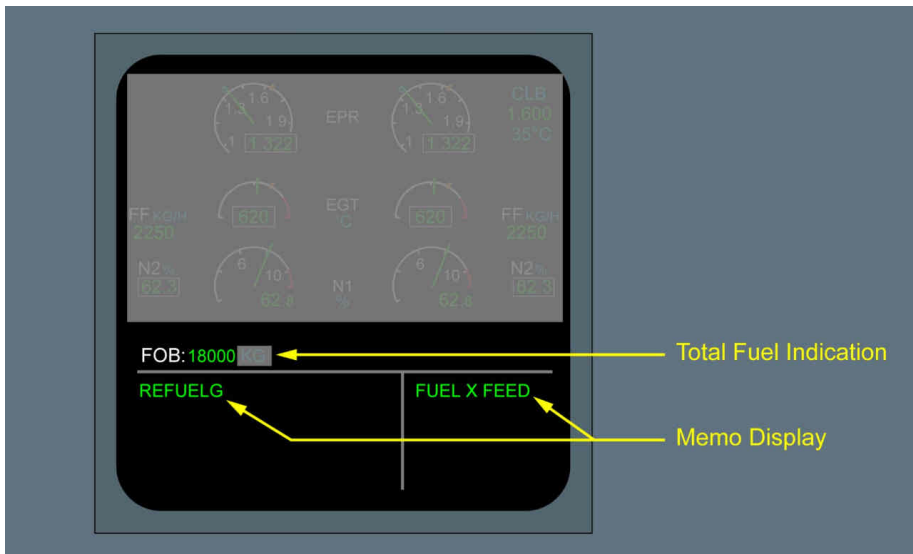


Both valves are closed.

ECAM UPPER DISPLAY

Ident.: DSC-28-20-E-00020189.0002001 / 16 MAY 24

Applicable to: ALL


TOTAL FUEL INDICATION

Ident.: DSC-28-20-E-00020193.0003001 / 17 MAR 17

Applicable to: MSN 07784-07792

TOTAL FUEL INDICATION

A half amber box appears around FOB, when the displayed quantity is not all usable (intercell transfer valve failure or both center tank transfer valves fail in the closed position).

Units may either be in KG or LB, depending on the DMC pin program.

If the FOB indication is displayed with two dashes across the last two digits, the FQI is in degraded mode. In this case, the ECAM FUEL page can be called on ECAM lower display to determine which tank is affected.

The loss of accuracy resulting from the loss of FQI normal mode is as follows :

Wing outer tank affected : +20 kg (+44 lb), -200 kg (-440 lb).

Wing inner tank affected : ±110 kg (240 lb).

Center tank affected : ±130 kg (290 lb).

All tanks affected : +390 kg (+860 lb), -750 kg (-1660 lb).

Ident.: DSC-28-20-E-00020193.0001001 / 17 MAR 17

Applicable to: MSN 02155-05746

TOTAL FUEL INDICATION

An amber half box appears around FOB, when the displayed quantity is not all usable (intercell transfer valve failure or loss of center tank pumps).

Units may either be in KG or LB, depending on the DMC pin program.

If the FOB indication is displayed with two dashes across the two least significant digits, the FQI is in degraded mode. In this case, the ECAM FUEL page can be called on ECAM lower display to determine which tank is affected.

The loss of accuracy resulting from the loss of FQI normal mode is as follows :

Wing outer tank affected : +20 kg (+44 lb), -200 kg (-440 lb).

Wing inner tank affected : ±110 kg (240 lb).

Center tank affected : ±130 kg (290 lb).

All tanks affected : +390 kg (+860 lb), -750 kg (-1660 lb).

Ident.: DSC-28-20-E-00020194.0001001 / 17 MAR 17

Applicable to: ALL

MEMO DISPLAY

Memos are normally in green color, but they may be in amber color in abnormal situations.

MEMO DISPLAY

Ident.: DSC-28-20-A-00016777.0001001 / 21 MAR 16

Applicable to: MSN 02155-05746

CTR TK FEEDG : This memo appears in green, if at least one center tank pump is energized.

Ident.: DSC-28-20-A-00016778.0001001 / 21 MAR 16

Applicable to: ALL

FUEL X FEED : This memo appears in green, if the fuel X FEED pb-sw is ON, and the X FEED valve is not fully closed. It appears in amber in flight phases 3,4, or 5.

Ident.: DSC-28-20-A-00016776.0001001 / 21 MAR 16

Applicable to: ALL

OUTR TK FUEL XFRD : This memo appears in green, if at least one transfer valve is open in one wing tank.

Ident.: DSC-28-20-A-00016779.0001001 / 21 MAR 16

Applicable to: ALL

REFUELG

: This memo appears in green, when :

- The door of the refuel control panel  on the fuselage or on the wing is open, or
- The PWR pb-sw of the refuel control panel  in the cockpit is ON.

AIRCRAFT SYSTEMS

FUEL

CONTROLS AND INDICATORS

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AIRCRAFT SYSTEMS

HYDRAULIC

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DSC-29-10 Description**DSC-29-10-10 General**

General.....	A
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DSC-29-10-20 Generation

Green System Pump.....	A
Blue System Pumps.....	B
Yellow System Pumps.....	C
Power Transfer Unit (PTU).....	D
Ram Air Turbine (RAT).....	E
System Accumulators.....	F
Priority Valves.....	G
Fire Shutoff Valves.....	H
Leak Measurement Valves.....	I
Filters.....	J
Generation.....	K
Reservoir Pressurization.....	L
Indications.....	M

DSC-29-10-30 Distribution

Distribution.....	A
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DSC-29-20 Controls and Indicators

Overhead Panel.....	A
Maintenance Panel.....	B
ECAM HYD Page.....	C
Memo Display.....	D

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS HYDRAULIC DESCRIPTION - GENERAL
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GENERAL

Ident.: DSC-29-10-10-00001133.0001001 / 21 MAR 16

Applicable to: ALL

The aircraft has three continuously operating hydraulic systems : blue, green, and yellow. Each system has its own hydraulic reservoir. Normal system operating pressure is 3 000 PSI (2 500 PSI when powered by the RAT). Hydraulic fluid cannot be transferred from one system to another.

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS HYDRAULIC DESCRIPTION - GENERATION
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GREEN SYSTEM PUMP

Ident.: DSC-29-10-20-00001134.0001001 / 21 MAR 16

Applicable to: ALL

A pump driven by engine 1 pressurizes the green system.

BLUE SYSTEM PUMPS

Ident.: DSC-29-10-20-00001135.0001001 / 21 MAR 16

Applicable to: ALL

An electric pump pressurizes the blue system. A pump driven by a ram air turbine (RAT) pressurizes this system in an emergency.

YELLOW SYSTEM PUMPS

Ident.: DSC-29-10-20-00001136.0001001 / 21 MAR 16

Applicable to: ALL

A pump driven by engine 2 pressurizes the yellow system.
An electric pump can also pressurize the yellow system, which allows yellow hydraulics to be used on the ground when the engines are stopped.
Crew members can also use a hand pump to pressurize the yellow system in order to operate the cargo doors when no electrical power is available.

POWER TRANSFER UNIT (PTU)

Ident.: DSC-29-10-20-00001137.0001001 / 04 DEC 18

Applicable to: ALL

A bidirectional power transfer unit enables the yellow system to pressurize the green system and vice versa.
The power transfer unit comes into action automatically when the differential pressure between the green and the yellow systems is greater than 500 PSI.
The PTU therefore allows the green system to be pressurized on the ground when the engines are stopped.

RAM AIR TURBINE (RAT)

Ident.: DSC-29-10-20-00001138.0001001 / 21 MAR 16

Applicable to: ALL

A drop-out RAT coupled to a hydraulic pump allows the blue system to function if electrical power is lost or both engines fail. The RAT deploys automatically if AC BUS 1 and AC BUS 2 are both lost. It

AIRCRAFT SYSTEMS**HYDRAULIC**

DESCRIPTION - GENERATION

can be deployed manually from the overhead panel. It can be stowed only when the aircraft is on the ground.

SYSTEM ACCUMULATORS

Ident.: DSC-29-10-20-00001139.0001001 / 21 MAR 16

Applicable to: ALL

An accumulator in each system helps to maintain a constant pressure by covering transient demands during normal operation.

PRIORITY VALVES

Ident.: DSC-29-10-20-00001141.0001001 / 21 MAR 16

Applicable to: ALL

Priority valves cut off hydraulic power to heavy load users if hydraulic pressure in a system gets low.

FIRE SHUTOFF VALVES

Ident.: DSC-29-10-20-00001142.0001001 / 21 MAR 16

Applicable to: ALL

Each of the green and yellow systems has a fire shutoff valve in its line upstream of its engine-driven pump. The flight crew can close it by pushing the ENG 1(2) FIRE pushbutton.

LEAK MEASUREMENT VALVES

Ident.: DSC-29-10-20-00001143.0001001 / 21 MAR 16

Applicable to: ALL

Each system has a leak measurement valve upstream of the primary flight controls. These valves, which measure the leakage in each circuit, are closed by operation of the LEAK MEASUREMENT VALVES pushbutton switch on the maintenance panel.

FILTERS

Ident.: DSC-29-10-20-00001144.0001001 / 21 MAR 16

Applicable to: ALL

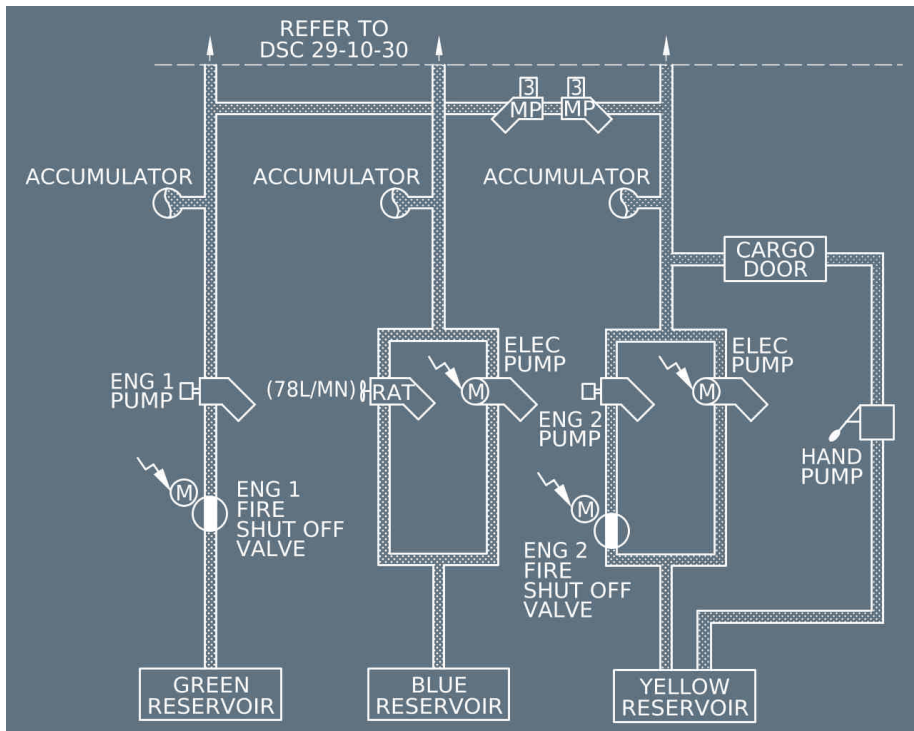
L3 Filters clean the hydraulic fluid as follows :

- HP filters on each system and on the reservoir filling system and the normal braking system
- return line filters on each line
- case drain filters on engine pumps and the blue electric pump (which permit maintenance crew to monitor pump wear by inspecting the filters for the presence of metallic particles).

GENERATION

Ident.: DSC-29-10-20-00001145.0001001 / 08 FEB 13

Applicable to: ALL

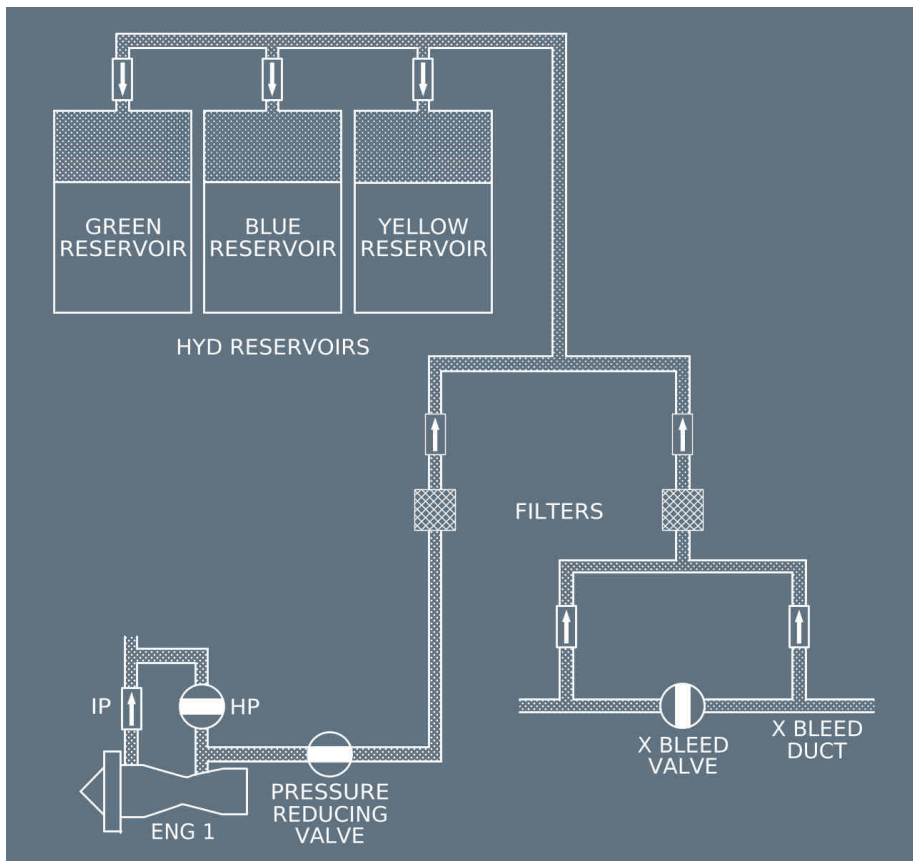


RESERVOIR PRESSURIZATION

Ident.: DSC-29-10-20-00001146.0001001 / 08 FEB 13

Applicable to: ALL

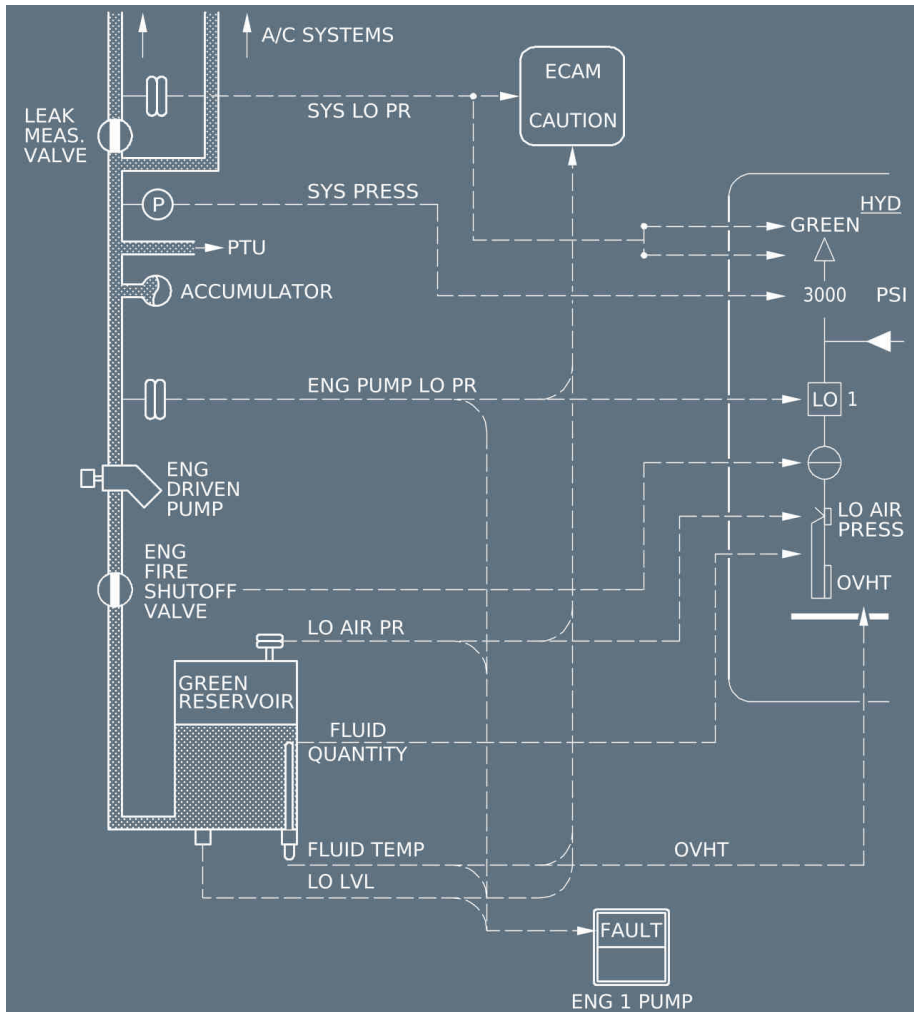
Normally, HP bleed air from engine 1 pressurizes the hydraulic reservoirs automatically. If the bleed air pressure is too low, the system takes bleed air pressure from the crossbleed duct. The systems maintain a high enough pressure to prevent their pumps from cavitating.



INDICATIONS

Ident.: DSC-29-10-20-00001147.0002001 / 09 OCT 12

Applicable to: ALL



AIRCRAFT SYSTEMS

HYDRAULIC

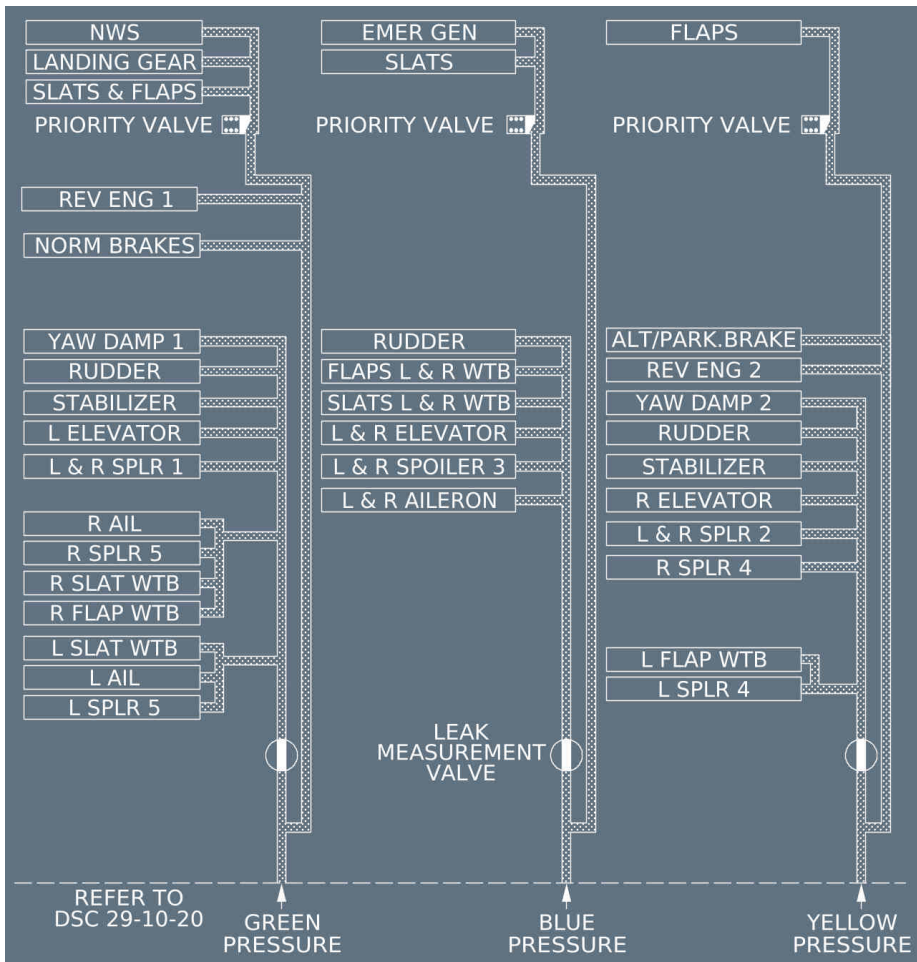
DESCRIPTION - GENERATION

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DISTRIBUTION

Ident.: DSC-29-10-30-00001148.0002001 / 08 FEB 13

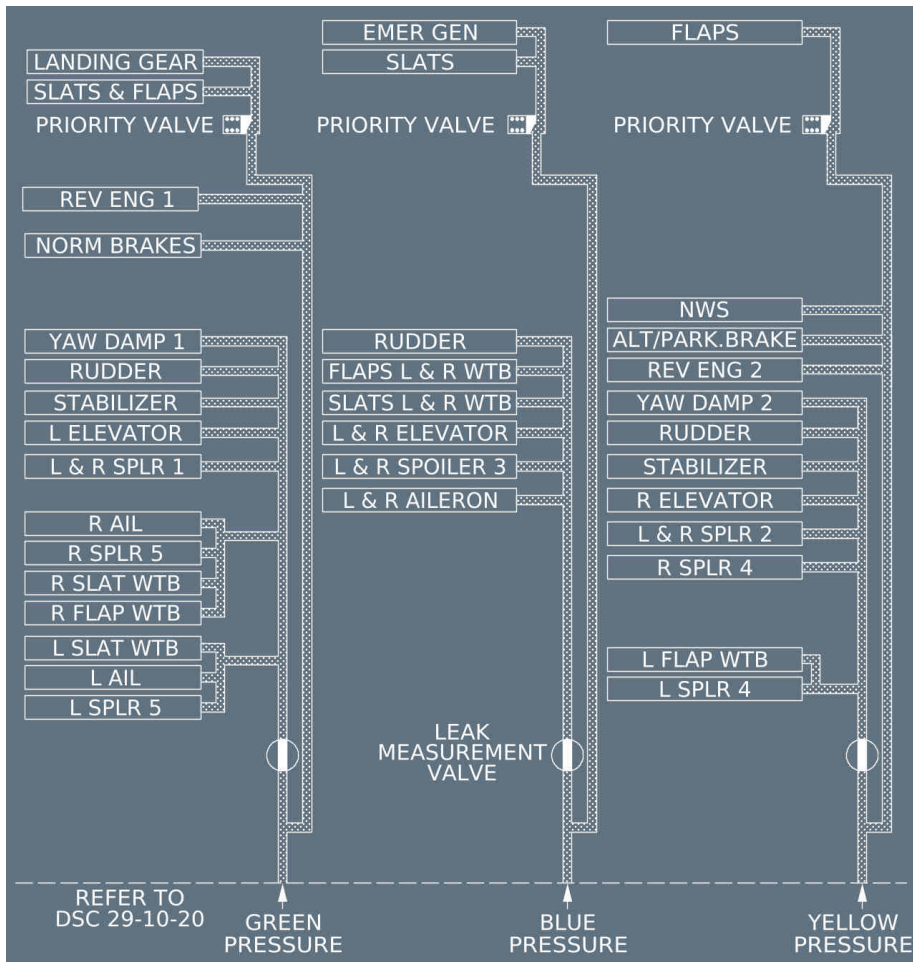
Applicable to: MSN 02155-02212



DISTRIBUTION

Ident.: DSC-29-10-30-00001148.0003001 / 08 FEB 13

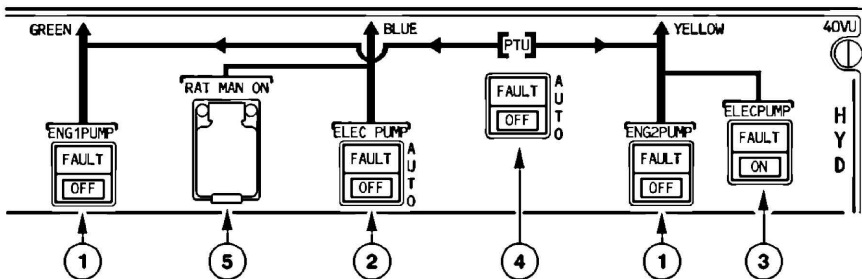
Applicable to: MSN 02719-07792



OVERHEAD PANEL

Ident.: DSC-29-20-00001149.0001001 / 21 MAR 16

Applicable to: ALL



(1) ENG 1 (2) PUMP pb

On : The pump pressurizes the system when the engine is running.

OFF : The pump is depressurized. The generation of hydraulic power stops.

FAULT It : This amber light comes on, and the ECAM caution appears, if :

- The reservoir level is low
- The reservoir overheats
- The reservoir air pressure is low
- The pump pressure is low (inhibited on the ground, when the engine is stopped).

This light goes out, when the crew selects OFF, except during an overheat. (The light stays on as long as the overheat lasts).

(2) BLUE ELEC PUMP pb (guarded)

AUTO : If AC power is available, the electric pump operates :

- In flight
- On the ground, if one engine is running or if the crew has pressed the BLUE PUMP OVRD pushbutton on the maintenance panel.

OFF : The pump is de-energized.

AIRCRAFT SYSTEMS
HYDRAULIC
CONTROLS AND INDICATORS

FAULT It : This amber light comes on, and a caution appears on the ECAM, if :

- The reservoir level is low
- The reservoir overheats
- The air pressure in the reservoir is low
- The pump is delivering low pressure (inhibited on the ground, when the engines are stopped)
- The pump overheats.

The light goes out, when the crew selects OFF, except during an overheat. (The light stays on as long as the overheat lasts).

(3) **YELLOW ELEC PUMP pb sw (springloaded)**

ON : The electric pump is ON.
 If the electrical power supply is removed, the pump will remain off when electrical power is applied again.

Off : The pump is off.
 It comes on automatically when a crewman sets the lever of the cargo door manual selector valve to OPEN or CLOSE.
 This inhibits the operation of other yellow system functions (except alternate braking and engine 2 reverse).

FAULT It : This amber light, accompanied by an ECAM caution, comes on if :

- the reservoir level is low
- air pressure in the reservoir is low
- the reservoir overheats
- pump pressure is low
- the pump overheats.

The light goes out when the crew selects OFF, except during an overheat. (The light stays on as long as the overheat lasts).

(4) **PTU pb sw**

AUTO : The bidirectional power transfer unit is armed and both the yellow and the green electrohydraulic valves are open.
 The power transfer unit runs automatically when the differential pressure between the green and yellow systems is more than 500 PSI.

***Note:** The PTU is inhibited during the first engine start and automatically tested during the second engine start.*

OFF : Both the green and the yellow PTU electrohydraulic valves close. Power transfer stops.

FAULT It : This amber light comes on, and a caution appears on the ECAM, if :

- the green or the yellow reservoir overheats
- the green or the yellow reservoir has low air pressure
- the green or the yellow reservoir has a low fluid level.

The light goes out when the crew selects OFF, except during an overheat. (The light stays on as long as the overheat lasts).

(5) **RAT MAN ON** pb

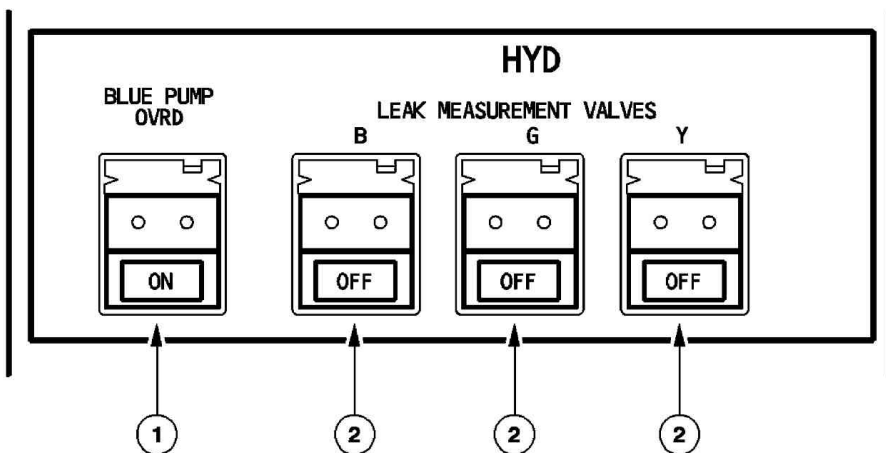
The flight crew may extend the RAT at any time by pressing the RAT MAN ON pushbutton.

Note: The RAT extends automatically if AC BUS 1 and AC BUS 2 are lost. (Refer to DSC-24-20 Overhead Panel (Cont'd)).

MAINTENANCE PANEL

Ident.: DSC-29-20-00001150.0001001 / 21 MAR 16

Applicable to: ALL



(1) **BLUE PUMP OVRD** pb sw (guarded)

ON : The blue electric pump is on if the ELEC PUMP pushbutton switch on the HYD panel is at AUTO.

Off : The blue electric pump is off.

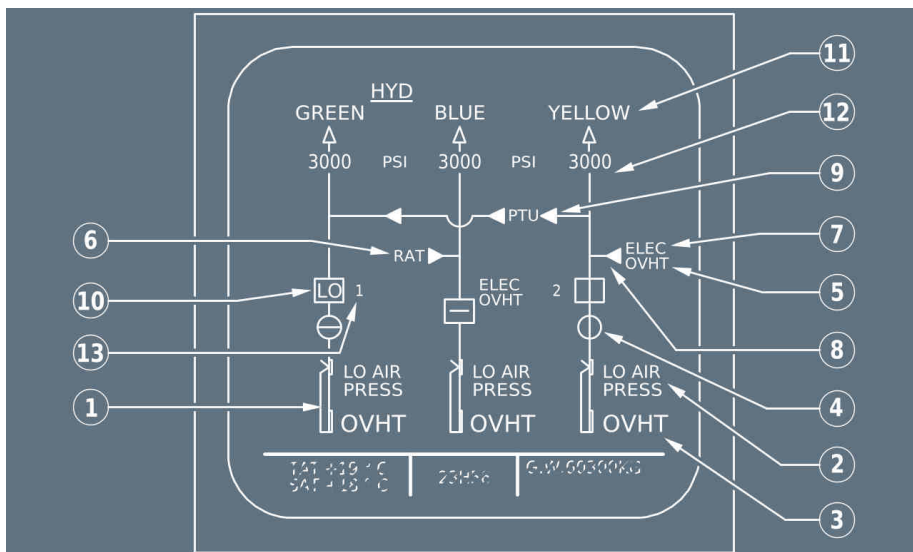
(2) LEAK MEASUREMENT VALVES pb sw (guarded)

OFF: The corresponding electrohydraulic valve closes and shuts off hydraulic supply to the primary flight controls.

On : The corresponding electrohydraulic valve opens to go back to normal hydraulic supply.

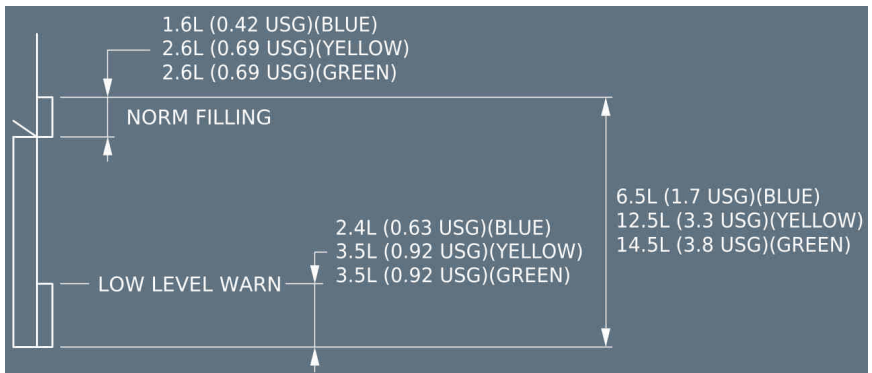
ECAM HYD PAGE

Ident.: DSC-29-20-00001151.0002001 / 23 JUN 15

 Applicable to: **ALL**


(1) Reservoir quantity

It is in green, unless the fluid level goes below the warning level, in which case it becomes amber.



(2) Reservoir LO AIR PRESS

This appears in amber, and a caution appears on ECAM, if the air pressure for the indicated reservoir drops below normal.

(3) Reservoir OVHT

This appears in amber, and a caution appears on ECAM, if the temperature of returning hydraulic fluid temperature at the inlet to its reservoir is above normal.

(4) FIRE VALVE

Cross line - Amber : The valve is fully closed.

In line - Green : The valve is not fully closed.

(5) OVHT

This appears in amber if the electric pump for that system (blue or yellow) overheats.

(6) RAT

RAT ▷ White : The RAT is stowed.

RAT ▢ Green : The RAT is not stowed.

RAT ► Amber : Pressure for stowing the RAT has been applied, or the RAT pump is not available.

(7) ELEC

This legend, normally white, becomes amber if the associated power supply fails.

(8) YELLOW ELEC PUMP control

◁ White : The electric pump is off.

▢ Green : The electric pump is ON.

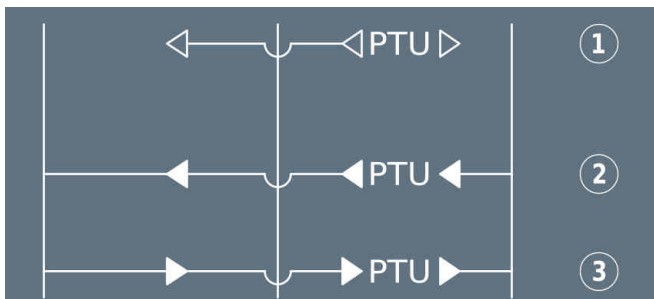
AIRCRAFT SYSTEMS

HYDRAULIC

CONTROLS AND INDICATORS

◀ Amber : The electric pump is ON and the yellow system has low pressure.

(9) PTU control



(1)

Green : The power transfer unit (PTU) pushbutton switch is in AUTO and the PTU is not transferring pressure.

Amber : The PTU pb-sw is OFF.

(2)

Green : The PTU is supplying the green hydraulic system.

(3)

Green : The PTU is supplying the yellow hydraulic system.

(10) ENG PUMP control and low pressure indication

In line (Green) : The pushbutton switch for the designated PUMP is on and hydraulic pressure is normal.

Cross line (Amber) : The pushbutton switch for the designated PUMP is OFF.

“LO” (Amber) : The pushbutton switch for the designated PUMP is on and hydraulic pressure is low.

(11) System label

	pressure > 1 450 PSI	pressure < 1 450 PSI
YELLOW	white	amber
Δ	green	amber

(12) System pressure

This legend, normally green, becomes amber when system pressure is below 1 450 PSI.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS HYDRAULIC CONTROLS AND INDICATORS
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- (13) PUMP
This legend, normally white, becomes amber when N2 is below idle.

MEMO DISPLAY

Applicable to: ALL

Ident.: DSC-29-20-A-00016787.0001001 / 21 MAR 16

HYD PTU : This memo appears in green, when the power transfer unit is running.

Ident.: DSC-29-20-A-00016786.0001001 / 21 MAR 16

RAT OUT : This memo appears in green, if the Ram Air Turbine is not fully stowed. The color changes to amber during flight phases 1 and 2.

AIRCRAFT SYSTEMS

HYDRAULIC

CONTROLS AND INDICATORS

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AIRCRAFT SYSTEMS

ICE AND RAIN PROTECTION

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DSC-30-10 General

DSC-30-10-10 Description

General.....	A
Anti-Ice.....	B
Rain Removal.....	C

DSC-30-20 Wing Anti-Ice

DSC-30-20-10 Description

Description.....	A
------------------	---

DSC-30-20-20 Controls And Indicators

Overhead Panel.....	A
ECAM BLEED Page.....	B
Memo Display.....	C

DSC-30-30 Engine Anti-Ice

DSC-30-30-10 Description

Description.....	A
------------------	---

DSC-30-30-20 Controls and Indicators

Overhead Panel.....	A
Memo Display.....	B

DSC-30-40 Window Heat

DSC-30-40-10 Description

Description.....	A
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DSC-30-40-20 Controls and Indicators

Overhead Panel.....	A
---------------------	---

DSC-30-50 Probes Heat

DSC-30-50-10 Description

Description.....	A
------------------	---

DSC-30-50-20 Controls and Indicators

Overhead Panel.....	A
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Continued on the following page

Continued from the previous page

DSC-30-60 Rain Removal

DSC-30-60-10 Description

Wipers.....	A
Rain Repellent 	B

DSC-30-60-20 Controls and Indicators

Overhead Panel.....	A
Rain Repellent  System Indicators.....	B

DSC-30-70 Ice Detection System

DSC-30-70-10 Description

Visual Ice Indicator.....	A
Ice Detection System.....	B

GENERAL

Ident.: DSC-30-10-10-00001154.0001001 / 16 MAR 11

Applicable to: ALL

The ice and rain protection system allows unrestricted operation of the aircraft in icing conditions and heavy rain.

ANTI-ICE

Ident.: DSC-30-10-10-00001155.0001001 / 29 MAR 12

Applicable to: ALL

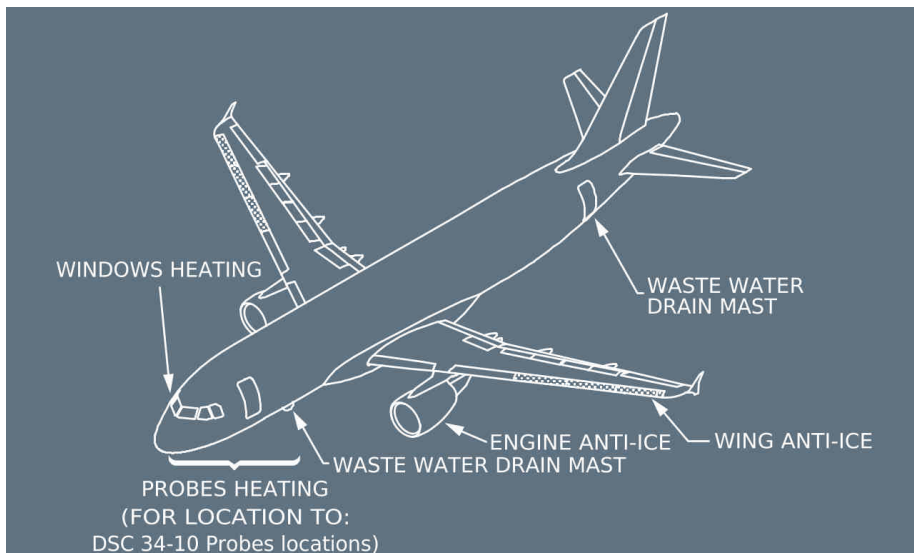
Either hot air or electrical heating protects critical areas of the aircraft as follows:

HOT AIR

- Three outboard leading-edge slats of each wing
- Engine air intakes.

ELECTRICAL HEATING

- Flight compartment windows
- Sensors, pitot probes and static ports
- Waste-water drain mast.





A318/A319/A320/A321
FLIGHT CREW
OPERATING MANUAL

AIRCRAFT SYSTEMS
ICE AND RAIN PROTECTION
GENERAL - DESCRIPTION

RAIN REMOVAL

Ident.: DSC-30-10-10-00017416.0001001 / 21 MAR 16

Applicable to: ALL

Wipers and fluid rain repellent  , remove rain from the front windshield panels.

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS ICE AND RAIN PROTECTION WING ANTI-ICE - DESCRIPTION
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DESCRIPTION

Ident.: DSC-30-20-10-00017417.0001001 / 21 MAR 16

Applicable to: ALL

In flight, hot air from the pneumatic system heats the three outboard slats (3-4-5) of each wing. Air is supplied through one valve in each wing.

The WING pushbutton on the ANTI ICE panel controls the valves.

When the aircraft is on ground, the flight crew can initiate a 30 s test sequence by turning the system ON.

If the system detects a leak during normal operation, the affected side's wing anti-ice valve automatically closes (*Refer to DSC-36-10-50 Leak Detection*).

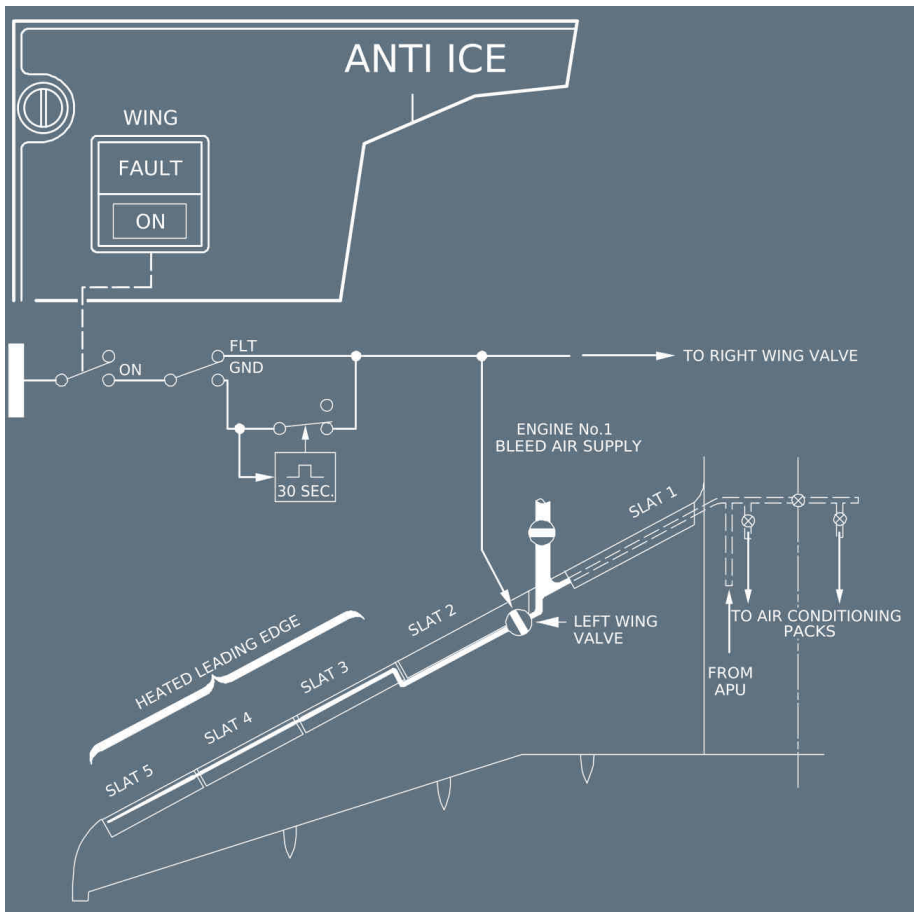
When wing anti-ice is selected, the N1 or EPR limit is automatically reduced, and the idle N1 or EPR is automatically increased.

If the electrical power supply fails, the valves close.

AIRCRAFT SYSTEMS

ICE AND RAIN PROTECTION

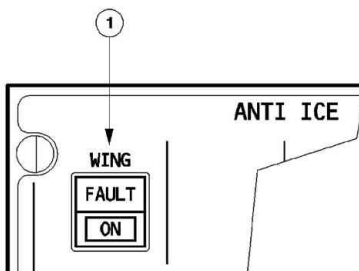
WING ANTI-ICE - DESCRIPTION



OVERHEAD PANEL

Ident.: DSC-30-20-20-00017418.0001001 / 21 MAR 16

Applicable to: ALL


(1) WING ANTI ICE pb sw

This switch controls the wing anti ice system on the left and right sides simultaneously.

Off : ON light goes off.

Wing anti-icing control valves close.

FAULT : Light comes on amber, and caution appears on ECAM, if:

- The position of the anti-icing control valve is not the required position, or
- Low pressure is detected.

Note: The amber FAULT light comes on briefly as the valves transit.

ON : Light comes on blue.

WING A. ICE appears on the ECAM MEMO page.

Wing anti ice control valves open if a pneumatic supply is available.

On the ground the wing anti-icing control valves open for 30 s only (test sequence).

ECAM BLEED PAGE

Ident.: DSC-30-20-20-00001159.0001001 / 21 MAR 16

Applicable to: ALL

Refer to DSC-36-20 ECAM Bleed Page

MEMO DISPLAY

Ident.: DSC-30-20-20-A-00016938.0001001 / 21 MAR 16

Applicable to: MSN 02719-02789, 03031-04392

ICE NOT DET : This memo appears in green, if ice is no longer detected after 190 s.

AIRCRAFT SYSTEMS
ICE AND RAIN PROTECTION

WING ANTI-ICE - CONTROLS AND INDICATORS

Ident.: DSC-30-20-20-A-00016939.0001001 / 21 MAR 16

Applicable to: ALL

WING A.ICE : This memo appears in green, if the WING ANTI ICE pb-sw is ON.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS ICE AND RAIN PROTECTION ENGINE ANTI-ICE - DESCRIPTION
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DESCRIPTION

Ident.: DSC-30-30-10-00017422.0001001 / 13 MAY 25

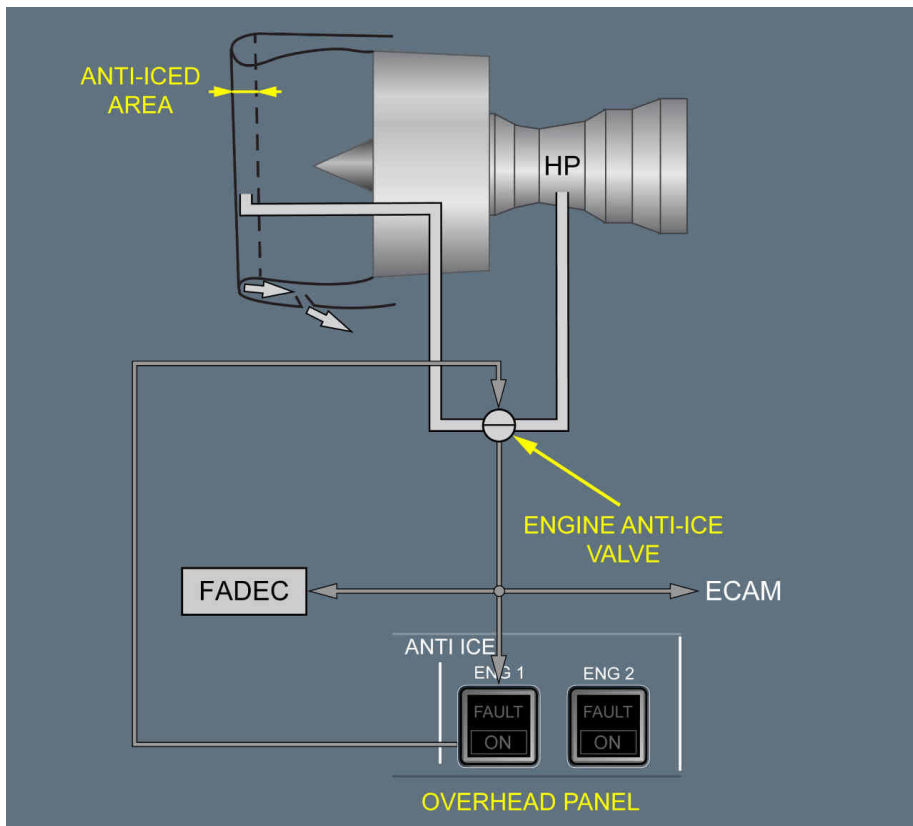
Applicable to: ALL

An independent air bleed from the high pressure compressor protects each engine nacelle from ice. Air is supplied through a two-position (open and closed) valve that the flight crew controls with two pushbuttons, one for each engine.

The valve automatically closes, if air is unavailable (engine not running).

When an engine anti-ice valve is open, the N1 or EPR limit is automatically reduced and, if necessary, the idle N1 or EPR is automatically increased for both engines in order to provide the required pressure.

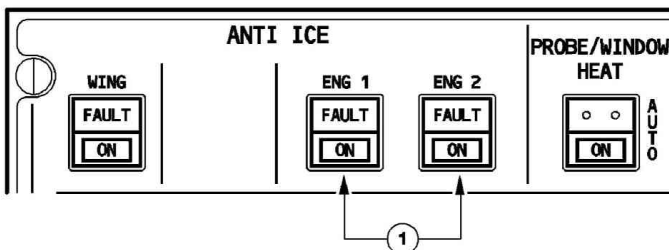
In the case of an **ELEC EMER CONFIG** alert, the SOVs will automatically open. This ensures that the anti-ice function is active for both engines.



OVERHEAD PANEL

Ident.: DSC-30-30-20-00017425.0003001 / 21 MAR 16

Applicable to: ALL



(1) ENG 1 (2) ANTI ICE pb-sw

Off : ON light goes off.
Engine anti-ice valve closes.

FAULT : Light comes on amber, and caution message appears on ECAM, if the position of the anti-ice valve disagrees with the ENG 1 (2) pushbutton selection.

Note: The amber FAULT light comes on briefly as valve transits.

ON : Light comes on blue.
ECAM MEMO displays “ENG A. ICE”.
Engine anti-icing valve opens if bleed air is available from the engine.

MEMO DISPLAY

Ident.: DSC-30-30-20-A-00016945.0001001 / 21 MAR 16

Applicable to: ALL

ENG A.ICE : This memo appears in green, if one or both ENG ANTI ICE pb-sw are ON.

Ident.: DSC-30-30-20-A-00016949.0001001 / 21 MAR 16

Applicable to: MSN 02719-02789, 03031-04392

ICE NOT DET : This memo appears in green, if no ice has been detected 190 s after the flight crew has selected the ENG ANTI ICE pb-sw are ON.

AIRCRAFT SYSTEMS

ICE AND RAIN PROTECTION

ENGINE ANTI-ICE - CONTROLS AND INDICATORS

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS ICE AND RAIN PROTECTION WINDOW HEAT - DESCRIPTION
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DESCRIPTION

Ident.: DSC-30-40-10-00017458.0001001 / 15 NOV 22

Applicable to: ALL

The aircraft uses electrical heating to anti-ice each windshield and defog the cockpit side windows. Two independent WHC, one on each side, automatically regulates the system, protects it against overheating, and indicates faults.

Window heating comes ON:

- Automatically when at least one engine is running, or when the aircraft is in flight
- Manually before engine start, when the flight crew switches ON the PROBE/WINDOW HEAT pb-sw.

The windshield heating operates at low power on ground and at normal power in flight. The changeover is automatic.

Only one heating level exists for the windows.

AIRCRAFT SYSTEMS

ICE AND RAIN PROTECTION

WINDOW HEAT - DESCRIPTION

Intentionally left blank

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS ICE AND RAIN PROTECTION WINDOW HEAT - CONTROLS AND INDICATORS
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OVERHEAD PANEL

Ident.: DSC-30-40-20-00001165.0001001 / 21 MAR 16

Applicable to: ALL

Refer to DSC-30-50-20 Overhead Panel

AIRCRAFT SYSTEMS

ICE AND RAIN PROTECTION

WINDOW HEAT - CONTROLS AND INDICATORS

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS ICE AND RAIN PROTECTION PROBES HEAT - DESCRIPTION
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DESCRIPTION

Ident.: DSC-30-50-10-00017459.0001001 / 21 MAR 16

Applicable to: ALL

Electrical heating protects:

- Pitot probes
- Static ports
- Angle-Of-Attack (AOAs) probes
- Total Air Temperature (TAT) probes.

Three independent Probe Heat Computers (PHCs) automatically control and monitor:

- Captain probes
- F/O probes
- STBY probes.

They protect against overheating and indicate faults.

The probes are heated:

- Automatically when at least one engine is running, or when the aircraft is in flight.
- Manually, when the flight crew switches ON the PROBE/WINDOW HEAT pb.

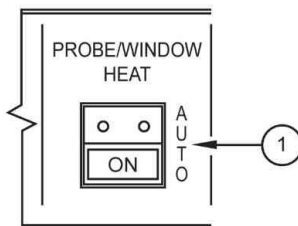
On the ground, the TAT probes are not heated and pitot heating operates at a low level (the changeover to normal power in flight is automatic).

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OVERHEAD PANEL

Ident.: DSC-30-50-20-00017460.0001001 / 15 NOV 22

Applicable to: ALL



(1) PROBE/WINDOW HEAT pb

- AUTO** Probes/Windows are heated automatically:
- In flight, or
 - On the ground (except TAT probes) provided one engine is running.
- ON** Light comes on blue. Probes and windows are heated permanently.

Note: Ensure that the probe covers are removed before setting the *PROBE/WINDOW HEAT pb-sw* to *ON*.

AIRCRAFT SYSTEMS

ICE AND RAIN PROTECTION

PROBES HEAT - CONTROLS AND INDICATORS

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AIRCRAFT SYSTEMS**ICE AND RAIN PROTECTION**

RAIN REMOVAL - DESCRIPTION

WIPERS

Ident.: DSC-30-60-10-00017461.0001001 / 21 MAR 16

Applicable to: ALL

Each front windshield has an electrical wiper with two speeds, and with an intermittent sweep function . A rotary selector controls each wiper.

**RAIN REPELLENT **

Ident.: DSC-30-60-10-00017462.0001001 / 01 JUN 17

Applicable to: ALL

In moderate to heavy rain, the flight crew can spray a rain repellent liquid on the windshield to improve visibility.

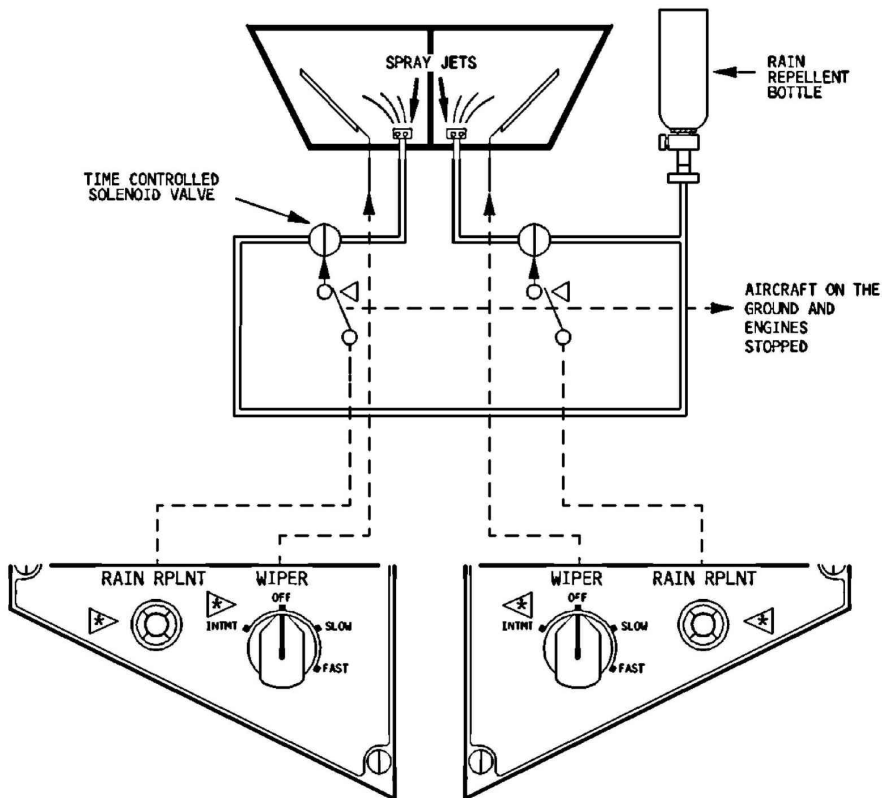
After about 30 s, the windows are covered with spray.

Separate pushbuttons control rain repellent application on each side of the windshield.

AIRCRAFT SYSTEMS

ICE AND RAIN PROTECTION

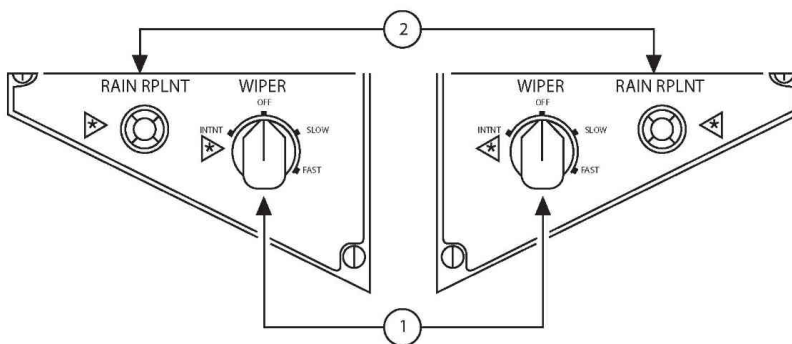
RAIN REMOVAL - DESCRIPTION



OVERHEAD PANEL

Ident.: DSC-30-60-20-00017466.0001001 / 21 MAR 16

Applicable to: ALL



(1) WIPER rotary selector

Each rotary selector controls its wiper at low speed, high speed, or intermittent sweeping . When turned off, the wiper stops out of view.

(2) RAIN RPLNT pb-sw

Each of these buttons controls the application of rain repellent fluid to the corresponding side of the front windshield.

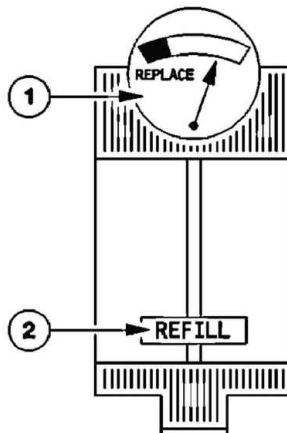
When the flight crew pushes the button, the timer applies a measured quantity of rain repellent to the windshield. To repeat the cycle, the flight crew must push the button again.

This function is inhibited when the aircraft is on the ground and the engines are stopped.

RAIN REPELLENT SYSTEM INDICATORS

Ident.: DSC-30-60-20-00017587.0001001 / 21 MAR 16

Applicable to: ALL



(1) Rain Repellent pressure indicator

This gauge shows the nitrogen pressure and therefore the remaining fluid in the rain repellent bottle. When the needle is in the yellow sector the bottle should be replaced.

(2) Rain Repellent low level indicator (depending on aircraft configuration)

When the REFILL float is in view the bottle should be replaced.

AIRCRAFT SYSTEMS**ICE AND RAIN PROTECTION****ICE DETECTION SYSTEM - DESCRIPTION****VISUAL ICE INDICATOR**

Ident.: DSC-30-70-10-00017471.0001001 / 21 MAR 16

Applicable to: ALL

An external visual ice indicator is installed between the two windshields.

There can be also an external ice detector light 

ICE DETECTION SYSTEM

Ident.: DSC-30-70-10-00017472.0001001 / 21 MAR 16

Applicable to: MSN 02719-02789, 03031-04392

The ice detection system has two separate ice detector probes on the forward lower section of the fuselage.

The probes detect ice accretion. They also indicate, through the MEMO display, that icing conditions have disappeared. The system logic generates ECAM messages according to ice detector signals and the flight crew's selection of engine or wing anti-icing systems.

The ice detection system does not control the ENG or WING anti-icing systems.

AIRCRAFT SYSTEMS

ICE AND RAIN PROTECTION

ICE DETECTION SYSTEM - DESCRIPTION

Intentionally left blank

AIRCRAFT SYSTEMS

INDICATING/RECORDING SYSTEMS

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DSC-31-05 EIS General
DSC-31-05-10 Introduction

Introduction.....	A
-------------------	---

DSC-31-05-20 Cockpit Arrangement

Cockpit Arrangement.....	A
--------------------------	---

DSC-31-05-30 Architecture

Display Unit (DU).....	A
Display Management Computer (DMC).....	B
System Data Acquisition Concentrator (SDAC).....	C
Flight Warning Computer (FWC).....	D
Attention - Getters.....	E
Loudspeaker.....	F
EIS Block Diagram.....	G

DSC-31-05-40 Controls and Switching

ECAM Control Panel (ECP).....	A
EIS DMC Switching Selector.....	B
ECAM/ND Switching.....	C
EFIS Switching.....	D

DSC-31-05-50 Reconfiguring the DMC

Reconfiguring the Display Management Computer (DMC).....	A
--	---

DSC-31-05-60 Reconfiguring DUs

Failure of Upper ECAM DU (or CTL/Brightness Knob Turned to Off).....	A
Failure of Lower ECAM DU (or CTL/Brightness Knob Turned to Off).....	B
Failure of both ECAM DUs.....	C
PFDU/NDU Reconfiguration.....	D
DU Reconfiguration.....	E
General.....	F
Failure of a DU.....	G
Feedback Messages.....	H
Side1/Side2 Discrepancy Messages.....	I
DU Reset.....	J

Continued on the following page

Continued from the previous page
DSC-31-10 ECAM Description

ECAM DU Arrangement.....	A
Color Code.....	B
Warning/Caution Classification.....	C
Priority Rules.....	D
Types of Failures.....	E
Audio Indicators.....	F

DSC-31-15 Indications on E/WD

General.....	A
Independent Failure.....	B
Primary and Secondary Failure.....	C
Flight Phases.....	D
Memos.....	E
Configuration Warnings.....	F

DSC-31-20 Indications on SD

General.....	A
System Pages.....	B
Status Page.....	C
Permanent Data.....	D
Amber Crosses "XX" on the SD.....	E
Amber dashes on the SD.....	F

DSC-31-25 ECAM Sequence
DSC-31-25-10 General

General.....	A
--------------	---

DSC-31-25-20 Example

1 - The Ecam Detects No Failure.....	A
2 - The ECAM Detects a Failure.....	B
3 - The Flight Crew Follows the Instruction Displayed on the E/WD.....	C
4 - One of the Pilots Pushes the CLR Pushbutton on the ECP.....	D
5 - One of the Pilots Pushes the CLR Pushbutton a Second Time.....	E
6 - One of the Pilots Pushes the CLR Pushbutton a Third Time.....	F

DSC-31-27 OEB Reminder

General.....	A
Description.....	B

Continued on the following page

Continued from the previous page

DSC-31-30 ECAM Controls

|	ECAM Control Panel.....	A
	Switching Panel.....	B
	Attention Getters.....	C
|	Memo Display.....	D

DSC-31-40 Indications on PFD

	General.....	A
	Specific Ground Indications.....	B
	Attitude Data.....	C
	Airspeed.....	D
|	Altitude.....	E
	Altitude (CONT'D).....	F
	Vertical Speed.....	G
	Heading.....	H
	Flight Path Vector.....	I
	Guidance.....	J
	Trajectory Deviation.....	K
	Flight Mode Annunciator.....	L
	Tailstrike Pitch Limit Indicator 	M
	Altitude Alert.....	N
|	Flags and Messages Displayed on PFD.....	O

DSC-31-45 Indications on ND

	General.....	A
	ROSE Modes.....	B
	ROSE LS Mode.....	C
	Rose VOR Mode.....	D
	ROSE NAV Mode/ARC Mode.....	E
	Plan Mode.....	F
	Weather Radar indications.....	G
	PWS  indications.....	H
	GPWS.....	I
	EGPWS.....	J
	GPWS.....	K
|	Flags and Messages Displayed on ND.....	L

Continued on the following page

Continued from the previous page
DSC-31-50 EFIS Controls

EFIS Control Panel.....	A
Other EFIS Controls.....	B
Chronometer.....	C

DSC-31-55 Clock

DSC-31-55-10 General

General.....	A
--------------	---

DSC-31-55-20 Controls and Indicators

General.....	A
Operation in Internal Mode.....	B

DSC-31-60 FLT Recorders

DSC-31-60-10 Flight Data Recording System

Description.....	A
------------------	---

DSC-31-60-20 Controls and Indicators

Overhead Panel.....	A
Pedestal.....	B

DSC-31-60-30 Aircraft Integrated Data System

Description.....	A
Controls On Pedestal.....	B

AIRCRAFT SYSTEMS

INDICATING/RECORDING SYSTEMS

PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS

Localization Title	Toc Index	ID	Reason
DSC-31-PLP-TOC Indications on E/WD		1	Documentation update: Deletion of "Configuration Warnings (00001214)".
			Documentation update: Deletion of "Configuration Warnings (00001214.0058001)".
			Documentation update: Deletion of "Configuration Warnings (00001214.0025001)".
DSC-31-PLP-TOC Memos		2	Documentation update: Deletion of "Memos - TO and LDG Memos (00001212.0002001)".
DSC-31-10 Audio Indicators - CONTINUOUS REPETITIVE CHIME	F	1	Addition of LANDING ON TAXIWAY warning in the exceptions in order to be in accordance with the system behaviour.
DSC-31-10 Audio Indicators - SINGLE CHIME	F	2	Layout enhancement. No technical change.
			Documentation update: Deletion of information.
			Documentation update: Deletion of text.
DSC-31-10 Audio Indicators - CAVALRY CHARGE	F	3	Layout enhancement. No technical change.
			Documentation update: Deletion of information.
DSC-31-10 Audio Indicators - TRIPLE CLICK	F	4	Layout enhancement. No technical change.
			Documentation update: Deletion of information.
			Documentation update: Deletion of text.
DSC-31-10 Audio Indicators - CRICKET and STALL Message	F	5	Layout enhancement. No technical change.
			Documentation update: Deletion of information.
			Documentation update: Deletion of text.
DSC-31-10 Audio Indicators - BUZZER	F	6	Documentation update: Deletion of text.
			Layout enhancement. No technical change.
			Documentation update: Deletion of information.
DSC-31-10 Audio Indicators - CONTINUOUS BUZZER	F	7	Documentation update: Deletion of text.
			Layout enhancement. No technical change.
			Documentation update: Deletion of information.
DSC-31-10 Audio Indicators - WINDSHEAR	F	8	Layout enhancement. No technical change.
			Documentation update: Deletion of information.
			Documentation update: Deletion of text.
DSC-31-10 Audio Indicators - C CHORD	F	9	Layout enhancement. No technical change.
			Documentation update: Deletion of information.
			Documentation update: Deletion of text.
DSC-31-10 Audio Indicators - AUTO CALL OUT	F	10	Layout enhancement. No technical change.
			Documentation update: Deletion of information.
			Documentation update: Deletion of text.
DSC-31-10	F	11	Layout enhancement. No technical change.
			Documentation update: Deletion of information.

Continued on the following page

AIRCRAFT SYSTEMS

INDICATING/RECORDING SYSTEMS

PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS

Continued from the previous page

Localization Title	Toc Index	ID	Reason
Audio Indicators - GROUND PROXIMITY WARNING			Documentation update: Deletion of text.
DSC-31-10 Audio Indicators - PRIORITY LEFT and PRIORITY RIGHT	F	12	Layout enhancement. No technical change. Documentation update: Deletion of information. Documentation update: Deletion of text.
DSC-31-10 Audio Indicators - RETARD	F	13	Documentation update: Deletion of text. Layout enhancement. No technical change. Documentation update: Deletion of information.
DSC-31-10 Audio Indicators - TCAS	F	14	Documentation update: Deletion of text. Layout enhancement. No technical change. Documentation update: Deletion of information.
DSC-31-10 Audio Indicators - SPEED, SPEED, SPEED	F	15	Documentation update: Deletion of text. Layout enhancement. No technical change. Documentation update: Deletion of information.
DSC-31-10 Audio Indicators - DUAL INPUT	F	16	Layout enhancement. No technical change. Documentation update: Deletion of information. Documentation update: Deletion of text.
DSC-31-10 Audio Indicators - STOP RUDDER INPUT	F	17	Documentation update: Deletion of text. Layout enhancement. No technical change. Documentation update: Deletion of information.
DSC-31-10 Audio Indicators - CONTINUOUS REPETITIVE CHIME	F	18	Addition of LANDING ON TAXIWAY warning in the exceptions in order to be in accordance with the system behaviour.
DSC-31-10 Audio Indicators - SINGLE CHIME	F	19	Layout enhancement. No technical change. Documentation update: Deletion of information. Documentation update: Deletion of text.
DSC-31-10 Audio Indicators - CAVALRY CHARGE	F	20	Layout enhancement. No technical change. Documentation update: Deletion of information.
DSC-31-10 Audio Indicators - TRIPLE CLICK	F	21	Layout enhancement. No technical change. Documentation update: Deletion of information. Documentation update: Deletion of text.
DSC-31-10 Audio Indicators - CRICKET and STALL Message	F	22	Layout enhancement. No technical change. Documentation update: Deletion of information. Documentation update: Deletion of text.
DSC-31-10 Audio Indicators - BUZZER	F	23	Documentation update: Deletion of text. Layout enhancement. No technical change. Documentation update: Deletion of information.
DSC-31-10	F	24	Documentation update: Deletion of text.

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Localization Title	Toc Index	ID	Reason
Audio Indicators - CONTINUOUS BUZZER			Layout enhancement. No technical change. Documentation update: Deletion of information.
DSC-31-10 Audio Indicators - WINDSHEAR	F	25	Layout enhancement. No technical change. Documentation update: Deletion of information. Documentation update: Deletion of text.
DSC-31-10 Audio Indicators - C CHORD	F	26	Layout enhancement. No technical change. Documentation update: Deletion of information. Documentation update: Deletion of text.
DSC-31-10 Audio Indicators - AUTO CALL OUT	F	27	Layout enhancement. No technical change. Documentation update: Deletion of information. Documentation update: Deletion of text.
DSC-31-10 Audio Indicators - GROUND PROXIMITY WARNING	F	28	Layout enhancement. No technical change. Documentation update: Deletion of information. Documentation update: Deletion of text.
DSC-31-10 Audio Indicators - PRIORITY LEFT and PRIORITY RIGHT	F	29	Layout enhancement. No technical change. Documentation update: Deletion of information. Documentation update: Deletion of text.
DSC-31-10 Audio Indicators - RETARD	F	30	Documentation update: Deletion of text. Layout enhancement. No technical change. Documentation update: Deletion of information.
DSC-31-10 Audio Indicators - TCAS	F	31	Documentation update: Deletion of text. Layout enhancement. No technical change. Documentation update: Deletion of information.
DSC-31-10 Audio Indicators - SPEED, SPEED, SPEED	F	32	Documentation update: Deletion of text. Layout enhancement. No technical change. Documentation update: Deletion of information.
DSC-31-10 Audio Indicators - DUAL INPUT	F	33	Layout enhancement. No technical change. Documentation update: Deletion of information. Documentation update: Deletion of text.
DSC-31-10 Audio Indicators - PITCH, PITCH	F	34	Documentation update: Deletion of text. Layout enhancement. No technical change. Documentation update: Deletion of information.
DSC-31-10 Audio Indicators - STOP RUDDER INPUT	F	35	Documentation update: Deletion of text. Layout enhancement. No technical change. Documentation update: Deletion of information.
DSC-31-10 Audio Indicators - CONTINUOUS REPETITIVE CHIME	F	36	Addition of LANDING ON TAXIWAY warning in the exceptions in order to be in accordance with the system behaviour.
DSC-31-10	F	37	Layout enhancement. No technical change.

Continued on the following page

AIRCRAFT SYSTEMS

INDICATING/RECORDING SYSTEMS

PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS

Continued from the previous page

Localization Title	Toc Index	ID	Reason
Audio Indicators - SINGLE CHIME			Documentation update: Deletion of information.
			Documentation update: Deletion of text.
DSC-31-10 Audio Indicators - CAVALRY CHARGE	F	38	Layout enhancement. No technical change.
			Documentation update: Deletion of information.
DSC-31-10 Audio Indicators - TRIPLE CLICK	F	39	Layout enhancement. No technical change.
			Documentation update: Deletion of information.
			Documentation update: Deletion of text.
DSC-31-10 Audio Indicators - CRICKET and STALL Message	F	40	Layout enhancement. No technical change.
			Documentation update: Deletion of information.
			Documentation update: Deletion of text.
DSC-31-10 Audio Indicators - BUZZER	F	41	Documentation update: Deletion of text.
			Layout enhancement. No technical change.
			Documentation update: Deletion of information.
DSC-31-10 Audio Indicators - CONTINUOUS BUZZER	F	42	Documentation update: Deletion of text.
			Layout enhancement. No technical change.
			Documentation update: Deletion of information.
DSC-31-10 Audio Indicators - WINDSHEAR	F	43	Layout enhancement. No technical change.
			Documentation update: Deletion of information.
			Documentation update: Deletion of text.
DSC-31-10 Audio Indicators - C CHORD	F	44	Layout enhancement. No technical change.
			Documentation update: Deletion of information.
			Documentation update: Deletion of text.
DSC-31-10 Audio Indicators - AUTO CALL OUT	F	45	Layout enhancement. No technical change.
			Documentation update: Deletion of information.
			Documentation update: Deletion of text.
DSC-31-10 Audio Indicators - GROUND PROXIMITY WARNING	F	46	Layout enhancement. No technical change.
			Documentation update: Deletion of information.
			Documentation update: Deletion of text.
DSC-31-10 Audio Indicators - PRIORITY LEFT and PRIORITY RIGHT	F	47	Layout enhancement. No technical change.
			Documentation update: Deletion of information.
			Documentation update: Deletion of text.
DSC-31-10 Audio Indicators - RETARD	F	48	Documentation update: Deletion of text.
			Layout enhancement. No technical change.
			Documentation update: Deletion of information.
DSC-31-10 Audio Indicators - TCAS	F	49	Documentation update: Deletion of text.
			Layout enhancement. No technical change.
			Documentation update: Deletion of information.
DSC-31-10	F	50	Documentation update: Deletion of text.

Continued on the following page

Continued from the previous page

Localization Title	Toc Index	ID	Reason
Audio Indicators - SPEED, SPEED, SPEED			Layout enhancement. No technical change. Documentation update: Deletion of information.
DSC-31-10 Audio Indicators - DUAL INPUT	F	51	Layout enhancement. No technical change. Documentation update: Deletion of information. Documentation update: Deletion of text.
DSC-31-10 Audio Indicators - PITCH, PITCH	F	52	Documentation update: Deletion of text. Layout enhancement. No technical change. Documentation update: Deletion of information.
DSC-31-10 Audio Indicators - STOP RUDDER INPUT	F	53	Documentation update: Deletion of text. Layout enhancement. No technical change. Documentation update: Deletion of information.
DSC-31-10 Audio Indicators - BANK BANK	F	54	Documentation update: Addition of "Audio Indicators - BANK BANK" documentary unit
DSC-31-15 General	A	1	Update of the illustration to remove bleed air information to be in accordance with the display on EWD.
DSC-31-15 Memos - TO and LDG Memos	E	2	Documentation update: Addition of "Memos - TO and LDG Memos" documentary unit
DSC-31-15 General	F	3	Documentation update: Addition of "General" documentary unit
DSC-31-15 BRAKES HOT	F	4	Documentation update: Addition of "BRAKES HOT" documentary unit
DSC-31-15 CONFIG FLAPS NOT IN T.O CONFIG	F	5	Documentation update: Addition of "CONFIG FLAPS NOT IN T.O CONFIG" documentary unit
DSC-31-15 CONFIG L(R) SIDESTICK FAULT	F	6	Documentation update: Addition of "CONFIG L(R) SIDESTICK FAULT" documentary unit
DSC-31-15 CONFIG PARK BRK ON	F	7	Documentation update: Addition of "CONFIG PARK BRK ON" documentary unit
DSC-31-15 CONFIG PITCH TRIM NOT IN T.O RANGE	F	8	Documentation update: Addition of "CONFIG PITCH TRIM NOT IN T.O RANGE" documentary unit
DSC-31-15 CONFIG RUD TRIM NOT IN T.O RANGE	F	9	Documentation update: Addition of "CONFIG RUD TRIM NOT IN T.O RANGE" documentary unit
DSC-31-15 CONFIG SLATS NOT IN T.O CONFIG	F	10	Documentation update: Addition of "CONFIG SLATS NOT IN T.O CONFIG" documentary unit
DSC-31-15 CONFIG SPD BRK NOT RETRACTED	F	11	Documentation update: Addition of "CONFIG SPD BRK NOT RETRACTED" documentary unit

Continued on the following page

AIRCRAFT SYSTEMS

INDICATING/RECORDING SYSTEMS

PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS

Continued from the previous page

Localization Title	Toc Index	ID	Reason
DSC-31-15 DOOR	F	12	Documentation update: Addition of "DOOR" documentary unit
DSC-31-15 ELEC GEN 1(2) FAULT	F	13	Documentation update: Addition of "ELEC GEN 1(2) FAULT" documentary unit
DSC-31-15 ELEC GEN 1(2) OFF	F	14	Documentation update: Addition of "ELEC GEN 1(2) OFF" documentary unit
DSC-31-15 ELEC IDG 1(2) DISCONNECTED	F	15	Documentation update: Addition of "ELEC IDG 1(2) DISCONNECTED" documentary unit
DSC-31-15 ENG REVERSE UNLOCKED	F	16	Documentation update: Addition of "ENG REVERSE UNLOCKED" documentary unit
DSC-31-15 ENG THR LEVERS NOT SET	F	17	Documentation update: Addition of "ENG THR LEVERS NOT SET" documentary unit
DSC-31-15 F/CTL FLAP/MCDU DISAGREE	F	18	Documentation update: Addition of "F/CTL FLAP/MCDU DISAGREE" documentary unit
DSC-31-15 F/CTL PITCH TRIM/MCDU/CG DISAGREE	F	19	Documentation update: Addition of "F/CTL PITCH TRIM/MCDU/CG DISAGREE" documentary unit
DSC-31-15 FUEL L(R) TK PUMP 1+2 LO PR	F	20	Documentation update: Addition of "FUEL L(R) TK PUMP 1+2 LO PR" documentary unit
DSC-31-15 FWS OEB/FWC DISCREPANCY	F	21	Documentation update: Addition of "FWS OEB/FWC DISCREPANCY" documentary unit
DSC-31-15 HYD G(B)(Y) SYS LO PR	F	22	Documentation update: Addition of "HYD G(B)(Y) SYS LO PR" documentary unit
DSC-31-15 HYD G ENG 1 PUMP LO PR	F	23	Documentation update: Addition of "HYD G ENG 1 PUMP LO PR" documentary unit
DSC-31-15 HYD Y ENG 2 PUMP LO PR	F	24	Documentation update: Addition of "HYD Y ENG 2 PUMP LO PR" documentary unit
DSC-31-15 VENT SKIN VALVE FAULT	F	25	Documentation update: Addition of "VENT SKIN VALVE FAULT" documentary unit
DSC-31-27 General	A	1	Enhancement of the description of the OEB reminder function to be in accordance with system behavior.
			Documentation update: Deletion of information.
DSC-31-30 ECAM Control Panel	A	1	Update of the reference to the Configuration Warnings section. No technical change.
DSC-31-30 Memo Display	D	2	Documentation update: Addition of "Memo Display" documentary unit
DSC-31-40 Altitude	E	1	Correction of the altitude indication description to be in accordance with the EIS behavior.
DSC-31-40 Altitude	E	2	Correction of the altitude indication description to be in accordance with the EIS behavior.

Continued on the following page

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Localization Title	Toc Index	ID	Reason
DSC-31-40 Altitude	E	3	Correction of the altitude indication description to be in accordance with the EIS behavior.
DSC-31-40	O	4	Layout modification. No technical change.
DSC-31-45 EGPWS	J	1	Layout enhancement. No technical change
			Documentation update: Deletion of information.
DSC-31-45 EGPWS	J	2	Wording enhancement. No technical change.
			Layout enhancement. No technical change
DSC-31-45 EGPWS	J	3	Wording enhancement. No technical change.
			Layout enhancement. No technical change
DSC-31-45 EGPWS	J	4	Wording enhancement. No technical change.
			Layout enhancement. No technical change
DSC-31-45 EGPWS	J	5	Wording enhancement. No technical change.
			Layout enhancement. No technical change
DSC-31-45 EGPWS	J	6	Wording enhancement. No technical change.
			Layout enhancement. No technical change
DSC-31-45 EGPWS	J	7	Wording enhancement. No technical change.
			Layout enhancement. No technical change
DSC-31-45 EGPWS	J	8	Wording enhancement. No technical change.
			Layout enhancement. No technical change
DSC-31-45 GPWS	K	9	Documentation update: Deletion of information.
DSC-31-45 GPWS	K	10	Wording enhancement. No technical change.
			Layout enhancement. No technical change.
DSC-31-45 GPWS	K	11	Layout enhancement. No technical change.
DSC-31-45 GPWS	K	12	Layout enhancement. No technical change.
DSC-31-45 GPWS	K	13	Layout enhancement. No technical change.
DSC-31-45 GPWS	K	14	Wording enhancement. No technical change.
			Layout enhancement. No technical change.
DSC-31-45 GPWS	K	15	Wording enhancement. No technical change.
			Layout enhancement. No technical change.
DSC-31-45 GPWS	K	16	Wording enhancement. No technical change.
			Layout enhancement. No technical change.
DSC-31-45 GPWS	K	17	Wording enhancement. No technical change.
			Layout enhancement. No technical change.
DSC-31-45	L	18	Layout modification. No technical change.
			Documentation update: Deletion of text.

Continued on the following page

AIRCRAFT SYSTEMS**INDICATING/RECORDING SYSTEMS**

PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS

Continued from the previous page

Localization Title	Toc Index	ID	Reason
DSC-31-60-30 Description	A	1	Layout modification. No technical change.
DSC-31-30 Memo Display	D	3	Effectivity update: The information no longer applies to all MSN.

INTRODUCTION

Ident.: DSC-31-05-10-00001182.0001001 / 21 MAR 16

Applicable to: ALL

The Electronic Instrument System (EIS) presents data on six identical Display Units (DUs):

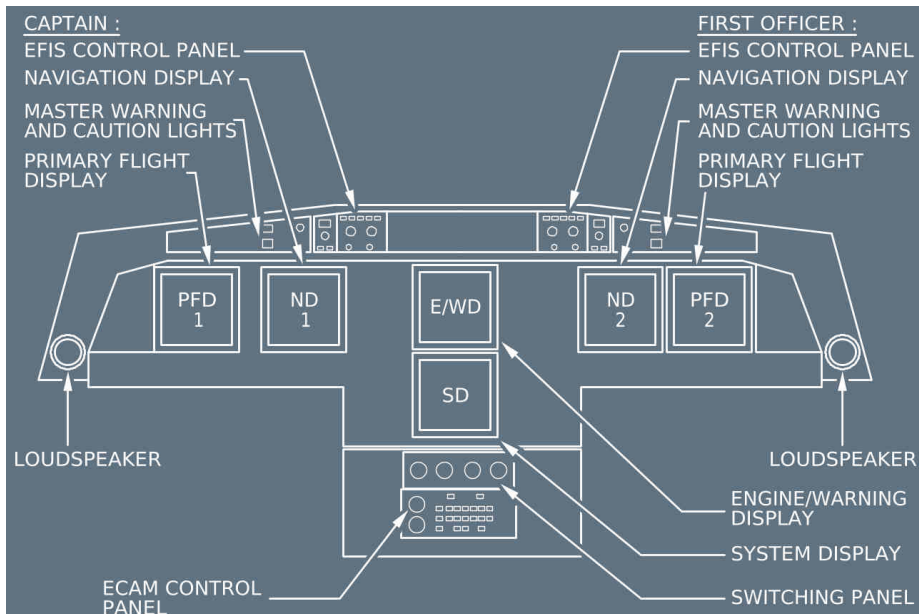
- The Electronic Flight Instrument System (EFIS) displays mostly flight parameters and navigation data on the Primary Flight Displays (PFDs) and Navigation Displays (NDs).
- The Electronic Centralized Aircraft Monitor (ECAM) presents data on the Engine/Warning Display (E/WD) and System Display (SD) :
 - Primary engine indications, fuel quantity, flap and slat position
 - Warning and caution alerts, or memos
 - Synoptic diagrams of aircraft systems, and status messages
 - Permanent flight data

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COCKPIT ARRANGEMENT

Ident.: DSC-31-05-20-00001183.0001001 / 09 OCT 12

Applicable to: ALL



AIRCRAFT SYSTEMS

INDICATING/RECORDING SYSTEMS

EIS GENERAL - COCKPIT ARRANGEMENT

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DISPLAY UNIT (DU)

Ident.: DSC-31-05-30-00001184.0002001 / 21 MAR 16

Applicable to: ALL

The instrument panels have six identical units.
These DUs are full-color Liquid Crystal Displays (LCD).

DISPLAY MANAGEMENT COMPUTER (DMC)
--

Ident.: DSC-31-05-30-00001185.0002001 / 20 DEC 10

Applicable to: ALL

Three identical Display Management Computers (DMCs) obtain data from the different sensors and computers, and send it to the display units. The display units then generate and display the applicable images. Each DMC has a single DMC channel, and can simultaneously supply one PFD, one ND and both ECAM display units (E/WD and SD).

SYSTEM DATA ACQUISITION CONCENTRATOR (SDAC)
--

Ident.: DSC-31-05-30-00001186.0001001 / 21 MAR 16

Applicable to: ALL

The two identical SDACs acquire data, then generate signals. Some of these signals go to the three DMCs, which use them to generate displays of system pages and engines parameters. Others go to the flight warning computers, which use them to generate ECAM messages and aural alerts.

FLIGHT WARNING COMPUTER (FWC)

Ident.: DSC-31-05-30-00001187.0001001 / 13 JAN 14

Applicable to: ALL

The two identical FWCs generate alert messages, memos, aural alerts, and synthetic voice messages. For this purpose they acquire data:

- Directly from aircraft sensors, or systems, to generate red warnings
- Through the SDACs to generate amber cautions.

The ECAM display units display the alert messages generated by the FWCs.

The FWCs also generate:

- Radio height callouts
- Decision height callouts
- Landing distance and landing speed increments.

AIRCRAFT SYSTEMS
INDICATING/RECORDING SYSTEMS**EIS GENERAL - ARCHITECTURE****ATTENTION - GETTERS**

Ident.: DSC-31-05-30-00001188.0001001 / 21 MAR 16

Applicable to: ALL

The FWCs also drive the attention-getters. Each pilot has a set of these on the panel under the glareshield. They are :

- A master warning light, that flashes "MASTER WARN" in red, for red warnings.
- A master caution light, that illuminates "MASTER CAUT" in amber, for amber cautions.

LOUDSPEAKER

Ident.: DSC-31-05-30-00001189.0001001 / 21 MAR 16

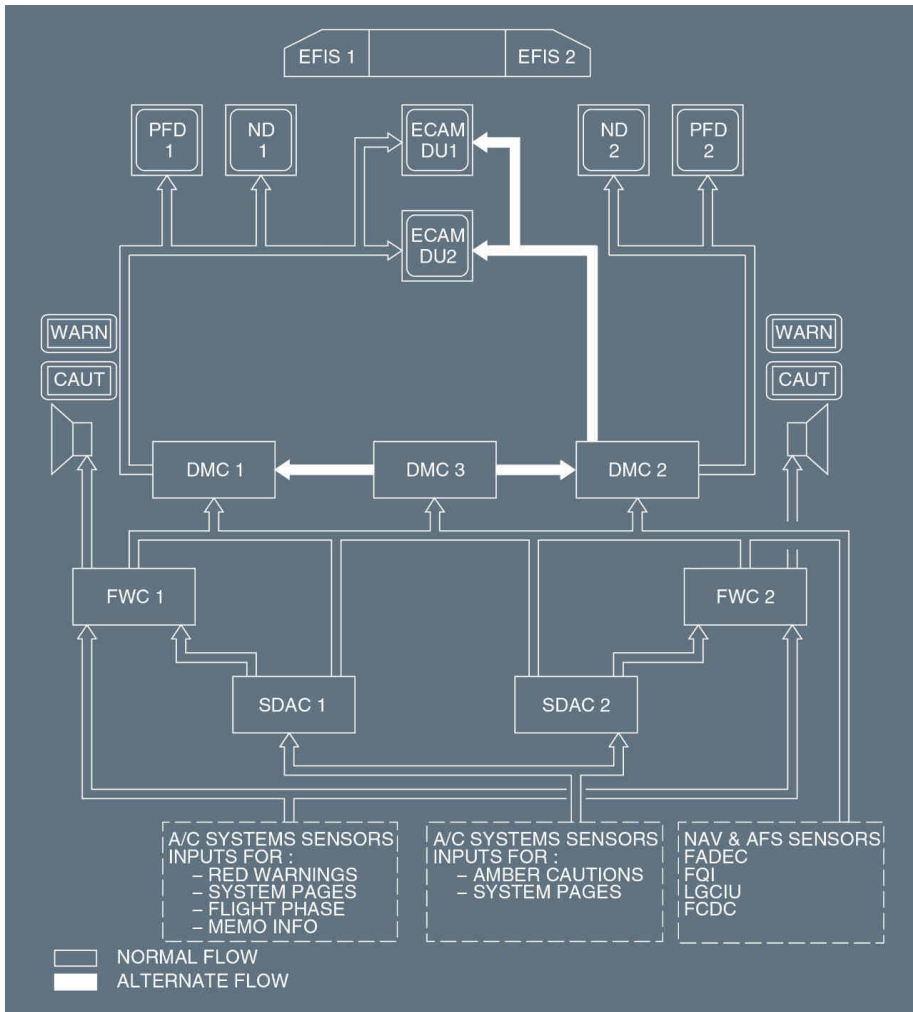
Applicable to: ALL

The communications loudspeakers announce aural alerts and voice messages, and do so even when they are turned off.

EIS BLOCK DIAGRAM

Ident.: DSC-31-05-30-00001190.0002001 / 06 JUL 17

Applicable to: ALL



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AIRCRAFT SYSTEMS**INDICATING/RECORDING SYSTEMS****EIS GENERAL - CONTROLS AND SWITCHING****ECAM CONTROL PANEL (ECP)**

Ident.: DSC-31-05-40-00001191.0001001 / 21 MAR 16

Applicable to: ALL

The ECAM Control Panel, located on the pedestal, includes :

- Such E/WD controls, as CLR, STS, and the brightness control knob.
- Such SD controls, as ENG, BLEED, PRESS..., system page selector, and the brightness control knob.

EIS DMC SWITCHING SELECTOR

Ident.: DSC-31-05-40-00001192.0001001 / 22 MAR 16

Applicable to: ALL

A switch near the center of the SWITCHING panel which is located just above the ECAM control panel, enables the flight crew to replace the Captain or First Officer's Display Management Computer (DMC 1, or DMC 2) by DMC 3.

ECAM/ND SWITCHING

Ident.: DSC-31-05-40-00001193.0001001 / 21 MAR 16

Applicable to: ALL

A switch on the right-hand side of the SWITCHING panel enables the flight crew to transfer the ECAM System Display to either the Captain or First Officer's Navigation Display.

EFIS SWITCHING

Ident.: DSC-31-05-40-00001194.0001001 / 21 MAR 16

Applicable to: ALL

A PFD/ND XFR pushbutton on each side console enables the pilot to swap displays to the respective onside DUs.

AIRCRAFT SYSTEMS

INDICATING/RECORDING SYSTEMS

EIS GENERAL - CONTROLS AND SWITCHING

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RECONFIGURING THE DISPLAY MANAGEMENT COMPUTER (DMC)

Ident.: DSC-31-05-50-00001195.0002001 / 21 MAR 16

Applicable to: ALL

In normal operation, each DMC drives the following Display Units :

- DMC 1 drives the CAPT PFD, CAPT ND and the ECAM DUs.
- DMC 2 drives the F/O PFD and F/O ND.
- DMC 3 is on standby, ready to drive any DU.

If DMC 1 or 2 fails (the "INVALID DATA" message is displayed on the DUs), the crew manually selects the DMC 3 source ("CAPT 3" or "F/O 3").

If DMC 1 fails (or DMC 3, if "CAPT 3" was selected), DMC 2 automatically drives the ECAM.

AIRCRAFT SYSTEMS

INDICATING/RECORDING SYSTEMS

EIS GENERAL - RECONFIGURING THE DMC

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FAILURE OF UPPER ECAM DU (OR CTL/BRIGHTNESS KNOB TURNED TO OFF)

Ident.: DSC-31-05-60-00001196.0001001 / 21 MAR 16

Applicable to: ALL

If the upper ECAM display fails, or is switched off :

- The engine/warning page automatically replaces the system/status page on the lower ECAM DU.

The flight crew can display the system/status page by :

- Using the "ECAM/ND XFR" switch, on the SWITCHING panel, to move it to a Navigation Display Unit (NDU), or
- Pushing and holding (for a maximum of 3 min) the related system page pushbutton, on the ECAM control panel, to temporarily display it on the lower ECAM DU (instead of the engine/warning page).

FAILURE OF LOWER ECAM DU (OR CTL/BRIGHTNESS KNOB TURNED TO OFF)

Ident.: DSC-31-05-60-00001197.0001001 / 21 MAR 16

Applicable to: ALL

If the lower ECAM display fails, or is switched off, the flight crew can display the system/status page by :

- Using the "ECAM/ND XFR" switch, on the SWITCHING panel, to display it on the NDU, or
- Pushing and holding (for a maximum of 3 min) the related system page pushbutton, on the ECAM control panel, to temporarily display it on the upper ECAM DU (instead of the engine/warning page).

FAILURE OF BOTH ECAM DUs

Ident.: DSC-31-05-60-00001198.0001001 / 21 MAR 16

Applicable to: ALL

If both ECAM displays fail, the flight crew may :

- Use the "ECAM/ND XFR", on the SWITCHING panel, to display the engine/warning page on a navigation display and, if needed,
- Push and hold (for a maximum of 3 min) the related system page pushbutton, on the ECAM control panel, to temporarily display the system/status page on an ND.

PFDU/NDU RECONFIGURATION

Ident.: DSC-31-05-60-00001199.0001001 / 21 MAR 16

Applicable to: ALL

If a PFDU fails, the system automatically transfers the PFD image to the NDU.

AIRCRAFT SYSTEMS**INDICATING/RECORDING SYSTEMS****EIS GENERAL - RECONFIGURING DUS**

The pilot can also make this transfer manually by :

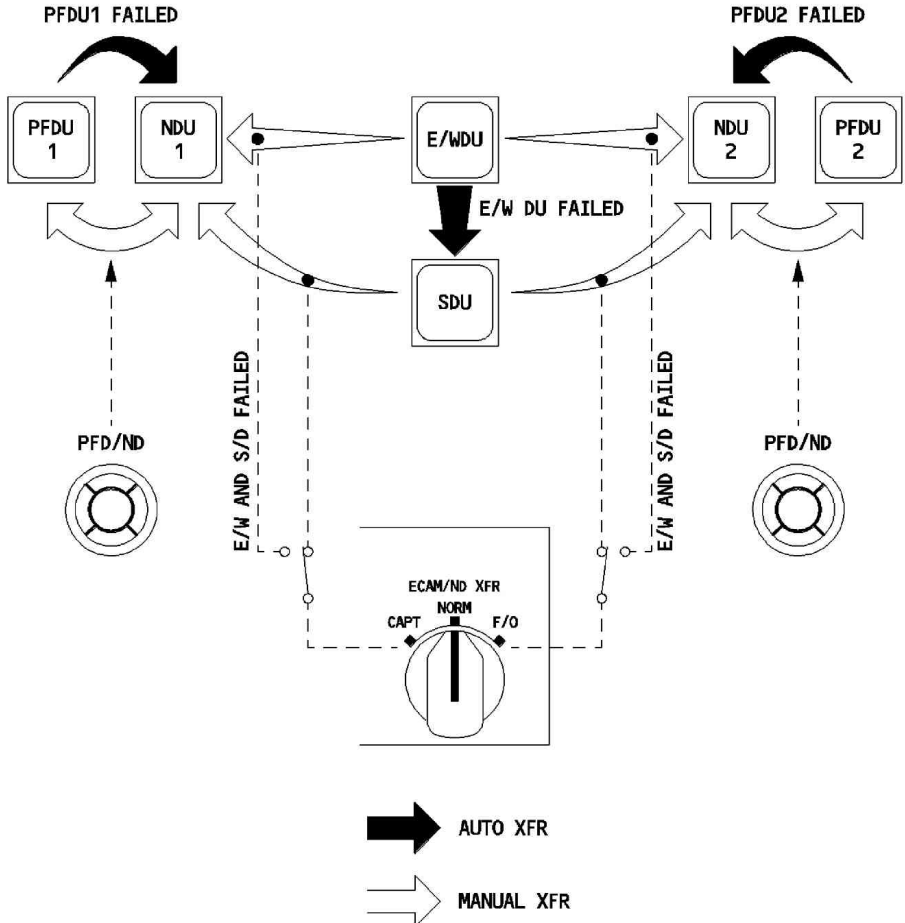
- turning the PFD ON-OFF/brightness control OFF, or
- pressing the PFD/ND/XFR pushbutton, which cross-changes the images between the PFDU and the NDU.

If an NDU fails, the pilot can use the PFD/ND/XFR pushbutton to transfer the ND image to the PFDU.

DU RECONFIGURATION

Ident.: DSC-31-05-60-00001200.0001001 / 21 MAR 16

Applicable to: ALL



AIRCRAFT SYSTEMS**INDICATING/RECORDING SYSTEMS**

EIS GENERAL - RECONFIGURING DUS

GENERAL

Ident.: DSC-31-05-60-00012844.0001001 / 20 DEC 10

Applicable to: ALL

These messages are displayed on either the EFIS or the ECAM Display Unit (DU) depending on the current EFIS or ECAM configuration.

FAILURE OF A DU

Ident.: DSC-31-05-60-00012846.0001001 / 20 DEC 10

Applicable to: ALL

If a DU fails, the flight crew may find one of the following displays:

- A blank screen with an "F" letter in amber, or
- A distorted display, or
- A blank screen with the "INVALID DISPLAY UNIT" message in amber.

FEEDBACK MESSAGES

Ident.: DSC-31-05-60-00012847.0001001 / 20 DEC 10

Applicable to: ALL

The DU displays the following messages in amber when the Display Management Computer (DMC) detects a discrepancy between the parameters obtained by the DMC and the operational parameters displayed on the DU:

- "CHECK CAPT PFD" ("CHECK F/O PFD") if the discrepancy concerns the PFD parameters
- "CHECK CAPT ND" ("CHECK F/O ND") if the discrepancy concerns the ND parameters
- "CHECK EWD" if the discrepancy concerns the EWD parameters
- "CHECK SD" if the discrepancy concerns the SD parameters.

In addition, if the aircraft is on ground, the "DU NOT MONITORED" message is displayed in amber when there is only one DMC, instead of two DMCs, that provides the affected DU with feedback information.

This message means that there is either a DMC test in progress or that there is an EIS failure.

In the case of an EIS failure, a maintenance action is necessary.

SIDE1/SIDE2 DISCREPANCY MESSAGES

Ident.: DSC-31-05-60-00012848.0003001 / 04 NOV 21

Applicable to: ALL

The DU displays the following messages along with a caution on the ECAM EWD.

CHECK ATT

Attitude data displayed on both PFDs differ by more than 5 ° in pitch and/or roll.

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CHECK ALT

Altitude data displayed on both PFDs differ by:

- More than 250 ft when the flight crew selects a QNH different from STD, or
- More than 500 ft when the flight crew selects a QNH STD.

Note: The caution and the **CHECK ALT** message disappear, when the CAPT EFIS and the F/O EFIS barometer references disagree.

CHECK HDG

Heading data displayed on both PFDs and NDs differ by more than 5 °.

- Note:
- The **CHECK HDG** message flashes for a few seconds on the NDs, and then remains steady.
 - If the flight crew selects the PLAN mode on the NDs, the message is not displayed.

DU RESET

Ident.: DSC-31-05-60-00012849.0001001 / 20 DEC 10

Applicable to: ALL

In the case of a DU reset, the message “SELF TEST IN PROGRESS” can be displayed in green and/or the message “WAITING FOR DATA” may be displayed in green during the EIS initialization.

AIRCRAFT SYSTEMS

INDICATING/RECORDING SYSTEMS

EIS GENERAL - RECONFIGURING DUS

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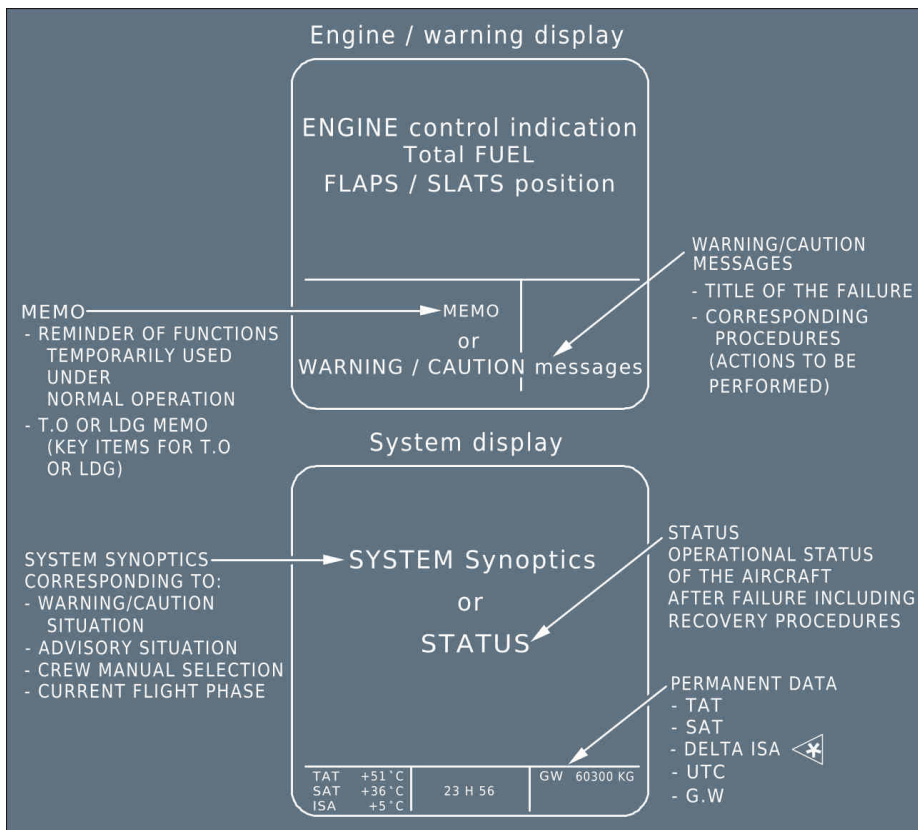
ECAM DU ARRANGEMENT

Ident.: DSC-31-10-00017519.0001001 / 21 MAR 16

Applicable to: ALL

The ECAM has two display units:

- One for the engine/warning display (E/WD).
- One for the system/status display (SD).



AIRCRAFT SYSTEMS
INDICATING/RECORDING SYSTEMS

ECAM DESCRIPTION

COLOR CODE

Ident.: DSC-31-10-00001202.0001001 / 21 MAR 16

Applicable to: ALL

The ECAM display uses a color code that indicates the importance of the failure or the indication.

- RED** : The configuration or failure requires immediate action.
- AMBER** : The flight crew should be aware of the configuration or failure, but need not take immediate action.
- GREEN** : The item is operating normally.
- WHITE** : These titles and remarks guide the flight crew, as they execute various procedures.
- BLUE** : These are actions to be carried out, or limitations.
- MAGENTA** : These are particular messages that apply to particular pieces of equipment or situations (inhibition messages, for example).

AIRCRAFT SYSTEMS

INDICATING/RECORDING SYSTEMS

ECAM DESCRIPTION

WARNING/CAUTION CLASSIFICATION

Ident.: DSC-31-10-00001203.0001001 / 21 MAR 16

Applicable to: ALL

	LEVEL	SIGNIFICATION	AURAL	VISUAL
FAILURE MODE	Level 3	Red warning : The configuration, or failure requires immediate action : - Aircraft in dangerous configuration, or limit flight conditions (eg: stall, o/speed) - System failure altering flight safety (eg : Eng fire, excess cab alt)	Continuous Repetitive Chime (CRC) or specific sound or synthetic voice	- MASTER WARN light red flashing or specific red light - Warning message (red) on E/WD - Automatic call of the relevant system page on the S/D ⁽¹⁾.
	Level 2	Amber caution : The flight crew should be aware of the configuration or failure, but does not need to take any immediate action. However, time and situation permitting, these cautions should be considered without delay to prevent any further degradation of the affected system : - System failure without any direct consequence on the flight safety (eg: HYD G SYS LO PR)	Single Chime (SC)	- MASTER CAUT light amber steady - Caution message (amber) on E/WD - Automatic call of the relevant system page on the S/D ⁽¹⁾.
	Level 1	Amber caution : Requires crew monitoring : - Failures leading to a loss of redundancy or system degradation (eg : FCDC fault)	NONE	- Caution message (amber) on E/WD generally without procedure.
INFORMATION	ADVISORY	System parameters monitoring	NONE	- Automatic call of the relevant system page on the S/D. The affected parameter pulses green.
	MEMO	Information : Recalls normal or automatic selection of functions which are temporarily used	NONE	- Green, Amber, or Magenta message on E/WD

⁽¹⁾ except in some cases

AIRCRAFT SYSTEMS
INDICATING/RECORDING SYSTEMS

ECAM DESCRIPTION

PRIORITY RULES

Ident.: DSC-31-10-00001204.0001001 / 17 MAR 17

Applicable to: ALL

There are three priority levels for warnings and cautions :

- A level 3 warning has priority over a level 2 caution which has priority over a level 1 caution.

The FWC observes these priorities.

INFORMATION PROVIDED WHEN NEEDED

One of the main advantages of the ECAM is that it displays applicable information to the flight crew, on an "as needed" basis. The following outlines the ECAM's operating modes:

- **Normal Mode:**
Automatically displays systems and memos, in accordance with the flight phase.
- **Failure Mode:**
Automatically displays the appropriate emergency/abnormal procedures, in addition to their associated system synoptic.
- **Advisory Mode:**
Automatically displays the appropriate system synoptic, associated with a drifting parameter.
- **Manual Mode:**
Enables the flight crew to manually select any system synoptic via the ECAM Control Panel (ECP).

Most warnings and cautions are inhibited during critical phases of flight (T/O INHIBIT – LDG INHIBIT), because most system failures will not affect the aircraft's ability to continue a takeoff or landing.

TYPES OF FAILURES

Ident.: DSC-31-10-00001205.0001001 / 21 MAR 16

Applicable to: ALL

- Independent : a failure that affects an isolated system or item of equipment without degrading the performance of others in the aircraft.
- Primary : a failure of a system or an item of equipment that costs the aircraft the use of other systems or items of equipment.
- Secondary : the loss of a system or an item of equipment resulting from a primary failure.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS INDICATING/RECORDING SYSTEMS ECAM DESCRIPTION
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AUDIO INDICATORS

Applicable to: MSN 02155-03060

AUDIO INDICATORS	MEANING	DURATION	AUDIO INDICATOR CANCELLATION ^(a)
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Ident.: DSC-31-10-A-00015446.0001001 / 06 NOV 25

1	CONTINUOUS REPETITIVE CHIME	RED WARNINGS	PERMANENT	Press MASTER WARN It
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Ident.: DSC-31-10-A-00015447.0001001 / 06 NOV 25

2	SINGLE CHIME	AMBER CAUTION	0.5 s	NIL
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Ident.: DSC-31-10-A-00015448.0001001 / 06 NOV 25

3	CAVALRY CHARGE	A/P DISCONNECTION BY TAKE OVER pb	1.5 s	Second push on TAKE OVER pb
		A/P DISCONNECTION DUE TO FAILURE	PERMANENT	Press MASTER WARN It or TAKE OVER pb

Ident.: DSC-31-10-A-00015449.0006001 / 06 NOV 25

4	TRIPLE CLICK	Landing capability downgrade or some cases of mode reversion	0.5 s (3 pulses)	NIL
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Ident.: DSC-31-10-A-00015450.0001001 / 06 NOV 25

5	CRICKET + "STALL" message (synthetic voice)	STALL	PERMANENT	NIL
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Ident.: DSC-31-10-A-00015451.0001001 / 06 NOV 25

6	BUZZER	CABIN CALL	3 s	NIL
		EMER CABIN CALL	3 s REPEATED 3 TIMES	NIL
		MECH CALL	As long as outside pb pressed	Press MASTER CAUT pb

Ident.: DSC-31-10-A-00015452.0001001 / 06 NOV 25

7	CONTINUOUS BUZZER	SELCAL CALL	PERMANENT	Press RESET key on ACP or press MASTER CAUT pb
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Continued on the following page

AIRCRAFT SYSTEMS

INDICATING/RECORDING SYSTEMS

ECAM DESCRIPTION

Continued from the previous page

AUDIO INDICATORS	MEANING	DURATION	AUDIO INDICATOR CANCELLATION ^(a)
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Ident.: DSC-31-10-A-00015453.0002001 / 06 NOV 25

8 "WINDSHEAR" (synthetic voice)	WINDSHEAR	REPEATED 3 TIMES	NIL
"GO AROUND WINDSHEAR AHEAD" (synthetic voice)	Windshear ahead detected during the landing phase	PERMANENT	NIL
"WINDSHEAR AHEAD" (twice) (synthetic voice)	Windshear ahead detected during the takeoff phase	PERMANENT	NIL
"MONITOR RADAR DISPLAY" (synthetic voice)	Windshear ahead detected caution message	PERMANENT	NIL

Ident.: DSC-31-10-A-00015454.0001001 / 06 NOV 25

9 C CHORD	ALTITUDE ALERT (Refer to DSC-31-40 Altitude Alert)	1.5 s or PERMANENT	new ALTITUDE selection or press MASTER WARN pb
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Ident.: DSC-31-10-A-00015455.0001001 / 06 NOV 25

10 AUTO CALL OUT (synthetic voice)	HEIGHT ANNOUNCEMENT BELOW 2 500 ft (Refer to DSC-34-NAV-40-10 Automatic Callout)	PERMANENT	NIL
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Ident.: DSC-31-10-A-00015456.0001001 / 06 NOV 25

11 GROUND PROXIMITY WARNING (synthetic voice)	(Refer to DSC-34-SURV-40-10 Overview)	PERMANENT	NIL
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Ident.: DSC-31-10-A-00015457.0001001 / 06 NOV 25

12 "PRIORITY LEFT" "PRIORITY RIGHT" (synthetic voice)	A/P TAKE OVER pb	1 s	NIL
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Ident.: DSC-31-10-A-00015458.0001001 / 06 NOV 25

13 "RETARD" (synthetic voice)	Thrust levers not in IDLE or REVERSE position for landing	ONE TIME at 20 ft (10 ft in autoland with A/THR ON), Then PERMANENT	All Thrust levers are set to IDLE or REVERSE
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Continued on the following page

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS INDICATING/RECORDING SYSTEMS ECAM DESCRIPTION
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Continued from the previous page

AUDIO INDICATORS	MEANING	DURATION	AUDIO INDICATOR CANCELLATION ^(a)
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Ident.: DSC-31-10-A-00015459.0001001 / 10 MAY 22

"RETARD-RETARD" (synthetic voice)	One thrust lever above IDLE after touchdown and the other one in IDLE or REVERSE position	PERMANENT if triggered above 40 kt	All thrust levers are set to IDLE or REVERSE
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Ident.: DSC-31-10-A-00015460.0001001 / 06 NOV 25

14 "TCAS" (synthetic voice)	(Refer to DSC-34-SURV-60-20 Aural Messages)	PERMANENT	NIL
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Ident.: DSC-31-10-A-00015461.0001001 / 06 NOV 25

15 "SPEED, SPEED, SPEED" (Synthetic voice)	Current thrust is not sufficient to recover a positive flight through pitch control	Every 5 s until thrust is increased	THRUST LEVER(s)
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Ident.: DSC-31-10-A-00015463.0001001 / 06 NOV 25

16 "DUAL INPUT" (synthetic voice)	Both sidesticks are moved simultaneously	Every 5 s	One sidestick deactivated
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Ident.: DSC-31-10-A-00015466.0001001 / 06 NOV 25

17 "STOP RUDDER INPUT" (synthetic voice)	Inappropriate rudder pedal inputs detected in cruise at high speed.	Message repeated at least TWO TIMES	NIL
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(a) *The pilot can cancel any audio indicator, by pressing:*

- The EMER CANC pb on the ECAM control panel, or
- The MASTER WARN pb, except for OVERSPEED, L/G NOT DOWN and LANDING ON TAXIWAY  audio indicators.

AIRCRAFT SYSTEMS

INDICATING/RECORDING SYSTEMS

ECAM DESCRIPTION

AUDIO INDICATORS

Applicable to: MSN 04392-05746

AUDIO INDICATORS	MEANING	DURATION	AUDIO INDICATOR CANCELLATION ^(a)
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Ident.: DSC-31-10-A-00015446.0001001 / 06 NOV 25

18	CONTINUOUS REPETITIVE CHIME	RED WARNINGS	PERMANENT	Press MASTER WARN It
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Ident.: DSC-31-10-A-00015447.0001001 / 06 NOV 25

19	SINGLE CHIME	AMBER CAUTION	0.5 s	NIL
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Ident.: DSC-31-10-A-00015448.0001001 / 06 NOV 25

20	CAVALRY CHARGE	A/P DISCONNECTION BY TAKE OVER pb	1.5 s	Second push on TAKE OVER pb
		A/P DISCONNECTION DUE TO FAILURE	PERMANENT	Press MASTER WARN It or TAKE OVER pb

Ident.: DSC-31-10-A-00015449.0006001 / 06 NOV 25

21	TRIPLE CLICK	Landing capability downgrade or some cases of mode reversion	0.5 s (3 pulses)	NIL
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Ident.: DSC-31-10-A-00015450.0001001 / 06 NOV 25

22	CRICKET + "STALL" message (synthetic voice)	STALL	PERMANENT	NIL
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Ident.: DSC-31-10-A-00015451.0001001 / 06 NOV 25

23	BUZZER	CABIN CALL	3 s	NIL
		EMER CABIN CALL	3 s REPEATED 3 TIMES	NIL
		MECH CALL	As long as outside pb pressed	Press MASTER CAUT pb

Ident.: DSC-31-10-A-00015452.0001001 / 06 NOV 25

24	CONTINUOUS BUZZER	SELCAL CALL	PERMANENT	Press RESET key on ACP or press MASTER CAUT pb
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Continued on the following page

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS INDICATING/RECORDING SYSTEMS ECAM DESCRIPTION
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Continued from the previous page

AUDIO INDICATORS	MEANING	DURATION	AUDIO INDICATOR CANCELLATION ^(a)
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Ident.: DSC-31-10-A-00015453.0002001 / 06 NOV 25

25 "WINDSHEAR" (synthetic voice)	WINDSHEAR	REPEATED 3 TIMES	NIL
"GO AROUND WINDSHEAR AHEAD" (synthetic voice)	Windshear ahead detected during the landing phase	PERMANENT	NIL
"WINDSHEAR AHEAD" (twice) (synthetic voice)	Windshear ahead detected during the takeoff phase	PERMANENT	NIL
"MONITOR RADAR DISPLAY" (synthetic voice)	Windshear ahead detected caution message	PERMANENT	NIL

Ident.: DSC-31-10-A-00015454.0001001 / 06 NOV 25

26 C CHORD	ALTITUDE ALERT (Refer to DSC-31-40 Altitude Alert)	1.5 s or PERMANENT	new ALTITUDE selection or press MASTER WARN pb
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Ident.: DSC-31-10-A-00015455.0001001 / 06 NOV 25

27 AUTO CALL OUT (synthetic voice)	HEIGHT ANNOUNCEMENT BELOW 2 500 ft (Refer to DSC-34-NAV-40-10 Automatic Callout)	PERMANENT	NIL
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Ident.: DSC-31-10-A-00015456.0001001 / 06 NOV 25

28 GROUND PROXIMITY WARNING (synthetic voice)	(Refer to DSC-34-SURV-40-10 Overview)	PERMANENT	NIL
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Ident.: DSC-31-10-A-00015457.0001001 / 06 NOV 25

29 "PRIORITY LEFT" "PRIORITY RIGHT" (synthetic voice)	A/P TAKE OVER pb	1 s	NIL
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Ident.: DSC-31-10-A-00015458.0001001 / 06 NOV 25

30 "RETARD" (synthetic voice)	Thrust levers not in IDLE or REVERSE position for landing	ONE TIME at 20 ft (10 ft in autoland with A/THR ON), Then PERMANENT	All Thrust levers are set to IDLE or REVERSE
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Continued on the following page

AIRCRAFT SYSTEMS

INDICATING/RECORDING SYSTEMS

ECAM DESCRIPTION

Continued from the previous page

AUDIO INDICATORS	MEANING	DURATION	AUDIO INDICATOR CANCELLATION ^(a)
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Ident.: DSC-31-10-A-00015459.0001001 / 10 MAY 22

"RETARD-RETARD" (synthetic voice)	One thrust lever above IDLE after touchdown and the other one in IDLE or REVERSE position	PERMANENT if triggered above 40 kt	All thrust levers are set to IDLE or REVERSE
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Ident.: DSC-31-10-A-00015460.0001001 / 06 NOV 25

31 TCAS (synthetic voice)	<i>(Refer to DSC-34-SURV-60-20 Aural Messages)</i>	PERMANENT	NIL
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Ident.: DSC-31-10-A-00015461.0001001 / 06 NOV 25

32 "SPEED, SPEED, SPEED" (Synthetic voice)	Current thrust is not sufficient to recover a positive flight through pitch control	Every 5 s until thrust is increased	THRUST LEVER(s)
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Ident.: DSC-31-10-A-00015463.0001001 / 06 NOV 25

33 "DUAL INPUT" (synthetic voice)	Both sidesticks are moved simultaneously	Every 5 s	One sidestick deactivated
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Ident.: DSC-31-10-A-00015465.0001001 / 06 NOV 25

34 "PITCH, PITCH" (synthetic voice)	The aircraft pitch attitude is becoming excessive during flare and landing.	one time	NIL
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Ident.: DSC-31-10-A-00015466.0001001 / 06 NOV 25

35 "STOP RUDDER INPUT" (synthetic voice)	Inappropriate rudder pedal inputs detected in cruise at high speed.	Message repeated at least TWO TIMES	NIL
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^(a) The pilot can cancel any audio indicator, by pressing:

- The EMER CANC pb on the ECAM control panel, or
- The MASTER WARN pb, except for OVERSPEED, L/G NOT DOWN and LANDING ON TAXIWAY  audio indicators.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS INDICATING/RECORDING SYSTEMS ECAM DESCRIPTION
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AUDIO INDICATORS

Applicable to: MSN 07784-07792

AUDIO INDICATORS	MEANING	DURATION	AUDIO INDICATOR CANCELLATION ^(a)
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Ident.: DSC-31-10-A-00015446.0001001 / 06 NOV 25

36 CONTINUOUS REPETITIVE CHIME	RED WARNINGS	PERMANENT	Press MASTER WARN It
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Ident.: DSC-31-10-A-00015447.0001001 / 06 NOV 25

37 SINGLE CHIME	AMBER CAUTION	0.5 s	NIL
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Ident.: DSC-31-10-A-00015448.0001001 / 06 NOV 25

38 CAVALRY CHARGE	A/P DISCONNECTION BY TAKE OVER pb	1.5 s	Second push on TAKE OVER pb
	A/P DISCONNECTION DUE TO FAILURE	PERMANENT	Press MASTER WARN It or TAKE OVER pb

Ident.: DSC-31-10-A-00015449.0006001 / 06 NOV 25

39 TRIPLE CLICK	Landing capability downgrade or some cases of mode reversion	0.5 s (3 pulses)	NIL
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Ident.: DSC-31-10-A-00015450.0001001 / 06 NOV 25

40 CRICKET + "STALL" message (synthetic voice)	STALL	PERMANENT	NIL
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Ident.: DSC-31-10-A-00015451.0001001 / 06 NOV 25

41 BUZZER	CABIN CALL	3 s	NIL
	EMER CABIN CALL	3 s REPEATED 3 TIMES	NIL
	MECH CALL	As long as outside pb pressed	Press MASTER CAUT pb

Ident.: DSC-31-10-A-00015452.0001001 / 06 NOV 25

42 CONTINUOUS BUZZER	SELCAL CALL	PERMANENT	Press RESET key on ACP or press MASTER CAUT pb
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Continued on the following page

AIRCRAFT SYSTEMS

INDICATING/RECORDING SYSTEMS

ECAM DESCRIPTION

Continued from the previous page

AUDIO INDICATORS	MEANING	DURATION	AUDIO INDICATOR CANCELLATION ^(a)
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Ident.: DSC-31-10-A-00015453.0002001 / 06 NOV 25

43	"WINDSHEAR" (synthetic voice)	WINDSHEAR	REPEATED 3 TIMES	NIL
	"GO AROUND WINDSHEAR AHEAD" (synthetic voice)	Windshear ahead detected during the landing phase	PERMANENT	NIL
	"WINDSHEAR AHEAD" (twice) (synthetic voice)	Windshear ahead detected during the takeoff phase	PERMANENT	NIL
	"MONITOR RADAR DISPLAY" (synthetic voice)	Windshear ahead detected caution message	PERMANENT	NIL

Ident.: DSC-31-10-A-00015454.0001001 / 06 NOV 25

44	C CHORD	ALTITUDE ALERT (Refer to DSC-31-40 Altitude Alert)	1.5 s or PERMANENT	new ALTITUDE selection or press MASTER WARN pb
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Ident.: DSC-31-10-A-00015455.0001001 / 06 NOV 25

45	AUTO CALL OUT (synthetic voice)	HEIGHT ANNOUNCEMENT BELOW 2 500 ft (Refer to DSC-34-NAV-40-10 Automatic Callout)	PERMANENT	NIL
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Ident.: DSC-31-10-A-00015456.0001001 / 06 NOV 25

46	GROUND PROXIMITY WARNING (synthetic voice)	(Refer to DSC-34-SURV-40-10 Overview)	PERMANENT	NIL
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Ident.: DSC-31-10-A-00015457.0001001 / 06 NOV 25

47	"PRIORITY LEFT" "PRIORITY RIGHT" (synthetic voice)	A/P TAKE OVER pb	1 s	NIL
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Ident.: DSC-31-10-A-00015458.0001001 / 06 NOV 25

48	"RETARD" (synthetic voice)	Thrust levers not in IDLE or REVERSE position for landing	ONE TIME at 20 ft (10 ft in autoland with A/THR ON), Then PERMANENT	All Thrust levers are set to IDLE or REVERSE
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Continued on the following page

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS INDICATING/RECORDING SYSTEMS ECAM DESCRIPTION
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Continued from the previous page

AUDIO INDICATORS	MEANING	DURATION	AUDIO INDICATOR CANCELLATION ^(a)
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Ident.: DSC-31-10-A-00015459.0001001 / 10 MAY 22

"RETARD-RETARD" (synthetic voice)	One thrust lever above IDLE after touchdown and the other one in IDLE or REVERSE position	PERMANENT if triggered above 40 kt	All thrust levers are set to IDLE or REVERSE
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Ident.: DSC-31-10-A-00015460.0001001 / 06 NOV 25

49 TCAS (synthetic voice)	(Refer to DSC-34-SURV-60-20 Aural Messages)	PERMANENT	NIL
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Ident.: DSC-31-10-A-00015461.0001001 / 06 NOV 25

50 "SPEED, SPEED, SPEED" (Synthetic voice)	Current thrust is not sufficient to recover a positive flight through pitch control	Every 5 s until thrust is increased	THRUST LEVER(s)
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Ident.: DSC-31-10-A-00015463.0001001 / 06 NOV 25

51 "DUAL INPUT" (synthetic voice)	Both sidesticks are moved simultaneously	Every 5 s	One sidestick deactivated
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Ident.: DSC-31-10-A-00015465.0001001 / 06 NOV 25

52 "PITCH, PITCH" (synthetic voice)	The aircraft pitch attitude is becoming excessive during flare and landing.	one time	NIL
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Ident.: DSC-31-10-A-00015466.0001001 / 06 NOV 25

53 "STOP RUDDER INPUT" (synthetic voice)	Inappropriate rudder pedal inputs detected in cruise at high speed.	Message repeated at least TWO TIMES	NIL
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54 Ident.: DSC-31-10-A-00024814.0002001 / 18 NOV 21

"BANK BANK" (synthetic voice)	The bank angle is more than a predefined value when the aircraft is in degraded law (Refer to DSC-27-20-20 Alternate Law).	1.5 s	NIL
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- (a) The pilot can cancel any audio indicator, by pressing:
- The EMER CANC pb on the ECAM control panel, or
 - The MASTER WARN pb, except for OVERSPEED, L/G NOT DOWN and LANDING ON TAXIWAY  audio indicators.

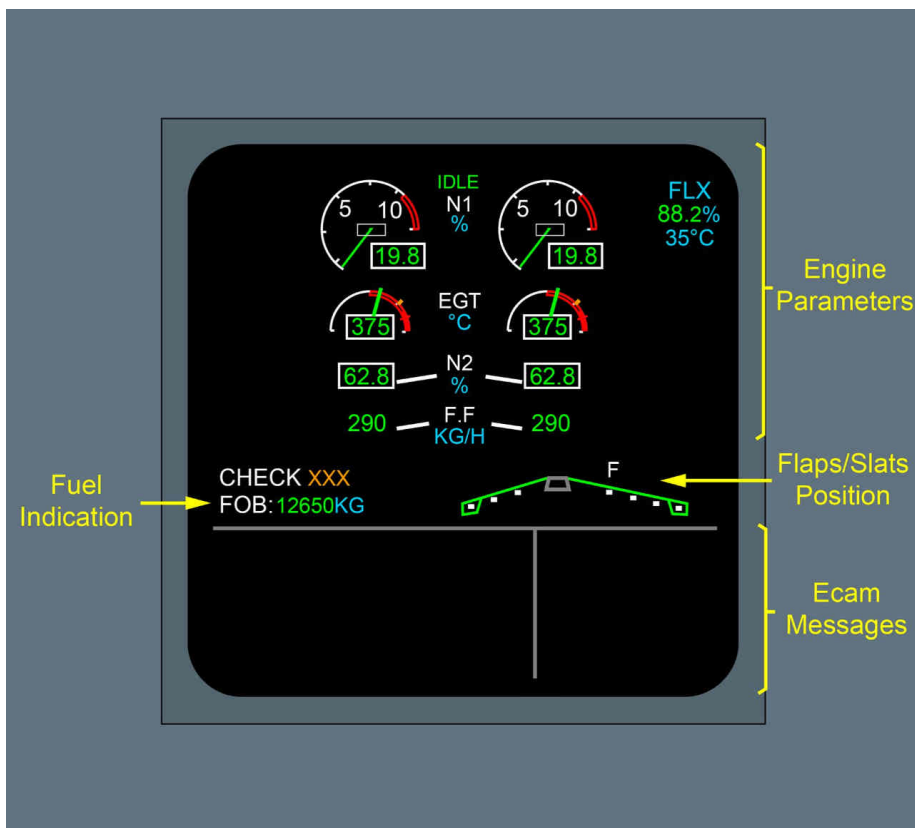
AIRCRAFT SYSTEMS
INDICATING/RECORDING SYSTEMS

ECAM DESCRIPTION

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 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS INDICATING/RECORDING SYSTEMS INDICATIONS ON E/WD
GENERAL	
Ident.: DSC-31-15-00001207.0003001 / 06 NOV 25 Applicable to: ALL	

- ¹ E/WD appears on the ECAM's upper DU.
- The upper part of this DU displays:
 - Engine parameters (*Refer to DSC-70-90-40 Engine Warning Display*)
 - Feedback messages (*Refer to DSC-31-05-60 Feedback Messages*)
 - FOB (*Refer to DSC-28-20 ECAM Upper Display*)
 - Slats/Flaps' position (*Refer to DSC-27-30-20 ECAM Upper Display*)
 - The lower part of this DU displays messages generated by the FWC:
 - Warning and caution messages, when a failure occurs
 - Memos when there is no failure.



The lower part of the DU, dedicated to ECAM messages, is divided into two sections that have several lines each.

- Bottom left :
 - Primary or independent warnings and cautions, or
 - Memo information.
- Bottom right :
 - Title of the system affected by a primary or independent warning or caution, in the case of overflow on the bottom left part, or
 - Secondary failure, or
 - Memo, or
 - Special lines (such as **AP OFF**, **LAND ASAP**).

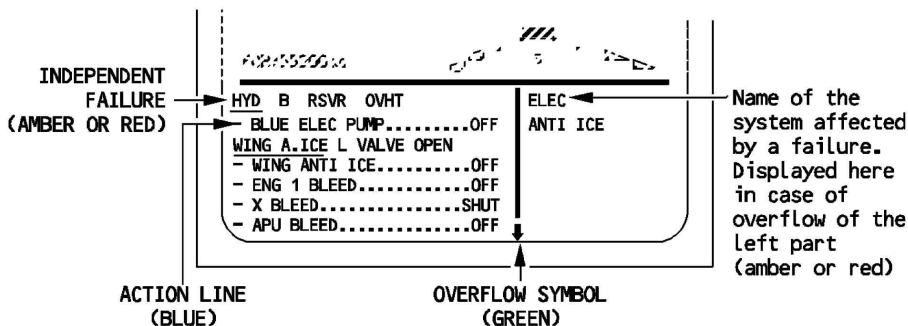
As soon as the FWC detects a failure, and if there is no flight phase inhibition active, the E/WD displays the title of the failure and actions that the flight crew must perform.

Depending on the action line, when the flight crew has performed the necessary action, the line will automatically disappear.

INDEPENDENT FAILURE

Ident.: DSC-31-15-00001208.0001001 / 03 FEB 11

Applicable to: ALL



If there are too many ECAM messages for the amount of space available in the lower part of the E/WD, a green arrow appears at the bottom of the display, pointing down to show that the information has overflowed off the screen. The pilot can scroll down to view additional messages by pushing the CLR pushbutton on the ECAM control panel (on the pedestal, just below the lower ECAM DU).

AIRCRAFT SYSTEMS

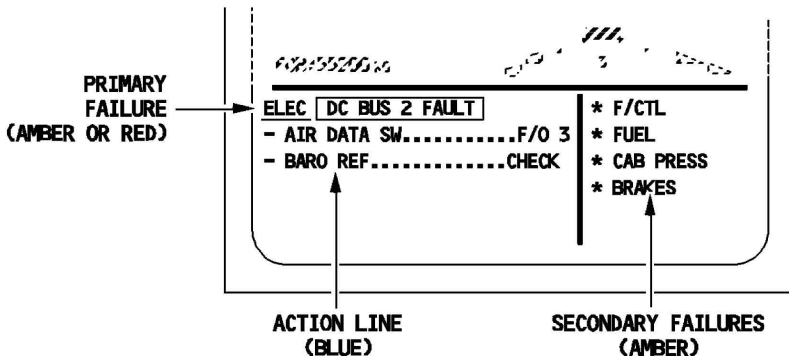
INDICATING/RECORDING SYSTEMS

INDICATIONS ON EWD

PRIMARY AND SECONDARY FAILURE

Ident.: DSC-31-15-00001209.0001001 / 03 FEB 11

Applicable to: ALL



The ECAM DU displays a primary failure as a boxed title.

It identifies a secondary failure by putting a star in front of the title of the affected system.

Note: The DU displays the overflow symbol, if primary or secondary failures overflow. In case of ELEC EMER CONFIG, the secondary failures are inhibited.

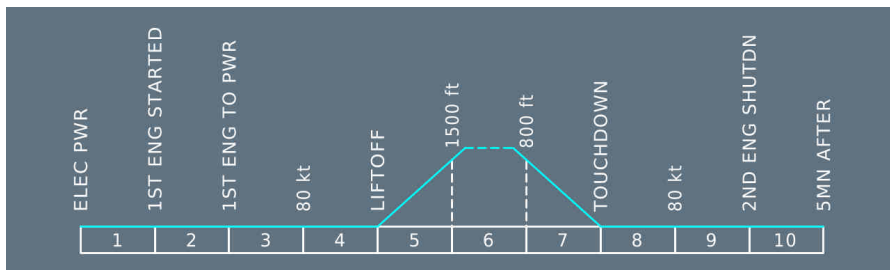
FLIGHT PHASES

Ident.: DSC-31-15-00001210.0001001 / 21 MAR 16

Applicable to: ALL

GENERAL

The FWC divides its functions according to these ten flight phases :



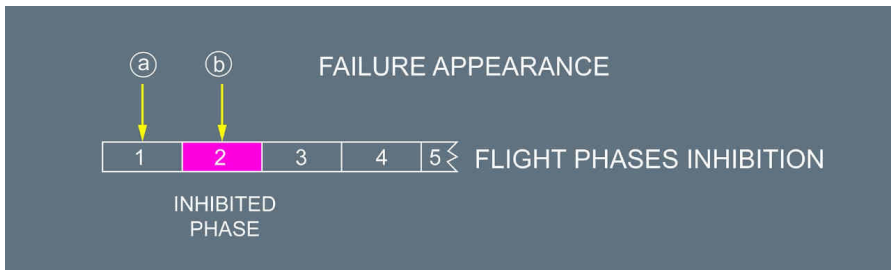
To improve its operational efficacy, the computer inhibits some warnings and cautions for certain flight phases. It does so to avoid alerting the pilots unnecessarily at times when they have high

workloads, such as during takeoff or landing. In these two phases, the DU displays magenta memos : “T.O. INHIBIT” (flight phases 3, 4, and 5), and “LDG INHIBIT” (flight phases 7 and 8).

Note: These flight phases are different from and independent of the ones that the FMGC uses.

FLIGHT PHASE INHIBITION

Two cases are possible (for instance) :



Effect on E/WD :

- The failure occurs during phase 1. The E/WD displays the warning immediately and continues to display it as long as the failure is present, even in phase 2.
- The failure occurs during phase 2. The E/WD displays the warning only when the aircraft has entered phase 3, where it is not inhibited. Then the warning remains displayed as long as the failure is present.

MEMOS

Applicable to: ALL

Ident.: DSC-31-15-A-00001211.0001001 / 21 MAR 16

DISPLAY

Memos appear in the lower part of the E/WD. They are normally in green, but may be amber in abnormal situations.

Memos list functions or systems that are temporarily used in normal operations.

²Ident.: DSC-31-15-A-00001212.0010001 / 09 FEB 18

TO AND LDG MEMOS

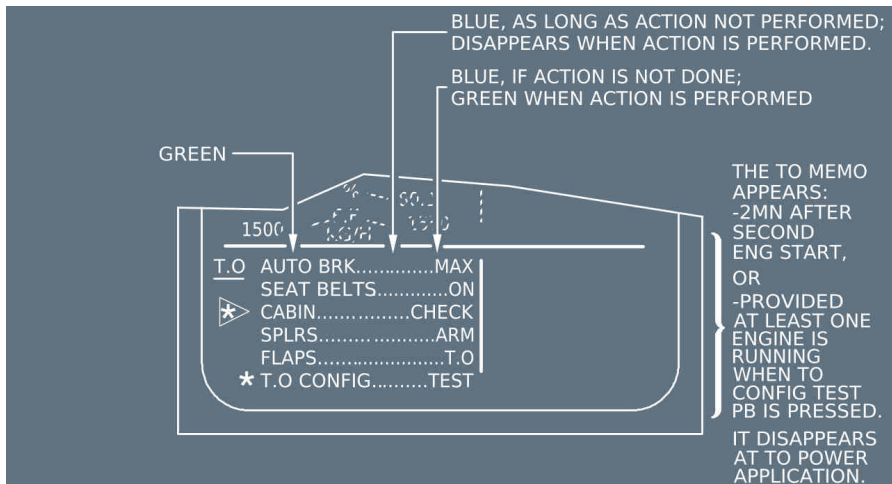
During the takeoff and landing phases, the right side of the memo area displays specific TO INHIBIT or LDG INHIBIT (magenta) memos.

Takeoff and landing memos are displayed, as follows, during the related flight phases:

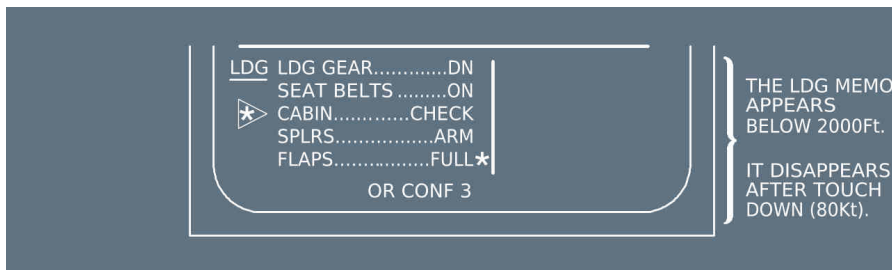
AIRCRAFT SYSTEMS

INDICATING/RECORDING SYSTEMS

INDICATIONS ON E/WD



- (*) This line disappears when the test is completed. It is replaced by "TO CONFIG NORMAL", if aircraft configuration is correct.
The test is requested again, if the configuration becomes abnormal.



- (*) "CONF 3" is displayed in alternate or direct law, or if the GPWS LDG FLAP 3 pushbutton is ON.

Note: After a go-around, if the aircraft does not climb above 2 200 ft RA, the landing memo appears only below 800 ft RA during the subsequent approach.

CONFIGURATION WARNINGS

Ident.: DSC-31-15-B-00028756.0001001 / 06 NOV 25

Applicable to: ALL

The following warnings and cautions appear in the lower part of the E/WD if the aircraft is not in takeoff configuration when the flight crew presses the T.O CONFIG pb on the ECAM control panel or applies takeoff power.

4 Ident.: DSC-31-15-B-00028723.0001001 / 06 NOV 25

Applicable to: ALL

BRAKES HOT	TRIGGERED	TRIGGERED
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5 Ident.: DSC-31-15-B-00028724.0001001 / 06 NOV 25

Applicable to: ALL

CONFIG FLAPS NOT IN T.O CONFIG	TRIGGERED	TRIGGERED
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6 Ident.: DSC-31-15-B-00028725.0001001 / 06 NOV 25

Applicable to: ALL

CONFIG L(R) SIDESTICK FAULT	TRIGGERED	TRIGGERED
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7 Ident.: DSC-31-15-B-00028726.0001001 / 06 NOV 25

Applicable to: ALL

CONFIG PARK BRK ON	NOT TRIGGERED	TRIGGERED
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8 Ident.: DSC-31-15-B-00028727.0001001 / 06 NOV 25

Applicable to: ALL

CONFIG PITCH TRIM NOT IN T.O RANGE	TRIGGERED	TRIGGERED
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9 Ident.: DSC-31-15-B-00028728.0001001 / 06 NOV 25

Applicable to: ALL

CONFIG RUD TRIM NOT IN T.O RANGE	TRIGGERED	TRIGGERED
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10 Ident.: DSC-31-15-B-00028729.0001001 / 06 NOV 25

Applicable to: ALL

CONFIG SLATS NOT IN T.O CONFIG	TRIGGERED	TRIGGERED
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11 Ident.: DSC-31-15-B-00028730.0001001 / 06 NOV 25

Applicable to: ALL

CONFIG SPD BRK NOT RETRACTED	TRIGGERED	TRIGGERED
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12 Ident.: DSC-31-15-B-00028731.0001001 / 06 NOV 25

Applicable to: ALL

DOOR	TRIGGERED	TRIGGERED
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AIRCRAFT SYSTEMS

INDICATING/RECORDING SYSTEMS

INDICATIONS ON E/WD

13 Ident.: DSC-31-15-B-00028732.0001001 / 06 NOV 25

Applicable to: ALL

<u>ELEC GEN 1(2) FAULT</u>	TRIGGERED if the two GENs are inoperative.	NOT TRIGGERED
----------------------------	--	---------------

14 Ident.: DSC-31-15-B-00028733.0001001 / 06 NOV 25

Applicable to: ALL

<u>ELEC GEN 1(2) OFF</u>	TRIGGERED if the two GENs are inoperative.	NOT TRIGGERED
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15 Ident.: DSC-31-15-B-00028734.0001001 / 06 NOV 25

Applicable to: ALL

<u>ELEC IDG 1(2) DISCONNECTED</u>	TRIGGERED if the two GENs are inoperative.	NOT TRIGGERED
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16 Ident.: DSC-31-15-B-00029189.0001001 / 06 NOV 25

Applicable to: ALL

<u>ENG 1(2) REVERSE UNLOCKED</u>	TRIGGERED	TRIGGERED
----------------------------------	-----------	-----------

17 Ident.: DSC-31-15-B-00028737.0001001 / 06 NOV 25

Applicable to: ALL

<u>ENG THR LEVERS NOT SET</u>	NOT TRIGGERED	TRIGGERED
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18 Ident.: DSC-31-15-B-00028738.0001001 / 06 NOV 25

Applicable to: MSN 07784-07792

<u>F/CTL FLAP/MCDU DISAGREE</u> Inhibited in the case of CONFIG FLAPS NOT IN T.O CONFIG warning.	TRIGGERED	TRIGGERED
--	-----------	-----------

19 Ident.: DSC-31-15-B-00028739.0001001 / 06 NOV 25

Applicable to: ALL

<u>F/CTL PITCH TRIM/MCDU/CG DISAGREE</u>	TRIGGERED	TRIGGERED
--	-----------	-----------

20 Ident.: DSC-31-15-B-00028740.0001001 / 06 NOV 25

Applicable to: ALL

<u>FUEL L(R) TK PUMP 1+2 LO PR</u>	TRIGGERED	NOT TRIGGERED
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AIRCRAFT SYSTEMS
INDICATING/RECORDING SYSTEMS

INDICATIONS ON E/WD

21 Ident.: DSC-31-15-B-00028741.0004001 / 06 NOV 25

Applicable to: ALL

<u>FWS OEB/FWC DISCREPANCY</u>	TRIGGERED	TRIGGERED
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22 Ident.: DSC-31-15-B-00028743.0001001 / 06 NOV 25

Applicable to: ALL

<u>HYD G(B)(Y) SYS LO PR</u>	TRIGGERED	NOT TRIGGERED
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23 Ident.: DSC-31-15-B-00028742.0001001 / 06 NOV 25

Applicable to: ALL

<u>HYD G ENG 1 PUMP LO PR</u>	TRIGGERED	TRIGGERED
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24 Ident.: DSC-31-15-B-00029192.0001001 / 06 NOV 25

Applicable to: ALL

<u>HYD Y ENG 2 PUMP LO PR</u>	TRIGGERED	TRIGGERED
-------------------------------	-----------	-----------

25 Ident.: DSC-31-15-B-00029190.0001001 / 06 NOV 25

Applicable to: ALL

<u>VENT SKIN VALVE FAULT</u>	NOT TRIGGERED	TRIGGERED
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AIRCRAFT SYSTEMS
INDICATING/RECORDING SYSTEMS

INDICATIONS ON E/WD

Intentionally left blank

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS INDICATING/RECORDING SYSTEMS INDICATIONS ON SD
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GENERAL

Ident.: DSC-31-20-00001215.0001001 / 21 MAR 16

Applicable to: ALL

The system/status display (SD) uses the lower ECAM DU to display :

- pages showing synoptic diagrams of the aircraft systems, or
- the status page.

SYSTEM PAGES

Ident.: DSC-31-20-00001216.0002001 / 10 MAY 21

Applicable to: ALL

The lower ECAM DU can display 12 system pages (for description see relevant FCOM chapter):

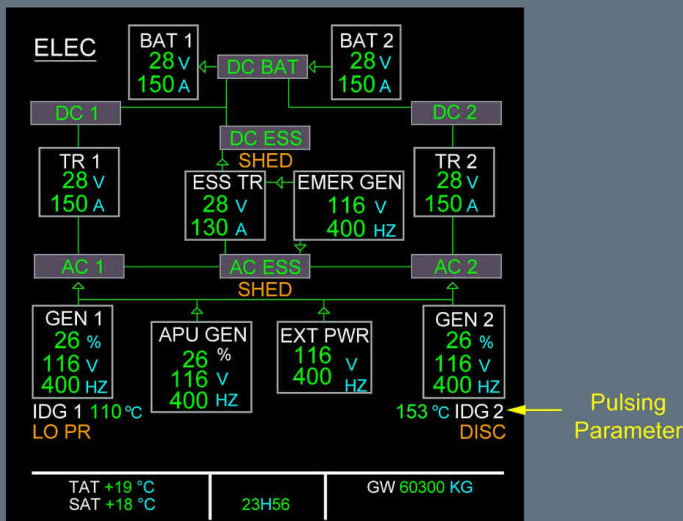
- ENGINE (secondary engine parameters)
- BLEED (air bleed)
- CAB PRESS (cabin pressurization)
- ELEC (electric power)
- HYD (hydraulic)
- FUEL (fuel)
- APU (auxiliary power unit)
- COND (air conditioning)
- DOOR/OXY (doors/oxygen)
- WHEEL (landing gear, braking, ground spoilers, etc.)
- F/CTL (flight controls)
- CRUISE (cruise).

The flight crew may manually call up a system page for display on the lower ECAM DU, or the system may automatically display a page:

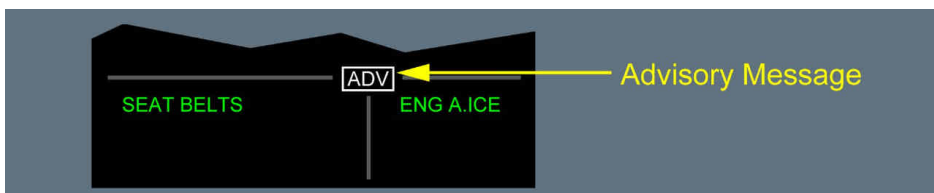
- Manually:
 - The flight crew can, at any time, use the pushbutton on the ECAM's control panel to call up and display any system page, except the CRUISE page
 - The corresponding pushbutton on the ECAM control panel lights up
 - A failure-related or advisory display automatically replaces a page the flight crew has manually called up.
- Automatically, related to a failure:
 - The relevant system page automatically appears, as soon as any fault or malfunction triggers a caution or warning message.

- Automatically, related to an advisory:
 - The relevant system page automatically appears, when a parameter drifts out of its normal range
 - The value (shown in green) pulses, as long as it is outside its limits
 - The advisory mode is inhibited in some flight phases.

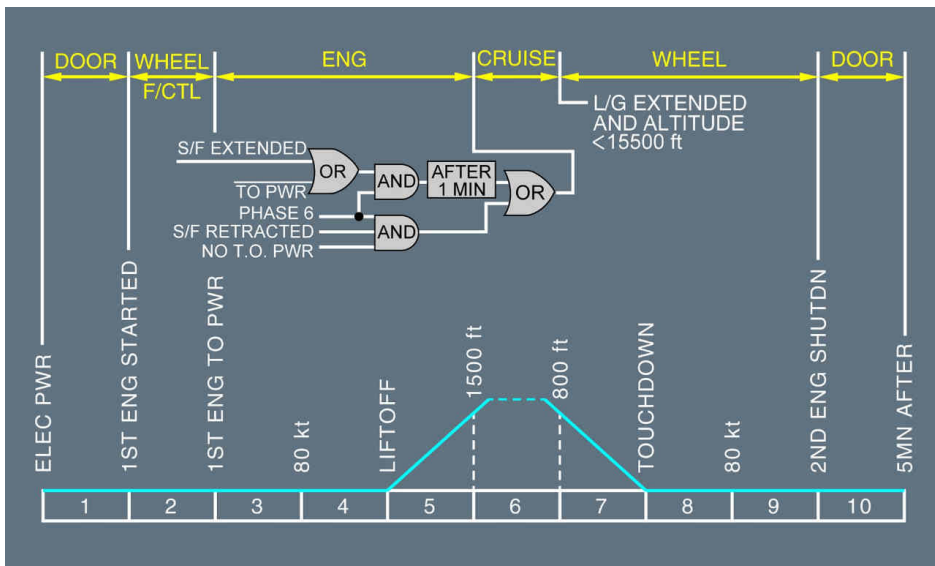
System Page in Advisory Mode



Note: If an advisory is triggered, when the ECAM is in the single-display configuration, an advisory message appears on the upper part of the E/WD, and the associated key on the ECAM control panel flashes to identify the appropriate system page.



- Automatically, related to flight phase mode:
 - If no other mode is engaged, the SD displays the system page related to the present flight phase, as shown in the following diagram



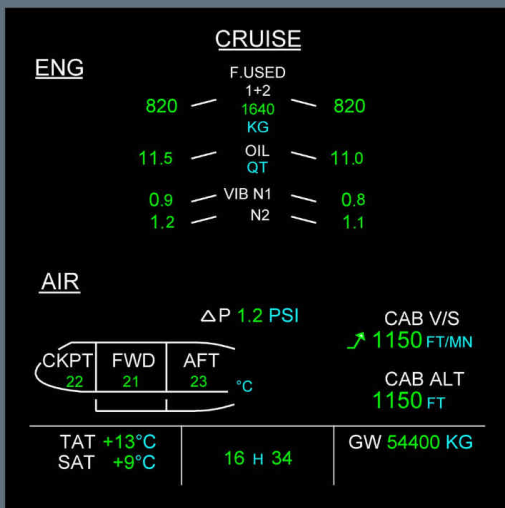
- Phase 2: The F/CTL SD page replaces the WHEEL SD page for 20 s when either flight crew moves the sidestick (more than 3 ° in pitch or roll) or when the rudder pedal deflection is more than 22 °
- The APU SD page appears when the APU MASTER SW pb-sw is ON. It disappears when APU RPM has been above 95 % for 10 s, or when the APU MASTER SW pb-sw is switched OFF
- The ENGINE SD page appears at the beginning of start sequence or when a flight crew selects CRANK. It disappears 10 s after the end of the start sequence, when the ENG MODE selector is set to NORM.

For a description of the ENGINE and AIR indications that appear when the SD is displaying the CRUISE page, see the relevant FCOM chapter.

AIRCRAFT SYSTEMS

INDICATING/RECORDING SYSTEMS

INDICATIONS ON SD



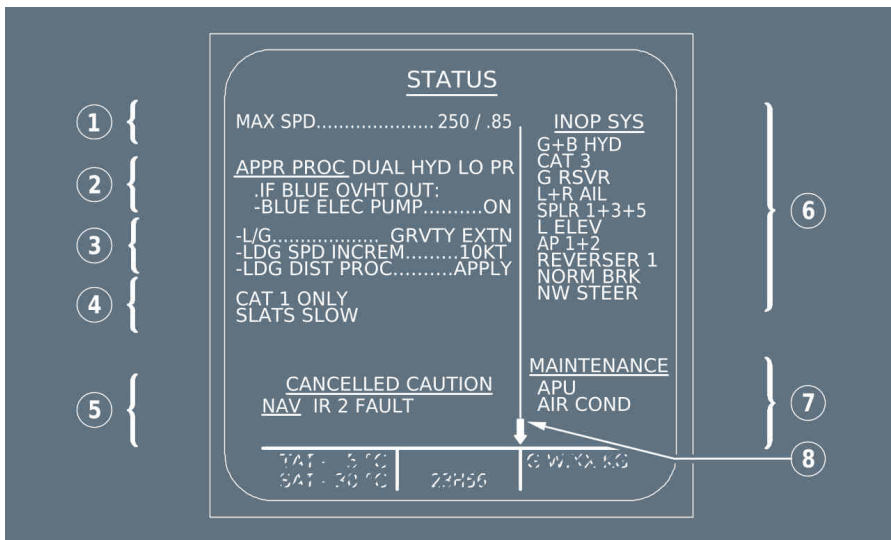
STATUS PAGE

Ident.: DSC-31-20-00001217.0001001 / 12 APR 16

Applicable to: ALL

PURPOSE

The STATUS page provides an operational summary of the state of the aircraft. As illustrated in the following image, this operational summary includes all of the following:



- (1) Limitations (speed, flight level): Blue
- (2) Approach procedures: White (Red) (Amber)
- (3) Procedures (corrections to apply for landing): Blue
- (4) Information: Green
- (5) Cancelled caution: White
- (6) Inoperative system: Amber
- (7) Maintenance status: White
- (8) The arrow appears if the data on the STATUS page overflows the left or right area of the page.

The flight crew can press the CLR pb, in order to scroll the display to view the overflow.

Note: The titles of the different parts of the display appear in white and underlined.

STATUS PAGE DISPLAY

The STATUS page appears when the flight crew presses the STS pb on the ECAM Control Panel (ECP).

The STATUS page automatically appears in abnormal operations if one of the following applies:

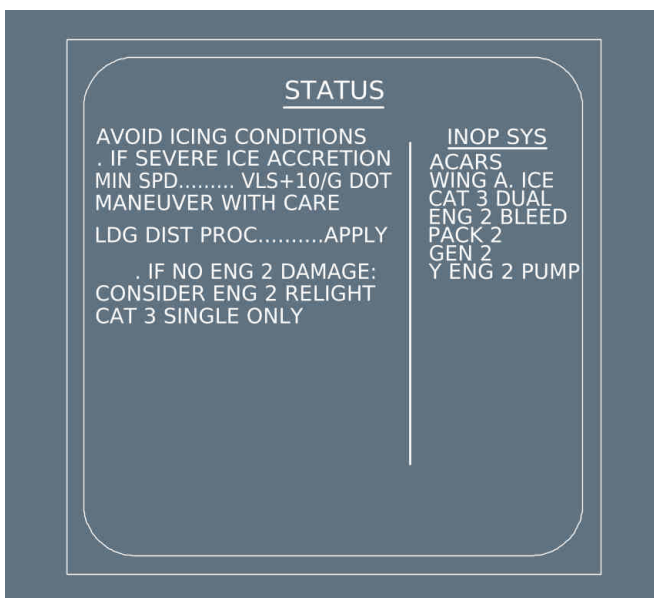
- The STATUS page is not empty, and the flight crew clears the last alert on the E/WD, or
- The STATUS page is not empty, and the flight crew selects the CONF1 for approach.

BLANK LINES

Each block that is described above (limitation block (1), approach procedure block (2), etc.) is separated by a blank line.

Therefore, a condition that is included in a limitation block (1) and the associated action line that is included in the procedure block (3) are separated by a blank line.

Example: Illustration with the ECAM alert **ENG 1(2) SHUTDOWN**.



In this example, the action line “LDG DIST PROC ... APPLY” applies only in the case of severe ice accretion.

STS REMINDER

The STS reminder appears on the E/WD if both the following conditions apply:

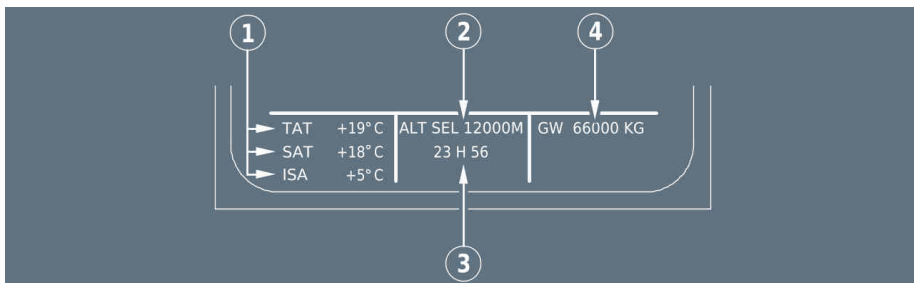
- The STATUS page is not empty: The STATUS page displays message other than “CANCELLED CAUTION” or MAINTENANCE status.
- There is a MAINTENANCE status at engines shutdown.

The MAINTENANCE status can appear only when the aircraft is on the ground, before engine start or after engine shutdown.

PERMANENT DATA

Ident.: DSC-31-20-00017520.0011001 / 17 MAY 21

Applicable to: MSN 04392-07792



(1) Temperature

The screen displays the Total Air Temperature (TAT) and Static Air Temperature (SAT) in green.

The difference between the SAT and the International Standard Atmosphere temperature (ISA) temperature (Delta ISA Δ) is displayed in green, in standard altitude mode and when the SAT is valid.

(2) G LOAD - ALT SEL

The screen displays one of the following items:

- Load factor (G LOAD) in amber, when the value is above 1.4 g or below 0.7 g for more than 2 s. The G LOAD amber indication remains displayed 5 s after the excessive load occurrence. The display of the load factor is inhibited during flight phases 1, 2, 3, 9 and 10.
- Altitude in green selected via the Flight Control Unit (FCU), if the flight crew selects metric units, and provided the load factor is not displayed.
- "CHECK CAPT (F/O) PFD", "CHECK CAPT (F/O) ND" or "CHECK SD" all in amber (*Refer to DSC-31-05-20 Cockpit Arrangement*).

Note: The display of the feedback messages takes priority over the load factor indication.

(3) UTC

The screen displays the Universal Time Coordinated (UTC), synchronized with the cockpit clock, in green.

AIRCRAFT SYSTEMS

INDICATING/RECORDING SYSTEMS

INDICATIONS ON SD

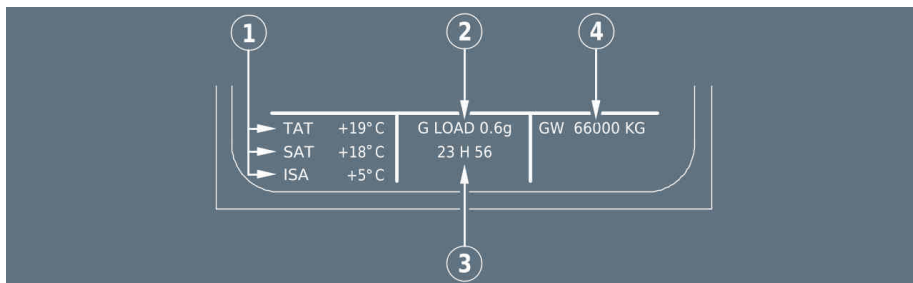
(4) GW

The screen displays the Gross Weight (GW) in green, as soon as the flight crew starts the first engine. The last two digits are dashed, if accuracy is degraded. On ground, blue dashes are displayed instead of the indication, if no computed data is available.

PERMANENT DATA

Ident.: DSC-31-20-00017520.0025001 / 25 JUL 16

Applicable to: MSN 02155-03060



(1) Temperature

The screen displays the Total Air Temperature (TAT) and Static Air Temperature (SAT) in green.

The difference between the International Standard Atmosphere (ISA) temperature (Delta ISA) is displayed in green, in standard altitude mode and when the SAT is valid.

(2) G LOAD

The screen displays one of the following items:

- Load factor (G LOAD) in amber, when the value is above 1.4 g or below 0.7 g for more than 2 s. The G LOAD amber indication remains displayed 5 s after the excessive load occurrence. The display of the load factor is inhibited during flight phases 1, 2, 3, 9 and 10.
- “CHECK CAPT (F/O) PFD”, “CHECK CAPT (F/O) ND” or “CHECK SD” all in amber (*Refer to DSC-31-05-20 Cockpit Arrangement*).

Note: The display of the feedback messages takes priority over the load factor indication.

(3) UTC

The screen displays the Universal Time Coordinated (UTC), synchronized with the cockpit clock, in green.

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(4) GW

The screen displays the Gross Weight (GW) in green, as soon as the flight crew starts the first engine. The last two digits are dashed, if accuracy is degraded. On ground, blue dashes are displayed instead of the indication, if no computed data is available.

AMBER CROSSES "XX" ON THE SD

Ident.: DSC-31-20-00013602.0001001 / 18 MAR 11

Applicable to: ALL

If a parameter value on any SD page is not available for display, amber crosses "XX" appear instead of the value.

AMBER DASHES ON THE SD

Ident.: DSC-31-20-00015526.0001001 / 01 APR 14

Applicable to: ALL

If the accuracy of a parameter value on any SD page is degraded, amber dashes are displayed over the last digits.

AIRCRAFT SYSTEMS
INDICATING/RECORDING SYSTEMS

INDICATIONS ON SD

Intentionally left blank

GENERAL

Ident.: DSC-31-25-10-00001219.0001001 / 22 MAR 16

Applicable to: ALL

If ECAM detects a failure :

- The E/WD displays warning or caution messages.
- The master warning or master caution lights light up (except in the case of a level 1 caution).
- The system sounds an aural signal (except in the case of a level 1 caution).
- The system display (SD) shows the system page for the affected system.
- The CLR pushbutton on the ECAM control panel lights up.

In addition, a local warning light controlled directly by the affected system can light up.

After completing remedial procedures, the flight crew must push the CLR pushbutton repeatedly until the displays return to their normal configurations :

- MEMO messages on the E/WD
- The system page related to the present flight phase on the SD.
- The CLR light on the ECAM control panel turned off.

AIRCRAFT SYSTEMS
INDICATING/RECORDING SYSTEMS

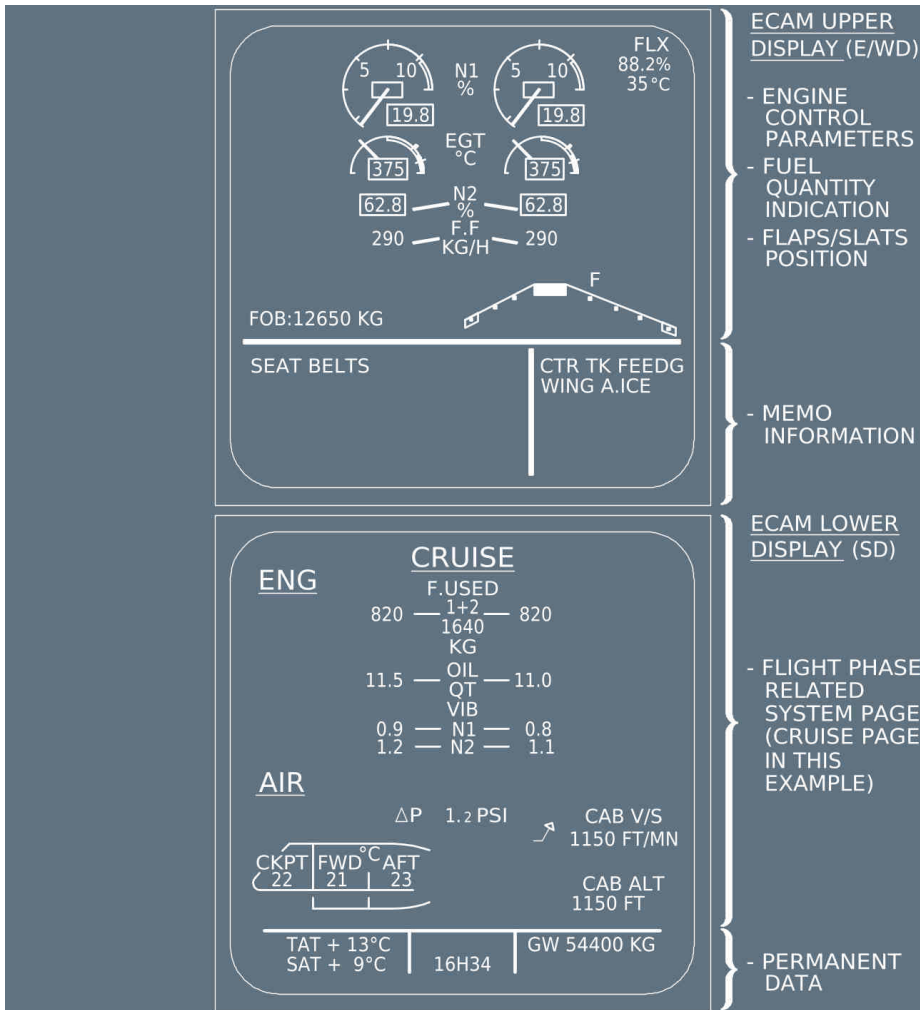
ECAM SEQUENCE - GENERAL

Intentionally left blank

1 - THE ECAM DETECTS NO FAILURE

Ident.: DSC-31-25-20-00001220.0004001 / 09 OCT 12

Applicable to: ALL



AIRCRAFT SYSTEMS
INDICATING/RECORDING SYSTEMS

ECAM SEQUENCE - EXAMPLE

2 - THE ECAM DETECTS A FAILURE

Ident.: DSC-31-25-20-00001221.0004001 / 09 OCT 12

Applicable to: ALL

For example, a hydraulic reservoir is overheat.

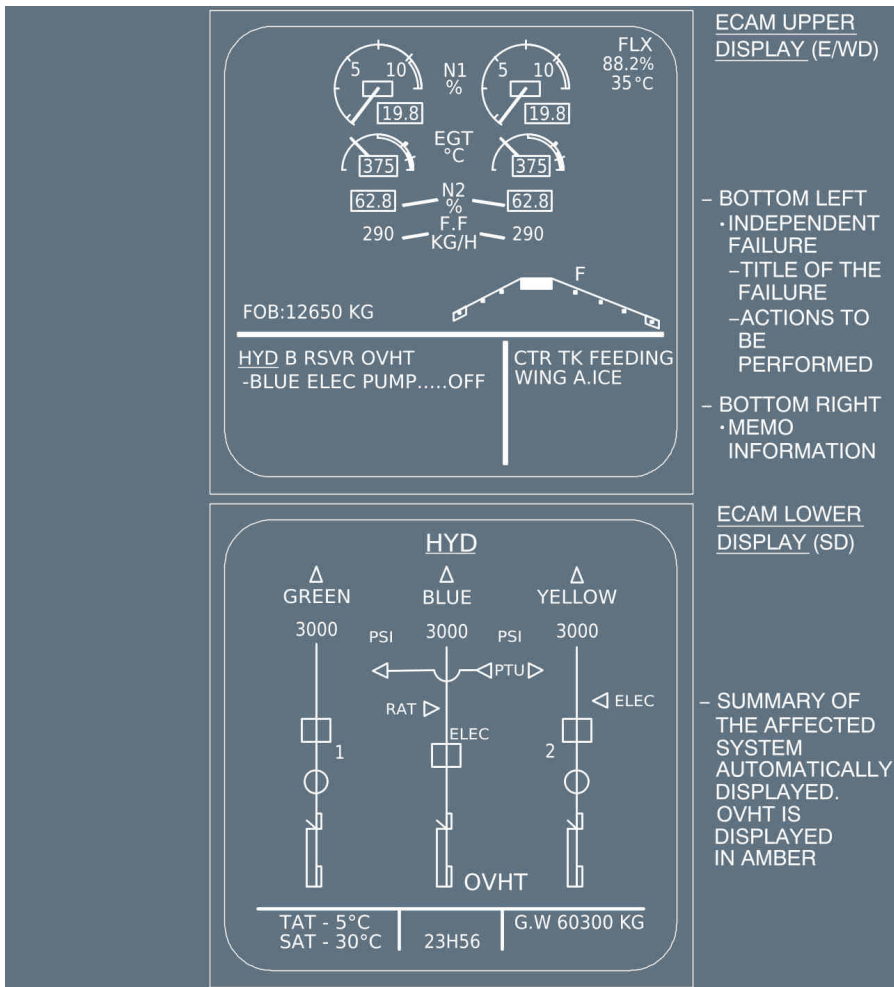
COCKPIT INDICATIONS

- A single chime sounds
- Both MASTER CAUTION lights come on, and stay on
- A FAULT light, on the overhead HYD panel, comes on
- The memo space on the E/WD displays the "HYD B RSVR OVHT" message, and the "BLUE ELEC PUMP OFF" instruction
- The lower ECAM display (SD) automatically calls up the hydraulic system's diagram, and displays "OVHT" in amber next to the blue system
- The ECAM's CLR pushbutton lights up.

AIRCRAFT SYSTEMS

INDICATING/RECORDING SYSTEMS

ECAM SEQUENCE - EXAMPLE



3 - THE FLIGHT CREW FOLLOWS THE INSTRUCTION DISPLAYED ON THE E/WD

Ident.: DSC-31-25-20-00001222.0002001 / 05 MAY 22

Applicable to: ALL

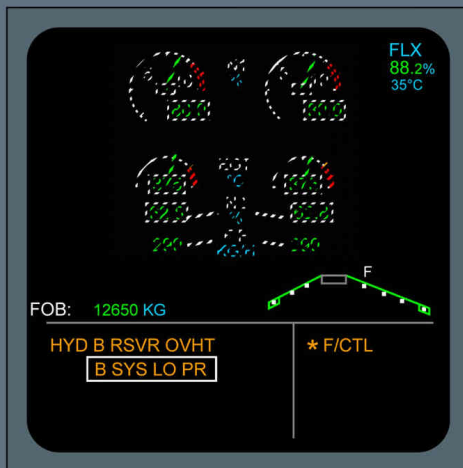
The flight crew switches off the BLUE ELEC PUMP pb-sw, depressurizing the blue hydraulic circuit.

AIRCRAFT SYSTEMS
INDICATING/RECORDING SYSTEMS

ECAM SEQUENCE - EXAMPLE

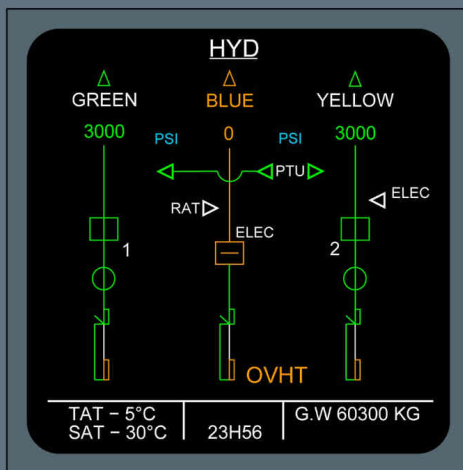
COCKPIT INDICATIONS

- A single chime sounds
- Both MASTER CAUTION lights stay on
- A FAULT/OFF light, on the overhead panel, comes on
- The second part of the message on the E/WD changes to **B SYS LO PR**
- The SD's system diagram shows **0** for the pressure in the blue system, along with **OVHT**
- The right side of the memo area indicates a secondary failure in the flight control system
- The ECAM control panel's CLR pb remains on.



ECAM UPPER
DISPLAY (EWD)

- BOTTOM LEFT
 - INDEPENDENT FAILURE AND PRIMARY FAILURE
- BOTTOM RIGHT
 - SECONDARY FAILURE



ECAM LOWER
DISPLAY (SD)

- THE SYNOPSIS OF THE SYSTEM PAGE IS CHANGED ACCORDING TO THE NEW SYSTEM CONFIGURATION OVHT AND THE PRESSURE ARE DISPLAYED IN AMBER

AIRCRAFT SYSTEMS
INDICATING/RECORDING SYSTEMS

ECAM SEQUENCE - EXAMPLE

4 - ONE OF THE PILOTS PUSHES THE CLR PUSHBUTTON ON THE ECP

Ident.: DSC-31-25-20-00001223.0003001 / 09 OCT 12

Applicable to: ALL

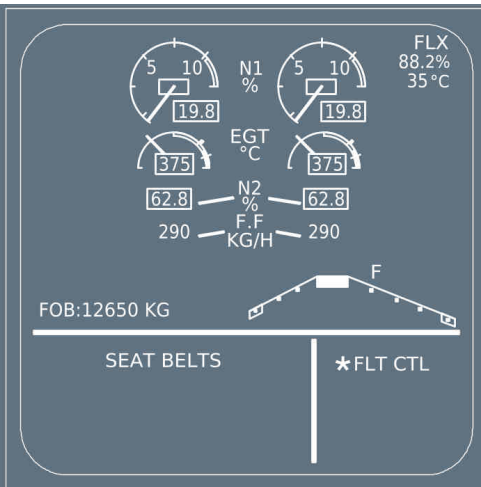
COCKPIT INDICATIONS

- The CLR pushbutton stays on.
- The FAULT/OFF light stays on.
- Hydraulic system messages disappear from the E/WD, and the right side of the memo area indicates a secondary failure in the flight control system.
- The SD automatically calls up the flight control system page, with surface actuator indications (associated with the blue hydraulic system) shown in amber.

AIRCRAFT SYSTEMS

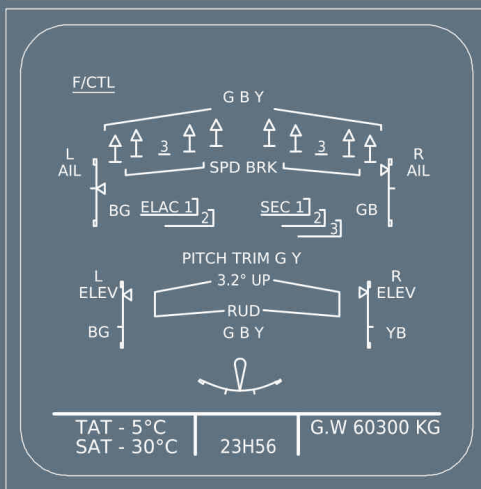
INDICATING/RECORDING SYSTEMS

ECAM SEQUENCE - EXAMPLE



ECAM UPPER DISPLAY (E/WD)

- BOTTOM LEFT
• MEMO INFORMATION
- BOTTOM RIGHT
• SECONDARY FAILURE



ECAM LOWER DISPLAY (SD)

- F/CTL SYSTEM PAGE
AUTOMATICALLY DISPLAYS
FAULTY SPOILERS (n°3)
AND SURFACE ACTUATOR B
PRESSURE INDICATIONS IN
AMBER

AIRCRAFT SYSTEMS
INDICATING/RECORDING SYSTEMS

ECAM SEQUENCE - EXAMPLE

5 - ONE OF THE PILOTS PUSHES THE CLR PUSHBUTTON A SECOND TIME

Ident.: DSC-31-25-20-00001224.0003001 / 09 OCT 12

Applicable to: ALL**COCKPIT INDICATIONS**

- The ECP's CLR and STS pushbuttons light up.
- The FAULT/OFF lights stay on.
- The E/WD's memo area returns to normal.
- The STATUS page automatically appears on the SD, displaying the procedures for completing the flight with a faulty blue system.

AIRCRAFT SYSTEMS

INDICATING/RECORDING SYSTEMS

ECAM SEQUENCE - EXAMPLE

The upper display shows engine parameters: N1 at 19.8%, EGT at 375°C, N2 at 62.8%, and F.F at 290 KG/H. Fuel flow is 19.8. Fuel oil balance (FOB) is 12650 KG. Seat belts are indicated as ON. Center tank feedwing a/ice is indicated as ON.

ECAM UPPER
DISPLAY (E/WD)

- FULL MEMO
DISPLAYED

STATUS

APPR PROC HYD LO PR
• IF BLUE OVHT OUT:
- BLUE ELEC PUMP..AUTO

LDG DIST.....x 1.1

SLATS SLOW
CAT 3 SINGLE ONLY

INOP SYS
CAT 3 DUAL
BLUE HYD
SPLR 3
B ELEC PUMP

TAT - 5°C
SAT - 30°C

23H56

G.W 60300 KG

ECAM LOWER
DISPLAY (SD)

- THE STATUS
PAGE IS
AUTOMATICALLY
DISPLAYED TO:
• PROVIDE THE
PROCEDURE TO
BE APPLIED
FOR APPROACH.
• PROVIDE
LANDING
DISTANCE
FACTORS AND
INFORMATION.
• LIST THE
INOPERATIVE
SYSTEMS.

AIRCRAFT SYSTEMS
INDICATING/RECORDING SYSTEMS

ECAM SEQUENCE - EXAMPLE

6 - ONE OF THE PILOTS PUSHES THE CLR PUSHBUTTON A THIRD TIME

Ident.: DSC-31-25-20-00001225.0003001 / 09 OCT 12

Applicable to: ALL

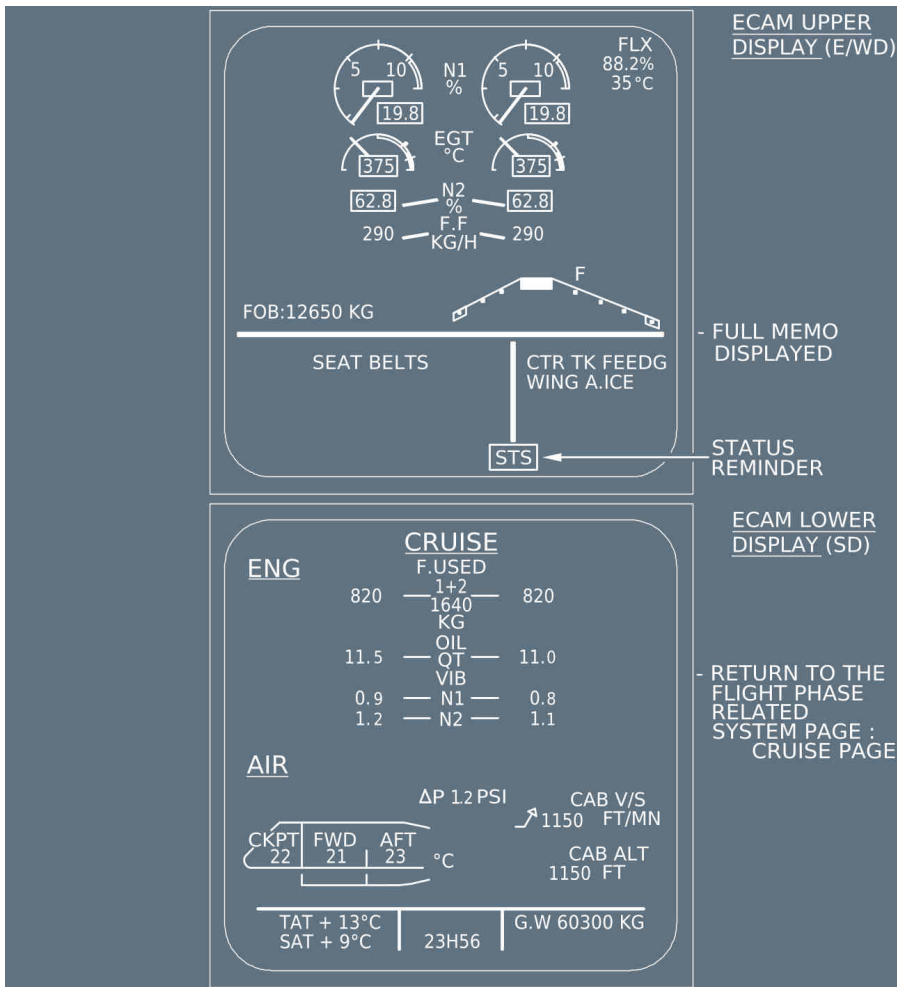
COCKPIT INDICATIONS

- The CLR pushbutton light goes off.
- The FAULT/OFF lights stay on.
- A status reminder appears at the bottom of the E/WD.
- The SD automatically displays the system page corresponding to the flight phase.

AIRCRAFT SYSTEMS

INDICATING/RECORDING SYSTEMS

ECAM SEQUENCE - EXAMPLE



AIRCRAFT SYSTEMS
INDICATING/RECORDING SYSTEMS

ECAM SEQUENCE - EXAMPLE

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS INDICATING/RECORDING SYSTEMS OEB REMINDER
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GENERAL

Ident.: DSC-31-27-00001226.0001001 / 06 NOV 25

Applicable to: ALL

- 1 The OEB reminder function provides operational help to the flight crew. This function enables the flight crew to clearly identify on the ECAM any procedure and STATUS message superseded by an OEB procedure.
When a situation causes an ECAM alert to trigger, a message informs the flight crew in real time if there is an OEB for the displayed ECAM alert and/or STATUS messages. As a result, the ECAM procedure and/or STATUS message is changed. In this case, a specific ECAM message informs the flight crew to refer to the QRH.
When an OEB with an associated OEB reminder code is applicable to the aircraft, the OEB reminder code needs to be activated by a maintenance action. When the OEB is no longer applicable to the aircraft, the OEB reminder code must be deactivated by the maintenance team.
Note: *If the OEB reminder code is not deactivated after OEB cancellation, the ECAM procedure and/or STATUS message will still be replaced by the REFER TO QRH/OEB PROC message.*

DESCRIPTION

Ident.: DSC-31-27-00001227.0003001 / 09 NOV 20

Applicable to: ALL

The OEB reminder flag may apply to one of the following:

- ECAM procedure only
- ECAM procedure and corresponding status messages
- Status message only.

ONLY PROCEDURE AFFECTED

- The ECAM warning title remains the same
- All corresponding actions are deleted. Instead, the “REFER TO QRH/OEB PROC” message appears.
- The associated status messages on the ECAM system display remain the same.

COCKPIT INDICATION

AIR PACK 1 OVHT -REFER TO QRH/OEB PROC -	ECAM UPPER DISPLAY (E/WD)
STATUS • WHEN PACK OVHT OUT: -PACK 1.....ON INOP SYS PACK 1	ECAM LOWER DISPLAY (SD)

PROCEDURE AND STATUS AFFECTED

- The ECAM warning title remains the same
- All corresponding actions are deleted. Instead, the “REFER TO QRH/OEB PROC” message appears.
- The associated status messages on the ECAM system display remain the same, except for the additional “REFER TO QRH/OEB PROC” title.

COCKPIT INDICATION

AIR PACK 1 OVHT -REFER TO QRH/OEB PROC -	ECAM UPPER DISPLAY (E/WD)
STATUS -REFER TO QRH/OEB PROC - • WHEN PACK OVHT OUT: -PACK 1.....ON INOP SYS PACK 1	ECAM LOWER DISPLAY (SD)

ONLY STATUS MESSAGE AFFECTED

- The ECAM warning title remains the same
- The corresponding procedure remains the same, except for the additional "FOR STS REFER TO OEB" line
- The associated status messages on the ECAM system display remain the same, except for the additional "REFER TO QRH/OEB PROC" title.

COCKPIT INDICATION

<pre> AIR PACK 1 OVHT -PACK 1.....OFF • WHEN PACK OVHT OUT: -PACK 1.....ON -FOR STS REFER TO OEB - </pre>	ECAM UPPER DISPLAY (E/WD)
<pre> STATUS -REFER TO QRH/OEB PROC - • WHEN PACK OVHT OUT: -PACK 1.....ON </pre>	ECAM LOWER DISPLAY (SD)

AIRCRAFT SYSTEMS
INDICATING/RECORDING SYSTEMS

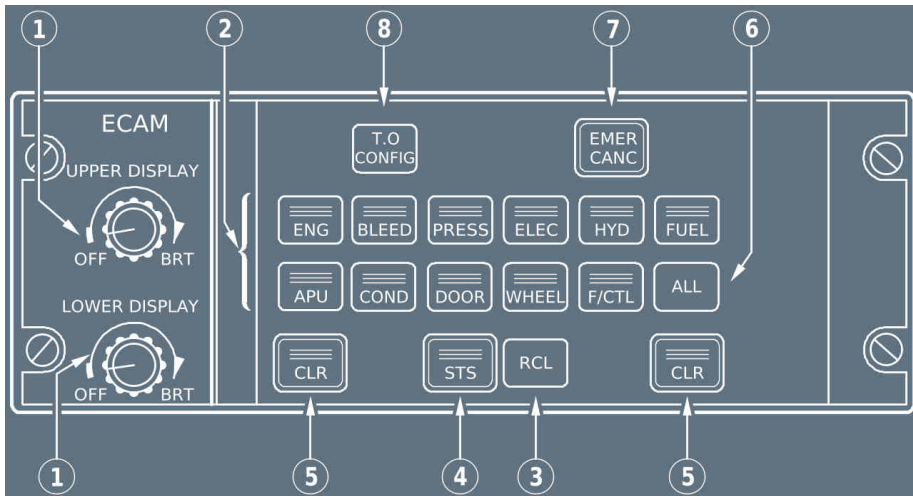
OEB REMINDER

Intentionally left blank

ECAM CONTROL PANEL

Ident.: DSC-31-30-00001229.0002001 / 06 NOV 25

Applicable to: ALL



(1) OFF / BRT knobs

Used to turn the ECAM DUs on and off, and to control their brightness (automatic adjustment of brightness for ambient light conditions is superimposed on this manual control).

Note: When the flight crew turns the UPPER DISPLAY knob to OFF, the engine/warning (E/W) display appears on the lower display unit (automatic transfer).

(2) System page pushbuttons

- Call up the corresponding system pages on the SD
- Light up, when pushed for manual selection, or when an advisory is detected
- Call up the aircraft system page corresponding to the present flight phase or the current warning when pushed a second time.

When only one ECAM display is on, the flight crew can display a system page for up to 3 min by pushing and holding the system page pushbutton.

- If an advisory condition arises, the relevant system page is not automatically displayed, but the pushbutton light pulses
- If an ECAM warning is triggered, the relevant system page is not automatically displayed, and the system page pushbutton does not light up.

AIRCRAFT SYSTEMS
INDICATING/RECORDING SYSTEMS

ECAM CONTROLS

(3) RCL pb

- When pressed, the E/WD displays all alerts previously cleared via the CLR pb that are still active.

***Note:** This action on the RCL pb also suppresses the flight phase inhibition function until the next flight phase. As a consequence, all new alerts that should normally be inhibited will be displayed.*

- When pressed for more than 3 s, the E/WD displays:
 - All alerts previously cleared via the CLR pb that are still active
 - All alerts previously cancelled via the EMER CANC pb.

***Note:** If there is no alert to recall, the “NORMAL” message appears for 3 s on the E/WD.*

(4) STS pb

The flight crew pushes this pushbutton to display the STATUS page on the lower SD. The pushbutton remains lit, as long as the SD displays the STS page. If the system has no status messages, the status page displays “NORMAL” for 3 s.

The flight crew can clear the STATUS page by pushing the CLR pb, or by pushing the STS pb a second time.

When only one ECAM display is on :

- It displays the STATUS page only when the flight crew pushes the STATUS pushbutton and holds it. The flight crew can display the next STATUS page, if any, by releasing the pushbutton and pushing it again (before 2 s have elapsed). The new page then appears after a short delay.
- The flight crew can keep the STS pb pressed to display the STATUS page for a maximum of 3 min, after which the ECAM automatically displays the engine/warning page.

(5) CLR pb

This pushbutton remains lit as long as the E/WD is displaying a warning or caution message, or a status message on the SD.

If it is lit, pressing it changes the ECAM display.

(6) ALL pb

When this pushbutton is pressed and held down, the SD successively displays all the system pages at 3 s intervals.

If the ECAM control panel fails, the flight crew can use this pushbutton to page through the system pages until it reaches the desired page. The flight crew then releases the pushbutton to select that page.

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(7) EMER CANC pb

This pushbutton affects the following :

- Warnings :
 - Cancels (stops) an aural warning for as long as the failure condition continues
 - Extinguishes the MASTER WARNINGS lights
 - Does not affect the ECAM message display.
- Cautions :
 - Cancels any present caution (single chime, MASTER CAUTION lights, ECAM message) for the rest of the flight.

The flight crew can press the RCL pb for more than 3 s in order to restore all the alerts previously cancelled via the EMER CANC pb.

All the alerts previously cancelled via the EMER CANC pb automatically reappear on the E/WD in flight phase 1 or 2, immediately after the alignment of IRs 1 and 2.

- Note:
- *The EMER CANC pb should only be used to suppress spurious MASTER CAUTIONS*
 - *It is recommended to press the EMER CANC pb for at least 1 s in order to ensure that the alert is correctly cancelled.*

(8) T.O CONFIG pb

This pushbutton simulates the application of takeoff power. This is a test that triggers a warning, if the aircraft is not in takeoff configuration (see *Refer to Aircraft Systems/31-15 Configuration Warnings*).

If the configuration is correct, the E/WD displays the "TO CONFIG NORMAL" message in the TO MEMO section.

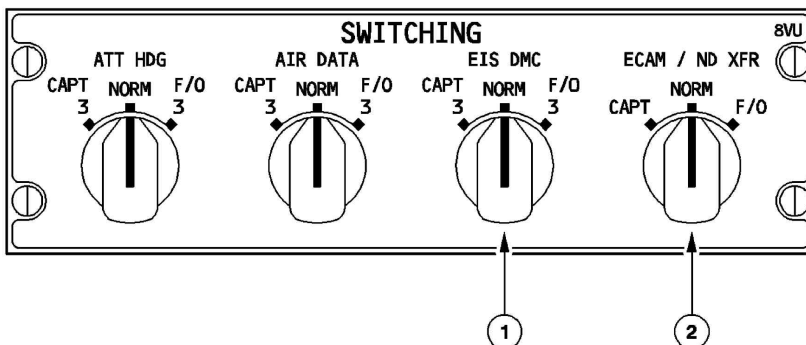
- Note: *If the ECAM control panel fails, the CLR, RCL, STS, EMER CANC, and ALL pushbuttons remain operative, because their contacts are directly wired to the flight warning and display management computers.*

SWITCHING PANEL

Ident.: DSC-31-30-00001230.0002001 / 17 MAR 11

Applicable to: ALL

ON PEDESTAL



(1) EIS DMC rotary selector

NORM : DMC 1 supplies the CAPT's PFD, the CAPT's ND, and the ECAM's DUs.
DMC 2 supplies the F/O's PFD and the F/O's ND.

CAPT 3 : DMC 3 replaces DMC 1.

F/O 3 : DMC 3 replaces DMC 2.

Note: If a DMC fails, each of its associated DUs displays an "INVALID DATA" message.

(2) ECAM/ND XFR rotary selector

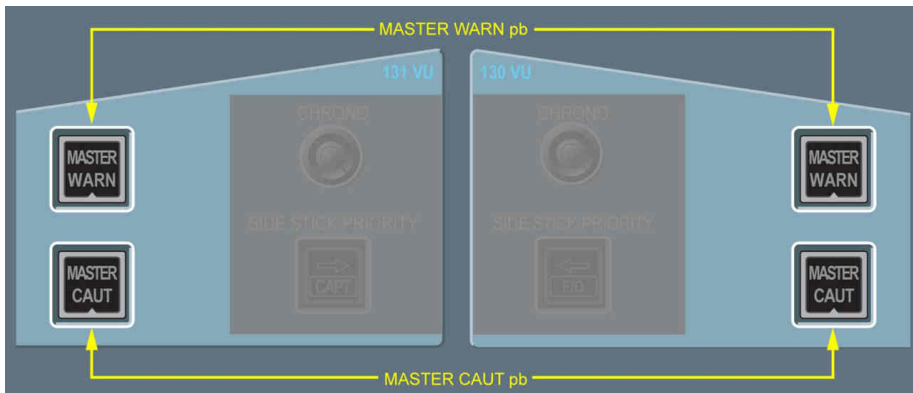
Transfers the system/status display to either the Captain's or the First Officer's ND.
The "ECAM ON ND" message is displayed on the lower ECAM display.

Note: If both ECAM DUs (E/WD and SD) fail, the flight crew may use this switch to transfer the E/WD display to either navigation display. In this case, the "ECAM ON ND" message is not displayed.

ATTENTION GETTERS

Ident.: DSC-31-30-00001231.0001001 / 13 MAY 25

Applicable to: ALL



MASTER WARN pb



- **MASTER WARN** flashes for a level 3 warning
- Associated with an aural warning (continuous repetitive chime, specific sounds or synthetic voice).

MASTER CAUT pb



- **MASTER CAUT** light steady for a level 2 caution
- Associated with a single chime.

These lights go off when:

- One of the flight crew presses the pb (except for some red warnings, such as the **OVERSPEED** and **STALL WARNING** alerts)
- The warning/caution situation is over
- The flight crew presses the CLR pb on the ECAM control panel (except for some red warnings, such as the **OVERSPEED** and **STALL WARNING** alerts)
- The flight crew presses the EMER CANC pb on the ECAM control panel.

AIRCRAFT SYSTEMS
INDICATING/RECORDING SYSTEMS

ECAM CONTROLS

The aural warnings stop when:

- One of the flight crew presses the **MASTER WARN** pb (except for some red warnings, such as the **OVERSPEED** and **STALL WARNING** alerts)
- The warning situation is over
- The flight crew presses the EMER CANC pb on the ECAM control panel.

MEMO DISPLAY

2 Ident.: DSC-31-30-00018053.0004001 / 18 NOV 21

Applicable to: MSN 07784-07792

- SWITCHG PNL** : This memo appears when one of the following is applicable:
- PFD/ND XFR pb is pressed and ECAM/ND XFR rotary selector is selected at CAPT or F/O simultaneously, or
 - EIS DMC rotary selector is selected at CAPT 3 or F/O 3.

MEMO DISPLAY

Ident.: DSC-31-30-00018053.0001001 / 18 NOV 21

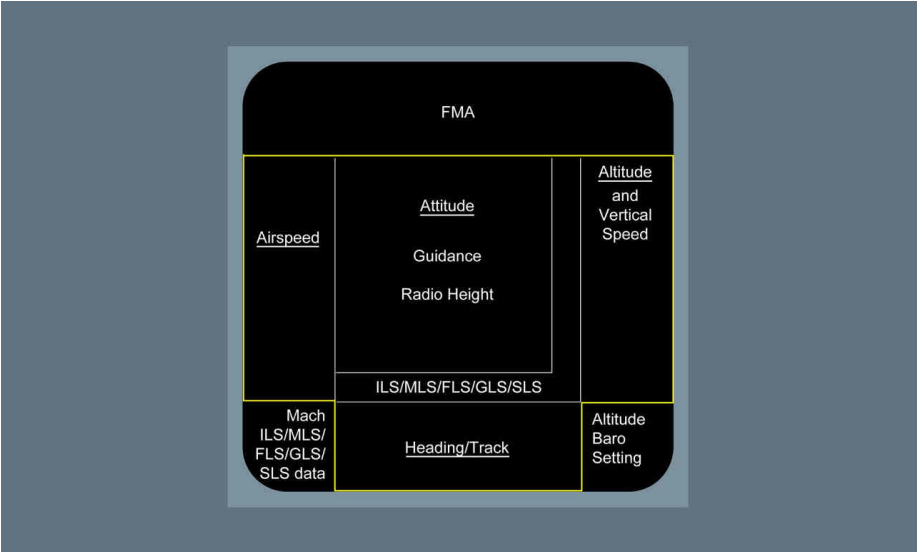
3 Applicable to: MSN 02155-05746

- SWITCHG PNL** : This memo appears when one of the following is applicable:
- PFD/ND XFR pb is pressed and ECAM/ND XFR rotary selector is selected at CAPT or F/O simultaneously, or
 - ATT HDG rotary selector is selected at CAPT 3 or F/O 3, or
 - AIR DATA rotary selector is selected at CAPT 3 or F/O 3, or
 - EIS DMC rotary selector is selected at CAPT 3 or F/O 3.

GENERAL

Ident.: DSC-31-40-00017531.0003001 / 12 MAY 22
Applicable to: ALL

- The PFD provides the following information to the flight crew:
- Attitude and guidance
 - Airspeed
 - Altitude (BARO and radio) and vertical speed
 - Heading and track
 - FMGS modes (FMA)
 - Vertical and lateral deviations
 - Radio navigation information (ILS, MLS  , FLS  , GLS  , SLS  , and DME).

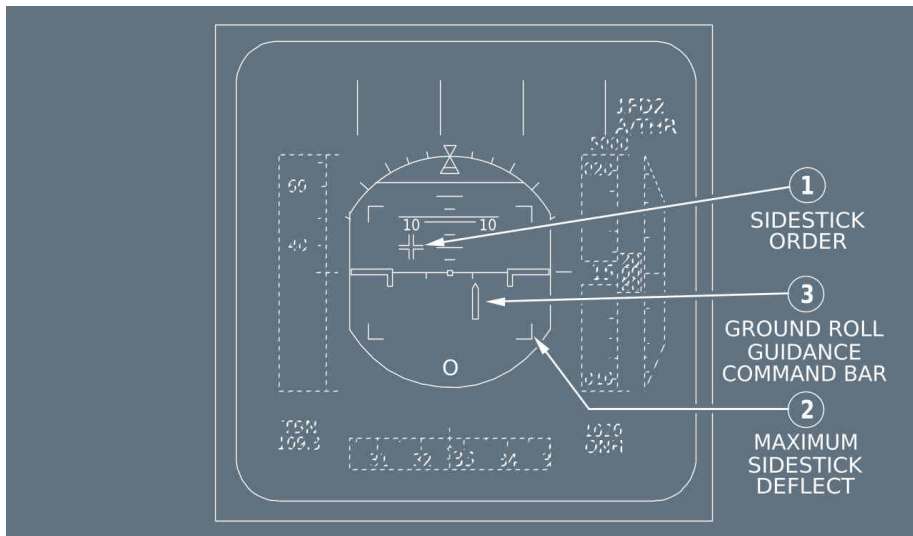


The FWC monitors main parameters such as attitude, heading, and altitude. For more information, Refer to DSC-31-40 Flags and Messages Displayed on PFD - Schematic.

SPECIFIC GROUND INDICATIONS

Ident.: DSC-31-40-00001233.0001001 / 13 JAN 14

Applicable to: **ALL**



(1) Sidestick order indication

This symbol is in white, and appears as soon as one engine is started.

It indicates the total of the Captain's and First Officer's sidestick orders (shown here as left wing down, pitch up).

(2) Max Sidestick Deflection

This symbol is in white, and appears as soon as one engine is started.

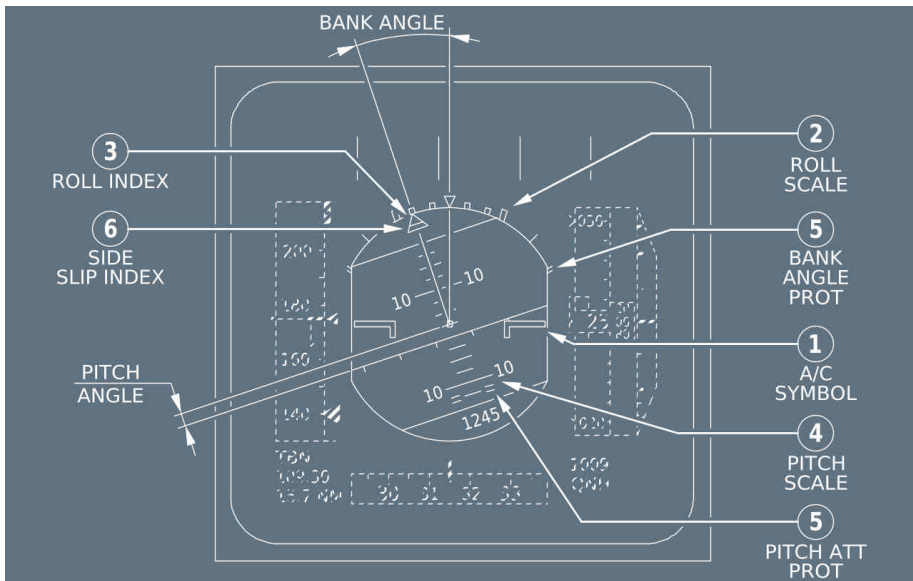
(3) Ground Roll Guidance Command Bar

This symbol is in green, and appears when the aircraft is on ground, or below 30 ft radio height, provided that a localizer signal is available. It indicates the Flight Director yaw orders, to maintain the aircraft on the runway centerline.

ATTITUDE DATA

Ident.: DSC-31-40-00001234.0003001 / 09 OCT 12

Applicable to: ALL



- (1) Fixed Aircraft Symbol
This symbol is in black, and outlined in yellow. The yellow outline is dimmed if the crew selects TRK-FPA, unless the FMA is in the TOGA or FLX mode.
- (2) Roll Scale
This scale is in white, and has markers at 0, 10, 20, 30, and 45 ° of bank.
- (3) Roll Index (yellow)
This pointer indicates the bank angle. When the bank angle exceeds 45 °, all the PFD symbols, except those for attitude, speed, heading, altitude, and vertical speed, disappear. The display returns to normal when the bank angle decreases below 40 °.
- (4) Pitch Scale (white)
This scale has markers every 10 ° between 80 ° nose up and 80 ° nose down (every 2.5 ° between 10 ° nose down and 30 ° nose up). When pitch angle exceeds 25 ° nose up or 13 ° nose down, all the PFD displays except attitude, speed, speed trend, heading, altitude, and vertical speed disappear. Beyond 30 °, large red arrowheads indicate that the attitude has

AIRCRAFT SYSTEMS

INDICATING/RECORDING SYSTEMS

INDICATIONS ON PFD

become excessive and show the direction to move the nose in order to reduce it. The display returns to normal when pitch angle becomes less than 22 ° nose up or 10 ° nose down.

(5) Flight Control Protection Symbols

The display shows these symbols (=) in green:

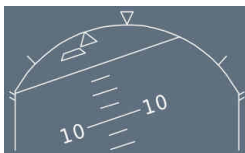
- On the roll scale to mark the bank angle protection availability.
- On the pitch scale at 15 ° nose down or 30 ° nose up to mark the pitch limits.

An amber x replaces these symbols if the corresponding protection is lost.

(Refer to DSC-27-20-10-20 Protections - General)

(6) Sideslip Index (yellow)

This trapezoidal index moves beneath the roll index. On ground, it represents the lateral acceleration of the aircraft. In flight, it shows sideslip (as computed by the FAC). One centimeter of displacement indicates 0.2 g. The sideslip index is against its stop at 0.3 g.



In case of engine failure at takeoff or go around, the sideslip index changes from yellow to blue.

Note: The sideslip target is blue, if:

- CONF 1, 2, or 3 is selected, and
- Any ENG N1 > 80 % or one Thrust Lever > MCT (≥ FLX if FLX or DERATED TO), and
- The difference between the ENG N1's exceeds 35 %.

In this case, the sideslip index is called β target.

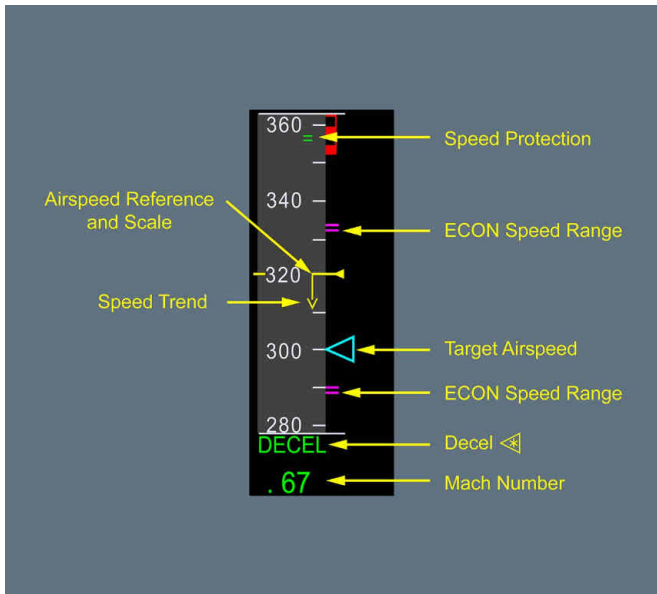
When this index is centered with the roll index, the sideslip equals the sideslip target for optimum aircraft performance.

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AIRSPEED

Ident.: DSC-31-40-00001235.0009001 / 03 MAY 21

Applicable to: ALL



ACTUAL AIRSPEED REFERENCE LINE AND SCALE

A white scale on a grey background moves in front of a fixed yellow reference line (next to a yellow triangle) to indicate airspeed. The minimum airspeed indication is 30 kt.

SPEED TREND

This pointer starts at the speed symbol. The tip indicates the speed that the aircraft will reach in 10 s if its acceleration remains constant. The pointer only appears when it is greater than 2 kt and disappears when it is less than 1 kt.

It also disappears if the FACs fail.

TARGET AIRSPEED

These symbols give the target airspeed or the airspeed corresponding to the target Mach number. The target airspeed is either computed by the FMGC in managed speed mode (magenta triangle) or I manually entered on the FCU in selected speed mode (blue triangle). The target speed is a magenta double bar (=) when associated with the ECON speed range.

When the target speed is off the speed scale, its value is displayed as numbers either above or below the speed scale.

MACH NUMBER

It is displayed when it is greater than M 0.5.

SPEED PROTECTION

This symbol indicates the speed (VMO +6 kt or MMO +0.01) at which overspeed protection becomes active (*Refer to DSC-27-20-10-20 Protections - General*).

ECON SPEED RANGE

In descent mode with the ECON/AUTO SPD mode active, these two thick lines replace the selected speed symbol. It shows the upper and lower limits calculated by the FMGC.

- The upper speed is the target speed +20 kt limited to VMAX or VMO -3 kt or MMO -0.006, whichever is the lowest.

If a speed limit or a speed constraint applies, the upper margin is limited to ECON SPD +5 kt.

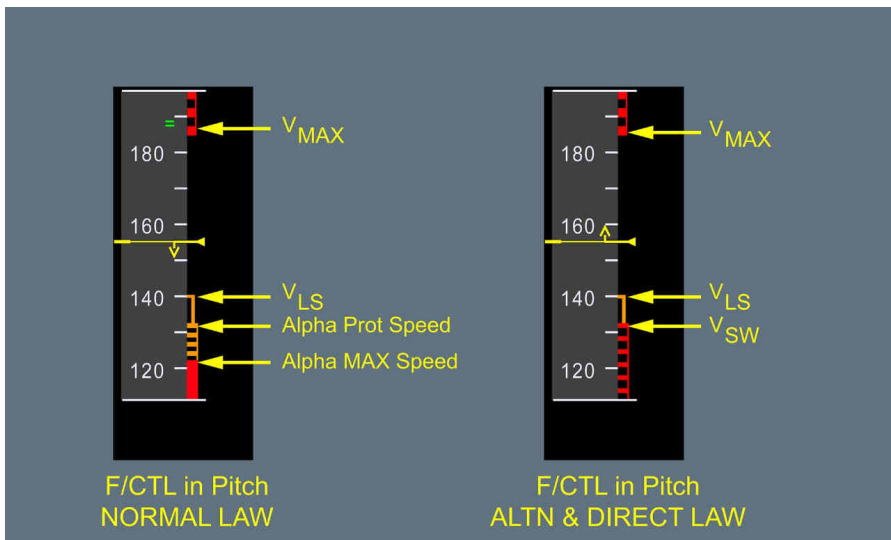
- The lower speed margin is the target speed -20 kt limited to green dot, F, S, or VLS, whichever is the highest.

DECEL

When the autobrake is active, the aircraft decelerates as selected via the AUTO BRK mode selector.

The **DECEL** message is displayed when the aircraft deceleration is at least 80 % of the selected deceleration. When the aircraft deceleration is less than 70 % of the selected deceleration, it disappears. The BSCU provides the **DECEL** information.

Note: *On a slippery runway, the A/SKID may be activated before the aircraft reaches 80 % of the deceleration. Therefore, the **DECEL** indication may not appear even if the autobrake is active.*



MINIMUM SELECTABLE SPEED (VLS)

The top of the amber strip along the speed scale indicates this speed. It represents the lowest selectable speed providing an appropriate margin to the stall speed.

VLS information is inhibited from touchdown until 10 s after liftoff.

ALPHA PROTECTION SPEED

The top of a black and amber strip along the speed scale indicates this speed.

It represents the speed corresponding to the angle of attack at which alpha protection becomes active (*Refer to DSC-27-20-10-20 Protections - General*).

It is displayed when in pitch normal law.

ALPHA MAX SPEED

The top of a red strip along the speed scale indicates this speed. It represents the speed corresponding to the maximum angle of attack that the aircraft can attain in pitch normal law (*Refer to DSC-27-20-10-20 Protections - General*).

It is displayed when in pitch normal law.

VMAX

The lower end of a red and black strip along the speed scale defines this speed.

It is the lowest of the following:

- VMO or the speed corresponding to MMO
- VLE
- VFE

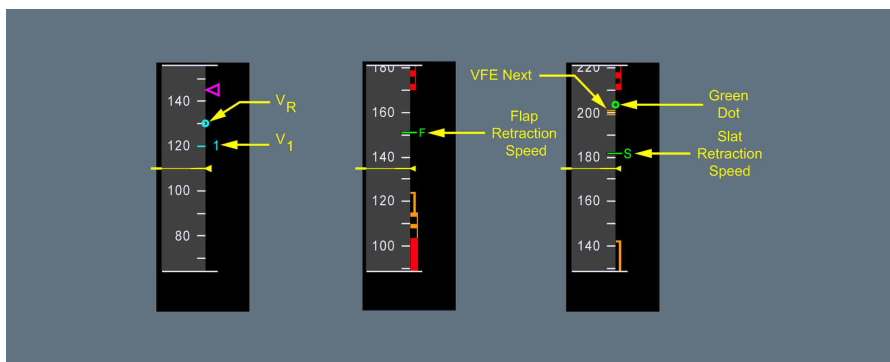
STALL WARNING SPEED (VSW)

The top of a red and black strip along the speed scale defines this speed.

It is the speed corresponding to the stall warning (*Refer to DSC-27-20-10-20 Protections - General*).

VSW information is inhibited from touchdown until 5 s after lift-off.

It is displayed when operating in pitch alternate or pitch direct law.



DECISION SPEED (V1)

This speed represented by the number (1) is manually inserted by the flight crew in the MCDU. When it is off the scale, the upper part of the scale shows it in numbers.

It disappears after lift-off (*Refer to DSC-22_10-50-50 Other Speeds*).

MINIMUM FLAP RETRACTION SPEED

This is represented by a **F**. It appears when the flap selector is in position 3 or 2.

MINIMUM SLAT RETRACTION SPEED

This is represented by a **S**. It appears when the flap selector is in position 1.

VFE NEXT

The VFE next symbol is an amber equal sign (=) showing the VFE corresponding to the next flap lever position.

It appears when the aircraft altitude is below 15 000 ft or 20 000 ft depending upon the FAC standard (*Refer to DSC-22_10-50-30 Limit Speeds*).

GREEN DOT (ENGINE-OUT OPERATING SPEED IN CLEAN CONFIGURATION)

This green dot appears when the aircraft is flying in clean configuration.
It shows the speed corresponding to the best lift-to-drag ratio.

ROTATION SPEED (VR)

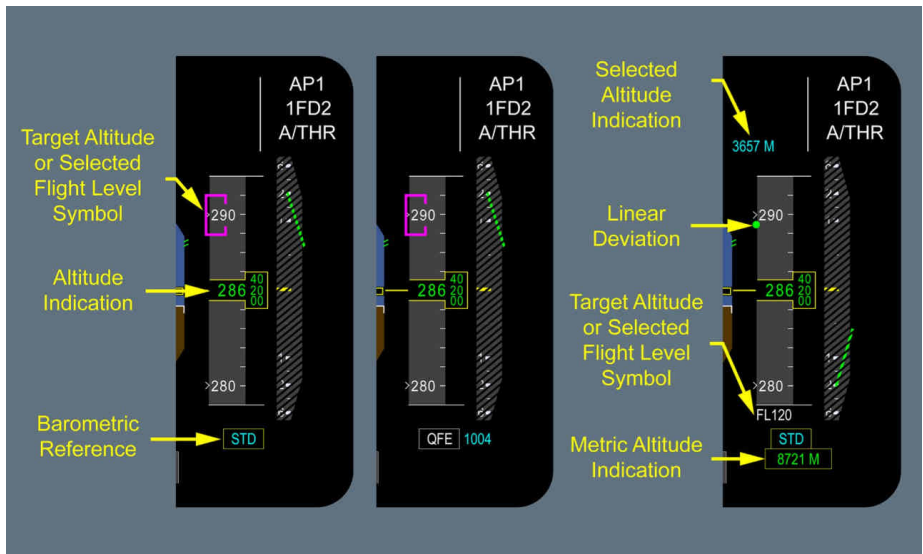
VR is entered on the PERF takeoff page of the MCDU and is indicated by a cyan circle (o).
This cyan circle is visible during takeoff.

Note: 1. V2 is represented by the target speed index during takeoff.
2. V2 is manually inserted by the flight crew via the MCDU.

ALTITUDE

Ident.: DSC-31-40-00001237.0076001 / 06 NOV 25

Applicable to: MSN 02155-02212



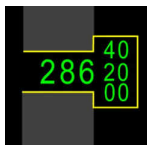
1 ALTITUDE INDICATION

The altitude indication appears both as a white moving scale and as a green digital readout on grey background. Small white marks are positioned on the scale against the round values (e.g. 280, 290,...).

AIRCRAFT SYSTEMS

INDICATING/RECORDING SYSTEMS

INDICATIONS ON PFD

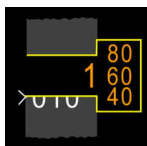


The altitude window is displayed in yellow when the difference between the current altitude and the selected altitude is less than 200 ft.

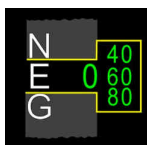
The altitude window flashes in yellow when the difference between the current altitude and the selected altitude exceeds 200 ft but decreases.

The altitude window flashes in amber when the difference between the current altitude and the selected altitude exceeds 200 ft and increases.

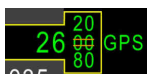
Refer to DSC-31-40 Altitude Alert.



The current altitude is below the MDA (or the MDH) entered in the FMS.



The current altitude is negative.

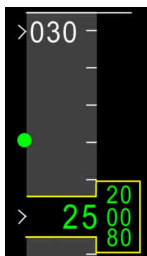


The current altitude is provided by the GPS and no longer by the ADR.

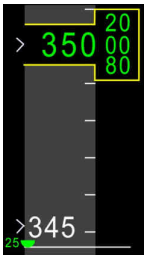
LINEAR DEVIATION

The linear deviation is the difference between the current altitude of the aircraft and the theoretical vertical profile of the FMS.

The linear deviation appears from the top of descent down to the MAP altitude.



When the linear deviation is less than 540 ft, the linear deviation symbol is a green filled circle, located at the theoretical FMS altitude.



When the linear deviation exceeds 540 ft, the vertical deviation symbol is a green half filled circle, located at the altitude scale limits. In this case, it is associated with the numerical value displayed on two digits, in hundreds of feet. The PROG page displays the exact value.

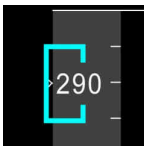
TARGET ALTITUDE OR SELECTED FLIGHT LEVEL SYMBOL

This symbol shows the FCU selected altitude (if QNH or QFE BARO reference is selected) or the selected flight level (if STD BARO reference is selected).



Indicates the selected altitude when the vertical guidance is either selected or managed.

The altitude target is outside the altitude scale.



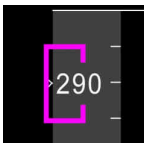
Indicates the selected altitude when the vertical guidance is either selected or managed.

The altitude target is within the altitude scale.



Indicates an altitude constraint when the vertical guidance is managed.

The altitude constraint is outside the altitude scale.



Indicates an altitude constraint when the vertical guidance is managed.

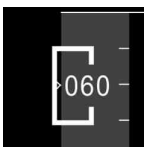
The altitude constraint is within the altitude scale.



Indicates the selected altitude when a vertical approach mode is engaged.

Note: The aircraft disregards this altitude target when a vertical approach mode is engaged.

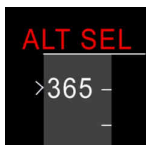
The altitude target is outside the altitude scale.



Indicates the selected altitude when a vertical approach mode is engaged.

Note: The aircraft disregards this altitude target when a vertical approach mode is engaged.

The altitude target is within the altitude scale.



Temporarily flashes then remains steady on the top of the altitude scale when the selected altitude from FCU or the altitude constraint from FMS is not valid.

BAROMETRIC REFERENCE



The flight crew selects the QNH pressure reference in hectopascal on the barometric reference knob of the EFIS CP.



The flight crew selects the QNH pressure reference in inches of mercury on the barometric reference knob of the EFIS CP.



The flight crew selects the QFE pressure reference in hectopascal on the barometric reference knob of the EFIS CP.



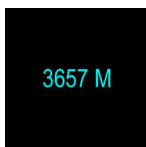
The flight crew selects the QFE pressure reference in inches of mercury on the barometric reference knob of the EFIS CP.



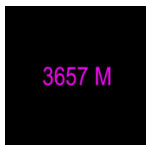
The flight crew selects the standard pressure reference on the barometric reference knob of the EFIS CP.

This indication flashes when the selection made by the flight crew is not correct (STD not selected above transition altitude in climb or STD still selected in approach below transition level).

SELECTED ALTITUDE INDICATION

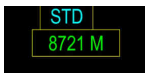


Indicates the altitude selected on the FCU in meters.



Indicates that the altitude selected on the FCU is controlled by the FMGC.

METRIC ALTITUDE INDICATION

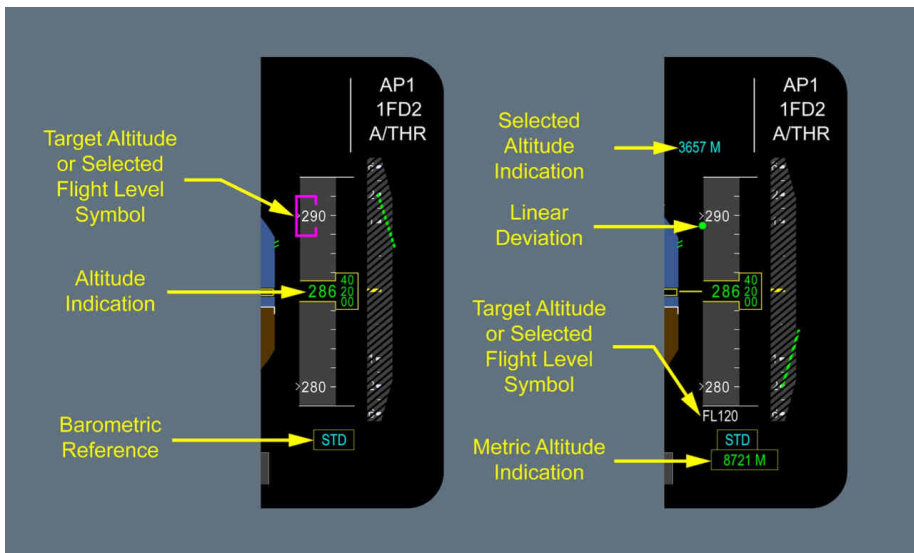


Indicates the current altitude in meters.

ALTITUDE

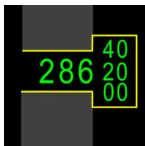
Ident.: DSC-31-40-00001237.0075001 / 06 NOV 25

Applicable to: MSN 02719-03060



2 ALTITUDE INDICATION

The altitude indication appears both as a white moving scale and as a green digital readout on grey background. Small white marks are positioned on the scale against the round values (e.g. 280, 290,...).



The altitude window is displayed in yellow when the difference between the current altitude and the selected altitude is less than 200 ft.

The altitude window pulses in yellow when the difference between the current altitude and the selected altitude exceeds 200 ft but decreases.

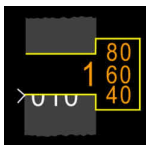
The altitude window flashes in amber when the difference between the current altitude and the selected altitude exceeds 200 ft and increases.

Refer to DSC-31-40 Altitude Alert.

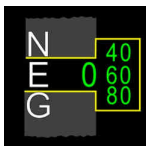
AIRCRAFT SYSTEMS

INDICATING/RECORDING SYSTEMS

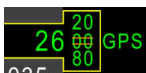
INDICATIONS ON PFD



The current altitude is below the MDA (or the MDH) entered in the FMS.



The current altitude is negative.

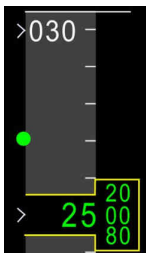


The current altitude is provided by the GPS and no longer by the ADR.

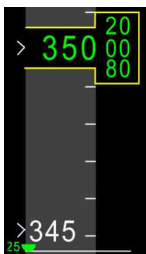
LINEAR DEVIATION

The linear deviation is the difference between the current altitude of the aircraft and the theoretical vertical profile of the FMS.

The linear deviation appears from the top of descent down to the MAP altitude.



When the linear deviation is less than 540 ft, the linear deviation symbol is a green filled circle, located at the theoretical FMS altitude.



When the linear deviation exceeds 540 ft, the vertical deviation symbol is a green half filled circle, located at the altitude scale limits. In this case, it is associated with the numerical value displayed on two digits, in hundreds of feet. The MCDU PROG page displays the exact value.

TARGET ALTITUDE OR SELECTED FLIGHT LEVEL SYMBOL

This symbol shows the FCU selected altitude (if QNH BARO reference is selected) or the selected flight level (if STD BARO reference is selected).

AIRCRAFT SYSTEMS

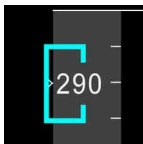
INDICATING/RECORDING SYSTEMS

INDICATIONS ON PFD



Indicates the selected altitude when the vertical guidance is either selected or managed.

The altitude target is outside the altitude scale.



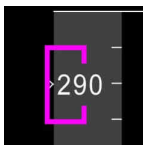
Indicates the selected altitude when the vertical guidance is either selected or managed.

The altitude target is within the altitude scale.



Indicates an altitude constraint when the vertical guidance is managed.

The altitude constraint is outside the altitude scale.



Indicates an altitude constraint when the vertical guidance is managed.

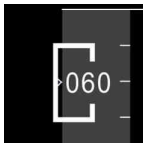
The altitude constraint is within the altitude scale.



Indicates the selected altitude when a vertical approach mode is engaged.

Note: The aircraft disregards this altitude target when a vertical approach mode is engaged.

The altitude target is outside the altitude scale.



Indicates the selected altitude when a vertical approach mode is engaged.

Note: The aircraft disregards this altitude target when a vertical approach mode is engaged.

The altitude target is within the altitude scale.



Temporarily flashes then remains steady on the top of the altitude scale when the selected altitude from FCU or the altitude constraint from FMS is not valid.

BAROMETRIC REFERENCE



The flight crew selects the QNH pressure reference in hectopascal on the barometric reference knob of the EFIS CP.



The flight crew selects the QNH pressure reference in inches of mercury on the barometric reference knob of the EFIS CP.

AIRCRAFT SYSTEMS

INDICATING/RECORDING SYSTEMS

INDICATIONS ON PFD



STD

The flight crew selects the standard pressure reference on the barometric reference knob of the EFIS CP.

This indication pulses when the selection made by the flight crew is not correct (STD not selected above transition altitude in climb or STD still selected in approach below transition level).

SELECTED ALTITUDE INDICATION



3657 M

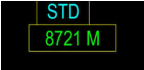
Indicates the altitude selected on the FCU in meters.



3657 M

Indicates that the altitude selected on the FCU is controlled by the FMGC.

METRIC ALTITUDE INDICATION



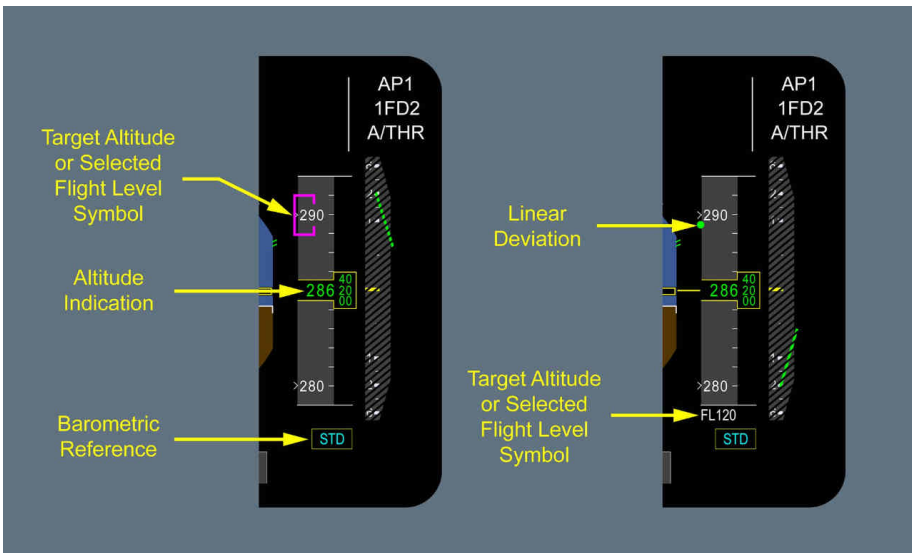
STD
8721 M

Indicates the current altitude in meters.

ALTITUDE

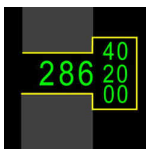
Ident.: DSC-31-40-00001237.0064001 / 06 NOV 25

Applicable to: MSN 04392-07792

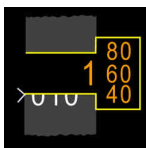


3 ALTITUDE INDICATION

The altitude indication appears both as a white moving scale and as a green digital readout on grey background. Small white marks are positioned on the scale against the round values (e.g. 280, 290,...).



The altitude window is displayed in yellow when the difference between the current altitude and the selected altitude is less than 200 ft.
The altitude window pulses in yellow when the difference between the current altitude and the selected altitude exceeds 200 ft but decreases.
The altitude window flashes in amber when the difference between the current altitude and the selected altitude exceeds 200 ft and increases.
Refer to DSC-31-40 Altitude Alert.

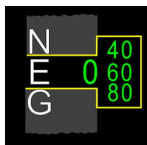


The current altitude is below the MDA (or the MDH) entered in the FMS.

AIRCRAFT SYSTEMS

INDICATING/RECORDING SYSTEMS

INDICATIONS ON PFD



The current altitude is negative.

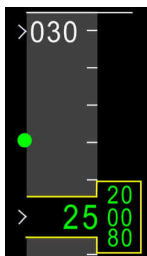


The current altitude is provided by the GPS and no longer by the ADR.

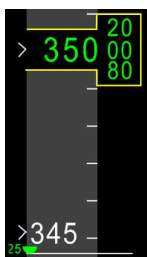
LINEAR DEVIATION

The linear deviation is the difference between the current altitude of the aircraft and the theoretical vertical profile of the FMS.

The linear deviation appears from the top of descent down to the MAP altitude.



When the linear deviation is less than 540 ft, the linear deviation symbol is a green filled circle, located at the theoretical FMS altitude.



When the linear deviation exceeds 540 ft, the vertical deviation symbol is a green half filled circle, located at the altitude scale limits. In this case, it is associated with the numerical value displayed on two digits, in hundreds of feet. The MCDU PROG page displays the exact value.

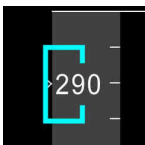
TARGET ALTITUDE OR SELECTED FLIGHT LEVEL SYMBOL

This symbol shows the FCU selected altitude (if QNH BARO reference is selected) or the selected flight level (if STD BARO reference is selected).



Indicates the selected altitude when the vertical guidance is either selected or managed.

The altitude target is outside the altitude scale.



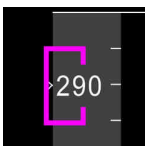
Indicates the selected altitude when the vertical guidance is either selected or managed.

The altitude target is within the altitude scale.



Indicates an altitude constraint when the vertical guidance is managed.

The altitude constraint is outside the altitude scale.



Indicates an altitude constraint when the vertical guidance is managed.

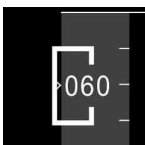
The altitude constraint is within the altitude scale.



Indicates the selected altitude when a vertical approach mode is engaged.

Note: The aircraft disregards this altitude target when a vertical approach mode is engaged.

The altitude target is outside the altitude scale.



Indicates the selected altitude when a vertical approach mode is engaged.

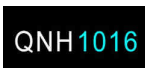
Note: The aircraft disregards this altitude target when a vertical approach mode is engaged.

The altitude target is within the altitude scale.



Temporarily flashes then remains steady on the top of the altitude scale when the selected altitude from FCU or the altitude constraint from FMS is not valid.

BAROMETRIC REFERENCE



The flight crew selects the QNH pressure reference in hectoPascals on the barometric reference knob of the EFIS CP.



The flight crew selects the QNH pressure reference in inches of mercury on the barometric reference knob of the EFIS CP.

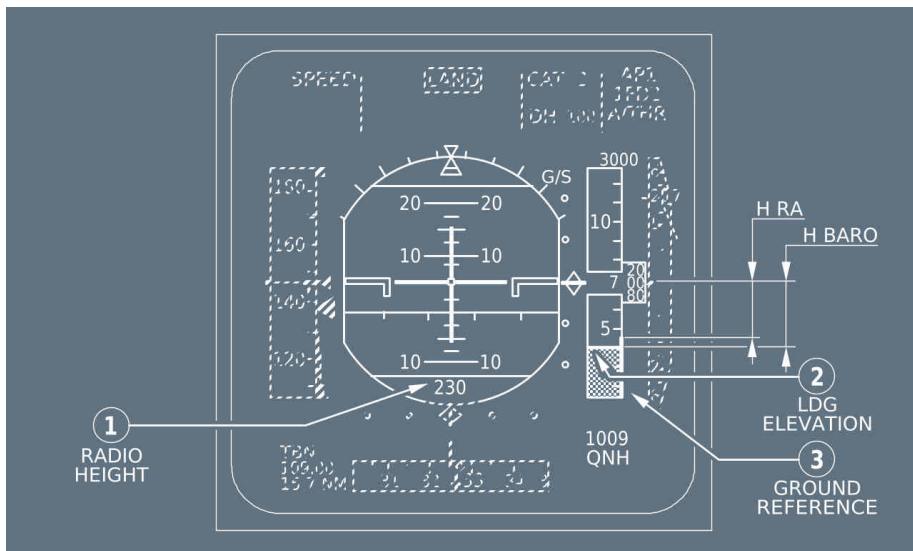


The flight crew selects the standard pressure reference on the barometric reference knob of the EFIS CP.

This indication pulses when the selection made by the flight crew is not correct (STD not selected above transition altitude in climb or STD still selected in approach below transition level).

ALTITUDE (CONT'D)

Ident.: DSC-31-40-00006121.0002001 / 13 JAN 14

 Applicable to: **ALL**

(1) Radio Height

A value appears, when the aircraft is lower than 2 500 ft.

- If a DH has been entered, the radio height appears:

- In green, when $DH + 100 \text{ ft} < RA < 2\,500 \text{ ft}$
- In amber, when $RA < DH + 100 \text{ ft}$

If "NO" is entered as the DH on the MCDU APPROACH page, 0 ft becomes a default value.

When the aircraft reaches the decision height selected on the MCDU, DH letters flash amber for 9 s, then remain amber above the radio height indication.

- If no DH has been entered, or if both FMGCs fail, the radio height appears:

- In green, when $400 \text{ ft} < RA < 2\,500 \text{ ft}$
- In amber, when $RA \leq 400 \text{ ft}$

The radio height indication changes every 10 ft down to 50 ft, then every 5 ft down to 10 ft, then every foot.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS INDICATING/RECORDING SYSTEMS INDICATIONS ON PFD
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(2) Landing Elevation (brown)

The top of the brown surface on the altitude scale represents the landing elevation at the flight-planned destination.

It is displayed:

- during flight phases 7 and 8 and
- if the STD reference mode is not selected.

(3) Ground reference

A red ribbon on the right of the altitude scale represents the field elevation. This ribbon, which is driven by the radio altimeter signal, is displayed below 570 ft.

It moves up, as does the lower line of the attitude sphere, with the altitude scale as the aircraft descends. When the aircraft has touched down, the top of this ribbon is at the middle of the altitude window.

VERTICAL SPEED

Ident.: DSC-31-40-00001239.0002001 / 21 MAR 17

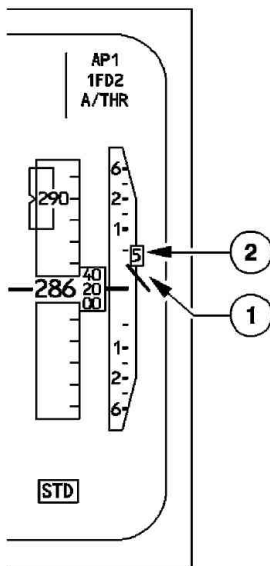
Applicable to: ALL

The displayed vertical speed information is normally based on both inertial and barometric data. If inertial data is not available, it is automatically replaced by barometric information. In this case, the window around the numerical value becomes amber.

AIRCRAFT SYSTEMS

INDICATING/RECORDING SYSTEMS

INDICATIONS ON PFD



(1) Analog pointer

This pointer, which is normally in green, points to a white vertical speed scale, displayed on a grey background and graduated at intervals of 500 ft/min.

If the V/S is greater than 6 000 ft/min, the pointer stays at the end of the scale.

(2) Digital indication

This number, normally in green, is the vertical speed in hundreds of feet per minute.

It disappears, if the vertical speed is less than 200 ft/min.

The analog pointer and the digital indication become amber, if:

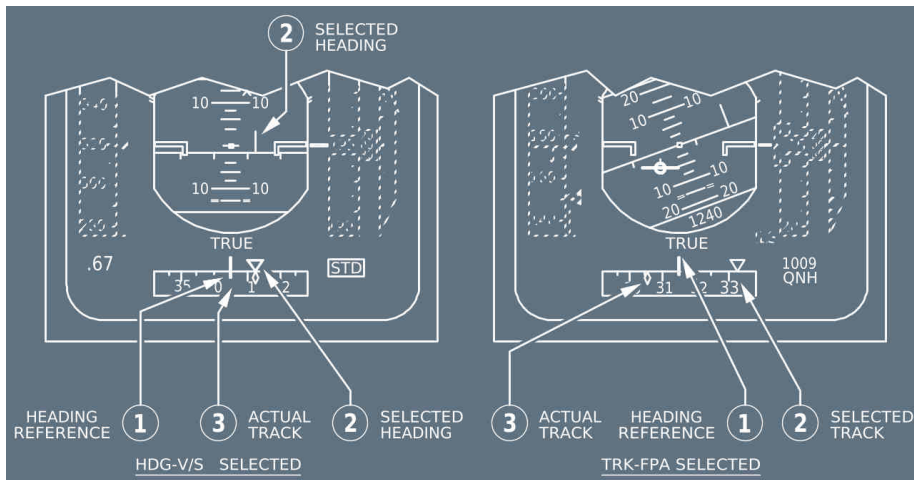
- V/S is greater than 6 000 ft/min, (climb or descent)
- V/S is greater than 2 000 ft/min, during descent when 1 000 ft < RA < 2 500 ft, or
- V/S is greater than 1 200 ft/min, during descent and RA < 1 000 ft.

Note: For TCAS, Refer to DSC-34-SURV-60-20 Messages on ND.

HEADING

Ident.: DSC-31-40-00001240.0002001 / 07 MAY 13

Applicable to: ALL



(1) Heading Reference Line and Scale

A white scale on a grey background moves in front of a fixed yellow reference line to indicate the actual magnetic heading.

“TRUE” appears, when the display indicates the true heading, rather than the magnetic heading (latitude above 73 ° North or below 60 ° South).

(2) Selected Heading or Track Index (blue)

This pointer is in blue, and indicates the heading or track displayed on the FCU HDG-TRK window.

The index is replaced by digits on the right or left side of the scale, when the selected value is off the scale.

If the FD pushbutton is OFF, a second heading/track symbol appears on the horizon line, and markers are displayed every 10 °.

(3) Actual Track Symbol

This symbol is a small green diamond.

AIRCRAFT SYSTEMS
INDICATING/RECORDING SYSTEMS

INDICATIONS ON PFD

FLIGHT PATH VECTOR

Ident.: DSC-31-40-00001241.0001001 / 17 MAY 21

Applicable to: ALL

The Flight Path Vector (FPV) is the flight reference with the TRK and FPA as basic guidance parameters. When the TRK/FPA is selected on the FCU, the FPV appears on the PFD.

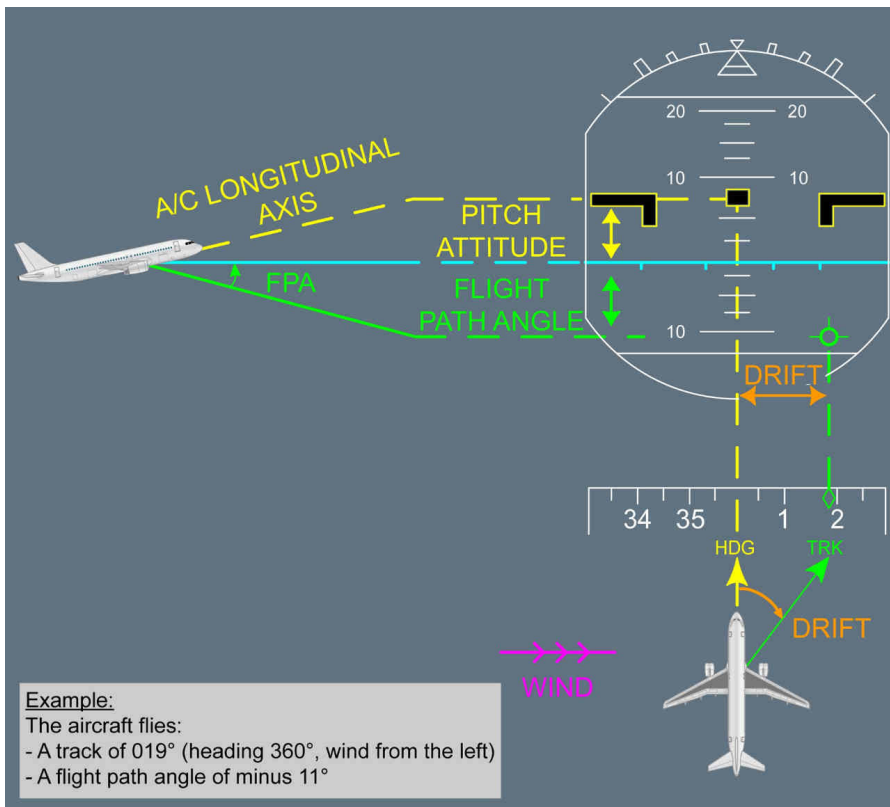
INFORMATION PRESENTATION

The FPV appears on the PFD as a symbol, known as the "bird". The bird indicates the track and flight path angle in relation to the ground.

The track is indicated on the PFD by a green diamond on the compass, in addition to the lateral movement of the bird in relation to the fixed aircraft symbol. On the ND, the track is indicated by a green diamond on the compass scale. The difference in angle between track and heading indicates the drift.

The flight path angle is indicated on the PFD by the vertical movement of the bird in relation to the pitch scale.

With the flight directors (FD) ON, the Flight Path Director (FPD) replaces the HDG-VS Flight Director (FD). With both FD pb set to OFF, the blue track index appears on the PFD horizon.



FLIGHT PATH VECTOR (FPV)



The FPV appears, when the pilot selects TRK/FPA on the FCU.

The flight path vector represents the lateral and vertical trajectory of the aircraft with respect to the ground.

- On the lateral scale, it indicates the aircraft's track.
- On the vertical scale, it indicates the aircraft's flight path angle.

USE OF FPV

The bird is the flying reference that should be used when flying a stabilized segment of trajectory, e.g.: non-precision approach when the FLS function  is not used or visual circuit.

AIRCRAFT SYSTEMS
INDICATING/RECORDING SYSTEMS

INDICATIONS ON PFD

In dynamic manoeuvres, the bird is directly affected by the aircraft inertia and has a delayed reaction. As a result, the bird should not be used as a flight reference in dynamic manoeuvres.

Refer to FCTM/AS-BIRD Introduction for more information.

GUIDANCE

Ident.: DSC-31-40-00001242.0001001 / 13 JAN 14

Applicable to: ALL

Two completely different flight director modes are available, each with its own characteristic symbols. The symbol displayed corresponds to the basic operating reference the pilot has selected – either HDG V/S or TRK FPA.

In normal operation, PFD1 displays FD1 orders.

If FD1 fails, PFD1 automatically displays FD2 orders on PFD1, the FD2 indication in the right column of the FMA flashes for a few seconds.

This is also applicable to FD2 orders, that are displayed on PFD2.

IF THE CREW HAS SELECTED HDG V/S TO BE THE BASIC REFERENCE:

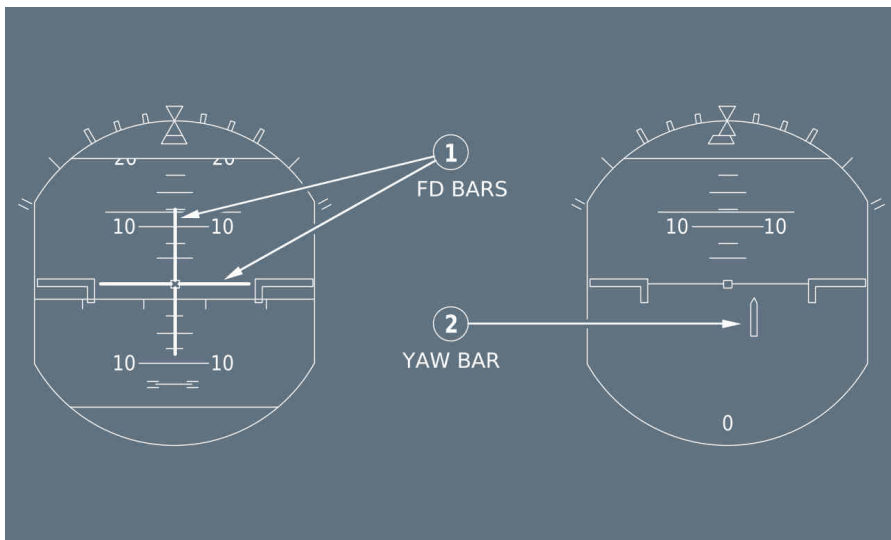
The PFD displays FD bars in green. They automatically move out of view at touchdown in ROLL OUT mode.

They flash for 10 s, and then remain steady, if the following occur:

- A reversion to the HDG V/S basic mode (manual or automatic), or
- The selected flight level is changed, when ALT CAPTURE mode is engaged, or
- The loss of LOC or G/S in LAND mode or loss of LAND mode, or
- At the first AP or FD engagement.

The PFD displays a yaw bar in green below 30 ft radio height, if a localizer signal is available:

- During takeoff (in RWY mode)
- Upon landing (in FLARE and ROLL OUT mode).



(1) FD Crossed Bars (green)

(2) Yaw Bar (green)

THE CREW HAS SELECTED TRK FPA AS THE BASIC REFERENCE:

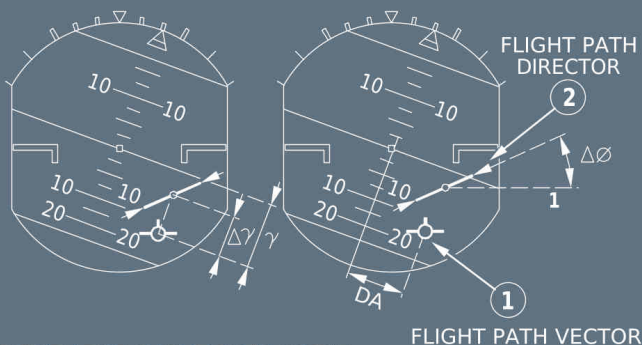
An inertial flight path vector defines the aircraft's horizontal and vertical track, taking wind effect into account.

An associated flight path director symbol guides the flight crew onto the vertical and horizontal flight path targets.

AIRCRAFT SYSTEMS

INDICATING/RECORDING SYSTEMS

INDICATIONS ON PFD



- γ REPRESENTS THE FLIGHT PATH ANGLE
- DA REPRESENTS THE DRIFT ANGLE
- $\Delta\gamma$ REPRESENTS THE DIFFERENCE BETWEEN THE ORDERED FLIGHT PATH ANGLE AND THE ACTUAL ONE
- $\Delta\emptyset$ REPRESENTS THE DIFFERENCE BETWEEN THE ORDERED ROLL ANGLE AND THE ACTUAL ONE

- (1) Flight Path Vector (green)
- (2) Flight Path Director (green)

TRAJECTORY DEVIATION

Applicable to: ALL

Ident.: DSC-31-40-A-00017532.0001001 / 12 NOV 24

ILS / GLS / MLS / SLS GUIDANCE MODE



LOCALIZER DEVIATION SCALE AND INDEX

Localizer Deviation Scale and Index

GLIDE SLOPE DEVIATION SCALE AND INDEX

Deviation scales appear as soon as the flight crew presses an LS/ILS pb on the EFIS control panel. Deviation indexes appear when the glide slope and localizer signals of the ILS / GLS  / SLS  (or the elevation and azimuth signals of the MLS ) are valid, if deviation scales are displayed.

When a deviation index is out of the displayed range, only half a symbol appears at the end of the scale.

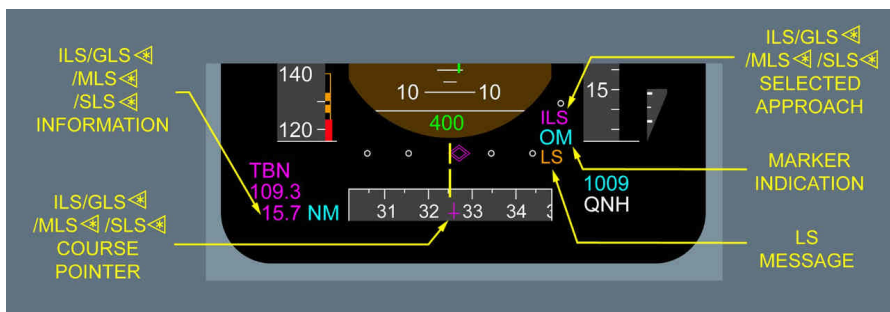
The LOC scale flashes and continues to flash if the deviation exceeds 1/4 dot for two seconds while the aircraft is between 15 ft and 1 000 ft, and CAT2 or CAT3 capability displayed on the FMA, and either LOC, LAND, or FLARE is engaged. The glideslope scale flashes and continues to flash if the deviation exceeds one dot for two seconds (above 100 ft RA).

LOC and the glideslope scale half index symbol flash, and continue to flash, when the deviation exceeds two dots for two seconds.

One dot represents a deviation of $\pm 0.8^\circ$ on the localizer scale, and $\pm 0.4^\circ$ on the glideslope scale.

Ident.: DSC-31-40-A-00017533.0004001 / 12 MAY 23

ILS / GLS / MLS / SLS APPROACH (CONT'D)



ILS / GLS / MLS / SLS INFORMATION

The following information appears on the PFD, when the flight crew has selected an ILS frequency / GLS channel / MLS channel / SLS channel and course, and pressed the the LS pb

- ILS / GLS / MLS / SLS identification, as decoded by the MMR
- ILS frequency / GLS channel / MLS channel / SLS channel
- For ILS / MLS: DME distance, if the ILS / MLS has a DME
- For GLS / SLS: distance to runway threshold computed by the MMR.

ILS / GLS / MLS / SLS COURSE POINTER

The pointer appears on the PFD, when the flight crew has selected an ILS frequency / GLS channel / MLS channel / SLS channel and course, and pressed the LS pb.

It is a dagger-shaped symbol on the heading scale.

The ILS / GLS / MLS / SLS course pointer is replaced by digits on the right or left hand of the heading scale, when the ILS / GLS / MLS / SLS course value is outside the displayed portion of the heading scale.

MARKER INDICATIONS

OM appears, when the aircraft flies over the outer marker.

MM appears, when the aircraft flies over the middle marker.

IM appears, when the aircraft flies over an airways marker beacon or the ILS / GLS inner marker.

LS MESSAGE

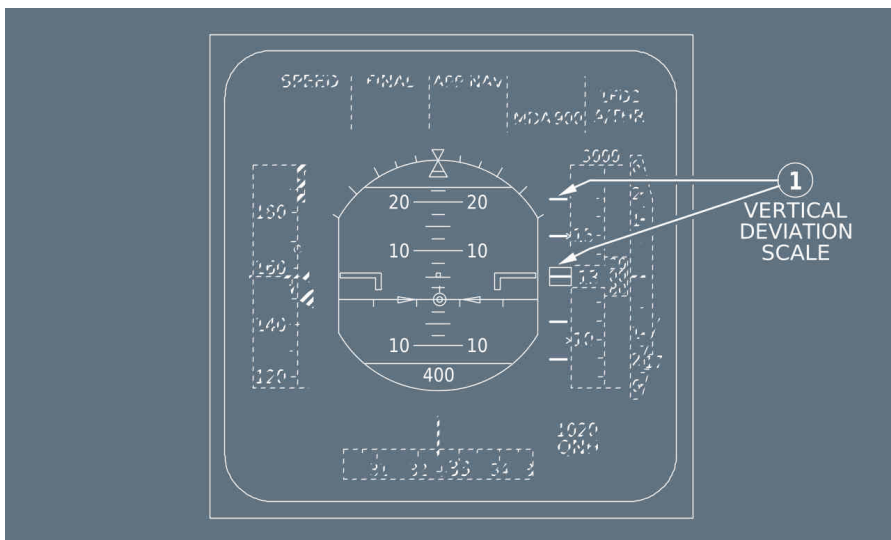
LS flashes, when the APPR mode is armed, but the LS pb is not selected.

SELECTED APPROACH

The ILS / GLS  / MLS  / SLS  indication is displayed according to the approach selected by the flight crew.

Ident.: DSC-31-40-A-00001245.0022001 / 09 OCT 12

NON PRECISION APPROACH



(1) Vertical Deviation Scale and Index

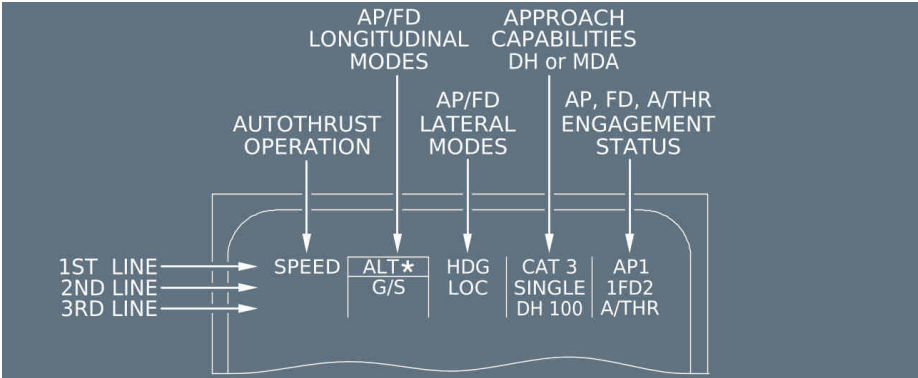
These symbols appear when in the approach phase and, when either FINAL is armed/engaged or a non-LS approach has been entered. They are displayed in the approach or go-around phase, until the MDA has been reached, or the MAP or the runway has been sequenced. They give the vertical deviation from the trajectory defined by the FMGC. Each index scale graduation represents 100 ft. The range is ± 200 ft.

Note: *If the LS pb is pressed, glide deviation has priority over vertical deviation information. As long as VDEV display conditions are met, and the LS pb is selected, an amber VDEV message flashes above the glide scale.*

FLIGHT MODE ANNUNCIATOR

Ident.: DSC-31-40-00001246.0002001 / 18 MAY 22

Applicable to: ALL

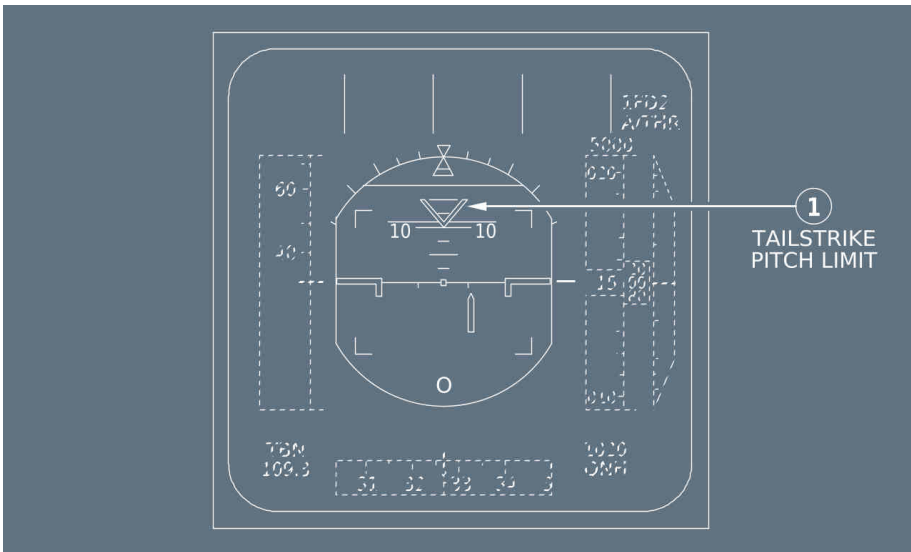


For a detailed discussion of legends and messages that may appear during FMGS operations, see FLIGHT GUIDANCE chapter (Refer to DSC-22_30-80-20 FMA Display).

TAILSTRIKE PITCH LIMIT

Ident.: DSC-31-40-00017534.0003001 / 21 MAR 16

Applicable to: ALL



(1) Tailstrike Pitch Limit

The pitch limit indicates the maximum pitch attitude to avoid the tailstrike risk at landing. The indication is a fixed value corresponding to the main landing gear compressed. The indication appears at 400 ft radio height. The indication disappears, when there is no longer a risk of tailstrike.

ALTITUDE ALERT

Ident.: DSC-31-40-00001247.0002001 / 22 MAY 12

Applicable to: MSN 02155-05746

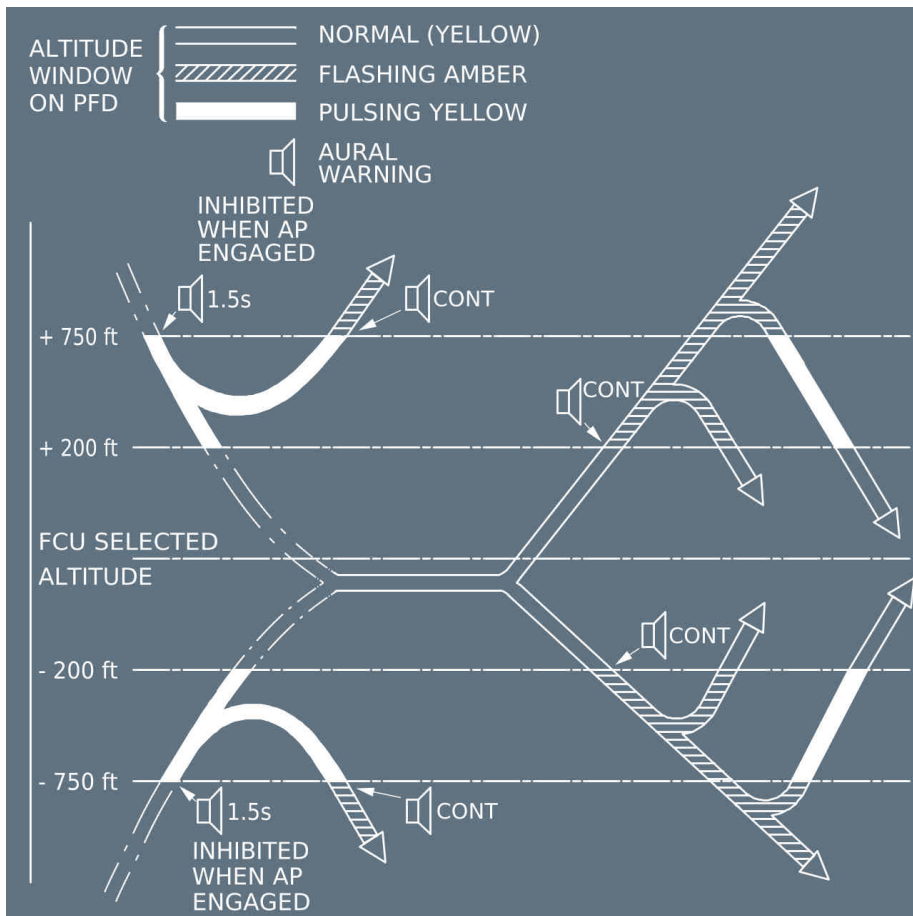
The FWC generates an altitude warning (C chord sound and PFD's altitude window pulses in yellow or flashes in amber), when the aircraft approaches a preselected altitude or flight level, or when it deviates from its selected altitude or flight level.

This warning results from a comparison between the altitude (ADIRS) and the preselected altitude displayed on FCU.

AIRCRAFT SYSTEMS

INDICATING/RECORDING SYSTEMS

INDICATIONS ON PFD



- Selecting a new altitude, or pushing the ECAM's EMER CANC pushbutton, or pressing either MASTER WARN pushbutton, cancels the continuous C chord.
- Selecting a new altitude stops the flashing of the altitude window.
- The altitude alert is inhibited:
 - When the slats are out, with the landing gear is selected down, or
 - In approach after the aircraft captures the glideslope, or
 - When the landing gear is locked down.

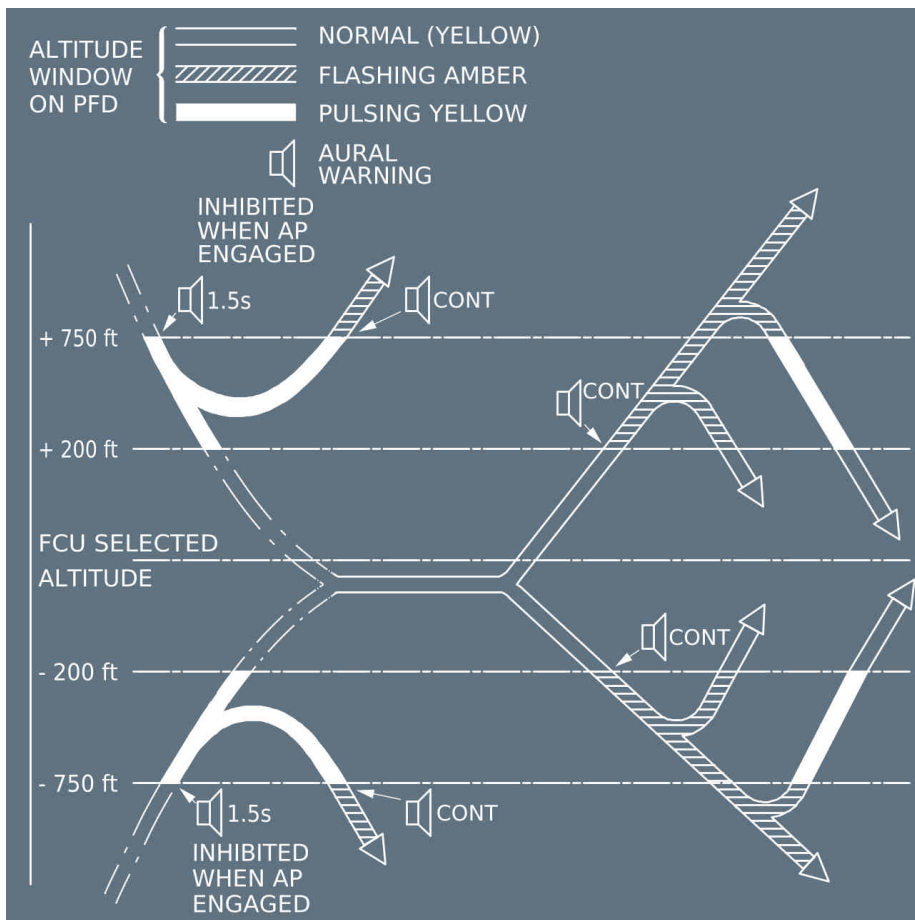
ALTITUDE ALERT

Ident.: DSC-31-40-00001247.0003001 / 22 MAY 12

Applicable to: MSN 07784-07792

The FWC generates an altitude warning (C chord sound and PFD's altitude window pulses in yellow or flashes in amber), when the aircraft approaches a preselected altitude or flight level, or when it deviates from its selected altitude or flight level.

This warning results from a comparison between the altitude (ADIRS) and the preselected altitude displayed on FCU.



AIRCRAFT SYSTEMS

INDICATING/RECORDING SYSTEMS

INDICATIONS ON PFD

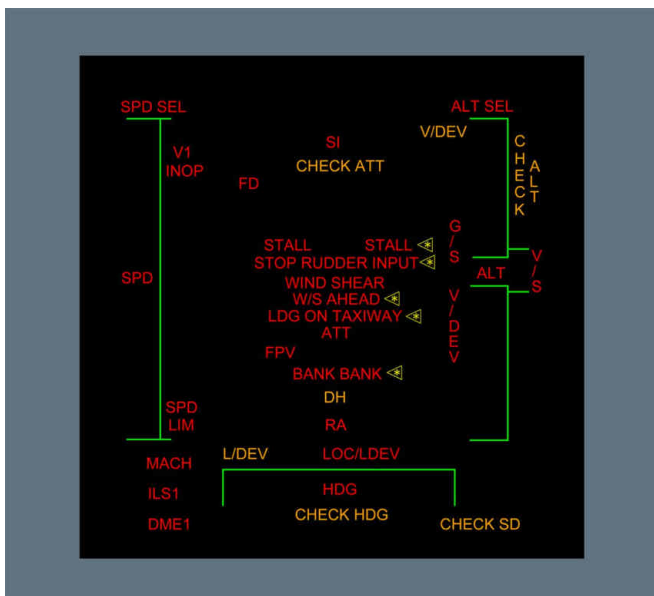
- Selecting a new altitude, or pushing the ECAM's EMER CANC pb, or pressing either MASTER WARN pb, cancels the continuous C chord
- Selecting a new altitude stops the flashing of the altitude window
- The altitude alert is inhibited:
 - When the slats are out, with the landing gear is selected down, or
 - In approach after the aircraft captures the glideslope, or
 - When the landing gear is locked down, or
 - In the case of a TCAS RA.

FLAGS AND MESSAGES DISPLAYED ON PFD

Ident.: DSC-31-40-D-00020521.0001001 / 14 NOV 24

Applicable to: ALL

FLAGS AND MESSAGES DISPLAYED ON PFD - DIAGRAM



- Note:**
1. All flags flash for 9 s, then remain steady, except **V1 INOP** that is continuously steady.
 2. For information on the **TCAS** flag, Refer to DSC-34-SURV-60-20 PFD Indications.

Ident.: DSC-31-40-D-00020531.0001001 / 04 NOV 21

Applicable to: ALL

ALT

Appears if the altitude information fails.

Ident.: DSC-31-40-D-00020533.0001001 / 04 NOV 21

Applicable to: ALL

ALT SEL

Appears if the selected altitude information fails.

Ident.: DSC-31-40-D-00020522.0001001 / 04 NOV 21

Applicable to: ALL

ATTAppears when the PFD loses all attitude data, its entire sphere is cleared to display the **ATT** flag.

Ident.: DSC-31-40-D-00024338.0004001 / 04 NOV 21

Applicable to: MSN 07784-07792

BANK BANK WARNING

Appears when the bank angle exceeds 45 ° in alternate or direct law.

Ident.: DSC-31-40-D-00020523.0001001 / 04 NOV 21

Applicable to: ALL

CHECK ATT, CHECK ALT, CHECK HDG*Refer to DSC-31-05-60 Side1/Side2 Discrepancy Messages.*

Ident.: DSC-31-40-D-00020547.0002001 / 04 NOV 21

Applicable to: ALL

CHECK SD, CHECK CAPT (F/O) PFD, CHECK CAPT (F/O) ND, CHECK EWD, CHECK DU NOT MONITORED*Refer to DSC-31-05-60 Feedback Messages.*

Ident.: DSC-31-40-D-00020538.0001001 / 04 NOV 21

Applicable to: ALL

DH

Appears when the aircraft reaches the selected DH.

Ident.: DSC-31-40-D-00020543.0001001 / 04 NOV 21

Applicable to: ALL

DME 1(2)Appears when the DME distance is not valid, a **DME 1** (on PFD1) or **DME 2** (on PFD2) flag replaces the DME distance indication.

Ident.: DSC-31-40-D-00020526.0001001 / 04 NOV 21

Applicable to: ALL

FD

Appears if both FMGCs fail, or if both FDs are disengaged and the FD pb is ON and the attitude is valid.

Ident.: DSC-31-40-D-00020525.0001001 / 04 NOV 21

Applicable to: ALL

FPV

Appears when the drift angle or flight path angle is not valid in the TRK FPA mode.

Ident.: DSC-31-40-D-00020539.0001001 / 04 NOV 21

Applicable to: ALL

HDG

Appears if the heading information fails.

Ident.: DSC-31-40-D-00020544.0001001 / 12 MAY 22

Applicable to: ALL

ILS 1(2) OR FLS 1(2) OR GLS 1(2) OR MLS 1(2) OR SLS 1(2)

Appears if an ILS / FLS  / GLS  / MLS  / SLS  frequency/channel fails, or if either the LOC /F-LOC  or G/S /F-G/S  signals fail. An ILS / FLS  / GLS  / MLS  / SLS  1 (on PFD1) or ILS / FLS  / GLS  / MLS  / SLS  2 (on PFD2) flag replaces the ILS / FLS  / GLS  / MLS  / SLS  frequency/channel indication.

Ident.: DSC-31-40-D-00020550.0001001 / 04 NOV 21

Applicable to: ALL

L/DEV

Appears at the top left of the LOC scale. This message flashes when the FINAL mode is armed/engaged, and the ILS/LS pb is selected.

Ident.: DSC-31-40-D-00020549.0001001 / 04 NOV 21

Applicable to: ALL

L/DEV

Appears when the crosstrack error is not valid.

Ident.: DSC-31-40-D-00020535.0001001 / 04 NOV 21

Applicable to: ALL

LOC OR G/S OR F-LOC OR F-G/S

If the localizer or glideslope receiver fails, a LOC or G/S flag appears on the deviation scale.
If the pseudo localizer or pseudo glideslope deviation is invalid, an F-G/S  or F-LOC  flag appears on the deviation scale.

If there is an inconsistency in the approach mode selection within one MMR, **LOC** and **F-LOC** flags and **G/S** and **F-G/S** flags appear.

Ident.: DSC-31-40-D-00020541.0001001 / 04 NOV 21

Applicable to: ALL

MACH

Appears if the **MACH** data fails.

Ident.: DSC-31-40-D-00020537.0001001 / 04 NOV 21

Applicable to: ALL

RA

Appears if both radio altimeters fails.

Ident.: DSC-31-40-D-00020524.0001001 / 04 NOV 21

Applicable to: ALL

SI

Appears if the sideslip information is lost or any reverse is deployed in flight.

Ident.: DSC-31-40-D-00020527.0001001 / 04 NOV 21

Applicable to: ALL

SPD

Appears if the speed information fails.

Ident.: DSC-31-40-D-00020529.0001001 / 04 NOV 21

Applicable to: ALL

SPD LIM

Appears when both FACs are inoperative, or in case of dual flap/slat channel failure.

In this case, the following PFD information are lost: VLS, S, F, Green Dot, Vtrend, VMAX, VFE next, VSW.

Ident.: DSC-31-40-D-00020528.0001001 / 04 NOV 21

Applicable to: ALL

SPD SEL

Appears if the selected speed information fails.

Ident.: DSC-31-40-D-00020548.0002001 / 04 NOV 21

Applicable to: ALL

STALL STALL WARNING

Appears when PFD displays this message when the AOA is greater than a predetermined angle.

WINDSHEAR message inhibits this message in normal law.

Ident.: DSC-31-40-D-00024316.0004001 / 04 NOV 21

Applicable to: ALL

STOP RUDDER INPUT

Appears when excessive rudder pedals inputs are detected during cruise.

Ident.: DSC-31-40-D-00020542.0001001 / 04 NOV 21

Applicable to: ALL

V/DEV

Appears at the top of the glide scale.

This message flashes in the following conditions:

- In approach phase, and
- The ILS/LS pb is selected, and
- When either the FINAL mode is armed/engaged, or a non-LS approach has been selected.

Ident.: DSC-31-40-D-00020536.0001001 / 04 NOV 21

Applicable to: ALL

V/DEV

Appears if the vertical deviation information fails, and the ILS/LS pb is not pressed.

Ident.: DSC-31-40-D-00020534.0001001 / 04 NOV 21

Applicable to: ALL

V/S

Appears if the vertical speed information fails.

Ident.: DSC-31-40-D-00020530.0001001 / 04 NOV 21

Applicable to: ALL

V1 INOP

Appears if the V1 signal is not valid.

Ident.: DSC-31-40-D-00020545.0001001 / 04 NOV 21

Applicable to: ALL

WINDSHEAR WARNING

Appears when windshear is detected (reactive windshear warning) by the FAC. *Refer to DSC-22_40-40 Windshear Detection Function.*

Ident.: DSC-31-40-D-00020546.0001001 / 07 NOV 25

Applicable to: ALL

W/S AHEAD OR W/S AHEAD (PWS <A>) WARNING

Appears when the predictive windshear system has detected windshear ahead of the aircraft. The message is in **amber** or **red**, depending on the alert level.

GENERAL

Ident.: DSC-31-45-00001249.0003001 / 21 MAR 16

Applicable to: ALL

There are five different displays (five modes to display navigation information) :

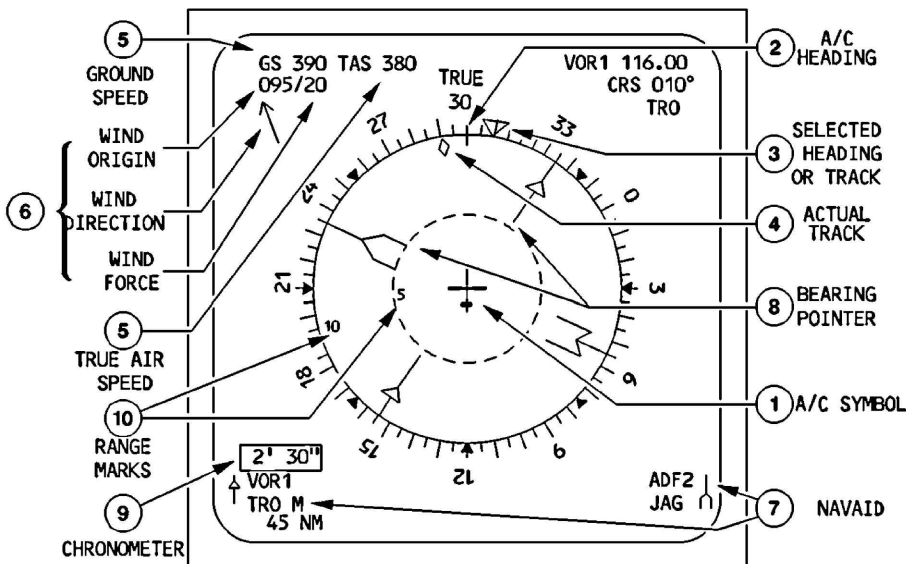
- ROSE LS
- ROSE VOR
- ROSE NAV
- ARC
- PLAN

The Navigation Display (ND) can provide a weather radar image in all modes, except PLAN.

ROSE MODES

Ident.: DSC-31-45-00001250.0002001 / 14 NOV 24

Applicable to: ALL



(1) Aircraft Symbol (Yellow)

Fixed and centered in the display, this symbol points to the yellow lubber line.

(2) Aircraft Heading

The fixed yellow lubber line points to the aircraft magnetic heading on the moving white compass rose. Small white triangles are fixed at 45 ° intervals on the circumference of the compass rose.

“TRUE” appears at the top of the compass rose, when it is displaying true heading instead of magnetic heading (latitude above 73 ° North or 60 ° South).

(3) Selected Heading or Track (Blue)

This pointer shows the heading or track indicated on the FCU's HDG TRK counter.

(4) Actual Aircraft Track (Green)

This symbol is a small green diamond.

(5) Ground Speed and True Air Speed (Green)

ADIRS furnishes these speeds.

(6) Wind Direction and Speed

ADIRS provides the wind direction and speed. The digital direction and the analog direction (indicated by the green arrow) both reflect the true north reference. The green arrow only appears, if the wind speed is above two knots.

If the display does not receive either wind speed or direction, dashes replace the numbers on the display.

(7) NAVAIDs

When the ADF  -OFF-VOR switch on either the CAPT's or F/O's EFIS control panel is set to ADF  or VOR, the onside ND displays the following characteristics of the corresponding NAVAID in white for VOR or in green for ADF  (left side for receiver 1 and right side for receiver 2):

- Type of NAVAID (ADF  or VOR)
- Shape and color of the associated bearing pointer (if the bearing pointer is in view).
- NAVAID identification (or frequency by default)
- DME distance if a DME is collocated with the selected VOR. ADF  and DME distance are never displayed at the same time.
- Mode of tuning:
 - M for a NAVAID tuned manually by the pilot through the MCDU (underlined and dimmed)
 - R for a NAVAID tuned from an RMP (Radio Management Panel) (underlined and dimmed)
 - Nothing for a NAVAID tuned automatically by the FMGC.

If reception fails, the ND stops displaying the associated data (except for the identification or frequency).

(8) Bearing Pointer (Green for ADF , White for VOR)

This pointer appears when bearing data is available.

If the aircraft is not receiving the beacon or if a receiver fails, the associated bearing pointer disappears.

(9) Chronometer Indication (White)

These numbers appear when the onside chronometer is started.

They display the elapsed time.

The indication is in minutes and seconds from 0 to 59 min 59 s, and in hours and minutes from 1 h to 99 h 59 min (Seconds are not displayed beyond 59 min 59 s).

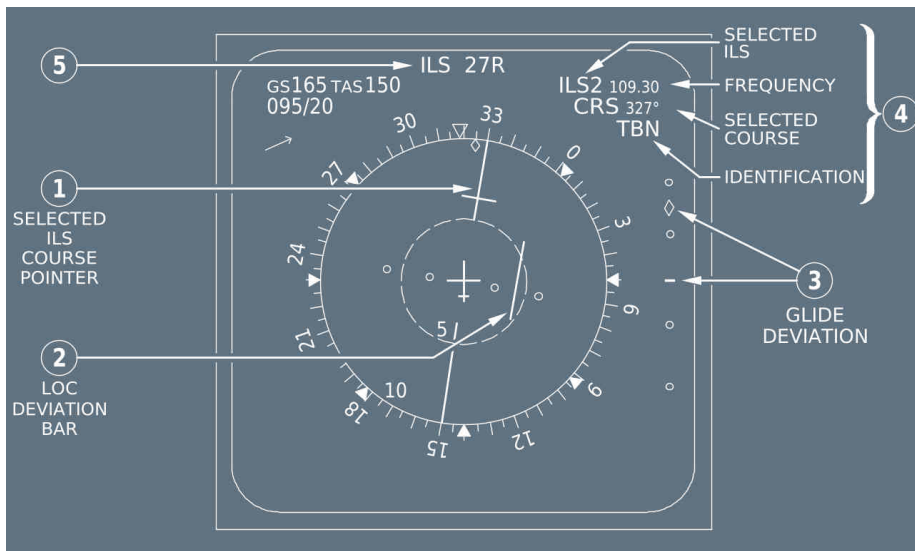
(10) Range Marks

The range scale value selected on the EFIS control panel (10 to 320 NM) governs the scale of the ND.

ROSE LS MODE

Ident.: DSC-31-45-00009584.0065001 / 24 NOV 15

Applicable to: ALL



(1) ILS Course Pointer (Magenta)

This symbol points at the selected ILS course.

The ILS is either selected by the FMGC (autotuned or manually) or manually selected by the flight crew via the RMP backup mode. If no course has been entered, the default value is 360 °.

AIRCRAFT SYSTEMS
INDICATING/RECORDING SYSTEMS

INDICATIONS ON ND

(2) Localizer Deviation Bar (Magenta)

This bar moves laterally with respect to the course pointer. Its scale has two white dots on each side of the zero deviation. Each dot corresponds to a deviation of approximately $\pm 0.8^\circ$.

If the lateral deviation exceeds 1/4 dot (0.2°) above 15 ft RA, both the bar and the scale flash.

(3) Glide Deviation (Magenta)

This diamond moves on a vertical scale that has two white dots on each side of the yellow reference line. Each dot corresponds to a deviation of approximately $\pm 0.4^\circ$.

If the deviation exceeds one dot above 100 ft RA, both the scale and the diamond flash.

(4) Selected ILS Information

This area displays the ILS frequency (magenta), selected course (magenta), and identification (magenta).

(5) ILS Message (Green)

This message indicates the full runway name of the selected approach. This message appears:

- The flight crew selects an ILS approach on the MCDU, and
- The FMS flight phase is DES, APP or GA, or the FMS phase is CRZ and the along track distance to destination is less than 250 NM.

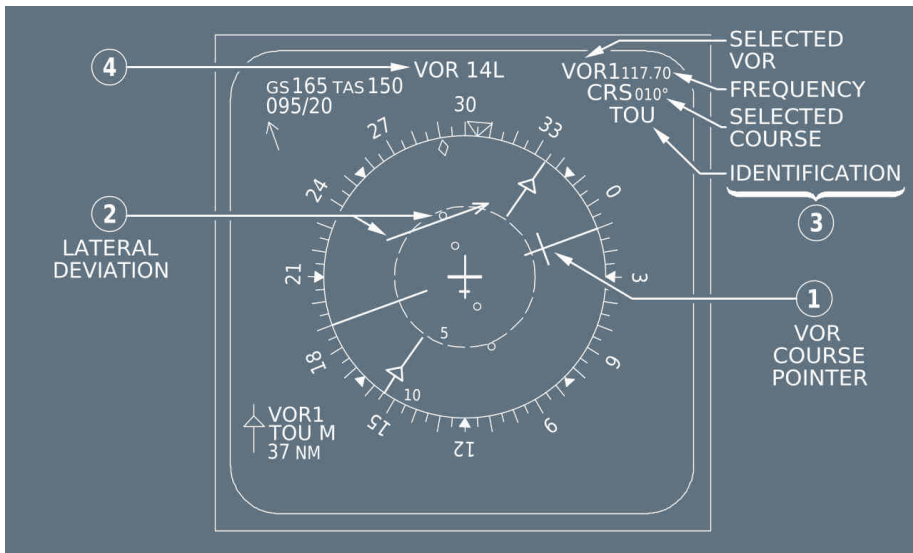
Note: ILS 1 information appears on PFD 1 and ND 2.

ILS 2 information appears on PFD 2 and ND 1.

ROSE VOR MODE

Ident.: DSC-31-45-00001252.0029001 / 05 NOV 15

Applicable to: ALL



(1) VOR Course Pointer (Cyan)

This symbol points at the selected VOR course.

The VOR course is either automatically selected by the FMGC or manually selected by the flight crew via the MCDU pages or the RMP backup mode.

(2) Lateral Deviation Bar (Cyan)

This bar indicates the VOR deviation on a lateral scale.

Each dot corresponds to 5° of lateral deviation. When the lateral deviation exceeds 10°, the bar remains displayed on the outer dot.

The arrow on the bar provides the TO/FROM indication.

(3) VOR Information (White and cyan)

This area displays the frequency and identification (if decoded by the receiver) of the selected VOR in white, the selected course in cyan, and the tuning mode in white.

(4) VOR or GPS Message (Green)

VOR 14L appears when the flight crew selects a VOR approach on the MCDU.

GPS 14L appears when the flight crew selects a GPS approach.

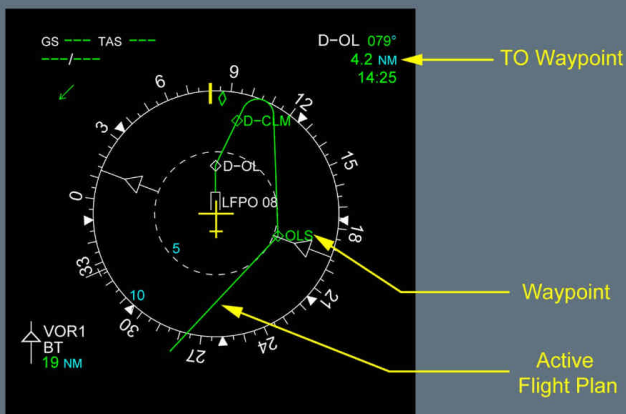
ROSE NAV MODE/ARC MODE

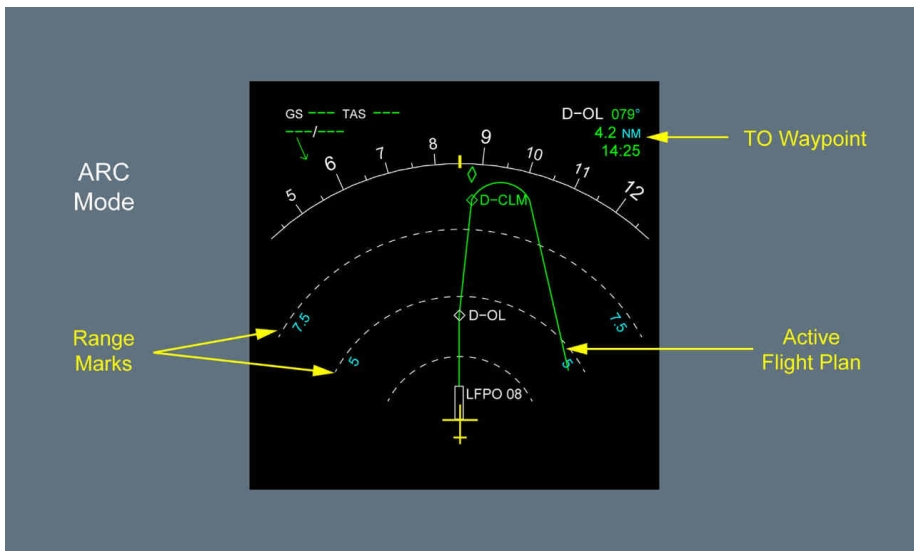
Ident.: DSC-31-45-A-00023604.0001001 / 26 NOV 19

Applicable to: ALL

ROSE NAV and ARC modes provide the same information to the flight crew, but ARC mode limits it to the forward 90 ° sector.

ROSE NAV
Mode





Ident.: DSC-31-45-A-00023605.0001001 / 26 NOV 19

Applicable to: ALL

RANGE MARKS AND VALUES

The values displayed on the ND are:

- | | |
|------------------|---|
| In ROSE NAV mode | 1/4 of the selected range for the inner circle. |
| | 1/2 of the selected range for the heading scale circle. |
| In ARC mode | 1/4 of the selected range for the first inner arc. |
| | 1/2 of the selected range for the second inner arc. |
| | 3/4 of the selected range for the third inner arc. |

Ident.: DSC-31-45-A-00023606.0001001 / 26 NOV 19

Applicable to: ALL

FLIGHT PLAN

The flight crew can use the MCDU to select all of the following types of flight plan:

- The active flight plan (the flight plan the aircraft follows when the NAV mode is engaged) is indicated by a continuous green line. The ND indicates only the part of the flight plan that is ahead of the aircraft. In addition, the ND indicates the waypoints that are still to be overflown and the waypoint that the aircraft left from.

The ND does not indicate a SID or a STAR, except for the last waypoint of the SID and the first waypoint of the STAR, when the selected range is 160 or 320 NM.

If the primary flight plan is not active, it is indicated by a dotted green line.

- Missed approach procedure

The missed approach procedure is indicated by a continuous blue line.

- Alternate

The flight plan to the alternate is indicated by a dashed blue line.

The missed approach and the alternate flight plan appear when:

- In ARC or ROSE NAV mode, a missed approach waypoint or an alternate flight plan waypoint is displayed on the onside MCDU
- In PLAN mode, a missed approach or alternate waypoint is displayed in the 2L field of the onside MCDU.

- The secondary flight plan

The ND continues to display the active flight plan. The secondary flight plan is indicated by a continuous white line.

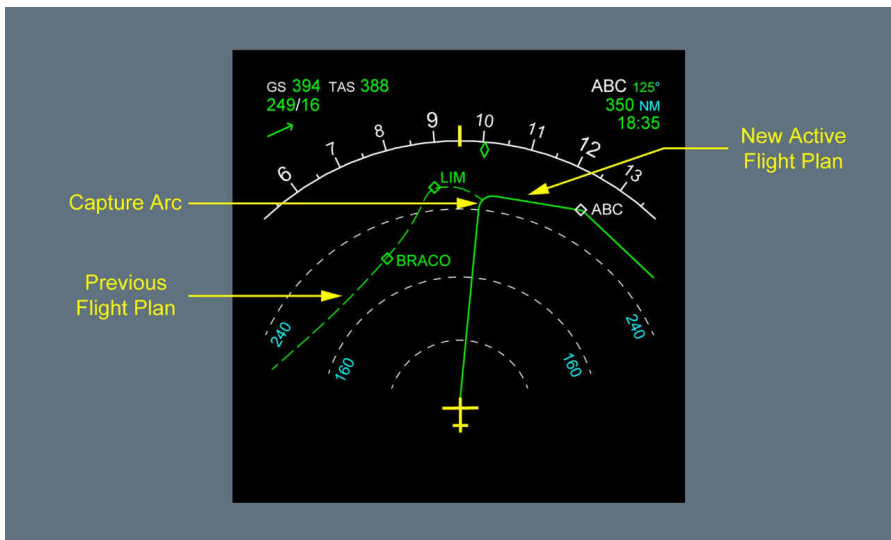
- Temporary flight plan

The revised portion of the flight plan is indicated by a dotted yellow line.

- Flight plan capture

When the aircraft is off the primary flight plan and flies toward it in HDG mode with the NAV mode armed, the ND indicates the new active flight plan as a continuous green line, if the FMGC computed the intercept path.

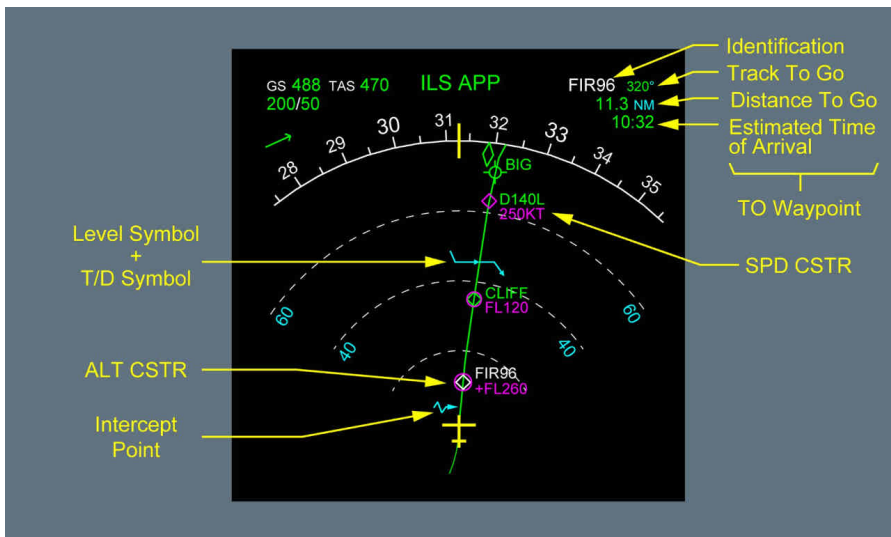
The part of the flight plan before the interception point is indicated as a dotted green line.



Ident.: DSC-31-45-A-00023608.0001001 / 26 NOV 19

Applicable to: ALL

WAYPOINT



The ND can display all of the following types of waypoints:

- **Flight plan waypoints**

The ND displays these as green diamonds (white, for TO waypoints). When the flight crew selects the WPT option on his EFIS control panel, all waypoints other than flight plan waypoints are displayed in magenta.

- **Pseudo waypoint**

Point of the flight path where the aircraft is predicted to reach a selected altitude or speed. *Refer to DSC-22_20-10-40-30 Predictions Displayed on the Navigation Display (ND).*

- **Constraint values**

When the flight crew presses the CSTR pb on the EFIS CP, the ND displays the constraints values below the waypoint ident.

If there are several constraints for the same waypoint, the ND displays the constraints in the following order of priority:

- The altitude constraint

The ND displays the altitude constraint value:

- In FL, when the altitude is above the transition altitude or the barometric setting is set to STD
- In feet in all other cases.

- The speed constraint

The ND displays the speed constraint value in knots or as a Mach number.

- The time constraint.

- Note:
1. For ILS approaches, the ND only displays speed and time constraints at the FAF waypoint up to destination.
 2. The ND is limited to the display of 3 lines of constraints for each waypoint. Therefore immediately after the fourth constraint is applied on the FMS:
 - With FMS Thales, the fourth constraint is not displayed on ND
 - With FMS Honeywell, the waypoint ID and all associated constraints disappear from the ND.

In both cases, all constraints are correctly managed by the FMS. The flight crew can refer to the MCDU F-PLN page to check all constraints associated with a waypoint.

The constraint value and the constraint symbol have identical color coding.

- Note: In PLAN mode, and at the MRP waypoint, the ND also displays the track and the distance to the next waypoint.

Ident.: DSC-31-45-A-00023609.0001001 / 26 NOV 19

Applicable to: ALL

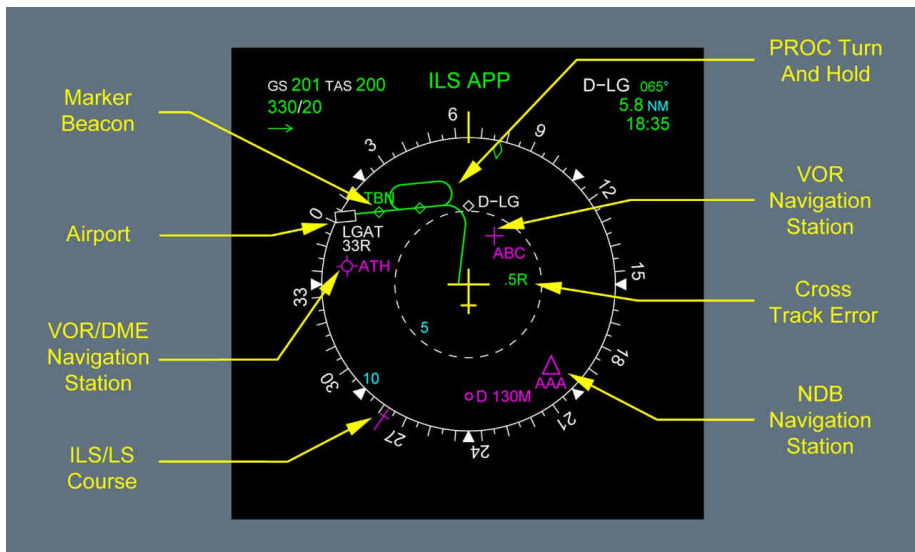
TO WAYPOINT

This is the next waypoint that the aircraft will overfly.

- L2** With the FMS standard Release 1A, when a DIR TO with ABEAM PTS is performed, the DIR TO waypoint appears on the top of the screen, instead of the NEXT ABEAM waypoint.
- L1** This area of the screen also indicates all of the following:
 - Waypoint identification
 - Track to go
 - Distance to go
 - Estimated time of arrival, with the assumption that the aircraft will directly fly from its present position to the TO waypoint at the current ground speed.

Ident.: DSC-31-45-A-00023629.0001001 / 26 NOV 19

Applicable to: ALL



Ident.: DSC-31-45-A-00023610.0001001 / 26 NOV 19

Applicable to: ALL

NAVAIDS

The display uses all of the following specific symbols for NAVAIDs:



DME or TACAN



VOR



VOR/DME



NDB

The symbol can appear in all of the four following colors:

- In green if the NAVAID is a current waypoint of the flight plan
- In white if it is the TO waypoint
- In blue when the NAVAID is tuned for display, either automatically by the FMGC, or manually via the MCDU
- In magenta when the NAVAID is not part of the flight plan and is displayed as an option (corresponding option pushbutton pressed on the FCU EFIS control panel).

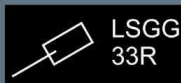
Ident.: DSC-31-45-A-00023611.0001001 / 26 NOV 19

Applicable to: ALL

AIRPORT

Airport included in the flight plan:

- If the runway is not specified, the airport is indicated by a star and the identification is displayed in white
- If the runway is specified, it is indicated by an oriented runway symbol in white.



LSGG
33R

The runway is drawn to scale (paved length) if the selected range is 10, 20 or 40 NM.

Optional airport information

The airports that are not displayed as part of the flight plan may be displayed (ARPT pb on the EFIS control panel).

They are indicated by a star and the identification in magenta.

Ident.: DSC-31-45-A-00023612.0001001 / 26 NOV 19

Applicable to: ALL

ILS/LS COURSE

When the pilot pushes the ILS/LS pb on the EFIS control panel, and if an ILS/GLS  /FLS  /MLS  approach is selected, the display shows an ILS/LS course symbol:



If an ILS/GLS  /MLS  or LOC approach is selected



If an NPA approach with the FLS  for lateral guidance is selected.

Ident.: DSC-31-45-A-00023614.0001001 / 26 NOV 19

Applicable to: ALL

ILS/GLS MARKER BEACONS

The screen indicates these as waypoints (diamonds).

When the aircraft overflies a marker beacon, the corresponding symbol flashes::

OM

The aircraft is over the outer marker

MM

The aircraft is over the middle marker

IM

The aircraft is over the inner marker.

Ident.: DSC-31-45-A-00023615.0002001 / 26 NOV 19

Applicable to: ALL

CROSS-TRACK ERROR

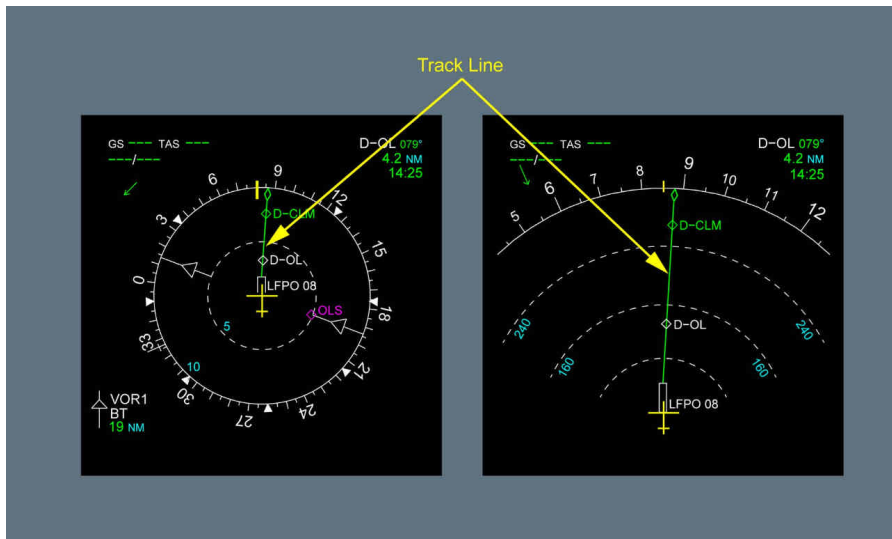
This is the lateral deviation of the aircraft from the active leg of the flight plan (related to the great circle route). It is indicated in nautical miles (NM), with the letter R (right) or L (left), according to the position of the aircraft compared to the flight plan.

Ident.: DSC-31-45-A-00023616.0001001 / 26 NOV 19

Applicable to: ALL

TRACK LINE

This line appears in green only in the ROSE NAV or ARC mode when HDG or TRK is selected on the FCU.

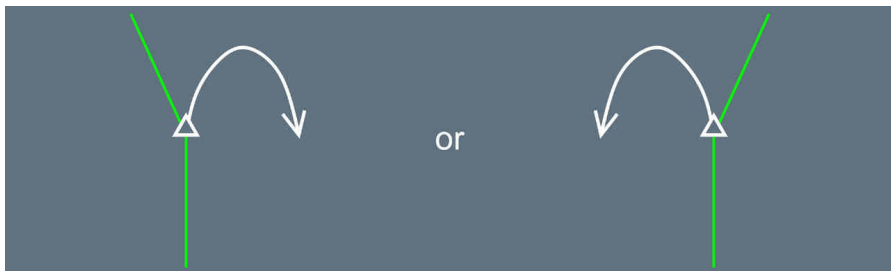


Ident.: DSC-31-45-A-00023617.0001001 / 26 NOV 19

Applicable to: ALL

PROCEDURE TURNS AND HOLDING PATTERNS

These only appear when they are part of the flight plan. For the 160 and 320 NM range scales, each one is indicated by a white arrow that originates at the associated fix and indicates the direction of the turn.



For shorter range scales, and if the procedure turn or the holding pattern is in the next or the active leg, the display indicates the full circuit or pattern.

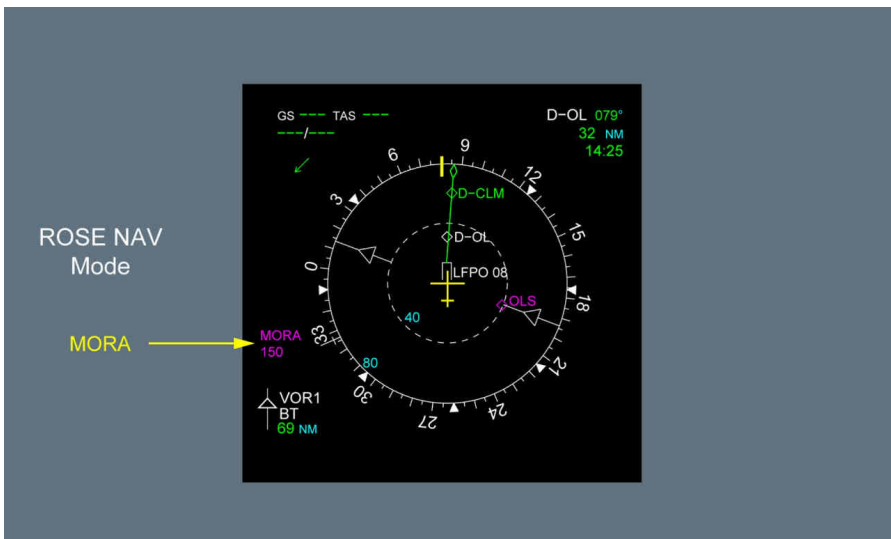


Ident.: DSC-31-45-A-00023618.0002001 / 02 MAY 24

Applicable to: MSN 02719-02789, 03031-05746

MINIMUM OFF ROUTE ALTITUDE (MORA)

Provided that CSTR is selected and the selected range is 40 NM or above, the MORA FL is displayed. This Flight Level indicates the MORA permitted, within a circular area centered on the current aircraft position and enclosed by 40 NM of radius limit. If the MORA is not available in the FMGS database for the current flight route, no MORA is displayed.



ARC
Mode

MORA



PLAN MODE

Ident.: DSC-31-45-00001254.0002001 / 29 NOV 19

Applicable to: ALL

This mode statically displays the flight plan legs on a map oriented to true north. The map is centered on a map reference point, that the pilot selects by scrolling to it on his MCDU.

The map reference point is the waypoint displayed on the second line of the MCDU's F-PLN page. It can either be the active waypoint (next waypoint to be overflown), or any other waypoint of the flight plan.

The pilot can scroll through the overall flight plan, and display it in PLAN mode.

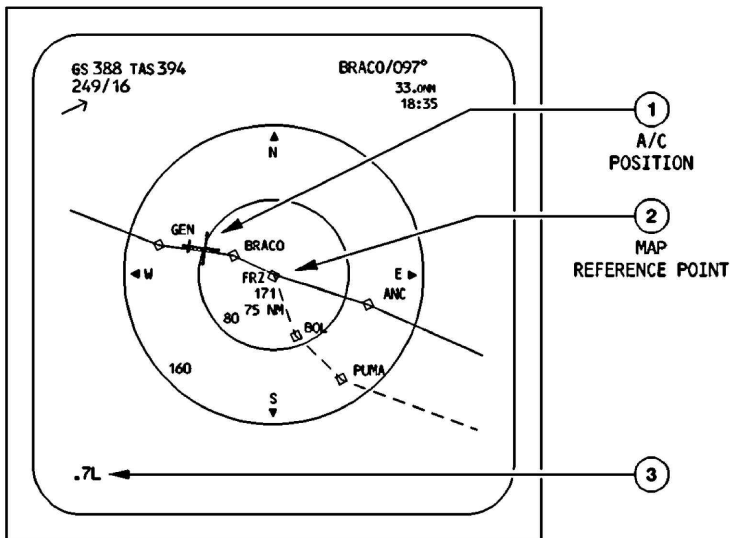
The pilot chooses the scale of the map with the range selector (the diameter of the outer circle corresponds to the selected range).

Data on NAVAIDS and on their characteristics and associated bearing pointers are not available in this mode.

AIRCRAFT SYSTEMS

INDICATING/RECORDING SYSTEMS

INDICATIONS ON ND



(1) Aircraft Position and True Track

The orientation of the yellow aircraft symbol always indicates the true track of the aircraft. Its position represents the aircraft position given by the FMGS.

(2) Map Reference Point

If the CSTR option is not selected, the track and distance from the map reference point to the next F-PLN waypoint is displayed in magenta.

(3) Cross Track Error

Refer to DSC-31-45 Cross Track Error.

WEATHER RADAR INDICATIONS

Ident.: DSC-31-45-00015503.0001001 / 21 MAR 17

Applicable to: ALL

Refer to DSC-34-SURV-30-30 Weather Radar indication on ND.

PWS INDICATIONS

Ident.: DSC-31-45-00015504.0001001 / 21 MAR 17

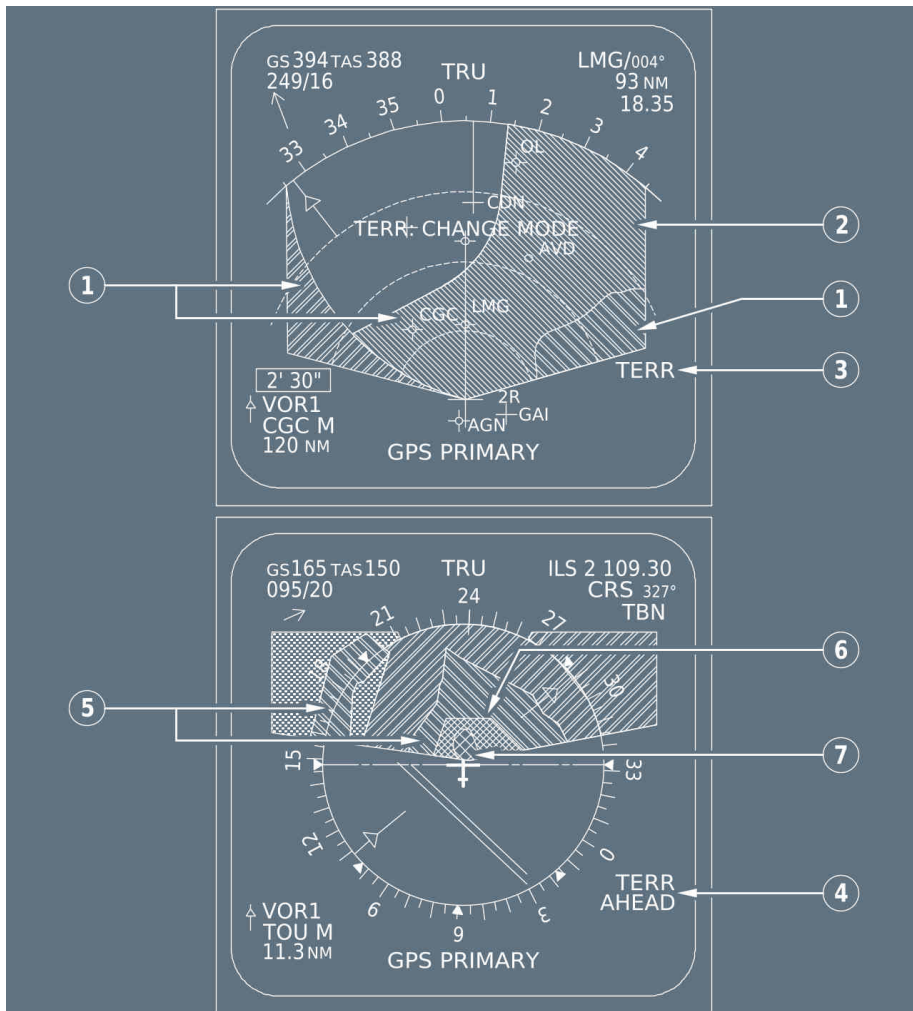
Applicable to: ALL

Refer to DSC-34-SURV-30-30 PWS (if installed) indication on PFD and ND

GPWS

Ident.: DSC-31-45-00009586.0004001 / 22 MAY 12

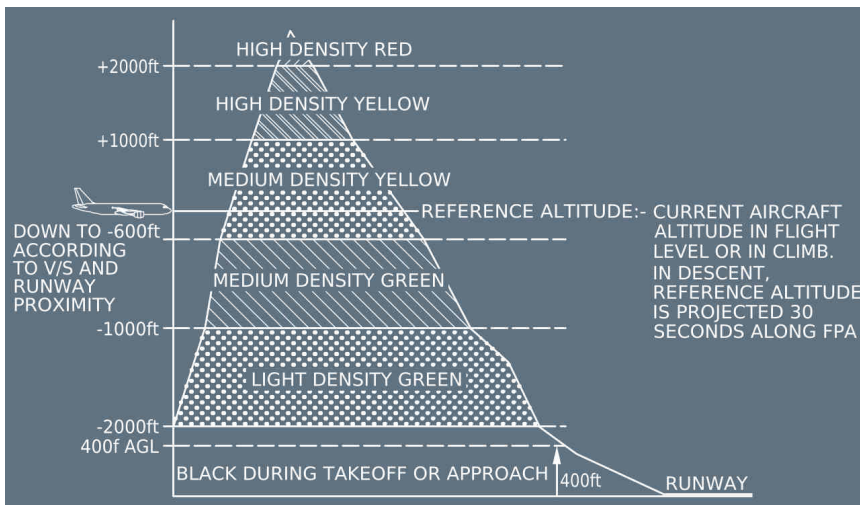
Applicable to: MSN 02926-02944



(1) GPWS terrain picture

The ND displays the GPWS terrain picture, when the TERR ON ND switch is selected ON, and the ND is not in PLAN mode. The terrain picture replaces the weather radar image.

The terrain appears in different colors and densities, in accordance with its relative height:



Note: Areas without available terrain data in the GPWS database appear in magenta.

(2) Center Part Messages

- The "TERR CHANGE MODE" indication is displayed in red (or amber), in the case of a predictive mode warning (or caution) alert, if the current selected display mode is PLAN.
- The "TERR REDUCE RANGE" indication is displayed in red (or amber), in the case of a predictive mode warning (or caution) alert, if the selected range is 160 NM or 320 NM.

(3) TERR indication

To differentiate between the terrain and the weather display, the weather radar TILT is replaced by a blue TERR, and the terrain display sweeps from the center outward to both ND sides.

(4) Warning and caution messages

TERR AHEAD (amber) : For a caution.

TERR AHEAD (red) : For a warning.

When triggered, these messages flash for 9 s, then remain steady until the caution or warning alert condition disappears.

TERR RNG (red) : For a RANGE error warning.

AIRCRAFT SYSTEMS

INDICATING/RECORDING SYSTEMS

INDICATIONS ON ND

TERR TST (amber) : Appears during the GPWS test, when the terrain pattern is displayed, and there is no failure.

(5) Terrain caution alert

Generated when a conflict exists between the terrain caution envelope, ahead of the aircraft, and the terrain data stored in the database. The conflict area is shown in solid yellow.

(6) Terrain warning

Generated when:

- A conflict exists between the terrain warning envelope, ahead of the aircraft, and the terrain data stored in the database
- The aircraft is able to climb over the terrain.

The conflict area is shown in solid red.

(7) Avoid Terrain warning

Generated when:

- There is a conflict between the terrain warning envelope, ahead of the aircraft, and the terrain data stored in the database
- The aircraft is not able to climb over the terrain with sufficient safety margin.

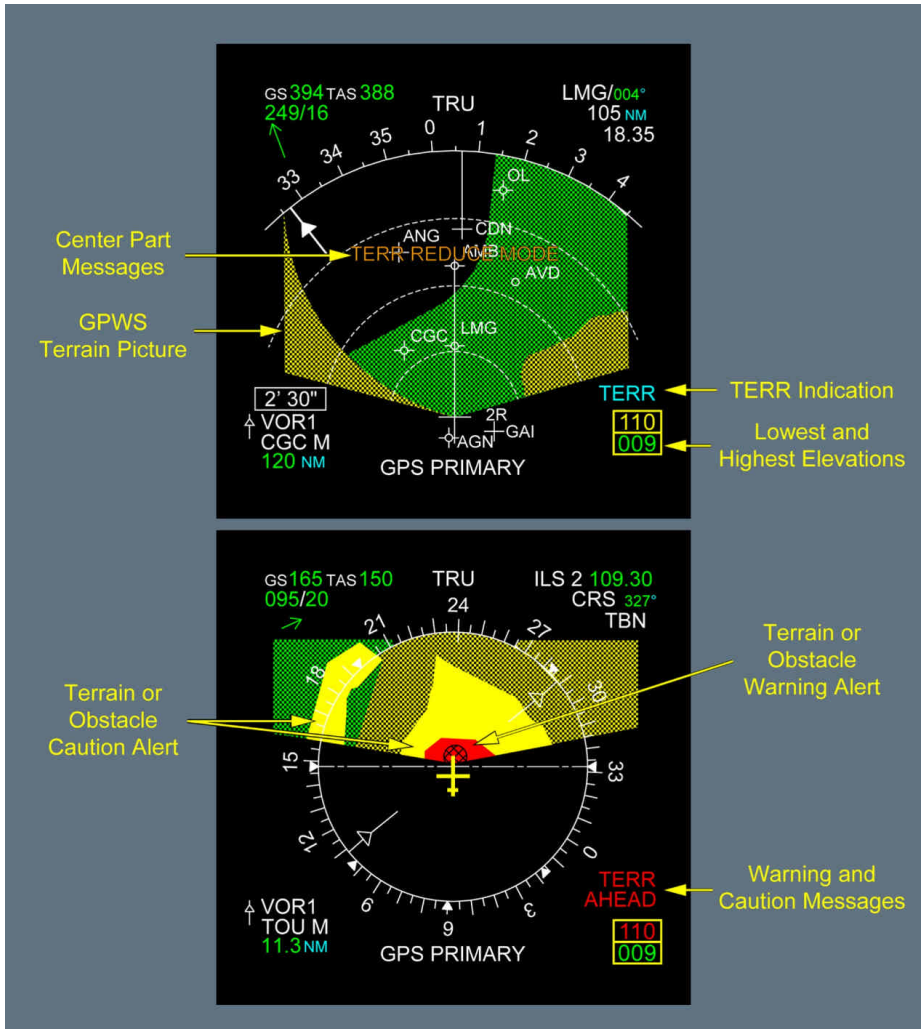
The conflict area is indicated by a red and black crosshatched pattern.

Note: When an alert is generated (either caution or warning) and TERR ON ND is not selected, the terrain is automatically displayed and the ON light on the TERR ON ND pushbutton comes on.

EGPWS

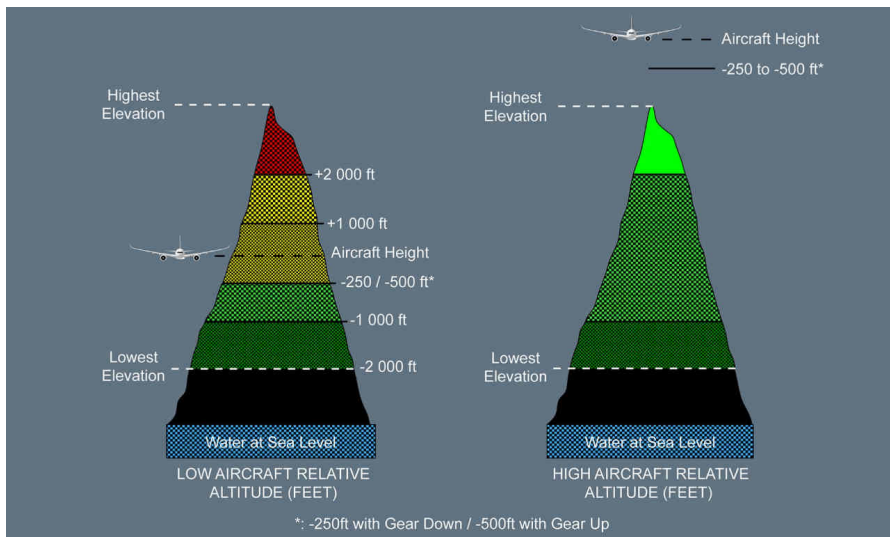
Ident.: DSC-31-45-00009586.0012001 / 12 NOV 25

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746



GPWS TERRAIN PICTURE

The ND displays the GPWS terrain picture, when the TERR ON ND pb is selected ON, and the ND is not in PLAN mode. The terrain picture appears instead of the weather radar image and the terrain display sweeps from the center outwards to both ND sides. Terrain data is displayed independently of the aircraft relative altitude. The terrain appears in different colors and densities, according to its relative and absolute height:



L2 In the case of flight above the highest elevation number, the relief between the minimum and maximum displayed elevations is displayed in three different green levels.

L1 Note:

- Areas without available terrain data in the GPWS database appear in magenta
- The reference altitude is computed based on the current aircraft altitude or, if descending at more than 1 000 ft/min, the altitude expected in 30 s.

CENTER PART MESSAGES

TERR CHANGE MODE

Appears in PLAN mode in the case of a predictive mode caution.

TERR CHANGE MODE

Appears in PLAN mode in the case of a predictive mode warning.

TERR REDUCE RANGE

Appears when the flight crew selects a range of 160 NM or 320 NM, in the case of a predictive mode caution.

TERR REDUCE RANGE

Appears when the flight crew selects a range of 160 NM or 320 NM, in the case of a predictive mode warning.

4 TERR INDICATION
TERR

Identifies that the ND currently displays terrain information. **TERR** is displayed instead of the weather radar tilt angle.

5 WARNING AND CAUTION MESSAGES

OBST AHEAD The GPWS triggers an obstacle caution.

OBST AHEAD The GPWS triggers an obstacle warning.

TERR AHEAD The GPWS triggers a terrain caution.

TERR AHEAD The GPWS triggers a terrain warning.

When triggered, the above messages flash for 9 s, then remain steady until the caution or warning alert condition disappears.

TERR RNG The GPWS triggers a range error warning.

TERR TST The GPWS is in test, when the terrain pattern is displayed, and there is no failure.

6 TERRAIN OR OBSTACLE CAUTION ALERT

A solid yellow area is generated when a conflict exists between the terrain/obstacle caution envelope, ahead of the aircraft, and the terrain/obstacle data stored in the database.

7 TERRAIN OR OBSTACLE WARNING ALERT

A solid red area is generated when a conflict exists between the terrain/obstacle warning envelope, ahead of the aircraft, and the terrain/obstacle data stored in the database.

Note: When an alert is generated (either caution or warning) and **TERR ON ND pb** is not selected, the terrain is automatically displayed and the **ON** light on the **TERR ON ND pb** comes on.

8 LOWEST AND HIGHEST ELEVATIONS

Minimum and maximum elevations encountered ahead of the aircraft, within the selected ND range. The color code of the elevation numbers is the same as for the GPWS terrain picture.

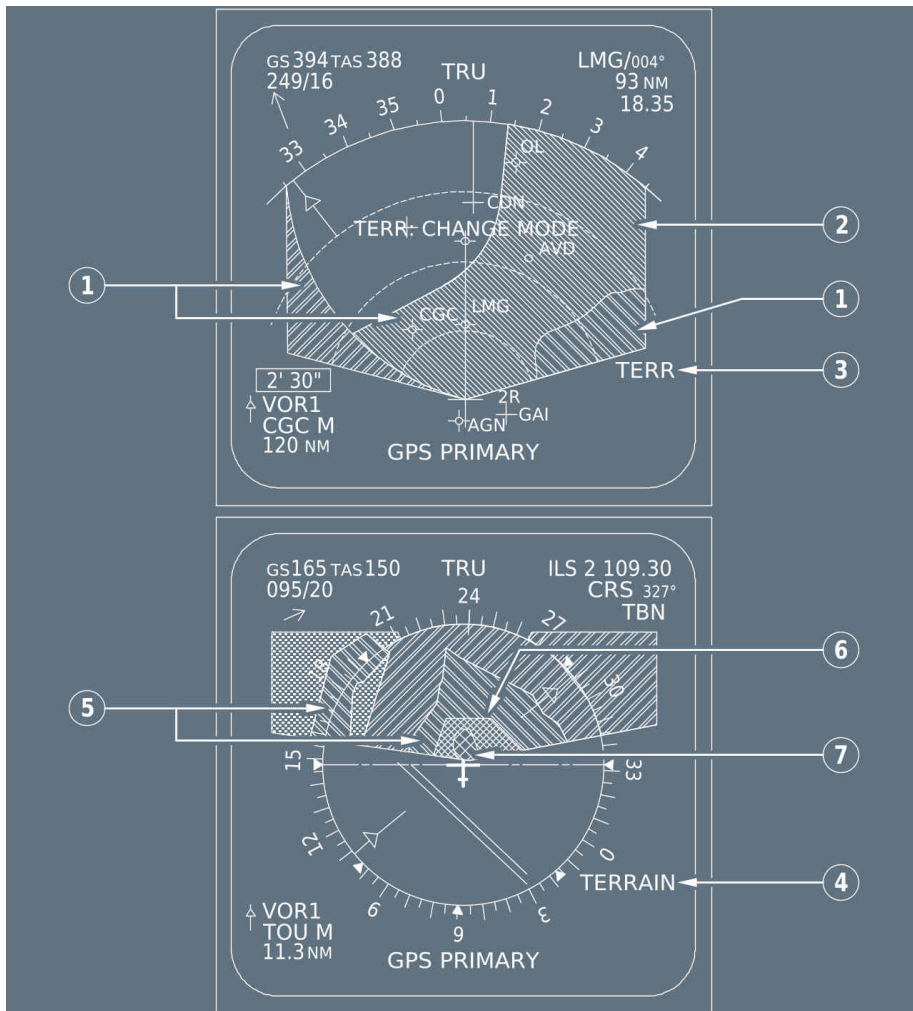
Note: The elevations indicated on the ND correspond to the terrain included in the selected ND range, ahead of the aircraft.

- In **ARC** mode, the elevation are linked with the terrain display on the **ND**
- In **ROSE** mode, the elevation may not represent the lowest and highest terrain currently displayed on the **ND**.

GPWS

Ident.: DSC-31-45-00009586.0005001 / 22 MAY 12

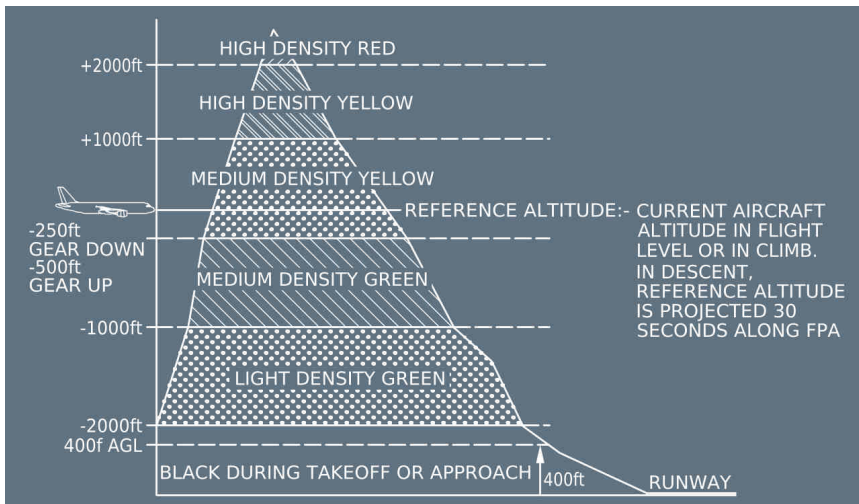
Applicable to: MSN 04392



(1) GPWS terrain picture

The ND displays the GPWS terrain picture, when the TERR ON ND switch is selected ON, and the ND is not in PLAN mode. The terrain picture replaces the weather radar image.

The terrain appears in different colors and densities, in accordance with its relative height :



Note: Areas without available terrain data in the GPWS database appear in magenta.

(2) Center Part Messages

- The "TERR CHANGE MODE" indication is displayed in red (or amber), in the case of a predictive mode warning (or caution) alert, if the current selected display mode is PLAN.
- The "TERR REDUCE RANGE" indication is displayed in red (or amber), in the case of a predictive mode warning (or caution) alert, if the selected range is 160 NM or 320 NM.

(3) TERR indication

To differentiate between the terrain and the weather display, the weather radar TILT is replaced by a blue TERR, and the terrain display sweeps from the center outward to both ND sides.

(4) Warning and caution messages

TERRAIN (amber) : For a caution.

TERRAIN (red) : For a warning.

When triggered, these messages flash for 9 s, then remain steady until the caution or warning alert condition disappears.

TERR RNG (red) : For a RANGE error warning.

AIRCRAFT SYSTEMS
INDICATING/RECORDING SYSTEMS

INDICATIONS ON ND

TERR TST (amber) : Appears during the GPWS test, when the terrain pattern is displayed, and there is no failure.

(5) Terrain caution alert

Generated when a conflict exists between the terrain caution envelope, ahead of the aircraft, and the terrain data stored in the database. The conflict area is shown in solid yellow.

(6) Terrain warning

Generated when a conflict exists between the terrain warning envelope, ahead of the aircraft, and the terrain data stored in the database. The conflict area is shown in solid red.

(7) Avoid Terrain warning

Generated when:

- There is a conflict between the terrain warning envelope, ahead of the aircraft, and the terrain data stored in the database
- The aircraft is not able to climb over the terrain with sufficient safety margin.

The conflict area is indicated by a red and black crosshatched pattern.

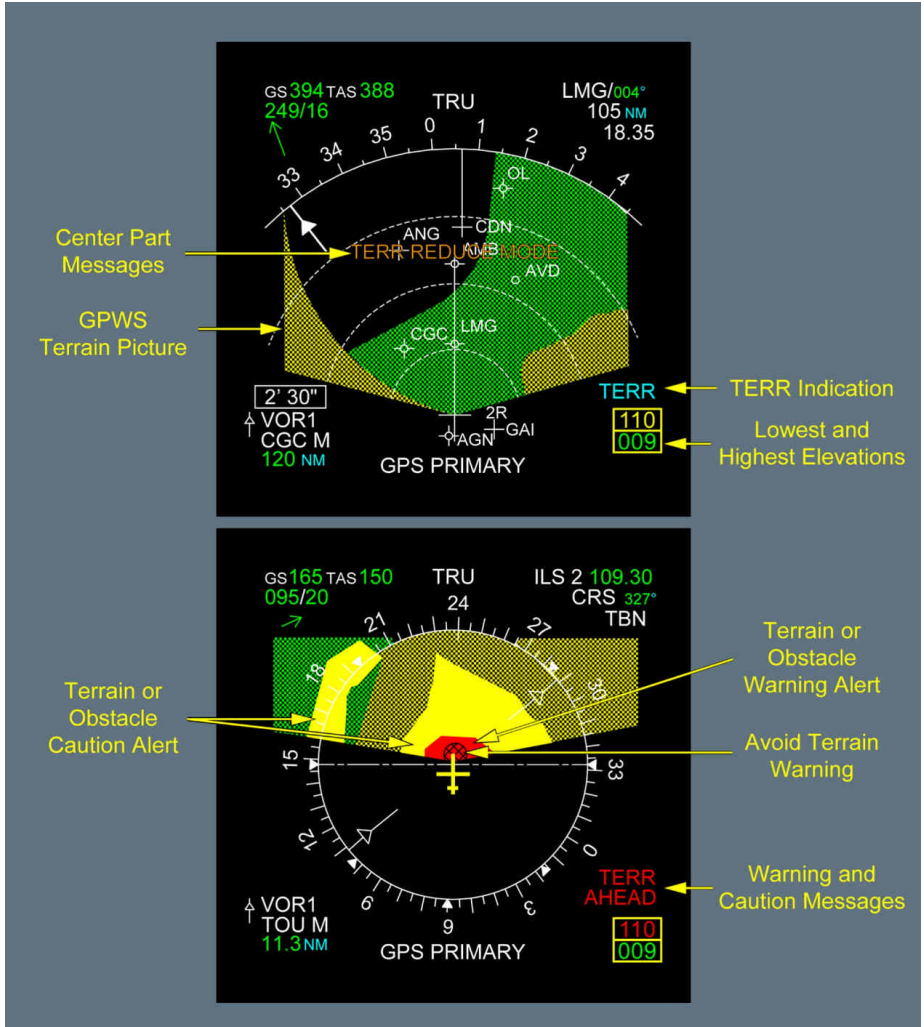
Note: *When an alert is generated (either caution or warning) and TERR ON ND is not selected, the terrain is automatically displayed and the ON light on the TERR ON ND pushbutton comes on.*

GPWS

Ident.: DSC-31-45-00009586.0044001 / 19 NOV 25

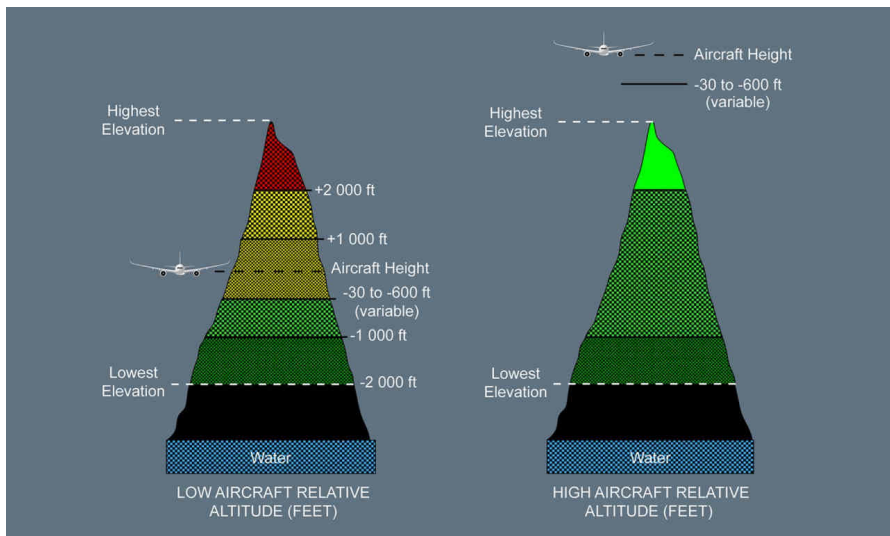
Applicable to: MSN 07784-07792

9



GPWS TERRAIN PICTURE

The ND displays the GPWS terrain picture, when the TERR ON ND pb is selected ON, and the ND is not in PLAN mode. The terrain picture appears instead of the weather radar image and the terrain display sweeps from the center outwards to both ND sides. Terrain data is displayed independently of the aircraft relative altitude. The terrain appears in different colors and densities, according to its relative and absolute height:



L2 In the case of flight above the highest elevation, the relief between the minimum and maximum displayed elevations is displayed in three different green levels.

L1 Note:

- Areas without available terrain data in the GPWS database appear in magenta
- The reference altitude is computed based on the current aircraft altitude or, if descending at more than 1 000 ft/min, the altitude expected in 30 s.

CENTER PART MESSAGES

TERR CHANGE MODE

Appears in PLAN mode in the case of a predictive mode caution.

TERR CHANGE MODE

Appears in PLAN mode in the case of a predictive mode warning.

TERR REDUCE MODE

Appears when the flight crew selects a range of 160 NM or 320 NM, in the case of a predictive mode caution.

TERR REDUCE MODE

Appears when the flight crew selects a range of 160 NM or 320 NM, in the case of a predictive mode warning.

TERR INDICATION
TERR

Identifies that the ND currently displays terrain information. **TERR** is displayed instead of the weather radar tilt angle.

WARNING AND CAUTION MESSAGES
OBST AHEAD

The GPWS triggers an obstacle caution.

OBST AHEAD

The GPWS triggers an obstacle warning.

TERR AHEAD

The GPWS triggers a terrain caution.

TERR AHEAD

The GPWS triggers a terrain warning.

When triggered, the above messages flash for 9 s, then remain steady until the caution or warning alert condition disappears.

TERR RNG

The GPWS triggers a range error warning.

TERR TST

The GPWS is in test, when the terrain pattern is displayed, and there is no failure.

TERRAIN OR OBSTACLE CAUTION ALERT

A solid yellow area is generated when a conflict exists between the terrain/obstacle caution envelope, ahead of the aircraft, and the terrain/obstacle data stored in the database.

TERRAIN OR OBSTACLE WARNING ALERT

A solid red area is generated when:

- A conflict exists between the terrain/obstacle warning envelope, ahead of the aircraft, and the terrain/obstacle data stored in the database
- The aircraft is able to climb over the terrain/obstacle.

LOWEST AND HIGHEST ELEVATIONS

Minimum and maximum elevations encountered ahead of the aircraft, within the selected ND range. The color code of the elevation numbers is the same as for the GPWS terrain picture.

Note: The elevations indicated on the ND (ROSE or ARC mode) correspond to the terrain included in the selected ND range, ahead of the aircraft.

AVOID TERRAIN WARNING

A red and black crosshatched pattern is generated when all the following conditions are fulfilled:

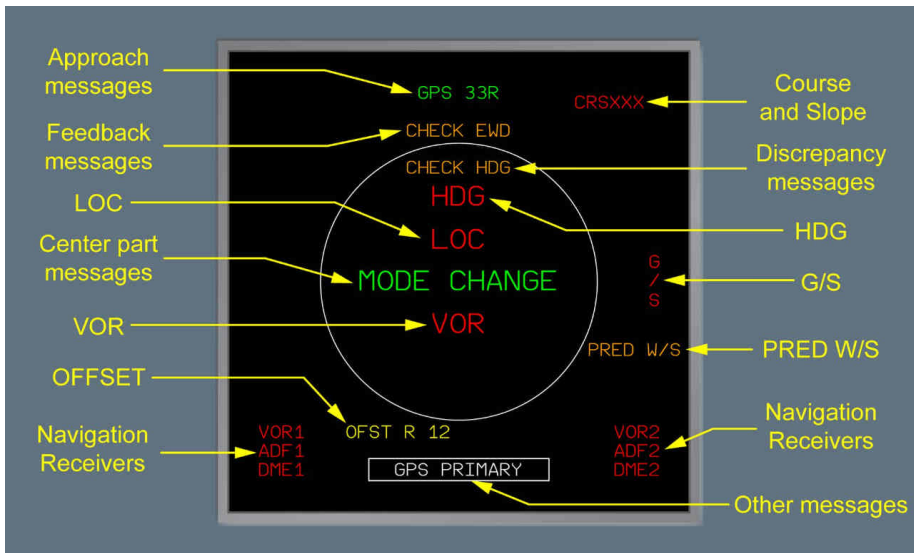
- There is a conflict between the terrain warning envelope, ahead of the aircraft, and the terrain data stored in the database
- The aircraft is not able to climb over the terrain with sufficient safety margin.

Note: When an alert is generated (either caution or warning) and TERR ON ND pb is not selected, the terrain is automatically displayed and the ON light on the TERR ON ND pb comes on.

FLAGS AND MESSAGES DISPLAYED ON ND

Applicable to: ALL

Ident.: DSC-31-45-B-00023766.0002001 / 28 MAY 20



Ident.: DSC-31-45-B-00023991.0001001 / 28 MAY 20

APPROACH MESSAGES

This message shows the full runway name of the selected approach.

Ident.: DSC-31-45-B-00023992.0002001 / 28 MAY 20

FEEDBACK MESSAGES

Refer to DSC-31-05-60 Feedback Messages.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS INDICATING/RECORDING SYSTEMS INDICATIONS ON ND
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Ident.: DSC-31-45-B-00023981.0001001 / 28 MAY 20

LOC OR F-LOC (FLS)

If LOC or F-LOC (FLS ) data fails, this flag flashes for 9 s, then remains steady.

If there is an inconsistency in the approach mode selection within one MMR, both **LOC** and **F-LOC** (FLS ) flags flash for 9 s, then remain steady.

Ident.: DSC-31-45-B-00023979.0001001 / 28 MAY 20

CENTER PART MESSAGES

MODE CHANGE

Appears if there is a discrepancy between the selected mode on the EFIS control panel and the mode sent from the onside FMGC, or while the DMC is preparing a new page for display.

RANGE CHANGE

Appears if there is a discrepancy between the range selected on the EFIS control panel and the range sent from the onside FMGC. A **MODE CHANGE** message has priority over a **RANGE CHANGE** message.

MAP NOT AVAIL

Appears when one of the following occurs:

- The **MODE CHANGE** or **RANGE CHANGE** message appears for more than 6 s, or
- The FMGC has failed, or
- The FMGC has delivered an invalid aircraft position.

W/S SET RNG 10 NM (PWS)

Appears if a predictive windshear warning alert is triggered and the range is above 10 NM.

W/S SET RNG 10 NM (PWS)

Appears if a predictive windshear caution alert is triggered and the range is above 10 NM.

W/S CHANGE MODE (PWS)

Appears if a predictive windshear warning alert is triggered and the ND is not in ARC or ROSE mode.

W/S CHANGE MODE (PWS)

Appears if a predictive windshear caution alert is triggered and the ND is not in ARC or ROSE mode.

TCAS Message

Refer to DSC-34-SURV-60-20 Messages on ND

Ident.: DSC-31-45-B-00023984.0001001 / 28 MAY 20

VOR

In ROSE VOR mode, when the VOR bearing is not valid, this flag flashes for 9 s, then remains steady.

Ident.: DSC-31-45-B-00023989.0001001 / 28 MAY 20

OFFSET MESSAGE

OFST R(L) XX

Appears when the flight crew prepares an offset or if an offset is selected. The offset value is provided in NM.

Ident.: DSC-31-45-B-00023985.0001001 / 14 NOV 24

NAVIGATION RECEIVERS

VOR 1

Appears if the VOR 1(2) fails. The associated flag flashes for 9 s, then remains steady.

ADF 1 (ADF )

Appears if the ADF 1(2) fails. The associated flag flashes for 9 s, then remains steady.

DME 1

Appears if the DME 1(2) fails. The associated flag flashes for 9 s, then remains steady.

Ident.: DSC-31-45-B-00023987.0001001 / 28 MAY 20

COURSE AND SLOPE INDICATION

CRSXXX

Appears if the VOR/FLS  /ILS course fails.

CRS---

Appears if there is non-computed data for the VOR/FLS  /ILS course.

XX

Appears if the FLS  slope is invalid.

--

Appears if there is non-computed data for the FLS  slope.

Ident.: DSC-31-45-B-00023966.0002001 / 28 MAY 20

DISCREPANCY MESSAGES

Refer to DSC-31-05-60 Side1/Side2 Discrepancy Messages.

Ident.: DSC-31-45-B-00023842.0001001 / 28 MAY 20

HDG

If the heading data fails, the ROSE, ARC and associated symbols disappear.
A **HDG** flag flashes for 9 s, then remains steady.

Ident.: DSC-31-45-B-00023983.0001001 / 28 MAY 20

G/S OR F-G/S (FLS)

If G/S or F-G/S (FLS ) data fails, this flag flashes for 9 s, then remains steady.
If there is an inconsistency in the approach mode selection within one MMR, both **G/S** and **F-G/S** (FLS ) flags flash for 9 s, then remain steady.

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Ident.: DSC-31-45-B-00023990.0001001 / 28 MAY 20

PRED W/S (PWS)

Appears if the WINDSHEAR sw (PWS ) on the weather radar panel is set to AUTO, and a PWS  fault is detected. This message appears on ground, or when flaps and slats are extended.

It is associated with a single chime. The radar image remains available, provided that the fault does not affect the radar mode.

Ident.: DSC-31-45-B-00023988.0001001 / 07 NOV 25

18

OTHER MESSAGES

↓ BACK UP NAV 	Overflow arrow, displayed when more than one of the other messages are present at the same time. Appears when the MCDU backup navigation mode is activated (<i>Refer to DSC-22_10-30 Back Up Navigation Mode</i>).
GPS PRIMARY 	Appears when GPS PRIMARY mode is available, or has been recovered. The flight crew can clear this message by pressing the CLR key on the MCDU.
GPS PRIMARY LOST 	Appears when GPS PRIMARY is not available, and not clearable by flight crew action.
MAP PARTLY DISPLAYED	Appears when there is an incomplete data transmission between the FMGC and the DMC, or if the DMC cannot draw the complete MAP.
NAV ACCUR UPGRAD or NAV ACCUR DOWNGRAD	Appears when there is a change in navigation accuracy.
OFFSIDE FM CONTROL	Appears when the offside FMGC supplies the onside ND.
RTA MISSED 	Appears when a time constraint is defined in the active flight plan and this time constraint is predicted as "missed" by the FMGC.
SET OFFSIDE RNG/MODE	Appears in case of an FMGC 1(2) failure when the two ND ranges or modes selected on the EFIS control panels are different
SPECIFIC VOR/D UNAVAIL	Appears when the NAVAID, that is tuned for the selected approach or departure, is not available.
TCAS Operating Messages	<i>Refer to DSC-34-SURV-60-20 Messages on ND</i>

AIRCRAFT SYSTEMS
INDICATING/RECORDING SYSTEMS

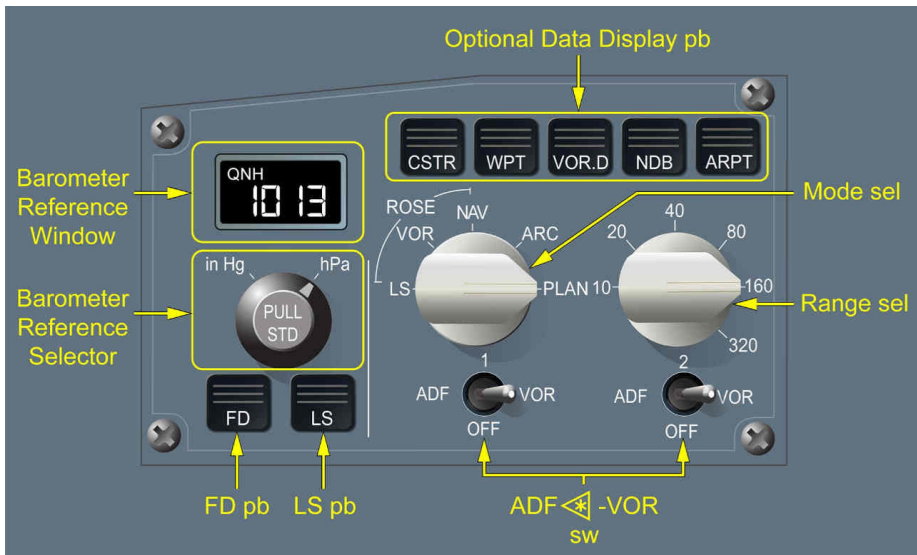
INDICATIONS ON ND

Intentionally left blank

EFIS CONTROL PANEL

Ident.: DSC-31-50-A-00024124.0001001 / 06 NOV 23

Applicable to: ALL



BAROMETER REFERENCE WINDOWS

Ident.: DSC-31-50-A-00024125.0001001 / 10 MAY 21

Applicable to: MSN 02719-07792

BAROMETER REFERENCE WINDOW

L12



The barometric reference is set to QNH and the QNH value is 1 013 hPa. The minimum QNH value that can be selected is 745 hPa (22.00 inHg) and the maximum is 1 100 hPa (32.48 inHg).



The barometric reference is set to STD.

Ident.: DSC-31-50-A-00024125.0004001 / 10 MAY 21

Applicable to: MSN 02155-02212

BAROMETER REFERENCE WINDOW

L12



The barometric reference is set to QNH and the QNH value is 1 013 hPa. The minimum QNH value that can be selected is 745 hPa (22.00 inHg) and the maximum is 1 100 hPa (32.48 inHg).

L12



The barometric reference is set to QFE and the QFE value is 1 013 hPa. The minimum QFE value that can be selected is 745 hPa (22.00 inHg) and the maximum is 1 100 hPa (32.48 inHg).



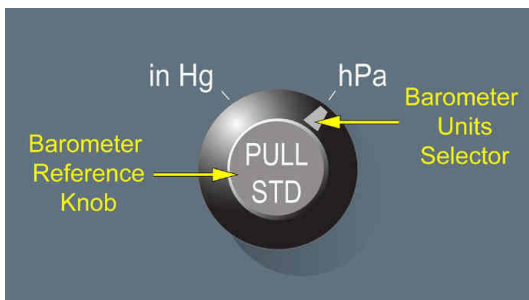
The barometric reference is set to STD.

Ident.: DSC-31-50-A-00024126.0001001 / 03 JUN 20

Applicable to: ALL

BAROMETER REFERENCE SELECTOR SCHEMATIC

The barometric reference controls have an outer selector, and an inner knob.



The flight crew uses the barometric reference selector to select the barometric unit hectoPascals (hPa) or inches of mercury (inHg).

Note: The PFDs do not display the selected barometric unit.

BAROMETER REFERENCE SELECTOR

Ident.: DSC-31-50-A-00024127.0002001 / 10 MAY 21

Applicable to: MSN 02719-07792

BAROMETER REFERENCE SELECTOR

The flight crew turns the barometric reference knob to select the QNH value.

The flight crew pulls or pushes the barometric reference knob to select the barometric reference (QNH or STD).

When the flight crew pulls the barometric reference knob, the barometric reference value is set to STD.

When the flight crew pushes the barometric reference knob, the barometric reference is set to QNH.

- L2** The selected QNH value appears in the barometric reference window, and under the altitude scale on the PFD.
- L1** At the EFIS CP power-up, the barometric reference is QNH and the QNH value is set to 1 013 hPa or 29.92 inHg, depending on the selected barometric unit.

Ident.: DSC-31-50-A-00024127.0001001 / 03 NOV 21

Applicable to: MSN 02155-02212

BAROMETER REFERENCE SELECTOR

The flight crew turns the barometric reference knob to select the QNH or QFE value.

The flight crew pulls or pushes the barometric reference knob to select the barometric reference (QNH, QFE, or STD).

When the flight crew pulls the barometric reference knob, the barometric reference is set to STD.

When the barometric reference is set to STD, and the flight crew pushes the barometric reference knob, the barometric reference changes to QNH or QFE (depending on the last barometric reference in use before switching to STD).

When the barometric reference is set to QNH (QFE), and the flight crew pushes again the barometric reference knob, the barometric reference changes to QFE (QNH).

- L2** The selected QNH value appears in the barometric reference window, and under the altitude scale on the PFD.
- L1** At the EFIS CP power-up, the barometric reference is QFE and the QFE value is set to 1 013 hPa or 29.92 inHg, depending on the selected barometric unit.

Ident.: DSC-31-50-A-00024128.0001001 / 03 JUN 20

Applicable to: ALL

FD PB


The CAPT(F/O) PFD displays the FD bars (or the FPD symbol if the TRK FPA reference is selected).



The CAPT(F/O) PFD does not display the FD bars (or the FPD symbol if the TRK FPA reference is selected).

Ident.: DSC-31-50-A-00024143.0001001 / 12 MAY 22

Applicable to: ALL

LS PB



The CAPT(F/O) PFD displays the following landing system data in accordance with the approach selected on the ARRIVAL page (LS / GLS  / FLS  / SLS ): Deviation scales, deviation signals, course pointer, information.

For more information about the landing system data "*Refer to DSC-31-40 Trajectory Deviation - ILS Approach*".

If the flight crew selected an approach compatible with the FLS , the FMA displays the FLS  capability, if the flight phase is descent or approach.

The FLS  capability does not appear, if the **NO FLS FOR THIS APPR** message appeared on the MCDU.

Note: *If the direct distance to the destination airport is more than 300 NM only the deviation scales appear.*



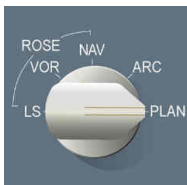
The CAPT(F/O) PFD does not display the landing system data.

Ident.: DSC-31-50-A-00024141.0001001 / 03 JUN 20

Applicable to: ALL

MODE SELECT SWITCH

L12



For navigation purposes, the flight crew can select one of the following display modes:

- PLAN mode, *Refer to DSC-31-45 Plan Mode*

If the flight crew selects the PLAN mode, the ND does not display terrain, weather, or traffic information.

- ARC mode

For more information, *Refer to DSC-31-45 ROSE NAV Mode/ARC Mode*

- ROSE-NAV mode

For more information, *Refer to DSC-31-45 ROSE NAV Mode/ARC Mode*

- ROSE-VOR mode

For more information, *Refer to DSC-31-45 ROSE VOR Mode*

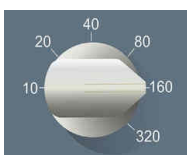
- ROSE-LS mode

For more information, *Refer to DSC-31-45 ROSE LS Mode.*

Ident.: DSC-31-50-A-00024131.0001001 / 03 JUN 20

Applicable to: ALL

RANGE SELECT SWITCH



The range selector enables the flight crew to select the range of the ND.

Note: *If the mode or the range data fails, the default selection is the ROSE NAV mode and 80 NM range.*

Ident.: DSC-31-50-A-00024132.0001001 / 14 NOV 24

Applicable to: ALL

ADF1(2) - VOR1(2) SWITCHES



The ND does not display the ADF1(2) or VOR1(2) bearing pointers and DME distance.



Enables the flight crew to select ADF1(2) on the outside ND, as well as the corresponding navaid data characteristics in any mode except PLAN mode.



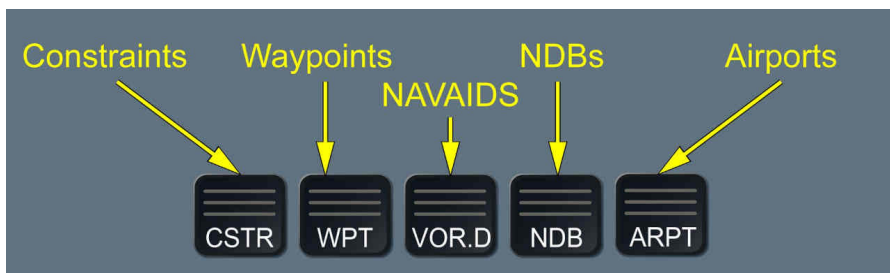
Enables the flight crew to select VOR1(2) bearing pointers and DME distance on the outside ND, as well as the corresponding navaid data characteristics in any mode except PLAN mode.

Ident.: DSC-31-50-A-00024133.0001001 / 03 JUN 20

Applicable to: ALL

OPTIONAL DATA DISPLAY PUSHBUTTON SCHEMATICS

The flight crew can use the following pushbuttons to display the associated optional data in addition to the data permanently displayed in PLAN, ARC, or ROSE NAV modes. Only one option can be activated at a time.



Ident.: DSC-31-50-A-00024134.0001001 / 03 JUN 20

Applicable to: ALL

OPTIONAL DATA DISPLAY PUSHBUTTON

CONSTRAINTS



The ND displays constraints related to the waypoints.



The ND does not display constraints.

WAYPOINTS



The ND displays the waypoints stored in the navigation database and the pilot stored nav aids.

The flight crew can only select one display at a time (WPT, VOR-D, or NBD (ADF1(2) ).



The ND does not display waypoints.

NAVAIDS



The ND displays the VORs and DMEs stored in the navigation database and the pilot stored nav aids.

The flight crew can only select one display at a time (WPT, VOR-D, or NBD (ADF1(2) ).



The ND does not display VORs and DMEs.

NDBS



The ND displays the NDBs stored in the navigation database.

The flight crew can only select one display at a time (WPT, VOR-D, or NBD (ADF1(2) ).



The ND does not display NDBs.

AIRPORTS



The ND displays the airports stored in the navigation database, other than the origin or destination airports.

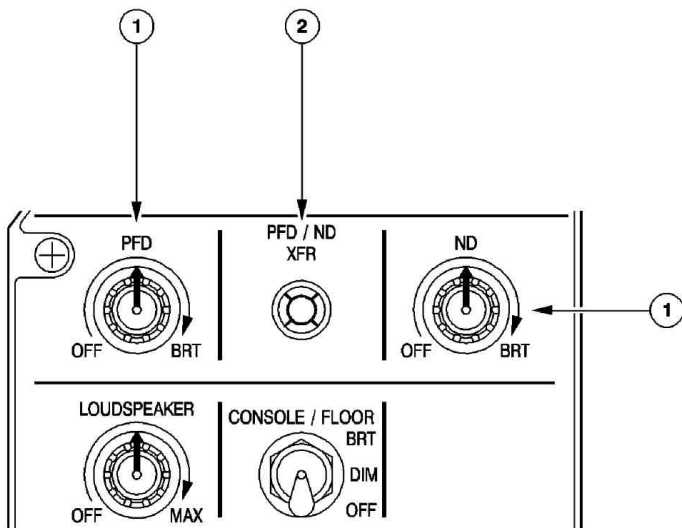


The ND does not display airports.

OTHER EFIS CONTROLS

Ident.: DSC-31-50-00001258.0002001 / 15 FEB 11

Applicable to: MSN 02155-02789, 03031-03060, 05152-07792


(1) OFF/BRT knobs

- These knobs turn the PFD and ND display units on and off, and control their brightness.
- The display brightness adjusts automatically for changing light conditions, and is also adjusted manually.

PFD Brightness Control Knob

Rotating this knob all the way counterclockwise switches off the PFD. In this case, the PFD image is automatically displayed on the NDU, but the pilot may recover the ND by means of the PFD-ND XFR pushbutton .

ND Brightness Control Knob

The outer knob controls the brightness of both the weather radar image and EGPWS terrain display.

The inner knob controls the general brightness of the ND symbols.

Rotating this knob all the way counterclockwise switches off the NDU.

(2) PFD/ND Pushbutton

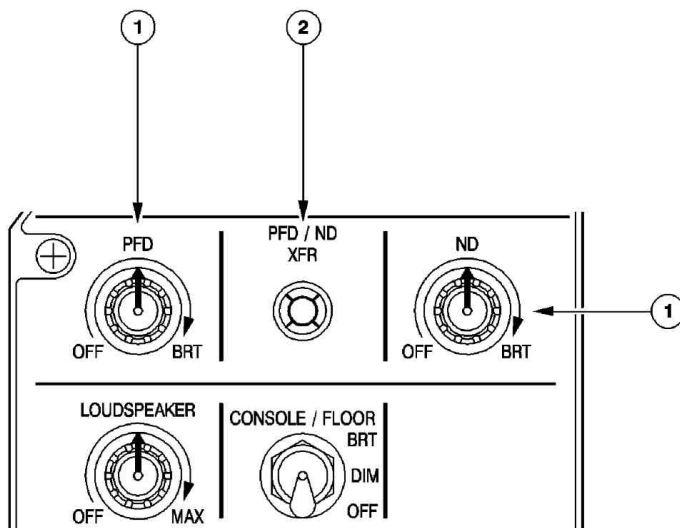
Pushing this button interchanges the PFD and the ND.

If the PFDU fails, the PFD automatically transfers to the NDU.

OTHER EFIS CONTROLS

Ident.: DSC-31-50-00001258.0003001 / 15 FEB 11

Applicable to: MSN 02926-02944, 04392



(1) OFF/BRT knobs

- These knobs turn the PFD and ND display units on and off, and control their brightness.
- The display brightness adjusts automatically for changing light conditions, and is also adjusted manually.

PFD Brightness Control Knob

Rotating this knob all the way counterclockwise switches off the PFD. In this case, the PFD image is automatically displayed on the NDU, but the pilot may recover the ND by means of the PFD-ND XFR pushbutton.

ND Brightness Control Knob

The outer knob controls the brightness of both the weather radar image and GPWS terrain display.

The inner knob controls the general brightness of the ND symbols.

Rotating this knob all the way counterclockwise switches off the NDU.

(2) PFD/ND Pushbutton

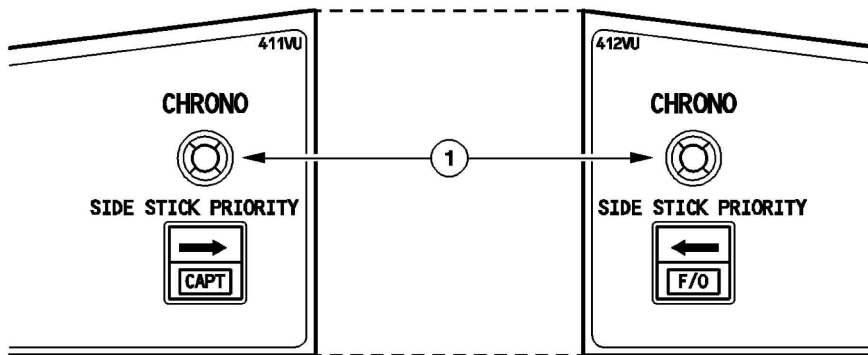
Pushing this button interchanges the PFD and the ND.

If the PFDU fails, the PFD automatically transfers to the NDU.

CHRONOMETER

Ident.: DSC-31-50-00001259.0001001 / 15 FEB 11

Applicable to: ALL



(1) CHRONO Pushbutton

Pushing this button displays chronometer time on the outside ND.

Pushing it again freezes the displayed value.

Pushing it a third time resets the chronometer, and the chronometer time disappears from the display.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS INDICATING/RECORDING SYSTEMS CLOCK - GENERAL
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GENERAL

Ident.: DSC-31-55-10-00001260.0002001 / 21 MAR 16

Applicable to: ALL

A fully independent clock is on the right side of the control panel.

It sends time to the centralized fault data interface unit, the flight data interface unit, and the flight management and guidance computer.

The clock has two electrical supplies, one of which is a direct connection to the aircraft battery hot bus.

The clock performs four functions :

- It displays "UTC" (GMT) time in hours, minutes and seconds on the center counter.
- It displays elapsed time (ET) (from engine startup) in hours and minutes on the lower counter.
- It drives the chronometer (CHR), which measures a time interval (from the pushing of the CHRONO button) in minutes and seconds.
- It can replace the UTC with the date.

AIRCRAFT SYSTEMS
INDICATING/RECORDING SYSTEMS

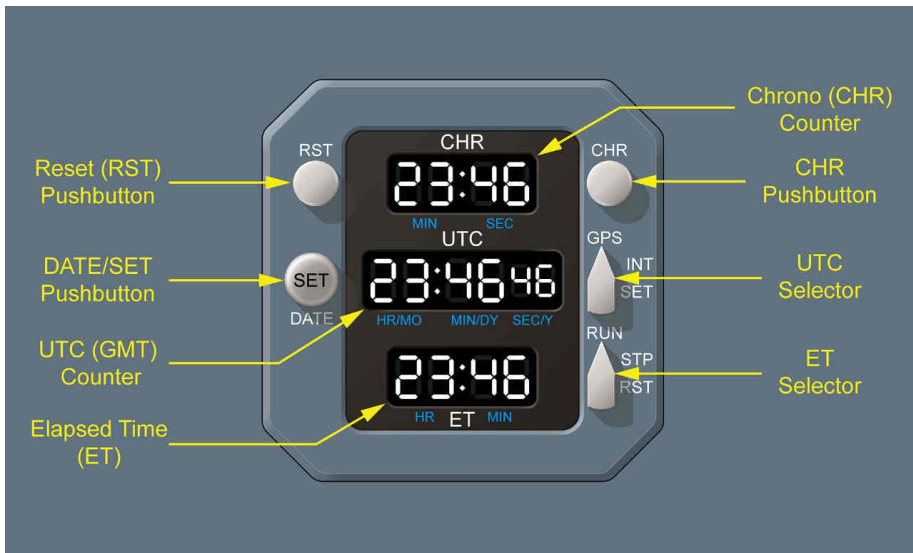
CLOCK - GENERAL

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GENERAL

Ident.: DSC-31-55-20-00001261.0003001 / 21 MAY 24

Applicable to: ALL



UTC (GMT) COUNTER

This counter displays the present time in 24 h format from 0 to 23 h 59 min 59 s.

ELAPSED TIME (ET)

This counter registers the elapsed time up to 99 h and 59 min.

CHRONO (CHR) COUNTER

This counter registers elapsed time from 0 to 99 min 59 s. It is controlled by the CHR pushbutton.

CHR PUSHBUTTON

First push : starts the CHR counter

Second push : stops the CHR counter, keeps the display at its last indication.

RESET (RST) PUSHBUTTON

When pressed, the CHR counter restarts from 0 provided that the chrono has been first stopped with the CHR pushbutton.

AIRCRAFT SYSTEMS**INDICATING/RECORDING SYSTEMS****CLOCK - CONTROLS AND INDICATORS****ET SELECTOR**

- “RUN” : the ET counter starts
- “STP” : the ET counter stops counting
- spring loaded “RST” : the ET counter is blanked. The selector returns to its STP position when the selector is released.

Note: A cumulative elapsed time can be realized by alternatively setting this switch in “RUN” and “STP” position.

DATE/SET PUSHBUTTON

- First push : sets the clock to date mode. The UTC time display is replaced by the date (month/day/year).
- Second push : sets the clock to time mode. The date display disappears.

Note: in order to select the date mode, the UTC selector must be set on “GPS” or “INT” position.

UTC SELECTOR

- “GPS” : Time (or date, if selected) is displayed, and this data is synchronized on GPS information.

Note:

- If the signal between the GPS and the clock is not detected, dashes are displayed. Only the “INT” and “SET” positions are then available.
- If the signal is detected, but GPS data is invalid, the clock automatically runs on its internal time.
- The clock will automatically resynchronize on the GPS information, as soon as the GPS data becomes available.

- “INT” : Internal time (or date, if selected) is displayed.

Note:

- The clock's internal time is initialized with the latest valid GPS information.
- If there is no valid GPS information at power up, the internal time will be 00:00:00, until the clock is initialized.

- “SET” : Allows the internal time and date to be initialized.

OPERATION IN INTERNAL MODE

Ident.: DSC-31-55-20-00007126.0001001 / 21 MAR 17

Applicable to: ALL

DATE INITIALIZATION

Set the UTC selector on “SET”. The minute digits flash, and the seconds' digits are blank.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS INDICATING/RECORDING SYSTEMS CLOCK - CONTROLS AND INDICATORS
--	---

To increase data, turn the DATE/SET button clockwise.

To decrease data, turn the DATE/SET button counterclockwise.

- First, push on DATE/SET : To set the hour.
- Second, push on DATE/SET : To set the year.
- Third, push on DATE/SET : To set the month.
- Fourth, push on DATE/SET : To set the day.

Switch the UTC selector to the "INT" position, and the clock starts with the seconds' digits at 00.

Note: This process must be completed in less than one minute. Otherwise, it will be necessary to reset the CFDS in order to synchronize the lower ECAM time display with the cockpit clock display. Resetting the CFDS is a maintenance operation.

PRECAUTION IN CASE OF ATC DATALINK COMMUNICATION

If the clock is set to internal (INT) mode and the flight crew manually sets the time and date, the clock does not comply with the time precision required for ATC datalink communication (+/-1 s UTC). This may lead to the rejection of messages, or to the acceptance of obsolete messages:

- The CPDLC function will send CPDLC messages with an erroneous date/time
- The CPDLC function will accept obsolete uplink messages and may reject uplink messages with a correct date/time
- The uplink messages for oceanic and departure clearance will be displayed in the Datalink Control and Display Unit (DCDU) with an erroneous time
- The ADS-C function will continue to operate, but in a degraded mode.

To comply with the time precision requirement for ATC datalink communication, the flight crew must either:

- Use the clock in GPS mode, or
 - Use the clock in INT mode and synchronize the clock with the GPS at least one time per day.
- This synchronization ensures that the UTC time drift is below +/- 1 s UTC.

GPS SYNCHRONIZATION IN INTERNAL MODE

When the clock is set to INT mode, the UTC time is only based on the internal clock and is not synchronized with the GPS. To reset the drift that results from the UTC internal time, the flight crew must perform the following actions:

- Set the UTC selector of the clock to the GPS mode and keep this setting during at least 10 seconds
- Then reset the UTC selector of the clock to INT mode.

These actions result in a resynchronization of the internal clock with the GPS.

AIRCRAFT SYSTEMS

INDICATING/RECORDING SYSTEMS

CLOCK - CONTROLS AND INDICATORS

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DESCRIPTION

Ident.: DSC-31-60-10-00001262.0002001 / 09 OCT 12

Applicable to: ALL

The Flight Data Recording System, which records the mandatory parameters, consists of the following components:

- A Flight Data Interface and Management Unit (FDIMU)
- A Digital Flight Data Recorder (DFDR)
- A three-axis Linear Accelerometer (LA)

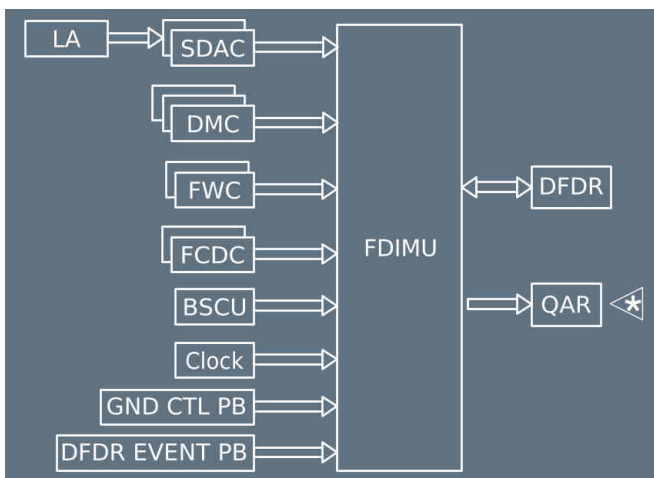
The FDIMU collects and processes parameters from the SDACs, DMCs, FWCs, FCDCs, BSCU, the DFDR event pushbutton, the GND CTL pushbutton and the Clock.

It stores the mandatory flight parameters in the DFDR.

The DFDR can store the last 25 h data, at least. It stores this data on a fireproof and shockproof device. An underwater locator beacon is attached to the DFDR.

The linear accelerometer measures the acceleration of the aircraft along each of the three axes.

The QAR is an operational recorder that stores the same data as the DFDR. However the QAR is more accessible for the maintenance crew.



The recording system is automatically active:

- On the ground, during the first five minutes after the aircraft electric network is energized.
- On the ground, after the first engine start.
- In flight (whether the engines are running or not).

On the ground, the recording system stops automatically five minutes after the second engine shuts down.

AIRCRAFT SYSTEMS**INDICATING/RECORDING SYSTEMS**

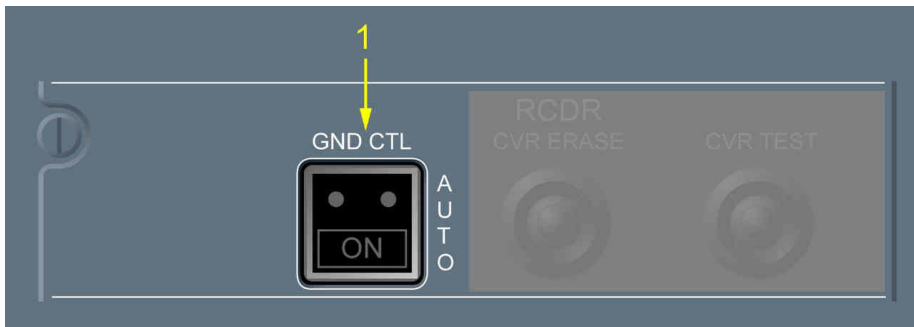
FLT RECORDERS - FLIGHT DATA RECORDING SYSTEM

On the ground, the crew can start the recording system manually by pressing the GND CTL pushbutton.

OVERHEAD PANEL

Ident.: DSC-31-60-20-00001263.0001001 / 04 SEP 18

Applicable to: ALL



(1) GND CTL pb-sw



The CVR, DFDR and QAR  automatically operate (AUTO), according to the logic (*Refer to DSC-31-60-10 Description*).



The flight crew manually starts the CVR, DFDR, and QAR . After engine start, the **ON** light goes off and the recorders automatically operate.

Note: The GND CTL pb-sw may revert to AUTO (active or inactive, according to the logic) during an electrical transient.

AIRCRAFT SYSTEMS

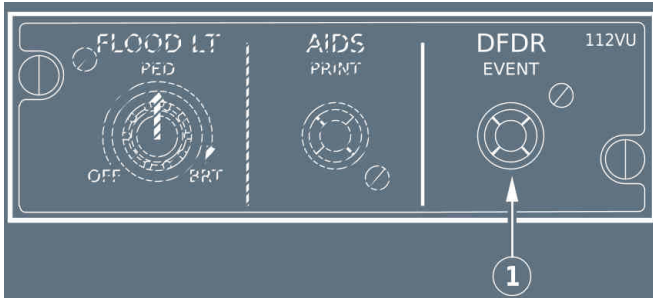
INDICATING/RECORDING SYSTEMS

FLT RECORDERS - CONTROLS AND INDICATORS

PEDESTAL

Ident.: DSC-31-60-20-00001264.0001001 / 22 MAY 12

Applicable to: ALL



(1) DFDR EVENT pushbutton

Pressing this button (briefly) sets an event mark on the Flight Data records.

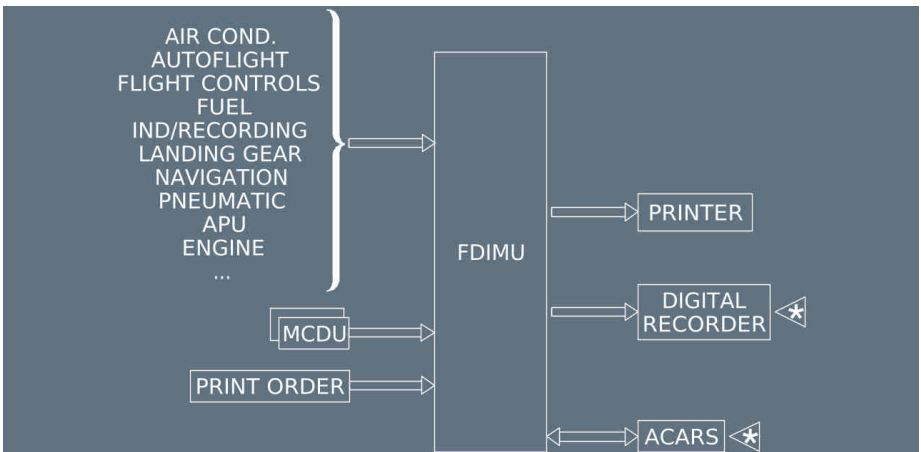
 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS INDICATING/RECORDING SYSTEMS FLT RECORDERS - AIRCRAFT INTEGRATED DATA SYSTEM
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DESCRIPTION

Ident.: DSC-31-60-30-00005369.0002001 / 07 NOV 25

Applicable to: ALL

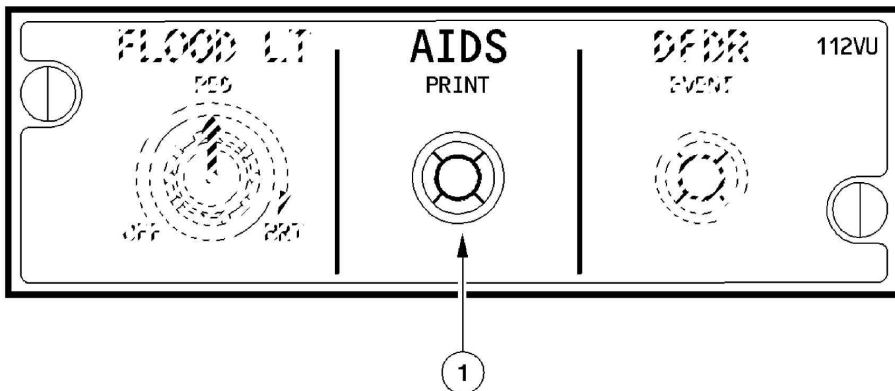
- 1 The AIDS is used to monitor various aircraft system parameters in order to make maintenance easier and to allow formulating operational recommendations.
The AIDS can generate system reports. The Airbus Standard Reports are preprogrammed reports available at aircraft delivery. The operator can create its own reports.
The AIDS uses the Flight Data Interface and Management Unit (FDIMU) to acquire the relevant aircraft system parameters. The FDIMU is connected to the rest of the AIDS as shown below.
The system may be programmed using the MCDUs. The crew can select any report to be displayed on the MCDUs.
The Printer prints the flight phase programmed reports or any report selected on the MCDU.
This printing may be automatic or in response to the AIDS PRINT pushbutton.
The AIDS may send automatic reports via ACARS <✶ /AOC <✶ .
An optional Digital Recorder may be installed to extend the recording capacity.



AIRCRAFT SYSTEMS
INDICATING/RECORDING SYSTEMS
FLT RECORDERS - AIRCRAFT INTEGRATED DATA SYSTEM
CONTROLS ON PEDESTAL

Ident.: DSC-31-60-30-00005370.0001001 / 20 DEC 10

Applicable to: ALL


(1) AIDS PRINT pushbutton

Pushing this pushbutton causes the immediate printing of a specific report, depending on the flight phase. The crew may then use the MCDU to select another report for immediate printing.

AIRCRAFT SYSTEMS

LANDING GEAR

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DSC-32-10 Gears and Doors

DSC-32-10-10 Description

General.....	A
Main Landing Gear (MLG).....	B
Nose Landing Gear (NLG).....	C
Landing Gear Extension and Retraction Equipment.....	D
Landing Gears and Doors Operation.....	E

DSC-32-10-20 Landing Gear System/Interface

Landing Gear Control Interface Unit (LGCIU).....	A
Proximity Detector Output Signals.....	B
Proximity Detector Output Signals (Cont'd).....	C

DSC-32-10-30 Interactions between Landing Gear and Aircraft Systems

GENERAL.....	A
Proximity Detectors on Shock Absorbers.....	B
Proximity Detectors on Uplocks.....	C
Proximity Detectors on Doors.....	D
Proximity Detectors on Downlocks.....	E
Proximity Detectors on Cargo Doors.....	F
Proximity Detectors on Flaps Attachments.....	G

DSC-32-10-40 Controls and Indicators

Landing Gear Indicator Panel.....	A
Landing Gear Selector Lever.....	B
Landing Gear Gravity Extension.....	C
WHEEL SD Page.....	D
Memo Display.....	E

DSC-32-20 Nose Wheel Steering

DSC-32-20-10 Description

Description.....	A
Architecture.....	B

DSC-32-20-20 Controls and Indicators

Side Consoles.....	A
WHEEL SD Page.....	B
Memo Display.....	C

Continued on the following page

Continued from the previous page

DSC-32-30 Brakes and Antiskid

DSC-32-30-10 Description

General.....	A
Anti-Skid System.....	B
Auto Brake.....	C
Braking Modes.....	D
Braking Schematic.....	E

DSC-32-30-20 Controls and Indicators

Center Instrument Panel.....	A
Auto BRK Panel.....	B
Brake Fan 	C
Pedestal.....	D
WHEEL SD Page.....	E
Audio Indicators.....	F
Memo Display.....	G

DSC-32-40 Tire Pressure Indicating System

DSC-32-40-10 Description

Description.....	A
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DSC-32-40-20 Controls and Indicators

WHEEL SD Page.....	A
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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS LANDING GEAR PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS
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Localization Title	Toc Index	ID	Reason
DSC-32-PLP-TOC Memo Display		1	Documentation update: Deletion of "AUTO BRK OFF (00016855.0001001)".
DSC-32-30-10 Braking Modes - Alternate Braking without Anti-Skid	D	1	Layout modification. No technical change.
			Simplification of the sentence.
DSC-32-30-20 Audio Indicators	F	1	Documentation update: Addition of "Audio Indicators" documentary unit
DSC-32-30-20 AUTO BRK OFF	G	2	Documentation update: Addition of "AUTO BRK OFF" documentary unit

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AIRCRAFT SYSTEMS**LANDING GEAR****GEARS AND DOORS - DESCRIPTION****GENERAL**

Ident.: DSC-32-10-10-00018598.0001001 / 21 MAR 16

Applicable to: ALL

The landing gear consists of :

- Two main landing gears that retract inboard
- One nose landing gear that retracts forward.

Doors enclose the landing gear bays. Gear and doors are electrically controlled and hydraulically operated.

The doors, which are fitted to the landing gear struts, are operated mechanically by the gear and close at the end of gear retraction.

All gear doors open while the gear is retracting or extending.

Two Landing Gear Control and Interface Units (LGCIUs) control the extension and retraction of the gear and the operation of the doors. They also supply information about the landing gear to ECAM for display, and send signals indicating whether the aircraft is in flight or on the ground to other aircraft systems.

A hand crank on the center pedestal allows the flight crew to extend the landing gear if the aircraft loses hydraulic systems or electrical power.

MAIN LANDING GEAR (MLG)

Ident.: DSC-32-10-10-00018599.0001001 / 21 MAR 16

Applicable to: ALL

Each main gear has twin wheels and an oleopneumatic shock absorber.

Each main wheel has an antiskid brake.

NOSE LANDING GEAR (NLG)

Ident.: DSC-32-10-10-00018600.0001001 / 21 MAR 16

Applicable to: ALL

The two-wheeled nose gear has an oleopneumatic shock strut and a nose wheel steering system.

AIRCRAFT SYSTEMS

LANDING GEAR

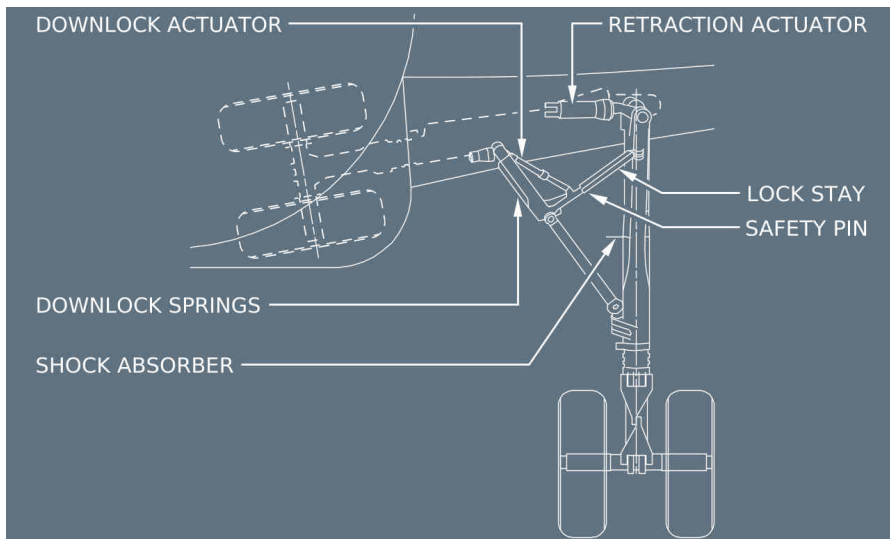
GEARS AND DOORS - DESCRIPTION

LANDING GEAR EXTENSION AND RETRACTION EQUIPMENT

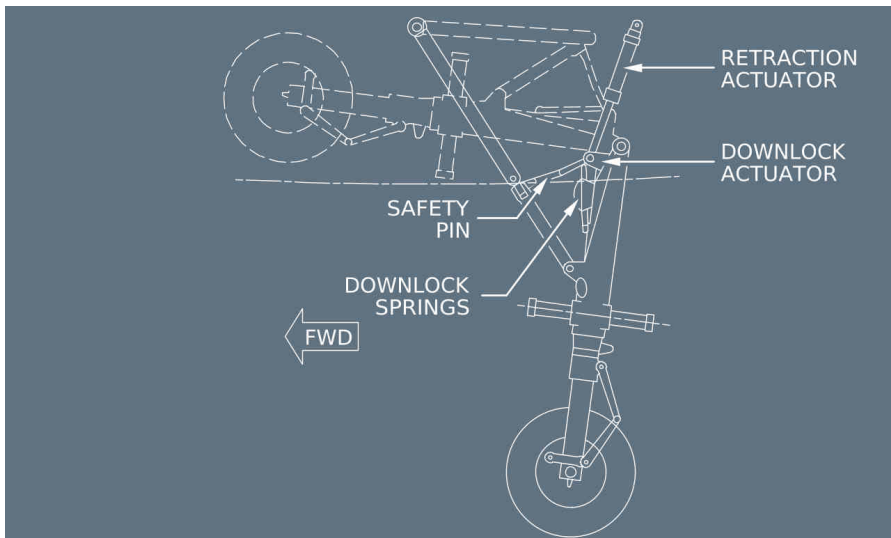
Ident.: DSC-32-10-10-00018601.0001001 / 21 MAR 16

Applicable to: ALL

MAIN LANDING GEAR



NOSE LANDING GEAR



LANDING GEARS AND DOORS OPERATION

Applicable to: ALL

Ident.: DSC-32-10-10-A-00018602.0001001 / 18 JUL 24

NORMAL OPERATION

The flight crew normally operates the landing gear by means of the lever on the center instrument panel.

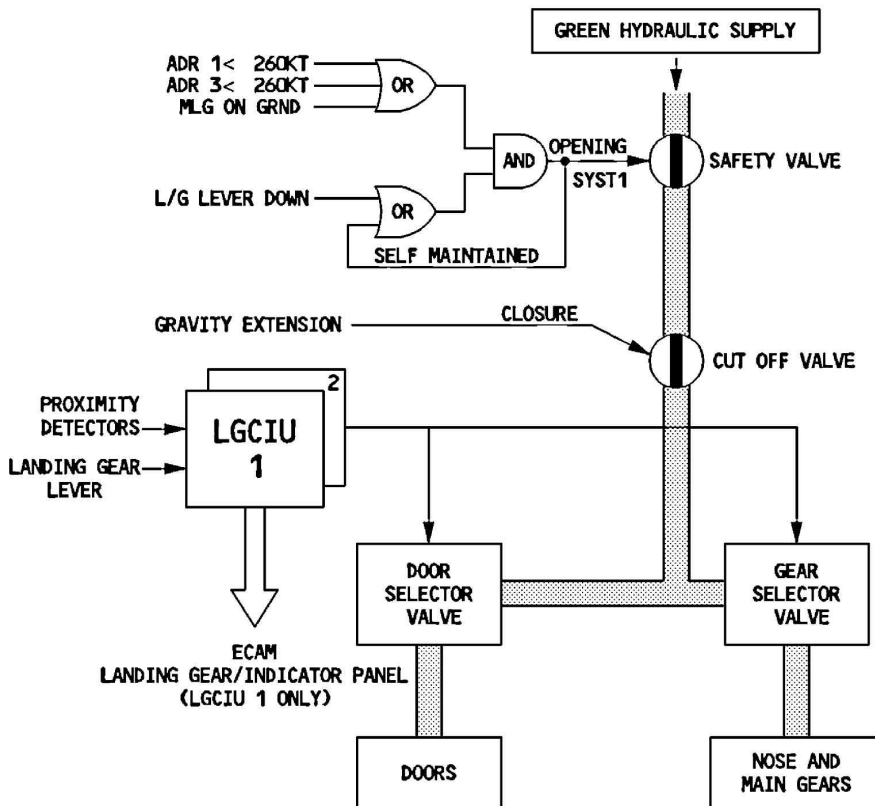
The LGCIUs control the sequencing of gear and doors electrically. One LGCIU controls one complete gear cycle, then switches over automatically to the other LGCIU at the completion of the retraction cycle. It also switches over in case of failure.

The green hydraulic system actuates all gear and doors. When the aircraft speed is above 264 kt, a safety valve automatically cuts off hydraulic supply to the landing gear system. Below 260 kt, the hydraulic supply remains cut off as long as the landing gear lever is up.

AIRCRAFT SYSTEMS

LANDING GEAR

GEARS AND DOORS - DESCRIPTION



Ident.: DSC-32-10-10-A-00018603.0001001 / 21 MAR 16

LANDING GEAR GRAVITY EXTENSION

If the normal system fails to extend the landing gear hydraulically, the flight crew can use a crank to extend it mechanically.

When a crew member turns the crank, it :

- Isolates the landing gear hydraulics from the green hydraulic system
- Unlocks the landing gear doors and the main and nose main gear
- Allows gravity to drop the gear into the extended position.

Locking springs help the crew to crank the main gear into the locked condition, and aerodynamic forces assist in the locking of the nose gear.

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS LANDING GEAR GEARS AND DOORS - DESCRIPTION
--	---

The gear doors remain open.
The flight crew can reset the emergency extension system in flight after using it for training (if green hydraulic pressure is available).

AIRCRAFT SYSTEMS

LANDING GEAR

GEARS AND DOORS - DESCRIPTION

Intentionally left blank

LANDING GEAR CONTROL INTERFACE UNIT (LGCIU)Applicable to: **ALL**

Ident.: DSC-32-10-20-A-00018604.0001001 / 21 MAR 16

GENERAL

The LGCIUs receive position information from the landing gear, cargo door, and landing flap systems.

Ident.: DSC-32-10-20-A-00018605.0001001 / 21 MAR 16

LANDING GEAR INFORMATION

The LGCIUs receive landing gear position information from proximity detectors when:

- The landing gears are locked down or up, or
- The shock absorbers are compressed or extended, or
- The landing gear doors are open, or closed, or
- The bogie are aligned or not.

The LGCIUs send the landing gear position data to other aircraft systems.

In case of a LGCIU failure, the landing gear is controlled by the remaining healthy LGCIU.

Ident.: DSC-32-10-20-A-00018606.0001001 / 17 MAY 21

CARGO DOORS INFORMATION

Sensors send to the LGCIUs the position of the following components :

- Manual selector valves
- Locking shaft
- Locking handle
- Safety shaft
- Door sills  .

The LGCIUs detect electrical failures only in certain proximity switches in the cargo door system :

- Locking shaft
- Locking handle
- Safety shaft.

When an LGCIU makes such a detection, it indicates the NON LOCKED condition for that component.

Ident.: DSC-32-10-20-A-00018607.0001001 / 21 MAR 16

LANDING FLAPS INFORMATION

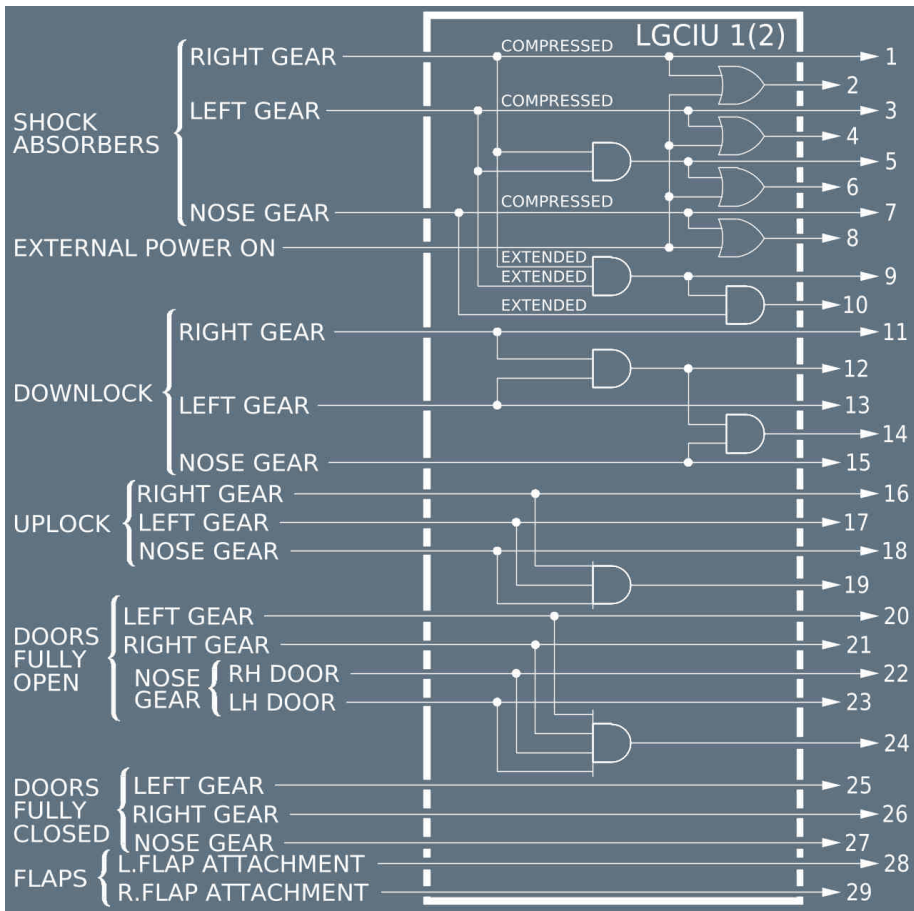
The LGCIUs process the signals from four flap disconnect proximity switches, then send them to the Slat/Flap Control Computers (SFCCs).

The LGCIUs do not monitor failures in the SFCC system.

PROXIMITY DETECTOR OUTPUT SIGNALS

Ident.: DSC-32-10-20-00001278.0001001 / 22 MAY 12

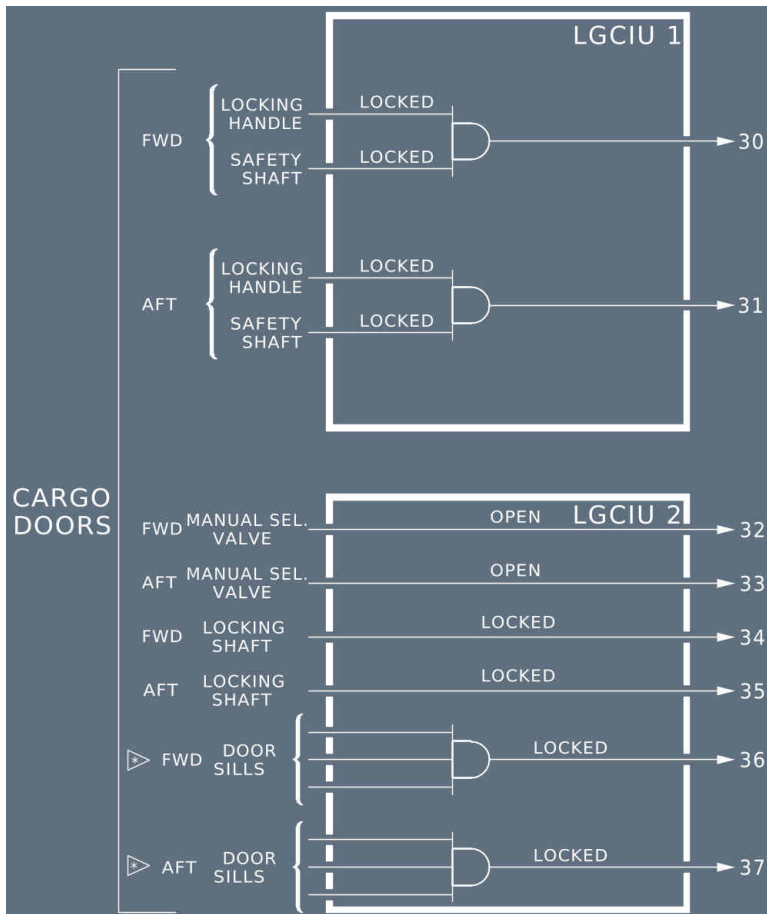
Applicable to: ALL



PROXIMITY DETECTOR OUTPUT SIGNALS (CONT'D)

Ident.: DSC-32-10-20-00001279.0001001 / 21 MAR 16

Applicable to: ALL



AIRCRAFT SYSTEMS

LANDING GEAR

GEARS AND DOORS - LANDING GEAR SYSTEM/INTERFACE

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS LANDING GEAR GEARS AND DOORS - INTERACTIONS BETWEEN LANDING GEAR AND AIRCRAFT SYSTEMS
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GENERAL

Ident.: DSC-32-10-30-00001285.0001001 / 10 DEC 09

Applicable to: ALL

The following tables present the operational effects of the proximity detectors on aircraft systems.
How to read the tables :

SYSTEM	LGCIU 1	LGCIU 2	A/C IN FLT	A/C ON GROUND
SERVICE INTERPHONE	6	6	.....	.....
SFCC 1(2)	5	(5)	.....	.....

The above lines mean that the service interphone receives the output n° 6 from both LGCIUs, while SFCC 1 receive the output 5 from LGCIU 1 and SFCC 2 the output 5 from LGCIU 2.

The two additional columns give the system functioning when the aircraft is in flight and on the ground.

PROXIMITY DETECTORS ON SHOCK ABSORBERS

Ident.: DSC-32-10-30-00018608.0001001 / 15 MAY 25

Applicable to: MSN 02719-03060, 07784-07792

	SYSTEM	LGCIU 1 OUTPUT	LGCIU 2 OUTPUT	A/C IN FLT	A/C ON GRND
GENERAL	STROBE lights		5	On when AUTO selected	Off when AUTO selected
	LOGO lights		5	Off when flaps retracted	On
	AIRSTAIRS 	3	1	Control inhibited ⁽¹⁾	Control not inhibited ⁽²⁾
	CARGO DOOR		5	Normal control not available	Normal control available
	WATER FILLING		5	Preselect water servicing inhibited	Preselect water servicing available

Continued on the following page

AIRCRAFT SYSTEMS

LANDING GEAR

GEARS AND DOORS - INTERACTIONS BETWEEN LANDING GEAR AND AIRCRAFT SYSTEMS

Continued from the previous page

	SYSTEM	LGCIU 1 OUTPUT	LGCIU 2 OUTPUT	A/C IN FLT	A/C ON GRND
AIR COND	AVNCS COOLING	5	5	- Skin temperature < 32 °C : The system is in closed configuration⁽¹⁾ - Skin temperature > 35 °C : The system is in intermediate configuration⁽¹⁾	- Skin temperature < 9 °C : The system is in closed configuration⁽²⁾ - Skin temperature > 12 °C : The system is in open configuration⁽²⁾
	GRND COOLING 	1 3	1 3	Inhibited ⁽¹⁾	Not inhibited ⁽²⁾
	FWD CARGO VENT		5	Extract fan stopped when ΔP > 1 PSI	Extract fan on
	CAB PRESS	5	5	Climb mode active ⁽⁴⁾	- Prepressurization active before TO ⁽³⁾ - Depressurization active after LDG ⁽³⁾
	PACK 1(2) TEMP CONTROL		3 (1)	Pack air inlet flaps opened.	Pack air inlet flap fully closed at TO and LDG
APU	APU AUTO SHUTDOWN	5		In case of oil low pressure, automatic shutdown is delayed by 15.5 s	In case of oil low pressure, the automatic shutdown is delayed by: 15.5 s if the oil temperature < -4 °C 0.05 s if oil temperature > -4 °C
	APU SPEED CONTROL			Speed is controlled at 100 %	Speed is controlled at 99 % (100 % for ENG start or when ambient temperature is below -18 °C or above 35 °C)

Continued on the following page

AIRCRAFT SYSTEMS
LANDING GEAR
**GEARS AND DOORS - INTERACTIONS BETWEEN
LANDING GEAR AND AIRCRAFT SYSTEMS**
Continued from the previous page

	SYSTEM	LGCIU 1 OUTPUT	LGCIU 2 OUTPUT	A/C IN FLT	A/C ON GRND
COMMUNICATIONS	SERVICE INTERPHONE	6	6	Inhibited ⁽⁵⁾	Available ⁽⁶⁾
	PUBLIC ADDRESS (PA)	1 3	1 3	PA increased level ⁽⁵⁾	PA low level ⁽⁶⁾
	ADIRU and AVIONICS ground warning	1 3	1 3	External horn and light inhibited ⁽⁵⁾	External horn and light not inhibited ⁽⁶⁾
	FLT INTERPHONE	9		Communication with ground mechanic inhibited	Communication with ground mechanic available
	COCKPIT CALL LIGHT	9		Inhibited	Not inhibited
	ACARS (ACARS MU or ATSU)	7		Available	Available
	CVR	1 3 7	1 3	Runs ⁽⁵⁾	Runs : ⁽⁶⁾ - During the first 5 min following energization - With at least one engine running Stops : ⁽⁶⁾ 5 min after second engine shutdown
	CVR		5	- ERASE function inhibited - No low frequency signal in the loudspeakers if test performed	- ERASE function not inhibited - Low frequency signal in the loudspeakers if test performed
ELEC	DC generation	5		APU start on batteries only, is delayed by 45 s	No APU start delay when on batteries only
	GALLEY supply		5	Main galley not supplied when APU GEN only is supplying	Main galley supplied when APU GEN only is supplying
EIS	EIS	5		Display test inhibited when ANN LT TEST is selected	Display test not inhibited
FIRE	APU	5		No APU fire automatic extinguishing	Automatic extinguishing not inhibited

Continued on the following page

AIRCRAFT SYSTEMS

LANDING GEAR

GEARS AND DOORS - INTERACTIONS BETWEEN LANDING GEAR AND AIRCRAFT SYSTEMS

Continued from the previous page

	SYSTEM	LGCIU 1 OUTPUT	LGCIU 2 OUTPUT	A/C IN FLT	A/C ON GRND
FLT CTL	SFCC 1(2)	5	(5)	- For SFCC 1(2): Slats alpha/speed lock function active - For SFCC(2): No flaps movement inhibition if the cargo door is opened	- For SFCC 1(2): Slats alpha/speed lock function active if speed > 60 kt - For SFCC (2): Flaps movement inhibition if cargo door is opened
FLT INST	- DFDR - QAR 	1 3 7	1 3	Runs ⁽⁵⁾	<u>Runs:</u> ⁽⁶⁾ - During the first 5 min following energization - With one engine running <u>Stops:</u> ⁽⁶⁾ 5 min after second engine shut down
FUEL	FQI	5		FQI uses flight attitude correction due to wing bending	FQI uses ground attitude correction

Continued on the following page

AIRCRAFT SYSTEMS
LANDING GEAR

 GEARS AND DOORS - INTERACTIONS BETWEEN
 LANDING GEAR AND AIRCRAFT SYSTEMS

Continued from the previous page

	SYSTEM	LGCIU 1 OUTPUT	LGCIU 2 OUTPUT	A/C IN FLT	A/C ON GRND
HYD	BLUE and GREEN pumps	1 3		Blue or green pump "FAULT" light not inhibited when related pump is stopped ⁽⁶⁾	Blue or green pump "FAULT" light inhibited when related pump is stopped ⁽⁶⁾
	BLUE pump	7		Runs when electrical power is available	Runs when at least one engine is running
	BLUE and YELLOW pumps		1 3	Blue or yellow pump "FAULT" light not inhibited when related pump is stopped ⁽⁶⁾	Blue or yellow pump "FAULT" light inhibited when related pump is stopped ⁽⁷⁾
	PTU		7	PTU runs if green/yellow different pressure > 500 PSI	PTU runs if green/yellow different pressure > 500 PSI and - Both MASTER LEVERS are at OFF or - Both MASTER LEVERS are at ON or - Nose wheel steering is not in towing position with parking brake released. PTU is inhibited during the use of the cargo door hand pump and for 40 s after its use.

Continued on the following page

AIRCRAFT SYSTEMS
LANDING GEAR

 GEARS AND DOORS - INTERACTIONS BETWEEN
 LANDING GEAR AND AIRCRAFT SYSTEMS

Continued from the previous page

	SYSTEM	LGCIU 1 OUTPUT	LGCIU 2 OUTPUT	A/C IN FLT	A/C ON GRND
ICE RAIN PROT	CAPT, (F/O), ((STBY)) probes and CAPT, (F/O) windshields and windows heating	4 (2) (8)	4 (2) (8)	• CAPT, (F/O), ((STBY)) pitots and CAPT, (F/O) windshields are heated at high level • All other probes and windows are heated⁽⁵⁾	• With engines stopped: no heating⁽⁷⁾ • With at least one engine running: • CAPT, (F/O), ((STBY)) pitots and CAPT, (F/O) windshields are heated at low level⁽⁷⁾ • All other probes and windows are heated (except TAT probes).
	WING ANTI ICE	3	1	Wing anti ice valves open when the WING ANTI ICE pb is at ON ⁽⁵⁾	Wing anti ice valves open for 30 s when the WING ANTI ICE pb is at ON ⁽⁷⁾
	RAIN REPELLENT	1 3	1 3	Not inhibited ⁽⁵⁾	Inhibited if engines are stopped ⁽⁶⁾
	DRAIN MAST		9	High heating level is applied	Low heating level is applied
LANDING GEAR	L/G SAFETY VALVE	6		Safety valve closes if aircraft speed > 264 kt	Safety valve opened
	L/G control	10	10	Retraction not inhibited ⁽⁸⁾	Retraction inhibited ⁽⁸⁾
	TIRE PRESS 		5	WHEEL TYRE LO PR threshold set to its flight level	WHEEL TYRE LO PR threshold set to its ground level
NAVIGATION	STANDBY ALTIMETER	5		VIBRATION function active	VIBRATION function inhibited
	ATC 1(2)	3	(1)	ATC 1(2) available in AUTO mode	ATC 1(2) inhibited in AUTO mode
	ADIRU 1	7		No external horn when ADIRU supplied from batteries only	External horn not inhibited

Continued on the following page

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS LANDING GEAR GEARS AND DOORS - INTERACTIONS BETWEEN LANDING GEAR AND AIRCRAFT SYSTEMS
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Continued from the previous page

	SYSTEM	LGCIU 1 OUTPUT	LGCIU 2 OUTPUT	A/C IN FLT	A/C ON GRND
POWER PLANT	FADEC 1(2)	1 3 8	(1) (3) (8)	On ENG 1(2): ⁽⁵⁾ - Reverse inhibited - No automatic start abort - FADEC always supplied - FLX not available - If installed, BUMP not selectable.	On ENG 1(2): ⁽⁷⁾ - Reverse available - Automatic start abort available 5 min after eng-shut down FADEC 1(2) no more supplied - FLX available - If installed, BUMP selectable.
		1 3 8	(1) (3) (8)	Modulated idle and approach idle are available ⁽⁵⁾	Modulated idle only available ⁽⁶⁾

- (1) When either LGCIU indicates flight.
- (2) When both LGCIU indicate ground.
- (3) When either LGCIU indicates ground.
- (4) When both LGCIU indicate flight.
- (5) When either output indicates flight.
- (6) When all outputs indicate ground.
- (7) When both outputs indicate ground.
- (8) One valid output is sufficient.

AIRCRAFT SYSTEMS

LANDING GEAR

GEARS AND DOORS - INTERACTIONS BETWEEN LANDING GEAR AND AIRCRAFT SYSTEMS

PROXIMITY DETECTORS ON SHOCK ABSORBERS

Ident.: DSC-32-10-30-00018608.0003001 / 15 MAY 25

Applicable to: MSN 02155-02212, 04392-05746

	SYSTEM	LGCIU 1 OUTPUT	LGCIU 2 OUTPUT	A/C IN FLT	A/C ON GRND
GENERAL	STROBE lights		5	On when AUTO selected	Off when AUTO selected
	LOGO lights		5	Off when flaps retracted	On
	AIRSTAIRS ✈	3	1	Control inhibited ⁽¹⁾	Control not inhibited ⁽²⁾
	CARGO DOOR		5	Normal control not available	Normal control available
	WATER FILLING		5	Preselect water servicing inhibited	Preselect water servicing available
AIR COND	AVNCS COOLING	5	5	- Skin temperature < 32 °C : The system is in closed configuration⁽¹⁾ - Skin temperature > 35 °C : The system is in intermediate configuration⁽¹⁾	- Skin temperature < 9 °C : The system is in closed configuration⁽²⁾ - Skin temperature > 12 °C : The system is in open configuration⁽²⁾
	GRND COOLING ✈	1 3	1 3	Inhibited ⁽¹⁾	Not inhibited ⁽²⁾
	FWD CARGO VENT		5	Extract fan stopped when ΔP > 1 PSI	Extract fan on
	CAB PRESS	5	5	Climb mode active ⁽⁴⁾	- Prepressurization active before TO⁽³⁾ - Depressurization active after LDG⁽³⁾
	PACK 1(2) TEMP CONTROL		3 (1)	Pack air inlet flaps opened	Pack air inlet flap fully closed at TO and LDG

Continued on the following page

AIRCRAFT SYSTEMS
LANDING GEAR

 GEARS AND DOORS - INTERACTIONS BETWEEN
 LANDING GEAR AND AIRCRAFT SYSTEMS

Continued from the previous page

	SYSTEM	LGCIU 1 OUTPUT	LGCIU 2 OUTPUT	A/C IN FLT	A/C ON GRND
APU	APU AUTO SHUTDOWN	5		In case of oil low press, automatic shutdown is delayed by 15.5 s	- In case of oil low pressure, the automatic shutdown is delayed by : • 15.5 s if the oil temperature < -4 °C • 0.05 s if oil temperature > -4 °C
COMMUNICATIONS	SERVICE INTERPHONE	6	6	Inhibited ⁽⁵⁾	Available ⁽⁶⁾
	PUBLIC ADDRESS (PA)	1 3	1 3	PA increased level ⁽⁶⁾	PA low level ⁽⁶⁾
	ADIRU and AVIONICS ground warning	1 3	1 3	External horn and light inhibited ⁽⁵⁾	External horn and light not inhibited ⁽⁶⁾
	FLT INTERPHONE	9		Communication with ground mechanic inhibited	Communication with ground mechanic available
	COCKPIT CALL LIGHT	9		Inhibited	Not inhibited
	ACARS (ACARS MU or ATSU)	7		Available	Available
	CVR	1 3 7	1 3	Runs ⁽⁵⁾	<u>Runs:</u> ⁽⁶⁾ - during the first 5 min following energization - with one engine running <u>Stops:</u> ⁽⁶⁾ 5 min after second engine shutdown
	CVR		5	• ERASE function inhibited • No low frequency signal in the loudspeakers if test performed	• ERASE function not inhibited • Low frequency signal in the loudspeakers if test performed

Continued on the following page

AIRCRAFT SYSTEMS

LANDING GEAR

GEARS AND DOORS - INTERACTIONS BETWEEN LANDING GEAR AND AIRCRAFT SYSTEMS

Continued from the previous page

	SYSTEM	LGCIU 1 OUTPUT	LGCIU 2 OUTPUT	A/C IN FLT	A/C ON GRND
ELEC	DC generation	5		APU start on batteries only, is delayed by 45 s	No APU start delay when on batteries only
	GALLEY supply		5	Main galley not supplied when APU GEN only is supplying	Main galley supplied when APU GEN only is supplying
EIS	EIS	5		Display test inhibited when ANN LT TEST is selected	Display test not inhibited
FIRE	APU	5		No APU fire automatic extinguishing	Automatic extinguishing not inhibited
FLT CTL	SFCC 1(2)	5	(5)	- For SFCC 1(2): Slats alpha/speed lock function active - For SFCC(2): No flaps movement inhibition if the cargo door is opened	- For SFCC 1(2): Slats alpha/speed lock function active if speed > 60 kt - For SFCC (2): Flaps movement inhibition if cargo door is opened
FLT INST	- DFDR - QAR 	1 3 7	1 3	Runs ⁽⁵⁾	Runs: ⁽⁶⁾ - During the first 5 min following energization - With one engine running Stops: ⁽⁶⁾ 5 min after second engine shut down
FUEL	FQI	5		FQI uses flight attitude correction due to wing bending	FQI uses ground attitude correction

Continued on the following page

AIRCRAFT SYSTEMS
LANDING GEAR

 GEARS AND DOORS - INTERACTIONS BETWEEN
 LANDING GEAR AND AIRCRAFT SYSTEMS

Continued from the previous page

	SYSTEM	LGCIU 1 OUTPUT	LGCIU 2 OUTPUT	A/C IN FLT	A/C ON GRND
HYD	BLUE and GREEN pumps	1 3		Blue or green pump "FAULT" light not inhibited when related pump is stopped ⁽⁵⁾	Blue or green pump "FAULT" light inhibited when related pump is stopped ⁽⁶⁾
	BLUE pump	7		Runs when electrical power is available	Runs when at least one engine is running
	BLUE and YELLOW pumps		1 3	Blue or yellow pump "FAULT" light not inhibited when related pump is stopped ⁽⁵⁾	Blue or yellow pump "FAULT" light inhibited when related pump is stopped ⁽⁷⁾
	PTU		7	PTU runs if green/yellow different pressure > 500 PSI	PTU runs if green/yellow different pressure > 500 PSI and • both MASTER LEVERS are at OFF or • Both MASTER LEVERS are at ON or • Nose wheel steering is not in towing position with parking brake released. PTU is inhibited during the use of the cargo door hand pump and for 40 s after its use.

Continued on the following page

AIRCRAFT SYSTEMS

LANDING GEAR

GEARS AND DOORS - INTERACTIONS BETWEEN LANDING GEAR AND AIRCRAFT SYSTEMS

Continued from the previous page

	SYSTEM	LGCIU 1 OUTPUT	LGCIU 2 OUTPUT	A/C IN FLT	A/C ON GRND
ICE RAIN PROT	CAPT, (F/O), ((STBY)) pitots and CAPT, (F/O) windshields and windows heating	4 (2) (8)	4 (2) (8)	- CAPT, (F/O), ((STBY)) pitots and CAPT, (F/O) windshields are heated at high level - All other probes and windows are heated⁽⁵⁾	- With engines stopped: no heating⁽⁷⁾ - With at least one engine running: - CAPT, (F/O), ((STBY)) pitots and CAPT, (F/O) windshields are heated at low level⁽⁷⁾ - All other probes and windows are heated (except TAT probes).
	WING ANTI ICE	3	1	Wing anti ice valves open when the WING ANTI ICE pb is at ON ⁽⁵⁾	Wing anti ice valves open for 30 s when the WING ANTI ICE pb is at ON ⁽⁷⁾
	RAIN REPELLENT	1 3	1 3	Not inhibited ⁽⁵⁾	Inhibited if engines are stopped ⁽⁶⁾
	DRAIN MAST		9	High heating level is applied	Low heating level is applied
LANDING GEAR	L/G SAFETY VALVE	6		Safety valve closes if aircraft speed > 264 kt	Safety valve opened
	L/G control	10	10	Retraction not inhibited ⁽⁸⁾	Retraction inhibited ⁽⁸⁾
	TIRE PRESS 		5	WHEEL TYRE LO PR threshold set to its flight level	WHEEL TYRE LO PR threshold set to its ground level
NAVIGATION	STANDBY ALTIMETER	5		VIBRATION function active	VIBRATION function inhibited
	ATC 1(2)	3	(1)	ATC 1(2) available in AUTO mode	ATC 1(2) inhibited in AUTO mode
	ADIRU 1	7		No external horn when ADIRU supplied from batteries only	External horn not inhibited

Continued on the following page

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS LANDING GEAR GEARS AND DOORS - INTERACTIONS BETWEEN LANDING GEAR AND AIRCRAFT SYSTEMS
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Continued from the previous page

	SYSTEM	LGCIU 1 OUTPUT	LGCIU 2 OUTPUT	A/C IN FLT	A/C ON GRND
POWER PLANT	FADEC 1(2)	1 3 8	(1) (3) (8)	On ENG 1(2): ⁽⁵⁾ - Reverse inhibited - No automatic start abort - FADEC always supplied - FLX not available - If installed, BUMP not selectable.	On ENG 1(2): ⁽⁷⁾ - Reverse available - Automatic start abort available 5 min after eng-shut down FADEC 1(2) no more supplied - FLX available - If installed, BUMP selectable.
		1 3 8	(1) (3) (8)	Modulated idle and approach idle are available ⁽⁵⁾	Modulated idle only available ⁽⁶⁾

- (1) When either LGCIU indicates flight.
- (2) When both LGCIU indicate ground.
- (3) When either LGCIU indicates ground.
- (4) When both LGCIU indicate flight.
- (5) When either output indicates flight.
- (6) When all outputs indicate ground.
- (7) When both outputs indicate ground.
- (8) One valid output is sufficient.

AIRCRAFT SYSTEMS

LANDING GEAR

GEARS AND DOORS - INTERACTIONS BETWEEN
 LANDING GEAR AND AIRCRAFT SYSTEMS

PROXIMITY DETECTORS ON UPLOCKS

Ident.: DSC-32-10-30-00018610.0002001 / 21 MAR 16

Applicable to: ALL

	SYSTEM	LGCIU 1 OUTPUT	LGCIU 2 OUTPUT	L/G UPLOCKED	L/G NOT UPLOCKED
LANDING GEAR	L/G control	19	19	If UP selected ⁽¹⁾ L/G doors will close	If UP selected ⁽¹⁾ L/G doors will not close
	ECAM WHEEL page	16 17 18	16 17 18	If UP selected ⁽²⁾ L/G uplocked indications	If UP selected ⁽²⁾ L/G in transit indications
	L/G indicator panel	16 17 18		If UP selected ⁽²⁾ no indication	If UP selected ⁽²⁾ "UNLK" red indications

⁽¹⁾ One valid output is sufficient.

⁽²⁾ When all outputs indicate the same position.

PROXIMITY DETECTORS ON DOORS

Ident.: DSC-32-10-30-00018611.0001001 / 21 MAR 16

Applicable to: ALL

	SYSTEM	LGCIU 1 OUTPUT	LGCIU 2 OUTPUT	DOORS FULLY OPENED	DOORS CLOSED
LANDING GEAR	L/G control	24	24	L/G extension or retraction possible ⁽¹⁾	L/G extension or retraction inhibited ⁽¹⁾
	ECAM WHEEL page	20 21 22 23	20 21 22 23	Doors fully opened indication	Doors closed indication

⁽¹⁾ One valid output is sufficient.

PROXIMITY DETECTORS ON DOWNLOCKS

Ident.: DSC-32-10-30-00018613.0001001 / 21 MAR 16

Applicable to: ALL

	SYSTEM	LGCIU 1 OUTPUT	LGCIU 2 OUTPUT	L/G DOWNLOCKED	L/G NOT DOWNLOCKED
GEN	TAXI/T.O lights		15	Lights not inhibited	Lights inhibited
COMM	SIGNS	12	12	"NO SMOKING" ⁽¹⁾ and "EXIT" signs on when AUTO selected ⁽²⁾	"NO SMOKING" ⁽¹⁾ and "EXIT" signs inhibited when AUTO selected ⁽³⁾

Continued on the following page

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS LANDING GEAR GEARS AND DOORS - INTERACTIONS BETWEEN LANDING GEAR AND AIRCRAFT SYSTEMS
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Continued from the previous page

	SYSTEM	LGCIU 1 OUTPUT	LGCIU 2 OUTPUT	L/G DOWNLOCKED	L/G NOT DOWNLOCKED
FLT INST	WBS 	15	15	Active ⁽⁴⁾	Inhibited ⁽⁵⁾
FMGS	FAC 1(2)	12	12	VLE indication displayed on PFD 1(2)	No VLE indication
LANDING GEAR	L/G control	14	14	If DOWN selected : ⁽⁶⁾ L/G doors will close	If DOWN selected : ⁽⁶⁾ L/G doors will not close
	ECAM WHEEL page	11 13 15	11 13 15	If DOWN selected : ⁽⁷⁾ L/G down indications	If DOWN selected : ⁽⁷⁾ L/G in transit indications
	L/G INDIC panel	11 13 15		If DOWN selected : ⁽⁷⁾ L/G down indications	If DOWN selected : ⁽⁷⁾ L/G in transit indications
	BRAKING STEERING	15	15	BSCU test operative ⁽²⁾	BSCU test inhibited ⁽³⁾
	BRAKE COOLING FANS 		13	Cooling available when ON selected	Cooling inhibited when ON selected
NAV	GPWS	13		"TOO LOW-FLAPS" or "TOO LOW TERRAIN" warning operative	"TOO LOW-GEAR" or "TOO LOW TERRAIN" warning operative

- (1) For cabin not configured for non smoking flight
- (2) When either output indicates DOWNLOCK.
- (3) When both outputs indicate NOT DOWNLOCK.
- (4) When both outputs indicate DOWNLOCK.
- (5) When either output indicates NOT DOWNLOCK.
- (6) One valid output is sufficient.
- (7) When all outputs indicate the same position.

AIRCRAFT SYSTEMS
LANDING GEAR
**GEARS AND DOORS - INTERACTIONS BETWEEN
LANDING GEAR AND AIRCRAFT SYSTEMS**
PROXIMITY DETECTORS ON CARGO DOORS

Ident.: DSC-32-10-30-00018614.0001001 / 10 MAY 22

Applicable to: ALL

LOCKING HANDLE OR SHAFT, DOOR SILLS

	SYSTEM	LGCIU 1 OUTPUT	LGCIU 2 OUTPUT	LOCKED	UNLOCKED
CRG DOORS	ECAM DOOR PAGE	30 (31)		Forward (aft) door symbol appears green	Forward (aft) door symbol appears amber, associated with "CARGO" amber
	CARGO DOOR OPERATION		34 (35)	Forward (aft) door normal opening inhibition	Forward (aft) door normal opening possible
			36  (37) 	Forward (aft) door normal operation possible	Forward (aft) door normal operation inhibited

MANUAL SELECTOR VALVE

	SYSTEM	LGCIU 1 OUTPUT	LGCIU 2 OUTPUT	CLOSE	OPEN
CRG DOORS	CARGO DOOR OPERATION		32 (33)	Forward (aft) door normal opening inhibition	Forward (aft) door normal opening possible

PROXIMITY DETECTORS ON FLAPS ATTACHMENTS

Ident.: DSC-32-10-30-00001291.0001001 / 22 MAR 16

Applicable to: ALL

	SYSTEM	LGCIU 1 OUTPUT	LGCIU 2 OUTPUT	FLAP ATTACHMENT	FLAP ATTACHMENT FAILURE
FLT CTL	SFCC	28 (29)	28 (29)	L(R) FLAPS normal operation ⁽¹⁾	"FLAPS LOCKED" warning ⁽²⁾

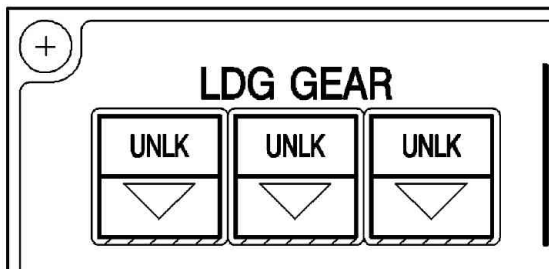
⁽¹⁾ When at least one SFCC detects normal operation

⁽²⁾ When both SFCCs detect attachment failure

LANDING GEAR INDICATOR PANEL

Ident.: DSC-32-10-40-00018615.0001001 / 21 MAR 16

Applicable to: ALL



This panel is connected to LGCIU1, which receives signals from proximity detectors.

▽ light: comes on green if the gear is locked down.

UNLK: comes on red if the gear is not locked in the selected position.
light

Note: This panel is connected to the LGCIU1 only, therefore, the lights on the LDG GEAR indicator panel come on as long as the LGCIU1 is electrically supplied.
If one UNLK indication remains on, the landing gear position can be confirmed using the WHEEL SD page (information from LGCIU 1 & 2). Only one green triangle on each landing gear is sufficient to confirm that the landing gear is downlocked.

LANDING GEAR SELECTOR LEVER

Ident.: DSC-32-10-40-00018616.0001001 / 20 MAY 16

Applicable to: ALL

A two-position selector lever sends electrical signals to the two LGCIUs. These control the green hydraulic supply to the landing gear system by means of selector valves.

The flight crew must always move the L/G lever in one continuous movement (i.e. with no stop between both positions).

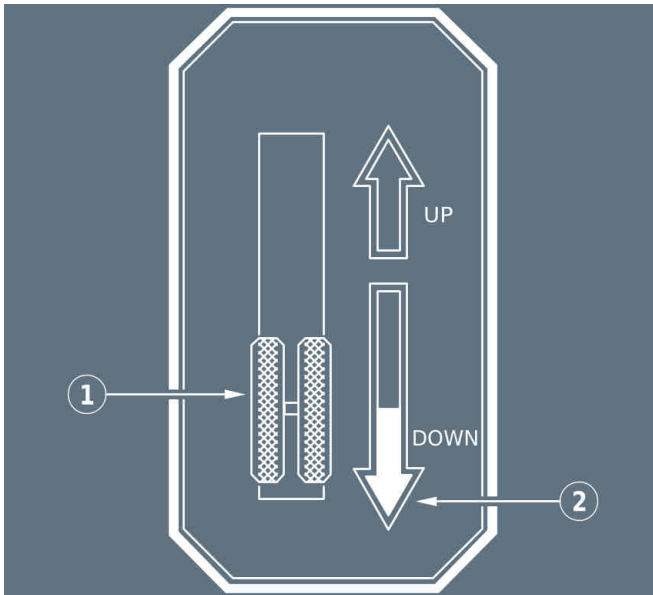
When the flight crew selects UP or DOWN (and if the airspeed is below 260 kt):

- All landing gear doors open
- Each landing gear moves to the selected position
- All landing gear doors close.

AIRCRAFT SYSTEMS

LANDING GEAR

GEARS AND DOORS - CONTROLS AND INDICATORS



(1) L/G LEVER

UP : This position selects landing gear retraction.

While the landing gear doors are opening, the normal brake system brakes the wheels of the main landing gear automatically.

A brake band in the nose landing gear well brakes the nose landing gear wheels as the doors close (for aircraft equipped with nose landing gear rubbing strips).

DOWN : This position selects landing gear extension.

An interlock mechanism prevents anyone from accidentally retracting the gear while the aircraft is on the ground. It does so by locking the lever in DOWN position when the shock absorber on either main gear is compressed (aircraft on ground) or the nose wheel steering is not centered.

The landing gear hydraulic system remains pressurized as long as the landing gear is extended (if green hydraulic pressure is available).

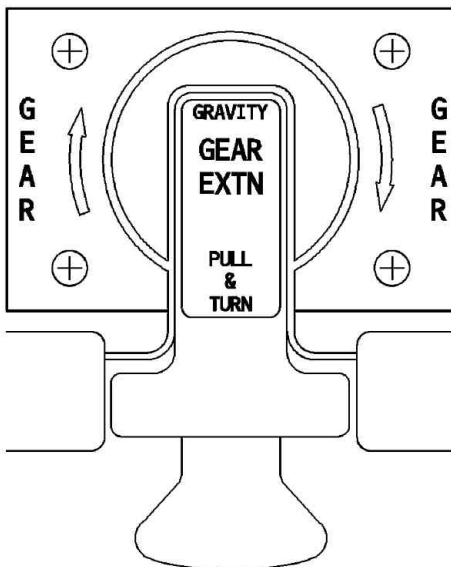
(2) RED ARROW

This red arrow lights up if the landing gear is not locked down when the aircraft is in the landing configuration, and a red warning appears on ECAM.

LANDING GEAR GRAVITY EXTENSION

Ident.: DSC-32-10-40-00018617.0001001 / 21 MAR 16

Applicable to: ALL



To put the landing gear down by gravity, the flight crew must pull the gear crank out, then turn it clockwise for 3 turns.

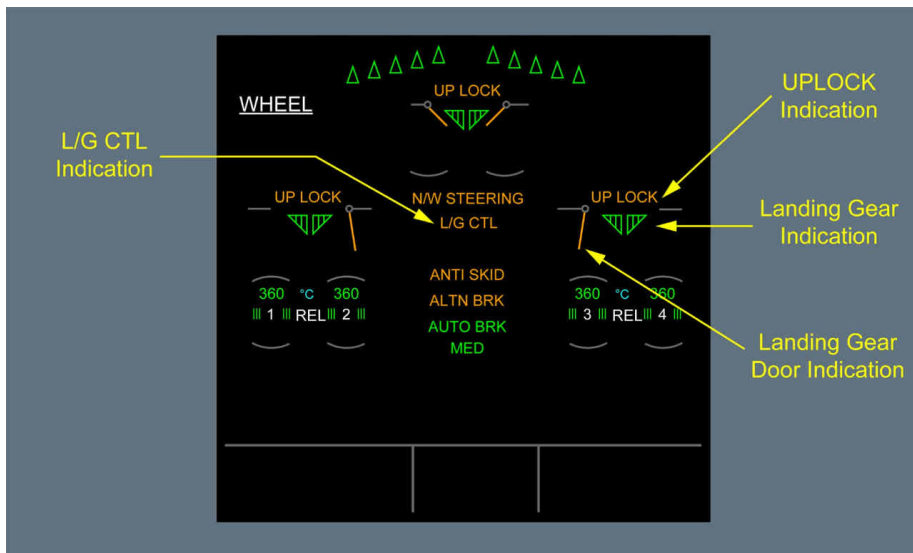
When the flight crew operates the crank handle, the cutout valve shuts off hydraulic pressure to the landing gear system and depressurizes it.

WHEEL SD PAGE

Ident.: DSC-32-10-40-00018618.0007001 / 06 NOV 23

Applicable to: ALL

Wheel SD Page



L/G CTL INDICATION

L/G CTL

The associated landing gear position disagrees with the lever position following a 30 s time delay.
The associated ECAM alert is triggered.

UPLOCK INDICATION

UP LOCK

The associated landing gear is locked down, and one or more uplocks are in the closed position.
Associated with the following ECAM alert: **L/G GEAR UPLOCK FAULT** (Refer to PRO-ABN-LG L/G GEAR UPLOCK FAULT).

LANDING GEAR INDICATION

The landing gear is indicated by two triangles for each gear.
The left triangle is controlled by LGCIU 1, the right one by LGCIU 2.

AIRCRAFT SYSTEMS

LANDING GEAR

GEARS AND DOORS - CONTROLS AND INDICATORS



The LGCIU detects the associated landing gear as locked down.



The LGCIU detects the associated landing gear as in transit.



The LGCIU detects the associated landing gear as retracted and uplocked.



The LGCIU is failed.

***Note:** When the landing gear lever is down, one LGCIU locked down indication (one green triangle per gear) is sufficient to indicate that the landing gear is down and locked.*

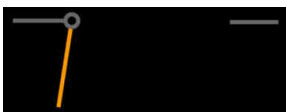
LANDING GEAR DOOR INDICATION



The associated landing gear door is closed and uplocked.



The associated landing gear door is in transit.



The associated landing gear door is open.

MEMO DISPLAY

Ident.: DSC-32-10-40-00018778.0001001 / 05 MAY 22

Applicable to: ALL

FLT L/G DOWN : This memo appears in green if the aircraft is operated in "flight with landing gear down" configuration.

AIRCRAFT SYSTEMS

LANDING GEAR

GEARS AND DOORS - CONTROLS AND INDICATORS

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS LANDING GEAR NOSE WHEEL STEERING - DESCRIPTION
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DESCRIPTION

Ident.: DSC-32-20-10-00018619.0007001 / 28 FEB 18

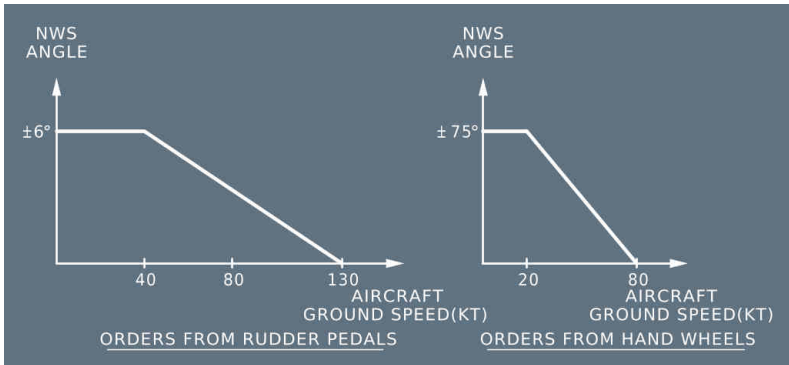
Applicable to: MSN 02719-07792

A hydraulic actuating cylinder steers the nose wheel. The yellow hydraulic system supplies pressure to the cylinder, and electric signals from the Brake and Steering Control Unit (BSCU) control it.

The BSCU receives orders from:

- Captain's, and the First Officer's steering hand wheels (orders added algebraically), or
- Rudder pedals, or
- Autopilot.

The BSCU transforms these orders into nose wheel steering angle. That angle has the following limits, which depend on ground speed and the origin of the orders.



The steering system receives actuating hydraulic pressure when:

- A/SKID & N/W STRG switch is ON
- Towing control lever is in normal position
- At least one engine is running
- Aircraft is on ground.

The handwheel can turn the nosewheel up to 75° in either direction. A lever, on the towing electrical box (on nose landing gear), enables ground crew to deactivate the steering system for towing. Then the wheel can be turned 95° in either direction.

To prevent rudder pedal orders, or autopilot orders, from going to the BSCU, the pilots can use the pushbutton on either steering handwheel.

An internal cam mechanism returns the nose wheel to the centered position after takeoff.

AIRCRAFT SYSTEMS

LANDING GEAR

NOSE WHEEL STEERING - DESCRIPTION

DESCRIPTION

Ident.: DSC-32-20-10-00018619.0002001 / 21 MAR 16

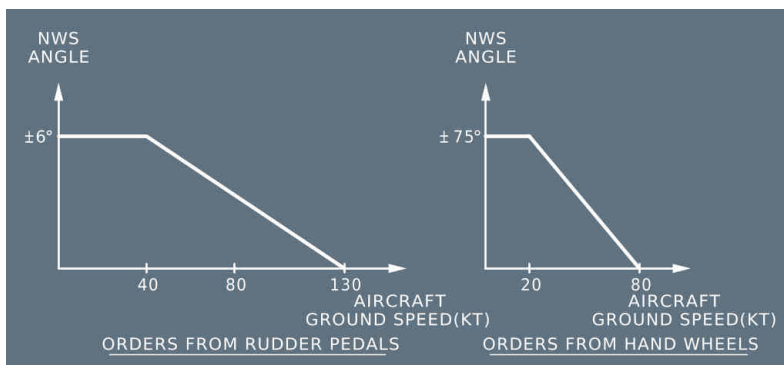
Applicable to: MSN 02155-02212

A hydraulic actuating cylinder steers the nose wheel. The green hydraulic system supplies pressure to the cylinder, and electric signals from the Brake and Steering Control Unit (BSCU) control it.

The BSCU receives orders from:

- Captain's, and the First Officer's steering hand wheels (orders added algebraically), or
- Rudder pedals, or
- Autopilot.

The BSCU transforms these orders into nose wheel steering angle. That angle has the following limits, which depend on ground speed and the origin of the orders.



The steering system receives actuating hydraulic pressure when:

- A/SKID & N/W STRG switch is ON
- Towing control lever is in normal position
- At least one engine is running
- Aircraft is on ground.

The nose landing gear doors must be closed in order for the green hydraulic system to apply pressure to the actuating cylinder.

The handwheel can turn the nose wheel up to 75° in either direction. A lever on the towing electrical box (on nose landing gear) allows ground crew to deactivate the steering system for towing. This then allows the wheel to be turned 95° in either direction.

The pilots can use a pushbutton on either steering handwheel to prevent rudder pedal orders or autopilot orders from going to the BSCU.

An internal cam mechanism returns the nose wheel to the centered position after takeoff.

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS LANDING GEAR NOSE WHEEL STEERING - DESCRIPTION
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ARCHITECTURE

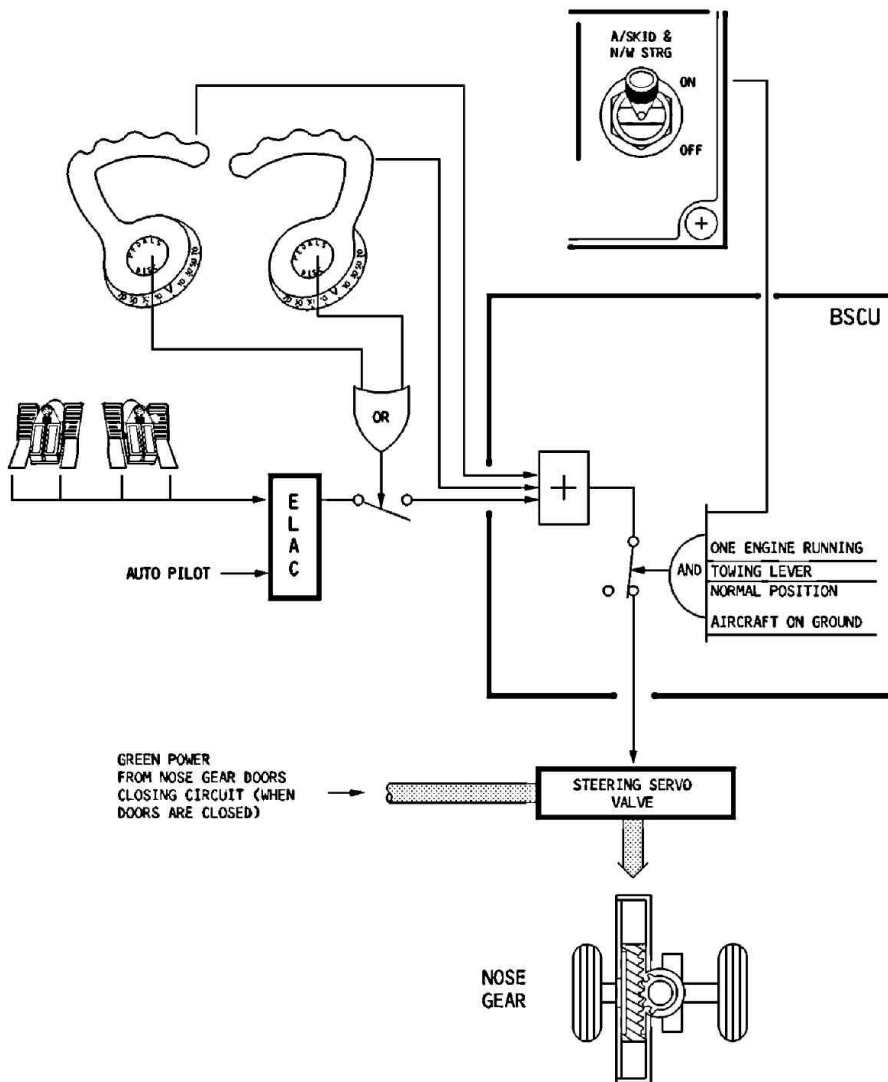
Ident.: DSC-32-20-10-00001298.0001001 / 21 MAR 16

AIRCRAFT SYSTEMS

LANDING GEAR

NOSE WHEEL STEERING - DESCRIPTION

Applicable to: MSN 02155-02212



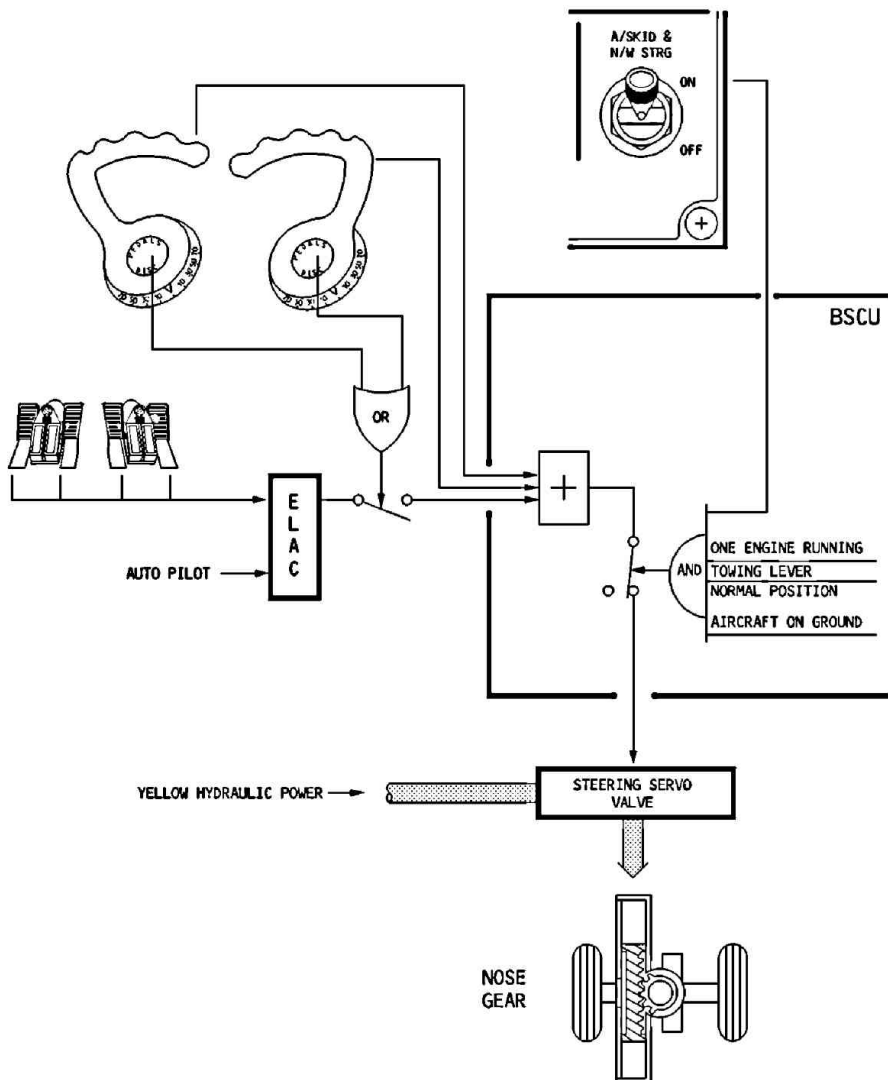
 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS LANDING GEAR NOSE WHEEL STEERING - DESCRIPTION
ARCHITECTURE	
Ident.: DSC-32-20-10-00001298.0002001 / 21 MAR 16	

AIRCRAFT SYSTEMS

LANDING GEAR

NOSE WHEEL STEERING - DESCRIPTION

Applicable to: MSN 02719-07792

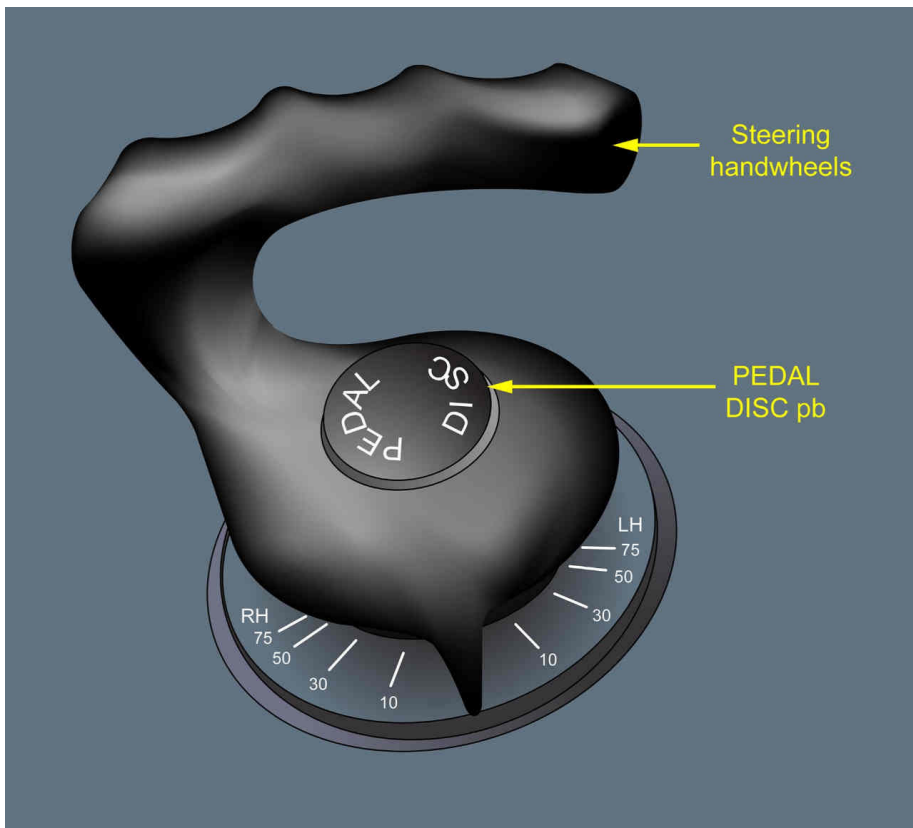


SIDE CONSOLES

Ident.: DSC-32-20-20-00018620.0001001 / 06 NOV 23

Applicable to: ALL

SIDE CONSOLES



STEERING HANDWHEELS

The steering handwheels, that are interconnected, can steer the nose wheel up to 75 ° in either direction.

Note: The steering system centers the nose wheel automatically after liftoff.

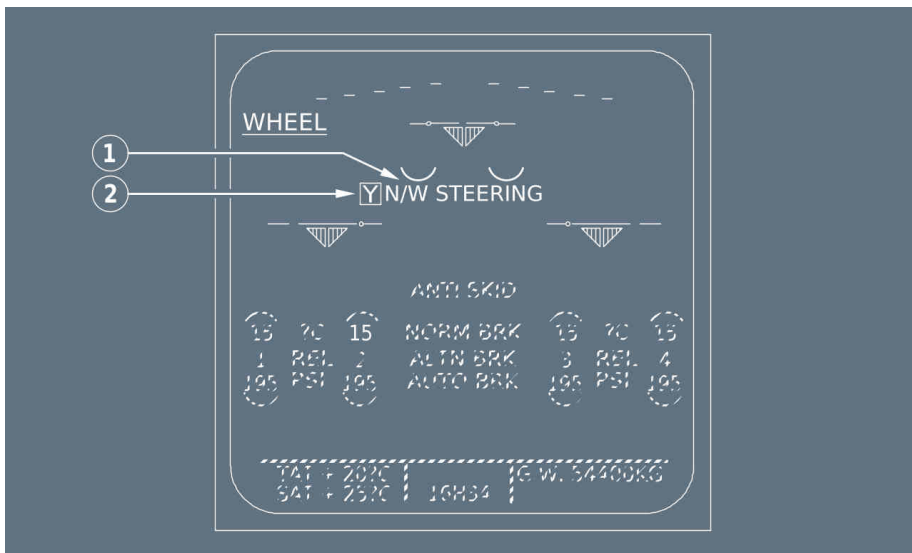
RUDDER PEDAL DISC pb

Pressing this button on either handwheel removes control of nose wheel steering from the rudder pedals until the button is released.

WHEEL SD PAGE

Ident.: DSC-32-20-20-00018622.0004001 / 21 MAR 16

Applicable to: MSN 02719-07792


(1) N/W STEERING indication

It appears in amber, when nosewheel steering is lost, due to failure of the nosewheel steering system, or of both BSCU channels, or in case of a yellow hydraulic system low pressure, or if the A/SKID & N/W STRG switch is OFF.

(2) N/W STEERING hydraulic supply indication:

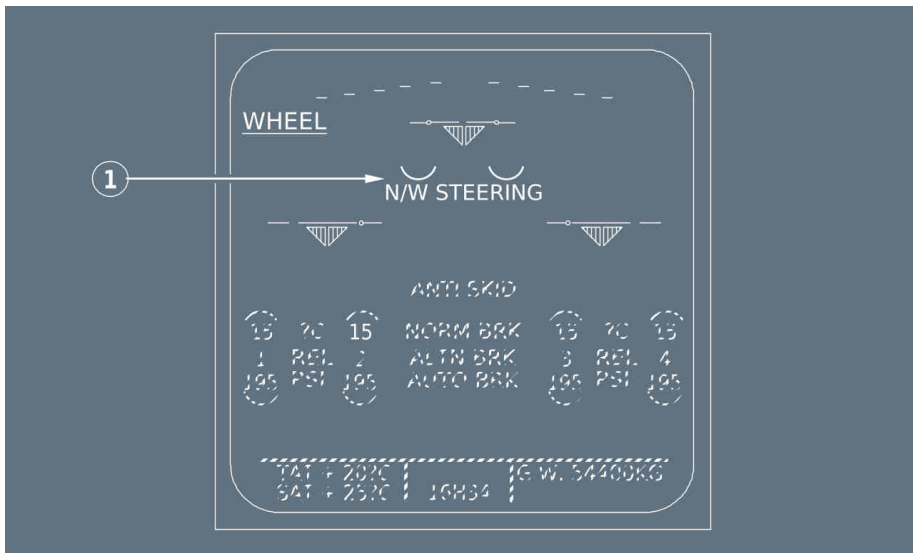
Only when the N/W STEERING indication is displayed, Y is displayed:

- In green when the yellow hydraulic system is not failed, or
- In amber when the yellow hydraulic system low pressure.

WHEEL SD PAGE

Ident.: DSC-32-20-20-00018622.0002001 / 21 MAR 16

Applicable to: MSN 02155-02212



(1) N/W STEERING indication

It appears in amber, when nosewheel steering is lost, due to failure of the nosewheel steering system, or of both BSCU channels, or when the A/SKID & N/W STRG switch is OFF.

MEMO DISPLAY

Ident.: DSC-32-20-20-00016853.0001001 / 04 JUN 19

Applicable to: ALL

- NW STRG DISC** : This memo appears, when the nose wheel steering selector is in the towing position and with engines not running.
- NW STRG DISC** : This memo appears, when the nose wheel steering selector is in the towing position and if at least one engine is running.

AIRCRAFT SYSTEMS

LANDING GEAR

NOSE WHEEL STEERING - CONTROLS AND INDICATORS

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS LANDING GEAR BRAKES AND ANTISKID - DESCRIPTION
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GENERAL

Ident.: DSC-32-30-10-00018623.0002001 / 21 MAR 16

Applicable to: MSN 02719-07792

The main wheels are equipped with carbon multidisc brakes, which can be actuated by either of two independent brake systems.

The normal system uses green hydraulic pressure, whereas the alternate system uses the yellow hydraulic system backed up by the hydraulic accumulator.

An anti-skid and autobrake system is also provided.

Braking commands come from either the brake pedals (pilot action), or the autobrake system (deceleration rate selected by the crew).

In normal operation, a dual channel Brake and Steering Control Unit (BSCU) controls normal braking and antiskid.

Depending on the failure, braking may revert to:

- Alternate braking with antiskid. This braking mode is controlled by the Alternate Braking Control Unit (ABCU), and the antiskid is controlled by the BSCU
- Alternate braking without antiskid. This braking mode is fully-controlled by the ABCU
- Alternate braking without antiskid on accumulator. This braking mode is fully-controlled by the ABCU.

All the normal and alternate braking components are fully-monitored. Any detected failure is signaled to the crew via ECAM warnings.

The BSCU performs the following secondary functions:

- Checks the residual pressure in the brakes
- Monitors the brake temperature
- Provides discrete wheel speed information to other aircraft systems.

A changeover between the two BSCU channels takes place at each DOWN landing gear lever selection, or in case one channel fails.

The main gear wheels are fitted with fusible plugs which protect against tire burst, in the event of overheating.

Main gear wheels are also equipped with brake cooling fans  , which permit a high speed cooling of brakes.

GENERAL

Ident.: DSC-32-30-10-00018623.0001001 / 21 MAR 16

Applicable to: MSN 02155-02212

The main wheels are equipped with carbon multidisc brakes, which can be actuated by either of two independent brake systems.

AIRCRAFT SYSTEMS

LANDING GEAR

BRAKES AND ANTISKID - DESCRIPTION

The normal system uses green hydraulic pressure, whereas the alternate system uses the yellow hydraulic system backed up by the hydraulic accumulator.

An anti-skid and autobrake system is also provided.

Braking commands come from either the brake pedals (pilot action), or the autobrake system (deceleration rate selected by the crew).

Two units on each main gear monitor the temperature of the brakes.

All braking functions (normal and alternate braking control, anti-skid control, autobraking, brake temperature indication) are controlled by a two-channel Brake and Steering Control Unit (BSCU).

The main gear wheels are fitted with fusible plugs which protect against tire burst, in the event of overheat.

Main gear wheels are also equipped with brake cooling fans  , which permit a high speed cooling of brakes.

ANTI-SKID SYSTEM

Ident.: DSC-32-30-10-00018624.0001001 / 21 MAR 16

Applicable to: **ALL**

The antiskid system provides maximum braking efficiency by maintaining the wheels at the limit of an impending skid.

At skid onset, brake release orders are sent to the normal and alternate servovalves, as well as to the ECAM system which displays the released brakes.

Without using autobrake, full braking performance is achieved only with brake pedals at full deflection.

The antiskid system is deactivated below 20 kt (ground speed).

An ON/OFF switch activates, or deactivates, the antiskid and nosewheel steering systems.

PRINCIPLE

The speed of each main gear wheel (given by a tachometer) is compared to the aircraft speed (reference speed). When the speed of a wheel decreases below approximately 0.87 times (depending on conditions) reference speed, brake release orders are given to maintain the wheel slip at that value (best braking efficiency).

In normal operation, the reference speed is determined by the BSCU from the horizontal acceleration of ADIRU 1, or ADIRU 2, or ADIRU 3.

In case all ADIRUs fail, reference speed equals the maximum of either main landing gear wheel speeds.

AUTO BRAKE

Ident.: DSC-32-30-10-A-00018625.0001001 / 21 MAR 16

Applicable to: ALL

GENERAL

The purposes of the autobrake system are the following:

- Reduce the braking distance in case of an aborted takeoff
- Establish and maintain a selected deceleration rate during landing, thereby improving passenger comfort and reducing crew workload.

AUTO BRAKE - SYSTEM ARMING

Ident.: DSC-32-30-10-A-00018626.0003001 / 09 NOV 17

Applicable to: MSN 02155-03060, 05152-07792

SYSTEM ARMING

The crew may arm the system by pressing the LO, MED, or MAX pushbutton provided all the following arming conditions are met:

- Green pressure available
- Anti-skid electrically-powered
- No failure in the braking system
- At least one ADIRU is available.

Note: 1. Auto brake may be armed with the parking brake on.
2. MAX autobrake mode cannot be armed in flight.

The armed AUTO BRK mode is displayed in blue on the Flight Mode Annunciator (FMA).

Ident.: DSC-32-30-10-A-00018626.0002001 / 21 MAR 16

Applicable to: MSN 04392

SYSTEM ARMING

The crew may arm the system by pressing the LO, MED, or MAX pushbutton provided all the following arming conditions are met :

- Green pressure available
- Anti-skid electrically-powered
- No failure in the braking system
- At least one ADIRU is available.

Note: 1. Auto brake may be armed with the parking brake on.
2. MAX autobrake mode cannot be armed in flight.

AUTO BRAKE - SYSTEM ACTIVATION

Ident.: DSC-32-30-10-A-00018627.0003001 / 09 NOV 17

Applicable to: MSN 02155-03060, 05152-07792

SYSTEM ACTIVATION

Automatic braking is activated when:

- The command for ground spoilers extension is detected (*Refer to DSC-27-10-20 Speed Brakes and Ground Spoilers - Speed Brake Control*), for LO and MED mode, or
- The command for ground spoilers extension is detected, and the wheel speed is above 40 kt, for MAX mode.

Therefore, if the aircraft makes an acceleration stop and begins to decelerate when the wheel speed is under 72 kt, the automatic braking will not activate because the ground spoilers will not extend.

For autobrake to activate, at least two SEC's must be operative.

The active AUTO BRK mode is displayed in green on the Flight Mode Annunciator (FMA).

Ident.: DSC-32-30-10-A-00018627.0002001 / 17 OCT 17

Applicable to: MSN 04392

SYSTEM ACTIVATION

Automatic braking is activated when:

- The command for ground spoilers extension is detected (*Refer to DSC-27-10-20 Speed Brakes and Ground Spoilers - Speed Brake Control*), for LO and MED mode, or
- The command for ground spoilers extension is detected, and the wheel speed is above 40 kt, for MAX mode.

Therefore, if the aircraft makes an acceleration stop and begins to decelerate when the wheel speed is under 72 kt, the automatic braking will not activate because the ground spoilers will not extend.

For autobrake to activate, at least two SEC's must be operative.

Ident.: DSC-32-30-10-A-00018628.0001001 / 21 MAR 16

Applicable to: ALL

SYSTEM DEACTIVATION

The system deactivates when:

- The system disarmed (*Refer to DSC-32-30-10 Auto Brake - System Disarming*), or
- The ground spoilers retract. In this case it remains armed.

Ident.: DSC-32-30-10-A-00018629.0002001 / 09 NOV 17

Applicable to: ALL

SYSTEM DISARMING

The system disarms when:

- Flight crew presses the pushbutton switch, or
- One or more arming conditions is lost, or
- After take-off/touch and go, or
- Flight crew applies enough deflection to at least one brake pedal when autobrake is active in MAX, MED or LO mode.

BRAKING MODES

Ident.: DSC-32-30-10-B-00018630.0001001 / 21 MAR 16

Applicable to: ALL

GENERAL

There are four modes of operation:

- Normal braking
- Alternate braking with antiskid
- Alternate braking without antiskid
- Parking brake.

Ident.: DSC-32-30-10-B-00018631.0001001 / 21 MAR 16

Applicable to: ALL

NORMAL BRAKING

Normal braking is operative when:

- Green hydraulic pressure is available
- A/SKID & N/W STRG switch is ON.

During normal braking, antiskid is operative and autobrake is available.

Braking is electrically-controlled through the BSCU from:

- Pilot's pedals, or
- Automatically activates when:
 - On ground by the autobrake system, or
 - In flight when the landing gear lever is up.

The antiskid system is controlled by the BSCU via the normal servo valves.

There is no brake pressure indication in the cockpit.

BRAKING MODES - ALTERNATE BRAKING WITH ANTI-SKID

Ident.: DSC-32-30-10-B-00018632.0002001 / 02 MAY 24

Applicable to: MSN 02719-07792**ALTERNATE BRAKING WITH ANTI-SKID**

Autobrake is inoperative.

Braking uses this mode when green hydraulic pressure is insufficient, and :

- Yellow hydraulic pressure is available
- A/SKID & N/W STRG switch is ON
- Parking brake is not ON.

Braking inputs are made by the brake pedals and sent to the ABCU. Then, taking into account the brake pedal input, the ABCU:

- Energizes the alternate brake selector valve to pressurize the yellow hydraulic circuit
- Electrically controls the Alternate Servo Valve to obtain the correct pressure for the related brakes.

Antiskid is controlled by the BSCU.

A triple indicator on the center instrument panel indicates the pressure delivered to the left and right brakes, as well as the accumulator pressure.

Ident.: DSC-32-30-10-B-00018632.0001001 / 17 MAR 17

Applicable to: MSN 02155-02212**ALTERNATE BRAKING WITH ANTI-SKID**

Autobrake is inoperative.

Braking uses this mode when green hydraulic pressure is insufficient, and :

- Yellow hydraulic pressure is available
- A/SKID & N/W STRG switch is ON
- Parking brake is not ON.

An automatic hydraulic selector changes from the green to the yellow system.

The pedals brake through the auxiliary low-pressure hydraulic distribution line acting on the dual valves. The BSCU controls the anti-skid system via the alternate servo valves.

A triple indicator on the center instrument panel indicates the pressure delivered to the left and right brakes, as well as the accumulator pressure.

Note: *Initial pedal force or displacement produces more braking action in alternate mode than in normal mode.*

BRAKING MODES - ALTERNATE BRAKING WITHOUT ANTI-SKID

Ident.: DSC-32-30-10-B-00018633.0002001 / 06 NOV 25

Applicable to: MSN 02719-07792

1 ALTERNATE BRAKING WITHOUT ANTISKID

Autobrake and antiskid are inoperative.

The antiskid system is deactivated either:

- Electrically (A/SKID & N/W STRG sw OFF, or power supply failure, or BSCU failure), or
- Hydraulically (Y + G system low pressure, the brakes are supplied by the brake accumulator only).

Depending on the brake pedals' demand, the ABCU controls the alternate brake selector and the alternate servovalves.

Brake pressure and accumulator pressure are indicated on a triple indicator, located on the center instrument panel. To limit the risk of wheel locking and tire burst, the brake pressure is automatically limited to 1 000 PSI.

The accumulator can supply at least 7 full brake applications.

Ident.: DSC-32-30-10-B-00018633.0001001 / 28 SEP 17

Applicable to: MSN 02155-02212

ALTERNATE BRAKING WITHOUT ANTI-SKID

Autobrake is inoperative.

The anti-skid system can be deactivated:

- Electrically (A/SKID & N/W STRG sw OFF, or power failure or BSCU failure), or
- Hydraulically (low pressure in both green and yellow systems, brakes being supplied by the brake accumulator only).

The pilot controls the braking with the pedals (acting on the dual valves).

Alternate servo valves are fully open.

Brake pressure and accumulator pressure are indicated on a triple indicator, located on the center instrument panel. The pilot must modulate brake pressure at, or below, 1 000 PSI in order to avoid wheel locking.

The accumulator can supply at least 7 full brake applications.

Note: *Initial pedal force or displacement produces more braking action in alternate mode than in normal mode.*

AIRCRAFT SYSTEMS**LANDING GEAR****BRAKES AND ANTISKID - DESCRIPTION****BRAKING MODES - PARKING BRAKE**

Ident.: DSC-32-30-10-B-00018634.0002001 / 21 MAR 16

Applicable to: MSN 02719-07792**PARKING BRAKE**

Brakes are supplied by the yellow hydraulic system, or by accumulator pressure via the parking brake control valve, which opens allowing full pressure application on the main gear wheel brakes.

The accumulator maintains the parking pressure for at least 12 h.

If the parking brake is activated and no yellow hydraulic or accumulator brake pressure is available, then the normal braking system can be applied via the brake pedals.

Yellow accumulators can be pressurized by pressing the yellow electrical pump switch.

A triple indicator on the center instrument panel indicates the pressure delivered to the left and right brakes, as well as the accumulator pressure.

Ident.: DSC-32-30-10-B-00018634.0001001 / 21 MAR 16

Applicable to: MSN 02155-02212**PARKING BRAKE**

Brakes are supplied by the yellow hydraulic system, or by accumulator via the dual shuttle valves. Alternate servo valves open allowing full pressure application.

The accumulator maintains the parking pressure for at least 12 h.

If the parking brake is activated and no yellow hydraulic or accumulator brake pressure is available, then the normal braking system can be applied via the brake pedals.

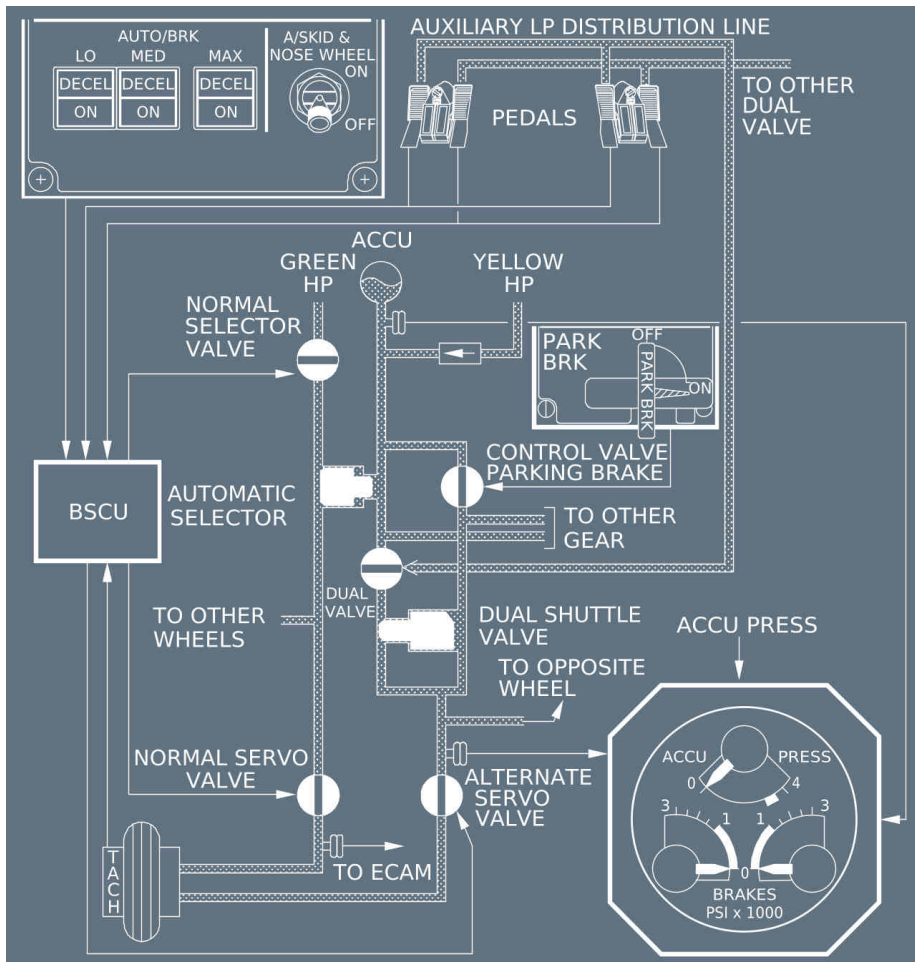
Yellow accumulators can be pressurized by pressing the yellow electrical pump switch.

A triple indicator on the center instrument panel indicates the pressure delivered to the left and right brakes, as well as the accumulator pressure.

BRAKING SCHEMATIC

Ident.: DSC-32-30-10-00001316.0004001 / 09 OCT 12

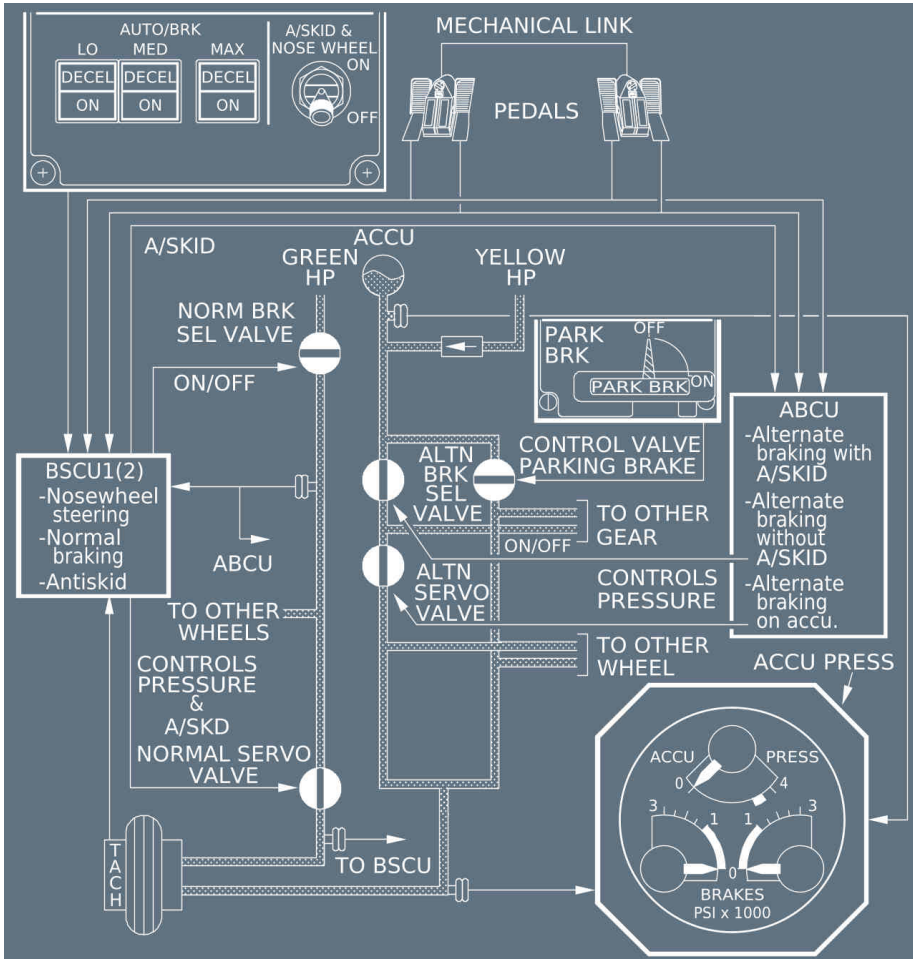
Applicable to: MSN 02155-02212



BRAKING SCHEMATIC

Ident.: DSC-32-30-10-00001316.0003001 / 09 OCT 12

Applicable to: MSN 02719-07792

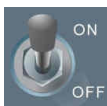
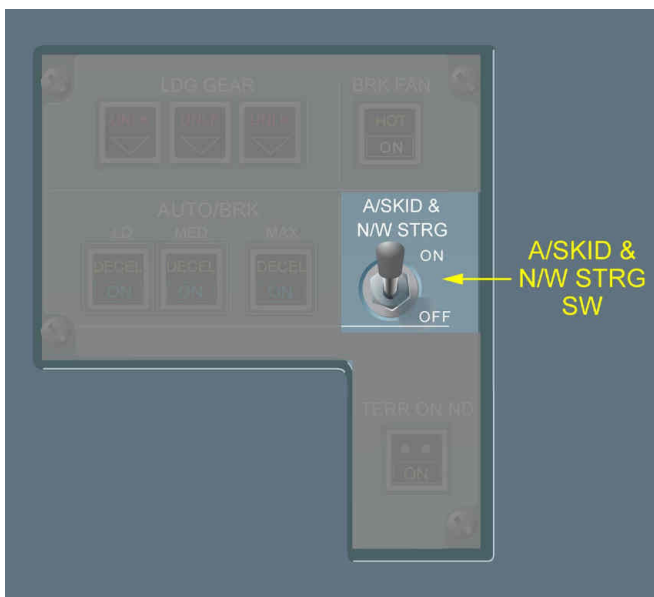


CENTER INSTRUMENT PANEL

Ident.: DSC-32-30-20-00018635.0002001 / 06 NOV 23

Applicable to: MSN 02719-07792

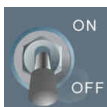
A/SKID & N/W STRG sw



If green hydraulic pressure is available, then antiskid is available.

If green hydraulic pressure is lost, then:

- Yellow hydraulic pressure automatically takes over to supply the brakes
- Antiskid and nosewheel steering remain available
- Triple indicator shows yellow system brake pressure.



The yellow hydraulic system supplies pressure to the brakes.

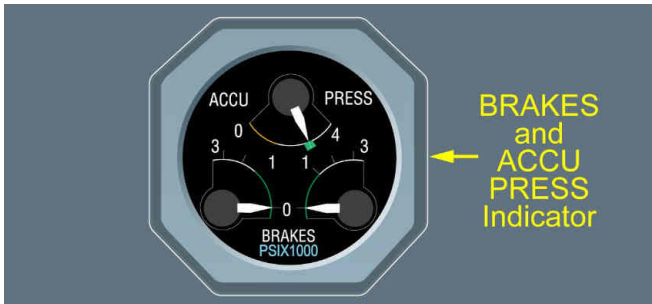
- Antiskid is deactivated. To avoid wheel locking and limiting the risk of tire burst, brake pressure is automatically limited to 1 000 PSI
- Nosewheel steering is lost
- Differential braking remains available through the pedals
- Triple indicator displays yellow system brake pressure.

AIRCRAFT SYSTEMS

LANDING GEAR

BRAKES AND ANTISKID - CONTROLS AND INDICATORS

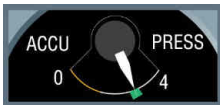
BRAKES and ACCU PRESS indicator



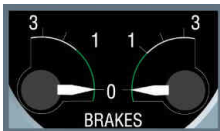
Brake pressure is only indicated when the yellow hydraulic system controls the brake pressure.

This is when the:

- Alternate braking system is activated, or
- Parking brake is applied.



Indicates the pressure in the yellow brake accumulator.

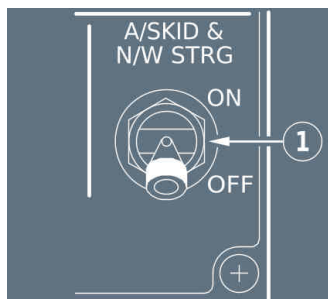


Indicates the yellow pressure delivered to the left and right brakes, as measured downstream of the alternate servovalves.

CENTER INSTRUMENT PANEL

Ident.: DSC-32-30-20-00018635.0001001 / 21 MAR 16

Applicable to: MSN 02155-02212



(1) A/SKID & N/W STRG sw

ON : If green hydraulic pressure is available:

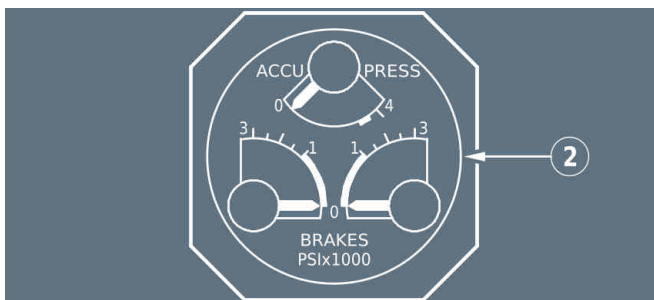
- Antiskid is available
- Nosewheel steering is available.

If green hydraulic pressure is lost, then:

- Yellow hydraulic pressure automatically takes over to supply the brakes
- Antiskid remains available
- Nosewheel steering is lost
- Triple indicator displays yellow system brake pressure.

OFF : The yellow hydraulic system supplies pressure to the brakes.

- Antiskid is deactivated. The pilot must refer to the triple indicator to limit brake pressure and avoid locking a wheel
- Nosewheel steering is lost
- Differential braking remains available through the pedals
- Triple indicator displays yellow system brake pressure.



(2) BRAKES and ACCU PRESS indicator

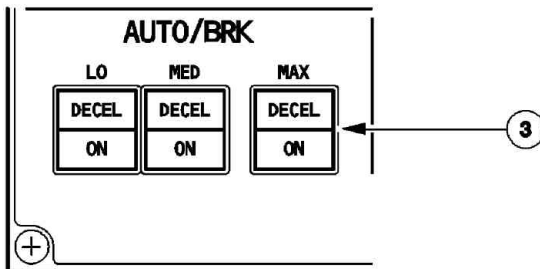
ACCU : Indicates the pressure in the yellow brake accumulator.
PRESS

BRAKES: Indicates the yellow pressure delivered to the left and right brakes, as measured upstream of the alternate servovalves.

AUTO BRK PANEL

Ident.: DSC-32-30-20-00018636.0004001 / 21 MAR 16

Applicable to: MSN 02155-05746


 (3) AUTO/BRK panel

The springloaded MAX, MED, and LO pushbutton switches arm the appropriate deceleration rate. The usage for each mode are as follow:

- MAX mode is normally selected for takeoff.
In the case of an aborted takeoff, maximum pressure goes to the brakes, as soon as the system generates the ground spoiler deployment order
- MED or LO mode is normally selected for landing:
 - MED mode sends progressive pressure to the brakes 2 s after the ground spoilers deploy in order to decelerate the aircraft at 3 m/s^2 (9.8 ft/s²)
 - LO mode sends progressive pressure to the brakes 2 s after the ground spoilers deploy, in order to decelerate the aircraft at 2 m/s^2 (6.6 ft/s²).

The lighting on the pushbutton switches are as follow:

- ON light : comes on blue to indicate positive arming
- DECEL light : comes on green when the actual deceleration is 80 % of the selected rate

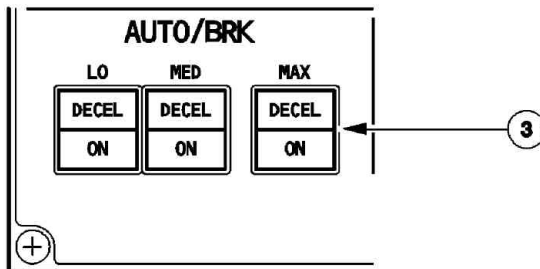
Note: On slippery runways, the predetermined deceleration may not be reached, due to antiskid operation. In this case, the DECEL light will not come on. This does not mean that autobrake is not working.

- Off : The corresponding autobrake mode is not armed

AUTO BRK PANEL

Ident.: DSC-32-30-20-00018636.0002001 / 21 MAR 16

Applicable to: MSN 07784-07792


(3) AUTO/BRK panel

The springloaded MAX, MED, and LO pushbutton switches arm the appropriate deceleration rate. The usage for each mode are as follow:

- MAX mode is normally selected for takeoff.
In the case of an aborted takeoff, maximum pressure goes to the brakes, as soon as the system generates the ground spoiler deployment order
- MED or LO mode is normally selected for landing:
 - MED mode sends progressive pressure to the brakes 2 s after the ground spoilers deploy in order to decelerate the aircraft at 3 m/s^2 (9.8 ft/s²)
 - LO mode sends progressive pressure to the brakes 4 s after the ground spoilers deploy, in order to decelerate the aircraft at 1.7 m/s^2 (5.6 ft/s²).

The lighting on the pushbutton switches are as follow:

- ON light : comes on blue to indicate positive arming
- DECEL light : comes on green when the actual deceleration is 80 % of the selected rate

Note: On slippery runways, the predetermined deceleration may not be reached, due to antiskid operation. In this case, the DECEL light will not come on. This does not mean that autobrake is not working.

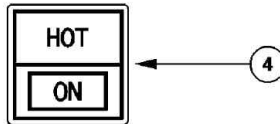
Off : The corresponding autobrake mode is not armed

BRAKE FAN

Ident.: DSC-32-30-20-00018637.0001001 / 21 MAR 16

Applicable to: ALL

BRK FAN



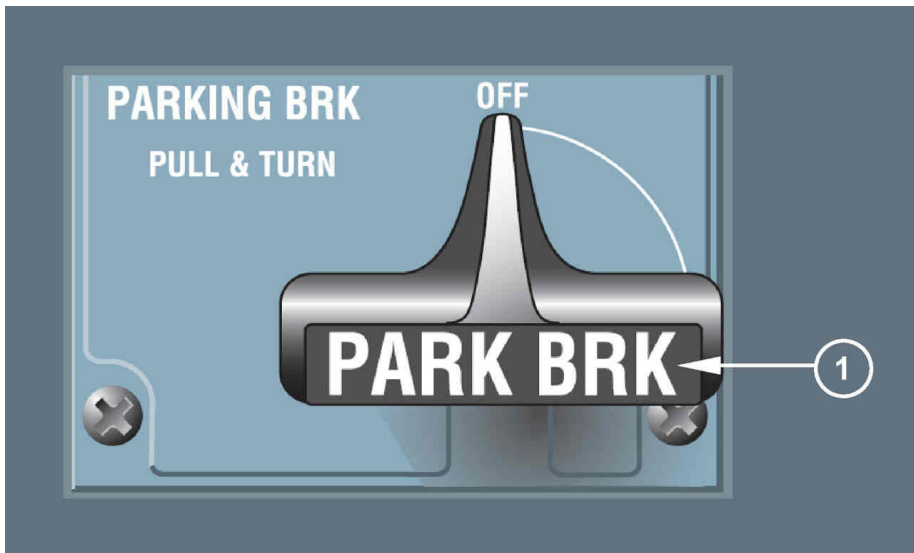
(4) **BRK FAN pb-sw**

- ON light : The brake fans run if the lefthand main landing gear is down and locked
- Off : The brake fans stop
- HOT : This amber light comes on when the brakes get too hot (A caution appears on light ECAM, also)

PEDESTAL

Ident.: DSC-32-30-20-00018638.0001001 / 21 MAR 16

Applicable to: ALL



(1) PARKING BRK handle

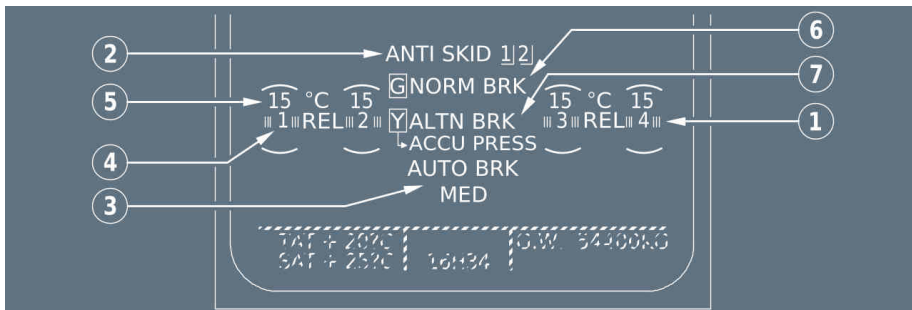
Flight crew pulls this handle, then turns it clockwise, to apply the parking brake.
The ECAM memo page displays "PARK BRK".

CAUTION If the pointer is not at ON, the parking brake is not on.

WHEEL SD PAGE

Ident.: DSC-32-30-20-00018639.0008001 / 21 MAR 16

Applicable to: MSN 02719-07792


 (1) Release indicators
 It appears in amber in case of brake released fault.

 (2) ANTI SKID indication

 (A) ANTISKID label

It appears in amber, a long with an ECAM caution, in case of a total BSCU failure, or when the A/SKID & N/W STRG sw is OFF, or if the BSCU detects an ANTI-SKID failure, or in case of normal braking and yellow hydraulic system low pressure.

It appears in green in case of autobrake, normal braking, or alternate braking failure, and antiskid is still available.

 (B) BSCU channel indication

When ANTISKID label is displayed, the number of the failed system(s) is (are) displayed in amber, if any.

 (3) AUTO BRK

This legend appears:

- In green when auto brake is armed, or
- Flashing green for 10 s after autobrake disengagement, or
- In amber, along with an ECAM caution, to indicate a system failure.

MED, LO, or MAX appears underneath in green to show which rate has been selected.

(4) Wheel number

This white number identifies individual wheels of the main landing gear.

(5) Brake temperature

- Temperature normally appears in green.
- Green arc appears on the hottest wheel when one brake temperature exceeds 100 °C.
- Green arc becomes amber, and an ECAM caution appears, when the corresponding brake temperature exceeds 300 °C.

(6) NORM BRK indication



(A) NORM BRK label

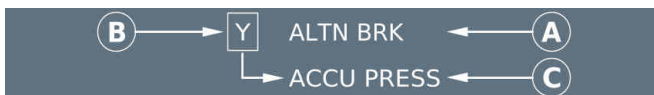
This indication appears in green when autobrake or alternate braking is failed, and normal braking is still available.

The legend appears in amber when normal braking is failed due to total BSCU failure, or to the loss of the green hydraulic pressure, or to the loss of antiskid.

(B) NORM BRK hydraulic supply indication

G is displayed when the NORM BRK label is displayed. It is green when green hydraulic pressure is available and amber, in case of green hydraulic low pressure.

(7)



(A) ALTN BRK label

This indication appears in green, if the braking system is in alternate mode and not failed, or in case autobrake or normal braking is failed and alternate braking is still available.

This indication appears in amber when alternate braking is failed.

(B) ALTN BRK hydraulic supply indication

Y is displayed when the ALTN BRK label is displayed. It is green when yellow hydraulic pressure is available and amber, in case of yellow hydraulic low pressure.

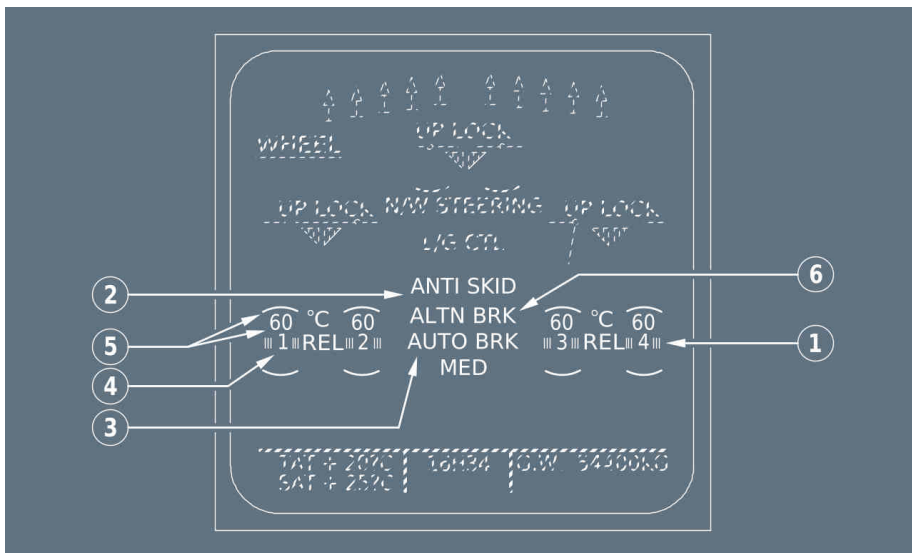
(C) ACCU indications


- (*) Appears in green, when the ALTN BRK label is displayed, and the yellow hydraulic pressure is available.
Appears in amber, with no arrow, when the yellow hydraulic system and the accumulator are in low pressure.
- (**) Appears in green when the alternate braking is pressurized by the yellow accumulator.

WHEEL SD PAGE

Ident.: DSC-32-30-20-00018639.0003001 / 21 MAR 16

Applicable to: MSN 02155-02212


(1) Release indicators

 These green lines appear temporarily after the landing gear has been lowered to indicate that the anti-skid function is ready.

They reappear after touchdown when the anti-skid is active.

(2) ANTI SKID

This legend appears in amber, along with an ECAM caution, in case of total BSCU failure, or when the A/SKID & N/W STRG sw is OFF, or if the BSCU detects an ANTI-SKID failure.

(3) AUTO BRK

This legend appears:

- In green when auto brake is armed, or
- Flashing green for 10 s after autobrake disengagement, or
- In amber, along with an ECAM caution, to indicate a system failure.

MED, LO, or MAX appears underneath in green to show which rate has been selected.

(4) Wheel number

This white number identifies individual wheels of the main landing gear.

(5) Brake temperature

- Temperature normally appears in green.
- Green arc appears on the hottest wheel when one brake temperature exceeds 100 °C.
- Green arc becomes amber, and an ECAM caution appears, when the corresponding brake temperature exceeds 300 °C.

(6) ALTN BRK

This legend appears in green if the braking system is in alternate mode.

AUDIO INDICATORS

¹ Ident.: DSC-32-30-20-00025022.0001001 / 02 MAY 24

Applicable to: ALL

Audio Indicator	Condition or Cause	Duration
Auto Brake Off (Synthetic Voice)	The flight crew disconnects the autobrake at a speed above 33 kt, after touchdown or after RTO. Associated with the AUTO BRK OFF memo. The master caution light comes on for 3 s and a single chime sounds.	Sounds one time
Auto Brake Off, Auto Brake Off (Synthetic Voice)	The autobrake is disconnected due to a system failure after touchdown or after RTO. Associated with the AUTO BRK OFF memo. The master caution light comes on and a single chime sounds.	Sounds one time

AIRCRAFT SYSTEMS

LANDING GEAR

BRAKES AND ANTISKID - CONTROLS AND INDICATORS

MEMO DISPLAY

Applicable to: ALL

Ident.: DSC-32-30-20-A-00016854.0001001 / 22 MAR 16

AUTO BRK LO/MED/MAX : This memo appears in green, depending on the selection of the AUTO BRK pb.

2 Ident.: DSC-32-30-20-A-00016855.0002001 / 09 NOV 21

AUTO BRK OFF Appears if:
- The flight crew disconnects the autobrake, or
- The autobrake fails.

Ident.: DSC-32-30-20-A-00016856.0001001 / 22 MAR 16

BRK FAN : This memo appears in green if the BRK FAN pb  is ON.

Ident.: DSC-32-30-20-A-00016857.0001001 / 22 MAR 16

PARK BRK : This memo appears in green, if the parking brake is ON, during flight phases 1, 2, 9 and 10.

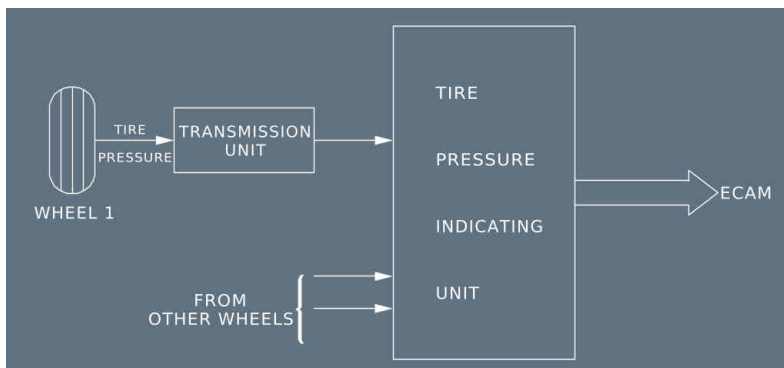
DESCRIPTION

Ident.: DSC-32-40-10-00018640.0002001 / 21 MAR 16

Applicable to: MSN 04392-05746

The tire pressure indicating system includes :

- One sensor that measures the pressure of each tire
- One transmission unit that transmits the electrical pressure signal from the sensor to the computer
- One tire pressure indicating unit computer that sends information to the ECAM for alerts and the system page display.



AIRCRAFT SYSTEMS**LANDING GEAR**

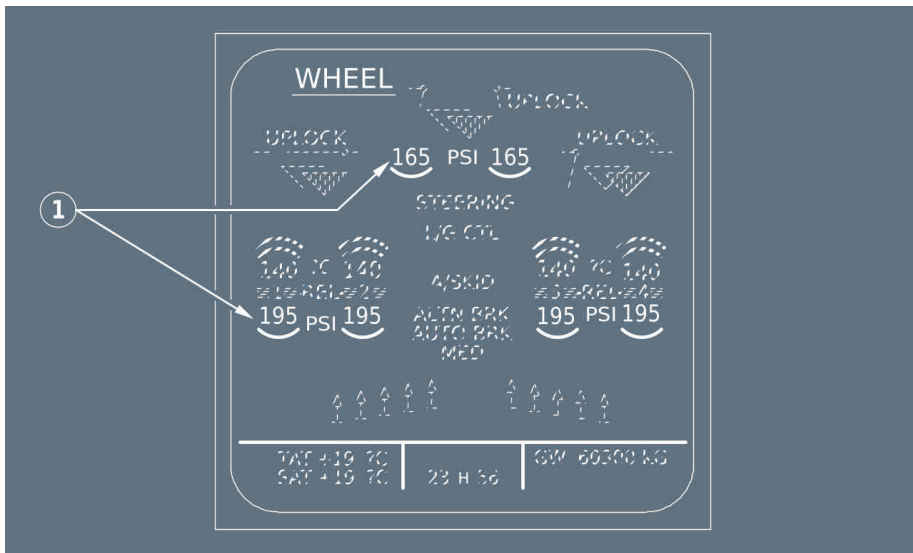
TIRE PRESSURE INDICATING SYSTEM - DESCRIPTION

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WHEEL SD PAGE

Ident.: DSC-32-40-20-00018641.0003001 / 21 MAR 16

Applicable to: MSN 04392-05746



(1) Tire press indication

The normal indication is green.

The indication becomes amber associated with an ECAM caution when tire low pressure is detected.

Note: The prescribed tire pressure depends on the tire type and the aircraft weight.

AIRCRAFT SYSTEMS

LANDING GEAR

TIRE PRESSURE INDICATING SYSTEM - CONTROLS AND INDICATORS

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AIRCRAFT SYSTEMS

LIGHTS

Intentionally left blank

DSC-33-10 Cockpit Lighting

DSC-33-10-10 General

General.....A

DSC-33-10-20 Description

Description.....A

Schematic.....B

DSC-33-10-30 Controls and Indicators

I Overhead Panel.....A

Maintenance Panel.....B

Lateral Window.....C

Pedestal.....D

I Glareshield.....E

Main Inst Panel.....F

DSC-33-20 Exterior Lighting

DSC-33-20-10 General

General.....A

DSC-33-20-20 Controls and Indicators

Schematic.....A

Overhead Panel.....B

Memo Display.....C

DSC-33-30 Emergency Lighting

DSC-33-30-10 Description

General.....A

Proximity Emergency Escape Path Marking System/Exit Signs.....B

DSC-33-30-20 Controls and Indicators

Controls and Indicators.....A

DSC-33-40 Signs

DSC-33-40-10 Controls and Indicators

I Overhead Panel.....A

Memo Display.....B

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Intentionally left blank

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS LIGHTS COCKPIT LIGHTING - GENERAL
--	--

GENERAL

Ident.: DSC-33-10-10-00017615.0001001 / 21 MAR 16

Applicable to: ALL

The instrument panel has both integral instrument lighting and flood lighting.

The brightness of all panel lighting is adjustable.

Spot lights and flood lights provide lighting for all work surfaces and the side consoles.

Two dimmable dome lights provide lighting for the overall cockpit. When the batteries are supplying electrical power, only the right-hand dome light is on line.

AIRCRAFT SYSTEMS

LIGHTS

COCKPIT LIGHTING - GENERAL

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS LIGHTS COCKPIT LIGHTING - DESCRIPTION
--	--

DESCRIPTION

Ident.: DSC-33-10-20-00017616.0001001 / 12 NOV 24

Applicable to: ALL

INTEGRATED LIGHTING FOR INSTRUMENTS AND PANELS

All instruments and panels in the cockpit (other than display units) have integral lighting.
The flight crew can adjust the brightness of all integral lighting.

ANNUNCIATOR LIGHTS

The ANN LT sw on the overhead panel controls the brightness of all the annunciator lights in the cockpit.
The ANN LT sw sets the brightness of all annunciator lights at the same level.
The flight crew can test the annunciator lights with the following procedure: Set the ANN LT sw to the TEST position, and check to see that the annunciator lights come on.

DOVE LIGHTS

Two dome lights provide the cockpit with shadow-free lighting.

MAP HOLDER LIGHTING

Each flight crewmember has a map holder that can be lighted.

CONSOLE AND BRIEFCASE LIGHTING

Each flight crewmember has lighting for briefcase stowage, the side console, and the floor.

CENTER INSTRUMENT PANEL

Lights under the glareshield provide lighting for the center instrument panel.

STANDBY COMPASS

The standby compass has integral lighting.

READING LIGHTS

Each flight crewmember has a reading light.

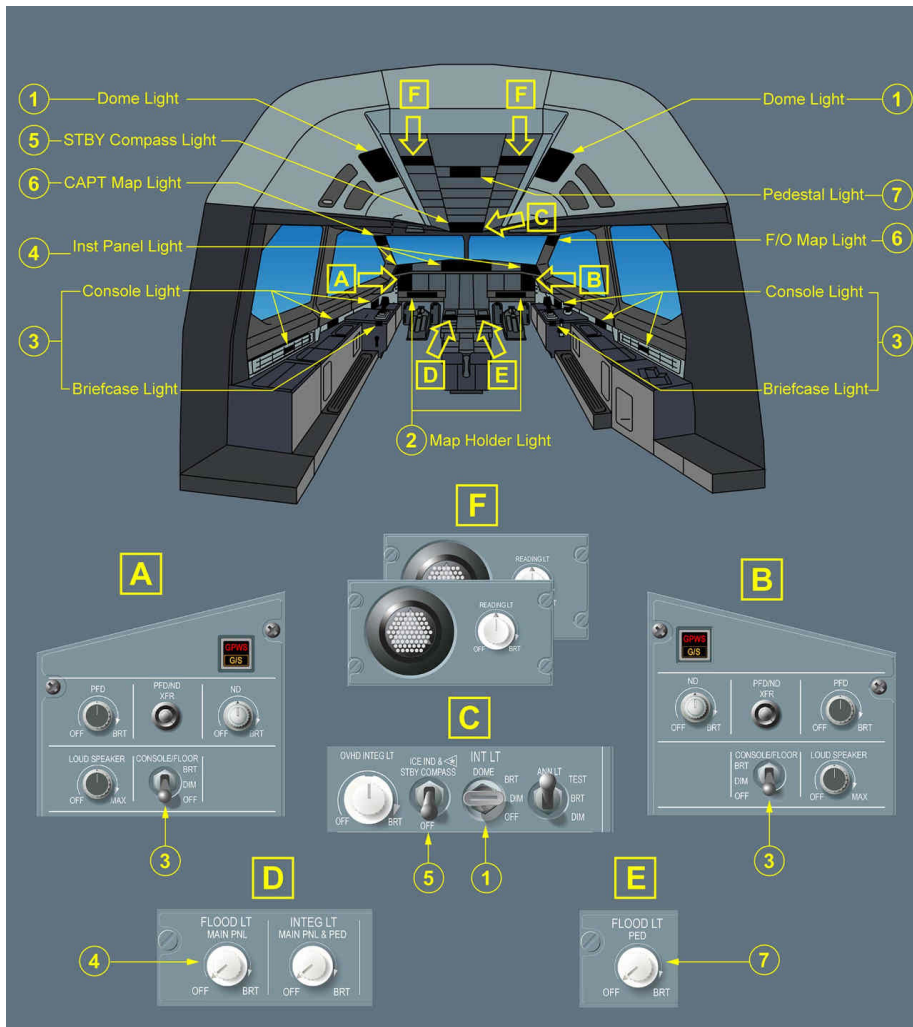
PEDESTAL LIGHTING

A flood light in the middle of the overhead panel provides lighting for the center pedestal.

SCHEMATIC

Ident.: DSC-33-10-20-00001336.0002001 / 11 SEP 18

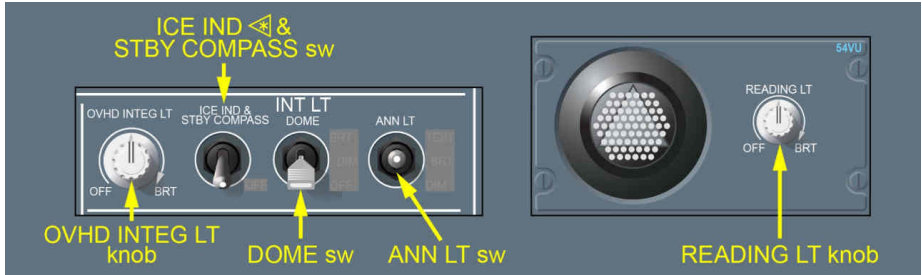
Applicable to: ALL



OVERHEAD PANEL

Ident.: DSC-33-10-30-00017617.0001001 / 06 NOV 25

Applicable to: ALL


OVHD INTEG LT knob


Turns on or off, and adjusts the brightness of the overhead panel's integral lighting.

ICE IND & STBY COMPASS sw

The ICE IND & STBY COMPASS sw can have one of the following configuration:

		
 The external ice detector light  and the standby compass lights are on.  The external ice detector light  and the standby compass lights are off.	 The external ice detector light  and the standby compass lights are on.  The external ice detector light  and the standby compass lights are off.	 The external ice detector light  and the standby compass lights are on.  The external ice detector light  and the standby compass lights are off.

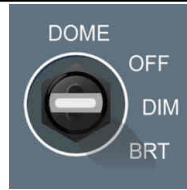
DOME sw

The DOME sw can have one of the following configuration:

AIRCRAFT SYSTEMS

LIGHTS

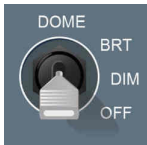
COCKPIT LIGHTING - CONTROLS AND INDICATORS



Both dome lights are on and bright.



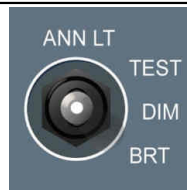
Both dome lights are on and dim.



Both dome lights are off.

5 **ANN LT sw**

The ANN LT sw can have one of the following configuration:



Turns on the lights of all the annunciators pb, pb-sw, and selectors. The flight crew can use this position to make sure that the lighting of all annunciators is operative.

The number 8 is displayed on all Liquid Crystal Display (LCD) of the FCU.

Note: When the ANN LT sw is set to TEST, do not reconfigure the DU (ECAM/ND transfer) or the DMC (DMC switching).



The annunciators lighting is at its maximum brightness.



Dims the annunciators lighting.

6 READING LT knob

Each flight crew has a reading light that can be manually adjusted.

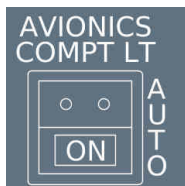


Turns on or off, and adjusts the brightness of the reading light.

MAINTENANCE PANEL

Ident.: DSC-33-10-30-00001338.0001001 / 22 MAY 12

Applicable to: ALL



(1) AVIONICS COMPT LT pushbutton switch

AUTO: avionic compartment lighting is automatically controlled by door opening.

ON : avionic compartment lighting is on.

AIRCRAFT SYSTEMS

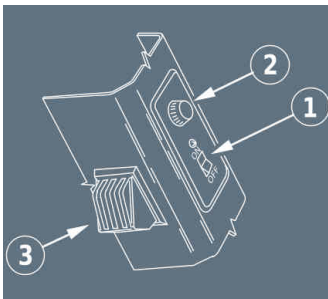
LIGHTS

COCKPIT LIGHTING - CONTROLS AND INDICATORS

LATERAL WINDOW

Ident.: DSC-33-10-30-00001339.0002001 / 15 MAY 25

Applicable to: ALL

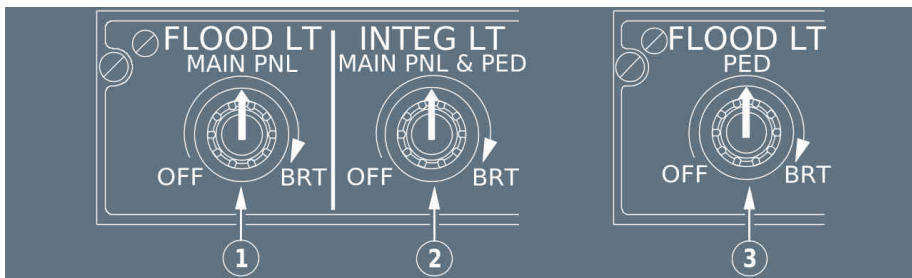


- (1) Map light sw (Captain and F/O)
- (2) Brightness adjustment knob
- (3) Light

PEDESTAL

Ident.: DSC-33-10-30-00017619.0001001 / 21 MAR 16

Applicable to: ALL



- (1) FLOOD LT MAIN PNL knob
Turns on or off, and adjusts the brightness of the main instrument panel.
- (2) INTEG LT MAIN PNL & PED knob
Turns on or off, and adjusts the brightness of the integral lights of:
 - The main instrument panel
 - The center pedestal.

(3) FLOOD LT PED knob

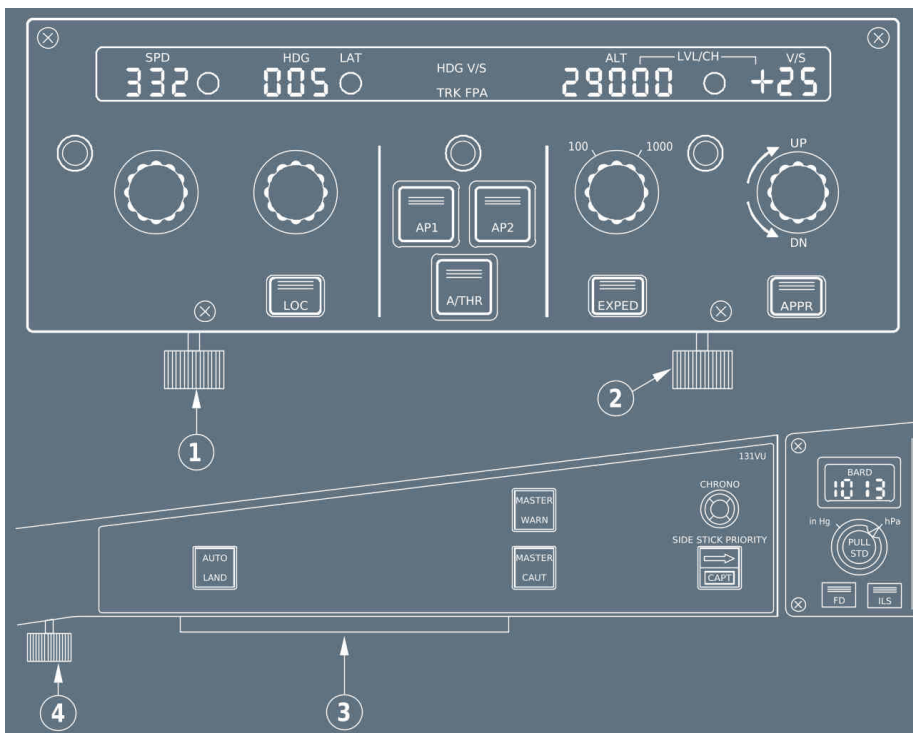
Turns on or off, and adjusts the brightness of the pedestal lights.

GLARESHIELD

Ident.: DSC-33-10-30-00001341.0002001 / 07 NOV 25

Applicable to: ALL

7

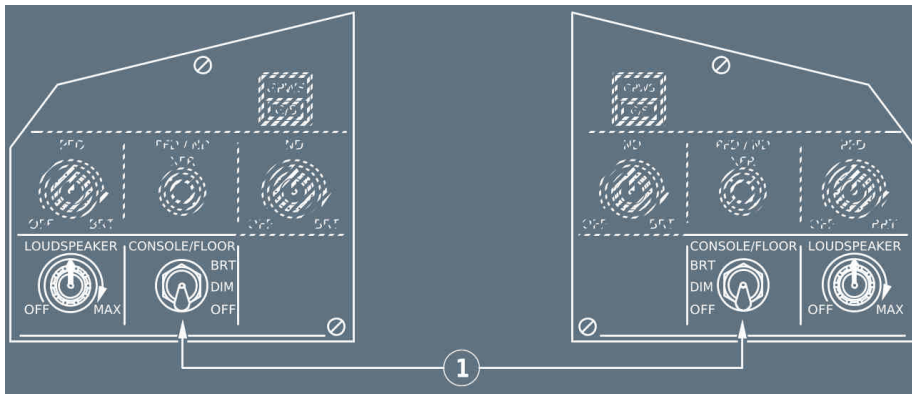


- (1) This knob adjusts the brightness of the integral lighting on the glare shield.
- (2) This knob adjusts the brightness of the FCU displays.
- (3) This lighting illuminates the sliding table and map holder.
- (4) This knob adjusts the brightness of the sliding table and map holder lighting.

MAIN INST PANEL

Ident.: DSC-33-10-30-00017620.0001001 / 21 MAR 16

Applicable to: **ALL**



(1) CONSOLE/FLOOR sw

Each switch controls the lights of the side console and of the briefcase on each side of the cockpit. In addition, each switch controls the lighting of the floor around each flight crew member's seat. The lights can either be bright, dim, or off.

GENERAL

Ident.: DSC-33-20-10-00017621.0001001 / 21 MAR 16

Applicable to: ALL

Exterior lighting includes the following lights:

- The navigation lights
- The landing lights
- The runway turn off lights
- The TO and TAXI lights
- The logo lights 
- The anticollision lights
- The wing and engine scan lights.

AIRCRAFT SYSTEMS

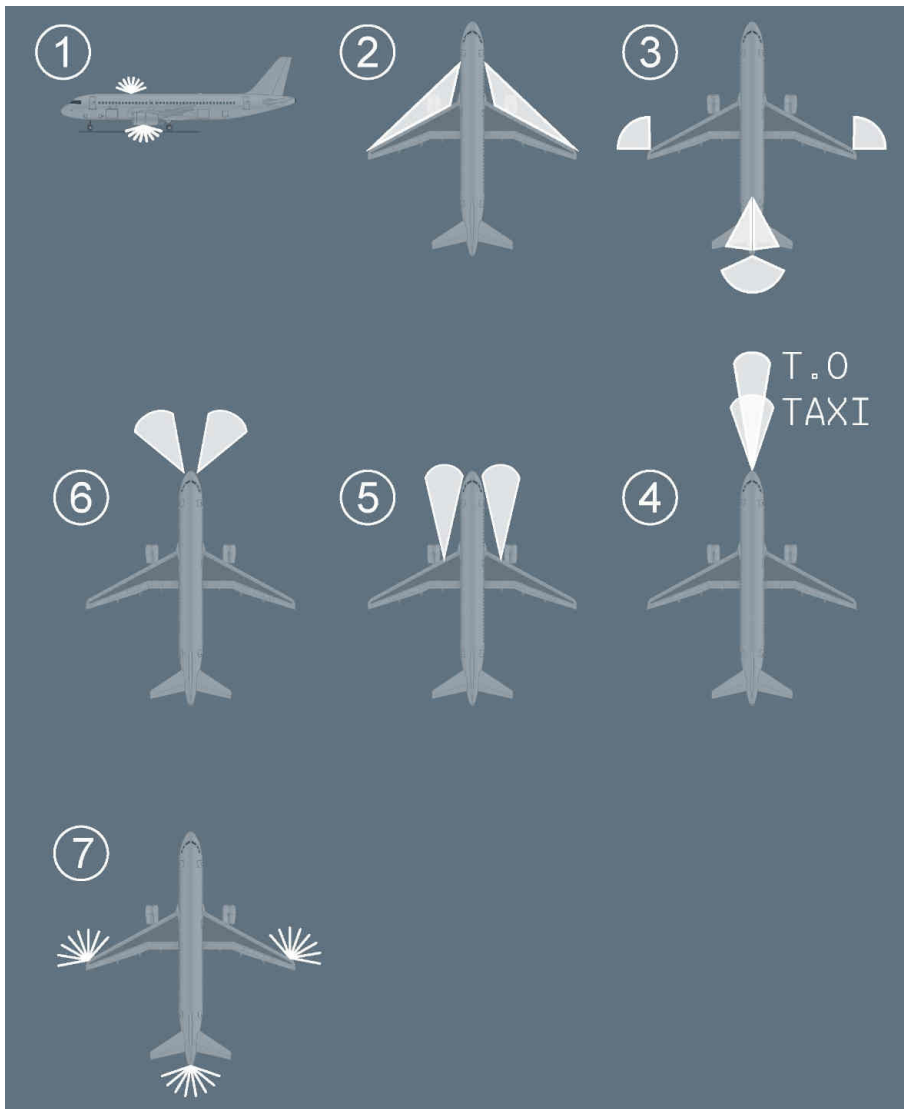
LIGHTS

EXTERIOR LIGHTING - GENERAL

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 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS LIGHTS EXTERIOR LIGHTING - CONTROLS AND INDICATORS
SCHEMATIC	
Ident.: DSC-33-20-20-00017622.0001001 / 21 MAR 16	

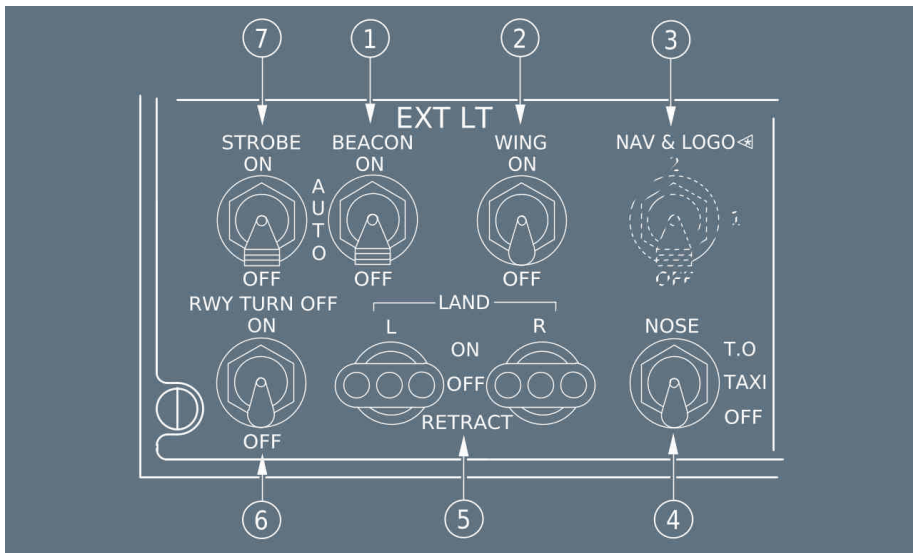
Applicable to: ALL



OVERHEAD PANEL

Ident.: DSC-33-20-20-00017623.0001001 / 12 MAY 23

Applicable to: ALL



(1) BEACON sw

This switch turns on and off the two flashing red lights, one on top and one on the bottom of the fuselage.

(2) WING sw

This switch turns on and off two beam lights on each side of the fuselage. These lights provide lighting on the wing leading edge and on the engine air intake to detect ice accretion.

(3) NAV & LOGO sw

There are single navigation light, or dual navigation lights on each wing and in the APU tail cone.

A blue light below each navigation light allows to monitor the navigation light wear (LED technology). When NAV & LOGO sw is ON, this light flashes in blue if the navigation light replacement should be planned.

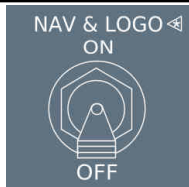
There are logo lights in the upper surface of each horizontal stabilizer. These lights provide lighting for the company logo on the vertical stabilizer provided the main landing gear is compressed, or depending on the aircraft configuration, when flaps are extended (at least 15° on some aircraft) or slats are extended.

AIRCRAFT SYSTEMS

LIGHTS

EXTERIOR LIGHTING - CONTROLS AND INDICATORS

The NAV & LOGO  sw can have one of the following configuration:



- ON : Turns on the NAV and the LOGO lights  .
OFF : The NAV and the LOGO lights  are off.

or



- 2 : Turns on NAV 2 and the LOGO lights  .
1 : Turns on NAV 1 and the LOGO lights  .
OFF : The NAV and the LOGO lights  are off.

(4) NOSE sw

This switch turns the taxi and takeoff lights on and off.

TO : Turns on both taxi and takeoff lights.

TAXI : Turns on only taxi light.

OFF : Taxi and takeoff lights off.

Note: These two lights, attached to the nose gear strut, go off automatically when landing gear is retracted.

(5) LAND sw

This switch controls the landing lights.

ON : Extends the (left or right) landing lights which come on automatically when fully extended.

OFF : Shuts off the landing lights which remain extended.

RETRACT : Shuts off and retracts the landing lights.

(6) RWY TURN OFF sw

This switch turns the runway turn-off lights on and off.

Note: These lights go off automatically when landing gear is retracted.

(7) STROBE sw

This switch turns on and off the three synchronized strobe lights, one on each wing and one below the tail cone.

AIRCRAFT SYSTEMS**LIGHTS****EXTERIOR LIGHTING - CONTROLS AND INDICATORS**

A blue light  below each strobe light allows to monitor the strobe light wear (LED technology). When STROBE sw is OFF or BEACON sw is ON, this light  flashes in blue if the strobe light replacement should be planned.

ON : The strobe lights flash white.

AUTO : The strobe lights come on automatically when the main landing gear is not compressed.

OFF : The strobe lights are off.

MEMO DISPLAY**Applicable to: ALL**

Ident.: DSC-33-20-20-M-00016785.0001001 / 21 MAR 16

LDG LT : The message is displayed in green, if one landing light is extended.

Ident.: DSC-33-20-20-M-00016784.0001001 / 21 MAR 16

STROBE LT OFF : The message is displayed in green, if the STROBE sw is OFF in flight.

AIRCRAFT SYSTEMS

LIGHTS

EXTERIOR LIGHTING - CONTROLS AND INDICATORS

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS LIGHTS EMERGENCY LIGHTING - DESCRIPTION
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GENERAL

Ident.: DSC-33-30-10-00017632.0001001 / 27 FEB 18

Applicable to: ALL

The emergency lighting system consists of the following:

- Proximity emergency escape path marking systems (escape path and exit markers)
- Overhead emergency lights
- EXIT signs
- Lavatory auxiliary lights
- Overwing escape route  lighting
- Escape slide lighting.

For aircraft equipped with electrical escape paths or electrical exit markers, internal batteries supply electrical power for at least 12 min.

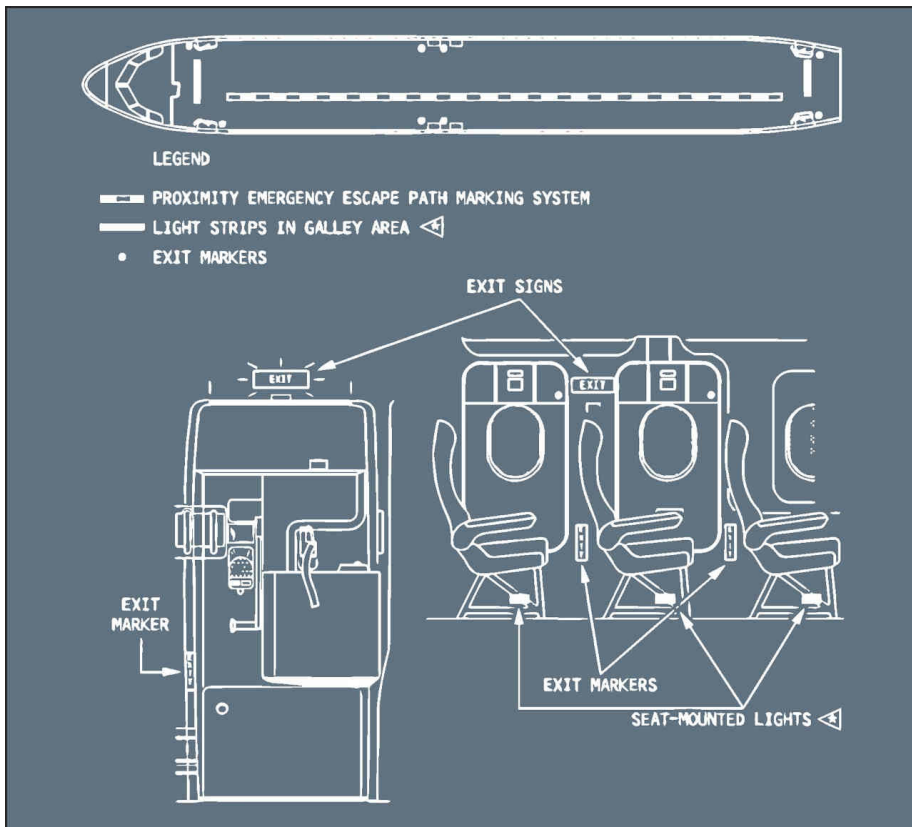
Lavatory auxiliary lights are always on.

The escape slides have an integral lighting system. The escape slide lights and overwing escape route  lights come on automatically when the slide is armed and the door or emergency exit is open. They are supplied by internal batteries.

PROXIMITY EMERGENCY ESCAPE PATH MARKING SYSTEM/EXIT SIGNS

Ident.: DSC-33-30-10-00017646.0013001 / 21 MAR 16

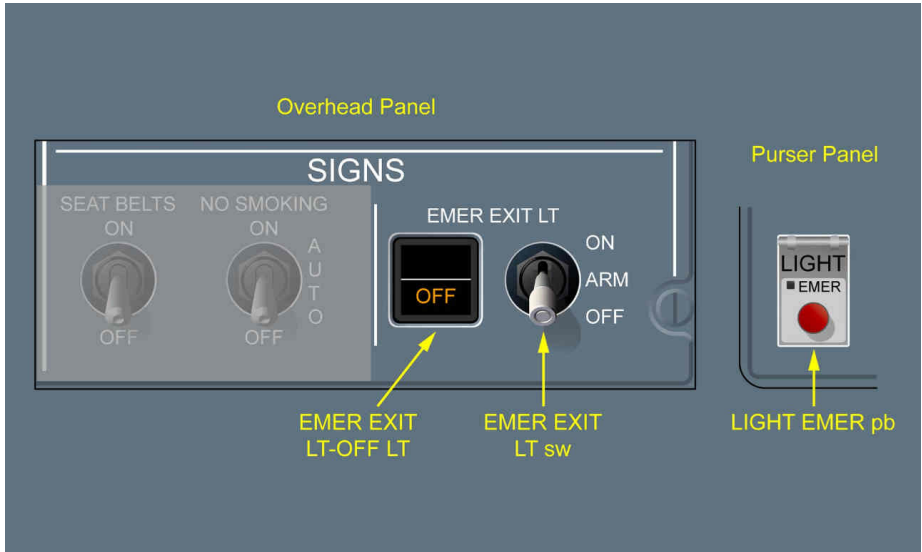
Applicable to: ALL



CONTROLS AND INDICATORS

Ident.: DSC-33-30-20-00017708.0003001 / 26 NOV 19

Applicable to: MSN 02155-02212



EMER EXIT LT sw

The EMER EXIT LT sw can have one of the following configuration:



Overhead emergency lights, EXIT signs and proximity marking system come on.



Above lights are off.



- The proximity emergency escape path marking system comes on when the normal aircraft electrical power or DC SHED ESS BUS is lost
- The overhead emergency lights come on if:
 - Normal aircraft electrical power system fails, or
 - DC SHED ESS BUS fails, or
 - AC BUS 1 fails.
- Exit signs come on if:
 - Normal aircraft electrical power system fails, or
 - DC SHED ESS BUS fails.

Note: The **LIGHT EMER pb** on the Purser panel can turn on the emergency lighting regardless of the position of the **EMER EXIT LT sw**.

EMER EXIT LT-OFF LT



The amber EMER EXIT LT-OFF It comes on when the EMER EXIT LT sw is set to OFF.

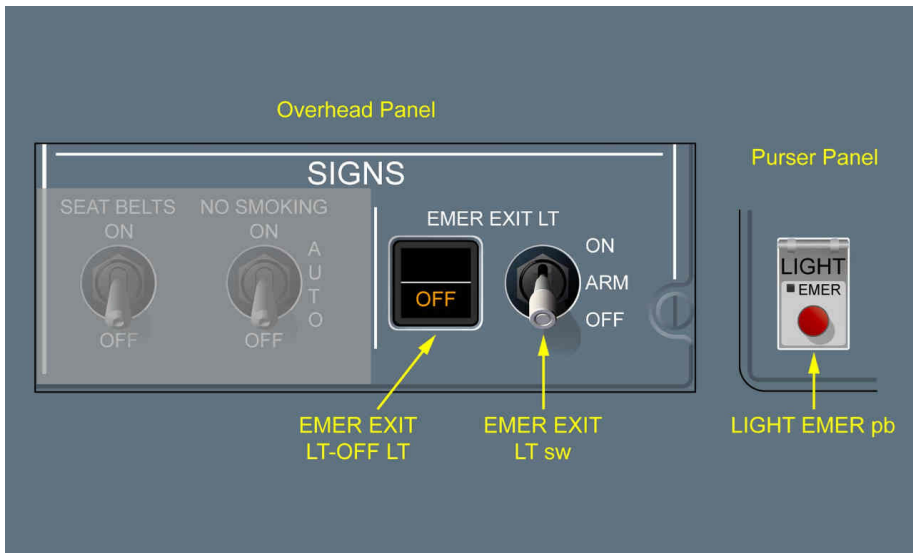
LIGHT EMER pb

When pressed, this button performs the same function as the EMER EXIT LT sw when it is set to ON.

CONTROLS AND INDICATORS

Ident.: DSC-33-30-20-00017708.0027001 / 26 NOV 19

Applicable to: MSN 02926-02944, 04392-07792



EMER EXIT LT sw

The EMER EXIT LT sw can have one of the following configuration:



Overhead emergency lights, EXIT signs and proximity marking system come on.



Above lights are off.



- Exit markers come on when the normal aircraft electrical power or DC SHED ESS BUS is lost.
- The overhead emergency lights come on if:
 - Normal aircraft electrical power system fails, or
 - DC SHED ESS BUS fails, or
 - AC BUS 1 fails.
- Exit signs come on if:
 - Normal aircraft electrical power system fails, or
 - DC SHED ESS BUS fails.

Note: The **LIGHT EMER pb** on the Purser panel can turn on the emergency lighting regardless of the position of the **EMER EXIT LT sw**.

EMER EXIT LT-OFF LT



The amber EMER EXIT LT-OFF It comes on when the EMER EXIT LT sw is set to OFF.

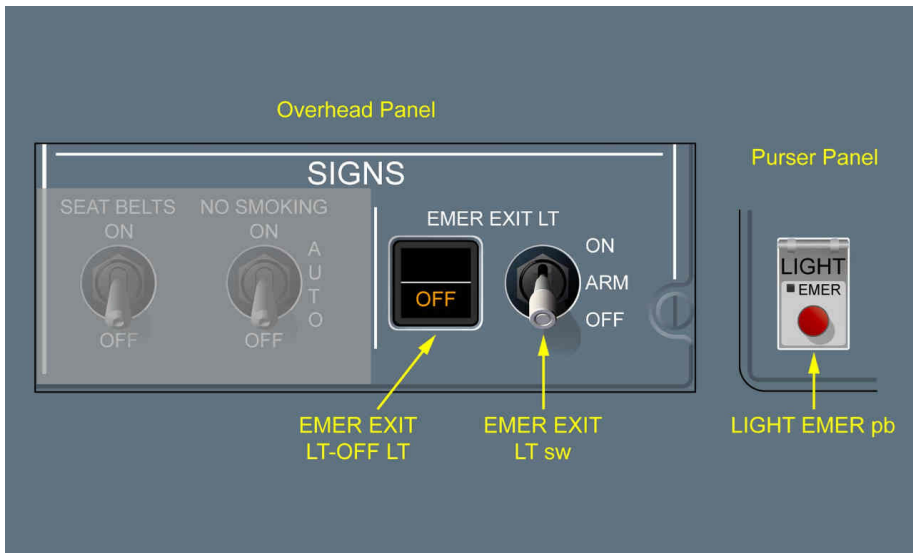
LIGHT EMER pb

When pressed, this button performs the same function as the EMER EXIT LT sw when it is set to ON.

CONTROLS AND INDICATORS

Ident.: DSC-33-30-20-00017708.0063001 / 26 NOV 19

Applicable to: MSN 02719-02789, 03031-03060



EMER EXIT LT sw

The EMER EXIT LT sw can have one of the following configuration:



Overhead emergency lights, EXIT signs and proximity marking system come on.



Above lights are off.



- Exit markers come on when the normal aircraft electrical power or DC SHED ESS BUS is lost
- The overhead emergency lights come on if:
 - Normal aircraft electrical power system fails, or
 - DC SHED ESS BUS fails, or
 - AC BUS 1 fails.
- Exit signs come on if:
 - Normal aircraft electrical power system fails, or
 - DC SHED ESS BUS fails.

Note:

- With EMER EXIT LT sw set to ON or ARM, the Passenger Address system is supplied by the HOT BUS
- The LIGHT EMER pb on the Purser panel can turn on the emergency lighting regardless of the position of the EMER EXIT LT sw.

EMER EXIT LT-OFF LT



The amber EMER EXIT LT-OFF It comes on when the EMER EXIT LT sw is set to OFF.

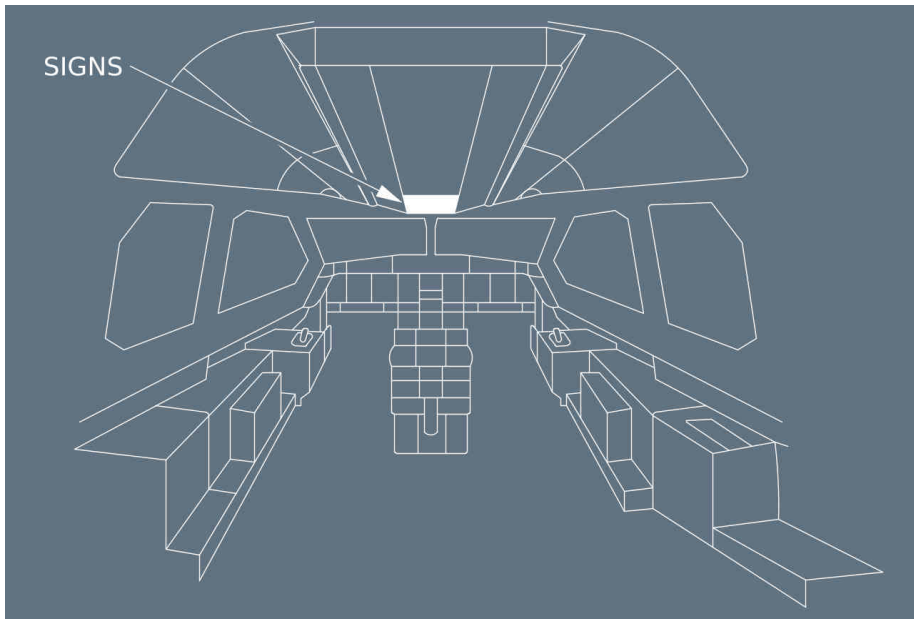
LIGHT EMER pb

When pressed, this button performs the same function as the EMER EXIT LT sw when it is set to ON.

OVERHEAD PANEL

Ident.: DSC-33-40-10-00017709.0001001 / 07 NOV 25

Applicable to: ALL



The switches described below are installed on the SIGNS panel on the overhead panel.

The cabin signs consist of the following:

- A SEAT BELTS sw, and
- A NO SMOKING sw, or
- An EXIT sw  , or
- A NO PORTABLE ELEC DEVICE sw  .

The SEAT BELTS sw activates the FASTEN SEAT BELT and RETURN TO YOUR SEAT signs.

The NO SMOKING sw or EXIT sw  activates the EXIT and NO SMOKING signs.

The NO PORTABLE ELEC DEVICE sw  activates the EXIT and NO MOBILE signs.

A low tone chime sounds (depending on CIDS/CAM programming) each time a sign goes on or off.

Each switch has 3 positions:

ON : Signs are on in the cabin

AIRCRAFT SYSTEMS

LIGHTS

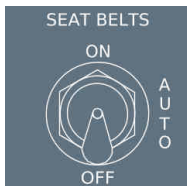
SIGNS - CONTROLS AND INDICATORS

AUTO : Signs are on in the cabin when either landing gear is extended or flaps/slats are extended
Mode (position 1, 2, 3, or FULL)



OFF : Signs are off in the cabin

Example of switches layout:



- Note:**
1. If the cabin altitude goes above 11 300 ft ($\pm$ 350 ft), the cabin lights (depending on CIDS/CAM programming) and all the cabin signs, except the NO PORTABLE ELEC DEVICE  signs come on regardless of switches position.
 2. For NON SMOKER, the NO SMOKING signs are always on.

MEMO DISPLAY

Ident.: DSC-33-40-10-00016783.0001001 / 05 MAY 22

Applicable to: **ALL**

When the corresponding signs are on, the ECAM displays **SEAT BELTS**, **NO SMOKING** or **NO PED** or **NO MOBILE** messages, depending on aircraft customization.

AIRCRAFT SYSTEMS

NAVIGATION

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DSC-34-NAV-10 ADIRS

DSC-34-NAV-10-10 Description

General.....	A
Probes Location.....	B
Probes Schematic.....	C
ADIRS Schematic.....	D

DSC-34-NAV-10-20 Controls and Indicators

Overhead Panel.....	A
Pedestal.....	B
Memo Display.....	C
Maximum Differences Between Speed/Mach Indications.....	D
ADIRS Operations - Status Messages.....	E

DSC-34-NAV-10-30 Abnormal Operations

DSC-34-NAV-10-30-10 Backup Speed/Altitude Scale

Backup Speed/Altitude Scale - General.....	A
Backup Speed/Altitude Scale - Backup Speed Scale.....	B

DSC-34-NAV-15 GPS

DSC-34-NAV-15-10 Description

Description.....	A
------------------	---

DSC-34-NAV-20 Standby Instruments

Compass.....	A
Description of the ISIS.....	B
Attitude.....	C
Airspeed.....	D
Altimeter.....	E
Landing System Function.....	F
Bugs Function.....	G
Flags.....	H

DSC-34-NAV-30 Radio Nav

DSC-34-NAV-30-10 Tuning

General.....	A
Architecture.....	B

Continued on the following page

Continued from the previous page

DSC-34-NAV-30-20 Nav aids

VOR.....	A
ILS/GLS /MLS 	B
ADF 	C
DME.....	D
Marker Beacon.....	E

DSC-34-NAV-30-30 Controls and Indicators

Digital Distance and Radio Magnetic Indicator (DDRMI).....	A
Radio Management Panel.....	B

DSC-34-NAV-40 Radio Altimeter

DSC-34-NAV-40-10 Description

General.....	A
Automatic Callout.....	B

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS NAVIGATION ADIRS - DESCRIPTION
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GENERAL

Ident.: DSC-34-NAV-10-10-00018524.0001001 / 21 MAR 16

Applicable to: ALL

The Air Data and Inertial Reference System (ADIRS) supplies temperature, anemometric, barometric and inertial parameters to the EFIS system (PFD and ND) and to other user systems (FMGC, FADEC, ELAC, SEC, FAC, FWC, SFCC, ATC, GPWS, CFDIU, CPC).

The system includes:

- Three identical ADIRUs (Air Data and Inertial Reference Units).

Each ADIRU is divided in two parts, either of which can work separately in case of failure in the other:

- The ADR part (Air Data Reference) which supplies barometric altitude, airspeed, Mach, angle of attack, temperature and overspeed warnings.
- The IR part (Inertial Reference) which supplies attitude, flight path vector, track, heading, accelerations, angular rates, ground speed and aircraft position.
- One ADIRS control panel on the overhead panel for selection of modes (NAV, ATT, OFF) and indications of failures.
- Four types of sensors:
 - Pitot probes (3)
 - Static pressure probes (STAT) (6)
 - Angle of attack sensors (AOA) (3)
 - Total air temperature probes (TAT) (2)

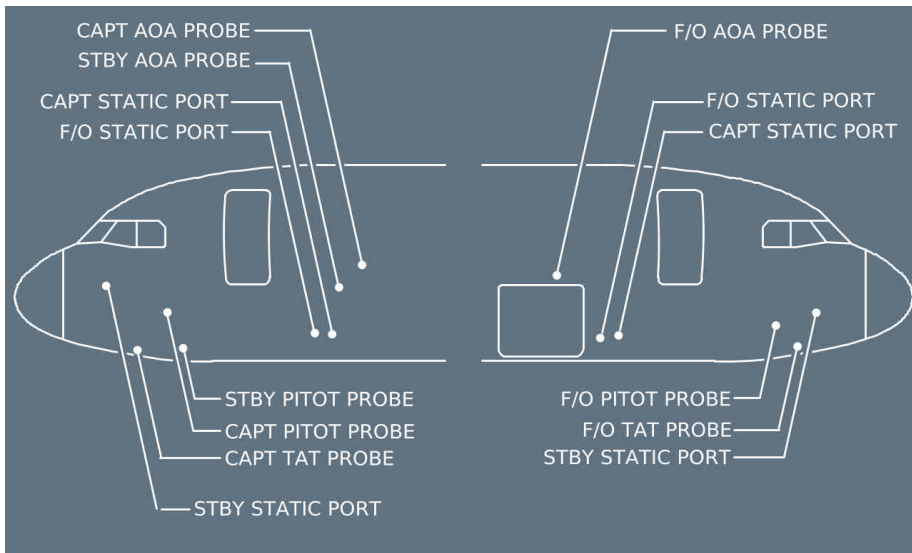
These sensors are electrically heated to prevent from icing up.

- Eight ADMs (Air Data Modules) which convert pneumatic data from PITOT and STAT probes into numerical data for the ADIRUs.
- A switching facility for selecting ADR3 or IR3 for instrument displays in case of ADIRU1 or 2 failure.

PROBES LOCATION

Ident.: DSC-34-NAV-10-10-00018525.0001001 / 21 MAR 16

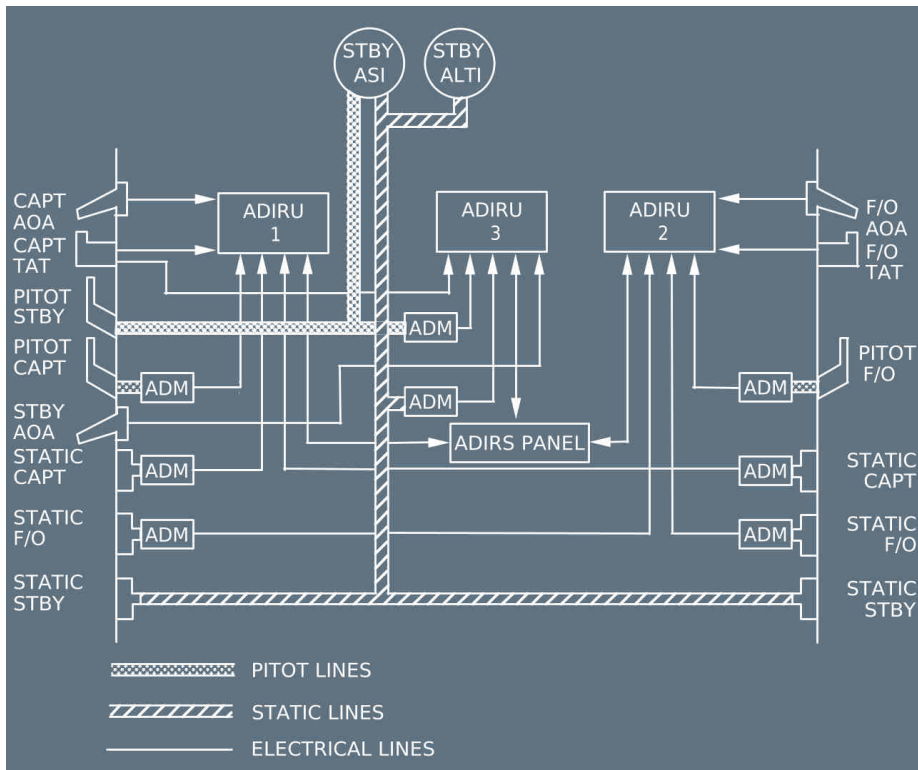
Applicable to: **ALL**



PROBES SCHEMATIC

Ident.: DSC-34-NAV-10-10-00018526.0001001 / 21 MAR 16

Applicable to: ALL

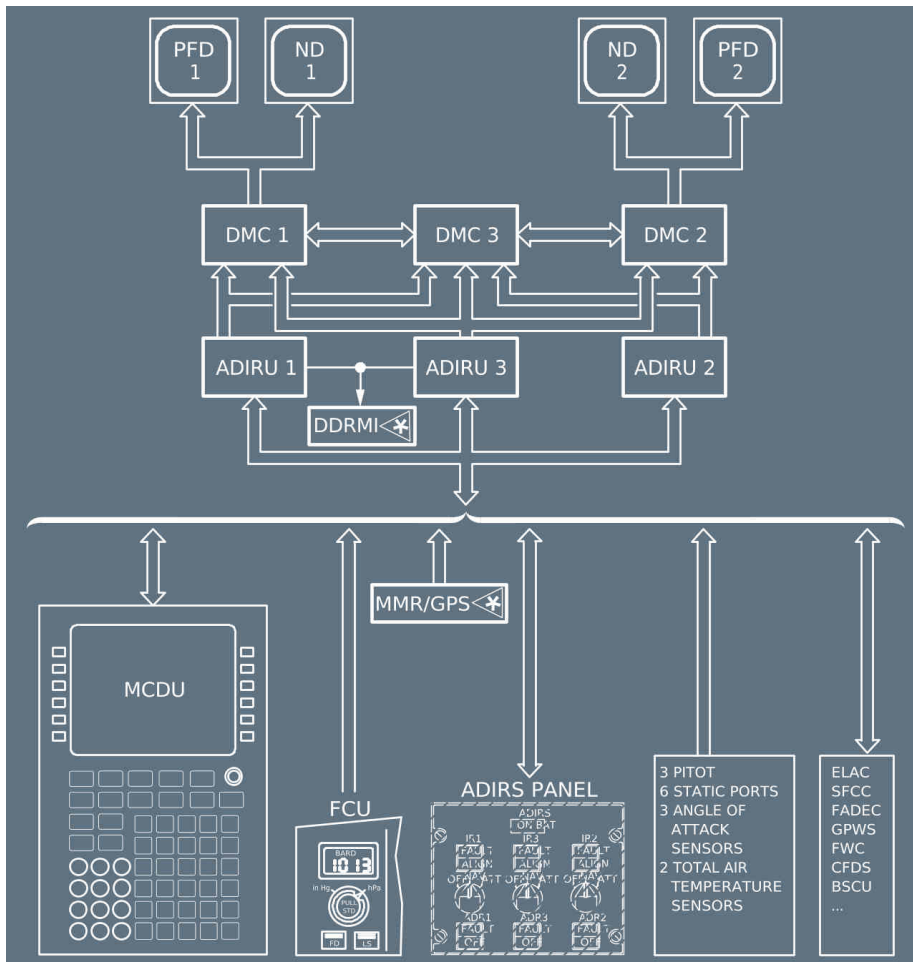


Note: ADIRU (1) is supplied by CAPT probes,
ADIRU (2) is supplied by F/O probes,
ADIRU (3) is supplied by STBY probes and CAPT TAT.

ADIRS SCHEMATIC

Ident.: DSC-34-NAV-10-10-00018527.0001001 / 21 MAR 16

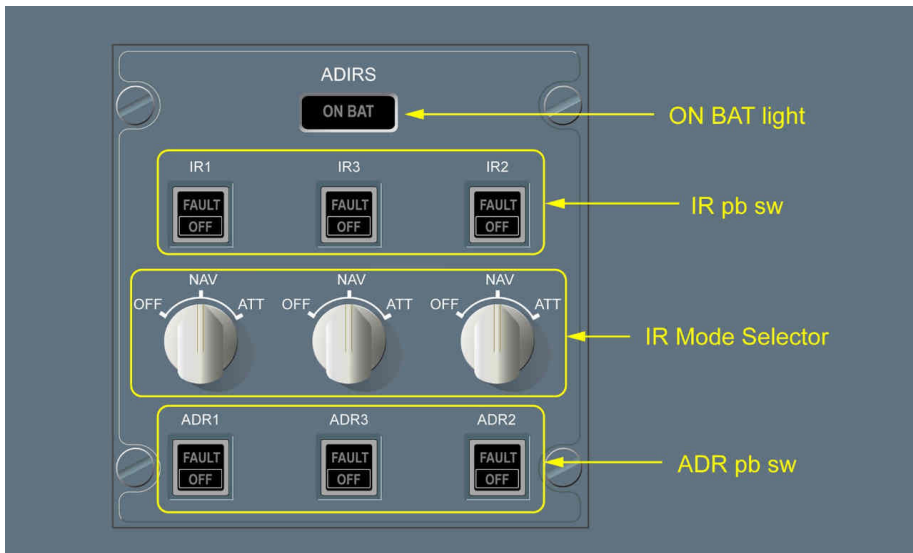
Applicable to: ALL



OVERHEAD PANEL

Ident.: DSC-34-NAV-10-20-00018528.0002001 / 06 NOV 23

Applicable to: MSN 04392-07792


ON BAT LIGHT


Batteries supply at least one ADIRU. The **ON BAT** light also comes on for a few seconds at the beginning of a complete IRS alignment.

The **ON BAT** light does not come on in the case of a fast alignment.

Note: When the aircraft is on ground and if at least one ADIRU is supplied by aircraft batteries:

- An external horn sounds
- The ADIRU and AVNCS lights come on amber on the EXTERNAL POWER panel.



One of the following applies:

- All three ADIRUs are on, and not supplied by batteries, or
- All three ADIRUs are off.

IR1(2)(3) PB SW



IR 1(2)(3) is on.
When pressed, turns off the IR 1(2)(3).



IR 1(2)(3) is off.
When pressed, turns on the IR 1(2)(3).



IR 1(2)(3) is failed.
Associated with the following ECAM alert: **NAV IR 1(2)(3) FAULT** (Refer to procedure).
When IR 1(2)(3) **FAULT** light flashes, the attitude and heading information may be recovered in ATT mode.
When IR 1(2)(3) **FAULT** light is steady, the IR 1(2)(3) is lost.
When pressed, turns off the IR 1(2)(3). The **FAULT** light goes off.

IR1(2)(3) MODE SELECTOR



ADIRU 1(2)(3) is not energized.
Both the IR 1(2)(3) data and the ADR 1(2)(3) data are not available.



IR 1(2)(3) operates in NAV mode
IR 1(2)(3) provides full inertial data to the aircraft systems.

Note: ADR 1(2)(3) provides full air data to the aircraft systems.



IR 1(2)(3) operates in ATT mode.
IR 1(2)(3) only provides attitude and heading data (if entered by the flight crew). The navigation data are not available.
The heading must be entered through the MCDU and has to be reset frequently (about every 10 min).

Note: During the flight, if the IR mode selector is set from NAV to ATT or NAV to OFF, the NAV mode is lost for the remainder of the flight.
When in ATT mode, the flight crew can only recover the NAV mode on ground via a complete alignment.

ADR 1(2)(3) PB SW



ADR 1(2)(3) is on.

When pressed, turns off the ADR 1(2)(3).



ADR 1(2)(3) is off.

When pressed, turns on the ADR 1(2)(3).



ADR 1(2)(3) is failed.

Associated with the following ECAM alert: **NAV ADR 1(2)(3) FAULT** (Refer to procedure).

When pressed, turns off the ADR 1(2)(3). The **FAULT** light goes off.

OVERHEAD PANEL

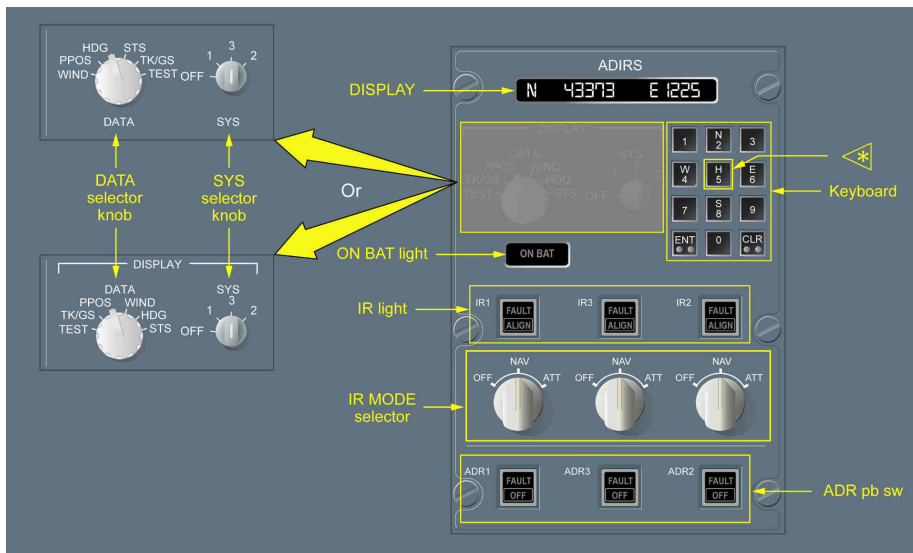
Ident.: DSC-34-NAV-10-20-00018528.0001001 / 06 NOV 23

Applicable to: MSN 02155-03060

The ADIRS CDU on the overhead panel provides the controls and indicators to permit:

- Selection of power supplies to the ADR and IRS systems
- Selection and display of navigation data
- Status and fault indication of IRS or ADRs.
- Manual initialization of IRS

Note: *IRS are normally initialized with the FMGC, but IRS may be initialized with the ADIRS CDU as a backup.*



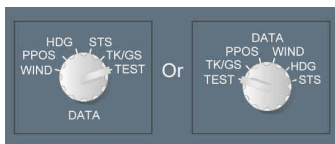
DISPLAY



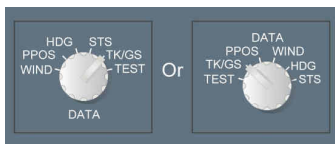
The display window presents the data selected by the DATA selector knob.

DATA SELECTOR KNOB

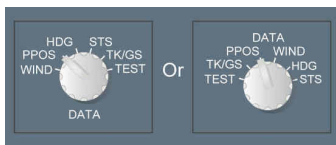
This knob selects the information to be displayed in the ADIRS display window.



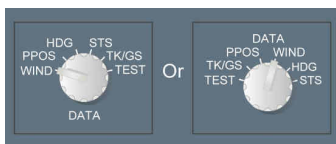
The ENT and CLR buttons on the keyboard come on, and the display windows shows all 8's.



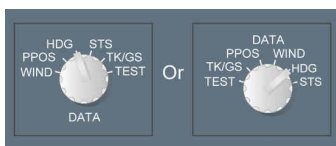
The display window shows true track and ground speed.



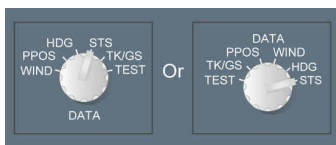
The display window shows present latitude and longitude.



The display window shows true wind direction and speed.



The display window shows true heading and the minutes remaining until alignment is completed.



The display window shows an action code.

SYS SELECTOR KNOB



The CDU display is not energized. ADIRS are still energized if the associated IR mode rotary selectors are not at OFF.



ADIRS 1 is selected for the data display.



ADIRS 3 is selected for the data display.



ADIRS 2 is selected for the data display.

KEYBOARD

The flight crew can use the keyboard to enter the present position, or the heading in ATT mode, into the selected system.



Used to enter N, S, E, or W for position, or entering H  for heading (ATT mode).



Used to enter the present position (or the present magnetic heading in ATT mode).



The integral cue light comes on after an entry operation if the data has an unreasonable value.



When pressed, clears the data display that has been keyed in but not yet entered.



The integral cue light comes on when a flight crew has keyed in a number for N, S, W, E or H .



When pressed, enters the data that has been keyed into the ADIRS.

ON BAT LIGHT



Batteries supply at least one ADIRU. The **ON BAT** light also comes on for a few seconds at the beginning of a complete IRS alignment. The **ON BAT** light does not come on in the case of a fast alignment.

Note: When the aircraft is on ground and if at least one ADIRU is supplied by aircraft batteries:

- An external horn sounds
- The ADIRU and AVNCS lights come on amber on the EXTERNAL POWER panel.



One of the following applies:

- All three ADIRUs are on, and not supplied by batteries, or
- All three ADIRUs are off.

IR 1(2)(3) LIGHT



IR 1(2)(3) is failed.

Associated with the following ECAM alert: **NAV IR 1(2)(3) FAULT** (Refer to procedure).

When IR 1(2)(3) **FAULT** light flashes, the attitude and heading information may be recovered in ATT mode.

When IR 1(2)(3) **FAULT** light is steady, the IR 1(2)(3) is lost.



When IR 1(2)(3) **ALIGN** light is steady, IR 1(2)(3) is operating normally in align mode.

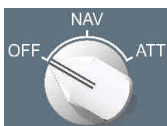
IR 1(2)(3) **ALIGN** light flashes when:

- The IR alignment fault, or
- No present position entry after 10 min, or
- There is a difference between the position at shutdown and the entered position exceeds 1 ° of latitude or longitude.



The alignment of IR 1(2)(3) has been completed.

IR MODE SELECTOR



ADIRU 1(2)(3) is not energized.

Both the IR 1(2)(3) data and the ADR 1(2)(3) data are not available.

AIRCRAFT SYSTEMS

NAVIGATION

ADIRS - CONTROLS AND INDICATORS



IR 1(2)(3) operates in NAV mode

IR 1(2)(3) provides full inertial data to the aircraft systems.

Note: ADR 1(2)(3) provides full air data to the aircraft systems.



IR 1(2)(3) operates in ATT mode.

IR 1(2)(3) only provides attitude and heading data (if entered by the flight crew). The navigation data are not available.

The heading must be entered using:

- The CDU keyboard, or
- The MCDU (if the entry field is available).

The heading has to be reset frequently (about every 10 min).

Note: During the flight, if the IR mode selector is set from NAV to ATT or NAV to OFF, the NAV mode is lost for the remainder of the flight.

When in ATT mode, the flight crew can only recover the NAV mode on ground via a complete alignment.

ADR 1(2)(3) PB SW



ADR 1(2)(3) is on.

When pressed, turns off the ADR 1(2)(3).



ADR 1(2)(3) is off.

When pressed, turns on the ADR 1(2)(3).



ADR 1(2)(3) is failed.

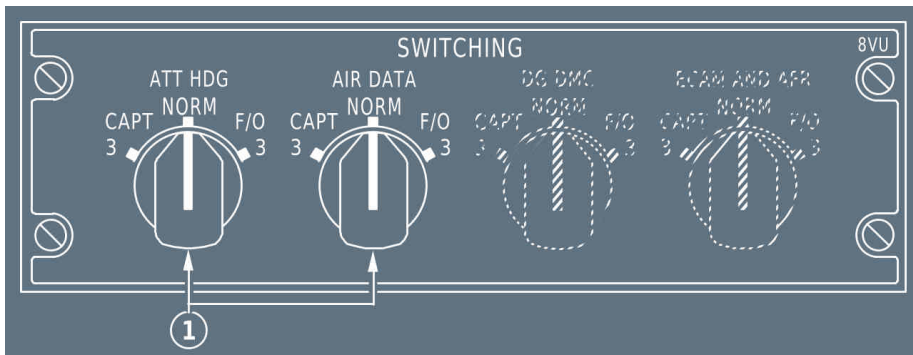
Associated with the following ECAM alert: **NAV ADR 1(2)(3) FAULT** (Refer to procedure).

When pressed, turns off the ADR 1(2)(3). The **FAULT** light goes off.

PEDESTAL

Ident.: DSC-34-NAV-10-20-00018529.0001001 / 21 MAR 16

Applicable to: ALL



(1) ATT HDG and AIR DATA sel

- NORM** : ADIRU1 supplies data to PFD1, ND1, DDRMI  and VOR/DME.
ADIRU 2 supplies data to PFD 2, and ND2.
- CAPT 3** : ADR3 or IR3 replaces ADR1 or IR1.
- F/O 3** : ADR 3 or IR3 replaces ADR 2 or IR2.

MEMO DISPLAY

Ident.: DSC-34-NAV-10-20-A-00025044.0001001 / 18 NOV 21

Applicable to: MSN 07784-07792

- ADIRS SWTG** : This memo appears when one of the following is applicable:
- AIR DATA rotary selector is selected at CAPT 3 or F/O 3 without the activation of BKUP SPD/ALT pb on the same side, or
 - ATT HDG rotary selector is selected at CAPT 3 or F/O 3.

Ident.: DSC-34-NAV-10-20-A-00017043.0002001 / 21 MAR 16

Applicable to: MSN 04392-07792

- IR IN ATT ALIGN** : This memo appears in green during the IR alignment in Attitude mode.

Ident.: DSC-34-NAV-10-20-A-00017042.0001001 / 21 MAR 16

Applicable to: MSN 02155-03060

- IRS IN ALIGN** : This memo appears in green if one of the 3 IRS is still in alignment and both engines are stopped.

AIRCRAFT SYSTEMS

NAVIGATION

ADIRS - CONTROLS AND INDICATORS

IRS IN ALIGN : This memo appears in amber if one of the 3 IRS is still in alignment and one engine is running.

IRS IN ALIGN X MN

Ident.: DSC-34-NAV-10-20-A-00017041.0001001 / 21 MAR 16

Applicable to: MSN 02155-03060

IRS IN ALIGN X MN : This memo appears in green, if both engines are stopped. The memo "IRS IN ALIGN X MN" appears during flight phase 1 or 2, if:

- At least one active IRS is in ALIGN submode
- The remaining time until NAV mode is obtained in X minutes ($1 < X < 10$).

IRS IN ALIGN X MN : This memo appears in amber, if one engine is running. The memo "IRS IN ALIGN X MN" appears during flight phase 1 or 2, if:

- At least one active IRS is in ALIGN submode
- The remaining time until NAV mode is obtained in X minutes ($1 < X < 10$).

Ident.: DSC-34-NAV-10-20-A-00017041.0002001 / 21 MAR 16

Applicable to: MSN 04392-07792

The memo "IRS IN ALIGN X MN" appears during IRS alignment in flight phase 1 or 2. X MN indicates the number of remaining minutes ($1 < X < 10$), until NAV mode is reached.

Before any engine is started:

IRS IN ALIGN X MN : This memo appears in green when at least one active IRS is being aligned.

IRS IN ALIGN X MN : This memo pulses in green, if the alignment of one IRS is faulty.

When one engine is started:

IRS IN ALIGN X MN : This memo appears in amber during IRS alignment. If the alignment of one IRS is faulty, this memo is replaced by the "IR NOT ALIGNED" ECAM caution.

MAXIMUM DIFFERENCES BETWEEN SPEED/MACH INDICATIONS

Ident.: DSC-34-NAV-10-20-00021130.0002001 / 13 MAY 25

Applicable to: ALL

The following table details the TSM values used to determine if a maintenance task is due when a difference between Speed/Mach indications is observed.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS NAVIGATION ADIRS - CONTROLS AND INDICATORS
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They are provided in order for flight crews to determine if indeed maintenance actions should be requested.

FL	SPEED	SPEED/MACH COMPARISON BETWEEN					
		ADR1 and ADR2 (on PFD)		ADR3 and ADR1, or ADR3 and ADR2 (on PFD)		Standby Airspeed Indicator and any ADR 1, or 2, or 3	
		kt	Mach	kt	Mach	kt	Mach on ISIS  ⁽¹⁾
FL 50	250 kt	4 kt	M 0.005	4 kt	M 0.007	7 kt	-
FL 100	250 kt	4 kt	M 0.005	5 kt	M 0.008	8 kt	M 0.032
FL 200	300 kt	3 kt	M 0.007	5 kt	M 0.011	9 kt	M 0.033
FL 300	M 0.78	3 kt	M 0.010	5 kt	M 0.014	9 kt	M 0.025
FL 390	M 0.78	3 kt	M 0.010	4 kt	M 0.014	8 kt	M 0.025

⁽¹⁾ Mach values lower than M 0.50 in climb, and M 0.45 in descent, are not displayed on ISIS  .

ADIRS OPERATIONS - STATUS MESSAGES

Ident.: DSC-34-NAV-10-20-00021988.0001001 / 09 NOV 17

Applicable to: MSN 02155-03060

STATUS MESSAGES

Status messages appear, when the DISPLAY DATA switch is set to STS. If there is more than one condition calling for a message, the display scrolls to the next message every 2 s.

MESSAGE	DESCRIPTION
STS IR FAULT	Hard failure. Select ATT (if corresponding message is displayed) or refer to MMEL or remove ADIRU for maintenance.
STS-DELAY MAINT	Failure not affecting IR functioning. Service ADIRU when convenient.
STS-ENTER PPOS	Enter present position or check entered position is correct. <i>Note: The confirmation of an erroneous longitude at the present position entry will create a wrong position of the aircraft symbol on the NDs.</i>
STS-SELECT ATT	Hard IRU failure, select ATT mode.
STS-EXCESS MOTION	Excess motion detected during alignment. ADIRU will automatically restart alignment. Ensure aircraft is not moving.
STS-SWITCH ADR	ADR invalid.
STS-CHECK CK/BK	Check circuit breakers ⁽¹⁾
STS-CDU FAULT	Remove CDU for maintenance.
STS-ENT MAG HDG	Enter magnetic heading.

⁽¹⁾ If a corresponding FAULT light comes on, check BAT 1 load.

AIRCRAFT SYSTEMS**NAVIGATION****ADIRS - CONTROLS AND INDICATORS**

- If the prompt REALIGN IRS is displayed on the MCDU INIT page:
Check and confirm the position initialization coordinates on the MCDU, then validate the REALIGN IRS prompt.

Note: The IRS records the last known position from the last time it was in NAV mode. The IRS is also able to estimate the present latitude during a complete alignment. The IRS uses both information sources to detect any significant position initialization error.

Backup Speed/Altitude Scale

BACKUP SPEED/ALTITUDE SCALE - GENERAL

Ident.: DSC-34-NAV-10-30-10-00019127.0002001 / 20 MAR 17

Applicable to: MSN 07784-07792

GENERAL

The BackUp Speed Scale (BUSS) enables to fly the aircraft when airspeed indications are unreliable.

When the BUSS is activated:

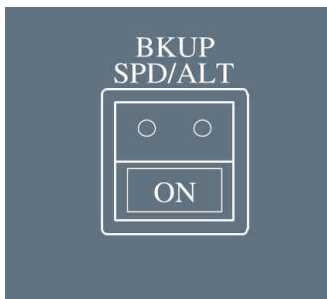
- The BUSS replaces the normal speed
- The GPS altitude replaces the barometric altitude scale.

The use of the BUSS is reversible.

The reversible BUSS is activated and deactivated with two BKUP SPD/ALT pb available on the main instrument panel:

- One on the left of the Captain PFD
- One on the right of the F/O PFD.

Each BKUP SPD/ALT pb independently commands the display of the BUSS on its associated side.



The BUSS information is based on the angle of attack (AOA), and depends on the slat/flap configuration.

ECAM ALERT AND MEMO

The ECAM displays a memo when the flight crew activates the BKUP SPD/ALT on one side:

BKUP SPD/ALT.

The ECAM displays an alert when the flight crew activates the BKUP SPD/ALT:

- On one side with the AP and/or FD engaged on the same side,
Refer to PRO-ABN-NAV NAV BKUP SPD/ALT ON CAPT(F/O) PFD, or
- On both sides,
Refer to PRO-ABN-NAV NAV BKUP SPD/ALT ON CAPT+F/O PFD.

BACKUP SPEED/ALTITUDE SCALE - GENERAL

Ident.: DSC-34-NAV-10-30-10-00019127.0001001 / 16 MAY 17

Applicable to: MSN 02719-05746

GENERAL

The BackUp Speed Scale (BUSS) enables to fly the aircraft when airspeed indications are unreliable.

When the BUSS is activated:

- The BUSS replaces the normal speed,
- The GPS altitude replaces the barometric altitude scales.

The BUSS is displayed on both PFDs when the flight crew turn off all ADRs.

The activation of this BUSS is not reversible.

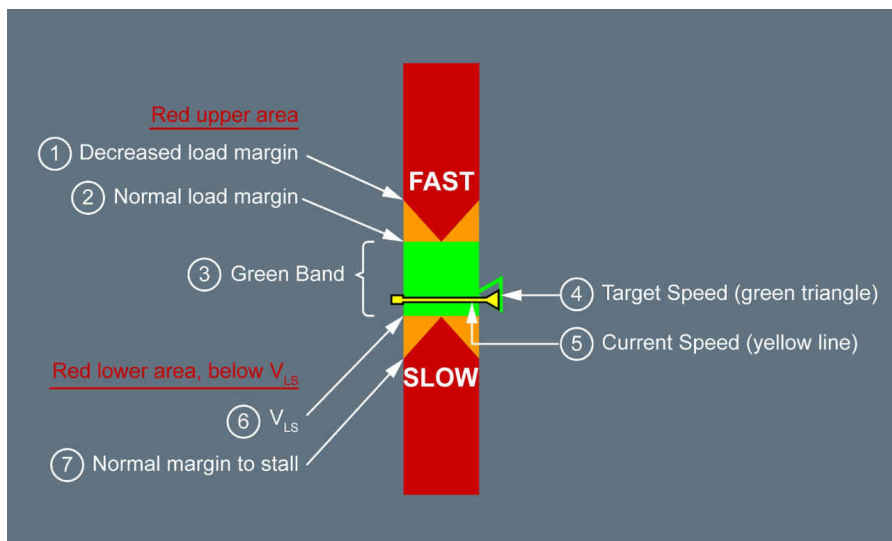
The BUSS information is based on the angle of attack (AOA), and depends on the slat/flap configuration.

BACKUP SPEED/ALTITUDE SCALE - BACKUP SPEED SCALE

Ident.: DSC-34-NAV-10-30-10-00019128.0001001 / 21 MAR 16

Applicable to: MSN 02719-07792

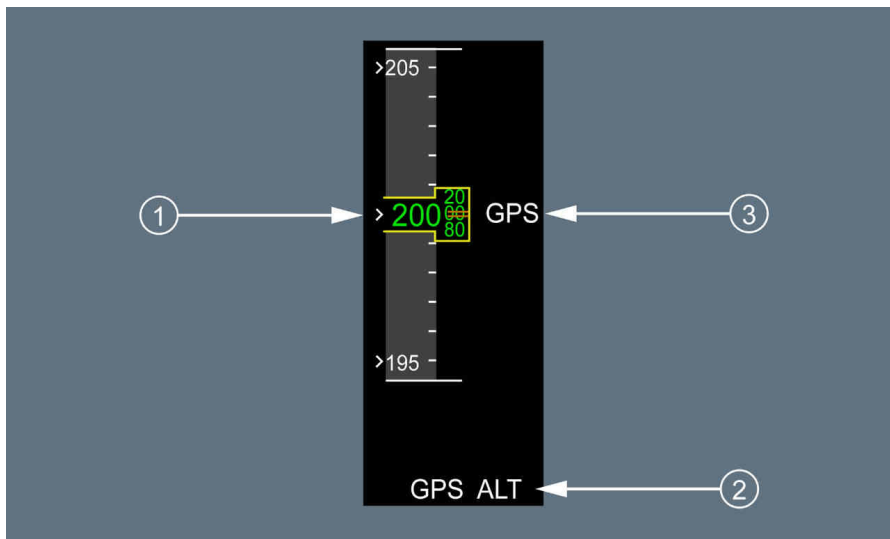
BACKUP SPEED SCALE



- (1) Red FAST area
This area indicates the excessive speed range while decreasing the margin to the maximum structural speed.
- (2) Amber FAST area
This area indicates the excessive speed range while keeping an appropriate margin to the maximum structural speed.
- (3) Green area
The green area indicates the safe speed range.
- (4) Target speed (green triangle)
This symbol indicates the optimum target speed.
During the approach, it indicates the target speed for the approach.
- (5) Actual speed reference (yellow line)
This line indicates the current speed of the aircraft.

- (6) Amber SLOW area
This area indicates the too low speed range while keeping an appropriate margin to the stall speed.
- (7) Red SLOW area
This area indicates the too low speed range while reducing the margin to the stall speed.

BACKUP ALTITUDE SCALE



- (1) Current GPS altitude
Two amber dashes cover the last two digits.
- (2) GPS ALT flag
This flag indicates that the barometric altitude is replaced by the GPS altitude.
- (3) GPS flag (displayed depending of the aircraft configuration)
This flag indicates that the barometric altitude is replaced by the GPS altitude.

Note: The vertical speed indication is no longer displayed.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS NAVIGATION GPS - DESCRIPTION
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DESCRIPTION

Ident.: DSC-34-NAV-15-10-00018530.0001001 / 21 MAR 16

Applicable to: ALL

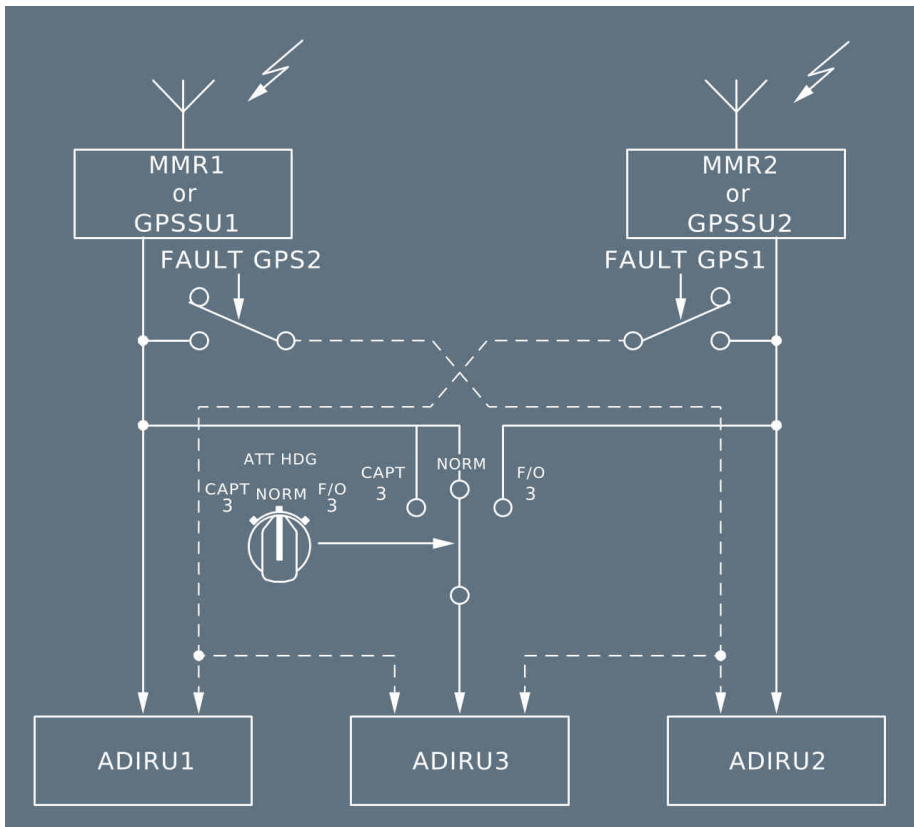
The Global Positioning System (GPS) is a satellite-based radio navigation aid.

Worldwide, 24 satellites broadcast accurate navigation data that the aircraft use for precise determination of its position.

The aircraft has two independent GPS receivers. Depending of the aircraft configuration, each receiver consists:

- Of a GPS Sensor Unit (GPSSU), or
- Is integrated in the Multi Mode Receiver (MMR). The GPS1 receiver in MMR1, and the GPS2 receiver in MMR2.

The GPSSU or the MMR processes the received data, and transfers them to the ADIRUs. Then each ADIRU performs the GP-IRS hybrid position calculation. FMGCs use this hybrid position.



OPERATIONS

GPS information are available on the FMS – GPS Monitor Page. *Refer to DSC-22_20-50-10 Pages descriptions.*

- During normal operations
The GPS receiver 1 supplies the ADIRU 1 and the ADIRU 3, and the GPS receiver 2 supplies the ADIRU 2.
- In case of failure of one GPS receiver
All ADIRUs use the operative GPS receiver.
- In case of failure of ADIRUs
 - If the ADIRU 1 fails, ADIRU 3 is supplied by the GPS receiver 1, and ADIRU 2 is supplied by the GPS receiver 2.
 - If the ADIRU 2 fails, the ATT HDG selector has to be set to F/O 3 in order to maintain Side 1 and Side 2 segregation. In this case, the ADIRU 3 will be supplied with GPS receiver 2.
 - If two ADIRUs fail, the remaining ADIRU is supplied by its own side GPS receiver.

AIRCRAFT SYSTEMS

NAVIGATION

GPS - DESCRIPTION

Intentionally left blank

COMPASS

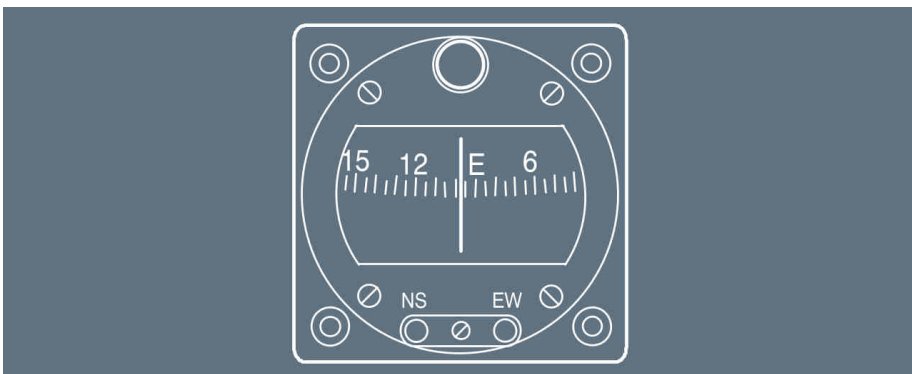
Ident.: DSC-34-NAV-20-00001367.0001001 / 19 DEC 12

Applicable to: ALL

There is a compass located on top of the windshield center post.

The deviation card is located above the compass.

Note: Because of the location of the APU power on contactor in the cockpit, the APU start sequence may disturb the compass reading.

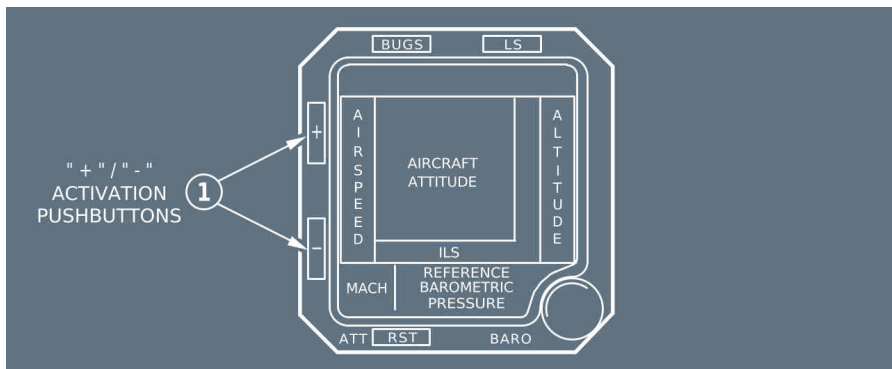

DESCRIPTION OF THE ISIS

Ident.: DSC-34-NAV-20-00018543.0002001 / 21 MAR 16

Applicable to: ALL
GENERAL

The ISIS system displays the following information:

- Attitude
- Airspeed and mach
- Altitude
- Barometric pressure
- LS function
- Bugs



(1) "+" / "-" activation pushbuttons

Two pushbuttons labelled "+" and "-" are used to adjust the level of brightness.

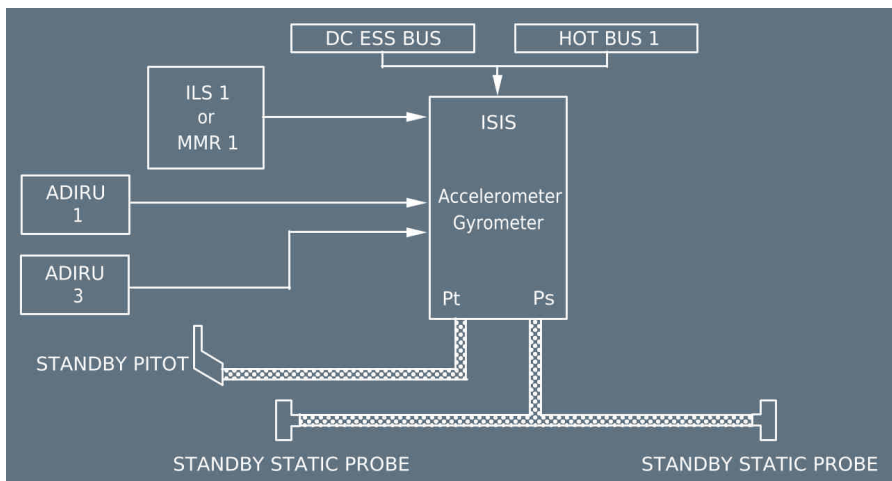
The brightness of the screen automatically adjusts after power-up tests.

This is because of the photosensitive cell located on the surface of the ISIS system display.

The "+" and "-" pushbuttons then allow this initial brightness to be manually adjusted and changed.

Note: The system must be reset after 350 h of continuous electrical supply using the « ATT RST » pushbutton.

ARCHITECTURE

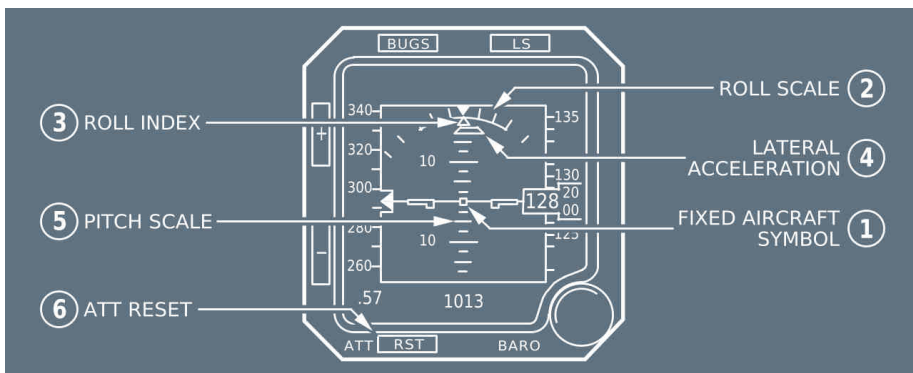


ATTITUDE

Ident.: DSC-34-NAV-20-00018575.0002001 / 21 MAR 16

Applicable to: ALL

Note: When leveling the wings after performing a small turn of a small bank angle, the displayed roll attitude may temporarily be incorrect by a few degrees.



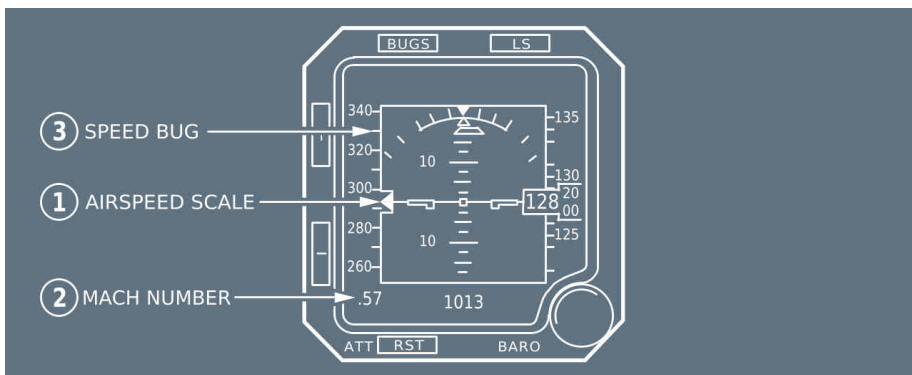
- (1) Fixed aircraft symbol
The fixed aircraft symbol is in black, and outlined in yellow.
Depending of the aircraft configuration, the center of the fixed aircraft symbol is a point (like on the illustration above) or "V-bars".
- (2) Roll scale
The roll scale is in white.
The markers are at 0 (small yellow triangle), 10, 20, 30, 45, 60 ° of bank.
- (3) Roll index
The roll index is in black, and outlined in white. It indicates the bank angle.
- (4) Lateral acceleration index
The trapezoidal index moves beneath the roll index. It represents the aircraft's lateral acceleration.
- (5) Pitch scale
The pitch scale is in white. The scale shows markers every 2.5 ° between 30 ° nose up and 30 ° nose down. Beyond 30 °, large red arrowheads (V-shaped) indicate that the attitude has become excessive, and show the direction to follow in order to reduce it. The minimum pitch scale displayed is -17.5 ° +15 ° at 0 ° pitch.

(6) ATT RST

The attitude indication can be reset by pressing this pushbutton for at least 2 s. The aircraft must be level during this procedure. During the reset time (approximately 10 s), the “ATT 10 s” message is displayed on the screen. This pushbutton is also used to realign the system, if excessive aircraft movement is detected during the alignment phase.

AIRSPEED

Ident.: DSC-34-NAV-20-00018576.0002001 / 12 MAY 23

 Applicable to: **ALL**


(1) Airspeed scale

A white scale moves in front of a yellow triangle indicating the airspeed. The scale ranges from 30 to 250 kt, with a mark every 5 kt, and from 250 to 520 kt, with a mark every 10 kt.

(2) Mach Number

The Mach number is displayed in green it goes greater than 0.5. And it disappears only when it goes below 0.45.

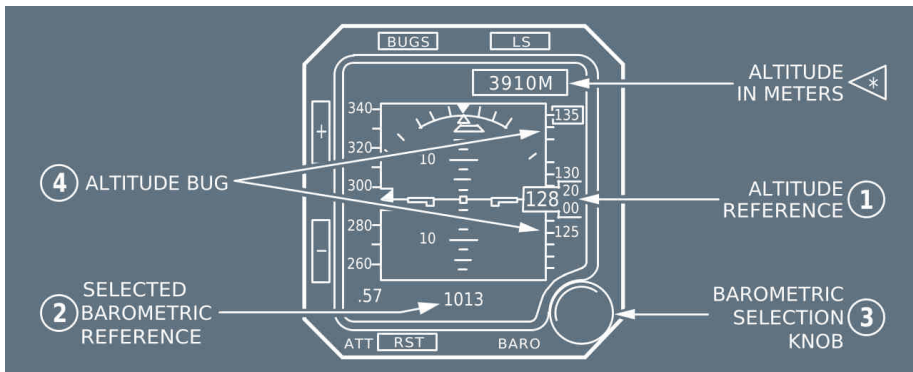
(3) Speed bug

When a speed bug is entered via the BUGS function, the corresponding speed mark is indicated by a cyan dash.

ALTIMETER

Ident.: DSC-34-NAV-20-00018577.0002001 / 21 MAR 16

Applicable to: ALL



(1) Altitude indication

The altitude indication is given as a white moving scale, and a green digital readout on a gray background.

The altitude scale ranges from -2 000 to 50 000 ft every 100 ft, with altitude digital indications every 500 ft.

For negative altitudes, "NEG" appears in the window in white.

The altitude box changes to cyan, when it also corresponds to a bug value.

Depending of the aircraft configuration, the altitude in meters is displayed above the altitude scale.

(2) Barometric reference

The barometric reference pressure is displayed in cyan.

The displayed barometric reference is:

- The standard barometric reference "STD", or
- Depending of the aircraft configuration, the barometric pressure is "hPa" or "hPa/ inHg".

(3) Barometric selection knob

This knob enables the selection of a barometric pressure, setting a variation of 10 hPa per knob rotation.

The standard barometric pressure can be selected by pressing the barometric knob. "STD" is then displayed, in place of the pressure value.

Pressing the knob again will display the selected barometric pressure.

LS SELECTION PUSHBUTTON

Pressing the LS pb will display the LS scales. Pressing the LS pb again will remove the LS scales.

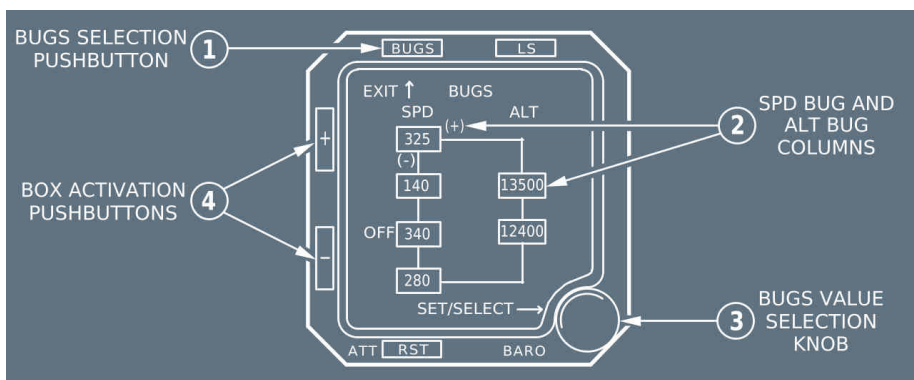
CAUTION

Do not use the ISIS LS for takeoff using the localizer of the opposite runway, or for a back-course localizer approach. The LOC deviations are given in the wrong sense.

BUGS FUNCTION

Ident.: DSC-34-NAV-20-00018578.0001001 / 21 MAR 16

Applicable to: ALL



- (1) BUGS function selection pushbutton
Pressing the BUGS pushbutton will activate the BUGS function and display the bug values to be selected.
- (2) SPD BUG and ALT BUG columns
The SPD BUG column gives four speed values (in knots) that can be selected by the crew. The ALT BUG column gives two altitude values (feet) to be selected by the crew.
- (3) BUGS value selection knob
It allows the bug value to be set by rotating the BARO knob. This value cannot be lower than 30 kt for a speed bug, or a negative value for an altitude bug. Pressing the BARO setting knob, once a bug value box is activated, will deselect the bug value. The "OFF" label comes on close to the activated box. The entered values are memorized by the system, when exiting the screen, by pressing the BUGS pushbutton (1), or after 15 s without any pilot action.
- (4) "+" / "-" box activation buttons
Access from one box to another is obtained by pressing the "+" or "-" pushbutton.

When a bug value is entered, access to the next box is obtained by pressing the “-” pushbutton. The box becomes active and flashes.

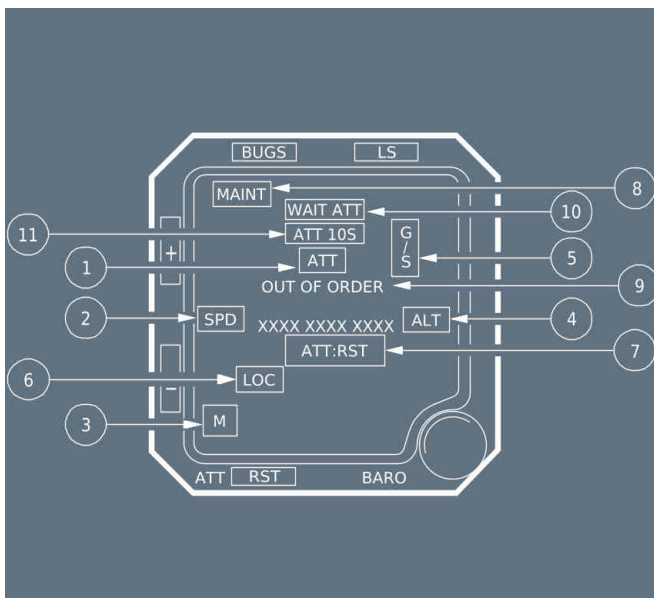
The “+” pushbutton can be used to return to a previous box.

***Note:** Use of the ISIS bugs function is not recommended because, in the event that both PFDs are lost in flight, when the ISIS bugs were previously set for takeoff, then for the approach, the bugs would remain at the takeoff characteristic speed settings.*

FLAGS

Ident.: DSC-34-NAV-20-00018580.0002001 / 21 MAR 16

Applicable to: ALL



- (1) ATT flag (red)
When attitude data is lost, the red ATT flag appears.
- (2) SPD flag (red)
When airspeed data is lost, the red SPD flag appears.
- (3) M flag (red)
When mach number is lost, the red M flag appears.

(4) ALT flag (red)

When altitude data is lost, the red ALT flag appears.

(5) G/S flag (red)

When glideslope information is lost, the red G/S flag appears.

(6) LOC flag (red)

When localizer data is lost, the red LOC flag appears.

(7) ATT: RST (yellow)

The “ATT: RST” flag appears:

- When excessive aircraft movement is detected during the alignment phase, or
- After 350 h of continuous electrical supply, or
- When the “WAIT ATT” flag is displayed during more than 10 s.

In both cases, press the ATT RST pb to reset/realign and recover the attitude indication.

(8) MAINT flag (white)

Maintenance required. This “MAINT flag” does not affect ISIS operation.

Displayed only on ground phase (speed < 60 kt).

(9) OUT OF ORDER (white)

When an internal failure of the ISIS indicator occurs, the “OUT OF ORDER” message appears, accompanied by a fault code.

(10) WAIT ATT flag (yellow)

If the ISIS loses attitude data, its entire sphere is cleared to display the: “WAIT ATT” flag.

- If the “WAIT ATT” flag is displayed during less than 10 s, a normal operation is recovered.
- If attitude data are lost for more than 10 s, the “WAIT ATT” flag is then replaced by the “ATT: RST” flag.

(11) ATT 10 s flag (yellow)

This count down flag appears, when the flight crew press the ATT RST pb, in order to indicate that the attitude reset function is in progress.

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GENERAL

Ident.: DSC-34-NAV-30-10-00018581.0001001 / 21 MAR 16

Applicable to: ALL

Three modes of tuning are available.

1. Automatic Tuning

This is the basic means for tuning nav aids.

In normal operation, the FMGC tunes nav aids automatically, with each FMGC controlling its own receivers.

If one FMGC fails, the remaining FMGC controls both sides receivers.

2. Manual Tuning

The flight crew can use the MCDU to override the automatic tuning of nav aids by FMGC in order to select a specific nav aid for visual display.

This does not affect the automatic function of the FMGC.

Any entry on one MCDU is sent to both FMGC in dual mode, or the remaining FMGC in single mode.

3. Back Up Tuning

If both FMGCs fail, the flight crew can use the RMPs (Radio Management Panels 1 and 2) on the pedestal for back up tuning.

The CAPT RMP controls VOR1 and ADF 1 .

The F/O RMP controls VOR2 and ADF 2 .

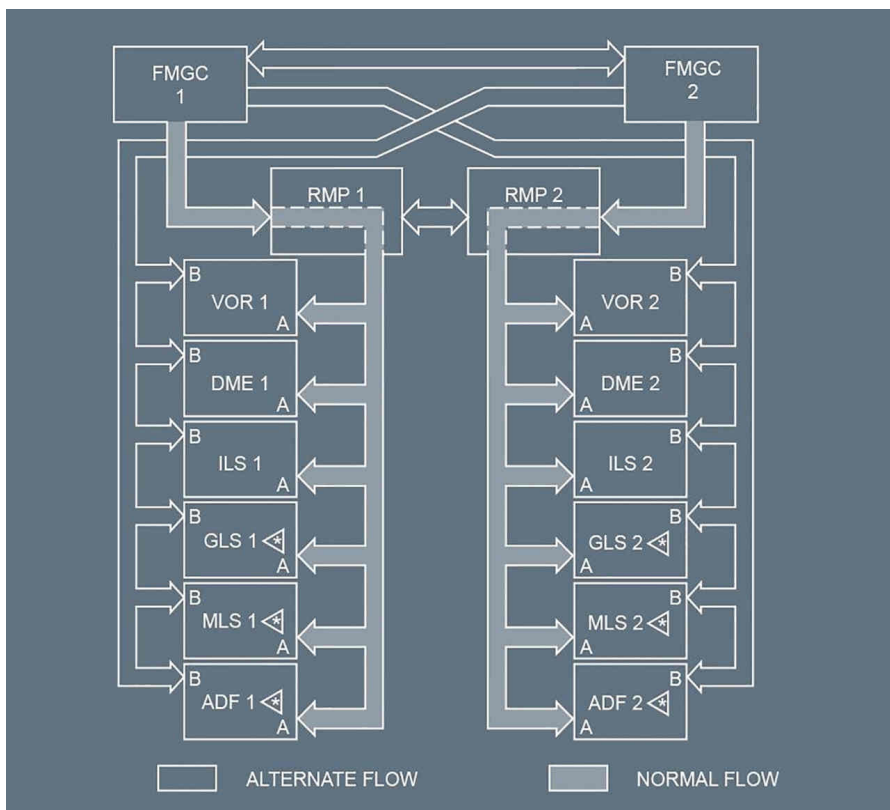
Either RMP controls ILS/GLS  / MLS , provided "STBY NAV" is selected on RMP1 and RMP2. RMP3  is not used for nav aids tuning.

ARCHITECTURE

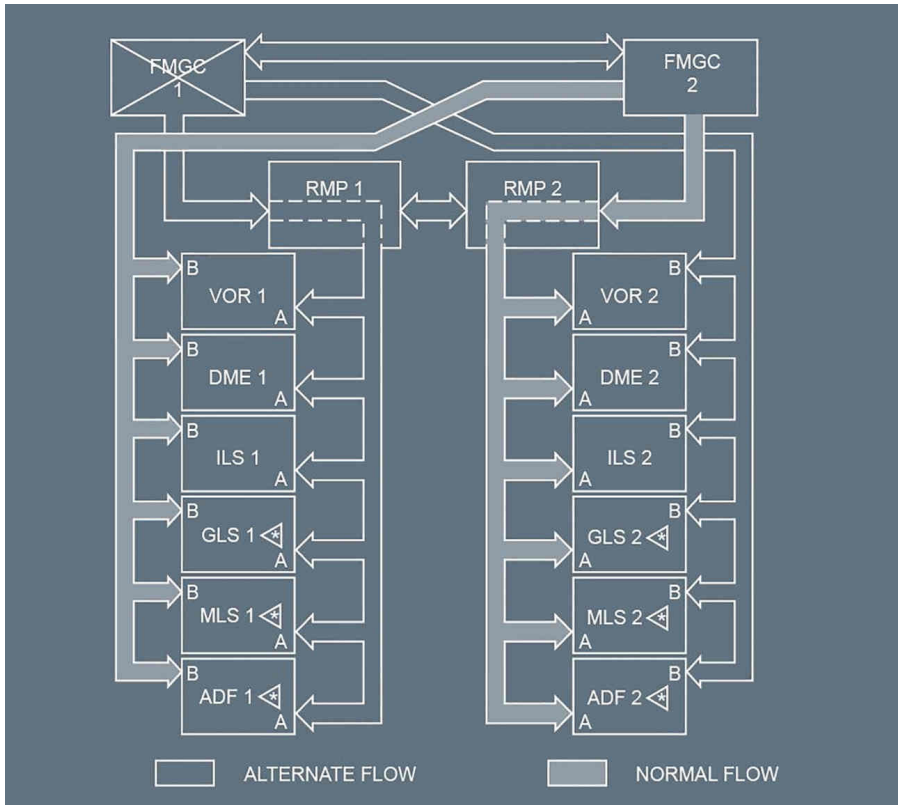
Ident.: DSC-34-NAV-30-10-00018582.0001001 / 21 MAR 16

Applicable to: ALL

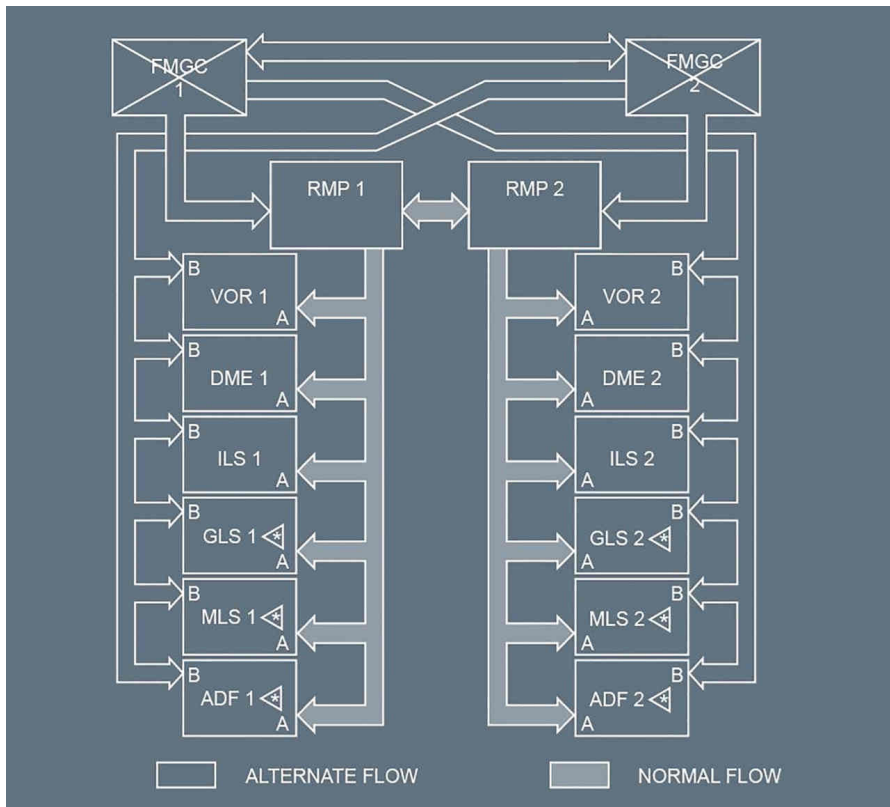
NORMAL OPERATION



FMGC 1 FAILURE



BACK UP TUNING



VOR

Ident.: DSC-34-NAV-30-20-00018657.0001001 / 06 NOV 23

Applicable to: ALL

The aircraft has two VOR receivers.

The NDs display VOR 1 and VOR 2 information, in accordance with the position of the ADF  /VOR sw on the EFIS control panel (*Refer to DSC-31-45 ROSE Modes*).

The DDRMI  also displays VOR 1 and VOR 2 bearings, if the heading signal is valid.

**ILS/GLS /MLS **

Ident.: DSC-34-NAV-30-20-00018658.0001001 / 29 MAY 20

Applicable to: ALL

The aircraft has two ILS/GLS  /MLS  receivers.

Note: When the aircraft is equipped with MMRs, ILS and GLS  and MLS  receivers are in the MMRs (ILS1/GLS1  /MLS1  in the MMR1 and the ILS2/GLS2  /MLS2  in the MMR2)

- PFD1 and ND2 display ILS1/GLS1  /MLS1  information.
- PFD2 and ND1 display ILS2/GLS2  /MLS2  information.
- The PFD display the ILS/GLS  /MLS  information if the flight crew press the LS pb or ILS pb (depending of the aircraft configuration) on the EFIS control panel (*Refer to DSC-31-50 EFIS Control Panel*).
- The NDs display the ILS/GLS  /MLS  information if the flight crew selects the ROSE LS mode or the ROSE ILS mode (depending of the aircraft configuration) on the EFIS control panel (*Refer to DSC-31-50 EFIS Control Panel*).

**ADF **

Ident.: DSC-34-NAV-30-20-00018659.0001001 / 14 NOV 24

Applicable to: ALL

The aircraft may be fitted with one ADF  or two ADFs .

The NDs display ADF information, depending on the position of the ADF/VOR sw on the EFIS control panel (*Refer to DSC-31-45 ROSE Modes*).

The DDRMI  also displays ADF 1 and ADF 2 bearings, depending on the position of the ADF/VOR selector on the DDRMI .

DME

Ident.: DSC-34-NAV-30-20-00018660.0001001 / 21 MAR 16

Applicable to: ALL

The aircraft has two DMEs.

AIRCRAFT SYSTEMS

NAVIGATION

RADIO NAV - NAVAIDS

The frequency that is automatically set on the DME corresponds to the frequency/channel that is set on the VOR, or ILS, or GLS  , or MLS  .

The NDs and the DDRMI  can display DME information associated with VOR.

The PFDs can display DME information associated with ILS/GLS  /MLS  (*Refer to DSC-31-40 Trajectory Deviation - ILS Approach*).

MARKER BEACON

Ident.: DSC-34-NAV-30-20-00001389.0001001 / 21 MAR 16

Applicable to: **ALL**

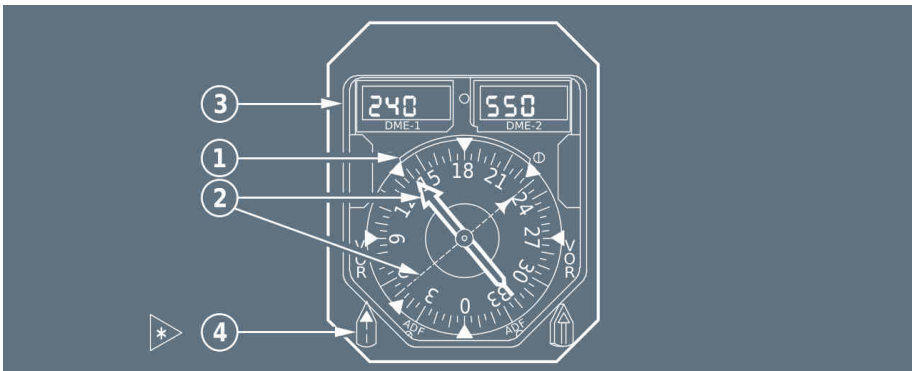
One marker beacon system is included in VOR receiver 1.

The PFD displays the outer, middle, and inner marker signals (*Refer to DSC-31-40 Trajectory Deviation - ILS Approach*).

DIGITAL DISTANCE AND RADIO MAGNETIC INDICATOR (DDRMI)

Ident.: DSC-34-NAV-30-30-00018583.0001001 / 14 NOV 24

Applicable to: ALL



(1) Compass Card

ADIRU1 normally supplies the signal that positions the compass card.

ADIRU3 supplies this signal when selected by the ATT HDG SWITCHING selector.

(2) Bearings Pointers

Indicate the magnetic bearing to the station received by VOR1 or ADF 1  (dashed pointer) and VOR2 or ADF 2  (double pointer).

Note: Depending on the quality of the VOR beacon's signal, and mainly at distances greater than 25 NM from the station, the processing of the signal, on aircraft equipped with COLLINS or BENDIX VOR may lead to bearing pointer oscillations.

(3) DME1(2) Counters

Indicates distance in nautical miles to/from DME station.

The counters indicate distances:

- in NM when the station is at more than 20 NM
- 1/10th of NM when the station is at less than 20 NM.

When the station is at less than 1 NM, 0 is shown.

The DME1 and DME2 display are blanked or dashed when a fault is detected or data invalid.

(4) VOR/ADF Selectors

- VOR1 or ADF 1 on the dashed pointer.
- VOR2 or ADF 2 on the double pointer (if ADF 2 is not installed, then ADF 1 may be selected).

The DDRMI  has also VOR/ADF  flags and HDG flags when the associated information is not available.

The indicators display these flags if:

- The VOR or ADF receiver fails (associated to the VOR/ADF flag only)
- The DDRMI has an internal failure
- The heading signal from ADIRS is not valid
- The power supply fails.

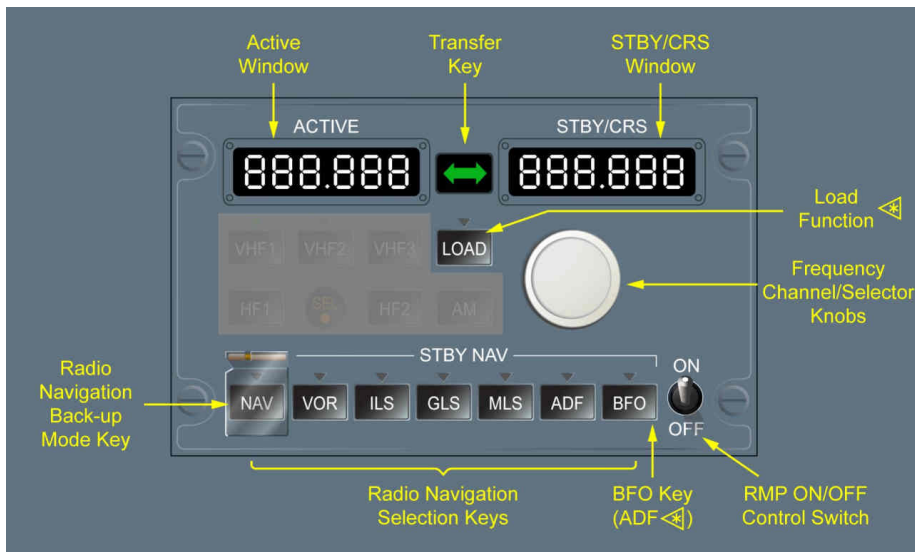
As long as the VOR/ADF flag is shown, and depending of the aircraft configuration, the associated bearing pointer remains:

- At the last valid position, or
- Into the horizontal line.

RADIO MANAGEMENT PANEL

Ident.: DSC-34-NAV-30-30-00018584.0001001 / 14 NOV 24

Applicable to: ALL



RMP ON/OFF CONTROL SWITCH



This switch controls the power supply to the panel.

RADIO NAVIGATION BACK-UP MODE KEY



- Pressing this key engages the radio navigation backup mode. It takes control of the VOR, ILS, GLS , MLS  and ADF  receivers away from the FMGC and gives it to the RMP. The green monitor light comes on.
- Pressing the NAV key a second time returns control of the navigation radios to the FMGC. The green monitor light goes off.

Note:

- The flight crew must select this backup tuning mode on both RMP 1 and RMP 2 if both FMGCs or both MCDUs fail. In the emergency electrical configuration, only RMP 1 receives power.
- Pressing the NAV key on RMP 3  has no effect
- In the NAV backup mode, the flight crew can select radio communication systems as it would in the normal mode. Setting one RMP to NAV backup mode removes nav aids tuning from both FMGCs.
- When the flight crew uses an RMP to tune an ILS/DME or GLS  /DME or MLS  /DME, the PFDs do not display the DME distance.

RADIO NAVIGATION SELECTION KEYS



When the radio navigation back-up mode is on and the flight crew presses the VOR STBY NAV key, the ACTIVE window displays the VOR frequency/channel to which that receiver is tuned. The green monitor light on the selected key comes on, and the one on the previously selected STBY NAV key or COM key goes out.



When the radio navigation back-up mode is on and flight crew presses the ILS STBY NAV key, the ACTIVE window displays the ILS frequency/channel to which that receiver is tuned. The green monitor light on the selected key comes on, and the one on the previously selected STBY NAV key or COM key goes out.

AIRCRAFT SYSTEMS

NAVIGATION

RADIO NAV - CONTROLS AND INDICATORS



When the radio navigation back-up mode is on and flight crew presses the GLS  STBY NAV key, the ACTIVE window displays the GLS frequency/channel to which that receiver is tuned. The green monitor light on the selected key comes on, and the one on the previously selected STBY NAV key or COM key goes out.



When the radio navigation back-up mode is on and flight crew presses the MLS  STBY NAV key, the ACTIVE window displays the MLS frequency/channel to which that receiver is tuned. The green monitor light on the selected key comes on, and the one on the previously selected STBY NAV key or COM key goes out.



When the radio navigation back-up mode is on and flight crew presses the ADF  STBY NAV key, the ACTIVE window displays the ADF frequency/channel to which that receiver is tuned. The green monitor light on the selected key comes on, and the one on the previously selected STBY NAV key or COM key goes out.

FREQUENCY/CHANNEL SELECTOR KNOBS



Two concentric knobs allow the flight crew to preselect frequencies/channels for communication radios and stand-by navigation systems and select courses for VOR, ILS, GLS  and MLS  . The desired frequency, channel or course is set in the STBY/CRS window. The outer and the inner knobs set a frequency/channel: the outer knob is for units, the inner knob is for decimals. A rate multiplier speeds up the tuning when the knob is rotated quickly. Only outer knob can set a course.

TRANSFER KEY



The flight crew presses this key to interchange ACTIVE and STBY frequencies/channels. This action tunes the selected receiver to the new ACTIVE frequency/channel.

STBY/CRS WINDOW

The flight crew can change the displayed frequency/channel by rotating the tuning knobs. The frequency/channel displayed in the window becomes the active frequency/channel when the flight crew presses the transfer key. If this window displays a course, then the ACTIVE window displays the associated frequency/channel.

Note: *If the STBY/CRS window is displaying a course, then pressing the transfer key displays the active frequency/channel in both windows.*



ACTIVE WINDOW

This window displays the frequency/channel of the selected navaid, which is identified by a green monitor light on the selection key.

LOAD FUNCTION



The flight crew can load the VHF frequency from the CPDLC CONTACT/MONITOR messages to the STBY/CRS window.

BFO KEY (ADF)



If the ADF is selected, pressing this key activates the BFO. For most ADF with BFO activated, the audio identification is heard. However, there are some ADF where the BFO must be deactivated in order to hear the audio identification.

AIRCRAFT SYSTEMS

NAVIGATION

RADIO NAV - CONTROLS AND INDICATORS

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS NAVIGATION RADIO ALTIMETER - DESCRIPTION
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GENERAL

Ident.: DSC-34-NAV-40-10-00018585.0001001 / 21 MAR 16
Applicable to: ALL

The aircraft has two radio altimeters (RA).
CAPT PFD displays the RA1 height, and the F/Os PFD displays the RA2 height.
If one RA fails, both PFDs display the height from the remaining RA.
For indication on the PFD, *Refer to DSC-31-40 Altitude (CONT'D)*.

AUTOMATIC CALLOUT

Ident.: DSC-34-NAV-40-10-00018656.0001001 / 13 MAY 25
Applicable to: ALL

GENERAL

The FWC generates a synthetic voice for radio height announcement below 2 500 ft. These announcements come through the cockpit loudspeakers, even if the speakers are turned off.

PREDETERMINED CALL OUT

The altitude call out uses the following predetermined threshold:

Height (feet)	Call out
2 500	TWO THOUSAND FIVE HUNDRED OR TWENTY FIVE HUNDRED
2 000	TWO THOUSAND
1 000	ONE THOUSAND
500	FIVE HUNDRED
400	FOUR HUNDRED
300	THREE HUNDRED
200	TWO HUNDRED
115	STANDBY ⁽¹⁾
100	ONE HUNDRED
90	STANDBY ⁽¹⁾
65	FLARE ⁽¹⁾
50	FIFTY
40	FORTY
30	THIRTY
20	TWENTY
10	TEN
5	FIVE
DH (or MDA/MDH) + 100	HUNDRED ABOVE
DH (or MDA/MDH)	MINIMUM

⁽¹⁾ These callouts are triggered only if the Steep Approach and Landing function  is active. In this case, the "ONE HUNDRED" callout is inhibited.

AIRCRAFT SYSTEMS**NAVIGATION****RADIO ALTIMETER - DESCRIPTION**

The reference altitude for callouts is the radio height (RADIO or DH), or the baro altitude (BARO or MDA/MDH), depending on the type of approach.

Pin programming enables Operators to select the required callouts. If the aircraft remains at a height that is in the detection zone for a height callout, the corresponding message is repeated at regular intervals.

INTERMEDIATE CALL OUT

If time between two consecutive predetermined call outs exceeds a certain threshold, the present height is repeated at regular intervals.

The threshold is:

- 11 s above 50 ft
- 4 s below 50 ft

The repeating interval is 4 s.

RETARD ANNOUNCEMENT

The loudspeaker announces RETARD at:

- 20 ft, or
- at 10 ft if autothrust is active and one autopilot is in LAND mode.

AIRCRAFT SYSTEMS

SURVEILLANCE

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DSC-34-SURV-10 ATC

DSC-34-SURV-10-10 Description	
Principle.....	A
ADS-B OUT.....	B
DSC-34-SURV-10-20 Controls and Indicators	
Control Panels.....	A

DSC-34-SURV-30 Weather Radar

DSC-34-SURV-30-10 Description	
Description.....	A
DSC-34-SURV-30-15 On Path Envelope Boundaries Definition	
On Path Envelope Boundaries Definition.....	A
DSC-34-SURV-30-20 Predictive Windshear System	
General.....	A
Windshear Alerts During Takeoff Roll, Up to 100 knots.....	B
Windshear Alerts Above 50 feet.....	C
Windshear Alerts Inhibition.....	D
DSC-34-SURV-30-30 Controls and Indicators	
Control Panel.....	A
Control Panel.....	B
Weather Radar indication on ND.....	C
PWS  indication on PFD and ND.....	D
Weather Hazard Prediction Function Indication on ND.....	E
Memo Display.....	F
DSC-34-SURV-30-40 Temporary Abnormal Behaviors	
Weather Radar Performance Above 80 NM.....	A

DSC-34-SURV-40 GPWS

DSC-34-SURV-40-10 Description	
Overview.....	A
Principle.....	B

Continued on the following page

*Continued from the previous page***DSC-34-SURV-40-20 GPWS Basics Modes**

Mode 1 : Excessive Rate of Descent.....	A
Mode 2 : Excessive Terrain Closure Rate.....	B
Mode 3 : Altitude Loss After Takeoff.....	C
Mode 4 : Unsafe Terrain Clearance when Not in Landing Configuration.....	D
Mode 5 : Descent Below Glideslope.....	E

DSC-34-SURV-40-35 Predictive GPWS Functions

Terrain Awareness and Display.....	A
Terrain Caution and Warning Envelope.....	B
Terrain Clearance Floor.....	C
Runway Field Clearance Floor.....	D
Runway Awareness and Advisory System.....	E
General.....	F
Alerts.....	G
Alerts Envelopes.....	H
Inhibition Logic of the GPWS Predictive Functions in Approach.....	I

DSC-34-SURV-40-40 Controls and Indicators

Overhead Panel.....	A
Instrument Panels.....	B
Memo Display.....	C

DSC-34-SURV-60 TCAS**DSC-34-SURV-60-10 Description**

Overview.....	A
Principle.....	B
Main Components.....	C
Intruder Detection Categories.....	D
TCAS Modes.....	E
AP/FD TCAS.....	F
Advisory Inhibition.....	G
TCAS INTRUDER WITH NO REPORTED ALTITUDE.....	H

DSC-34-SURV-60-20 Controls and Indicators

ATC/TCAS Panel.....	A
ND Indications.....	B
Messages on ND.....	C
PFD Indications.....	D
Aural Messages.....	E
Memo Display.....	F

Localization Title	Toc Index	ID	Reason
DSC-34-SURV-PLP-TOC TCAS		1	Documentation update: Deletion of "Temporary Abnormal Behaviors (NP05660)".
			Documentation update: Deletion of "Undue NAV TCAS FAULT (00024314.0003001)".
			Documentation update: Deletion of "Undue NAV TCAS FAULT (00024314.0002001)".
DSC-34-SURV-40-20 Mode 5 : Descent Below Glideslope	E	1	Update of the description to specify that the GPWS mode 5 alert can only be triggered during ILS, SLS and GLS approaches.
			Layout modification. No technical change.
			Enhancement of the illustration. No technical change.
			Documentation update: Deletion of information.
DSC-34-SURV-40-40 Overhead Panel	A	1	Addition of the "If installed" symbol.
			Addition of ECAM NAV GPWS FAULT in accordance with system behaviour.
DSC-34-SURV-40-40 Overhead Panel	A	2	Addition of the "If installed" symbol.
DSC-34-SURV-60-20 ND Indications	B	1	Update of the illustration, removal of the If-installed symbol. No technical change.
DSC-34-SURV-40-40 TERR STBY	C	3	Effectivity update: The information no longer applies to MSN 02926, 02944, 04392.
DSC-34-SURV-40-40 TERR STBY	C	4	Effectivity update: The information now also applies to MSN 02926, 02944, 04392.

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PRINCIPLE

Ident.: DSC-34-SURV-10-10-00020602.0002001 / 17 MAR 17

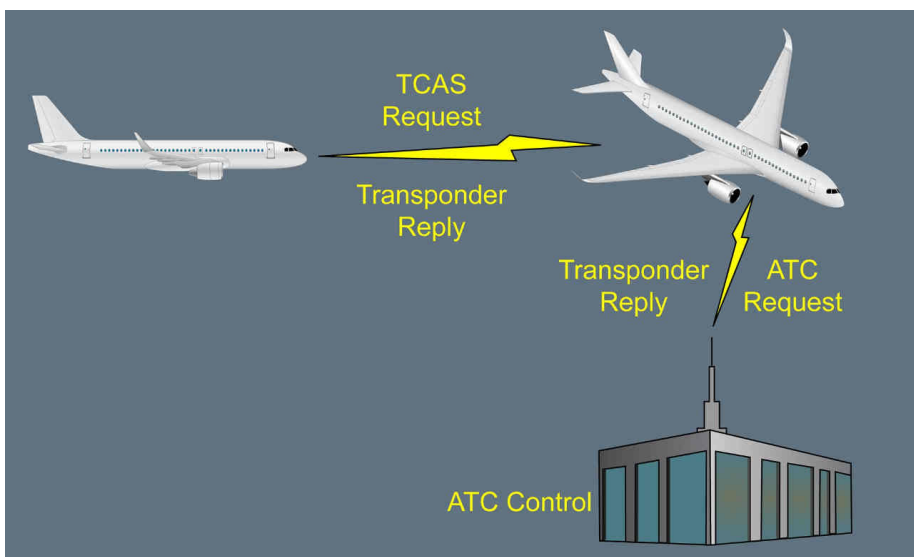
Applicable to: ALL

The aircraft has two ATC transponders (XPDR) which are controlled by a control panel (ATC/TCAS) on the center pedestal.

Only the selected XPDR operates.

The XPDR automatically responds to requests:

- From the ATC, to ensure effective air traffic surveillance
- From other aircraft that have a TCAS, to ensure that traffic alerts are triggered.



The XPDR is capable of elementary surveillance (ELS) and enhanced surveillance (EHS). It transmits the following data to the ATC center:

- The aircraft 24 bit address, the aircraft altitude, the flight number, the RA report
- The indicated airspeed, the Mach number, and the barometric vertical speed that are all supplied by the ADRs
- The magnetic heading, the roll angle, the ground speed, the track angle, the track angle rate, and the inertial vertical speed, that are all supplied by the IRs
- The selected altitude and barometric reference settings supplied by the FCUs.

ADS-B OUT

Ident.: DSC-34-SURV-10-10-00020606.0002001 / 17 MAR 17

Applicable to: ALL

With the ADS-B OUT capability, the Mode S transponders automatically and continuously transmit surveillance data, without preliminary interrogation, to:

- The ATC ground station
- Aircraft capable of ADS-B IN function.

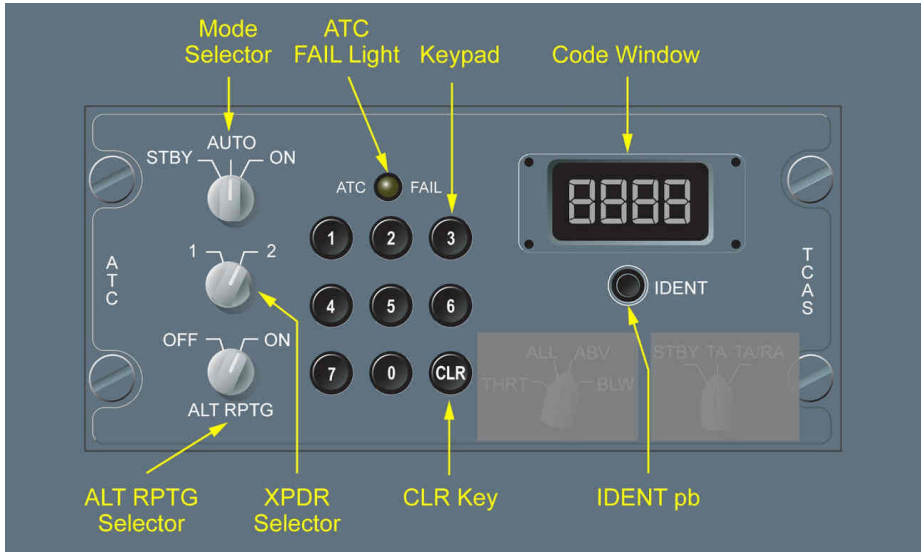
The ADS-B OUT surveillance data that are automatically and continuously transmitted, include the following:

- The latitude and longitude, the Horizontal Integrity Limit (HIL), the difference between barometric altitude and geometric altitude, the ground speed, all supplied by GPS
- The barometric altitude supplied by ADIRS
- The track, the vertical speed, all supplied by the IRs
- The flight number (registered on the ATC flight plan and entered in the FMS during cockpit preparation) supplied by the FMS
- The emergency situation indicator
- The selected altitude and heading, the barometric pressure setting (QNH/QFE) from FCU.

CONTROL PANELS

Ident.: DSC-34-SURV-10-20-00020607.0027001 / 13 MAY 25

Applicable to: MSN 02155-02212, 02926-02944, 07784-07792



ALT RPTG SELECTOR



The XPDR sends barometric standard altitude data.



No altitude data transmission. With TCAS, the upper ECAM displays **TCAS STBY** during flight phases other than 6, or **TCAS STBY** during flight phase 6.

ATC FAIL LIGHT



The selected XPDR is normal.



The selected XPDR fails.

CLR KEY



The flight crew uses this key to clear the code window.

Note: As long as the four figures of the new code are not entirely written, the previous code remains.

CODE WINDOW



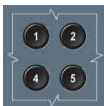
The code window displays the selected code.

IDENT PB



The flight crew presses this button to send the aircraft identification signal.

KEYPAD



The flight crew uses the keypad to set the code assigned by ATC.

MODE SELECTOR



Both XPDRs are electrically supplied but do not operate.



In flight: The selected XPDR operates.

On ground: The selected XPDR only operates in mode S (Selective aircraft interrogation mode).



In flight: The selected XPDR operates.

On ground: The selected XPDR only operates in mode S (Selective aircraft interrogation mode).

XPDR SELECTOR



The XPDR 1 is selected.

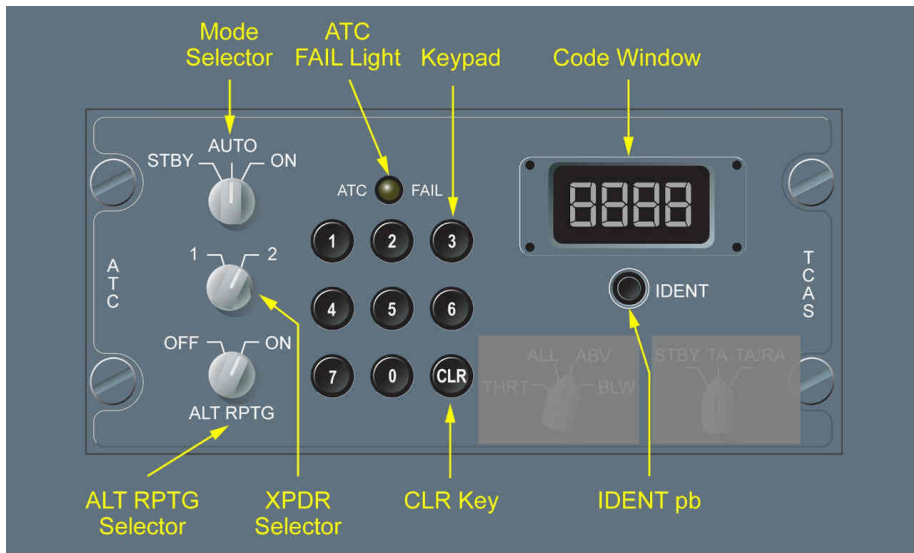


The XPDR 2 is selected.

CONTROL PANELS

Ident.: DSC-34-SURV-10-20-00020607.0009001 / 13 MAY 25

Applicable to: MSN 02719-02789, 03031-03060, 05152-05746



ALT RPTG SELECTOR



The XPDR sends barometric standard altitude data.



No altitude data transmission. With TCAS, the upper ECAM displays **TCAS STBY** during flight phases other than 6, or **TCAS STBY** during flight phase 6.

ATC FAIL LIGHT



The selected XPDR is normal.



The selected XPDR fails.

CLR KEY



The flight crew uses this key to clear the code window.

Note: As long as the four figures of the new code are not entirely written, the previous code remains.

CODE WINDOW



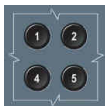
The code window displays the selected code.

IDENT PB



The flight crew presses this button to send the aircraft identification signal.

KEYPAD



The flight crew uses the keypad to set the code assigned by ATC.

MODE SELECTOR



Both XPDRs are electrically supplied but do not operate.



The selected XPDR operates.



In flight: The selected XPDR operates.

On ground: The selected XPDR only operates in mode S (Selective aircraft interrogation mode).

XPDR SELECTOR



The XPDR 1 is selected.

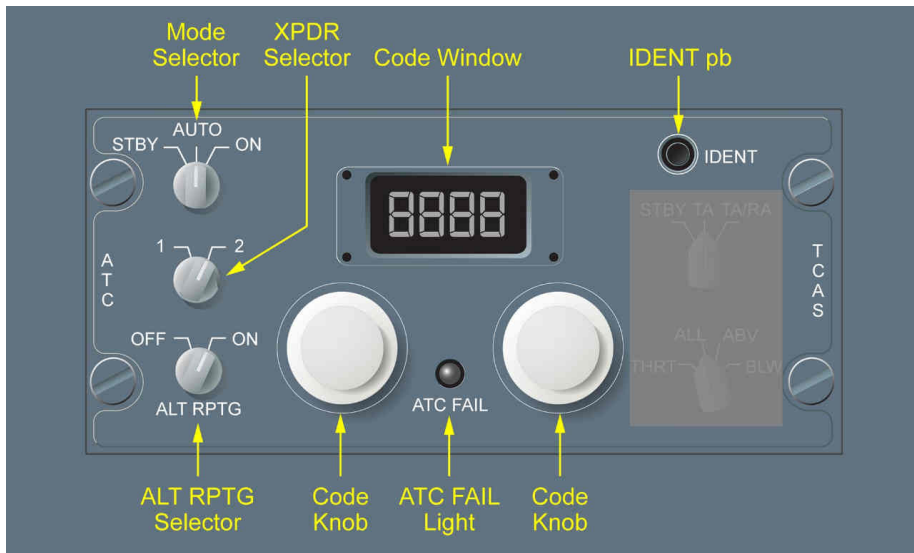


The XPDR 2 is selected.

CONTROL PANELS

Ident.: DSC-34-SURV-10-20-00020607.0037001 / 13 MAY 25

Applicable to: MSN 04392



ALT RPTG SELECTOR



The XPDR sends barometric standard altitude data.



No altitude data transmission. With TCAS, the upper ECAM displays **TCAS STBY** during flight phases other than 6, or **TCAS STBY** during flight phase 6.

ATC FAIL LIGHT



The selected XPDR is normal.



The selected XPDR fails.

CODE KNOB



The flight crew uses these knobs to set the code assigned by ATC.

CODE WINDOW



The code window displays the selected code.

IDENT PB



The flight crew presses this button to send the aircraft identification signal.

MODE SELECTOR



Both XPDRs are electrically supplied but do not operate.



The selected XPDR operates.



In flight: The selected XPDR operates.

On ground: The selected XPDR only operates in mode S (Selective aircraft interrogation mode).

XPDR SELECTOR



The XPDR 1 is selected.



The XPDR 2 is selected.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS SURVEILLANCE WEATHER RADAR - DESCRIPTION
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DESCRIPTION

Ident.: DSC-34-SURV-30-10-00014867.0002001 / 06 NOV 23

Applicable to: MSN 02155-03060, 07784-07792

The aircraft has one or two weather radar systems with Multiscan function, a Predictive Windshear System and a Weather Hazard Prediction Function .

The flight crew can display weather data on the CAPT and/or F/O NDs in either ARC or ROSE mode.

The flight crew can adjust the brightness of the weather image on the ND by rotating the outer knob of the ND Brightness Control knob (*Refer to DSC-31-50 Other EFIS Controls*).

Note: A low brightness setting of the weather display may reduce the visibility of weather data, and therefore reduce crew awareness of the weather situation.

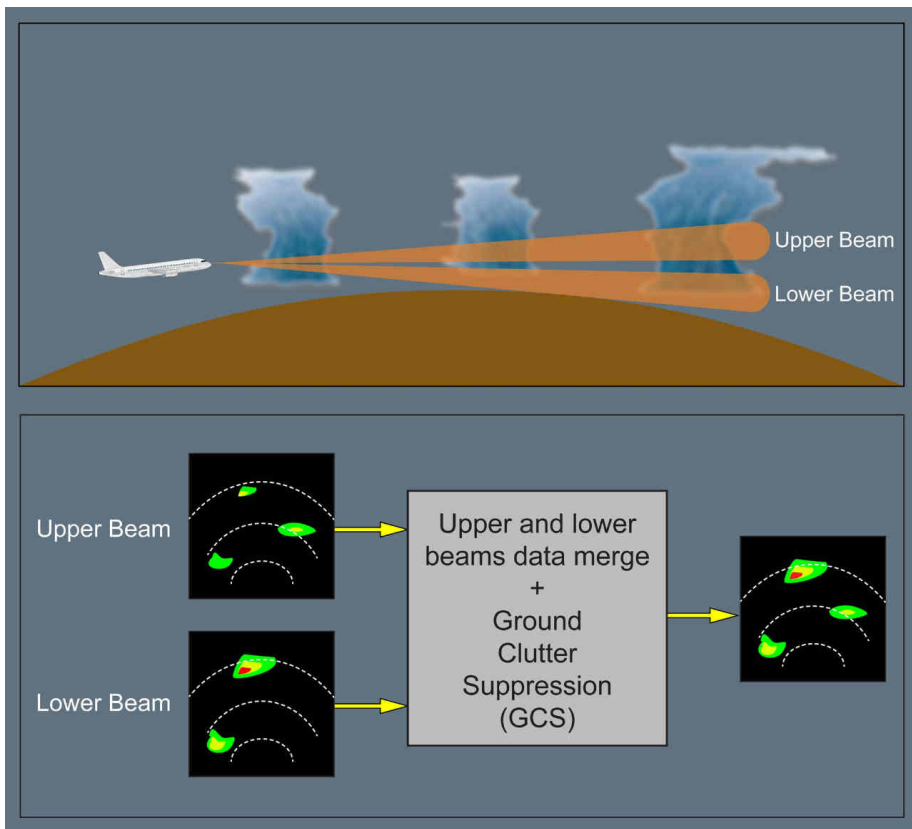
The flight crew can use the radar in the following modes:

- Multiscan Automatic mode: MULTISCAN sw set to AUTO (recommended), or
- Manual mode: MULTISCAN sw set to MAN.

When in Multiscan Automatic mode:

- The radar alternatively scans at two antenna tilt settings. The weather radar image that is displayed is the result of the stored and combined information from each beam
- When the gain selector is set to CAL, the radar automatically adjusts the gain based on various parameters (aircraft altitude, geographical area, season, time of the day) to obtain the best weather display
- To prevent unnecessary clutter display, the “Quiet and Dark cockpit” philosophy removes the weather that:
 - is not on the aircraft flight path
 - is not a threat to the aircraft (post convective cell).
- The GCS function removes the ground returns from the ND.

Multiscan Principle



When in Manual mode:

- The flight crew can adjust manually the antenna tilt settings, and can adjust gain either automatically or manually using knobs located on the radar control panel
- The GCS function is not available
- When the gain selector is set to CAL, there is no automatic gain adjustment based on altitude, geographical area, season and time of the day.

As a consequence, when the flight crew switches from the Multiscan Automatic mode with CAL gain to the Manual mode with CAL gain, the weather displayed on the ND may be significantly different.

DESCRIPTION

Ident.: DSC-34-SURV-30-10-00014867.0005001 / 12 NOV 24

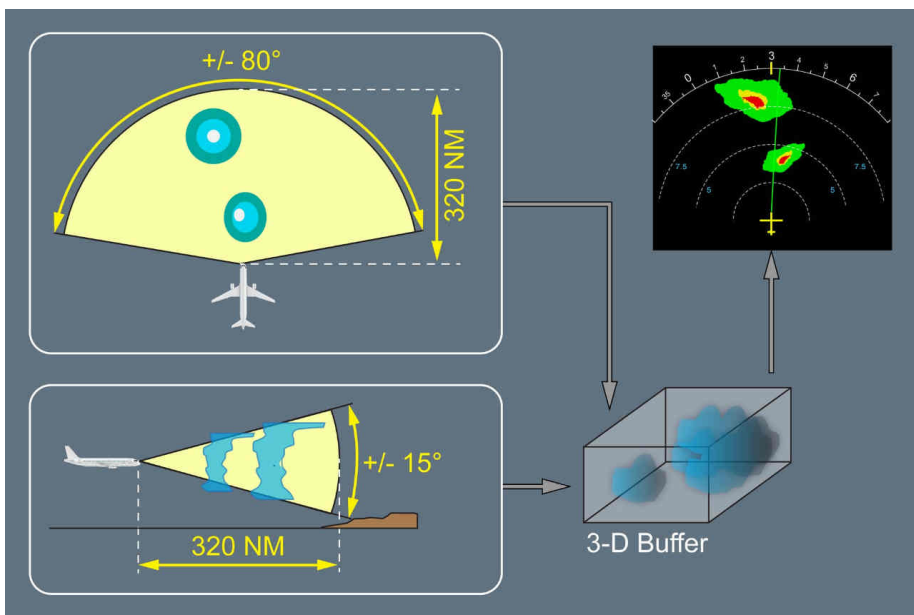
Applicable to: MSN 04392-05746

The aircraft has one or two weather radar systems . The RDR-4000 weather radar has a Predictive Windshear System  and a Weather Hazard Prediction Function . The flight crew can display weather data on the CAPT and/or F/O NDs in either ARC or ROSE mode. The flight crew can adjust the brightness of the weather image on the ND by rotating the outer knob of the ND Brightness Control knob (*Refer to DSC-31-50 Other EFIS Controls*).

Note: A low brightness setting of the weather display may reduce the visibility of weather data, and therefore reduce crew awareness of the weather situation.

When activated, the radar scans the weather located ahead of the aircraft. It stores and updates a 3D image of the weather in its memory, and displays the weather image according to the display mode selected on the radar control panel.

3D Buffer Principle



AIRCRAFT SYSTEMS

SURVEILLANCE

WEATHER RADAR - DESCRIPTION

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ON PATH ENVELOPE BOUNDARIES DEFINITION

Ident.: DSC-34-SURV-30-15-00013760.0001001 / 01 OCT 12

Applicable to: MSN 04392-05746

The radar takes into account a vertical envelope along the vertical flight path of the aircraft. It defines if the weather echo is on the aircraft flight path or not.

ON PATH envelope limits

Aircraft Altitude (feet MSL)	Lower Envelope Boundary (feet MSL)	Upper Envelope Boundary (feet MSL)
> 29,000	25,000	Flight Altitude plus 4,000 (max: 60,000)
6,000 to 29,000	Flight Altitude minus 4,000 (min: Gnd Elev)	
< 6,000		10,000

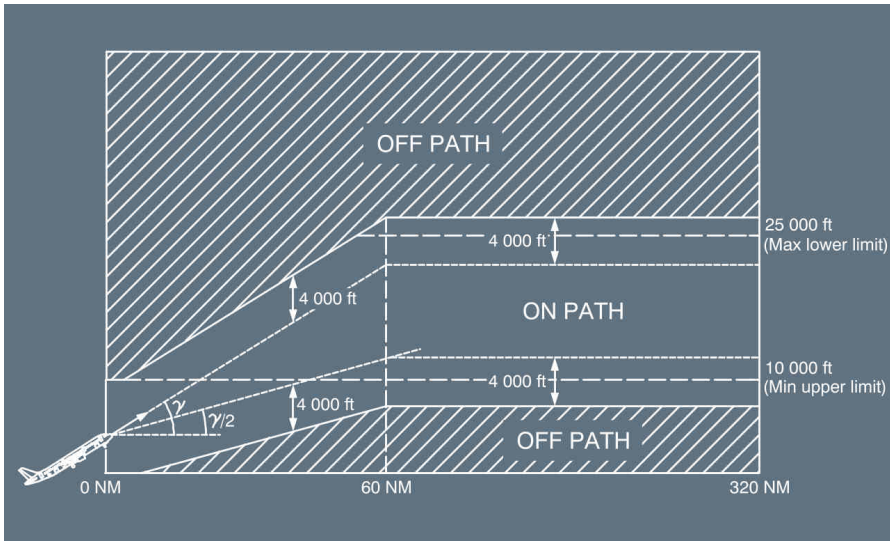
The basis ON PATH envelope is bounded at plus and minus 4 000 ft of the reference flight path. The lower envelope boundary is fixed at 25 000 ft when the aircraft is above 29 000 ft. The upper envelope boundary is set at 10 000 ft when the aircraft is below 6 000 ft.

The ON PATH envelope is based on a reference flight path defined as follows : The current speed vector is extrapolated to 60 NM ahead of the aircraft based on the ratio between vertical speed and ground speed . Beyond 60 NM, the ON PATH envelope is based to a levelled reference flight path. As a result, the ON PATH envelope is defined as follows :

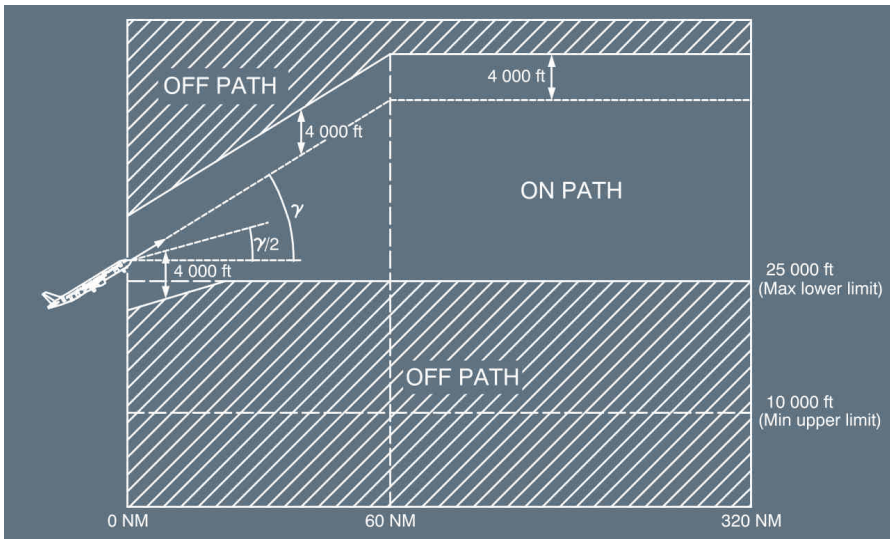
CLIMB PATH

During climb, the top of the ON PATH envelope is 4 000 ft above the expected flight path. The lower boundary is located 4 000 ft below the half of the expected flight path angle (γ) .

Climb from low altitude



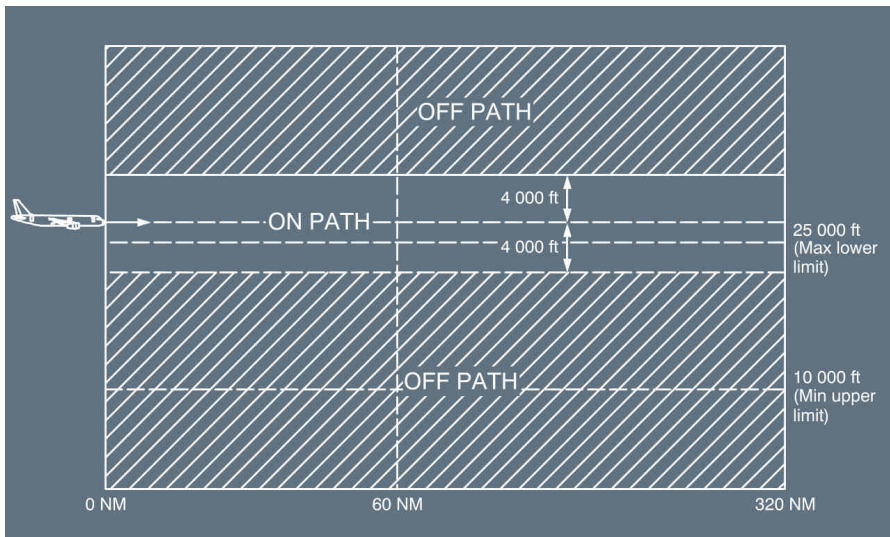
Climb for high altitude



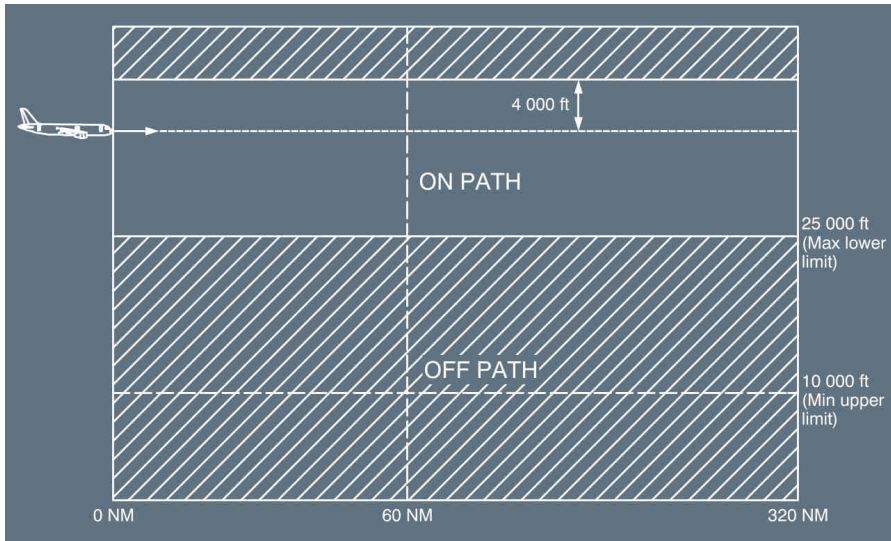
LEVEL FLIGHT

During level flight the ON PATH envelope extends from 4 000 ft above to 4 000 ft below the aircraft's altitude. However, the lower boundary cannot go higher than 25 000 ft and the upper boundary cannot go lower than 10 000 ft.

Level flight below 29 000 FT



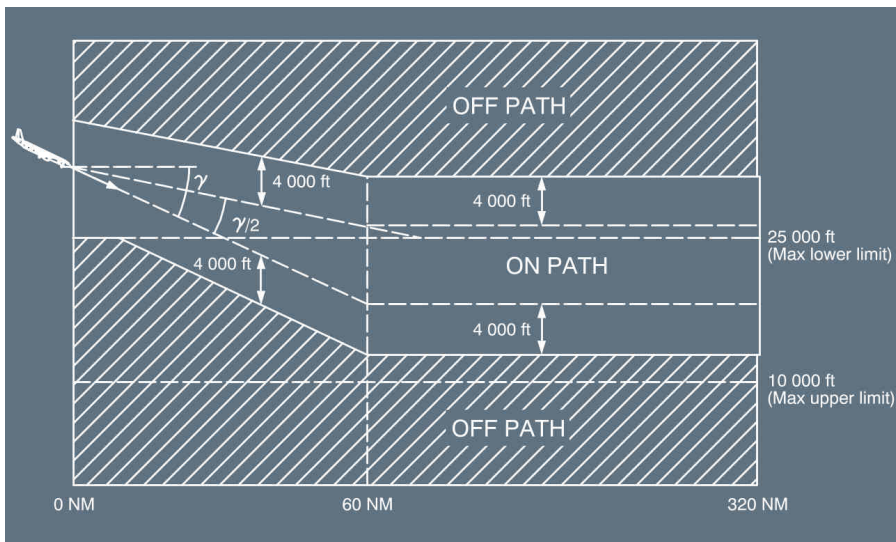
Level flight above 29 000 FT



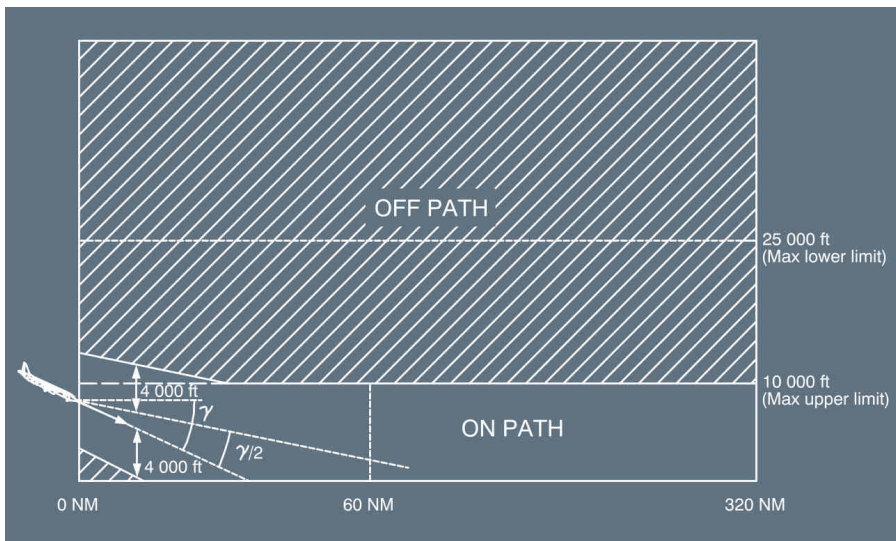
DESCENT PATH

When the aircraft descends, the lower boundary of the ON PATH envelope is 4 000 ft below the expected flight path, while the upper boundary is 4 000 ft above the half of the expected flight path angle (γ) .

Descent from high altitude



Descent from low altitude



AIRCRAFT SYSTEMS

SURVEILLANCE

WEATHER RADAR - ON PATH ENVELOPE BOUNDARIES DEFINITION

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS SURVEILLANCE WEATHER RADAR - PREDICTIVE WINDSHEAR SYSTEM
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GENERAL

Ident.: DSC-34-SURV-30-20-00020942.0003001 / 17 MAR 17

Applicable to: MSN 04392-05746

The weather radar has a Predictive WindShear system (PWS) that operates when WXR/PWS sw is in position 1 or 2 and the aircraft radio-height is below 1 800 ft, and

- CAPT or F/O display mode is different from OFF, or
- CAPT and F/O display modes are OFF, and
 - At least one engine is running, and
 - Aircraft ground speed is greater than 30 kt, or
 - Aircraft longitudinal acceleration is above a given threshold during at least 0.5 s.

Note: If two weather radars are installed, when the selected weather radar fails, the flight crew can recover the PWS function by selecting the operative system on the WXR/PWS sw of the radar control panel.

The system scans the airspace for windshear within a range of 5 NM ahead of the aircraft. When the system detects windshear, a windshear symbol appears on the ND (*Refer to DSC-34-SURV-30-30 PWS (if installed) indication on PFD and ND*).

Predictive windshear warnings and cautions are associated to an aural alert and to a red (warning) or amber (caution) "W/S AHEAD" message on the PFD, whereas windshear advisories are only displayed on the ND (*Refer to DSC-34-SURV-30-30 PWS (if installed) indication on PFD and ND*) without message on the PFD.

Alert Level	Aural Warning	PFD	ND (<i>Refer to DSC-34-SURV-30-30 PWS (if installed) indication on PFD and ND</i>)
Warning (Approach)	«GO AROUND WINDSHEAR AHEAD»	W/S AHEAD (red)	Windshear icon
Warning (Takeoff)	«WINDSHEAR AHEAD» (twice)	W/S AHEAD (red)	Windshear icon
Caution	«MONITOR RADAR DISPLAY»	W/S AHEAD (amber)	Windshear icon
Advisory	Nil	Nil	Windshear icon

AIRCRAFT SYSTEMS
SURVEILLANCE
WEATHER RADAR - PREDICTIVE WINDSHEAR SYSTEM
GENERAL

Ident.: DSC-34-SURV-30-20-00020942.0004001 / 17 MAR 17

Applicable to: MSN 02155-03060, 07784-07792

The weather radar has a Predictive WindShear system (PWS) that operates when the PWS switch is in the AUTO position, and the aircraft radio height is below 2 300 ft, and

- Weather radar is ON (Radar sw on position 1 or 2), or
- Weather radar is OFF, and
 - At least one engine is running, and
 - Aircraft ground speed is greater than 30 kt, or
 - Aircraft longitudinal acceleration is above a given threshold during at least 0.5 s.

Note: If two weather radars are installed, when the selected weather radar fails, the flight crew can recover the PWS function by selecting the operative system on the Radar sw of the radar control panel.

The system scans the airspace for windshear within a range of 5 NM ahead of the aircraft. When the system detects windshear, a windshear symbol appears on the ND (*Refer to DSC-34-SURV-30-30 PWS (if installed) indication on PFD and ND*).

Predictive windshear warnings and cautions are associated to an aural alert and to a red (warning) or amber (caution) "W/S AHEAD" message on the PFD, whereas windshear advisories are only displayed on the ND (*Refer to DSC-34-SURV-30-30 PWS (if installed) indication on PFD and ND*) without message on the PFD.

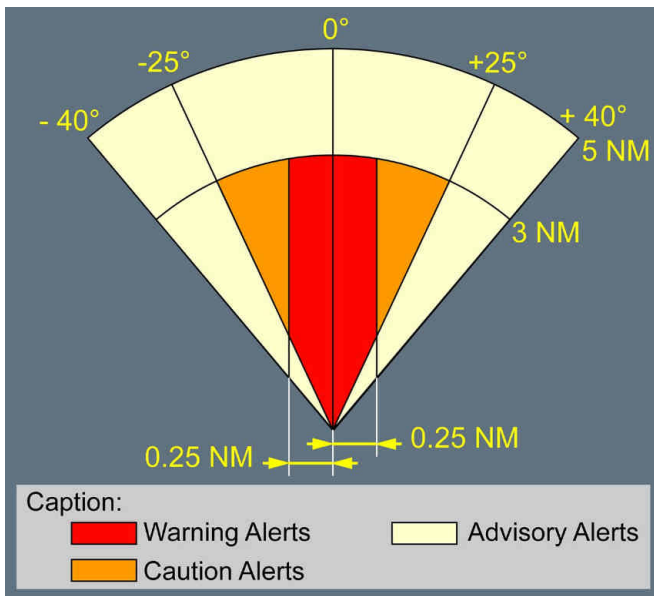
Alert Level	Aural Warning	PFD	ND (<i>Refer to DSC-34-SURV-30-30 PWS (if installed) indication on PFD and ND</i>)
Warning (Approach)	«GO AROUND WINDSHEAR AHEAD»	W/S AHEAD (red)	Windshear icon
Warning (Takeoff)	«WINDSHEAR AHEAD» (twice)	W/S AHEAD (red)	Windshear icon
Caution	«MONITOR RADAR DISPLAY»	W/S AHEAD (amber)	Windshear icon
Advisory	Nil	Nil	Windshear icon

WINDSHEAR ALERTS DURING TAKEOFF ROLL, UP TO 100 KNOTS

Ident.: DSC-34-SURV-30-20-00020944.0003001 / 17 MAR 17

Applicable to: MSN 04392-05746

WINDSHEAR ALERTS during takeoff roll, up to 100 knots



During the takeoff roll, up to 100 kt, both warnings and cautions are available within a range of 3 NM.

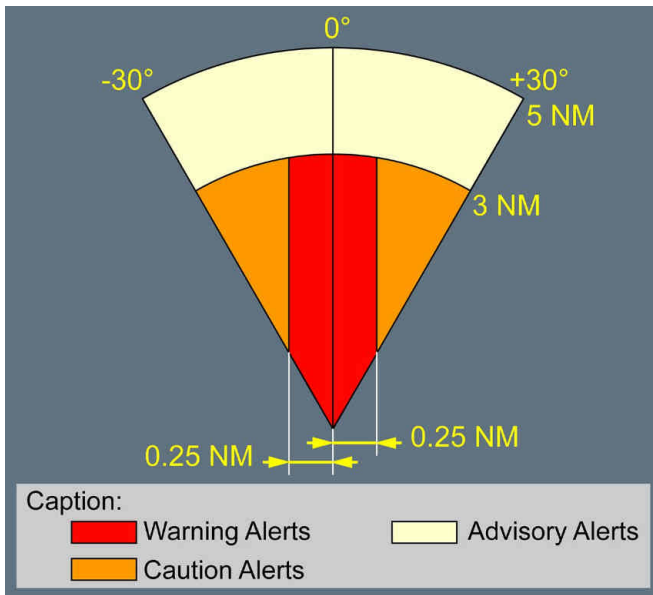
Note: This is also applicable during taxi when CAPT or F/O display mode is different from OFF.

WINDSHEAR ALERTS DURING TAKEOFF ROLL, UP TO 100 KNOTS

Ident.: DSC-34-SURV-30-20-00020944.0001001 / 17 MAR 17

Applicable to: MSN 02155-03060, 07784-07792

Windshear Alerts During Takeoff Roll, Up to 100 knots



During the takeoff roll, up to 100 kt, both warnings and cautions are available within a range of 3 NM.

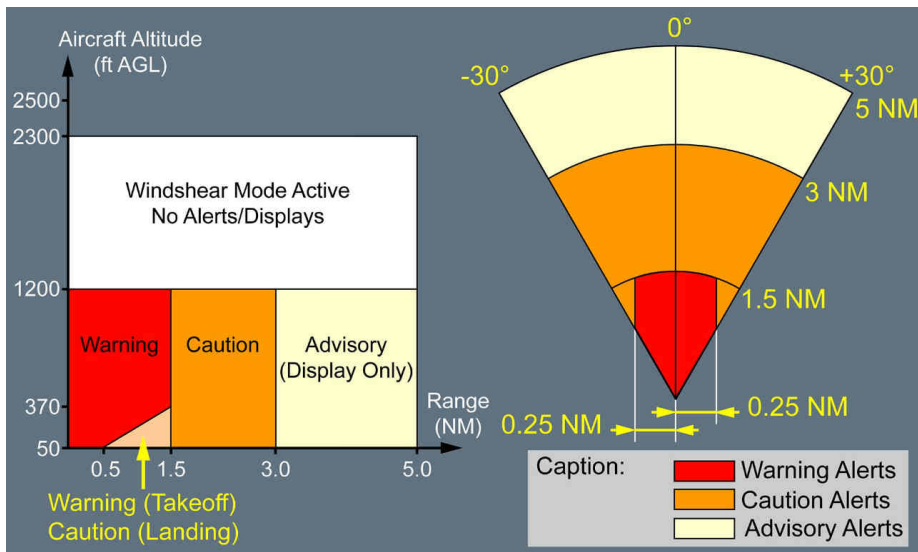
Note: This is also applicable during taxi when weather radar is set to ON.

WINDSHEAR ALERTS ABOVE 50 FEET

Ident.: DSC-34-SURV-30-20-00006422.0001001 / 28 MAY 20

Applicable to: MSN 02155-03060, 07784-07792

Windshear Alerts Above 50 feet



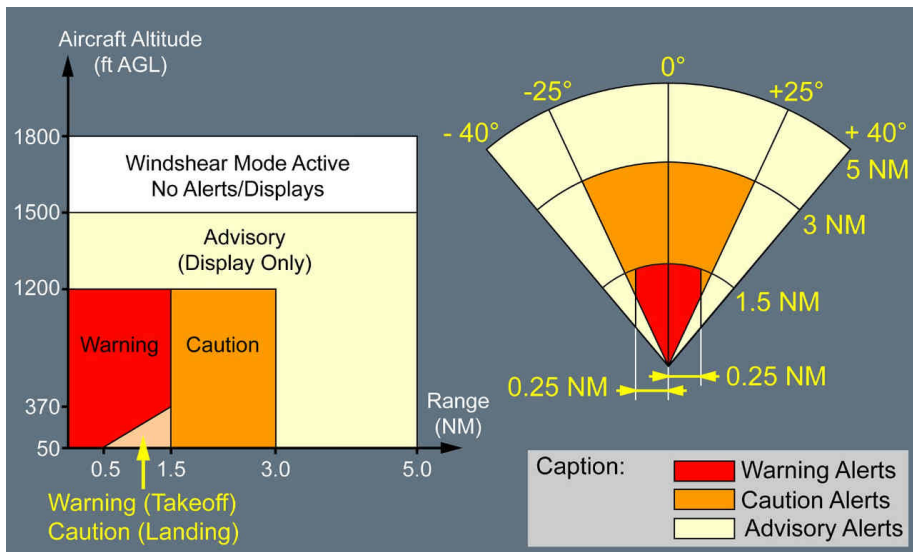
During final approach, the visual and aural warning alerts are downgraded to caution alerts between 370 ft AGL and 50 ft AGL, and range between 1.5 NM and 0.5 NM.

WINDSHEAR ALERTS ABOVE 50 FEET

Ident.: DSC-34-SURV-30-20-00006422.0004001 / 28 MAY 20

Applicable to: MSN 04392-05746

Windshear Alerts above 50 feet



During final approach, the visual and aural warning alerts are downgraded to caution alerts between 370 ft AGL and 50 ft AGL, and range between 1.5 NM and 0.5 NM.

WINDSHEAR ALERTS INHIBITION

Ident.: DSC-34-SURV-30-20-00006426.0002001 / 20 JUL 15

Applicable to: ALL

At takeoff, alerts are inhibited above 100 kt and up to 50 ft.

During landing, alerts are inhibited below 50 ft.

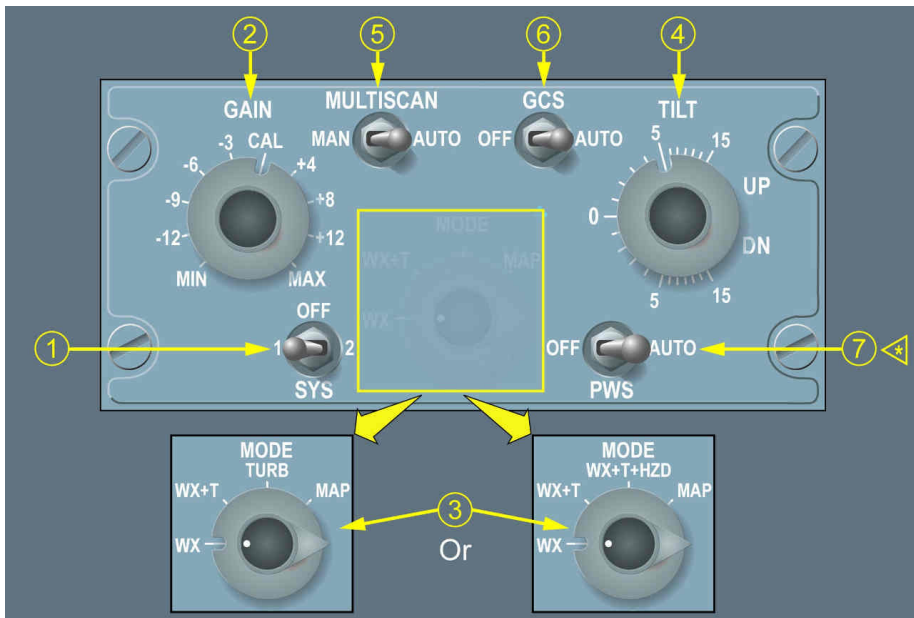
The aural alerts of the Predictive WindShear system (PWS):

- Have priority over TCAS, GPWS, and other FWC aural warnings
- Are inhibited by reactive windshear detection and aural messages of stall warnings.

CONTROL PANEL

Ident.: DSC-34-SURV-30-30-00014841.0012001 / 28 NOV 17

Applicable to: MSN 07784-07792



(1) Radar sw

This switch sets one radar to ON or turns both radars to OFF.

Note: If only one radar is installed on the aircraft, either:

- a "INOP" or "DEACT" sticker replaces the "2", or
- a "ON/OFF" Radar sw replaces the "1/OFF/2" Radar sw.

Note: If only one radar is installed on the aircraft, no weather image is displayed on the Navigation Display (ND) when the "1/OFF/2" SYS sw is set to "2".

(2) GAIN knob

This knob adjusts the sensitivity of the radar.

CAL is the normal position of the knob :

- When in Multiscan Automatic mode and gain set to CAL, the radar automatically adjusts the gain according to various parameters (aircraft altitude, geographical area, season, time of the day) to obtain the best weather display
- When in Manual mode and gain set to CAL, the radar adjusts the gain to a calibrated setting.

(3) Display mode selector

WX : Weather mode :

Colors indicate the intensity of precipitation (black for the lowest intensity, green, amber and red indicate progressively higher intensity).

WX+T : Weather and Turbulence mode :

The ND indicates precipitation and turbulence areas. Turbulence areas are displayed in magenta (within 40 NM).

TURB  : Turbulence mode :

The ND only displays turbulence areas in magenta (within 40 NM).

WX+T+HZD: Weather, Turbulence and Hazard mode (recommended position) :



The ND indicates precipitation, turbulence areas in magenta (within 40 NM) and hazard prediction risk areas.

Hazard prediction function is only available when the MULTISCAN sw is set to AUTO.

Note: When MULTISCAN sw is set to MAN, WX+T+HZD mode is equivalent to WX+T mode.

MAP : Map mode :

The radar operates in ground mapping mode: black indicates water, green indicates the ground, and amber indicates cities and mountains.

(4) TILT knob

This knob adjusts the antenna tilt when MULTISCAN sw is set to MAN.

Zero indicates the horizon reference provided by the IRS.

(5) MULTISCAN sw

AUTO : Activates Multiscan mode

Multiscan controls the tilt automatically and combines two scans done at different tilt angles to optimize weather detection and minimize ground clutter.

MAN : When set to MAN, the crew can manually adjust the tilt by using the TILT knob.

(6) GCS sw

The Ground Clutter Suppression (GCS) switch is spring-loaded to the AUTO position.

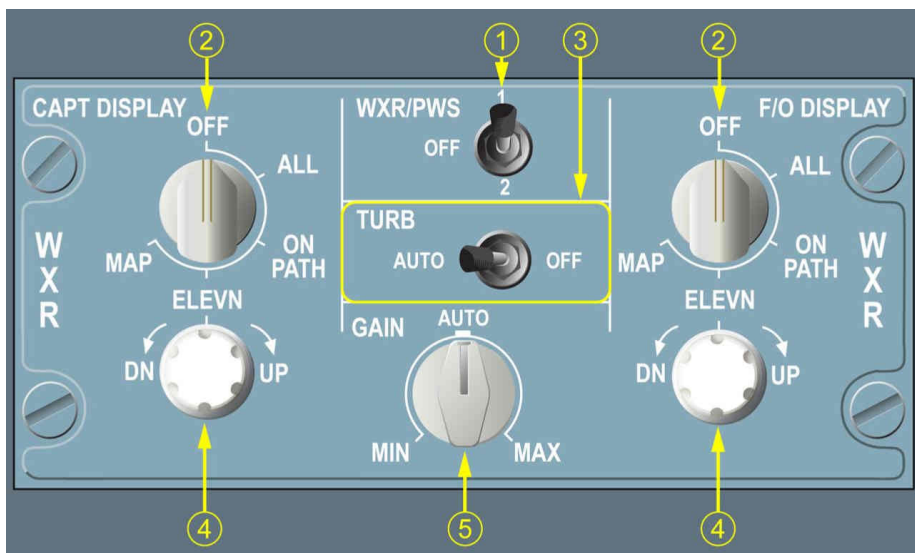
- AUTO : - If MULTISCAN sw is set to AUTO, the radar is in normal use. Ground clutter is not displayed on the screen
- If MUTLISCAN sw is set to MAN, the GCS sw has no utility. Ground clutter is displayed on the screen.
- OFF : Ground clutter is displayed on the screen.
- (7) **PWS sw** 
- AUTO : Activates the Predictive WindShear function in accordance with activation conditions (*Refer to DSC-34-SURV-30-20 Windshear Alerts Above 50 feet*).
- OFF : The Predictive WindShear function is off.

CONTROL PANEL

Ident.: DSC-34-SURV-30-30-00014841.0016001 / 22 MAR 17

Applicable to: MSN 05152-05746

Control Panel



- (1) **WXR/PWS sw**
This switch sets one radar to ON or turns off both radars.

AIRCRAFT SYSTEMS

SURVEILLANCE

WEATHER RADAR - CONTROLS AND INDICATORS

- Note:
- If only one radar is installed, a DEACT sticker placed next to the "2" label indicates that the system 2 is deactivated.
 - When the flight crew sets a radar to ON, a delay of 30 seconds is necessary to display the weather data. This is the time required to scan the entire volume ahead of the aircraft for the first time.
 - The Predictive WindShear detection is available as soon as a radar is selected ON and activation conditions are satisfied. Refer to DSC-34-SURV-30-20 Windshear Alerts Above 50 feet

(2) CAPT DISPLAY mode selector and F/O DISPLAY mode selector

- OFF** : No weather data is displayed on the corresponding Navigation Display (ND). If the WXR/PWS sw is not set OFF, Predictive WindShear (PWS) function is active during takeoff and landing.
- ALL** : The ND displays ON PATH and OFF PATH weather. PWS and turbulence display are available.
- ON PATH** : The ND displays ON PATH weather only. PWS and turbulence display are available.
- ELEVN** : The ND displays the weather data at a selected altitude only (use of ELEVN knob). PWS display is available. Turbulence display is not available.
- MAP** : The ND only displays ground echoes. PWS display is available. Turbulence display is not available.

- Note: On the ground, the radar is scanning when :
- The flight crew sets one radar to ON (WXR/PWS sw set to 1 or 2) and selects a display mode on the DISPLAY mode selector different from OFF on at least one side, or
 - The PWS activation conditions are satisfied (Refer to DSC-34-SURV-30-20 Windshear Alerts Above 50 feet).

When the aircraft is airborne, the selected radar is scanning continuously. If the DISPLAY mode selector are set to OFF, the radar stores the scanned weather in its memory but the weather data is not displayed on the NDs.

(3) TURB sw

In normal operation, the TURB sw is in AUTO position. The flight crew can remove the turbulence display from the ND (for de-cluttering purpose) by setting the TURB sw to the OFF position.

Turbulence areas are displayed in magenta (within 40 NM)

(4) ELEVN knob

When the flight crew sets the DISPLAY mode selector to ELEVN, the flight crew can turn the ELEVN knob to select the altitude (or FL depending on barometric setting) of the weather return to be displayed on the ND.

Note: After weather analysis, the flight crew must return to ALL display mode.

(5) GAIN knob

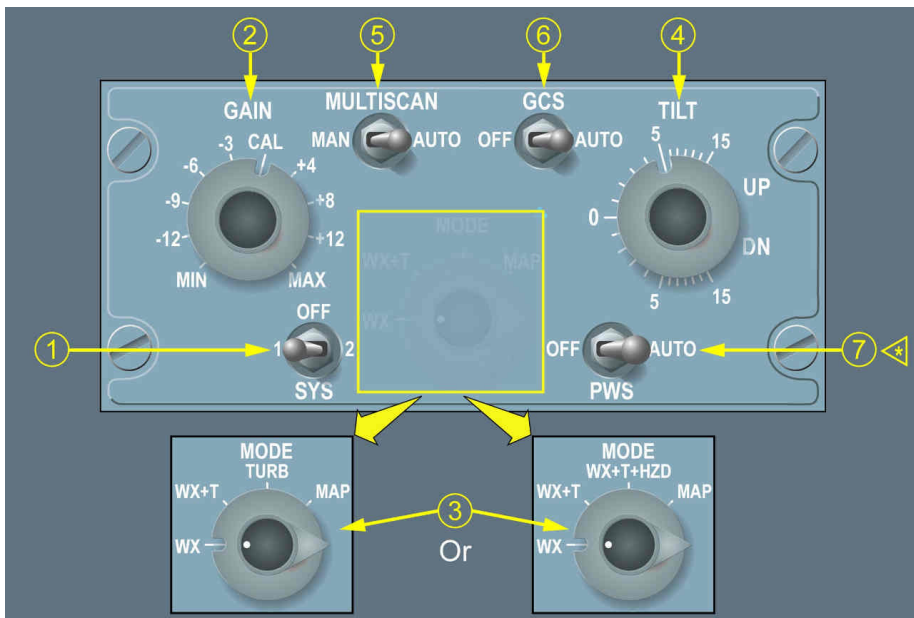
The GAIN knob adjusts the sensitivity of the radar, around a calibrated position (AUTO). The flight crew can manually adjust the gain of the weather radar display using the GAIN knob.

Note: In normal operation, the GAIN knob should be set to the AUTO position.

CONTROL PANEL

Ident.: DSC-34-SURV-30-30-00001402.0002001 / 28 NOV 17

Applicable to: MSN 02155-03060



(1) Radar sw

This switch sets one radar to ON or turns both radars to OFF.

Note: If only one radar is installed on the aircraft, either:

- a "INOP" or "DEACT" sticker replaces the "2", or
- a "ON/OFF" Radar sw replaces the "1/OFF/2" Radar sw.

Note: If only one radar is installed on the aircraft, no weather image is displayed on the Navigation Display (ND) when the "1/OFF/2" SYS sw is set to "2".

(2) GAIN knob

This knob adjusts the sensitivity of the radar.

CAL is the normal position of the knob :

- When in Multiscan Automatic mode and gain set to CAL, the radar automatically adjusts the gain according to various parameters (aircraft altitude, geographical area, season, time of the day) to obtain the best weather display
- When in Manual mode and gain set to CAL, the radar adjusts the gain to a calibrated setting.

(3) Display mode selector

WX : Weather mode :

Colors indicate the intensity of precipitation (black for the lowest intensity, green, amber and red indicate progressively higher intensity).

WX+T : Weather and Turbulence mode :

The ND indicates precipitation and turbulence areas. Turbulence areas are displayed in magenta (within 40 NM).

TURB  : Turbulence mode :

The ND only displays turbulence areas in magenta (within 40 NM).

WX+T+HZD: Weather, Turbulence and Hazard mode (recommended position) :

 : The ND indicates precipitation, turbulence areas in magenta (within 40 NM) and hazard prediction risk areas.

Hazard prediction function is only available when the MULTISCAN sw is set to AUTO.

Note: When MULTISCAN sw is set to MAN, WX+T+HZD mode is equivalent to WX+T mode.

MAP : Map mode :

The radar operates in ground mapping mode: black indicates water, green indicates the ground, and amber indicates cities and mountains.

(4) TILT knob

This knob adjusts the antenna tilt when MULTISCAN sw is set to MAN.

Zero indicates the horizon reference provided by the IRS.

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(5) MULTISCAN sw

AUTO : Activates Multiscan mode

Multiscan controls the tilt automatically and combines two scans done at different tilt angles to optimize weather detection and minimize ground clutter.

MAN : When set to MAN, the crew can manually adjust the tilt by using the TILT knob.

(6) GCS sw

The Ground Clutter Suppression (GCS) switch is spring-loaded to the AUTO position.

AUTO : - If MULTISCAN sw is set to AUTO, the radar is in normal use. Ground clutter is not displayed on the screen
- If MULTISCAN sw is set to MAN, the GCS sw has no utility. Ground clutter is displayed on the screen.

OFF : Ground clutter is displayed on the screen.

(7) PWS sw

AUTO : Activates the Predictive WindShear function in accordance with activation conditions (*Refer to DSC-34-SURV-30-20 Windshear Alerts Above 50 feet*).

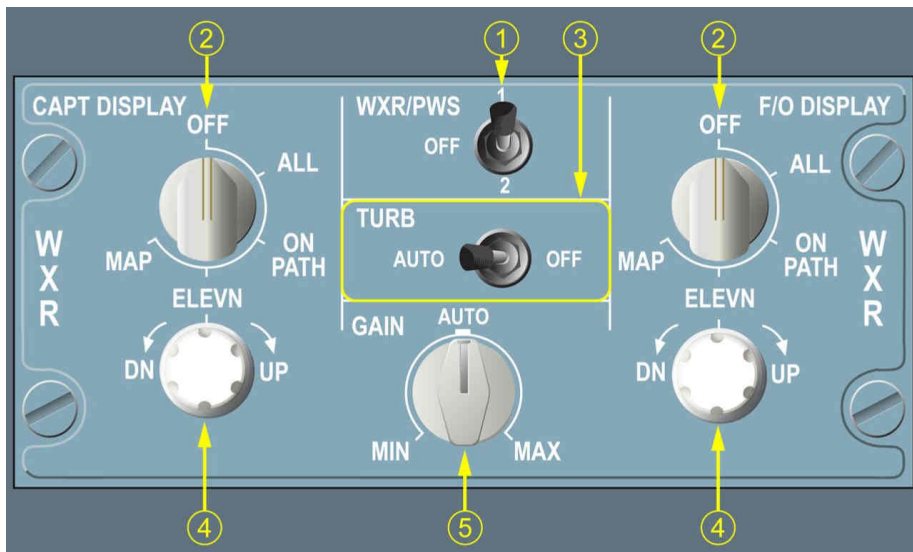
OFF : The Predictive WindShear function is off.

CONTROL PANEL

Ident.: DSC-34-SURV-30-30-00001402.0100001 / 22 MAR 17

Applicable to: MSN 04392

Control Panel



(1) WXR/PWS sw

This switch sets one radar to ON or turns off both radars.

- Note:
- If only one radar is installed, a DEACT sticker placed next to the "2" label indicates that the system 2 is deactivated.
 - When the flight crew sets a radar to ON, a delay of 30 seconds is necessary to display the weather data. This is the time required to scan the entire volume ahead of the aircraft for the first time.
 - The Predictive WindShear detection is available as soon as a radar is selected ON and activation conditions are satisfied. Refer to DSC-34-SURV-30-20 Windshear Alerts Above 50 feet

(2) CAPT DISPLAY mode selector and F/O DISPLAY mode selector

OFF : No weather data is displayed on the corresponding Navigation Display (ND). If the WXR/PWS sw is not set OFF, Predictive WindShear (PWS) function is active during takeoff and landing.

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- ALL : The ND displays ON PATH and OFF PATH weather.
PWS and turbulence display are available.
- ON PATH : The ND displays ON PATH weather only.
PWS and turbulence display are available.
- ELEVN : The ND displays the weather data at a selected altitude only (use of ELEVN knob).
PWS display is available. Turbulence display is not available.
- MAP : The ND only displays ground echoes.
PWS display is available. Turbulence display is not available.

Note: On the ground, the radar is scanning when :

- The flight crew sets one radar to ON (WXR/PWS sw set to 1 or 2) and selects a display mode on the DISPLAY mode selector different from OFF on at least one side, or
- The PWS activation conditions are satisfied (Refer to DSC-34-SURV-30-20 Windshear Alerts Above 50 feet).

When the aircraft is airborne, the selected radar is scanning continuously. If the DISPLAY mode selector are set to OFF, the radar stores the scanned weather in its memory but the weather data is not displayed on the NDs.

(3) TURB sw

In normal operation, the TURB sw is in AUTO position. The flight crew can remove the turbulence display from the ND (for de-cluttering purpose) by setting the TURB sw to the OFF position.

Turbulence areas are displayed in magenta (within 40 NM)

(4) ELEVN knob

When the flight crew sets the DISPLAY mode selector to ELEVN, the flight crew can turn the ELEVN knob to select the altitude (or FL depending on barometric setting) of the weather return to be displayed on the ND.

Note: After weather analysis, the flight crew must return to ALL display mode.

(5) GAIN knob

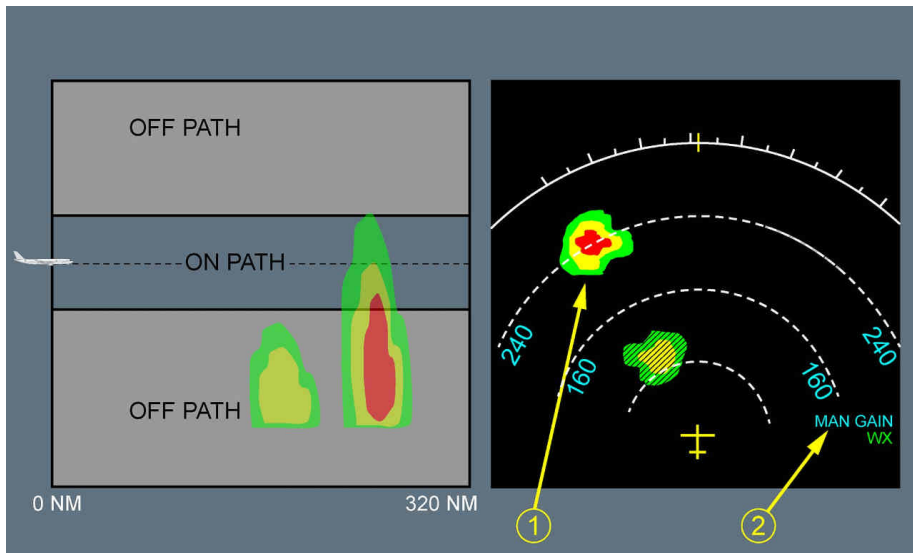
The GAIN knob adjusts the sensitivity of the radar, around a calibrated position (AUTO). The flight crew can manually adjust the gain of the weather radar display using the GAIN knob.

Note: In normal operation, the GAIN knob should be set to the AUTO position.

WEATHER RADAR INDICATION ON ND

Ident.: DSC-34-SURV-30-30-00001255.0012001 / 17 MAR 17

Applicable to: MSN 04392-05746



(1) Weather Radar Picture

The flight crew can display the weather radar on the NDs when:

- The ND is in ARC or ROSE mode
- One radar system is ON
- The corresponding DISPLAY mode selector is not set to OFF.

The weather echoes (or ground echoes in MAP mode) appear in different colors, depending on the precipitation rates (or ground reflectivity): black, green, yellow or red or in magenta for turbulence.

In the ALL (ALL WX) display mode, the ND displays ON PATH weather in plain color and OFF PATH weather in hash marks.

Refer to FCTM/AS-WXR Analysis of weather radar data

(2) Weather Radar Information

Four rows located at the bottom right corner of the ND display weather radar information:

- 1st row: MAN GAIN appears in cyan when a manual gain is selected
- 2nd row: dedicated to active display modes
- WX, WX+T, WX+H, WX+T+H:
 Depending on the selection of HZD and TURB switches, the following indications are displayed on the ND:

HZD switch OFF or HZD function not installed		HZD switch ON 	
TURB switch OFF	TURB switch ON	TURB switch OFF	TURB switch ON
WX	WX+T	WX+H	WX+T+H

Note: The indications described in the table above are displayed:

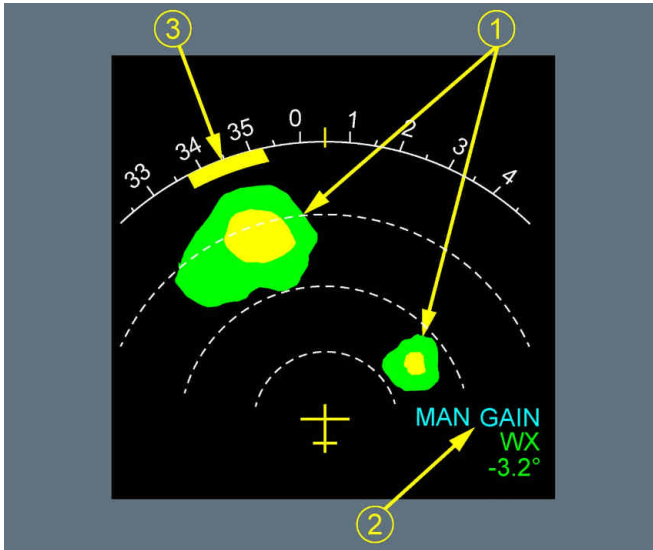
- In green when PATH WX (ON PATH) or ALL WX (ALL) display mode is selected
- In cyan when ELEVN display mode is selected.
- PWS SCAN: appears in green when the WXR/PWS switch is set to OFF during takeoff and approach
- WXR OFF: appears in white when the weather radar and the GPWS are not active
- MAP appears in cyan when the MAP display mode is selected
- 3rd row:
 - PATH appears in green when PATH WX (ON PATH) display mode is selected
 - The selected altitude (or FL) appears in cyan when the ELEVN display mode is selected
- 4th row: dedicated to weather radar failure messages, displayed in red or amber:

NO WXR (red)	:	Radar display failure
WXR R/T (red)	:	Radar transceiver failure
WXR ANT (red)	:	Radar antenna failure
WXR CTL (red)	:	Radar control unit failure
WXR RNG (red)	:	Range error
WXR WEAK (amber)	:	Calibration failure
WXR ATT (amber)	:	Attitude control failure
WXR STAB (amber)	:	Antenna stabilization failure
PRED W/S (amber)	:	PWS  function failure
NO AUTO TILT (amber)	:	Automatic tilt adjustment failure
WXR TEST (amber)	:	Radar system test

WEATHER RADAR INDICATION ON ND

Ident.: DSC-34-SURV-30-30-00001255.0014001 / 12 NOV 24

Applicable to: MSN 02155-03060, 07784-07792



(1) Weather Radar Picture

- When the radar is operating, and when the ND is not in PLAN mode, the ND displays the weather radar picture.
- The weather echoes appear in different colors, depending on the precipitation rates (black, green, yellow, red or magenta for turbulence).
- The selected ND range will determine how often the image is refreshed.

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(2) Weather Radar Indication

- 1st row: Gain Mode
MAN GAIN appears when the flight crew selects the manual gain mode.
- 2nd row: Active Detection Mode
The active detection modes appear in:
 - **Cyan** when the MULTISCAN SW is on the MAN position, or
 - **Green** when the MULTISCAN SW is on the AUTO position.

The active detection modes can be one of the following:

- WX
- WX+T
- TURB 
- MAP
- WX+T+H 
- **PWS SCAN**  (when the PWS function is active)
- **WXR OFF**

Note: Except for PWS SCAN and WXR OFF, the active detection modes are displayed:

- In **cyan** if the manual mode is selected
- In **green** if the automatic mode is selected

- 3rd row: Tilt Angle

The multiscan function of the weather radar alternatively scans at low and high beam, and automatically sets the tilt of these beams to optimize the weather radar detection. The displayed weather radar picture is the result of the storing and merging of the information from each beam.

The tilt angle is the angle between the horizon and the radar beam axis. The value of the tilt angle is in degrees, and quarters of a degree. It is displayed:

- In **green**, when the MULTISCAN sw is set to AUTO. This value represents the average of the lower and the upper beam tilts.
- In **cyan**, next to the **MAN** indication, when the flight crew sets the MULTISCAN sw to MAN.

When the multiscan function is lost, the tilt value is dashed and the **NO AUTO TILT** message appears the ND, until the flight crew sets the MULTISCAN sw to MAN.

- 4th row: Failure Messages

The ND lists the detected failures.

If the message is in **red**, the ND does not display any radar image.

If the message is in **amber**, the image is not affected.

- NO WXR** : Radar display failure.
- WXR RT** : Radar transceiver failure.
- WXR ANT** : Radar antenna failure.
- WXR CTL** : Radar control unit failure.
- WXR RNG** : Range error.
- WXR DU** : Overheating of the display unit
- WXR WEAK** : Calibration failure.
- WXR ATT** : Attitude control failure.
- WXR STAB** : Antenna stabilization failure.
- PRED W/S** : PWS  function failure.
- NO AUTO** : Automatic tilt adjustment failure.
- TILT**
- WXR TEST** : Radar system test.

(3) PAC Alert

When the flight crew sets the display mode selector to WX or WX+T, or WX+T+HZD  and sets the gain to CAL, and when the aircraft is within 80 NM of a storm cell, the PAC alert is available.

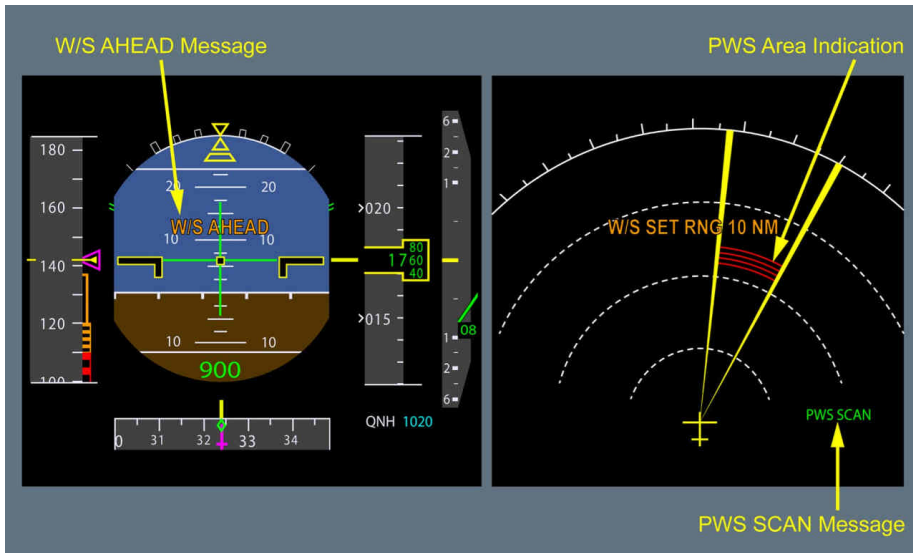
The PAC alert displays a yellow arc on the outermost scale of the ND, when an intervening rainfall creates an attenuated area behind a storm cell (also called a radar shadow or attenuation effect).

Note: The PAC alert is only available when the MULTISCAN sw is in the AUTO position.

PWS INDICATION ON PFD AND ND

Ident.: DSC-34-SURV-30-30-00020941.0002001 / 03 MAY 23

Applicable to: ALL



W/S AHEAD MESSAGE

This message is displayed when the Predictive Windshear System detects windshear ahead of the aircraft.

The message is in amber or red, depending on the level of the alert.

PWS AREA INDICATION

A red and black symbol and two yellow radial lines indicate the predicted windshear area.

Windshear indication is available in ARC and ROSE ND modes.

When the radar detects a windshear event and the ND range is set above 10 NM, a W/S SET RNG 10 NM (Windshear, set range to 10 NM) message appears. This message requests the flight crew to adjust the range on the corresponding ND.

Depending on the windshear alert level, ND indication may be associated with an aural message and a PFD message.

PWS SCAN MESSAGE

If only the PWS detection is active, the ND displays a PWS SCAN message when the PWS is active. In this mode, when the radar detects a windshear event, a windshear symbol and the weather returns appear automatically on the ND.

WEATHER HAZARD PREDICTION FUNCTION INDICATION ON ND

Ident.: DSC-34-SURV-30-30-00016149.0001001 / 17 MAY 21

Applicable to: MSN 07784-07792

The Weather, Turbulence and Hazard mode (WX+T+HZD) enables the flight crew to have the following information displayed on the ND:

- The weather returns that appear in different colors, depending on the precipitation rates (black, green, yellow or red)
- The turbulence areas in magenta (within 40 NM)
- The weather hazard predictions computed by the weather radar.

For the weather hazard predictions:

- The weather radar computes an automatic threat assessment of the lightning, hail and convective activity in a storm cell and in the area near the storm cell (Core Threat Assessment and Associated Threat Assessment)
- The weather radar is also able to alert the flight crew of storm cells that may rapidly build below the aircraft flight path (Predictive Overflight).

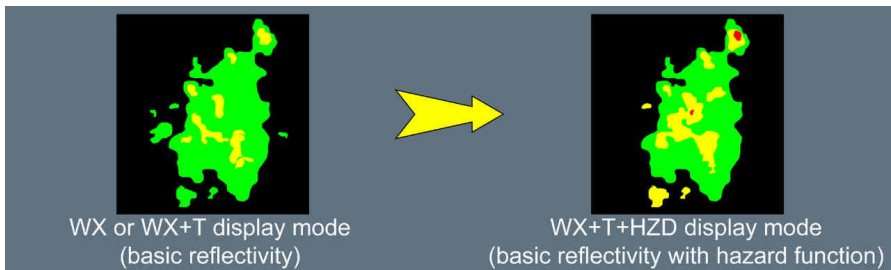
Note: The hazard predictions are only available when the Multiscan mode is in AUTO.

CORE THREAT ASSESSMENT

The Core Threat Assessment function operates until 320 NM. In case the weather radar determines that lightning, hail or turbulence may occur in a given cell, native reflectivity color of the weather is increased in order to better reflect the threat associated with a cell core.

The adjustment can go up to a color level (green cells may become yellow, yellow cells may become red).

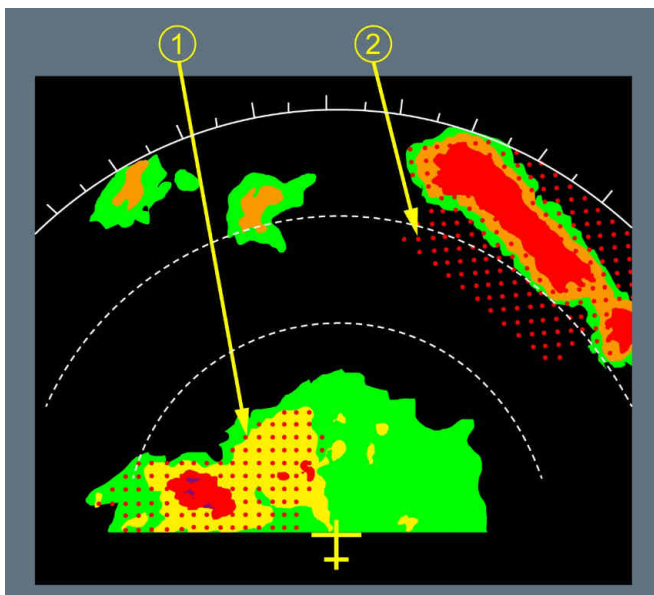
Core Threat Assessment



ASSOCIATED THREAT ASSESSMENT

Associated threat assessment enables to indicate an area of possible hail, lightning, and convection on the ND. This permits to identify potential threats even if there is no reflective activity in the area.

Associated Threat Assessment



Associated threats are represented by red dots on the ND and can be within the cell boundary or outside. Two types of indications can be displayed:

AIRCRAFT SYSTEMS

SURVEILLANCE

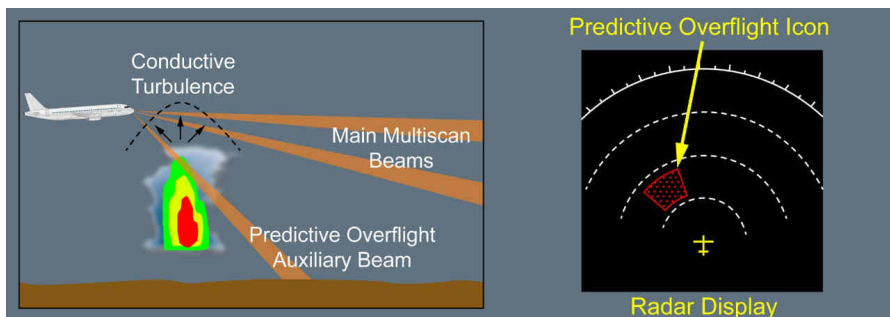
WEATHER RADAR - CONTROLS AND INDICATORS

- (1) The first type of indication is represented by red dots in the area of potential lightning and icing found in precipitation around the freezing level. This information is available only when the aircraft is below the freezing level or up to 6 000 ft above the freezing level.
- (2) The second type of indication is represented by red dots in a rectangular shape on top of a storm cell displayed on the ND. The dotted rectangle above a storm cell indicates a potential of icing, hail and/or lightning. This information is available at all altitudes. The rectangle may extend beyond the storm cell to indicate potential threats that can not be seen by the basic reflectivity function of the weather radar.

PREDICTIVE OVERFLIGHT FUNCTION

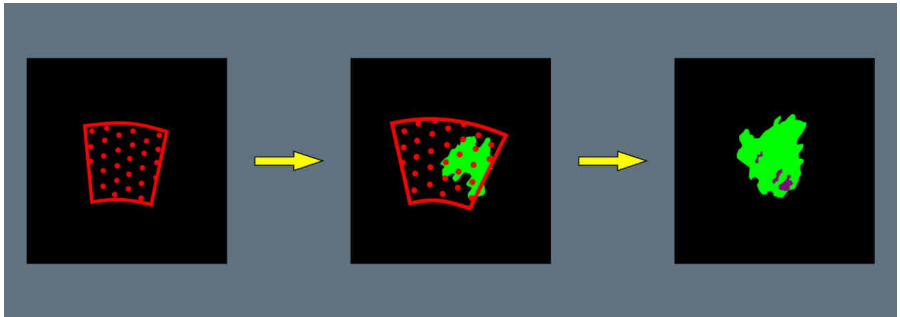
The predictive overflight function is active above 25 000 ft and operates up to 40 NM. Its aim is to indicate risk constituted by cells growing rapidly underneath main radar beams. For this purpose, an auxiliary beam with very low tilt searches for growing cells. When a conflict between a fast growing cell and the aircraft flight path is detected, a Predictive Overflight icon is displayed. The Predictive Overflight icon is represented by an area of red dots with red boundaries. As it is based on actual convection measurement, the flight crew should avoid predictive overflight areas.

Predictive Overflight Function



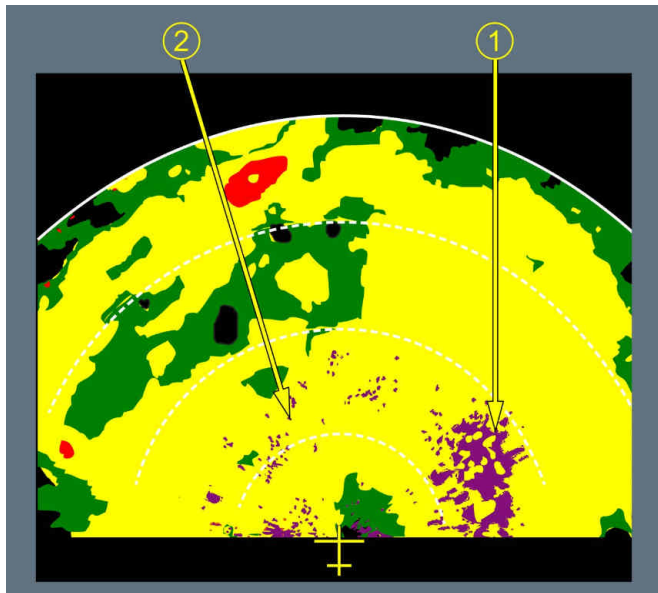
First, the icon is displayed “alone” over black when the concerned cell can not be displayed (the cell is much lower than aircraft flight level). Then, when cell reach aircraft flight level, the icon and the reflectivity are displayed together. Finally, the icon is removed 1 min after cell ceases to be considered as a threat by the weather radar or when the relevant depiction (i.e. at least red core) for the cell is displayed on ND.

Predictive Overflight Icon Evolution



SEVERE AND MODERATE TURBULENCE DISPLAY

Example of Severe and Moderate Turbulence Display



The weather hazard prediction function provides two levels of turbulence:

- (1) Basic plain magenta:

It indicates potential severe turbulences (available in WX+T or WX+T+HZD display mode).

AIRCRAFT SYSTEMS**SURVEILLANCE**

WEATHER RADAR - CONTROLS AND INDICATORS

(2) Speckle magenta:

It indicates potential moderate turbulences that could decrease passenger comfort (available only in WX+T+HZD display mode).

MEMO DISPLAY

Ident.: DSC-34-SURV-30-30-00017051.0001001 / 21 MAR 16

Applicable to: ALL

The "PRED W/S OFF" message appears when windshear is set to OFF on the weather radar panel.

PRED W/S OFF : This memo appears in green during flight phases 2 and 6.

PRED W/S OFF : This memo appears in amber when:

- The aircraft is in flight phases 3, 4, 5, 7, 8, and 9.
- The T.O. CONFIG pb is pressed during flight phase 2.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS SURVEILLANCE WEATHER RADAR - TEMPORARY ABNORMAL BEHAVIORS
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WEATHER RADAR PERFORMANCE ABOVE 80 NM
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Ident.: DSC-34-SURV-30-40-00027098.0001001 / 06 JUL 23

Applicable to: MSN 04392-05746

DESCRIPTION

In some operational conditions, the performance of the weather radar may be below its standard level at detection ranges above 80 NM.
This reduced performance of the weather radar above 80 NM can result in an underestimation, or late detection of the weather by the flight crew.

OPERATIONAL RECOMMENDATIONS

The flight crew should take into account all weather information displayed on the ND.
The flight crew should pay attention to the possibility of a late weather display, particularly in areas where convective weather is expected.

AIRCRAFT SYSTEMS

SURVEILLANCE

WEATHER RADAR - TEMPORARY ABNORMAL BEHAVIORS

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OVERVIEW

Ident.: DSC-34-SURV-40-10-00021292.0001001 / 14 NOV 24

Applicable to: ALL

The purpose of the Ground Proximity Warning System (GPWS), also named Terrain Awareness Warning System (TAWS), is to warn the flight crew of potentially hazardous situations, such as a collision with terrain. It detects terrain collision threats and triggers applicable aural and visual indications.

The GPWS includes:

- Five basic modes active up to radio height of 2 500 ft:
 - Excessive rate of descent (Mode 1)
 - Excessive terrain closure rate (Mode 2)
 - Altitude loss after takeoff or go-around (Mode 3)
 - Terrain clearance not sufficient, if not in landing configuration (Mode 4)
 - Excessive descent below the glide slope (Mode 5).
- A predictive GPWS  function, based on a GPWS database, to display terrain information. It can be provided:
 - By Honeywell through Enhanced GPWS (EGPWS)
 - By ACSS as Ground Collision Avoidance System (GCAS), through T2CAS or T3CAS.

The predictive GPWS is composed of:

- Mandatory functions such as the Forward Looking Terrain Alerting function
- Optional functions such as the obstacle database.

Note: *The terrain data are displayed on the ND and the brightness is controlled via the ND Brightness Control knob. If the weather radar brightness was set to low (due to bad weather) and a terrain alert occurs, then the brightness of the terrain display will also be low.*

PRINCIPLE

Ident.: DSC-34-SURV-40-10-00021293.0002001 / 03 MAY 23

Applicable to: MSN 02926-02944, 04392, 07784-07792

The GPWS computes the geometric altitude of the aircraft by using:

- Pressure altitude
- Radio altitude
- Temperature
- Barometric references
- GPS altitude for predictive GPWS 

- Data from the GPWS database for predictive GPWS ⚠
- GPS altitude and GPS vertical speed for Mode 3.

PRINCIPLE

Ident.: DSC-34-SURV-40-10-00021293.0001001 / 17 MAR 17

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

The GPWS computes the geometric altitude of the aircraft by using:

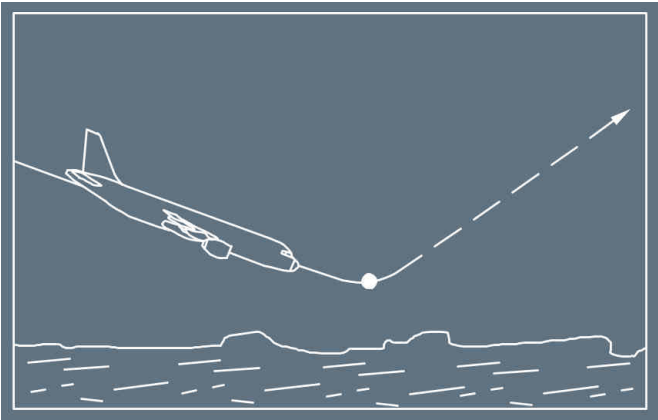
- Pressure altitude
- Radio altitude
- Temperature
- Barometric references
- GPS altitude for predictive GPWS ⚠
- Data from the GPWS database for predictive GPWS ⚠ .

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MODE 1 : EXCESSIVE RATE OF DESCENT

Ident.: DSC-34-SURV-40-20-00015115.0004001 / 13 JAN 14

Applicable to: ALL



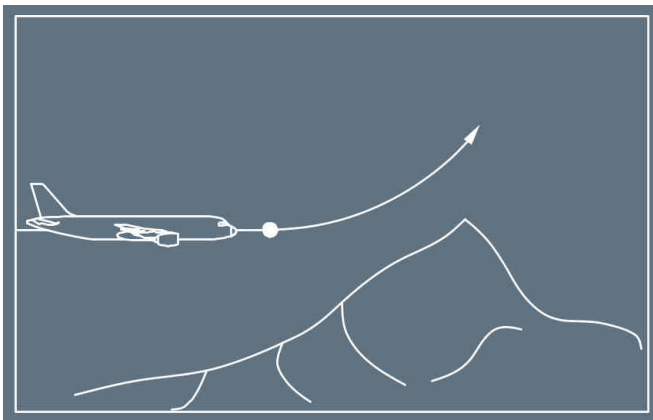
Mode 1 triggers aural and visual alerts about excessive rates of descent, based on the radio height, and the rate of descent of the aircraft.
Mode 1 is active for all phases of the flight.

	CAUTION		WARNING	
AURAL ALERT	"SINK RATE, SINK RATE"		"PULL UP" (repeated as long as MODE 1 is triggered)	
VISUAL ALERT		The GPWS amber lights come on		The PULL UP red lights come on

MODE 2 : EXCESSIVE TERRAIN CLOSURE RATE

Ident.: DSC-34-SURV-40-20-00015116.0004001 / 03 AUG 17

Applicable to: ALL



Mode 2 triggers aural and visual alerts, based on the landing gear/flaps configuration of the aircraft, the radio height, and the RA rate of change.

There are two types of Mode 2 alerts, Mode 2A (active during climb, cruise, and initial approach), and Mode 2B (active during approach and 60 s after takeoff).

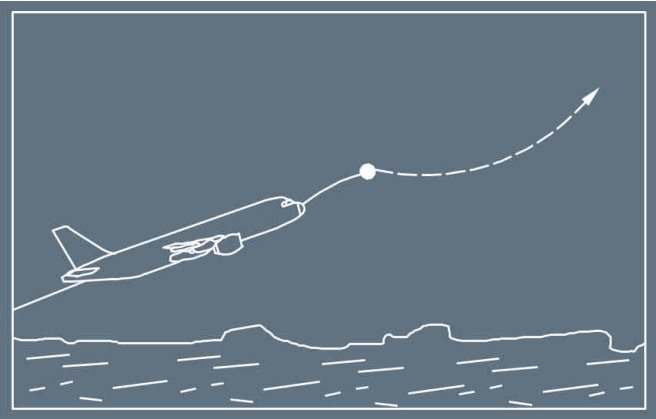
CONFIGURATION	Flaps not in Landing Position + Landing Gear Up (Mode 2A)			
	Flaps in landing position + Landing Gear Up (Mode 2B)			
	CAUTION		WARNING	
AURAL ALERT	"TERRAIN, TERRAIN"		"PULL UP" (repeated as long as MODE 2 is triggered in the warning conditions)	"TERRAIN" (repeated as long as MODE 2 is triggered after leaving the warning conditions)
VISUAL ALERT		The GPWS amber lights come on		The PULL UP red lights come on
				The PULL UP red lights stay on

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS SURVEILLANCE GPWS - GPWS BASICS MODES
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CONFIGURATION	Flaps in landing position + Landing Gear Down (Mode 2B)	
AURAL ALERT	CAUTION	
	"TERRAIN" (repeated as long as MODE 2 is triggered)	
VISUAL ALERT		The GPWS amber lights come on

MODE 3 : ALTITUDE LOSS AFTER TAKEOFF

Ident.: DSC-34-SURV-40-20-00015117.0004001 / 19 SEP 13
Applicable to: ALL



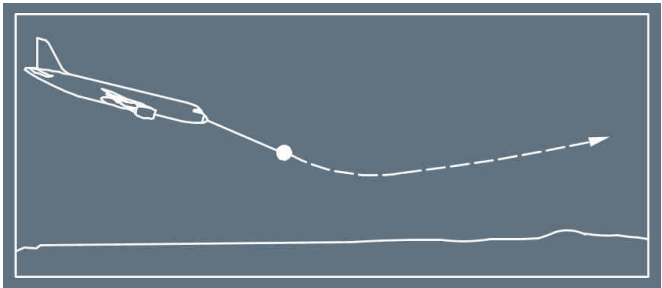
Mode 3 triggers aural and visual alerts when the altitude significantly decreases after takeoff, and go-arounds with landing gear or flaps not in landing configuration.

	CAUTION	
AURAL ALERT	"DON'T SINK, DON'T SINK" (repeated as long as MODE 3 is triggered)	
VISUAL ALERT		The GPWS amber lights come on

MODE 4 : UNSAFE TERRAIN CLEARANCE WHEN NOT IN LANDING CONFIGURATION

Ident.: DSC-34-SURV-40-20-00015118.0004001 / 19 SEP 13

Applicable to: MSN 02926-02944, 04392, 07784-07792



There are two types of Mode 4 alerts, Mode 4A and Mode 4B (both active during cruise and approach).

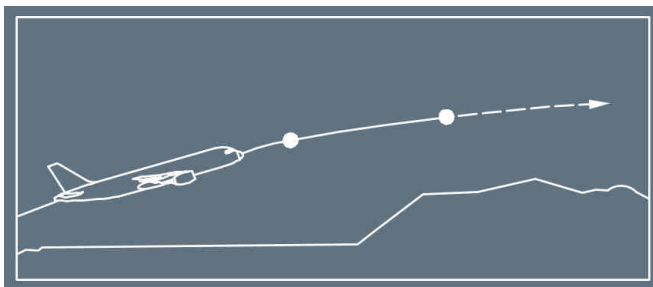
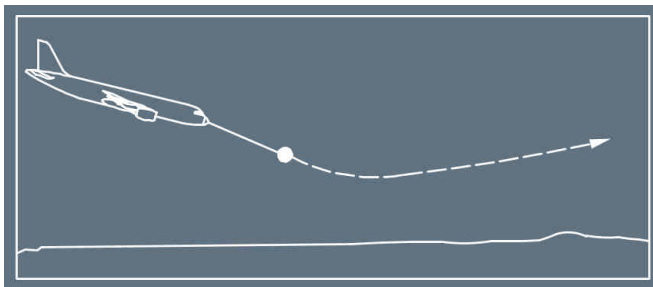
Mode 4A and Mode 4B trigger aural and visual alerts when terrain clearance is not sufficient based on the phase of flight, the configuration of the landing gear and the flaps, and the speed.

CONFIGURATION	Landing gear Up (Mode 4A)		Flaps not in landing position + Landing gear down (Mode 4B)	
AURAL ALERT	CAUTION			
	"TOO LOW TERRAIN"	"TOO LOW GEAR"	"TOO LOW TERRAIN"	"TOO LOW FLAPS"
VISUAL ALERT	The GPWS amber lights come on			

MODE 4 : UNSAFE TERRAIN CLEARANCE WHEN NOT IN LANDING CONFIGURATION

Ident.: DSC-34-SURV-40-20-00015118.0005001 / 13 JAN 14

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746



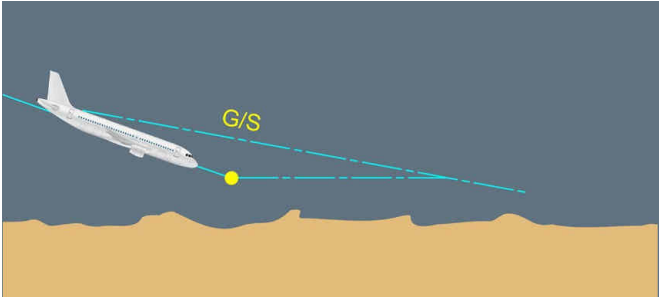
There are three types of Mode 4 alerts, Mode 4A and Mode 4B (both active during cruise and approach), and Mode 4C (active during takeoff*).

Mode 4A and Mode 4B trigger aural and visual alerts when terrain clearance is not sufficient based on the phase of flight, the configuration of the landing gear and the flaps, and the speed. Mode 4C triggers aural and visual alerts based on the minimum terrain clearance and the radio height of the aircraft. *(Only EGPWS not T2CAS)

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CONFIGURATION	Landing gear Up (Mode 4A)		Flaps not in landing position + Landing gear down (Mode 4B)		Flaps not in landing position OR Landing Gear Up (Mode 4C)
AURAL ALERT	CAUTION				
	"TOO LOW TERRAIN"	"TOO LOW GEAR"	"TOO LOW TERRAIN"	"TOO LOW FLAPS"	"TOO LOW TERRAIN"
VISUAL ALERT	The GPWS amber lights come on				

MODE 5 : DESCENT BELOW GLIDESLOPE
Ident.: DSC-34-SURV-40-20-00015119.0004001 / 06 NOV 25 Applicable to: ALL



Mode 5 triggers aural and visual alerts, when the aircraft descends below the glide slope on ILS, SLS and GLS approaches.

	CAUTION
AURAL ALERT	"GLIDESLOPE" (repeated as long as MODE 5 is triggered)
VISUAL ALERT	 The GPWS lights come on

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TERRAIN AWARENESS AND DISPLAY

Ident.: DSC-34-SURV-40-35-00001417.0275001 / 21 MAY 24
Applicable to: MSN 02155-02212, 03031-03060, 05152-05746

The TAD function computes a caution and a warning envelope in front of the aircraft, depending on all of the following:

- The aircraft altitude
- The nearest runway altitude
- The distance to the nearest runway threshold
- The ground speed
- The turn rate.

When the boundary of these envelopes conflicts with the terrain, or with an obstacle memorized in the database, the system generates the related alert:

Alert Level	Aural Warning	ND (Refer to DSC-31-45 Flags and Messages Displayed on ND)	Local Warning
Warning	TERRAIN AHEAD, PULL UP	- Automatic terrain display⁽¹⁾ - Solid red areas - TERR AHEAD	On each pilot's instrument panel, the pushbutton light comes on.
	OBSTACLE AHEAD, PULL UP	- Automatic terrain display⁽¹⁾ - Solid red areas - OBST AHEAD	
Caution	TERRAIN AHEAD	- Automatic terrain display⁽¹⁾ - Solid yellow areas - TERR AHEAD	
	OBSTACLE AHEAD	- Automatic terrain display⁽¹⁾ - Solid yellow areas - OBST AHEAD	

⁽¹⁾ Depending on the aircraft position, when the TERR ON ND pb is set to ON, and the ARC or ROSE mode is selected, the ND displays both of the following:

- The terrain
- The obstacles memorized in the database.

The terrain appears in various densities of green, yellow, red, or magenta, depending on the threat (Refer to DSC-31-45 GPWS (EGPWS)). If an alert is generated (caution or warning), and TERR ON ND pb is not selected by the flight crew, the terrain and the obstacles automatically appear, and the ON light of the TERR ON ND pb comes on.

AIRCRAFT SYSTEMS

SURVEILLANCE

GPWS - PREDICTIVE GPWS FUNCTIONS

- Note:
1. When **TERR ON ND pb** is selected by the flight crew, the weather radar image does not appear
 2. The Geometric Altitude function can protect against some **BARO** setting errors, provided the components used to compute the Geometric Altitude are valid and sufficiently accurate
 3. The **TAD** and **TCF** functions operate with the use of the pure lateral **GPS** position. The **FMS1** position provides the backup.

If the FMGC detects low-navigation accuracy, then the enhanced modes of the EGPWS are automatically deactivated. The 5 GPWS modes remain active.

TERRAIN AWARENESS AND DISPLAY

Ident.: DSC-34-SURV-40-35-00001417.0111001 / 21 MAY 24

Applicable to: MSN 02719-02789

The Terrain Awareness and Display (TAD) function computes a caution and a warning envelope in front of the aircraft, depending on the aircraft altitude, the nearest runway altitude, the distance to the nearest runway threshold, the ground speed, and the turn rate. When the boundary of these envelopes conflicts with the terrain, or with an obstacle memorized in the database, the system generates the relevant alert:

Alert Level	Aural Warning	ND (Refer to DSC-31-45 Flags and Messages Displayed on ND)	Local Warning
Warning	TERRAIN AHEAD, PULL UP	- Automatic terrain display See * - Solid red areas - TERR AHEAD (red)	On each pilot's instrument panel, The pushbutton light comes on.
	OBSTACLE AHEAD, PULL UP	- Automatic terrain display See * - Solid red areas - OBST AHEAD (red)	
Caution	TERRAIN AHEAD	- Automatic terrain display See * - Solid yellow areas - TERR AHEAD (amber)	
	OBSTACLE AHEAD	- Automatic terrain display See * - Solid yellow areas - OBST AHEAD (amber)	

* When the TERR ON ND pb-sw is set to ON, and ARC or ROSE mode is selected, the ND displays the terrain and the obstacles memorized in the database, depending on the aircraft's position. The terrain is displayed in various densities of green, yellow, red, or magenta, depending on the threat, (*Refer to DSC-31-45 GPWS (EGPWS)*). If an alert is generated (caution or warning), and TERR ON ND pb-sw is not selected, the terrain and the obstacles are automatically displayed, and the ON light of the TERR ON ND pb-sw comes on.

Note:

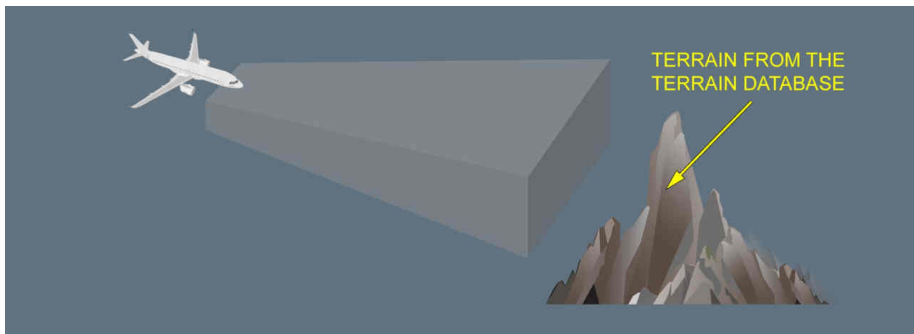
1. When the TERR ON ND pb-sw is set to ON, the weather radar image is not displayed.
2. The Geometric Altitude function can protect against certain BARO setting errors, provided the components used to compute the Geometric Altitude are valid and accurate.
3. The TAD and Terrain Clearance Floor (TCF) functions use FMS1 position information to perform their calculations. Therefore, in case of an FMS1 position error, the TAD and TCF will also provide erroneous information and/or warnings.

If the crew identifies that navigation accuracy is low, it must set the enhanced modes to off, via the TERR pb-sw. The 5 GPWS modes remain active.

TERRAIN CAUTION AND WARNING ENVELOPE

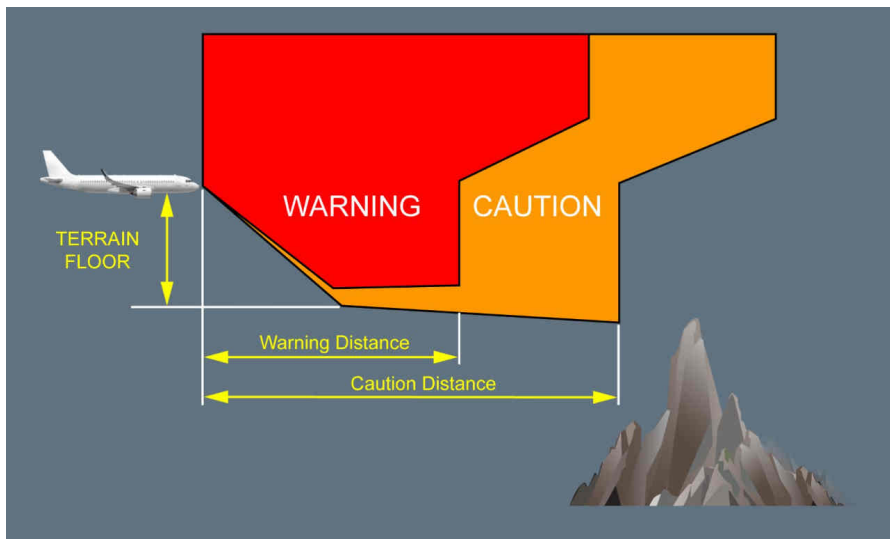
Ident.: DSC-34-SURV-40-35-00006161.0002001 / 13 MAY 25

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746



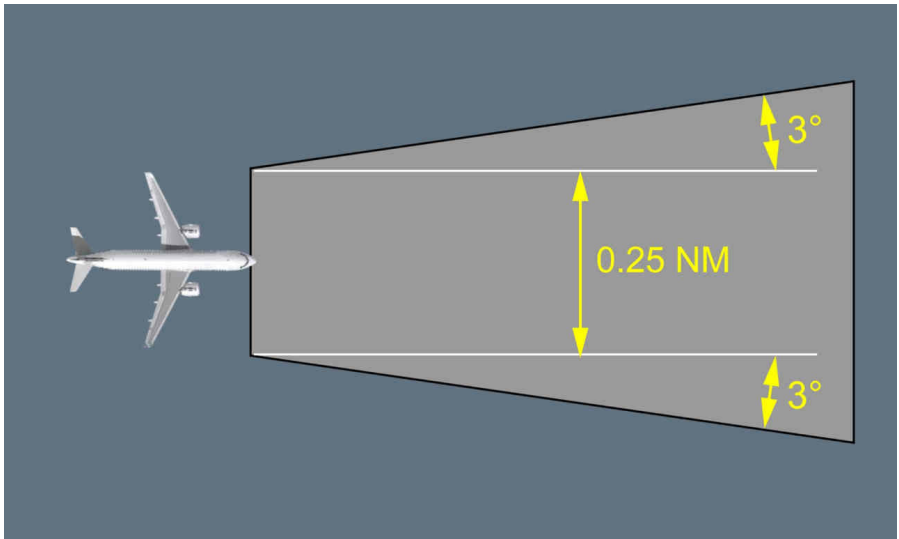
Note: If the caution or warning envelope conflicts with the terrain in the terrain database, then a warning or caution is triggered.

VERTICAL ENVELOPE



Note: Terrain floor changes with distance and altitude to the nearest airport. Warning and caution distances change with ground speed and turn rate. Warning distance is approximately 30 s. Caution distance is approximately 60 s.

HORIZONTAL ENVELOPE



***Note:** When the aircraft turns, the horizontal envelope changes to take into account the flight path of the aircraft.*

TERRAIN CLEARANCE FLOOR

Ident.: DSC-34-SURV-40-35-00006162.0002001 / 06 NOV 23

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

TERRAIN CLEARANCE FLOOR (TCF)

The TCF function computes a terrain clearance envelope around the airport runway. This function triggers an alert if the terrain clearance is not sufficient (even when the aircraft is in landing configuration). This function provides an enhanced GPWS mode 4.

The TCF function also protects against an attempt to land where there is no airfield.

The TAWS database includes the applicable TCF envelope for each airport runway that has terrain data, and that is longer than 3 500 ft.

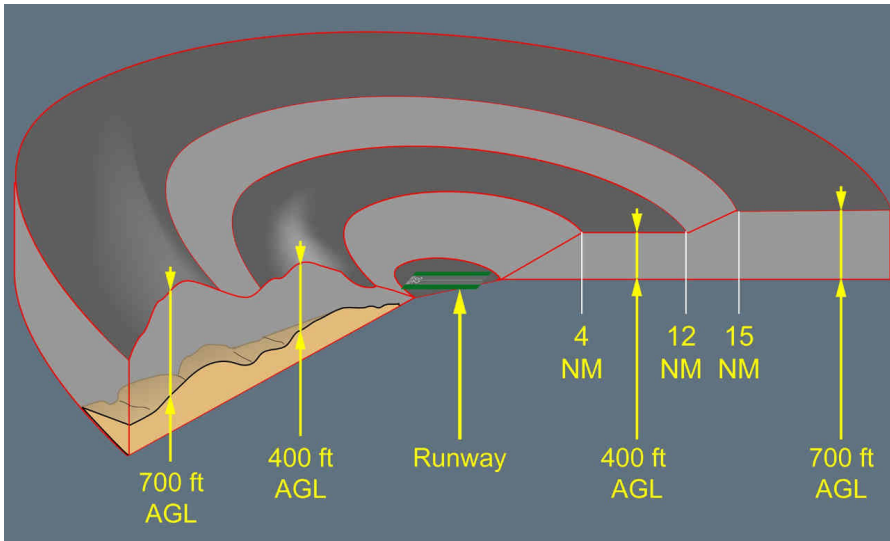
The TCF function is active during all the following flight phases: Takeoff, cruise and approach.

AIRCRAFT SYSTEMS

SURVEILLANCE

GPWS - PREDICTIVE GPWS FUNCTIONS

TCF Envelope



If the aircraft descends below the protection envelope, both of the following alerts are triggered:

- The "TOO LOW TERRAIN" aural alert, if the aircraft enters the envelope
- If the aircraft continues to descend below the envelope, the alert is triggered one time for every 20 % degradation in radio altitude
- The GPWS light of the GPWS pb-sw on each instrument panel comes on (*Refer to DSC-34-SURV-40-40 Instrument Panels*).

RUNWAY FIELD CLEARANCE FLOOR

Ident.: DSC-34-SURV-40-35-00006163.0002001 / 28 MAY 20

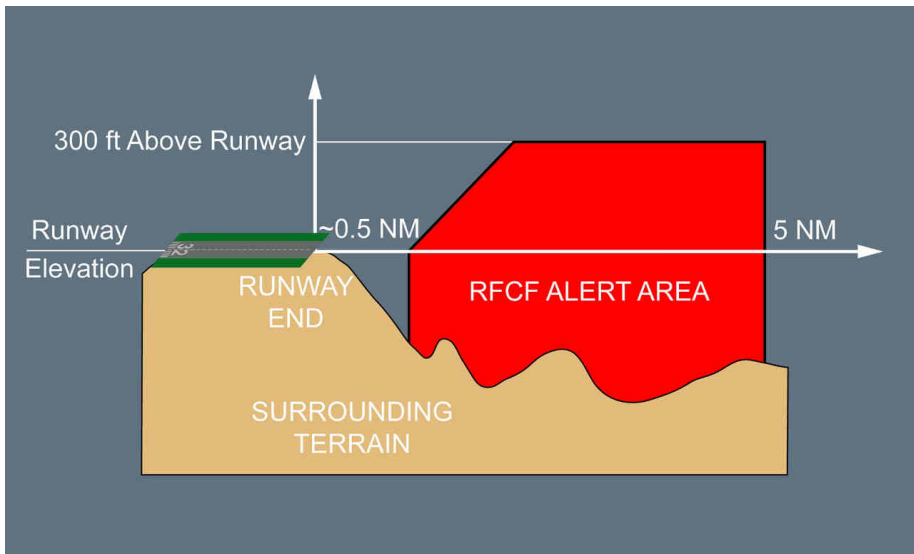
Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

The Runway Field Clearance Floor (RFCF) provides an additional protection envelope for runways that are at an elevation that is significantly more than the surrounding terrain.

The envelope is a circular band that starts within a specific distance of the runway. The width of this circular band depends on the runway. The envelope is based on both the geometric altitude and the runway elevation.

If the aircraft descends below this protection envelope, the "TOO LOW TERRAIN" aural and visual alerts are triggered.

RFCF



RUNWAY AWARENESS AND ADVISORY SYSTEM

Ident.: DSC-34-SURV-40-35-00013214.0001001 / 17 MAR 11

Applicable to: MSN 05152-05746

The Runway Awareness and Advisory System (RAAS) enhances the flight crew's awareness of the aircraft position on ground. The RAAS uses the EGPWS to trigger aural alerts in the three following cases:

- Approaching the runway: When the aircraft is within a specific distance from the runway, e.g. "Approaching three four left".
If the aircraft is within a specific distance from more than one runway, the "Approaching runways" aural alert is triggered
- On the runway: When the aircraft enters a runway and the aircraft heading aligns with the runway direction, e.g. "On runway three four left"
- Takeoff from the taxiway: When the aircraft speed exceeds 40 kt, while the aircraft is not on a runway, the "On taxiway! On taxiway!" aural alert is triggered.

AIRCRAFT SYSTEMS**SURVEILLANCE****GPWS - PREDICTIVE GPWS FUNCTIONS****GENERAL**

Ident.: DSC-34-SURV-40-35-00006159.0002001 / 23 JUN 15

Applicable to: MSN 02926-02944, 04392

The GPWS system :

- Correlates the current aircraft position to terrain and airport database.
- Computes a caution and a warning envelope ahead of the aircraft. This includes the determination of the climb prediction envelope for terrain avoidance, using the modeled climb capability of the aircraft.
- Displays the terrain hazards along the projected flight path ahead of the aircraft.
- Generates alerts described below.

While the predictive GPWS functions are operative, the basic GPWS Mode 2 is inhibited.

If the predictive GPWS functions fail or if there is significant difference between the radio height and the altitude computed by the T2CAS, the basic GPWS Mode 2 is reactivated.

GENERAL

Ident.: DSC-34-SURV-40-35-00006159.0003001 / 13 JAN 14

Applicable to: MSN 07784-07792

The GPWS system :

- Correlates the current aircraft position to terrain (and obstacle ) and airport database.
- Computes a caution and a warning envelope ahead of the aircraft. This includes the determination of the climb prediction envelope for terrain (and obstacle ) avoidance, using the modeled climb capability of the aircraft.
- Displays the terrain (and obstacle ) hazards along the projected flight path ahead of the aircraft.
- Generates alerts described below.

While the predictive GPWS functions are operative, the basic GPWS Mode 2 is inhibited.

If the predictive GPWS functions fail or if there is significant difference between the radio height and the altitude computed by the T3CAS, the basic GPWS Mode 2 is reactivated.

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ALERTS

Ident.: DSC-34-SURV-40-35-00006160.0014001 / 30 JUN 20

Applicable to: MSN 07784-07792

THE FOLLOWING TABLE PROVIDES THE RELEVANT WARNING AND CAUTION ALERTS

Alert Level	Aural alert	ND (Refer to DSC-31-45 GPWS (EGPWS))	Local alert
Warning	TERRAIN AHEAD, PULL UP	- Automatic terrain display ⁽¹⁾ - Solid red areas - TERR AHEAD (red)	The GPWS/PULL UP pb light comes on, on each pilot's instrument panel.
	OBSTACLE AHEAD, PULL UP 	- Automatic obstacle display ⁽¹⁾ - Solid red areas - OBST AHEAD (red) 	
	AVOID TERRAIN	- Automatic terrain display ⁽¹⁾ - Red/black crosshatched areas - TERR AHEAD (red)	
	AVOID OBSTACLE 	- Automatic obstacle display ⁽¹⁾ - Red/black crosshatched areas - OBST AHEAD (red) 	

Continued on the following page

AIRCRAFT SYSTEMS

SURVEILLANCE

GPWS - PREDICTIVE GPWS FUNCTIONS

Continued from the previous page

Alert Level	Aural alert	ND (Refer to DSC-31-45 GPWS (EGPWS))	Local alert
Caution	TERRAIN AHEAD	- Automatic terrain display ⁽¹⁾ - Solid yellow areas - TERR AHEAD (Amber)	The GPWS light of the GPWS/PULL UP pb comes on, on each pilot's instrument panel.
	OBSTACLE AHEAD 	- Automatic obstacle display ⁽¹⁾ - Solid yellow areas - OBST AHEAD (Amber)	
	TOO LOW TERRAIN	NIL	

- ⁽¹⁾ When the TERR ON ND pb is set to ON, and ARC or ROSE mode is selected, the ND displays the terrain (and obstacle ) memorized in the database, depending on the aircraft's position. The terrain (and obstacle ) are displayed in various densities of green, yellow, red, or magenta, depending on the threat, (Refer to DSC-31-45 Flags and Messages Displayed on ND). If an alert is generated (caution or warning), and TERR ON ND is not selected, the terrain (and obstacle ) are automatically displayed, and the ON light of the TERR ON ND pb comes on.

In case of low accuracy of the aircraft position computed by the FMGC, the predictive functions of the GPWS are automatically deactivated. The 5 GPWS basic modes remain active.

ALERTS

Ident.: DSC-34-SURV-40-35-00006160.0008001 / 30 JUN 20

Applicable to: MSN 02926-02944

THE FOLLOWING TABLE PROVIDES THE RELEVANT WARNING AND CAUTION ALERTS

Alert Level	Aural alert	ND (Refer to DSC-31-45 GPWS (EGPWS))	Local alert
Warning	TERRAIN AHEAD, PULL UP	- Automatic terrain display. ⁽¹⁾ - Solid red areas. - TERR AHEAD (red)	The GPWS/PULL UP pushbutton light comes on, on each pilot's instrument panel.
	AVOID TERRAIN	- Automatic terrain display. ⁽¹⁾ - Red/black crosshatched areas. - TERR AHEAD (red)	

Continued on the following page

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS SURVEILLANCE GPWS - PREDICTIVE GPWS FUNCTIONS
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Continued from the previous page

Alert Level	Aural alert	ND (Refer to DSC-31-45 GPWS (EGPWS))	Local alert
Caution	TERRAIN AHEAD	- Automatic terrain display.⁽¹⁾ - Solid yellow areas - TERR AHEAD (Amber)	The GPWS light of the GPWS/PULL UP pushbutton comes on, on each pilot's instrument panel.
	TOO LOW TERRAIN	NIL	

- ⁽¹⁾ When the TERR pb-sw ON ND is set to ON, and ARC or ROSE mode is selected, the ND displays the terrain memorized in the database, depending on the aircraft's position. The terrain is displayed in various densities of green, yellow, red, or magenta, depending on the threat, (Refer to DSC-31-45 Flags and Messages Displayed on ND). If an alert is generated (caution or warning), and TERR pb ON ND is not selected, the terrain is automatically displayed, and the ON light of the TERR pb-sw ON ND comes on.

In case of low accuracy of the aircraft position computed by the FMGC, the predictive functions of the GPWS are automatically deactivated. The 5 GPWS modes remain active.

ALERTS
Ident.: DSC-34-SURV-40-35-00006160.0010001 / 30 JUN 20 Applicable to: MSN 04392

THE FOLLOWING TABLE PROVIDES THE RELEVANT WARNING AND CAUTION ALERTS

Alert Level	Aural alert	ND (Refer to DSC-31-45 GPWS (EGPWS))	Local alert
Warning	TERRAIN TERRAIN, PULL UP	- Automatic terrain display.⁽¹⁾ - Solid red areas. - TERRAIN (red)	The GPWS/PULL UP pushbutton light comes on, on each pilot's instrument panel.
	AVOID TERRAIN	- Automatic terrain display.⁽¹⁾ - Red/black crosshatched areas. - TERRAIN (red)	

Continued on the following page

AIRCRAFT SYSTEMS

SURVEILLANCE

GPWS - PREDICTIVE GPWS FUNCTIONS

Continued from the previous page

Alert Level	Aural alert	ND (Refer to DSC-31-45 GPWS (EGPWS))	Local alert
Caution	CAUTION TERRAIN	- Automatic terrain display.⁽¹⁾ - Solid yellow areas - TERRAIN (Amber)	The GPWS light of the GPWS/PULL UP pushbutton comes on, on each pilot's instrument panel.
	TOO LOW TERRAIN	NIL	

- ⁽¹⁾ When the TERR pb-sw ON ND is set to ON, and ARC or ROSE mode is selected, the ND displays the terrain memorized in the database, depending on the aircraft's position. The terrain is displayed in various densities of green, yellow, red, or magenta, depending on the threat, (Refer to DSC-31-45 Flags and Messages Displayed on ND). If an alert is generated (caution or warning), and TERR pb-sw ON ND is not selected, the terrain is automatically displayed, and the ON light of the TERR pb-sw ON ND comes on.

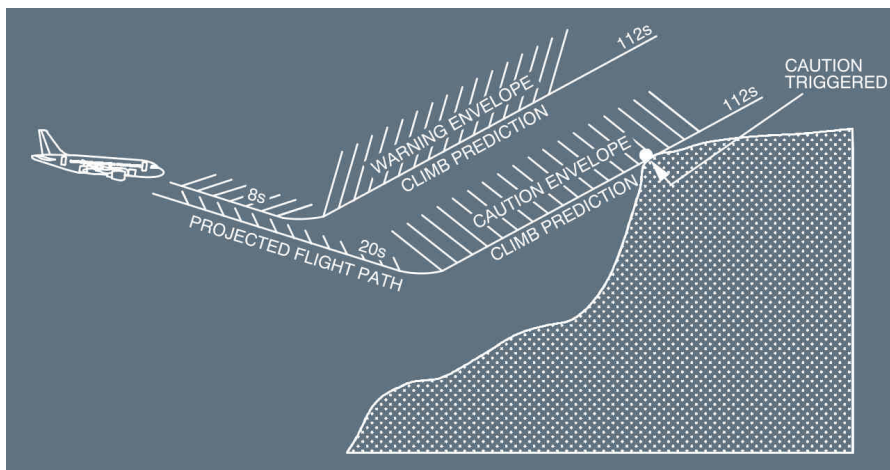
In case of low accuracy of the aircraft position computed by the FMGC, the predictive functions of the GPWS are automatically deactivated. The 5 GPWS modes remain active.

ALERTS ENVELOPES

Ident.: DSC-34-SURV-40-35-00006166.0007001 / 14 MAY 12

Applicable to: MSN 07784-07792

VERTICAL ENVELOPE



CAUTION ENVELOPE

The caution envelope extends along the flight path, from a distance of 20 s in front of the aircraft, to a constructed climb path, at a distance of 132 s in front of the aircraft.

If there is a conflict between the terrain caution envelope and the terrain data stored in the database, one of the following cautions is triggered:

- A "TERRAIN AHEAD" caution, if the terrain conflict is ahead of the aircraft.
- A "TOO LOW TERRAIN" caution, if the terrain conflict is below the aircraft, instead of ahead of the aircraft.

WARNING ENVELOPE

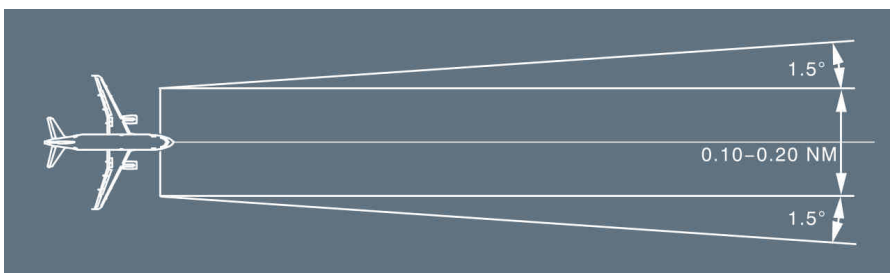
The warning envelope extends along the flight path, from a distance of 8 s in front of the aircraft, to a constructed climb path, at a distance of 120 s in front of the aircraft.

In a Mountainous Approach Area (MAA: Existence of terrain more than 2 000 ft above the runway and within 6 NM of this runway), this distance is linearly reduced to 30 s, to prevent nuisance alerts during low altitude maneuvers.

If there is a conflict between the terrain warning envelope ahead of the aircraft, and the terrain data stored in the database, one of the following warnings is triggered:

- A "TERRAIN AHEAD-PULL UP" warning, if the aircraft can climb over the terrain.
- An "AVOID TERRAIN" warning, if the aircraft cannot climb over the terrain with sufficient safety margin.

HORIZONTAL ENVELOPE



During turns, the sensor opens up into turns to determine if there are possible terrain conflicts (up to 90 °).

RUNWAY CONVERGENCE CRITERIA

When the aircraft enters the approach sector (approximately 2.7 NM or 5 km from the runway threshold), the system computes runway convergence criteria in order to inhibit the Terrain Awareness and Warning System (TAWS) predictive alerts. For more information on the inhibition

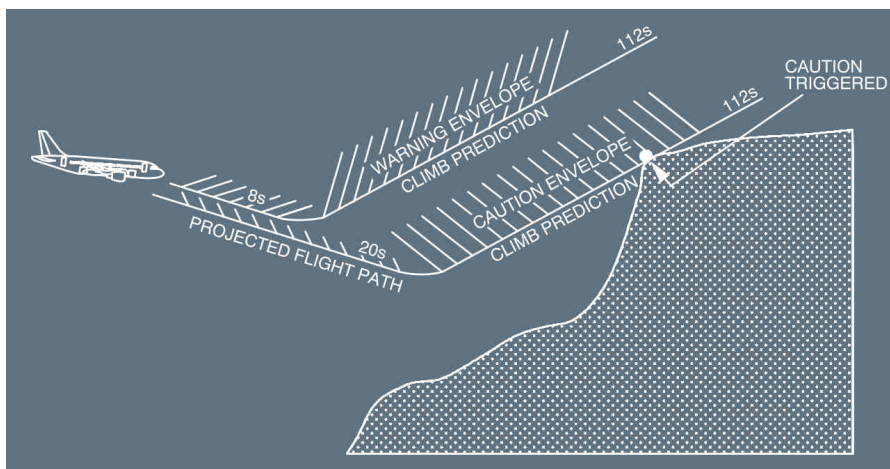
logic of the T3CAS. *Refer to DSC-34-SURV-40-35 Inhibition Logic of the GPWS Predictive Functions in Approach*

ALERTS ENVELOPES

Ident.: DSC-34-SURV-40-35-00006166.0003001 / 14 MAY 12

Applicable to: MSN 02926-02944

VERTICAL ENVELOPE



CAUTION ENVELOPE

The caution envelope extends along the flight path, from a distance of 20 s in front of the aircraft, to a constructed climb path, at a distance of 132 s in front of the aircraft.

If there is a conflict between the terrain caution envelope and the terrain data stored in the database, one of the following cautions is triggered:

- A "TERRAIN AHEAD" caution, if the terrain conflict is ahead of the aircraft.
- A "TOO LOW TERRAIN" caution, if the terrain conflict is below the aircraft, instead of ahead of the aircraft.

WARNING ENVELOPE

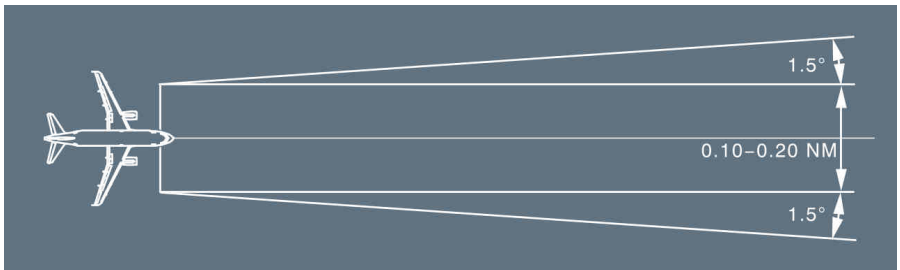
The warning envelope extends along the flight path, from a distance of 8 s in front of the aircraft, to a constructed climb path, at a distance of 120 s in front of the aircraft.

In a Mountainous Approach Area (MAA: Existence of terrain more than 2 000 ft above the runway and within 6 NM of this runway), this distance is linearly reduced to 30 s, to prevent nuisance alerts during low altitude maneuvers.

If there is a conflict between the terrain warning envelope ahead of the aircraft, and the terrain data stored in the database, one of the following warnings is triggered:

- A "TERRAIN AHEAD-PULL UP" warning, if the aircraft can climb over the terrain.
- An "AVOID TERRAIN" warning, if the aircraft cannot climb over the terrain with sufficient safety margin.

HORIZONTAL ENVELOPE



During turns, the sensor opens up into turns to determine if there are possible terrain conflicts (up to 90 °).

CONVERGENCE ENVELOPE

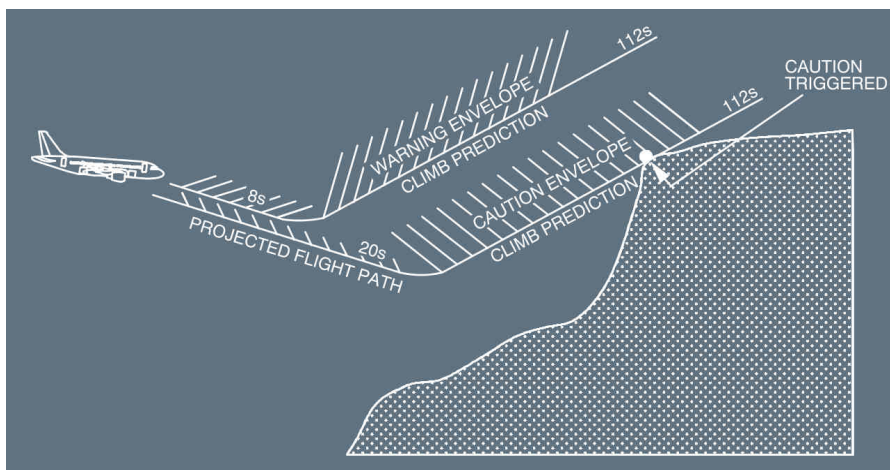
When the aircraft enters the approach sector (approximately 2.7 NM or 5 km from the runway threshold), the system computes runway convergence criteria in order to inhibit the Terrain Awareness and Warning System (TAWS) predictive alerts. For more information on the inhibition logic of the T2CAS. *Refer to DSC-34-SURV-40-35 Inhibition Logic of the GPWS Predictive Functions in Approach*

ALERTS ENVELOPES

Ident.: DSC-34-SURV-40-35-00006166.0006001 / 23 JUL 12

Applicable to: MSN 04392

VERTICAL ENVELOPE



CAUTION ENVELOPE

The caution envelope extends along the flight path, from a distance of 20 s in front of the aircraft, to a constructed climb path, at a distance of 132 s in front of the aircraft.

If there is a conflict between the terrain caution envelope and the terrain data stored in the database, one of the following cautions is triggered:

- A "CAUTION TERRAIN" caution, if the terrain conflict is ahead of the aircraft.
- A "TOO LOW TERRAIN" caution, if the terrain conflict is below the aircraft, instead of ahead of the aircraft.

WARNING ENVELOPE

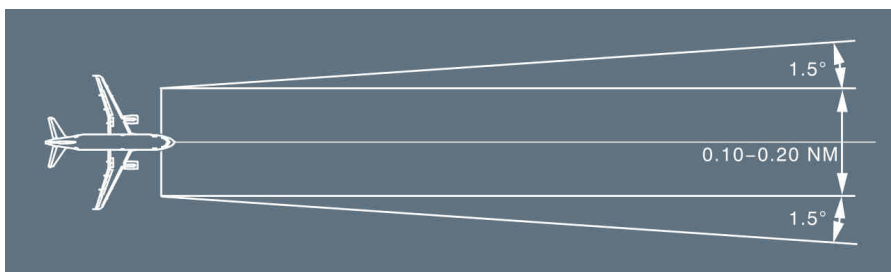
The warning envelope extends along the flight path, from a distance of 8 s in front of the aircraft, to a constructed climb path, at a distance of 120 s in front of the aircraft.

In a Mountainous Approach Area (MAA: Existence of terrain more than 2 000 ft above the runway and within 6 NM of this runway), this distance is linearly reduced to 30 s, to prevent nuisance alerts during low altitude maneuvers.

If there is a conflict between the terrain warning envelope ahead of the aircraft, and the terrain data stored in the database, one of the following warnings is triggered:

- A "TERRAIN TERRAIN PULL-UP" warning, if the aircraft can climb over the terrain.
- An "AVOID TERRAIN" warning, if the aircraft cannot climb over the terrain with sufficient safety margin.

HORIZONTAL ENVELOPE



During turns, the sensor opens up into turns to determine if there are possible terrain conflicts (up to 90 °).

CONVERGENCE ENVELOPE

When the aircraft enters the approach sector (approximately 2.7 NM or 5 km from the runway threshold), the system computes runway convergence criteria in order to inhibit the Terrain Awareness and Warning System (TAWS) predictive alerts. For more information on the inhibition logic of the T2CAS. *Refer to DSC-34-SURV-40-35 Inhibition Logic of the GPWS Predictive Functions in Approach*

INHIBITION LOGIC OF THE GPWS PREDICTIVE FUNCTIONS IN APPROACH

Ident.: DSC-34-SURV-40-35-00013669.0002001 / 17 MAR 17

Applicable to: MSN 07784-07792

In approach, as the aircraft is flying towards the ground, the runway convergence criteria will inhibit the Ground Proximity Warning System (GPWS) predictive functions. Therefore, depending on the convergence criterion, GPWS alert may not be triggered in the landing tunnel described below, even close to terrain.

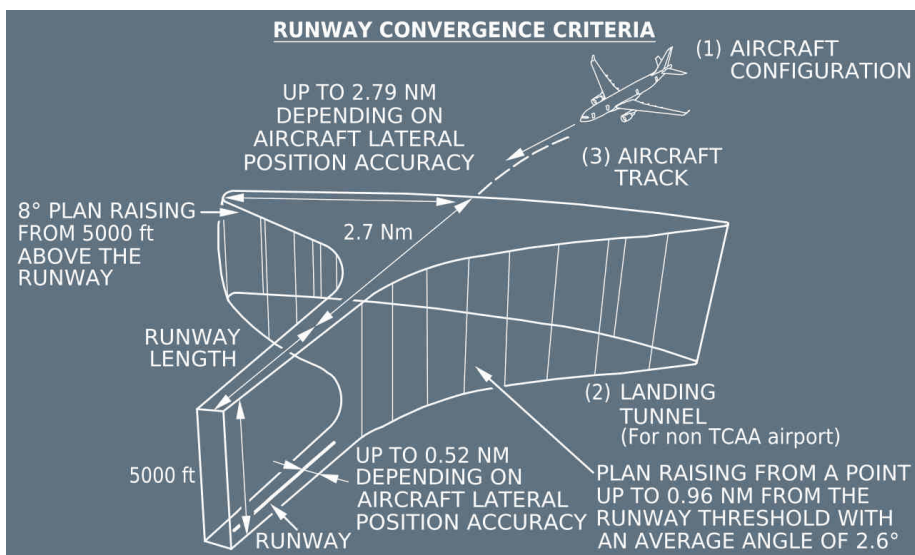
The main runway convergence criteria are the following:

- (1) Aircraft flaps/landing gear configuration,
- (2) Aircraft horizontal and vertical position from the runway threshold (landing tunnel criterion),
- (3) Aircraft track (convergence criterion).

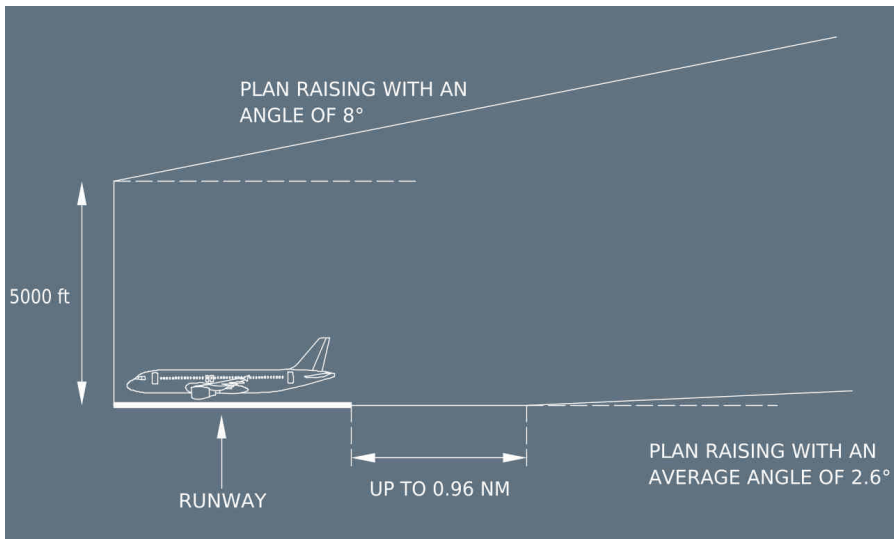
The airports stored in the terrain database are split into two categories:

- Airport flagged as Terrain Challenging Airport Area (TCAA),
- Airport not TCAA flagged.

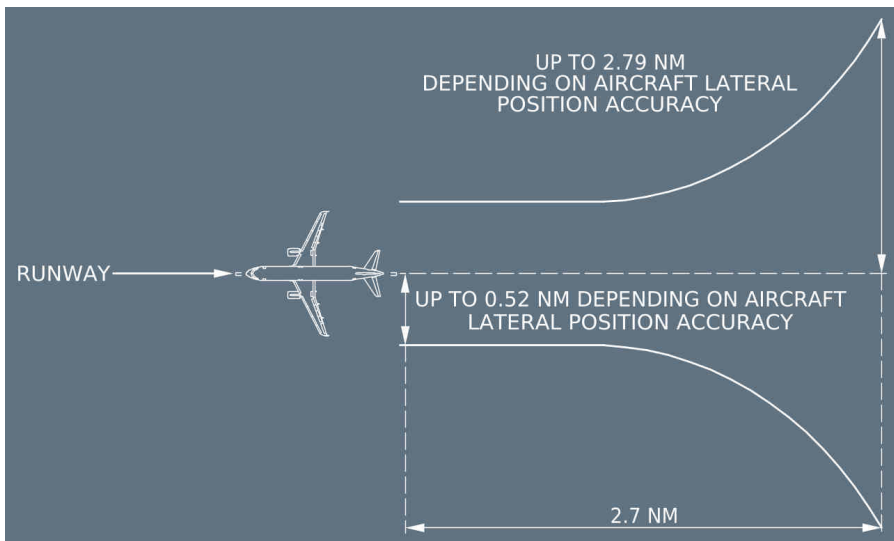
For TCAA flagged airports, the shape and dimensions of the landing tunnel are tailored to each TCAA airport while for non TCAA airports the landing tunnel shape and dimensions are described below.



LANDING TUNNEL - LATERAL VIEW (FOR NON TCAA AIRPORT)



LANDING TUNNEL - VIEW FROM ABOVE (FOR NON TCAA AIRPORT)



INHIBITION LOGIC OF THE GPWS PREDICTIVE FUNCTIONS IN APPROACH

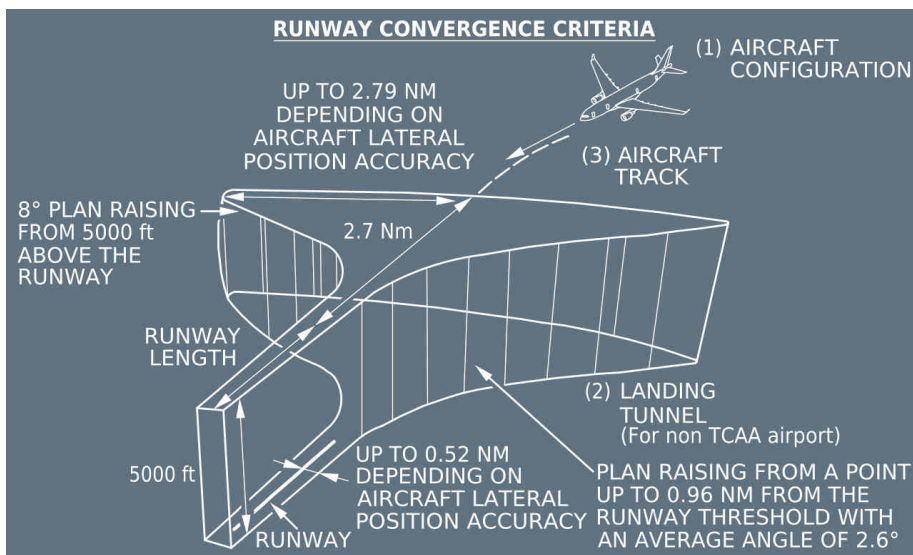
Ident.: DSC-34-SURV-40-35-00013669.0003001 / 17 MAR 17

Applicable to: MSN 02926-02944, 04392

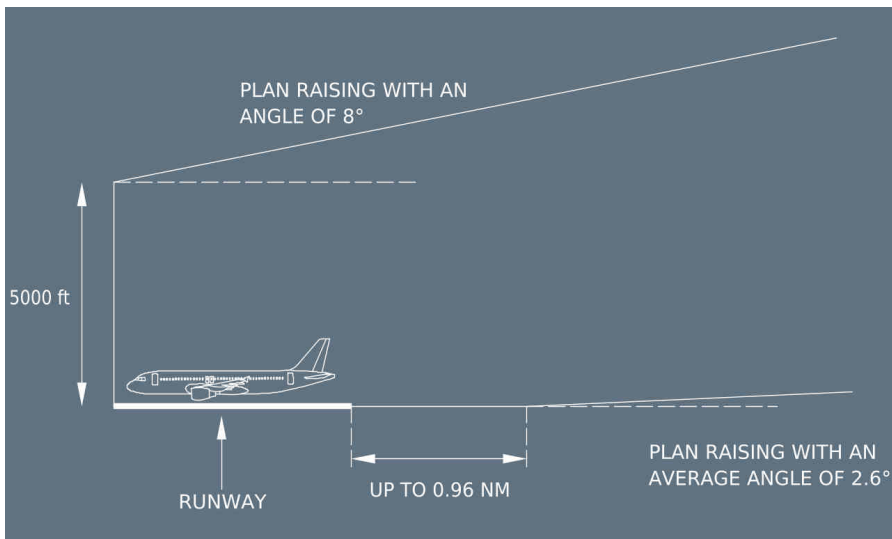
In approach, as the aircraft is flying towards the ground, the runway convergence criteria will inhibit the Ground Proximity Warning System (GPWS) predictive functions. Therefore, depending on the convergence criterion, GPWS alert may not be triggered in the landing tunnel described below, even close to terrain.

The main runway convergence criteria are the following:

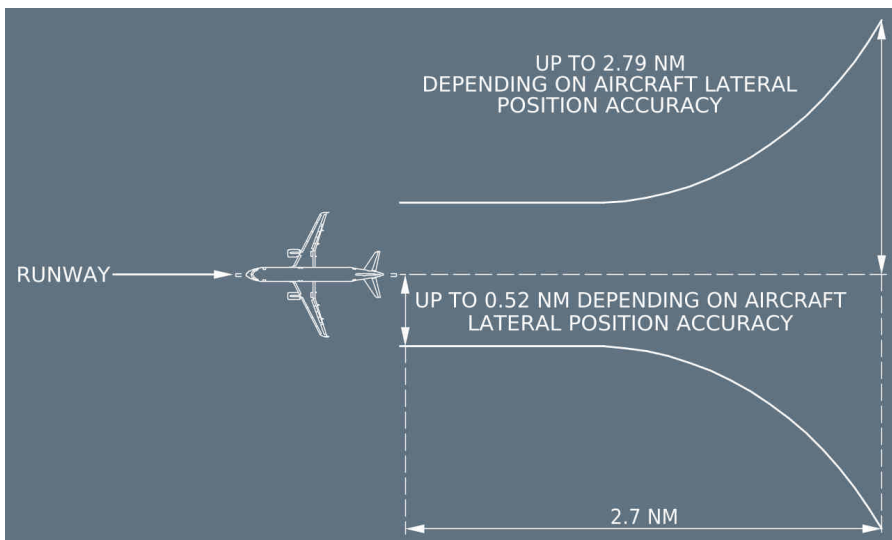
- (1) Aircraft flaps/landing gear configuration,
- (2) Aircraft horizontal and vertical position from the runway threshold (landing tunnel criterion),
- (3) Aircraft track (convergence criterion).



LANDING TUNNEL (LATERAL VIEW)



LANDING TUNNEL (VIEW FROM ABOVE)



AIRCRAFT SYSTEMS

SURVEILLANCE

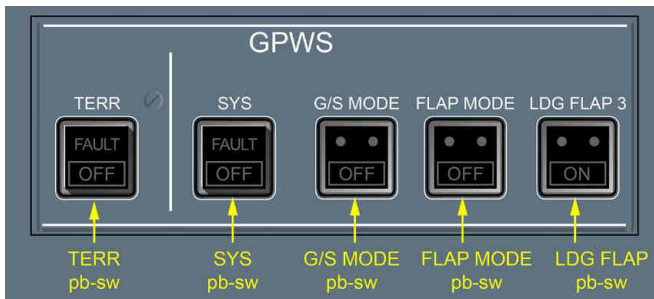
GPWS - PREDICTIVE GPWS FUNCTIONS

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OVERHEAD PANEL

Ident.: DSC-34-SURV-40-40-00001418.0007001 / 10 NOV 25

Applicable to: ALL


1 SYS pb-sw


All basic GPWS alerts (mode 1 to 5) are inhibited. The **NAV GPWS FAULT** alert is triggered.



Basic GPWS mode 1 to 5 are failed. The **NAV GPWS FAULT** alert is triggered.

Note: If ILS 1 (or GLS $\triangleleft$ 1 or SLS $\triangleleft$ 1) fails, only GPWS mode 5 is lost. The **NAV GPWS FAULT** alert does not trigger. On ground, the GPWS FAULT light turns on. In flight, the GPWS FAULT light does not turn on, while GPWS modes 1 to 4 are operative.

G/S MODE pb-sw


Glide slope mode (mode 5) is active.



Glide slope mode (mode 5) is inhibited.

FLAP MODE pb-sw



Flap mode ("TOO LOW FLAPS" mode 4) is active.



Flap mode ("TOO LOW FLAPS" mode 4) is inhibited (to avoid nuisance warning in the case of landing with flaps setting reduced).

LDG FLAP 3 pb-sw



Flap mode is not inhibited when CONF 3 is selected.



Flap mode is inhibited when CONF 3 is selected (to avoid nuisance warning in the case of landing in CONF 3).

LDG MEMO displays **FLAPS...3** instead of **FLAPS...FULL**.

2 TERR pb-sw



The predictive modes of the GPWS are inhibited. The basic GPWS modes 1 to 5 are operative.

The inhibition of predictive GPWS modes may lead to nuisance alerts of the basic GPWS mode 2 alerts on approaches with sudden radio altitude changes (e.g. cliff on the approach path).

The ROW/ROP  and the TLM  functions are inhibited.

RNP AR operations are not permitted.



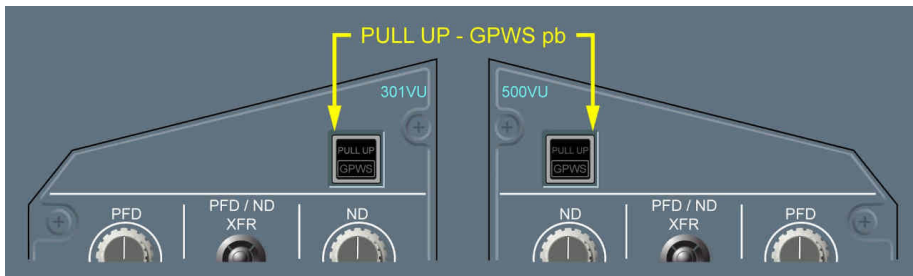
Predictive GPWS modes are failed. The **NAV GPWS TERR DET FAULT** alert is triggered. The terrain is not shown on the ND.

Note: The basic GPWS modes 1 to 5 are still operative when the SYS pb-sw OFF light or the SYS pb-sw FAULT light are not illuminated.

INSTRUMENT PANELS

Ident.: DSC-34-SURV-40-40-00001419.0029001 / 21 MAY 24

Applicable to: MSN 02926-02944, 04392, 07784-07792


PULL UP – GPWS pb

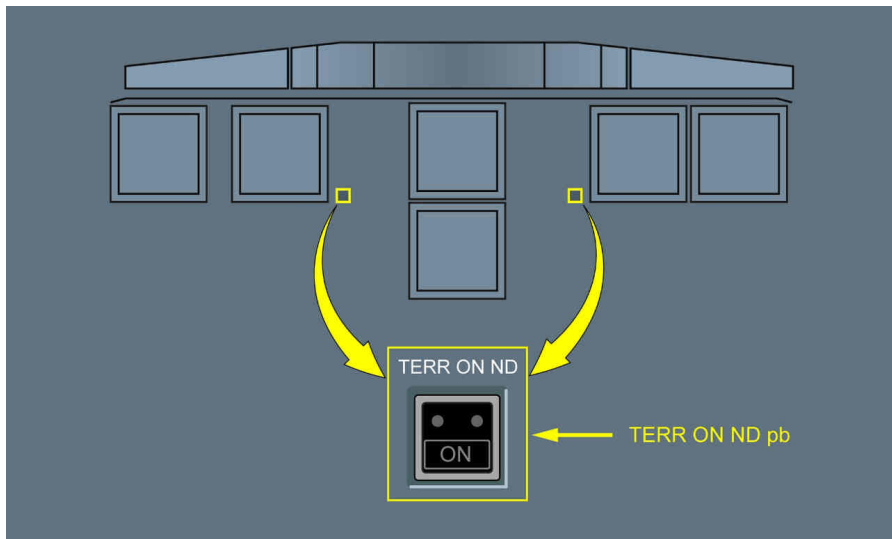

Comes on when the second boundary of mode 1 is penetrated or when the mode 2 is activated.

A “PULL UP” or “TERRAIN - TERRAIN PULL UP” aural alert is associated.



Comes on when any other mode is activated. It is associated with a corresponding aural alert.

- Note:**
1. If the flight crew briefly presses the PULL UP – GPWS pb when mode 5 alert is heard, the GPWS light goes off and the aural alert stops.
 2. On the ground only, the flight crew presses this pb to test the GPWS.



TERR ON ND pb

These pbs are on both sides of the ECAM. Each pb controls the onside terrain display.



The terrain appears on the ND if all of the following apply:

- TERR ON ND pb-sw is set to ON
- TERR FAULT light is not on
- TERR STBY ECAM memo does not appear
- The FMGS navigation accuracy is high.

The ON light comes on.



The terrain data does not appear on the ND.

- Note:
1. If the predictive functions of the GPWS generate a caution or a warning, while the TERR ON ND pb is off, the terrain automatically appears on the NDs and the ON light of the TERR ON ND pb comes on.
 2. To be able to identify the difference between the terrain and the weather display, the terrain display goes from the center outward to both sides of the ND.
 3. The terrain and obstacles image appears on the ND if:
 - The aircraft is within 2 000 ft above the terrain, and
 - The TERR ON ND pb is pressed, or automatically, in case of terrain caution(warning) alerts

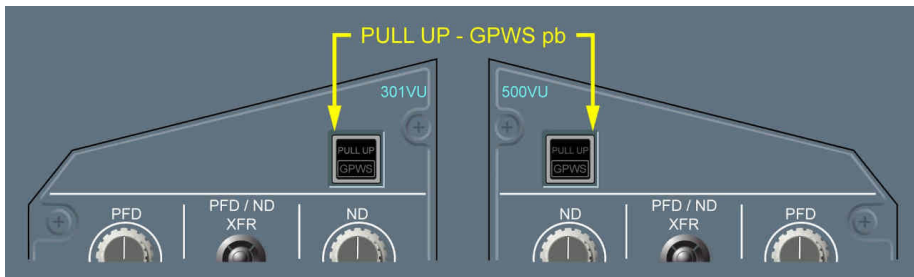
Depending on the capacity of the TAWS system installed (e.g. with Eleview or Peaks functions), the terrain can display the highest and lowest geographic terrain elevations for the selected ND range. The terrain can also increase situation awareness, regardless of the aircraft altitude.

If the terrain(obstacle) image is being automatically displayed on the ND, if the flight crew presses the TERR ON ND pb, the terrain(obstacle) image no longer appears.

INSTRUMENT PANELS

Ident.: DSC-34-SURV-40-40-00001419.0009001 / 28 MAY 20

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746



PULL UP – GPWS pb

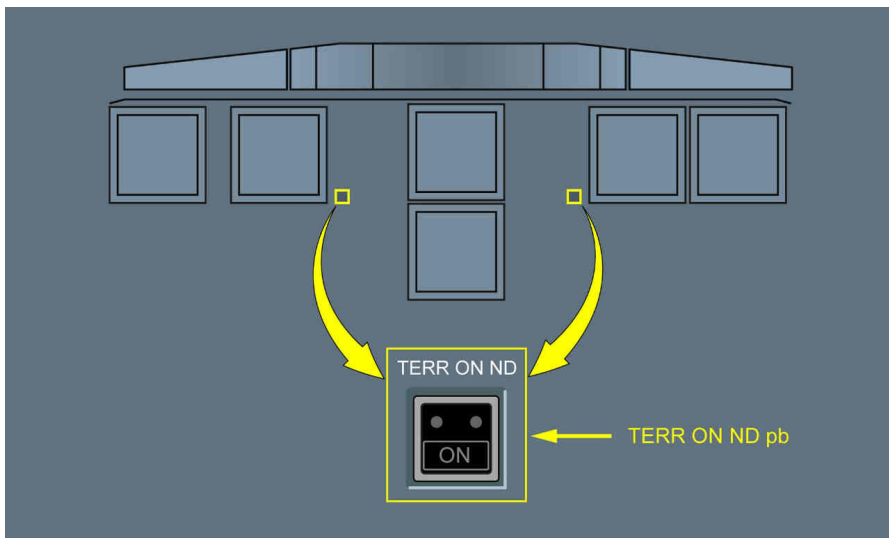


Comes on to give a visual indication, when a PULL UP warning is triggered in modes 1, 2, and TAD. The corresponding aural alert sounds.



Comes on when any other mode is activated. The corresponding aural alert sounds.

- Note:
1. If the flight crew briefly presses this button when one of these modes is activated, the GPWS light goes off and the aural alert stops.
 2. On the ground, the flight crew presses this pb to test the GPWS. If the flight crew briefly presses this pb, some of the aural alerts sound and the pb captions, associated with the GPWS come on. If the flight crew continuously presses this pb, all the aural alerts sound.



TERR ON ND pb

These pb are on both sides of the ECAM. Each pb controls the onside terrain display.



The terrain appears on the ND if both of the following apply:

- TERR ON ND pb-sw is set to ON
- TERR FAULT light is not on.

The ON light comes on.



The terrain data does not appear on the ND.

- Note:
1. If the TAD mode generates a caution or a warning while the **TERR ON ND pb** is off, the terrain automatically appears on the NDs. In addition, the **ON** light of the **TERR ON ND pb** will come on.
 2. To be able to identify the difference between the terrain and the weather display, the terrain display goes from the center outward to both sides of the ND.
 3. The terrain and obstacles image appears on the ND if:
 - The aircraft is within 2 000 ft above the terrain, and
 - The **TERR ON ND pb** is passed, or automatically, in case of terrain caution(warning) alerts

Depending on the capacity of the TAWS system installed (e.g. with Eleview or Peaks functions), the terrain can display the highest and lowest geographic terrain elevations for the selected ND range. The terrain can also increase situation awareness, regardless of the aircraft altitude.

If the terrain(obstacle) image is being automatically displayed on the ND, if the flight crew presses the **TERR ON ND pb**, the terrain(obstacle) image no longer appears.

MEMO DISPLAY

Ident.: DSC-34-SURV-40-40-A-00017057.0001001 / 21 MAR 16

Applicable to: ALL

GPWS FLAP 3 : This memo appears in green when GPWS LDG FLAP 3 pb-sw is ON.

Ident.: DSC-34-SURV-40-40-A-00017058.0001001 / 21 MAR 16

Applicable to: ALL

GPWS FLAP MODE OFF : This memo appears in green when GPWS FLAP MODE pb-sw is OFF.

Ident.: DSC-34-SURV-40-40-A-00017060.0004001 / 21 MAR 16

Applicable to: ALL

The **TERR OFF** memo appears when the **TERR** pb-sw is OFF.

TERR OFF : This memo appears in green when:

- The aircraft is in flight phase 2, before the Take Off Configuration test is launched.
- The aircraft is in flight phase 6.

TERR OFF : This memo appears in amber when:

- The aircraft is in flight phase 2, after the Take Off Configuration test.
- The aircraft is in flight phases 3, 4, 5, 7, 8 and 9.

AIRCRAFT SYSTEMS**SURVEILLANCE****GPWS - CONTROLS AND INDICATORS****TERR STBY**

Ident.: DSC-34-SURV-40-40-A-00017059.0007001 / 21 MAR 16

Applicable to: MSN 02155-02212, 03031-03060, 05152-05746

TERR STBY : Airborne TERR STBY memo appears in green when the aircraft position accuracy (computed by the EGPWS) is not sufficient to allow the enhanced TCF and TAD modes to operate. These modes are not available until the TERR STBY memo disappears. If selected, the terrain data display on ND is automatically deselected when the TERR STBY memo is triggered.

Ident.: DSC-34-SURV-40-40-A-00017059.0004001 / 21 MAR 16

3 Applicable to: MSN 07784-07792

TERR STBY : This memo appears in green when any required predictive function input is missing or considered invalid. The predictive functions are not available, until the TERR STBY memo disappears. If selected, the terrain data display on the ND is automatically deselected when the TERR STBY memo is triggered.

Ident.: DSC-34-SURV-40-40-A-00017059.0003001 / 21 MAR 16

4 Applicable to: MSN 02719-02944, 04392

TERR STBY : Airborne TERR STBY memo appears in green when the aircraft position accuracy (provided by the FMS) is not sufficient to allow the enhanced TCF and TAD modes to operate. These modes are not available until the TERR STBY memo disappears. If selected, the terrain data display on ND is automatically deselected when the TERR STBY memo is triggered.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS SURVEILLANCE TCAS - DESCRIPTION
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OVERVIEW

Ident.: DSC-34-SURV-60-10-00020407.0001001 / 21 MAR 17

Applicable to: ALL

The Traffic alert and Collision Avoidance System (TCAS):

- Detects and displays surrounding aircraft that have a transponder
- Calculates and display possible collision threats
- Triggers vertical speed orders, in order to avoid collisions.

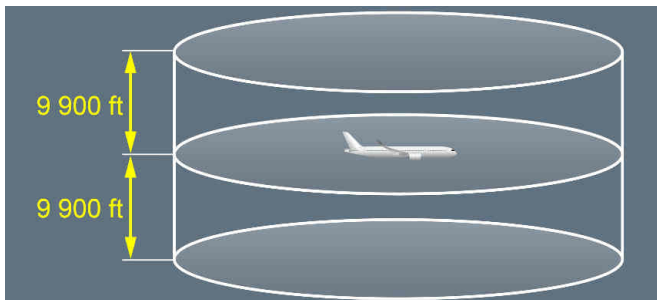
PRINCIPLE

Ident.: DSC-34-SURV-60-10-00020408.0001001 / 05 JUN 18

Applicable to: ALL

The TCAS detection capability is limited to intruders flying within a maximum range of 30 NM on either sides and approximately 30 NM to 80 NM longitudinally (depending on aircraft configuration and external conditions), and within a maximum altitude range of 9 900 ft above and below the aircraft.

TCAS Range



The TCAS obtains data transmitted by the transponders of nearby aircraft, and uses this data to evaluate possible collision threats.

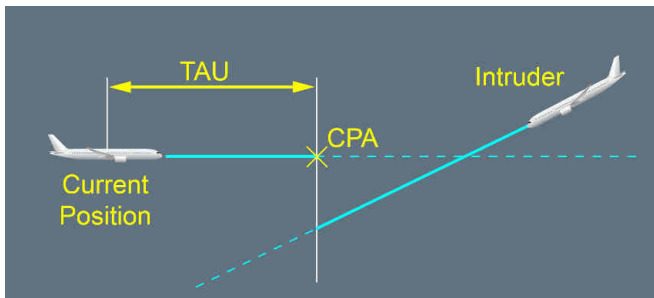
The TCAS determines:

- The bearing of intruders, in relation to the bearing of the aircraft.
- The distance between the aircraft and intruders, and the rate of separation or closure.
- The relative altitude of intruders, if intruders report their altitude via a Mode-C or Mode-S transponder.

The TCAS then calculates the intruder trajectory, the Closest Point of Approach (CPA), and the estimated time (TAU) before reaching the CPA.

The TAU is the ratio between the distance that separates both aircraft, and the sum of their speed.

TAU Definition



If the TCAS detects that the trajectory of an intruder may be a collision threat, it triggers:

- Audio and visual indicators
- Vertical speed orders, to ensure a sufficient trajectory separation and a minimal vertical speed variation considering all intruders.

MAIN COMPONENTS

Ident.: DSC-34-SURV-60-10-00020409.0001001 / 21 MAR 17

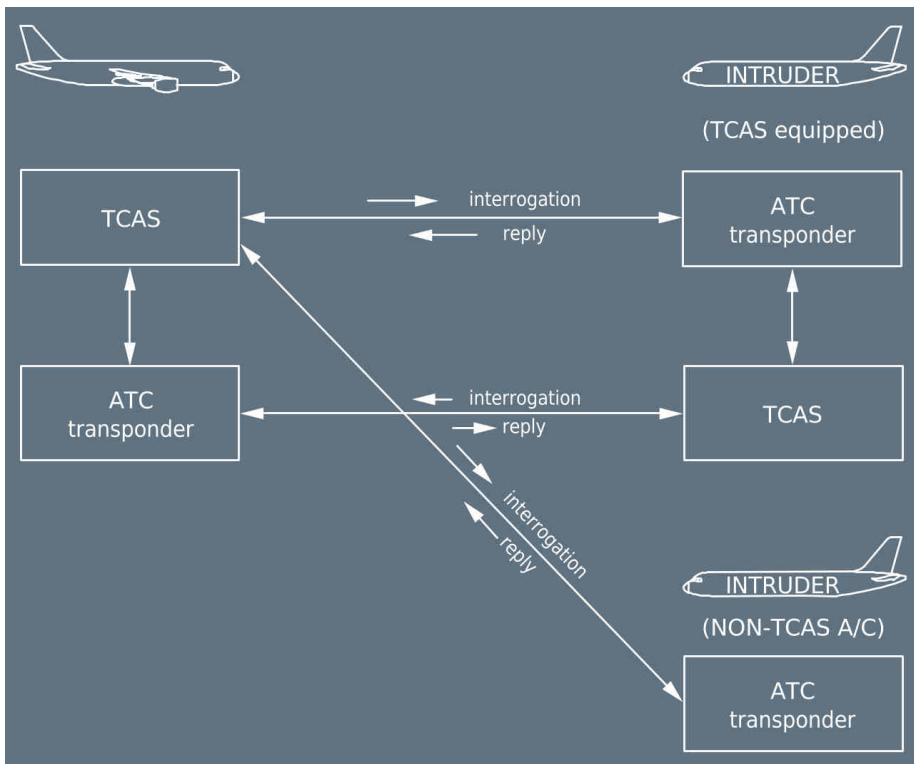
Applicable to: **ALL**

The system includes:

- A single channel TCAS computer
- Two TCAS antennas
- Two mode S ATC transponders, one active the other in standby

These transponders allow:

- Interface between the ATC/TCAS control panel and the TCAS computer
- Communication between the aircraft and intruders equipped with a TCAS system.
- An ATC/TCAS control panel.



INTRUDER DETECTION CATEGORIES

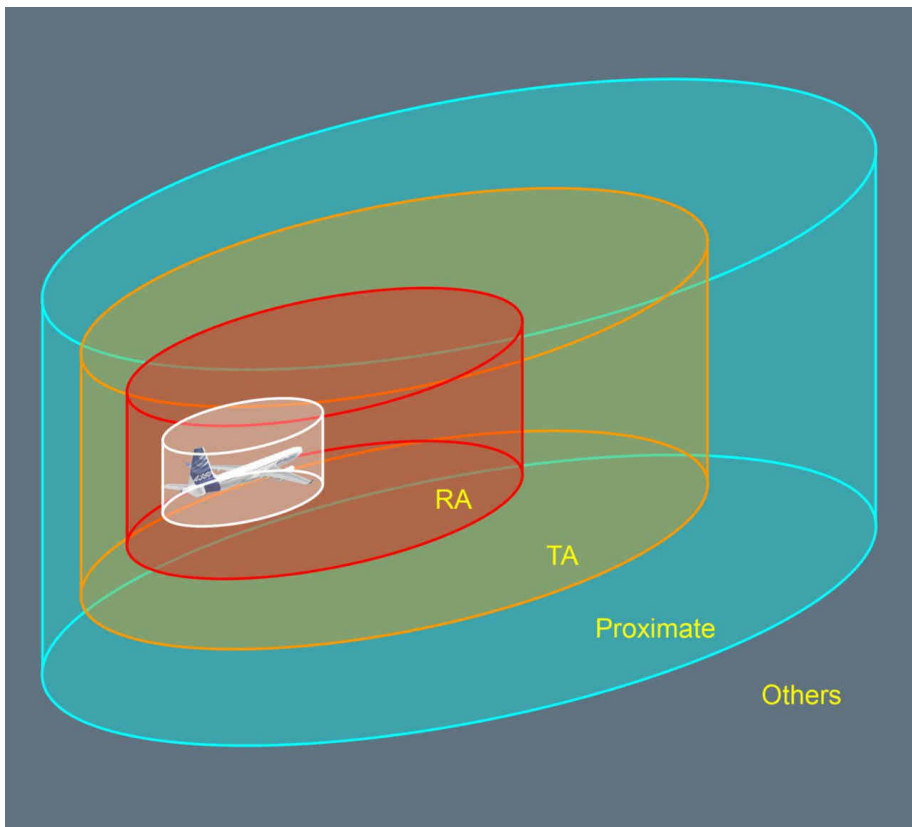
Ident.: DSC-34-SURV-60-10-00020410.0001001 / 28 NOV 19

Applicable to: ALL

The TCAS divides the space surrounding the aircraft into the following four zones, in order to evaluate and categorize possible collision threats:

- Resolution Advisory (RA)
- Traffic Advisory (TA)
- Proximate intruders
- Other intruders.

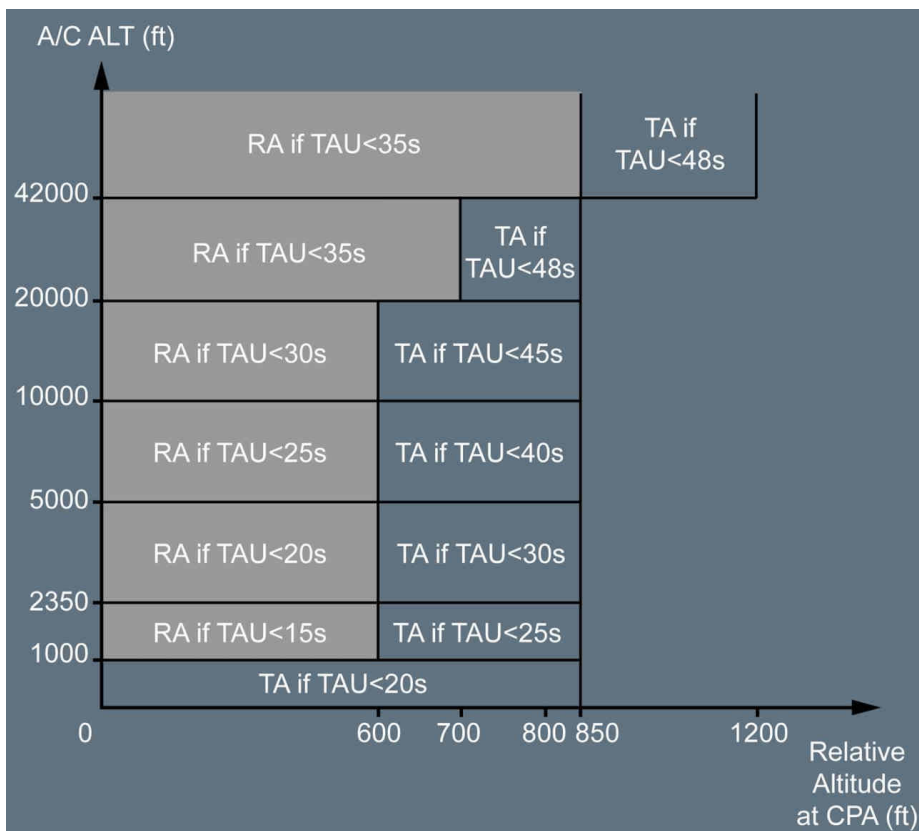
TCAS Envelopes



Depending on the level of the collision threat, the TCAS triggers audio and visual indicators::

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LEVEL	INTRUDER POSITION	DISPLAYED INFORMATION AND MESSAGE	
Other intruders	- No collision threat - Any non proximate, TA, RA within the surveillance envelope (lateral range: Closer than 30 NM)	- ND: Intruder position	
Proximate	- No collision threat - Intruder in the vicinity of the A/C (closer than 6 NM laterally and ±1200 ft vertically)	- ND: Intruder position	
Traffic Advisory (TA)	- Potential collision threat - TAU is about 40 s	- ND: Intruder position - Aural messages	
Resolution Advisory (RA)	- Real collision threat - TAU is about 25 s	- ND: Intruder position - Aural messages - PFD: Vertical orders • Maintain actual V/S (Preventive Advisory) or • Modify V/S (Corrective Advisory)	

TA/RA thresholds



 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS SURVEILLANCE TCAS - DESCRIPTION
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TCAS MODES

Applicable to: ALL

Ident.: DSC-34-SURV-60-10-10-00020411.0001001 / 21 MAR 17

TCAS MODES

The TCAS has three different modes of operations that can be selected on the ATC / TCAS control panel:

- The Traffic Advisory/Resolution Advisory (TA/RA) mode
- The Traffic Advisory Only (TA ONLY) mode
- The standby (STBY) mode.

Ident.: DSC-34-SURV-60-10-10-00020412.0001001 / 21 MAR 17

TRAFFIC ADVISORY/RESOLUTION ADVISORY (TA/RA) MODE

The TA/RA mode is the normal TCAS operating mode that enables:

- The ND to display all intruders
- The PFD to display the vertical speed orders that indicate the vertical direction that the aircraft should take, in order to avoid a collision.

Ident.: DSC-34-SURV-60-10-10-00020413.0001001 / 21 MAR 17

TRAFFIC ADVISORY ONLY (TA ONLY) MODE

The TA ONLY mode can be selected:

- Manually in case of aircraft degraded performance (engine failure, landing gear extended), or in specific airports, and for specific procedures (identified by operators) that may provide RA that are neither wanted nor appropriate (e.g. closely-spaced parallel or converging runways)
- Automatically, if TA/RA mode is previously selected and:
 - The windshear alert is triggered
 - The stall warning is triggered
 - GPWS alerts are triggered
 - Aircraft is below 1 000 ft AGL.

When the TCAS is operating in TA ONLY mode:

- All RAs are inhibited and converted into TAs
- TA threshold is set to TAU ≤ 20 s, irrespective of the aircraft altitude
- No vertical speed advisories are indicated on the PFDs
- "TA ONLY" is displayed on the NDs

Ident.: DSC-34-SURV-60-10-10-00020414.0001001 / 21 MAR 17

STANDBY MODE

In the standby mode, the advisory generation and surveillance functions are not active. The TCAS does not trigger any alert. No TCAS information can be displayed on the PFDs and NDs.

AP/FD TCAS

Ident.: DSC-34-SURV-60-10-10-00020415.0002001 / 18 MAY 22

Applicable to: MSN 07784-07792**MODE**

The AP/FD TCAS mode is a vertical guidance mode of the AP/FD. In the case the TCAS generates a Resolution Advisory (RA) alert, this mode automatically engages to assist the flight crew to follow the RA orders, and to revert toward initial trajectory:

- Automatically if the AP is engaged, or
- Manually with the guidance of the Flight Director (FD), if the AP is not engaged.

The AP/FD TCAS mode optimizes the vertical speed for a rapid and appropriate response to an RA, and minimizes the deviations from the latest ATC clearance.

When the TCAS is operating in TA ONLY mode, the AP/FD TCAS mode is inhibited.

INTRUDER DETECTION

Based on the received information from the intruders, the TCAS may generate the following sequence of alerts:

● If the TCAS considers the intruder to be a possible collision threat

- It generates a visual and aural Traffic Advisory (TA).
- In that case, the AP/FD TCAS mode automatically arms: **TCAS** appears on the FMA to inform the flight crew that the AP/FD TCAS mode will be available in the case a Resolution Advisory (RA) is subsequently triggered.

● If the TCAS considers the intruder to be a real collision threat:

- It generates a visual and aural Resolution Advisory (RA).
- The AP/FD TCAS mode automatically engages: **TCAS** appears on the FMA. The flight crew has vertical guidance to fly the RA orders, automatically with the AP/FD, or manually with the FDs only (if AP was not engaged).

- If the A/THR is disconnected, it automatically becomes armed or active, depending on the thrust lever position. When active, the speed/Mach mode engages, and the speed/Mach control becomes selected. For more information, *Refer to DSC-22_30-40-100 Normal Operations - When a RA is triggered - Consequence on A/THR and Speed/Mach Control.*
- The vertical speed scale on the PFD indicates the vertical speed range within which the aircraft should fly.

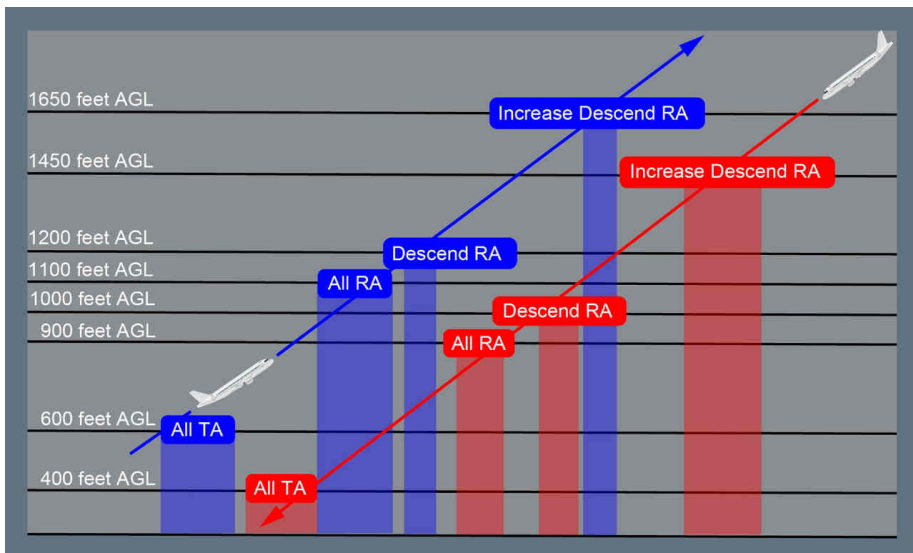
● **When the TCAS considers that there is no more collision threat:**

- It triggers the "CLEAR OF CONFLICT" aural alert.
- In most of the cases, the AP/FD TCAS mode automatically reverts to V/S mode: The vertical speed target leads the aircraft toward the FCU selected altitude. If the altitude capture conditions are met at the clear of conflict, the AP/FD TCAS mode can revert to an altitude acquire, or an altitude hold mode. *Refer to DSC-22_30-40-100 Normal Operations - When a RA is triggered - Consequence on AP/FD Vertical Mode.*

ADVISORY INHIBITION

Ident.: DSC-34-SURV-60-10-00020416.0007001 / 05 MAY 22

Applicable to: ALL



Some advisories are inhibited depending on the aircraft altitude:

- All intruders flying below 380 ft AGL when the own aircraft altitude is below 1 750 ft AGL in climb or 1 650 ft AGL in descent
- All TA aural messages below 600 ft AGL in climb or below 400 ft AGL in descent
- All RA aural messages below 1 100 ft AGL in climb or 900 ft AGL in descent. In this case, the RA are converted into TA
- “Descend” RA below 1 200 ft AGL in climb or 1 000 ft AGL in descent
- “Increase Descent” RA below 1 650 ft AGL in climb or 1 450 ft AGL in descent
- The AP/FD TCAS  flight guidance mode is inhibited below 900 ft.

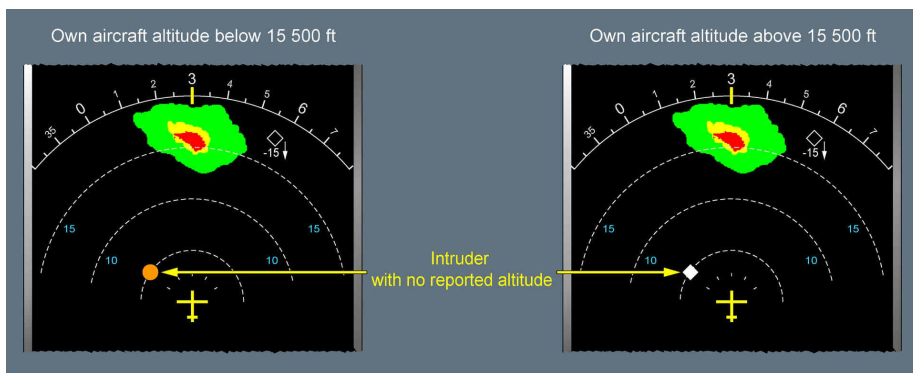
TCAS INTRUDER WITH NO REPORTED ALTITUDE

Ident.: DSC-34-SURV-60-10-00022303.0001001 / 05 JUN 18

Applicable to: ALL

For intruders that do not report their altitude:

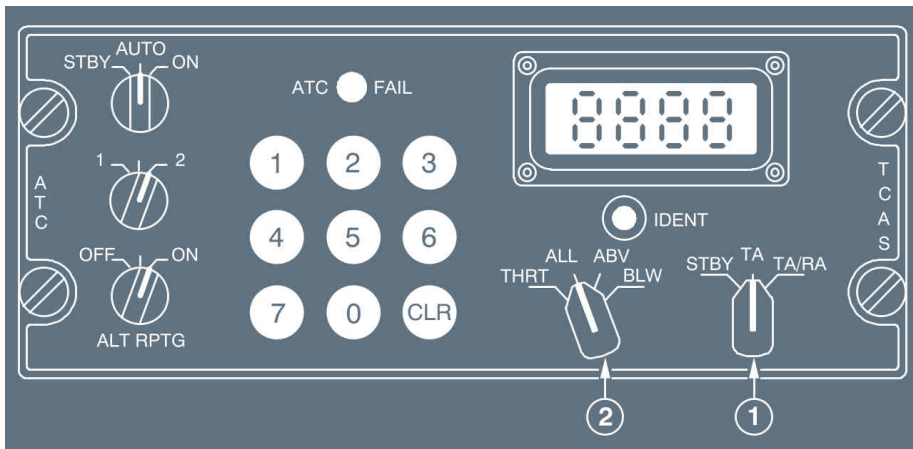
- The relative altitude does not appear on ND
- The TCAS never triggers any RA
- The TCAS inhibits the TA when own aircraft altitude is above 15500 ft.



ATC/TCAS PANEL

Ident.: DSC-34-SURV-60-20-00001429.0004001 / 01 OCT 12

Applicable to: MSN 02155-03060, 05152-07792



(1) Mode sel

TA/RA : Normal position.

The RAs, TAs and proximate intruders are displayed if the ALT RPTG switch is ON and the transponder is not on STBY.

TA : The TCAS does not generate any vertical orders. This mode should be used, in case of degraded aircraft performance (engine failure, landing gear extended, or approach on parallel runways).

All RAs are converted into TAs. TAs, proximate and intruders are displayed if the ALT RPTG switch is ON and the transponder is not on STBY
The "TA ONLY" white memo is displayed on the NDs.

STBY : The TCAS is on standby.

(2) TRAFFIC sel

THRT : Proximate and other intruders are displayed only if a TA or RA is present, and they are within 2 700 ft above and 2 700 ft below the aircraft.

ALL : Proximate and other intruders are displayed even if no TA or RA is present (full time function). The altitude range is -2700 ft to +2 700 ft.

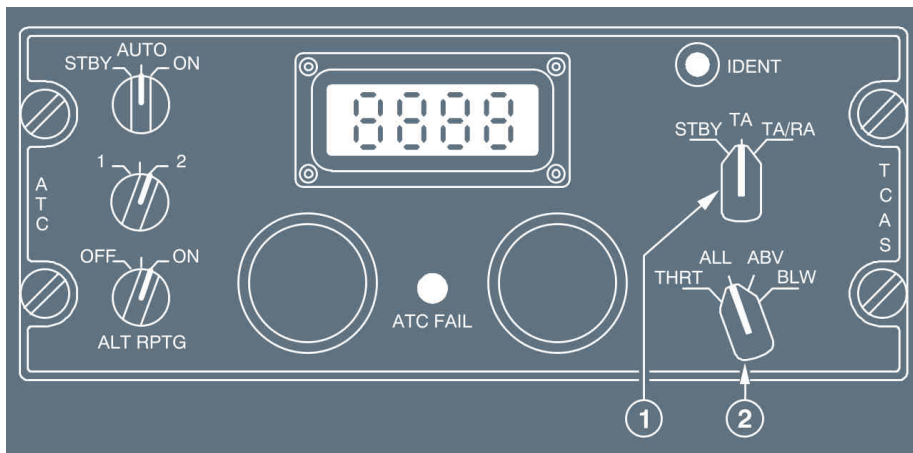
ABV : The same as ALL, except that the other intruders are displayed if within 9 900 ft above the aircraft and 2 700 ft below.

BLW : The same as ALL, except that the other intruders are displayed if within 9 900 ft below the aircraft and 2 700 ft above.

ATC/TCAS PANEL

Ident.: DSC-34-SURV-60-20-00001429.0063001 / 01 OCT 12

Applicable to: MSN 04392


(1) TCAS mode selector

TA/RA : Normal position.

The RAs, TAs and proximate intruders are displayed if the ALT RPTG switch is ON and the transponder is not on STBY.

TA : The TCAS does not generate any vertical orders. This mode should be used, in case of degraded aircraft performance (engine failure, landing gear extended, or approach on parallel runways).

All RAs are converted into TAs. TAs, proximate and intruders are displayed if the ALT RPTG switch is ON and the transponder is not on STBY

The "TA ONLY" white memo is displayed on the NDs.

STBY : The TCAS is in standby.

(2) TRAFFIC sel

THRT : Proximate and other intruders are displayed only if a TA or a RA is present at the same time.

ALL : The other and proximate intruders are displayed even if no TA or RA is present at the same time (full time function)

- ABV : The other intruders are displayed within 9 900 ft above the aircraft and 2 700 ft below
- BLW : The other intruders are displayed within 9 900 ft below the aircraft and 2 700 ft above

ND INDICATIONS

Ident.: DSC-34-SURV-60-20-00020418.0002001 / 06 NOV 25

Applicable to: ALL

- ¹ The traffic is displayed in all ROSE modes and ARC mode when 10, 20 or 40 NM range is selected. Only the 8 most threatening intruders are displayed.



- (1) Proximate intruder
Indicated by a white filled diamond.
- (2) TA intruder
Indicated by an amber circle.
Associated with the TRAFFIC-TRAFFIC aural message.
- (3) RA intruder
Indicated by a red square.
Associated with vertical orders displayed on the PFD and aural messages.

(4) Other intruders

Indicated by a white empty diamond.

Note: If the range of an intruder is not available, the intruder is not displayed. An intruder may be partially displayed when its range is out of scale.

(5) Relative altitude

Indicated in hundred of feet above or below the symbol depending on the intruder position.

(6) Vertical speed arrow

Displayed only if the intruder V/S > 500 ft/min.

The relative altitude and vertical speed arrow are displayed in the same color as the associated intruder symbol.

When an intruder does not report its altitude, the relative altitude and the vertical movement are not displayed.

(7) No bearing intruder

If the bearing of TA or RA intruder is not available the following data is presented in digital form at the bottom of the ND:

- range
- relative altitude and vertical speed arrow if available.

Displayed amber or red according to threat level.

(8) Range ring

A 2.5 NM white range ring is displayed when a 10 NM or 20 NM range is selected.

AIRCRAFT SYSTEMS

SURVEILLANCE

TCAS - CONTROLS AND INDICATORS

ADS-B ONLY (ATSAW )

Displayed in the case of TCAS failure or TCAS in STBY, but with ATSAW  available.

ADS-B (ATSAW )

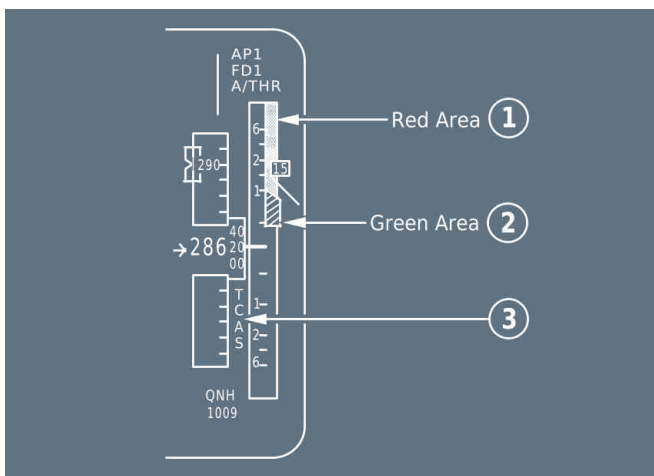
Displayed in the case of ATSAW  failure.

PFD INDICATIONS

Ident.: DSC-34-SURV-60-20-00020420.0005001 / 17 MAR 17

Applicable to: **ALL**

In case of RA detection, the vertical speed scale becomes rectangular and the PFD presents vertical orders on the vertical speed scale. The vertical speed scale background is normally grey, but may be partially replaced by green and/or red areas.



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(3) TCAS message

Appears in amber provided that the TCAS is not in standby, when the TCAS cannot deliver RA data, or in case of an internal TCAS failure.

AURAL MESSAGES
Ident.: DSC-34-SURV-60-20-00001433.0018001 / 08 FEB 13 Applicable to: ALL

TA/RA detection is associated with the following messages:

"TRAFFIC TRAFFIC"	: Only in case of TA detection.
"CLIMB CLIMB"	: Climb at the vertical speed indicated by the green area on the PFD.
"CLIMB, CROSSING CLIMB" (twice)	: Same as above. Indicates that you will cross through the intruder altitude.
"INCREASE CLIMB" (twice)	: Triggered after the CLIMB message, if vertical speed is insufficient to achieve safe vertical separation.
"DESCEND DESCEND"	: Descend at the vertical speed indicated by the green area on the PFD.
"DESCEND, CROSSING DESCEND" (twice)	: Same as above. Indicates that you will cross through the intruder altitude.
"INCREASE DESCEND" (twice)	: Triggered after the DESCEND message, if the vertical speed is insufficient to achieve safe vertical separation.
"LEVEL OFF, LEVEL OFF"	: Set the Vertical Speed to 0.
"CLIMB CLIMB NOW" (twice)	: Triggered after the DESCEND message, if the intruder trajectory has changed.
"DESCEND DESCEND NOW" (twice)	: Triggered after the CLIMB message, if the intruder trajectory has changed.
"MONITOR VERTICAL SPEED"	: Ensure that the vertical speed remains outside the red area. Triggered only once, in case of preventive RA.
"MAINTAIN VERTICAL SPEED, MAINTAIN"	: Maintain the vertical speed indicated on the green area of the PFD.
"MAINTAIN VERTICAL SPEED, CROSSING MAINTAIN"	: Maintain the vertical speed indicated on the green area of the PFD. Indicates that you will cross through the intruder altitude.
"CLEAR OF CONFLICT"	: The range increases and separation is adequate. Return to assigned clearance.

AIRCRAFT SYSTEMS**SURVEILLANCE**

TCAS - CONTROLS AND INDICATORS

MEMO DISPLAY

Ident.: DSC-34-SURV-60-20-00020422.0002001 / 04 NOV 20

Applicable to: ALL

TCAS STBY : This memo appears during flight phases other than 6 when:

- ATC STBY is selected by the flight crew, or
- TCAS STBY is selected by the flight crew, or
- ALT RPTG sw is OFF, or
- The selected ATC is failed, or
- Both RAs are failed, or
- A failure of the ADR in use on the selected ATC/XPDR.

TCAS STBY : This memo appears during flight phase 6 when:

- ATC STBY is selected by the flight crew, or
- TCAS STBY is selected by the flight crew, or
- ALT RPTG sw is OFF, or
- The selected ATC is failed, or
- Both RAs are failed, or
- A failure of the ADR in use on the selected ATC/XPDR.

AIRCRAFT SYSTEMS

OXYGEN

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DSC-35-10 General
Description..... A

DSC-35-20 Fixed Oxygen System for Cockpit
DSC-35-20-10 Description
General.....A
Operation.....B
Schematic.....C
Mask Setting.....D
Mask Stowage.....E

DSC-35-20-20 Controls and Indicators
Overhead Panel.....A
Stowage Box.....B
Crew Oxygen Mask.....C
Pressure Regulator.....D
ECAM DOOR/OXY Page.....E

DSC-35-20-30 How to
How to Test the Mask.....A

DSC-35-30 Fixed Oxygen System for Cabin
DSC-35-30-10 Description
General.....A
Operation.....B
Schematic.....C

DSC-35-30-20 Controls and Indicators
Overhead Panel.....A
Overhead Maintenance Panel.....B
Memo Display.....C

DSC-35-40 Portable Oxygen System
¹ DSC-35-40-10 Description
Protective Breathing Equipment (PBE)..... A

² DSC-35-40-20 How To
How to Use the PBE.....A

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS OXYGEN PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS
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Localization Title	Toc Index	ID	Reason
DSC-35-PLP-TOC Description		1	Documentation update: Deletion of "Flight Crews Portable Oxygen System (00001465)".
			Documentation update: Deletion of "Flight Crews Portable Oxygen System (00001465.0003001)".
			Documentation update: Deletion of "Flight Crews Portable Oxygen System (00001465.0007001)".
			Documentation update: Deletion of "Flight Crews Portable Oxygen System (00001465.0004001)".
DSC-35-PLP-TOC How To		2	Documentation update: Deletion of "How to Don the PBE (00006226)".
			Documentation update: Deletion of "How to Operate the PBE (00029105)".
			Documentation update: Deletion of "Using the Hood (00006226.0003001)".
			Documentation update: Deletion of "Using the Hood (00006226.0012001)".
			Documentation update: Deletion of "Using the Hood (00006226.0004001)".
			Documentation update: Deletion of "How to Operate the PBE (00029105.0001001)".
DSC-35-40-10 Protective Breathing Equipment (PBE)	A	1	Documentation update: Deletion of information.
DSC-35-40-10 Protective Breathing Equipment (PBE)	A	2	Update of the content to provide generic information on PBE and removal of the information associated to a specific PBE model.
DSC-35-40-10 Protective Breathing Equipment (PBE)	A	3	Update of the content to provide generic information on PBE and removal of the information associated to a specific PBE model.
DSC-35-40-10 Protective Breathing Equipment (PBE)	A	4	Update of the content to provide generic information on PBE and removal of the information associated to a specific PBE model.
DSC-35-40-10 Protective Breathing Equipment (PBE)	A	5	Update of the content to provide generic information on PBE and removal of the information associated to a specific PBE model.
DSC-35-40-20 How to Use the PBE	A	1	Documentation update: Addition of "How to Use the PBE" documentary unit

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS OXYGEN GENERAL
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DESCRIPTION

Ident.: DSC-35-10-00001448.0001001 / 20 DEC 10

Applicable to: ALL

The oxygen system consists of:

- A cockpit-fixed oxygen system, which supplies adequate breathing oxygen to the cockpit occupants in case of depressurization, or emission of smoke and noxious gases.
- A cabin-fixed oxygen system, which supplies oxygen for cabin occupants (passengers and cabin crew) in case of depressurization.
- A portable oxygen system, which is provided in both the cockpit and cabin and is to be used:
 - As PROTECTION for the crew during on board emergencies.
 - For FIRST AID purposes.

AIRCRAFT SYSTEMS

OXYGEN

GENERAL

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 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS OXYGEN FIXED OXYGEN SYSTEM FOR COCKPIT - DESCRIPTION
--	--

GENERAL

Ident.: DSC-35-20-10-00017801.0001001 / 21 MAR 16

Applicable to: ALL

The cockpit's fixed oxygen system consists of :

- A high-pressure cylinder, located in the left-hand lower fuselage.
- A pressure regulator, connected directly to the cylinder that delivers oxygen, at a pressure suitable for users.
- Two overpressure safety systems to vent oxygen overboard, through a safety port, if the pressure becomes too high.
- A supply solenoid valve that allows the crew to shut off the distribution system.
- Three (or four ) full-face quick-donning masks, stowed in readily-accessible boxes adjacent to the crewmembers' seats (one at each seat).

OPERATION

Ident.: DSC-35-20-10-00001450.0001001 / 21 MAR 16

Applicable to: ALL

The crewmember squeezes the red grips to pull the mask out of its box, and this action causes the mask harness to inflate.

A mask-mounted regulator supplies a mixture of air and oxygen or pure oxygen, or performs emergency pressure control. With the regulator set to NORMAL, the user breathes a mixture of cabin air and oxygen up to the cabin altitude at which the regulator supplies 100 % oxygen. The user can select 100 %, in which case the regulator supplies pure oxygen at all cabin altitudes.

If the situation calls for it, the user can use the emergency overpressure rotating knob and receive pure oxygen at positive pressure.

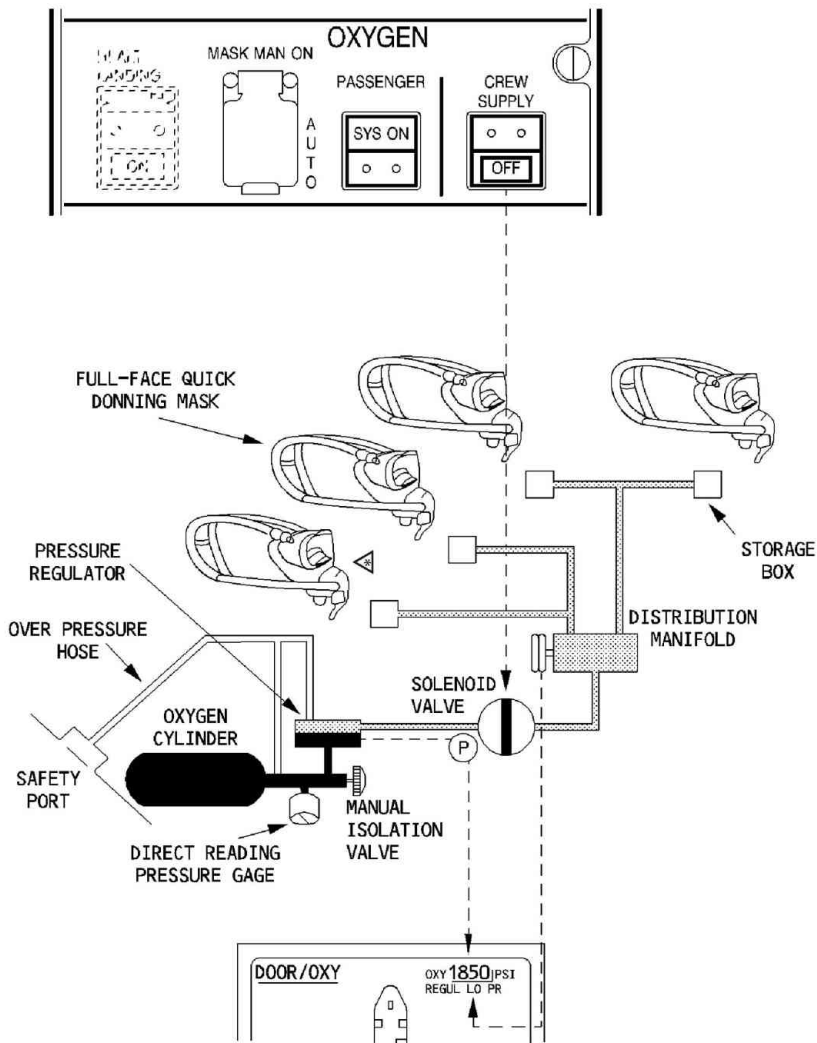
The storage box contains a microphone lead, with a quick-disconnect, for connection to the appropriate mask microphone cable.

Note: *Each mask may have a removable film that protects the visor against scratches.
This strip is optional and may be removed from the mask at any time.*

SCHEMATIC

Ident.: DSC-35-20-10-00017802.0001001 / 21 MAR 16

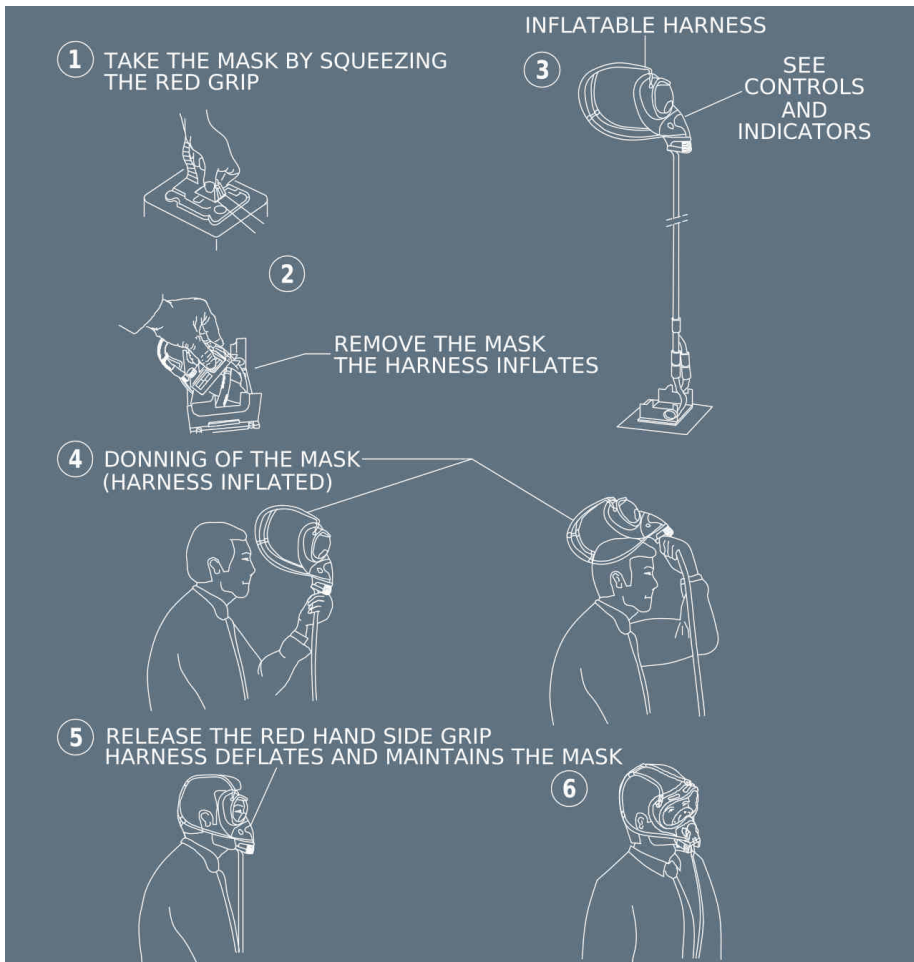
Applicable to: ALL



MASK SETTING

Ident.: DSC-35-20-10-00016919.0001001 / 21 MAR 16

Applicable to: ALL



Note: The captain (first officer) must exercise caution and turn the head to the right (left) in the direction of the first officer (captain) in order to ensure fast donning of the mask when the HUD  on the captain (first officer) side is deployed.

AIRCRAFT SYSTEMS

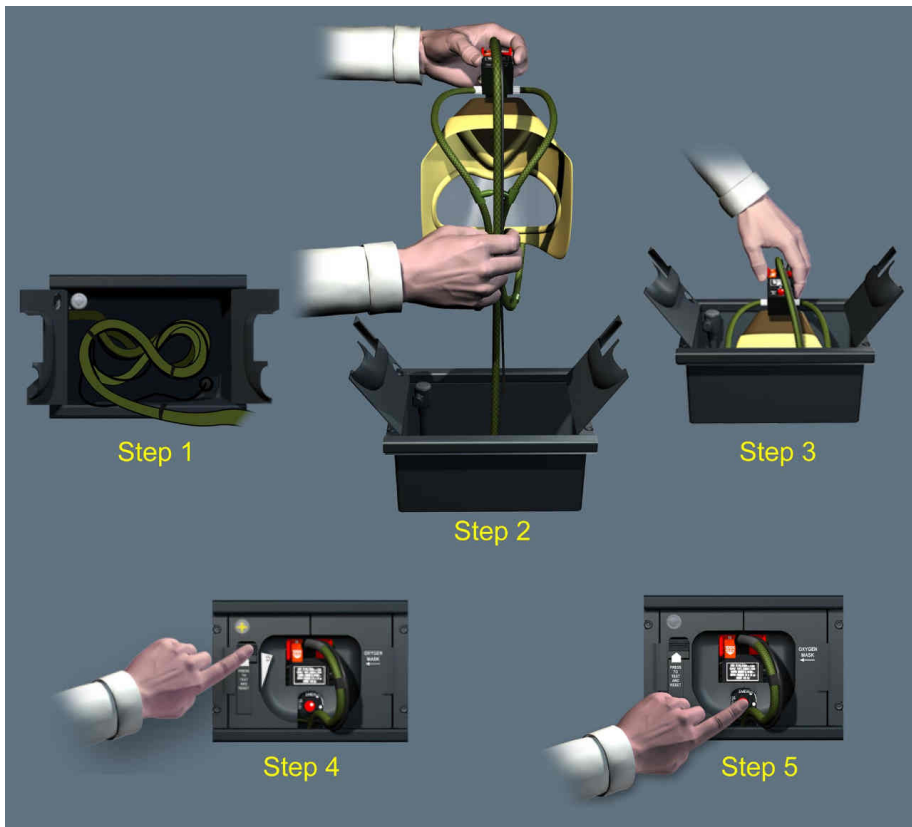
OXYGEN

FIXED OXYGEN SYSTEM FOR COCKPIT - DESCRIPTION

MASK STOWAGE

Ident.: DSC-35-20-10-00001453.0001001 / 03 NOV 22

Applicable to: ALL



STEP 1

Coil the supply hose that is connected to the crew oxygen mask in an "eight (8)" symbol and place it in the bottom of the stowage box.

STEP 2

Position the remaining hose in the middle of the mask.
Fold the two harness portions together.

STEP 3

Put the mask in the stowage box.

Make sure that the mask touches the bottom of the stowage box.

STEP 4

Close the doors of the mask stowage box.

Firmly press the PRESS TO TEST AND RESET pb.

When released, check that the OXY ON flag disappears.

STEP 5

Press the EMERGENCY selector, and check that the blinker remains black.

Return the N/100% selector to the 100% position.

CAUTION

Maintaining the EMERGENCY selector in the EMERGENCY position can deplete the crew oxygen cylinder.

AIRCRAFT SYSTEMS

OXYGEN

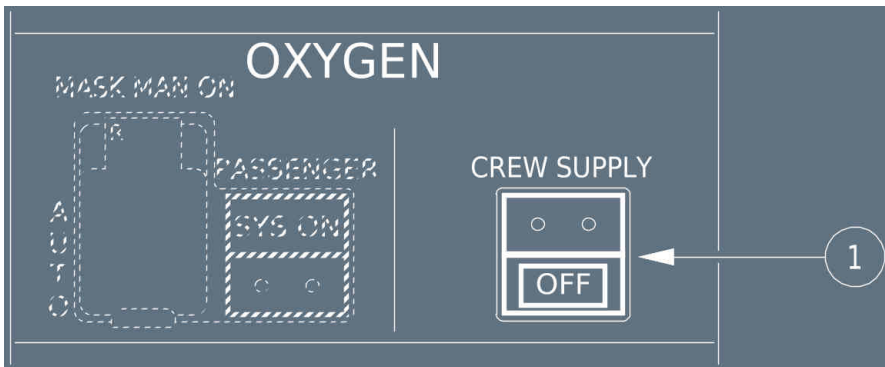
FIXED OXYGEN SYSTEM FOR COCKPIT - DESCRIPTION

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OVERHEAD PANEL

Ident.: DSC-35-20-20-00017803.0001001 / 21 MAR 16

Applicable to: ALL



(1) CREW SUPPLY pb

This pushbutton controls the solenoid valve.

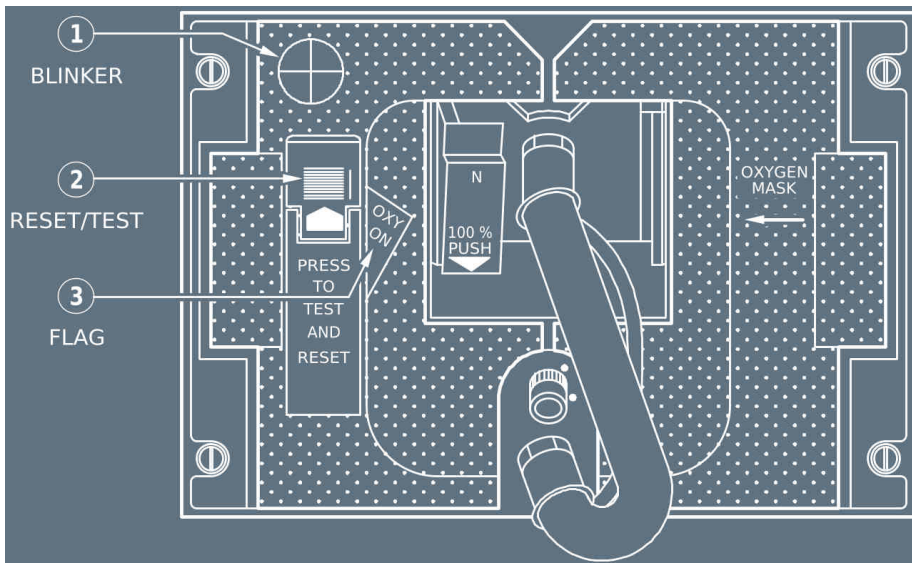
On : The valve is open, and supplies low pressure oxygen to the masks (normal position in flight).

OFF: The valve is closed, and the white light comes on.

STOWAGE BOX

Ident.: DSC-35-20-20-00001455.0001001 / 22 MAY 12

Applicable to: ALL

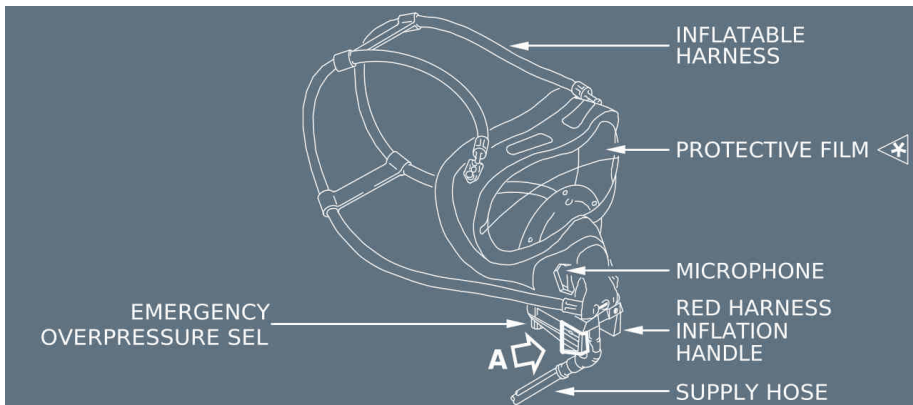


- (1) Blinker flowmeter (yellow)
This indicator flashes when oxygen is flowing.
- (2) RESET/TEST control slide
The crewmember presses the slide, and pushes it in the direction of the arrow to test: the operation of the blinker; the regulator supply; system sealing downstream of the valve; and the regulator sealing and system operation. Pressing the RESET control slide, after the oxygen mask has been used, cuts off the oxygen, and the mask microphone.
- (3) OXY ON flag
As soon as the left flap door opens, the mask is supplied with oxygen and, once it closes (mask still supplied with oxygen), the "OXY ON" flag appears.

CREW OXYGEN MASK

Ident.: DSC-35-20-20-00001456.0001001 / 21 MAR 16

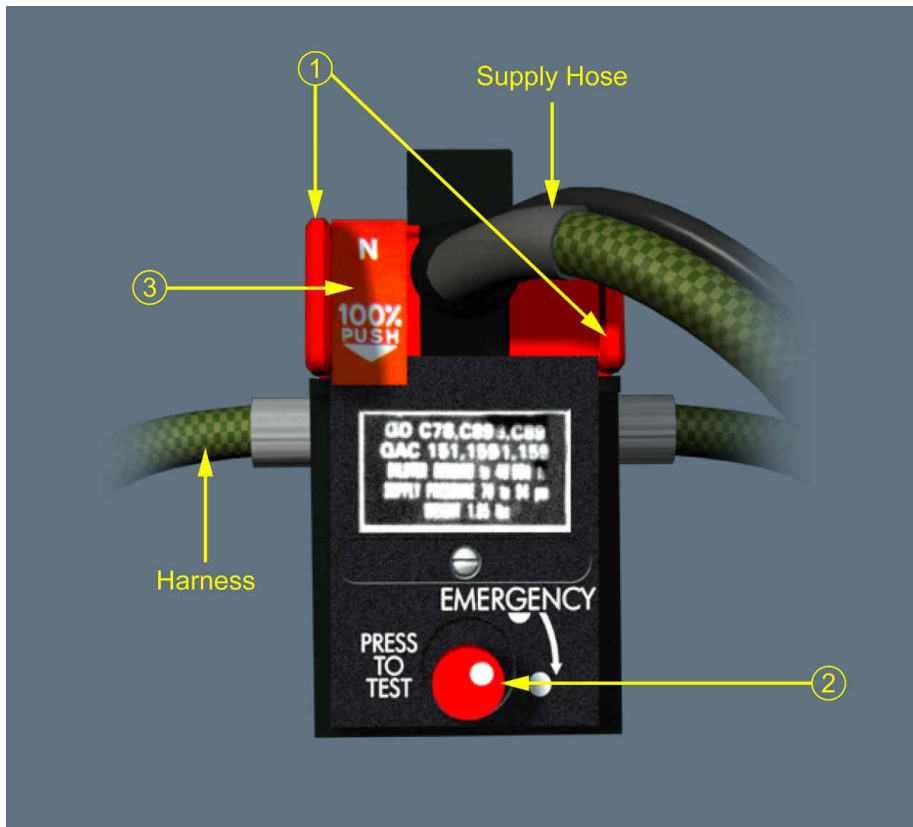
Applicable to: ALL



PRESSURE REGULATOR

Ident.: DSC-35-20-20-00001457.0001001 / 24 NOV 15

Applicable to: ALL



(1) Red grips

Squeezing the right-hand side grip unlocks the two-flap door, and permits the harness to inflate.

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS OXYGEN FIXED OXYGEN SYSTEM FOR COCKPIT - CONTROLS AND INDICATORS
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(2) EMERGENCY pressure selector

Use of this selector creates an overpressure which eliminates condensation or fogging of the mask, and prevents smoke, smell or ashes from entering the mask.

- Pressing this knob generates an overpressure for a few seconds.
- Turning the knob, in the direction of the arrow, generates a permanent overpressure.

- Note:
1. Overpressure supply is automatically started, when cabin altitude exceeds 30 000 ft.
 2. Overpressure supply is available only when the N/100% selector is set on the normal position.

(3) N/100 % selector

This two-position button is locked down (100% position) when the crewmember pulls the mask out of the stowage. Pushing the button up from underneath releases it, and it pops up to the N (normal) position. Pressing it again returns it to 100 %.

100 % : The mask delivers 100 % oxygen.

N : The mask provides the flight crew with a mixture of air and oxygen. This mixture changes with cabin altitude. The higher the cabin altitude, the more oxygen the mask provides, until the mask supplies 100 % oxygen.

AIRCRAFT SYSTEMS

OXYGEN

FIXED OXYGEN SYSTEM FOR COCKPIT - CONTROLS AND INDICATORS



When the pushbutton-switch is pressed (100% PUSH position), the mask provides 100% oxygen.

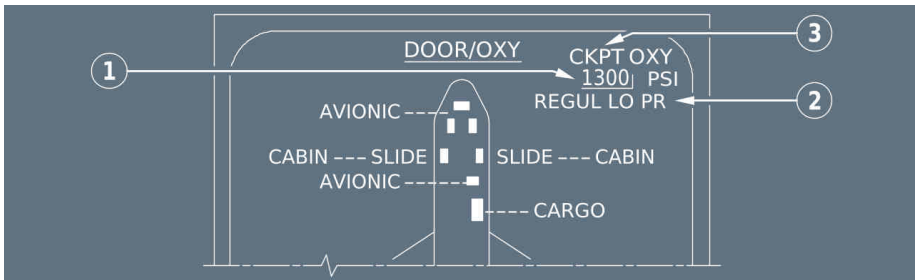


When the pushbutton-switch is released (N position), the mask provides a mixture from ambient cockpit air and the oxygen.

ECAM DOOR/OXY PAGE

Ident.: DSC-35-20-20-00001458.0004001 / 21 MAR 17

Applicable to: MSN 02155-02212, 05152-07792



(1) OXY pressure indication

It is in green, when the pressure is ≥ 800 PSI.

It pulses in green, when the pressure is < 800 PSI (the DOOR/OXY SD page is automatically displayed).

It is in amber, when the pressure is < 400 PSI.

On ground, an amber half frame appears when oxygen pressure is $< 1\,500$ PSI.

In this case, the flight crew must check that the remaining quantity is not below the minimum (Refer to LIM-OXY Minimum Flight Crew Oxygen Pressure).

(2) REGUL LO PR indication

It is in amber, if oxygen pressure on the low-pressure circuit is low (50 PSI).

(3) CKPT OXY indication

It is normally in white.

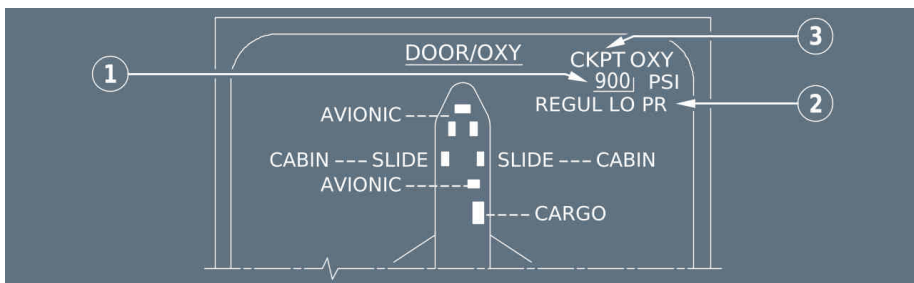
It becomes amber, when:

- Pressure goes below 400 PSI
- Low oxygen pressure is detected
- The overhead panel's OXYGEN CREW SUPPLY pb is OFF.

ECAM DOOR/OXY PAGE

Ident.: DSC-35-20-20-00001458.0005001 / 21 MAR 17

Applicable to: MSN 02719-04392



(1) OXY pressure indication

It is in green, when the pressure is ≥ 600 PSI.

It pulses in green, when the pressure is < 600 PSI (the DOOR/OXY SD page is automatically displayed).

It is in amber, when the pressure is < 300 PSI.

On ground, an amber half frame appears when oxygen pressure is $< 1\,000$ PSI.

In this case, the flight crew must check that the remaining quantity is not below the minimum (Refer to LIM-OXY Minimum Flight Crew Oxygen Pressure).

AIRCRAFT SYSTEMS**OXYGEN****FIXED OXYGEN SYSTEM FOR COCKPIT - CONTROLS AND INDICATORS**

(2) REGUL LO PR indication

It is in amber, if oxygen pressure on the low-pressure circuit is low (50 PSI).

(3) CKPT OXY indication

It is normally in white.

It becomes amber, when:

- Pressure goes below 300 PSI
- Low oxygen pressure is detected
- The OXYGEN CREW SUPPLY pb on the overhead panel is OFF.

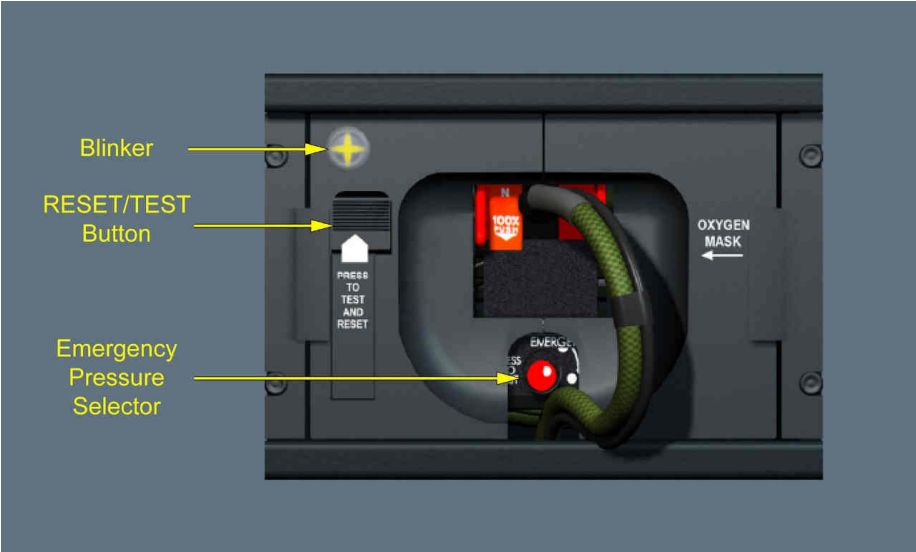
HOW TO TEST THE MASK

Ident.: DSC-35-20-30-00024268.0001001 / 04 NOV 20
Applicable to: ALL

WARNING

To prevent hearing damage to the ground crew connected to the intercom system, inform them that a loud noise may be heard in the headset when performing the oxygen mask test.

Mask Stowage Box



- **On the OXYGEN panel:**
 CREW SUPPLY pb.....CHECK ON
- **On the glareshield:**
 LOUDSPEAKERS..... ON
- **On the ACP:**
 INT reception knob..... PRESS OUT - ADJUST
 INT/RAD sw..... INT

● On the mask stowage box:

- Press and hold the RESET/TEST button in the direction of the arrow.
 - Check that the blinker turns yellow for a short time, and then goes black.
- Hold the RESET/TEST button down, and press the Emergency Pressure selector.
 - Check that the blinker turns yellow and remains yellow, as long as the Emergency Pressure selector is pressed.
 - Listen for oxygen flow through the loudspeakers.
- Check that the RESET/TEST button returns to the up position and the N/100% selector is in the 100 % position.
- Press the Emergency Pressure selector again, and check that the blinker does not turn yellow. This ensures that the mask is not supplied.
- Check that the Emergency Pressure selector is NOT turned right in the direction of the arrow (permanent overpressure). This ensures that the oxygen permanent overpressure is not supplied.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS OXYGEN FIXED OXYGEN SYSTEM FOR CABIN - DESCRIPTION
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GENERAL

Ident.: DSC-35-30-10-00017804.0001001 / 13 MAY 16

Applicable to: ALL

In the case of depressurization, the fixed oxygen system in the cabin supplies oxygen to the cabin occupants.

Chemical generators produce the oxygen. Each generator feeds a group of 2, 3, or 4 masks.

Oxygen masks are located in containers above the passenger seats, in the lavatories, in each galley  , and at each cabin crew station.

Note: *Gaseous generators  replace chemical generators in the lavatories.*

OPERATION

Ident.: DSC-35-30-10-00016920.0001001 / 21 MAR 16

Applicable to: ALL

Each container has an electrical latching mechanism that opens automatically to allow the masks to drop, if the cabin pressure altitude exceeds 14 000 ft (+250, -750 ft), or 16 000 ft (+250, -750 ft) for the operation on high altitude airfields  .

Members of the flight crew can override the automatic control.

When the masks are released, the passenger address system automatically broadcasts prerecorded instructions  .

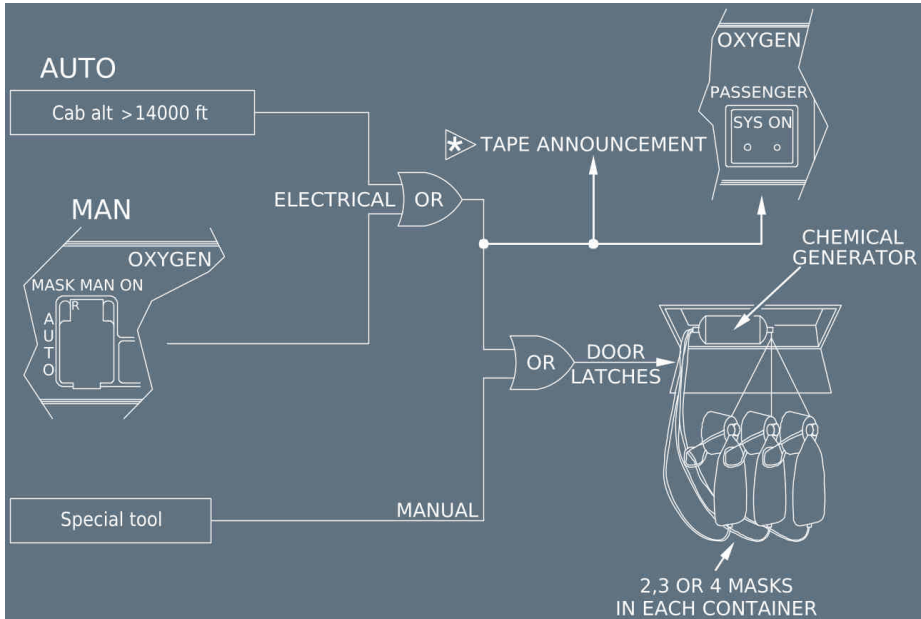
The generation of oxygen begins when the passenger pulls the mask towards the passenger seat. The chemical reaction used for oxygen generation creates heat. Therefore, the smell of burning, smokes and cabin temperature increase may be associated with the normal operation of the oxygen generators. The mask receives pure oxygen under positive pressure for about 13 min  , 15 min  , or up to 22 min  , until the generator is exhausted.

A reset is available for the rearming of the system after the masks are restowed. A manual release tool allows crew members to open the doors manually in case of electrical failure.

SCHEMATIC

Ident.: DSC-35-30-10-00001461.0001001 / 16 MAY 12

Applicable to: ALL

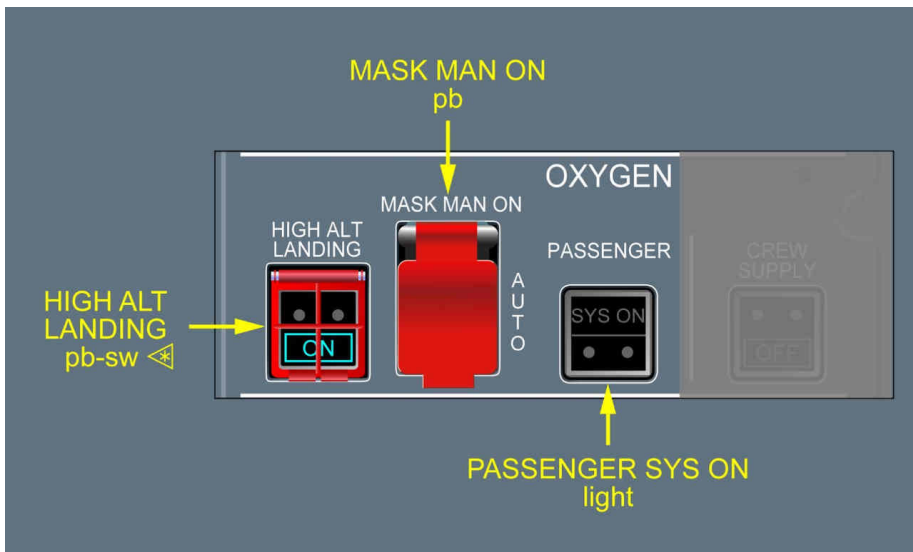


OVERHEAD PANEL

Ident.: DSC-35-30-20-00017805.0001001 / 15 MAY 25

Applicable to: ALL

Oxygen Panel



HIGH ALT LANDING pb-sw

This pushbutton-switch changes the altitude threshold for the deployment of the cabin oxygen masks.



The cabin oxygen masks drop, if the cabin pressure exceeds 14 000 ft (+250, -750 ft).



The cabin oxygen masks drop, if the cabin pressure exceeds 16 000 ft (+250, -750 ft).

MASK MAN ON pb

The MASK MAN ON pb is a guarded pushbutton.



Normal position. The pushbutton is in the AUTO position.

The cabin oxygen mask doors open automatically, when the cabin altitude exceeds 14 000 ft, or 16 000 ft if the HIGH ALT LANDING pb-sw  is set to ON.



The guard is open, and the pushbutton is pressed: The cabin oxygen masks will drop.

PASSENGER SYS ON light

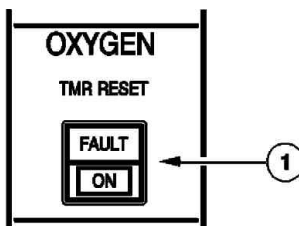


This light comes on, when the control for the cabin oxygen mask doors is activated. It remains on, until TMR RESET pb is pressed (*Refer to DSC-35-30-20 Overhead Maintenance Panel*).

OVERHEAD MAINTENANCE PANEL

Ident.: DSC-35-30-20-00001463.0001001 / 11 FEB 11

Applicable to: ALL


(1) TMR RESET pushbutton

The maintenance crew uses this pushbutton to reset the control circuit, after the system has operated.

ON : The PASSENGER SYS ON light goes off.

FAULT : This light comes on in white, when the door latch solenoids are energized for more than 30 s.

MEMO DISPLAY

Applicable to: MSN 07784-07792

Ident.: DSC-35-30-20-A-00016866.0006001 / 21 MAR 16

The OXY PAX ON memo displays as soon as cabin oxygen masks fall down in the cabin, either automatically, or manually.

OXY PAX ON : This memo appears in green when both CPC detect excessive cabin altitude.

OXY PAX ON : This memo appears in amber when one CPC or both CPC do not detect excessive cabin altitude.

AIRCRAFT SYSTEMS

OXYGEN

FIXED OXYGEN SYSTEM FOR CABIN - CONTROLS AND INDICATORS

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS OXYGEN PORTABLE OXYGEN SYSTEM - DESCRIPTION
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PROTECTIVE BREATHING EQUIPMENT (PBE)

Ident.: DSC-35-40-10-00029098.0001001 / 24 OCT 25

Applicable to: ALL

1
2

GENERAL

The Protective Breathing Equipment (PBE) protects the eyes and respiratory system of the user from toxic fumes, gases and smoke. Different models of PBEs can be installed in the aircraft.

3

DESCRIPTION

Each PBE model has:

- An oxygen generator that supplies oxygen to the PBE for 15 minutes
- A mechanism to initiate oxygen flow
- A visor and a hood
- A neck seal:
 - To prevent oxygen leakage from outside the PBE, and
 - To keep fumes, gases and smoke out of the PBE.
- An optional mouthpiece (speech transmitter) and/or valve to help:
 - Breathing, and/or
 - Communication.
- An optional body belt.

4

LOCATION

The PBE is installed in several areas in the cabin and in the cockpit. *Refer to DSC-25-20 Cockpit Emergency Equipment.*

5

STOWAGE

Each PBE is stowed in a vacuum sealed or moisture resistant bag that is then stowed in a protective container.

AIRCRAFT SYSTEMS

OXYGEN

PORTABLE OXYGEN SYSTEM - DESCRIPTION

Intentionally left blank

HOW TO USE THE PBE¹ Ident.: DSC-35-40-20-00029319.0001001 / 24 OCT 25

Applicable to: ALL

PREFLIGHT CHECK

The PBE is stowed in a container that enables the flight crew to perform the preflight check via a condition indicator, serviceability indicator or humidity indicator via an observation window. Some PBE containers have a tamper seal or tamper latch to indicate if the container was opened. In the case the tamper seal or tamper latch is broken, immediately inform the maintenance team. It is the responsibility of the operator to define the preflight checks in accordance with the manufacturers guidelines and local regulations. Preflight checks of the PBE may include:

- The location is correct
- The quantity is correct
- Check the condition, serviceability or humidity Indicator
- The tamper seal or tamper latch is intact
- The equipment is secured
- The expiration date of the equipment is not expired
- The general condition of the container.

REMOVAL FROM CONTAINER AND VACUUM OR MOISTURE RESISTANT BAG

The PBE must be removed from the container and from the vacuum/moisture resistant bag in accordance with the instructions of the manufacturer.

Note: Force may be required to break the seal and/or bracket of the container.

To remove the PBE from the vacuum/moisture resistant bag, the user must pull the 'tear-off strips', or where indicated on the bag. More than one 'tear-off strip' may be installed.

Note: Ensure hands are dry to open the vacuum/moisture resistant bag.

When removed from the vacuum/moisture resistant bag, the PBE must be unfolded. The PBE must be unfolded in accordance with the instructions of the manufacturer to prevent damage to the device.

HOW TO DON THE PBE

The user must don the PBE away from fire/flames.

The PBE neck seal must be widened to be able to don the PBE in accordance with the instructions of the manufacturer. The neck seal of the PBE is tight, in order to keep any smoke, gases or fumes out of the hood of the PBE.

The hair of the user must be fully in the hood, if not, this may enable outside air to enter the PBE. If the neck seal is damaged, the PBE must be replaced.

Note: Users who wear glasses should refer to the documentation of the manufacturer for guidance to don the PBE.

WARNING Make sure all hair is in the neck seal/hood so that there is an entire seal around the neck.

OXYGEN ACTIVATION

The oxygen supply of the PBE is activated before, during or after the user dons the PBE. When the oxygen supply is activated, there may be a noise due to the oxygen that flows inside the hood. The noise may disappear after this initial phase depending on the PBE model. When the oxygen supply is activated, the oxygen flow cannot be stopped. The user should be aware of the time when the oxygen is activated, and check the time of when the oxygen flow started.

HOW TO KNOW WHEN THE OXYGEN FLOW STOPS

WARNING The crew must be aware of the indications when the oxygen flow stops. When the oxygen flow stops, the crew must remove the PBE.

Refer to the documentation of the manufacturer for the indications when the oxygen supply stops. Each PBE model may have different indications when the oxygen supply stops. When the oxygen supply stops or if the oxygen supply is not able to be activated or if the PBE malfunctions, the user must immediately remove the PBE.

PBE REMOVAL

WARNING Do not smoke or go near fire after the removal of the PBE, because there may be a lot of oxygen on the hair.

The PBE may still generate oxygen for a period of time after it is removed. Therefore, the PBE must be removed away from areas with smoke/fire. After the activation of the PBE, the generator may be hot after use. Therefore the user should not touch the generator.

WARNING Do not touch the PBE generator after it is activated.

CAUTION Put the PBE on a heat resistant surface, to enable the generator to cool down.

For more information refer to the documentation of the manufacturer.

AIRCRAFT SYSTEMS

PNEUMATIC

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DSC-36-10 Description
DSC-36-10-10 General

General.....	A
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DSC-36-10-20 Engine Bleed System

General.....	A
Architecture.....	B
Air Bleed Selection.....	C
Pressure Regulation and Limitation.....	D
Temperature Regulation and Limitation.....	E

DSC-36-10-30 APU Bleed Air Supply

General.....	A
--------------	---

DSC-36-10-40 Crossbleed

General.....	A
ECAM Indication.....	B

DSC-36-10-50 Leak Detection

Leak Detection.....	A
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DSC-36-10-60 Operation Following Failures

BMC Failure.....	A
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DSC-36-20 Controls and Indicators

Overhead Panel.....	A
ECAM Bleed Page.....	B
Memo Display.....	C

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GENERAL

Ident.: DSC-36-10-10-00020804.0001001 / 17 MAR 17

Applicable to: ALL

The pneumatic system supplies high-pressure air for :

- Air conditioning
- Engine starting
- Wing anti-icing
- Water pressurization
- Hydraulic reservoir pressurization
- FWD cargo heating 
- AFT cargo heating 
- Fuel Tank Inerting System (FTIS)  .

High-pressure air has three sources :

- Engine bleed systems
- APU load compressor
- HP ground connection

Note: An external HP source may be used for air conditioning.

A crossbleed duct interconnects the engine bleed systems and receives air from the APU and ground sources when appropriate.

A valve mounted on the crossbleed duct allows the left side (engine 1) and right side (engine 2) to be interconnected.

Two Bleed Monitoring Computers (BMC1 and BMC2), the overhead control panel, and the ECAM control and monitor the operation of the pneumatic system.

A leak detection system detects any overheating in the vicinity of hot air ducts.

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS PNEUMATIC DESCRIPTION - ENGINE BLEED SYSTEM
--	--

GENERAL

Ident.: DSC-36-10-20-00001469.0001001 / 21 MAR 16

Applicable to: ALL

The aircraft has two similar engine bleed air systems.

Each system is designed to :

- select the compressor stage to use as a source of air
- regulate the bleed air temperature
- regulate the bleed air pressure.

A Bleed Monitoring Computer (BMC) controls and monitors each system.

Each BMC receives information about bleed pressure and temperature and valve position.

Each is connected with :

- other systems using air or information from the bleed system
- the other BMC.

Each supplies indications and warnings to the ECAM and CFDS.

If one BMC fails, the other one takes over most of the monitoring functions.

Each bleed valve is pneumatically operated and controlled electrically by its associated BMC.

AIRCRAFT SYSTEMS

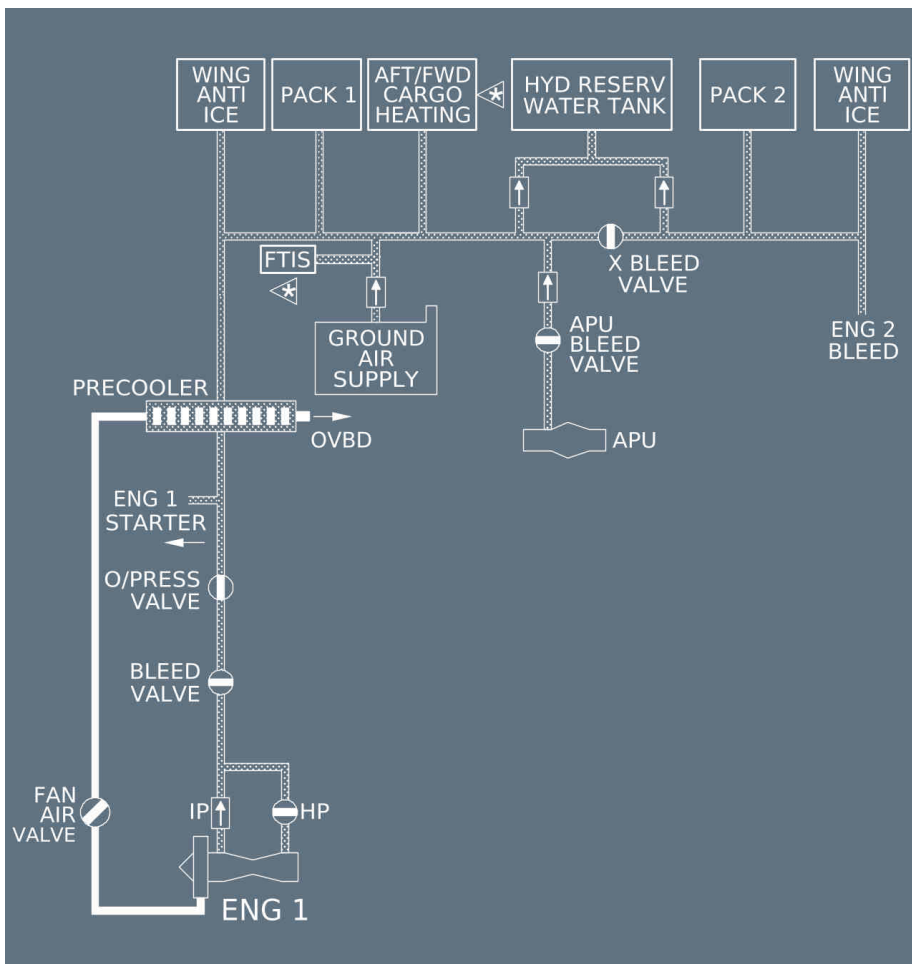
PNEUMATIC

DESCRIPTION - ENGINE BLEED SYSTEM

ARCHITECTURE

Ident.: DSC-36-10-20-00001470.0005001 / 15 MAR 17

Applicable to: ALL



AIR BLEED SELECTION

Ident.: DSC-36-10-20-00001471.0003001 / 05 MAR 19

Applicable to: ALL

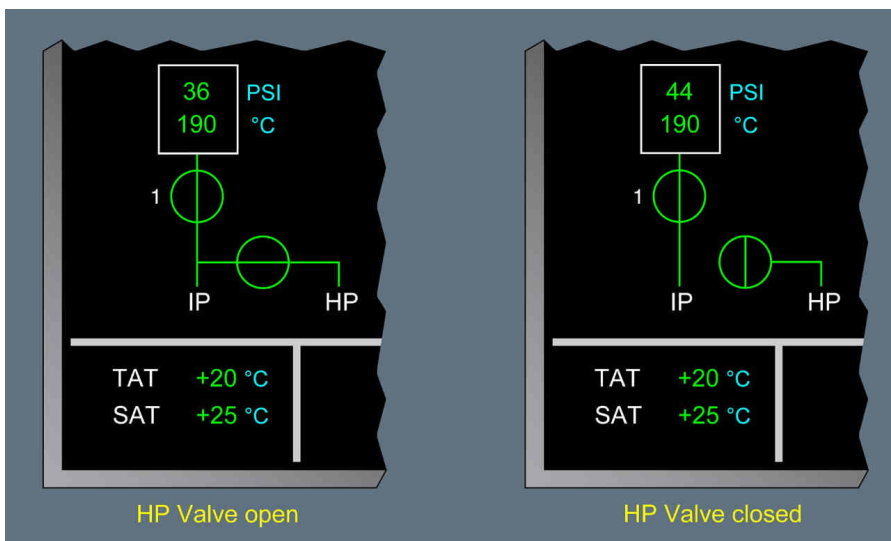
Air is normally bled from the intermediate pressure stage (IP) of engine's high-pressure (HP) compressor to minimize fuel penalty.

At low engine speed, when the pressure and temperature of the IP air are too low, the system bleeds air from the HP stage and maintains it at 36 ± 4 PSI.

An intermediate pressure check valve downstream of the IP port closes to prevent air from the HP stage from being circulated to the IP stage.

L3 The HP valve closes automatically:

- Pneumatically:
 - In case of low upstream pressure
 - In case of excessive upstream pressure
- Electrically when the bleed valve is closed electrically.

ECAM INDICATION


AIRCRAFT SYSTEMS**PNEUMATIC**

DESCRIPTION - ENGINE BLEED SYSTEM

PRESSURE REGULATION AND LIMITATION

Ident.: DSC-36-10-20-00001472.0001001 / 09 NOV 17

Applicable to: MSN 02155-03060

The bleed valve, which is downstream of the junction of HP and IP ducting, acts as a shut-off and pressure regulating valve.

It maintains delivery pressure at 45 ± 5 PSI.

Note: Bleed pressure may fluctuate between 38 and 56 PSI (with a maximum peak to peak pressure of 16 PSI) particularly at high engine power (takeoff or climb) up to FL 100.

The bleed valve is fully closed:

- Pneumatically:
 - If upstream pressure goes below 8 PSI
 - If there is return flow
- Electrically by means of:
 - The BLEED pushbutton switch (switched OFF)
 - The ENG FIRE pushbutton (pushed)
 - The Bleed air Monitoring Computer (BMC) in the following cases:
 - Overtemperature
 - Overpressure
 - Leak
 - Open starter valve
 - APU bleed being ON.

If pressure regulation fails, the overpressure valve closes when the pressure goes over 75 PSI.

Note: If APU Bleed is ON and the crossbleed valve is SHUT, the Engine bleed valve 2, remains open.

PRESSURE REGULATION AND LIMITATION

Ident.: DSC-36-10-20-00001472.0004001 / 09 NOV 17

Applicable to: MSN 04392-05746

The bleed valve, which is downstream of the junction of HP and IP ducting, acts as a shut-off and pressure regulating valve.

It maintains delivery pressure at 45 ± 5 PSI.

Note: Bleed pressure may fluctuate between 38 and 56 PSI (with a maximum peak to peak pressure of 16 PSI) particularly at high engine power (takeoff or climb) up to FL 100.

The bleed valve is fully closed:

- Pneumatically:
 - If upstream pressure goes below 8 PSI
 - If there is return flow
- Electrically by means of:
 - The BLEED pushbutton switch (switched OFF)
 - The ENG FIRE pushbutton (pushed)
 - The Bleed air Monitoring Computer (BMC) in the following cases:
 - Overtemperature
 - Overpressure
 - Leak
 - Open starter valve
 - Engine shutdown
 - APU bleed being ON.

If pressure regulation fails, the overpressure valve closes when the pressure goes over 75 PSI.

Note: If APU Bleed is ON and the crossbleed valve is SHUT, the Engine bleed valve 2, remains open.

PRESSURE REGULATION AND LIMITATION

Ident.: DSC-36-10-20-00001472.0006001 / 09 NOV 17

Applicable to: MSN 07784-07792

The bleed valve, which is downstream of the junction of HP and IP ducting, acts as a shut-off and pressure regulating valve.

It maintains delivery pressure at 45 ± 5 PSI.

Note: Bleed pressure may fluctuate between 38 and 56 PSI (with a maximum peak to peak pressure of 16 PSI) particularly at high engine power (takeoff or climb) up to FL 100.

AIRCRAFT SYSTEMS**PNEUMATIC**

DESCRIPTION - ENGINE BLEED SYSTEM

The bleed valve is fully closed:

- Pneumatically:
 - If upstream pressure goes below 8 PSI
 - If there is return flow
- Electrically by means of:
 - The BLEED pushbutton switch (switched OFF)
 - The ENG FIRE pushbutton (pushed)
 - The Bleed air Monitoring Computer (BMC) in the following cases:
 - Overtemperature
 - Overpressure
 - Leak
 - Open starter valve
 - Engine shutdown
 - APU bleed being ON.

If pressure regulation fails, the overpressure valve closes when the pressure goes over 80 PSI.

Note: If APU Bleed is ON and the crossbleed valve is SHUT, the Engine bleed valve 2, remains open.

TEMPERATURE REGULATION AND LIMITATION

Ident.: DSC-36-10-20-00001473.0001001 / 21 MAR 16

Applicable to: ALL

A precooler downstream of the bleed valve regulates the temperature of the bleed air.

The precooler is an air-to-air heat exchanger that uses cooling air bled from the engine fan to regulate the temperature to approximately 200 °C.

The fan air valve controls fan air flow.

A spring keeps the fan air valve closed in the absence of pressure.

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS PNEUMATIC DESCRIPTION - APU BLEED AIR SUPPLY
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GENERAL

Ident.: DSC-36-10-30-00001474.0001001 / 09 NOV 17

Applicable to: ALL

Air from the APU load compressor is available on ground and in flight.

The APU bleed valve operates as a shut-off valve to control APU bleed air.

The APU BLEED pb-sw, on the AIR COND panel, controls the APU bleed valve. When the flight crew selects ON with the pushbutton, APU bleed air supplies the pneumatic system, if the APU speed is above 95 %. This opens the crossbleed valve and closes the engine bleed automatically. If the APU bleed valve is opened, it automatically closes in the case of APU leak, left wing leak, or pylon 1 leak (except during engine start). *Refer to DSC-36-10-50 Leak Detection.*

A check valve near the crossbleed duct protects the APU, when bleed air comes from another source.

AIRCRAFT SYSTEMS

PNEUMATIC

DESCRIPTION - APU BLEED AIR SUPPLY

Intentionally left blank

GENERAL

Ident.: DSC-36-10-40-00001476.0001001 / 21 MAR 16

Applicable to: ALL

A crossbleed valve on the crossbleed duct allows the air supply systems of the two engines to be isolated or interconnected.

On the AIR COND panel, a rotary selector controls the crossbleed valve electrically.

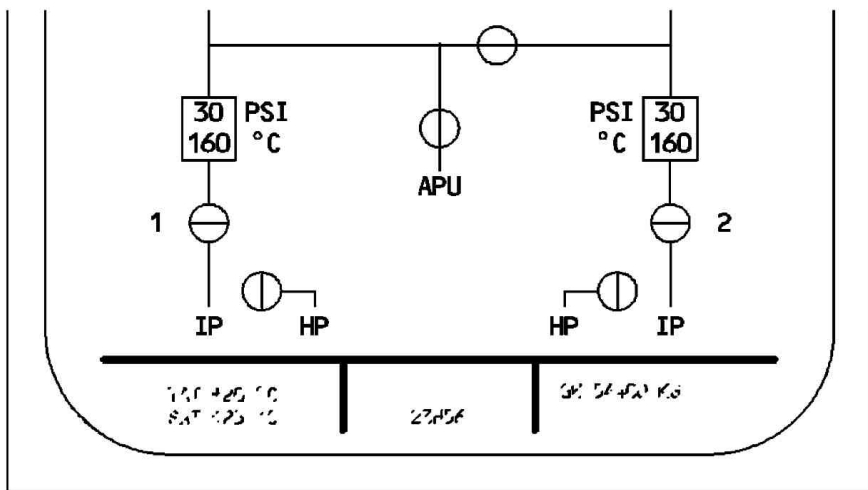
Two electric motors, one for automatic mode and one for manual mode, control the valve.

In automatic mode, the crossbleed valve opens when the system uses APU bleed air. It closes, if the system detects an air leak (except during engine start).

ECAM INDICATION

Ident.: DSC-36-10-40-00001478.0002001 / 21 MAR 16

Applicable to: ALL


X-BLEED VALVE OPEN. AIR SUPPLIED FROM APU

AIRCRAFT SYSTEMS

PNEUMATIC

DESCRIPTION - CROSSBLEED

Intentionally left blank

LEAK DETECTION

Ident.: DSC-36-10-50-00001479.0001001 / 15 MAR 17

Applicable to: ALL

Leak detection loops detect any overheating near the hot air ducts in the fuselage, pylons, and wings.

For the pylon and APU, the sensing elements are tied to form a single loop and for the wing, a double loop.

When the two wing loops detect a leak, or when one loop detects the leak and the other one is inoperative, they activate a wing leak signal.

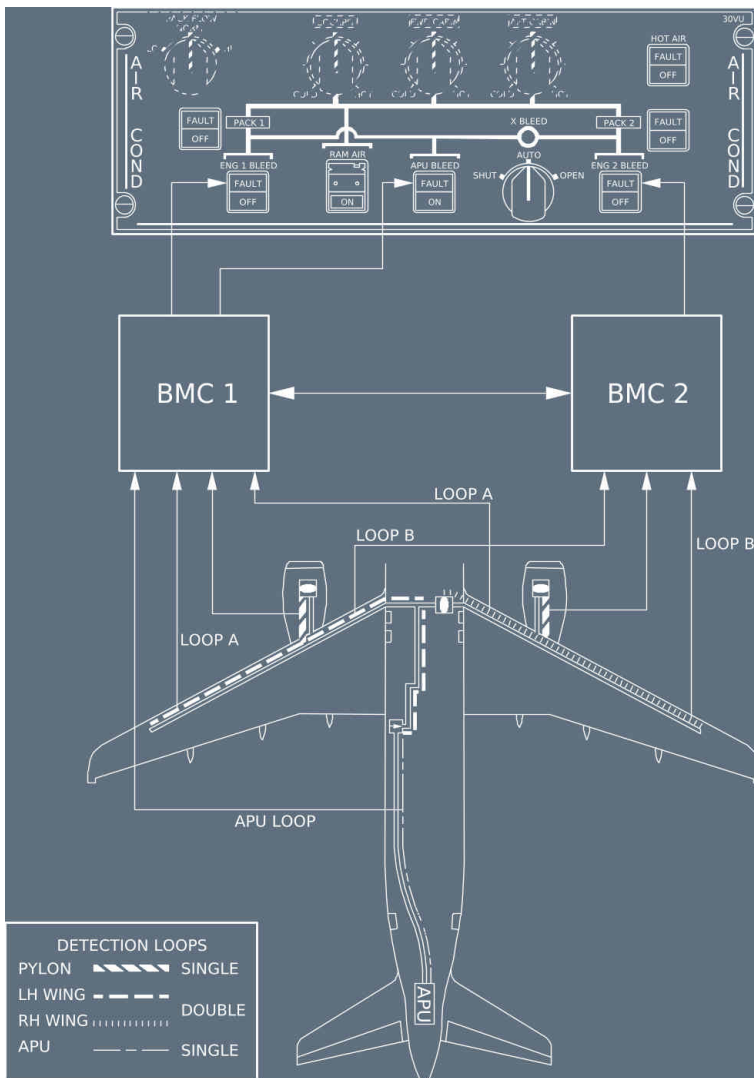
BMC1 and BMC2 each contain identical control logic for the system.

- A wing leak signal causes :
 - the bleed valve on the related side to close automatically
 - the associated FAULT light on the AIR COND panel to come on
 - the x-bleed valve to close automatically (except during an engine start)
 - the APU bleed valve to close automatically if the APU bleed valve is open and if the leak concerns the left wing (except during engine start).
- A pylon leak signal causes :
 - the bleed valve on the related side to close automatically
 - the FAULT light for the related engine on the AIR COND panel to come on
 - the x-bleed valve to close automatically (except during an engine start).
 - the APU bleed valve to close automatically if the APU bleed valve is open and if the leak concerns the pylon 1 (except during engine start).
- An APU leak signal causes :
 - the APU bleed valve to close automatically (except during engine start).
 - the FAULT light the APU BLEED pushbutton switch on the AIR COND panel to come on
 - the x-bleed valve to close automatically (except during an engine start).

AIRCRAFT SYSTEMS

PNEUMATIC

DESCRIPTION - LEAK DETECTION



 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS PNEUMATIC DESCRIPTION - OPERATION FOLLOWING FAILURES
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BMC FAILURE

Ident.: DSC-36-10-60-00001480.0001001 / 21 MAR 16

Applicable to: ALL

If one BMC fails, the adjacent BMC takes over the monitoring of the bleed system to issue the following ECAM warnings if necessary :

- overpressure
- overtemperature
- wing leak.

Nevertheless, the associated FAULT light on the AIR COND panel is lost, and the associated bleed valve does not close automatically.

ENG BLEED LEAK warning is lost for the associated engine, as is also the APU BLEED LEAK warning if BMC1 has failed.

AIRCRAFT SYSTEMS

PNEUMATIC

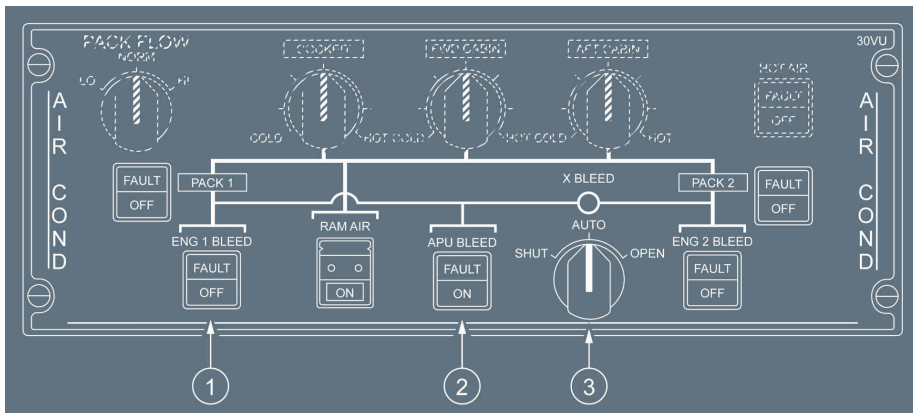
DESCRIPTION - OPERATION FOLLOWING FAILURES

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OVERHEAD PANEL

Ident.: DSC-36-20-00001481.0001001 / 09 NOV 17

Applicable to: ALL



(1) ENG 1 and ENG 2 BLEED pb sw

- On : Bleed valve opens if :
- Upstream pressure is above 8 PSI.
 - APU BLEED pushbutton switch is off or APU bleed valve is closed.
 - There is no outside wing or pylon leak, and no overpressure or overtemperature has been detected.
 - The ENG FIRE pushbutton has not been popped out.
 - The engine start valve is closed.

FAULT It : This amber light comes on, and an ECAM caution appears, if :

- There is an overpressure downstream of the bleed valve.
- There is a bleed air overheat.
- There is a wing or pylon leak on the related side.
- The bleed valve is not closed during engine start.
- The bleed valve is not closed with APU bleed ON.

It goes out when the ENG BLEED pushbutton switch is OFF if the fault has disappeared.

OFF : The bleed valve and HP valve close. The white OFF light comes on.

(2) APU BLEED pb sw

ON : The APU valve opens if N > 95 % and there is no leak in the APU or in the left side bleed. (If there is a leak on the right side, the x-bleed valve closes.)
 The blue ON light comes on.

Off : The APU valve closes.

FAULT light : This amber light comes on, and an ECAM caution appears, when the system detects an APU leak.

(3) X-BLEED selector sw

AUTO : The crossbleed valve is open if the APU bleed valve is open.
 The crossbleed valve is closed if the APU bleed valve is closed or, in case of a wing, pylon, or APU leak (except during engine start).

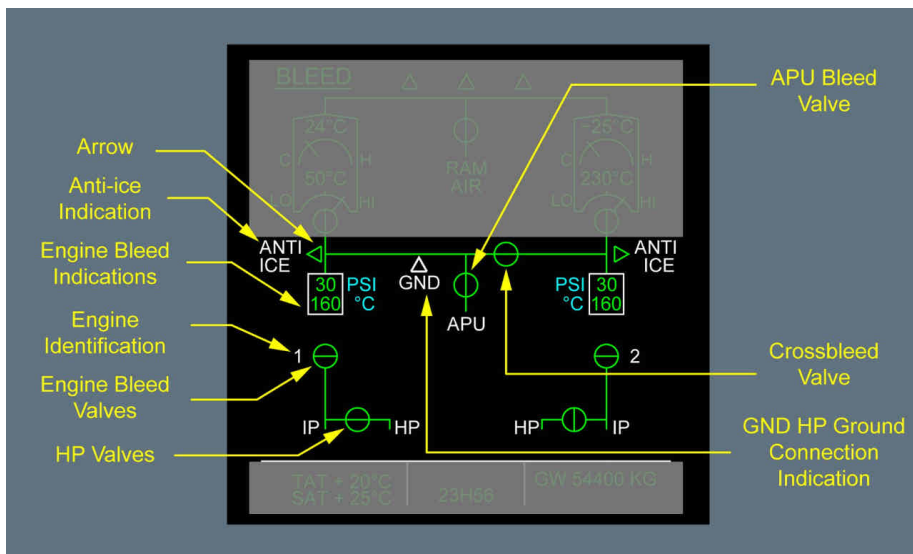
OPEN : The crossbleed valve is open.

SHUT : The crossbleed valve is closed.

ECAM BLEED PAGE

Ident.: DSC-36-20-00001482.0004001 / 04 NOV 20

Applicable to: ALL



HP VALVE INDICATIONS



HP valve normally fully closed.



HP valve not fully closed.



HP valve not in commanded (closed) position.

ENGINE BLEED VALVE INDICATIONS



BLEED valve normally open.



BLEED valve normally fully closed.

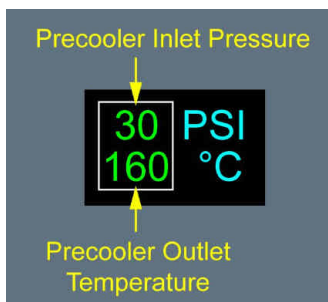


BLEED valve not in commanded (open) position.



BLEED valve not in commanded (closed) position.

ENGINE BLEED INDICATIONS



Precooler inlet pressure

- It is normally in green.

It becomes amber, if under 4 PSI, or if overpressure is detected by the BMC (threshold between 57 and 60 PSI).

Precooler outlet temperature

- It is normally in green.

It becomes amber, if the BMC detects an overheat or low temperature.

Overheat: Temperature exceeds:

- 290 °C for more than 5 s, or
- 270 °C for more than 15 s, or
- 257 °C for more than 55 s.

Low temperature is detected (only in-flight), if the bleed temperature drops below 150 °C, the wing anti-ice is on, and the pressure regulating valve is in the open position. Low temperature may, however, only be due to low outside air temperature.

Note: When the engines are at idle, and depending on the ambient temperature, the precooler outlet temperature may be below 150 °C (displayed amber).

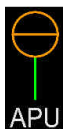
APU BLEED VALVE INDICATIONS



The APU valve is not fully open, and the APU master switch is ON.



The APU valve is fully open, and the APU master switch is ON.



The APU valve is fully closed, the APU master switch is ON, and the APU bleed switch is ON for more than 10 s.

CROSSBLEED VALVE INDICATIONS



The crossbleed valve is normally closed.



The crossbleed valve is normally open.



The crossbleed valve is not in the commanded (closed) position.



The crossbleed valve is not in the commanded (open) position.



The crossbleed valve is in transit.

GND HP GROUND CONNECTION INDICATION



Indicates that it is possible to connect the HP ground air supply.
It appears on ground only.

ANTI ICE INDICATION



When the WING pb on the ANTI-ICE panel is ON.

ARROW



- It is normally not displayed, when the corresponding valve is closed.
- It is normally displayed in green, when the corresponding valve is open.
- It becomes amber, when the
 - Valve is open and air pressure is low or high, or
 - Valve is open on ground for more than 10 s.

ENGINE IDENTIFICATION (1-2)



The engine is running.



The engine N2 is below idle.

MEMO DISPLAY

Ident.: DSC-36-20-00016746.0001001 / 21 MAR 16

Applicable to: ALL

APU BLEED : This memo appears in green, if the APU is available and the APU BLEED pb-sw is ON.

AIRCRAFT SYSTEMS

PNEUMATIC

CONTROLS AND INDICATORS

Intentionally left blank

AIRCRAFT SYSTEMS

WATER / WASTE

Intentionally left blank

DSC-38-10 Description

General.....	A
Potable Water.....	B
Wastewater System.....	C
Toilet System.....	D

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS WATER / WASTE DESCRIPTION
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GENERAL

Ident.: DSC-38-10-00017274.0001001 / 21 MAR 16

Applicable to: ALL

The water and waste systems :

- Distribute potable water to the toilets and the galleys
- Dispose waste water
- Store toilet wastes.

The systems are insulated to prevent water leaks and ice build up.

Controls of the water and waste systems are located on the Forward Attendant Panel (FAP).

POTABLE WATER

Applicable to: ALL

Ident.: DSC-38-10-A-00017286.0002001 / 28 MAY 20

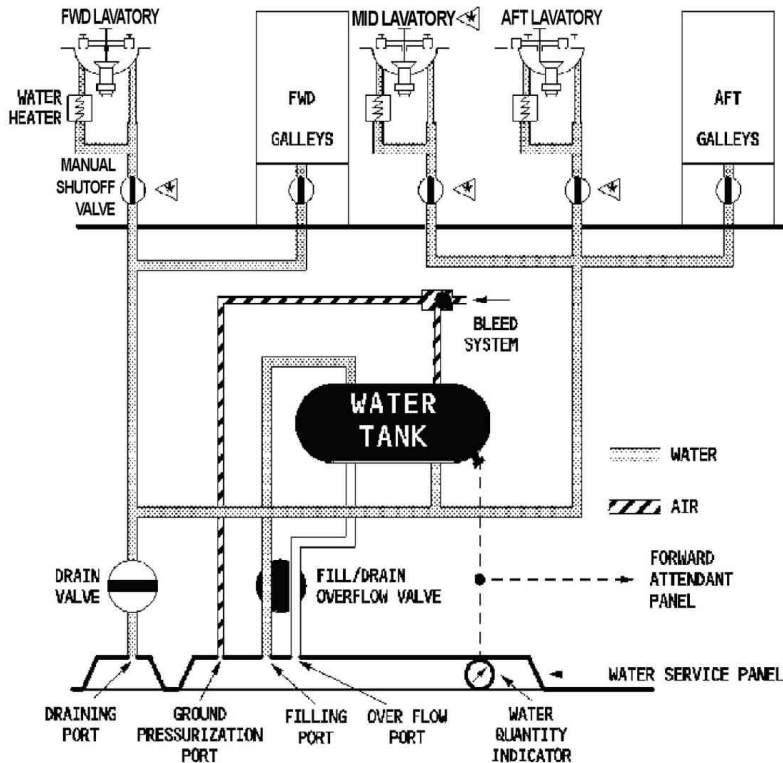
Potable water is stored in a 200 l water tank located in front of the wing box, behind the FWD cargo compartment.

On ground, the water system is pressurized by the air from the service panel pressure port (or the air-supply boost system). In flight, the water system is pressurized by the bleed air.

Potable water is piped to the galleys and lavatories. Manual shutoff valves  isolate wet galleys, the FWD lavatory (or the MID lavatory) and the aft lavatory from the water system. Manual shutoff valves are located under the washbasins or toilet bowls. The position of each valve is indicated by OPEN and SHUT legend.

The system can be filled or drained from the service panel under the fuselage. The indication of the water quantity in the water tank is displayed on the FAP and the aft service panel.

Ident.: DSC-38-10-A-00017435.0001001 / 21 MAR 16



WASTEWATER SYSTEM

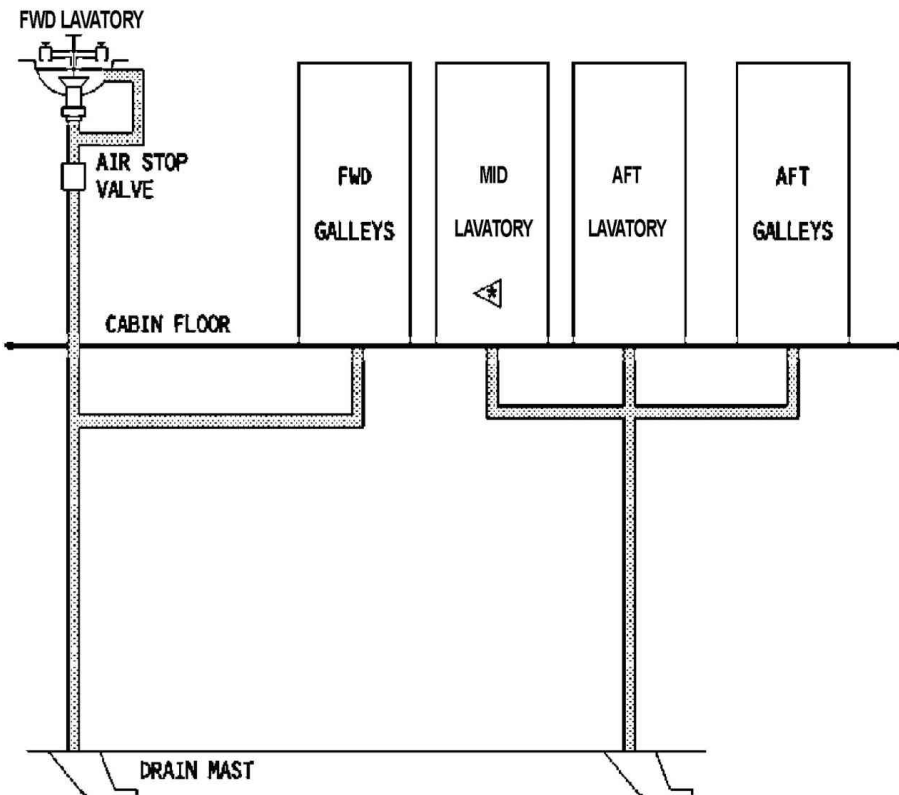
Ident.: DSC-38-10-00017287.0001001 / 21 MAR 16

Applicable to: ALL

The waste/water (from galleys and lavatories) drains overboard through two heated drain masts. The forward mast drains the waste/water from the forward cabin. The aft mast drains the waste/water from the aft cabin.

The waste and water are discharged by:

- Gravity, on ground
- Differential pressure, in flight.



TOILET SYSTEM

Ident.: DSC-38-10-00017288.0002001 / 21 MAR 16

Applicable to: ALL

Differential pressure forces the waste from the toilet bowls into the waste tank. The waste tank has a usable capacity of 170 l. On ground, and in flight below 16 000 ft, the differential pressure is generated by the vacuum generator.

Clean water from the potable water system flushes toilets.

AIRCRAFT SYSTEMS

WATER / WASTE

DESCRIPTION

A flush control unit controls the flush sequence in each toilet.

The Vacuum System Controller (VSC) ensures system control, monitoring and fault reporting.

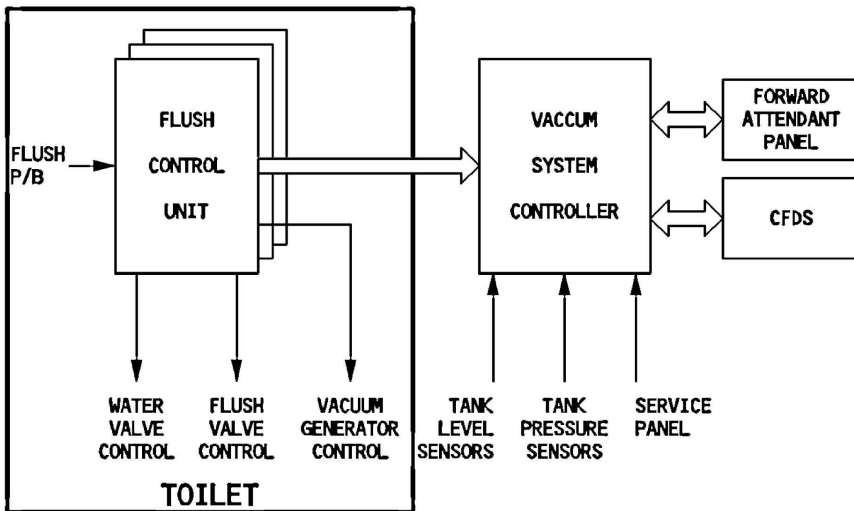
The VSC transmits information to:

- Flight attendant panel to indicate the waste tank levels and report system defects
- Centralized Fault Display System (CFDS) to signal the system defects to the maintenance.

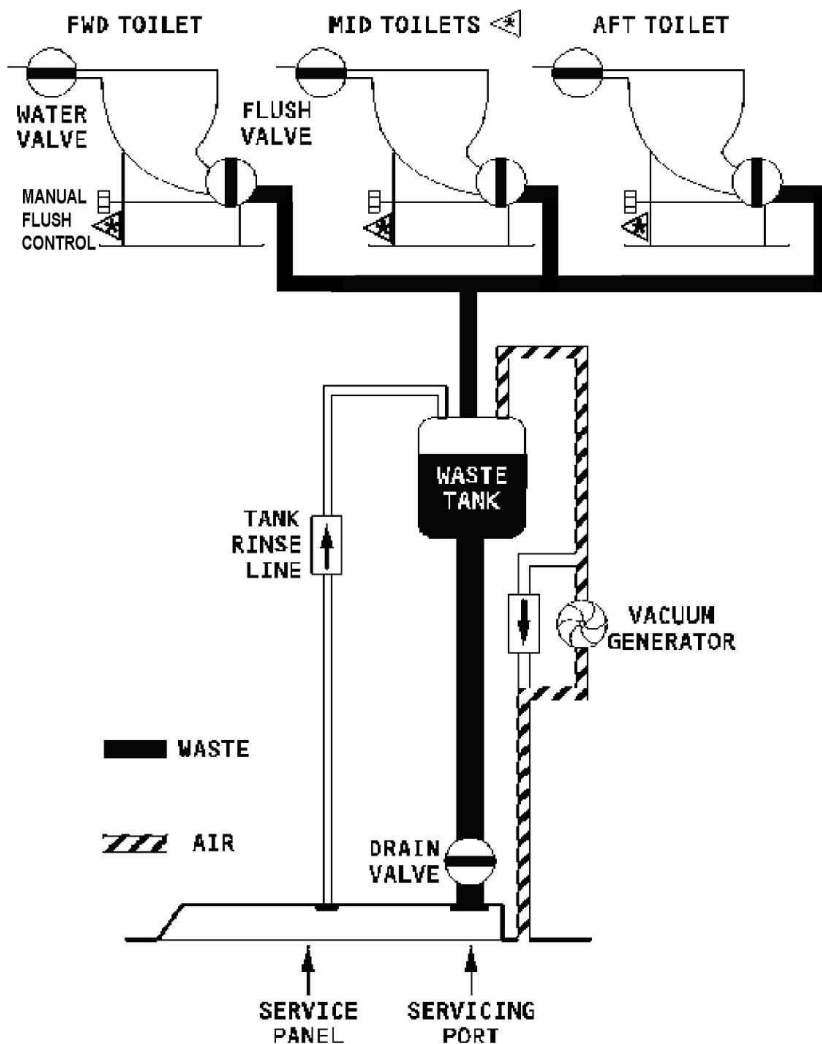
Ground personnel services the waste tank via a service panel, located under the fuselage.

A manual shutoff valve isolates an inoperative toilet. In the case of an electrical failure of flush valve, the manual flush control  can be used. The manual flush control is located under each toilet bowl.

ARCHITECTURE



SCHEMATIC



AIRCRAFT SYSTEMS

WATER / WASTE

DESCRIPTION

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AIRCRAFT SYSTEMS

MAINTENANCE SYSTEM

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DSC-45-10 Description

General.....	A
Components.....	B
Modes of Operation.....	C
Architecture.....	D
Failure/Fault Classification.....	E
Functions of the Centralized Fault Display System (CFDS).....	F
Cockpit/CFDS Interface.....	G

DSC-45-20 System Operation

Maintenance Menu.....	A
Last (or Current) Leg Report.....	B
Last (or Current) Leg ECAM Report.....	C
Previous Leg Report.....	D
Avionics Status.....	E
System Report/Test.....	F
GMT/Date Initialization.....	G
ACARS Print Program.....	H

DSC-45-25 Data Loading

General.....	A
Data Loading Selector on the Overhead Panel.....	B

DSC-45-30 Printer

General.....	A
System Description.....	B
How to change the paper roll.....	C
How to solve a paper jam.....	D

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS MAINTENANCE SYSTEM DESCRIPTION
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GENERAL

Ident.: DSC-45-10-00001490.0001001 / 21 MAR 16

Applicable to: ALL

The purpose of the Centralized Fault Display System (CFDS) is to make the maintenance task easier by displaying fault messages in the cockpit and permitting the flight crew to make some specific tests.

There are two levels of maintenance :

- at the line stop : removal and replacement of equipment
- at the main base : troubleshooting

COMPONENTS

Ident.: DSC-45-10-00001491.0001001 / 21 MAR 16

Applicable to: ALL

The CFDS includes :

- the BITE (Built-In Test Equipment) for each electronic system
- a central computer, the Centralized Fault Display Interface Unit (CFDIU)
- two MCDUs (Multipurpose Control and Display Units), used also for FMGS (Flight Management and Guidance System), AIDS (Aircraft Integrated Data System), and ACARS (Aircraft Communication And Reporting System, if installed), which work with the CFDIU to display information or initiate tests
- one printer.

If a main channel of the CFDIU fails, the backup channel takes over.

MODES OF OPERATION

Ident.: DSC-45-10-00001492.0001001 / 22 MAR 16

Applicable to: ALL

The CFDS operates in two main modes :

- the NORMAL mode or REPORTING mode (in flight)
- the INTERACTIVE mode or MENU mode (on ground).

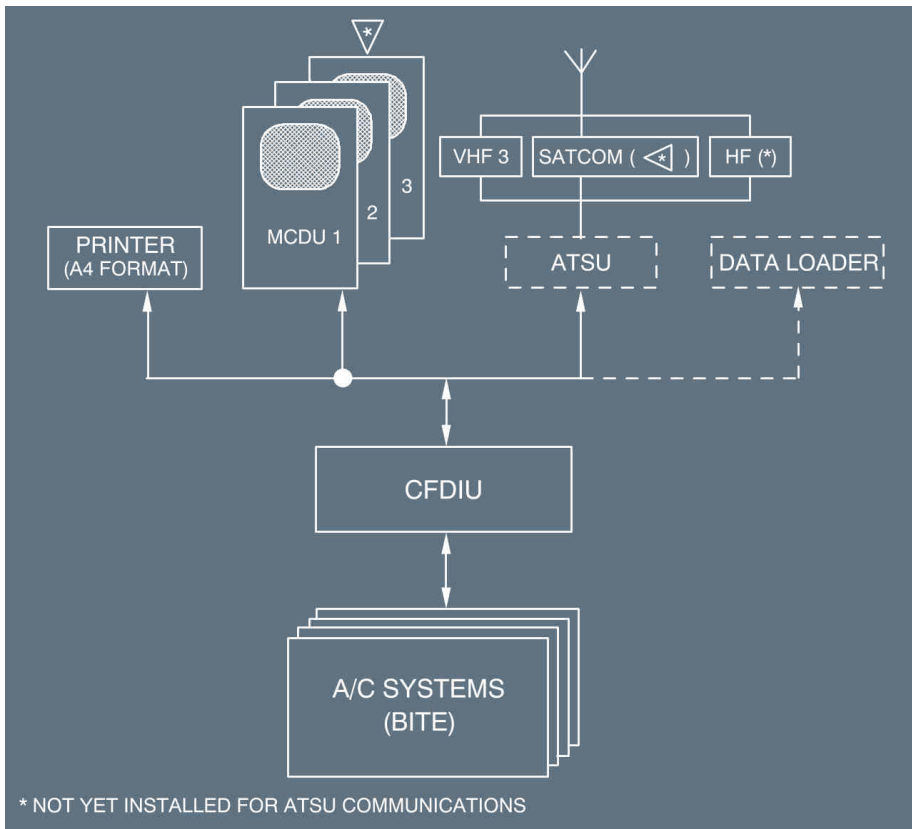
In NORMAL mode, the CFDS records and displays the failure messages transmitted by each system BITE.

In INTERACTIVE mode, the CFDS allows any BITE to be connected with the MCDU in order to display the maintenance data stored and formatted by the BITE or to initiate a test.

ARCHITECTURE

Ident.: DSC-45-10-00001493.0002001 / 19 DEC 12

Applicable to: ALL



 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS MAINTENANCE SYSTEM DESCRIPTION
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FAILURE/FAULT CLASSIFICATION

Ident.: DSC-45-10-00017082.0001001 / 21 MAR 16

Applicable to: ALL

The Centralized Fault Display System (CFDS) identifies the faulty system and puts any failures or faults into one of three classes :

- Class 1: Failures indicated to the flight crew by means of the ECAM, or other flight deck effect. They must be repaired or entered in the MEL (Minimum Equipment List) before the aircraft can depart.
- Class 2: Faults indicated to maintenance personnel by the CFDS and which trigger a MAINT status entry on the maintenance part of the ECAM status page. The aircraft can operate with these faults, but they must be rectified within the timescale defined in the Trouble Shooting Manual (TSM).
- Class 3: Faults indicated to maintenance personnel by the CFDS, but which do not trigger a MAINT status. The operator may have these faults corrected at his convenience.

Failure/fault classes	Class 1	Class 2	Class 3
Operational consequences	YES	NO	NO
Indication to the flight crew	YES Automatically displayed - Warning or caution messages on Engine Warning Display - Flag or indication in the flight deck.	YES Available on ECAM status page.	NO
Dispatch consequences	Refer to MEL may be : "GO" "GO IF" "NO GO"	<i>Refer to MMEL/MI-00-08 ECAM and MAINTENANCE STATUS</i>	MEL not applicable
Indication to the maintenance team	YES Automatically print out at the end of each flight : Fault messages on the CFDS Post Flight Report.		YES Available on request through system report/Test

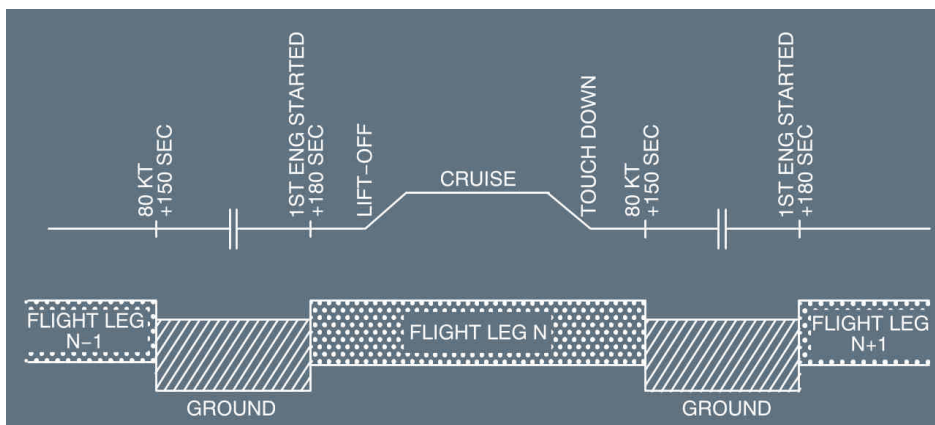
FUNCTIONS OF THE CENTRALIZED FAULT DISPLAY SYSTEM (CFDS)

Ident.: DSC-45-10-00001495.0002001 / 21 MAR 16

Applicable to: ALL

The main functions of the CFDS are :

- obtaining and storing messages transmitted by the connected system BITEs, or by the Flight Warning Computer (Warning and Caution titles)
- Detailing the maintenance phases.



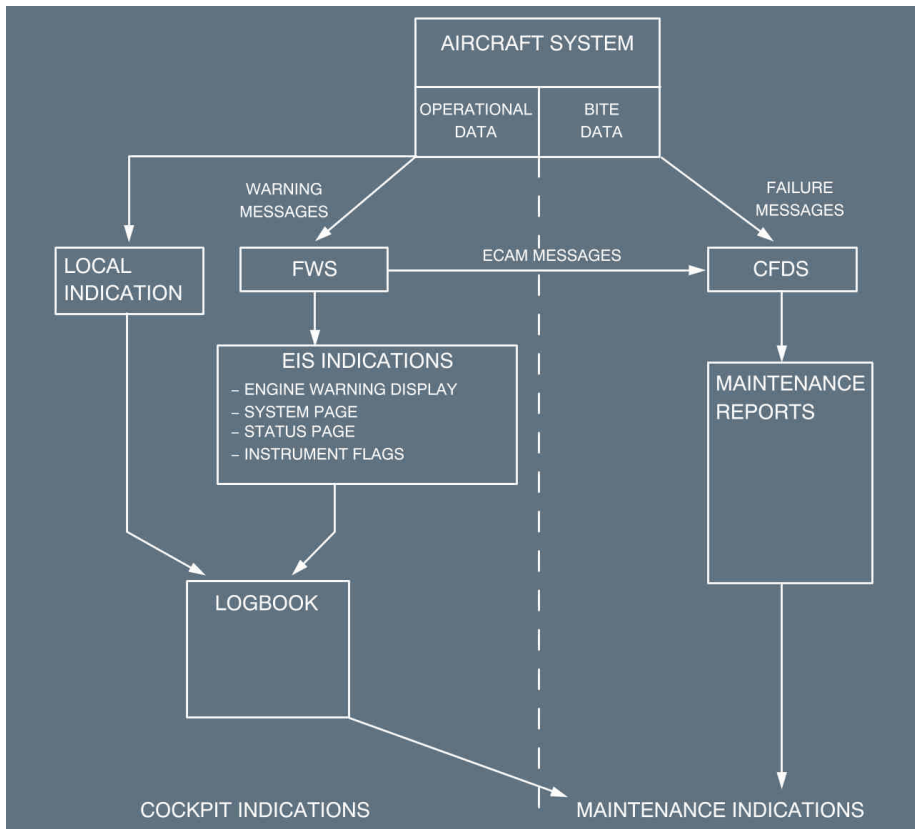
- Presenting maintenance reports :

- Last leg report
- Last leg ECAM report
- Previous leg report
- Avionics status
- System report test
- Post-flight report.

COCKPIT/CFDS INTERFACE

Ident.: DSC-45-10-00001496.0001001 / 22 MAR 16

Applicable to: ALL



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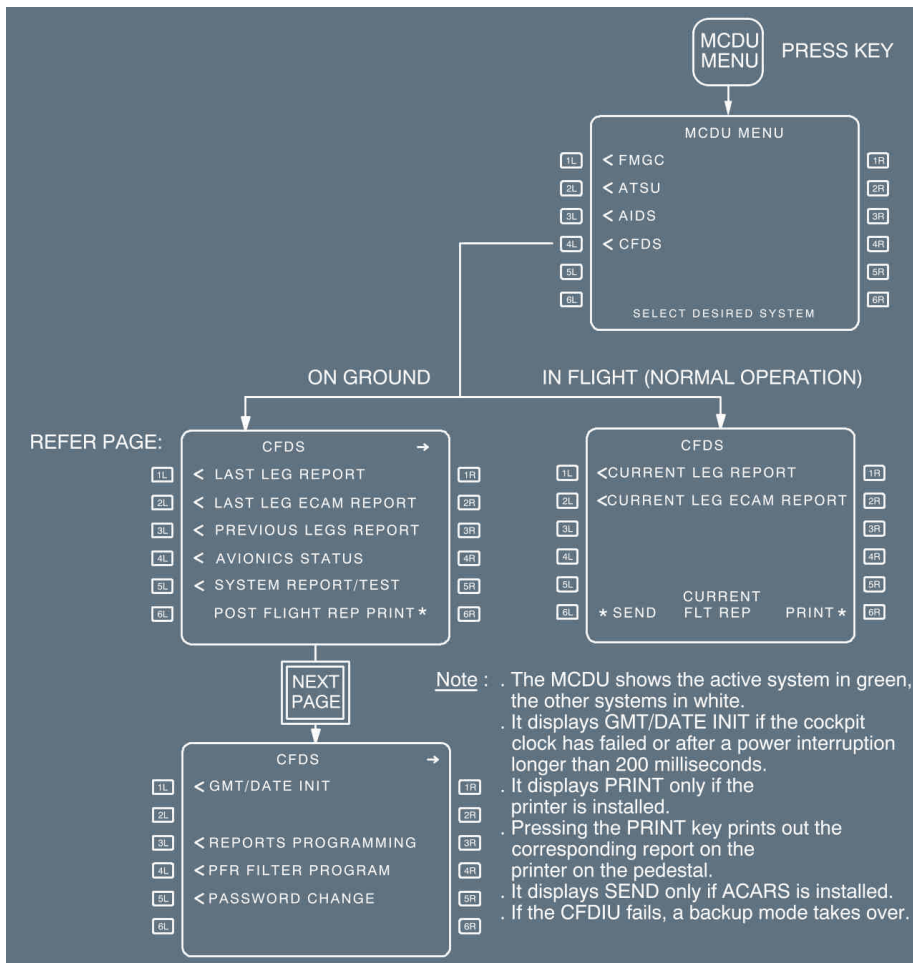
 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS MAINTENANCE SYSTEM SYSTEM OPERATION
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MAINTENANCE MENU

Ident.: DSC-45-20-00001497.0002001 / 14 MAY 12 Applicable to: ALL

The CFDS uses menus displayed on the MCDU. The operator selects functions or reports from these menus.

Pressing the MCDU MENU key and then selecting CFDS brings up the MAINTENANCE MENU page (different pages for the aircraft in flight and the aircraft on the ground).



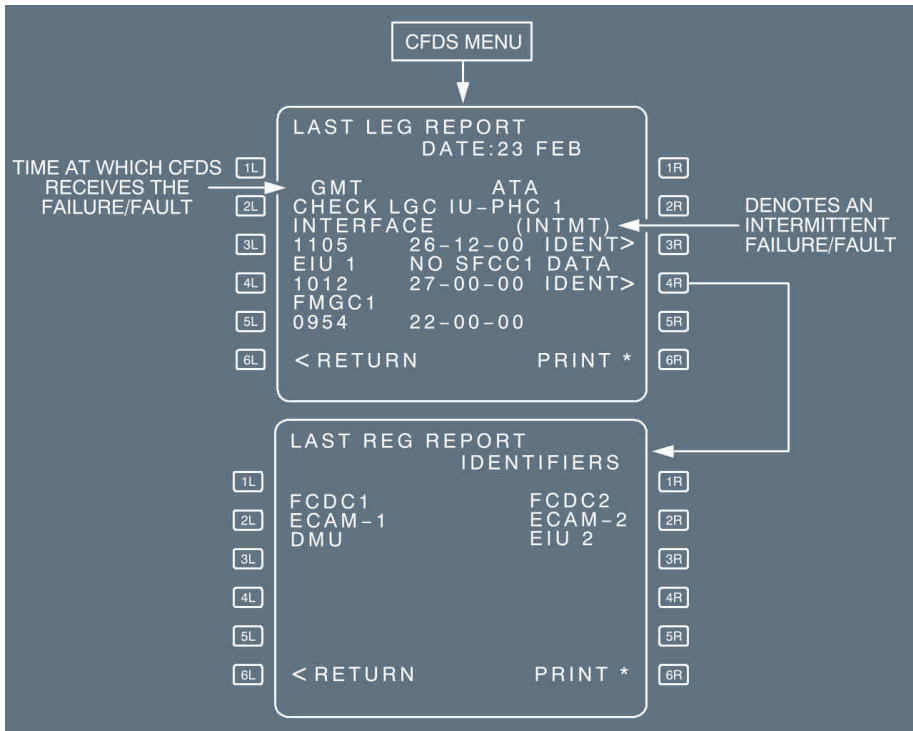
LAST (OR CURRENT) LEG REPORT

Ident.: DSC-45-20-00001498.0001001 / 21 MAR 16

Applicable to: ALL

The LAST LEG REPORT (on the ground) or the CURRENT LEG REPORT (in flight), list all class 1 failures and class 2 faults and all system failure and system fault messages received by the CFDS during the last flight leg or the current flight leg. Pressing the IDENT key displays a list of the systems

(called identifiers) affected by the failure or fault, which helps the pilot or maintenance person to identify the failure or fault.



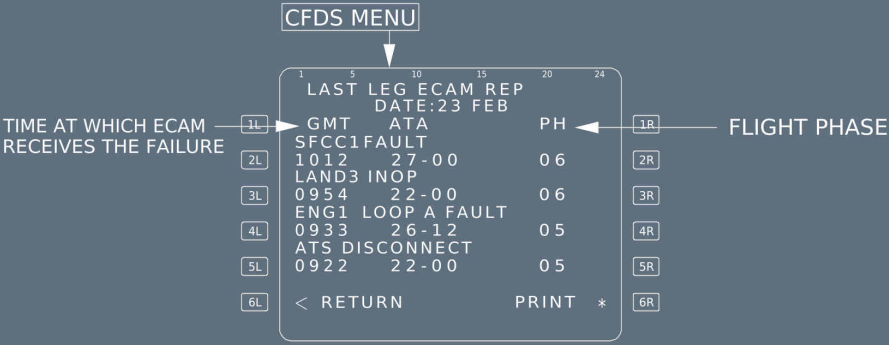
LAST (OR CURRENT) LEG ECAM REPORT

Applicable to: ALL

Ident.: DSC-45-20-A-00001499.0001001 / 21 MAR 16

GENERAL

- In flight : The CURRENT LEG ECAM REPORT displays the primary and independent warning (class I) messages and MAINTENANCE STATUS (class II) messages of the current flight leg.
- On the ground : The LAST LEG ECAM REPORT displays the primary and independent warning (class I) messages plus MAINTENANCE STATUS (class II) messages of the last flight leg.



Note: This screen displays PRINT only if the printer is installed.

Ident.: DSC-45-20-A-00001500.0001001 / 14 MAY 12

POST FLIGHT REPORT PRINT

At the end of a flight, LAST LEG and LAST LEG ECAM REPORTS are printed out automatically after the last engine shutdown. The flight or ground crew can also print them out by selecting POST FLIGHT REP PRINT.

The report first lists the ECAM warnings, then the FAULT messages.

CFDS POST FLIGHT REPORT

A/C IDENT	DATE	GMT	FLT#	CITY PAIR
XY-ABCD	FEB23	2355	XY-1234	LFBO/LFPO

ECAM WARNINGS

GMT	ATA PH	MESSAGE
1012	27-00 06	SFCC 1 FAULT
0954	22-00 06	LAND3 INOP
0933	26-12 05	ENG 1 LOOP A FAULT
0922	22-00 05	ATS DISCONNECT
0915	28-21 04	FUEL L TK PUMP 1 LO PR
0904	36-22 04	BLEED LOOP

FAULT MESSAGES

GMT	ATA	MESSAGE
1105	26-12-00	CHECK LGCIU-PHC 1 INTERFACE (INTMT)
1012	27-00-00	EIU 1--NO SFCC 1 DATA
0954	22-00-00	FMGC 1
0933	36-11-00	BMC 1
0915	28-21-00	FUEL L TK PUMP 1 QM
0904	26-12-00	CHECK R WING LOOP A

COMMENTS

PREVIOUS LEG REPORT

Ident.: DSC-45-20-00001501.0001001 / 21 MAR 16

Applicable to: ALL

This report gives access to the POST FLIGHT REPORTS of the previous 63 flight legs.

1L

2L

3L

4L

5L

6L

PREVIOUS LEGS REPORT→
 XY-ABCD
 LEG DATE GMT ATA
 NO FAC 1 DATA (INTMT)
 -01FEB22- 1312 20-00-00
 N2 SENSOR ENG 1
 -01FEB22- 1248 77-45-11

CHECK ADIRU 1 STATICS
 PHC1 INTERFACE
 -05FEB20- 1733 34-67-00

< RETURN PRINT*

1R

2R

3R

4R

5R

6R

1L

2L

3L

4L

5L

6L

PREVIOUS LEGS REPORT
 XY-ABCD
 LEG DATE GMT ATA
 CHECK LGDIU-PHC2
 INTERFACE
 -12FEB15-0966 26-12-00

< RETURN PRINT *

1R

2R

3R

4R

5R

6R

NEXT PAGE

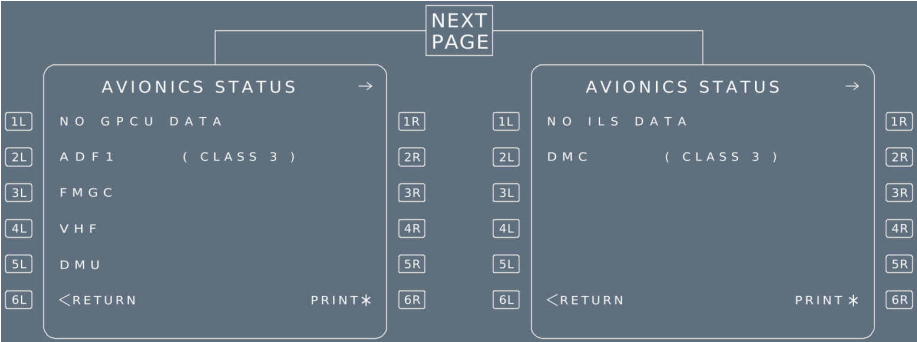
On ground, the Operator can print copies of the screen. If ACARS is installed, the Operator can send the flight report (*Refer to DSC-45-20 Last (or Current) Leg ECAM Report - Post Flight Report Print*).

AVIONICS STATUS

Ident.: DSC-45-20-00001502.0001001 / 21 MAR 16

Applicable to: ALL

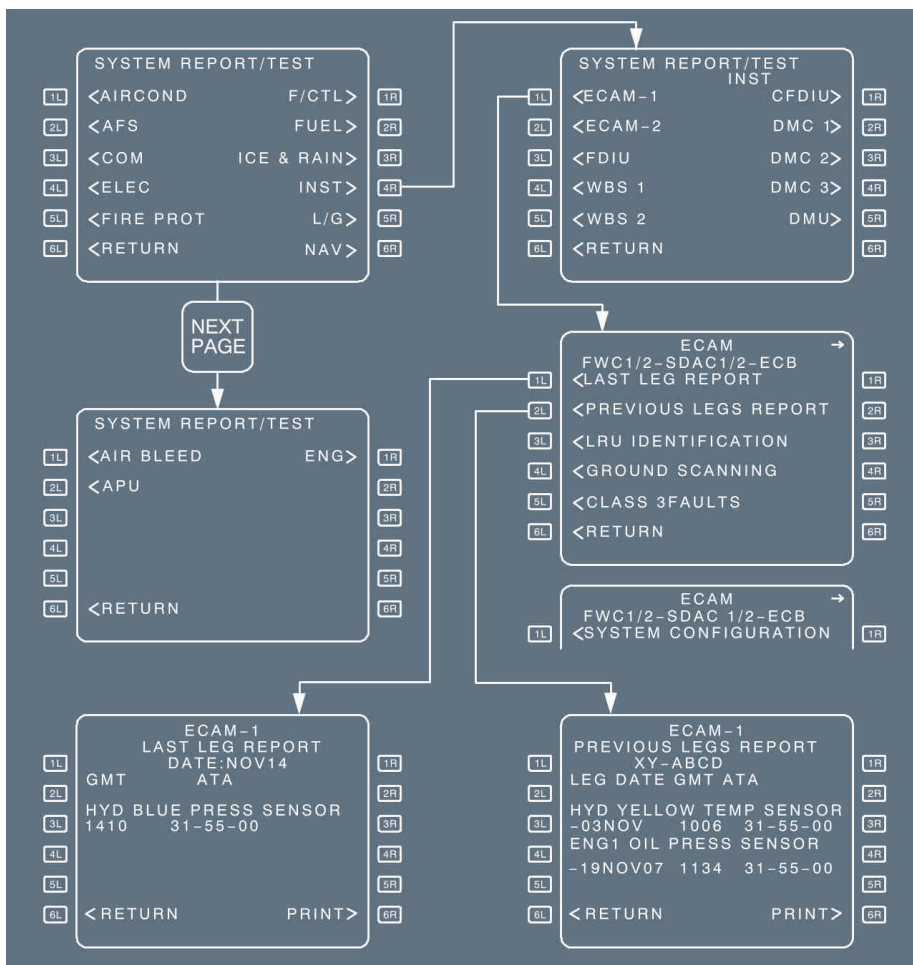
This screen displays the list of systems affected by a failure or fault. If a system is affected by at least a Class 3 fault, CLASS 3 appears beside it. The display is continuously updated.



SYSTEM REPORT/TEST

Ident.: DSC-45-20-00001503.0001001 / 21 MAR 16
Applicable to: ALL

This screen gives the operator access to all electronic systems. The CFDIU enters into interactive dialogue with the selected system.



In the above example, the operator has called up menus of the selected systems :

- LAST or PREVIOUS LEG REPORT presents the list of Line-Replaceable Units (LRUs) affected by a failure.
- LRU IDENTIFICATION contains the part numbers of all LRUs in the system.
- GND SCANNING runs the flight monitoring on the ground and indicates the faulty LRU.
- CLASS 3 FAULTS lists class 3 faults detected by the system during the last flight leg.
- SYSTEM CONFIGURATION presents the system configuration in a digital form.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS MAINTENANCE SYSTEM SYSTEM OPERATION
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Note: These screens (except LAST or PREVIOUS LEG REPORT) are not shown above.

GMT/DATE INITIALIZATION

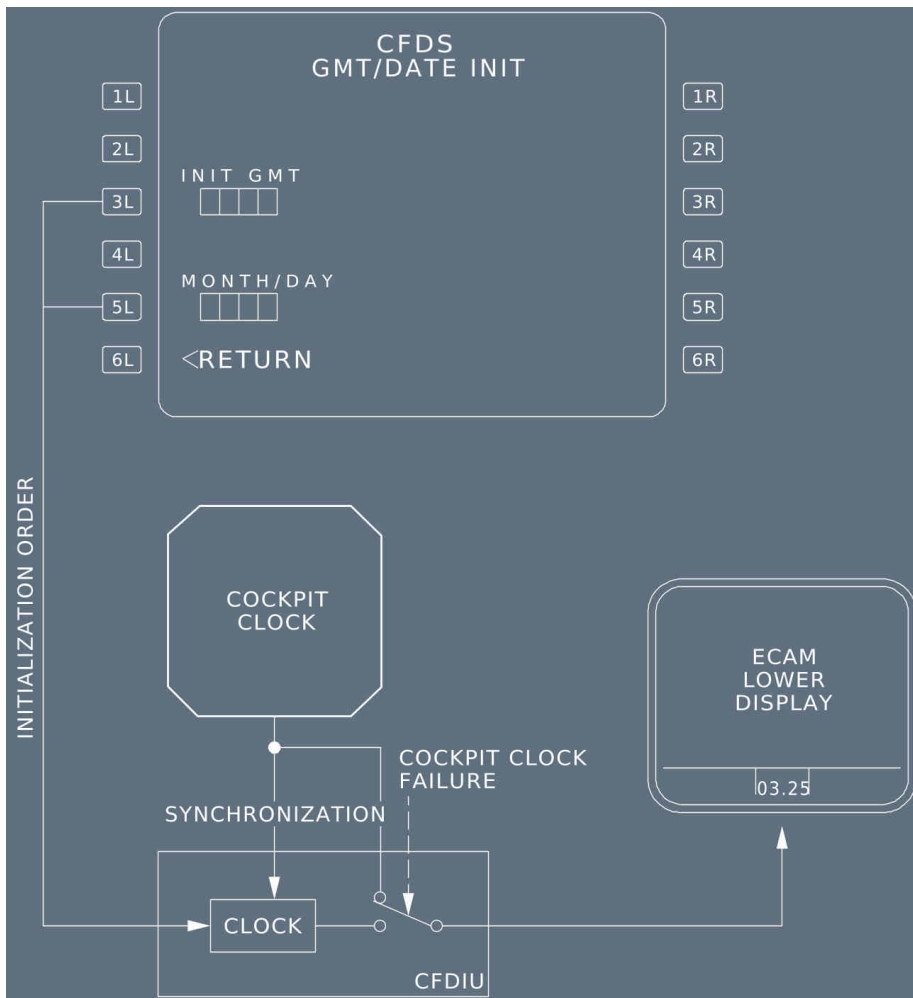
Ident.: DSC-45-20-00001504.0001001 / 21 MAR 16

Applicable to: ALL

A CFDIU clock is synchronized with the cockpit clock in order to keep GMT (UTC) displayed on the ECAM lower display (except in flight Phases 1 and 2, if the weight and balance system is installed). If the cockpit clock fails, the CFDIU clock continues to display GMT (UTC) on the ECAM lower display.

If electrical power is interrupted for more than 200 ms, the crew initializes GMT (UTC) and the DATE via the MCDU :

- Write GMT (UTC) in the scratchpad, then press the "INIT GMT" key.
- Do the same for the month and day.



ACARS PRINT PROGRAM

Ident.: DSC-45-20-00005361.0001001 / 14 FEB 11

Applicable to: **ALL**

This function gives access to reprogramming page.

The programming is provided by the ACARS or manually (on the ground or in flight) :

No star indicates an ACARS programming. The YES indicates that the REAL TIME FAIL will be automatically transmitted to the ACARS.

The star indicates a manually modified programming: pressing the corresponding key changes the YES into a NO. The YES indicates that the REAL TIME FAIL page will be printed simultaneously with the transmission to the ACARS.

ACARS/PRINT PROGRAM																				
SEND										PRINT										
1L	N	O	P	O	S	T	F	L	T	R	E	P	N	O	*	1R				
2L	Y	E	S	R	E	A	L	T	I	M	E	F	A	I	L	Y	E	S	*	2R
3L	Y	E	S	R	E	A	L	T	I	M	E	W	A	R	N	N	O	*	3R	
4L	*	Y	E	S	A	V	I	O	N	I	C	S	D	A	T	A	Y	E	S	4R
5L															5R					
6L	<RETURN										PRINT *				6R					

Note: The CFDIU memorizes all manual programming so that at initialisation the last configuration will be retained.

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS MAINTENANCE SYSTEM DATA LOADING
--	--

GENERAL

Ident.: DSC-45-25-00001506.0005001 / 06 NOV 23
Applicable to: MSN 05152-07792

With the data loading system, it is possible to upload databases and operational software, or to download system reports from various onboard computers.
The data transfer is performed by a portable data loader via the data loading connector located on the overhead panel.

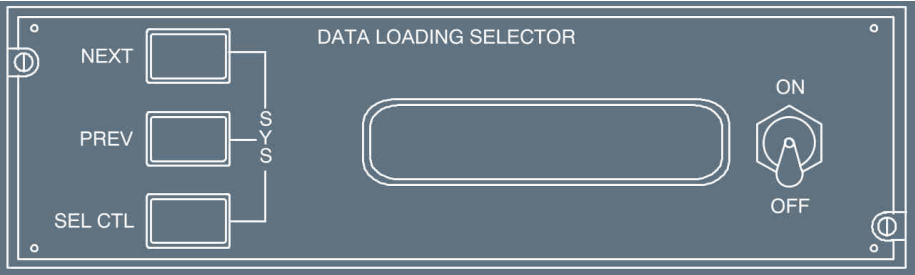
GENERAL

Ident.: DSC-45-25-00001506.0001001 / 10 JAN 11
Applicable to: MSN 02155-04392

With the data loading system, it is possible to upload databases and operational software, or to download system reports from various onboard computers.
The data transfer is performed via 3.5 in disks and a portable data loader, or the aircraft fixed Multipurpose Disk Drive Unit  (MDDU).

DATA LOADING SELECTOR ON THE OVERHEAD PANEL
--

Ident.: DSC-45-25-00001507.0001001 / 19 DEC 12
Applicable to: ALL



When the data loading selector is ON, the 3 keys (NEXT, PREV, SEL CTRL) enable the display and selection of various applicable aircraft systems (FMGC, TCAS  etc...).

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS MAINTENANCE SYSTEM PRINTER
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GENERAL

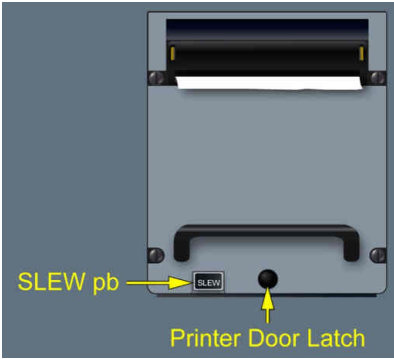
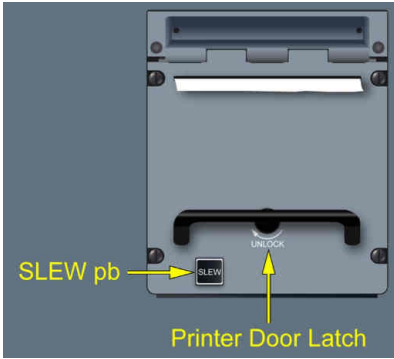
Ident.: DSC-45-30-00001508.0001001 / 21 MAR 16
Applicable to: ALL

The printer prints reports from the following systems (if installed) : ACARS, AIDS, FMGC, CFDIU and EVMU. It prints these on paper, and does so either on the ground or in flight.
The printer is installed at the rear of the pedestal on the right side.

SYSTEM DESCRIPTION

Ident.: DSC-45-30-00001509.0001001 / 13 MAY 25
Applicable to: ALL

Depending on the type of printer installed on the aircraft, the flight crew may use one of the following descriptions.

 SLEW pb → [SLEW] → [Printer Door Latch]	 SLEW pb → [SLEW] → [UNLOCK]
SLEW PB  When pressed, the paper comes out of the printer. The SLEW pb is used to feed the paper to the printer.	SLEW PB  When pressed, the paper comes out of the printer. In the case of an internal paper jam, the SLEW pb light flashes two times per second (<i>Refer to procedure</i>). If it takes more than 30 s to start the printing, the SLEW pb light comes on during one second every three seconds, and goes off when the report starts printing.
PRINTER DOOR LATCH  The printer door latch locks the door.	

HOW TO CHANGE THE PAPER ROLL

Ident.: DSC-45-30-00028793.0001001 / 13 MAY 25

Applicable to: ALL

In order to change the paper roll of the printer, the flight crew should apply the following procedure:

STEP 1

- Release the locking system and lift the door.
- Remove the remaining paper from the paper cutter.
- Move the paper mandrel to disengage it from its base.

STEP 2

- Take a new paper roll.
- Make sure that the edge of the paper has a smooth cut, that the paper is free of creases and is rolled tight.
- Remove the empty paper roll and replace it with the new one.
- Re-engage the paper mandrel into its initial position.

STEP 3

- Feed the paper under the black roller and through the slot of the paper cutter in the indicated direction.
- Make sure that the paper is held firmly in position.

STEP 4

- Close and lock the door.
- Verify that the latch is engaged by pulling the door handle outward.

Note: To confirm that the printer is ready for subsequent printing operations, press on the **SLEW pb** and check that the paper comes out correctly.

HOW TO SOLVE A PAPER JAM

Ident.: DSC-45-30-00028835.0001001 / 13 MAY 25

Applicable to: ALL

In the case of a confirmed paper jam, the flight crew should apply the following procedure:

● If the paper can be grasp:

- Pull the paper with two hands until the printer releases the paper.
- Pull the paper off.
- Release the locking system and lift the door.
- Close and lock the door.

● **If the paper cannot be grasp:**

Release the locking system and lift the door.

Remove all the paper from the mechanical block and ensure that the paper is flat.

Feed the paper under the black roller and through the slot of the paper cutter in the direction indicated on the self-adhesive labels.

Pull the paper until the paper is free of creases.

Close and lock the door.

Remove the creased paper with the paper cutter.

To confirm that the printer is ready for subsequent printing operations, press on the SLEW pb and check that the paper comes out correctly.

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AIRCRAFT SYSTEMS

INFORMATION SYSTEMS

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DSC-46-10 Datalink**DSC-46-10-10 General System Description**

Overview.....	A
Architecture.....	B
Cockpit Interface.....	C
Datalink Message.....	D

DSC-46-10-20 AOC Applications**DSC-46-10-20-10 General**

General.....	A
--------------	---

DSC-46-10-30 ATC Applications**DSC-46-10-30-10 Notifications**

Notification.....	A
-------------------	---

DSC-46-10-30-20 Controller/Pilot Datalink Communication (CPDLC)

General.....	A
Connect.....	B
Request.....	C
Edit.....	D
MAX Uplink Delay	E
Message Timers.....	F

DSC-46-10-30-70 Message Record

Message Record.....	A
---------------------	---

DSC-46-10-40 Controls and Indicators**DSC-46-10-40-10 ATC Message Pushbutton (ATC MSG PB)**

ATC MSG Pb.....	A
-----------------	---

DSC-46-10-40-20 Datalink Control and Display Unit (DCDU)

DCDU.....	A
-----------	---

DSC-46-10-40-30 MCDU Datalink Pages

Introduction.....	A
ATC MENU.....	B
ATSU DATALINK.....	C
COMM CONFIG.....	D
COMM MENU.....	E
CONNECTION.....	F
CONNECTION STATUS.....	G
DATALINK STATUS.....	H

Continued on the following page

Continued from the previous page

EDIT.....	I
FREQUENCY REPORTING.....	J
MSG RECORD.....	K
NOTIFICATION.....	L
REQUEST.....	M
TEXT.....	N
VHF3 DATA MODE.....	O
VHF3 SCAN SELECT.....	P

DSC-46-10-40-40 MCDU Scratchpad Messages

MCDU Scratchpad Messages.....	A
-------------------------------	---

DSC-46-10-40-50 MCDU Data Entry Format

MCDU Data Entry Format.....	A
-----------------------------	---

DSC-46-10-40-60 ECAM

Memo Display.....	A
-------------------	---

DSC-46-10-50 How To

Introduction.....	A
How to Initialize.....	B
How to Notify	C
How to Connect.....	D
How to Send Request to ATC.....	E
How to Answer.....	F
How to Manage Temporary Loss of Datalink Communication Means.....	G
How to Modify FLT Plan.....	H

DSC-46-10-60 Temporary Abnormal Behaviors

ATC MSG RECORD NOT RELIABLE - Displayed at ATSU Power-up.....	A
---	---

DSC-46-40 Pax Entertainment & Connectivity Systems (If Installed)

DSC-46-40-10 General

General.....	A
--------------	---

DSC-46-40-20 In Seat Power Supply System

IN SEAT POWER SUPPLY SYSTEM 	A
---	---

Continued on the following page

Continued from the previous page

DSC-46-40-30 Controls and Indicators

MOBILE COM PB-SW	◀▶	.....	A
DISC IN PROG Light	◀▶	.....	B
CINS RESET PB	◀▶	.....	C
PAX COM PB-SW	◀▶	.....	D
PAX SYS PB-SW	◀▶	.....	E
PAX PERSONAL ELEC SPLY PB-SW	◀▶	.....	F
MEMO DISPLAY		.....	G



A318/A319/A320/A321
FLIGHT CREW
OPERATING MANUAL

AIRCRAFT SYSTEMS

INFORMATION SYSTEMS

PRELIMINARY PAGES - TABLE OF CONTENTS

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Localization Title	Toc Index	ID	Reason
DSC-46-10-10 Overview	A	1	Layout modification. No technical change.
			Documentation update: Deletion of text.
DSC-46-10-10 Overview	A	2	Layout modification. No technical change.
			Documentation update: Deletion of text.
DSC-46-10-10 Overview	A	3	Layout modification. No technical change.
			Documentation update: Deletion of text.
DSC-46-10-10 Overview	A	4	Layout modification. No technical change.
			Documentation update: Deletion of text.
DSC-46-10-10 Overview	A	5	Layout modification. No technical change.
			Documentation update: Deletion of text.
DSC-46-10-10 Overview	A	6	Layout modification. No technical change.
			Documentation update: Deletion of text.
DSC-46-10-10 ATSU	B	7	Layout modification. No technical change.
			Documentation update: Deletion of text.
DSC-46-10-10 Cockpit Interface	C	8	Layout modification. No technical change.
			Documentation update: Deletion of text.
DSC-46-10-30-20 Message Timers	F	1	Correction of the description of the operational response timer: NO ATC REPLY is a message information, not a message sent by the ATC.
DSC-46-10-40-30 Introduction	A	1	Layout modification. No technical change.



A318/A319/A320/A321
FLIGHT CREW
OPERATING MANUAL

AIRCRAFT SYSTEMS

INFORMATION SYSTEMS

PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS

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OVERVIEW

Ident.: DSC-46-10-10-00020333.0001001 / 07 NOV 25

Applicable to: MSN 02155-02212, 02926-02944, 04392

The datalink has:

- AOC  applications

L2 The flight crew uses the AOC applications to communicate with Airline Operational Center (AOC).

L1 - ATC applications

L2 The flight crew uses the ATC applications to communicate with Air Traffic Control (ATC) centers.

L1 The ATC datalink  provides communication, navigation, and surveillance for Air Traffic Management (ATM) services.

The ATC datalink  applications enable air traffic controllers to follow the aircraft navigation, and enhance the air traffic flow.

The datalink communication (messages exchange) between the aircraft and the ground is achieved:

- Automatically (without a flight crew action)
- Manually (with a flight crew action via the DCDU/MCDU and/or RMP).

The datalink messages are:

- Uplink (from a ground facilities to the flight crew), or
- Downlink (from the flight crew to an ground facilities).

2 **COMMUNICATION AND NAVIGATION FOR AIR TRAFFIC MANAGEMENT**

At the beginning of the flight, the flight crew sends a notification message to the ATC center, via the MCDU (ATC datalink  notification application).

Then, an air traffic controller will establish a connection between the aircraft and the ATC center.

As a result, the flight crew can exchange messages with the ATC center, via the DCDU  (CPDLC application). The messages that the flight crew sends to the ATC center can be built with present frames and modified via the MCDU.

Depending on the type of datalink exchange, the datalink uses one of the following communication networks:

- ACARS for FANS A  applications
- ACARS Air Traffic Services (ATS 623) for optional applications 
- Aeronautical Telecommunication Network (ATN) for FANS B  applications

L2 The ATN supports increasing volume of ATC and AOC communication.

L1 Note: *FANS A+  (FANS B+ ) is an evolution of the FANS A  (FANS B ) that introduces ATS 623 applications and datalink recording capability.*

FUTURE AIR NAVIGATION SYSTEM (FANS)

The ATC datalink provides:

- FANS A  Applications, for operations in remote and in oceanic areas:
 - Notification
 - Controller-Pilot Data Link Communication (CPDLC)
 - Automatic Dependent Surveillance Contract (ADS-C).
- FANS B  Applications, for operations in high-density continental areas:
 - Notification
 - Controller-Pilot Data Link Communication (CPDLC).
- Optional applications  (compatible only with FANS A+ or FANS B+):
 - Departure Clearance
 - Oceanic Clearance
 - Digital - Automatic Terminal Information Service (D-ATIS).

3 NAVIGATION AND SURVEILLANCE FOR AIR TRAFFIC MANAGEMENT

The Automatic Dependent Surveillance (ADS) system sends aircraft position and aircraft navigation data to ATC centers and other aircraft.

There are two different ADS applications:

- ADS-Contract (ADS-C )
 The ADS-C automatically sends aircraft surveillance data to connected ATC centers via ATC Datalink  in remote or oceanic areas.
- ADS-Broadcast (ADS-B )
 The ADS-B automatically broadcasts the aircraft position and navigation data to other users (ATC centers or other aircraft) equipped with a Mode S transponder. The ATC Datalink  does not host the ADS-B .

SERVICE PROVIDERS

The role of a communication service provider is to deliver a message from the A/C to a ground end system and vice versa.

A datalink service provider ensures routing of datalink messages between the aircraft and ATC center.

-  For VHF communication, the two main providers are ARINC and SITA that operate worldwide networks.

L1 REVERSION TO VOICE COMMUNICATION

Voice communication is a primary means of communication on board.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS INFORMATION SYSTEMS DATALINK - GENERAL SYSTEM DESCRIPTION
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The flight crew must revert from datalink communication to voice communication, if:

- There is an emergency situation (exchange of a critical or urgent message)
- There is a doubt about a datalink message, the voice should be used for clarification
- An operational timer of datalink message exchange times out
- A response to an ATC message was not correctly transmitted via datalink.

CLOCK ACCURACY

The required time precision for ATC datalink communications is +/-1 s UTC. If this constraint is not respected, a rejection of datalink message or acceptance of obsolete datalink message may occur.

Not respecting this constraint may lead to the rejection of messages or to the acceptance of obsolete messages.

For FANS operations, the flight crew should not manually set the clock during cockpit preparation.

OVERVIEW

Ident.: DSC-46-10-10-00020333.0002001 / 07 NOV 25

Applicable to: MSN 02719-02789, 03031-03060, 05152-07792

4

The datalink has:

- AOC  applications
-  The flight crew uses the AOC applications to communicate with Airline Operational Center (AOC).
-  - ATC applications
-  The flight crew uses the ATC applications to communicate with Air Traffic Control (ATC) centers.
-  The ATC datalink provides communication, navigation, and surveillance for Air Traffic Management (ATM) services.

The ATC datalink applications enable air traffic controllers to follow the aircraft navigation, and enhance the air traffic flow.

The datalink communication (messages exchange) between the aircraft and the ground is achieved:

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5

COMMUNICATION AND NAVIGATION FOR AIR TRAFFIC MANAGEMENT

At the beginning of the flight, the flight crew sends a notification message to the ATC center, via the MCDU, notification application.

Then, an air traffic controller will establish a connection between the aircraft and the ATC center. As a result, the flight crew can exchange messages with the ATC center, via the DCDU (CPDLC application). The messages that the flight crew sends to the ATC center can be built with present frames and modified via the MCDU.

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L2 The ATN supports increasing volume of ATC and AOC communication.

L1 *Note: FANS A+ (FANS B+) is an evolution of the FANS A (FANS B) that introduces ATS 623 applications and datalink recording capability.*

ATC DATALINK COMMUNICATION

The ATC datalink provides:

- FANS B applications (ATN B1 in ICAO designation) using ATN ground network, for operations in high-density continental areas:
 - Notification
 - Controller-Pilot Data Link Communication (CPDLC).

6 NAVIGATION AND SURVEILLANCE FOR AIR TRAFFIC MANAGEMENT

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS INFORMATION SYSTEMS DATALINK - GENERAL SYSTEM DESCRIPTION
--	--

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Not respecting this constraint may lead to the rejection of messages or to the acceptance of obsolete messages.

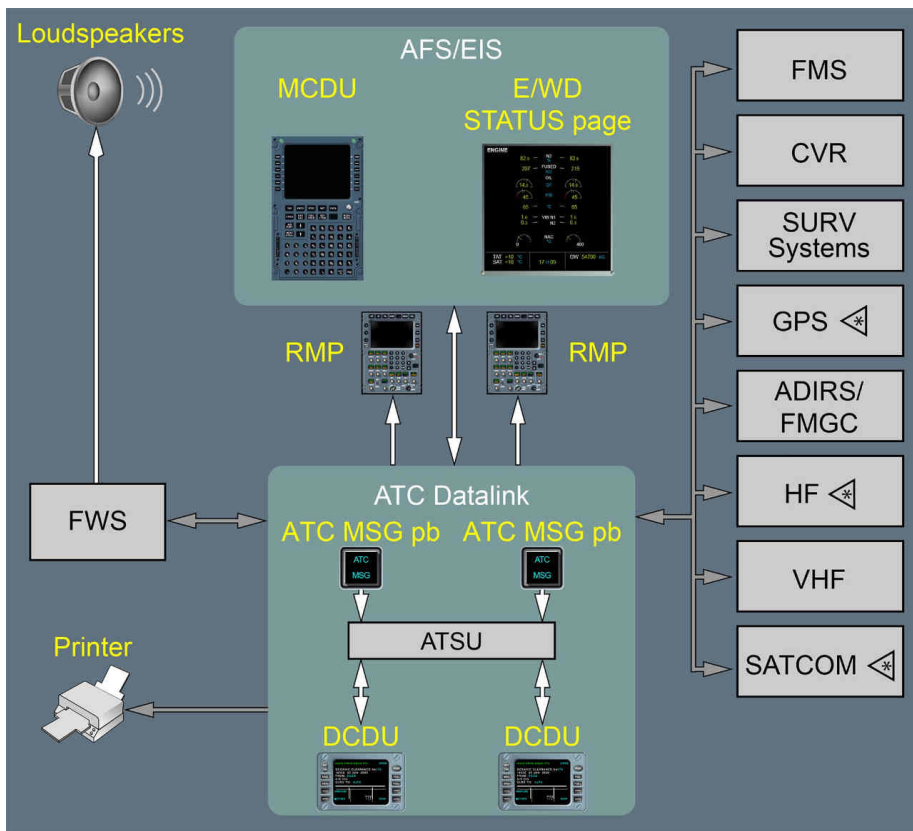
For FANS operations, the flight crew should not manually set the clock during cockpit preparation.

ARCHITECTURE

Ident.: DSC-46-10-10-00020332.0001001 / 17 MAR 17

Applicable to: MSN 02719-02789, 03031-03060, 05152-07792

Architecture of the ATC Datalink



Ident.: DSC-46-10-10-00020323.0001001 / 17 MAR 17

Applicable to: MSN 02719-02789, 03031-03060, 05152-07792

AIR DATA/INERTIAL REFERENCE SYSTEM (ADIRS)

The ADIRS provide aircraft position data to the FMGC. The FMGC consolidates the position value from different sources and transmits it to the ATSU. This is the primary source for the aircraft position.

Ident.: DSC-46-10-10-10-00020329.0001001 / 07 NOV 25

Applicable to: ALL

7 **AIR TRAFFIC SERVICE UNIT (ATSU)**

The ATSU controls all datalink communication and automatically selects the best available communication media:

- VHF
- HF 
- SATCOM  .

The ATSU hosts:

- AOC  applications
- ATC applications
- Router services

The ATSU routers automatically select VHF frequency, depending on the aircraft position, in accordance with an entered scan mask (airline policy).

The scan mask means that a list of VHF datalink service providers, selected via the VHF3 SCAN SELECT page, is scanned, in accordance with their priority level. The VHF scan mask is compulsory for correct router operation. If there is no scan mask, the ECAM displays DATALINK ATSU FAULT – ATSU INIT FAULT.

Refer to DSC-46-10-40-30 VHF3 SCAN SELECT for more information about the VHF3 SCAN SELECT page.

Ident.: DSC-46-10-10-10-00020325.0001001 / 17 MAR 17

Applicable to: MSN 07784-07792

COCKPIT VOICE RECORDER (CVR)

In addition to its voice recording function, the CVR records the data that the flight crew and the air traffic controller exchange.

Ident.: DSC-46-10-10-10-00020330.0001001 / 17 MAR 17

Applicable to: MSN 02719-02789, 03031-03060, 05152-07792

DATALINK CONTROL AND DISPLAY UNIT (DCDU)

The DCDU enables the flight crew to:

- Read and answer datalink messages, received from the ground
- Display datalink messages, before sending.

Ident.: DSC-46-10-10-10-00020326.0001001 / 17 MAR 17

Applicable to: MSN 02719-02789, 03031-03060, 05152-07792

FLIGHT MANAGEMENT SYSTEM (FMS)

The ATC datalink interacts with Flight Management Computers (FMC).

The FMS:

- Processes datalink messages
- Prepares/generates an answer to datalink messages
- Monitors clearances
- Reminds the flight crew about a clearance, before reaching a clearance condition.

When a monitored parameter reaches the assigned value, the FMS generates a reminder message via the DCDU.

Ident.: DSC-46-10-10-10-00020331.0001001 / 17 MAR 17

Applicable to: MSN 02719-02789, 03031-03060, 05152-07792

FLIGHT WARNING SYSTEM (FWS)

The FWS interacts with the ATSU and:

- Alerts, when a datalink message is received
- Alerts, in the case of detected failures
- Inhibits alerts, depending on the flight phase.

Ident.: DSC-46-10-10-10-00021433.0001001 / 17 MAR 17

Applicable to: MSN 02719-02789, 03031-03060, 05152-07792

GLOBAL POSITIONING SYSTEM (GPS)

The GPS provides the position information to the FMGC. The position information is consolidated with the ADIRS data and sent to the ATSU.

The GPS also enables time synchronization to the clock, in order to provide UTC date and time for datalink system. If the GPS fails, the clock continues to calculate the time by incrementing the last received pertinent information as the reference time.

Ident.: DSC-46-10-10-10-00020322.0001001 / 17 MAR 17

Applicable to: ALL

HIGH FREQUENCY (HF)

The HF communication system  has:

- Data mode
- Voice mode.

HF communication system  can be used in the data mode as an alternative to VHF 3 and SATCOM . In this case, the communication between the aircraft and HF ground stations is established on a HF frequency. A HF frequency of HF DataLink (HFDL) is tuned automatically.

DATALINK/VOICE SWITCHING

The HF  can be used in the voice mode. The flight crew can switch datalink/voice and set a voice frequency via the RMP.

Green **HF VOICE** memo indicates that HF datalink communication is interrupted, when the HF transceiver operates in the voice mode.

Ident.: DSC-46-10-10-10-00020328.0001001 / 17 MAR 17

Applicable to: MSN 02719-02789, 03031-03060, 05152-07792

MULTI-PURPOSE CONTROL AND DISPLAY UNIT (MCDU)

The MCDU enables the flight crew to access functions to:

- Manage the ATC datalink connections
- Send notifications
- Edit datalink messages
- Consult reports
- Access Message Record application.

Ident.: DSC-46-10-10-10-00021339.0001001 / 17 MAR 17

Applicable to: MSN 02719-02789, 03031-03060, 05152-07792

PRINTER

The flight crew can print ATC messages, displayed on the DCDU, or the MCDU.

***Note:** Each time the flight crew prints a message, they must check that the printed message is identical to the message on the display unit.*

The reference information is the information, that the display unit displays.

Ident.: DSC-46-10-10-10-00020327.0001001 / 17 MAR 17

Applicable to: MSN 02719-02789, 03031-03060, 05152-07792

RADIO MANAGEMENT PANEL (RMP)

The flight crew sets a radio frequency into the RMP, when a specific datalink message (e.g.: CONTACT, MONITOR, ...) is received, or when a voice contact is required.

Ident.: DSC-46-10-10-10-00021236.0002001 / 21 MAR 17

Applicable to: MSN 02719-02789, 03031-03060, 05152-07792

Frequencies that some datalink messages contain, can be loaded into RMP via LOAD pb of the RMP.

Ident.: DSC-46-10-10-10-00020319.0001001 / 17 MAR 17

Applicable to: ALL

SATELLITE COMMUNICATIONS (SATCOM)

The SATCOM system  provides voice and data services. The voice/data are transmitted via satellite, from the aircraft to the ground earth stations, and then switched through international telecommunications networks (ARINC, SITA, etc.) to anywhere in the world (airline operational centers, ATC centers, etc).

The ATSU (router) manages switching to/from SATCOM  (ACARS environments only).

Ident.: DSC-46-10-10-10-00020324.0002001 / 17 MAR 17

Applicable to: MSN 02719-02789, 03031-03060, 05152-07792

SURVEILLANCE SYSTEMS (SURV)

The ATC datalink system interacts with the surveillance system and enables the flight crew to:

- Provide the ATC center with a TCAS status, sent via the ADS application
- Provide the ATC center with the SQUAWK code as a response to CONFIRM SQUAWK uplink message.

VHF

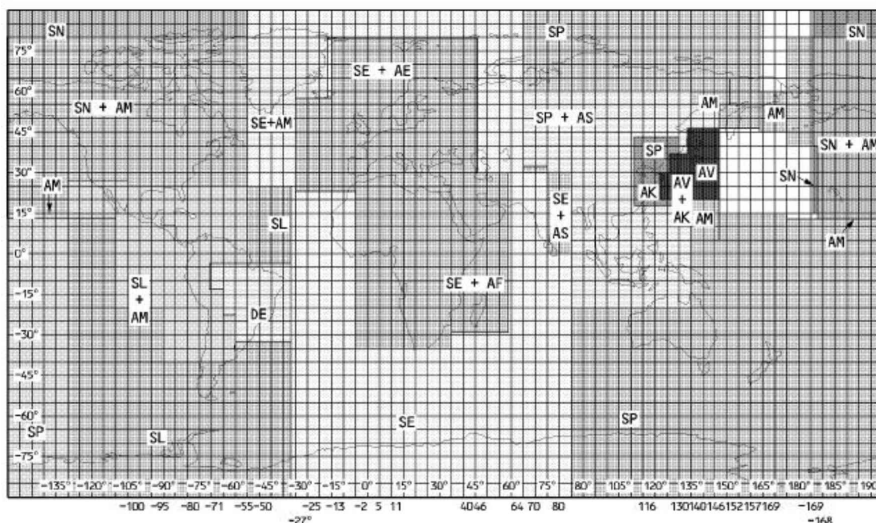
Ident.: DSC-46-10-10-10-00020321.0001001 / 02 MAY 24

Applicable to: MSN 02719-02789, 03031-03060, 05152-07792

VERY HIGH FREQUENCY (VHF)

The communication between the aircraft and VHF ground stations is established on a VHF frequency. The datalink system mainly uses the VHF 3 radio communication system. The ATSU router automatically selects a VHF frequency, depending on the entered configuration, the scan mask for VHF Datalink (VDL), and the aircraft position.

VHF data link service providers are available in each geographical area:



SOUTH
ACARS WORLD MAP

The table below defines the world zone abbreviations, indicates their associated Service Provider, MCDU label, and ACARS frequency:

ABBREVIATION	SERVICE PROVIDER	MCDU LABEL	FREQUENCY	Family
SP	SITA PACIFIC	SIT-PAC	131.550 MHz	SITA
SN	SITA NORTH AMERICA	SIT-NAM	131.725 MHz	SITA
SL	SITA LATIN AMERICA	SIT-LAM	131.725 MHz	SITA
SE	SITA EUROPE	SIT-E/A	131.725 MHz	SITA
DE	DEPV BRAZIL	DEPV	131.825 MHz	SITA
AV	AVICOM	AVICOM	131.450 MHz	SITA
AM	ARINC AMERICA	ARI-AM	131.550 MHz	ARINC
AE	ARINC EUROPE	ARI-EUR	131.825 MHz	ARINC
AF	ARINC AFRICA	ARI-AFR	126.900 MHz	ARINC
AK	ARINC KOREA	ARI-KOR	131.725 MHz	ARINC
AS	ARINC ASIA	ARI-ASI	131.450 MHz	ARINC

The VHF 3 radio communication system has:

- Data mode
- Voice mode.

DATALINK/VOICE SWITCHING

The VHF 3 can be used in the voice mode, in the case of:

- VHF 1 failure
- VHF 2 failure
- Specific AOC functions (Operator's customization).

The flight crew can switch datalink/voice and set a voice frequency via the RMP.

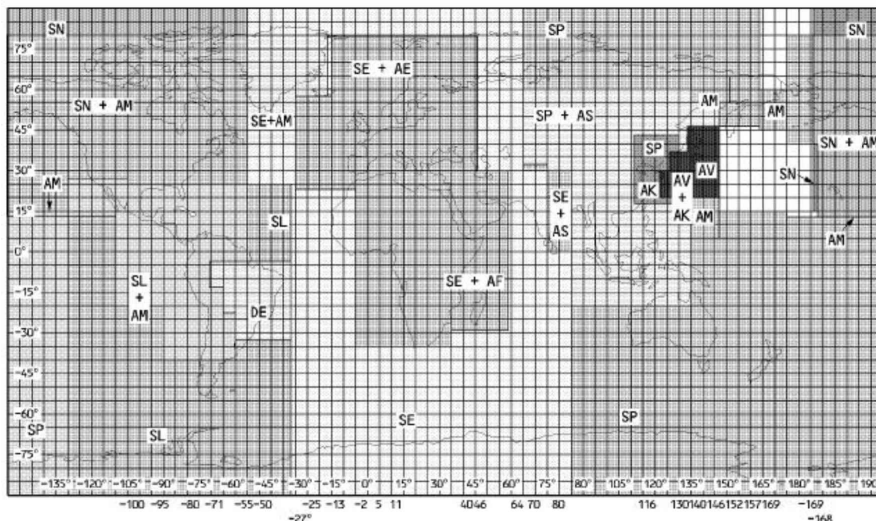
Ident.: DSC-46-10-10-10-00020321.0002001 / 02 MAY 24

Applicable to: MSN 02155-02212, 02926-02944, 04392

VERY HIGH FREQUENCY (VHF)

The communication between the aircraft and VHF ground stations is established on a VHF frequency. The datalink system mainly uses the VHF 3 radio communication system. The ATSU router automatically selects a VHF frequency, depending on the entered configuration, the scan mask for VHF Datalink (VDL), and the aircraft position.

VHF data link service providers are available in each geographical area:



SOUTH
ACARS WORLD MAP

The table below defines the world zone abbreviations, indicates their associated Service Provider, MCDU label, and ACARS frequency:

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SL	SITA LATIN AMERICA	SIT-LAM	131.725 MHz	SITA
SE	SITA EUROPE	SIT-E/A	131.725 MHz	SITA
DE	DEPV BRAZIL	DEPV	131.825 MHz	SITA
AV	AVICOM	AVICOM	131.450 MHz	SITA
AM	ARINC AMERICA	ARI-AM	131.550 MHz	ARINC
AE	ARINC EUROPE	ARI-EUR	131.825 MHz	ARINC
AF	ARINC AFRICA	ARI-AFR	126.900 MHz	ARINC
AK	ARINC KOREA	ARI-KOR	131.725 MHz	ARINC
AS	ARINC ASIA	ARI-ASI	131.450 MHz	ARINC

The VHF 3 radio communication system has:

- Data mode
- Voice mode.

DATALINK/VOICE SWITCHING

The VHF 3 can be used in the voice mode, in the case of:

- VHF 1 failure
- VHF 2 failure
- Specific AOC functions (Operator's customization).

The flight crew can switch datalink/voice via the RMP, or via VHF3 VOICE DIRECTORY page of the MCDU.

The voice frequency can be tuned by:

- ATSU automatically, or
- Fight crew, via the RMP.

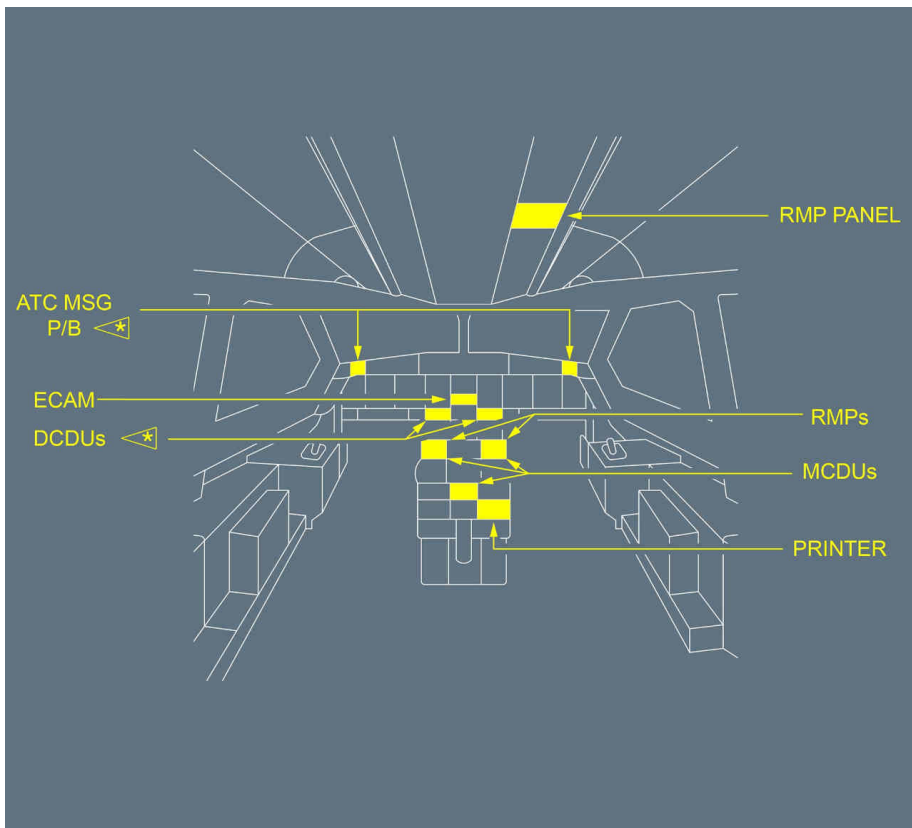
VHF3 VOICE memo indicates that VHF 3 datalink communication is interrupted, when the VHF 3 transceiver operates in the voice mode.

COCKPIT INTERFACE

Ident.: DSC-46-10-10-00020373.0001001 / 07 NOV 25

Applicable to: ALL

8



The cockpit interface of the datalink system has:

- Datalink Control and Display Unit (DCDU) on the CAPT and F/O side
The DCDU displays the uplink and downlink messages and enable the flight crew to control the datalink message exchange.
- ATC MSG pb on the CAPT and F/O side of the glareshield
The ATC MSG pb alerts when an uplink message is received and enables the flight crew to cancel the alert.

- Multipurpose Control and Display Unit (MCDU)
The MCDU enables to manage AOC and ATC functions and data transfer to the DCDU 
- Printer
Datalink messages can be printed, when displayed on the DCDU.
- RMP
The RMP enables frequency tuning.
- ECAM
The ECAM informs about the abnormal operation.

DATALINK MESSAGE

Applicable to: MSN 02719-02789, 03031-03060, 05152-07792

Ident.: DSC-46-10-10-30-00020966.0001001 / 17 MAR 17

UPLINK MESSAGE RECEPTION

When a datalink message is received, the flight crew reads, and manages the messages on the DCDU. The status of received message is **OPEN**, and changes during processing. Urgent messages or messages with higher priority are automatically displayed to the flight crew. If a normal message is displayed on the DCDU, when receiving an urgent message, the DCDU will display the urgent message. The normal message stays in the file queue. The flight crew can retrieve the normal message by pressing MSG+/MSG- keys.

Ident.: DSC-46-10-10-30-00020374.0001001 / 17 MAR 17

UPLINK MESSAGE RECEPTION ALERT

The flight crew is alerted, when a datalink message is received. A dedicated aural alert activates and the ATC MSG pb-sw illuminates on CAPT side and on F/O side.

Note: *The ATC chime is triggered:*

- Every 15 s, if a normal datalink message is received
- Every 5 s, if an urgent datalink message is received

These cockpit alerts stop, if one of the ATC MSG pb-sw is pushed, or if the flight crew answers the datalink message via the DCDU.

Note: *ATC datalink alerts are inhibited during takeoff and landing phases.*

When a normal datalink message is received, this message will appear on the DCDU screen, if the screen is empty. If the DCDU screen is not empty, this message will not appear on the screen automatically, and the MSG (number) will flash in the information field of the DCDU.

When an urgent datalink message is received, this message will automatically appear on the DCDU screen.

UPLINK MESSAGE RESPONSE

The flight crew can answer to an ATC datalink message:

- Directly

Several types of datalink messages enable the flight crew to answer directly, via the DCDU. The flight crew can launch preparation of a response message by pressing an appropriate function key (e.g.: **WILCO**, **ROGER**, **AFFIRM**, **NEGATIVE**, ...), on the DCDU. Consequently, the FMGS will generate a response message on the DCDU. The flight crew can send prepared response message to the ATC by pressing **SEND** function key of the DCDU.

- Indirectly

Datalink messages that cannot be answered directly via the DCDU, are prepared on the MCDU. The flight crew selects the appropriate function key (**EDIT** or **MODIFY**), on the DCDU, in order to display desired MCDU page (**EDIT** or **MESSAGE MODIFY** page). The flight crew enters relevant values and information for the response via the page of the MCDU.

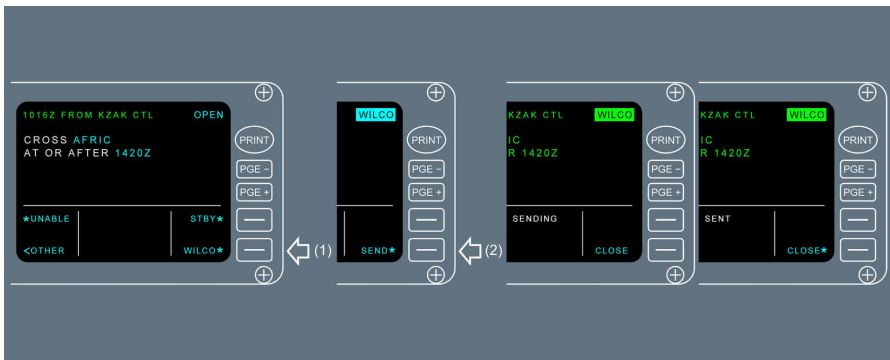
When desired information is inserted, the flight crew must transfer the information from the MCDU to the DCDU, by pressing appropriate key on the MCDU. Consequently, prepared response message appears on the DCDU.

If the prepared downlink message has more than one page, the flight crew must display, and review all pages of the message on the DCDU, before the message is sent to the ATC. When the flight crew displays all pages of the message, an asterisk (*) appears next to **SEND** function key of the DCDU. The asterisk (*) indicates that the function key is active, and the function can be used. If the flight crew cannot answer to an ATC uplink message immediately, a stand-by (**STBY**) message can be sent to the ATC. When a **STBY** response message is sent, the message status, displayed on the DCDU, changes to **STBY**. This message cannot be removed from the DCDU, until the flight crew sends a final response later on.

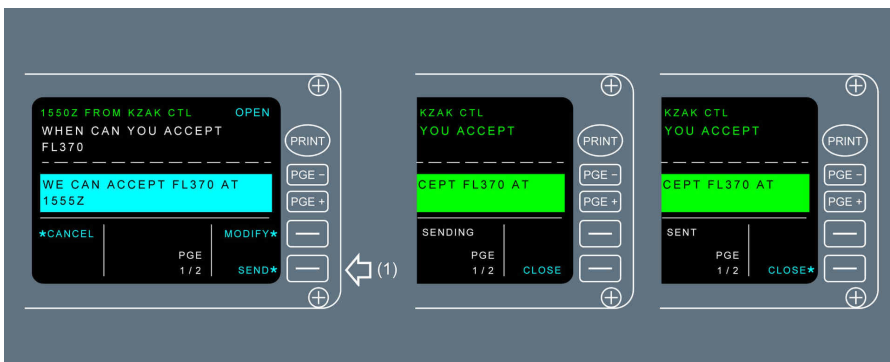
When a downlink message is successfully sent, the message information area will indicate **SENT** and the color code of the message will change.

EXAMPLE

Clearance message: The flight crew can answer positively, by selecting **WILCO*** See (1) and send the message to the ATC, by selecting **SEND*** See (2) on the DCDU.
SENDING appears in the information area of the DCDU, when **SEND*** is selected.
SENT appears in the information area of the DCDU, when the message is successfully sent.



EXAMPLE Negotiation message: The flight crew can send the response message, automatically generated on the DCDU, to the ATC, by selecting **SEND***. See (1). **SENDING** appears in the information area of the DCDU, when **SEND*** is selected. **SENT** appears in the information area of the DCDU, when the message is successfully sent.



When a downlink message is not successfully sent, the message information area will indicate **SEND FAILED** or other, depending on a datalink connection error or failure. In these cases, the flight crew must close the message. A new request can be created, in order to send the message.

Ident.: DSC-46-10-10-30-00021222.0002001 / 17 MAR 17

Note: If the ATC center is equipped to support the Logical Acknowledgment (LACK) function. The LACK function informs the flight crew when the downlink message displays on the ATC screen. Consequently, **RECEIVED BY ATC** will appear in the information area of DCDU instead of **SENT**.



Ident.: DSC-46-10-10-30-00020970.0001001 / 17 MAR 17

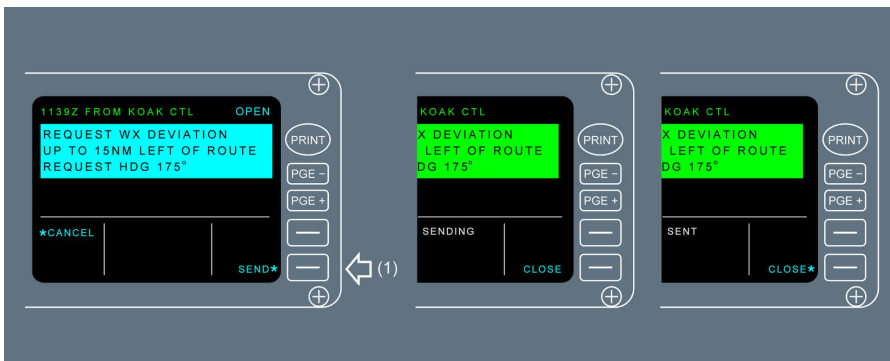
DOWNLINK MESSAGE CREATION

The flight crew can also create and send a request to the ATC.

A request message created by the flight crew and sent to ATC has:

- Cyan (blue) background before sending
- Green background, after sending.

EXAMPLE	Request message: The flight crew can send prepared message to the ATC by selecting SEND* See (1) on the DCDU. SENDING appears in the information area of the DCDU, when SEND* is selected. SENT appears in the information area of the DCDU, when the message is successfully sent.
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Note: The flight crew should avoid:

- Sending multiple clearance requests in the same message.
- Re-sending a message, if the ATC does not answer immediately.

Ident.: DSC-46-10-10-30-00021458.0001001 / 17 MAR 17

CLOSING AND REMOVAL OF THE MESSAGE FROM THE DCDU

When the flight crew sends the datalink message via the DCDU, The message should be closed, by pressing the CLOSE function key. Closing the message will clean the DCDU screen.

Ident.: DSC-46-10-10-30-00020972.0001001 / 17 MAR 17

The RECALL function key of the DCDU can be used to display the last closed message. Other messages can be viewed on the MSG RECORD page of the MCDU .

Note: Before each flight, the MSG RECORD file of previous flight should be erased.

Ident.: DSC-46-10-10-30-00021192.0001001 / 21 MAR 17

AUTO-CLOSING

The message closes and the system automatically removes the message from the DCDU, 5 s after the ATC center successfully receives the message.

Clearance messages and messages, related to loss of communication or datalink transmission error, do not close automatically, when sent or received by the ATC. The flight crew must close these messages by pressing the CLOSE key, on the DCDU. Closing the message will remove the message from the DCDU screen.

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General

GENERAL

Ident.: DSC-46-10-20-10-00020385.0001001 / 17 MAR 17
Applicable to: ALL

The AOC applications  are datalink applications. The AOC applications enable an exchange of specific messages between the flight crew and the Airline Operational Control (AOC). The AOC applications are customized by each operator and depend on operator's choices and the datalink service provider.

Note: *Details about AOC applications cannot be provided due to the wide range of customization by the operator.*
 Airbus does not supervise customization of AOC applications. It is recommended to insert AOC application description into this chapter in accordance with AOC applications installed on the aircraft.

The AOC applications can offer the following functions:

EXAMPLE	- Preflight Functions: - Flight log - Departure Delay Message - Takeoff Delay Message - Weather Request - NOTAM Request - Loadsheets Request - Others - En-Route Functions: - Flight log - Diversion Message - En-route Delay - Estimated Time of Arrival (ETA) Message - Weather Request - NOTAM Request - Others - Postflight Functions: - Flight log - Flight summary - Gate delay - Others
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The flight crew uses the datalink cockpit interface for the AOC applications.

EXAMPLE**Flight Plan Modification**

This flight plan modification example is based on following assumptions:

- The AOC sends a flight plan modification message to the flight crew.
- The flight crew loads the flight plan modification in the FMGS, into the secondary F-PLN.
- The crew obtains ATC clearance before activating the modified flight plan.
- *Refer to DSC-46-10-50 How to Modify FLT Plan* for the flight plan modification based on an AOC request.

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Notifications

NOTIFICATION

Ident.: DSC-46-10-30-10-00020375.0001001 / 03 NOV 22
Applicable to: MSN 02719-02789, 03031-03060, 05152-07792

The Notification application enables the flight crew to send a notification message to an ATC center, if the datalink system is correctly initialized.

Refer to DSC-46-10-50 How to Initialize for more information about datalink initialization.

The flight crew must notify the ATC center, from 15 min to 45 min, before entering the ATC area.

The flight crew notifies a desired ATC center via the NOTIFICATION page of the MCDU.

However, ATC centers initiate automatic notification, when the aircraft flies from one ATC area to another.

Note: *The ATC center initiates a CPDLC connection, when the flight crew sends the notification. The NOTIFICATION page of the MCDU will display "XXXX NOTIFIED HHMM Z"). Therefore, it is not necessary to repeat notifications to the ATC center.*

The notification procedure enables the ATC to correlate the aircraft with the ICAO flight number.

Note: *The FMGC provides the FLT number.*

Consequently, it is essential to enter, into the FMGC, via the INIT page of the MCDU, the same flight number as the flight number, indicated on the ICAO flight plan (with the same number of letters).

ATS623 ✈ applications (Departure Clearance (DCL), OCL and D-ATIS) do not require previous notifications, or connection to an ATC center.

ATS623 ✈ applications workflow are based on equivalent voice exchanges:

1. Request - crew requests
2. Clearance - ground clears
3. Read-back - crew reads back
4. Confirmation - ground confirms.

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Controller/Pilot Datalink Communication (CPDLC)**GENERAL**

Applicable to: MSN 02719-02789, 03031-03060, 05152-07792

Ident.: DSC-46-10-30-20-10-00020376.0001001 / 17 MAR 17

The CPDLC application enables an exchange of specific ATC messages between the flight crew and air traffic controller.

The air traffic controller initiates the CPDLC connection with the aircraft, after the reception of a notification message from the flight crew.

Note: When the aircraft flies from one air traffic control area to another, the CPDLC ensures an automatic transfer of ATC centers.

The flight crew and air traffic controller use a set of predefined messages to build datalink messages. The flight crew and air traffic controller can also send freetext datalink messages. Freetext messages can only be used, when pre-formatted datalink messages do not allow to send the information.

Note: The freetext message does not allow the datalink system to generate automatic pre-formatted answer.

The freetext message must contain standard ATC phraseology and standard abbreviations.

The CPDLC application enables the flight crew to answer following uplink messages via the DCDU:

- Clearance
- Report request
- Negotiation message
- Information message.

Ident.: DSC-46-10-30-20-10-00021043.0002001 / 05 JUN 18

The CPDLC application supports the following functions:

- Connection (Refer to DSC-46-10-30-20 Connection)
- Request (Refer to DSC-46-10-30-20 Request)
- Edit (Refer to DSC-46-10-30-20 Edit)
- Message Timer (Refer to DSC-46-10-30-20 Message Timer).

CONNECT

Ident.: DSC-46-10-30-20-00020998.0001001 / 17 MAR 17

Applicable to: MSN 02719-02789, 03031-03060, 05152-07792

The notified ATC center can initiate a CPDLC connection with the aircraft. This ATC center is then considered as active. The active ATC center appears on the DCDU, and on the MCDU, in the active ATC field of the CONNECTION STATUS page.

Only one ATC center can be active at a time.

During flight, the aircraft may move from one ATC area to another ATC area. The next ATC may anticipate this change. The next ATC center may initiate a passive connection with the aircraft, when the aircraft is still connected to the active ATC. In this case, the next ATC center appears on the DCDU, and on the MCDU, in the next ATC field of the CONNECTION STATUS page. When the ATC area changes, the active ATC center ends the connection with the aircraft, and the next ATC center automatically becomes the active ATC center.

The CONNECTION STATUS page of the MCDU displays ICAO codes of both, the active and the next (if any) ATC centers. The flight crew can manually disconnect the ATC centers via the CONNECTION STATUS page.

Refer to DSC-46-10-40-30 CONNECTION STATUS for information about the CONNECTION STATUS page.

REQUEST

Ident.: DSC-46-10-30-20-00021000.0002001 / 01 MAR 18

Applicable to: MSN 02719-02789, 03031-03060, 05152-07792

In the REQUEST page of the MCDU, the flight crew can request:

- Direct to
- Altitude / Flight Level
- Speed / Mach

Note: *Requests of the departure clearance, oceanic clearance and ATIS are not part of the CPDLC application.*

EDIT

Ident.: DSC-46-10-30-20-00021013.0002001 / 17 MAR 17

Applicable to: MSN 02719-02789, 03031-03060, 05152-07792

The EDIT function enables the flight crew to modify a downlink message before sending.

The flight crew can modify the message on the MCDU, before the message is sent to ATC center via the DCDU.

Note: *The EDIT page appears automatically on the MCDU, if the EDIT function key is pressed on the DCDU. Pressing EDIT also triggers MCDU FOR EDIT indication, in the message information area, on the DCDU.*

Refer to DSC-46-10-40-20 Message Information Area for information about MCDU FOR EDIT indication on the DCDU.

Refer to DSC-46-10-40-30 EDIT for more information about the EDIT page.

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MAX UPLINK DELAY

Ident.: DSC-46-10-30-20-00020999.0003001 / 13 MAY 25
Applicable to: MSN 02719-02789, 03031-03060, 05152-07792

The MAX Uplink Delay function enables the aircraft to reject (without any notification to the flight crew) any obsolete CPDLC uplink message. Messages are considered obsolete if the delay between the message ground emission and the message onboard reception exceeds the maximum uplink delay value.

In ATN datalink operations, the MAX Uplink Delay function is implemented through a message latency monitoring function that is transparent to the flight crew.

MESSAGE TIMERS

Ident.: DSC-46-10-30-20-00028755.0003001 / 06 NOV 25
Applicable to: MSN 02719-02789, 03031-03060, 05152-07792

TECHNICAL TIMER

When the flight crew sends a downlink message, a timer is started to ensure the successful delivery of the message. If the ground does not confirm the good reception of the message in time or the transmission of the message takes too long, the message delivery is considered failed and **SEND FAILED** is displayed on the message information area.

1 OPERATIONAL RESPONSE TIMER

Operational response timers are used in order to avoid datalink dialogues to remain open for too long.

When the ATC sends an uplink message, the flight crew has 100 s to answer. If the flight crew needs more time to process the message and provide an answer, they should answer STBY, in order to reset the operational response timer. If the flight crew does not answer in time, the dialogue is closed and **REPLY: TIME OUT** is displayed on the message information area. The flight crew should revert to voice communication to provide an answer to the ATC.

***Note:** The DCDU displays **XX S FOR REPLY**, on the message information area, 30 s before the expiration of the operational response timer. This message informs the flight crew about the time that remains until the timer expires.*

When the flight crew sends a downlink message that requires an answer from the ATC, the answer from the ATC must be received within 4 min 30 s (270 s). If the ATC does not answer in time, the dialogue is closed and **NO ATC REPLY** is displayed on the message information area. The flight crew should revert to voice communication to clarify the message status.

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Message Record

MESSAGE RECORD

Ident.: DSC-46-10-30-70-00020377.0001001 / 17 MAR 17
Applicable to: MSN 02719-02789, 03031-03060, 05152-07792

The Message Record application enables to store datalink messages. The flight crew can display the recorded messages at any time.

When the flight crew closes a message on the DCDU, the message is stored and disappears from the DCDU.

The messages are stored in chronological order and grouped by flight number. When the maximum number of stored messages is reached (up to 99 messages), any new message will be stored and the oldest message will be deleted.

The flight crew can access the stored message via the MSG RECORD page of the MCDU.

- Note:
1. The flight crew can print recorded messages.
 2. The flight crew can erase all recorded messages.
 3. The ADS-C  reports are not stored.

Intentionally left blank

ATC Message Pushbutton (ATC MSG PB)**ATC MSG PB**

Ident.: DSC-46-10-40-10-00021077.0002001 / 20 NOV 18

Applicable to: MSN 02719-02789, 03031-03060, 05152-07792



No datalink message from the ATC center was received.



Flashes when a datalink message from the ATC center is received, or a reminder message (linked to a deferred clearance or a report request) is received. When a message is received, the DCDU automatically displays the message on the screen if no other message is already displayed.

Associated with audio alert.

When the flight crew presses one of the two ATC MSG pbs or a key on the DCDU, the ATC MSG lights go off and the aural alert associated with the reception of the message is cancelled.

ATC alerts are inhibited during the takeoff and landing phases. If the aircraft receives a message during the inhibition period, the ATC center is automatically warned of the uplink message rejection (except for A623 application messages).

Intentionally left blank

Datalink Control and Display Unit (DCDU)

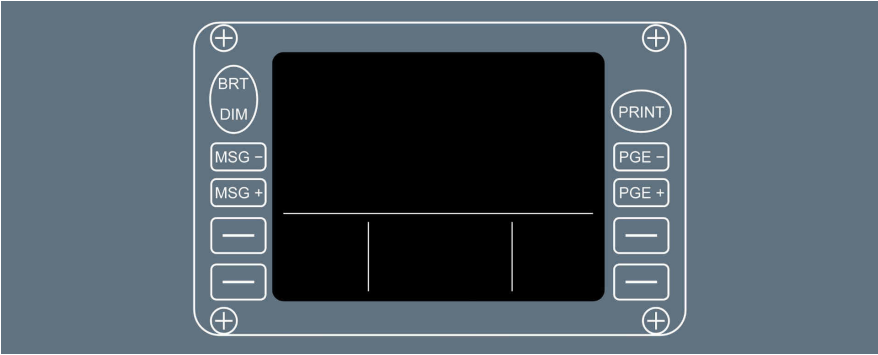
DCDU

Applicable to: MSN 02719-02789, 03031-03060, 05152-07792

Ident.: DSC-46-10-40-20-10-00021076.0001001 / 02 MAY 24

- If datalink connection is not established:**
- By default, the DCDU displays no information. The DCDU screen is black without information.

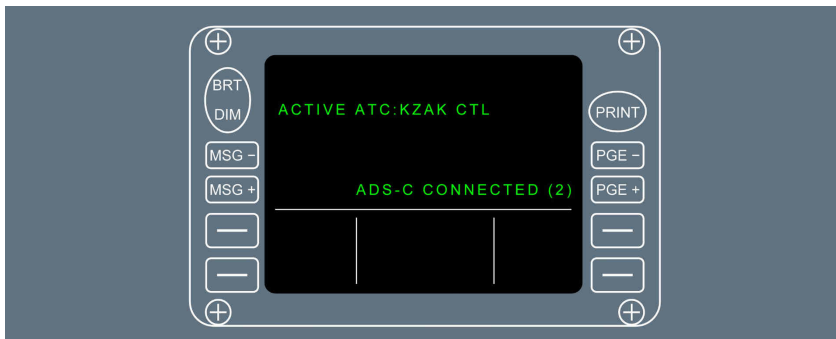
DCDU Screen with No Datalink Connected



- If datalink connection is established:**
- If no datalink message is displayed on the DCDU:**
- By default, the DCDU displays:
- ACTIVE ATC and the active ATC ICAO code
 - NEXT ATC and the next ATC ICAO code, if the active ATC initiated an automatic transfer to a next ATC
 - ADS-C status, when the ADS-C is set to OFF
 - ADS-C CONNECTED (X), if an ADS-Contract is established with ATC center(s) (X) : Displays the number of ADS-C active connections, when at least one ATC center is connected
 - NO ATC DLK/ATC DISCONNECTED, when the datalink connection is lost.

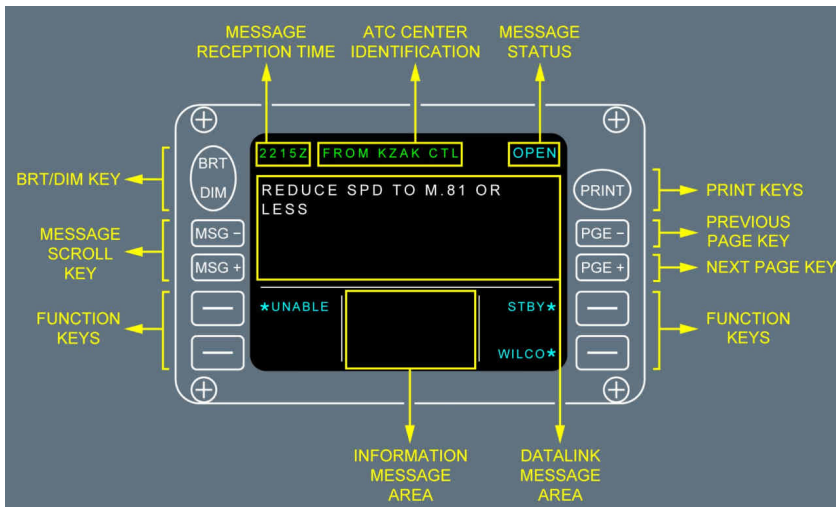
EXAMPLE	The DCDU default screen, when the datalink is connected and no message is displayed on the screen:
----------------	--

DCDU Screen with Datalink Connected and No Datalink Message Displayed



● If a datalink message is displayed on the DCDU:

DCDU Screen with Datalink Connected and Datalink Message Displayed



Ident.: DSC-46-10-40-20-10-00021243.0002001 / 17 MAR 17

DATALINK MESSAGE AREA

Displays uplink and downlink messages.

Uplink messages are displayed on a black background, and:

- When received, the message appears in white and the main parameters in cyan.
- When answered, the message becomes green.

Downlink messages appear in black:

- On a cyan background before sending
- On a green background while and after sending.

Ident.: DSC-46-10-40-20-10-00021241.0001001 / 17 MAR 17

MESSAGE STATUS

Indicates the status of the message or the response of the flight crew to a message received from the active ATC center.

AFFIRM

The status of the message changes to **AFFIRM**, when the flight crew selects a positive answer to the ATC uplink message on the DCDU.

AFFIRM

The status of the message changes to **AFFIRM**, when the flight crew sends a positive answer to the ATC center.

NEGATV

The status of the message changes to **NEGATV**, when the flight crew selects a negative answer to the ATC uplink message on the DCDU.

NEGATV

The status of the message changes to **NEGATV**, when the flight crew sends a negative answer to the ATC center.

ROGER

The status of the message changes to **ROGER**, when the flight crew selects ROGER, in order to inform the ATC center that they received and understood the uplink message.

ROGER

The status of the message changes to **ROGER**, when the flight crew sends a ROGER answer to the ATC center.

STBY

The status of the message changes to **STBY**, when the flight crew selects STBY, in order to inform the ATC center that they need time to answer the uplink message.

STBY

The status of the message changes to **STBY**, when the flight crew sends a STBY answer to the ATC center.

UNABLE

The status of the message changes to **UNABLE**, when the flight crew selects UNABLE, in order to inform the ATC center that they cannot comply with the request.

UNABLE

The status of the message changes to **UNABLE**, when the flight crew sends a UNABLE answer to the ATC center.

WILCO

The status of the message changes to **WILCO**, when the flight crew selects WILCO, in order to inform the ATC center that they understood the request and that they will comply with it.

WILCO

The status of the message changes to **WILCO**, when the flight crew sends a WILCO answer to the ATC center.

OPEN

Indicates that the received uplink message requires a response. The status **OPEN** remains until the flight crew answers the uplink message.

OPEN

Indicates that:

- The flight crew did not answer the uplink message in due time, or
- The flight crew sent a downlink or a response message, but no acknowledgment from the ground was received.

ABORT

Indicates that a disconnection occurred during a pending uplink or downlink message.

Note: The status field remains empty for:

- A downlink message sent to the active ATC center
- An uplink message for which no response is expected.

Ident.: DSC-46-10-40-20-10-00021242.0004001 / 21 MAY 24

FUNCTION KEYS

Depending on the nature of the message, the system automatically displays an appropriate function by each function key.

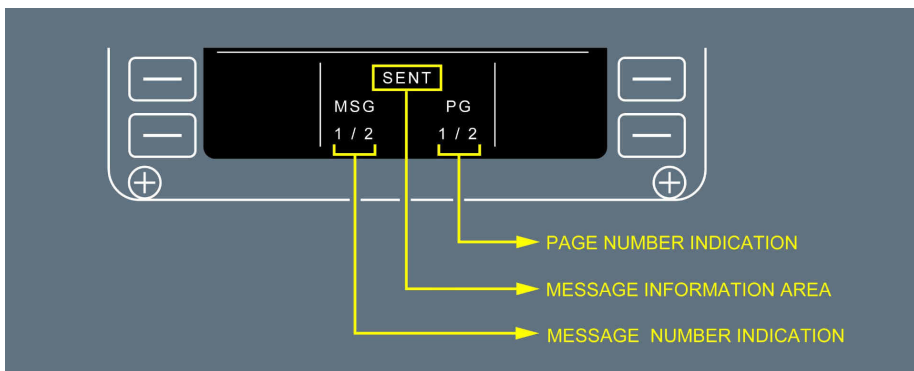
Possible functions are detailed below.

- AFFIRM** : When selected, prepares an affirmative response to accept an ATC negotiation message (e.g. CAN YOU ACCEPT [altitude] AT [time]).
- ANSWER** : When selected, prepares a default response to an uplink message with two or more confirm/open negotiation message elements.
- CANCEL** : When selected, enables the flight crew to:
 - Remove a prepared downlink message from the DCDU
 - Cancel a selected reply to an uplink message.
- CANNOT** : When selected, prepares a negative answer to an OPEN negotiation message from the ATC.
- CLOSE** : When selected, erases a message (from the DCDU screen) that was sent to the ATC, or erases a message from the ATC that was answered. This message is stored in the MSG RECORD. This is not applicable when the answer is on stand-by (STBY).
- EDIT** : When selected, accesses the EDIT page, on the MCDU.
- NEGATIV** : When selected, prepares a negative response to an ATC message.

- RECALL** : When selected, recalls the most recently closed message if it was closed within the last 5 min. If the flight crew selects the RECALL more than 5 min after the last message was closed, the RECALL EMPTY CONSULT MSG RECORD message appears.
- ROGER** : When selected, confirms the reception, and understanding of ATC information or report request.
- SEND** : When selected, sends a message or an answer, that was prepared by using other function keys (Example: **WILCO**, **ROGER**, **AFFIRMATIVE**, **STBY**, ...).
- STBY** : When selected, informs the ATC that the flight crew needs to delay the answer.
- UNABLE** : When selected, rejects an ATC clearance.
- WILCO** : When selected, accepts an ATC clearance.
- *** : The function keys are operative, if an asterisk or a function is visible.

Ident.: DSC-46-10-40-20-10-00021240.0007001 / 13 MAY 25

Message Information Area on the DCDU



MESSAGE NUMBER INDICATION

Indicates the rank of the message that is displayed on the DCDU.

If there is only one message on the DCDU, the message number information does not appear in the information field. In the case of a new message reception, the message number indication flashes.

PAGE NUMBER INDICATION

Indicates the page number of the message that is displayed on the DCDU.

If the message contains only one page, the page number information does not appear in the information field.

MESSAGE INFORMATION AREA

- ANSWER MSG** (amber) : Maximum number of pending uplink messages is reached.
- COM FAULT** (amber) : ATC communication means faulty.
- COM NOT AVAIL** (amber) : Communication means temporarily unavailable.
- COM NOT INIT** (amber) : Router not initialized.
- FILE FULL** (amber) : Maximum number of downlink messages, accessible on the DCDUs, is reached.
- LINK LOST** (amber) : Communication with the ATC is unavailable (displayed on any message pending when the loss occurred).
- MCDU FOR EDIT** (white) : Follows pressing of the "EDIT" key.
- MCDU FOR TEXT** (white) : Follows pressing the "UNABLE" key.
- NO ATC DLK** (white) : ATC communication means temporarily unavailable.
- NO ATC REPLY** (amber) : No answer received within 270 s.
- NO MORE MSG** (white) : Follows pressing of the "MSG + " or "MSG -" key, when no more messages are accessible.
- NO MORE PGE** (white) : Follows pressing of the "PGE +" or "PGE -" key, when no more pages are accessible.
- OVERFLW CLOSED** (amber) : Maximum number of non-pending messages is reached, and a new non-pending message is registered in the file.
- PRINT FAILED** (amber) : Printing was requested from the DCDUs and printing failed.
- PRINTING** (white) : Printing was requested from the DCDUs and printing is in progress.
- PRINTING UNAVAIL** (white) : Printing was requested from the DCDUs, but the printer is unavailable.
- RECALL EMPTY CONSULT MSG RECORD** (white) : If the flight crew has pressed the "RECALL" key, and the last message was closed more than 5 minutes before.
- RECALL MODE** (white) : If the flight crew has pressed the "RECALL" key and the last message was closed within the last 5 minutes.
- RECEIVD BY ATC** (white) : The current message has been received by the controller.

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- REJ BY ATC** (amber) : Message rejected by the ATC system, controller not aware of this message.
- REPLY: TIME OUT** (amber) : Crew answers have to be delivered within 100 s.
- SENDING** (white) : The current message is being sent.
- SEND FAILED** (amber) : Transmission of a request or a reply to an uplink message are unsuccessful.
- SENT** (white) : The current message was sent, but not necessarily received.
- XX S FOR REPLY** (white) : The current ATC message has to be answered within XX seconds. It is displayed when the time remaining is 30 s. The timer value is updated every 5 s.

Ident.: DSC-46-10-40-20-10-00021244.0003001 / 17 MAR 17

TIME

Indicated time corresponds to the time of:

- *Uplink message*, when the ATC center sent the message.
- *Downlink message*, when the flight crew transferred the message from the MCDU.

Ident.: DSC-46-10-40-20-10-00021245.0001001 / 17 MAR 17

BRT/DIM KEY

Adjusts the brightness of the DCDU

DESTINATION/ORIGIN ATC CENTER

Indicates the active ATC center that sent or received the message.

MESSAGE SCROLL KEY (MSG- / MSG+)

When pressed, displays the previous/next message in the file.

NEXT/PREVIOUS PAGE KEYS (PGE- / PGE+)

When pressed, displays the previous/next page of the message, if the message cannot be displayed on one single page.

PRINT KEY

Prints the message that is currently displayed on the DCDU.

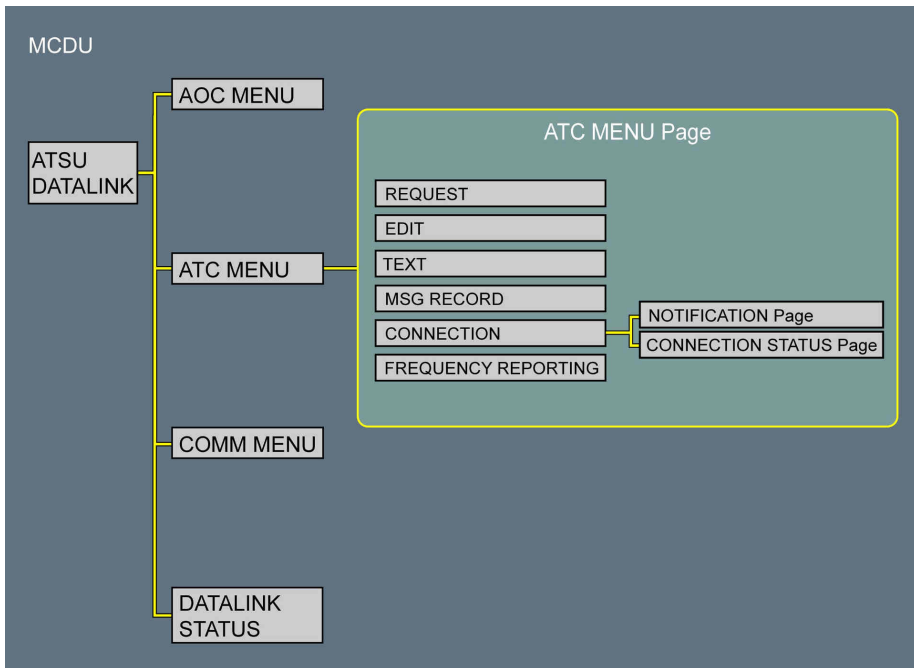
Intentionally left blank

MCDU Datalink Pages**INTRODUCTION**

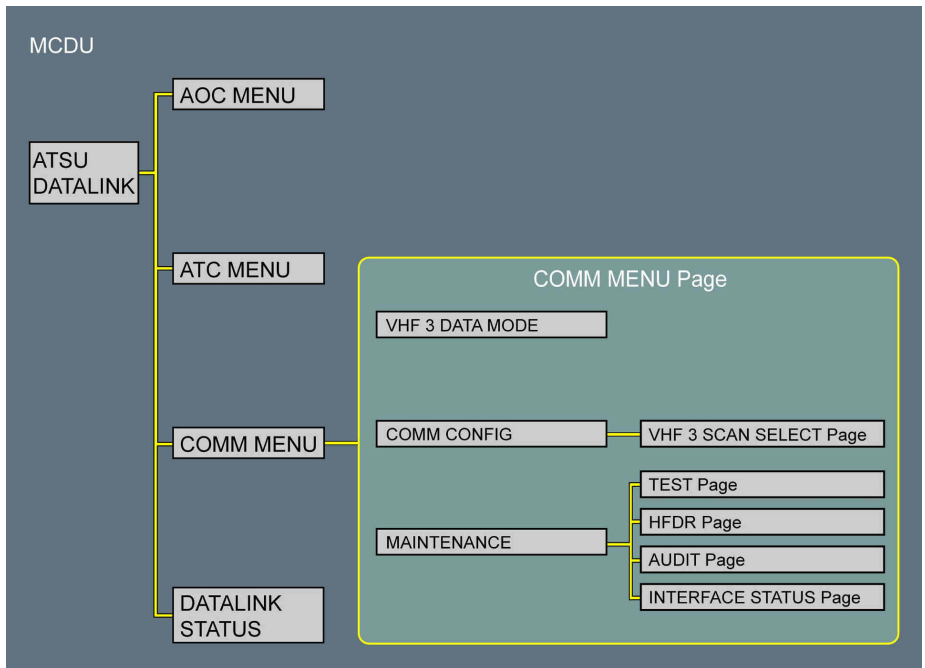
Applicable to: MSN 02719-02789, 03031-03060, 05152-07792

Ident.: DSC-46-10-40-30-10-00021078.0002001 / 07 NOV 25

- ¹ The MCDU MENU page enables access to datalink pages when the flight crew selects ATSU. The ATSU of the MCDU MENU enables to access ATSU DATALINK page. The ATSU DATALINK page provides a subsequent access to:
- AOC MENU pages
- Note: Due to the customization of AOC ✈ applications by each operator that is not monitored by Airbus, this Controls and Indicators chapter does not contain a description of controls and indicators associated with AOC applications.
- ATC MENU pages
 - COMM MENU pages
 - DATALINK STATUS page
- Refer to DSC-46-10-40-30 DATALINK STATUS*



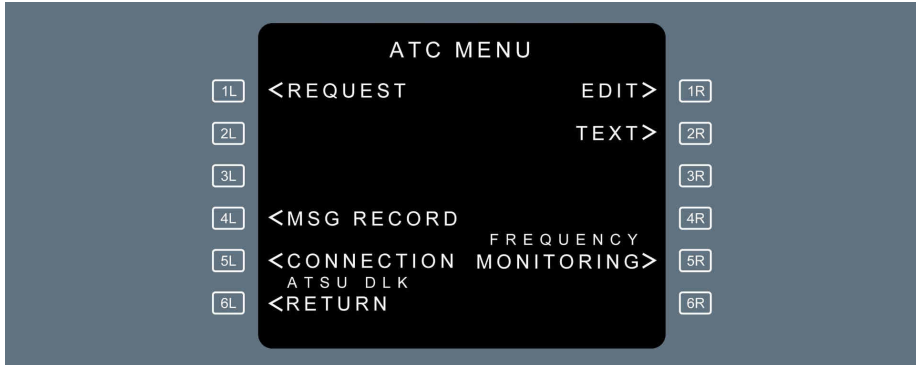
Ident.: DSC-46-10-40-30-10-00021463.0002001 / 17 MAR 17



ATC MENU

Applicable to: MSN 02719-02789, 03031-03060, 05152-07792

Ident.: DSC-46-10-40-30-20-00021079.0004001 / 17 MAR 17



- | | |
|---------------------------|--|
| [1L] REQUEST | When selected, the MCDU displays the REQUEST page. |
| [4L] MSG RECORD | When selected, the MCDU displays the MSG RECORD page. |
| [5L] CONNECTION | When selected, the MCDU displays the CONNECTION page. |
| [6L] ATSU DLK RETURN | When selected, the MCDU displays the ATSU DATALINK page. |
| [1R] EDIT | When selected, the MCDU displays the EDIT page.

<i><u>Note:</u> EDIT appears on the ATC MENU page, when the flight crew presses EDIT on the DCDU, associated with a datalink message.</i> |
| [2R] TEXT | When selected, the MCDU displays the TEXT page.

<i><u>Note:</u> TEXT appears on the ATC MENU page, when the flight crew selects a negative answer (e.g.: UNABLE) on a DCDU, associated with a datalink message.</i> |
| [5R] FREQUENCY MONITORING | When selected, the MCDU displays the FREQUENCY MONITORING page. |

ATSU DATALINK

Ident.: DSC-46-10-40-30-00021081.0003001 / 17 MAR 17
Applicable to: MSN 02155-02212, 02926-02944, 04392



- | | |
|---------------|--|
| [1R] AOC MENU | When selected, the MCDU displays the AOC MENU page. |
| [6R] COMM | When selected, the MCDU displays the COMM MENU page. |

ATSU DATALINK

Ident.: DSC-46-10-40-30-00021081.0002001 / 17 MAR 17
Applicable to: MSN 02719-02789, 03031-03060, 05152-07792



- | | |
|---------------|---|
| [1L] ATC MENU | When selected, the MCDU displays the ATC MENU page. |
| [1R] AOC MENU | When selected, the MCDU displays the AOC MENU page. |

- | | |
|----------------------|--|
| [5R] DATALINK STATUS | When selected, the MCDU displays the DATALINK STATUS page. |
| [6R] COMM MENU | When selected, the MCDU displays the COMM MENU page. |

COMM CONFIG

Ident.: DSC-46-10-40-30-00021253.0002001 / 17 MAR 17

Applicable to: MSN 02719-02789, 03031-03060, 05152-07792

EXAMPLE	This is an example of the COMM CONFIG page. Information, that are displayed on the COMM CONFIG page, depend on datalink customization, selected by each operator. E.g.: If a router configuration file, integrated in the ATSU, contains a customized VHF scan mask, the access to the VHF 3 SCAN SELECT page will not display. The VHF 3 SCAN SELECT page will not accessible.
----------------	--

	COMM CONFIG		
	A/C ICAO CODE	CONFIG	
[1L]	160213	ACTIVATE*	[1R]
	A/C REGISTR		
[2L]	F-WWAI		[2R]
	ACARS A/L ID		
[3L]	4Y		[3R]
	STANDARD A/L ID	VHF3	
[4L]	AIB	SCAN SEL>	[4R]
	MULTICAST	MED ADV: ON	
[5L]	AF04420	SET OFF*	[5R]
		PAGE	
[6L]	<RETURN	PRINT*	[6R]

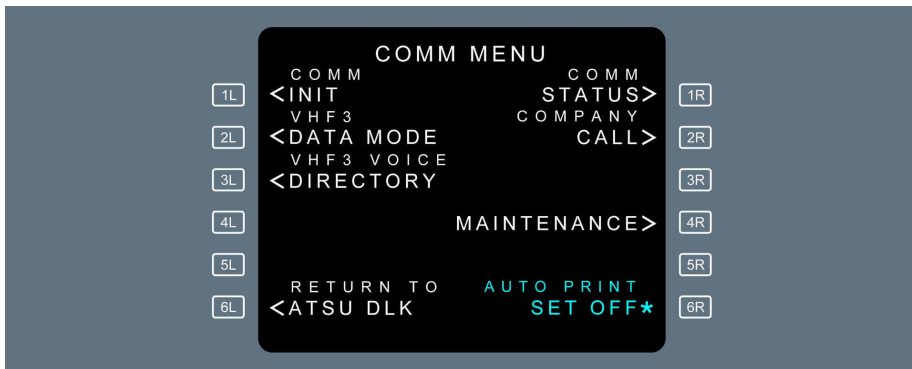
EXAMPLE	[1L] A/C ICAO CODE	Displays the aircraft ICAO code. <i><u>Note:</u> If the FMGC does not enter the parameter automatically, the flight crew can enter the A/C ICAO CODE manually.</i>
	[2L] A/C REGISTR	Displays the aircraft registration. <i><u>Note:</u> If the FMGC does not enter the parameter automatically, the flight crew can enter the A/C REGISTR manually.</i>
	[3L] ACARS A/L ID	Displays the ACARS airline identification. <i><u>Note:</u> If the FMGC does not enter the parameter automatically, the flight crew can enter the ACARS A/L ID manually.</i>
	[4L] STANDARD A/L ID	Displays the standard airline identification. <i><u>Note:</u> If the FMGC does not enter the parameter automatically, the flight crew can enter the STANDARD A/L ID manually.</i>
	[5L] MULTICAST	Displays the optional multicast ACARS address.
	[6L] RETURN	When selected, the MCDU displays the COMM MENU page.
	[1R] CONFIG ACTIVATE	When selected, the system activates parameters that were entered manually.
	[5R] VHF3 SCAN SEL	When selected, the DCDU displays the VHF3 SCAN SELECT page.
	[5R] MED ADV	Sets the transition status of labels on/off.
	[6R] PAGE PRINT	When selected, the printer prints information.

COMM MENU

Ident.: DSC-46-10-40-30-00021090.0003001 / 17 MAR 17

Applicable to: MSN 02155-02212, 02926-02944, 04392

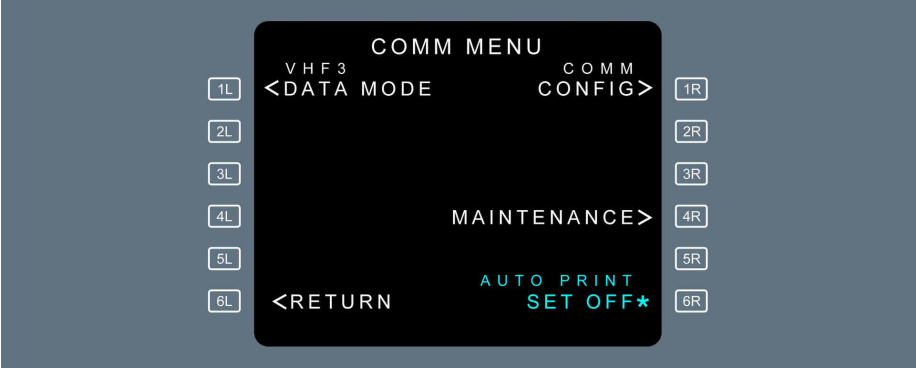
EXAMPLE	This is an example of the COMM MENU page. Information, that are displayed on the COMM MENU page and subsequent pages, accessible via the COMM MENU page, depend on datalink customization, selected by each operator for AOC applications.
----------------	--



EXAMPLE	[1L] COMM INIT	When selected, the DCDU displays the COMM INIT page.
	[2L] VHF3 DATA MODE	When selected, the DCDU displays the VHF3 DATA MODE page.
	[3L] VHF3 VOICE DIRECTORY	When selected, the DCDU displays the VHF3 VOICE DIRECTORY page.
	[6L] RETURN TO ATSU DLK	When selected, the MCDU displays the ATSU DATALINK page.
	[1R] COMM STATUS	When selected, the DCDU displays the COMM STATUS page.
	[2R] COMPANY CALL	When selected, the DCDU displays the COMM CONFIG page.
	[4R] MAINTENANCE	When selected, the MCDU displays the MAINTENANCE page.
	[6R] AUTO PRINT	Sets the auto-print on or off.

COMM MENU

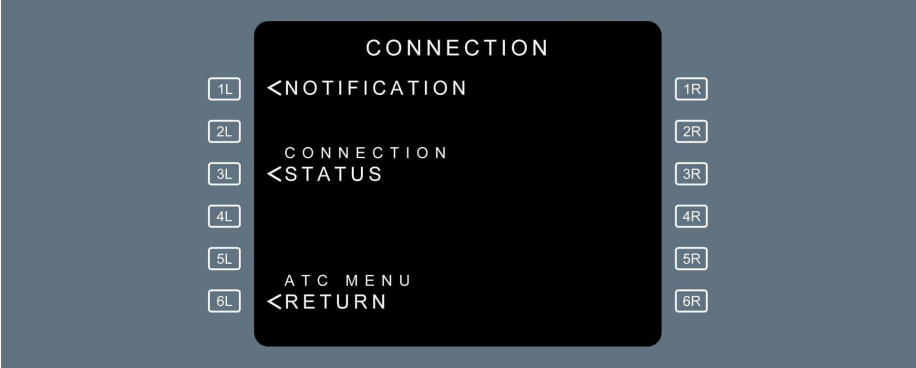
Ident.: DSC-46-10-40-30-00021090.0002001 / 17 MAR 17
 Applicable to: MSN 02719-02789, 03031-03060, 05152-07792



- | | |
|--|--|
| <p>[1L] VHF3 DATA MODE</p> <p>[6L] RETURN</p> <p>[1R] COMM CONFIG</p> <p>[4R] MAINTENANCE</p> <p>[6R] AUTO PRINT</p> | <p>When selected, the MCDU displays the VHF3 DATA MODE page.</p> <p>When selected, the MCDU displays the ATSU DATALINK page.</p> <p>When selected, the MCDU displays the COMM CONFIG page.</p> <p>When selected, the MCDU displays the MAINTENANCE page.</p> <p>Sets the auto-print on or off.</p> |
|--|--|

CONNECTION

Ident.: DSC-46-10-40-30-00021104.0003001 / 17 MAR 17
 Applicable to: MSN 02719-02789, 03031-03060, 05152-07792

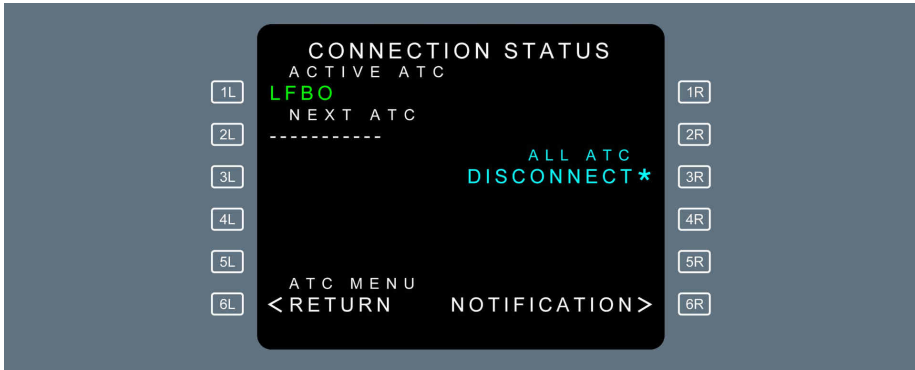


- | | |
|------------------------|--|
| [1L] NOTIFICATION | When selected, the MCDU displays the NOTIFICATION page. |
| [3L] CONNECTION STATUS | When selected, the MCDU displays the CONNECTION STATUS page. |
| [6L] ATC MENU RETURN | When selected, the MCDU displays the ATC MENU page. |

CONNECTION STATUS

Ident.: DSC-46-10-40-30-00021101.0003001 / 17 MAR 17

Applicable to: MSN 02719-02789, 03031-03060, 05152-07792

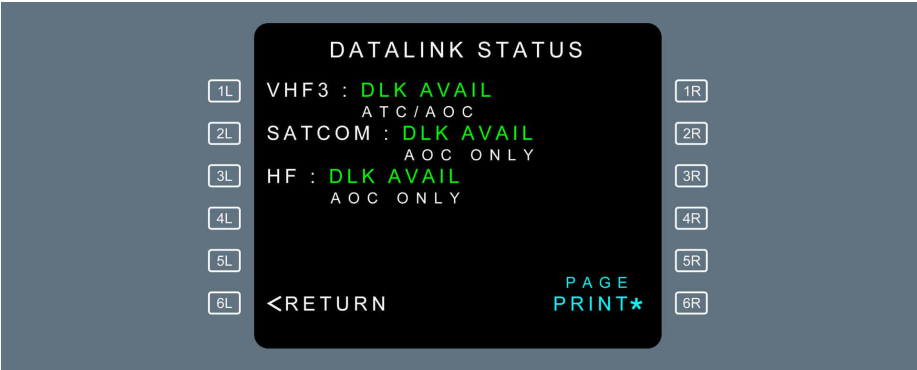


- | | |
|-------------------------|---|
| [1L] ACTIVE ATC | Displays the currently active ATC for CPDLC connection. |
| [2L] NEXT ATC | Displays the next ATC for CPDLC connection. |
| [6L] ATC MENU RETURN | When selected, the MCDU displays the ATC MENU page. |
| [1R] ALL ATC DISCONNECT | Disconnects all established CPDLC connections. |
| [6R] NOTIFICATION | When selected, the MCDU displays the NOTIFICATION page. |

DATALINK STATUS

Ident.: DSC-46-10-40-30-00021091.0002001 / 05 MAR 19

Applicable to: MSN 02719-02789, 03031-03060, 05152-07792



VHF 3 Line 1

Displays datalink status:

- **DLK AVAIL**
The datalink communication is established and available.
- **DLK NOT AVAIL**
The datalink communication is not established.
- **INOP**
The VHF3 datalink is not operative.
- **NO NETWORK**
The VHF3 datalink is inhibited.
- **VOICE**
The VHF3 datalink operates in the voice mode.

VHF 3 Line 2

Displays availability of datalink applications:

- **ATC / AOC**
Datalink communication via ATC and AOC applications is available.
- **ATC ONLY**
Datalink communication via ATC applications is available.
- **AOC ONLY**
Datalink communication via AOC applications is available.

SATCOM Line 1

Displays datalink status:

- **DLK AVAIL**
The datalink communication is established and available.
- **DLK NOT AVAIL**
The datalink communication is not established.
- **INOP**
The SATCOM datalink is not operative.
- **NOT INSTALLED**
The SATCOM datalink is not installed.

SATCOM Line 2

Displays availability of datalink applications:

- **ATC / AOC**
Datalink communication via ATC and AOC applications is available.
- **ATC ONLY**
Datalink communication via ATC applications is available.
- **AOC ONLY**
Datalink communication via AOC applications is available.

HF Line 1

Displays datalink status:

- **DLK AVAIL**
The datalink communication is established and available.
- **DLK NOT AVAIL**
The datalink communication is not established.
- **INOP**
The HF datalink is not operative.
- **VOICE**
The HF datalink operates in the voice mode.
- **NOT INSTALLED**
The HF datalink is not installed.

HF Line 2

Displays availability of datalink applications:

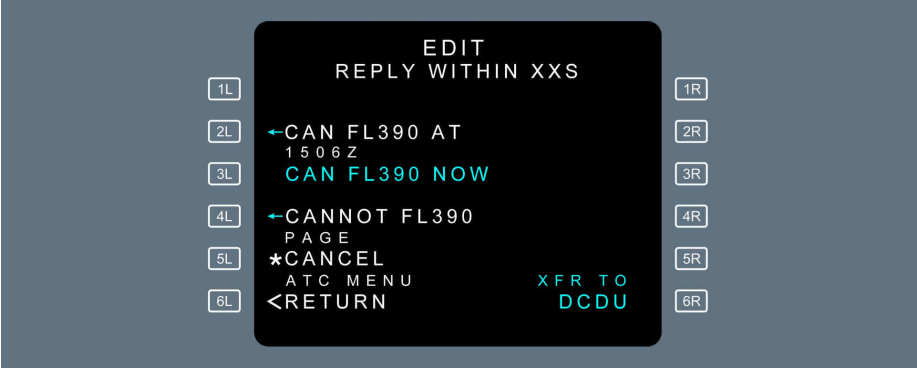
- **ATC / AOC**
Datalink communication via ATC and AOC applications is available.
- **ATC ONLY**
Datalink communication via ATC applications is available.
- **AOC ONLY**
Datalink communication via AOC applications is available.

[6L] RETURN

When selected, the MCDU displays the ATSU DATALINK page.

[6R] PAGE PRINT

When selected, the printer prints the information.



REPLAY WITHIN XXS Appears for 5 s, when the remaining time to answer is less than 30 s. XX represents the number of remaining seconds, before the message timer expires.

- [2L]:

PRESENT LEVEL

Inserts the present flight level in the message, in order to notify the ATC.

ASSIGNED LEVEL

Inserts the assigned flight level in the message, in order to read-back the assigned flight level.

CAN (AT)

Inserts CAN (AT), in order to accept the specified flight level (at the specified time).

CAN BLOCK LEVEL (AT)

Inserts CAN BLOCK LEVEL (AT), in order to accept the specified block flight level (at the specified time).

PREFERRED LEVEL

Inserts the preferred flight level, in order to notify the ATC.

TOP OF DESCENT

Inserts the preferred time to commence descent for approach, in order to notify the ATC.
- [3L] CAN LEVEL NOW

Inserts CAN LEVEL NOW, in order to accept the specified flight level immediately.
- [4L]:

CANNOT

Inserts CANNOT, in order to refuse the specified flight level.

CANNOT BLOCK LEVEL

Inserts CANNOT BLOCK LEVEL, in order to refuse the specified block flight level.
- [5L] PAGE CANCEL

When selected, the MCDU displays the EDIT page.

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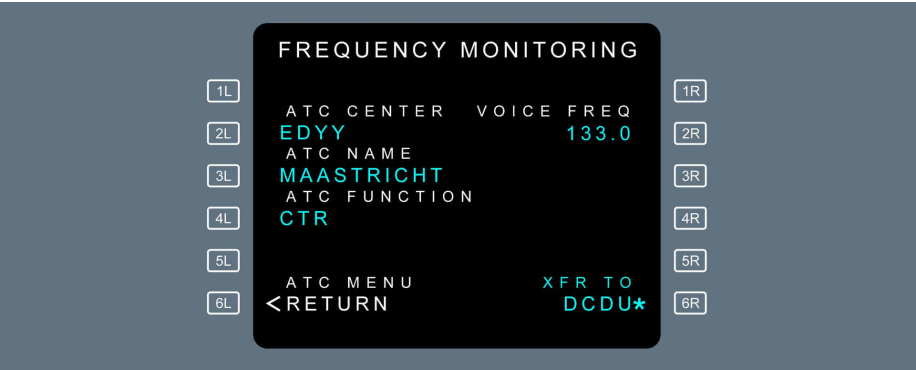
- [6L] ATC MENU RETURN

When selected, the MCDU displays the ATC MENU page.
- [6R] XFR TO DCDU

When selected, the DCDU displays prepared message.

FREQUENCY REPORTING

Ident.: DSC-46-10-40-30-00021099.0001001 / 17 MAR 17
Applicable to: MSN 02719-02789, 03031-03060, 05152-07792



- [2L]

Enters the ICAO code of the ATC center.
- [3L]

Enters the ATC facility.
- [4L]

Enters the ATC function name.
- [6L]

When selected, the MCDU displays the ATC MENU page.
- [2R]

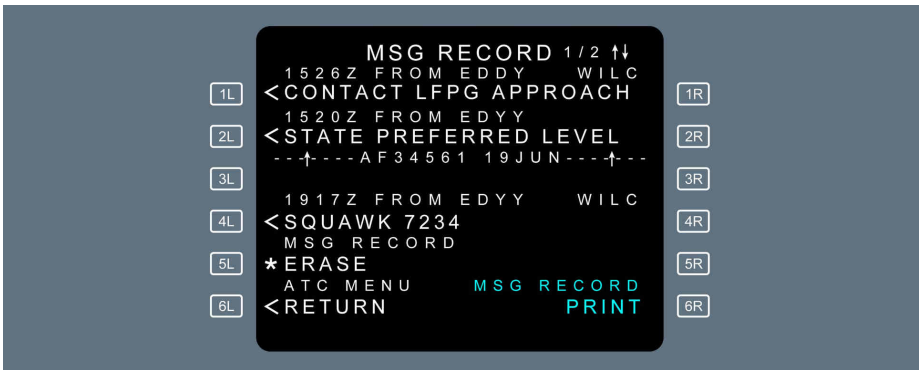
Enters the voice frequency of the ATC center.
- [6R]

When selected, the DCDU displays prepared message.

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS INFORMATION SYSTEMS DATALINK - CONTROLS AND INDICATORS
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MSG RECORD

Ident.: DSC-46-10-40-30-00021098.0004001 / 17 MAR 17
Applicable to: MSN 02719-02789, 03031-03060, 05152-07792



Lines 1 to 4

Display a summary of each recorded message:

- Time
- ATC center
- Message status
- Beginning of the message

The latest recorded message is displayed at the top of the message record list.

Pressing the left key, adjacent to each message title, displays full content of recorded message.

Note: Due to limitations of line length, the status of datalink messages is abbreviated:

- "WILC" for WILCO
- "UNBL" for UNABLE
- "ABRT" for ABORT
- "ROGR" for ROGER
- "AFRM" for AFFIRM
- "NEG" for NEGATIVE
- "STBY" for STANDBY

[5L] MSG RECORD ERASE Clears all the recorded messages.

When pressing MSG RECORD ERASE, MSG RECORD ERASE is replaced by ERASE MSG RECORD CONFIRM, in order to prevent an inadvertent erase.

[6L] ATC MENU RETURN When selected, the MCDU displays the ATC MENU page.

[6R] MSG RECORD PRINT When selected, the printer prints all recorded messages.

Note: If sending a downlink message fails, the message appears in white on the MSG RECORD page.

EXAMPLE
Indication of Flight Number Change

When the flight number changes, a specific message with the new flight number value is stored in the message record.

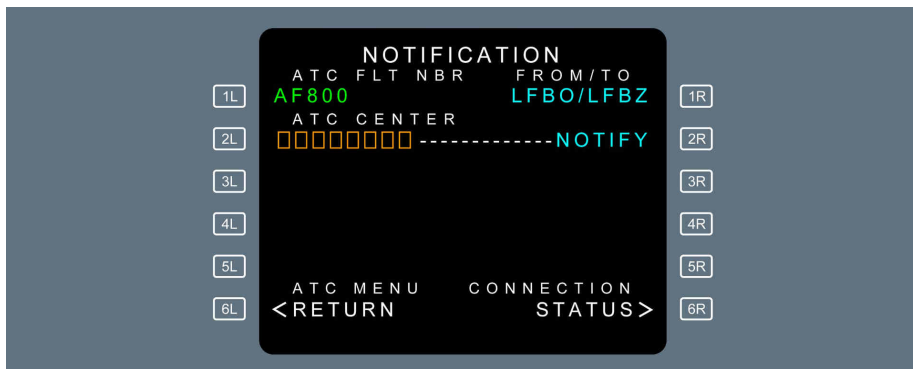
Line 3 : The specific message of the flight number change, indicating:

- New flight number
- Date of change.

NOTIFICATION

Ident.: DSC-46-10-40-30-00021100.0002001 / 17 MAR 17

Applicable to: MSN 02719-02789, 03031-03060, 05152-07792



[1L] ATC FLT NBR Displays the flight number, filled by the FMGS. The FLT NBR cannot be modified via this page.

Line 2 ATC CENTER Displays the logon status in front of the ATC CENTER. The logon status can indicate:

- NOTIFYING indicates that the logon is in progress.
- **NOTIF FAILED** indicates that the logon has failed.

The logon status disappears, when the logon notification is completed.

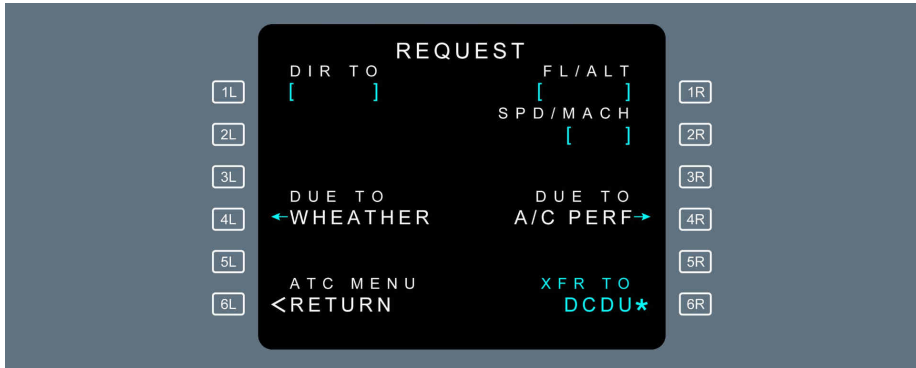
 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS INFORMATION SYSTEMS DATALINK - CONTROLS AND INDICATORS
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[2L] ATC CENTER	Enters the ATC ICAO code for notification. The ATC code, entered correctly, is displayed in large cyan font. When the logon procedure is successfully completed, 8 amber boxes will be displayed. <u>Note:</u> At initialization, a default code is displayed in small cyan font, and corresponds to one of following options: - Last manually-entered ATC code - Last ATC code, associated to an established CPDLC connection, if no ATC code was manually entered - 8 amber boxes appear.
Lines 3 to 5	Displays the last ATC centers, to which a manual and successful logon notification was performed. Once a CPDLC connection is established, the indication disappears. <u>Note:</u> NOTIFICATION UNAVAILABLE is displayed in line 5, if the communication means, or the flight number are unavailable.
[6L] ATC MENU RETURN	When selected, the MCDU displays the ATC MENU page.
[1R] FROM/TO	Displays the departure and destination airports.
[2R] NOTIFY	Sends a notification to the ATC. NOTIFY is not active, during a notification process, or if the communication means, ATC center, flight number, or departure/destination airport are unavailable.
[6R] CONNECTION STATUS	When selected, the MCDU displays the CONNECTION STATUS page.

REQUEST

Ident.: DSC-46-10-40-30-00021113.0003001 / 17 MAR 17

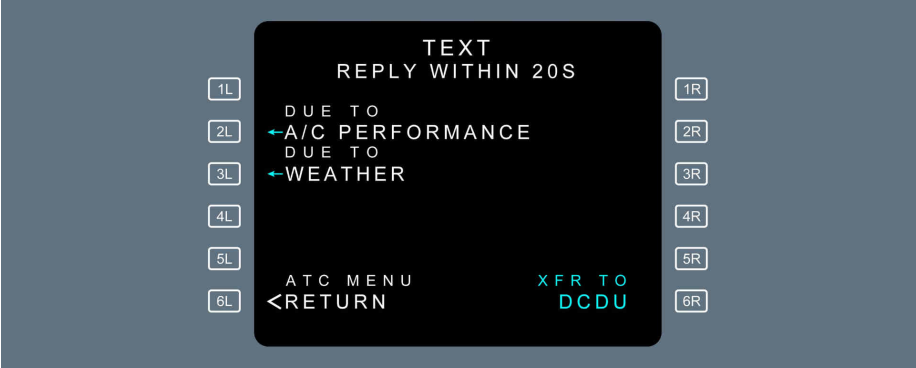
Applicable to: MSN 02719-02789, 03031-03060, 05152-07792



[1L] DIR TO	Prepares a request, in order to proceed from the present position to a selected waypoint.
[4L] DUE TO WEATHER	When selected, DUE TO WEATHER conditions (justification) is inserted into the datalink message.
[6L] ATC MENU RETURN	When selected, the MCDU displays the ATC MENU page.
[1R] FL/ALT	Prepares a request of new altitude.
[2R] SPD/MACH	Prepares a request of new speed.
[4R] DUE TO A/C PERF	When selected, DUE TO A/C PERFORMANCE justification is inserted into the datalink message.
[6R] XFR TO DCDU	When selected, the DCDU displays prepared message.

TEXT

Ident.: DSC-46-10-40-30-00021096.0003001 / 17 MAR 17
Applicable to: MSN 02719-02789, 03031-03060, 05152-07792



- REPLAY WITHIN XXS

Appears for 5 s, when the remaining time to answer is less than 30 s. XX represents the number of remaining seconds, before the message timer expires. When selected, due to aircraft performance justification is inserted into the datalink message.
- [2L] DUE TO A/C PERFORMANCE

When selected, due to aircraft performance (justification) is inserted into the datalink message.
- [3L] DUE TO WEATHER

When selected, due to weather conditions (justification) is inserted into the datalink message.
- [6L] ATC MENU RETURN

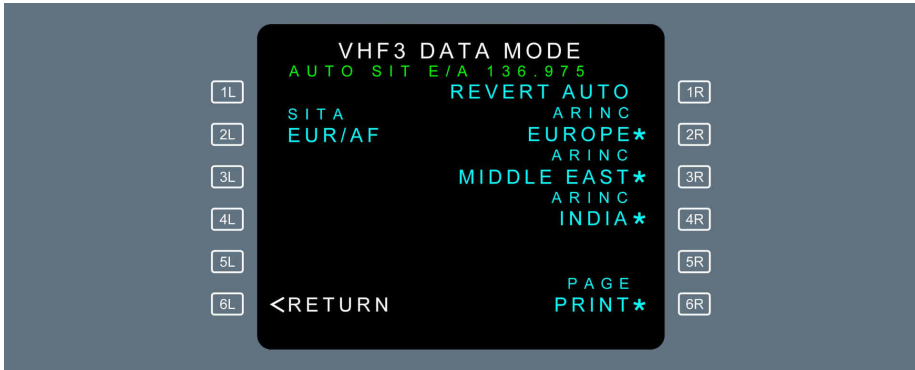
When selected, the MCDU displays the ATC MENU page.
- [6R] XFR TO DCDU

When selected, the DCDU displays the prepared message.

VHF3 DATA MODE

Ident.: DSC-46-10-40-30-00021252.0002001 / 17 MAR 17
Applicable to: MSN 02719-02789, 03031-03060, 05152-07792

EXAMPLE	This is an example of the VHF3 DATA MODE page. Information, that are displayed on the VHF3 DATA MODE page, depend on the service provider and datalink customization, selected by each operator. The VHF3 DATA MODE displays regions, and associated frequencies of datalink service providers that were selected.
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EXAMPLE	Line 1	Displays: - Mode of VHF provider selection: - MANUAL The VHF3 is tuned to a frequency manually selected by the flight crew via the VHF3 DATA MODE page. - AUTO The VHF3 is tuned to a frequency automatically selected by the ATSU. - VOICE The VHF3 is in the voice mode. - SCAN The VHF3 system scans for a data frequency. - AUTO DATA INHIB No datalink service provider is available in the area. - Datalink service provider identification - The frequency of the service provide that the system is tuned to
	[2L] SITA EUR/AF	Displays the service provider (SITA Europe/Africa). In this example, the ATSU is connected to the provider SITA Europe/Africa (136.975 MHz).
	[6L] RETURN	When selected, the MCDU displays the COMM MENU page.
	[1R] REVERT AUTO	Reverts to VHF3 auto-tuning.
	[2R] ARINC EUROPE	When selected, the VHF3 tunes to the frequency of the ARINC EUROPE provider. The mode of VHF provider selection changes to MANUAL .
	[3R] ARINC MIDDLE EAST	When selected, the VHF3 tunes to the frequency of the ARINC MIDDLE EAST provider. The mode of VHF provider selection changes to MANUAL .
	[4R] ARINC INDIA	When selected, the VHF3 tunes to the frequency of the ARINC INDIA provider. The mode of VHF provider selection changes to MANUAL .
	[6R] PAGE PRINT	When selected, the printer prints information from the VHF3 DATA MODE page.

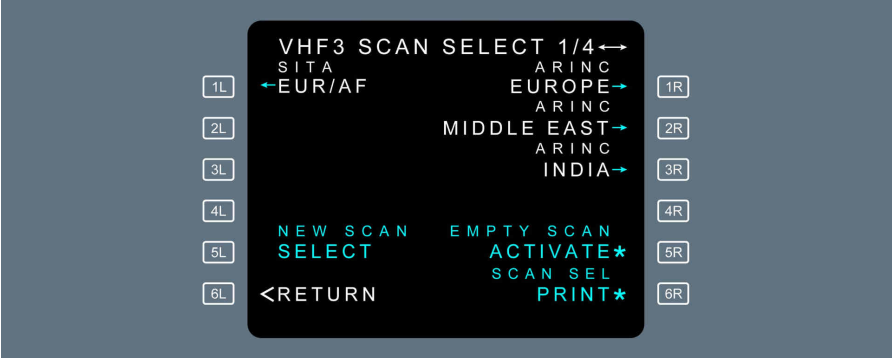
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VHF3 SCAN SELECT

Ident.: DSC-46-10-40-30-00021254.0001001 / 21 MAY 24
Applicable to: **ALL**

EXAMPLE	This is an example of VHF3 SCAN SELECT pages. Information, that are displayed on the VHF3 SCAN SELECT pages, depend on datalink customization, selected by each operator.
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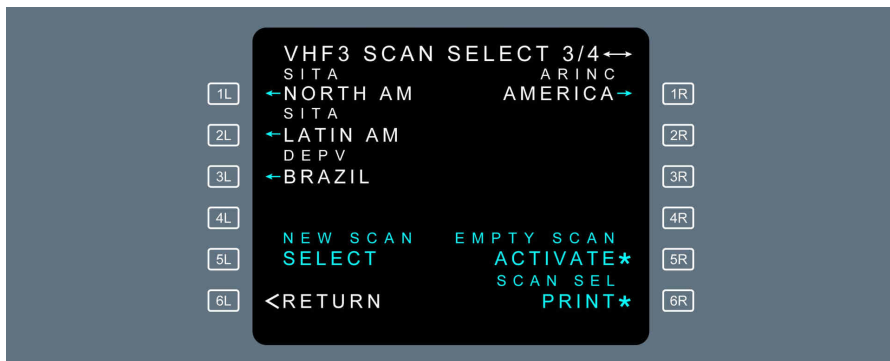
THE VHF 3 SCAN SELECT PAGE 1/4



EXAMPLE	[1L] SITA EUR/AF Selects the SITA Europe/Africa (datalink service provider). [5L]: NEW SCAN SELECT : Selects the scan mask. ACTIVE SEL DISPLAY : Displays the scan mask used by ATSU. [6L] RETURN When selected, the MCDU displays the COMM CONFIG page. [1R] ARINC EUROPE Selects the ARINC Europe (datalink service provider). [2R] ARINC MIDDLE EAST Selects the ARINC Middle East (datalink service provider). [3R] ARINC INDIA Selects the ARINC India (datalink service provider). [5R] EMPTY SCAN ACTIVATE Activates an empty scan mask to inhibit VHF datalink communication. [6R] SCAN SEL PRINT When selected, the printer prints information.
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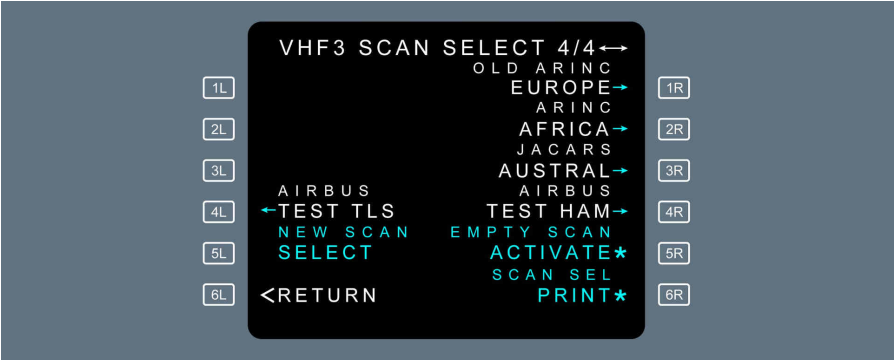
THE VHF 3 SCAN SELECT PAGE 2/4


EXAMPLE	[1L] SITA PACIFIC	Selects the SITA Pacific (datalink service provider).
	[4L] AVICOM JAPAN	Selects the AVICOM Japan (datalink service provider).
	[5L]:	
	NEW SCAN SELECT :	Selects the scan mask.
	ACTIVE SEL DISPLAY :	Displays the scan mask used by ATSU.
	[6L] RETURN	When selected, the MCDU displays the COMM CONFIG page.
	[1R] ARINC RUSSIA	Selects the ARINC Russia (datalink service provider).
	[2R] ARINC ASIA	Selects the ARINC Asia (datalink service provider).
	[3R] ARINC AUSTRAL	Selects the ARINC Australia (datalink service provider).
	[4R] ARINC KOREA	Selects the ARINC Korea (datalink service provider).
	[5R] EMPTY SCAN ACTIVATE	Activates an empty scan mask, in order to inhibit VHF datalink communication.
	[6R] SCAN SEL PRINT	When selected, the printer prints information.

THE VHF 3 SCAN SELECT PAGE 3/4


EXAMPLE	[1L] SITA NORTH AM	Selects the SITA North America (datalink service provider).
	[2L] SITA SOUTH AM	Selects the SITA South America (datalink service provider).
	[3L] DEP V BRASIL	Selects the DEP V Brasil (datalink service provider).
	[5L]:	
	NEW SCAN SELECT :	Selects the scan mask.
	ACTIVE SEL DISPLAY :	Displays the scan mask used by ATSU.
	[6L] RETURN	When selected, the MCDU displays the COMM CONFIG page.
	[1R] ARINC AMERICA	Selects the ARINC America (datalink service provider).
	[5R] EMPTY SCAN ACTIVATE	Activates an empty scan mask, in order to inhibit VHF datalink communication.
	[6R] SCAN SEL PRINT	When selected, the printer prints information.

THE VHF 3 SCAN SELECT PAGE 4/4



EXAMPLE	[5L]: NEW SCAN SELECT : Selects the scan mask. ACTIVE SEL DISPLAY : Displays the scan mask used by ATSU. [6L] RETURN When selected, the MCDU displays the COMM CONFIG page. [1R] OLD ARINC EUROPE Selects the OLD ARINC Europe (datalink service provider). [2R] ARINC AFRICA Selects the ARINC Africa (datalink service provider). [3R] JACARS AUSTRAL Selects the JACARS Australia (datalink service provider). [5R] EMPTY SCAN ACTIVATE Activates an empty scan mask, in order to inhibit VHF datalink communication. [6R] SCAN SEL PRINT When selected, the printer prints information.
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MCDU Scratchpad Messages
MCDU SCRATCHPAD MESSAGES

Ident.: DSC-46-10-40-40-10-00021084.0001001 / 17 MAR 17

Applicable to: MSN 02719-02789, 03031-03060, 05152-07792

MESSAGE	CONDITIONS
FORMAT: _ _ _	The acquisition format is not valid. An example of the required format is displayed (FORMAT: NNN, FORMAT : XXXX, etc), where: - N : Numerical data (0 to 9) - X : Alphanumerical data (0 to 9, or A to Z). To display the required format of specific data on the scratchpad message field, press on the corresponding empty field. This serves as a reference to the crew.
ENTRY OUT OF RANGE	The single value that was entered is out of range.
OUT OF RANGE	A single value of double data is out of range.
TWO ENTRIES OUT OF RANGE	The double value that was entered is out of range.
NON MODIFIABLE FIELD	A non-modifiable field was selected.
KEY NOT ACTIVE	It is not allowed to press this key.
ALREADY SELECTED	The selectable key has already been selected.
NOT ALLOWED	Data entry not allowed, or deselection of a selectable key not yet selected, or selection of a selectable key with any entry on the scratchpad other than CLR.
CLR NOT ALLOWED	An available key has been selected, but the function is not available due to CLR still displayed on the scratchpad field.
FLIGHT NBR UNAVAILABLE	Notification is not available, because the flight number is unavailable.
ENTER MANDATORY FIELDS	Selection of a command is not available, because mandatory fields are not filled in.
NO WHOLE MSG PREPARED	Selection of the ATC DISPL or ADD TEXT command is not available, because the message is not completely prepared.
COM UNAVAILABLE	The selected command is not available, because datalink communications means are currently unavailable.
DCDU FILE FULL	The selected command is not available, because the DCDU file is full.

Continued on the following page

Continued from the previous page

MESSAGE	CONDITIONS
MSG ALREADY DISPLAYED	The XFR to DCDU command (FANS B  / FANS B+ ), or the ATC DISPL command (FANS A+ ) is not available, because the message is already displayed on the DCDU.
NO MSG TO PRINT	The PRINT key was selected, but the function is currently unavailable because there is no message to be printed.
PRINTER UNAVAILABLE	The PRINT key was selected, but the printer is currently unavailable.
LAST MSG ELEMENT	Maximum number of message elements for a given downlink message is reached.
TOO MANY MSG ELEMENTS	Entry of a new parameter is not allowed, because the maximum number of message elements has been reached.
NO ACTIVE ATC	The XFR to DCDU key (FANS B  / FANS B+ ) or ATC DISPL command (FANS A+ ) or MAX UPLINK DELAY command (FANS A+ ) was selected, but the function is currently unavailable because there is no active CPDLC connection.
LAT/LON DISPL ABBREVIATED	The LAT/LONG display is abbreviated only on the MCDU display field, because there is lack of space.
MSG RECORD NOT RELIABLE	Due to a technical problem, the list of messages recorded is not reliable. All CPDLC messages are deleted and new messages should not be recorded.
MSG RECORD IS EMPTY	The MSG RECORD ERASE command is not available, because there are no messages recorded.
NOT IN DATABASE	Entry not in database.

MESSAGES ON COMM MENU PAGE

Ident.: DSC-46-10-40-10-00021338.0002001 / 17 MAR 17

Applicable to: MSN 02719-02789, 03031-03060, 05152-07792

SCRATCHPAD MESSAGES ON THE COMM MENU PAGE

MESSAGE	CONDITIONS
COMMAND NOT AVAIL	The command is not available.
DEFAULT VHF SP LIST ⁽¹⁾	The new SCAN MASK is not available. The system displays the default SCAN MASK instead.

Continued on the following page

Continued from the previous page

MESSAGE	CONDITIONS
ENTER A/C ICAO CODE	The aircraft ICAO code is not valid. To enter the A/C ICAO code, <i>Refer to DSC-46-10-50 How to Initialize</i>
ENTER A/C REGISTR or ENTER A/C REGISTER	The aircraft registration number is not valid. To enter this parameter, <i>Refer to DSC-46-10-50 How to Initialize</i> .
ENTER A/L ID or ENTER ACARS A/L ID or ENTER STANDARD A/L ID	The airline identification number is not valid. To enter this parameter, <i>Refer to DSC-46-10-50 How to Initialize</i> .
ENTER VHF 3 SCAN SELECT ⁽¹⁾ or ENTER VHF 3 SCAN MASK ⁽¹⁾	No service provider has been selected.
FAILED COMMAND	The command, selected by the flight crew, cannot currently be performed.
FORMAT ERROR	The message was entered in an inappropriate format.
KEY NOT ACTIVE	The flight crew has pressed on MCDU a non allocated/non active key.
MULTICAST IGNORED	The multicast address is invalid (because equal to a/c ARN).
NOT ALLOWED	It is not permitted to press this key.
PRESS CONFIG ACTIVATE	Parameters of COMM MENU page have been modified. It is required to activate the new configuration.
PRINT FAILED	A print command is not successful.
PRT MSG PRINT FAIL	Automatic print of an AOC uplink message was not successful.
SYSTEM BUSY-TRY LATER	The system is busy. The command, selected by the flight crew, cannot currently be performed.
VHF 3 CAN BE SET IN VOICE	VHF 3 datalink communications are lost. However, VHF 3 can be used in voice mode.
VHF 3 SWITCH IMPOSSIBLE	It is not possible to switch from VHF 3 voice mode to VHF 3 data mode.

⁽¹⁾ Depending on airline customization, access to the SCAN SELECT menu may not be possible. If it is not, the DEFAULT VHF SP LIST and ENTER VHF 3 SCAN SELECT/MASK scratchpad messages are not applicable.

Ident.: DSC-46-10-40-40-10-00021338.0001001 / 17 MAR 17

Applicable to: MSN 02155-02212, 02926-02944, 04392

SCRATCHPAD MESSAGES ON THE COMM MENU PAGE

MESSAGE	CONDITIONS
COMMAND NOT AVAILABLE	The command is not available.
DEFAULT VHF SP LIST	The new SCAN MASK is not available. The system displays the default SCAN MASK instead.
ENTER A/C REGISTR	The aircraft registration number is not valid. To enter this parameter, <i>Refer to DSC-46-10-50 How to Initialize.</i>
ENTER A/L ID	The airline identification number is not valid. To enter this parameter, <i>Refer to DSC-46-10-50 How to Initialize.</i>
ENTER VHF 3 SCAN MASK	No service provider has been selected.
FAILED COMMAND	The command, selected by the flight crew, cannot currently be performed.
FORMAT ERROR	The message was entered in an inappropriate format.
NOT ALLOWED	It is not permitted to press this key.
PRINT FAILED	A print command is not successful.
PRT MSG PRINT FAIL	Automatic print of an AOC uplink message was not successful.
VHF 3 CAN BE SET IN VOICE	VHF 3 datalink communications are lost. However, VHF 3 can be used in voice mode.
VHF 3 SWITCH IMPOSSIBLE	It is not possible to switch from VHF 3 voice mode to VHF 3 data mode.

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MCDU Data Entry Format

MCDU DATA ENTRY FORMAT

Applicable to: MSN 02719-02789, 03031-03060, 05152-07792

Ident.: DSC-46-10-40-50-10-00021085.0003001 / 14 NOV 24

This chapter lists the data that the flight crew can enter in the ATSU DATALINK pages of the MCDU.

For each type of data, the table displays:

- Acceptable format
- Units of entry
- Acceptable range
- Page(s) where the flight crew enters the data

The following characters are used to indicate the format:

- A : Letters
- N : Numeric (numbers)
- X : Alphanumeric (letters and numbers).

DATA NAME	FORMAT	RANGE	UNIT	DISPLAY PAGE
A/C ICAO CODE	XXXXXX	6 characters		COMM CONFIG
A/C REGISTR	XXXXXX	7 characters		COMM CONFIG
ACARS A/L ID	AA	2 letters		COMM CONFIG
ASSIGNED ALT	Same as ALT			EDIT
ATC CENTER	XXXXXXXX	4 to 8 characters		NOTIFICATION or FREQUENCY MONITORING
ATC NAME	AAAAAAAAAAAAAAAAAAAA	3 to 18 letters		FREQUENCY MONITORING
ATC FUNCTION	CTR/APP/TWR/FNL/GND/CLR/DEP/CTL/RAD	3 letters		FREQUENCY MONITORING
DIR TO	XXXXX (Fixname)	Min 1 alphanumeric Max 5 alphanumeric		REQUEST
	DDMM.MB/ EEEMM.MC (LAT/LONG)	DD: 0-89 B: N or S	Degrees	
	"DD" = LAT degrees "EEE" = LONG degrees	MM.M: 0-59,9	Minutes	
	"MM.M" = LAT and LONG minutes Leading zeros may be omitted	EEE: 0-179 C: E or W	Degrees	

Continued on the following page

AIRCRAFT SYSTEMS
INFORMATION SYSTEMS
DATALINK - CONTROLS AND INDICATORS
Continued from the previous page

DATA NAME	FORMAT	RANGE	UNIT	DISPLAY PAGE
FL/ALT	FLNNN or NNN Leading zeros on NNN may be omitted	30-410	Hundreds of feet (MSL)	REQUEST
	NNNNNFT or NNNNN Between 0 and 410 feet, "FT" must be written. Leading zeros may be omitted.	-600-41 000	Feet	
	NNNNNM or -NNNNNM or +NNNNNM Leading zeros may be omitted	-30-12 500	Meters	
FROM/TO	AAAA			NOTIFICATION
PRESENT ALT	Same as ALT			EDIT
PREFERRED	Same as ALT			EDIT
SPD/MACH	NNN or NNNKT Leading zeros may be omitted	0-350	Kt	REQUEST
	M.NN or .NN The decimal point must be written, trailing zeros may be omitted	0.5-0.92	Mach	
STANDARD A/L ID	AAA			COMM CONFIG
TOD	HHMM "HH" = NN or NNH "MM" = NN or NNMIN "MIN" = "MIN" or "MN" or "M" or "Z"	HH: 0-23 MM: 0-59	Hours Minutes	EDIT
VOICE FREQ	NNN.NNN	118.000 to 136.975	MHz	FREQUENCY MONITORING

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ECAM

MEMO DISPLAY

Applicable to: ALL

Ident.: DSC-46-10-40-60-A-00016906.0001001 / 21 MAR 16

COMPANY ALERT : This memo appears in green when the aircraft receives an uplink alert message, or when an AOC special condition requires a pilot action on the MCDU (depends on AOC programming). This memo pulses green for 180 s, then remains steady. It is associated with a buzzer for 1 s.

Ident.: DSC-46-10-40-60-A-00016904.0001001 / 21 MAR 16

COMPANY CALL : This memo appears in green when the aircraft receives a message from the ground requesting voice communication on VHF.

Ident.: DSC-46-10-40-60-A-00016903.0001001 / 21 MAR 16

COMPANY DATALINK STBY : This memo appears in green when AOC datalink air-ground communication is temporarily unavailable, but not lost.

Ident.: DSC-46-10-40-60-A-00016905.0001001 / 21 MAR 16

COMPANY MSG : This memo appears in green when the aircraft receives a message from the ground.

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INTRODUCTION

Ident.: DSC-46-10-50-00021191.0002001 / 17 MAR 17

Applicable to: MSN 02155-02212, 02926-02944, 04392

How To chapter contains examples of:

- How to initialize the datalink
- How to modify the flight plan.

Illustrations in How To are generic and do not reflect differences depending on the datalink standard installed in the aircraft.

INTRODUCTION

Ident.: DSC-46-10-50-00021191.0001001 / 17 MAR 17

Applicable to: MSN 02719-02789, 03031-03060, 05152-07792

How To chapter contains examples of:

- How to activate the datalink connection
- How to receive a datalink message
- How to create a datalink message
- How to send a datalink message.

Illustrations in How To are generic and do not reflect differences depending on the datalink standard installed in the aircraft.

HOW TO INITIALIZE

Ident.: DSC-46-10-50-00021142.0002001 / 17 MAR 17

Applicable to: MSN 02155-02212, 02926-02944, 04392

Datalink may be initialized:

- Automatically
Datalink initializes automatically, provided that a list of service providers is scanned, and all required parameters are received, and validated by the ATSU.
- Manually
Datalink may be initialized manually, when the system is not correctly initialized automatically.

The VHF3 SCAN SELECT page of the MCDU displays the list of service providers.
The COMM CONFIG / COMM INIT page, on the MCDU displays required parameters.

MANUAL INITIALIZATION

If one of required parameters is not valid, one or more manual entries may be required:

- **If ARN is not valid:**

The MCDU scratchpad displays ENTER A/C REGISTER:

1L	COMM CONFIG A/C REGISTR □□□□□□ ACARS A/L ID AIT STANDARD A/L ID VHF3 AITB SCAN SEL> <RETURN ENTER A/C REGISTER PAGE PRINT★		1R
2L			2R
3L			3R
4L			4R
5L			5R
6L			6R

The flight crew clears the scratchpad, and inserts the A/C registration via the MCDU scratchpad.

A/C REGISTR..... INSERT

The flight crew inserts A/C ICAO registration via the MCDU scratchpad to A/C REGISTR.

CONFIG ACTIVATE..... SELECT

The flight crew selects 1R/CONFIG ACTIVATE to activate manual entry of the A/C registration.

- **If the A/L ID is not valid:**
 The MCDU scratchpad displays ENTER A/L IDENT:

1L	COMM CONFIG A/C REGISTR □GEMHOL ACARS A/L ID □□ STANDARD A/L ID VHF3 AITB SCAN SEL> <RETURN ENTER A/L IDENT PAGE PRINT★		1R
2L			2R
3L			3R
4L			4R
5L			5R
6L			6R

The flight crew clears the scratchpad, and inserts the two-letter A/L ID code via the MCDU scratchpad.

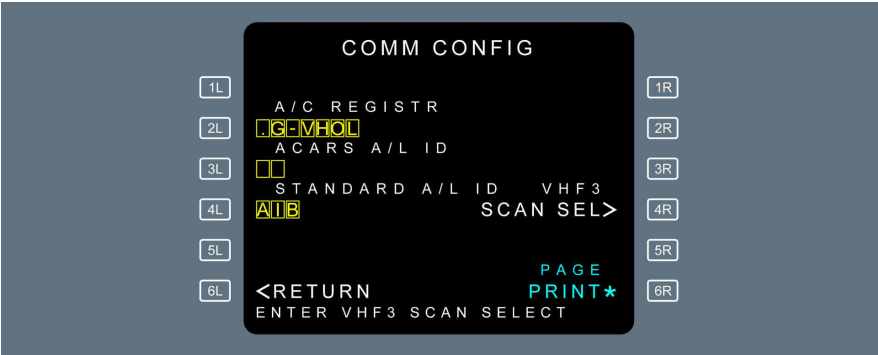
A/L ID..... INSERT

The flight crew inserts A/L ID code via the MCDU scratchpad to A/L ID.

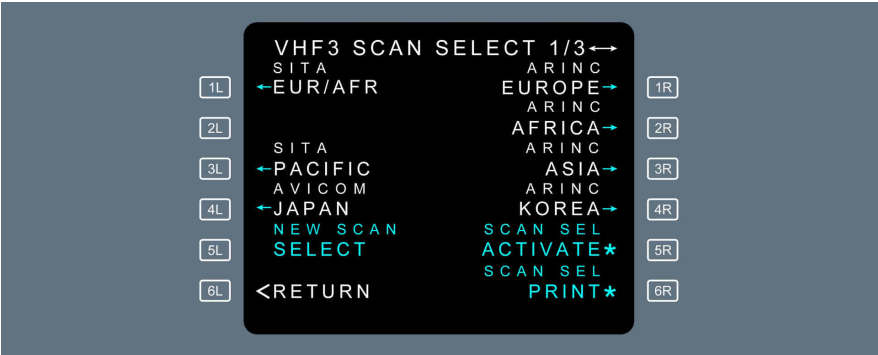
CONFIG ACTIVATE.....SELECT

The flight crew selects 1R/CONFIG ACTIVATE to activate manual entry of the A/C registration.

- **If VHF service provider is not selected**
 and
if the VHF3 SCAN/MASK SELECT menu can be accessed:
 The MCDU scratchpad displays ENTER VHF3 SCAN SELECT:



On the VHF3 SCAN SELECT page, select service providers, in the airline priority order, and activate the VHF SCAN SELECT function.



EXAMPLE OF SELECTION OF DATALINK SERVICE PROVIDERS:

- Selection of SITA 725 and ARINC service providers :
1. Press 5L key: The asterisk next to SELECT indication disappears, then reappears.
 2. Press 1L key to select SITA 725: SELECT indication goes off, and the priority number of selection 1 appears.

3. Press 1R key to select ARINC: SELECT indication goes off, and the priority number of selection 2 appears.
4. Press 5R key to activate the VHF SCAN SELECT function: The star next to SCAN SELECT ACTIVATE indication disappears, then reappears.

Note: Modification of the SCAN SELECT setting may result in the loss of air-ground VHF datalink communication, and the increase of datalink service provider charges. Therefore, the SCAN SELECT setting should not be modified by the flight crew, unless the flight crew is instructed to do so.

HOW TO INITIALIZE

Ident.: DSC-46-10-50-00021142.0001001 / 14 NOV 24

Applicable to: MSN 02719-02789, 03031-03060, 05152-07792

Datalink may be initialized:

- Automatically

Datalink initializes automatically, provided that a list of service providers is scanned, and all required parameters are received, and validated by the ATSU.

- Manually

Datalink may be initialized manually, when the system is not correctly initialized automatically.

The VHF3 SCAN SELECT page of the MCDU displays the list of service providers.

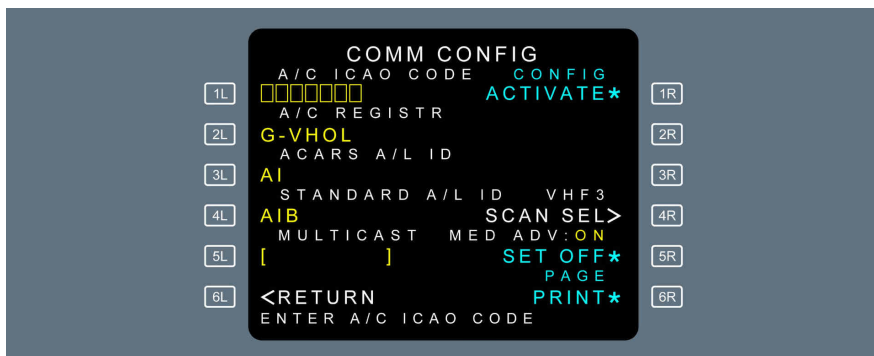
The COMM CONFIG page, on the MCDU displays required parameters.

MANUAL INITIALIZATION

If one of required parameters is not valid, one or more manual entries may be required:

● **If the A/C ICAO CODE is not valid:**

The MCDU scratchpad displays ENTER A/C ICAO CODE:



The flight crew clears the scratchpad, and inserts the A/C ICAO code via the MCDU scratchpad.

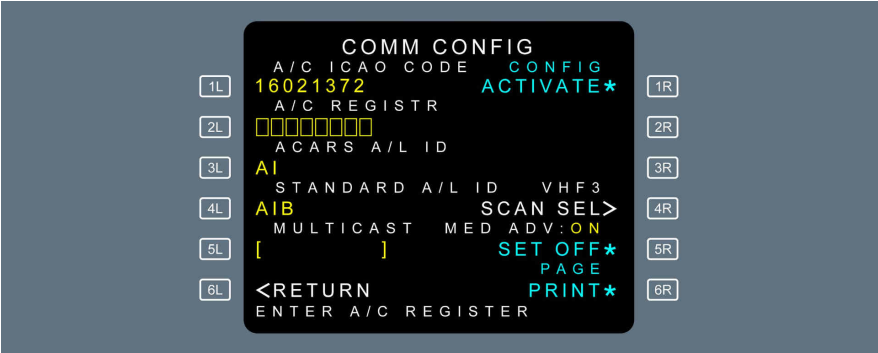
A/C ICAO CODE.....INSERT

The flight crew inserts A/C ICAO code via the MCDU scratchpad into A/C ICAO CODE, Refer to DSC-46-10-40-50 Data Entry Format.

CONFIG ACTIVATE.....SELECT

The flight crew selects 1R/CONFIG ACTIVATE to activate manual entry of the A/C ICAO code.

- **If ARN is not valid:**
 The MCDU scratchpad displays ENTER A/C REGISTER:



The flight crew clears the scratchpad, and inserts the A/C registration via the MCDU scratchpad.

A/C REGISTR.....INSERT

The flight crew inserts A/C ICAO registration via the MCDU scratchpad to A/C REGISTR.

CONFIG ACTIVATE.....SELECT

The flight crew selects 1R/CONFIG ACTIVATE to activate manual entry of the A/C registration.

- **If the A/L ID is not valid:**
 The MCDU scratchpad displays ENTER A/L IDENT:

1L	COMM CONFIG A/C ICAO CODE CONFIG 16021372 ACTIVATE*		1R
2L	A/C REGISTR G-VHOL ACARS A/L ID		2R
3L	☐ ☐ STANDARD A/L ID VHF3		3R
4L	AIB SCAN SEL> MULTICAST MED ADV: ON		4R
5L	[] SET OFF* PAGE		5R
6L	<RETURN PRINT* ENTER A/L IDENT		6R

The flight crew clears the scratchpad, and inserts the two-letter A/L ID code via the MCDU scratchpad.

A/L ID..... INSERT

The flight crew inserts A/L ID code via the MCDU scratchpad to A/L ID.

CONFIG ACTIVATE..... SELECT

The flight crew selects 1R/CONFIG ACTIVATE to activate manual entry of the A/C registration.

● **If VHF Service Provider is not selected**

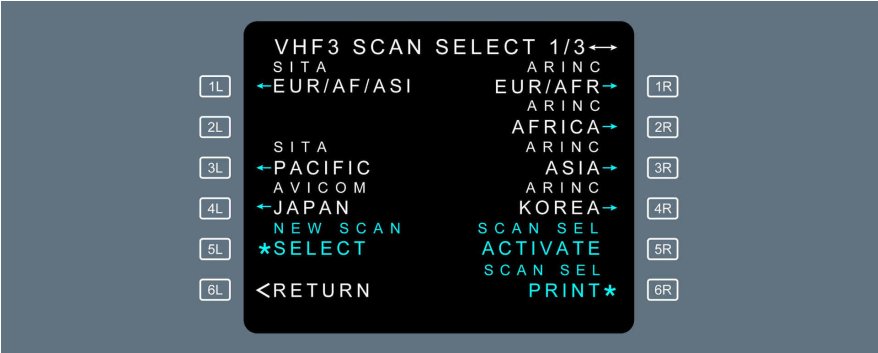
and

if the VHF3 SCAN/MASK SELECT menu can be accessed:

The MCDU scratchpad displays ENTER VHF3 SCAN SELECT:

1L	COMM CONFIG A/C ICAO CODE CONFIG 16021372 ACTIVATE*		1R
2L	A/C REGISTR G-VHOL ACARS A/L ID		2R
3L	AI STANDARD A/L ID VHF3		3R
4L	AIB SCAN SEL> MULTICAST MED ADV: ON		4R
5L	[] SET OFF* PAGE		5R
6L	<RETURN PRINT* ENTER VHF3 SCAN SELECT		6R

On the VHF3 SCAN SELECT page, select service providers, in the airline priority order, and activate the VHF SCAN SELECT function.



EXAMPLE OF SELECTION OF DATALINK SERVICE PROVIDERS:

- Selection of SITA 725 and ARINC service providers :
1. Press 5L key: The asterisk next to SELECT indication disappears, then reappears.
 2. Press 1L key to select SITA 725: SELECT indication goes off, and the priority number of selection # 1 appears.
 3. Press 1R key to select ARINC: SELECT indication goes off, and the priority number of selection # 2 appears.
 4. Press 5R key to activate the VHF SCAN SELECT function: The asterisk next to SCAN SELECT ACTIVATE indication disappears, then reappears.

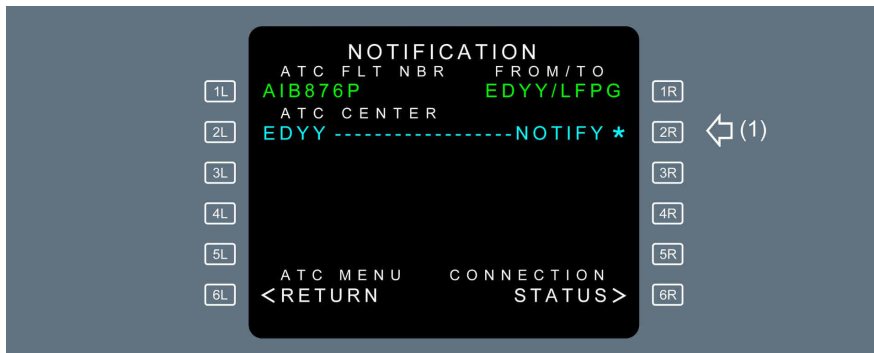
Note: *Modification of the SCAN SELECT setting may result in the loss of air-ground VHF datalink communication, and the increase of datalink service provider charges. Therefore, the SCAN SELECT setting should not be modified by the flight crew, unless the flight crew is instructed to do so.*

HOW TO NOTIFY

Ident.: DSC-46-10-50-00021143.0001001 / 17 MAR 17

Applicable to: MSN 02719-02789, 03031-03060, 05152-07792

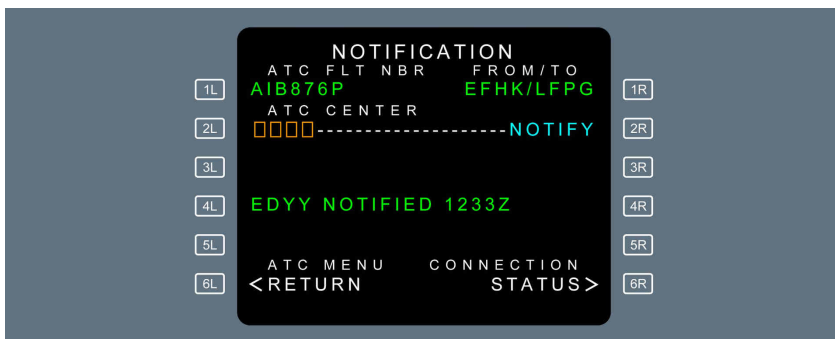
- **On the MCDU:**
NOTIFICATION Page:
NOTIFY..... SELECT See (1)
The flight crew enters the ATC code via the MCDU scratchpad, if the FMS does not enter the ATC code automatically.



■ **If the ATC center accepts the notification:**

When ATC center accepts the notification, the MCDU displays the name of the notified ATC center:

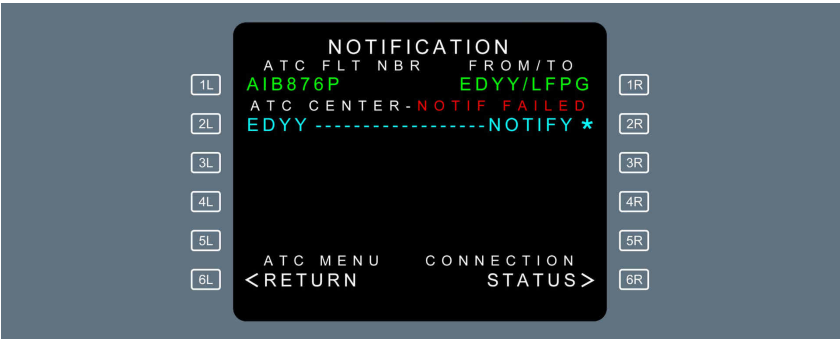
ATC NOTIFIED on the MCDU



■ **If the notification fails:**

If the notification fails, the MCDU displays **NOTIF FAILED** information:

NOTIF FAILED on the MCDU



- Note:
1. For ADS-C  operations, check on the CONNECTION STATUS page, on the MCDU, that the ADS-C  is set to ARMED before sending a notification.
 2. The notified ATC center initiates the CPDLC and/or ADS-C  connection. Therefore, re-notifications should be avoided.
 3. An automatic transfer from one ATC center to the next ATC center can be expected, if:
 - The MCDU displays the next ATC code, on the CONNECTION STATUS Page
 - The DCDU displays NEXT ATC information with the desired ATC code, on the default screen, when no datalink message is displayed.

HOW TO CONNECT

Applicable to: MSN 02719-02789, 03031-03060, 05152-07792

Ident.: DSC-46-10-50-10-00021239.0003001 / 17 MAR 17

CPDLC CONNECTION

CONNECTION TO ACTIVE ATC

The ATC center initializes the CPDLC connection, when the ATC center receives a notification from the aircraft.

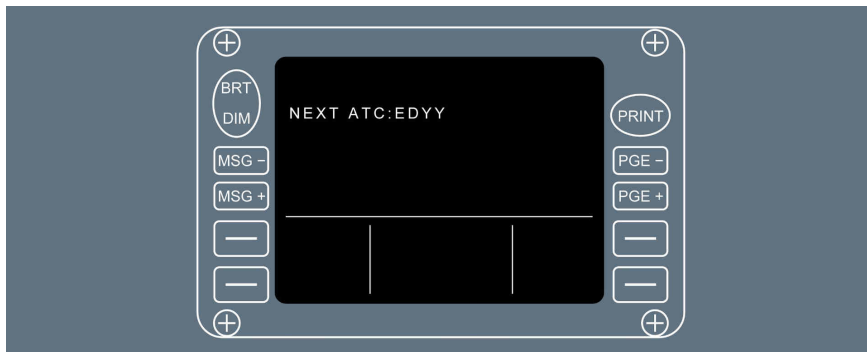
The DCDU displays the connected ATC (ACTIVE ATC), when the connection is established.

The MCDU displays the connected ATC (ACTIVE ATC) on the CONNECTION STATUS page.

NEXT ATC..... VERIFY

The flight crew should verify that the desired ATC center is connected.

NEXT ATC on the DCDU



- When the **CURRENT ATC** uplink message is received:

CAUTION

The aircraft can be considered under the control of the active ATC center, when the flight crew receives a **CURRENT ATC** uplink message.

Note: The transmission of the **CURRENT ATC** uplink message may take a few minutes.



CLOSE..... SELECT See (1)

The flight crew must close the message.

ACTIVE ATC.....VERIFY

The status of the connected ATC center, indicated as NEXT ATC (when the connection was initialized), changes to ACTIVE ATC.

The flight crew must verify that the desired ATC center is connected.

The aircraft is connected with the active ATC center (e.g. EDYY) and can exchange datalink messages.

ACTIVE ATC on the DCDU



CONNECTION TO NEXT ATC

The active ATC can transfer the datalink connection to a next ATC without requiring a flight crew action.

If the active ATC transfers the connection to the next ATC, the DCDU will automatically display the next ATC code in the NEXT ATC field, on the default screen, under the next ATC code in the NEXT ATC field.

When the flight crew receives a message of service termination from the active ATC, the next ATC becomes the active ATC.

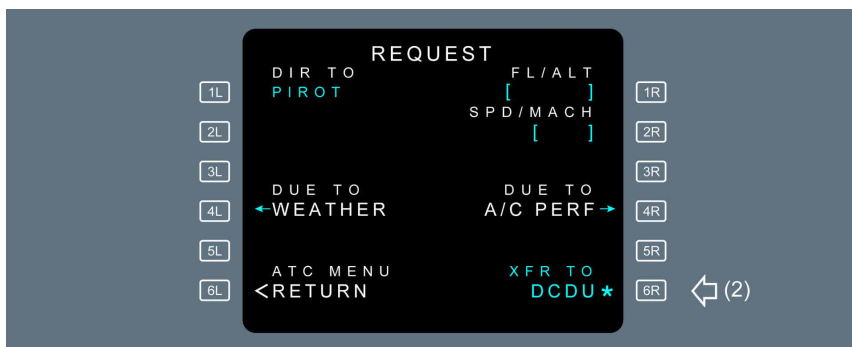
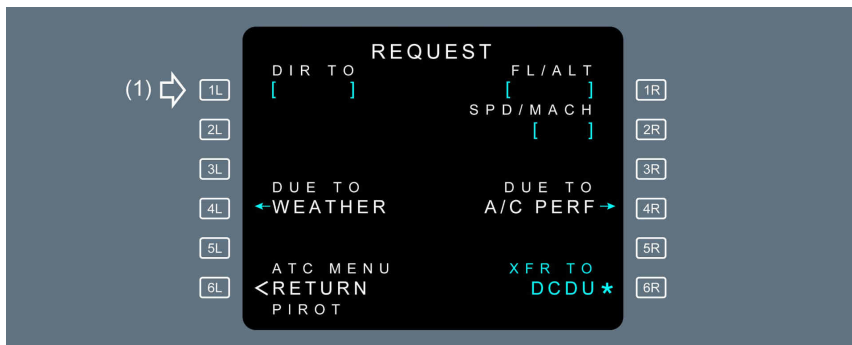
HOW TO SEND REQUEST TO ATC

Ident.: DSC-46-10-50-00021188.0002001 / 17 MAR 17
Applicable to: MSN 02719-02789, 03031-03060, 05152-07792

AIRCRAFT REQUEST OF LATERAL FLIGHT PLAN DEVIATION

Example: DIRECT TO REQUEST

- **On the MCDU:**
REQUEST Page:
 DIR TO.....INSERT See (1)
Insert a desired waypoint via the MCDU scratchpad.
 XFR TO DCDU..... SELECT See (2)
The DCDU displays prepared DIR TO request.



- **On the DCDU:**
SEND..... SELECT See (3)

L2

The OPEN status of the message disappears.

L1

The flight crew can close the message by selecting CLOSE, if the message is not closed automatically.



HOW TO ANSWER

Applicable to: MSN 02719-02789, 03031-03060, 05152-07792

Ident.: DSC-46-10-50-20-00021187.0002001 / 17 MAR 17

- ATC IMMEDIATE CLEARANCE**
- Example: DIRECT ROUTE Clearance:
- **On the glareshield:**

ATC MSG pb.....PRESS

The aural and visual alerts stop.
 - **On the DCDU:**

WILCO.....SELECT See (1)

The message status changes to WILCO See (2).

SEND.....SELECT See (3)

L2 *The DCDU displays the message and the message status in green See (4).*

L1 CLOSE.....SELECT See (5)

Closing the message clears the DCDU.

The flight crew must insert the direct to in the FMGS flight plan..



Ident.: DSC-46-10-50-20-00021221.0001001 / 04 JUN 19

ATC NEGOTIATION MESSAGE

Example: WHEN CAN YOU ACCEPT Negotiation

- **On the glareshield:**
ATC MSG pb.....PRESS
The aural and visual alerts stop.

- **On the DCDU:**
The DCDU displays the ATC negotiation message:



Note: A default answer is automatically generated on the DCDU and proposed to the flight crew.

- **If the flight crew can comply with the proposed action immediately:**
 - **On the DCDU:**
SEND.....SELECT See (1)
The flight crew can close the message, if the message is not closed automatically.



- If the flight crew can comply with the proposed action, but cannot perform the proposed action immediately:

● On the DCDU:

MODIFY.....SELECT (1)

MCDU FOR MODIF/MCDU FOR EDIT appears on the DCDU, in the message information area See (2) .

The MESSAGE MODIFY page appears automatically on the corresponding MCDU if an ATC page was displayed See (3).



● On the MCDU:

MESSAGE MODIFY Page

or

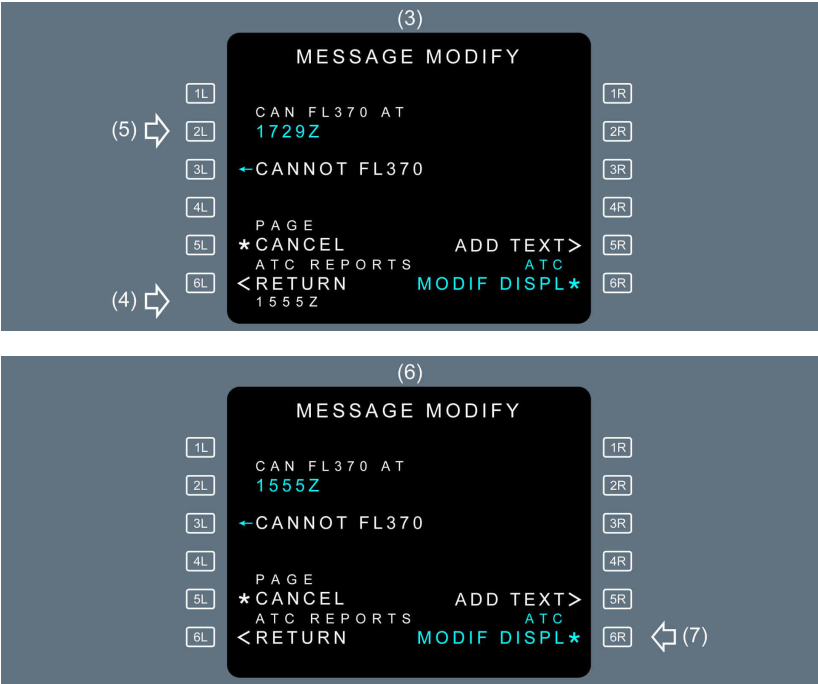
EDIT Page:

The flight crew specifies, when they can comply with the proposed action.

A default time value appears in the 2L field, on the MESSAGE MODIFY/EDIT page. The flight crew can modify the default time value via the MCDU scratchpad.

CAN FL370 AT.....SELECT See (5)
The flight crew can propose a new time value via the scratchpad See (4). The new time value will be inserted to the datalink message via the MESSAGE MODIFY/EDIT page See (6).

ATC MODIF DISPL.....SELECT See (7)
The message appears on the DCDU See (8).



- **On the DCDU:**
 SEND.....SELECT See (9)
The OPEN status of the message disappears.
The flight crew can close the message, if the message is not closed automatically.



■ If the flight crew cannot comply with the proposed action:

● On the DCDU:

CANNOT.....SELECT See (1)

The generated message changes from the positive message (CAN) to a negative message (CANNOT).

The message status remains OPEN See (2).

SEND.....SELECT See (3)

The flight crew can close the message, if the message is not closed automatically.

The OPEN status of the message disappears.

L2

L1

L2

L1





Ident.: DSC-46-10-50-20-00021190.0002001 / 17 MAR 17

ATC CONFIRMATION REQUEST

Example: CONFIRM PRESENT LEVEL Request

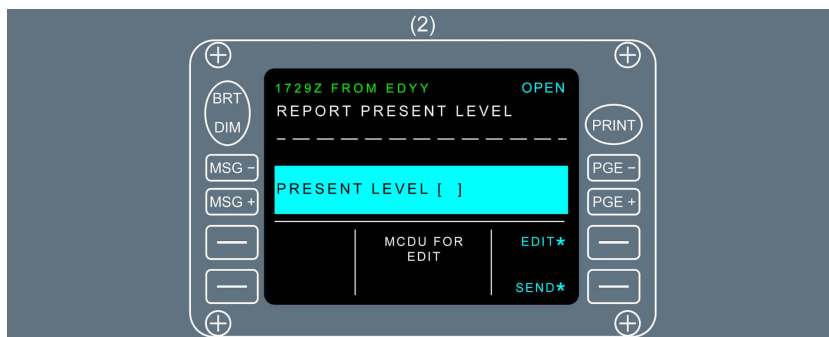
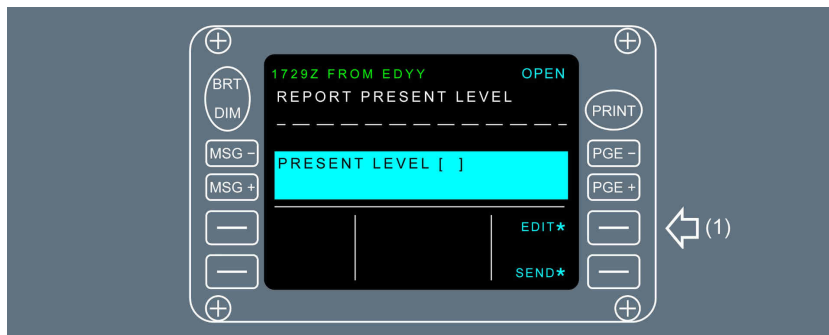
RECEPTION

- **On the glareshield:**
ATC MSG pb.....PRESS
The aural and visual alerts stop.
- **On the DCDU:**
The DCDU displays the ATC confirmation request:



RESPONSE

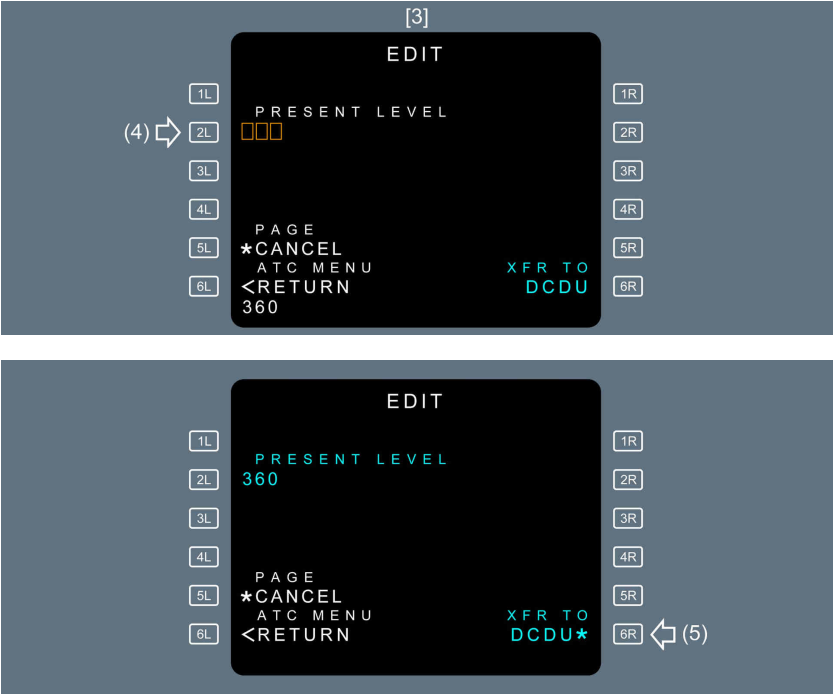
- **On the DCDU:**
EDIT..... SELECT See (1)
MCDU FOR EDIT information appears on the DCDU, in the message information area See (2). The MCDU automatically displays the EDIT page See (3).



- **On the MCDU:**
EDIT Page:
PRESENT LEVEL..... INSERT See (4)
Insert the value of the present flight level via the MCDU scratchpad.
A default value may appear in the 2L field of the MCDU EDIT page.
XFR TO DCDU..... SELECT See (5)
The DCDU displays the prepared message.

L2

L1



- **On the DCDU:**
 SEND.....SELECT See (6)
 The OPEN status of the message disappears.
 The flight crew can close the message, if the message is not closed automatically.

L2
L1



HOW TO MANAGE TEMPORARY LOSS OF DATALINK COMMUNICATION MEANS

Ident.: DSC-46-10-50-00022516.0003001 / 13 MAY 25
 Applicable to: MSN 02719-02789, 03031-03060, 05152-07792

In the case of a temporary loss of datalink communication means, the DCDU displays:



CLOSE.....SELECT See (1)



No further flight crew action is needed to recover the datalink connection.

Note: If a message was in “ready to be sent” state on DCDU message queue, the “SEND” key is disabled and the **NO ATC DLK** feedback is displayed on the information area:



HOW TO MODIFY FLT PLAN

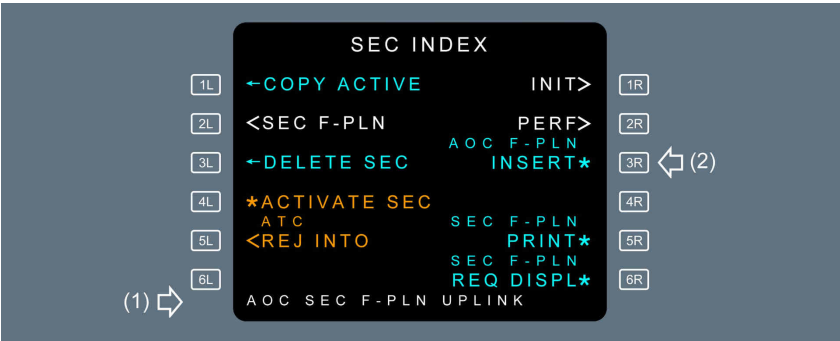
Ident.: DSC-46-10-50-00021153.0001001 / 21 MAR 17

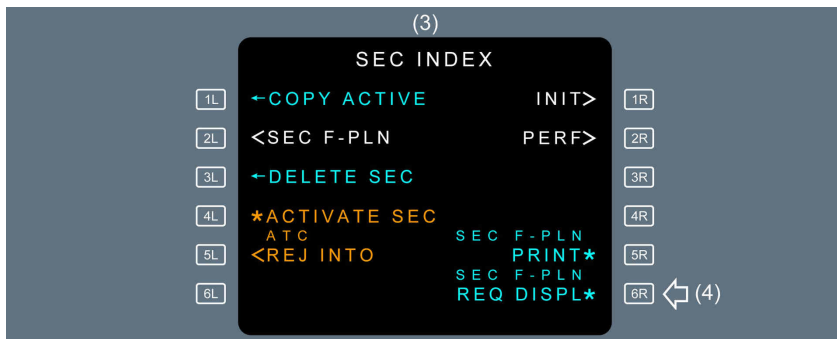
Applicable to: ALL

- When the scratchpad (1) displays the AOC SEC F-PLN UPLINK message:
- On the MCDU:
 - SEC INDEX Page:
 - AOC F-PLN INSERT.....SELECT See (2)
 - The flight plan is inserted in the secondary F-PLN See (3).*
 - The flight can review and modify the flight plan.*
 - SEC F-PLN REQ DISPLAY.....SELECT See (4)
 - The DCDU automatically displays a datalink message See (5).*
 - The flight crew sends the message to the ATC from the DCDU.*

L2

L1





● **When ATC clearance is received:**

● **On the glareshield:**

ATC MSG pb.....PRESS
The aural and visual alerts stop.

● **On the DCDU:**

STBY.....SELECT See (1)

The message status changes to STBY on a blue background See (2).

SEND.....SELECT See (3)

The background color of the STBY message status changes to green.

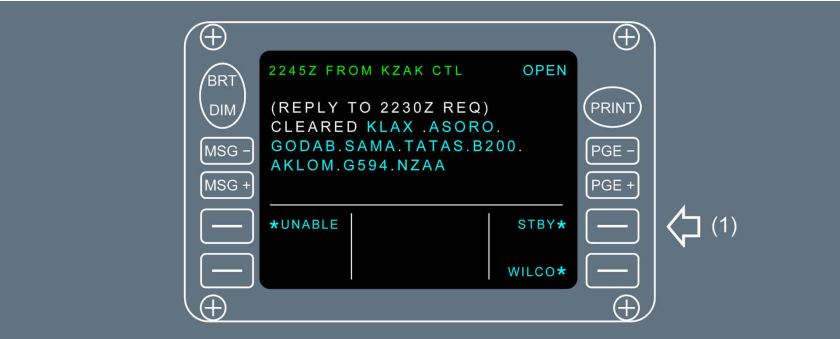
LOAD.....SELECT See (4)

LOAD must be selected. Other selection may prevent loading of the clearance.

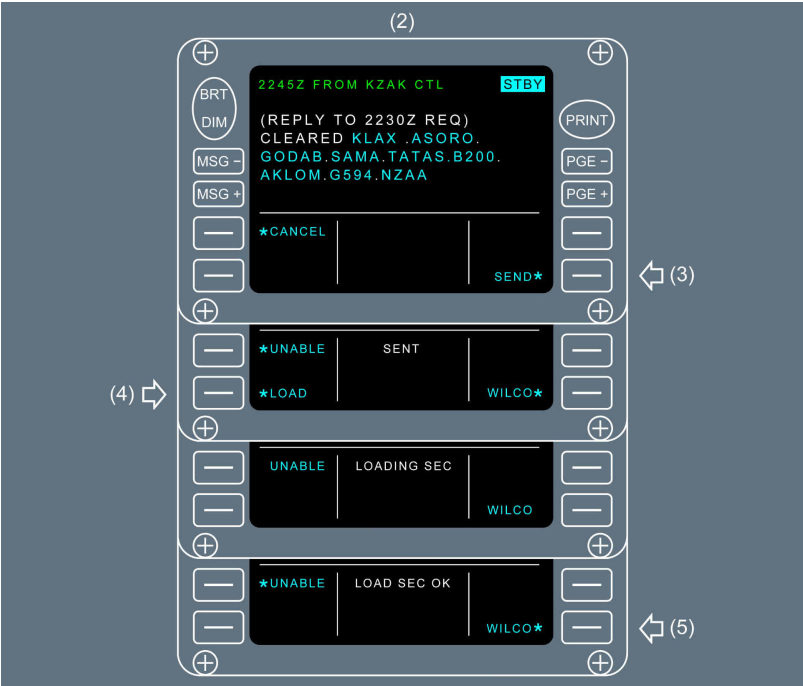
The LOAD SEC OK displays in the information field of the DCDU, if loading is successful.

The flight crew can review the clearance on the MCDU, in SEC F-PLN pages.

L1



- If the flight crew accepts the clearance:
 WILCO.....SELECT See (5)
The flight crew can activate the secondary F-PLN.



■ **If the flight crew decides to modify the clearance:**

- The flight crew loads the clearance into the SEC F-PLN, on the MCDU and modifies it.
- The flight crew rejects the clearance by selecting UNABLE on the DCDU.
- The flight crew sends a new request (with the modified F-PLN) to the ATC.

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS INFORMATION SYSTEMS DATALINK - TEMPORARY ABNORMAL BEHAVIORS
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ATC MSG RECORD NOT RELIABLE - DISPLAYED AT ATSU POWER-UP

Ident.: DSC-46-10-60-00024038.0001001 / 12 NOV 24

Applicable to: MSN 02719-02789, 03031-07792

DESCRIPTION

In some specific cases, such as ATSU power-up, the flight crew may experience the following:

- **ATC MSG RECORD NOT RELIABLE** DCDU message
- **MSG RECORD NOT RELIABLE** MCDU scratchpad message when the flight crew selects the MSG RECORD menu on the MCDU.

The flight crew may experience this abnormal behavior if, before the previous ATSU power-off, two CPDLC messages with the same time stamp were stored in the MSG RECORD.

At the next ATSU power-up, the MSG RECORD is emptied and the subsequent CPDLC messages are not stored in the MSG RECORD.

OPERATIONAL RECOMMENDATION

In such situation, the flight crew should perform a manual reset of the ATSU in order to recover the nominal ATSU behavior. *Refer to QRH/ABN-02 DATALINK - ATSU Malfunction.*

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS INFORMATION SYSTEMS PAX ENTERTAINMENT & CONNECTIVITY SYSTEMS (IF INSTALLED) - GENERAL
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GENERAL

Ident.: DSC-46-40-10-00017604.0001001 / 04 MAY 18

Applicable to: ALL

The aircraft is equipped with cabin connectivity systems which enable passengers to use:

- Mobile phones for voice and data services, and/or
- Internet wireless connection for access to the World Wide Web

The use of mobile phones is prohibited in cockpit and lavatories.

The following table provides the list of controls dedicated to Pax Entertainment & Connectivity Systems:

P/B 	EQUIPMENTS (FUNCTIONS)	DESCRIPTIONS
GALLEY	Mobile, Wifi, IFE, Seat actuators, PED	<i>Refer to DSC-24-20 Overhead Panel</i>
COMMERCIAL	Mobile, Wifi, IFE, Seat actuators, PED	<i>Refer to DSC-24-20 Overhead Panel</i>
NO PED	Signs	<i>Refer to DSC-33-40-10 Overhead Panel</i>
PAX SYS	Mobile, Wifi, IFE, Seat actuators, PED	<i>Refer to DSC-46-40-30 PAX SYS PB-SW</i>
PAX PERSONAL ELEC SPLY	PED	<i>Refer to DSC-46-40-30 PAX PERSONAL ELEC SPLY PB-SW</i>
MOBILE COM	Mobile, Wifi	<i>Refer to DSC-46-40-30 MOBILE COM PB-SW</i>
CINS reset	Mobile, Wifi	<i>Refer to DSC-46-40-30 CINS RESET PB</i>

AIRCRAFT SYSTEMS

INFORMATION SYSTEMS

PAX ENTERTAINMENT & CONNECTIVITY
SYSTEMS (IF INSTALLED) - GENERAL

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS INFORMATION SYSTEMS PAX ENTERTAINMENT & CONNECTIVITY SYSTEMS (IF INSTALLED) - IN SEAT POWER SUPPLY SYSTEM
IN SEAT POWER SUPPLY SYSTEM	

Ident.: DSC-46-40-20-00017606.0001001 / 04 MAY 18

Applicable to: ALL

The In-Seat Power Supply System (ISPSS) provides electrical power to the In-Seat Power Supply Unit (IPSU) outlets, and enables passengers to use Portable Electronic Devices (PED).
In the case of rapid cabin decompression, the ISPSS is automatically disconnected.

AIRCRAFT SYSTEMS

INFORMATION SYSTEMS

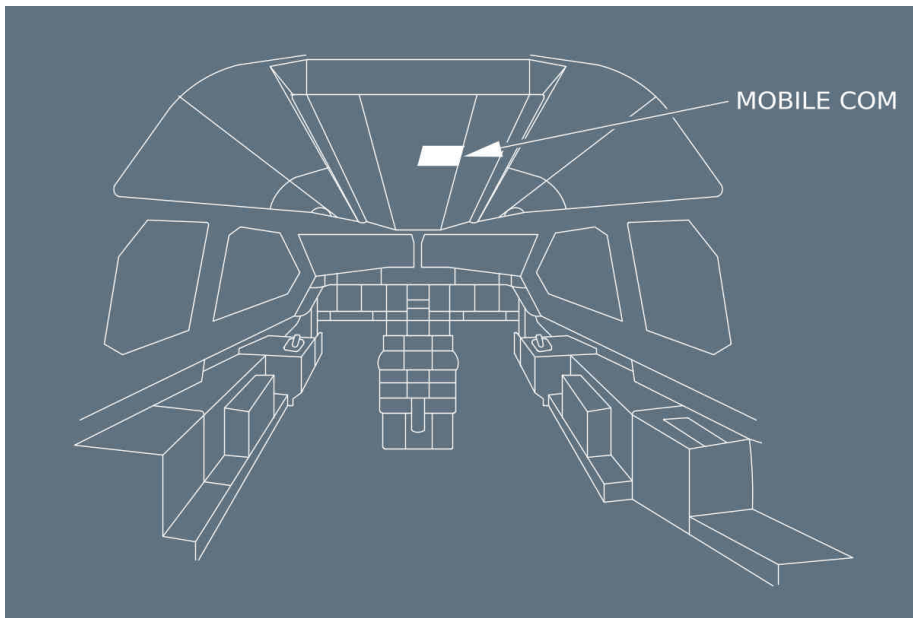
PAX ENTERTAINMENT & CONNECTIVITY SYSTEMS
(IF INSTALLED) - IN SEAT POWER SUPPLY SYSTEM

Intentionally left blank

MOBILE COM PB-SW

Ident.: DSC-46-40-30-00017631.0001001 / 04 MAY 18

Applicable to: ALL



The pushbutton-switch described here below is installed on the 45 VU panel on the overhead panel.



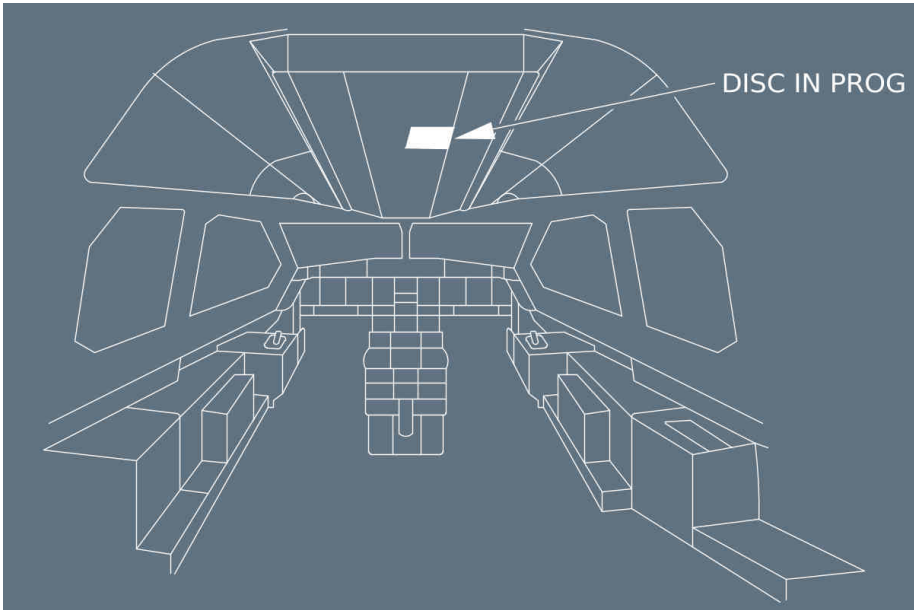
- ON** : The mobile phone system and the passenger Internet wireless connection  are activated.
- OFF** : The mobile phone system and the passenger Internet wireless connection  are deactivated.

Note: When the pushbutton is released, the OFF light comes on in white however the mobile phone system takes approximately 4 min to disconnect. During this disconnection process, the passengers can use their mobile phones.

DISC IN PROG LIGHT

Ident.: DSC-46-40-30-00019278.0001001 / 21 MAR 17

Applicable to: ALL



The pushbutton-switch described here below is installed on the 45 VU panel on the overhead panel.

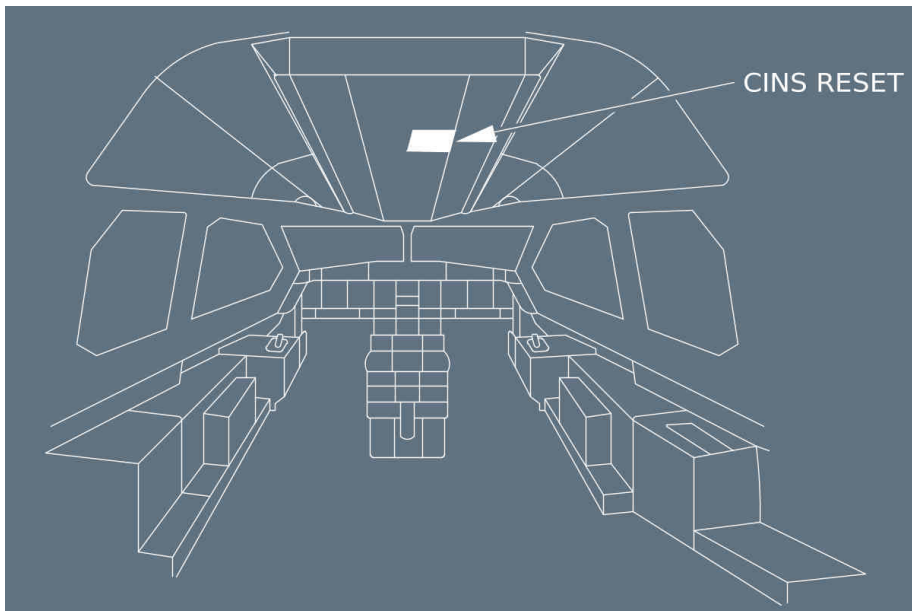


Note: After the release of Mobile Com pushbutton, the DISC IN PROG light comes in blue and remains on until the total disconnection of the system.

CINS RESET PB

Ident.: DSC-46-40-30-00017630.0001001 / 10 NOV 15

Applicable to: ALL



The pushbutton-switch described here below is installed on the 45 VU panel on the overhead panel.

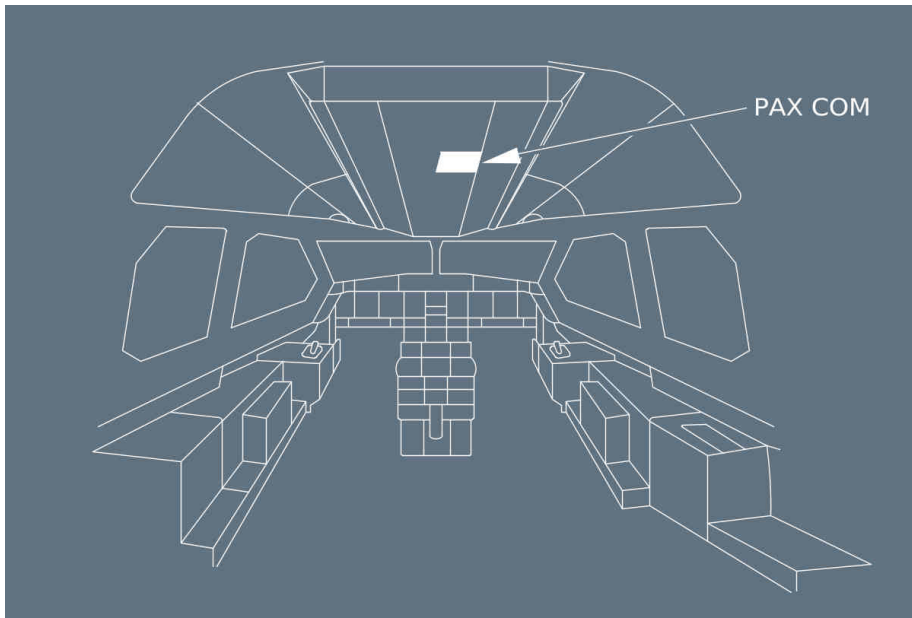


When pressed, it resets all Cabin Connectivity systems.

PAX COM PB-SW

Ident.: DSC-46-40-30-00021654.0001001 / 05 JUN 18

Applicable to: ALL



The pushbutton-switch described here below is installed on the overhead panel.



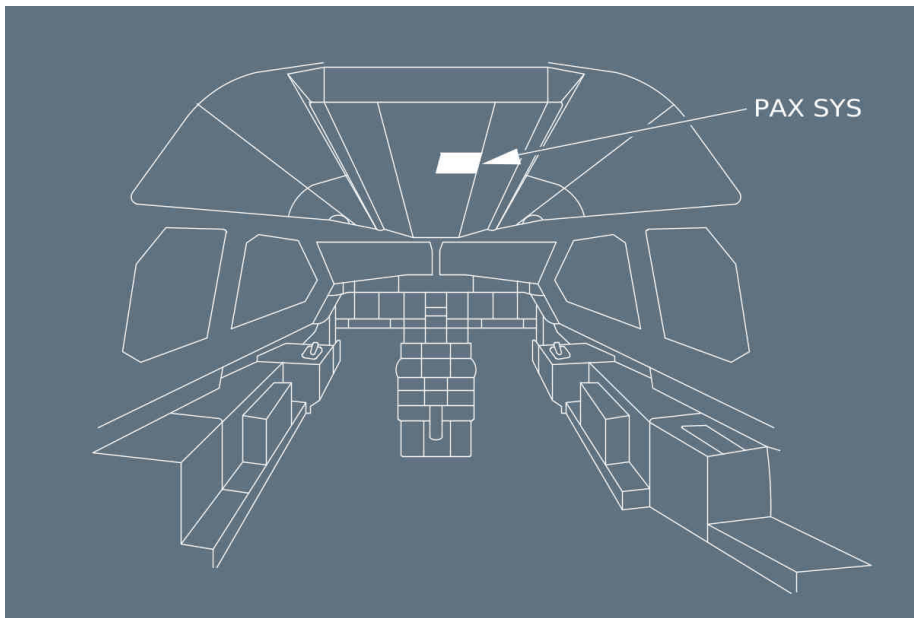
OFF : The Cabin Connectivity system is cut-off. When the pushbutton-switch is released, the OFF light comes on in white.

Note: The location of the PAX COM PB-SW  on the overhead panel may differ (e.g. 45VU or 9020VU) depending on the aircraft configuration.

PAX SYS PB-SW

Ident.: DSC-46-40-30-00017735.0001001 / 05 JUN 18

Applicable to: ALL



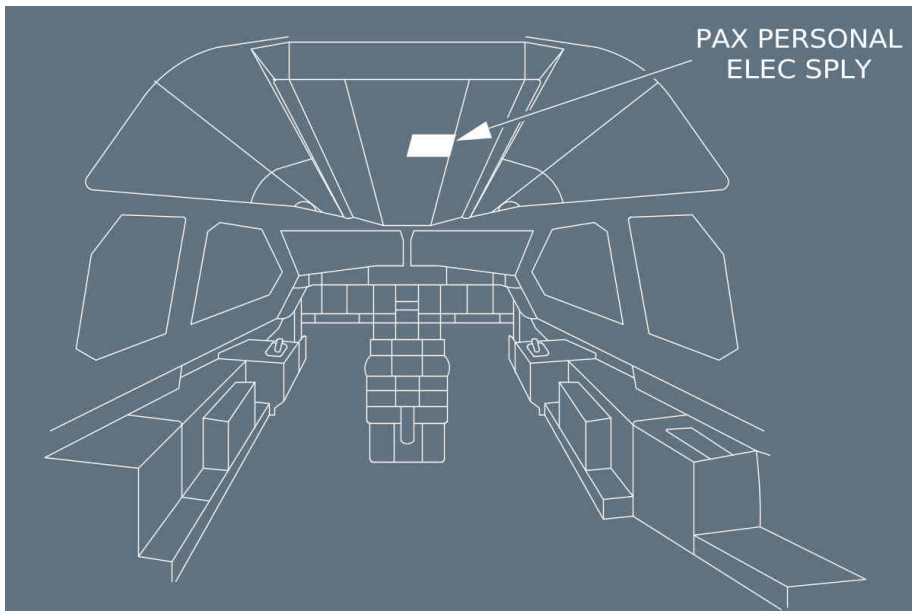
The pushbutton-switch described here below is installed on the overhead panel.



- On or AUTO  : All IPSUs, In-Flight Entertainment (IFE) and Cabin Connectivity systems are powered.
- OFF : Simultaneously turns off all IPSUs, In-Flight Entertainment (IFE) and Cabin Connectivity systems.

PAX PERSONAL ELEC SPLY PB-SW

Ident.: DSC-46-40-30-00017629.0001001 / 04 MAY 18

Applicable to: ALL


The pushbutton-switch described here below is installed on the 56VU panel on the overhead panel.



- AUTO**  : All ISPSUs are powered except in the following conditions:
- If the PED power switch located on the FAP is in the OFF position, or
 - Takeoff, landing or decompression.
- OFF** : Turns off all ISPSUs.
- INOP**  : This label indicates that the ISPSS has been deactivated and is inoperative.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS INFORMATION SYSTEMS PAX ENTERTAINMENT & CONNECTIVITY SYSTEMS (IF INSTALLED) - CONTROLS AND INDICATORS
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MEMO DISPLAY

Ident.: DSC-46-40-30-00017628.0001001 / 05 MAY 22
Applicable to: ALL

GSM DISC < 4 MN

This memo appears, if the MOBILE COM pb-sw  is pushed. It initiates a shutdown of the cabin connectivity systems within 4 minutes. This message is replaced by the **NO MOBILE** memo when the shutdown is completed.

AIRCRAFT SYSTEMS

INFORMATION SYSTEMS

PAX ENTERTAINMENT & CONNECTIVITY SYSTEMS
(IF INSTALLED) - CONTROLS AND INDICATORS

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AIRCRAFT SYSTEMS

APU

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DSC-49-10 Description

DSC-49-10-10 General	
General.....	A
DSC-49-10-20 Main Components	
APU Engine.....	A
Electronic Control Box.....	B
Air Intake System.....	C
Starter.....	D
Fuel System.....	E
Oil System.....	F
Inlet Guide Vanes (IGV).....	G
Air Bleed System.....	H

DSC-49-20 Controls and Indicators

Overhead Panel.....	A
External Controls.....	B
ECAM APU Page.....	C
Memo Display.....	D

DSC-49-30 Abnormal Operations

I Abnormal Operations.....	A
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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS APU PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS
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Localization Title	Toc Index	ID	Reason
DSC-49-30 APU Automatic Shutdown	A	1	Update of APU fire shutdown conditions to be in accordance with the system behavior.
			Layout modification. No technical change.

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 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS APU DESCRIPTION - GENERAL
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GENERAL

Ident.: DSC-49-10-10-A-00017436.0001001 / 21 MAR 17

Applicable to: ALL

The Auxiliary Power Unit (APU) is a self-contained unit that supplies the aircraft with pneumatic and electrical power.

On the ground

- It supplies bleed air for starting the engines and for the air conditioning system
- It supplies electrical power to the electrical system.

During takeoff

- It supplies bleed air for air conditioning (for example, when optimum aircraft performance is required).

In flight

- It backs up the electrical system
- It backs up the air conditioning
- It can be used to start the engines.

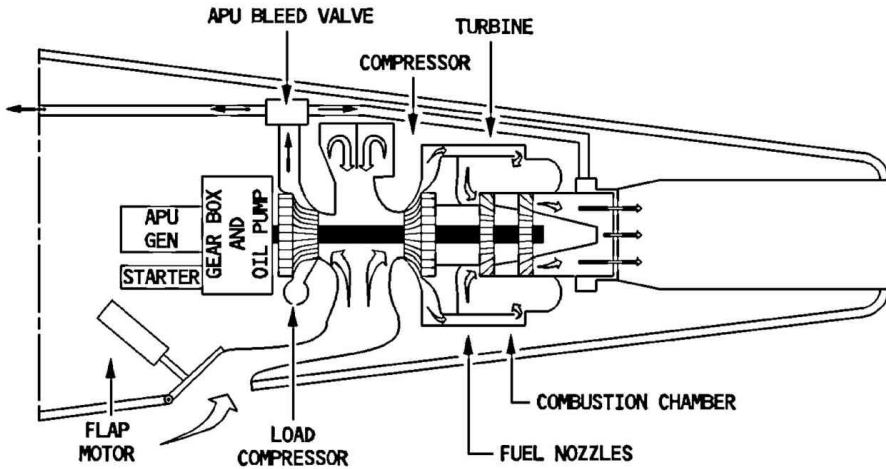
The APU may obtain power for starting from the aircraft's batteries or normal electrical system, or from ground service.

APU starting is permitted throughout the normal flight envelope (*Refer to LIM-APU Operational Envelope*).

ARCHITECTURE

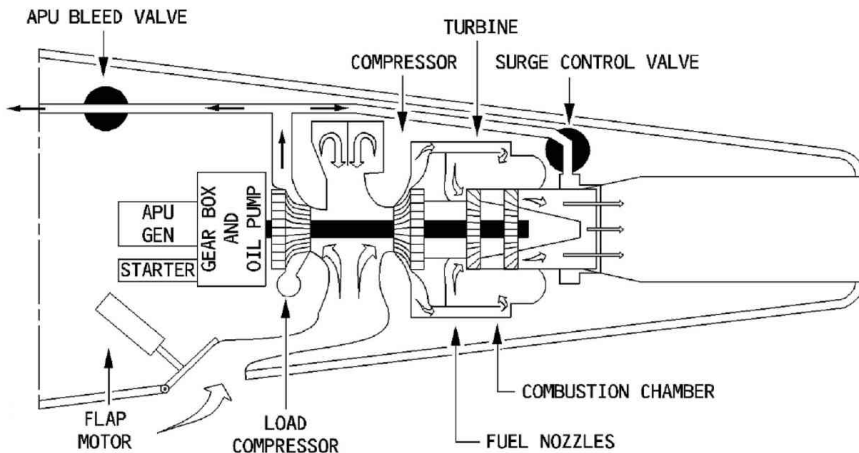
Ident.: DSC-49-10-10-A-00017437.0002001 / 21 MAR 16

Applicable to: MSN 02155-02212, 04392-05746



Ident.: DSC-49-10-10-A-00017437.0003001 / 21 MAR 16

Applicable to: MSN 02719-03060, 07784-07792



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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS APU DESCRIPTION - MAIN COMPONENTS
--	--

APU ENGINE

Ident.: DSC-49-10-20-00001528.0001001 / 21 MAR 16

Applicable to: ALL

The basic element of the APU is a single-shaft gas turbine that delivers mechanical shaft power for driving the accessory gearbox (electrical generator, starter, etc.) and produces bleed air (engine starting and pneumatic supply).

ELECTRONIC CONTROL BOX

Ident.: DSC-49-10-20-00001529.0001001 / 21 MAR 16

Applicable to: ALL

The Electronic Control Box (ECB) is a full-authority digital electronic controller that performs the bulk of the APU system logic for all modes of engine operation, such as :

- Sequences the start and monitors it.
- Monitors speed and temperature.
- Monitors bleed air.
- Sequences the shutdown.
- Controls the automatic shutdown.

AIR INTAKE SYSTEM

Ident.: DSC-49-10-20-00001530.0001001 / 21 MAR 16

Applicable to: ALL

The air intake and an electrically operated flap allow external air to reach the compressor inlet.

STARTER

Ident.: DSC-49-10-20-00001531.0001001 / 21 MAR 16

Applicable to: ALL

The ECB controls the electric starter. The starter engages if the air intake is fully open and the MASTER SW and the START pushbutton are ON.

FUEL SYSTEM

Ident.: DSC-49-10-20-00001532.0001001 / 21 MAR 16

Applicable to: ALL

The left fuel feed line supplies the APU.

The required pressure is normally available from tank pumps.

If pressure is not available (batteries only or pumps off) the APU FUEL PUMP starts automatically.

The ECB controls the fuel flow.

AIRCRAFT SYSTEMS**APU**

DESCRIPTION - MAIN COMPONENTS

OIL SYSTEM

Ident.: DSC-49-10-20-00001533.0001001 / 21 MAR 16

Applicable to: ALL

The APU has an integral independent lubrication system (for lubrication and cooling).

INLET GUIDE VANES (IGV)

Ident.: DSC-49-10-20-00001534.0001001 / 21 MAR 16

Applicable to: ALL

The IGVs control bleed air flow, and a fuel-pressure-powered actuator positions the IGVs.
The ECB controls the actuator in response to aircraft demand.

AIR BLEED SYSTEM

Ident.: DSC-49-10-20-00001535.0002001 / 03 FEB 11

Applicable to: MSN 02155-02212, 04392-05746

The air bleed system is fully automatic.
The APU speed is always 100 % whatever the air bleed system demand and the ground/flight configuration are.

AIR BLEED SYSTEM

Ident.: DSC-49-10-20-00001535.0003001 / 03 FEB 11

Applicable to: MSN 02719-03060, 07784-07792

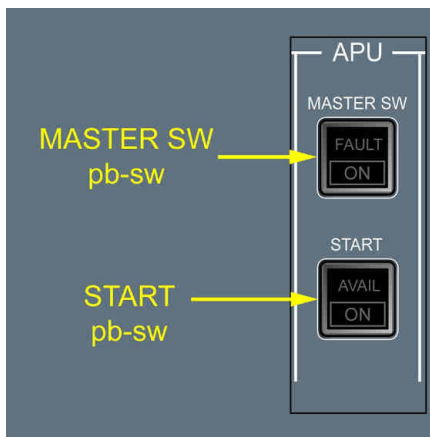
The air bleed system is fully automatic.
The ECB always sets the APU speed to 100 % except for air conditioning demand, if the ambient temperature is between -18 °C and 35 °C. In this case, the ECB sets the APU speed to 99 %. For all other ambient temperatures (less than -18 °C or more than 35 °C), the ECB sets the APU speed to 100 %.

OVERHEAD PANEL

Ident.: DSC-49-20-A-00017438.0001001 / 28 MAY 20

Applicable to: ALL

APU Panel



OVERHEAD PANEL - MASTER SW PB-SW

Ident.: DSC-49-20-A-00017685.0002001 / 13 MAY 25

Applicable to: MSN 02155-03060, 07784-07792

MASTER SW pb-sw

This pb-sw controls the power supply for the operation of the APU and its protective features. It also controls the starting and shutdown sequences.

L12



- The APU is off, or
- The APU is in manual shutdown sequence

Manual shutdown sequence:

- The **ON** light on the MASTER SW pb-sw, and the **AVAIL** light on the START pb-sw go off
- If the aircraft was using APU bleed air, the APU keeps running for a cooling period of 60 s up to 120 s
- At N 7 % the air inlet flap closes.
- When pressed, initiates APU operation.

L12



- The APU is in operation, or
- The APU is in starting sequence

Starting sequence:

- Electric power feeds the APU system, and the ECB runs a power-up test
- The APU air intake flap opens
- The APU fuel isolation valve opens
- If no fuel tank pump is running, the APU fuel pump operates
- If the aircraft is powered, the APU page appears on the ECAM display.
- When pressed, the APU shutdown sequence begins.

L12



- The APU is failed, or
- An automatic shutdown is in progress, or
- An emergency shutdown has occurred.

 Associated with the **APU AUTO (EMER) SHUT DOWN** alert (*Refer to PRO-ABN-APU APU AUTO (EMER) SHUT DOWN - ANNUNCIATION*).

Ident.: DSC-49-20-A-00017685.0003001 / 13 MAY 25

Applicable to: MSN 04392-05746

MASTER SW pb-sw

This pb-sw controls the power supply for the operation of the APU and its protective features. It also controls the starting and shutdown sequences.

L12



- The APU is off, or
- The APU is in manual shutdown sequence

Manual shutdown sequence:

- The **ON** light on the MASTER SW pb-sw, and the **AVAIL** light on the START pb go off
- If the aircraft was using APU bleed air, the APU keeps running for a cooling period of 60 s up to 120 s
- At N 7 % the air inlet flap closes.
- When pressed, initiates APU operation.

L12



- The APU is in operation, or
- The APU is in starting sequence

Starting sequence:

- Electric power feeds the APU system, and the ECB runs a power-up test
- The APU air intake flap opens
- The APU fuel isolation valve opens
- If no fuel tank pump is running, the APU fuel pump operates
- If the aircraft is powered, the APU page appears on the ECAM display.
- When pressed, the APU shutdown sequence begins.

L12



- The APU is failed, or
- An automatic shutdown is in progress, or
- An emergency shutdown has occurred.

Associated with the **APU AUTO (EMER) SHUT DOWN** alert (*Refer to PRO-ABN-APU APU AUTO (EMER) SHUT DOWN - ANNUNCIATION*).

In the case of an automatic shutdown, the air inlet flap closes 15 min after the APU speed is lower than 7 %.

If an automatic shutdown happens on ground, the 15 min countdown starts after liftoff.

OVERHEAD PANEL - START PB-SW

Ident.: DSC-49-20-A-00017439.0002001 / 28 MAY 20

Applicable to: MSN 02155-02212, 04392-05746

START pb-sw


- The APU is off
- When pressed, starts the APU.

L12



- The APU start sequence is in progress
- When the APU reaches the appropriate speed, the **ON** light goes off and the **AVAIL** light comes on.
- Regarding the start sequence:
 - When the flap is completely open, the APU starter is energized
 - 1.5 s after the starter is energized, the ignition turns ON
 - When N = 55 %, the APU starter is de-energized, and the ignition turns OFF
 - 2 s after N reaches 95 %, or when N is above 99.5 %, the **ON** light on the START pb goes out
 - 10 s later, the APU page disappears from the ECAM display.



- The APU is started, and can supply bleed air and electrical power to the aircraft systems
- The **AVAIL** light comes on when N is above 99.5 % or 2 s after N reaches 95 %.

Ident.: DSC-49-20-A-00017439.0003001 / 28 MAY 20

Applicable to: MSN 02719-03060, 07784-07792

START pb-sw



- The APU is off
- When pressed, starts the APU.

L12



- The APU start sequence is in progress
- When the APU reaches the appropriate speed, the **ON** light goes off and the **AVAIL** light comes on.
- Regarding the start sequence:
 - When the flap is completely open, the APU starter is energized
 - 1.5 s after the starter is energized, the ignition turns ON
 - When N = 60 %, the APU starter is de-energized, and the ignition turns OFF
 - 2 s after N reaches 95 %, or when N is above 99.5 % the **ON** light on the START pb goes out
 - 10 s later, the APU page disappears from the ECAM display.



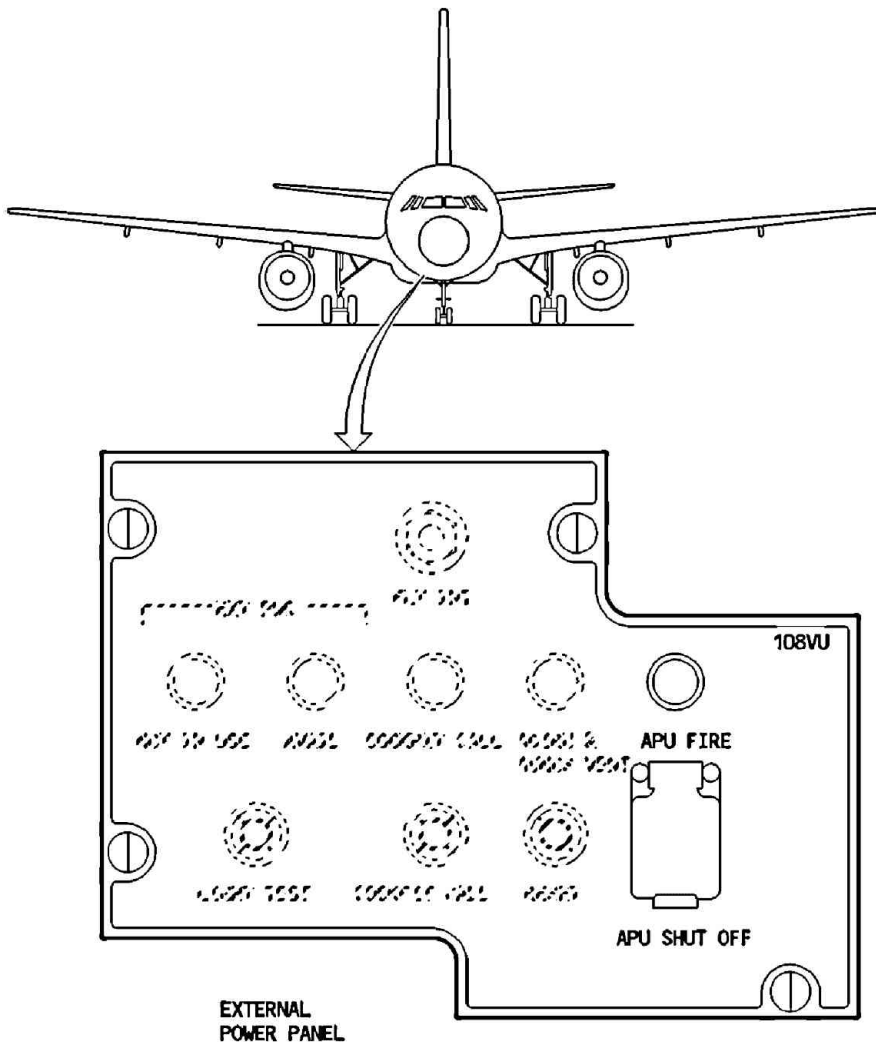
- The APU is started, and can supply bleed air and electrical power to the aircraft systems
- The **AVAIL** light comes on when N is above 95 %.

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS APU CONTROLS AND INDICATORS
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EXTERNAL CONTROLS

Ident.: DSC-49-20-00001539.0001001 / 21 MAR 16

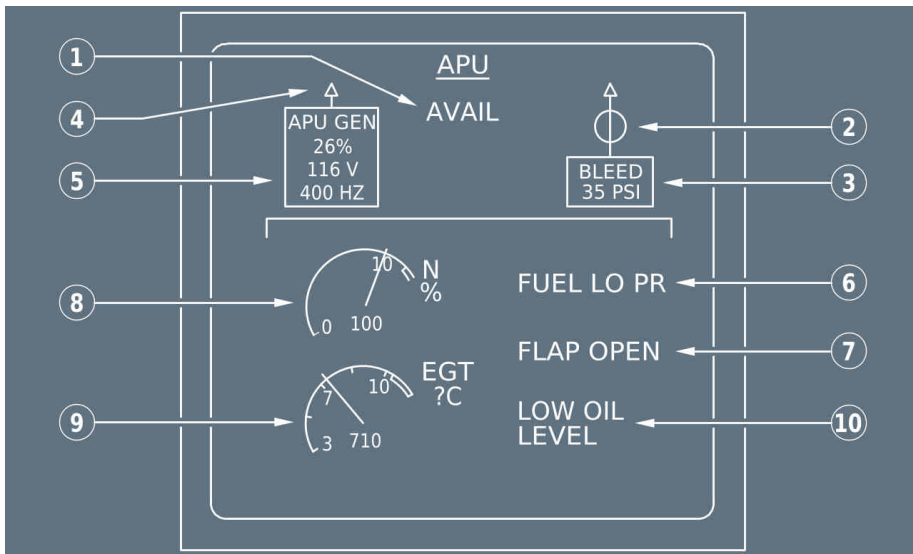
Applicable to: ALL



ECAM APU PAGE

Ident.: DSC-49-20-B-00017440.0001001 / 21 MAR 16

Applicable to: ALL



ECAM - AVAIL

Ident.: DSC-49-20-B-00017441.0001001 / 21 MAR 16

Applicable to: MSN 02719-03060, 07784-07792

(1) AVAIL

Displayed in green when APU N is above 95 %.

Ident.: DSC-49-20-B-00017441.0002001 / 21 MAR 16

Applicable to: MSN 02155-02212, 04392-05746

(1) AVAIL

Displayed in green when APU N is above 99.5 % or 2 s after N is above 95 %.

Ident.: DSC-49-20-B-00017442.0001001 / 21 MAR 16

Applicable to: ALL

(2) APU bleed air valve position

Inline-Green : The APU bleed air valve is not closed.

Crossline-Green : The APU bleed air valve is closed.

- Crossline-Amber : The APU bleed air valve is closed and the APU bleed is ON.
- XX-Amber : The APU bleed air valve status information is not available, or the APU BLEED pb status is not available.

Ident.: DSC-49-20-B-00017443.0001001 / 21 MAR 16

Applicable to: ALL

(3) APU bleed air pressure

This box displays the relative bleed air pressure in green.

It shows an amber XX when the ADIRS1 or the ADIRS2 is not available or selected OFF or the data from the ECB are invalid or not transmitted.

Ident.: DSC-49-20-B-00017444.0001001 / 21 MAR 16

Applicable to: ALL

(4) APU GEN line contactor indication

Displayed in green when the APU GEN line contactor is closed.

Ident.: DSC-49-20-B-00017445.0001001 / 21 MAR 16

Applicable to: ALL

(5) APU GEN parameters

Identical to the APU GEN parameters on the ELEC page.

Ident.: DSC-49-20-B-00017446.0001001 / 21 MAR 16

Applicable to: ALL

(6) FUEL LO PR

Displayed in amber if APU fuel pressure gets low.

Ident.: DSC-49-20-B-00017447.0001001 / 21 MAR 16

Applicable to: ALL

(7) FLAP OPEN

Displayed in green when APU air intake flap is fully open.

Ident.: DSC-49-20-B-00017448.0001001 / 21 MAR 16

Applicable to: ALL

(8) APU N

- Displays APU speed in green.
- Becomes amber when $N \geq 102\%$.
- Becomes red when $N \geq 107\%$.

ECAM - APU EGT

Ident.: DSC-49-20-B-00017449.0002001 / 06 NOV 23

Applicable to: MSN 02155-02212, 04392-05746

(9) APU EGT

- Displays APU EGT in green.
- Becomes amber when $EGT \geq EGT\ MAX -33\ ^\circ C$.
- Becomes red when $EGT \geq EGT\ MAX$ (automatic shutdown begins).

Note: ECB calculates EGT MAX and transmits it to the ECAM. It is a function of N during start, and a function of ambient temperature when the APU is running.

Maximum EGT during start: 982 °C.

Maximum EGT with APU running:

- 682 °C during at least 5 s.
- or, 700 °C to 742 °C depending on the ambient temperature.

Ident.: DSC-49-20-B-00017449.0003001 / 06 NOV 23

Applicable to: MSN 02719-03060, 07784-07792

(9) APU EGT

- Displays APU EGT in green.
- Becomes amber when $EGT \geq EGT\ MAX -33\ ^\circ C$.
- Becomes red when $EGT \geq EGT\ MAX$ (automatic shutdown begins).

Note: ECB calculates EGT MAX and transmits it to the ECAM. It is a function of N during start, and a function of ambient temperature when the APU is running.

Maximum EGT during start: 1 120 °C (above 35 000 ft).

Maximum EGT during start: 1 090 °C (below 35 000 ft).

Maximum EGT with APU running: 675 °C.

Ident.: DSC-49-20-B-00017450.0001001 / 21 MAR 16

Applicable to: ALL

(10) LOW OIL LEVEL

Advisory: Displayed if the ECB detects a low APU oil level when the aircraft is on the ground, and the APU is not running.

MEMO DISPLAY

Ident.: DSC-49-20-00016689.0001001 / 21 MAR 16

Applicable to: ALL

APU AVAIL : This memo appears in green, when APU N is above 99.5 % or 2 s after N is above 95 % (depending on the aircraft configuration).

AIRCRAFT SYSTEMS

APU

CONTROLS AND INDICATORS

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS APU ABNORMAL OPERATIONS
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ABNORMAL OPERATIONS

Applicable to: ALL

Ident.: DSC-49-30-10-00028502.0001001 / 06 NOV 25

1 **APU AUTOMATIC SHUTDOWN**

In the case of an APU failure or misbehavior, the APU may automatically shut down, without a cooling period, in order to avoid subsequent damage.

After more than three consecutive APU start attempts, the flight crew should wait 60 min before a new start attempt.

The automatic shutdown is associated with the **APU AUTO SHUT DOWN** alert (*Refer to procedure*).

L2

Shutdown Conditions	On ground with engines not running	On ground with at least one engine running or In flight
APU Fire	Yes	Yes (on ground only)
ECB failure	Yes	No
N overspeed: N is greater than 107 %	Yes	No
No speed	Yes	No
Air inlet flap closed	Yes	Yes
APU oil filter clogged	Yes	Yes
Loss of DC power	Yes	Yes
EGT Limit Exceeded: EGT is more than approx. 700 °C	Yes	Yes
High oil temperature	Yes	Yes
IGV temperature	Yes	Yes
Inlet overheat	Yes	Yes
Loss of EGT thermocouples	Yes	Yes
Loss of N overspeed protection	Yes	Yes
Low oil pressure	Yes	Yes
N underspeed	Yes	Yes
No acceleration	Yes	Yes
No flame	Yes	Yes
Oil system shutdown	Yes	Yes
Overcurrent	Yes	Yes
Reverse flow	Yes	Yes
Sensor failure	Yes	Yes
Slow start	Yes	Yes

APU EMERGENCY SHUTDOWN

An immediate APU emergency shutdown, without a cooling period, can occur when one of the following occurs:

- The APU FIRE pb of the overhead panel is pressed
- The APU SHUT OFF sw of the external power panel is pressed.

The emergency shutdown is associated with the **APU EMER SHUT DOWN** alert (*Refer to procedure*).

AIRCRAFT SYSTEMS

DOORS

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DSC-52-10 Description

DSC-52-10-10 General

Description.....	A
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DSC-52-10-20 Passenger Doors

General.....	A
Outside.....	B
Inside.....	C

DSC-52-10-30 Emergency Exits

Cockpit.....	A
Cabin.....	B

DSC-52-10-40 Cargo Doors

General.....	A
Fwd and Aft Cargo Doors.....	B
Bulk Cargo Door 	C
Location of Service Panels.....	D

DSC-52-10-50 Avionics Compartment Access Door

Avionics Compartment Access Door.....	A
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DSC-52-10-60 Cockpit Door

Cockpit Door.....	A
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DSC-52-10-80 Escape Slides/Rafts

Door Slides.....	A
Wing Slides.....	B
Escape Slide Arrangement.....	C

DSC-52-20 Controls and Indicators

DOOR/OXY SD Page.....	A
-----------------------	---

DSC-52-40 Cockpit Door Security System

DSC-52-40-10 Description

Cockpit Door Description.....	A
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DSC-52-40-20 Cockpit Door Locking System (CDLS)

COCKPIT DOOR LOCKING SYSTEM (CDLS).....	A
Controls.....	B

Continued on the following page

Continued from the previous page

DSC-52-40-30 Cockpit Door Surveillance System (CDSS)

General.....	A
Controls.....	B

DSC-52-50 How to

How to Operate the Cockpit Door	A
How to Operate the Fwd and Aft Cargo Door.....	B
How to Operate the Fwd and Aft Cargo Doors (Auxiliary Operation).....	C

DSC-52-70 Temporary Abnormal Behaviors

Erroneous Activation of the Cabin Pressure Warning Lights without Residual differential Pressure.....	A
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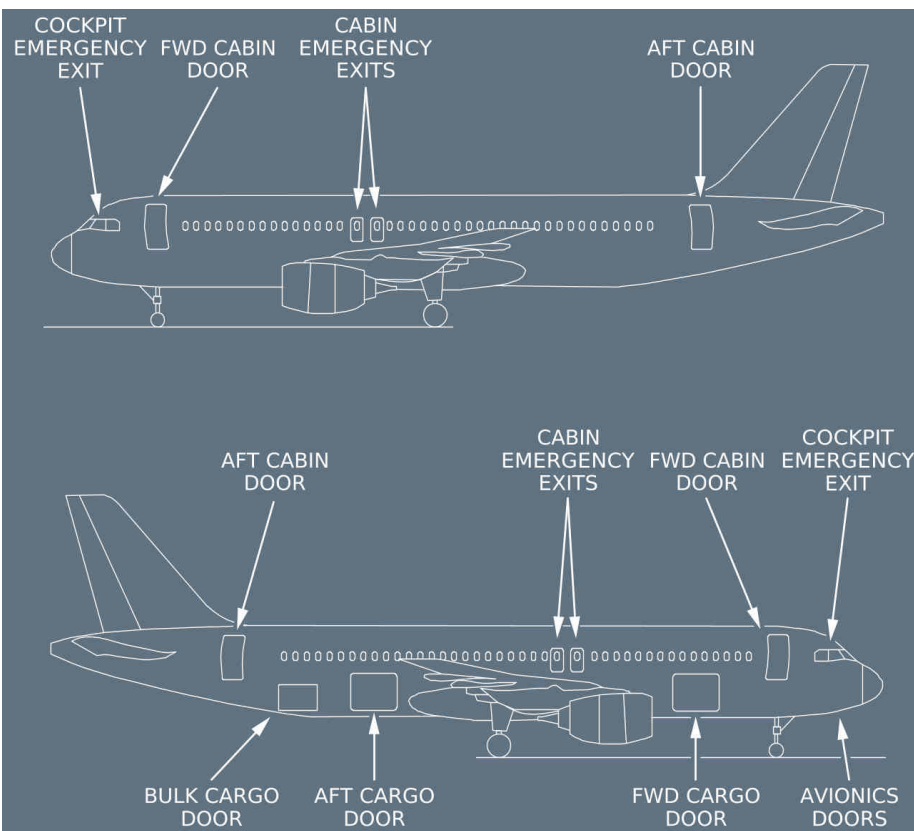
DESCRIPTION

Ident.: DSC-52-10-10-00001544.0002001 / 22 MAY 12

Applicable to: ALL

The A320's fuselage has:

- Four passenger doors
- Four emergency exits in the cabin
- Cockpit emergency exits (two sliding windows)
- Three cargo compartment doors
- Four avionic compartment access doors.



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 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS DOORS DESCRIPTION - PASSENGER DOORS
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GENERAL

Ident.: DSC-52-10-20-00017564.0001001 / 12 MAY 22

Applicable to: ALL

The aircraft has four plug-type doors that open outward and forward. There are two doors on each side of the fuselage (one door in the FWD section and one door in the AFT section).

The doors are operated from inside or outside of the aircraft. Normal operation is manual, with hydraulic damping.

Each door has emergency features:

- A slide stowed in a container attached to the inboard lower side of the door
- A damper actuator. In normal mode, the damper actuator limits the door travel. In emergency mode, the damper actuator drives the automatic door opening
- A slide arming lever.

Note: *The aircraft can be equipped with either escape slide or slide raft.*

When the slide arming lever is in the ARMED position, the slide is connected to the floor brackets on both sides of the door. When the door is opened, the slide inflates and deploys automatically. If the inflation bottle fails to discharge automatically, a crew member can open its valve to make it discharge. Opening the door from outside disarms the door and the slide.

Each passenger door has :

- A mechanical locking indicator that confirms the locked or unlocked position of the door
- One warning light to show the ARMED or DISARMED indication of the slides
- One CABIN PRESSURE warning light that illuminates in the case of a residual pressure in the cabin.

AIRCRAFT SYSTEMS

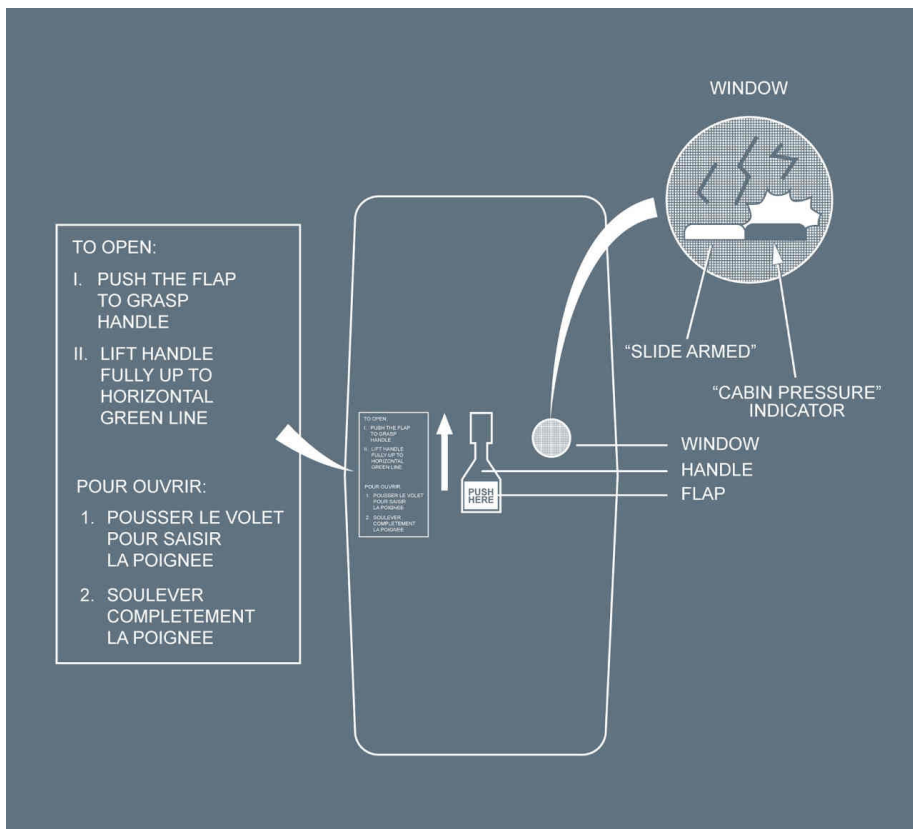
DOORS

DESCRIPTION - PASSENGER DOORS

OUTSIDE

Ident.: DSC-52-10-20-00017565.0001001 / 21 MAR 16

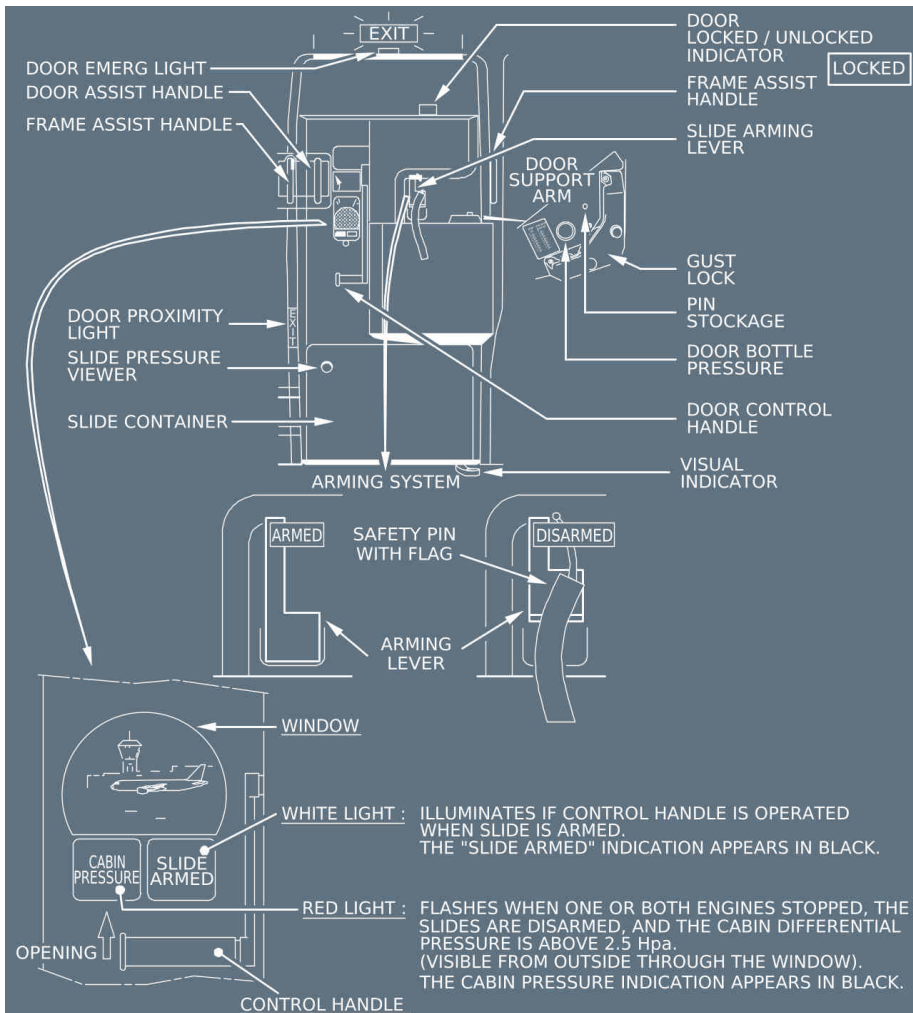
Applicable to: ALL



INSIDE

Ident.: DSC-52-10-20-00001547.0002001 / 22 MAY 12

Applicable to: ALL



AIRCRAFT SYSTEMS

DOORS

DESCRIPTION - PASSENGER DOORS

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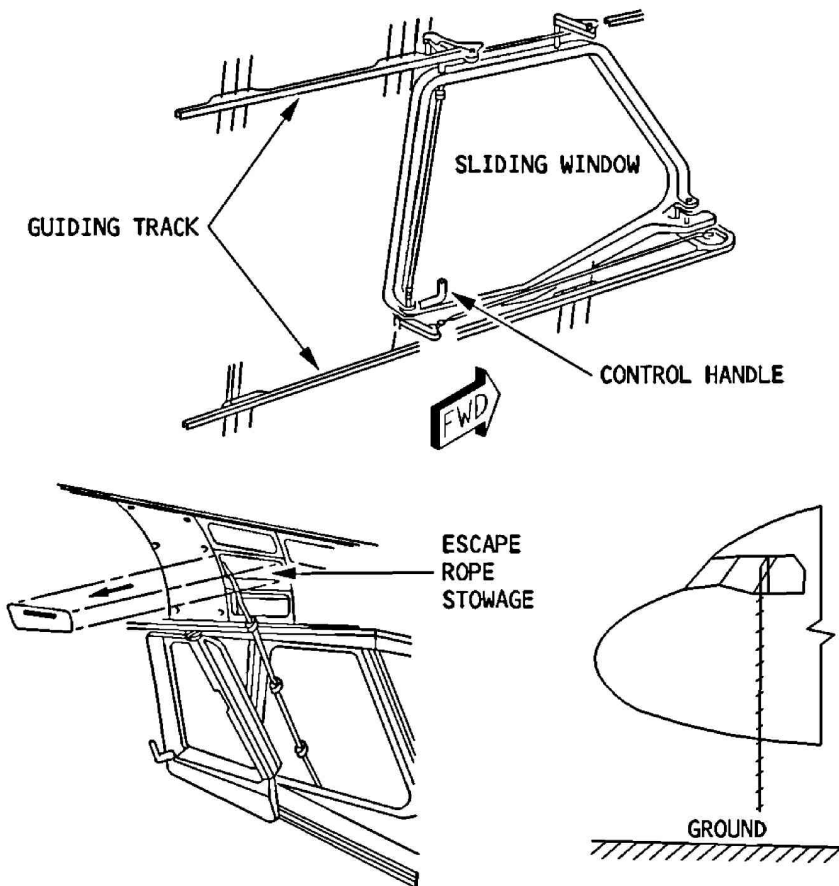
COCKPIT

Ident.: DSC-52-10-30-00017567.0001001 / 21 MAR 16

Applicable to: ALL

The two sliding windows in the cockpit are flight crew emergency exits.

A small compartment, located above each window, contains an escape rope that is long enough to reach the ground when lowered through either sliding window. The cockpit windows can only be opened from inside.



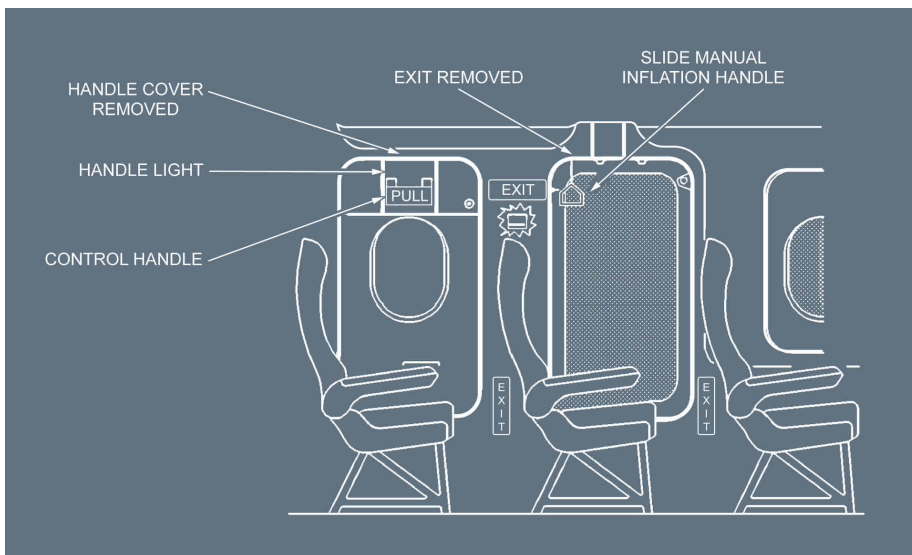
Emergency cockpit evacuation is also possible through the cockpit door escape panel . This panel is designed to be pushed open in the direction of the cabin after removal of the quick-release pins.

CABIN

Ident.: DSC-52-10-30-00017568.0001001 / 06 DEC 16

 Applicable to: **ALL**

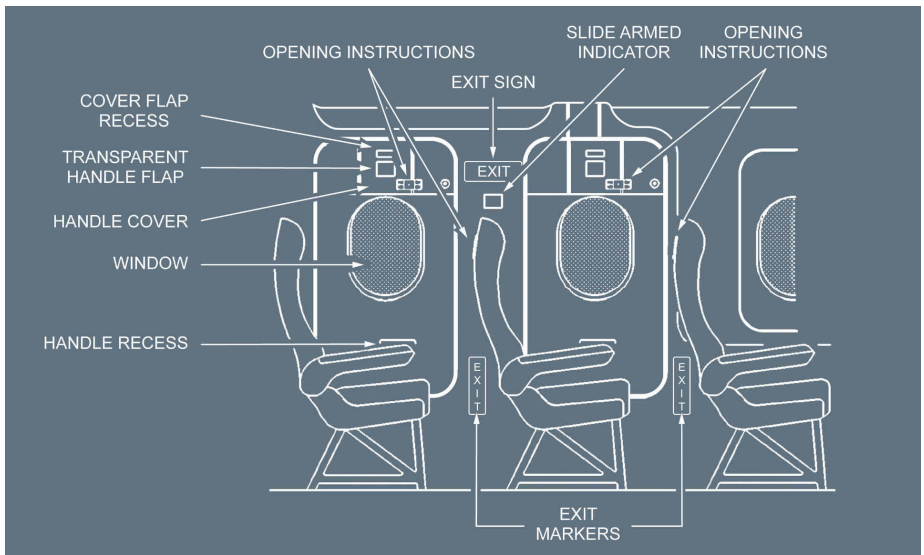
Two emergency exits are located on each side of the cabin, in addition to the passenger doors. The emergency exits are also equipped with escape slides. In the case of an emergency, the exits open inwards.



The slides of the overwing emergency exits are always in armed configuration.

To open :

- Remove HANDLE COVER : The HANDLE LIGHT and SLIDE ARMED indicator illuminate
- Pull CONTROL HANDLE : The EXIT moves inwards
- Lift EXIT from frame by holding the HANDLE RECESS
- Throw EXIT out.



AIRCRAFT SYSTEMS

DOORS

DESCRIPTION - EMERGENCY EXITS

Intentionally left blank

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS DOORS DESCRIPTION - CARGO DOORS
--	--

GENERAL

Ident.: DSC-52-10-40-00017569.0001001 / 21 MAR 16

Applicable to: ALL

The aircraft has two cargo doors (FWD and AFT cargo doors) on the right side of the fuselage below the cabin floor.

FWD AND AFT CARGO DOORS

Ident.: DSC-52-10-40-00017570.0001001 / 21 MAR 16

Applicable to: ALL

The FWD and AFT cargo doors hydraulically open outward and upward. The doors are hydraulically operated by the yellow hydraulic system. The door locking system (locked open/locked closed) is mechanical.

If the electric pump of the yellow hydraulic system fails, the system can be powered by using a hand pump, located on the hydraulic maintenance panel.

The FWD and AFT cargo doors open only from outside.

Note: *When the electric pump operates the FWD or AFT cargo door, the remaining yellow system devices that operate are the brakes and the engine 2 thrust reverser.*

BULK CARGO DOOR
--

Ident.: DSC-52-10-40-00017571.0001001 / 21 MAR 16

Applicable to: ALL

The bulk cargo door opens inward and upward. The bulk cargo door is a plug-type door. The door is mechanically locked and manually operated.

The bulk cargo door opens from the outside or from the inside.



A318/A319/A320/A321
FLIGHT CREW
OPERATING MANUAL

AIRCRAFT SYSTEMS

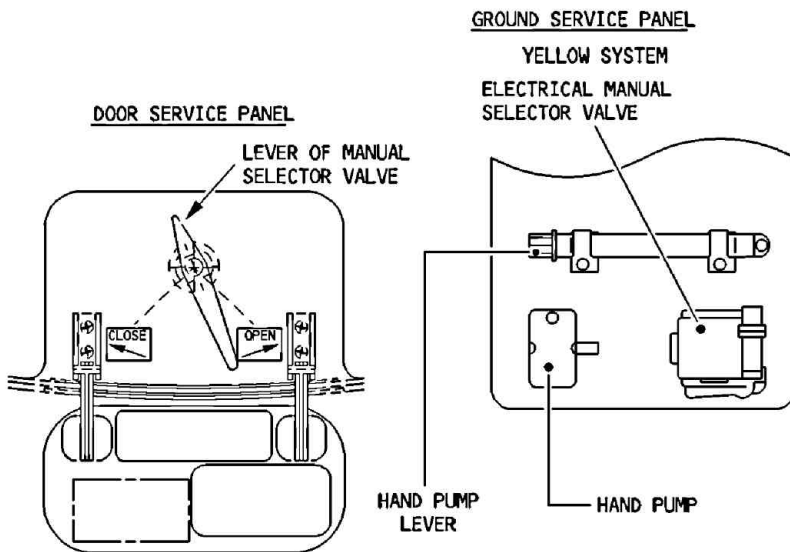
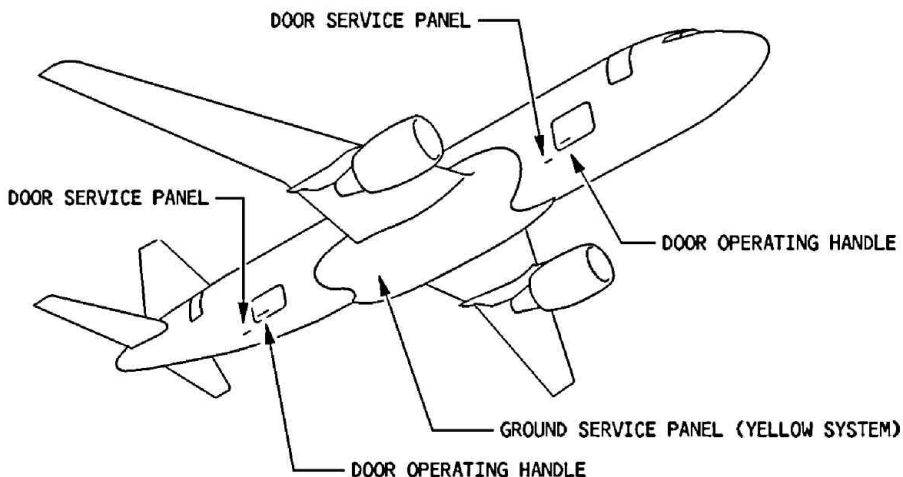
DOORS

DESCRIPTION - CARGO DOORS

LOCATION OF SERVICE PANELS

Ident.: DSC-52-10-40-00020676.0002001 / 17 MAR 17

Applicable to: ALL



AIRCRAFT SYSTEMS

DOORS

DESCRIPTION - CARGO DOORS

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS DOORS DESCRIPTION - AVIONICS COMPARTMENT ACCESS DOOR
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AVIONICS COMPARTMENT ACCESS DOOR

Ident.: DSC-52-10-50-00017579.0001001 / 21 MAR 16
Applicable to: ALL

Four avionics compartment access doors enable an external access to the avionics compartment. The doors are manually operated, hinged doors. The doors open inwards. These doors are in the lower fuselage, around the nose landing gear bay.

AIRCRAFT SYSTEMS

DOORS

DESCRIPTION - AVIONICS COMPARTMENT ACCESS DOOR

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 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS DOORS DESCRIPTION - COCKPIT DOOR
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COCKPIT DOOR

Ident.: DSC-52-10-60-00017573.0002001 / 21 MAR 17
Applicable to: ALL

Refer to DSC-52-40-10 Cockpit Door Description for information about the secured cockpit door.

AIRCRAFT SYSTEMS

DOORS

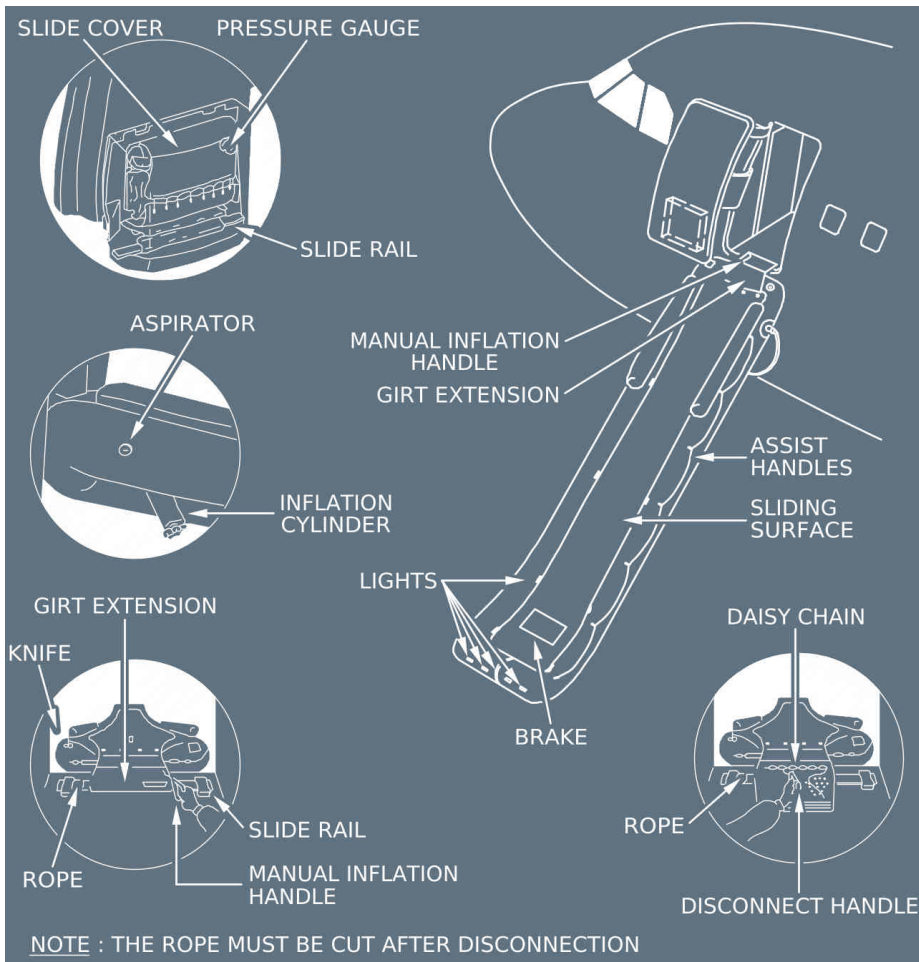
DESCRIPTION - COCKPIT DOOR

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DOOR SLIDES

Ident.: DSC-52-10-80-00001555.0001001 / 09 OCT 12

Applicable to: ALL



AIRCRAFT SYSTEMS

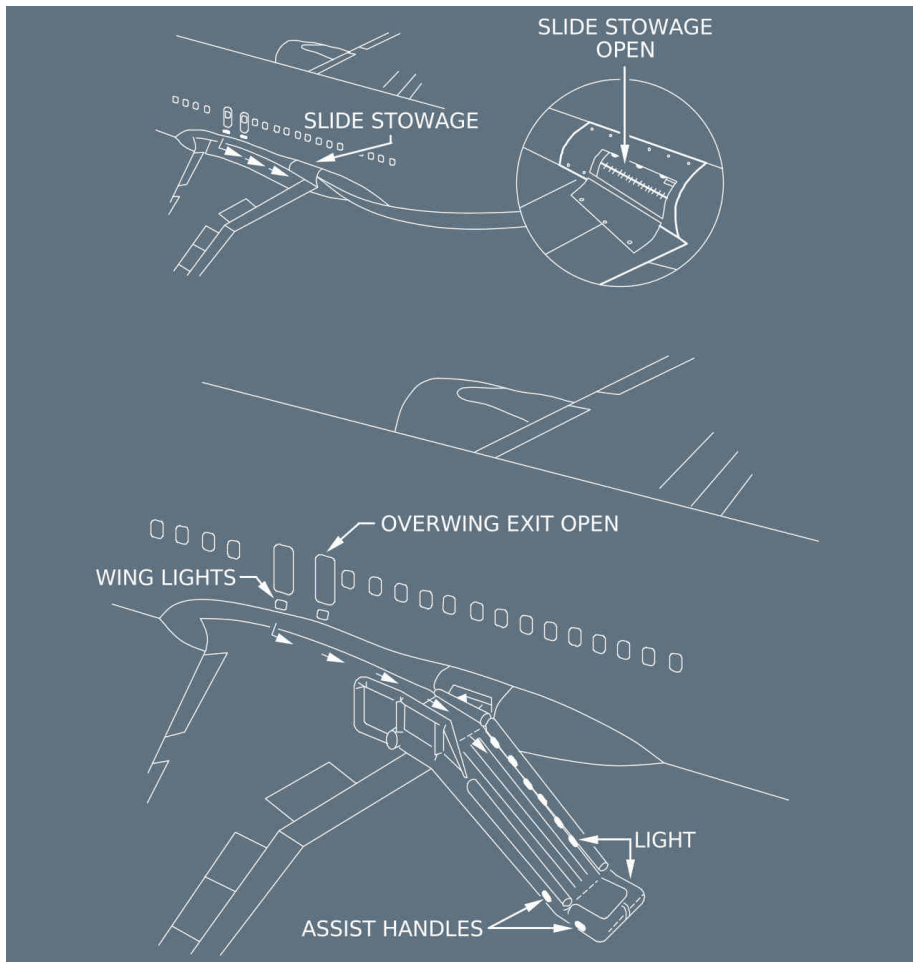
DOORS

DESCRIPTION - ESCAPE SLIDES/RAFTS

WING SLIDES

Ident.: DSC-52-10-80-00001556.0001001 / 09 OCT 12

Applicable to: ALL

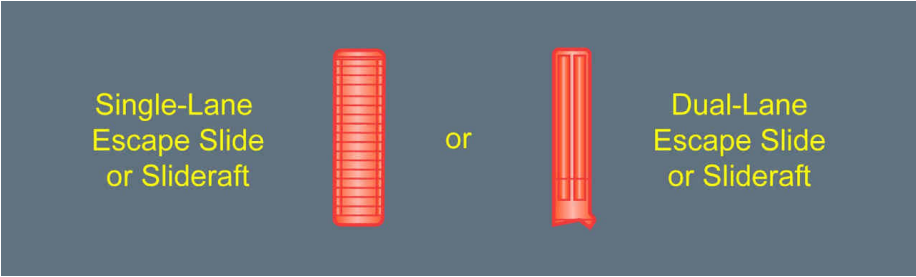


 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS DOORS DESCRIPTION - ESCAPE SLIDES/RAFTS
--	--

ESCAPE SLIDE ARRANGEMENT

Ident.: DSC-52-10-80-00017577.0001001 / 26 NOV 19
Applicable to: ALL

There are two types of emergency slides: a single-lane escape slide/slideraft or a dual-lane escape slide/slideraft.

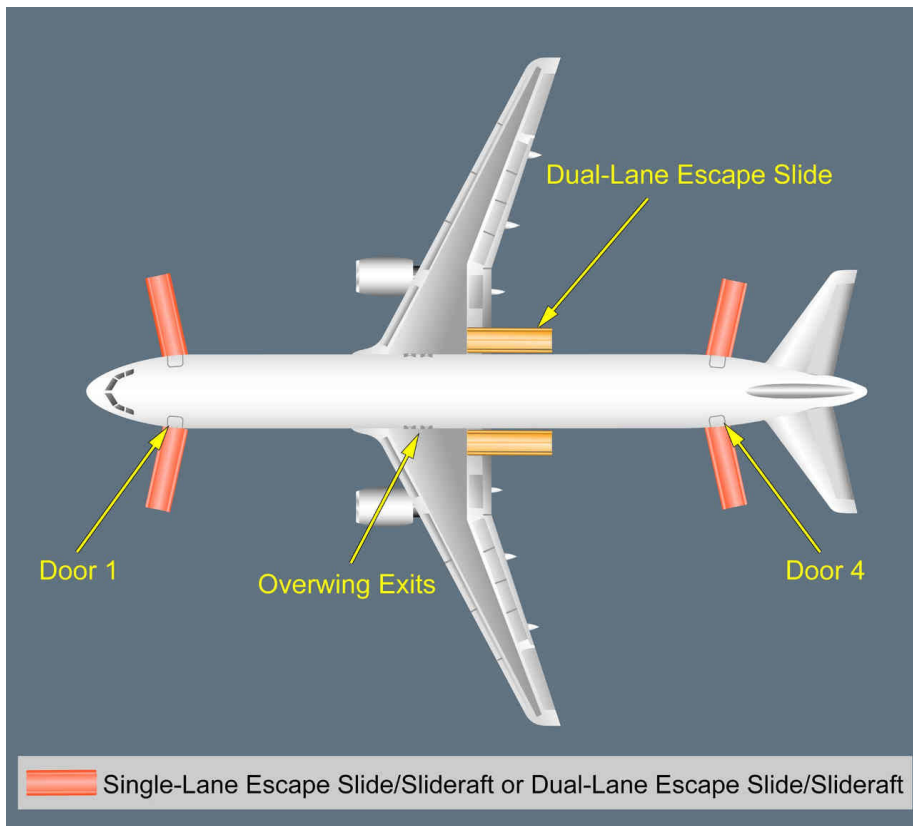


Each passenger door either has a single-lane escape slide/slideraft, or a dual-lane escape slide/slideraft, and each emergency exit has a dual-lane escape slide.

AIRCRAFT SYSTEMS

DOORS

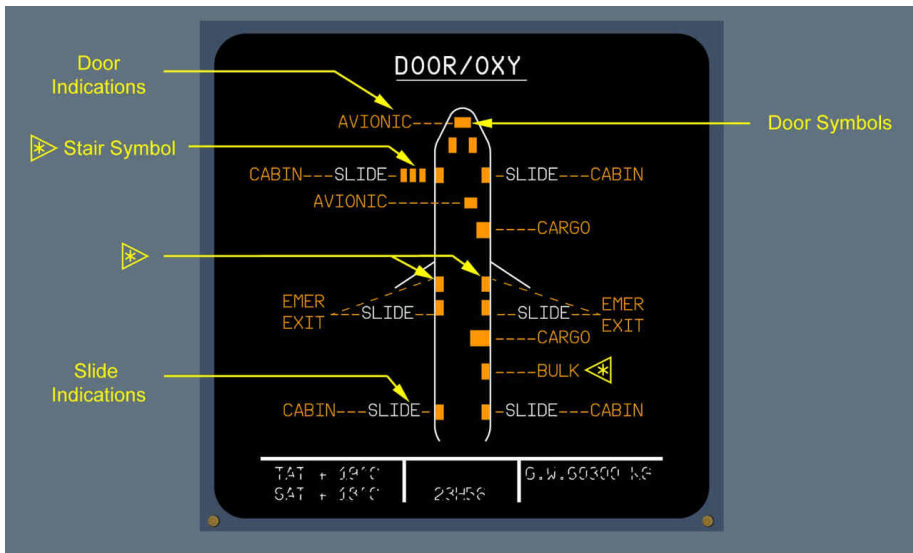
DESCRIPTION - ESCAPE SLIDES/RAFTS



DOOR/OXY SD PAGE

Ident.: DSC-52-20-00017645.0001001 / 28 MAY 20

Applicable to: ALL



DOOR SYMBOLS



The door is closed and locked.



The door is not locked.



The information is not valid.

Note: For aircraft without FWD EMER EXIT  doors, the FWD EMER EXIT door symbols are always displayed in green.

DOOR INDICATIONS



The door is not locked.



The information is not valid.

AIRCRAFT SYSTEMS**DOORS****CONTROLS AND INDICATORS****SLIDE INDICATIONS** SLIDE

The slide is armed.

STAIR SYMBOL 

The stair door is not closed.

COCKPIT DOOR DESCRIPTION

Ident.: DSC-52-40-10-00017010.0001001 / 13 MAY 25

Applicable to: ALL

A forward-opening hinge door separates the cockpit from the passenger compartment. It has three electric locking strikes, controlled by the flight crew. In normal conditions, when the door is closed, they remain locked. When there is a request to enter the cockpit, the flight crew can authorize entry by unlocking the door, that remains closed until it is pushed open.

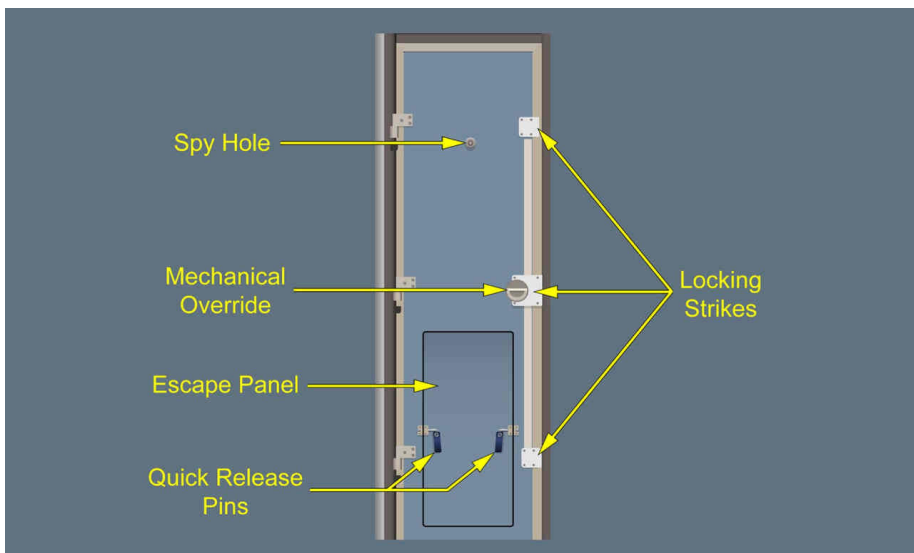
When the flight crew does not respond to requests for entry, the door can also be unlocked by the cabin crew, by entering a two to seven-digits code (programmed by the airline) on the keypad, installed on the lateral side of the FAP.

The door is bulletproof and fully compliant with rapid decompression requirements.

In the case of rapid decompression in the cockpit, the CDLS automatically unlocks the door. If a rapid decompression in the cabin occurs, the cockpit door stays closed and locked.

A mechanical override enables the flight crew to open the door from the cockpit side.

A deadbolt  is installed at the level of the center latch area of the cockpit door. This deadbolt  locks the door from the cockpit side, in the event that more than one locking latch strike fails, or in the case of a total CDLS failure.



AIRCRAFT SYSTEMS**DOORS****COCKPIT DOOR SECURITY SYSTEM - DESCRIPTION**

- Note:
1. The escape panel enables the flight crew to evacuate the cockpit, in the case of an emergency, when the door is jammed. This panel can only be removed from the cockpit side by pulling the quick release pins towards the center of the flap and kicking the panel open.
 2. In the case of an electrical supply failure, the door is automatically unlocked, but remains closed.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS DOORS COCKPIT DOOR SECURITY SYSTEM - COCKPIT DOOR LOCKING SYSTEM (CDLS)
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COCKPIT DOOR LOCKING SYSTEM (CDLS)

Ident.: DSC-52-40-20-00001007.0001001 / 21 MAR 17

Applicable to: ALL

The Cockpit Door Locking System (CDLS) provides a means of electrically locking and unlocking the cockpit door. This system is mainly composed of :

- A keypad, located in the forward cabin, near the cockpit door,
- A toggle switch, located in the center pedestal's Cockpit Door panel,
- A control unit and its CKPT DOOR CONT normal panel, located on the overhead panel,
- A buzzer.

The keypad enables the cabin crew to request access to the cockpit. There are two different access request types : "Routine" and "Emergency" access request.

The toggle switch enables the flight crew to lock or unlock the cockpit door, following an access request, thereby allowing or denying the entry to the cockpit.

The cockpit door control unit is the system controller, in charge of :

- Locking or unlocking the door latches, upon flight crew action.
- Unlocking the door, in case of cockpit decompression (the door then opens towards the cockpit under differential pressure).
- Indicating system failures of electrical latches and pressure sensors.
- Activating the access request buzzer and turning on the keypad LEDs.

The buzzer sounds in the cockpit for 1 to 9 s to indicate that a routine access request has been made, or sounds continuously if an emergency access procedure has been initiated.

CONTROLS

Applicable to: ALL

Ident.: DSC-52-40-20-A-00001008.0001001 / 21 MAR 17

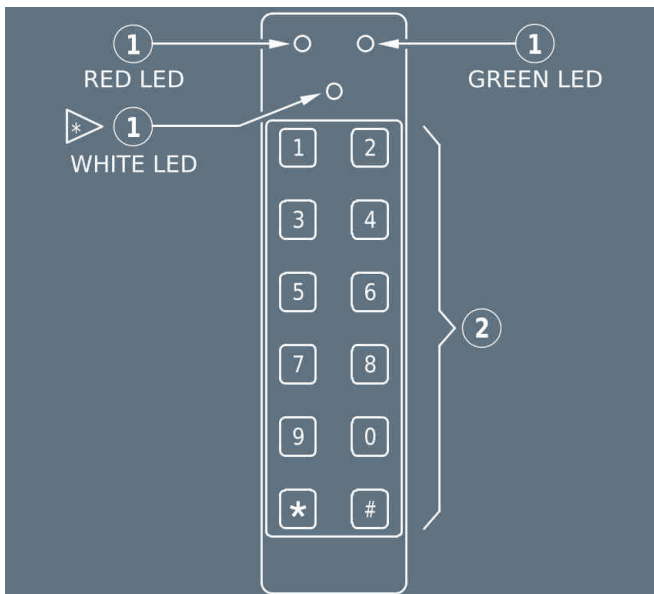
KEYPAD

The keypad is used by the cabin crew to request pilots to open the door.

AIRCRAFT SYSTEMS

DOORS

COCKPIT DOOR SECURITY SYSTEM - COCKPIT DOOR LOCKING SYSTEM (CDLS)



(1) Locked/Unlocked Door Indicator

- GREEN light ON** : The door has been unlocked either by a flight crew action, or automatically (during 5 s) when no flight crew action is performed during the delay following an emergency access request. The door can be pushed open.
- GREEN light flashes** : An emergency request to enter the cockpit has been made; the buzzer will sound continuously in the cockpit, but no action has yet been taken by the flight crew.
- RED light ON** : The flight crew has denied access, and the door remains locked.
- WHITE light ON**  : The light comes on each time the cabin crew presses a key on the keypad.

(2) Digital Keypad

The keypad is used to sound the buzzer in the cockpit for 1 to 9 s (3 s by default), by entering a zero to seven-digit code, as programmed by the airline, followed by the '#' key. It is also used to enter the two to seven-digit emergency code, followed by the '#' key, when the flight crew does not respond.

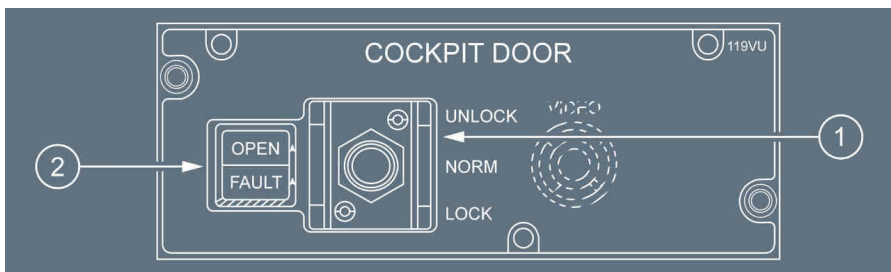
Note: During the test performed by the cockpit door control unit, the CDLS keypad remains operational, and the CDLS operates as follows:
 The control unit will store access codes that are entered, and the LOCKED/UNLOCKED DOOR INDICATOR (RED/GREEN LEDs) of the keypad will remain on, as long as the test is running.

- If the correct access code is entered on the keypad, the buzzer will not sound, until the test is completed.
- If the emergency access code is entered, the door will unlock. The cockpit buzzer and the LOCKED/UNLOCKED DOOR INDICATOR will be inoperative.

Ident.: DSC-52-40-20-A-00018437.0001001 / 17 MAR 17

CENTRAL PEDESTAL COCKPIT DOOR PANEL

The secured cockpit door opening is controlled by a toggle switch, located on the central pedestal.



(1) COCKPIT DOOR toggle switch

- UNLOCK position :** This position is used to enable the cabin crewmember to open the door. The switch must be pulled and maintained in the unlock position until the door is pushed open.
- NORM position :** All latches are locked, and EMERGENCY access is possible for the cabin crew.
- LOCK position :** Once the button has been moved to this position, the door is locked ; emergency access, the buzzer, and the keypad are inhibited for a preselected time (5 to 20 min).

Note:

1. If the LOCK position has not been used by the pilot, for at least 5 to 20 min, the cabin crew is able to request emergency access to open the cockpit door.
2. The UNLOCK position overrides and resets any previous selection.
3. In case of an electrical supply failure, the cockpit door is automatically unlocked, but remains closed.

AIRCRAFT SYSTEMS

DOORS

COCKPIT DOOR SECURITY SYSTEM - COCKPIT DOOR LOCKING SYSTEM (CDLS)

(2) COCKPIT DOOR Fault Open indicator

OPEN light ON : The door is not closed.

OPEN light flashes : The cabin crew has started an emergency access procedure. If there is no reaction from the flight crew, the door will unlock at the end of the adjustable time delay (15 to 120 s).

FAULT : This light comes on when a system failure has been identified (Example : Latch, pressure sensors, control unit).
The inoperative item can be identified by checking the strike and pressure sensor status lights on the CKPT DOOR CONT panel.

Ident.: DSC-52-40-20-A-00001010.0001001 / 09 OCT 12

OVERHEAD CONTROL PANEL

The Cockpit Door Locking System's control panel is located on the overhead panel.



(1) Strikes' status lights

Off : The corresponding (upper, mid, or lower) locking latch is operative.

On : The corresponding (upper, mid, or lower) locking latch is faulty.

(2) Pressure sensor

Two redundant differential pressure sensors enable rapid pressure variation in the cockpit to be detected, in order to command simultaneous opening of all latches when a defined pressure drop is detected.

(3) Pressure sensor status lights

Off : The corresponding (1 or 2) pressure sensor is operative.

On : The corresponding (1 or 2) pressure sensor is faulty.

Note: These indicators enable the crew to identify the faulty item, when the Central Pedestal Fault indicator light is ON.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS DOORS COCKPIT DOOR SECURITY SYSTEM - COCKPIT DOOR SURVEILLANCE SYSTEM (CDSS)
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GENERAL

Ident.: DSC-52-40-30-00018415.0002001 / 17 MAR 17

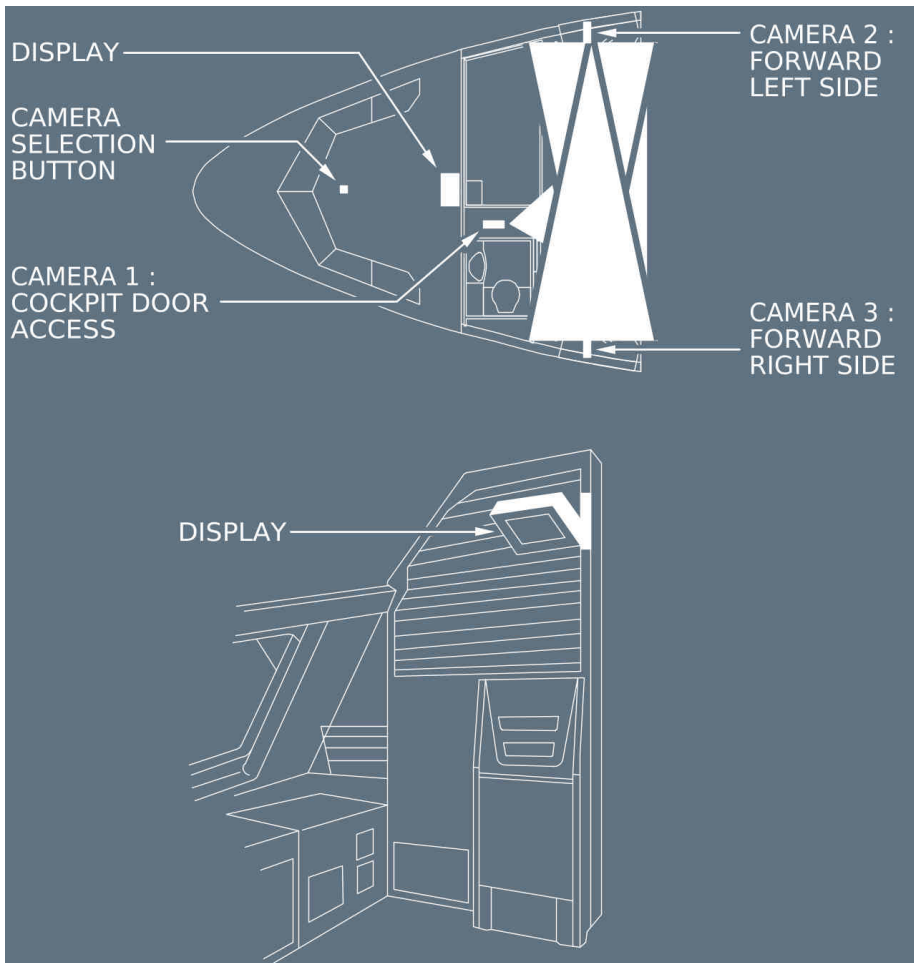
Applicable to: ALL

The Cockpit Door Surveillance system consists of three video cameras, which enable the flight crew to identify persons prior to authorizing their entry into the cockpit. An LCD display, located on the rear panel, shows the various camera views. It has automatic brightness adjustment and is activated by the Cockpit Door Video pb.

AIRCRAFT SYSTEMS

DOORS

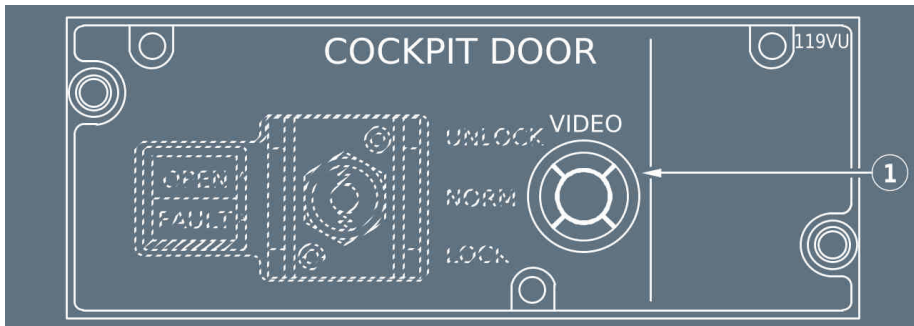
COCKPIT DOOR SECURITY SYSTEM - COCKPIT DOOR SURVEILLANCE SYSTEM (CDSS)



CONTROLS

Applicable to: ALL

Ident.: DSC-52-40-30-A-00018416.0004001 / 17 MAR 17

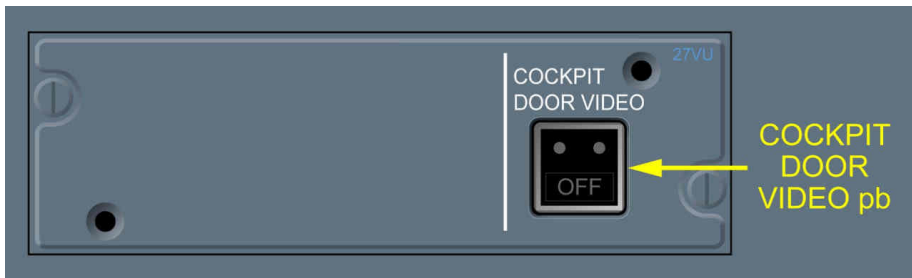


(1) Cockpit Door Video pb

Selects the various camera image displays.

- Camera 1 image : Displayed by pressing the pushbutton when the screen is on standby, or after Camera 2 and 3 images have been displayed. Automatically displayed, after an entry request is performed on the keypad.
- Camera 2 and 3 images : Displayed on a split screen, when the pushbutton is pressed after Camera 1's image has been displayed.
- Standby : If the pushbutton is maintained pressed for at least two seconds, or if no action has been taken for 5 min, the screen goes blank and remains on standby.

Note: An entry request, performed on the keypad within 30 s following an earlier entry request, will not lead to the automatic selection of Camera 1, since the flight crew is given authority to select any desired camera image via the cockpit door video pb. After these 30 s, the system reverts to its normal operation.



COCKPIT DOOR VIDEO PB



CDSS is energized and on.



CDSS is manually de-energized and OFF.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS DOORS HOW TO
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HOW TO OPERATE THE COCKPIT DOOR

Ident.: DSC-52-50-00020495.0001001 / 27 JUN 25

Applicable to: ALL

The secured cockpit door operation is controlled by a toggle sw that is located on the COCKPIT DOOR panel (central pedestal).

DOOR OPENING FROM THE COCKPIT

To enable access to the cockpit, set and maintain the COCKPIT DOOR sw to the UNLOCK position until the door is fully opened. When the door is fully opened, the COCKPIT DOOR sw can be released to the NORM position.

DOOR CLOSING FROM THE COCKPIT

Close the door and check that the OPEN indicator goes off. If the COCKPIT DOOR sw is in the NORM position, the door is locked and emergency access is possible from the cabin. When the door is fully closed, if the cockpit door FAULT light is ON, *Refer to PRO-ABN-DOOR [QRH] COCKPIT DOOR FAULT.*

***Note:** If the OPEN indicator is ON when the door is closed, the door may be unlocked. Repeat the above-mentioned opening/closing procedure.*

When the COCKPIT DOOR sw is in the LOCK position the door is locked. In this position, the emergency access, the buzzer, and the keypad are inhibited for a preselected time (5 to 20 min).

ROUTINE ACCESS TO THE COCKPIT FROM THE CABIN (I.E. NORMAL ACCESS)

To request access to the cockpit from the cabin, use the keypad to enter the code and validate with the “#” key.

L2 The Operator defines this code (between 0 and 7 digits).

L1 The buzzer sounds in the cockpit for 1 to 9 s (3 s by default).

After identification of the person that requests access, set the COCKPIT DOOR sw to UNLOCK position to unlock the door. A steady green light on the keypad comes on, that indicates that the door is unlocked.

If the flight crew refuses access to the cockpit by setting the COCKPIT DOOR sw to LOCK position, a steady red light on the keypad comes on, that indicates that the door is locked. The keypad and the buzzer are inhibited for a defined period of time.

If the flight crew does not respond, the door remains locked. If the flight crew does not take any action after a routine cabin request, the cabin crew will be able to open the door with the emergency access procedure.

EMERGENCY ACCESS FROM CABIN TO THE COCKPIT

To request emergency access to the cockpit, use the keypad to enter the emergency code and validate with the “#” key.

L2

The Operator defines this emergency code (between 2 and 7 digits).

L1

The buzzer continuously sounds in the cockpit and the OPEN light flashes on the COCKPIT DOOR panel (central pedestal). In the cabin, the green light on the keypad flashes until the flight crew uses the COCKPIT DOOR sw to either lock or unlock the cockpit door.

After identification of the person that requests access, use the COCKPIT DOOR sw to unlock the door.

If the flight crew refuses access by setting the COCKPIT DOOR sw to LOCK position, the keypad and the buzzer are inhibited for a defined period of time.

If the flight crew does not respond, after a preselected time between 15 and 120 s, the door automatically unlocks for 5 s and a steady green light on the keypad comes. The buzzer stops and indicates that the door is unlocked.

EVACUATION THROUGH THE DECOMPRESSION AND EVACUATION PANEL

Pull the quick-release pins of the escape panel towards the center of the flap.

Kick the escape panel toward the cabin and evacuate the cockpit.

HOW TO OPERATE THE FWD AND AFT CARGO DOOR

Ident.: DSC-52-50-00020574.0003001 / 02 MAY 24

Applicable to: ALL

NORMAL OPERATION

OPENING

On the cargo door, push the door handle flap inward to release the door handle from the recess of the door structure. Then, pull the door handle away and upward from the LOCKED to the UNLOCKED position.

Open the access door of the service panel to get access to the selector valve lever. Set the selector valve lever to the OPEN position and maintain the lever in this position until the green indicator light comes on. The green indicator light indicates that the door is fully opened and locked.

*Note: The yellow hydraulic system is pressurized (the YELLOW ELEC PUMP is energized).
The operation of the flight controls and PTU is inhibited.*

When the door is fully open, release the selector valve lever. When released, the selector valve lever returns to the neutral position and shuts down the electrical pump.

CLOSING

In order to close the cargo door, set the selector valve lever to the CLOSE position and maintain the lever in this position until the door is fully closed and locked. The green indicator light goes off when the cargo door starts to close.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS DOORS HOW TO
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***Note:** At first the selector valve lever locks in an intermediate position maintaining a preset pressurization to prevent the door from dropping open.*

When the door is fully closed, the selector valve lever returns to the neutral position and shuts down the electrical pump.

On the cargo door, push the door handle flap downwards to the LOCKED position. When the door is locked, the cargo door symbol appears in green on the DOOR/OXY SD page. The CARGO door indication on the ECAM goes off, and the handle flap mechanism locks the operating handle.

Close the access door of the service panel.

HOW TO OPERATE THE FWD AND AFT CARGO DOORS (AUXILIARY OPERATION)

Ident.: DSC-52-50-00020577.0002001 / 17 MAR 17

Applicable to: ALL

AUXILIARY OPERATION

If there is an electrical failure or if the yellow hydraulic electric pump fails, the operator can open or close the cargo door with the use of the hand pump that is accessible via the ground service panel.

***Note:** Two persons are necessary for this operation.*

MANUAL OPENING

To open the cargo door with the use of the hand pump, unlock the cargo door by using the operating handle as for normal operation.

Open the ground service panel of the yellow hydraulic system that is in the belly fairing area.

Open the access door of the door service panel. Set the selector valve lever to the OPEN position and maintain the lever in this position during the operation of the hand pump.

Operate the hand pump until the cargo door is in the fully open position. The green light comes on and indicates that the door is fully opened and locked.

When the cargo door is fully opened, release the selector valve lever of the door service panel.

MANUAL CLOSING

To close the cargo door, set the selector valve lever (on the door service panel) to the CLOSE position and maintain the lever in this position during the operation of the hand pump.

Operate the hand pump until the cargo door is in the fully closed position.

When the cargo door is fully closed, release the selector valve lever of the door service panel.

Lock the cargo door with the use of the operating handle as for normal operation.

Close the access door of the door service panel and of the ground service panel.

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**ERRONEOUS ACTIVATION OF THE CABIN PRESSURE WARNING
LIGHTS WITHOUT RESIDUAL DIFFERENTIAL PRESSURE**

Ident.: DSC-52-70-00023541.0001001 / 12 NOV 24

Applicable to: ALL

DESCRIPTION

At touchdown, the CPCS automatically operates the opening of the OFV to reduce the differential pressure to a safe level, even when both packs are operating.

However, the differential pressure sensor may have a defect. The CABIN PRESSURE WARNING lights may temporarily come on without residual differential pressure. In that case, the **CAB PR EXCES RESIDUAL PR** alert may not trigger.

This erroneous activation of the CABIN PRESSURE WARNING lights can last up to 30 min.

OPERATIONAL RECOMMENDATION

Before the cabin crew opens the cabin door, the flight crew must confirm the absence of residual differential pressure. The flight crew must wait for the CABIN PRESSURE WARNING lights to stop flashing, or perform both of the following actions:

- Check that both air conditioning packs are set to OFF
- On the **CAB PRESS** SD page, check that:
 - $\Delta P = 0.0$ PSI
 - the OFV is fully open.
- Open one of the cockpit sliding windows.

If the flight crew cannot open one of the cockpit sliding windows, it means that residual pressure remains. Therefore, the cabin doors **MUST NOT BE OPENED**. In this case, the flight crew may regularly try to open the cockpit sliding window, to confirm the absence of residual pressure.

If the flight crew can open one of cockpit sliding windows, the flight crew can consider the CABIN PRESSURE WARNING lights as spurious. The flight crew can therefore order the cabin crew to open the cabin doors.

AIRCRAFT SYSTEMS

DOORS

TEMPORARY ABNORMAL BEHAVIORS

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AIRCRAFT SYSTEMS

COCKPIT WINDOWS

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS COCKPIT WINDOWS PRELIMINARY PAGES - TABLE OF CONTENTS
--	--

DSC-56-10 General	
General.....	A
DSC-56-20 Fixed Windows	
Fixed Windows.....	A
DSC-56-30 Sliding Windows	
Sliding Windows.....	A
DSC-56-40 Description	
Description.....	A

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS COCKPIT WINDOWS GENERAL
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GENERAL

Ident.: DSC-56-10-00000998.0001001 / 17 MAR 17
Applicable to: ALL

The cockpit has fixed and sliding windows.

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS COCKPIT WINDOWS FIXED WINDOWS
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FIXED WINDOWS

Ident.: DSC-56-20-00000999.0001001 / 17 MAR 17

Applicable to: ALL

There are four fixed windows :

- two windshields
- two fixed side windows

AIRCRAFT SYSTEMS

COCKPIT WINDOWS

FIXED WINDOWS

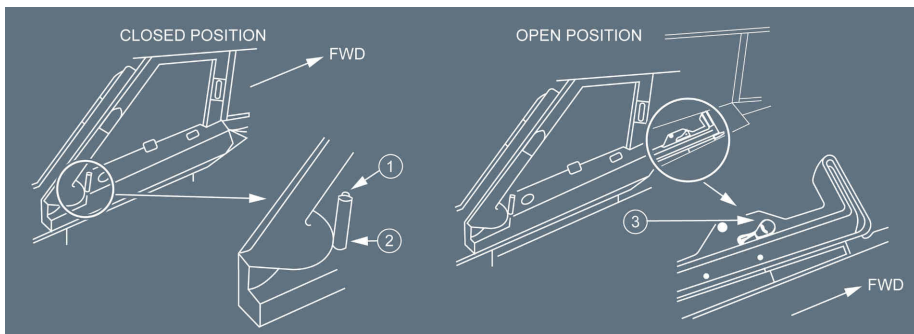
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SLIDING WINDOWS

Ident.: DSC-56-30-00018432.0001001 / 17 MAR 17

Applicable to: ALL

The flight crew can use the sliding windows as emergency exits. Therefore they are not permitted to stow any object so that it protrudes into the window area from the side console. Members of the flight crew can use the control handle to slide each of the windows rearward, and can use a locking pin to lock each window open.



(1) Unlocking button

Flight crew presses this button to unlock the control handle.

(2) Control handle

- To open the window, the crew member pulls inward and rearward.
- To close the window, the crew member pushes forward.

(3) Locking pin

This pin locks the window open.

It is near the window's lower guide track and is visible when the window is open.

- Forward

Between the closed position and the one-third open position, the window is free to move forward and aft.

When the window is more than one-third open, this pin prevents it from moving forward.

- Aft

Flight crew must move the locking pin aft in order to close the window. Left sliding window.

AIRCRAFT SYSTEMS

COCKPIT WINDOWS

SLIDING WINDOWS

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS COCKPIT WINDOWS DESCRIPTION
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DESCRIPTION

Ident.: DSC-56-40-00013772.0001001 / 17 MAR 17

Applicable to: ALL

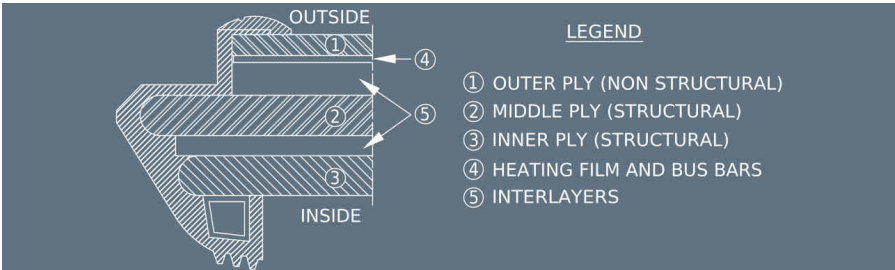
COCKPIT WINDSHIELD AND WINDOWS DESCRIPTION

All cockpit windows are fail-safe design.

The windows are made of:

- A non structural ply, the Outer ply (1), which is only a protective layer
- Two structural plies, the Middle ply (2) and the Inner ply (3)
Each structural ply is able to sustain individually the pressurization loads
- A heating film (4) to defog and/or de-ice the windshield/window
- Two interlayers (5).

Typical Structure Of A Cockpit Window (Cut View)



For information on cockpit window damage procedure, description and evaluation method, *Refer to FCTM/PR-AEP-MISC Cockpit Windshield/Window Cracked.*

AIRCRAFT SYSTEMS**COCKPIT WINDOWS**

DESCRIPTION

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AIRCRAFT SYSTEMS

ENGINES

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DSC-70-05 Overview

Overview.....	A
---------------	---

DSC-70-10 System Description

Engine.....	A
Engine.....	B
LP Compressor Turbine Assembly.....	C
HP Compressor Turbine Assembly.....	D
Combustion Chamber.....	E
Accessory Gearbox.....	F

DSC-70-20 FADEC

General.....	A
Architecture.....	B
Functions	C
Idle Control.....	D

DSC-70-30 Thrust Control System (CFM+PW)**DSC-70-30-10 General**

General.....	A
--------------	---

DSC-70-30-20 Thrust Levers

Thrust Levers.....	A
--------------------	---

DSC-70-30-30 Thrust Rating Limit

Thrust Rating Limit.....	A
--------------------------	---

DSC-70-30-40 Thrust Control

Manual Mode.....	A
Automatic Mode.....	B

DSC-70-40 Fuel System (CFM56)

General.....	A
Fuel pump Unit.....	B
Shut-Off Valves.....	C
Hydromechanical Unit.....	D
IDG Cooling System	E

DSC-70-50 Oil System

General.....	A
--------------	---

Continued on the following page

Continued from the previous page

DSC-70-60 Airbleed System (CFM56)

General.....	A
Cooling.....	B

DSC-70-70 Thrust Reverser System

General.....	A
Actuation Logic.....	B
Protection.....	C
Schematic.....	D

DSC-70-80 Ignition and Starting

DSC-70-80-10 General

General.....	A
--------------	---

DSC-70-80-20 Architecture

Architecture.....	A
-------------------	---

DSC-70-80-30 Ignition System

General.....	A
Ignition for Starting.....	B
Continuous Ignition.....	C

DSC-70-80-40 Engine Starting System

General.....	A
Automatic Starting.....	B
Automatic Starting Sequence.....	C
Manual Starting.....	D
Engine Ventilation (Dry Cranking).....	E

DSC-70-90 Controls and Indicators

DSC-70-90-10 Overhead Panel

ENG MAN START Panel.....	A
--------------------------	---

DSC-70-90-20 Pedestal

ENG MODE Selector and ENG MASTER Levers.....	A
Thrust Levers.....	B

DSC-70-90-30 Maintenance Panel

ENG FADEC GND PWR Panel.....	A
------------------------------	---

Continued on the following page

Continued from the previous page

DSC-70-90-40 Engine Display	
Engine/Warning Display.....	A
1 ENG SD Page.....	B
DSC-70-90-50 Memo Display	
Memo Display.....	A

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS ENGINES PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS
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Localization Title	Toc Index	ID	Reason
DSC-70-PLP-TOC ENG SD Page		1	Documentation update: Deletion of "N1, N2 Vibrations (00018267.0001001)".
DSC-70-90-40 N1, N2 Vibrations	B	1	Documentation update: Addition of "N1, N2 Vibrations" documentary unit

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS ENGINES OVERVIEW
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OVERVIEW

Applicable to: ALL

Ident.: DSC-70-05-10-00018242.0002001 / 21 MAR 16

The aircraft has two CFM International CFM56-5B engines that supply power to the aircraft.

Ident.: DSC-70-05-10-00018265.0001001 / 21 MAR 16

The engines are turbofan engines that have:

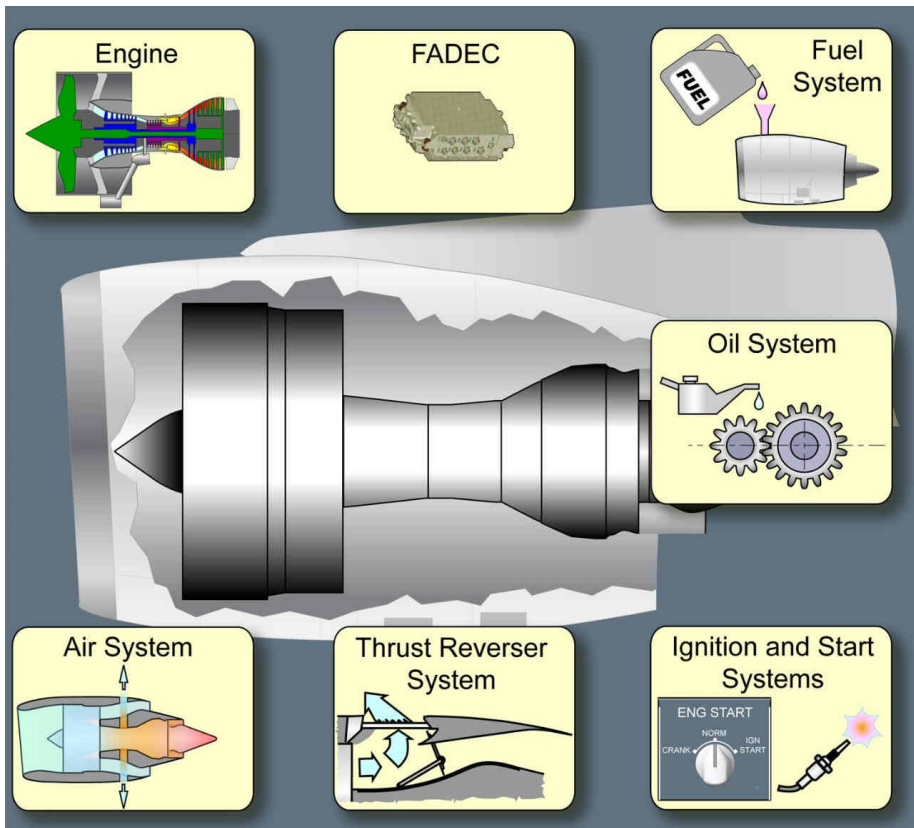
- A high bypass ratio,
- A Full Authority Digital Engine Control (FADEC),
- A fuel system,
- An oil system,
- An air system,
- A thrust reverser system,
- An ignition system and a start system.

AIRCRAFT SYSTEMS

ENGINES

OVERVIEW

Overview



 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS ENGINES SYSTEM DESCRIPTION
--	---

ENGINE

Ident.: DSC-70-10-00018361.0001001 / 21 MAR 16

Applicable to: ALL

The engine has:

- Two compressor turbine assemblies:
 - The Low Pressure (LP) compressor turbine assembly,
 - The High Pressure (HP) compressor turbine assembly.

L2 Each turbine operates its associated compressor via a shaft.

- L1** - One accessory gearbox,
- One combustion chamber.

The engine operates as follows:

1. The LP compressor, compresses the air.
2. Then, the air is divided into two flows:
 - Most of the air flows out of the core engine, and provides most of the engine thrust.
 - The remaining air enters the core engine.
3. The HP compressor compresses the air that enters the core engine.
4. The fuel is added to and mixed with the compressed air of the core engine. The mixture is ignited in the combustion chamber.
5. The gas that results from combustion drives the HP and the LP turbines.

The rotation speed of the fan provides the N1 engine parameter.

The rotation speed of the HP rotor provides the N2 engine parameter.

The N1 and N2 engine parameters appear on the Engine/Warning Display (E/WD).

L2 The N1 and N2 engine parameters are current rotation speeds displayed in percentage.

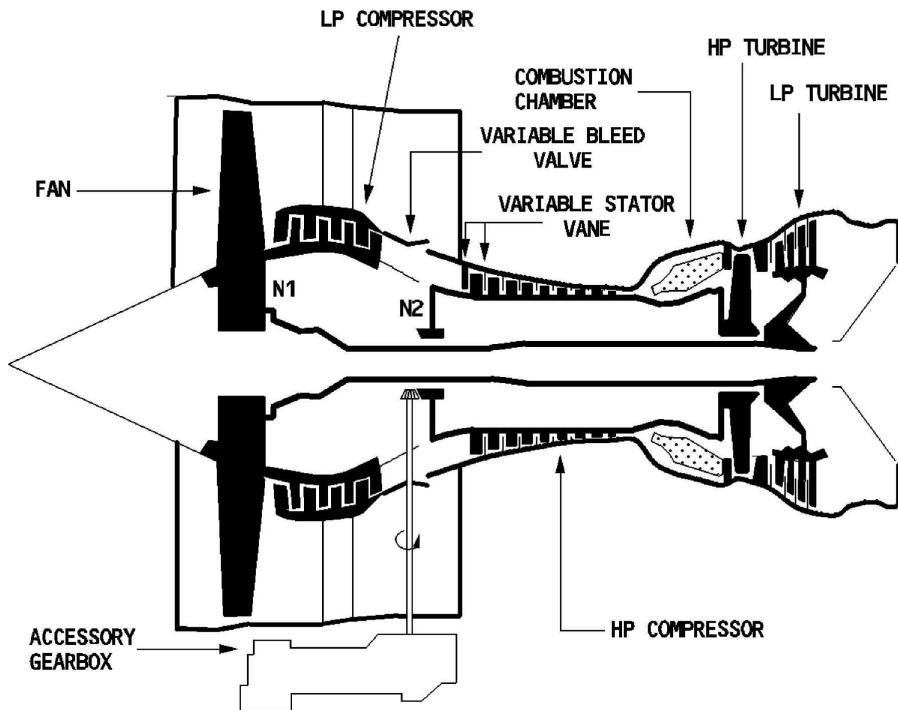
L1 The FADEC uses:

- The N1 engine parameter to compute the applicable engine thrust,
- The N1 and N2 engine parameters for engine control and monitoring.

ENGINE

Ident.: DSC-70-10-00018362.0002001 / 21 MAR 16

Applicable to: ALL



LP COMPRESSOR TURBINE ASSEMBLY

Ident.: DSC-70-10-00018289.0002001 / 21 MAR 16

Applicable to: ALL

LP COMPRESSOR TURBINE ASSEMBLY

The LP compressor turbine assembly has:

- One LP compressor,
- L2** - One LP shaft,
- L1** - One LP turbine.

L2 The LP shaft connects the LP compressor to the LP turbine.

- L3** The LP compressor has a fan and 4 stages, and the LP turbine has 4 stages.

HP COMPRESSOR TURBINE ASSEMBLY

Ident.: DSC-70-10-00018290.0001001 / 21 MAR 16

Applicable to: ALL

HP COMPRESSOR TURBINE ASSEMBLY

The HP compressor turbine assembly has:

- One HP compressor,
- L2** - One HP shaft,
- L1** - One HP turbine.

- L2** The HP shaft connects the HP compressor to the HP turbine.

- L3** The HP compressor has 9 stages, and the HP turbine has a single stage.

COMBUSTION CHAMBER

Ident.: DSC-70-10-00018292.0001001 / 21 MAR 16

Applicable to: ALL

COMBUSTION CHAMBER

The combustion chamber burns a mixture of fuel and HP air. The FADEC controls the fuel/air mixture in accordance with the position of the thrust lever and the aircraft operating conditions.

- L3** The combustion chamber is an annular assembly with fuel nozzles and two igniters.

The combustion chamber is between the HP compressor and the HP turbine.

ACCESSORY GEARBOX

Ident.: DSC-70-10-00018364.0001001 / 21 MAR 16

Applicable to: ALL

ACCESSORY GEARBOX

The accessory gearbox drives various accessories with mechanical power via the HP shaft for the operation of the engine and the aircraft systems.

- L2** The accessory gearbox of each engine operates:
- The oil feed pump that provides the oil system with oil.
 - The main engine fuel pump that provides the combustion chamber with fuel.
 - The engine-driven hydraulic pumps that pressurize the GREEN and the YELLOW hydraulic systems.
 - The engine-driven generators that are the primary source of electrical power.

AIRCRAFT SYSTEMS**ENGINES**

SYSTEM DESCRIPTION

- The FADEC alternator that provides the FADEC with electrical power.
- The pneumatic starter that enables the engine start.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS ENGINES FADEC
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GENERAL

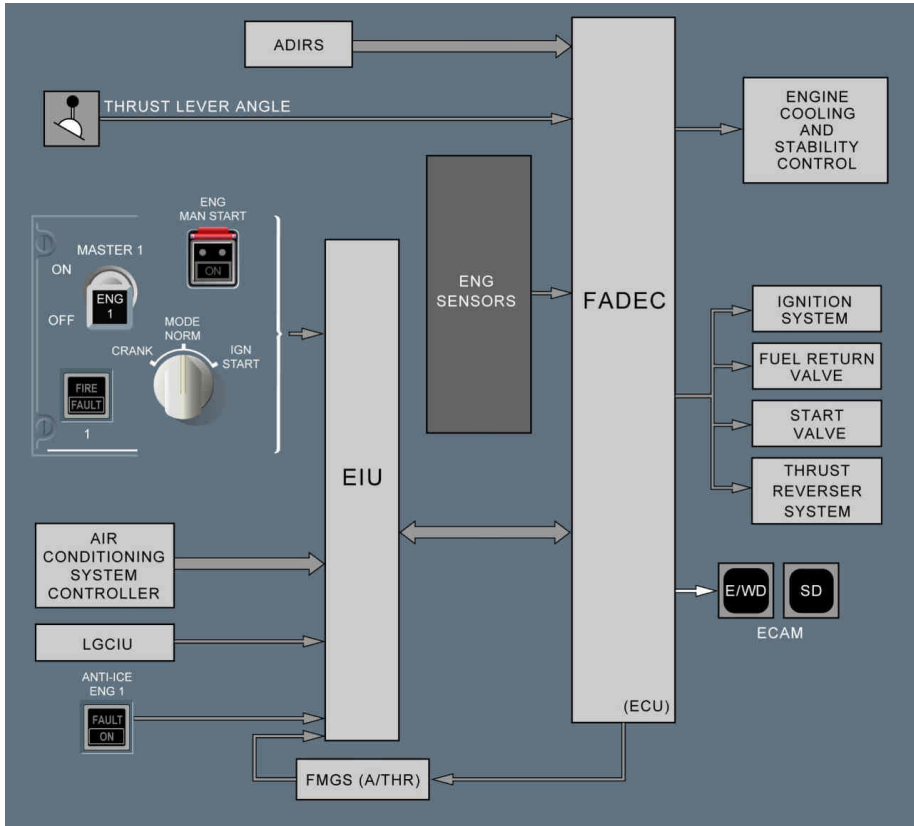
Ident.: DSC-70-20-00020869.0001001 / 17 MAR 17
Applicable to: ALL

Each powerplant has a FADEC (Full Authority Digital Engine Control) system.
FADEC is a digital control system that performs complete engine management.
FADEC has two-channel redundancy, with one channel active and one in standby.
If one channel fails, the other automatically takes control.
The system has a magnetic alternator for an internal power source.
FADEC is mounted on the fan case.
The Engine Interface Unit (EIU) transmits to FADEC the data it uses for engine management.

ARCHITECTURE

Ident.: DSC-70-20-00001566.0005001 / 06 NOV 23

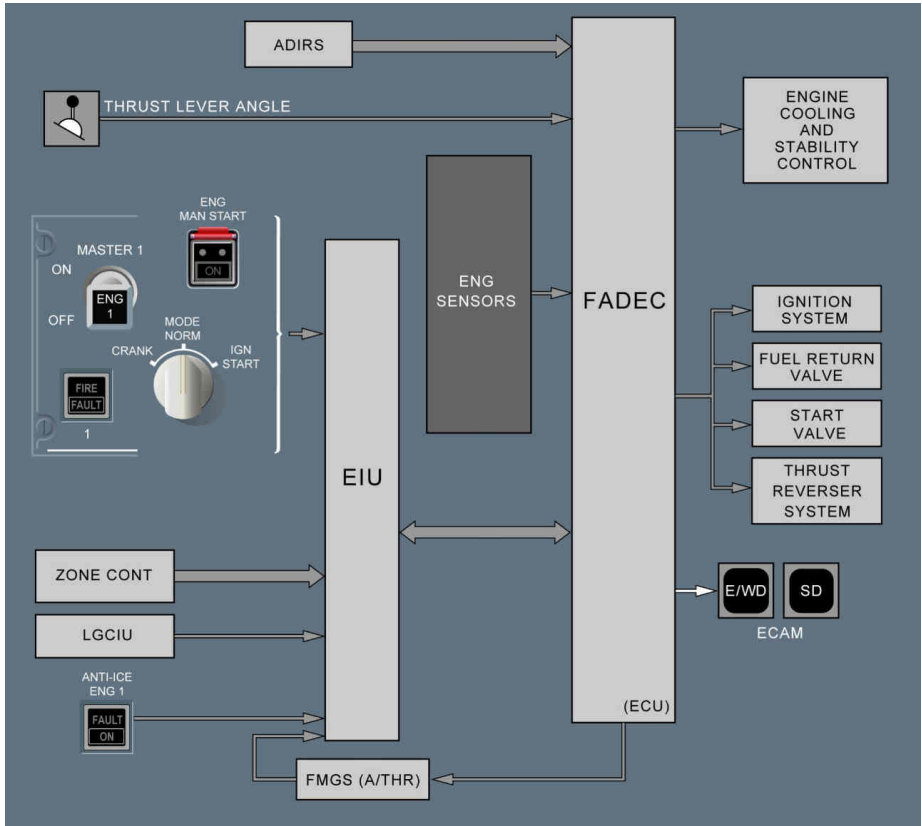
Applicable to: MSN 02719-07792



ARCHITECTURE

Ident.: DSC-70-20-00001566.0004001 / 06 NOV 23

Applicable to: MSN 02155-02212



FUNCTIONS

Ident.: DSC-70-20-00001567.0001001 / 21 MAR 16

Applicable to: ALL

The FADEC system performs the following functions :

Control of gas generator

- control of fuel flow
- acceleration and deceleration schedules
- variable bleed valve and variable stator vane schedules
- control of turbine clearance
- idle setting

Protection against engine exceeding limits

- protection against N1 and N2 overspeed
- monitoring of EGT during engine start

Power management

- automatic control of engine thrust rating
- computation of thrust parameter limits
- manual management of power as a function of thrust lever position
- automatic management of power (A/THR demand).

Automatic engine starting sequence

- control of :
 - the start valve (ON/OFF)
 - the HP fuel valve
 - the fuel flow
 - the ignition (ON/OFF)
- monitoring of N1, N2, FF and EGT
- initiation of abort and recycle (on the ground only)

Manual engine starting sequence

- passive monitoring of engine
- control of :
 - the start valve
 - the HP fuel valve
 - the ignition

Thrust reverser control

- Actuation of the blocker doors
- Engine setting during reverser operation

Fuel recirculation control

- Recirculation of fuel to the fuel tanks, depending on the engine oil temperature, the fuel system configuration, and the flight phase.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS ENGINES FADEC
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Transmission of engine parameters and engine monitoring information to cockpit indicators

- Primary engine parameters
- Starting system status
- Thrust reverser system status
- FADEC system status

Detection, isolation, and recording of failures

FADEC cooling

IDLE CONTROL

Ident.: DSC-70-20-00015374.0001001 / 17 NOV 14

Applicable to: ALL

The FADEC has the following three idle modes :

Modulated idle

- Is regulated according to :
 - bleed system demand
 - ambient conditions
- Is selected :
 - In flight, when the flaps are retracted (FLAPS lever at zero position)
 - On ground, provided reverse is not selected.

Approach idle

- Is regulated according to aircraft altitude, regardless of bleed system demand.
- Is selected in flight, when the flaps are extended (FLAPS lever not at zero position)
- Allows the engine to accelerate rapidly from idle to go-around thrust.

Reverse idle

- Is selected on ground, when the thrust lever is in REV IDLE position.
- Is slightly higher than forward idle thrust.

AIRCRAFT SYSTEMS

ENGINES

FADEC

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS ENGINES THRUST CONTROL SYSTEM (CFM+PW) - GENERAL
--	---

GENERAL

Ident.: DSC-70-30-10-00020872.0002001 / 17 MAR 17

Applicable to: ALL

A FADEC dedicated to each engine controls the thrust.

The pilot uses the thrust levers to set the thrust in manual mode, and the FMGS sets the thrust in automatic mode (A/THR function).

The FADEC prevents the thrust from exceeding the limit for the thrust lever position in both manual and automatic modes.

AIRCRAFT SYSTEMS

ENGINES

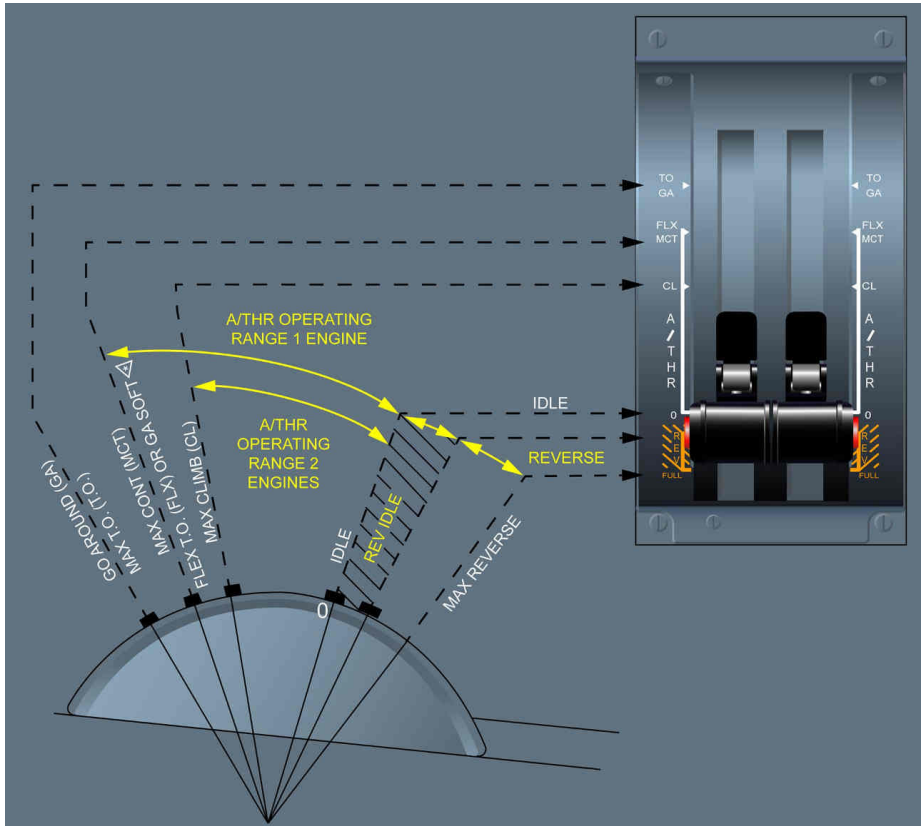
THRUST CONTROL SYSTEM (CFM+PW) - GENERAL

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THRUST LEVERS

Ident.: DSC-70-30-20-00020873.0002001 / 28 MAY 20

Applicable to: ALL



The thrust levers are only manually moved.

The thrust levers move over a sector divided into four operating segments.

The sector has six positions defined by detents or stops.

The FADEC receives the thrust lever position, then computes and displays all of the following:

- The thrust rating limit
- The N1 for the TLA.

AIRCRAFT SYSTEMS**ENGINES**

THRUST CONTROL SYSTEM (CFM+PW) - THRUST LEVERS

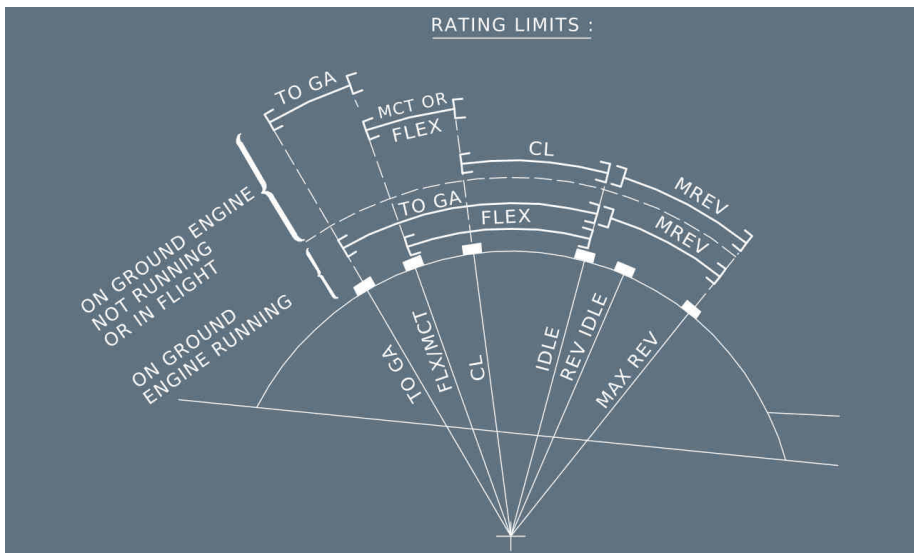
Note: To select reverse idle, the flight crew pulls up the reverse lever. The thrust lever can no longer remain in the idle position.

THRUST RATING LIMIT

Ident.: DSC-70-30-30-00001571.0001001 / 21 MAR 16

Applicable to: ALL

The FADEC computes the thrust rating limit for each thrust lever position, as shown below.
If the thrust lever is set in a detent, the FADEC selects the rating limit corresponding to this detent.
If the thrust lever is set between two detents, the FADEC selects the rating limit corresponding to the higher detent.



AIRCRAFT SYSTEMS

ENGINES

THRUST CONTROL SYSTEM (CFM+PW) - THRUST RATING LIMIT

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MANUAL MODE

Ident.: DSC-70-30-40-00001572.0001001 / 13 MAY 24

Applicable to: ALL

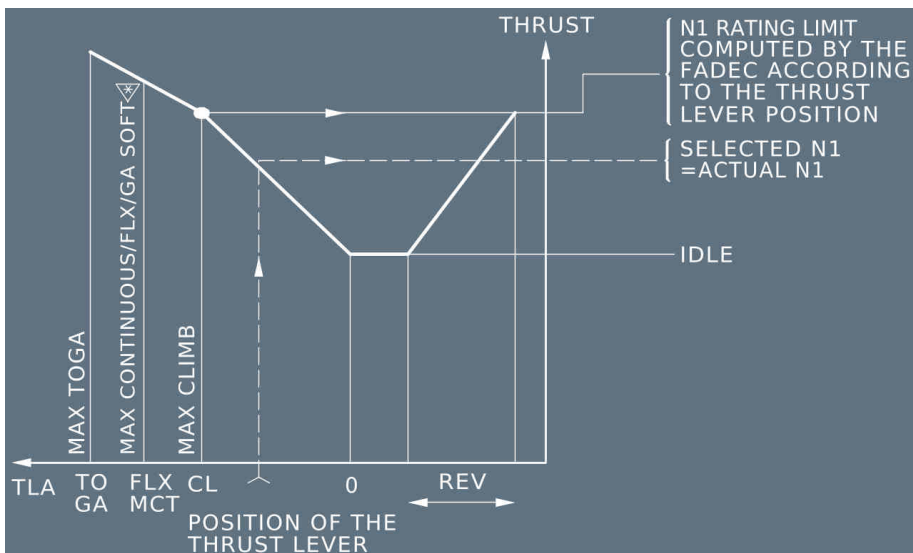
The engines are in the manual mode provided the A/THR function is:

- Not armed or
- Armed and not active (thrust lever not in the A/THR operating range and no alpha floor).

In manual mode, each FADEC computes the associated engine thrust based on the position of the corresponding thrust lever. The flight crew can move the thrust lever from the idle (0) detent to the TOGA detent.

The position of the thrust lever corresponds to a specific percent of maximum thrust.

For each detent, the FADEC selects the corresponding thrust rating mode and its thrust limit value (N1).



TAKEOFF**FLEXIBLE TAKEOFF**

If the flight crew enters a valid flexible takeoff temperature on the PERF TAKEOFF page and sets the thrust levers to the FLX/MCT detent, the engine will run at:

- The FLEX takeoff thrust rating mode if the flexible takeoff temperature is more than the current OAT, or
- The MCT rating mode if the flexible takeoff temperature is less than or equal to current OAT.

Note: Any change on the flexible temperature during the takeoff has no effect on the thrust.

The flight crew can always get the maximum available thrust by setting the thrust levers to the TOGA detent at any time.

DERATED TAKEOFF

If the flight crew enters a derated thrust level on the PERF TAKEOFF page and sets the thrust levers to the FLX/MCT detent, the engine will run at the derated takeoff thrust rating mode.

AFTER TAKEOFF

To change the thrust rating mode from **FLX** to **MCT** (on the EWD), the flight crew should move:

- The thrust levers either to TOGA or CL detent
- Then to FLX/MCT detent.

Note: The flight crew must ensure that the detents are correctly reached in order to change the thrust rating mode. If not, there is no effect.

The flight crew can always get the maximum available thrust by setting the thrust levers to the TOGA detent:

- At any time for a flexible takeoff, or
- Above F speed for a derated takeoff .

SOFT GO-AROUND

The flight crew performs a soft go-around when the thrust levers are set to TOGA then to FLX/MCT detent:

1. The flight crew sets the thrust levers to the TOGA detent
2. Then, the flight crew sets the thrust levers to FLX/MCT detent. The engines apply:
 - A computed thrust to a target vertical speed of approximately 2 300 ft/min, or
 - TOGA if 2 300 ft/min cannot be reached.

AUTOMATIC TOGA FUNCTION (DURING TAKEOFF)

The purpose of the automatic TOGA function is to secure the engine thrust for continuing the takeoff with the maximum available thrust when:

- The TOGA thrust rating mode is selected (as neither a flexible nor a derated  takeoff is entered in the FMS)
- The thrust levers are not set to the TOGA detent but are set to the FLX/MCT detent.

This avoids:

- A takeoff with the MCT thrust, or
- A rejected takeoff.

In that case, the **ENG THR LEVERS NOT SET** alert triggers 3 s after the flight crew sets the thrust levers to FLX/MCT detent, in order to warn that there is a discrepancy between the position of the thrust levers and the takeoff thrust mode that the FADECs select (**TOGA** displayed on the EWD). If the flight crew does not set the thrust levers to TO/GA detent within 5 s (as requested by the **ENG THR LEVERS NOT SET** alert), then the automatic TOGA function will activate and the FADEC will automatically select the maximum available thrust (TOGA).

Note: As the automatic TOGA function controls the engine thrust in manual mode, the blue circle (also referred to as Thrust Lever Position on the EWD) will move to the maximum available thrust regardless of the current thrust levers position. For more information, Refer to DSC-70-90-40 Engine Warning Display.

- L2** The automatic TOGA function activates when all of the following conditions are applicable for at least 8 s:
- The aircraft is on ground with the flaps and slats extended
 - Neither a flexible nor a derated  takeoff is entered on the PERF TAKEOFF page of the FMS
 - At least one thrust lever is set to the FLX/MCT detent.

The automatic TOGA function deactivates when one of the following conditions occurs:

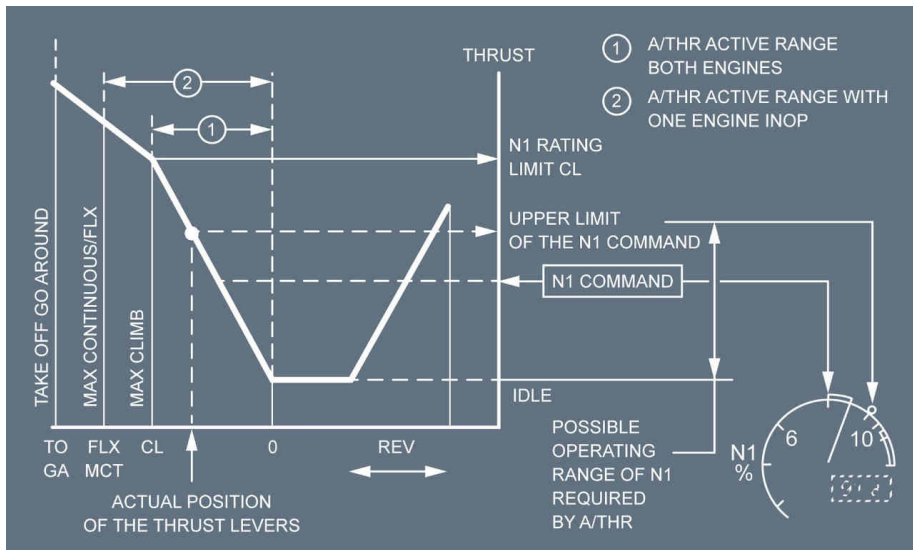
- At least one thrust lever is set to either TOGA or CL detent, or
- The thrust reversers are selected.

AUTOMATIC MODE

Ident.: DSC-70-30-40-00020874.0003001 / 18 MAY 22

Applicable to: ALL

In the autothrust mode (A/THR function active), the FMGC computes the thrust which is limited to the value corresponding to the thrust lever position (unless the alpha-floor mode is activated).



INDICATIONS ON FMA

The FADECs monitor the positions of the thrust levers, and trigger appropriate indications on the FMA. *Refer to DSC-22_30-80-20 MAN TOGA.*

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS ENGINES FUEL SYSTEM (CFM56)
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GENERAL

Ident.: DSC-70-40-00020868.0001001 / 17 MAR 17
Applicable to: ALL

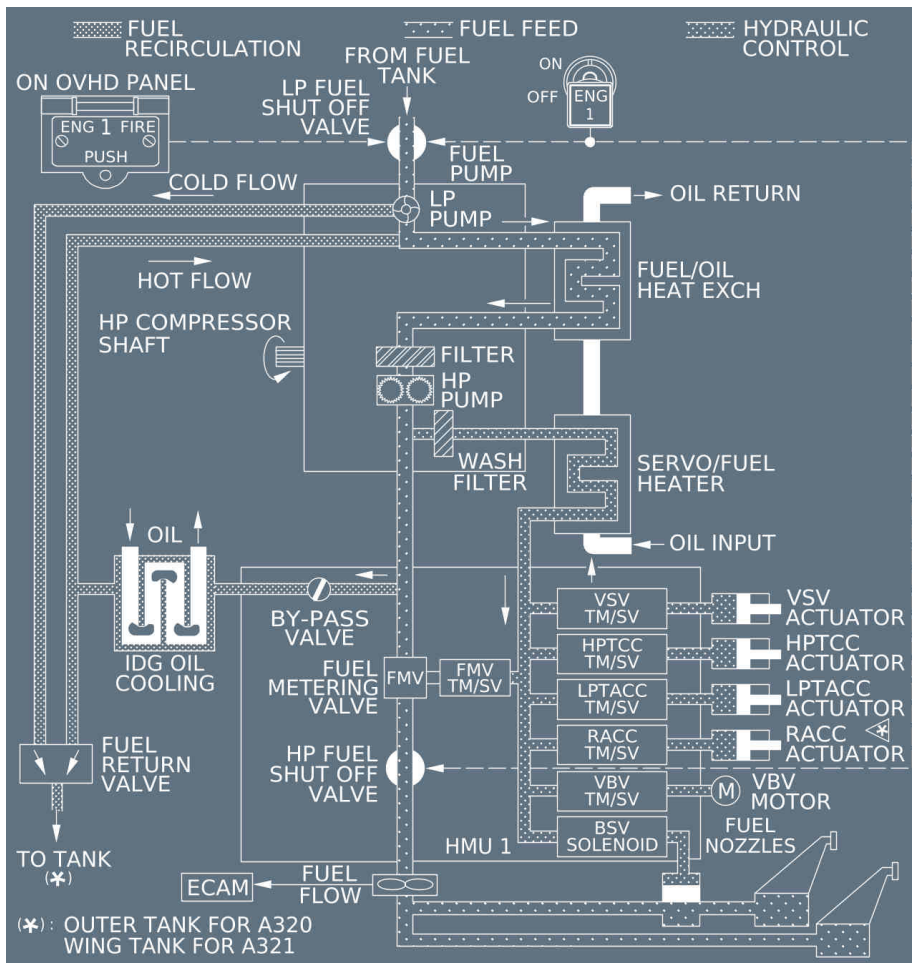
The fuel system supplies fuel to the combustion chamber at the required flow rate, pressure, and temperature.

The fuel flows from the tank, via the fuel pump unit and the fuel/oil heat exchanger, to the Hydromechanical Unit (HMU) and to the fuel nozzles.

AIRCRAFT SYSTEMS

ENGINES

FUEL SYSTEM (CFM56)



FUEL PUMP UNIT

Ident.: DSC-70-40-00001586.0001001 / 21 MAR 16

Applicable to: ALL

The HP compressor shaft drives the HP fuel pump assembly. Fuel flows through the LP pump, then through the fuel/oil heat exchanger and the HP pump (gear pump).

The fuel then divides into a filtered flow for the servo fuel heater and the servo valves of the HMU, and an unfiltered flow for the metering valve of the HMU.

SHUT-OFF VALVES

Ident.: DSC-70-40-00001587.0001001 / 12 MAY 23

Applicable to: ALL

Moving the ENG1 (ENG2) MASTER lever to OFF directly commands the closing of the LP and HP fuel shut off valves for that engine's fuel system.

It also closes the fuel return valve and opens the bypass valve.

HYDROMECHANICAL UNIT

Applicable to: ALL

Ident.: DSC-70-40-A-00001588.0001001 / 17 MAR 17

GENERAL

The FADEC controls the HMU, which :

- controls fuel flow to the engine combustion chamber
- controls fuel hydraulic signals to actuators
- protects against overspeeding.

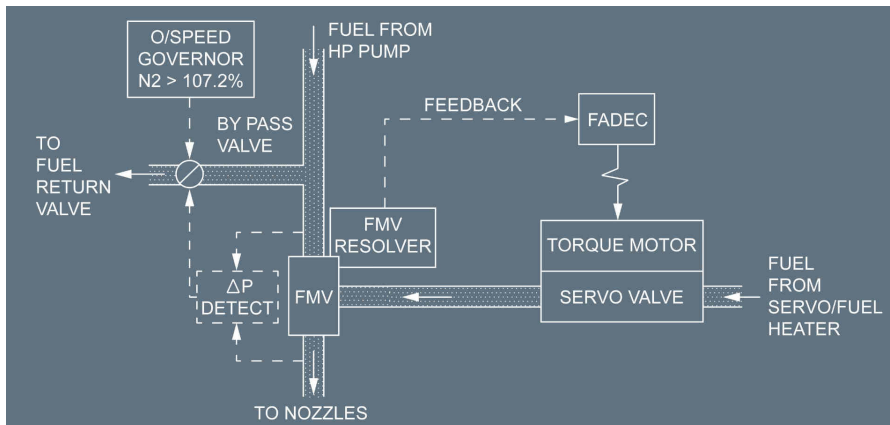
Ident.: DSC-70-40-A-00020880.0001001 / 17 MAR 17

FUEL FLOW

L3 The Fuel Metering Valve (FMV) transforms FADEC orders through a torque motor and servo valve into fuel flow to the engine fuel nozzles.

The FMV resolver generates a feedback signal proportional to the FMV position.

The bypass valve maintains a constant pressure drop across the FMV to ensure that the metered fuel flow is proportional to the FMV position.

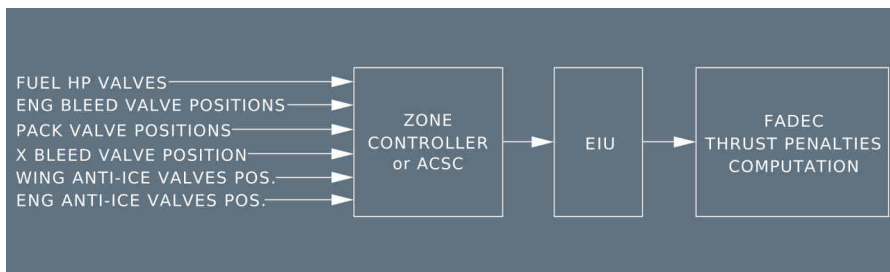


L1 The FADEC computes the fuel flow that will maintain the target N_1 .

As the FADEC maintains this N_1 , it allows N_2 to vary while remaining between N_2 minimum and N_2 maximum. The FADEC also controls the engine parameters to :

- Limit acceleration and deceleration ;
- Avoid engine stall or flameout ;
- Limit maximum N_1 and N_2 ;
- Maintain air bleed pressure requirement.

The FADEC computes an N_2 correction according to the bleed configuration.



Ident.: DSC-70-40-A-00001590.0001001 / 17 MAR 17

OVERSPEED GOVERNOR SYSTEM

Independent of the FADEC, the overspeed governor limits the N_2 by opening the fuel bypass valve, in the event of a malfunction that could lead to an overspeed condition.

Ident.: DSC-70-40-A-00001592.0002001 / 17 MAR 17

FUEL HYDRAULIC SIGNALS

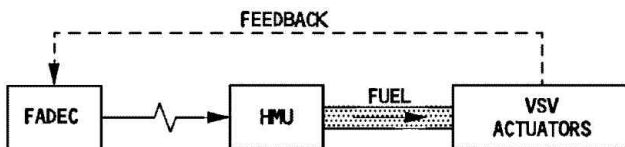
L3 Fuel hydraulic signals go to :

- Low Pressure Turbine Clearance Control (LPTCC) valves
(Refer to DSC-70-60 General)
- High Pressure Turbine Clearance Control (HPTCC) valves
(Refer to DSC-70-60 General)
- Rotor Active Clearance Control (RACC) system
(Refer to DSC-70-60 General)
- Variable Stator Vanes (VSV)

The VSV system positions the compressor variable vanes.

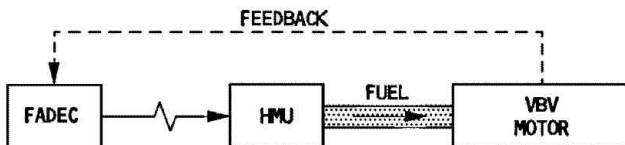
The FADEC maintains optimum compressor efficiency at a steady state and an adequate stall margin for transient engine operation.

VSVs are fully closed during engine start and are fully open at high thrust.



- Variable Bleed Valves (VBV)

The FADEC controls the VBVs, upstream of the HP compressor. Their setting depends on compressor inlet temperature and on N₂. It varies between full open (start, low thrust, and during fast deceleration) and full closed (high thrust) positions.



AIRCRAFT SYSTEMS**ENGINES**

FUEL SYSTEM (CFM56)

IDG COOLING SYSTEM

Ident.: DSC-70-40-00001593.0001001 / 26 JUL 12

Applicable to: ALL

Some of the fuel flowing out of the HMU goes to cool the oil systems of the Integrated Drive Generators (IDGs). It then returns to the fuel pump unit or to the tank.

The Fuel Return Valve (FRV), controlled by the FADEC, ensures that this flow is adequate.

L3 At low engine thrust, if the oil going into the IDG is too hot, the cooling fuel is sent back to the tank (300 kg/h).

If oil temperature continues to rise, the ECU increases the minimum N2.

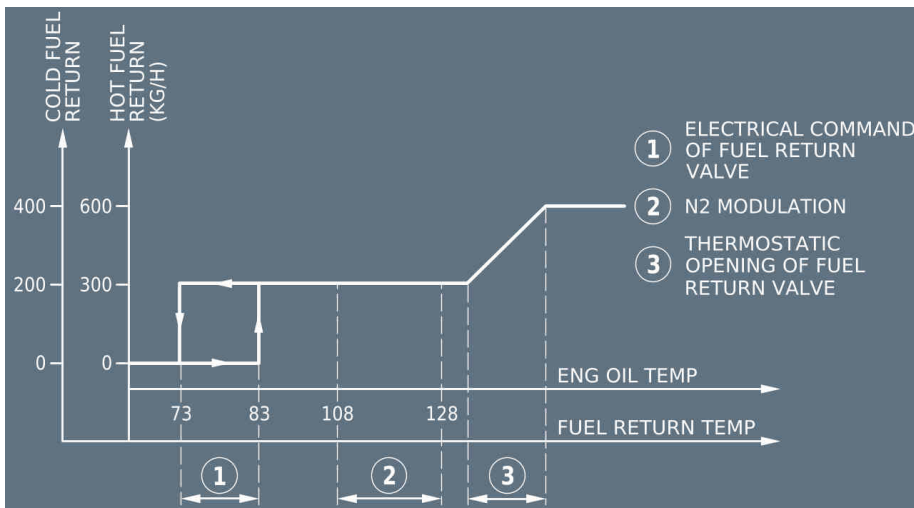
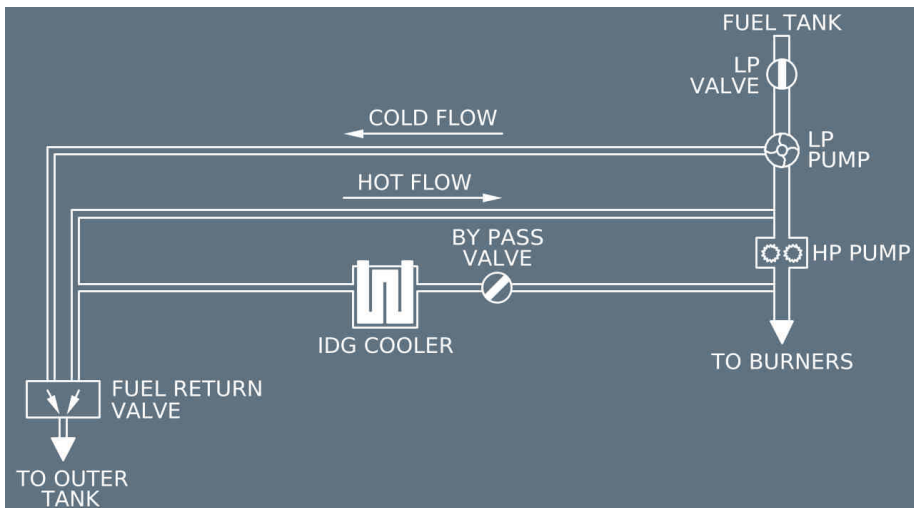
If oil temperature still keeps rising, the FADEC increases the fuel flow to the tank (from 300 to 600 kg/h, depending on fuel return temperature).

The fuel return valve is always mixing hot fuel with cold fuel so that the temperature of fuel returning to the tank stays below 100 °C (from 200 to 400 kg/h, depending on fuel return temperature).

Fuel recirculation to the tank is inhibited (FRV closed) in the following cases :

- at engine shutdown
- during takeoff and climb
- if :
 - wing tank level is below about 300 kg (660 lb).
 - there is fuel overflow in the surge tank
 - fuel feed is by gravity only.
- when fuel temperature in the wing tank in flight is above 52.5 °C

Note: *On the ground, high fuel temperature in the wing tank or fuel overflow in the surge tank does not inhibit the fuel recirculation to the wing tank (FRV remains open).*



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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS ENGINES OIL SYSTEM
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GENERAL

Ident.: DSC-70-50-00001603.0001001 / 21 MAR 16

Applicable to: ALL

The oil system lubricates the engine components.

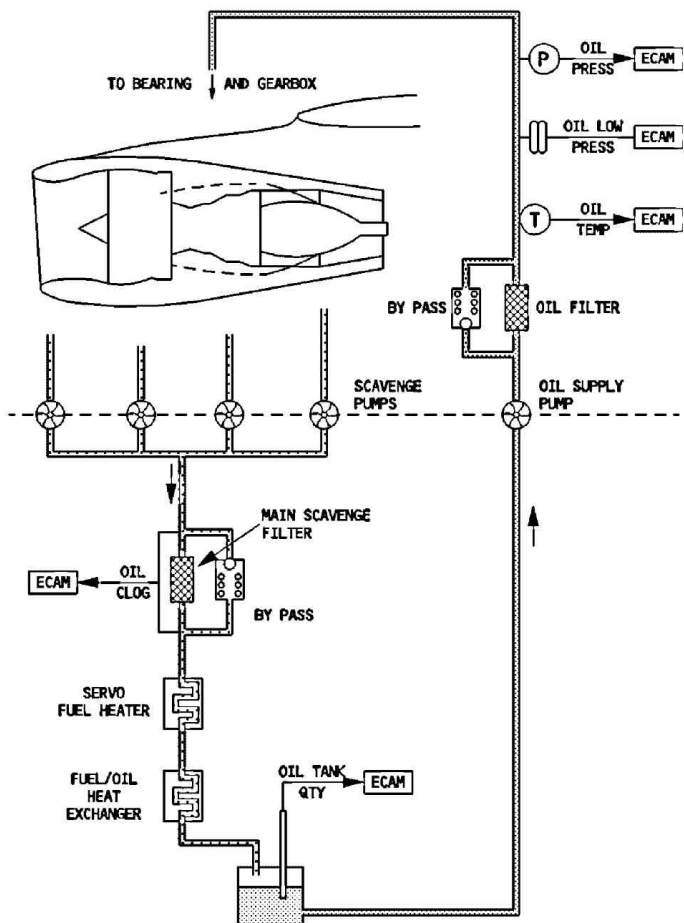
It contains :

- the oil tank
- the lube and scavenge pump modules
- the fuel/oil heat exchanger
- the filters, chip detectors, pressure relief and bypass valves.

AIRCRAFT SYSTEMS

ENGINES

OIL SYSTEM



GENERAL

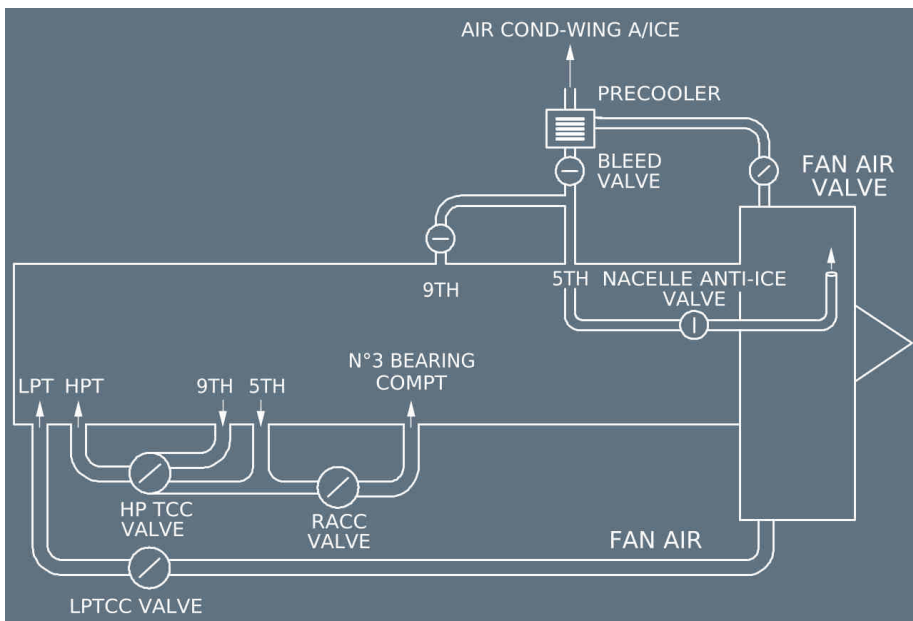
Ident.: DSC-70-60-00001604.0002001 / 21 MAR 17

Applicable to: **ALL**

The air bleed system supplies the aircraft with compressed air.

It uses the air for:

- pneumatic system (*Refer to DSC-36-10-10 General*)
- cooling the engine compartment and the turbines.



COOLING

Ident.: DSC-70-60-00001605.0002001 / 21 MAR 16

Applicable to: **ALL**

ROTOR ACTIVE CLEARANCE CONTROL (RACC) SYSTEM

The FADEC controls the RACC system through the HMU. The RACC system controls the clearance between the rotor blades of the HP compressor and its stator case.

The RACC system uses fifth-stage compressor bleed air that has been modulated according to the N2 and the flight parameters. The bleed air goes to the N°3 bearing compartment, where it is mixed with fan boost discharge.

AIRCRAFT SYSTEMS**ENGINES****AIRBLEED SYSTEM (CFM56)**

Clearances are at the maximum when the RACC valve is closed.

HP TURBINE CLEARANCE CONTROL (HPTCC) SYSTEM

The FADEC controls the HPTCC system through the HMU. The HPTCC system controls the HP turbine clearance by modulating the HP compressor bleed air flow for cooling the HP turbine case. It optimizes HP turbine performance and reduces exhaust gas temperature.

LP TURBINE CLEARANCE CONTROL (LPTCC) SYSTEM

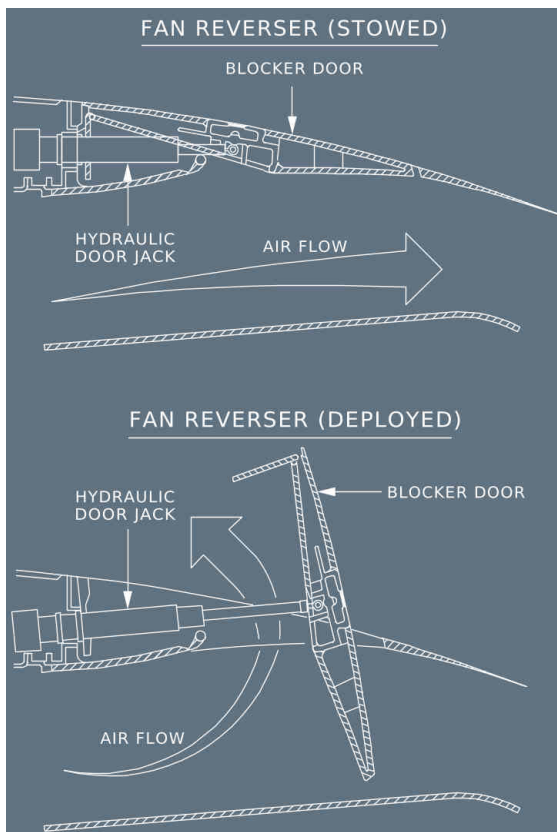
The FADEC controls the LPTCC system through the HMU. The LPTCC system controls LP turbine clearance by modulating the fan bleed air flow for cooling the LP turbine case.

GENERAL

Ident.: DSC-70-70-00020918.0003001 / 17 MAR 17

Applicable to: ALL

The aircraft reverses engine thrust by using four pivoting blocker doors on each engine to deflect the fan airstream.



A hydraulic door jack positions each door.

- The green circuit powers the doors on ENG 1.
- The yellow circuit powers the doors on ENG 2.

The FADEC controls the thrust reverser system. Each FADEC channel performs control and monitoring functions. The systems for the two engines are independent of each other.

The thrust reverser system on each engine has :

- 4 actuators,
- 4 latches,
- Door position switches,
- A Hydraulic Control Unit (HCU) that :
 - Pressurizes the thrust reverser hydraulic system,
 - Regulates the speed of the blocker doors, and
 - Supplies actuators with hydraulic power.
- A hydraulic shutoff valve which allows hydraulic pressure to the HCU.

Each pivoting door moves independently (the doors are not synchronized).

The total actuation time is less than two seconds.

ACTUATION LOGIC

Ident.: DSC-70-70-00020920.0001001 / 17 MAR 17

Applicable to: **ALL**

Deployment requires :

- One FADEC channel, operating with its associated throttle reverse signal ;
- Right and left main gear compressed signal from the corresponding LGCIUs ;
- A Thrust Lever Angle (TLA) reverse signals from at least one Spoiler Elevator Computer (SEC).

Before deployment is completed, the FADEC sets reverse idle thrust on the engine that is having its thrust reversed.

PROTECTION

Ident.: DSC-70-70-00020921.0002001 / 17 MAR 17

Applicable to: ALL**- AUTO RESTOW FUNCTION**

The FADEC will automatically command the reverse to stow, if at least one door is unstowed and reverse thrust is not selected while the engine is running.

Auto restow is inhibited in flight, and on ground, with N1 greater than 70 %.

- IDLE PROTECTION

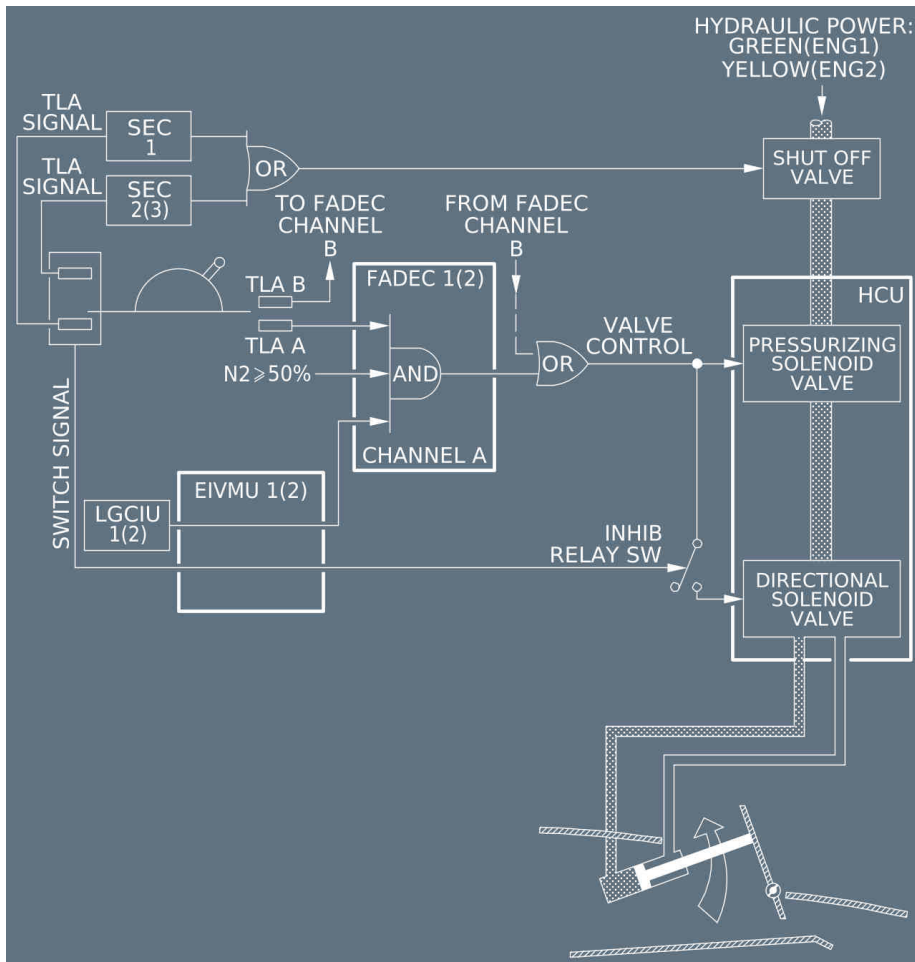
The FADEC will automatically select idle thrust if reverse thrust is not selected and :

- The four doors are detected unstowed, or
- At least one door is detected unstowed, and hydraulic pressure is detected in the HCU (downstream of the pressurizing valve), or
- The door position is indefinite, and hydraulic pressure is detected in the HCU (downstream of the pressurizing valve).

SCHEMATIC

Ident.: DSC-70-70-00020919.0006001 / 17 MAR 17

Applicable to: ALL



 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS ENGINES IGNITION AND STARTING - GENERAL
--	--

GENERAL

Ident.: DSC-70-80-10-00020922.0001001 / 28 MAY 20

Applicable to: ALL

The FADEC controls and monitors the ignition and starting system according to:

- The position of the ENG MODE selector
- The position of the ENG MASTER lever
- The position of the ENG MAN START pb-sw
- The aircraft status (flight or ground).

The FADEC receives the previous inputs from the EIVMU/EIU.

AIRCRAFT SYSTEMS

ENGINES

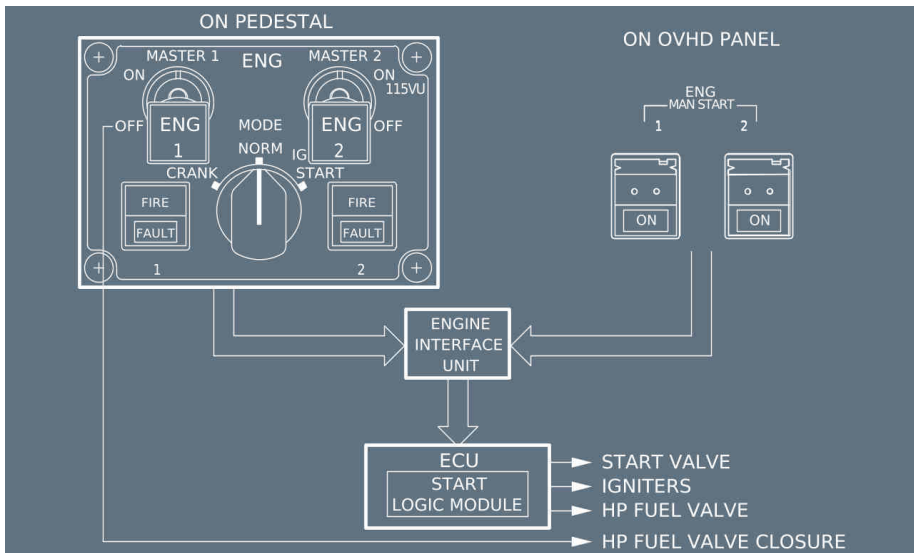
IGNITION AND STARTING - GENERAL

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ARCHITECTURE

Ident.: DSC-70-80-20-00001617.0002001 / 21 MAR 16

Applicable to: ALL



AIRCRAFT SYSTEMS

ENGINES

IGNITION AND STARTING - ARCHITECTURE

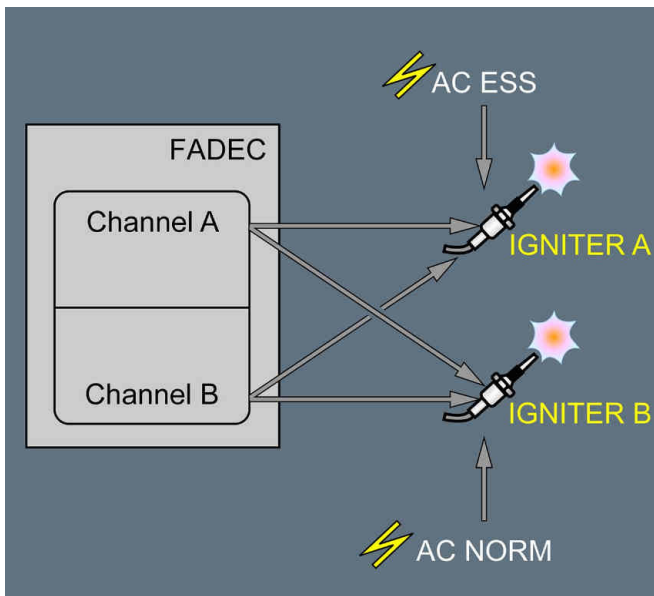
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GENERAL

Ident.: DSC-70-80-30-00020923.0001001 / 17 MAR 17

Applicable to: ALL

The ignition system is for engine starting on the ground and restarting in flight. It consists of two identical independent circuits for each engine, normally controlled by the FADEC channel A and channel B. Each FADEC channel can control both igniters.



Note: Supply for igniter A switches to the STAT INV BUS BAR as soon as the static inverter is operative.

AIRCRAFT SYSTEMS**ENGINES****IGNITION AND STARTING - IGNITION SYSTEM****IGNITION FOR STARTING**

Ident.: DSC-70-80-30-00020924.0002001 / 28 MAY 20

Applicable to: MSN 02155-04392

ON THE GROUND

Automatic start:

- During a first automatic start attempt only one igniter is supplied. The FADEC automatically alternates the igniters and/or channels used in successive start sequences.
- The ignition comes on automatically when N2 reaches 16 % and cuts off automatically when N2 reaches 50 %
- During an automatic start, if the first attempt fails, the FADEC automatically initiates a new start attempt with both igniters energized.

Manual start:

- During a manual start both igniters are supplied, when the ENG MASTER lever is ON
- Both igniters are cut off when N2 reaches approximately 50 %.

IN FLIGHT

In case of start attempt in flight, when the ENG MASTER lever is ON, both igniters are supplied.

IGNITION FOR STARTING

Ident.: DSC-70-80-30-00020924.0018001 / 28 MAY 20

Applicable to: MSN 05152-07792

ON THE GROUND

Automatic start:

- During a first automatic start attempt only one igniter is supplied. The FADEC automatically alternates the igniters and/or channels used in successive start sequences.
- The ignition comes on automatically when N2 reaches 16 % and cuts off automatically when N2 reaches 50 %
- During automatic ground start, when engine is cold and above 10 000 ft:
 1. One igniter is supplied, and
 2. When the ignition is detected, the second igniter is supplied.
- During an automatic start, if the first attempt fails, the FADEC automatically initiates a new start attempt with both igniters energized.

Manual start:

- During a manual start both igniters are supplied, when the ENG MASTER lever is ON
- Both igniters are cut off when N2 reaches approximately 50 %.

IN FLIGHT

In case of start attempt in flight, when the ENG MASTER lever is ON, both igniters are supplied.

CONTINUOUS IGNITION

Ident.: DSC-70-80-30-00001620.0004001 / 04 SEP 18

Applicable to: ALL

Continuous ignition may be selected either manually or automatically to maintain engine combustion.

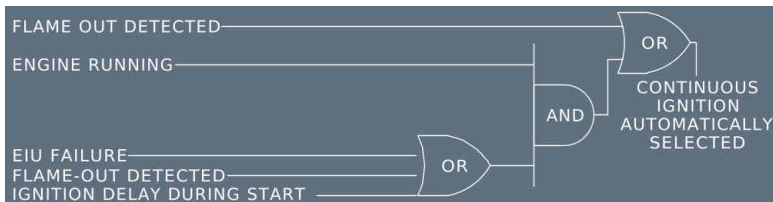
MANUAL SELECTION

In flight, continuous ignition is on when the ENG MODE selector is on IGN/START, if the corresponding engine is running.

Only one igniter is selected. If failed, both igniters are automatically selected.

On the ground after the engine is started, because ignition cuts off automatically, the flight crew must switch the ENG MODE selector to NORM then back to IGN/START to turn on continuous ignition.

AUTOMATIC SELECTION



WINDMILLING QUICK RELIGHT

In case of inadvertent engine shutdown by cycling the Engine Master lever to OFF then ON, in the windmilling quick relight envelope, the FADEC will attempt automatically a relight regardless of the rotary selector position.

AIRCRAFT SYSTEMS

ENGINES

IGNITION AND STARTING - IGNITION SYSTEM

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GENERAL

Ident.: DSC-70-80-40-00001621.0001001 / 21 MAR 16

Applicable to: ALL

The engine starting system consists of an air turbine starter and a start valve.

The start valve admits air supplied by the pneumatic system to operate the starter.

The FADEC controls the start valve electrically and bleed pressure is required for opening the start valve. If electrical control fails when the aircraft is on the ground, a handle allows the start valve to be operated manually.

AUTOMATIC STARTING**Applicable to: ALL**

Ident.: DSC-70-80-40-10-00020932.0001001 / 21 MAR 17

GENERAL

This sequence is under the full authority of the FADEC, which controls:

- The start valve
- The igniters
- The fuel HP valves.

Ident.: DSC-70-80-40-10-00020933.0001001 / 04 NOV 20

PROTECTION

The FADEC:

- Detects a hot start, a hung start, a stall, a failed light up, a low start air pressure, a starter time exceeded and a thrust lever not at idle
- Announces FAULT and identifies the fault in an ECAM message
- Runs an abort sequence if a start aborts on the ground, and :
 - Closes the HP valve
 - Closes the start valve
 - Turns off ignition
 - Ensures an automatic dry crank cycle after the abort sequence in order to remove the fuel vapors
 - Controls any additional start attempts.

Ident.: DSC-70-80-40-10-00020935.0001001 / 28 MAY 20

WINDMILLING

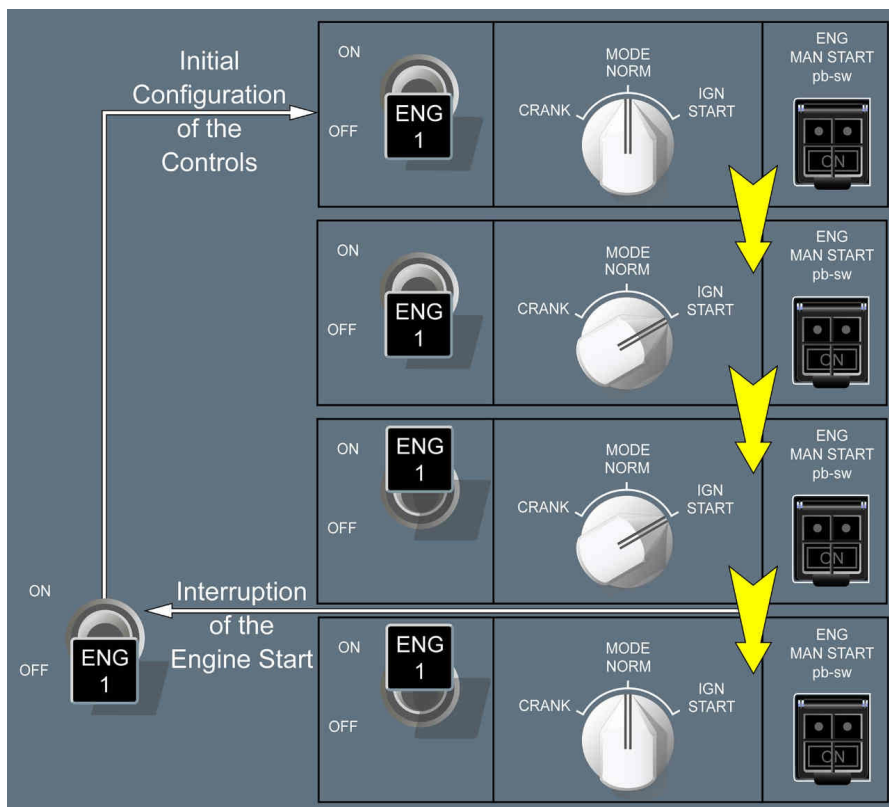
For an in-flight start, the FADEC decides whether the engine is windmilling fast enough or needs assistance from the starter in view of current engine parameters and flight environment parameters.

Flight crew may interrupt this start sequence by moving the ENG MASTER lever to OFF.

AUTOMATIC STARTING SEQUENCE

Applicable to: ALL

Ident.: DSC-70-80-40-20-00020925.0001001 / 21 MAR 17

SEQUENCE OF THE AUTOMATIC START


Ident.: DSC-70-80-40-20-00020926.0001001 / 12 MAY 23

INITIAL CONFIGURATION OF THE CONTROLS

The initial configuration prior an automatic engine start is the following :

- The ENG MASTER lever is set to OFF
- The ENG MODE selector is set to NORM
- The ENG MAN START pb-sw is set to OFF.

Ident.: DSC-70-80-40-20-00020927.0001001 / 28 MAY 20

FIRST STEP

The flight crew must set the ENG MODE selector to IGN/START, leading to the following:

- The ENG SD page appears on the SD
- All engine parameters are available
- Pack valves automatically close.

After 30 s, if the flight crew does not set the ENG MASTER lever to ON (*Refer to DSC-70-80-40 Second Step*), pack valves automatically open again.

Ident.: DSC-70-80-40-20-00020928.0001001 / 28 MAY 20

SECOND STEP

The flight crew must set the ENG MASTER lever to ON, and the following steps occur:

- The LP fuel valve opens
- The engine start valve opens
- The ignition starts:
 - On ground: when N2 is more than 16 %
 - In flight: Immediately.
- The HP fuel valve opens:
 - On ground: when N2 is more than 22 %
 - In flight: when N2 is more than 15 %.
- When N2 is more than 50 %:
 - The engine start valve closes
 - The ignition stops if on ground
 - The pack valves reopen if another engine is not started within 30 s.

Ident.: DSC-70-80-40-20-00020929.0001001 / 21 MAR 17

THIRD STEP

The automatic engine start is finished.

The flight crew must set the ENG START selector to NORM.

Ident.: DSC-70-80-40-20-00020930.0001001 / 28 MAY 20

INTERRUPTION OF THE AUTOMATIC START

When required by ECAM and after confirmation, the flight crew must set the ENG MASTER lever to OFF.

If the flight crew sets the ENG MASTER lever to OFF, the FADEC automatically :

- Closes the LP and the HP fuel shutoff valves
- Stops to energize the ignitor
- Closes the engine start valve.

MANUAL STARTING

Ident.: DSC-70-80-40-00020937.0001001 / 28 MAY 20

Applicable to: ALL

If an automatic start is not successful, the flight crew can perform a manual start.

In the manual start sequence, the FADEC has limited control. As a result, the flight crew must monitor engine acceleration.

To perform a manual start, the flight crew must :

- Set the ENG MODE selector to IGN/START
- Set the ENG MAN START pb-sw to ON
- Set the ENG MASTER lever to ON.

The FADEC:

- Opens the engine start valve when the flight crew :
 - Sets the ENG MODE selector to IGN/START
 - Sets the ENG MAN START pb-sw to ON.
- Opens the HP shutoff valve, and operates both igniters when the flight crew sets the ENG MASTER lever to ON
- Closes the engine start valve, and cuts off the ignition when N2 reaches 50 %.

For more information about the manual start sequence, *Refer to PRO-NOR-SUP-ENG Manual Engine Start - General.*

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS ENGINES IGNITION AND STARTING - ENGINE STARTING SYSTEM
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The FADEC makes a passive survey of the engine during the starting sequence: the flight crew is made aware of an abnormal start by a proper ECAM warning and has to interrupt the start sequence. The FADEC has not the authority to abort the manual start:

- In flight
- On ground, except if the start EGT limit is exceeded before reaching 50 % N2. In this case only, the FADEC aborts the start.

In flight, the FADEC always commands a starter-assisted air start.

ENGINE VENTILATION (DRY CRANKING)
--

Ident.: DSC-70-80-40-00020938.0001001 / 12 MAY 23

Applicable to: ALL

A dry cranking cycle ventilates the engine to remove fuel vapors after an unsuccessful start attempt on the ground.

The flight crew can manually select cranking by setting the ENG MODE selector to CRANK and the ENG MAN START pb-sw to ON (ENG MASTER lever OFF). Flight crew can stop the cranking by setting the ENG MAN START pb-sw to OFF.

AIRCRAFT SYSTEMS

ENGINES

IGNITION AND STARTING - ENGINE STARTING SYSTEM

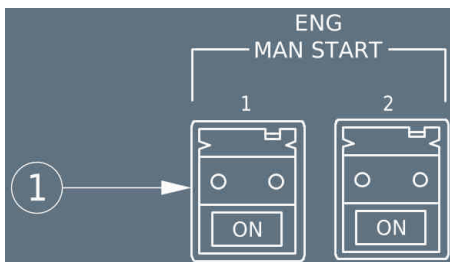
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ENG MAN START PANEL

Applicable to: **ALL**

Ident.: DSC-70-90-10-20-00018366.0001001 / 21 MAR 16

ENG MAN START Panel



Ident.: DSC-70-90-10-20-00018370.0001001 / 12 MAY 16

ENG MAN START pb-sw

- Off** :
- Aborts the manual start sequence of the associated engine, when the ENG MODE selector is set to IGN/START and the ENG MASTER lever is set to OFF, or
 - Stops the dry crank process of the associated engine, when the ENG MODE selector is set to CRANK and the ENG MASTER lever is set to OFF.

L13

- ON (in blue)** :
- Initiates the manual start sequence of the associated engine, when the ENG MODE selector is set to IGN/START, or
 - Initiates the wet crank process of the associated engine, when the ENG MODE selector is set to CRANK and the ENG MASTER lever is set to ON, or
 - Initiates the dry crank process of the associated engine, when the ENG MODE selector is set to CRANK and the ENG MASTER lever is set to OFF.

AIRCRAFT SYSTEMS

ENGINES

CONTROLS AND INDICATORS - OVERHEAD PANEL

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ENG MODE SELECTOR AND ENG MASTER LEVERS

Applicable to: ALL

Ident.: DSC-70-90-20-30-00018367.0001001 / 12 OCT 16

ENG MODE selector and ENG MASTER Levers



Ident.: DSC-70-90-20-30-00018373.0001001 / 21 MAR 17

ENG MODE START selector

NORM : Normal mode of operation.

IGN/START : Use the IGN/START position to:

- Initiate the automatic or manual start sequences of the associated engine, when the ENG MASTER lever is set to OFF, or
- Initiate the ignitors in flight as required.

L13

CRANK : Use the CRANK position to:

- Initiate the dry crank process of the associated engine, when the ENG MASTER lever is set to OFF and the ENG MAN START pb-sw is set to ON.
- Initiate the wet crank process of the associated engine for maintenance purpose, when the ENG MASTER lever, and the ENG MAN START pb-sw are set to ON.

Ident.: DSC-70-90-20-30-00018371.0001001 / 28 MAY 20

ENG MASTER lever



The FADEC:

- Initiates the automatic start sequence of the associated engine, when the ENG MODE selector is set to IGN/START, or
- Initiates the manual start sequence of the associated engine, when the ENG MODE selector is set to IGN/START and the ENG MAN START pb-sw is set to ON.



The FADEC:

- Shuts down the associated engine, or
- Aborts the start sequence of the associated engine.

Ident.: DSC-70-90-20-30-00018372.0001001 / 21 MAR 17

ENG 1(2) FIRE light

FIRE Light :

A fire is detected in the corresponding engine.

Refer to DSC-26-20-20 ENG 1(2) FIRE Light

ENG 1(2) FAULT light

FAULT light :

This amber light comes on, and a caution appears on ECAM, if there is:

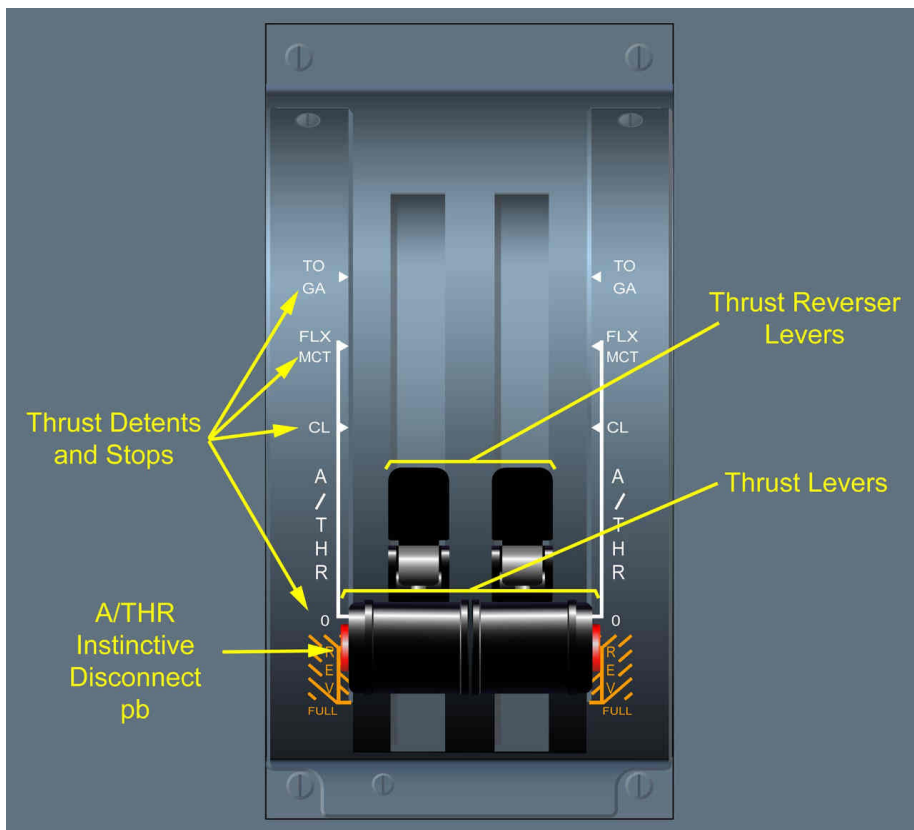
- The position of the HP fuel shutoff valve is abnormal, or
- The automatic start sequence of the associated engine aborts, or
- There is a malfunction of the thrust control.

THRUST LEVERS

Applicable to: ALL

Ident.: DSC-70-90-20-40-00018368.0001001 / 28 JUL 16

Thrust Levers



Ident.: DSC-70-90-20-40-00018376.0001001 / 21 MAR 16

THRUST LEVERS

The flight crew uses the thrust levers in order to:

- Adjust the thrust, or
- Select a thrust stop or detent, or

- Control the deployment and the stowage of the associated reversers, or
- Adjust the associated reverse thrust.

The flight crew can move each thrust lever individually.

L2 The position of the thrust levers appears on the E/WD, via a blue circle on the thrust gauge.

L1 The flight crew can move each thrust lever forward the Idle (0) stop, when the associated thrust reverser lever is set to the locked position.

The flight crew can move each thrust lever backward the Idle (0) stop, when the associated thrust reverser lever is in the unlocked position.

Ident.: DSC-70-90-20-40-00018377.0001001 / 28 MAY 20

THRUST DETENTS AND STOPS

There are three stops and three detents:

- The Rev Max (F or FULL) stop
- The Rev Idle (R or REV) detent
- The Idle (0) stop
- The Climb (CL) detent
- The Maximum Continuous Thrust (MCT)/Flexible Take Off (FLX) detent
- The Takeoff (TO)/Go-Around (GA) stop.

Ident.: DSC-70-90-20-40-00018378.0001001 / 21 MAR 16

THRUST REVERSER LEVERS

The flight crew uses the thrust reverser levers in order to unlock the associated thrust lever.

The flight crew can move each thrust reverser lever upward to the unlocked position, when the associated thrust lever is set to the Idle (0) stop.

The thrust reverser levers are automatically reset to the locked position, when the flight crew moves the thrust levers forward the Idle (0) stop.

Ident.: DSC-70-90-20-40-00018379.0001001 / 18 MAY 22

A/THR Instinctive Disconnect pb

Pressing the A/THR instinctive disconnect pb disconnects the A/THR.

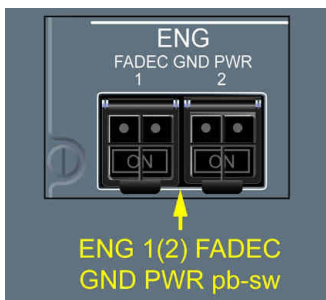
L2 For more information about A/THR instinctive disconnect pb, *Refer to DSC-22_30-50-40 A/THR Disconnection.*

ENG FADEC GND PWR PANEL

Applicable to: ALL

Ident.: DSC-70-90-30-10-00018365.0001001 / 12 OCT 16

ENG FADEC GND PWR Panel



Ident.: DSC-70-90-30-10-00018369.0001001 / 21 MAR 16

ENG FADEC GND PWR PB-SW

- Off : The electrical network of the aircraft or the FADEC alternator automatically supplies the FADEC.
- ON : On ground, when pressed the electrical network of the aircraft supplies the FADEC when:
- The ENG FIRE pb-sw is not pressed,
 - The FADEC alternator does not supply the FADEC.

AIRCRAFT SYSTEMS

ENGINES

CONTROLS AND INDICATORS - MAINTENANCE PANEL

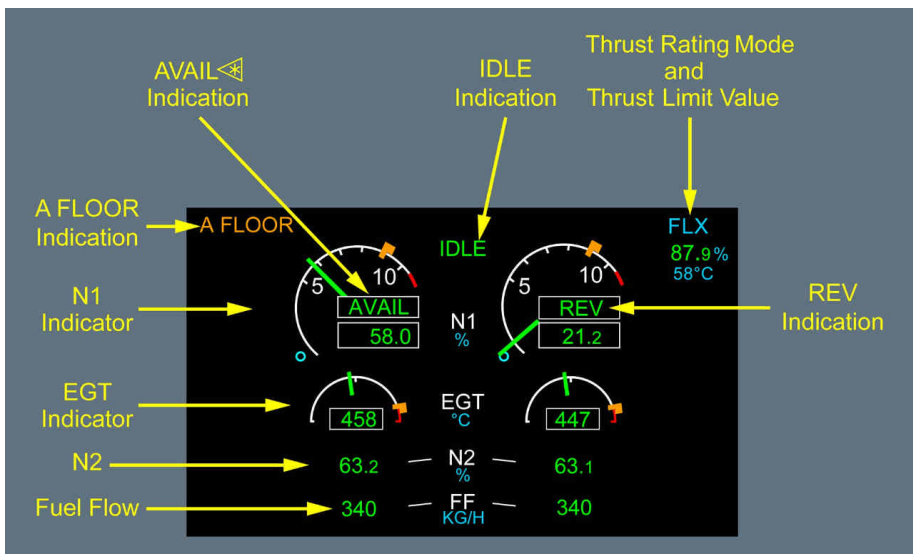
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ENGINE/WARNING DISPLAY

Applicable to: ALL

Ident.: DSC-70-90-40-50-00017843.0003001 / 12 OCT 16

Engine/Warning Display



Ident.: DSC-70-90-40-50-00017845.0001001 / 18 MAY 22

A FLOOR INDICATION

The alpha floor protection is active.

 For more information, Refer to DSC-22_30-50-50 ALPHA FLOOR

Ident.: DSC-70-90-40-50-00017846.0001001 / 21 MAR 16

THRUST RATING MODE AND THRUST LIMIT VALUE

Indicates the thrust limit value and the associated thrust rating mode based on:

- The position of the thrust levers,
- Aircraft on ground or in flight,
- The engine status, i.e. running or not running,
- The data entered in the T.O and CLB panels of the FMS ACTIVE/PERF page.

Ident.: DSC-70-90-40-50-00017847.0003001 / 21 MAR 16



Ident.: DSC-70-90-40-50-00018201.0001001 / 05 MAR 19

THRUST RATING MODES

The thrust rating modes are:

- TOGA : Takeoff or go-around thrust rating mode is selected.
- MCT : Maximum continuous thrust rating mode is selected.
- CLB : Climb thrust rating mode is selected.
- FLX : Flexible takeoff thrust rating mode is selected.
- D04 : Derated takeoff  thrust rating mode is selected.
There are several levels of derated takeoff: D04, D08, D12, D16, D20, ...
- GA SOFT : Soft go-around  thrust rating mode is selected.
- MREV : Maximum reverse thrust rating mode is selected.

Ident.: DSC-70-90-40-50-00018203.0001001 / 21 MAR 16

THRUST LIMIT VALUE

N1 value : Indicates the N1 limit value associated with the thrust rating mode.

 The thrust limit value disappears when the thrust reversers are selected.

Ident.: DSC-70-90-40-50-00017849.0001001 / 21 MAR 16

FLEX TEMPERATURE

Cyan : Indicates the flexible temperature that the flight crew entered in the T.O panel of the FMS PERF page, when the FLX rating mode is selected

Dashes in cyan : Indicates that the Static Air Temperature is above the flexible temperature.

Ident.: DSC-70-90-40-50-00018209.0001001 / 21 MAR 16

IDLE INDICATION

Both engines are at idle speed, and the aircraft is in flight.

L2 Pulses during 10 s, and then remains steady.

Ident.: DSC-70-90-40-50-00018210.0001001 / 21 MAR 16

AVAIL INDICATION

The engine is started, and at or above idle.

L2 On ground, appears steady during 10 s after a successful start. In flight, pulses during 1 min after a successful relight.

The AVAIL Indication  disappears when the flight crew moves the thrust lever forward the idle detent.

Ident.: DSC-70-90-40-50-00018211.0001001 / 21 MAR 16

REV INDICATION

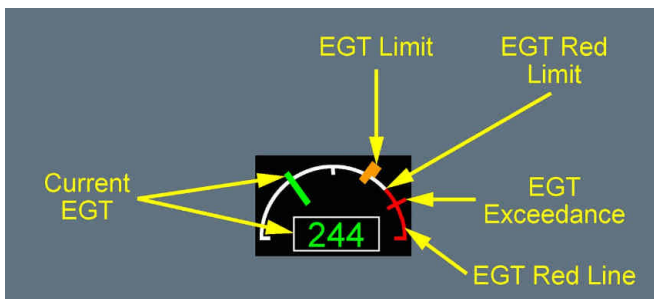
REV in green : On ground, the thrust reverser system is fully deployed.

L12

REV in amber : The thrust reverser system is unlocked.
In flight, the REV indication pulses during 9 s and then remains steady.

Ident.: DSC-70-90-40-50-00018213.0001001 / 21 MAR 16

EGT INDICATOR



Ident.: DSC-70-90-40-50-00018216.0002001 / 21 MAR 16

CURRENT EGT

L12

- Green : The current EGT is in normal range.
The scale goes from 0 °C to 1 000 °C.
- Amber : The current EGT exceeds the EGT amber limit.
- Red : The current EGT exceeds the EGT red limit.

Ident.: DSC-70-90-40-50-00018218.0003001 / 21 MAR 16

EGT LIMIT

The amber line indicates the maximum EGT (i.e. the EGT limit).

L2

The maximum EGT is:

- 725 °C, during the engine start sequence on ground, or
- 915 °C, in all other cases.

The EGT limit does not appear:

- When a takeoff or a go-around mode is selected, or
- When the thrust reversers are selected, or
- If the alpha floor protection is activated.

Ident.: DSC-70-90-40-50-00018219.0001001 / 21 MAR 16

EGT EXCEEDANCE

The EGT exceedance is the highest value that the EGT reached.

The EGT exceedance appears when:

- The current EGT exceeds the EGT red limit, or
- The EGT exceeded the EGT red limit.

L2

The red mark no longer appears at the next engine start sequence on ground, or after a maintenance action.

Ident.: DSC-70-90-40-50-00018220.0003001 / 21 MAR 16

EGT RED LINE

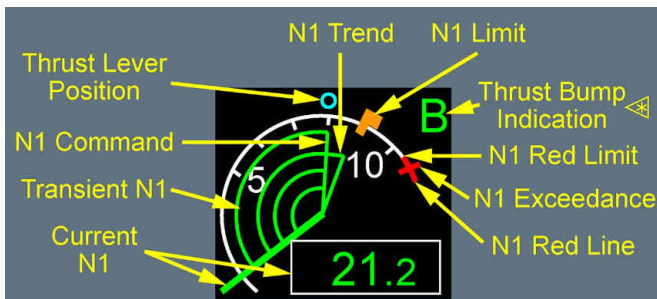
The EGT red line appears between the EGT red limit and the end of the scale.

L2

The EGT red limit is 950 °C.

Ident.: DSC-70-90-40-50-00018228.0001001 / 21 MAR 16

N1 INDICATOR



Ident.: DSC-70-90-40-50-00018229.0003001 / 04 JUL 17

CURRENT N1

- Green : The current N1 is in normal range.
- Amber : The current N1 exceeds the N1 limit.
- L12** Red : The current N1 exceeds the N1 red limit.
N1 red limit is 104 %.

- L12** Dashed : The accuracy of the N1 measurement is degraded.
Two amber dashes appear over the last digit.

Ident.: DSC-70-90-40-50-00018231.0001001 / 21 MAR 16

N1 TREND

The green triangle indicates the direction of the N1 trend, when the A/THR mode is active.

Ident.: DSC-70-90-40-50-00018232.0001001 / 21 MAR 16

N1 COMMAND

Indicates the N1 target, when the A/THR mode is active.

Ident.: DSC-70-90-40-50-00018233.0001001 / 21 MAR 16

TRANSIENT N1

The four green arcs indicate the difference between the N1 command and the current N1, when the A/THR is active.

Ident.: DSC-70-90-40-50-00018235.0001001 / 13 MAY 24

THRUST LEVER POSITION

The blue circle indicates:

- In manual mode, the thrust (N1 value) after the engine stabilization
- In automatic mode, the thrust (N1 value) that corresponds to the position of the associated thrust lever.

Ident.: DSC-70-90-40-50-00018236.0001001 / 21 MAR 16

N1 LIMIT

The amber mark indicates the N1 limit.

- L2** This corresponds to the maximum N1 value when the thrust levers are in TO/GA detent.

Ident.: DSC-70-90-40-50-00018237.0001001 / 21 MAR 16

N1 EXCEEDANCE

The N1 exceedance is the highest value that the N1 reached.

The N1 exceedance appears when the current N1 exceeds the N1 red limit.

The N1 exceedance remains even if the N1 value decreases below the N1 red limit.

- L2** The red mark no longer appears at the next engine start sequence on ground, or after a maintenance action.

Ident.: DSC-70-90-40-50-00018238.0003001 / 21 MAR 16

N1 RED LINE

The N1 red line appears between the N1 red limit and the end of the scale.

- L2** The N1 red limit is 104 %.

Ident.: DSC-70-90-40-50-00018239.0002001 / 21 MAR 16

N2

In a grey box : The engine start sequence or the crank process is in progress.

Green: : N2 is in normal range.

L12

Red : N2 exceeds the N2 red limit.

N2 red limit is 105 %.

A red cross appears.

The red cross no longer appears at the next engine start sequence on ground, or after a maintenance action.

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS ENGINES CONTROLS AND INDICATORS - ENGINE DISPLAY
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L12

Dashed : The accuracy of the N2 measurement is degraded.
Two amber dashes appear over the last digit.

Ident.: DSC-70-90-40-50-00018243.0001001 / 21 MAR 16

FUEL FLOW

Green : The fuel flow is normal.

Note: *If the system detects a discrepancy between the N1, N2, EGT and fuel flow values on the FADEC-DMC bus and the corresponding displayed values, an amber CHECK appears underneath the affected parameter.*

Ident.: DSC-70-90-40-50-00018244.0001001 / 21 MAR 16

THRUST BUMP INDICATION

Green : Indicates that the thrust bump is engaged.

Amber : When on the ground, indicates that the thrust bump is selected but not engaged.

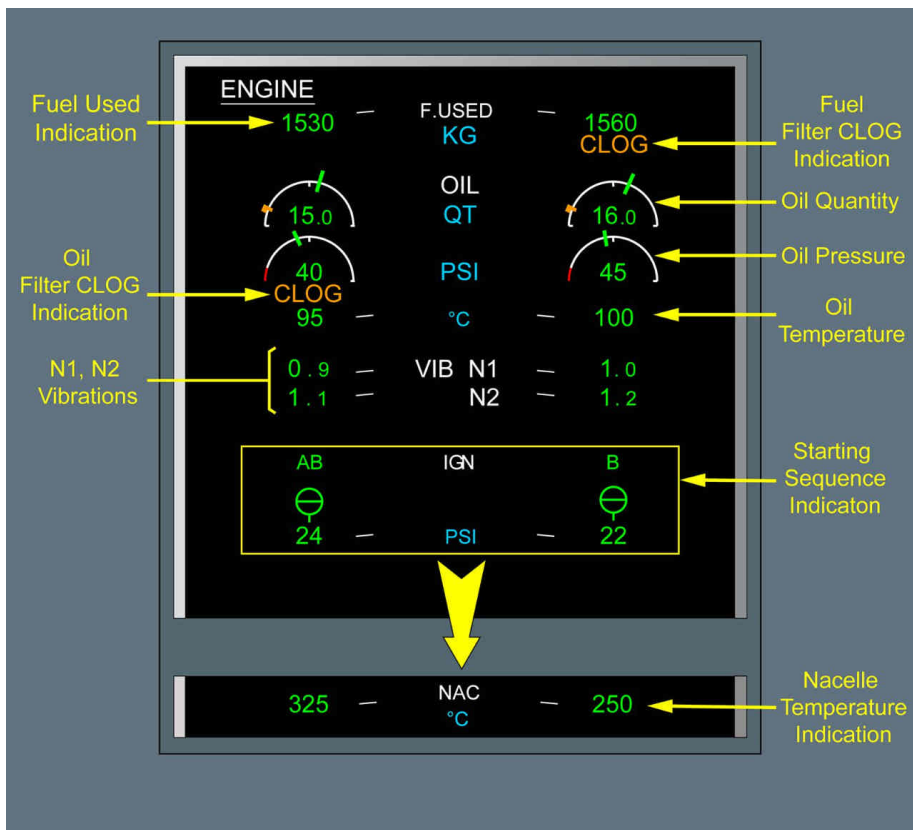
Cyan : When on the ground, Indicates that the thrust bump is selected.

ENG SD PAGE

Applicable to: ALL

Ident.: DSC-70-90-40-60-00018259.0006001 / 21 MAR 16

ENG SD page



Ident.: DSC-70-90-40-60-00018230.0001001 / 21 MAR 16

FUEL USED INDICATION

L12

Green : Indicates the fuel used by each engine.
This value automatically resets on ground, at the next engine start.
Appears in multiples of 10 kg (20 lb).

L12

Dashed : The value accuracy is degraded.
 Two amber dashes appear over all five digits.
 This occurs when the Fuel Flow is not valid in flight, for more than 1 min.

Ident.: DSC-70-90-40-60-00018260.0001001 / 21 MAR 16

FUEL FILTER CLOG INDICATION

Indicates that the pressure loss across the fuel filter is excessive.

Ident.: DSC-70-90-40-60-00018262.0002001 / 22 MAR 16

OIL QUANTITY

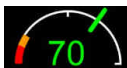
L12

Green : The oil quantity is in normal range.
 The scale goes from 0 to 22 QT.

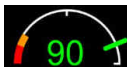
Pulses green : The oil quantity goes below the oil advisory limit (3 QT), that corresponds to the amber mark.
 The needle and the oil quantity value pulse green.
 The indication pulses, when oil quantity goes below 3.25 QT, and remains pulsing as long as oil quantity is below 4.75 QT.

Ident.: DSC-70-90-40-60-00018261.0002001 / 28 MAY 20

OIL PRESSURE

L12


Green
 The oil pressure is in normal range.
 The scale goes from 0 to 100 PSI.

L12


Pulses green
 The oil pressure is:

- Above 90 PSI, or

The oil pressure stops pulsing when oil pressure goes below 85 PSI.

- Between 13 PSI and 16 PSI, when N2 is above 75 %.

The oil pressure stops pulsing when oil pressure goes above 20 PSI.

L12


Red
 The oil pressure is in the red range.
 The red range is between 0 and 13 PSI.

Ident.: DSC-70-90-40-60-00018263.0007001 / 30 AUG 18

OIL TEMPERATURE

- Green : The oil temperature is in normal range.
- Pulses green : The oil temperature is between the advisory and caution thresholds for less than 15 min.
- Amber : The oil temperature is:
- Between the advisory and caution thresholds for more than 15 min, or
 - Above the caution threshold, or
 - Under the minimum temperature before takeoff threshold.

Ident.: DSC-70-90-40-60-00018266.0001001 / 21 MAR 16

OIL FILTER CLOG INDICATION

Indicates that the pressure loss across the oil filter is excessive.

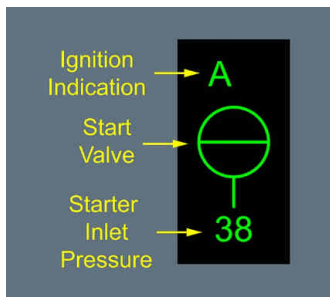
Ident.: DSC-70-90-40-60-00018267.0006001 / 31 OCT 23

N1, N2 VIBRATIONS

- Green : The vibration of the LP(HP) rotor is in normal range.
- Pulses green : The level of LP(HP) rotor vibration is excessive.
Associated with the ECAM alert **ENG 1(2) HIGH VIBRATION** (Refer to *PRO-ABN-ENG ENG 1(2) HIGH VIBRATION - ANNUNCIATION*).

Ident.: DSC-70-90-40-60-00018268.0002001 / 21 MAR 16

STARTING SEQUENCE INDICATION



Ident.: DSC-70-90-40-60-00018269.0001001 / 21 MAR 16

IGNITION INDICATION



: The igniter A (B) is used for the engine start sequence.



: Both igniters A and B are used for the engine start sequence or continuous ignition.

Ident.: DSC-70-90-40-60-00018270.0001001 / 21 MAR 16

START VALVE



: The engine start valve is fully closed.



: The engine start valve is fully open.

Ident.: DSC-70-90-40-60-00018271.0001001 / 21 MAR 16

STARTER INLET PRESSURE

Green : The starter inlet pressure is normal.

Amber : The starter inlet pressure is either:

- Abnormally high, or
- Abnormally low (below 21 PSI, when N2 is above 10 % and the starter valve is not closed).

Ident.: DSC-70-90-40-60-00018272.0006001 / 21 MAR 16

NACELLE TEMPERATURE INDICATION

The nacelle temperature indication appears when the nacelle temperature of at least one engine goes above the advisory limit if not during the start sequence.

Green : The nacelle temperature is normal.

L12

Pulses green : The nacelle temperature goes above the advisory limit.
The advisory limit is 240 °C.

AIRCRAFT SYSTEMS

ENGINES

CONTROLS AND INDICATORS - ENGINE DISPLAY

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	AIRCRAFT SYSTEMS ENGINES CONTROLS AND INDICATORS - MEMO DISPLAY
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MEMO DISPLAY

Applicable to: ALL

Ident.: DSC-70-90-50-A-00018777.0001001 / 13 MAY 16

IGNITION : This memo appears in green when continuous ignition is activated on any engine.

AIRCRAFT SYSTEMS

ENGINES

CONTROLS AND INDICATORS - MEMO DISPLAY

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PROCEDURES

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES PRELIMINARY PAGES TABLE OF CONTENTS
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PRO-ABN Abnormal and Emergency Procedures

PRO-NOR Normal Procedures

PRO-SPO Special Operations

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M ⁽¹⁾	Localization	DU Title	DU identification	DU date
N	PRO-NOR-SOP-04	ADIRS	00022626.0014001	03 NOV 22
	Criteria: 31-1608, 34-1332, 34-1550, P12909, P6985, P8194 Applicable to: ALL Impacted DU: 00011159 ADIRS <u>Reason for issue:</u> This TDU is issued to inform Operators that with some dedicated FWC standards, some systems that depend on ADIRS data might generate spurious alerts until at least one IR mode selector is switched to NAV.			

R	PRO-NOR-SOP-10	All Engines Taxi at Departure	NG00715	
	PRO-NOR-SOP-10	Radar	00015299.0002001	03 NOV 22
	Criteria: 34-1443, 34-1820, P4647, P4766, P7929 Applicable to: MSN 02155-03060 Impacted DU: 00015298 Taxi - Radar <u>Reason for issue:</u> When in the AUTO position, the MultiScan AUTO mode adjusts the tilt according to the altitude of the aircraft. In cruise, MULTISCAN function provides a large view of the weather ahead, ie display of weather cells located on and below aircraft path. At low altitudes (below FL 200), the tilt is adjusted upward to manage clutter from strong ground targets. In some cases, the weather may be low-lying and therefore may be below the radar beam and not be displayed until the aircraft descends closer to the precipitation level. Therefore, this Temporary Revision is issued to indicate that, when the Multiscan is in the AUTO position, the GAIN should be manually set to +4 when the aircraft is below FL 200. In addition, the flight crew should temporarily set the MULTISCAN sw to MAN, if: - If the weather is good, or not significant, in order to check that the radar is operating correctly: down tilt until displaying ground echoes - The weather display is ambiguous or unexpected, in order to better analyze the weather situation using manual tilt according to standard technique - In particular below FL 200, for situations with low-level weather, weather with low reflectivity or in front of suspected active cells, the flight crew should switch to Manual mode and adjust the tilt setting downward until the weather is detected or the ground clutter appears on the upper part of the display. In addition, the flight crew may increase the manual gain control to display lower reflectivity targets. The manual gain control can be increased in both AUTO and Manual modes to display lower levels of weather. In both cases, ground clutter may also be displayed as a result of low settings and/or increased gain.			

R	PRO-NOR-SOP-10	One Engine Taxi At Departure	NG02221	
	PRO-NOR-SOP-10	Taxi - Radar	00027799.0002001	14 NOV 24
	Criteria: 34-1443, 34-1820, P4647, P4766, P7929 Applicable to: MSN 02155-03060 Impacted DU: 00027798 Taxi - Radar			

Continued on the following page

Continued from the previous page

M ⁽¹⁾	Localization	DU Title	DU identification	DU date
	<u>Reason for issue:</u> When in the AUTO position, the MultiScan AUTO mode adjusts the tilt according to the altitude of the aircraft. In cruise, MULTISCAN function provides a large view of the weather ahead, ie display of weather cells located on and below aircraft path. At low altitudes (below FL 200), the tilt is adjusted upward to manage clutter from strong ground targets. In some cases, the weather may be low-lying and therefore may be below the radar beam and not be displayed until the aircraft descends closer to the precipitation level. Therefore, this Temporary Revision is issued to indicate that, when the Multiscan is in the AUTO position, the GAIN should be manually set to +4 when the aircraft is below FL 200. In addition, the flight crew should temporarily set the MULTISCAN sw to MAN, if: - If the weather is good, or not significant, in order to check that the radar is operating correctly: down tilt until displaying ground echoes - The weather display is ambiguous or unexpected, in order to better analyze the weather situation using manual tilt according to standard technique - In particular below FL 200, for situations with low-level weather, weather with low reflectivity or in front of suspected active cells, the flight crew should switch to Manual mode and adjust the tilt setting downward until the weather is detected or the ground clutter appears on the upper part of the display. In addition, the flight crew may increase the manual gain control to display lower reflectivity targets. The manual gain control can be increased in both AUTO and Manual modes to display lower levels of weather. In both cases, ground clutter may also be displayed as a result of low settings and/or increased gain.			

	PRO-NOR-SOP-11	Before Takeoff	NG00745	
	PRO-NOR-SOP-11	Before Takeoff - Exterior Lights	00014740.0001001	09 NOV 21
	Criteria: J3283 Applicable to: MSN 05746-07792 Impacted DU: 00010392 Before Takeoff - Exterior Lights			
	<u>Reason for issue:</u> The new strobe lights on the Sharklet aircraft can cause visual troubles. Pending final fix, this temporary amendment recalls that the flight crew can switch off the strobe lights if deemed necessary.			

R	PRO-NOR-SOP-14	Climb	NG00723	
	PRO-NOR-SOP-14	Climb - At the Transition Altitude	00025011.0001001	14 NOV 23
	Criteria: 34-1369, 34-1692, P3379, P7425, P7585, P9207, SA Applicable to: MSN 02155-02789, 03031-03060, 05152-05746 Impacted DU: 00025005 Climb - At the Transition Altitude			

Continued on the following page

Continued from the previous page

M ⁽¹⁾	Localization	DU Title	DU identification	DU date
	<u>Reason for issue:</u> <u>Issue 2:</u> The temporary information is reissued to provide more information concerning barometric pressure setting error, in accordance with EASA SIB 2016-05. <u>Issue 1:</u> The temporary revision is issued to advise operators that above the transition level, when the flight crew selects STD on the FCU, the last QNH or QFE barometric pressure setting is transmitted to the ground, instead of the standard pressure value (1 013 hPa). Only the FCU selected altitude, if used by the ATC on ground, may be misinterpreted. The real aircraft altitude transmitted to the ground is not affected, because the standard barometric altitude is transmitted, regardless of the barometric setting selected on the FCU. In addition, the STD value is correctly transmitted to other aircraft systems.			
	PRO-NOR-SOP-14	Climb - Radar	00013047.0003001	24 NOV 23
	Criteria: 34-1443, 34-1820, P7929, SA Applicable to: MSN 02155-03060 Impacted DU: 00010259 Climb - Radar <u>Reason for issue:</u> When in the AUTO position, the MultiScan AUTO mode adjusts the tilt according to the altitude of the aircraft. In cruise, MULTISCAN function provides a large view of the weather ahead, ie display of weather cells located on and below aircraft path. At low altitudes (below FL 200), the tilt is adjusted upward to manage clutter from strong ground targets. In some cases, the weather may be low-lying and therefore may be below the radar beam and not be displayed until the aircraft descends closer to the precipitation level. Therefore, this Temporary Revision is issued to indicate that, when the Multiscan is in the AUTO position, the GAIN should be manually set to +4 when the aircraft is below FL 200. In addition, the flight crew should temporarily set the MULTISCAN sw to MAN, if: - If the weather is good, or not significant, in order to check that the radar is operating correctly: down tilt until displaying ground echoes - The weather display is ambiguous or unexpected, in order to better analyze the weather situation using manual tilt according to standard technique - In particular below FL 200, for situations with low-level weather, weather with low reflectivity or in front of suspected active cells, the flight crew should switch to Manual mode and adjust the tilt setting downward until the weather is detected or the ground clutter appears on the upper part of the display. In addition, the flight crew may increase the manual gain control to display lower reflectivity targets. The manual gain control can be increased in both AUTO and Manual modes to display lower levels of weather. In both cases, ground clutter may also be displayed as a result of low settings and/or increased gain.			

	PRO-NOR-SOP-15	Cruise	NG00734	
	PRO-NOR-SOP-15	Cruise - Radar Tilt	00013068.0006001	09 NOV 21
	Criteria: 34-1443, 34-1820, P7929, SA Applicable to: MSN 02155-03060 Impacted DU: 00010291 Cruise - Radar Tilt			

Continued on the following page

PROCEDURES

PRELIMINARY PAGES

LIST OF EFFECTIVE TEMPORARY DOCUMENTARY UNITS

Continued from the previous page

M ⁽¹⁾	Localization	DU Title	DU identification	DU date
	<u>Reason for issue:</u> When in the AUTO position, the MultiScan AUTO mode adjusts the tilt according to the altitude of the aircraft. In cruise, MULTISCAN function provides a large view of the weather ahead, ie display of weather cells located on and below aircraft path. At low altitudes (below FL 200), the tilt is adjusted upward to manage clutter from strong ground targets. In some cases, the weather may be low-lying and therefore may be below the radar beam and not be displayed until the aircraft descends closer to the precipitation level. Therefore, this Temporary Revision is issued to indicate that, when the Multiscan is in the AUTO position, the GAIN should be manually set to +4 when the aircraft is below FL 200. In addition, the flight crew should temporarily set the MULTISCAN sw to MAN, if: - The weather is good, or not significant, in order to check that the radar is operating correctly: down tilt until displaying ground echoes - The weather display is ambiguous or unexpected, in order to better analyze the weather situation using manual tilt according to standard technique - In particular below FL 200, for situations with low-level weather, weather with low reflectivity or in front of suspected active cells, the flight crew should switch to Manual mode and adjust the tilt setting downward until the weather is detected or the ground clutter appears on the upper part of the display. In addition, the flight crew may increase the manual gain control to display lower reflectivity targets. The manual gain control can be increased in both AUTO and Manual modes to display lower levels of weather. In both cases, ground clutter may also be displayed as a result of low settings and/or increased gain.			

R	PRO-NOR-SOP-16	Descent Preparation	NG00916	
	PRO-NOR-SOP-16	Descent Preparation - Radar	00013353.0003001	09 NOV 21
	Criteria: 34-1443, 34-1820, P7929, SA Applicable to: MSN 02155-03060 Impacted DU: 00011545 Descent Preparation - Radar			

Continued on the following page

Continued from the previous page

M ⁽¹⁾	Localization	DU Title	DU identification	DU date
	<u>Reason for issue:</u> When in the AUTO position, the MultiScan AUTO mode adjusts the tilt according to the altitude of the aircraft. In cruise, MULTISCAN function provides a large view of the weather ahead, ie display of weather cells located on and below aircraft path. At low altitudes (below FL 200), the tilt is adjusted upward to manage clutter from strong ground targets. In some cases, the weather may be low-lying and therefore may be below the radar beam and not be displayed until the aircraft descends closer to the precipitation level. Therefore, this Temporary Revision is issued to indicate that, when the Multiscan is in the AUTO position, the GAIN should be manually set to +4 when the aircraft is below FL 200. In addition, the flight crew should temporarily set the MULTISCAN sw to MAN, if: - If the weather is good, or not significant, in order to check that the radar is operating correctly: down tilt until displaying ground echoes - The weather display is ambiguous or unexpected, in order to better analyze the weather situation using manual tilt according to standard technique - In particular below FL 200, for situations with low-level weather, weather with low reflectivity or in front of suspected active cells, the flight crew should switch to Manual mode and adjust the tilt setting downward until the weather is detected or the ground clutter appears on the upper part of the display. In addition, the flight crew may increase the manual gain control to display lower reflectivity targets. The manual gain control can be increased in both AUTO and Manual modes to display lower levels of weather. In both cases, ground clutter may also be displayed as a result of low settings and/or increased gain.			

PRO-NOR-SOP-18-B	Initial Approach	NG01260	
PRO-NOR-SOP-18-B	Initial Approach - Radar	00014648.0003001	09 NOV 21
Criteria: 34-1443, 34-1820, P7929, SA Applicable to: MSN 02155-03060 Impacted DU: 00014647 Initial Approach - Radar			

Continued on the following page

Continued from the previous page

M ⁽¹⁾	Localization	DU Title	DU identification	DU date
	<u>Reason for issue:</u> When in the AUTO position, the MultiScan AUTO mode adjusts the tilt according to the altitude of the aircraft. In cruise, MULTISCAN function provides a large view of the weather ahead, ie display of weather cells located on and below aircraft path. At low altitudes (below FL 200), the tilt is adjusted upward to manage clutter from strong ground targets. In some cases, the weather may be low-lying and therefore may be below the radar beam and not be displayed until the aircraft descends closer to the precipitation level. Therefore, this Temporary Revision is issued to indicate that, when the Multiscan is in the AUTO position, the GAIN should be manually set to +4 when the aircraft is below FL 200. In addition, the flight crew should temporarily set the MULTISCAN sw to MAN, if: - If the weather is good, or not significant, in order to check that the radar is operating correctly: down tilt until displaying ground echoes - The weather display is ambiguous or unexpected, in order to better analyze the weather situation using manual tilt according to standard technique - In particular below FL 200, for situations with low-level weather, weather with low reflectivity or in front of suspected active cells, the flight crew should switch to Manual mode and adjust the tilt setting downward until the weather is detected or the ground clutter appears on the upper part of the display. In addition, the flight crew may increase the manual gain control to display lower reflectivity targets. The manual gain control can be increased in both AUTO and Manual modes to display lower levels of weather. In both cases, ground clutter may also be displayed as a result of low settings and/or increased gain.			

(1) Evolution code : N=New, R=Revised, E=Effectivity

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

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PRO-ABN-ABN-00 INTRODUCTION

	Content.....	A
I	Procedure Layout.....	B
	Abnormal and Emergency Callouts.....	C

PRO-ABN-ABN-ADV [ADV] ECAM ADVISORY

I 1	ECAM Advisory Conditions.....	A
-----	-------------------------------	---

PRO-ABN-ABN-MEM [MEM] MEMORY ITEMS

	[MEM] Memory Items.....	A
--	-------------------------	---

PRO-ABN-ABN-QRH [QRH] PROCEDURES

2	[QRH] Procedures.....	A
---	-----------------------	---

I 3 PRO-ABN-A-ICE A-ICE

	ANTI ICE ALL PITOT.....	A
	ANTI ICE CAPT(F/O) TAT.....	B
I	ANTI ICE CAPT + F/O AOA.....	C
	ANTI ICE CAPT + F/O PITOT.....	D
I	ANTI ICE CAPT + STBY AOA.....	E
	ANTI ICE CAPT + STBY PITOT.....	F
	ANTI ICE CAPT PITOT	G
	ANTI ICE CAPT L(R) STAT.....	H
I 4	ANTI ICE CAPT AOA.....	I
	ANTI ICE CAPT PROBES.....	J
	ANTI ICE DETECT FAULT.....	K
I 5	ANTI ICE ENG 1(2) VALVE CLSD.....	L
	ANTI ICE ENG 1(2) VALVE OPEN.....	M
I	ANTI ICE F/O + STBY AOA.....	N
	ANTI ICE F/O + STBY PITOT.....	O
	ANTI ICE F/O PITOT or L(R) STAT or AOA.....	P
	ANTI ICE F/O PROBES.....	Q
	ANTI ICE ICE DETECTED.....	R
	ANTI ICE L + R WINDSHIELD.....	S
	ANTI ICE L(R) WINDOW.....	T
	ANTI ICE L(R) WINDSHIELD.....	U
	ANTI ICE STBY PITOT or L(R) STAT or AOA.....	V
	ANTI ICE STBY PROBES.....	W

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

PRELIMINARY PAGES - TABLE OF CONTENTS

Continued from the previous page

6 PRO-ABN-AIR AIR

	[QRH] BLEED 1+2 FAULT.....	A
	<u>AIR</u> APU BLEED FAULT.....	B
	<u>AIR</u> APU BLEED LEAK.....	C
	<u>AIR</u> APU BLEED LEAK APU LEAK FED BY ENG.....	D
	<u>AIR</u> APU LEAK DET FAULT.....	E
	<u>AIR</u> BLEED 1(2) OFF.....	F
	<u>AIR</u> COND CTL 1(2) - A(B) FAULT.....	G
7	<u>AIR</u> ENG 1(2) BLEED ABNORM PR.....	H
8	<u>AIR</u> ENG 1(2) BLEED FAULT.....	I
9	<u>AIR</u> ENG 1(2) BLEED FAULT BLEED NOT CLOSED.....	J
	<u>AIR</u> ENG 1+2 BLEED FAULT.....	K
	<u>AIR</u> ENG 1+2 BLEED FAULT LEFT LEAK.....	L
	<u>AIR</u> ENG 1+2 BLEED FAULT RIGHT LEAK.....	M
	<u>AIR</u> ENG 1+2 BLEED FAULT LEFT LEAK AND RIGHT LEAK.....	N
	<u>AIR</u> ENG 1(2) BLEED LO TEMP (OPPOSITE BLEED AVAILABLE).....	O
10	<u>AIR</u> ENG 1(2) BLEED LO TEMP (OPPOSITE BLEED NOT AVAILABLE).....	P
11	<u>AIR</u> ENG 1+2 BLEED LO TEMP.....	Q
	<u>AIR</u> ENG 1(2) BLEED HI TEMP.....	R
12	<u>AIR</u> ENG 1(2) BLEED LEAK.....	S
	<u>AIR</u> ENG 1(2) BLEED NOT CLSD.....	T
	<u>AIR</u> ENG 1(2) HP VALVE FAULT.....	U
	<u>AIR</u> ENG 1(2) LEAK DET FAULT.....	V
13	<u>AIR</u> aft CRG VENT FAULT.....	W
	<u>AIR</u> FWD CRG VENT FAULT.....	X
14	<u>AIR</u> L(R) WING LEAK.....	Y
	<u>AIR</u> L(R) WNG LEAK DET FAULT.....	Z
	<u>AIR</u> PACK 1(2) FAULT.....	AA
15	<u>AIR</u> PACK 1+2 FAULT.....	AB
	<u>AIR</u> PACK 1(2) OFF.....	AC
	<u>AIR</u> PACK 1(2) OVHT.....	AD
	<u>AIR</u> PACK 1(2) REGUL FAULT.....	AE
	<u>AIR</u> X BLEED FAULT.....	AF

Continued on the following page

Continued from the previous page

PRO-ABN-APU APU

<u>APU</u> AUTO (EMER) SHUT DOWN.....	A
<u>APU</u> FIRE DET FAULT.....	B
<u>APU</u> FIRE LOOP A(B) FAULT.....	C

PRO-ABN-APUF APU FIRE

■ <u>APU</u> FIRE ■.....	A
--------------------------	---

| PRO-ABN-AUTO_FLT AUTO FLT

<u>AUTO FLT</u> A/THR LIMITED.....	A
<u>AUTO FLT</u> A/THR OFF.....	B
■ <u>AUTO FLT</u> AP OFF ■.....	C
<u>AUTO FLT</u> FAC 1(2) FAULT.....	D
16 | <u>AUTO FLT</u> FAC 1 + 2 FAULT.....	E
| <u>AUTO FLT</u> FAC VERSIONS DISAGREE.....	F
<u>AUTO FLT</u> FCU 1(2) FAULT.....	G
| <u>AUTO FLT</u> FCU 1 + 2 FAULT.....	H
<u>AUTO FLT</u> REAC W/S DET FAULT.....	I
<u>AUTO FLT</u> RUD TRIM 1(2) FAULT.....	J
17 | <u>AUTO FLT</u> RUD TRIM SYS.....	K
18 | <u>AUTO FLT</u> RUD TRV LIM 1(2).....	L
19 | <u>AUTO FLT</u> RUD TRV LIM SYS.....	M
<u>AUTO FLT</u> TCAS MODE FAULT.....	N
<u>AUTO FLT</u> YAW DAMPER 1(2).....	O
20 | <u>AUTO FLT</u> YAW DAMPER SYS.....	P

PRO-ABN-AVNCS AVIONICS SMOKE

<u>AVIONICS SMOKE</u>	A
-----------------------------	---

PRO-ABN-BLEED BLEED

<u>BLEED</u> MONITORING FAULT.....	A
<u>BLEED</u> MONIT SYS 1(2) FAULT.....	B

Continued on the following page

Continued from the previous page
PRO-ABN-BRAKES BRAKES

■■■■ [MEM] LOSS OF BRAKING ■■■■.....	A
[QRH] ASYMMETRIC BRAKING.....	B
[QRH] RESIDUAL BRAKING.....	C
BRAKES A/SKID N/WS FAULT or A/SKID N/WS OFF.....	D
BRAKES ALTN BRK FAULT.....	E
BRAKES ALTN L(R) RELEASED.....	F
BRAKES AUTO BRK FAULT.....	G
BRAKES BRK Y ACCU LO PR.....	H
BRAKES HOT.....	I
BRAKES NORM + ALTN FAULT.....	J
BRAKES NORM BRK FAULT.....	K
BRAKES PARK BRK FAULT 	L
BRAKES PARK BRK LO PR.....	M
BRAKES PARK BRK ON.....	N
BRAKES RELEASED.....	O
BRAKES SYS 1(2) FAULT.....	P

PRO-ABN-NWS BRAKES-N/WS

BRAKES-N/WS MINOR FAULT.....	A
------------------------------	---

PRO-ABN-CAB_PR CAB PR

[QRH] CABIN OVERPRESSURE.....	A
■■■■ CAB PR EXCESS CAB ALT ■■■■.....	B
■■■■ CAB PR EXCES RESIDUAL PR ■■■■.....	C
CAB PR LDG ELEV FAULT.....	D
CAB PR LO DIFF PR.....	E
CAB PR OFV NOT OPEN	F
CAB PR SAFETY VALVE OPEN.....	G
CAB PR SYS 1(2) FAULT.....	H
CAB PR SYS 1+2 FAULT.....	I

PRO-ABN-CRG_SMOKE CARGO SMOKE

CARGO SMOKE FWD(AFT) BTL SQUIB FAULT.....	A
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PRO-ABN-C_B C/B

C/B TRIPPED.....	A
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Continued on the following page

Continued from the previous page
PRO-ABN-COM COM

	<u>COM</u> ACARS FAULT 	A
	<u>COM</u> CIDS 1 + 2 FAULT.....	B
	<u>COM</u> HF 1(2) DATA FAULT 	C
	<u>COM</u> SATCOM DATA FAULT 	D
	<u>COM</u> SATCOM FAULT 	E
23	<u>COM</u> SINGLE PTT STUCK.....	F
	<u>COM</u> VHF 1(2)(3) /HF 1(2) EMITTING 	G
	<u>COM</u> VHF 3 DATA FAULT 	H

PRO-ABN-COND COND

	[QRH] TOO HOT COCKPIT AND CABIN TEMPERATURE IN FLIGHT.....	A
24	<u>COND</u> FWD CAB/AFT CAB/CKPT DUCT OVHT.....	B
25	<u>COND</u> AFT CARGO DUCT OVHT.....	C
	<u>COND</u> FWD CARGO DUCT OVHT.....	D
26	<u>COND</u> AFT CRG HEAT FAULT.....	E
	<u>COND</u> FWD CRG HEAT FAULT.....	F
27	<u>COND</u> aft CRG ISOL VALVE.....	G
	<u>COND</u> FWD(AFT) CRG ISOL VALVE 	H
	<u>COND</u> FWD CRG ISOL VALVE.....	I
28	<u>COND</u> HOT AIR FAULT.....	J
	<u>COND</u> L+R CAB FAN FAULT.....	K
	<u>COND</u> LAV + GALLEY FAN FAULT.....	L
	<u>COND</u> TRIM AIR SYS FAULT.....	M
	<u>COND</u> ZONE REGUL FAULT (PRIMARY CHANNEL FAILED).....	N
	<u>COND</u> ZONE REGUL FAULT (PRIMARY AND SECONDARY CHANNELS FAILED).....	O

PRO-ABN-CONFIG CONFIG

	<u>CONFIG</u> L(R) SIDESTICK FAULT (BY TAKE OVER) 	A
	<u>CONFIG</u> PARK BRK ON 	B
	<u>CONFIG</u> PITCH TRIM NOT IN T.O RANGE 	C
	<u>CONFIG</u> RUD TRIM NOT IN T.O RANGE 	D
	<u>CONFIG</u> SLATS (FLAPS) NOT IN T.O CONFIG 	E
	<u>CONFIG</u> SPD BRK NOT RETRACTED 	F

Continued on the following page

Continued from the previous page
PRO-ABN-DATALINK DATALINK

<u>DATALINK</u> ATC FAULT.....	A
<u>DATALINK</u> ATSU FAULT.....	B
<u>DATALINK</u> COMPANY FAULT.....	C

PRO-ABN-DOOR DOOR

[QRH] COCKPIT DOOR FAULT.....	A
29 <u>DOOR</u> L(R)(FWD)(AFT) AVIONICS (IN FLIGHT).....	B
<u>DOOR</u> L(R)(FWD)(AFT) AVIONICS (ON GROUND).....	C
30 <u>DOOR</u> L(R) FWD(AFT) CABIN (IN FLIGHT).....	D
<u>DOOR</u> L(R) FWD(AFT) CABIN (ON GROUND).....	E
31 <u>DOOR</u> L(R) FWD(AFT) EMER EXIT (IN FLIGHT).....	F
<u>DOOR</u> L(R) FWD(AFT) EMER EXIT (ON GROUND).....	G
32 <u>DOOR</u> FWD(AFT)(BULK) CARGO (IN FLIGHT).....	H
<u>DOOR</u> FWD(AFT)(BULK) CARGO (ON GROUND).....	I

PRO-ABN-EIS EIS

[QRH] Display Unit Failure.....	A
<u>EIS</u> DMC 1(2)(3) FAULT.....	B
<u>EIS</u> DMC/FWC COM FAULT.....	C

PRO-ABN-ELEC ELEC

[QRH] C/B Tripped.....	A
I [QRH] ELEC EMER CONFIG SYS REMAINING.....	B
<u>ELEC</u> AC BUS 1 FAULT.....	C
<u>ELEC</u> AC BUS 2 FAULT.....	D
<u>ELEC</u> AC ESS BUS ALTN.....	E
<u>ELEC</u> AC ESS BUS FAULT.....	F
<u>ELEC</u> AC ESS BUS SHED.....	G
<u>ELEC</u> APU GEN FAULT.....	H
<u>ELEC</u> BAT 1(2) FAULT.....	I
<u>ELEC</u> BAT 1(2) OFF.....	J
<u>ELEC</u> BCL 1(2) FAULT.....	K
<u>ELEC</u> DC BAT BUS FAULT.....	L
33 <u>ELEC</u> DC BUS 1 FAULT.....	M
34 <u>ELEC</u> DC BUS 2 FAULT.....	N
<u>ELEC</u> DC BUS 1+2 FAULT.....	O

Continued on the following page

Continued from the previous page

35	ELEC DC EMER CONFIG.....	P
36	ELEC DC ESS BUS FAULT.....	Q
	ELEC DC ESS BUS SHED.....	R
37	■ ELEC EMER CONFIG ■.....	S
	ELEC EMER GEN 1 LINE OFF.....	T
	■ ELEC ESS BUSES ON BAT ■.....	U
	ELEC GEN 1(2) or APU GEN OVERLOAD.....	V
	ELEC GEN 1(2) FAULT.....	W
38	ELEC GEN 1(2) OFF.....	X
39	ELEC IDG 1(2) DISCONNECTED.....	Y
	ELEC IDG 1(2) OIL LO PR/OVHT.....	Z
	ELEC STATIC INV FAULT.....	AA
	ELEC TR 1(2) FAULT.....	AB

40 PRO-ABN-ENG ENG

	[QRH] ENG RELIGHT IN FLIGHT.....	A
	■ [QRH] ALL ENG FAIL ■.....	B
	[QRH] ENG 1(2) STALL.....	C
	[QRH] ENGINE TAILPIPE FIRE.....	D
	[QRH] HIGH ENGINE VIBRATION.....	E
	[QRH] On Ground - Non ENG Shutdown after ENG Master OFF.....	F
	[QRH] One Engine Inoperative - Circling Approach.....	G
	[QRH] One Engine Inoperative - Straight-In Approach.....	H
41	■ ENG ALL ENGINES FAILURE ■.....	I
	ENG FUEL CONTAMINATED.....	J
	ENG 1(2) BLEED STATUS FAULT (IN FLIGHT).....	K
42	ENG 1(2) BLEED STATUS FAULT (ON GROUND).....	L
43	ENG 1+2 COMPRESSOR VANE.....	M
	ENG 1(2) COMPRESSOR VANE.....	N
	ENG 1(2) CTL VALVE FAULT.....	O
44	ENG 1(2) EIU FAULT.....	P
	ENG 1(2) FADEC A(B) FAULT.....	Q
	ENG 1(2) FADEC ALTERNATOR.....	R
45	ENG 1(2) FADEC FAULT.....	S
	ENG 1(2) FADEC HI TEMP.....	T
46	ENG 1(2) FAIL.....	U
	■ ENG 1(2) FIRE (IN FLIGHT) ■.....	V
	■ ENG 1(2) FIRE (ON GROUND) ■.....	W

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

PRELIMINARY PAGES - TABLE OF CONTENTS

Continued from the previous page

ENG 1(2) FIRE DET FAULT.....	X
ENG 1(2) FIRE LOOP A(B) FAULT.....	Y
ENG 1(2) FUEL CTL FAULT.....	Z
ENG 1(2) FUEL FILTER CLOG.....	AA
ENG 1(2) FUEL RETURN VALVE.....	AB
ENG 1(2) HIGH VIBRATION.....	AC
ENG 1(2) HP FUEL VALVE.....	AD
ENG 1(2) IGN FAULT (IGN A or B Fault).....	AE
ENG 1(2) IGN FAULT (IGN A+B FAULT).....	AF
ENG 1(2) LOW N1 (On Ground).....	AG
ENG 1(2) N1 or N2 or EGT or FF DISCREPANCY.....	AH
ENG 1(2) N1/N2/EGT OVER LIMIT.....	AI
ENG 1(2) OIL FILTER CLOG.....	AJ
ENG 1(2) OIL HI TEMP.....	AK
ENG 1(2) OIL LO PR.....	AL
ENG 1(2) ONE TLA FAULT.....	AM
ENG 1(2) OVSPD PROT FAULT.....	AN
ENG 1(2) PROBES FAULT.....	AO
ENG 1(2) REV INHIBITED.....	AP
ENG 1(2) REV ISOL FAULT.....	AQ
ENG 1(2) REV PRESSURIZED.....	AR
ENG REV SET.....	AS
ENG 1(2) REV SWITCH FAULT.....	AT
ENG 1(2) REVERSE UNLOCKED.....	AU
ENG 1(2) REVERSER FAULT.....	AV
ENG SAT ABOVE FLEX TEMP.....	AW
ENG 1(2) SENSOR FAULT.....	AX
ENG 1(2) SHUT DOWN.....	AY
ENG 1(2) STALL.....	AZ
ENG 1(2) START FAULT.....	BA
ENG 1(2) START VALVE FAULT.....	BB
ENG 1(2) THR LEVER ABV IDLE.....	BC

Continued on the following page

Continued from the previous page

	ENG 1(2) THR LEVER DISAGREE.....	BD
	ENG 1(2) THR LEVER FAULT.....	BE
I	ENG THR LEVERS NOT SET.....	BF
	ENG THRUST LOCKED.....	BG
	ENG TYPE DISAGREE.....	BH
	ENG VIB SYS FAULT.....	BI
55	PRO-ABN-F_CTL F/CTL	
	[QRH] Landing with Slats or Flaps Jammed.....	A
	[QRH] RUDDER JAM.....	B
	[QRH] STABILIZER JAM.....	C
	F/CTL AIL SERVO FAULT.....	D
56	F/CTL ALTN LAW.....	E
57	F/CTL DIRECT LAW.....	F
	F/CTL ELAC 1(2) FAULT (ONE COMPUTER FAILED).....	G
58	F/CTL ELAC 1(2) FAULT (BOTH COMPUTERS FAILED).....	H
59	F/CTL ELAC 1(2) PITCH FAULT (ONE COMPUTER FAILED).....	I
	F/CTL ELAC PITCH FAULT	J
	F/CTL ELEV REDUND DEGRDD	K
	F/CTL ELEV SERVO FAULT.....	L
	F/CTL FCDC 1(2) FAULT.....	M
	F/CTL FCDC 1+2 FAULT.....	N
	F/CTL FLAP ATTACH SENSOR.....	O
60	F/CTL FLAPS FAULT/LOCKED.....	P
	■ F/CTL FLAP LVR NOT ZERO ■.....	Q
	F/CTL FLAP SYS 1(2) FAULT.....	R
	F/CTL FLAP/MCDU DISAGREE.....	S
	F/CTL FLAPS/SLATS FAULT/LOCKED.....	T
	F/CTL GND SPLR 5 FAULT.....	U
	F/CTL GND SPLR 1+2(3+4) FAULT.....	V
	F/CTL GND SPLR NOT ARMED.....	W
	F/CTL L(R) AIL FAULT.....	X
61	F/CTL L(R) ELEV FAULT.....	Y
62	■ F/CTL L+R ELEV FAULT ■.....	Z
	F/CTL L(R) SIDESTICK FAULT.....	AA
	F/CTL PITCH TRIM/MCDU/CG DISAGREE.....	AB
63	F/CTL SEC 1(2)(3) FAULT.....	AC

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

PRELIMINARY PAGES - TABLE OF CONTENTS

Continued from the previous page

F/CTL SIDESTICK PRIORITY.....	AD
F/CTL SLAT (FLAP) TIP BRK FAULT.....	AE
F/CTL SLATS AND FLAPS FAULT IN CONF 0.....	AF
F/CTL SLATS FAULT/LOCKED.....	AG
F/CTL SLAT SYS 1(2) FAULT.....	AH
F/CTL SPD BRK 2 (3+4) FAULT.....	AI
F/CTL SPD BRK DISAGREE (SURFACES 3+4 AFFECTED).....	AJ
F/CTL SPD BRK DISAGREE (SURFACES 2+3+4 AFFECTED).....	AK
F/CTL SPD BRK FAULT.....	AL
F/CTL SPD BRK STILL OUT.....	AM
F/CTL SPLR FAULT.....	AN
F/CTL STABILIZER JAM.....	AO

PRO-ABN-FUEL FUEL

[QRH] FUEL IMBALANCE.....	A
[QRH] FUEL LEAK.....	B
[QRH] FUEL OVERREAD.....	C
[QRH] GRAVITY FUEL FEEDING.....	D
FUEL ACT XFR FAULT 	E
FUEL ACT PUMP LO PR 	F
FUEL APU LP VALVE FAULT.....	G
FUEL AUTO FEED FAULT.....	H
FUEL AUTO TRANSFER FAULT.....	I
FUEL CTR L(R) XFR FAULT.....	J
FUEL CTR L + R XFR FAULT (VALVES NOT FULLY CLOSED).....	K
FUEL CTR L + R XFR FAULT (VALVES NOT FULLY OPEN).....	L
FUEL CTR TK PUMP 1(2) LO PR.....	M
FUEL CTR TK PUMPS LO PR.....	N
FUEL CTR TK PUMPS OFF.....	O
FUEL CTR TK XFR OFF.....	P
FUEL ENG 1(2) LP VALVE FAULT.....	Q
FUEL F. USED/FOB DISAGREE.....	R
FUEL FQI CH 1(2) FAULT.....	S
FUEL FQI CH 1+2 FAULT.....	T
FUEL IDG 1(2) COOL FAULT.....	U
FUEL FUEL INERTING SYS FAULT.....	V
FUEL L (R) OUTER (INNER) TK HI TEMP.....	W

Continued on the following page

Continued from the previous page

	FUEL L (R) OUTER (INNER) TK LO TEMP.....	X
	FUEL L (R) OUTER XFR CLOSED.....	Y
	FUEL L (R) OUTER XFR OPEN.....	Z
	FUEL L (R) TK PUMP 1(2) LO PR.....	AA
70	FUEL L (R) TK PUMP 1 + 2 LO PR.....	AB
71	FUEL L (R) TK PUMP 1 + 2 LO PR (CENTER TANK EMPTY).....	AC
72	FUEL L (R) TK PUMP 1 + 2 LO PR (CENTER TANK NOT EMPTY).....	AD
73	FUEL L (R) WING TK LO LVL.....	AE
	FUEL L + R WING TK LO LVL.....	AF
	FUEL L (R) WING TK OVERFLOW.....	AG
	FUEL LO LVL DET FAULT.....	AH
	FUEL X FEED VALVE FAULT.....	AI

PRO-ABN-FWS FWS

	FWS AUDIO DEGRADED.....	A
	FWS AUDIO REDUND LOST ON FWC 1(2).....	B
	FWS FWC 1 + 2 FAULT.....	C
	FWS FWC 1(2) FAULT.....	D
	FWS OEB/FWC DISCREPANCY.....	E
	FWS SDAC 1 + 2 FAULT.....	F
	FWS SDAC 1(2) FAULT.....	G
	FWS SLAT (FLAP) SYNCHRO FAULT.....	H

PRO-ABN-HYD HYD

	HYD B ELEC PUMP LO PR or OVHT.....	A
	HYD B RSVR LO AIR PR.....	B
	HYD B RSVR LO LVL.....	C
	HYD B RSVR OVHT.....	D
	HYD G ENG 1 PUMP LO PR (PTU OPERATIVE).....	E
74	HYD G ENG 1 PUMP LO PR (PTU INOPERATIVE).....	F
75	HYD G RSVR LO AIR PR.....	G
76	HYD G RSVR LO LVL.....	H
77	HYD G RSVR OVHT.....	I
	HYD Y ELEC PUMP LO PR or OVHT.....	J
	HYD Y ENG 2 PUMP LO PR (PTU OPERATIVE).....	K
78	HYD Y ENG 2 PUMP LO PR (PTU INOPERATIVE).....	L
79	HYD Y RSVR LO AIR PR.....	M

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

PRELIMINARY PAGES - TABLE OF CONTENTS

Continued from the previous page

HYD Y RSVR LO LVL.....	N
HYD Y RSVR OVHT.....	O
■ HYD B+Y SYS LO PR ■.....	P
■ HYD G+B SYS LO PR ■.....	Q
■ HYD G+Y SYS LO PR ■.....	R
HYD PTU FAULT.....	S
HYD RAT FAULT.....	T

PRO-ABN-LG L/G

[QRH] Landing with Abnormal L/G.....	A
[QRH] L/G GRAVITY EXTENSION.....	B
L/G DOORS NOT CLOSED.....	C
■ L/G GEAR NOT DOWN ■.....	D
■ L/G GEAR NOT DOWNLOCKED ■.....	E
L/G GEAR NOT UNLOCKED.....	F
L/G GEAR UPLOCK FAULT.....	G
L/G LGCIU 1(2) FAULT.....	H
L/G LGCIU 1+2 FAULT.....	I
L/G SHOCK ABSORBER FAULT (SHOCK ABSORBER EXTENDED ON GROUND).....	J
L/G SHOCK ABSORBER FAULT (SHOCK ABSORBER NOT EXTENDED AFTER LIFTOFF).....	K
L/G SYS DISAGREE.....	L

PRO-ABN-MISC MISC

■ [MEM] EMER DESCENT ■.....	A
■ [MEM] Stall Recovery ■.....	B
■ [MEM] Stall Warning At Liftoff ■.....	C
[QRH] BOMB ON BOARD.....	D
[QRH] COCKPIT WINDSHIELD / WINDOW ARCING.....	E
[QRH] COCKPIT WINDSHIELD / WINDOW CRACKED.....	F
■ [QRH] DITCHING ■.....	G
■ [QRH] EMER EVAC ■.....	H
■ [QRH] EMER LANDING ALL ENG FAILURE ■.....	I
■ [QRH] FORCED LANDING ■.....	J
[QRH] Overweight Landing.....	K
[QRH] Severe Turbulence.....	L
[QRH] TAILSTRIKE.....	M
[QRH] VOLCANIC ASH ENCOUNTER	N

Continued on the following page

Continued from the previous page
92 PRO-ABN-NAV NAV

93	[MEM] Unreliable Speed Indication.....	A
	[QRH] ADR 1+2+3 FAULT.....	B
	■ [QRH] ALL ADR OFF ■.....	C
	[QRH] IR Alignment in ATT Mode.....	D
	NAV ADR 1(2)(3) FAULT.....	E
94	NAV ADR 1+2(1+3)(2+3) FAULT.....	F
95	■ NAV ADR 1+2+3 FAULT ■.....	G
96	NAV ADR DISAGREE.....	H
	NAV ADS-B RPTG 1(2) FAULT.....	I
	NAV ALT DISCREPANCY.....	J
	NAV AOA DISAGREE.....	K
	NAV CAPT(F/O)(STBY) AOA FAULT.....	L
	NAV ATC/XPDR 1(2) FAULT.....	M
	NAV ATC/XPDR 1+2 FAULT.....	N
	NAV ATC/XPDR STBY.....	O
	NAV ATT DISCREPANCY.....	P
	NAV BARO REF DISCREPANCY.....	Q
	NAV BARO VALUE DISAGREE.....	R
	NAV BKUP SPD/ALT ON CAPT(F/O) PFD.....	S
97	NAV BKUP SPD/ALT ON CAPT+F/O PFD.....	T
98	NAV FM/GPS POS DISAGREE 	U
	NAV GPS 1(2) FAULT 	V
	NAV GPWS FAULT.....	W
	NAV GPWS TERR DET FAULT.....	X
	NAV HDG DISCREPANCY.....	Y
	NAV IAS DISCREPANCY.....	Z
	NAV ILS 1(2)(1+2) FAULT.....	AA
	NAV IR 1(2)(3) FAULT.....	AB
99	NAV IR 1+2(1+3)(2+3) FAULT.....	AC
00	NAV IR DISAGREE.....	AD
	NAV IR NOT ALIGNED.....	AE
	NAV LS TUNING DISAGREE.....	AF
	NAV PRED W/S DET FAULT 	AG
01	NAV RA 1 AND 2 FAULT (DUAL RA FAILURE).....	AH

Continued on the following page

Continued from the previous page

NAV RA 1(2) FAULT.....	AI
NAV RA DEGRADED.....	AJ
NAV TCAS FAULT.....	AK
NAV TCAS STBY.....	AL
NAV L(R) CAPT(F/O) STATIC FAULT.....	AM
■■■■ STALL WARNING ■■■■.....	AN

PRO-ABN-OVERSPEED OVERSPEED

■■■■ OVERSPEED ■■■■.....	A
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PRO-ABN-RECORDER RECORDER

RECORDER CVR FAULT.....	A
RECORDER DFDR FAULT.....	B
RECORDER SYS FAULT.....	C

PRO-ABN-SEVERE_ICE SEVERE ICE

SEVERE ICE DETECTED.....	A
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PRO-ABN-SMOKE SMOKE

■■■■ [QRH] SMOKE / FUMES / AVNCS SMOKE ■■■■.....	A
■■■■ [QRH] REMOVAL OF SMOKE / FUMES ■■■■.....	B
[QRH] SMOKE / FIRE FROM LITHIUM BATTERY.....	C
■■■■ SMOKE AFT CARGO SMOKE <A> ■■■■.....	D
SMOKE AFT CRG DET FAULT <A>.....	E
■■■■ SMOKE FWD CARGO SMOKE <A> ■■■■.....	F
SMOKE FWD(AFT) CRG BTL 1(2) FAULT <A>.....	G
SMOKE FWD CRG DET FAULT <A>.....	H
SMOKE DET FAULT.....	I
SMOKE LAVATORY DET FAULT.....	J
■■■■ SMOKE LAVATORY SMOKE ■■■■.....	K

PRO-ABN-SURV SURV

[MEM] TAWS CAUTION.....	A
■■■■ [MEM] TAWS WARNING ■■■■.....	B
[MEM] TCAS CAUTION - TRAFFIC ADVISORY.....	C
■■■■ [MEM] TCAS WARNING - RESOLUTION ADVISORY ■■■■.....	D
■■■■ [MEM] WINDSHEAR WARNING - REACTIVE WINDSHEAR ■■■■.....	E

Continued on the following page

Continued from the previous page

PRO-ABN-VENT VENT

<u>VENT</u> AVNCS SYS FAULT.....	A
<u>VENT</u> BLOWER FAULT.....	B
<u>VENT</u> EXTRACT FAULT.....	C
<u>VENT</u> SKIN VALVE FAULT.....	D

PRO-ABN-WHEEL WHEEL

[QRH] WHEEL TIRE DAMAGE SUSPECTED.....	A
<u>WHEEL</u> HYD SEL FAULT.....	B
<u>WHEEL</u> N/W STRG FAULT.....	C
<u>WHEEL</u> TYRE LO PR 	D

| PRO-ABN-W_A_ICE WING A.ICE

<u>WING A.ICE</u> L(R) HI PR.....	A
<u>WING A.ICE</u> L(R) VALVE OPEN (FAILURE DETECTED IN FLIGHT).....	B
<u>WING A.ICE</u> L(R) VALVE OPEN (FAILURE DETECTED ON GROUND).....	C
<u>WING A.ICE</u> L(R) WING LO PR.....	D
<u>WING A.ICE</u> OPEN ON GND.....	E
<u>WING A.ICE</u> SYS FAULT.....	F

PRO-ABN-90 Detailed Cockpit Evacuation Procedure

General.....	A
Cockpit-Assigned Duties for Evacuation.....	B
Communications.....	C
On Ground Evacuation.....	D
Cockpit Evacuation through Window.....	E

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

PRELIMINARY PAGES - TABLE OF CONTENTS

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PROCEDURES
ABNORMAL AND EMERGENCY PROCEDURES
PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS

Localization Title	Toc Index	ID	Reason
PRO-ABN-PLP-TOC ECAM Advisory Conditions		1	Documentation update: Deletion of "ECAM Advisory Conditions - ENG (00012122.0002001)".
PRO-ABN-PLP-TOC ECAM Advisory Conditions		1	Documentation update: Deletion of "ECAM Advisory Conditions - ENG (00012122.0002001)".
PRO-ABN-PLP-TOC ECAM Advisory Conditions		1	Documentation update: Deletion of "ECAM Advisory Conditions - ENG (00012122.0002001)".
PRO-ABN-PLP-TOC [QRH] Procedures		2	Documentation update: Deletion of "[QRH] AIR (00021355.0001001)".
			Documentation update: Deletion of "[QRH] A-ICE (00021342)".
			Documentation update: Deletion of "[QRH] A-ICE (00021342.0002001)".
			Documentation update: Deletion of "[QRH] ENG (00021356.0001001)".
			Documentation update: Deletion of "[QRH] NAV (00021354.0003001)".
			Documentation update: Deletion of "[QRH] NAV (00021354.0005001)".
PRO-ABN-PLP-TOC A-ICE		3	Documentation update: Deletion of "[QRH] DOUBLE PROBE or AOA HEAT FAILURE (00010253)".
			Documentation update: Deletion of "[QRH] DOUBLE AOA HEAT FAILURE (00010253.0002001)".
PRO-ABN-PLP-TOC ANTI ICE CAPT AOA		4	Documentation update: Deletion of "ANTI ICE CAPT AOA (00024223.0002001)".
			Documentation update: Deletion of "ANTI ICE CAPT AOA - FWSPAGE (00024224.0001001)".
PRO-ABN-PLP-TOC ANTI ICE ENG 1(2) VALVE CLSD		5	Documentation update: Deletion of "ANTI ICE ENG 1(2) VALVE CLSD (00010269.0001001)".
PRO-ABN-PLP-TOC AIR		6	Documentation update: Deletion of "[QRH] Engine 1+2 Bleed Fault (00017611.0001001)".
PRO-ABN-PLP-TOC AIR ENG 1(2) BLEED ABNORM PR		7	Documentation update: Deletion of "AIR ENG 1(2) BLEED ABNORM PR (00017584.0005001)".
PRO-ABN-PLP-TOC AIR ENG 1(2) BLEED FAULT		8	Documentation update: Deletion of "AIR ENG 1(2) BLEED FAULT (00017605.0005001)".
PRO-ABN-PLP-TOC AIR ENG 1(2) BLEED FAULT (BLEED NOT CLOSED)		9	Documentation update: Deletion of "AIR ENG 1(2) BLEED FAULT BLEED NOT CLOSED (00017607.0005001)".
PRO-ABN-PLP-TOC AIR ENG 1(2) BLEED LO TEMP (Opposite Bleed not Available)		10	Documentation update: Deletion of "AIR ENG 1(2) BLEED LO TEMP (Opposite Bleed not Available) (00017561.0001001)".
PRO-ABN-PLP-TOC AIR ENG 1+2 BLEED LO TEMP		11	Documentation update: Deletion of "AIR ENG 1 + 2 BLEED LO TEMP (00011118.0001001)".

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS

Continued from the previous page

Localization Title	Toc Index	ID	Reason
PRO-ABN-PLP-TOC AIR ENG 1(2) BLEED LEAK		12	Documentation update: Deletion of "AIR ENG 1(2) BLEED LEAK (00022403.0001001)".
PRO-ABN-PLP-TOC AIR FWD(AFT) CRG VENT FAULT		13	Documentation update: Deletion of "AIR FWD(AFT) CRG VENT FAULT (If Installed) - FWSPACE (00017934.0001001)".
			Documentation update: Deletion of "AIR FWD(AFT) CRG VENT FAULT (If Installed) (00017337.0001001)".
			Documentation update: Deletion of "AIR FWD(AFT) CRG VENT FAULT (If Installed) (00017933.0001001)".
PRO-ABN-PLP-TOC AIR FWD(AFT) CRG VENT FAULT		13	Documentation update: Deletion of "AIR FWD(AFT) CRG VENT FAULT (If Installed) - FWSPACE (00017934.0001001)".
			Documentation update: Deletion of "AIR FWD(AFT) CRG VENT FAULT (If Installed) (00017337.0001001)".
			Documentation update: Deletion of "AIR FWD(AFT) CRG VENT FAULT (If Installed) (00017933.0001001)".
PRO-ABN-PLP-TOC AIR L(R) WING LEAK		14	Documentation update: Deletion of "AIR L(R) WING LEAK (00017563.0001001)".
PRO-ABN-PLP-TOC AIR PACK 1+2 FAULT		15	Documentation update: Deletion of "AIR PACK 1 + 2 FAULT - FWSPACE (00017936.0002001)".
			Documentation update: Deletion of "AIR PACK 1 + 2 FAULT (00017935.0001001)".
PRO-ABN-PLP-TOC AIR PACK 1+2 FAULT		15	Documentation update: Deletion of "AIR PACK 1 + 2 FAULT - FWSPACE (00017936.0002001)".
			Documentation update: Deletion of "AIR PACK 1 + 2 FAULT (00017935.0001001)".
PRO-ABN-PLP-TOC AUTO FLT FAC 1 + 2 FAULT		16	Documentation update: Deletion of "AUTO FLT FAC 1 + 2 FAULT - FWSPACE (00017456.0006001)".
			Documentation update: Deletion of "AUTO FLT FAC 1 + 2 FAULT - FWSPACE (00017456.0008001)".
PRO-ABN-PLP-TOC AUTO FLT FAC 1 + 2 FAULT		16	Documentation update: Deletion of "AUTO FLT FAC 1 + 2 FAULT - FWSPACE (00017456.0006001)".
			Documentation update: Deletion of "AUTO FLT FAC 1 + 2 FAULT - FWSPACE (00017456.0008001)".
PRO-ABN-PLP-TOC AUTO FLT RUD TRIM SYS		17	Documentation update: Deletion of "AUTO FLT RUD TRIM SYS (00010451.0002001)".
PRO-ABN-PLP-TOC AUTO FLT RUD TRV LIM 1(2)		18	Documentation update: Deletion of "AUTO FLT RUD TRV LIM 1(2) (00010453.0001001)".
PRO-ABN-PLP-TOC AUTO FLT RUD TRV LIM SYS		19	Documentation update: Deletion of "AUTO FLT RUD TRV LIM SYS (00017465.0003001)".
PRO-ABN-PLP-TOC AUTO FLT YAW DAMPER SYS		20	Documentation update: Deletion of "AUTO FLT YAW DAMPER SYS (00017469.0004001)".

Continued on the following page

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES ABNORMAL AND EMERGENCY PROCEDURES PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS
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Continued from the previous page

Localization Title	Toc Index	ID	Reason
			Documentation update: Deletion of "AUTO FLT YAW DAMPER SYS - FWSPAGE (00017470.0003001)".
			Documentation update: Deletion of "AUTO FLT YAW DAMPER SYS - FWSPAGE (00017470.0014001)".
PRO-ABN-PLP-TOC AUTO FLT YAW DAMPER SYS		20	Documentation update: Deletion of "AUTO FLT YAW DAMPER SYS (00017469.0004001)".
			Documentation update: Deletion of "AUTO FLT YAW DAMPER SYS - FWSPAGE (00017470.0003001)".
			Documentation update: Deletion of "AUTO FLT YAW DAMPER SYS - FWSPAGE (00017470.0014001)".
PRO-ABN-PLP-TOC BRAKES NORM BRK FAULT		21	Documentation update: Deletion of "BRAKES NORM BRK FAULT (00017814.0001001)".
PRO-ABN-PLP-TOC CAB PR EXCESS CAB ALT		22	Documentation update: Deletion of "CAB PR EXCESS CAB ALT (00018066.0004001)".
			Documentation update: Deletion of "CAB PR EXCESS CAB ALT - FWSPAGE (00010755.0001001)".
PRO-ABN-PLP-TOC COM SINGLE PTT STUCK		23	Documentation update: Deletion of "COM SINGLE PTT STUCK (00017503.0001001)".
PRO-ABN-PLP-TOC COND FWD CAB/AFT CAB/CKPT DUCT OVHT		24	Documentation update: Deletion of "COND FWD CAB/AFT CAB/CKPT DUCT OVHT (00010720.0001001)".
PRO-ABN-PLP-TOC COND FWD CAB/AFT CAB/CKPT DUCT OVHT		24	Documentation update: Deletion of "COND FWD CAB/AFT CAB/CKPT DUCT OVHT (00010720.0001001)".
PRO-ABN-PLP-TOC COND FWD(AFT) CARGO DUCT OVHT		25	Documentation update: Deletion of "COND FWD(AFT) CARGO DUCT OVHT (If Installed) - FWSPAGE (00018039.0001001)".
			Documentation update: Deletion of "COND FWD(AFT) CARGO DUCT OVHT (If Installed) (00018038.0001001)".
			Documentation update: Deletion of "COND FWD(AFT) CARGO DUCT OVHT (If Installed) (00018038.0002001)".
			Documentation update: Deletion of "COND FWD(AFT) CARGO DUCT OVHT (If Installed) (00017339.0002001)".
PRO-ABN-PLP-TOC COND FWD(AFT) CARGO DUCT OVHT		25	Documentation update: Deletion of "COND FWD(AFT) CARGO DUCT OVHT (If Installed) - FWSPAGE (00018039.0001001)".
			Documentation update: Deletion of "COND FWD(AFT) CARGO DUCT OVHT (If Installed) (00018038.0001001)".
			Documentation update: Deletion of "COND FWD(AFT) CARGO DUCT OVHT (If Installed) (00018038.0002001)".
			Documentation update: Deletion of "COND FWD(AFT) CARGO DUCT OVHT (If Installed) (00017339.0002001)".

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS

Continued from the previous page

Localization Title	Toc Index	ID	Reason
PRO-ABN-PLP-TOC COND FWD(AFT) CRG HEAT FAULT		26	Documentation update: Deletion of "COND FWD(AFT) CRG HEAT FAULT (If Installed) (00018040.0001001)".
			Documentation update: Deletion of "COND FWD(AFT) CRG HEAT FAULT (If Installed) - FWSPAGE (00018041.0001001)".
			Documentation update: Deletion of "COND FWD(AFT) CRG HEAT FAULT (If Installed) (00017341.0002001)".
PRO-ABN-PLP-TOC COND FWD(AFT) CRG HEAT FAULT		26	Documentation update: Deletion of "COND FWD(AFT) CRG HEAT FAULT (If Installed) (00018040.0001001)".
			Documentation update: Deletion of "COND FWD(AFT) CRG HEAT FAULT (If Installed) - FWSPAGE (00018041.0001001)".
			Documentation update: Deletion of "COND FWD(AFT) CRG HEAT FAULT (If Installed) (00017341.0002001)".
PRO-ABN-PLP-TOC COND FWD(AFT) CRG ISOL VALVE		27	Documentation update: Deletion of "COND FWD(AFT) CRG ISOL VALVE (If Installed) (00017335.0001001)".
			Documentation update: Deletion of "COND FWD(AFT) CRG ISOL VALVE (If Installed) - FWSPAGE (00018043.0001001)".
PRO-ABN-PLP-TOC COND FWD(AFT) CRG ISOL VALVE		27	Documentation update: Deletion of "COND FWD(AFT) CRG ISOL VALVE (If Installed) (00017335.0001001)".
			Documentation update: Deletion of "COND FWD(AFT) CRG ISOL VALVE (If Installed) - FWSPAGE (00018043.0001001)".
PRO-ABN-PLP-TOC COND FWD(AFT) CRG ISOL VALVE		27	Documentation update: Deletion of "COND FWD(AFT) CRG ISOL VALVE (If Installed) (00017335.0001001)".
			Documentation update: Deletion of "COND FWD(AFT) CRG ISOL VALVE (If Installed) - FWSPAGE (00018043.0001001)".
PRO-ABN-PLP-TOC COND HOT AIR FAULT		28	Documentation update: Deletion of "COND HOT AIR FAULT (00018940.0001001)".
PRO-ABN-PLP-TOC DOOR L(R)(FWD)(AFT) AVIONICS or STAIRS (In flight)		29	Documentation update: Deletion of "DOOR L(R)(FWD)(AFT) AVIONICS or STAIRS - FWSPAGE (In flight) (00018944.0002001)".
			Documentation update: Deletion of "DOOR L(R)(FWD)(AFT) AVIONICS (In flight) (00018945.0001001)".
PRO-ABN-PLP-TOC DOOR L(R) FWD(AFT) CABIN (In flight)		30	Documentation update: Deletion of "DOOR L(R) FWD(AFT) CABIN - FWSPAGE (In flight) (00019104.0002001)".
			Documentation update: Deletion of "DOOR L(R) FWD(AFT) CABIN (In flight) (00019101.0001001)".
PRO-ABN-PLP-TOC DOOR L(R) EMER EXIT (In flight)		31	Documentation update: Deletion of "DOOR L(R) FWD(AFT) EMER EXIT (In flight) (00019120.0001001)".
			Documentation update: Deletion of "DOOR L(R) FWD(AFT) EMER EXIT - FWSPAGE (In flight) (00019122.0004001)".
PRO-ABN-PLP-TOC		32	Documentation update: Deletion of "DOOR FWD(AFT)(BULK) - FWSPAGE (In flight) (00018946.0002001)".

Continued on the following page

Continued from the previous page

Localization Title	Toc Index	ID	Reason
DOOR FWD(AFT)(BULK) CARGO (In flight)			Documentation update: Deletion of "DOOR FWD(AFT)(BULK) CARGO (In flight) (00019126.0001001)".
PRO-ABN-PLP-TOC ELEC DC BUS 1 FAULT		33	Documentation update: Deletion of "ELEC DC BUS 1 FAULT - FWSPAGE (00018555.0011001)". Documentation update: Deletion of "ELEC DC BUS 1 FAULT - FWSPAGE (00018555.0012001)". Documentation update: Deletion of "ELEC DC BUS 1 FAULT - FWSPAGE (00018555.0014001)".
PRO-ABN-PLP-TOC ELEC DC BUS 1 FAULT		33	Documentation update: Deletion of "ELEC DC BUS 1 FAULT - FWSPAGE (00018555.0011001)". Documentation update: Deletion of "ELEC DC BUS 1 FAULT - FWSPAGE (00018555.0012001)". Documentation update: Deletion of "ELEC DC BUS 1 FAULT - FWSPAGE (00018555.0014001)".
PRO-ABN-PLP-TOC ELEC DC BUS 1 FAULT		33	Documentation update: Deletion of "ELEC DC BUS 1 FAULT - FWSPAGE (00018555.0011001)". Documentation update: Deletion of "ELEC DC BUS 1 FAULT - FWSPAGE (00018555.0012001)". Documentation update: Deletion of "ELEC DC BUS 1 FAULT - FWSPAGE (00018555.0014001)".
PRO-ABN-PLP-TOC ELEC DC BUS 2 FAULT		34	Documentation update: Deletion of "ELEC DC BUS 2 FAULT (00017898.0004001)".
PRO-ABN-PLP-TOC ELEC DC BUS 2 FAULT		34	Documentation update: Deletion of "ELEC DC BUS 2 FAULT (00017898.0004001)".
PRO-ABN-PLP-TOC ELEC DC BUS 2 FAULT		34	Documentation update: Deletion of "ELEC DC BUS 2 FAULT (00017898.0004001)".
PRO-ABN-PLP-TOC ELEC DC EMER CONFIG		35	Documentation update: Deletion of "ELEC DC EMER CONFIG - FWSPAGE (00018558.0004001)". Documentation update: Deletion of "ELEC DC EMER CONFIG (00018557.0006001)".
PRO-ABN-PLP-TOC ELEC DC ESS BUS FAULT		36	Documentation update: Deletion of "ELEC DC ESS BUS FAULT - FWSPAGE (00018671.0010001)". Documentation update: Deletion of "ELEC DC ESS BUS FAULT - FWSPAGE (00018671.0011001)". Documentation update: Deletion of "ELEC DC ESS BUS FAULT (00012511.0005001)". Documentation update: Deletion of "ELEC DC ESS BUS FAULT (00012511.0018001)".
PRO-ABN-PLP-TOC ELEC DC ESS BUS FAULT		36	Documentation update: Deletion of "ELEC DC ESS BUS FAULT - FWSPAGE (00018671.0010001)".

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS

Continued from the previous page

Localization Title	Toc Index	ID	Reason
			Documentation update: Deletion of "ELEC DC ESS BUS FAULT - FWSPAGE (00018671.0011001)".
			Documentation update: Deletion of "ELEC DC ESS BUS FAULT (00012511.0005001)".
			Documentation update: Deletion of "ELEC DC ESS BUS FAULT (00012511.0018001)".
PRO-ABN-PLP-TOC ELEC DC ESS BUS FAULT		36	Documentation update: Deletion of "ELEC DC ESS BUS FAULT - FWSPAGE (00018671.0010001)".
			Documentation update: Deletion of "ELEC DC ESS BUS FAULT - FWSPAGE (00018671.0011001)".
			Documentation update: Deletion of "ELEC DC ESS BUS FAULT (00012511.0005001)".
			Documentation update: Deletion of "ELEC DC ESS BUS FAULT (00012511.0018001)".
PRO-ABN-PLP-TOC ELEC EMER CONFIG		37	Documentation update: Deletion of "ELEC EMER CONFIG - FWSPAGE (00018643.0023001)".
			Documentation update: Deletion of "ELEC EMER CONFIG - FWSPAGE (00018643.0025001)".
PRO-ABN-PLP-TOC ELEC EMER CONFIG		37	Documentation update: Deletion of "ELEC EMER CONFIG - FWSPAGE (00018643.0023001)".
			Documentation update: Deletion of "ELEC EMER CONFIG - FWSPAGE (00018643.0025001)".
PRO-ABN-PLP-TOC ELEC EMER CONFIG		37	Documentation update: Deletion of "ELEC EMER CONFIG - FWSPAGE (00018643.0023001)".
			Documentation update: Deletion of "ELEC EMER CONFIG - FWSPAGE (00018643.0025001)".
PRO-ABN-PLP-TOC ELEC GEN 1(2) OFF		38	Documentation update: Deletion of "ELEC GEN 1(2) OFF (00017361.0001001)".
PRO-ABN-PLP-TOC ELEC IDG 1(2) DISCONNECTED		39	Documentation update: Deletion of "ELEC IDG 1(2) DISCONNECTED (00017366.0001001)".
PRO-ABN-PLP-TOC ENG		40	Documentation update: Deletion of "[QRH] HIGH ENGINE VIBRATION (00012294.0006001)".
			Documentation update: Deletion of "[QRH] ENG DUAL FAILURE - FUEL REMAINING (NG01054)".
			Documentation update: Deletion of "[QRH] ENG DUAL FAILURE - NO FUEL REMAINING (NG01055)".
			Documentation update: Deletion of "ENG DUAL FAILURE (NG01968)".
			Documentation update: Deletion of "[QRH] ENG DUAL FAILURE - FUEL REMAINING (00012309.00061001)".

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS

Continued from the previous page

Localization Title	Toc Index	ID	Reason
			Documentation update: Deletion of "ENG DUAL FAILURE - FUEL REMAINING - SECURE CABIN AND COCKPIT (00012310.0041001)".
			Documentation update: Deletion of "ENG DUAL FAILURE - FUEL REMAINING - COMMON ACTIONS FOR THE APPROACH (00012311.0001001)".
			Documentation update: Deletion of "ENG DUAL FAILURE - FUEL REMAINING - FORCED LANDING (00012312.0065001)".
			Documentation update: Deletion of "ENG DUAL FAILURE - FUEL REMAINING - DITCHING (00012313.0065001)".
			Documentation update: Deletion of "[QRH] ENG DUAL FAILURE - NO FUEL REMAINING (00012602.0108001)".
			Documentation update: Deletion of "ENG DUAL FAILURE - NO FUEL REMAINING - COMMON APPROACH FOR THE ACTION (00012317.0001001)".
			Documentation update: Deletion of "ENG DUAL FAILURE - NO FUEL REMAINING - FORCED LANDING (00012318.0065001)".
			Documentation update: Deletion of "ENG DUAL FAILURE - NO FUEL REMAINING - DITCHING (00012319.0065001)".
			Documentation update: Deletion of "ENG DUAL FAILURE (00017909.0002001)".
			Documentation update: Deletion of "ENG DUAL FAILURE (00012282.0370001)".
			Documentation update: Deletion of "ENG DUAL FAILURE - FWSPAGE (00012283.0044001)".
PRO-ABN-PLP-TOC ENG ALL ENGINES FAILURE		41	Documentation update: Deletion of "ENG ALL ENGINES FAILURE (00019673.0022001)".
PRO-ABN-PLP-TOC ENG 1(2) BLEED STATUS FAULT (On Ground)		42	Documentation update: Deletion of "ENG 1(2) BLEED STATUS FAULT (On Ground) (00018708.0001001)".
PRO-ABN-PLP-TOC ENG COMPRESSOR VANE		43	Documentation update: Deletion of "ENG COMPRESSOR VANE (00017907.0001001)".
			Documentation update: Deletion of "ENG COMPRESSOR VANE (00017757.0001001)".
PRO-ABN-PLP-TOC ENG 1(2) EIU FAULT		44	Documentation update: Deletion of "ENG 1(2) EIU FAULT (00017970.0001001)".
			Documentation update: Deletion of "ENG 1(2) EIU FAULT - FWSPAGE (00017659.0001001)".
PRO-ABN-PLP-TOC ENG 1(2) FADEC FAULT		45	Documentation update: Deletion of "ENG 1(2) FADEC FAULT (00017663.0005001)".

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS

Continued from the previous page

Localization Title	Toc Index	ID	Reason
			Documentation update: Deletion of "ENG 1(2) FADEC FAULT - FWSPACE (00019553)".
			Documentation update: Deletion of "ENG 1(2) FADEC FAULT - FWSPACE (00019553.0001001)".
PRO-ABN-PLP-TOC ENG 1(2) FAIL		46	Documentation update: Deletion of "ENG 1(2) FAIL (00017667.0003001)".
PRO-ABN-PLP-TOC ENG 1(2) LOW N1 (On Ground)		47	Documentation update: Deletion of "ENG 1(2) LOW N1 (On Ground) (00017958.0001001)".
PRO-ABN-PLP-TOC ENG 1(2) OIL FILTER CLOG		48	Documentation update: Deletion of "ENG 1(2) OIL FILTER CLOG (00012078.0003001)".
PRO-ABN-PLP-TOC ENG 1(2) PROBES FAULT		49	Documentation update: Deletion of "ENG 1(2) PROBES FAULT (00017981.0001001)".
PRO-ABN-PLP-TOC ENG 1(2) REV PRESSURIZED		50	Documentation update: Deletion of "ENG 1(2) REV PRESSURIZED (00017702.0002001)".
PRO-ABN-PLP-TOC ENG 1(2) REVERSE UNLOCKED		51	Documentation update: Deletion of "ENG 1(2) REVERSE UNLOCKED (00017871.0001001)".
PRO-ABN-PLP-TOC ENG 1(2) SHUT DOWN		52	Documentation update: Deletion of "ENG 1(2) SHUT DOWN - FWSPACE (00017852.0005001)".
			Documentation update: Deletion of "ENG 1(2) SHUT DOWN (00017837.0006001)".
PRO-ABN-PLP-TOC ENG 1(2) STALL		53	Documentation update: Deletion of "ENGINE STALL (00017749.0004001)".
PRO-ABN-PLP-TOC ENG 1(2) START VALVE FAULT		54	Documentation update: Deletion of "ENG 1(2) START VALVE FAULT (00018010.0016001)".
PRO-ABN-PLP-TOC F/CTL		55	Documentation update: Deletion of "F/CTL ELAC 1(2) PITCH FAULT(both computer failed) (NG01888)".
			Documentation update: Deletion of "F/CTL ELAC 1(2) PITCH FAULT (Both Computer Failed) (00023245.0001001)".
			Documentation update: Deletion of "F/CTL ELAC 1(2) PITCH FAULT (Both Computer Failed) (00023244.0001001)".
			Documentation update: Deletion of "F/CTL ELAC 1(2) PITCH FAULT (Both Computer Failed) (00023243.0001001)".
PRO-ABN-PLP-TOC F/CTL ALTN LAW		56	Documentation update: Deletion of "F/CTL ALTN LAW - FWSPACE (00018414.0003001)".
			Documentation update: Deletion of "F/CTL ALTN LAW - FWSPACE (00018414.0004001)".
PRO-ABN-PLP-TOC F/CTL ALTN LAW		56	Documentation update: Deletion of "F/CTL ALTN LAW - FWSPACE (00018414.0003001)".
			Documentation update: Deletion of "F/CTL ALTN LAW - FWSPACE (00018414.0004001)".

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS

Continued from the previous page

Localization Title	Toc Index	ID	Reason
PRO-ABN-PLP-TOC F/CTL DIRECT LAW		57	Documentation update: Deletion of "F/CTL DIRECT LAW - FWSPAGE (00018422.0003001)".
PRO-ABN-PLP-TOC F/CTL ELAC 1(2) FAULT (Both Computers Failed)		58	Documentation update: Deletion of "F/CTL ELAC 1 (2) FAULT (Both Computers Failed) - FWSPAGE (00018434.0004001)".
PRO-ABN-PLP-TOC F/CTL ELAC 1(2) PITCH FAULT (One Computer Failed)		59	Documentation update: Deletion of "F/CTL ELAC 1 (2) PITCH FAULT - FWSPAGE (One Computer Failed) (00018448.0001001)".
PRO-ABN-PLP-TOC F/CTL FLAPS FAULT/LOCKED		60	Documentation update: Deletion of "F/CTL FLAPS FAULT/LOCKED - FWSPAGE (00018456.0004001)".
			Documentation update: Deletion of "F/CTL FLAPS FAULT/LOCKED (00011744.0002001)".
PRO-ABN-PLP-TOC F/CTL L(R) ELEV FAULT		61	Documentation update: Deletion of "F/CTL L(R) ELEV FAULT (00018484.0002001)".
			Documentation update: Deletion of "F/CTL L (R) ELEV FAULT - FWSPAGE (00018490.0003001)".
			Documentation update: Deletion of "F/CTL L (R) ELEV FAULT - FWSPAGE (00018490.0007001)".
			Documentation update: Deletion of "F/CTL L(R) ELEV FAULT (00018484.0001001)".
PRO-ABN-PLP-TOC F/CTL L+R ELEV FAULT		62	Documentation update: Deletion of "F/CTL L+R ELEV FAULT - FWSPAGE (00018492.0006001)".
PRO-ABN-PLP-TOC F/CTL SEC 1(2) (3) FAULT		63	Documentation update: Deletion of "F/CTL SEC 1(2)(3) FAULT - FWSPAGE (00018504.0004001)".
PRO-ABN-PLP-TOC F/CTL SLATS AND FLAPS FAULT IN CONF 0		64	Documentation update: Deletion of "F/CTL SLATS AND FLAPS FAULT IN CONF 0 - FWSPAGE (00018512.0002001)".
			Documentation update: Deletion of "F/CTL SLATS AND FLAPS FAULT IN CONF 0 - FWSPAGE (00018512.0003001)".
PRO-ABN-PLP-TOC F/CTL SLATS AND FLAPS FAULT IN CONF 0		64	Documentation update: Deletion of "F/CTL SLATS AND FLAPS FAULT IN CONF 0 - FWSPAGE (00018512.0002001)".
			Documentation update: Deletion of "F/CTL SLATS AND FLAPS FAULT IN CONF 0 - FWSPAGE (00018512.0003001)".
PRO-ABN-PLP-TOC F/CTL SLATS FAULT/LOCKED		65	Documentation update: Deletion of "F/CTL SLATS FAULT/LOCKED - FWSPAGE (00018518.0004001)".
			Documentation update: Deletion of "F/CTL SLATS FAULT/LOCKED - FWSPAGE (00018518.0005001)".
			Documentation update: Deletion of "F/CTL SLATS FAULT/LOCKED (00018517.0006001)".
PRO-ABN-PLP-TOC F/CTL SLATS FAULT/LOCKED		65	Documentation update: Deletion of "F/CTL SLATS FAULT/LOCKED - FWSPAGE (00018518.0004001)".

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS

Continued from the previous page

Localization Title	Toc Index	ID	Reason
			Documentation update: Deletion of "F/CTL SLATS FAULT/LOCKED - FWSPAGE (00018518.0005001)".
			Documentation update: Deletion of "F/CTL SLATS FAULT/LOCKED (00018517.0006001)".
PRO-ABN-PLP-TOC F/CTL SPLR FAULT		66	Documentation update: Deletion of "F/CTL SPLR FAULT - FWSPAGE (00018544.0004001)".
PRO-ABN-PLP-TOC F/CTL STABILIZER JAM		67	Documentation update: Deletion of "F/CTL STABILIZER JAM (00018545.0001001)".
			Documentation update: Deletion of "F/CTL STABILIZER JAM - FWSPAGE (00018546.0003001)".
PRO-ABN-PLP-TOC FUEL		68	Documentation update: Deletion of "FUEL ENG 1(2) LP VALVE OPEN (NG01611)".
			Documentation update: Deletion of "FUEL ENG 1(2) LP VALVE OPEN (00016814.0001001)".
			Documentation update: Deletion of "FUEL ENG 1(2) LP VALVE OPEN (00011217.0001001)".
PRO-ABN-PLP-TOC FUEL F. USED/FOB DISAGREE		69	Documentation update: Deletion of "FUEL F. USED/FOB DISAGREE (00017634.0001001)".
PRO-ABN-PLP-TOC FUEL L (R) TK PUMP 1 + 2 LO PR		70	Documentation update: Deletion of "FUEL L (R) TK PUMP 1 + 2 LO PR (00017636.0001001)".
			Documentation update: Deletion of "FUEL L (R) TK PUMP 1 + 2 LO PR - FWSPAGE (00018926.0001001)".
PRO-ABN-PLP-TOC FUEL L (R) TK PUMP 1 + 2 LO PR (Center Tank Empty)		71	Documentation update: Deletion of "FUEL L (R) TK PUMP 1 + 2 LO PR - FWSPAGE (Center Tank Empty) (00011175.0001001)".
			Documentation update: Deletion of "FUEL L (R) TK PUMP 1 + 2 LO PR (Center Tank Empty) (00018184.0001001)".
			Documentation update: Deletion of "FUEL L (R) TK PUMP 1 + 2 LO PR (Center Tank Empty) (00017648.0004001)".
PRO-ABN-PLP-TOC FUEL L (R) TK PUMP 1 + 2 LO PR (Center Tank not Empty)		72	Documentation update: Deletion of "FUEL L (R) TK PUMP 1 + 2 LO PR (Center Tank not Empty) (00018196.0001001)".
PRO-ABN-PLP-TOC FUEL L (R) WING TK LO LVL		73	Documentation update: Deletion of "FUEL L (R) WING TK LO LVL (00018927.0002001)".
PRO-ABN-PLP-TOC HYD G ENG 1 PUMP LO PR (PTU Inoperative)		74	Documentation update: Deletion of "HYD G ENG 1 PUMP LO PR - FWSPAGE (PTU Inoperative) (00018316.0003001)".
			Documentation update: Deletion of "HYD G ENG 1 PUMP LO PR - FWSPAGE (PTU Inoperative) (00018316.0004001)".
PRO-ABN-PLP-TOC HYD G ENG 1 PUMP LO PR (PTU Inoperative)		74	Documentation update: Deletion of "HYD G ENG 1 PUMP LO PR - FWSPAGE (PTU Inoperative) (00018316.0003001)".
			Documentation update: Deletion of "HYD G ENG 1 PUMP LO PR - FWSPAGE (PTU Inoperative) (00018316.0004001)".

Continued on the following page

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES ABNORMAL AND EMERGENCY PROCEDURES PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS
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Continued from the previous page

Localization Title	Toc Index	ID	Reason
PRO-ABN-PLP-TOC HYD G RSVR LO AIR PR		75	Documentation update: Deletion of "HYD G RSVR LO AIR PR - FWSPAGE (00018317.0006001)".
			Documentation update: Deletion of "HYD G RSVR LO AIR PR - FWSPAGE (00018317.0007001)".
PRO-ABN-PLP-TOC HYD G RSVR LO AIR PR		75	Documentation update: Deletion of "HYD G RSVR LO AIR PR - FWSPAGE (00018317.0006001)".
			Documentation update: Deletion of "HYD G RSVR LO AIR PR - FWSPAGE (00018317.0007001)".
PRO-ABN-PLP-TOC HYD G RSVR LO LVL		76	Documentation update: Deletion of "HYD G RSVR LO LVL - FWSPAGE (00018320.0006001)".
			Documentation update: Deletion of "HYD G RSVR LO LVL - FWSPAGE (00018320.0007001)".
PRO-ABN-PLP-TOC HYD G RSVR LO LVL		76	Documentation update: Deletion of "HYD G RSVR LO LVL - FWSPAGE (00018320.0006001)".
			Documentation update: Deletion of "HYD G RSVR LO LVL - FWSPAGE (00018320.0007001)".
PRO-ABN-PLP-TOC HYD G RSVR OVHT		77	Documentation update: Deletion of "HYD G RSVR OVHT - FWSPAGE (00018321.0006001)".
			Documentation update: Deletion of "HYD G RSVR OVHT - FWSPAGE (00018321.0007001)".
PRO-ABN-PLP-TOC HYD G RSVR OVHT		77	Documentation update: Deletion of "HYD G RSVR OVHT - FWSPAGE (00018321.0006001)".
			Documentation update: Deletion of "HYD G RSVR OVHT - FWSPAGE (00018321.0007001)".
PRO-ABN-PLP-TOC HYD Y ENG 2 PUMP LO PR (PTU Inoperative)		78	Documentation update: Deletion of "HYD Y ENG 2 PUMP LO PR - FWSPAGE (PTU Inoperative) (00018323.0001001)".
			Documentation update: Deletion of "HYD Y ENG 2 PUMP LO PR - FWSPAGE (PTU Inoperative) (00018323.0002001)".
PRO-ABN-PLP-TOC HYD Y ENG 2 PUMP LO PR (PTU Inoperative)		78	Documentation update: Deletion of "HYD Y ENG 2 PUMP LO PR - FWSPAGE (PTU Inoperative) (00018323.0001001)".
			Documentation update: Deletion of "HYD Y ENG 2 PUMP LO PR - FWSPAGE (PTU Inoperative) (00018323.0002001)".
PRO-ABN-PLP-TOC HYD Y RSVR LO AIR PR		79	Documentation update: Deletion of "HYD Y RSVR LO AIR PR - FWSPAGE (00018324.0006001)".
			Documentation update: Deletion of "HYD Y RSVR LO AIR PR - FWSPAGE (00018324.0007001)".
PRO-ABN-PLP-TOC HYD Y RSVR LO AIR PR		79	Documentation update: Deletion of "HYD Y RSVR LO AIR PR - FWSPAGE (00018324.0006001)".
			Documentation update: Deletion of "HYD Y RSVR LO AIR PR - FWSPAGE (00018324.0007001)".

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS

Continued from the previous page

Localization Title	Toc Index	ID	Reason
PRO-ABN-PLP-TOC HYD Y RSVR LO LVL		80	Documentation update: Deletion of "HYD Y RSVR LO LVL - FWSPAGE (00018326.0005001)".
			Documentation update: Deletion of "HYD Y RSVR LO LVL - FWSPAGE (00018326.0006001)".
PRO-ABN-PLP-TOC HYD Y RSVR LO LVL		80	Documentation update: Deletion of "HYD Y RSVR LO LVL - FWSPAGE (00018326.0005001)".
			Documentation update: Deletion of "HYD Y RSVR LO LVL - FWSPAGE (00018326.0006001)".
PRO-ABN-PLP-TOC HYD Y RSVR OVHT		81	Documentation update: Deletion of "HYD Y RSVR OVHT - FWSPAGE (00018327.0006001)".
			Documentation update: Deletion of "HYD Y RSVR OVHT - FWSPAGE (00018327.0007001)".
PRO-ABN-PLP-TOC HYD Y RSVR OVHT		81	Documentation update: Deletion of "HYD Y RSVR OVHT - FWSPAGE (00018327.0006001)".
			Documentation update: Deletion of "HYD Y RSVR OVHT - FWSPAGE (00018327.0007001)".
PRO-ABN-PLP-TOC HYD B+Y SYS LO PR		82	Documentation update: Deletion of "HYD B+Y SYS LO PR (00018727.0002001)".
			Documentation update: Deletion of "HYD B+Y SYS LO PR (00018727.0003001)".
			Documentation update: Deletion of "HYD B+Y SYS LO PR - FWSPAGE (00018342.0009001)".
			Documentation update: Deletion of "HYD B+Y SYS LO PR - FWSPAGE (00018342.0011001)".
			Documentation update: Deletion of "HYD B+Y SYS LO PR - FWSPAGE (00018342.0013001)".
PRO-ABN-PLP-TOC HYD B+Y SYS LO PR		82	Documentation update: Deletion of "HYD B+Y SYS LO PR (00018727.0002001)".
			Documentation update: Deletion of "HYD B+Y SYS LO PR (00018727.0003001)".
			Documentation update: Deletion of "HYD B+Y SYS LO PR - FWSPAGE (00018342.0009001)".
			Documentation update: Deletion of "HYD B+Y SYS LO PR - FWSPAGE (00018342.0011001)".
			Documentation update: Deletion of "HYD B+Y SYS LO PR - FWSPAGE (00018342.0013001)".
PRO-ABN-PLP-TOC HYD G+B SYS LO PR		83	Documentation update: Deletion of "HYD G+B SYS LO PR (00018349.0002001)".
			Documentation update: Deletion of "HYD G+B SYS LO PR (00018349.0004001)".

Continued on the following page

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES ABNORMAL AND EMERGENCY PROCEDURES PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS
--	--

Continued from the previous page

Localization Title	Toc Index	ID	Reason
			Documentation update: Deletion of "HYD G+B SYS LO PR - FWSPAGE (00018350.0013001)".
			Documentation update: Deletion of "HYD G+B SYS LO PR - FWSPAGE (00018350.0017001)".
			Documentation update: Deletion of "HYD G+B SYS LO PR - FWSPAGE (00018350.0023001)".
PRO-ABN-PLP-TOC HYD G+B SYS LO PR		83	Documentation update: Deletion of "HYD G+B SYS LO PR (00018349.0002001)".
			Documentation update: Deletion of "HYD G+B SYS LO PR (00018349.0004001)".
			Documentation update: Deletion of "HYD G+B SYS LO PR - FWSPAGE (00018350.0013001)".
			Documentation update: Deletion of "HYD G+B SYS LO PR - FWSPAGE (00018350.0017001)".
			Documentation update: Deletion of "HYD G+B SYS LO PR - FWSPAGE (00018350.0023001)".
PRO-ABN-PLP-TOC HYD G+Y SYS LO PR		84	Documentation update: Deletion of "HYD G+Y SYS LO PR (00018352.0003001)".
			Documentation update: Deletion of "HYD G+Y SYS LO PR - FWSPAGE (00018353.0014001)".
PRO-ABN-PLP-TOC L/G DOORS NOT CLOSED		85	Documentation update: Deletion of "L/G DOORS NOT CLOSED (00011287.0003001)".
PRO-ABN-PLP-TOC L/G GEAR NOT DOWNLOCKED		86	Documentation update: Deletion of "L/G GEAR NOT DOWNLOCKED (00011284.0002001)".
PRO-ABN-PLP-TOC L/G GEAR NOT DOWNLOCKED		86	Documentation update: Deletion of "L/G GEAR NOT DOWNLOCKED (00011284.0002001)".
PRO-ABN-PLP-TOC L/G GEAR NOT UNLOCKED		87	Documentation update: Deletion of "L/G GEAR NOT UNLOCKED (00011061.0003001)".
PRO-ABN-PLP-TOC L/G LGCIU 1+2 FAULT		88	Documentation update: Deletion of "L/G LGCIU 1+2 FAULT - FWSPAGE (00018684.0006001)".
			Documentation update: Deletion of "L/G LGCIU 1+2 FAULT - FWSPAGE (00018684.0008001)".
			Documentation update: Deletion of "L/G LGCIU 1+2 FAULT - FWSPAGE (00018684.0011001)".
			Documentation update: Deletion of "L/G LGCIU 1+2 FAULT (00018683.0002001)".
PRO-ABN-PLP-TOC L/G LGCIU 1+2 FAULT		88	Documentation update: Deletion of "L/G LGCIU 1+2 FAULT - FWSPAGE (00018684.0006001)".
			Documentation update: Deletion of "L/G LGCIU 1+2 FAULT - FWSPAGE (00018684.0008001)".

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS

Continued from the previous page

Localization Title	Toc Index	ID	Reason
			Documentation update: Deletion of "L/G LGCIU 1+2 FAULT - FWSPAGE (00018684.0011001)".
			Documentation update: Deletion of "L/G LGCIU 1+2 FAULT (00018683.0002001)".
PRO-ABN-PLP-TOC L/G LGCIU 1+2 FAULT		88	Documentation update: Deletion of "L/G LGCIU 1+2 FAULT - FWSPAGE (00018684.0006001)".
			Documentation update: Deletion of "L/G LGCIU 1+2 FAULT - FWSPAGE (00018684.0008001)".
			Documentation update: Deletion of "L/G LGCIU 1+2 FAULT - FWSPAGE (00018684.0011001)".
			Documentation update: Deletion of "L/G LGCIU 1+2 FAULT (00018683.0002001)".
PRO-ABN-PLP-TOC L/G SYS DISAGREE		89	Documentation update: Deletion of "L/G SYS DISAGREE (00017861.0002001)".
PRO-ABN-PLP-TOC MISC		90	Documentation update: Deletion of "[QRH] FORCED LANDING (00022092.0006001)".
			Documentation update: Deletion of "[QRH] VOLCANIC ASH ENCOUNTER (00012176.0001001)".
			Documentation update: Deletion of "[QRH] DITCHING (00022090.0006001)".
PRO-ABN-PLP-TOC [QRH] Severe Turbulence		91	Documentation update: Deletion of "[QRH] Landing (00007388)".
			Documentation update: Deletion of "LANDING (00007388.0002001)".
PRO-ABN-PLP-TOC NAV		92	Documentation update: Deletion of "[QRH] ADR CHECK PROC (00015311)".
			Documentation update: Deletion of "NAV ALTI DISCREPANCY (NG01504)".
			Documentation update: Deletion of "[QRH] ADR CHECK PROC (00015311.0001001)".
			Documentation update: Deletion of "NAV ALTI DISCREPANCY (00018116.0001001)".
			Documentation update: Deletion of "NAV ALTI DISCREPANCY (00012411.0002001)".
PRO-ABN-PLP-TOC [MEM] UNRELIABLE SPEED INDICATION		93	Documentation update: Deletion of "Unreliable Speed Indication - Level-Off (00017722.0039001)".
			Documentation update: Deletion of "Unreliable Speed Indication - Level-Off (00017722.0040001)".
			Simplification of configuration management
			Documentation update: Deletion of "Unreliable Speed Indication - Flight Path Stabilized (00017724.0003001)".

Continued on the following page

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES ABNORMAL AND EMERGENCY PROCEDURES PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS
--	---

Continued from the previous page

Localization Title	Toc Index	ID	Reason
			Documentation update: Deletion of "Unreliable Speed Indication - Pitch/Thrust Tables (00017726.0008001)". Documentation update: Deletion of "UNRELIABLE SPEED INDICATION - Pitch/Thrust Tables (00017726.0026001)". Documentation update: Deletion of "Unreliable Speed Indication - Level-Off (00017722.0008001)".
PRO-ABN-PLP-TOC [MEM] UNRELIABLE SPEED INDICATION		93	Documentation update: Deletion of "Unreliable Speed Indication - Level-Off (00017722.0039001)". Documentation update: Deletion of "Unreliable Speed Indication - Level-Off (00017722.0040001)". Simplification of configuration management Documentation update: Deletion of "Unreliable Speed Indication - Flight Path Stabilized (00017724.0003001)". Documentation update: Deletion of "Unreliable Speed Indication - Pitch/Thrust Tables (00017726.0008001)". Documentation update: Deletion of "UNRELIABLE SPEED INDICATION - Pitch/Thrust Tables (00017726.0026001)". Documentation update: Deletion of "Unreliable Speed Indication - Level-Off (00017722.0008001)".
PRO-ABN-PLP-TOC [MEM] UNRELIABLE SPEED INDICATION		93	Documentation update: Deletion of "Unreliable Speed Indication - Level-Off (00017722.0039001)". Documentation update: Deletion of "Unreliable Speed Indication - Level-Off (00017722.0040001)". Simplification of configuration management Documentation update: Deletion of "Unreliable Speed Indication - Flight Path Stabilized (00017724.0003001)". Documentation update: Deletion of "Unreliable Speed Indication - Pitch/Thrust Tables (00017726.0008001)". Documentation update: Deletion of "UNRELIABLE SPEED INDICATION - Pitch/Thrust Tables (00017726.0026001)". Documentation update: Deletion of "Unreliable Speed Indication - Level-Off (00017722.0008001)".
PRO-ABN-PLP-TOC NAV ADR 1+2(1+3)(2+3) FAULT		94	Documentation update: Deletion of "NAV ADR 1+2(1+3)(2+3) FAULT - FWSPAGE (00017397.0007001)". Documentation update: Deletion of "NAV ADR 1+2(1+3)(2+3) FAULT - FWSPAGE (00017397.0009001)". Documentation update: Deletion of "NAV ADR 1+2(1+3)(2+3) FAULT (00017147.0003001)".
PRO-ABN-PLP-TOC NAV ADR 1+2(1+3)(2+3) FAULT		94	Documentation update: Deletion of "NAV ADR 1+2(1+3)(2+3) FAULT - FWSPAGE (00017397.0007001)".

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS

Continued from the previous page

Localization Title	Toc Index	ID	Reason
			Documentation update: Deletion of "NAV ADR 1+2(1+3)(2+3) FAULT - FWSPAGE (00017397.0009001)".
			Documentation update: Deletion of "NAV ADR 1+2(1+3)(2+3) FAULT (00017147.0003001)".
PRO-ABN-PLP-TOC NAV ADR 1+2+3 FAULT		95	Documentation update: Deletion of "NAV ADR 1+2+3 FAULT - FWSPAGE (00016858.0002001)".
			Documentation update: Deletion of "NAV ADR 1+2+3 FAULT - FWSPAGE (00016858.0008001)".
PRO-ABN-PLP-TOC NAV ADR 1+2+3 FAULT		95	Documentation update: Deletion of "NAV ADR 1+2+3 FAULT - FWSPAGE (00016858.0002001)".
			Documentation update: Deletion of "NAV ADR 1+2+3 FAULT - FWSPAGE (00016858.0008001)".
PRO-ABN-PLP-TOC NAV ADR DISAGREE		96	Documentation update: Deletion of "NAV ADR DISAGREE (00017130.0002001)".
			Documentation update: Deletion of "NAV ADR DISAGREE - FWSPAGE (00017131.0001001)".
			Documentation update: Deletion of "NAV ADR DISAGREE (00017130.0003001)".
			Documentation update: Deletion of "NAV ADR DISAGREE - FWSPAGE (00017131.0012001)".
PRO-ABN-PLP-TOC NAV ADR DISAGREE		96	Documentation update: Deletion of "NAV ADR DISAGREE (00017130.0002001)".
			Documentation update: Deletion of "NAV ADR DISAGREE - FWSPAGE (00017131.0001001)".
			Documentation update: Deletion of "NAV ADR DISAGREE (00017130.0003001)".
			Documentation update: Deletion of "NAV ADR DISAGREE - FWSPAGE (00017131.0012001)".
PRO-ABN-PLP-TOC NAV BKUP SPD/ALT ON CAPT+F/O PFD		97	Documentation update: Deletion of "NAV BKUP SPD/ALT ON CAPT+F/O PFD (00020398.0001001)".
PRO-ABN-PLP-TOC NAV FM/GPS POS DISAGREE (If Installed)		98	Documentation update: Deletion of "NAV FM/GPS POS DISAGREE (If Installed) (00017090.0002001)".
			Documentation update: Deletion of "NAV FM/GPS POS DISAGREE (If Installed) (00017148.0002001)".
			Documentation update: Deletion of "NAV FM/GPS POS DISAGREE (If Installed) (00017148.0003001)".
			Simplification of configuration management
PRO-ABN-PLP-TOC NAV IR 1+2(1+3)(2+3) FAULT		99	Documentation update: Deletion of "NAV IR 1+2(1+3)(2+3) FAULT - FWSPAGE (00016864.0004001)".

Continued on the following page

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES ABNORMAL AND EMERGENCY PROCEDURES PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS
--	--

Continued from the previous page

Localization Title	Toc Index	ID	Reason
PRO-ABN-PLP-TOC NAV IR DISAGREE		100	Documentation update: Deletion of "NAV IR DISAGREE- FWSPAGE (00016852.0001001)".
PRO-ABN-PLP-TOC NAV RA 1 AND 2 FAULT (Dual RA Failure)		101	Documentation update: Deletion of "NAV RA 1 AND 2 FAULT - FWSPAGE (Dual RA Failure) (00016850.0003001)".
			Documentation update: Deletion of "NAV RA 1 AND 2 FAULT - FWSPAGE (Dual RA Failure) (00016850.0004001)".
PRO-ABN-PLP-TOC SMOKE AFT CARGO SMOKE		102	Documentation update: Deletion of "SMOKE AFT CARGO SMOKE (If Installed)- FWSPAGE (00018590.0002001)".
PRO-ABN-PLP-TOC VENT SKIN VALVE FAULT		103	Documentation update: Deletion of "VENT SKIN VALVE FAULT (00018941.0001001)".
			Documentation update: Deletion of "VENT SKIN VALVE FAULT (00018941.0002001)".
			Documentation update: Deletion of "VENT SKIN VALVE FAULT - FWSPAGE (00018942.0002001)".
PRO-ABN-PLP-TOC VENT SKIN VALVE FAULT		103	Documentation update: Deletion of "VENT SKIN VALVE FAULT (00018941.0001001)".
			Documentation update: Deletion of "VENT SKIN VALVE FAULT (00018941.0002001)".
			Documentation update: Deletion of "VENT SKIN VALVE FAULT - FWSPAGE (00018942.0002001)".
PRO-ABN-ABN-00 Procedure Title	B	1	Documentation update: Deletion of information.
PRO-ABN-ABN-00 Procedure Title	B	2	Documentation update: Deletion of information.
			Documentation update: Information "N.00020864.0001001.024" moved from "N.00020864.0001001.023" to "N.00020864.0001001.065"
			Layout and Wording enhancement. No technical change.
PRO-ABN-ABN-00 Procedure Title	B	3	Layout and Wording enhancement. No technical change.
PRO-ABN-ABN-ADV ECAM Advisory Conditions - ENG	A	1	Documentation update: Addition of "ECAM Advisory Conditions - ENG" documentary unit
PRO-ABN-ABN-ADV ECAM Advisory Conditions - ENG	A	2	Documentation update: Addition of "ECAM Advisory Conditions - ENG" documentary unit
PRO-ABN-ABN-ADV ECAM Advisory Conditions - ENG	A	3	Documentation update: Addition of "ECAM Advisory Conditions - ENG" documentary unit
PRO-ABN-ABN-QRH [QRH] NAV	A	3	Documentation update: Addition of "[QRH] NAV" documentary unit
PRO-ABN-ABN-QRH [QRH] NAV	A	4	Documentation update: Addition of "[QRH] NAV" documentary unit

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS

Continued from the previous page

Localization Title	Toc Index	ID	Reason
PRO-ABN-A-ICE ANTI ICE CAPT + F/O AOA	C	1	Documentation update: Addition of "ANTI ICE CAPT + F/O AOA" documentary unit
PRO-ABN-A-ICE ANTI ICE CAPT + F/O AOA	C	2	Documentation update: Addition of "ANTI ICE CAPT + F/O AOA" documentary unit
PRO-ABN-A-ICE ANTI ICE CAPT + F/O AOA - FWSPAGE	C	3	Documentation update: Addition of "ANTI ICE CAPT + F/O AOA - FWSPAGE" documentary unit
PRO-ABN-A-ICE ANTI ICE CAPT + STBY AOA	E	4	Documentation update: Addition of "ANTI ICE CAPT + STBY AOA" documentary unit
PRO-ABN-A-ICE ANTI ICE CAPT + STBY AOA	E	5	Documentation update: Addition of "ANTI ICE CAPT + STBY AOA" documentary unit
PRO-ABN-A-ICE ANTI ICE CAPT + STBY AOA - FWSPAGE	E	6	Documentation update: Addition of "ANTI ICE CAPT + STBY AOA - FWSPAGE" documentary unit
PRO-ABN-A-ICE ANTI ICE CAPT AOA	I	7	Documentation update: Addition of "ANTI ICE CAPT AOA" documentary unit
PRO-ABN-A-ICE ANTI ICE CAPT AOA - FWSPAGE	I	8	Documentation update: Addition of "ANTI ICE CAPT AOA - FWSPAGE" documentary unit
PRO-ABN-A-ICE ANTI ICE ENG 1(2) VALVE CLSD	L	9	Documentation update: Addition of "ANTI ICE ENG 1(2) VALVE CLSD" documentary unit
PRO-ABN-A-ICE ANTI ICE F/O + STBY AOA	N	10	Documentation update: Addition of "ANTI ICE F/O + STBY AOA" documentary unit
PRO-ABN-A-ICE ANTI ICE F/O + STBY AOA	N	11	Documentation update: Addition of "ANTI ICE F/O + STBY AOA" documentary unit
PRO-ABN-A-ICE ANTI ICE F/O + STBY AOA - FWSPAGE	N	12	Documentation update: Addition of "ANTI ICE F/O + STBY AOA - FWSPAGE" documentary unit
PRO-ABN-AIR AIR APU BLEED LEAK APU LEAK FED BY ENG	D	2	Documentation update: Addition of "AIR APU BLEED LEAK APU LEAK FED BY ENG" documentary unit
PRO-ABN-AIR AIR APU BLEED LEAK APU LEAK FED BY ENG	D	3	Documentation update: Addition of "AIR APU BLEED LEAK APU LEAK FED BY ENG" documentary unit
PRO-ABN-AIR AIR APU BLEED LEAK - FWSPAGE APU LEAK FED BY ENG	D	4	Documentation update: Addition of "AIR APU BLEED LEAK - FWSPAGE APU LEAK FED BY ENG" documentary unit
PRO-ABN-AIR AIR ENG 1(2) BLEED FAULT	I	9	Documentation update: Addition of "AIR ENG 1(2) BLEED FAULT" documentary unit
PRO-ABN-AIR AIR ENG 1(2) BLEED FAULT BLEED NOT CLOSED	J	11	Documentation update: Addition of "AIR ENG 1(2) BLEED FAULT BLEED NOT CLOSED" documentary unit

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS

Continued from the previous page

Localization Title	Toc Index	ID	Reason
PRO-ABN-AIR AIR ENG 1(2) BLEED LEAK	S	27	Documentation update: Addition of "AIR ENG 1(2) BLEED LEAK" documentary unit
PRO-ABN-AIR AIR aft CRG VENT FAULT	W	28	Documentation update: Addition of "AIR aft CRG VENT FAULT" documentary unit
PRO-ABN-AIR AIR FWD(AFT) CRG VENT FAULT	W	29	Documentation update: Addition of "AIR FWD(AFT) CRG VENT FAULT" documentary unit
PRO-ABN-AIR AIR AFT CRG VENT FAULT - FWSPAGE	W	30	Documentation update: Addition of "AIR AFT CRG VENT FAULT - FWSPAGE" documentary unit
PRO-ABN-AIR AIR FWD CRG VENT FAULT	X	31	Documentation update: Addition of "AIR FWD CRG VENT FAULT" documentary unit
PRO-ABN-AIR AIR FWD(AFT) CRG VENT FAULT	X	32	Documentation update: Addition of "AIR FWD(AFT) CRG VENT FAULT" documentary unit
PRO-ABN-AIR AIR FWD CRG VENT FAULT - FWSPAGE	X	33	Documentation update: Addition of "AIR FWD CRG VENT FAULT - FWSPAGE" documentary unit
PRO-ABN-AIR AIR L(R) WING LEAK	Y	34	Documentation update: Addition of "AIR L(R) WING LEAK" documentary unit
PRO-ABN-AUTO_FLT AUTO FLT FAC 1 + 2 FAULT - FWSPAGE	E	1	Documentation update: Addition of "AUTO FLT FAC 1 + 2 FAULT - FWSPAGE" documentary unit
PRO-ABN-AUTO_FLT AUTO FLT FAC 1 + 2 FAULT - FWSPAGE	E	2	Documentation update: Addition of "AUTO FLT FAC 1 + 2 FAULT - FWSPAGE" documentary unit
PRO-ABN-AUTO_FLT AUTO FLT FAC VERSIONS DISAGREE	F	3	Documentation update: Addition of "AUTO FLT FAC VERSIONS DISAGREE" documentary unit
PRO-ABN-AUTO_FLT AUTO FLT FAC VERSIONS DISAGREE	F	4	Documentation update: Addition of "AUTO FLT FAC VERSIONS DISAGREE" documentary unit
PRO-ABN-AUTO_FLT AUTO FLT FCU 1 + 2 FAULT - FWSPAGE	H	5	Addition of ROW/ROP as an INOP SYS (If-Installed) to reflect the behaviour of the system.
PRO-ABN-AUTO_FLT AUTO FLT RUD TRIM SYS	K	6	Documentation update: Addition of "AUTO FLT RUD TRIM SYS" documentary unit
PRO-ABN-AUTO_FLT AUTO FLT RUD TRV LIM 1(2)	L	7	Documentation update: Addition of "AUTO FLT RUD TRV LIM 1(2)" documentary unit
PRO-ABN-AUTO_FLT AUTO FLT RUD TRV LIM SYS	M	8	Documentation update: Addition of "AUTO FLT RUD TRV LIM SYS" documentary unit
PRO-ABN-AUTO_FLT AUTO FLT YAW DAMPER SYS	P	9	Documentation update: Addition of "AUTO FLT YAW DAMPER SYS" documentary unit

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS

Continued from the previous page

Localization Title	Toc Index	ID	Reason
PRO-ABN-AUTO_FLT AUTO FLT YAW DAMPER SYS - FWSPAGE	P	10	Documentation update: Addition of "AUTO FLT YAW DAMPER SYS - FWSPAGE" documentary unit
PRO-ABN-AUTO_FLT AUTO FLT YAW DAMPER SYS	P	11	Documentation update: Addition of "AUTO FLT YAW DAMPER SYS" documentary unit
PRO-ABN-AUTO_FLT AUTO FLT YAW DAMPER SYS - FWSPAGE	P	12	Documentation update: Addition of "AUTO FLT YAW DAMPER SYS - FWSPAGE" documentary unit
PRO-ABN-BRAKES BRAKES NORM BRK FAULT	K	1	Documentation update: Addition of "BRAKES NORM BRK FAULT" documentary unit
PRO-ABN-CAB_PR CAB PR OUTFLOW VALVE NOT OPEN	F	3	Correction of the time needed by the ECAM indication to get updated in order to be in accordance with the system behaviour.
PRO-ABN-CAB_PR CAB PR SAFETY VALVE OPEN	G	4	Correction of the time needed by the ECAM indication to get updated in order to be in accordance with the system behaviour.
PRO-ABN-CAB_PR CAB PR SYS 1+2 FAULT	I	5	Correction of the time needed by the ECAM indication to get updated in order to be in accordance with the system behaviour.
PRO-ABN-CAB_PR CAB PR SYS 1+2 FAULT	I	6	Correction of the time needed by the ECAM indication to get updated in order to be in accordance with the system behaviour.
PRO-ABN-COM COM SINGLE PTT STUCK	F	1	Documentation update: Addition of "COM SINGLE PTT STUCK" documentary unit
PRO-ABN-COND COND AFT CARGO DUCT OVHT	C	3	Documentation update: Addition of "COND AFT CARGO DUCT OVHT" documentary unit
PRO-ABN-COND COND FWD(AFT) CARGO DUCT OVH	C	4	Documentation update: Addition of "COND FWD(AFT) CARGO DUCT OVH" documentary unit
PRO-ABN-COND COND AFT CARGO DUCT OVHT - FWSPAGE	C	5	Documentation update: Addition of "COND AFT CARGO DUCT OVHT - FWSPAGE" documentary unit
PRO-ABN-COND COND FWD CARGO DUCT OVHT	D	6	Documentation update: Addition of "COND FWD CARGO DUCT OVHT" documentary unit
PRO-ABN-COND COND FWD(AFT) CARGO DUCT OVH	D	7	Documentation update: Addition of "COND FWD(AFT) CARGO DUCT OVH" documentary unit
PRO-ABN-COND COND FWD CARGO DUCT OVHT - FWSPAGE	D	8	Documentation update: Addition of "COND FWD CARGO DUCT OVHT - FWSPAGE" documentary unit
PRO-ABN-COND COND AFT CRG HEAT FAULT	E	9	Documentation update: Addition of "COND AFT CRG HEAT FAULT" documentary unit
PRO-ABN-COND	E	10	Documentation update: Addition of "COND FWD(AFT) CRG HEAT FAULT" documentary unit

Continued on the following page

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES ABNORMAL AND EMERGENCY PROCEDURES PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS
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Continued from the previous page

Localization Title	Toc Index	ID	Reason
COND FWD(AFT) CRG HEAT FAULT			
PRO-ABN-COND COND AFT CRG HEAT FAULT - FWSPAGE	E	11	Documentation update: Addition of "COND AFT CRG HEAT FAULT - FWSPAGE" documentary unit
PRO-ABN-COND COND FWD CRG HEAT FAULT	F	12	Documentation update: Addition of "COND FWD CRG HEAT FAULT" documentary unit
PRO-ABN-COND COND FWD(AFT) CRG HEAT FAULT	F	13	Documentation update: Addition of "COND FWD(AFT) CRG HEAT FAULT" documentary unit
PRO-ABN-COND COND FWD CRG HEAT FAULT - FWSPAGE	F	14	Documentation update: Addition of "COND FWD CRG HEAT FAULT - FWSPAGE" documentary unit
PRO-ABN-COND COND aft CRG ISOL VALVE	G	15	Documentation update: Addition of "COND aft CRG ISOL VALVE" documentary unit
PRO-ABN-COND COND FWD(AFT) CRG ISOL VALVE	G	16	Documentation update: Addition of "COND FWD(AFT) CRG ISOL VALVE" documentary unit
PRO-ABN-COND COND AFT CRG ISOL VALVE - FWSPAGE	G	17	Documentation update: Addition of "COND AFT CRG ISOL VALVE - FWSPAGE" documentary unit
PRO-ABN-COND COND FWD CRG ISOL VALVE	I	19	Documentation update: Addition of "COND FWD CRG ISOL VALVE" documentary unit
PRO-ABN-COND COND FWD(AFT) CRG ISOL VALVE	I	20	Documentation update: Addition of "COND FWD(AFT) CRG ISOL VALVE" documentary unit
PRO-ABN-COND COND FWD CRG ISOL VALVE - FWSPAGE	I	21	Documentation update: Addition of "COND FWD CRG ISOL VALVE - FWSPAGE" documentary unit
PRO-ABN-ELEC [QRH] ELEC EMER CONFIG SYS REMAINING - 21 - AIR CONDITIONING/VENTILATION/ PRESSURIZATION	B	1	Clarification of the PACK VALVE 1 condition to be in accordance with the system design.
			Update of the PACK VALVE 1 condition to be in accordance with the system design.
PRO-ABN-ELEC [QRH] ELEC EMER CONFIG SYS REMAINING - 21 - AIR CONDITIONING/VENTILATION/ PRESSURIZATION	B	2	Clarification of the PACK VALVE 1 condition to be in accordance with the system design.
			Update of the PACK VALVE 1 condition to be in accordance with the system design.
PRO-ABN-ELEC [QRH] ELEC EMER CONFIG SYS REMAINING - 21 - AIR	B	3	Clarification of the PACK VALVE 1 condition to be in accordance with the system design.
			Update of the PACK VALVE 1 condition to be in accordance with the system design.

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS

Continued from the previous page

Localization Title	Toc Index	ID	Reason
CONDITIONING/VENTILATION/ PRESSURIZATION			
PRO-ABN-ELEC [QRH] ELEC EMER CONFIG SYS REMAINING - 21 - AIR CONDITIONING/VENTILATION/ PRESSURIZATION	B	4	Clarification of the PACK VALVE 1 condition to be in accordance with the system design. Update of the PACK VALVE 1 condition to be in accordance with the system design.
PRO-ABN-ELEC ELEC DC BAT BUS FAULT - FWSPAGE	L	5	Layout modification. No technical change. Documentation update: Deletion of information. Addition of If-installed tag "Forward cargo fire extinguishing" and "AFT cargo fire extinguishing". Addition of If-installed tag "Forward cargo heat controller" and "AFT cargo heat controller".
PRO-ABN-ELEC ELEC DC BUS 1 FAULT - FWSPAGE	M	6	Documentation update: Addition of "ELEC DC BUS 1 FAULT - FWSPAGE" documentary unit
PRO-ABN-ELEC ELEC DC BUS 1 FAULT - FWSPAGE	M	7	Documentation update: Addition of "ELEC DC BUS 1 FAULT - FWSPAGE" documentary unit
PRO-ABN-ELEC ELEC DC BUS 1 FAULT - FWSPAGE	M	8	Documentation update: Addition of "ELEC DC BUS 1 FAULT - FWSPAGE" documentary unit
PRO-ABN-ELEC ELEC DC BUS 2 FAULT	N	9	Documentation update: Addition of "ELEC DC BUS 2 FAULT" documentary unit
PRO-ABN-ELEC ELEC DC BUS 2 FAULT - FWSPAGE	N	10	Correction of a typo error. Addition of If-installed tag "CIDS 2 SMOKE DETECT". Layout modification. No technical change.
PRO-ABN-ELEC ELEC DC BUS 2 FAULT	N	11	Documentation update: Addition of "ELEC DC BUS 2 FAULT" documentary unit
PRO-ABN-ELEC ELEC DC BUS 2 FAULT - FWSPAGE	N	12	Layout modification. No technical change. Correction of a typo error. Addition of If-installed tag "CIDS 2 SMOKE DETECT".
PRO-ABN-ELEC ELEC DC BUS 2 FAULT	N	13	Documentation update: Addition of "ELEC DC BUS 2 FAULT" documentary unit
PRO-ABN-ELEC ELEC DC BUS 2 FAULT - FWSPAGE	N	14	Layout modification. No technical change. Correction of a typo error. Addition of If-installed tag "CIDS 2 SMOKE DETECT".
PRO-ABN-ELEC ELEC DC BUS 1+2 FAULT	O	15	Addition of AVNCS VENT as secondary failure in order to be in accordance with the system behavior.

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS

Continued from the previous page

Localization Title	Toc Index	ID	Reason
PRO-ABN-ELEC ELEC DC BUS 1 + 2 FAULT - FWSPAGE	O	16	Addition of If-installed tag "Forward cargo fire extinguishing" and "AFT cargo fire extinguishing".
			Addition of If-installed tag "Forward cargo heat controller" and "AFT cargo heat controller".
			Addition of If-installed tag "AFT CRG HEAT" and "FWD CRG HEAT".
			Addition of If-installed tag "Forward cargo isolation valves" and "AFT cargo isolation valves".
			Addition of If-installed tag "CIDS 2 SMOKE DETECT".
			Deletion of BRK SYS inop sys to be in accordance with the system behavior.
			Documentation update: Deletion of text.
			Addition of a note in order to be in accordance with the system behavior.
PRO-ABN-ELEC ELEC DC BUS 1+2 FAULT	O	17	Addition of AVNCS VENT as secondary failure in order to be in accordance with the system behavior.
PRO-ABN-ELEC ELEC DC BUS 1 + 2 FAULT - FWSPAGE	O	18	Addition of If-installed tag "Forward cargo isolation valves" and "AFT cargo isolation valves".
			Addition of If-installed tag "Forward cargo fire extinguishing" and "AFT cargo fire extinguishing".
			Addition of If-installed tag "Forward cargo heat controller" and "AFT cargo heat controller".
			Deletion of BRK SYS inop sys to be in accordance with the system behavior.
			Documentation update: Deletion of text.
			Addition of If-installed tag "AFT CRG HEAT" and "FWD CRG HEAT".
			Addition of a note in order to be in accordance with the system behavior.
			Addition of If-installed tag "CIDS 2 SMOKE DETECT".
PRO-ABN-ELEC ELEC DC BUS 1+2 FAULT	O	19	Addition of AVNCS VENT as secondary failure in order to be in accordance with the system behavior.
PRO-ABN-ELEC ELEC DC BUS 1 + 2 FAULT - FWSPAGE	O	20	Addition of If-installed tag "Forward cargo fire extinguishing" and "AFT cargo fire extinguishing".
			Addition of If-installed tag "Forward cargo heat controller" and "AFT cargo heat controller".
			Addition of If-installed tag "Forward cargo isolation valves" and "AFT cargo isolation valves".
			Addition of If-installed tag "AFT CRG HEAT" and "FWD CRG HEAT".

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS

Continued from the previous page

Localization Title	Toc Index	ID	Reason
			Addition of If-installed tag "CIDS 2 SMOKE DETECT".
			Addition of a note in order to be in accordance with the system behavior.
			Deletion of BRK SYS inop sys to be in accordance with the system behavior.
			Documentation update: Deletion of text.
PRO-ABN-ELEC ELEC DC EMER CONFIG	P	21	Documentation update: Addition of "ELEC DC EMER CONFIG" documentary unit
PRO-ABN-ELEC ELEC DC EMER CONFIG - FWSPAGE	P	22	Documentation update: Addition of "ELEC DC EMER CONFIG - FWSPAGE" documentary unit
PRO-ABN-ELEC ELEC DC ESS BUS FAULT	Q	23	Documentation update: Addition of "ELEC DC ESS BUS FAULT" documentary unit
PRO-ABN-ELEC ELEC DC ESS BUS FAULT - FWSPAGE	Q	24	Documentation update: Addition of "ELEC DC ESS BUS FAULT - FWSPAGE" documentary unit
PRO-ABN-ELEC ELEC DC ESS BUS FAULT	Q	25	Documentation update: Addition of "ELEC DC ESS BUS FAULT" documentary unit
PRO-ABN-ELEC ELEC DC ESS BUS FAULT - FWSPAGE	Q	26	Documentation update: Addition of "ELEC DC ESS BUS FAULT - FWSPAGE" documentary unit
PRO-ABN-ELEC ELEC DC ESS BUS FAULT	Q	27	Documentation update: Addition of "ELEC DC ESS BUS FAULT" documentary unit
PRO-ABN-ELEC ELEC DC ESS BUS FAULT - FWSPAGE	Q	28	Documentation update: Addition of "ELEC DC ESS BUS FAULT - FWSPAGE" documentary unit
PRO-ABN-ELEC ELEC DC ESS BUS SHED - FWSPAGE	R	29	Addition of If-installed tag "SDCU" and "CIDS 1 SMOKE DETECT".
PRO-ABN-ELEC ELEC EMER CONFIG - FWSPAGE	S	30	Documentation update: Addition of "ELEC EMER CONFIG - FWSPAGE" documentary unit
PRO-ABN-ELEC ELEC EMER CONFIG - FWSPAGE	S	31	Documentation update: Addition of "ELEC EMER CONFIG - FWSPAGE" documentary unit
PRO-ABN-ELEC ELEC EMER CONFIG - FWSPAGE	S	32	Documentation update: Addition of "ELEC EMER CONFIG - FWSPAGE" documentary unit
PRO-ABN-ELEC ELEC IDG 1(2) DISCONNECTED	Y	34	Documentation update: Addition of "ELEC IDG 1(2) DISCONNECTED" documentary unit
PRO-ABN-ENG [QRH] ALL ENG FAIL - If ditching anticipated	B	8	Reintroduction of the procedure line: "KEEP LANDING GEAR UP" that was erroneously deleted.

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS

Continued from the previous page

Localization Title	Toc Index	ID	Reason
PRO-ABN-ENG [QRH] ALL ENG FAIL - If ditching anticipated	B	17	Reintroduction of the procedure line: "KEEP LANDING GEAR UP" that was erroneously deleted.
PRO-ABN-ENG [QRH] ENG 1(2) STALL	C	20	Update of the note to consider an engine relight in the case of a transient stall.
			Documentation update: Deletion of information.
			Correction of a typo error.
PRO-ABN-ENG [QRH] HIGH ENGINE VIBRATION	E	21	Documentation update: Addition of "[QRH] HIGH ENGINE VIBRATION" documentary unit
PRO-ABN-ENG ENG ALL ENGINES FAILURE - FWS PAGE	I	26	Documentation update: Addition of "ENG ALL ENGINES FAILURE - FWS PAGE" documentary unit
PRO-ABN-ENG ENG FUEL CONTAMINATED	J	27	Documentation update: Addition of "ENG FUEL CONTAMINATED" documentary unit
PRO-ABN-ENG ENG FUEL CONTAMINATED	J	28	Documentation update: Addition of "ENG FUEL CONTAMINATED" documentary unit
PRO-ABN-ENG ENG FUEL CONTAMINATED - FWSPAGE	J	29	Documentation update: Addition of "ENG FUEL CONTAMINATED - FWSPAGE" documentary unit
PRO-ABN-ENG ENG FUEL CONTAMINATED	J	30	Documentation update: Addition of "ENG FUEL CONTAMINATED" documentary unit
PRO-ABN-ENG ENG FUEL CONTAMINATED	J	31	Documentation update: Addition of "ENG FUEL CONTAMINATED" documentary unit
PRO-ABN-ENG ENG FUEL CONTAMINATED - FWSPAGE	J	32	Documentation update: Addition of "ENG FUEL CONTAMINATED - FWSPAGE" documentary unit
PRO-ABN-ENG ENG 1(2) BLEED STATUS FAULT (On Ground)	L	33	Documentation update: Addition of "ENG 1(2) BLEED STATUS FAULT (On Ground)" documentary unit
PRO-ABN-ENG ENG 1(2) EIU FAULT	P	36	Documentation update: Addition of "ENG 1(2) EIU FAULT" documentary unit
PRO-ABN-ENG ENG 1(2) EIU FAULT - FWSPAGE	P	37	Documentation update: Addition of "ENG 1(2) EIU FAULT - FWSPAGE" documentary unit
PRO-ABN-ENG ENG 1(2) FADEC FAULT	S	38	Documentation update: Addition of "ENG 1(2) FADEC FAULT" documentary unit
PRO-ABN-ENG ENG 1(2) FAIL	U	39	Documentation update: Addition of "ENG 1(2) FAIL" documentary unit
PRO-ABN-ENG ENG 1(2) HIGH VIBRATION	AC	40	Documentation update: Addition of "ENG 1(2) HIGH VIBRATION" documentary unit
PRO-ABN-ENG ENG 1(2) HIGH VIBRATION	AC	41	Documentation update: Addition of "ENG 1(2) HIGH VIBRATION" documentary unit

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS

Continued from the previous page

Localization Title	Toc Index	ID	Reason
PRO-ABN-ENG ENG 1(2) OIL FILTER CLOG	AJ	43	Documentation update: Addition of "ENG 1(2) OIL FILTER CLOG" documentary unit
PRO-ABN-ENG ENG 1(2) REV PRESSURIZED	AR	45	Documentation update: Addition of "ENG 1(2) REV PRESSURIZED" documentary unit
PRO-ABN-ENG ENG 1(2) REVERSE UNLOCKED	AU	46	Documentation update: Addition of "ENG 1(2) REVERSE UNLOCKED" documentary unit
PRO-ABN-ENG ENG 1(2) SHUT DOWN	AY	47	Documentation update: Addition of "ENG 1(2) SHUT DOWN" documentary unit
PRO-ABN-ENG ENG 1(2) SHUT DOWN - FWSPAGE	AY	48	Documentation update: Addition of "ENG 1(2) SHUT DOWN - FWSPAGE" documentary unit
PRO-ABN-ENG ENG THR LEVERS NOT SET	BF	52	Layout modification. No technical change. Modification on the note associated with the engagement of takeoff thrust mode by adding the CL position. This is because the FADEC will engage the takeoff thrust mode starting from CL position.
PRO-ABN-ENG ENG THR LEVERS NOT SET	BF	53	Wording enhancement. No technical change.
PRO-ABN-F_CTL F/CTL ALTN LAW - FWSPAGE	E	1	Documentation update: Addition of "F/CTL ALTN LAW - FWSPAGE" documentary unit
PRO-ABN-F_CTL F/CTL ALTN LAW - FWSPAGE	E	2	Documentation update: Addition of "F/CTL ALTN LAW - FWSPAGE" documentary unit
PRO-ABN-F_CTL F/CTL DIRECT LAW (PROT LOST)	F	3	Wording enhancement. No technical change. Documentation update: Deletion of information.
PRO-ABN-F_CTL F/CTL DIRECT LAW (PROT LOST)	F	4	Correction of the action line to be in accordance with the ECAM display.
PRO-ABN-F_CTL F/CTL DIRECT LAW - FWSPAGE	F	5	Documentation update: Addition of "F/CTL DIRECT LAW - FWSPAGE" documentary unit
PRO-ABN-F_CTL F/CTL ELAC 1(2) FAULT (Both Computers Failed) - FWSPAGE	H	6	Documentation update: Addition of "F/CTL ELAC 1(2) FAULT (Both Computers Failed) - FWSPAGE" documentary unit
PRO-ABN-F_CTL F/CTL ELAC 1(2) PITCH FAULT - FWSPAGE (ONE COMPUTER FAILED)	I	7	Documentation update: Addition of "F/CTL ELAC 1(2) PITCH FAULT - FWSPAGE (One Computer Failed)" documentary unit
PRO-ABN-F_CTL F/CTL ELAC PITCH FAULT	J	8	Documentation update: Addition of "F/CTL ELAC PITCH FAULT" documentary unit
PRO-ABN-F_CTL F/CTL ELAC PITCH FAULT	J	9	Documentation update: Addition of "F/CTL ELAC PITCH FAULT" documentary unit
PRO-ABN-F_CTL F/CTL ELAC PITCH FAULT	J	10	Documentation update: Addition of "F/CTL ELAC PITCH FAULT" documentary unit

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS

Continued from the previous page

Localization Title	Toc Index	ID	Reason
PRO-ABN-F_CTL F/CTL ELEV REDUND DEGRDD	K	11	Documentation update: Addition of "F/CTL ELEV REDUND DEGRDD" documentary unit
PRO-ABN-F_CTL F/CTL ELEV REDUND DEGRDD	K	12	Documentation update: Addition of "F/CTL ELEV REDUND DEGRDD" documentary unit
PRO-ABN-F_CTL F/CTL FLAPS FAULT/LOCKED - FWSPAGE	P	14	Documentation update: Addition of "F/CTL FLAPS FAULT/LOCKED - FWSPAGE" documentary unit
PRO-ABN-F_CTL F/CTL L(R) ELEV FAULT	Y	15	Documentation update: Addition of "F/CTL L(R) ELEV FAULT" documentary unit
PRO-ABN-F_CTL F/CTL L(R) ELEV FAULT - FWSPAGE	Y	16	Documentation update: Addition of "F/CTL L(R) ELEV FAULT - FWSPAGE" documentary unit
PRO-ABN-F_CTL F/CTL L+R ELEV FAULT - FWSPAGE	Z	17	Documentation update: Addition of "F/CTL L+R ELEV FAULT - FWSPAGE" documentary unit
PRO-ABN-F_CTL F/CTL SEC 1(2)(3) FAULT - FWSPAGE	AC	18	Documentation update: Addition of "F/CTL SEC 1(2)(3) FAULT - FWSPAGE" documentary unit
PRO-ABN-F_CTL F/CTL SLATS AND FLAPS FAULT IN CONF 0 - FWSPAGE	AF	19	Documentation update: Addition of "F/CTL SLATS AND FLAPS FAULT IN CONF 0 - FWSPAGE" documentary unit
PRO-ABN-F_CTL F/CTL SLATS AND FLAPS FAULT IN CONF 0 - FWSPAGE	AF	20	Documentation update: Addition of "F/CTL SLATS AND FLAPS FAULT IN CONF 0 - FWSPAGE" documentary unit
PRO-ABN-F_CTL F/CTL SLATS FAULT/LOCKED - FWSPAGE	AG	22	Documentation update: Addition of "F/CTL SLATS FAULT/LOCKED - FWSPAGE" documentary unit
PRO-ABN-F_CTL F/CTL SLATS FAULT/LOCKED - FWSPAGE	AG	23	Documentation update: Addition of "F/CTL SLATS FAULT/LOCKED - FWSPAGE" documentary unit
PRO-ABN-F_CTL F/CTL SPLR FAULT - FWSPAGE	AN	24	Documentation update: Addition of "F/CTL SPLR FAULT - FWSPAGE" documentary unit
PRO-ABN-F_CTL F/CTL STABILIZER JAM	AO	25	Documentation update: Addition of "F/CTL STABILIZER JAM" documentary unit
PRO-ABN-F_CTL F/CTL STABILIZER JAM - FWSPAGE	AO	26	Documentation update: Addition of "F/CTL STABILIZER JAM - FWSPAGE" documentary unit
PRO-ABN-FUEL FUEL ENG 1(2) LP VALVE FAULT	Q	1	Documentation update: Addition of "FUEL ENG 1(2) LP VALVE FAULT" documentary unit
PRO-ABN-FUEL FUEL ENG 1(2) LP VALVE FAULT	Q	2	Documentation update: Addition of "FUEL ENG 1(2) LP VALVE FAULT" documentary unit

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS

Continued from the previous page

Localization Title	Toc Index	ID	Reason
PRO-ABN-FUEL FUEL F.USED/FOB DISAGREE	R	3	Documentation update: Addition of "FUEL F.USED/FOB DISAGREE" documentary unit
PRO-ABN-FUEL FUEL FQI CH 1+2 FAULT	T	4	Documentation update: Addition of "FUEL FQI CH 1+2 FAULT" documentary unit
PRO-ABN-FUEL FUEL FQI CH 1+2 FAULT	T	5	Documentation update: Addition of "FUEL FQI CH 1+2 FAULT" documentary unit
PRO-ABN-FUEL FUEL L(R) TK PUMP 1 + 2 LO PR	AB	6	Documentation update: Addition of "FUEL L(R) TK PUMP 1 + 2 LO PR" documentary unit
PRO-ABN-FUEL FUEL L(R) TK PUMP 1 + 2 LO PR - FWSPAGE	AB	7	Documentation update: Addition of "FUEL L(R) TK PUMP 1 + 2 LO PR - FWSPAGE" documentary unit
PRO-ABN-FUEL FUEL L (R) TK PUMP 1 + 2 LO PR (CENTER TANK EMPTY)	AC	8	Documentation update: Addition of "FUEL L (R) TK PUMP 1 + 2 LO PR (Center Tank Empty)" documentary unit
PRO-ABN-FUEL FUEL L (R) TK PUMP 1 + 2 LO PR (CENTER TANK EMPTY)	AC	9	Documentation update: Addition of "FUEL L (R) TK PUMP 1 + 2 LO PR (Center Tank Empty)" documentary unit
PRO-ABN-FUEL FUEL L (R) TK PUMP 1 + 2 LO PR - FWSPAGE (CENTER TANK EMPTY)	AC	10	Documentation update: Addition of "FUEL L (R) TK PUMP 1 + 2 LO PR - FWSPAGE (Center Tank Empty)" documentary unit
PRO-ABN-FUEL FUEL L (R) TK PUMP 1 + 2 LO PR (CENTER TANK NOT EMPTY)	AD	11	Documentation update: Addition of "FUEL L (R) TK PUMP 1 + 2 LO PR (Center Tank not Empty)" documentary unit
PRO-ABN-FUEL FUEL L(R) WING TK LO LVL	AE	12	Documentation update: Addition of "FUEL L(R) WING TK LO LVL" documentary unit
PRO-ABN-FWS FWS AUDIO DEGRADED	A	1	Documentation update: Addition of "FWS AUDIO DEGRADED" documentary unit
PRO-ABN-FWS FWS AUDIO DEGRADED	A	2	Documentation update: Addition of "FWS AUDIO DEGRADED" documentary unit
PRO-ABN-FWS FWS AUDIO REDUND LOST ON FWC 1(2)	B	3	Documentation update: Addition of "FWS AUDIO REDUND LOST ON FWC 1(2)" documentary unit
PRO-ABN-FWS FWS AUDIO REDUND LOST ON FWC 1(2)	B	4	Documentation update: Addition of "FWS AUDIO REDUND LOST ON FWC 1(2)" documentary unit
PRO-ABN-FWS FWS SLAT (FLAP) SYNCHRO FAULT	H	5	Documentation update: Addition of "FWS SLAT (FLAP) SYNCHRO FAULT" documentary unit
PRO-ABN-FWS FWS SLAT (FLAP) SYNCHRO FAULT	H	6	Documentation update: Addition of "FWS SLAT (FLAP) SYNCHRO FAULT" documentary unit

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS

Continued from the previous page

Localization Title	Toc Index	ID	Reason
PRO-ABN-HYD HYD G ENG 1 PUMP LO PR - FWSPAGE (PTU INOPERATIVE)	F	1	Documentation update: Addition of "HYD G ENG 1 PUMP LO PR - FWSPAGE (PTU Inoperative)" documentary unit
PRO-ABN-HYD HYD G ENG 1 PUMP LO PR - FWSPAGE (PTU INOPERATIVE)	F	2	Documentation update: Addition of "HYD G ENG 1 PUMP LO PR - FWSPAGE (PTU Inoperative)" documentary unit
PRO-ABN-HYD HYD G RSVR LO AIR PR - FWSPAGE	G	3	Documentation update: Addition of "HYD G RSVR LO AIR PR - FWSPAGE" documentary unit
PRO-ABN-HYD HYD G RSVR LO AIR PR - FWSPAGE	G	4	Documentation update: Addition of "HYD G RSVR LO AIR PR - FWSPAGE" documentary unit
PRO-ABN-HYD HYD G RSVR LO LVL - FWSPAGE	H	5	Documentation update: Addition of "HYD G RSVR LO LVL - FWSPAGE" documentary unit
PRO-ABN-HYD HYD G RSVR LO LVL - FWSPAGE	H	6	Documentation update: Addition of "HYD G RSVR LO LVL - FWSPAGE" documentary unit
PRO-ABN-HYD HYD G RSVR OVHT - FWSPAGE	I	7	Documentation update: Addition of "HYD G RSVR OVHT - FWSPAGE" documentary unit
PRO-ABN-HYD HYD G RSVR OVHT - FWSPAGE	I	8	Documentation update: Addition of "HYD G RSVR OVHT - FWSPAGE" documentary unit
PRO-ABN-HYD HYD Y ENG 2 PUMP LO PR - FWSPAGE (PTU INOPERATIVE)	L	9	Documentation update: Addition of "HYD Y ENG 2 PUMP LO PR - FWSPAGE (PTU Inoperative)" documentary unit
PRO-ABN-HYD HYD Y ENG 2 PUMP LO PR - FWSPAGE (PTU INOPERATIVE)	L	10	Documentation update: Addition of "HYD Y ENG 2 PUMP LO PR - FWSPAGE (PTU Inoperative)" documentary unit
PRO-ABN-HYD HYD Y RSVR LO AIR PR - FWSPAGE	M	11	Documentation update: Addition of "HYD Y RSVR LO AIR PR - FWSPAGE" documentary unit
PRO-ABN-HYD HYD Y RSVR LO AIR PR - FWSPAGE	M	12	Documentation update: Addition of "HYD Y RSVR LO AIR PR - FWSPAGE" documentary unit
PRO-ABN-HYD HYD Y RSVR LO LVL - FWSPAGE	N	13	Documentation update: Addition of "HYD Y RSVR LO LVL - FWSPAGE" documentary unit
PRO-ABN-HYD HYD Y RSVR LO LVL - FWSPAGE	N	14	Documentation update: Addition of "HYD Y RSVR LO LVL - FWSPAGE" documentary unit
PRO-ABN-HYD HYD Y RSVR OVHT - FWSPAGE	O	15	Documentation update: Addition of "HYD Y RSVR OVHT - FWSPAGE" documentary unit
PRO-ABN-HYD HYD Y RSVR OVHT - FWSPAGE	O	16	Documentation update: Addition of "HYD Y RSVR OVHT - FWSPAGE" documentary unit

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS

Continued from the previous page

Localization Title	Toc Index	ID	Reason
PRO-ABN-HYD HYD B+Y SYS LO PR	P	17	Documentation update: Addition of "HYD B+Y SYS LO PR" documentary unit
PRO-ABN-HYD HYD B+Y SYS LO PR - FWSPAGE	P	18	Documentation update: Addition of "HYD B+Y SYS LO PR - FWSPAGE" documentary unit
PRO-ABN-HYD HYD B+Y SYS LO PR	P	19	Documentation update: Addition of "HYD B+Y SYS LO PR" documentary unit
PRO-ABN-HYD HYD B+Y SYS LO PR - FWSPAGE	P	20	Documentation update: Addition of "HYD B+Y SYS LO PR - FWSPAGE" documentary unit
PRO-ABN-HYD HYD G+B SYS LO PR	Q	21	Documentation update: Addition of "HYD G+B SYS LO PR" documentary unit
PRO-ABN-HYD HYD G+B SYS LO PR - FWSPAGE	Q	22	Documentation update: Addition of "HYD G+B SYS LO PR - FWSPAGE" documentary unit
PRO-ABN-HYD HYD G+B SYS LO PR	Q	23	Documentation update: Addition of "HYD G+B SYS LO PR" documentary unit
PRO-ABN-HYD HYD G+B SYS LO PR - FWSPAGE	Q	24	Documentation update: Addition of "HYD G+B SYS LO PR - FWSPAGE" documentary unit
PRO-ABN-HYD HYD G+Y SYS LO PR	R	25	Documentation update: Addition of "HYD G+Y SYS LO PR" documentary unit
PRO-ABN-HYD HYD G+Y SYS LO PR - FWSPAGE	R	26	Documentation update: Addition of "HYD G+Y SYS LO PR - FWSPAGE" documentary unit
PRO-ABN-LG L/G DOORS NOT CLOSED	C	1	Documentation update: Addition of "L/G DOORS NOT CLOSED" documentary unit
PRO-ABN-LG L/G GEAR NOT DOWNLOCKED	E	2	Documentation update: Addition of "L/G GEAR NOT DOWNLOCKED" documentary unit
PRO-ABN-LG L/G GEAR NOT DOWNLOCKED	E	3	Documentation update: Addition of "L/G GEAR NOT DOWNLOCKED" documentary unit
PRO-ABN-LG L/G GEAR NOT UNLOCKED	F	4	Documentation update: Addition of "L/G GEAR NOT UNLOCKED" documentary unit
PRO-ABN-LG L/G LGCIU 1+2 FAULT	I	5	Documentation update: Addition of "L/G LGCIU 1+2 FAULT" documentary unit
PRO-ABN-LG L/G LGCIU 1+2 FAULT - FWSPAGE	I	6	Documentation update: Addition of "L/G LGCIU 1+2 FAULT - FWSPAGE" documentary unit
PRO-ABN-LG L/G LGCIU 1+2 FAULT	I	7	Documentation update: Addition of "L/G LGCIU 1+2 FAULT" documentary unit
PRO-ABN-LG L/G LGCIU 1+2 FAULT - FWSPAGE	I	8	Documentation update: Addition of "L/G LGCIU 1+2 FAULT - FWSPAGE" documentary unit
PRO-ABN-LG L/G LGCIU 1+2 FAULT	I	9	Documentation update: Addition of "L/G LGCIU 1+2 FAULT" documentary unit
PRO-ABN-LG L/G LGCIU 1+2 FAULT - FWSPAGE	I	10	Documentation update: Addition of "L/G LGCIU 1+2 FAULT - FWSPAGE" documentary unit

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS

Continued from the previous page

Localization Title	Toc Index	ID	Reason
PRO-ABN-LG L/G SYS DISAGREE	L	11	Documentation update: Addition of "L/G SYS DISAGREE" documentary unit
PRO-ABN-MISC [QRH] COCKPIT WINDSHIELD / WINDOW CRACKED	F	1	Update of XML data. No change of technical content.
			Documentation update: Information "N.00012097.0001001.085" moved from "N.00012097.0001001.084" to "N.00012097.0001001.089"
			Documentation update: Deletion of information.
PRO-ABN-MISC [QRH] VOLCANIC ASH ENCOUNTER	N	5	Update of the If-installed tag "CARGO ISO VALVES" by "AFT CARGO ISO VALVES" and "FWD CARGO ISO VALVES" to be in accordance with the cockpit layout.
PRO-ABN-NAV Unreliable Speed Indication - Level-Off	A	1	Documentation update: Addition of "Unreliable Speed Indication - Level-Off" documentary unit
PRO-ABN-NAV Unreliable Speed Indication - Pitch/Thrust Tables	A	2	Documentation update: Addition of "Unreliable Speed Indication - Pitch/Thrust Tables" documentary unit
PRO-ABN-NAV Unreliable Speed Indication - Level-Off	A	3	Documentation update: Addition of "Unreliable Speed Indication - Level-Off" documentary unit
PRO-ABN-NAV Unreliable Speed Indication - Pitch/Thrust Tables	A	4	Documentation update: Addition of "Unreliable Speed Indication - Pitch/Thrust Tables" documentary unit
PRO-ABN-NAV Unreliable Speed Indication - Level-Off	A	5	Documentation update: Addition of "Unreliable Speed Indication - Level-Off" documentary unit
PRO-ABN-NAV Unreliable Speed Indication - Flight Path Stabilized	A	6	Documentation update: Addition of "Unreliable Speed Indication - Flight Path Stabilized" documentary unit
PRO-ABN-NAV Unreliable Speed Indication - Pitch/Thrust Tables	A	7	Documentation update: Addition of "Unreliable Speed Indication - Pitch/Thrust Tables" documentary unit
PRO-ABN-NAV NAV ADR 1+2(1+3)(2+3) FAULT	F	8	Documentation update: Addition of "NAV ADR 1+2(1+3)(2+3) FAULT" documentary unit
PRO-ABN-NAV NAV ADR 1+2(1+3)(2+3) FAULT - FWSPACE	F	9	Documentation update: Addition of "NAV ADR 1+2(1+3)(2+3) FAULT - FWSPACE" documentary unit
PRO-ABN-NAV NAV ADR 1+2(1+3)(2+3) FAULT	F	10	Documentation update: Addition of "NAV ADR 1+2(1+3)(2+3) FAULT" documentary unit
PRO-ABN-NAV NAV ADR 1+2(1+3)(2+3) FAULT - FWSPACE	F	11	Documentation update: Addition of "NAV ADR 1+2(1+3)(2+3) FAULT - FWSPACE" documentary unit

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS

Continued from the previous page

Localization Title	Toc Index	ID	Reason
PRO-ABN-NAV NAV ADR 1+2+3 FAULT - FWSPAGE	G	12	Documentation update: Addition of "NAV ADR 1+2+3 FAULT - FWSPAGE" documentary unit
PRO-ABN-NAV NAV ADR 1+2+3 FAULT - FWSPAGE	G	13	Documentation update: Addition of "NAV ADR 1+2+3 FAULT - FWSPAGE" documentary unit
PRO-ABN-NAV NAV ADR DISAGREE	H	14	Documentation update: Addition of "NAV ADR DISAGREE" documentary unit
PRO-ABN-NAV NAV ADR DISAGREE - FWSPAGE	H	15	Documentation update: Addition of "NAV ADR DISAGREE - FWSPAGE" documentary unit
PRO-ABN-NAV NAV ADR DISAGREE	H	16	Documentation update: Addition of "NAV ADR DISAGREE" documentary unit
PRO-ABN-NAV NAV ADR DISAGREE - FWSPAGE	H	17	Documentation update: Addition of "NAV ADR DISAGREE - FWSPAGE" documentary unit
PRO-ABN-NAV NAV ALT DISCREPANCY	J	18	Documentation update: Addition of "NAV ALT DISCREPANCY" documentary unit
PRO-ABN-NAV NAV ALT DISCREPANCY	J	19	Documentation update: Addition of "NAV ALT DISCREPANCY" documentary unit
PRO-ABN-NAV NAV AOA DISAGREE	K	20	Documentation update: Addition of "NAV AOA DISAGREE" documentary unit
PRO-ABN-NAV NAV AOA DISAGREE	K	21	Documentation update: Addition of "NAV AOA DISAGREE" documentary unit
PRO-ABN-NAV NAV AOA DISAGREE	K	22	Documentation update: Addition of "NAV AOA DISAGREE" documentary unit
PRO-ABN-NAV NAV AOA DISAGREE	K	23	Documentation update: Addition of "NAV AOA DISAGREE" documentary unit
PRO-ABN-NAV NAV AOA DISAGREE	K	24	Documentation update: Addition of "NAV AOA DISAGREE" documentary unit
PRO-ABN-NAV NAV BARO VALUE DISAGREE	R	25	Documentation update: Addition of "NAV BARO VALUE DISAGREE" documentary unit
PRO-ABN-NAV NAV BARO VALUE DISAGREE	R	26	Documentation update: Addition of "NAV BARO VALUE DISAGREE" documentary unit
PRO-ABN-NAV NAV BKUP SPD/ALT ON CAPT+F/O PFD	T	27	Documentation update: Addition of "NAV BKUP SPD/ALT ON CAPT+F/O PFD" documentary unit
PRO-ABN-NAV NAV FM/GPS POS DISAGREE 	U	29	Documentation update: Addition of "NAV FM/GPS POS DISAGREE (If Installed)" documentary unit
PRO-ABN-NAV NAV IR 1+2(1+3)(2+3) FAULT - FWSPAGE	AC	30	Documentation update: Addition of "NAV IR 1+2(1+3)(2+3) FAULT - FWSPAGE" documentary unit

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS

Continued from the previous page

Localization Title	Toc Index	ID	Reason
PRO-ABN-NAV NAV IR DISAGREE- FWSPAGE	AD	31	Documentation update: Addition of "NAV IR DISAGREE- FWSPAGE" documentary unit
PRO-ABN-NAV NAV RA 1 AND 2 FAULT - FWSPAGE (DUAL RA FAILURE)	AH	32	Documentation update: Addition of "NAV RA 1 AND 2 FAULT - FWSPAGE (Dual RA Failure)" documentary unit
PRO-ABN-NAV NAV RA 1(2) FAULT - FWSPAGE	AI	33	Addition of "STEEP APPR (If Installed)" in INOP SYS to comply with the real ECAM display.
			Layout modification, no technical change.
			Documentation update: Deletion of information.
PRO-ABN-NAV NAV RA 1(2) FAULT - FWSPAGE	AI	34	Addition of "STEEP APPR (If Installed)" in INOP SYS to comply with the real ECAM display.
PRO-ABN-SMOKE SMOKE AFT CARGO SMOKE - FWSPAGE	D	1	Documentation update: Addition of "SMOKE AFT CARGO SMOKE (If Installed)- FWSPAGE" documentary unit
PRO-ABN-VENT VENT BLOWER FAULT	B	2	Documentation update: Addition of "VENT BLOWER FAULT" documentary unit
PRO-ABN-VENT VENT SKIN VALVE FAULT	D	4	Documentation update: Addition of "VENT SKIN VALVE FAULT" documentary unit
PRO-ABN-VENT VENT SKIN VALVE FAULT	D	6	Documentation update: Addition of "VENT SKIN VALVE FAULT" documentary unit
PRO-ABN-VENT VENT SKIN VALVE FAULT	D	7	Documentation update: Addition of "VENT SKIN VALVE FAULT" documentary unit
PRO-ABN-W_A_ICE WING A.ICE L(R) WING LO PR	D	1	Documentation update: Addition of "WING A.ICE L(R) WING LO PR" documentary unit
PRO-ABN-W_A_ICE WING A.ICE L(R) WING LO PR	D	2	Documentation update: Addition of "WING A.ICE L(R) WING LO PR" documentary unit
PRO-ABN-W_A_ICE WING A.ICE L(R) WING LO PR - FWSPAGE	D	3	Documentation update: Addition of "WING A.ICE L(R) WING LO PR - FWSPAGE" documentary unit
PRO-ABN-ABN-QRH [QRH] AIR	A	1	Effectivity update: The information now applies to all MSN.
PRO-ABN-ABN-QRH [QRH] ENG	A	2	Effectivity update: The information now applies to all MSN.
PRO-ABN-AIR [QRH] BLEED 1+2 FAULT	A	1	Effectivity update: The information now applies to all MSN.
PRO-ABN-AIR AIR APU LEAK DET FAULT	E	5	Effectivity update: The information now applies to all MSN.
PRO-ABN-AIR AIR APU LEAK DET FAULT	E	6	Effectivity update: The information now applies to all MSN.
PRO-ABN-AIR	E	7	Effectivity update: The information now applies to all MSN.

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS

Continued from the previous page

Localization Title	Toc Index	ID	Reason
AIR APU LEAK DET FAULT - FWSPAGE			
PRO-ABN-AIR AIR ENG 1(2) BLEED ABNORM PR	H	8	Effectivity update: The information now applies to all MSN.
PRO-ABN-AIR AIR ENG 1(2) BLEED FAULT BLEED NOT CLOSED	J	10	Effectivity update: The information now applies to all MSN.
PRO-ABN-AIR AIR ENG 1(2) BLEED FAULT - FWSPAGE BLEED NOT CLOSED	J	12	Effectivity update: The information now applies to all MSN.
PRO-ABN-AIR AIR ENG 1+2 BLEED FAULT	K	13	Effectivity update: The information now applies to all MSN.
PRO-ABN-AIR AIR ENG 1+2 BLEED FAULT	K	14	Effectivity update: The information now applies to all MSN.
PRO-ABN-AIR AIR ENG 1+2 BLEED FAULT - FWSPAGE	K	15	Effectivity update: The information now applies to all MSN.
PRO-ABN-AIR AIR ENG 1+2 BLEED FAULT LEFT LEAK	L	16	Effectivity update: The information now applies to all MSN.
PRO-ABN-AIR AIR ENG 1+2 BLEED FAULT LEFT LEAK	L	17	Effectivity update: The information now applies to all MSN.
PRO-ABN-AIR AIR ENG 1+2 BLEED FAULT - FWSPAGE LEFT LEAK	L	18	Effectivity update: The information now applies to all MSN.
PRO-ABN-AIR AIR ENG 1+2 BLEED FAULT RIGHT LEAK	M	19	Effectivity update: The information now applies to all MSN.
PRO-ABN-AIR AIR ENG 1+2 BLEED FAULT RIGHT LEAK	M	20	Effectivity update: The information now applies to all MSN.
PRO-ABN-AIR AIR ENG 1+2 BLEED FAULT - FWSPAGE RIGHT LEAK	M	21	Effectivity update: The information now applies to all MSN.
PRO-ABN-AIR AIR ENG 1+2 BLEED FAULT LEFT LEAK AND RIGHT LEAK	N	22	Effectivity update: The information now applies to all MSN.
PRO-ABN-AIR AIR ENG 1+2 BLEED FAULT LEFT LEAK RIGHT LEAK	N	23	Effectivity update: The information now applies to all MSN.

Continued on the following page

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES ABNORMAL AND EMERGENCY PROCEDURES PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS
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Continued from the previous page

Localization Title	Toc Index	ID	Reason
PRO-ABN-AIR AIR ENG 1+2 BLEED FAULT - FWSPAGE LEFT LEAK RIGHT LEAK	N	24	Effectivity update: The information now applies to all MSN.
PRO-ABN-AIR AIR ENG 1(2) BLEED LO TEMP (OPPOSITE BLEED NOT AVAILABLE)	P	25	Effectivity update: The information now applies to all MSN.
PRO-ABN-AIR AIR ENG 1+2 BLEED LO TEMP	Q	26	Effectivity update: The information now applies to all MSN.
PRO-ABN-AIR AIR PACK 1 + 2 FAULT	AB	35	Effectivity update: The information now applies to all MSN.
PRO-ABN-AIR AIR PACK 1 + 2 FAULT	AB	36	Effectivity update: The information now applies to all MSN.
PRO-ABN-AIR AIR PACK 1 + 2 FAULT - FWSPAGE	AB	37	Effectivity update: The information now also applies to MSN 03031, 04392.
PRO-ABN-CAB_PR CAB PR EXCESS CAB ALT	B	1	Effectivity update: The information now applies to all MSN.
PRO-ABN-CAB_PR CAB PR EXCESS CAB ALT - FWSPAGE	B	2	Effectivity update: The information now applies to all MSN.
PRO-ABN-COND COND FWD CAB/AFT CAB/CKPT DUCT OVHT	B	1	Effectivity update: The information now applies to all MSN.
PRO-ABN-COND COND FWD CAB/AFT CAB/CKPT DUCT OVHT	B	2	Effectivity update: The information now applies to all MSN.
PRO-ABN-COND COND FWD(AFT) CRG ISOL VALVE ->X	H	18	Effectivity update: The information no longer applies to all MSN.
PRO-ABN-COND COND HOT AIR FAULT	J	22	Effectivity update: The information now applies to all MSN.
PRO-ABN-DOOR DOOR L(R)(FWD)(AFT) AVIONICS (IN FLIGHT)	B	1	Effectivity update: The information now applies to all MSN.
PRO-ABN-DOOR DOOR L(R)(FWD)(AFT) AVIONICS or STAIRS - FWSPAGE (IN FLIGHT)	B	2	Effectivity update: The information now applies to all MSN.
PRO-ABN-DOOR DOOR L(R) FWD(AFT) CABIN (IN FLIGHT)	D	3	Effectivity update: The information now applies to all MSN.

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS

Continued from the previous page

Localization Title	Toc Index	ID	Reason
PRO-ABN-DOOR DOOR L(R) FWD(AFT) CABIN - FWSPAGE (IN FLIGHT)	D	4	Effectivity update: The information now applies to all MSN.
PRO-ABN-DOOR DOOR L(R) FWD(AFT) EMER EXIT (IN FLIGHT)	F	5	Effectivity update: The information now applies to all MSN.
PRO-ABN-DOOR DOOR L(R) FWD(AFT) EMER EXIT - FWSPAGE (IN FLIGHT)	F	6	Effectivity update: The information now applies to all MSN.
PRO-ABN-DOOR DOOR FWD(AFT)(BULK) CARGO (IN FLIGHT)	H	7	Effectivity update: The information now applies to all MSN.
PRO-ABN-DOOR DOOR FWD(AFT)(BULK) - FWSPAGE (IN FLIGHT)	H	8	Effectivity update: The information now applies to all MSN.
PRO-ABN-ELEC ELEC GEN 1(2) OFF	X	33	Effectivity update: The information now applies to all MSN.
PRO-ABN-ENG [QRH] ALL ENG FAIL	B	1	Effectivity update: The information now applies to all MSN.
PRO-ABN-ENG ECAM - Pitch Table	B	2	Effectivity update: The information now applies to all MSN.
PRO-ABN-ENG ECAM - Gliding Distance	B	3	Effectivity update: The information now applies to all MSN.
PRO-ABN-ENG ECAM - Relight Attempted or not Attempted	B	4	Effectivity update: The information now applies to all MSN.
PRO-ABN-ENG [QRH] ALL ENG FAIL - If engine relight can be attempted	B	5	Effectivity update: The information now also applies to MSN 03031.
PRO-ABN-ENG [QRH] ALL ENG FAIL - If engine relight cannot be attempted	B	6	Effectivity update: The information now applies to all MSN.
PRO-ABN-ENG [QRH] ALL ENG FAIL - If ditching anticipated	B	7	Effectivity update: The information now applies to all MSN.
PRO-ABN-ENG [QRH] ALL ENG FAIL - If forced landing anticipated	B	9	Effectivity update: The information now applies to all MSN.
PRO-ABN-ENG [QRH] ALL ENG FAIL	B	10	Effectivity update: The information now applies to all MSN.
PRO-ABN-ENG	B	11	Effectivity update: The information now applies to all MSN.

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS

Continued from the previous page

Localization Title	Toc Index	ID	Reason
ECAM - Pitch Table			
PRO-ABN-ENG ECAM - Gliding Distance	B	12	Effectivity update: The information now applies to all MSN.
PRO-ABN-ENG ECAM - Relight Attempted or not Attempted	B	13	Effectivity update: The information now applies to all MSN.
PRO-ABN-ENG [QRH] ALL ENG FAIL - If engine relight can be attempted	B	14	Effectivity update: The information now also applies to MSN 04392.
PRO-ABN-ENG [QRH] ALL ENG FAIL - If engine relight cannot be attempted	B	15	Effectivity update: The information now applies to all MSN.
PRO-ABN-ENG [QRH] ALL ENG FAIL - If ditching anticipated	B	16	Effectivity update: The information now applies to all MSN.
PRO-ABN-ENG [QRH] ALL ENG FAIL - If forced landing anticipated	B	18	Effectivity update: The information now applies to all MSN.
PRO-ABN-ENG [QRH] ENG 1(2) STALL	C	19	Effectivity update: The information now applies to all MSN.
PRO-ABN-ENG ENG ALL ENGINES FAILURE	I	22	Effectivity update: The information now applies to all MSN.
PRO-ABN-ENG ENG ALL ENGINES FAILURE	I	23	Effectivity update: The information now applies to all MSN.
PRO-ABN-ENG Gliding Distance	I	24	Effectivity update: The information now applies to all MSN.
PRO-ABN-ENG Associated Procedures	I	25	Effectivity update: The information now applies to all MSN.
PRO-ABN-ENG ENG 1+2 COMPRESSOR VANE	M	34	Effectivity update: The information now applies to all MSN.
PRO-ABN-ENG ENG 1+2 COMPRESSOR VANE	M	35	Effectivity update: The information now applies to all MSN.
PRO-ABN-ENG ENG 1(2) LOW N1 (On Ground)	AG	42	Effectivity update: The information now applies to all MSN.
PRO-ABN-ENG ENG 1(2) PROBES FAULT	AO	44	Effectivity update: The information now applies to all MSN.
PRO-ABN-ENG ENGINE STALL	AZ	49	Effectivity update: The information now applies to all MSN.
PRO-ABN-ENG ENG 1(2) START VALVE FAULT	BB	50	Effectivity update: The information now applies to all MSN.
PRO-ABN-ENG	BB	51	Effectivity update: The information now applies to all MSN.

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS

Continued from the previous page

Localization Title	Toc Index	ID	Reason
ENG 1(2) START VALVE FAULT - FWSPAGE			
PRO-ABN-F_CTL F/CTL FLAPS FAULT/LOCKED	P	13	Effectivity update: The information now applies to all MSN.
PRO-ABN-F_CTL F/CTL SLATS FAULT/LOCKED	AG	21	Effectivity update: The information now also applies to MSN 03031, 04392.
PRO-ABN-MISC [QRH] DITCHING	G	2	Effectivity update: The information now applies to all MSN.
PRO-ABN-MISC [QRH] FORCED LANDING	J	3	Effectivity update: The information now applies to all MSN.
PRO-ABN-MISC [QRH] VOLCANIC ASH ENCOUNTER	N	4	Effectivity update: The information now applies to all MSN.
PRO-ABN-NAV NAV FM/GPS POS DISAGREE 	U	28	Effectivity update: The information now applies to all MSN.
PRO-ABN-VENT VENT BLOWER FAULT	B	1	Effectivity update: The information no longer applies to all MSN.
PRO-ABN-VENT VENT SKIN VALVE FAULT	D	3	Effectivity update: The information no longer applies to all MSN.
PRO-ABN-VENT VENT SKIN VALVE FAULT - FWSPAGE	D	5	Effectivity update: The information now applies to all MSN.
PRO-ABN-VENT VENT SKIN VALVE FAULT - FWSPAGE	D	8	Effectivity update: The information now applies to all MSN.

CONTENT

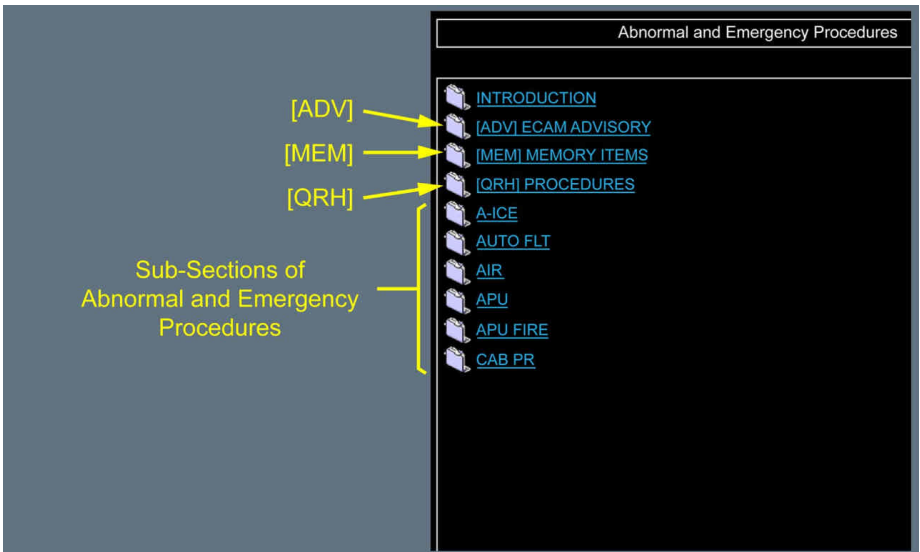
Ident.: PRO-ABN-ABN-00-00020862.0001001 / 12 NOV 24

Applicable to: ALL

Abnormal and Emergency procedures involve actions that the flight crew must perform to ensure the overall safety of the flight, and adequate workload.

- [2]** For more information about the management of abnormal operations, *Refer to FCTM/AOP-30-10 Introduction.*

Abnormal and Emergency Procedure Overview



[1] [ADV] ECAM ADVISORY

The [ADV] ECAM ADVISORY section provides direct access to the list of all advisories that can be displayed on the ECAM SD pages. The [ADV] section is also available in the QRH.

- [2]** For more information, *Refer to [ADV] ECAM Advisory.*
- [1]** Advisories are system parameters that start to deviate from their usual operational range. However, an advisory does not require flight crew actions, except monitoring.
- [2]** For more information about Advisory function, *Refer to DSC-31-20 System Pages.*

[1] [MEM] MEMORY ITEMS

The [MEM] MEMORY ITEMS menu provides direct access to the list of memory items.

- [2]** For more information, *Refer to [MEM] Memory Items.*

PROCEDURES**ABNORMAL AND EMERGENCY PROCEDURES**

INTRODUCTION

- L1** The content of the memory items are described in the applicable sub-sections of the abnormal and emergency procedures.

Memory items are procedures of an ECAM or QRH procedure that the flight crew must apply by memory to ensure a safe flight path. In some time-critical situations, the flight crew has no time to refer to the ECAM and/or to the QRH.

- L2** For more information, *Refer to FCTM/AOP-10-40 Abnormal and Emergency Procedures.*

L1 [QRH] PROCEDURES

The [QRH] PROCEDURES menu provides direct access to the list of all the FCOM abnormal and emergency procedures that are also in the QRH.

- L2** For more information, *Refer to [QRH] Procedures.*

- L1** The content of the QRH procedures are described in the applicable sub-sections of the abnormal and emergency procedures.

Note: Only the FCOM version of a procedure provides layer 2 and 3 information for consultation purpose.

SUB-SECTIONS OF ABNORMAL AND EMERGENCY PROCEDURES

This part of the FCOM describes the detailed content of all abnormal and emergency procedures. All procedures are grouped in sub-sections that can be system related (e.g. AIR, FUEL, etc.) or non-system related (e.g. MISC, T.O, CONFIG, etc.).

The sub-sections are sorted by alphabetic order.

For each sub-section, procedures are listed in the following order:

1. The memory items
The title of the memory items starts with the [MEM] prefix
2. The abnormal and emergency procedures of the QRH
The title of these procedures starts with the [QRH] prefix
3. The ECAM procedures.

PROCEDURE LAYOUT

Applicable to: ALL

Ident.: PRO-ABN-ABN-00-A-00020863.0001001 / 17 MAR 17

GENERAL

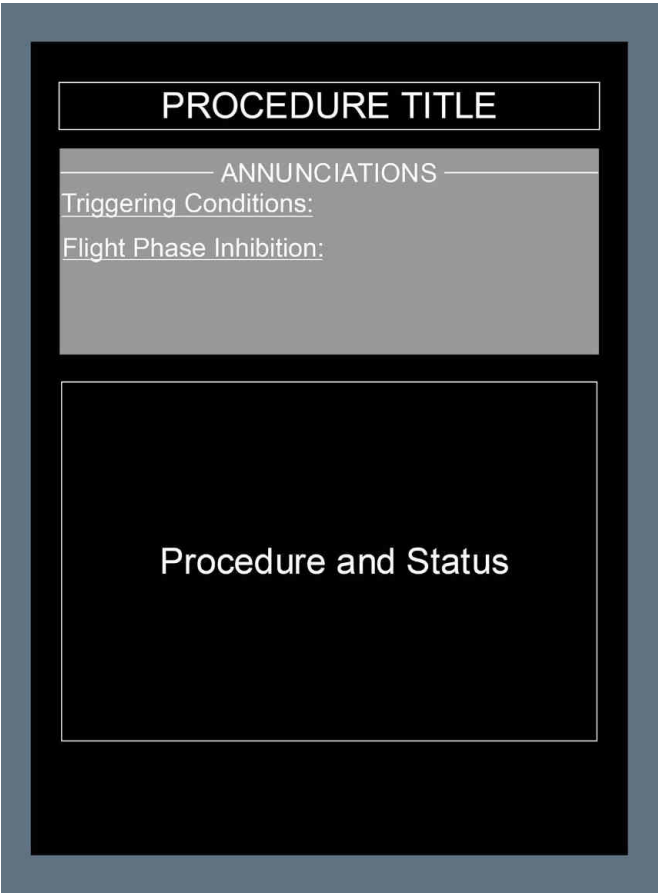
The presentation of procedures is, as far as practicable, identical to the way it is displayed on the ECAM. The abbreviations are identical to those used on the cockpit panels.

All actions and information displayed on ECAM are provided in large letters. Other information, not on ECAM, is provided in small letters.

Expanded information is as far as practicable provided in layer 2. This information:

- Identifies the particular failures
- Explains actions for which the reason is not self-evident
- Provides some background on the reasons and /or the effects of a given action.

FCOM presentation of ABN or EMER procedures



PROCEDURE TITLE

ECAM PROCEDURES

The title of an abnormal or emergency procedure, that appears on the ECAM, is:

- **Red** for a warning
- **Amber** for a caution
- On a black background

Examples:

SMOKE LAVATORY SMOKE

SMOKE DET FAULT

NON ECAM PROCEDURES

The title of an abnormal or emergency procedure, that does not appear on the ECAM, is:

- **Red** for a warning
- **Amber** for a caution
- On a grey background

Note:

- The **[MEM]** prefix indicates that the procedure contains memory items
- The **[QRH]** prefix indicates that the procedure is a QRH procedure.

Examples:

[MEM] TAWS CAUTION

[QRH] REMOVAL OF SMOKE / FUMES

SUBTITLE

When relevant, a subtitle is defined. It is displayed below the procedure title.

Example:

F/CTL ELAC 1(2) FAULT
(ONE COMPUTER FAILED)

SEVERAL ALERTS UNDER THE SAME TITLE

When relevant, several alerts are grouped into the same Documentary Unit. In this case, a unique title is defined.

Depending on the failure, the required actions may differ. Therefore, those actions are either factorized or separated.

Examples (extracts of procedures for illustration purpose only):

The ECAM actions appear factorized

The ECAM actions appear separated

ENG 1(2) THR LEVER ADV IDLE

THR LEVER (AFFECTED ENGINE) IDLE

NAV IR 1(2)(3) FAULT

Note: In case of a simultaneous ADR and IR (same ADIRU) failure, apply the ADR FAULT procedure before the IR FAULT procedure.

IR 1 FAULT:
ATT HDG SWTG CAPT 3

IR 2 FAULT:
ATT HDG SWTG F/O 3

IR 3 FAULT:
ATT HDG SWTG (IF IR 3 IN USE) NORM
This line is not displayed on the ECAM.

3 SPECIFICITIES FOR PAPER OR PDF DOCUMENTATION

On Paper or PDF format, the layout is different for the following:

- ECAM alert: the black background is replaced by a white background
- Red warning: two red squares are added on each side of the warning title.

Example:

SMOKE LAVATORY SMOKE

Ident.: PRO-ABN-ABN-00-A-00020865.0001001 / 17 MAR 17

ANNUNCIATIONS

When applicable, the annunciations section provides:

- The triggering conditions, that describe the cause of the alert activation
- The flight phase inhibition.

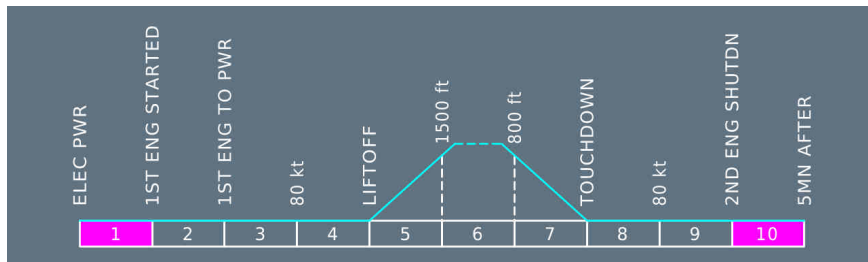
PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

INTRODUCTION

FLIGHT PHASE INHIBITION

The Flight Phase Inhibition section indicates the flight phases during which the alert is inhibited. In the below example, the alert is inhibited in flight phase 1, and 10.



L2 For more information, *Refer to DSC-31-15 Flight Phases.*

Ident.: PRO-ABN-ABN-00-A-00020866.0001001 / 03 NOV 21

PROCEDURES AND STATUS

The Procedure and Status section provides the procedure and the Status (including approach procedure, limitations, inoperative systems, etc.), with additional information when relevant.

CONDITIONS

BLACK SQUARE

When several procedures appear under the same title, a black square marks the starting point of each procedure.

For example:

<u>ANTI ICE CAPT (F/O) (STBY) PROBES</u>	
☐ <u>CAPT PROBES</u>	} a procedure to be applied
☐ <u>F / O PROBES</u>	
☐ <u>STBY PROBES</u>	
	} b a or b or c
	} c

Black squares also indicate parts of a procedure among which only one is applicable. For example:

BRAKES HOT

BRK FAN (if installed) ON	a procedure to be applied
<u>ON GROUND</u>	b (a+b) or (a+c)
<u>IN FLIGHT</u>	c

The ECAM does not display black squares.

BLACK DOT

If an action depends on a precondition, a black dot identifies the precondition. If the precondition appears on ECAM, it appears in LARGE LETTERS. If not, it appears in small letters.
 For example:

F / CTL FLAPS FAULT

FLAPS LEVER RECYCLE	"If unsuccessful" does not appear on ECAM
If unsuccessful :	
GPWS FLAP MODE OFF	

INDENTATION

Indentation is used in order to identify when an action depends on a precondition/flight phase/procedure.
 For example:

IN FLIGHT

If Flaps locked

APPR SPEED VREF +30

 MAX SPEED 250 kt

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

INTRODUCTION

- The APPR SPEED is equal to VREF +30 kt only if the flaps are locked, because "APPR SPEED.....VREF +30" is indented below "• If flaps locked".
- The MAX SPEED of 250 kt does not depend on the flaps locked condition because it is aligned with "• If Flaps locked". Therefore, MAX SPEED has to be respected whether the flaps are locked or not.

BOXED ITEMS

Items surrounded by a box enable the flight crew to easily identify them, as Memory items, OEB immediate actions or items introduced by "At ANY TIME of the procedure".

MEMORY ITEMS

Memory items are items that the flight crew must memorize, in order to be able to rapidly apply them, without referring to the ECAM, and/or to the QRH.

Memory items



ABNORMAL AND EMERGENCY CALLOUTS

Applicable to: ALL

Ident.: PRO-ABN-ABN-00-B-00011915.0001001 / 17 MAR 17

ECAM PROCEDURES

1. "ECAM ACTION" is commanded by PF when required.
2. "CLEAR __ (title of the system) ?" is asked by the PM for confirmation by the PF, that all actions have been taken/reviewed on the present WARNING/CAUTION or SYSTEM PAGE. e.g.:
CLEAR HYDRAULIC ?
3. "CLEAR __ (title of the system)" is the command by the PF that the action and review is confirmed. For status page; REMOVE STATUS will be used.
4. "ECAM ACTIONS COMPLETE" is the announcement by the PM that all APPLICABLE ACTIONS have been completed.
5. Should the PF require an action from the PM during ECAM procedures, the order "STOP ECAM" will be used. When ready to resume the ECAM the order "CONTINUE ECAM" will be used.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES ABNORMAL AND EMERGENCY PROCEDURES INTRODUCTION
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Ident.: PRO-ABN-ABN-00-B-00020059.0001001 / 16 JAN 18

EMERGENCY CALL

Some abnormal/emergency procedures require flight and cabin crews to use specific phraseology when communicating with each other. To ensure effective communication between the flight and cabin crews, the standard phraseology may be recalled at the preflight phase.

FROM	TO	PHRASEOLOGY	REMARKS
cockpit	cabin	Passenger Address (PA) System: "PURSER TO COCKPIT, PLEASE!"	The Purser, or any other cabin crewmember, must go to the cockpit
Cockpit	Cabin	Passenger Address (PA) System: "ATTENTION CREW! AT STATIONS!"	An emergency evacuation may soon be required.
cockpit	cabin	Passenger Address (PA) System: "CABIN CREW and PASSENGERS REMAIN SEATED!"	The captain decides that an evacuation is not required
cockpit	cabin	Passenger Address (PA) System: "EVACUATE, EVACUATE"	The captain orders an immediate evacuation
cabin	cockpit	Interphone: "PRIO CAPT"	Any crew member can make such a call. The flight crew must reply.

Ident.: PRO-ABN-ABN-00-B-00011916.0001001 / 14 NOV 23

MEMORY ITEMS

The aim of the following callouts is to announce the appropriate procedure by calling out, in most cases, the title of the procedure. This allows the flight crew to be aware of the situation and be prepared to properly react (crew coordination, tasksharing and communication).

GPWS

As soon as avoidance maneuver is envisaged:
"PULL UP TOGA"

REACTIVE WINDSHEAR WARNING

"WINDSHEAR TOGA"

UNRELIABLE SPEED INDICATION

"UNRELIABLE SPEED"

TCAS

■ For aircraft equipped with AP/FD TCAS function:

As soon as a TA is triggered:

- If the AP/FD TCAS mode is armed: "TCAS blue"
- If the AP/FD TCAS mode does not arm: "TCAS, I have control".

- For aircraft not equipped with AP/FD TCAS  function:

As soon as a TA is triggered: "TCAS, I have control".

EMERGENCY DESCENT

"EMERGENCY DESCENT"

LOSS OF BRAKING

"LOSS OF BRAKING"

STALL RECOVERY

As soon as any stall indication is recognized:

"STALL, I have control"

STALL WARNING AT LIFT-OFF

"STALL, TOGA 15°"

MALFUNCTION BEFORE V1 AT TAKEOFF

EVENT	CAPT	F/O
If GO decision	GO	
If RTO decision - REV on EWD	STOP	REVERSE GREEN ⁽¹⁾

Continued on the following page

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES ABNORMAL AND EMERGENCY PROCEDURES INTRODUCTION
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Continued from the previous page

EVENT	CAPT	F/O
- Deceleration - Autobrake disengagement	MANUAL BRAKING ⁽³⁾	DECCEL ⁽²⁾ AUTOBRAKE OFF ⁽⁴⁾

(1) If the reverse deployment is not as expected, call "NO REVERSE ENGINE__" or "NO REVERSE", as appropriate.

(2) In the case of a failure or no positive deceleration, call "NO DECEL".

The "DECCEL" callout means that the deceleration is felt by the flight crew and confirmed by:

- The speed trend on the PFD, or
- The **DECCEL**  indication on the PFD, if the autobrake is active.

The **DECCEL**  indication appears when the current deceleration reaches 80 % of the selected rate. However, the **DECCEL**  indication does not indicate the correct operation of the autobrake, but it only indicates that the selected deceleration rate is reached. For example, the **DECCEL**  indication may not appear on a contaminated runway, because of the anti-skid effect, even if the autobrake is active.

(3) CAPT announces MANUAL BRAKING if:

- CAPT uses the brake pedals, and
- No AUTOBRAKE OFF callout from the F/O.

(4) F/O announces AUTOBRAKE OFF if:

- A/BRK does not engage as expected or A/BRK disengages, and
- No MANUAL BRAKING callout from the CAPT.

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

INTRODUCTION

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES ABNORMAL AND EMERGENCY PROCEDURES [ADV] ECAM ADVISORY
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ECAM ADVISORY CONDITIONS

Applicable to: MSN 02155-02212, 07784-07792

SYSTEM	CONDITIONS	RECOMMENDED ACTION
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Ident.: PRO-ABN-ABN-ADV-A-00012117.0003001 / 17 MAR 17

APU	EGT > EGT MAX -33 °C (inhibited during APU start)	If there is no oil leak, then the remaining oil quantity allows normal APU operation for about 10 h.
	OIL QTY (message LOW OIL LEVEL pulsing)	

Ident.: PRO-ABN-ABN-ADV-A-00012107.0001001 / 05 MAR 19

CAB PR	CAB VERTICAL SPEED V/S > 1 800 ft/min	CPC changeover is recommended: - MODE SEL: MAN - Wait 10 s - MODE SEL: AUTO • If unsuccessful: - MODE SEL: MAN - Manual pressure control
	CAB ALTITUDE altitude ≥ 8 800 ft	PACK FLOW: HI CPC changeover is recommended: - MODE SEL: MAN - Wait 10 s - MODE SEL: AUTO • If unsuccessful: - MODE SEL: MAN - Manual pressure control
	ΔP ≥ 1.5 PSI in phase 7	LDG ELEV: ADJUST • If unsuccessful: - MODE SEL: MAN - Manual pressure control

Ident.: PRO-ABN-ABN-ADV-A-00012112.0001001 / 17 MAR 17

ELEC	IDG OIL TEMP ≥ 147 °C	Reduce IDG load if possible (GALLEY or GEN OFF). If required, restore when temperature has dropped. Restrict use of generator to short time, if temperature rises again excessively.
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1 Ident.: PRO-ABN-ABN-ADV-A-00012122.0007001 / 06 NOV 25

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

[ADV] ECAM ADVISORY

Continued from the previous page

SYSTEM	CONDITIONS	RECOMMENDED ACTION
ENG	OIL PRESS P < 16 PSI	- If oil pressure is between 16 and 13 PSI (advisory), continue normal operation. - If oil pressure is below 13 PSI (red indication) without the ENG 1(2) OIL LO PR alert, continue normal engine operation (it can be assumed that the oil pressure transducer is faulty). In both cases, monitor other engine parameters especially oil temperature and oil quantity.
	OIL PRESS P > 90 PSI	Monitor other engine parameters closely for symptoms of engine malfunction. If there is high oil pressure without other abnormal indications, operate engine normally for remainder of the flight. Record high oil pressure and corresponding N2 readings for maintenance action.
	OIL TEMP T > 140 °C	An increase in oil temperature during normal steady-state operation indicates a system malfunction and should be closely monitored for other symptoms of engine malfunction. <u>Note:</u> If the OIL TEMP increase follows thrust reduction, increasing thrust may reduce oil temperature. In addition, an increase in oil temperature could be related to the IDG oil cooling system. To reduce oil temperature increase before limits are reached, the following are recommended: 1. <u>Low Speed</u> - Increase engine speed to increase fuel flow and thereby cool IDG oil. 2. <u>High Speed</u> - Reduce generator load or turn off generator. If oil temperature continues to increase, mechanically disconnect IDG.
	OIL QTY < 3 qt	The oil quantity in the tank can decrease at high thrust setting due to the effect of oil gulping. In that case, the indicated oil quantity will increase after thrust reduction. Monitor the affected engine oil parameters and crosscheck with the other engine. As long as the oil temperature and the oil pressure of the affected engine remain within limits, normal engine operation is not affected. If the oil quantity continues to decrease, the ECAM alert ENG 1(2) OIL LO PR can be triggered. (Refer to PRO-ABN-ENG ENG 1(2) OIL LO PR (Warning) - ANNUNCIATION)
	NAC TEMP ≥ 240 °C	Monitor engine parameters and crosscheck with other engine.

Continued on the following page

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES ABNORMAL AND EMERGENCY PROCEDURES [ADV] ECAM ADVISORY
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Continued from the previous page

SYSTEM	CONDITIONS	RECOMMENDED ACTION
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Ident.: PRO-ABN-ABN-ADV-A-00012114.0001001 / 21 MAR 17

FUEL	Difference between wing fuel quantities greater than 1 500 kg (3 307 lb)	FUEL MANAGEMENT: CHECK If a fuel leak is suspected, <i>Refer to PRO-ABN-FUEL [QRH] FUEL LEAK.</i> For limitations, <i>Refer to LIM-FUEL Maximum Allowed Fuel Imbalance</i>
	Fuel temp greater than 45 °C in inner cell, or 55 °C in outer cell	GALLEY: OFF
	Fuel temp lower than -40 °C in inner or outer cell	Consider descending to a lower altitude and/or increasing Mach to increase TAT.

Ident.: PRO-ABN-ABN-ADV-A-00012119.0028001 / 17 MAR 17

OXY	CKPT OXY Pulsing green: When pressure is < 800 PSI. Amber: When pressure is < 400 PSI.	If mask is not being used, check if it is correctly stowed, <i>Refer to DSC-35-20-10 Mask Stowage.</i>
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ECAM ADVISORY CONDITIONS

Applicable to: MSN 02719-04392

SYSTEM	CONDITIONS	RECOMMENDED ACTION
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Ident.: PRO-ABN-ABN-ADV-A-00012117.0003001 / 17 MAR 17

APU	EGT > EGT MAX -33 °C (inhibited during APU start)	
	OIL QTY (message LOW OIL LEVEL pulsing)	If there is no oil leak, then the remaining oil quantity allows normal APU operation for about 10 h.

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

[ADV] ECAM ADVISORY

Continued from the previous page

SYSTEM	CONDITIONS	RECOMMENDED ACTION
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Ident.: PRO-ABN-ABN-ADV-A-00012107.0001001 / 05 MAR 19

CAB PR	CAB VERTICAL SPEED V/S > 1 800 ft/min	CPC changeover is recommended: - MODE SEL: MAN - Wait 10 s - MODE SEL: AUTO • If unsuccessful: - MODE SEL: MAN - Manual pressure control
	CAB ALTITUDE altitude ≥ 8 800 ft	PACK FLOW: HI CPC changeover is recommended: - MODE SEL: MAN - Wait 10 s - MODE SEL: AUTO • If unsuccessful: - MODE SEL: MAN - Manual pressure control
	ΔP ≥ 1.5 PSI in phase 7	LDG ELEV: ADJUST • If unsuccessful: - MODE SEL: MAN - Manual pressure control

Ident.: PRO-ABN-ABN-ADV-A-00012112.0001001 / 17 MAR 17

ELEC	IDG OIL TEMP ≥ 147 °C	Reduce IDG load if possible (GALLEY or GEN OFF). If required, restore when temperature has dropped. Restrict use of generator to short time, if temperature rises again excessively.
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2 Ident.: PRO-ABN-ABN-ADV-A-00012122.0007001 / 06 NOV 25

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

[ADV] ECAM ADVISORY

Continued from the previous page

SYSTEM	CONDITIONS	RECOMMENDED ACTION
ENG	OIL PRESS P < 16 PSI	- If oil pressure is between 16 and 13 PSI (advisory), continue normal operation. - If oil pressure is below 13 PSI (red indication) without the ENG 1(2) OIL LO PR alert, continue normal engine operation (it can be assumed that the oil pressure transducer is faulty). In both cases, monitor other engine parameters especially oil temperature and oil quantity.
	OIL PRESS P > 90 PSI	Monitor other engine parameters closely for symptoms of engine malfunction. If there is high oil pressure without other abnormal indications, operate engine normally for remainder of the flight. Record high oil pressure and corresponding N2 readings for maintenance action.
	OIL TEMP T > 140 °C	An increase in oil temperature during normal steady-state operation indicates a system malfunction and should be closely monitored for other symptoms of engine malfunction. <u>Note:</u> If the OIL TEMP increase follows thrust reduction, increasing thrust may reduce oil temperature. In addition, an increase in oil temperature could be related to the IDG oil cooling system. To reduce oil temperature increase before limits are reached, the following are recommended: 1. <u>Low Speed</u> - Increase engine speed to increase fuel flow and thereby cool IDG oil. 2. <u>High Speed</u> - Reduce generator load or turn off generator. If oil temperature continues to increase, mechanically disconnect IDG.
	OIL QTY < 3 qt	The oil quantity in the tank can decrease at high thrust setting due to the effect of oil gulping. In that case, the indicated oil quantity will increase after thrust reduction. Monitor the affected engine oil parameters and crosscheck with the other engine. As long as the oil temperature and the oil pressure of the affected engine remain within limits, normal engine operation is not affected. If the oil quantity continues to decrease, the ECAM alert ENG 1(2) OIL LO PR can be triggered. (Refer to PRO-ABN-ENG ENG 1(2) OIL LO PR (Warning) - ANNUNCIATION)
	NAC TEMP ≥ 240 °C	Monitor engine parameters and crosscheck with other engine.

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

[ADV] ECAM ADVISORY

Continued from the previous page

SYSTEM	CONDITIONS	RECOMMENDED ACTION
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Ident.: PRO-ABN-ABN-ADV-A-00012114.0001001 / 21 MAR 17

FUEL	Difference between wing fuel quantities greater than 1 500 kg (3 307 lb)	FUEL MANAGEMENT: CHECK If a fuel leak is suspected, <i>Refer to PRO-ABN-FUEL [QRH] FUEL LEAK.</i> For limitations, <i>Refer to LIM-FUEL Maximum Allowed Fuel Imbalance</i>
	Fuel temp greater than 45 °C in inner cell, or 55 °C in outer cell	GALLEY: OFF
	Fuel temp lower than -40 °C in inner or outer cell	Consider descending to a lower altitude and/or increasing Mach to increase TAT.

Ident.: PRO-ABN-ABN-ADV-A-00012119.0029001 / 17 MAR 17

OXY	CKPT OXY Pulsing green: When pressure is < 600 PSI. Amber: When pressure is < 300 PSI.	If mask is not being used, check if it is correctly stowed, <i>Refer to DSC-35-20-10 Mask Stowage.</i>
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ECAM ADVISORY CONDITIONS

Applicable to: MSN 05152-05746

SYSTEM	CONDITIONS	RECOMMENDED ACTION
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Ident.: PRO-ABN-ABN-ADV-A-00012117.0003001 / 17 MAR 17

APU	EGT > EGT MAX -33 °C (inhibited during APU start)	
	OIL QTY (message LOW OIL LEVEL pulsing)	If there is no oil leak, then the remaining oil quantity allows normal APU operation for about 10 h.

Continued on the following page

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES ABNORMAL AND EMERGENCY PROCEDURES [ADV] ECAM ADVISORY
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Continued from the previous page

SYSTEM	CONDITIONS	RECOMMENDED ACTION
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Ident.: PRO-ABN-ABN-ADV-A-00012107.0004001 / 05 MAR 19

CAB PR	CAB VERTICAL SPEED V/S > 1 800 ft/min	CPC changeover is recommended: - MODE SEL: MAN - Wait 10 s - MODE SEL: AUTO • If unsuccessful: - MODE SEL: MAN - Manual pressure control
	CAB ALTITUDE altitude ≥ 8 800 ft	PACK FLOW: HI CPC changeover is recommended: - MODE SEL: MAN - Wait 10 s - MODE SEL: AUTO • If unsuccessful: - MODE SEL: MAN - Manual pressure control If the cargo freight permits, set FWD ISOL VALVE: OFF to reduce the rate of cabin altitude increase.
	ΔP ≥ 1.5 PSI in phase 7	LDG ELEV: ADJUST • If unsuccessful: - MODE SEL: MAN - Manual pressure control

Ident.: PRO-ABN-ABN-ADV-A-00012112.0001001 / 17 MAR 17

ELEC	IDG OIL TEMP ≥ 147 °C	Reduce IDG load if possible (GALLEY or GEN OFF). If required, restore when temperature has dropped. Restrict use of generator to short time, if temperature rises again excessively.
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3 Ident.: PRO-ABN-ABN-ADV-A-00012122.0007001 / 06 NOV 25

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

[ADV] ECAM ADVISORY

Continued from the previous page

SYSTEM	CONDITIONS	RECOMMENDED ACTION
ENG	OIL PRESS P < 16 PSI	- If oil pressure is between 16 and 13 PSI (advisory), continue normal operation. - If oil pressure is below 13 PSI (red indication) without the ENG 1(2) OIL LO PR alert, continue normal engine operation (it can be assumed that the oil pressure transducer is faulty). In both cases, monitor other engine parameters especially oil temperature and oil quantity.
	OIL PRESS P > 90 PSI	Monitor other engine parameters closely for symptoms of engine malfunction. If there is high oil pressure without other abnormal indications, operate engine normally for remainder of the flight. Record high oil pressure and corresponding N2 readings for maintenance action.
	OIL TEMP T > 140 °C	An increase in oil temperature during normal steady-state operation indicates a system malfunction and should be closely monitored for other symptoms of engine malfunction. <u>Note:</u> If the OIL TEMP increase follows thrust reduction, increasing thrust may reduce oil temperature. In addition, an increase in oil temperature could be related to the IDG oil cooling system. To reduce oil temperature increase before limits are reached, the following are recommended: 1. <u>Low Speed</u> - Increase engine speed to increase fuel flow and thereby cool IDG oil. 2. <u>High Speed</u> - Reduce generator load or turn off generator. If oil temperature continues to increase, mechanically disconnect IDG.
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	NAC TEMP ≥ 240 °C	Monitor engine parameters and crosscheck with other engine.

Continued on the following page

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES ABNORMAL AND EMERGENCY PROCEDURES [ADV] ECAM ADVISORY
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Continued from the previous page

SYSTEM	CONDITIONS	RECOMMENDED ACTION
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Ident.: PRO-ABN-ABN-ADV-A-00012114.0001001 / 21 MAR 17

FUEL	Difference between wing fuel quantities greater than 1 500 kg (3 307 lb)	FUEL MANAGEMENT: CHECK If a fuel leak is suspected, <i>Refer to PRO-ABN-FUEL [QRH] FUEL LEAK.</i> For limitations, <i>Refer to LIM-FUEL Maximum Allowed Fuel Imbalance</i>
	Fuel temp greater than 45 °C in inner cell, or 55 °C in outer cell	GALLEY: OFF
	Fuel temp lower than -40 °C in inner or outer cell	Consider descending to a lower altitude and/or increasing Mach to increase TAT.

Ident.: PRO-ABN-ABN-ADV-A-00012119.0028001 / 17 MAR 17

OXY	CKPT OXY Pulsing green: When pressure is < 800 PSI. Amber: When pressure is < 400 PSI.	If mask is not being used, check if it is correctly stowed, <i>Refer to DSC-35-20-10 Mask Stowage.</i>
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PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

[ADV] ECAM ADVISORY

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES ABNORMAL AND EMERGENCY PROCEDURES [MEM] MEMORY ITEMS
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[MEM] MEMORY ITEMS

Applicable to: ALL

Ident.: PRO-ABN-ABN-MEM-ABN-MEM-00020871.0001001 / 17 MAR 17

BRAKES

[MEM] **LOSS OF BRAKING** (*Refer to procedure*)

Ident.: PRO-ABN-ABN-MEM-ABN-MEM-00020948.0001001 / 17 MAR 17

MISC

[MEM] **EMER DESCENT** (*Refer to procedure*)

[MEM] **STALL RECOVERY** (*Refer to procedure*)

[MEM] **STALL WARNING AT LIFT OFF** (*Refer to procedure*)

Ident.: PRO-ABN-ABN-MEM-ABN-MEM-00020949.0001001 / 01 JUN 17

NAV

[MEM] **UNRELIABLE SPEED INDICATION** (*Refer to procedure*)

Ident.: PRO-ABN-ABN-MEM-ABN-MEM-00020950.0001001 / 15 NOV 24

SURV

[MEM] **TAWS CAUTION** (*Refer to procedure*)

[MEM] **TAWS WARNING** (*Refer to procedure*)

[MEM] **TCAS CAUTION - TRAFFIC ADVISORY** (*Refer to procedure*)

[MEM] **TCAS WARNING - RESOLUTION ADVISORY** (*Refer to procedure*)

[MEM] **WINDSHEAR WARNING - REACTIVE WINDSHEAR** (*Refer to procedure*)

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

[MEM] MEMORY ITEMS

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES ABNORMAL AND EMERGENCY PROCEDURES [QRH] PROCEDURES
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[QRH] PROCEDURES

Ident.: PRO-ABN-ABN-QRH-ABN-QRH-00021355.0002001 / 17 MAR 17

1 Applicable to: ALL

AIR

[QRH] **BLEED 1+2 FAULT** (*Refer to procedure*)

[QRH] BRAKES

Ident.: PRO-ABN-ABN-QRH-ABN-QRH-00021352.0001001 / 17 MAR 17

Applicable to: MSN 02155-02212

BRAKES

[QRH] **RESIDUAL BRAKING** (*Refer to procedure*)

Ident.: PRO-ABN-ABN-QRH-ABN-QRH-00021352.0002001 / 17 MAR 17

Applicable to: MSN 02719-07792

BRAKES

[QRH] **ASYMMETRIC BRAKING** (*Refer to procedure*)

[QRH] **RESIDUAL BRAKING** (*Refer to procedure*)

Ident.: PRO-ABN-ABN-QRH-ABN-QRH-00021343.0001001 / 17 MAR 17

Applicable to: ALL

CAB PR

[QRH] **CABIN OVERPRESSURE** (*Refer to procedure*)

Ident.: PRO-ABN-ABN-QRH-ABN-QRH-00021344.0002001 / 04 NOV 20

Applicable to: ALL

COND

[QRH] **TOO HOT COCKPIT AND CABIN TEMPERATURE IN FLIGHT** (*Refer to procedure*)

Ident.: PRO-ABN-ABN-QRH-ABN-QRH-00021346.0001001 / 17 MAR 17

Applicable to: ALL

DOOR

[QRH] **COCKPIT DOOR FAULT** (*Refer to procedure*)

Ident.: PRO-ABN-ABN-QRH-ABN-QRH-00021511.0001001 / 17 MAR 17

Applicable to: ALL

EIS

PROCEDURES**ABNORMAL AND EMERGENCY PROCEDURES****[QRH] PROCEDURES****[QRH] DISPLAY UNIT FAILURE** (*Refer to procedure*)

Ident.: PRO-ABN-ABN-QRH-ABN-QRH-00021345.0002001 / 17 MAR 17

Applicable to: ALL**ELEC****[QRH] C/B TRIPPED** (*Refer to procedure*)**[QRH] ELEC EMER CONFIG SYS REMAINING** (*Refer to procedure*)

Ident.: PRO-ABN-ABN-QRH-ABN-QRH-00021356.0003001 / 05 MAR 19

2 Applicable to: ALL**ENG****[QRH] ALL ENG FAIL** (*Refer to procedure*)**[QRH] ENG RELIGHT IN FLIGHT** (*Refer to procedure*)**[QRH] ENG 1(2) STALL** (*Refer to procedure*)**[QRH] ENG TAILPIPE FIRE** (*Refer to procedure*)**[QRH] HIGH ENGINE VIBRATION** (*Refer to procedure*)**[QRH] ON GROUND - NON ENG SHUTDOWN AFTER ENG MASTER OFF** (*Refer to procedure*)**[QRH] ONE ENGINE INOPERATIVE - CIRCLING APPROACH** (*Refer to procedure*)**[QRH] ONE ENGINE INOPERATIVE - STRAIGHT-IN APPROACH** (*Refer to procedure*)

Ident.: PRO-ABN-ABN-QRH-ABN-QRH-00021347.0001001 / 10 MAY 21

Applicable to: ALL**F/CTL****[QRH] LANDING WITH SLATS OR FLAPS JAMMED** (*Refer to procedure*)**[QRH] RUDDER JAM** (*Refer to procedure*)**[QRH] STABILIZER JAM** (*Refer to procedure*)

Ident.: PRO-ABN-ABN-QRH-ABN-QRH-00021348.0001001 / 16 NOV 20

Applicable to: ALL**FUEL****[QRH] FUEL IMBALANCE** (*Refer to procedure*)**[QRH] FUEL LEAK** (*Refer to procedure*)**[QRH] FUEL OVERREAD** (*Refer to procedure*)**[QRH] GRAVITY FUEL FEEDING** (*Refer to procedure*)

Ident.: PRO-ABN-ABN-QRH-ABN-QRH-00021353.0001001 / 17 MAR 17

Applicable to: ALL**L/G**

[QRH] **LANDING WITH ABNORMAL L/G** (Refer to procedure)[QRH] **L/G GRAVITY EXTENSION** (Refer to procedure)

Ident.: PRO-ABN-ABN-QRH-ABN-QRH-00022319.0001001 / 17 NOV 20

Applicable to: ALL

MISC[QRH] **BOMB ON BOARD** (Refer to procedure)[QRH] **COCKPIT WINDSHIELD / WINDOW ARCING** (Refer to procedure)[QRH] **COCKPIT WINDSHIELD / WINDOW CRACKED** (Refer to procedure)[QRH] **DITCHING** (Refer to procedure)[QRH] **EMER EVAC** (Refer to procedure)[QRH] **EMER LANDING** (Refer to procedure)[QRH] **FORCED LANDING** (Refer to procedure)[QRH] **OVERWEIGHT LANDING** (Refer to procedure)[QRH] **SEVERE TURBULENCE** (Refer to procedure)[QRH] **TAILSTRIKE** (Refer to procedure)[QRH] **VOLCANIC ASH ENCOUNTER** (Refer to procedure)

[QRH] NAV

3 Ident.: PRO-ABN-ABN-QRH-ABN-QRH-00021354.0007001 / 06 NOV 25

Applicable to: MSN 02719-07792

NAV[QRH] **UNRELIABLE SPEED INDICATION** (Refer to procedure)[QRH] **ALL ADR OFF** (Refer to procedure)[QRH] **IR ALIGNMENT IN ATT MODE** (Refer to procedure)

4 Ident.: PRO-ABN-ABN-QRH-ABN-QRH-00021354.0006001 / 07 NOV 25

Applicable to: MSN 02155-02212

NAV[QRH] **UNRELIABLE SPEED INDICATION** (Refer to procedure)[QRH] **ADR 1+2+3 FAULT** (Refer to procedure)[QRH] **IR ALIGNMENT IN ATT MODE** (Refer to procedure)

Ident.: PRO-ABN-ABN-QRH-ABN-QRH-00020870.0001001 / 17 MAR 17

Applicable to: ALL

SMOKE

PROCEDURES**ABNORMAL AND EMERGENCY PROCEDURES****[QRH] PROCEDURES**

[QRH] **SMOKE / FUMES / AVNCS SMOKE** (*Refer to procedure*)

[QRH] **REMOVAL OF SMOKE / FUMES** (*Refer to procedure*)

[QRH] **SMOKE / FIRE FROM LITHIUM BATTERY** (*Refer to procedure*)

Ident.: PRO-ABN-ABN-QRH-ABN-QRH-00021512.0001001 / 17 MAR 17

Applicable to: ALL

WHEEL

[QRH] **WHEEL TIRE DAMAGE SUSPECTED** (*Refer to procedure*)

ANTI ICE ALL PITOT

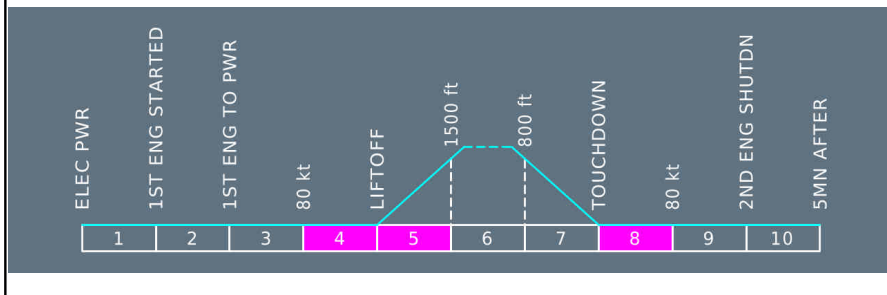
Applicable to: ALL

Ident.: PRO-ABN-A-ICE-U-00017184.0003001 / 21 MAR 16

ANNUNCIATIONS
Triggering Conditions:

L2

This alert triggers when the heating systems of the CAPT, F/O and STBY pitot probes are failed.

Flight Phase Inhibition:


Continued on the following page

ANTI ICE ALL PITOT (Cont'd)

Ident.: PRO-ABN-A-ICE-U-00018180.0004001 / 21 MAR 17

[L2] In the case of simultaneous pitot icing and in the same amount, ADR 1, ADR 2, and ADR 3 speeds will be in agreement, but incorrect. The following ECAM procedure avoids that the flight controls use erroneous, but coherent, sources.

[L1] **ADR 1(2)(3) P/B..... OFF**

[L2] Depending on the status of the static, AOA, and TAT heating, the ECAM requires that either ADR 1, 2 or 3 be switched OFF.

Note: In the case of subsequent, significant, speed discrepancy between the two remaining ADRs, the “ADR DISAGREE” ECAM caution will trigger.

[L1] ● **IF ICING EXPECTED:**
ADR 2(3) P/B..... OFF

[L2] Depending on the status of the static, AOA, and TAT heating, the ECAM requires that either ADR 2 or 3 be switched OFF.

[L1] **UNREL SPD PROC..... APPLY**

[L2] Only one ADR is available, and the corresponding pitot probe may be affected by ice accretion. Be prepared to use the UNRELIABLE SPEED INDICATION procedure (Refer to procedure).

[L12]

ASSOCIATED PROCEDURES

NAV ADR FAULT

Single ADR FAULT or double ADR FAULT ECAM cautions may trigger, depending on the number of ADRs switched OFF.

[L12]

ASSOCIATED PROCEDURES

F/CTL ALTN LAW (PROT LOST)

Alternate law becomes active, if:

- One ADR was already switched OFF, and the two remaining ADRs are not in agreement, or
- Two ADRs were switched OFF.

Continued on the following page

ANTI ICE ALL PITOT (Cont'd)

Ident.: PRO-ABN-A-ICE-U-00018298.0002001 / 21 MAR 16

STATUS	
● IF ICING EXPECTED: ADR 2(3) P/B..... OFF UNREL SPD PROC..... APPLY	INOP SYS CAPT PITOT F/O PITOT STBY PITOT CAPT PROBES ⁽¹⁾ F/O PROBES ⁽²⁾ STBY PROBES ⁽³⁾ STEEP APPR  (If in ALTN LAW)
⁽¹⁾ (If all CAPT PROBES heating is lost) ⁽²⁾ (If all F/O PROBES heating is lost) ⁽³⁾ (If all STBY PROBES heating is lost)	

ANTI ICE CAPT(F/O) TAT

Applicable to: ALL

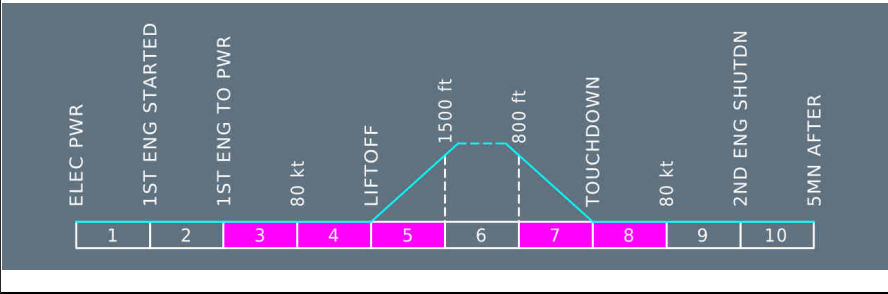
Ident.: PRO-ABN-A-ICE-E-00017171.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the heating system of the corresponding probe is failed.

Flight Phase Inhibition:



Ident.: PRO-ABN-A-ICE-E-00018299.0001001 / 21 MAR 16

Crew awareness.

Ident.: PRO-ABN-A-ICE-E-00018889.0001001 / 21 MAR 16

STATUS

INOP SYS

CAPT(F/O) TAT

ANTI ICE CAPT + F/O AOA

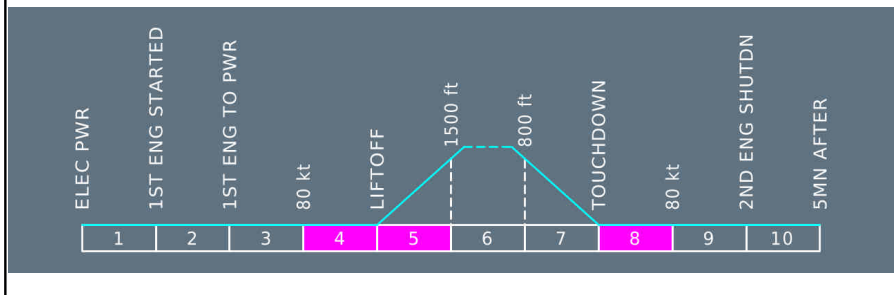
Applicable to: ALL

Ident.: PRO-ABN-A-ICE-AA-00022251.0001001 / 30 MAR 18

ANNUNCIATIONS
Triggering Conditions:

L2

This alert triggers when the heating systems of the CAPT and F/O AOA probes are failed.

Flight Phase Inhibition:


Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

A-ICE

ANTI ICE CAPT + F/O AOA (Cont'd)

Ident.: PRO-ABN-A-ICE-AA-00022252.0001001 / 30 MAR 18

- [L2]** In the case of simultaneous AOA probes icing and if the AOA probes are blocked in the same angular position, AOA values from ADR 1 and ADR 2 will be in agreement but incorrect. Therefore, flight controls will consider the remaining correct ADR 3 source as being faulty, and will reject the only correct source. The following ECAM procedure avoids that the flight controls use two erroneous but coherent AOA sources.

[L1] **ADR 1(2) P/B**..... **OFF**

- [L2]** Depending on the status of the static, pitot and TAT heating, the ECAM requires that either ADR 1 or 2 be switched OFF.

Note: In the case of subsequent and significant AOA discrepancy between the two remaining ADRs, the "NAV ADR DISAGREE" ECAM caution will trigger.

[L1]

ASSOCIATED PROCEDURES

NAV ADR FAULT

Ident.: PRO-ABN-A-ICE-AA-00022253.0001001 / 30 MAR 18

STATUS

INOP SYS

CAPT AOA
 F/O AOA
 CAPT PROBES ⁽¹⁾
 F/O PROBES ⁽²⁾

⁽¹⁾ (If all CAPT PROBES heating is lost)

⁽²⁾ (If all F/O PROBES heating is lost)

ANTI ICE CAPT + F/O PITOT

Applicable to: ALL

Ident.: PRO-ABN-A-ICE-R-00017177.0003001 / 21 MAR 16

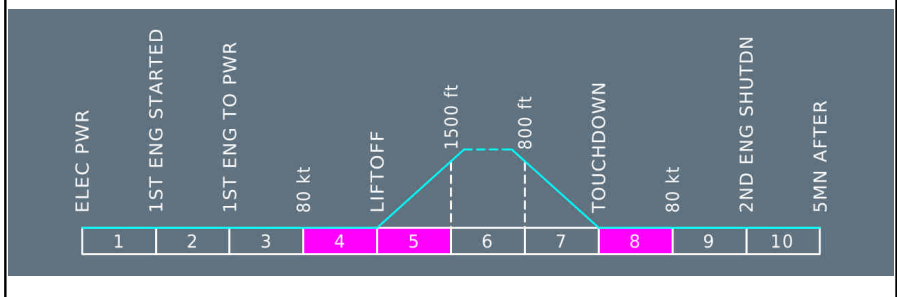
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the heating systems of the CAPT and F/O pitot probes are failed.

Flight Phase Inhibition:



Continued on the following page

ANTI ICE CAPT + F/O PITOT (Cont'd)

Ident.: PRO-ABN-A-ICE-R-00018300.0002001 / 21 MAR 17

[L2] In the case of simultaneous pitot icing and in the same amount, ADR 1 and ADR 2 speeds will be in agreement, but incorrect. Therefore, flight controls will consider the remaining correct source as being faulty, and will reject the only correct source. The following ECAM procedure avoids that the flight controls use two erroneous, but coherent, sources.

[L1] ■ **If ADR 3 operative and ON:**

ADR 1(2) P/B..... OFF

[L2] Depending on the status of the static, AOA, and TAT heating, the ECAM requires that either ADR 1 or 2 be switched OFF

Note: In the case of subsequent, significant, speed discrepancy between the two remaining ADRs, the "ADR DISAGREE" ECAM caution will trigger.

[L1] ■ **If ADR 3 failed or OFF:**

[L2] No action is required, as long as there are no icing conditions, in order to keep two independent speed sources.

[L1] ● **IF ICING EXPECTED:**

ADR 1(2) P/B..... APPLY

[L2] Depending on the status of the static, AOA, and TAT heating, the ECAM requires that either ADR 1 or 2 be switched OFF.

[L1] UNREL SPD PROC..... APPLY

[L2] Only one ADR is available, and the corresponding pitot probe may be affected by ice accretion. Be prepared to use the UNRELIABLE SPEED INDICATION procedure (Refer to procedure).

[L1]

ASSOCIATED PROCEDURES

NAV ADR FAULT

Continued on the following page

ANTI ICE CAPT + F/O PITOT (Cont'd)

Ident.: PRO-ABN-A-ICE-R-00018301.0002001 / 21 MAR 16

STATUS

- If ADR 3 failed or OFF:
- IF ICING EXPECTED:
 ADR 1(2) P/B.....OFF
 UNREL SPD PROC.....APPLY

INOP SYS

 CAPT PITOT
 F/O PITOT
 CAPT PROBES ⁽¹⁾
 F/O PROBES ⁽²⁾
⁽¹⁾ (If all CAPT PROBES heating is lost)

⁽²⁾ (If all F/O PROBES heating is lost)

ANTI ICE CAPT + STBY AOA

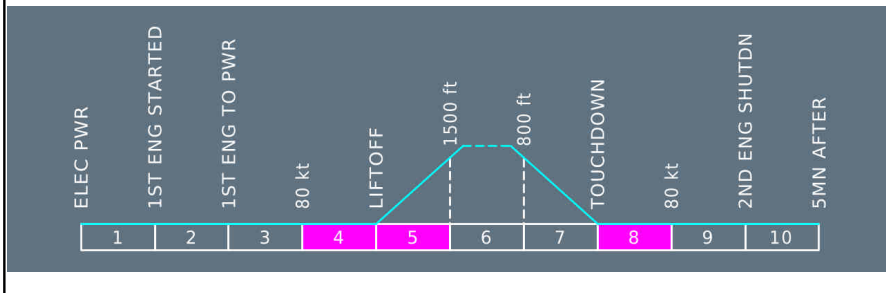
Applicable to: ALL

Ident.: PRO-ABN-A-ICE-AB-00022254.0001001 / 30 MAR 18

ANNUNCIATIONS
Triggering Conditions:

L2

This alert triggers when the heating systems of the CAPT and STBY AOA probes are failed.

Flight Phase Inhibition:


Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

A-ICE

ANTI ICE CAPT + STBY AOA (Cont'd)

5 Ident.: PRO-ABN-A-ICE-AB-00022256.0001001 / 30 MAR 18

- [L2] In the case of simultaneous AOA probes icing and if the AOA probes are blocked in the same angular position, AOA values from ADR 1 and ADR 3 will be in agreement but incorrect. Therefore, flight controls will consider the remaining correct ADR 2 source as being faulty, and will reject the only correct source. The following ECAM procedure avoids that the flight controls use two erroneous but coherent AOA sources.

[L1] **ADR 1(3) P/B**..... **OFF**

- [L2] Depending on the status of the static, pitot and TAT heating, the ECAM requires that either ADR 1 or 3 be switched OFF.

Note: In the case of subsequent and significant AOA discrepancy between the two remaining ADRs, the "NAV ADR DISAGREE" ECAM caution will trigger.

[L1]

ASSOCIATED PROCEDURES

NAV ADR FAULT

6 Ident.: PRO-ABN-A-ICE-AB-00022257.0001001 / 30 MAR 18

STATUS

INOP SYS

CAPT AOA

stby AOA

CAPT PROBES ⁽¹⁾

STBY PROBES ⁽²⁾

⁽¹⁾ (If all CAPT PROBES heating is lost)

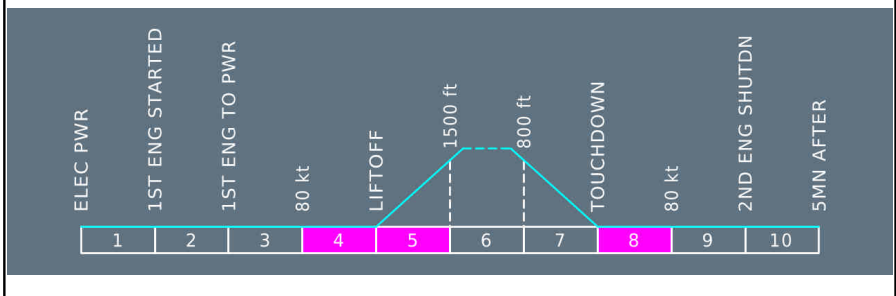
⁽²⁾ (If all STBY PROBES heating is lost)

ANTI ICE CAPT + STBY PITOT
Applicable to: ALL

Ident.: PRO-ABN-A-ICE-S-00017178.0003001 / 21 MAR 16

ANNUNCIATIONS
Triggering Conditions:
L2

This alert triggers when the heating systems of the CAPT and STBY pitot probes are failed.

Flight Phase Inhibition:

Continued on the following page

ANTI ICE CAPT + STBY PITOT (Cont'd)

Ident.: PRO-ABN-A-ICE-S-00018302.0002001 / 21 MAR 17

[L2] In the case of simultaneous pitot icing and in the same amount, ADR 1 and ADR 3 speeds will be in agreement, but incorrect. Flight controls will consider the remaining correct source as being faulty, and will reject the only correct source. The following ECAM procedure avoids that the flight controls use two erroneous, but coherent, sources.

[L1] ■ **If ADR 2 operative and ON:**
 ADR 1(3) P/B..... OFF

[L2] Depending on the status of the static, AOA, and TAT heating, the ECAM requires that either ADR 1 or 3 be switched OFF

Note: In the case of subsequent, significant, speed discrepancy between the two remaining ADRs, the "ADR DISAGREE" ECAM caution will trigger.

[L1] ■ **If ADR 2 failed or OFF:**

[L2] No action is required, as long as there are no icing conditions, in order to keep two independent speed sources.

[L1] ● **IF ICING EXPECTED:**
 ADR 1(3) P/B..... APPLY

[L2] Depending on the status of the static, AOA, and TAT heating, the ECAM requires that either ADR 1 or 3 be switched OFF.

[L1] UNREL SPD PROC..... APPLY

[L2] Only one ADR is available, and the corresponding pitot probe may be affected by ice accretion. Be prepared to use the UNRELIABLE SPEED INDICATION procedure (Refer to procedure).

[L1]

ASSOCIATED PROCEDURES

NAV ADR FAULT

Continued on the following page

ANTI ICE CAPT + STBY PITOT (Cont'd)

Ident.: PRO-ABN-A-ICE-S-00018303.0002001 / 21 MAR 16

STATUS ● If ADR 2 failed or OFF: ● IF ICING EXPECTED: ADR 1(3) P/B.....OFF UNREL SPD PROC.....APPLY <u>INOP SYS</u> CAPT PITOT STBY PITOT CAPT PROBES ⁽¹⁾ STBY PROBES ⁽²⁾	
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⁽¹⁾ (If all CAPT PROBES heating is lost)

⁽²⁾ (If all STBY PROBES heating is lost)

ANTI ICE CAPT PITOT

Applicable to: ALL

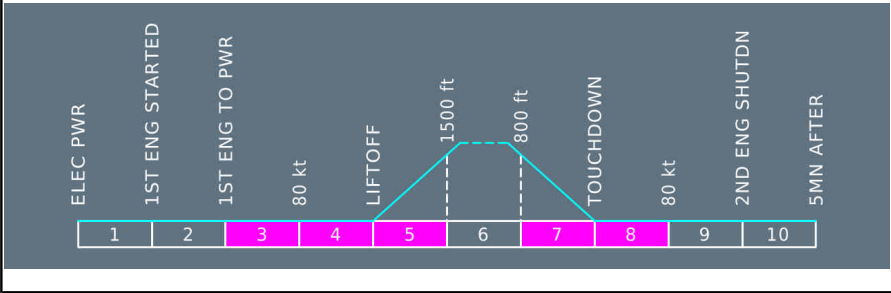
Ident.: PRO-ABN-A-ICE-AD-00024161.0001001 / 10 MAY 21

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the heating system of the corresponding probe is failed.

Flight Phase Inhibition:



The diagram shows a flight profile with 10 time segments. Above the segments are labels for flight phases: ELEC PWR, 1ST ENG STARTED, 1ST ENG TO PWR, 80 kt, LIFTOFF, 1500 ft, 800 ft, TOUCHDOWN, 80 kt, 2ND ENG SHUTDN, and 5MN AFTER. The segments are numbered 1 to 10. The alert is inhibited (greyed out) during segments 1, 2, 3, 4, 5, 6, 7, and 8, and active (pink) during segments 9 and 10.

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

A-ICE

ANTI ICE CAPT PITOT (Cont'd)

Ident.: PRO-ABN-A-ICE-AD-00024162.0002001 / 10 MAY 21

AIR DATA SWTGCAPT 3

L2 Select ADR 3 to CAPT side if ADR 3 is reliable and not in use.

Ident.: PRO-ABN-A-ICE-AD-00024163.0001001 / 10 MAY 21

STATUS

INOP SYS

CAPT PITOT

ANTI ICE CAPT L(R) STAT

Applicable to: ALL

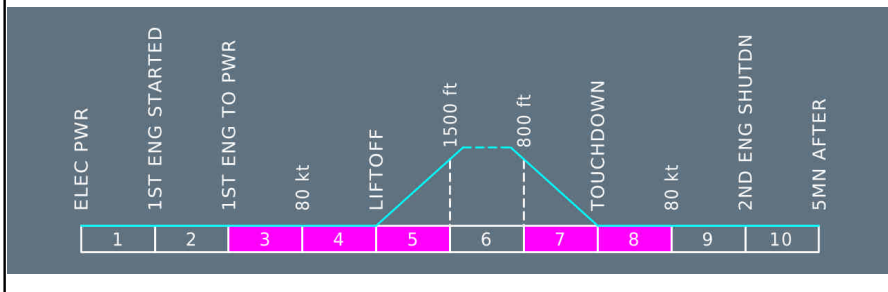
Ident.: PRO-ABN-A-ICE-AE-00024219.0001001 / 10 MAY 21

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the heating system of the corresponding probe is failed.

Flight Phase Inhibition:



Continued on the following page

ANTI ICE CAPT L(R) STAT (Cont'd)

Ident.: PRO-ABN-A-ICE-AE-00024220.0002001 / 10 MAY 21

AIR DATA SWTGCAPT 3

L2 Select ADR 3 to CAPT side if ADR 3 is reliable and not in use.

Ident.: PRO-ABN-A-ICE-AE-00024221.0001001 / 10 MAY 21

STATUS	INOP SYS CAPT L(R) STAT
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ANTI ICE CAPT AOA

Applicable to: ALL

Ident.: PRO-ABN-A-ICE-AF-00024222.0001001 / 10 MAY 21

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the heating system of the corresponding probe is failed.

Flight Phase Inhibition:

Continued on the following page

ANTI ICE CAPT AOA (Cont'd)

Ident.: PRO-ABN-A-ICE-AF-00024223.0004001 / 10 MAY 21

AIR DATA SWTG..... CAPT 3

[L2] Select ADR 3 to CAPT side if ADR 3 is reliable and not in use.

 [L1] ● If **NAV ADR 2+3 FAULT:**
 AVOID ICING CONDITIONS

Ident.: PRO-ABN-A-ICE-AF-00024224.0002001 / 10 MAY 21

STATUS

 ● If **NAV ADR 2+3 FAULT:**
 AVOID ICING CONDITIONS

INOP SYS

CAPT AOA

ANTI ICE CAPT PROBES

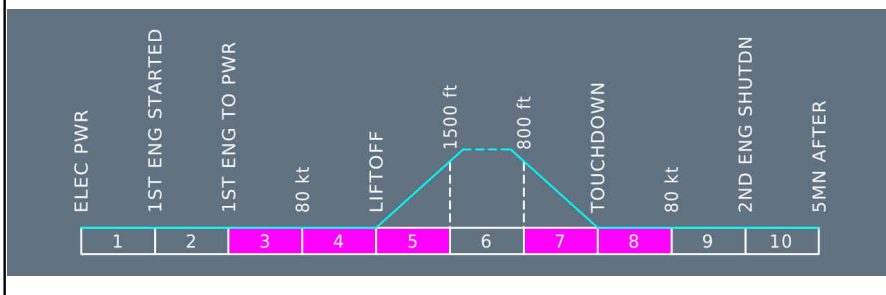
Applicable to: ALL

Ident.: PRO-ABN-A-ICE-G-00017173.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

[L2] This alert triggers when the captain probe heat computer is failed.

Flight Phase Inhibition:


Continued on the following page

ANTI ICE CAPT PROBES (Cont'd)

Ident.: PRO-ABN-A-ICE-G-00010255.0002001 / 05 AUG 10

AIR DATA SWTG.....CAPT 3

L2 Note: *AIR DATA SWTG should not be selected to CAPT 3 if ADR 3 is not available.*

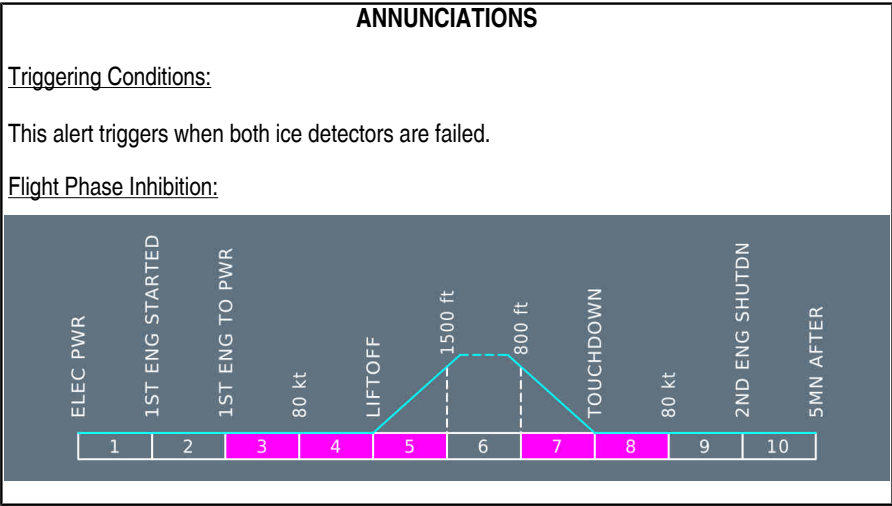
Ident.: PRO-ABN-A-ICE-G-00010256.0001001 / 05 AUG 10

	STATUS INOP SYS CAPT PROBES
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ANTI ICE DETECT FAULT

Applicable to: MSN 02719-02789, 03031-04392

Ident.: PRO-ABN-A-ICE-L-00017189.0001001 / 21 MAR 16



Ident.: PRO-ABN-A-ICE-L-00018890.0001001 / 21 MAR 16

ANTI ICE.....AS RQRD

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

A-ICE

ANTI ICE DETECT FAULT (Cont'd)

Ident.: PRO-ABN-A-ICE-L-00010276.0001001 / 05 AUG 10

STATUS

INOP SYS

ICE DETECT

ANTI ICE ENG 1(2) VALVE CLSD

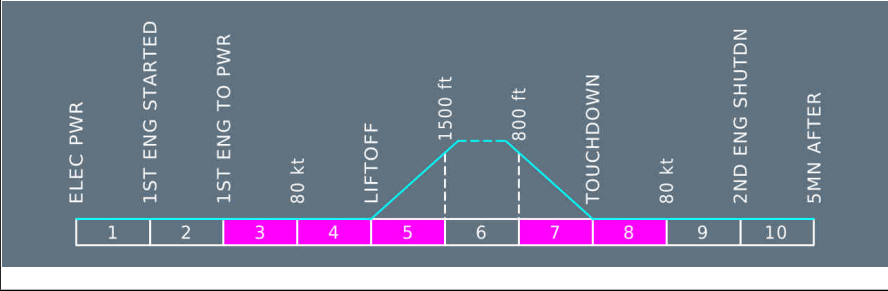
Applicable to: ALL

Ident.: PRO-ABN-A-ICE-J-00017163.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

[L2] This alert triggers when the valve is abnormally closed.

Flight Phase Inhibition:


Ident.: PRO-ABN-A-ICE-J-00010269.0005001 / 03 JAN 17

THRUST..... INCREASE

- IF UNSUCCESSFUL:
AVOID ICING CONDITIONS

Continued on the following page

ANTI ICE ENG 1(2) VALVE CLSD (Cont'd)

Ident.: PRO-ABN-A-ICE-J-00010270.0001001 / 05 AUG 10

AVOID ICING CONDITIONS

STATUS

INOP SYS

ENG 1 (2) A. ICE

ANTI ICE ENG 1(2) VALVE OPEN

Applicable to: ALL

Ident.: PRO-ABN-A-ICE-K-00017162.0001001 / 21 MAR 16

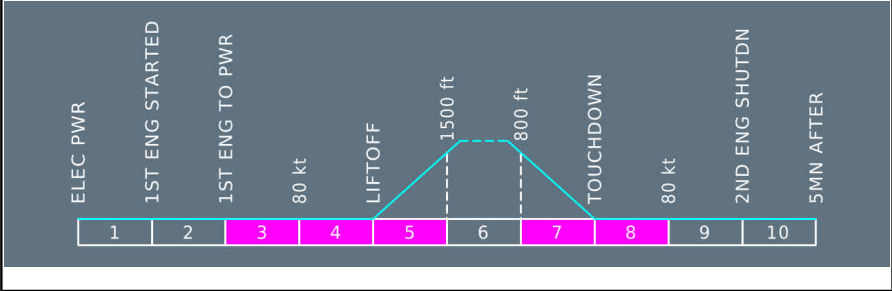
L2

ANNUNCIATIONS

Triggering Conditions:

This alert triggers when the valve is abnormally open.

Flight Phase Inhibition:



Ident.: PRO-ABN-A-ICE-K-00010272.0001001 / 05 AUG 10

THRUST LIM PENALTY

Continued on the following page

ANTI ICE ENG 1(2) VALVE OPEN (Cont'd)

Ident.: PRO-ABN-A-ICE-K-00010273.0001001 / 05 AUG 10

STATUS

THRUST LIM PENALTY

ANTI ICE F/O + STBY AOA

Applicable to: ALL

Ident.: PRO-ABN-A-ICE-AC-00022258.0001001 / 30 MAR 18

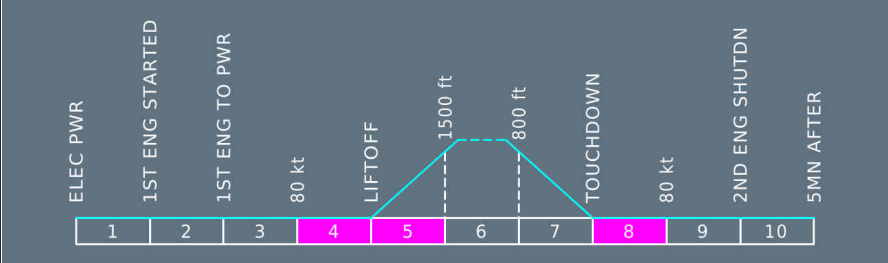
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the heating systems of the F/O and STBY AOA probes are failed.

Flight Phase Inhibition:



The diagram shows a 10-phase timeline for flight phase inhibition. The phases are: 1. ELEC PWR, 2. 1ST ENG STARTED, 3. 1ST ENG TO PWR, 4. 80 kt, 5. LIFTOFF, 6. 1500 ft, 7. 800 ft, 8. TOUCHDOWN, 9. 80 kt, 10. 2ND ENG SHUTDN. The phases are numbered 1 to 10 in a box at the bottom. The phases 4, 5, 6, 7, and 8 are highlighted in pink. The phases 1, 2, 3, 9, and 10 are not highlighted. The diagram also includes labels for 5MN AFTER and 2ND ENG SHUTDN.

Continued on the following page

ANTI ICE F/O + STBY AOA (Cont'd)

11 Ident.: PRO-ABN-A-ICE-AC-00022259.0001001 / 30 MAR 18

L2 In the case of simultaneous AOA probes icing and if the AOA probes are blocked in the same angular position, AOA values from ADR 2 and ADR 3 will be in agreement but incorrect. Therefore, flight controls will consider the remaining correct ADR 1 source as being faulty, and will reject the only correct source. The following ECAM procedure avoids that the flight controls use two erroneous but coherent AOA sources.

L1 **ADR 2(3) P/B** **OFF**

L2 Depending on the status of the static, pitot and TAT heating, the ECAM requires that either ADR 2 or 3 be switched OFF.

Note: In the case of subsequent and significant AOA discrepancy between the two remaining ADRs, the "NAV ADR DISAGREE" ECAM caution will trigger.

L1

ASSOCIATED PROCEDURES
NAV ADR FAULT

12 Ident.: PRO-ABN-A-ICE-AC-00022260.0001001 / 30 MAR 18

STATUS
INOP SYS

F/O AOA
 STBY AOA
 F/O PROBES ⁽¹⁾
 STBY PROBES ⁽²⁾

⁽¹⁾ (If all F/O PROBES heating is lost)

⁽²⁾ (If all STBY PROBES heating is lost)

ANTI ICE F/O + STBY PITOT

Applicable to: ALL

Ident.: PRO-ABN-A-ICE-T-00017179.0003001 / 21 MAR 16

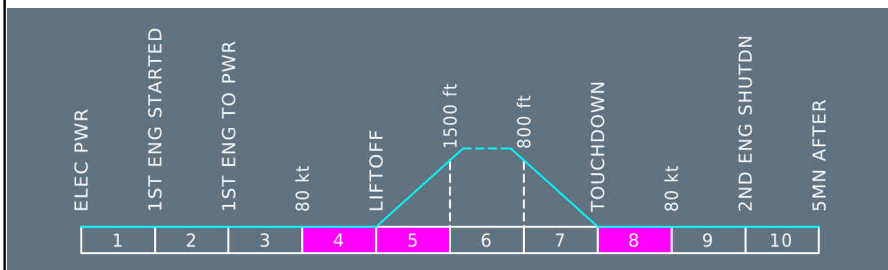
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the heating systems of the F/O and STBY pitot probes are failed.

Flight Phase Inhibition:



Continued on the following page

ANTI ICE F/O + STBY PITOT (Cont'd)

Ident.: PRO-ABN-A-ICE-T-00018307.0002001 / 21 MAR 17

L2 In the case of simultaneous pitot icing and in the same amount, ADR 2 and ADR 3 speeds will be in agreement, but incorrect. Therefore, flight controls will consider the remaining correct source as being faulty, and will reject the only correct source. The following ECAM procedure avoids that the flight controls use two erroneous, but coherent, sources.

L1 ■ **If ADR 1 operative and ON:**

L2 ADR 2(3) P/B.....OFF

L2 Depending on the status of the static, AOA, and TAT heating, the ECAM requires that either ADR 2 or 3 be switched OFF.

Note: In the case of subsequent, significant, speed discrepancy between the two remaining ADRs, the "ADR DISAGREE" ECAM caution will trigger.

L1 ■ **If ADR 1 failed or OFF:**

L2 No action is required, as long as there are no icing conditions, in order to keep two independent speed sources.

L1 ● **IF ICING EXPECTED:**

L2 ADR 2(3) P/B.....OFF

L2 Depending on the status of the static, AOA, and TAT heating, the ECAM requires that either ADR 2 or 3 be switched OFF.

L1 UNREL SPD PROC.....APPLY

L2 Only one ADR is available, and the corresponding pitot probe may be affected by ice accretion. Be prepared to use the UNRELIABLE SPEED INDICATION procedure (Refer to procedure).

L1

ASSOCIATED PROCEDURES
NAV ADR FAULT

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

A-ICE

ANTI ICE F/O + STBY PITOT (Cont'd)

Ident.: PRO-ABN-A-ICE-T-00018308.0002001 / 21 MAR 16

STATUS

● If ADR 1 failed or OFF:

● IF ICING EXPECTED:

ADR 2(3) P/B..... OFF
 UNREL SPD PROC..... APPLY

INOP SYS

F/O PITOT
 STBY PITOT
 F/O PROBES ⁽¹⁾
 STBY PROBES ⁽²⁾

⁽¹⁾ (If all F/O PROBES heating is lost)

⁽²⁾ (If all STBY PROBES heating is lost)

ANTI ICE F/O PITOT OR L (R) STAT OR AOA

Applicable to: ALL

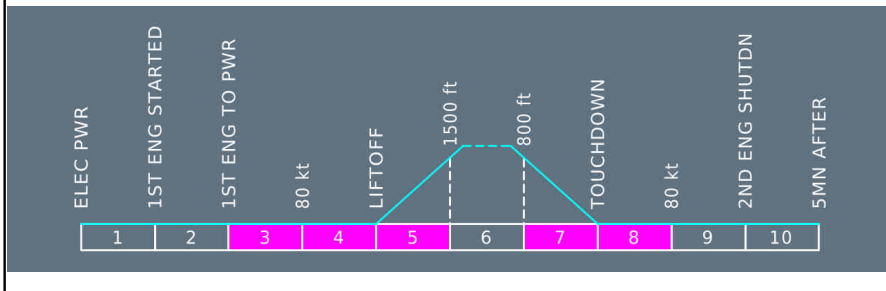
Ident.: PRO-ABN-A-ICE-D-00017170.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the heating system of the corresponding probe is failed.

Flight Phase Inhibition:



Continued on the following page

ANTI ICE F/O PITOT OR L(R) STAT OR AOA (Cont'd)

Ident.: PRO-ABN-A-ICE-D-00018309.0002001 / 21 MAR 16

AIR DATA SWTG.....
F/O 3

- L2

ADR 3 supplies data to PFD 2 and ND 2.

Note: AIR DATA SWTG should not be selected to F/O 3 if ADR 3 is not available.

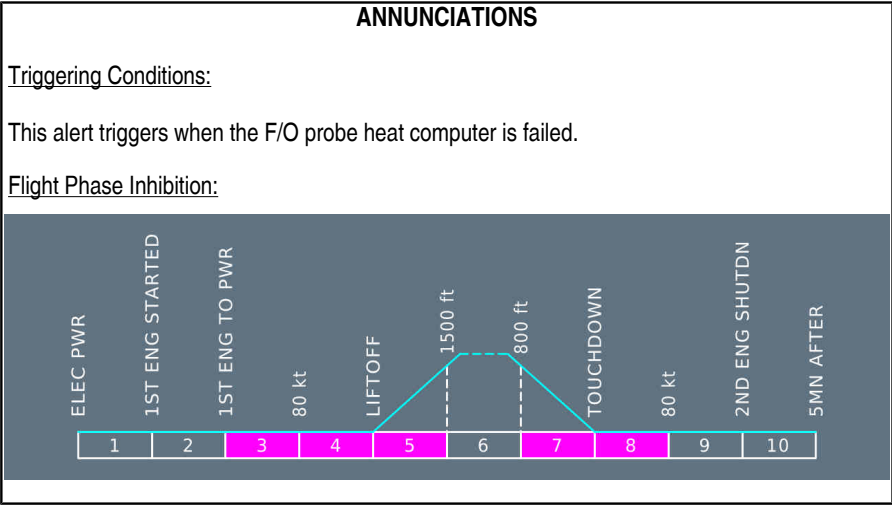
Ident.: PRO-ABN-A-ICE-D-00018901.0001001 / 21 MAR 16

	STATUS <u>INOP SYS</u> F/O PITOT F/O L(R) STAT F/O AOA
--	--

ANTI ICE F/O PROBES

Applicable to: ALL

Ident.: PRO-ABN-A-ICE-H-00017174.0001001 / 21 MAR 16



Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

A-ICE

ANTI ICE F/O PROBES (Cont'd)

Ident.: PRO-ABN-A-ICE-H-00010261.0002001 / 05 AUG 10

AIR DATA SWTG.....F/O 3

[L2] Note: AIR DATA SWTG should not be selected to F/O 3 if ADR 3 is not available.

Ident.: PRO-ABN-A-ICE-H-00010263.0001001 / 05 AUG 10

STATUS

INOP SYS

F/O PROBES

ANTI ICE ICE DETECTED

Applicable to: MSN 02719-02789, 03031-04392

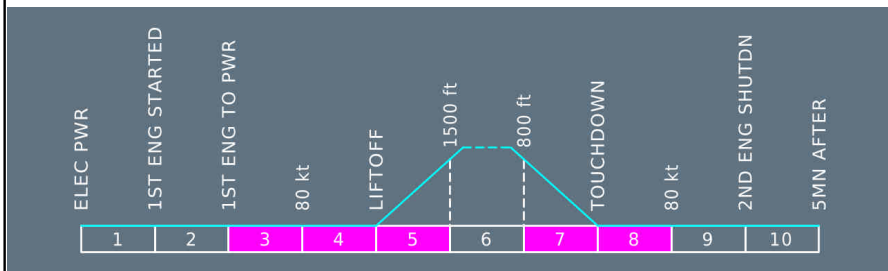
Ident.: PRO-ABN-A-ICE-Z-00017187.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

[L2] This alert triggers when ice is detected in flight above 1 500 ft (with TAT<10 °C) and the ENG ANTI ICE pb-sw is set to OFF.

Flight Phase Inhibition:



Continued on the following page

ANTI ICE ICE DETECTED (Cont'd)

Ident.: PRO-ABN-A-ICE-Z-00018891.0001001 / 21 MAR 16

ENG 1 ANTI ICE.....ON

ENG 2 ANTI ICE.....ON

ANTI ICE L + R WINDSHIELD

Applicable to: ALL

Ident.: PRO-ABN-A-ICE-B-00017167.0001001 / 21 MAR 16

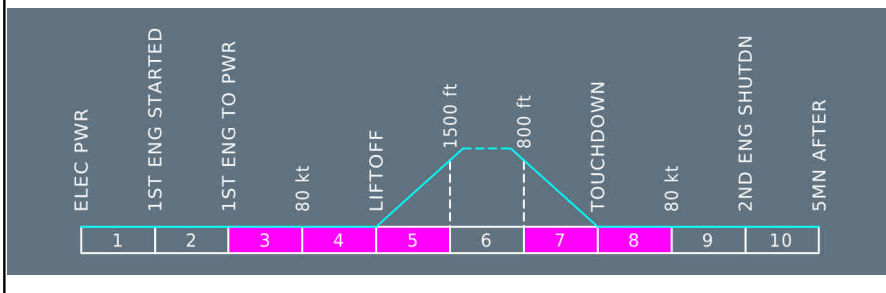
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the heating system of both windshields is failed.

Flight Phase Inhibition:



Ident.: PRO-ABN-A-ICE-B-00010236.0001001 / 25 FEB 14

Crew awareness.

Ident.: PRO-ABN-A-ICE-B-00010237.0001001 / 05 AUG 10

STATUS

INOP SYS

WSHLD HEAT

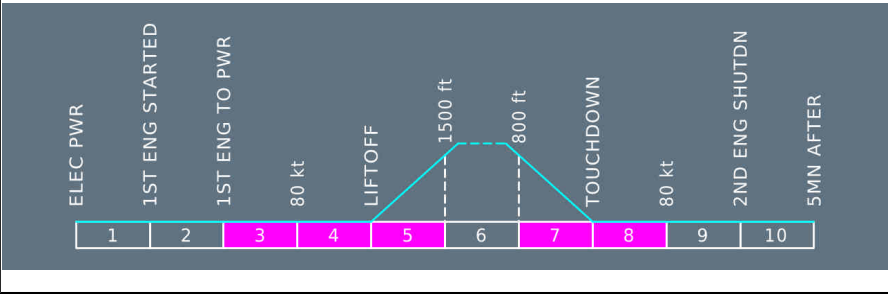
ANTI ICE L(R) WINDOW

Applicable to: ALL

Ident.: PRO-ABN-A-ICE-V-00017168.0001001 / 21 MAR 16

ANNUNCIATIONS

- Triggering Conditions:
- L2** This alert triggers when the heating system of the left(right) cockpit window is failed.
- Flight Phase Inhibition:



Ident.: PRO-ABN-A-ICE-V-00010234.0001001 / 25 FEB 14

- Crew awareness.
- Ident.: PRO-ABN-A-ICE-V-00010235.0001001 / 05 AUG 10

STATUS

INOP SYS
 L(R) WNDW HEAT

ANTI ICE L(R) WINDSHIELD

Applicable to: ALL

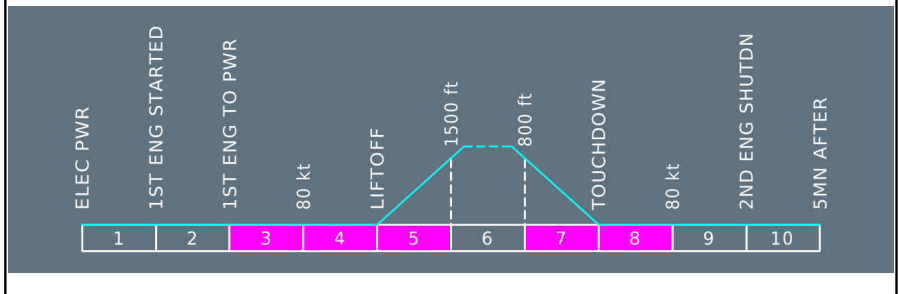
Ident.: PRO-ABN-A-ICE-A-00017166.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the heating system of the left(right) windshield is failed.

Flight Phase Inhibition:


Ident.: PRO-ABN-A-ICE-A-00010232.0001001 / 25 FEB 14

Crew awareness.

Ident.: PRO-ABN-A-ICE-A-00010233.0001001 / 05 AUG 10

STATUS

INOP SYS

L(R) WSHLD HEAT

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

A-ICE

ANTI ICE STBY PITOT OR L(R) STAT OR AOA

Applicable to: ALL

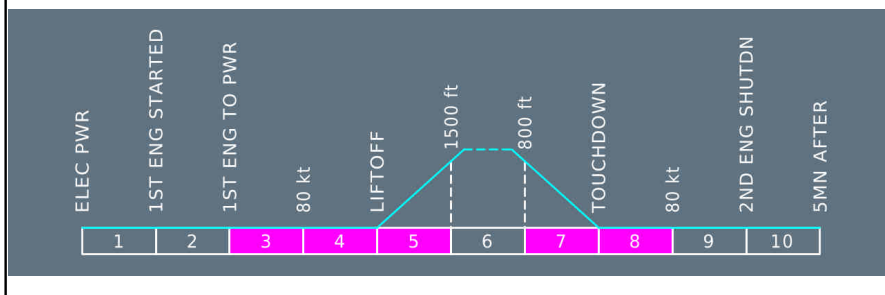
Ident.: PRO-ABN-A-ICE-F-00017172.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the heating system of the corresponding probe is failed.

Flight Phase Inhibition:



Ident.: PRO-ABN-A-ICE-F-00010250.0001001 / 25 FEB 14

Crew awareness.

L2 If standby instruments are used, monitor air data information.

Ident.: PRO-ABN-A-ICE-F-00010251.0001001 / 05 AUG 10

STATUS

INOP SYS

STBY PITOT
 STBY L(R) STAT
 STBY AOA

ANTI ICE STBY PROBES

Applicable to: ALL

Ident.: PRO-ABN-A-ICE-I-00017176.0001001 / 21 MAR 16

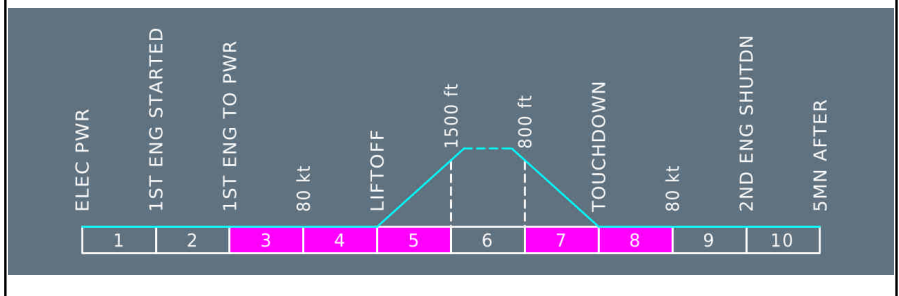
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the standby probe heat computer is failed.

Flight Phase Inhibition:



Ident.: PRO-ABN-A-ICE-I-00010265.0001001 / 25 FEB 14

Crew awareness.

Ident.: PRO-ABN-A-ICE-I-00010266.0001001 / 05 AUG 10

STATUS

INOP SYS

STBY PROBES

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

A-ICE

Intentionally left blank

[QRH] BLEED 1+2 FAULT

Ident.: PRO-ABN-AIR-00017611.0002001 / 21 MAR 17

1 Applicable to: ALL

Apply this procedure when both engine bleed supply systems are failed at the end of the **AIR ENG 1+2 BLEED FAULT** ECAM procedure.

- **At ANY TIME of the procedure, if **CAB PR EXCESS CAB ALT** alert triggers: APPLY ECAM PROC**

CONTINUE DESCENT TO FL 100 / MEA-MORA
 KEEP WING A.ICE OFF

L2 *APU BLEED must not be used for wing anti-ice.*

L1 AVOID ICING CONDITIONS

RCL pb..... PRESS

*This action enables to recover the subtitle (if any) associated with the **AIR ENG 1+2 BLEED FAULT** alert.*

- **If no subtitle with **AIR ENG 1+2 BLEED FAULT** alert**

and

If both engine bleeds lost NOT due to engine fire NOR Start Air Valve failed open:

APU..... START

- **If APU available:**

- **When at or below FL 200:**

KEEP WING A.ICE OFF

L2 *APU BLEED must not be used for wing anti-ice.*

L1 APU BLEED.....ON

When APU bleed is ON and pressurization is recovered, reduce rate of descent and consider MAX FL 200.

- **If PACK 1 available:**

PACK 2.....OFF

- **If APU bleed available:**

MAX FL: 200

PACK 1.....ON

PACK 2.....ON

ENG 1 BLEED.....ON

ENG 2 BLEED.....ON

APU BLEED.....OFF

Continued on the following page

[QRH] BLEED 1+2 FAULT (Cont'd)

● If no engine bleed recovered:

APU BLEED..... ON

● If PACK 1 available:

PACK 2..... OFF

ENG 1 BLEED..... OFF

ENG 2 BLEED..... OFF

WING A.ICE NOT AVAILABLE

■ If APU bleed not available:

APU BLEED..... OFF

● When at or below FL 100 / MEA-MORA:

PACK 1..... ON

PACK 2..... ON

ENG 1 BLEED..... ON

ENG 2 BLEED..... ON

● If no engine bleed recovered:

ENG 1 BLEED..... OFF

ENG 2 BLEED..... OFF

MAX FL: 100 / MEA-MORA

WING A.ICE NOT AVAILABLE

 ● When CAB PR $\Delta P < 1$ psi:

RAM AIR..... ON

■ If APU not available:

APU BLEED..... OFF

● When at or below FL 100 / MEA-MORA:

PACK 1..... ON

PACK 2..... ON

ENG 1 BLEED..... ON

ENG 2 BLEED..... ON

● If no engine bleed recovered:

ENG 1 BLEED..... OFF

ENG 2 BLEED..... OFF

MAX FL: 100 / MEA-MORA

WING A.ICE NOT AVAILABLE

Continued on the following page

[QRH] BLEED 1+2 FAULT (Cont'd)

- When CAB PR $\Delta P < 1$ psi:
 RAM AIR..... ON

■ If **LEFT LEAK** subtitle with **AIR ENG 1+2 BLEED FAULT** alert

or

If engine 1 bleed lost due to engine 1 fire or Start Air Valve 1 failed open or APU leak fed by engine:

- When at or below FL 100 / MEA-MORA:
 PACK 2..... ON
 ENG 2 BLEED..... ON

- If engine 2 bleed not recovered:
 ENG 2 BLEED..... OFF
 MAX FL: 100 / MEA-MORA

WING A.ICE NOT AVAILABLE

- When CAB PR $\Delta P < 1$ psi:
 RAM AIR..... ON

■ If **RIGHT LEAK** subtitle with **AIR ENG 1+2 BLEED FAULT** alert

or

If engine 2 bleed lost due to engine 2 fire or Start Air Valve 2 failed open:

APU..... START

■ If APU available:

- When at or below FL 200:

KEEP WING A.ICE OFF

APU BLEED must not be used for wing anti-ice.

APU BLEED..... ON

When APU bleed is ON and pressurization is recovered, reduce rate of descent and consider MAX FL 200.

■ If APU bleed available:

MAX FL: 200

PACK 1..... ON

ENG 1 BLEED..... ON

APU BLEED..... OFF

- If engine 1 bleed not recovered:
 APU BLEED..... ON

Continued on the following page

[QRH] BLEED 1+2 FAULT (Cont'd)

ENG 1 BLEED..... OFF

WING A.ICE NOT AVAILABLE

■ If APU bleed not available:

APU BLEED..... OFF

● When at or below FL 100 / MEA-MORA:

PACK 1..... ON

ENG 1 BLEED..... ON

● If engine 1 bleed not recovered:

ENG 1 BLEED..... OFF

MAX FL: 100 / MEA-MORA

WING A.ICE NOT AVAILABLE

● When CAB PR $\Delta P < 1$ psi:

RAM AIR..... ON

■ If APU not available:

APU BLEED..... OFF

● When at or below FL 100 / MEA-MORA:

PACK 1..... ON

ENG 1 BLEED..... ON

● If engine 1 bleed not recovered:

ENG 1 BLEED..... OFF

MAX FL: 100 / MEA-MORA

WING A.ICE NOT AVAILABLE

● When CAB PR $\Delta P < 1$ psi:

RAM AIR..... ON

■ If both LEFT LEAK and RIGHT LEAK subtitles with AIR ENG 1+2 BLEED FAULT alert

or

If both engine bleeds lost due to engine fire or Start Air Valve failed open or APU leak fed by engine:

NO ENGINE BLEED CAN BE RECOVERED

MAX FL: 100 / MEA-MORA

WING A.ICE NOT AVAILABLE

Continued on the following page

[QRH] BLEED 1+2 FAULT (Cont'd)

● When CAB PR ΔP < 1 psi:

RAM AIR..... ON

AIR APU BLEED FAULT

Applicable to: ALL

Ident.: PRO-ABN-AIR-G-00017375.0001001 / 21 MAR 16

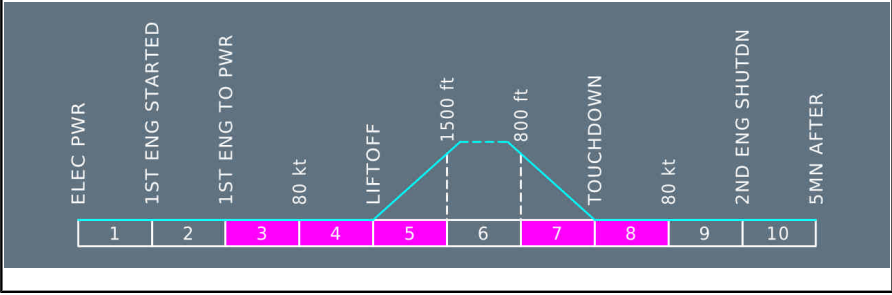
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the APU is running and the position of the APU bleed valve disagrees with the selected position of the APU BLEED pb-sw.

Flight Phase Inhibition:



The diagram shows a flight profile across 10 phases. Phases 3, 4, 5, 7, and 8 are highlighted in pink. The profile includes labels for ELEC PWR, 1ST ENG STARTED, 1ST ENG TO PWR, 80 kt, LIFTOFF, 1500 ft, 800 ft, TOUCHDOWN, 80 kt, 2ND ENG SHUTDN, and 5MN AFTER.

Ident.: PRO-ABN-AIR-G-00017552.0001001 / 21 MAR 16

Crew awareness.

Ident.: PRO-ABN-AIR-G-00011266.0001001 / 05 AUG 10

STATUS

INOP SYS

APU BLEED (If valve closed)

AIR APU BLEED LEAK

Applicable to: ALL

Ident.: PRO-ABN-AIR-F-00017376.0001001 / 21 MAR 16

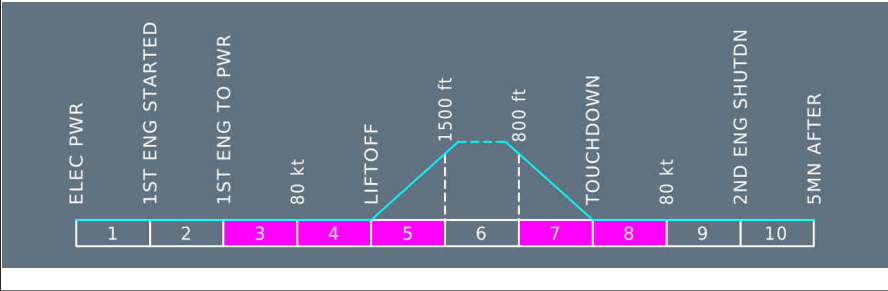
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the APU bleed leak detection loop detects a temperature above 124 °C.

Flight Phase Inhibition:



Ident.: PRO-ABN-AIR-F-00017553.0001001 / 21 MAR 16

APU BLEED (IF NOT CLOSED).....OFF

L2

When the APU BLEED pb-sw is ON, the FAULT light remains on.
 When the APU BLEED pb-sw is OFF, the FAULT light goes off when the overheat disappears.

Ident.: PRO-ABN-AIR-F-00011100.0001001 / 05 AUG 10

STATUS

INOP SYS

APU BLEED

AIR APU BLEED LEAK

APU LEAK FED BY ENG

Applicable to: ALL

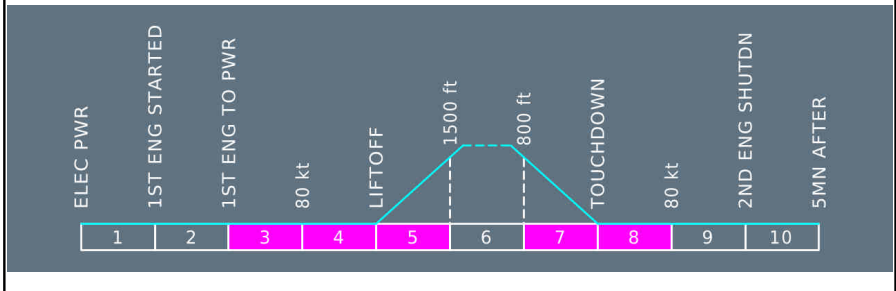
Ident.: PRO-ABN-AIR-Z-00018057.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when a bleed leak is detected in the APU bleed ducts and the APU is OFF.

Flight Phase Inhibition:


Ident.: PRO-ABN-AIR-Z-00017554.0001001 / 21 MAR 16

ENG 1 BLEED.....OFF
 X BLEED.....SHUT
 PACK 1.....OFF
 WING ANTI ICE.....OFF
 AVOID ICING CONDITIONS

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

AIR

AIR APU BLEED LEAK (Cont'd)

APU LEAK FED BY ENG

Ident.: PRO-ABN-AIR-Z-00015878.0001001 / 17 MAR 17

STATUS

AVOID ICING CONDITIONS

● IF SEVERE ICE ACCRETION:

MIN SPD.....VLS +10 / G DOT

MANEUVER WITH CARE

LDG DIST PROC.....APPLY

INOP SYS

WING A. ICE
 ENG 1 BLEED
 PACK 1
 APU BLEED

AIR APU LEAK DET FAULT

Applicable to: ALL

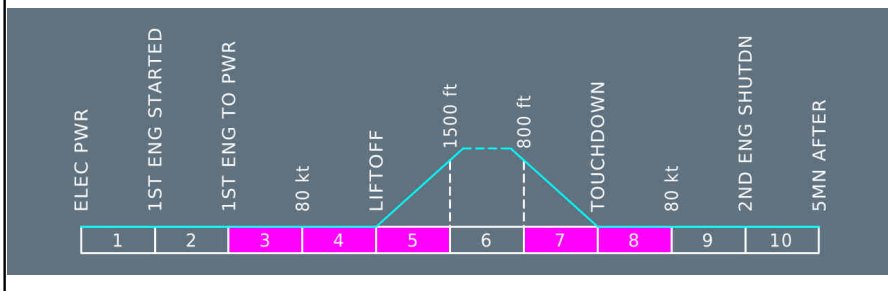
Ident.: PRO-ABN-AIR-Q-00017394.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the APU bleed leak detection loop is inoperative.

Flight Phase Inhibition:



Ident.: PRO-ABN-AIR-Q-00015830.0001001 / 21 AUG 15

Crew awareness.

Continued on the following page

AIR APU LEAK DET FAULT (Cont'd)

Ident.: PRO-ABN-AIR-Q-00015831.0001001 / 21 AUG 15

STATUS

INOP SYS

APU LEAK DET

AIR BLEED 1(2) OFF

Applicable to: ALL

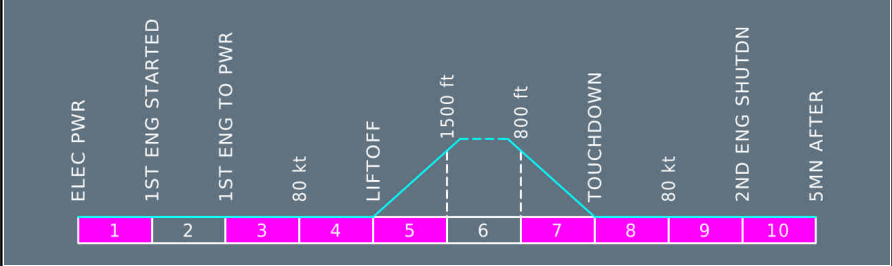
Ident.: PRO-ABN-AIR-AA-00017374.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the ENG 1(2) BLEED pb-sw is abnormally set to OFF.

Flight Phase Inhibition:



The diagram shows a flight profile over 10 time segments. The bleed system is inhibited (OFF) during segments 1 through 7. The inhibition ends at segment 8. The flight phases are: ELEC PWR (1), 1ST ENG STARTED (2), 1ST ENG TO PWR (3), 80 kt (4), LIFTOFF (5), 1500 ft (6), 800 ft (7), TOUCHDOWN (8), 80 kt (9), 2ND ENG SHUTDN (10), and 5MN AFTER (11).

Ident.: PRO-ABN-AIR-AA-00017555.0001001 / 21 MAR 16

Crew awareness.

PIA A318/A319/A320/A321 FLEET

PRO-ABN-AIR P 9/50

FCOM

← E to F

09 FEB 26

AIR COND CTL 1(2) - A(B) FAULT

Applicable to: MSN 02719-07792

Ident.: PRO-ABN-AIR-AC-00017315.0001001 / 21 MAR 16

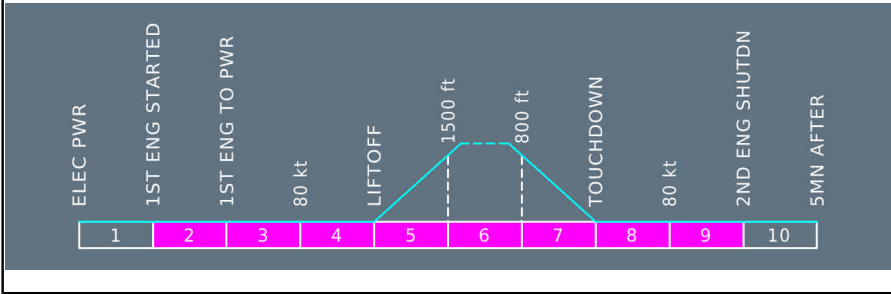
ANNUNCIATIONS

Triggering Conditions:

L2

 This alert triggers when the lane A(B) of ACSC 1(2) is failed.

Flight Phase Inhibition:



Ident.: PRO-ABN-AIR-AC-00018084.0001001 / 21 MAR 16

Crew awareness.

Ident.: PRO-ABN-AIR-AC-00010777.0001001 / 05 AUG 10

STATUS

INOP SYS

COND CTL 1(2)-A(B)

AIR ENG 1(2) BLEED ABNORM PR

Applicable to: ALL

Ident.: PRO-ABN-AIR-B-00017378.0001001 / 21 MAR 16

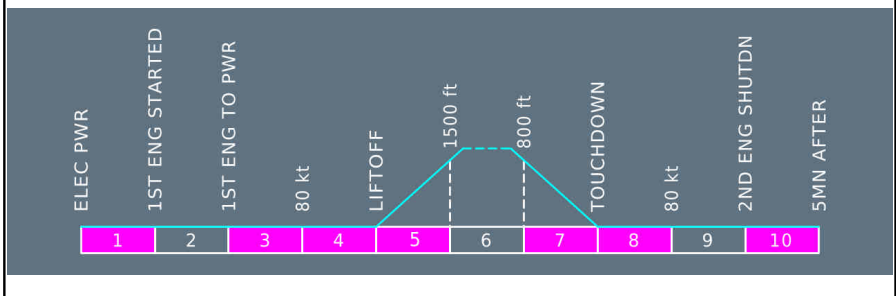
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the regulated pressure in the engine bleed duct is abnormal.

Flight Phase Inhibition:



Ident.: PRO-ABN-AIR-B-00017584.0009001 / 02 MAY 16

- If wing anti-ice is off, and both packs are on:

PACK FLOW..... LO

L2

The PACK FLOW selector must be set to LO, due to precooler performance.

L1

- If wing anti-ice is on, and both packs are on:

PACK (AFFECTED)..... OFF

L2

One pack must be closed when the flight crew uses wing anti-ice because of precooler performance.

L1

ENG BLEED (AFFECTED)..... OFF

X BLEED..... OPEN

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

AIR

AIR ENG 1(2) BLEED ABNORM PR (Cont'd)

Ident.: PRO-ABN-AIR-B-00011089.0001001 / 05 AUG 10

STATUS

INOP SYS

ONE PACK ONLY IF WAI ON

ENG 1(2) BLEED
PACK 1(2) (If closed)

AIR ENG 1(2) BLEED FAULT

Applicable to: ALL

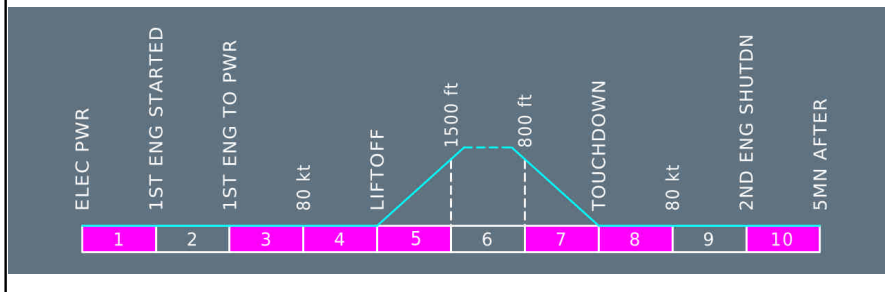
Ident.: PRO-ABN-AIR-C-00017369.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

- L2** This alert triggers when the engine 1(2) is running and:
- The engine bleed air pressure is above 57 PSI (+3/-0), or
 - The engine bleed air temperature is above:
 - 257 °C for more than 55 s
 - 270 °C for more than 15 s
 - 290 °C for more than 5 s.

Flight Phase Inhibition:



Continued on the following page

AIR ENG 1(2) BLEED FAULT (Cont'd)

Ident.: PRO-ABN-AIR-C-00017605.0013001 / 28 MAY 18

- ENG BLEED (AFFECTED)..... OFF

L2

When the ENG BLEED pb-sw is ON, the FAULT light remains on.
When the ENG BLEED pb-sw is OFF, the FAULT light goes off when the failure (overheat or overpressure) disappears.

L1

● If wing anti-ice is off and both packs are on:
PACK FLOW..... LO
The PACK FLOW selector must be set to LO, due to precooler performance.

● If wing anti-ice is on and both packs are on:
PACK (AFFECTED)..... OFF

L2

One pack must be closed when the flight crew uses wing anti-ice because of precooler performance.

L1

X BLEED..... OPEN
- Ident.: PRO-ABN-AIR-C-00011092.0001001 / 05 AUG 10
- | STATUS | |
|-------------------------|--|
| ONE PACK ONLY IF WAI ON | <div>INOP SYS

ENG 1(2) BLEED
PACK 1(2) (If closed)</div> |
- PIA A318/A319/A320/A321 FLEET
FCOM

← |

PRO-ABN-AIR P 13/50
09 FEB 26

AIR ENG 1(2) BLEED FAULT
 BLEED NOT CLOSED

Applicable to: ALL

Ident.: PRO-ABN-AIR-T-00018049.0002001 / 02 MAY 16

ANNUNCIATIONS

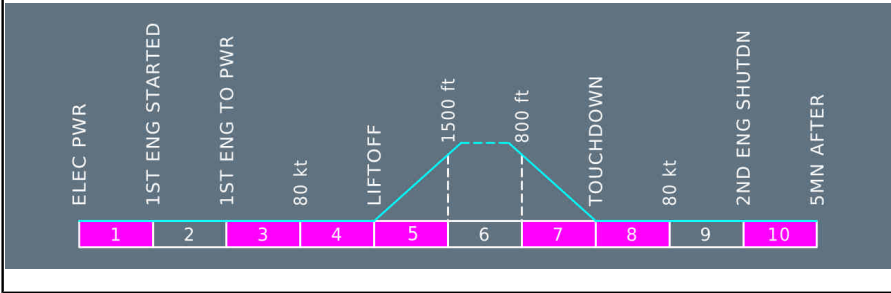
Triggering Conditions:

- L2

This alert triggers when the engine 1(2) is running, the engine 1(2) bleed valve fails to close, and:

 - The engine 1(2) bleed air pressure is above 57 PSI (+3/-0), or
 - The engine 1(2) bleed air temperature is above:
 - 257 °C for more than 55 s
 - 270 °C for more than 15 s
 - 290 °C for more than 5 s.

Flight Phase Inhibition:



Ident.: PRO-ABN-AIR-T-00017607.0002001 / 02 MAY 16

- ENG BLEED (AFFECTED)..... OFF
 PACK (AFFECTED)..... OFF
 X BLEED..... SHUT
 WING ANTI ICE..... OFF
 AVOID ICING CONDITIONS
- If engine 1 bleed is affected:

APU BLEED..... OFF

Continued on the following page

AIR ENG 1(2) BLEED FAULT (Cont'd)
BLEED NOT CLOSED

Ident.: PRO-ABN-AIR-T-00015887.0028001 / 05 MAY 22

STATUS

AVOID ICING CONDITIONS

ONE PACK ONLY IF WAI ON

INOP SYS

ENG 1(2) BLEED
PACK 1(2)
WING A. ICE
APU BLEED

AIR ENG 1+2 BLEED FAULT

Applicable to: ALL

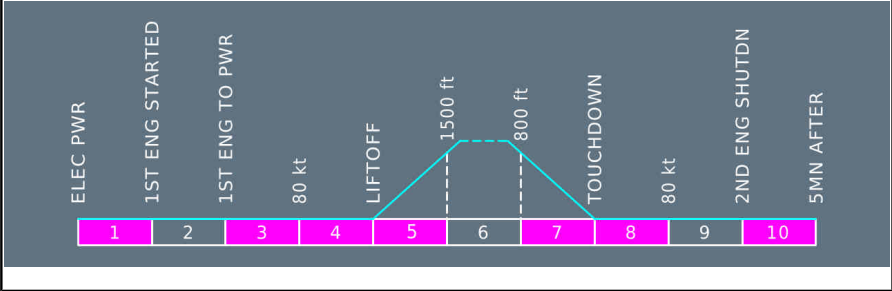
Ident.: PRO-ABN-AIR-R-00017092.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

This alert triggers when both engine bleed supply systems are lost without wing leak or pylon leak on any side.

Flight Phase Inhibition:



Continued on the following page

AIR ENG 1+2 BLEED FAULT (Cont'd)

Ident.: PRO-ABN-AIR-R-00017556.0001001 / 21 MAR 17

X BLEED.....AUTO
 WING ANTI ICE..... OFF
 AVOID ICING CONDITIONS
 ● If APU Bleed is ON and fails:
 APU BLEED..... OFF

L2 Recall in the case of failure of the APU Bleed.

L1 ENG 1 BLEED.....OFF THEN ON
 ENG 2 BLEED.....OFF THEN ON
 ● IF UNSUCCESSFUL:
 ENG 1 BLEED..... OFF
 ENG 2 BLEED..... OFF
 DES TO FL 100/MEA-MORA
 BLEED 1+2 PROC.....APPLY
 Refer to procedure.

Ident.: PRO-ABN-AIR-R-00015836.0001001 / 17 MAR 17

STATUS

AVOID ICING CONDITIONS

INOP SYS

● IF SEVERE ICE ACCRETION:
 MIN SPD.....VLS +10 / G DOT
 MANEUVER WITH CARE
 LDG DIST PROC.....APPLY

WING A. ICE
 ENG 1 BLEED
 ENG 2 BLEED
 APU BLEED
 PACK 1+2

AIR ENG 1+2 BLEED FAULT LEFT LEAK

Applicable to: ALL

Ident.: PRO-ABN-AIR-Y-00017094.0001001 / 21 MAR 16

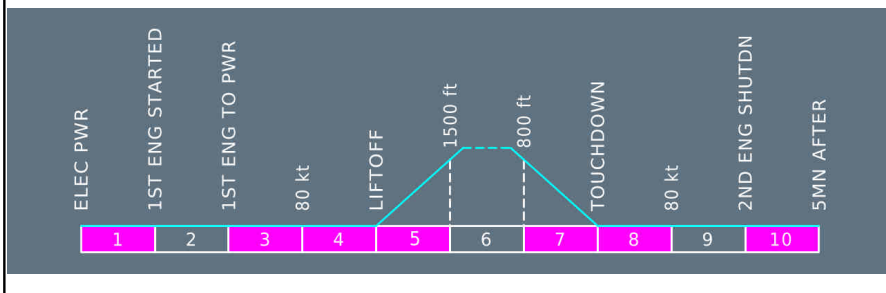
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when both engine bleed supply systems are lost with a left wing leak or a pylon leak on side 1.

Flight Phase Inhibition:



Ident.: PRO-ABN-AIR-Y-00017557.0001001 / 21 MAR 17

X BLEED.....SHUT
 WING ANTI ICE.....OFF
 AVOID ICING CONDITIONS

● If APU bleed is ON:

APU BLEED.....OFF

ENG 2 BLEED.....OFF THEN ON

● IF UNSUCCESSFUL:

ENG 1 BLEED.....OFF

ENG 2 BLEED.....OFF

DES TO FL 100/MEA-MORA

BLEED 1+2 PROC.....APPLY

Refer to procedure.

Continued on the following page

PROCEDURES
ABNORMAL AND EMERGENCY PROCEDURES

AIR

AIR ENG 1+2 BLEED FAULT (Cont'd)
LEFT LEAK

Ident.: PRO-ABN-AIR-Y-00015880.0001001 / 17 MAR 17

STATUS

AVOID ICING CONDITIONS

INOP SYS

- **IF SEVERE ICE ACCRETION:**
MIN SPD.....VLS +10 / G DOT
MANEUVER WITH CARE
LDG DIST PROC.....APPLY

- WING A. ICE
- ENG 1 BLEED
- ENG 2 BLEED
- APU BLEED
- PACK 1+2

AIR ENG 1+2 BLEED FAULT
RIGHT LEAK

Applicable to: ALL

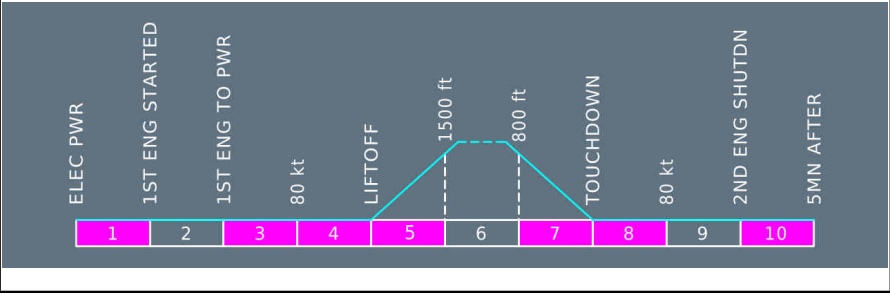
Ident.: PRO-ABN-AIR-X-00017093.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

This alert triggers when both engine bleed supply systems are lost with a right wing leak or a pylon leak on side 2.

Flight Phase Inhibition:



Continued on the following page

AIR ENG 1+2 BLEED FAULT (Cont'd)
RIGHT LEAK

Ident.: PRO-ABN-AIR-X-00017558.0001001 / 21 MAR 17

X BLEED.....SHUT
WING ANTI ICE..... OFF
AVOID ICING CONDITIONS

● If APU bleed is ON and fails:
APU BLEED.....OFF

L2

Recall in the case of failure of the APU Bleed.

L1

ENG 1 BLEED.....OFF THEN ON

● IF UNSUCCESSFUL:
ENG 1 BLEED..... OFF
ENG 2 BLEED..... OFF
DES TO FL 100/MEA-MORA
BLEED 1+2 PROC.....APPLY
Refer to procedure.

Ident.: PRO-ABN-AIR-X-00015882.0001001 / 17 MAR 17

STATUS	
AVOID ICING CONDITIONS	<u>INOP SYS</u>
● IF SEVERE ICE ACCRETION: MIN SPD.....VLS +10 / G DOT MANEUVER WITH CARE LDG DIST PROC.....APPLY	WING A. ICE ENG 1 BLEED ENG 2 BLEED APU BLEED PACK 1+2

AIR ENG 1+2 BLEED FAULT
LEFT LEAK AND RIGHT LEAK

Applicable to: ALL

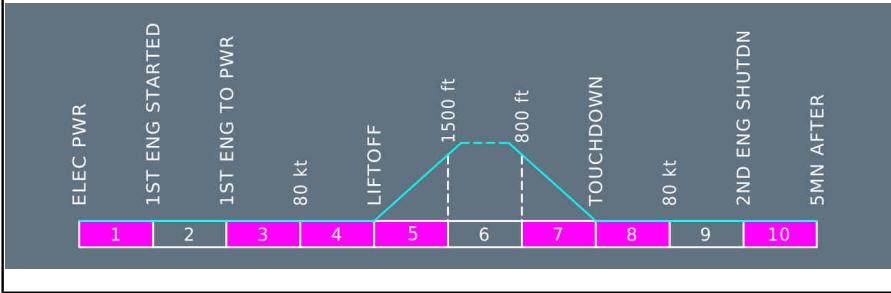
Ident.: PRO-ABN-AIR-W-00017095.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

This alert triggers when both engine bleed supply systems are lost with a wing leak or a pylon leak on both sides.

Flight Phase Inhibition:



Ident.: PRO-ABN-AIR-W-00017559.0001001 / 21 MAR 17

- X BLEED.....SHUT
 WING ANTI ICE..... OFF
 AVOID ICING CONDITIONS
 ● If APU bleed is ON:
 APU BLEED..... OFF
 ENG 1 BLEED.....OFF
 ENG 2 BLEED.....OFF
 DES TO FL 100/MEA-MORA
 BLEED 1+2 PROC.....APPLY

Refer to procedure.

Continued on the following page

AIR ENG 1+2 BLEED FAULT (Cont'd)
LEFT LEAK AND RIGHT LEAK

Ident.: PRO-ABN-AIR-W-00015884.0001001 / 17 MAR 17

STATUS

AVOID ICING CONDITIONS

● **IF SEVERE ICE ACCRETION:**
MIN SPD.....VLS +10 / G DOT
MANEUVER WITH CARE
LDG DIST PROC.....APPLY

INOP SYS

WING A. ICE
ENG 1 BLEED
ENG 2 BLEED
APU BLEED
PACK 1+2

AIR ENG 1(2) BLEED LO TEMP
(OPPOSITE BLEED AVAILABLE)

Applicable to: ALL

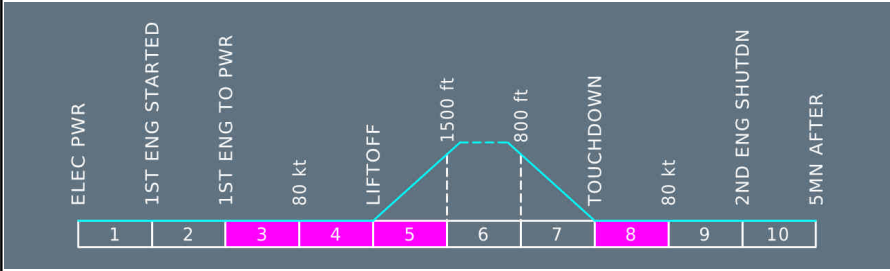
Ident.: PRO-ABN-AIR-M-00017379.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the associated engine bleed supplies bleed air at a temperature below 150 °C in flight and the WING A-ICE pb-sw is set to ON.

Flight Phase Inhibition:



The diagram shows a flight profile across 10 phases. The alert is inhibited (indicated by a red line) from Phase 1 to Phase 7. It becomes active (indicated by a green line) at Phase 8 and remains active through Phase 10. Key flight events are marked: ELEC PWR (Phase 1), 1ST ENG STARTED (Phase 2), 1ST ENG TO PWR (Phase 3), 80 kt (Phase 4), LIFTOFF (Phase 5), 1500 ft (Phase 6), 800 ft (Phase 7), TOUCHDOWN (Phase 8), 80 kt (Phase 9), 2ND ENG SHUTDN (Phase 10), and 5MN AFTER (Phase 10).

Continued on the following page

AIR ENG 1(2) BLEED LO TEMP (Cont'd)

Ident.: PRO-ABN-AIR-M-00017560.0001001 / 21 MAR 16

A/THR..... OFF
THR LEVER (AFFECTED ENGINE)..... ADVANCE

- L2** The thrust lever of the affected engine must be advanced, with the autothrust OFF.
Low bleed temperature may be due to low outside air temperature. Therefore, increasing engine thrust may increase bleed temperature and clear the ECAM caution.

- IF UNSUCCESSFUL:**
 X BLEED..... OPEN
 ENG BLEED (AFFECTED)..... OFF
 ASSOCIATED PACK (IF OPPOSITE PACK ON)..... OFF

- 12** *One pack must be closed, when the flight crew uses wing anti-ice, due to precooler performance.*

Ident.: PRO-ABN-AIR-M-00011115.0001001 / 21 AUG 15

STATUS

INOP SYS

ENG 1(2) BLEED
PACK 1(2) (If selected OFF)

AIR ENG 1(2) BLEED LO TEMP (OPPOSITE BLEED NOT AVAILABLE)

Applicable to: ALL

Ident.: PRO-ABN-AIR-N-00018208.0001001 / 21 MAR 16

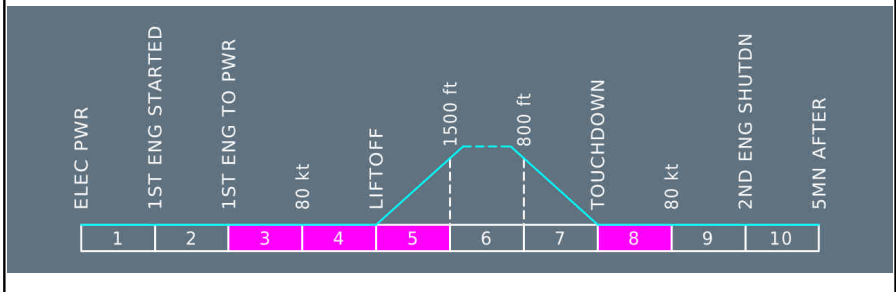
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the associated engine bleed supplies bleed air at a temperature below 150 °C in flight and the WING A-ICE pb-sw is set to ON.

Flight Phase Inhibition:



Ident.: PRO-ABN-AIR-N-00017561.0002001 / 21 MAR 16

A/THR.....OFF
 THR LEVER (AFFECTED ENGINE).....ADVANCE

L2

The thrust lever of the affected engine must be advanced, with the autothrust OFF.

Low bleed temperature may be due to low outside air temperature. Therefore, increasing engine thrust may increase bleed temperature and clear the ECAM caution.

L1

● IF UNSUCCESSFUL:

WING ANTI ICE.....OFF
 AVOID ICING CONDITIONS

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

AIR

AIR ENG 1(2) BLEED LO TEMP (Cont'd)

(OPPOSITE BLEED NOT AVAILABLE)

Ident.: PRO-ABN-AIR-N-00011117.0003001 / 17 MAR 17

STATUS

AVOID ICING CONDITIONS

● **IF SEVERE ICE ACCRETION:**

MIN SPD.....VLS +10 / G DOT
 MANEUVER WITH CARE
 LDG DIST PROC.....APPLY

INOP SYS

WING A. ICE

AIR ENG 1+2 BLEED LO TEMP

Applicable to: ALL

Ident.: PRO-ABN-AIR-O-00017381.0001001 / 21 MAR 16

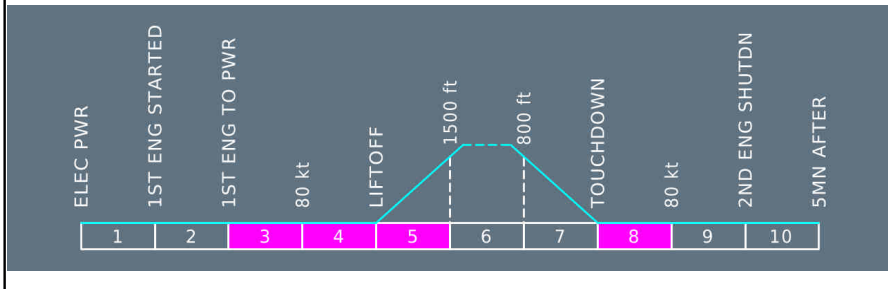
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when both engine bleeds supply bleed air at a temperature below 150 °C in flight and the WING A-ICE pb-sw is set to ON.

Flight Phase Inhibition:



Continued on the following page

AIR ENG 1+2 BLEED LO TEMP (Cont'd)

Ident.: PRO-ABN-AIR-O-00011118.0002001 / 21 AUG 15

A/THR
OFF

THR LEVERS.....
ADVANCE

L2

The thrust lever of the affected engine must be advanced, with the autothrust OFF.

Low bleed temperature may be due to low outside air temperature. Therefore, increasing engine thrust may increase bleed temperature and clear the ECAM caution.

L1

● **IF UNSUCCESSFUL:**

WING ANTI ICE.....OFF

AVOID ICING CONDITIONS

Ident.: PRO-ABN-AIR-O-00011119.0003001 / 17 MAR 17

STATUS	
AVOID ICING CONDITIONS ● IF SEVERE ICE ACCRETION: MIN SPD.....VLS +10 / G DOT MANEUVER WITH CARE LDG DIST PROC.....APPLY	INOP SYS WING A. ICE

AIR ENG 1(2) BLEED HI TEMP

Applicable to: ALL

Ident.: PRO-ABN-AIR-P-00017391.0002001 / 21 MAR 16

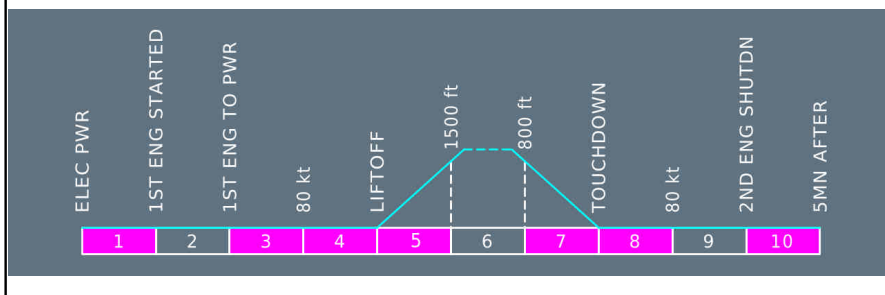
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the precooler outlet temperature is above 240 °C.

Flight Phase Inhibition:



Ident.: PRO-ABN-AIR-P-00014306.0001001 / 21 AUG 15

■ If wing anti-ice off:

PACK 2 (1)..... OFF

■ If wing anti-ice on and opposite pack off:

Note: If Wing Anti-Ice is required (icing conditions) while operating with one PACK, consider switching OFF the remaining pack, if aircraft's altitude permits.

PACK 1 (2) OR WAI..... OFF

■ If wing anti-ice on and affected pack off:

PACK 2 (1) OR WAI..... OFF

Continued on the following page

AIR ENG 1(2) BLEED HI TEMP (Cont'd)

Ident.: PRO-ABN-AIR-P-00014307.0005001 / 17 MAR 17

L12

AVOID ICING CONDITIONS

● IF SEVERE ICE ACCRETION:
MIN SPD..... VLS+10/G DOT

Note: In the case of severe ice accretion, with wing anti-ice failed, the Angle-of-Attack (AOA) protections remain efficient.

MANEUVER WITH CARE
LDG DIST PROC.....APPLY

STATUS

INOP SYS

WING A. ICE

AIR ENG 1(2) BLEED LEAK

Applicable to: ALL

Ident.: PRO-ABN-AIR-K-00022402.0001001 / 04 JUN 19

ANNUNCIATIONS

Triggering Conditions:

L2
 The **AIR ENG 1(2) BLEED LEAK** alert triggers when the pylon bleed leak detection loop detects a temperature above 204 °C and engine 1(2) is running.

Flight Phase Inhibition:

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

AIR

AIR ENG 1(2) BLEED LEAK (Cont'd)

Ident.: PRO-ABN-AIR-K-00022403.0003001 / 18 NOV 21

ENG BLEED (AFFECTED)..... OFF

- [2] When the ENG BLEED pb-sw is ON, the FAULT light remains on.
 When the ENG BLEED pb-sw is OFF, the FAULT light goes off when the overheat disappears.

- [1] ● If **AIR ENG 1 BLEED LEAK**:
 APU BLEED (IF NOT CLOSED)..... OFF
 X BLEED..... SHUT
 WING ANTI-ICE..... OFF
 AVOID ICING CONDITIONS

Ident.: PRO-ABN-AIR-K-00022404.0002001 / 04 JUN 19

STATUS

AVOID ICING CONDITIONS

INOP SYS

- IF SEVERE ICE ACCRETION:
 MIN SPD.....VLS +10 / G DOT
 MANEUVER WITH CARE
 LDG DIST PROC.....APPLY

 WING A.ICE
 ENG 1(2) BLEED
 PACK 1(2)

AIR ENG 1(2) BLEED NOT CLSD

Applicable to: ALL

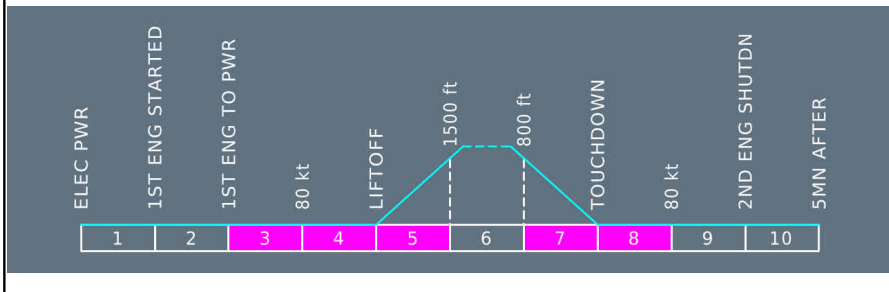
Ident.: PRO-ABN-AIR-A-00017372.0001001 / 21 MAR 16

ANNUNCIATIONS
Triggering Conditions:

L2

This alert triggers when the engine bleed valve fails to close:

- During engine start or when APU BLEED pb-sw is set to ON
- At engine shutdown or when APU BLEED pb-sw is set to OFF with engine not running.

Flight Phase Inhibition:


Ident.: PRO-ABN-AIR-A-00017562.0001001 / 21 MAR 16

ENG BLEED (AFFECTED)..... OFF

L2

Note: The warning may be triggered due to residual pressure between the HP or IP valves and the engine bleed valve after:

- Engine shutdown, or
- APU BLEED pb-sw is selected OFF with engine not running.

Ident.: PRO-ABN-AIR-A-00011087.0001001 / 05 AUG 10

STATUS

ONE PACK ONLY IF WAI ON

INOP SYS

ENG 1(2) BLEED

AIR ENG 1(2) HP VALVE FAULT

Applicable to: ALL

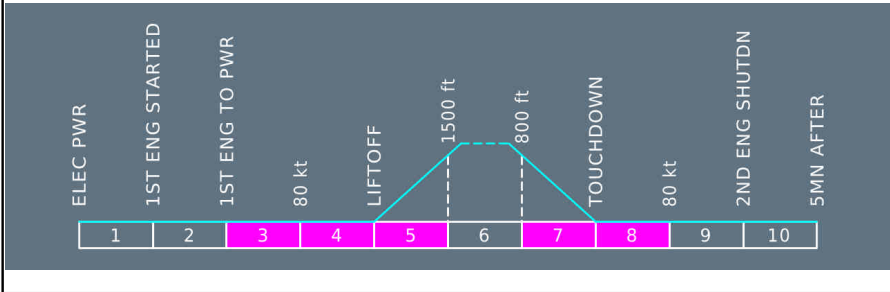
Ident.: PRO-ABN-AIR-H-00017384.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the HP valve is abnormally closed.

Flight Phase Inhibition:



Ident.: PRO-ABN-AIR-H-00011103.0001001 / 25 FEB 14

Crew awareness.

Ident.: PRO-ABN-AIR-H-00011104.0001001 / 05 AUG 10

STATUS

AIR PRESS LOW AT IDLE

AIR ENG 1(2) LEAK DET FAULT

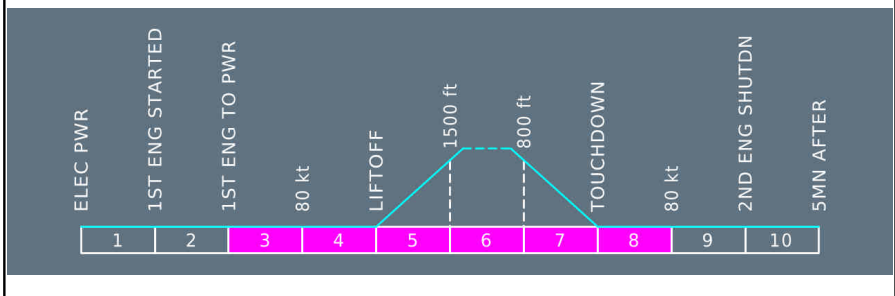
Applicable to: MSN 04392-07792

Ident.: PRO-ABN-AIR-I-00017389.0002001 / 21 MAR 16

ANNUNCIATIONS
Triggering Conditions:

L2

This alert triggers when the pylon bleed leak detection loop is inoperative.

Flight Phase Inhibition:


Ident.: PRO-ABN-AIR-I-00011105.0004001 / 25 FEB 14

Crew awareness.

Ident.: PRO-ABN-AIR-I-00011106.0004001 / 17 MAR 11

STATUS
INOP SYS

ENG 1(2) LK DET

AIR AFT CRG VENT FAULT

Applicable to: MSN 02155-02789, 03031-04392, 07784-07792

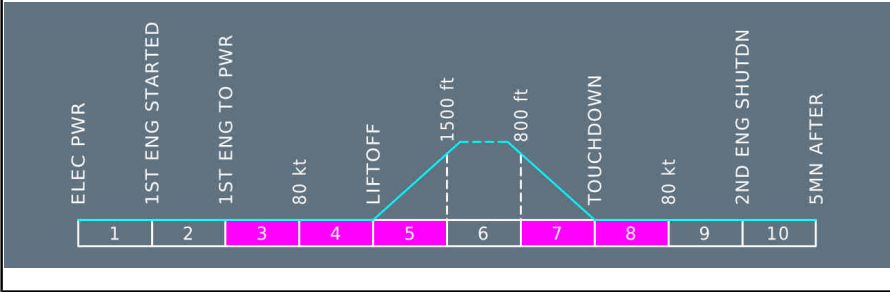
Ident.: PRO-ABN-AIR-AE-00017337.0003001 / 06 NOV 25

ANNUNCIATIONS

Triggering Conditions:

This alert triggers when the aft cargo ventilation fan is failed.

Flight Phase Inhibition:



Ident.: PRO-ABN-AIR-AE-00017933.0002001 / 06 NOV 25

Crew awareness.

Ident.: PRO-ABN-AIR-AE-00017934.0003001 / 06 NOV 25

STATUS

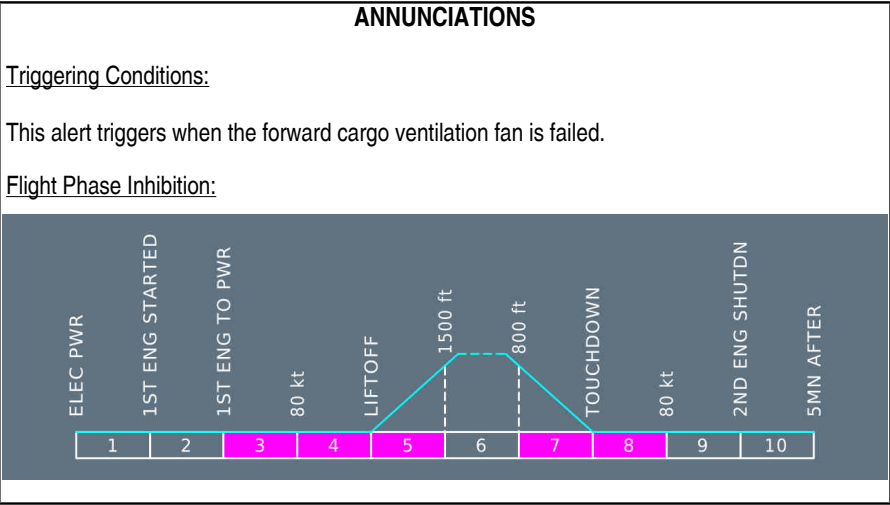
INOP SYS

- AFT CRG HEAT 
 FWD CRG HEAT 
 AFT CRG VENT 

AIR FWD CRG VENT FAULT

Applicable to: MSN 05152-05746

Ident.: PRO-ABN-AIR-AE-00017337.0002001 / 06 NOV 25



Ident.: PRO-ABN-AIR-AE-00017933.0002001 / 06 NOV 25

Crew awareness.

Ident.: PRO-ABN-AIR-AE-00017934.0002001 / 06 NOV 25

STATUS

INOP SYS

AFT CRG HEAT 

FWD CRG HEAT 

FWD CRG VENT

AIR L(R) WING LEAK

Applicable to: ALL

Ident.: PRO-ABN-AIR-D-00017370.0001001 / 09 MAY 23

ANNUNCIATIONS

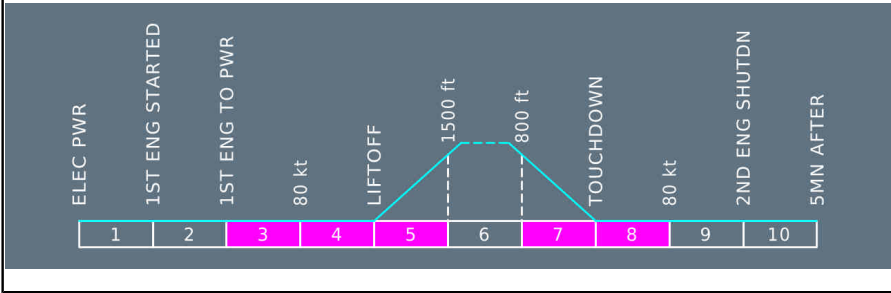
Triggering Conditions:

- L2

The **AIR L(R) WING LEAK** alert triggers when:

 - Both BMCs are operative and detect a temperature above 124 °C for L(R) wing or,
 - One BMC is failed and the other BMC detects a temperature above 124 °C for L(R) wing.

Flight Phase Inhibition:



Ident.: PRO-ABN-AIR-D-00017563.0003001 / 18 NOV 21

ENG BLEED (AFFECTED)..... OFF

- L2

When the ENG BLEED pb-sw is ON, the FAULT light remains on.

When the ENG BLEED pb-sw is OFF, the FAULT light goes off when the overheat disappears.

- L1

● If **AIR L WING LEAK**:

APU BLEED (IF NOT CLOSED)..... OFF

X BLEED.....SHUT

WING ANTI-ICE..... OFF

AVOID ICING CONDITIONS

Continued on the following page

AIR L(R) WING LEAK (Cont'd)

Ident.: PRO-ABN-AIR-D-00011096.0003001 / 04 JUN 19

STATUS	
AVOID ICING CONDITIONS ● IF SEVERE ICE ACCRETION: - MIN SPD.....VLS +10 / G DOT - MANEUVER WITH CARE - LDG DIST PROC.....APPLY	<u>INOP SYS</u> WING A.ICE ENG 1(2) BLEED PACK 1(2)

AIR L(R) WNG LEAK DET FAULT

Applicable to: ALL

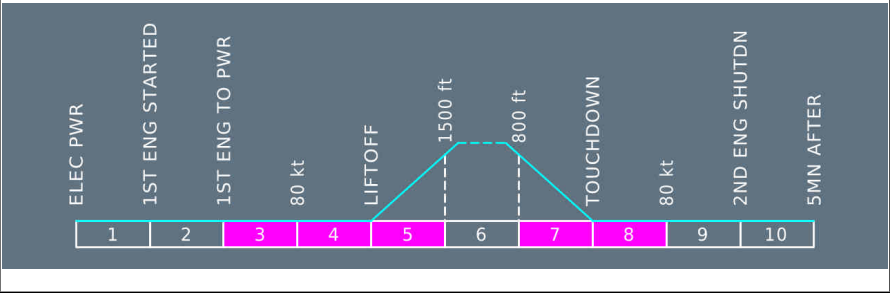
Ident.: PRO-ABN-AIR-J-00017387.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

This alert triggers when both wing bleed leak detection loops are inoperative in one wing.

Flight Phase Inhibition:



Ident.: PRO-ABN-AIR-J-00011107.0001001 / 25 FEB 14

Crew awareness.

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

AIR

AIR L(R) WNG LEAK DET FAULT (Cont'd)

Ident.: PRO-ABN-AIR-J-00011108.0005001 / 17 MAR 11

STATUS

INOP SYS

L(R) WNG LK DET

AIR PACK 1(2) FAULT

Applicable to: MSN 02155-02212

Ident.: PRO-ABN-AIR-AF-00017290.0001001 / 21 MAR 16

ANNUNCIATIONS

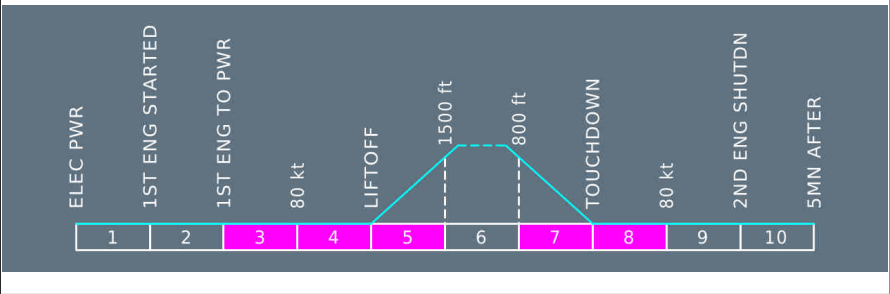
Triggering Conditions:

[L2]

This alert triggers when:

- The position of the pack flow control valve disagrees with the commanded position, or
- The pack compressor outlet temperature rises above 230 °C four times during the same flight.

Flight Phase Inhibition:



Ident.: PRO-ABN-AIR-AF-00010712.0001001 / 05 AUG 10

PACK (AFFECTED)..... **OFF**

Continued on the following page

AIR PACK 1(2) FAULT (Cont'd)

Ident.: PRO-ABN-AIR-AF-00010713.0001001 / 05 AUG 10

STATUS

INOP SYS

PACK 1(2)

AIR PACK 1(2) FAULT

Applicable to: MSN 02719-07792

Ident.: PRO-ABN-AIR-AF-00017290.0002001 / 21 MAR 16

ANNUNCIATIONS

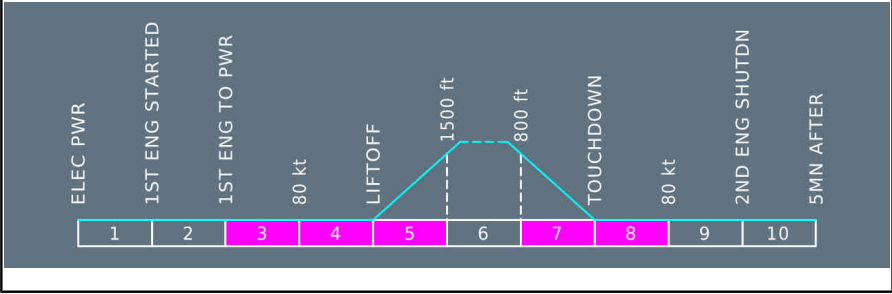
Triggering Conditions:

L2

This alert triggers when:

- The position of the pack flow control valve disagrees with the commanded position, or
- The pack valve is closed.

Flight Phase Inhibition:



The diagram shows a flight profile across 10 phases. The y-axis represents altitude/pressure. Key points are: 1500 ft at phase 5, 800 ft at phase 6, and TOUCHDOWN at phase 7. Vertical labels indicate: ELEC PWR (phase 1), 1ST ENG STARTED (phase 2), 1ST ENG TO PWR (phase 3), 80 kt (phase 4), LIFTOFF (phase 5), 1500 ft (phase 5), 800 ft (phase 6), TOUCHDOWN (phase 7), 80 kt (phase 8), 2ND ENG SHUTDN (phase 9), and 5MN AFTER (phase 10). The x-axis is a timeline of 10 phases, with phases 1-4 in green, 5-8 in red, and 9-10 in green.

Ident.: PRO-ABN-AIR-AF-00010712.0001001 / 05 AUG 10

PACK (AFFECTED)..... OFF

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

AIR

AIR PACK 1(2) FAULT (Cont'd)

Ident.: PRO-ABN-AIR-AF-00010713.0002001 / 16 NOV 11

STATUS

INOP SYS

- If ACSC 1 failed:
CKPT AT FIXED TEMP
- If ACSC 2 failed:
CAB AT FIXED TEMP

PACK 1(2)
COND CTL 1(2)
FWD CRG HEAT  (If ACSC
1 failed)

AIR PACK 1+2 FAULT

Applicable to: MSN 02155-02212

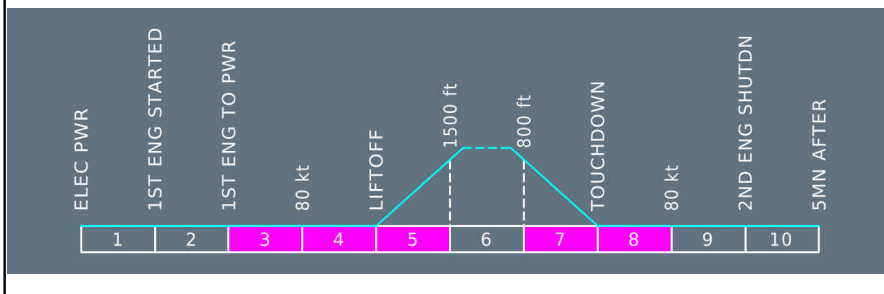
Ident.: PRO-ABN-AIR-AG-00017292.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

- L2 This alert triggers when one pack is off, and the other is failed.

Flight Phase Inhibition:



Continued on the following page

AIR PACK 1+2 FAULT (Cont'd)

Ident.: PRO-ABN-AIR-AG-00017935.0002001 / 21 MAR 16

PACK 1.....
OFF

PACK 2.....
OFF

L2 *The fault light goes off, when the failure disappears.*

Note: *The rate at which the cabin altitude increases may be minimized by closing the FWD CARGO ISOL VALVE , if the cargo freight permits.*

L1 DESCENT TO FL 100/MEA-MORA.

L2 *Descend to FL 100, or MEA-MORA, whichever is higher.*

L1

- **WHEN DIFF PR < 1 PSI AND FL BELOW 100:**

RAM AIR.....
ON

MAX FL.....
100/MEA-MORA
- **If FAULT was due to an overheat:**

ASSOCIATED PROCEDURES

AIR PACK 1 (2) OVHT

- **WHEN PACK OVHT OUT:**

PACK (AFFECTED).....
ON

Ident.: PRO-ABN-AIR-AG-00017936.0006001 / 17 MAR 17

STATUS	
● If packs not recovered: MAX FL..... 100/MEA-MORA ● If FAULT was due to an overheat: ● WHEN PACK OVHT OUT: PACK (AFFECTED)..... ON	<b style="color: #000080;">INOP SYS PACK 1+2 FWD CRG HEAT

AIR PACK 1+2 FAULT

Applicable to: MSN 02719-07792

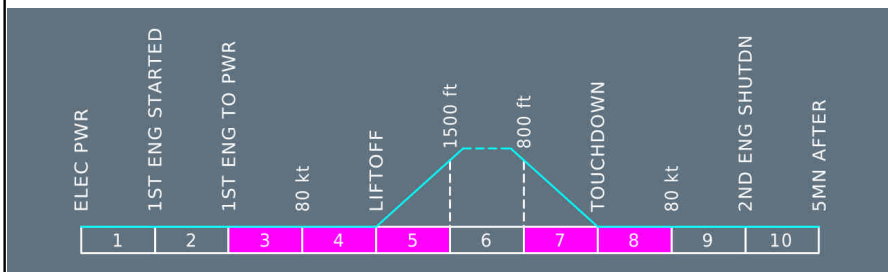
Ident.: PRO-ABN-AIR-AG-00017292.0002001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when both ACSCs are failed.

Flight Phase Inhibition:



Continued on the following page

AIR PACK 1+2 FAULT (Cont'd)

Ident.: PRO-ABN-AIR-AG-00017935.0002001 / 21 MAR 16

PACK 1.....OFF
 PACK 2.....OFF

L2 The fault light goes off, when the failure disappears.

Note: The rate at which the cabin altitude increases may be minimized by closing the FWD CARGO ISOL VALVE , if the cargo freight permits.

L1 DESCENT TO FL 100/MEA-MORA.

L2 Descend to FL 100, or MEA-MORA, whichever is higher.

L1 ● WHEN DIFF PR < 1 PSI AND FL BELOW 100:

RAM AIR.....ON
 MAX FL.....100/MEA-MORA

● If FAULT was due to an overheat:

ASSOCIATED PROCEDURES

AIR PACK 1 (2) OVHT

● WHEN PACK OVHT OUT:

PACK (AFFECTED).....ON

Ident.: PRO-ABN-AIR-AG-00017936.0005001 / 17 MAR 17

STATUS

● If packs not recovered:

MAX FL.....100/MEA-MORA
 CKPT AT FIXED TEMP
 CAB AT FIXED TEMP

● If FAULT was due to an overheat:

● WHEN PACK OVHT OUT:

PACK (AFFECTED).....ON

INOP SYS

PACK 1 + 2
 COND CTL 1
 COND CTL 2
 FWD CRG HEAT 

PROCEDURES
ABNORMAL AND EMERGENCY PROCEDURES

AIR

AIR PACK 1(2) OFF

Applicable to: ALL

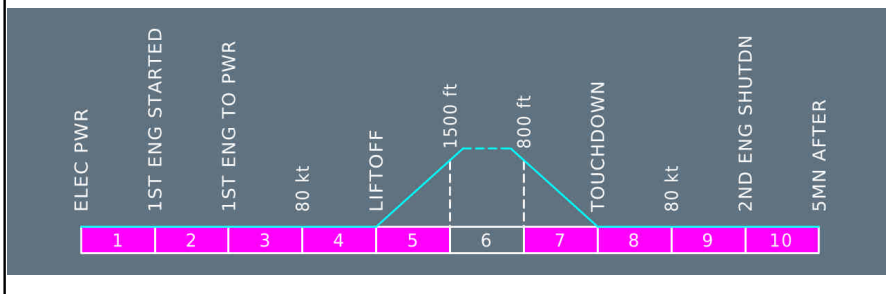
Ident.: PRO-ABN-AIR-AJ-00017294.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the PACK 1(2) pb-sw is set to OFF and no failure is detected.

Flight Phase Inhibition:



Ident.: PRO-ABN-AIR-AJ-00017941.0001001 / 21 MAR 16

Crew awareness.

Ident.: PRO-ABN-AIR-AJ-00010715.0001001 / 05 AUG 10

STATUS

INOP SYS

PACK 1(2)

AIR PACK 1(2) OVHT (Cont'd)

Ident.: PRO-ABN-AIR-AK-00010711.0001001 / 10 JAN 11

STATUS

● **WHEN PACK OVHT OUT:**

PACK (AFFECTED)..... ON

INOP SYS

PACK 1(2) ⁽¹⁾

⁽¹⁾ (If pack not recovered)

AIR PACK 1(2) OVHT

Applicable to: MSN 02719-07792

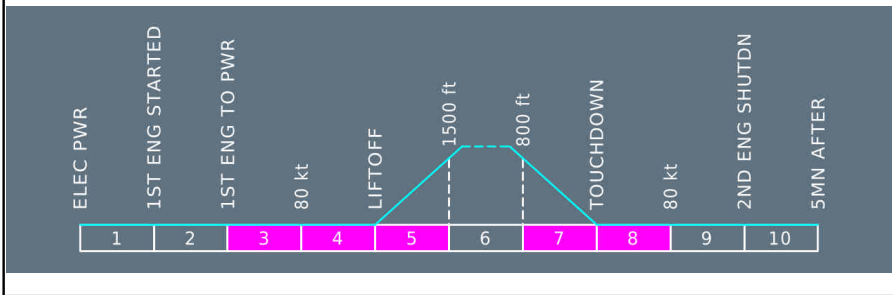
Ident.: PRO-ABN-AIR-AK-00017284.0002001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the pack compressor outlet temperature rises above 260 °C.

Flight Phase Inhibition:



Continued on the following page

AIR PACK 1(2) OVHT (Cont'd)

Ident.: PRO-ABN-AIR-AK-00017942.0001001 / 21 MAR 16

PACK (AFFECTED)..... OFF

- L2

High flow is automatically selected on the remaining pack.
 Fault light goes off, when the overheat disappears.

- L1

● **WHEN PACK OVHT OUT:**
 PACK (AFFECTED)..... ON

Ident.: PRO-ABN-AIR-AK-00010711.0001001 / 10 JAN 11

STATUS	
● WHEN PACK OVHT OUT: PACK (AFFECTED)..... ON	<u>INOP SYS</u> PACK 1(2) ⁽¹⁾

⁽¹⁾ (If pack not recovered)

AIR PACK 1(2) REGUL FAULT

Applicable to: MSN 02155-02212

Ident.: PRO-ABN-AIR-AL-00017298.0001001 / 21 MAR 16

ANNUNCIATIONS

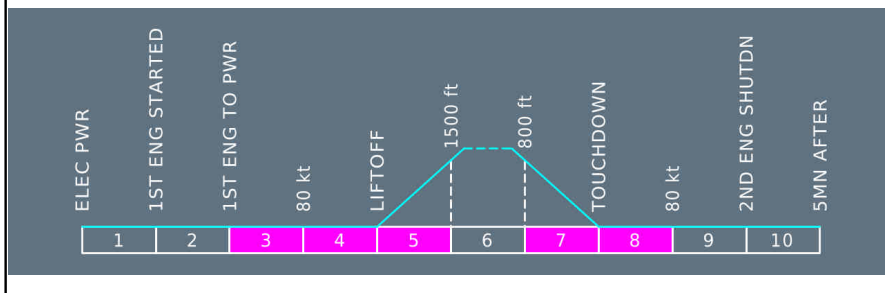
Triggering Conditions:

L2

This alert triggers when:

- The pack main channel is failed, or
- The pack main and secondary channels are failed.

Flight Phase Inhibition:



Ident.: PRO-ABN-AIR-AL-00018089.0001001 / 21 MAR 16

Crew awareness.

Continued on the following page

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES ABNORMAL AND EMERGENCY PROCEDURES AIR
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AIR PACK 1(2) REGUL FAULT (Cont'd)

Ident.: PRO-ABN-AIR-AL-00010719.0002001 / 10 JAN 11

L12

STATUS

■ **If the primary channel fails:**

The pack air inlet flap fully opens; pack flow is fixed at the previous setting.

■ **If the primary and secondary channels fail:**

PACK 1(2) AT FIXED TEMP

The pack outlet temperature is controlled by the pack anti-ice valve and is stabilized to a temperature between 5 °C (41 °F) and 30 °C (86 °F) within a maximum of 6 min.

INOP SYS

PACK 1(2) REGUL

AIR PACK 1(2) REGUL FAULT

Applicable to: MSN 02719-07792

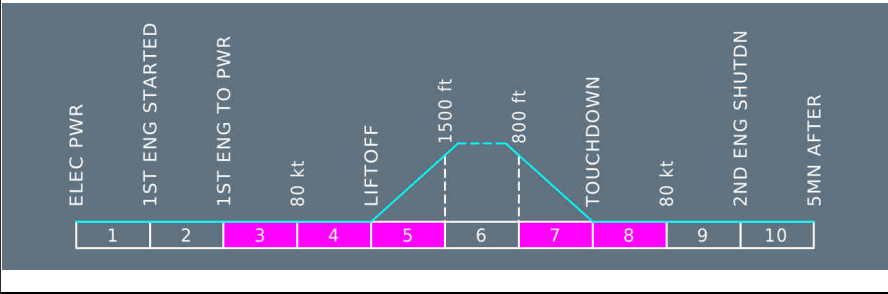
Ident.: PRO-ABN-AIR-AL-00017298.0002001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the temperature regulation performance is degraded.

Flight Phase Inhibition:



Ident.: PRO-ABN-AIR-AL-00018089.0001001 / 21 MAR 16

Crew awareness.

Ident.: PRO-ABN-AIR-AL-00010719.0003001 / 10 JAN 11

STATUS

INOP SYS

PACK 1(2) REGUL ⁽¹⁾
 HOT AIR ⁽²⁾

⁽¹⁾ (In case of By Pass Valve or RAM Air Inlet failure)
⁽²⁾ (In case of Flow Control Valve in backup mode)

AIR X BLEED FAULT

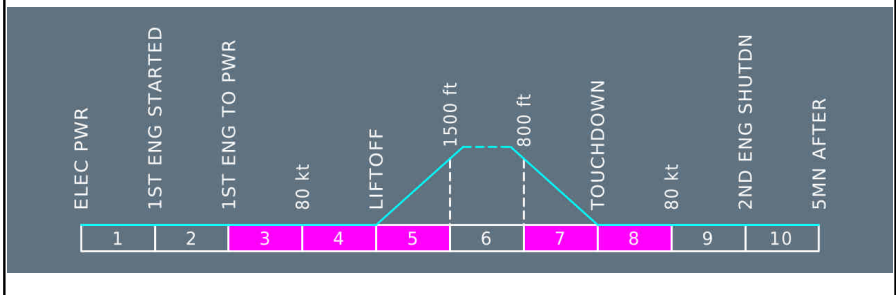
Applicable to: ALL

Ident.: PRO-ABN-AIR-E-00017383.0001001 / 21 MAR 16

ANNUNCIATIONS
Triggering Conditions:

L2

This alert triggers when the crossbleed valve position disagrees with the X-BLEED selector position.

Flight Phase Inhibition:


Ident.: PRO-ABN-AIR-E-00011097.0001001 / 05 AUG 10

X BLEED..... MAN CTL

L2

 Select OPEN, when the APU BLEED pb-sw is ON, or for engine start, or when WING ANTI-ICE pb-sw is ON and one bleed is inoperative.
 Select SHUT in other cases.

L1

- If manual opening inoperative, and only one bleed available:

WING ANTI ICE.....OFF

AVOID ICING CONDITIONS

Continued on the following page

PROCEDURES
ABNORMAL AND EMERGENCY PROCEDURES

AIR

AIR X BLEED FAULT (Cont'd)

Ident.: PRO-ABN-AIR-E-00017612.0002001 / 06 NOV 23

STATUS

INOP SYS

- If manual opening inoperative, and only one bleed available:

AVOID ICING CONDITIONS

- IF SEVERE ICE ACCRETION:

MIN SPD..... VLS +10 / G DOT

MANEUVER WITH CARE

LDG DIST PROC..... APPLY

WING A.ICE

X BLEED

X BLEED MAN CTL

APU AUTO (EMER) SHUT DOWN

Applicable to: ALL

Ident.: PRO-ABN-APU-A-00016876.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

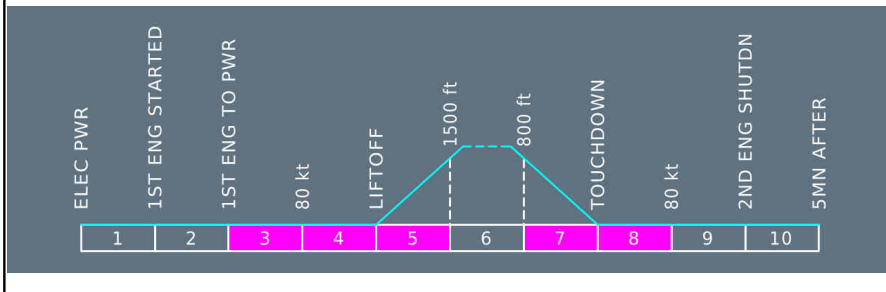
L2

The APU AUTO SHUT DOWN alert triggers when an automatic shutdown of the APU occurs for a reason other than a fire.

The APU EMER SHUT DOWN triggers when:

- The APU SHUT OFF sw on the External Power Panel is pushed or,
- The APU FIRE pb is pushed or,
- An APU fire on ground is detected.

Flight Phase Inhibition:



Ident.: PRO-ABN-APU-A-00018193.0001001 / 05 MAY 22

MASTER SW.....OFF

L2

In the case of APU auto shut down, APU restart can be considered. After three consecutive APU start attempts, the flight crew must wait 60 min before a new start attempt.

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

APU

APU AUTO (EMER) SHUT DOWN (Cont'd)

Ident.: PRO-ABN-APU-A-00010106.0001001 / 05 AUG 10

STATUS

INOP SYS

APU

APU FIRE DET FAULT

Applicable to: ALL

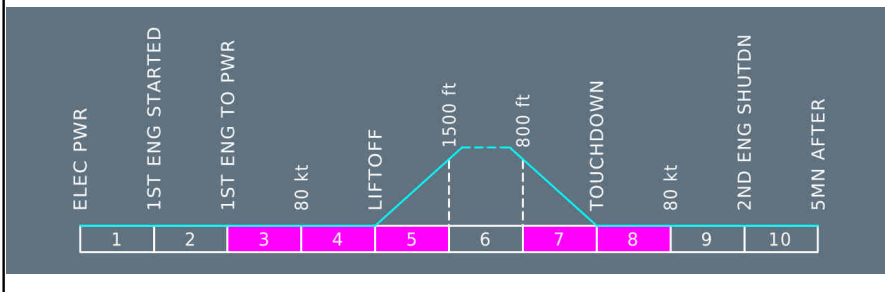
Ident.: PRO-ABN-APU-D-00021359.0001001 / 03 NOV 21

ANNUNCIATIONS

Triggering Conditions:

- [L2]** This alert triggers when:
- Both loops fail with more than 5 s between both failures, or
 - The FDU is failed.

Flight Phase Inhibition:



Ident.: PRO-ABN-APU-D-00021360.0001001 / 17 MAR 17

Crew awareness.

Continued on the following page

APU FIRE DET FAULT (Cont'd)

Ident.: PRO-ABN-APU-D-00021361.0001001 / 17 MAR 17

STATUS
INOP SYS

APU FIRE DET

APU FIRE LOOP A(B) FAULT

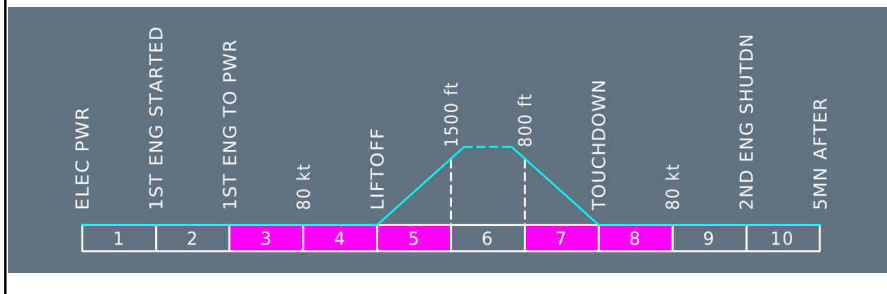
Applicable to: ALL

Ident.: PRO-ABN-APU-B-00021362.0001001 / 03 NOV 21

ANNUNCIATIONS
Triggering Conditions:

L2

This alert triggers when one loop is failed.

Flight Phase Inhibition:


Ident.: PRO-ABN-APU-B-00021363.0001001 / 17 MAR 17

L2

Crew awareness.

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

APU

APU FIRE LOOP A(B) FAULT (Cont'd)

Ident.: PRO-ABN-APU-B-00021364.0001001 / 17 MAR 17

STATUS

INOP SYS

APU LOOP A(B)

APU FIRE

Applicable to: ALL

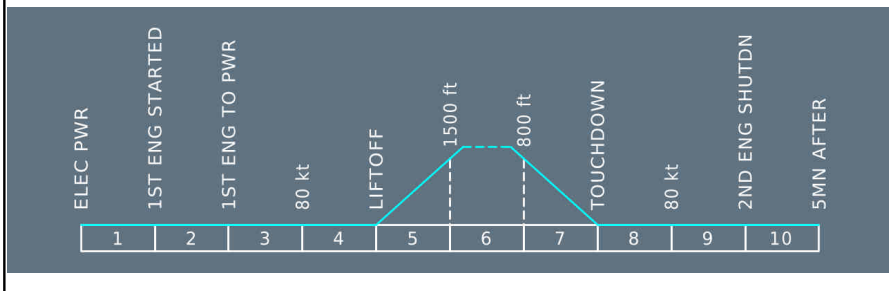
Ident.: PRO-ABN-APUF-C-00017402.0001001 / 21 MAR 16

ANNUNCIATIONS
Triggering Conditions:

L2

This alert triggers when:

- Fire is detected by both loops, or
- Fire is detected by one loop when the other loop is faulty, or
- A rupture occurs in both loops within 5 s.

Flight Phase Inhibition:


Ident.: PRO-ABN-APUF-C-00017925.0001001 / 21 MAR 16

LAND ASAP

APU FIRE P/B.....PUSH

L2

APU LP valve closes.

Aural warning stops.

APU FIRE pb-sw remains on, as long as a fire is detected.

L1

AGENT AFTER 10 S.....DISCH

L2

The 10 s delay allows the airflow to decrease, which increases the effect of the agent.

Automatic countdown on the ECAM.

L1

MASTER SW.....OFF

L2

Do not attempt to restart the APU.

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

APU FIRE

APU FIRE (Cont'd)

Ident.: PRO-ABN-APUF-C-00012211.0001001 / 16 NOV 11

STATUS

INOP SYS

APU

AUTO FLT A/THR LIMITED

Applicable to: ALL

Ident.: PRO-ABN-AUTO_FLT-S-00016943.0001001 / 21 MAR 16

ANNUNCIATIONS

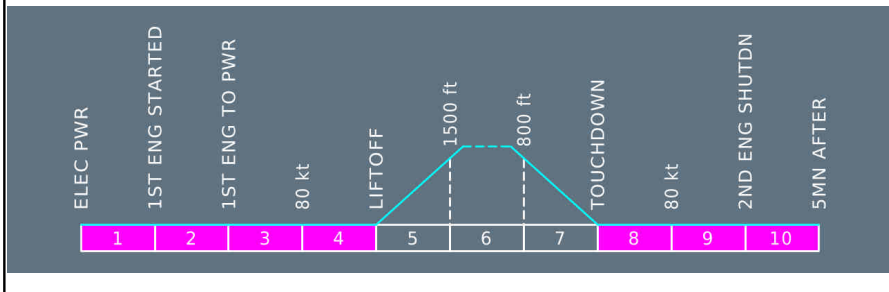
Triggering Conditions:

L2

This alert triggers when A/THR is active but thrust levers are set below CL detent (2 engines), or MCT detent (1 engine).

This caution is repeated every 5 s as long as the thrust lever are not moved.

Flight Phase Inhibition:



Ident.: PRO-ABN-AUTO_FLT-S-00018689.0001001 / 21 MAR 16

THR LEVERS.....MOVE

L2

Thrust lever must be set in the relevant detent.

AUTO FLT A/THR OFF

Applicable to: ALL

Ident.: PRO-ABN-AUTO_FLT-L-00016941.0002001 / 20 APR 17

ANNUNCIATIONS

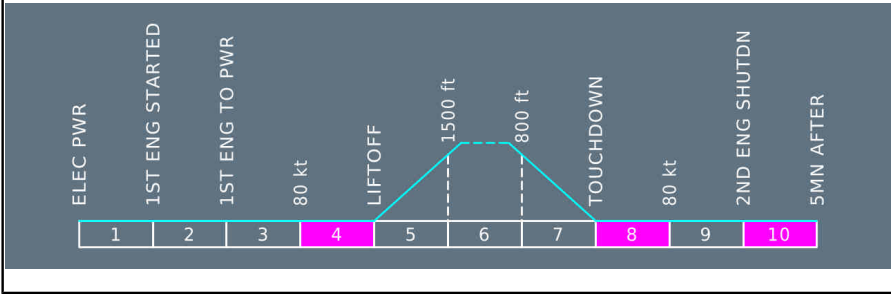
Triggering Conditions:

- L2

This alert triggers when this warning is displayed only for involuntary disconnection. The amber **A/THR OFF** and **ENG THRUST LOCKED** messages are displayed in the left lower part of ECAM upper DU.

For voluntary disconnection, an amber **A/THR OFF** message is displayed on the right lower part of ECAM upper DU.

Flight Phase Inhibition:



Ident.: PRO-ABN-AUTO_FLT-L-00018694.0002001 / 21 MAR 16

- L2

If the A/THR is failed, the flight crew may recover it by engaging the other AP, and then trying to re-engage the A/THR.

Note: If the A/THR is recovered with AP 2, A/THR will be lost again at AP 2 disengagement.

L1 THR LEVERS.....MOVE

- L2

If the thrust levers are not moved within 5 s, the “**ENG THRUST LOCKED**” warning is displayed (Refer to PRO-ABN-ENG ENG THRUST LOCKED).

Continued on the following page

AUTO FLT A/THR OFF (Cont'd)

Ident.: PRO-ABN-AUTO_FLT-L-00010469.0001001 / 05 AUG 10

CAT 2 ONLY

STATUS

INOP SYS

A/THR
CAT 3

AUTO FLT AP OFF

Applicable to: ALL

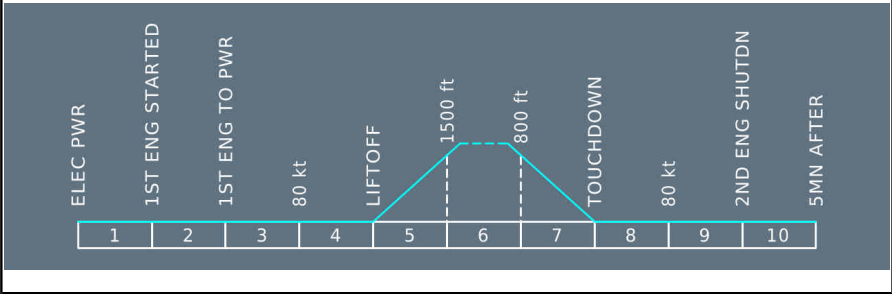
Ident.: PRO-ABN-AUTO_FLT-K-00016947.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when this warning is displayed only for involuntary disconnection. For voluntary disconnection, a red **AP OFF** message is displayed in the right lower part of ECAM upper DU.

Flight Phase Inhibition:



Ident.: PRO-ABN-AUTO_FLT-K-00018695.0001001 / 21 MAR 16

Crew awareness.

Continued on the following page

PIA A318/A319/A320/A321 FLEET

FCOM

← B to C →

PRO-ABN-AUTO_FLT P 3/28

09 FEB 26

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

AUTO FLT

AUTO FLT AP OFF (Cont'd)

Ident.: PRO-ABN-AUTO_FLT-K-00017453.0002001 / 21 MAR 16

STATUS

INOP SYS

AP (Affected)

CAT 2 ⁽¹⁾

GLS AUTOLAND  ⁽¹⁾

⁽¹⁾ (If both AP lost)

AUTO FLT FAC 1(2) FAULT

Applicable to: ALL

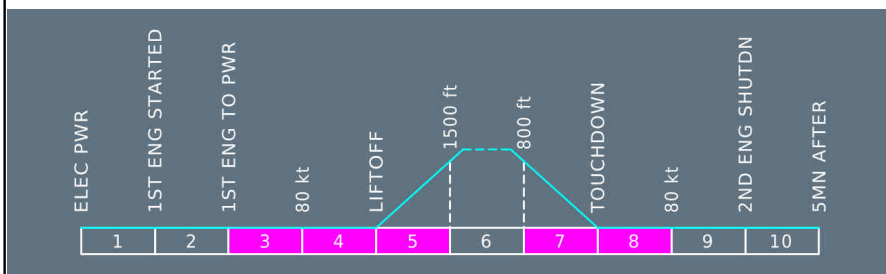
Ident.: PRO-ABN-AUTO_FLT-G-00016911.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when one FAC computer is failed.

Flight Phase Inhibition:



Continued on the following page

AUTO FLT FAC 1(2) FAULT (Cont'd)

Ident.: PRO-ABN-AUTO_FLT-G-00010457.0001001 / 05 AUG 10

FAC (AFFECTED)..... OFF THEN ON

● IF UNSUCCESSFUL:

FAC (AFFECTED)..... OFF

L2 All functions are performed by the remaining FAC.

Ident.: PRO-ABN-AUTO_FLT-G-00017506.0001001 / 21 MAR 16

L12

STATUS

BOTH PFD ON SAME FAC

See ⁽¹⁾

CAT 3 SINGLE ONLY

INOP SYS

CAT 3 DUAL
FAC 1(2)

⁽¹⁾ Characteristic speeds, displayed on the two PFDs, are computed by the same FAC.

AUTO FLT FAC 1 + 2 FAULT

Applicable to: MSN 02155-05253

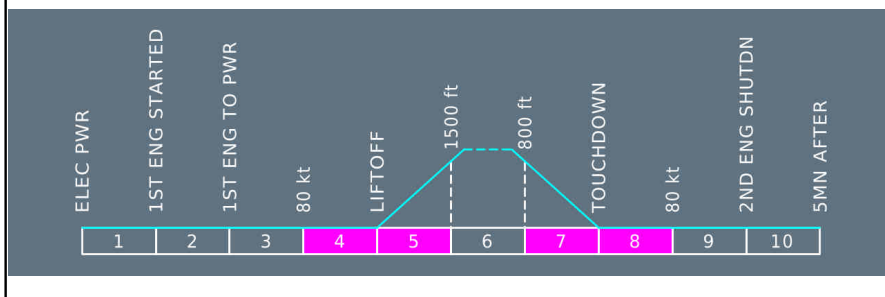
Ident.: PRO-ABN-AUTO_FLT-H-00016926.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the two FAC computers are failed.

Flight Phase Inhibition:



Continued on the following page

AUTO FLT FAC 1 + 2 FAULT (Cont'd)

Ident.: PRO-ABN-AUTO_FLT-H-00017454.0002001 / 22 MAR 17

RUD WITH CARE ABV 160 KT

L2 Depending on when the failure occurs, the rudder travel limiter system may not be in the correct position for the flight speed. Therefore, to prevent damage to the aircraft structure, use the rudder with care, when the speed is above 160 kt.

At slats' extension, full rudder travel authority is recovered.

L1 **FAC 1** OFF THEN ON
FAC 2 OFF THEN ON

● IF UNSUCCESSFUL:

FAC 1 + 2 OFF

L2 With FAC 1 + 2 inoperative, the rudder travel limit system, rudder trim control, yaw damper and PFD characteristic speeds are lost.

L12

ASSOCIATED PROCEDURES

F/CTL ALTN LAW
(PROT LOST)

F/CTL normal laws are lost. All protections, except maneuver protections, are lost.

L1 **MAX SPEED** 320 KT

L2 Speed is limited, due to the loss of high-speed protections.

Continued on the following page

AUTO FLT FAC 1 + 2 FAULT (Cont'd)

Ident.: PRO-ABN-AUTO_FLT-H-00017456.0046001 / 05 APR 22

L12

STATUS

 MAX SPEED..... 320 KT
 RUD WITH CARE ABV 160 KT

APPR PROC

FOR LDG.....FLAP LVR 3

 This line is replaced by "FOR LDG : FLAP LVR 3" when
 CONF 3 is selected, as a reminder.

GPWS LDG FLAP 3.....ON

This line is displayed when flaps are in CONF 3.

APPR SPD..... VREF + 10 KT

OPERATING SPD.....COMPUTE

LDG DIST PROC..... APPLY

ALTN LAW : PROT LOST

 See ⁽²⁾

WHEN L/G DN : DIRECT LAW

 See ⁽³⁾
INOP SYS

 WND SHEAR DET ⁽¹⁾

 REAC W/S DET ⁽¹⁾

F/CTL PROT

FAC 1+2

AP 1+2

A/THR

CAT 2

 GLS AUTOLAND 

 STEEP APPR 

 ROW/ROP 

⁽¹⁾ (The REAC W/S DET inop sys replaces the WND SHEAR DET inop sys on aircraft equipped with the PWS )

⁽²⁾ Note: For the characteristics of the alternate law, Refer to DSC-27-20-20 Flight Controls Law Reconfiguration.

⁽³⁾ Note: At landing gear extension, control reverts to direct law in pitch, as well as in roll (Refer to PRO-ABN-F_CTL F/CTL DIRECT LAW).

AUTO FLT FAC 1 + 2 FAULT

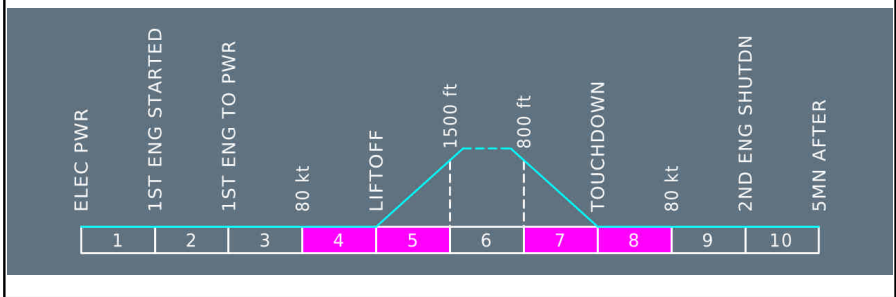
Applicable to: MSN 05746-07792

Ident.: PRO-ABN-AUTO_FLT-H-00016926.0001001 / 21 MAR 16

ANNUNCIATIONS
Triggering Conditions:

L2

This alert triggers when the two FAC computers are failed.

Flight Phase Inhibition:


Continued on the following page

AUTO FLT FAC 1 + 2 FAULT (Cont'd)

Ident.: PRO-ABN-AUTO_FLT-H-00017454.0006001 / 04 NOV 20

RUD WITH CARE ABV 160 KT

L2 Depending on when the failure occurs, the rudder travel limiter system may not be in the correct position for the flight speed. Therefore, to prevent damage to the aircraft structure, use the rudder with care, when the speed is above 160 kt.

At slats' extension, full rudder travel authority is recovered.

L1 **FAC 1** **OFF THEN ON**
FAC 2 **OFF THEN ON**

● IF UNSUCCESSFUL:

FAC 1 + 2 **OFF**

L2 With FAC 1 + 2 inoperative, the rudder travel limit system, rudder trim control, yaw damper and PFD characteristic speeds are lost.

L12

ASSOCIATED PROCEDURES

F/CTL ALTN LAW
(PROT LOST)

For the characteristics of the alternate law, Refer to DSC-27-20-20 Flight Controls Law Reconfiguration.

L1 **MAX SPEED** **320 KT**

L2 Speed is limited, due to the loss of high-speed protections.

Continued on the following page

AUTO FLT FAC 1 + 2 FAULT (Cont'd)

Ident.: PRO-ABN-AUTO_FLT-H-00017456.0044001 / 05 APR 22

L12

STATUS

 MAX SPEED..... 320 KT
 RUD WITH CARE ABV 160 KT

APPR PROC

FOR LDG.....FLAP LVR 3

*This line is replaced by "FOR LDG : FLAP LVR 3" when
 CONF 3 is selected, as a reminder.*

GPWS LDG FLAP 3.....ON

This line is displayed when flaps are in CONF 3.

APPR SPD.....VREF + 10 KT

OPERATING SPD.....COMPUTE

LDG DIST PROC.....APPLY

ALTN LAW : PROT LOST

 See ⁽²⁾
INOP SYS

 WND SHEAR DET ⁽¹⁾

 REAC W/S DET ⁽¹⁾

F/CTL PROT

FAC 1+2

AP 1+2

A/THR

CAT 2

 GLS AUTOLAND 

 STEEP APPR 

 ROW/ROP 

⁽¹⁾ (The REAC W/S DET inop sys replaces the WND SHEAR DET inop sys on aircraft equipped with the PWS )

⁽²⁾ Note: For the characteristics of the alternate law, Refer to DSC-27-20-20 Flight Controls Law Reconfiguration.

AUTO FLT FAC VERSIONS DISAGREE

Applicable to: MSN 07784-07792

Ident.: PRO-ABN-AUTO_FLT-U-00024825.0002001 / 18 NOV 21

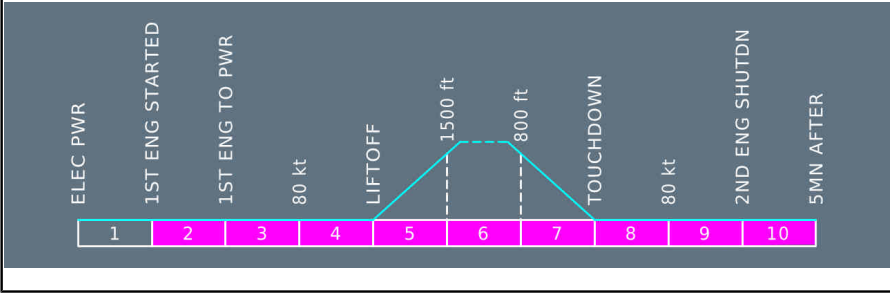
ANNUNCIATIONS

Triggering Conditions:

L2

 This alert triggers when the FAC1 and FAC2 software versions are not compatible.

Flight Phase Inhibition:



Ident.: PRO-ABN-AUTO_FLT-U-00024826.0002001 / 18 NOV 21

Crew awareness.

AUTO FLT FCU 1(2) FAULT

Applicable to: ALL

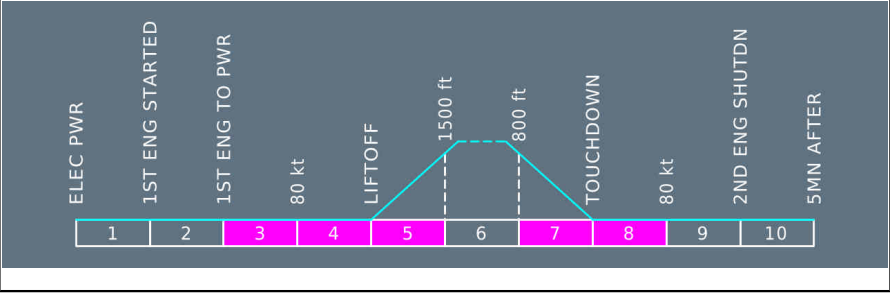
Ident.: PRO-ABN-AUTO_FLT-J-00016923.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when only one FCU channel remain operative.

Flight Phase Inhibition:



The diagram shows a flight profile across 10 phases. Phases 1-4 (ELEC PWR, 1ST ENG STARTED, 1ST ENG TO PWR, 80 kt) are inhibited (grey). Phases 5-8 (LIFTOFF, 1500 ft, 800 ft, TOUCHDOWN) are active (pink). Phases 9-10 (80 kt, 2ND ENG SHUTDN, 5MN AFTER) are inhibited (grey).

Ident.: PRO-ABN-AUTO_FLT-J-00010464.0001001 / 05 AUG 10

BARO REF.....X CHECK

L2 One FCU channel is lost:
Therefore, crosscheck the barometric reference settings on the FCU and PFDs.

Ident.: PRO-ABN-AUTO_FLT-J-00010465.0001001 / 05 AUG 10

STATUS

INOP SYS

FCU 1(2)

PIA A318/A319/A320/A321 FLEET

FCOM

G

PRO-ABN-AUTO_FLT P 13/28

09 FEB 26

AUTO FLT FCU 1 + 2 FAULT

Applicable to: ALL

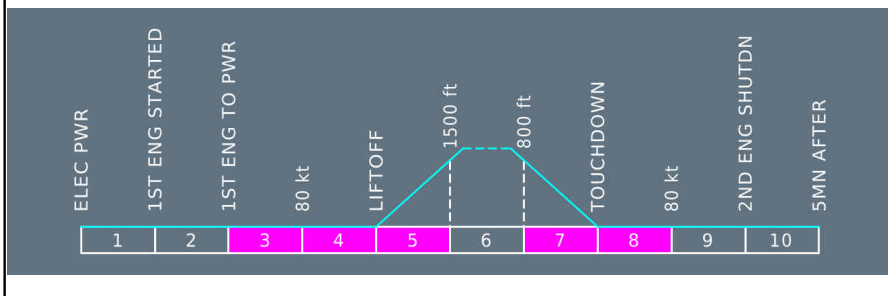
Ident.: PRO-ABN-AUTO_FLT-I-00016946.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the FCU is completely loss.

Flight Phase Inhibition:



Continued on the following page

AUTO FLT FCU 1 + 2 FAULT (Cont'd)

Ident.: PRO-ABN-AUTO_FLT-I-00017463.0002001 / 14 NOV 24

PFD BARO REF: STD ONLY

L2 With both FCU channels failed, the barometer reference automatically goes to 1 013 hPa.

Use standby altimeter, and change this to the actual barometer setting.

Do not insert the MDA (MDH) value on the PERF APPR page (because the PFD altitude is referenced to STD, and not to the correct barometric value).

The PM must then perform the standard callouts ("HUNDRED ABOVE" and "MINIMUM"), using the STBY altimeter.

In addition:

- All FCU controls are inoperative.
- A/THR, AP 1 + 2, and FD 1 + 2 are not available.
(Except in LAND or GO AROUND mode where only A/THR is lost).
- On PFD:
 - Altitude alert is inoperative.
 - ILS/GLS  /MLS  deviation scales are displayed.
 - Flight path vector is displayed.
 - Mach indication is inoperative.
 - FMA is lost except in LAND or GA mode.
- On ND:
 - ARC mode with map (20 NM range) is displayed.
 - VOR/ADF  needles:
 - Needle 1 is related to VOR1 only.
 - Needle 2 is related to ADF 2  only (it is related to ADF 1  if ADF 2 not installed).
 - (VOR selection on DDRMI  is not affected)
 - (ADF  selection on DDRMI  (if available) is not affected).
 - The weather radar image may be lost. If the image remains displayed it must be disregarded.
In all cases, **WXR RNG** message is displayed.

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

AUTO FLT

AUTO FLT FCU 1 + 2 FAULT (Cont'd)

Ident.: PRO-ABN-AUTO_FLT-I-00017512.0002001 / 06 NOV 25

STATUS

INOP SYS

PFD BARO REF : STD ONLY

● **If in LAND or GA:**

CAT 2 ONLY

FCU 1 + 2

AP 1 + 2 ⁽¹⁾

A/THR

CAT 3 ⁽²⁾

CAT 2 ⁽¹⁾

GPWS TERR

ROW/ROP 

⁽¹⁾ (If not LAND or GA)

⁽²⁾ (If in LAND or GA mode)

AUTO FLT REAC W/S DET FAULT

Applicable to: ALL

Ident.: PRO-ABN-AUTO_FLT-N-00017473.0001001 / 21 MAR 16

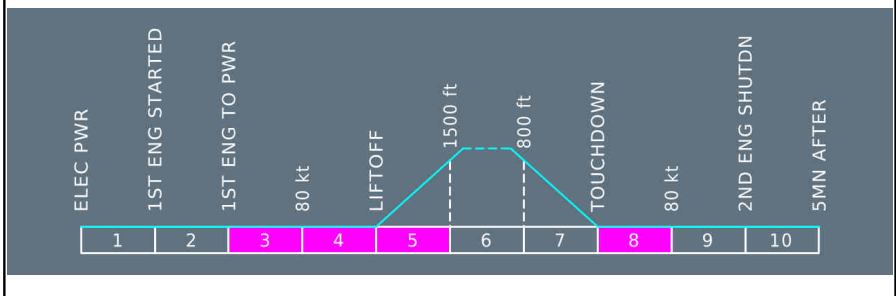
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the reactive windshear function is lost.

Flight Phase Inhibition:



Ident.: PRO-ABN-AUTO_FLT-N-00017479.0001001 / 21 MAR 16

Crew awareness.

Ident.: PRO-ABN-AUTO_FLT-N-00017480.0001001 / 05 JUN 18

STATUS

INOP SYS

REAC W/S DET

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

AUTO FLT

AUTO FLT RUD TRIM 1(2) FAULT

Applicable to: ALL

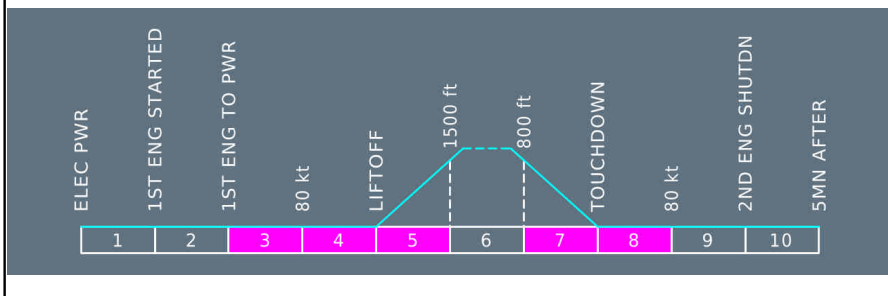
Ident.: PRO-ABN-AUTO_FLT-C-00016921.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when one rudder trim actuator is failed.

Flight Phase Inhibition:



Ident.: PRO-ABN-AUTO_FLT-C-00010449.0001001 / 25 FEB 14

Crew awareness.

Ident.: PRO-ABN-AUTO_FLT-C-00017513.0001001 / 21 MAR 16

STATUS

INOP SYS

CAT 3 SINGLE ONLY

**CAT 3 DUAL
RUD TRIM 1(2)**

AUTO FLT RUD TRIM SYS

Applicable to: ALL

Ident.: PRO-ABN-AUTO_FLT-D-00016928.0001001 / 21 MAR 16

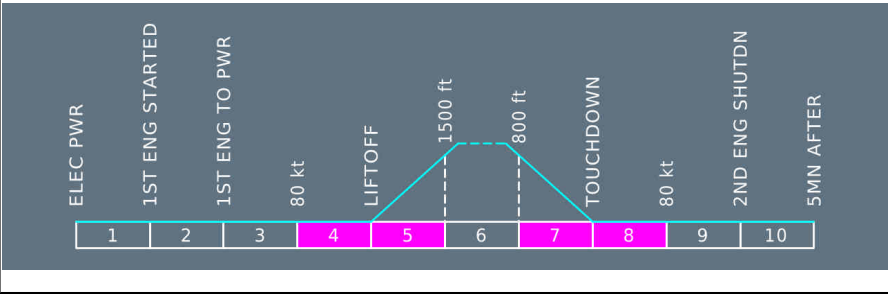
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the rudder trim system is failed.

Flight Phase Inhibition:



Ident.: PRO-ABN-AUTO_FLT-D-00010451.0003001 / 03 MAR 20

FAC 1..... OFF THEN ON

● IF UNSUCCESSFUL:

FAC 2..... OFF THEN ON

Ident.: PRO-ABN-AUTO_FLT-D-00017464.0002001 / 21 MAR 16

STATUS

INOP SYS

RUD TRIM
 AP 1 + 2
 CAT 2
 GLS AUTOLAND

AUTO FLT RUD TRV LIM 1(2)

Applicable to: ALL

Ident.: PRO-ABN-AUTO_FLT-E-00016922.0001001 / 21 MAR 16

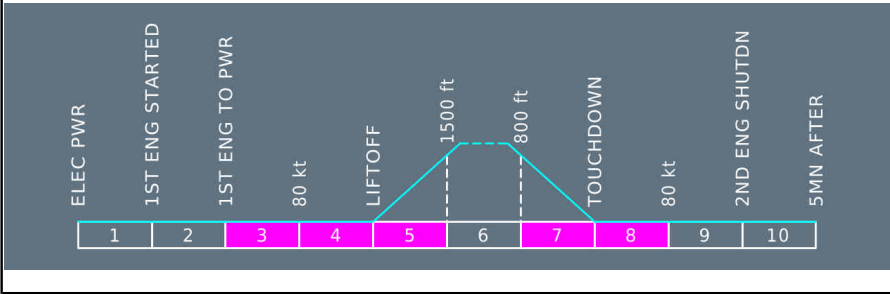
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when one rudder travel limitation actuator is failed.

Flight Phase Inhibition:



7 Ident.: PRO-ABN-AUTO_FLT-E-00010453.0002001 / 09 APR 18

FAC 1..... OFF THEN ON

FAC 2..... OFF THEN ON

L2

The reset of both FACs enables to recover the AP function.

Ident.: PRO-ABN-AUTO_FLT-E-00010454.0001001 / 05 AUG 10

STATUS

INOP SYS

RUD TRV LIM 1(2)

AUTO FLT RUD TRV LIM SYS

Applicable to: ALL

Ident.: PRO-ABN-AUTO_FLT-F-00016929.0002001 / 21 MAR 16

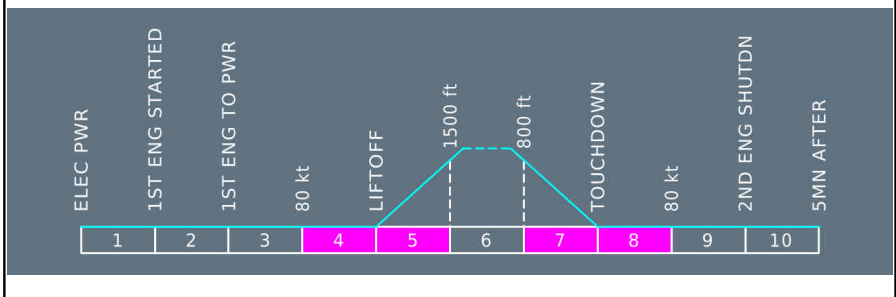
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the rudder travel limitation system is failed.

Flight Phase Inhibition:



Continued on the following page

AUTO FLT RUD TRV LIM SYS (Cont'd)

Ident.: PRO-ABN-AUTO_FLT-F-00017465.0007001 / 12 MAY 23

RUD WITH CARE ABV 160 KT

- [L2]** Depending on when the failure occurs, the rudder travel limiter system may not be in the correct position for the flight speed. Therefore, to prevent damage to the aircraft structure, use the rudder with care, when the speed is greater than 160 kt.

At slats' extension, full rudder travel authority can be recovered.

[L1] FAC 1..... OFF THEN ON

● IF UNSUCCESSFUL:

FAC 2..... OFF THEN ON

● If TLU (rudder or pedals) remains locked at high speed after slat extension:

MAX X WIND FOR LDG 15 KT

AUTO BRK..... DO NOT USE

- [L2]** Do not use the autobrake, so as not to delay the application of differential braking at landing roll.

[L1] ● AT LDG ROLL:
DIFF BRAKING..... AS RQRD

Ident.: PRO-ABN-AUTO_FLT-F-00017467.0003001 / 28 MAY 20

[L12] STATUS

RUD WITH CARE ABV 160 KT

INOP SYS

RUD TRV LIM

● If TLU (rudder or pedals) remains locked at high speed after slat extension:

MAX X WIND FOR LDG 15 KT

AUTO BRK..... DO NOT USE

Do not use the autobrake, so as not to delay the application of differential braking at landing roll.

● AT LDG ROLL:
DIFF BRAKING..... AS RQRD

AUTO FLT TCAS MODE FAULT

Applicable to: MSN 07784-07792

Ident.: PRO-ABN-AUTO_FLT-R-00016998.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the TCAS flight guidance mode is inoperative.

Flight Phase Inhibition:

Ident.: PRO-ABN-AUTO_FLT-R-00014408.0001001 / 07 NOV 13

- FOR TCAS ALERT

AP+FD.....OFF

FLY MANUALLY TCAS ORDER

Ident.: PRO-ABN-AUTO_FLT-R-00014409.0001001 / 07 NOV 13

STATUS

INOP SYS

AP/FD TCAS

AUTO FLT YAW DAMPER 1(2)

Applicable to: ALL

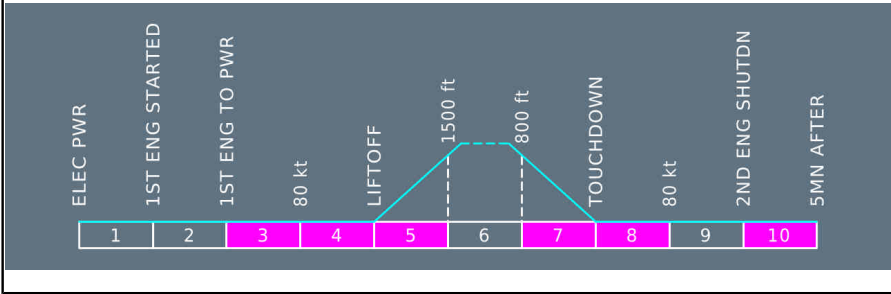
Ident.: PRO-ABN-AUTO_FLT-A-00016912.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when one yaw damper actuator is failed.

Flight Phase Inhibition:



Ident.: PRO-ABN-AUTO_FLT-A-00010444.0001001 / 25 FEB 14

Crew awareness.

Ident.: PRO-ABN-AUTO_FLT-A-00017515.0001001 / 21 MAR 16

STATUS

CAT 3 SINGLE ONLY

INOP SYS

CAT 3 DUAL
YAW DAMPER 1(2)

AUTO FLT YAW DAMPER SYS

Applicable to: MSN 02155-05253

Ident.: PRO-ABN-AUTO_FLT-B-00016927.0001001 / 21 MAR 16

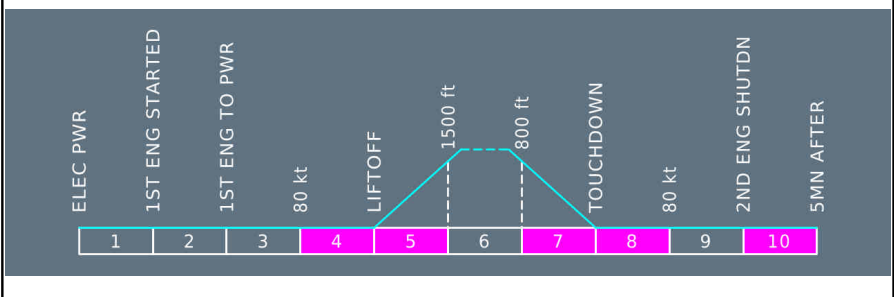
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the yaw damper system is failed.

Flight Phase Inhibition:



Ident.: PRO-ABN-AUTO_FLT-B-00017469.0007001 / 09 MAY 25

L2

Loss of yaw dampers 1 + 2.

L1

FAC 1..... OFF THEN ON

● IF UNSUCCESSFUL:

FAC 2..... OFF THEN ON

● If fault remains:

ASSOCIATED PROCEDURES

F/CTL ALTN LAW

(PROT LOST)

Refer to PRO-ABN-F_CTL F/CTL ALTN LAW - ANNUNCIATION
Continued on the following page

AUTO FLT YAW DAMPER SYS (Cont'd)

Ident.: PRO-ABN-AUTO_FLT-B-00017470.0016001 / 03 NOV 21

L12

STATUS

INOP SYS

MAX SPEED..... 320 KT

Speed is limited due to the loss of high-speed protections.

APPR PROC

FOR LDG..... FLAP LVR 3

This line is replaced by "FOR LDG : FLAP LVR 3" when CONF 3 is selected, as a reminder.

GPWS LDG FLAP 3..... ON

This line is displayed when flaps are in CONF 3.

APPR SPD..... VREF + 10 KT

LDG DIST PROC..... APPLY

ALTN LAW : PROT LOST

WHEN L/G DN : DIRECT LAW

F/CTL PROT
YAW DAMPER
AP 1+2
CAT 2
STEER APPR 
GLS AUTOLAND 

Note: At landing gear extension, control reverts to direct law in pitch, as well as in roll, Refer to PRO-ABN-F_CTL F/CTL DIRECT LAW.

AUTO FLT YAW DAMPER SYS

Applicable to: MSN 05746-07792

Ident.: PRO-ABN-AUTO_FLT-B-00016927.0001001 / 21 MAR 16

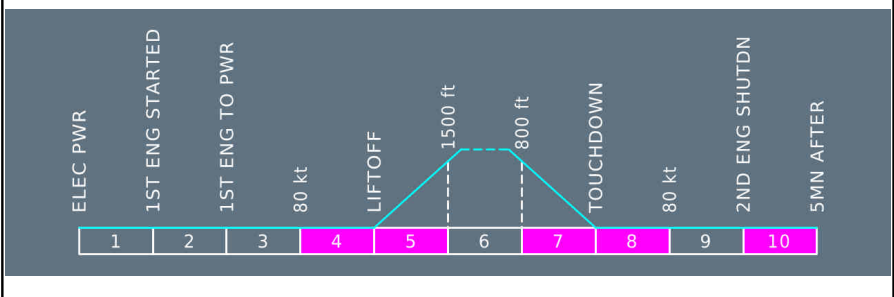
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the yaw damper system is failed.

Flight Phase Inhibition:



Ident.: PRO-ABN-AUTO_FLT-B-00017469.0007001 / 09 MAY 25

L2

Loss of yaw dampers 1 + 2.

L1

FAC 1..... OFF THEN ON

● IF UNSUCCESSFUL:

FAC 2..... OFF THEN ON

● If fault remains:

ASSOCIATED PROCEDURES

F/CTL ALTN LAW
(PROT LOST)

Refer to PRO-ABN-F_CTL F/CTL ALTN LAW - ANNUNCIATION

Continued on the following page

AUTO FLT YAW DAMPER SYS (Cont'd)

Ident.: PRO-ABN-AUTO_FLT-B-00017470.0020001 / 03 NOV 21

L12

STATUS

MAX SPEED..... 320 KT

Speed is limited due to the loss of high-speed protections.

APPR PROC

FOR LDG.....FLAP LVR 3

This line is replaced by "FOR LDG : FLAP LVR 3" when CONF 3 is selected, as a reminder.

GPWS LDG FLAP 3.....ON

This line is displayed when flaps are in CONF 3.

APPR SPD..... VREF + 10 KT

LDG DIST PROC..... APPLY

ALTN LAW : PROT LOST

Note: For the characteristics of the alternate law, Refer to DSC-27-20-20 Flight Controls Law Reconfiguration.

INOP SYS

 F/CTL PROT
 YAW DAMPER
 AP 1+2
 CAT 2
 GLS AUTOLAND

AVIONICS SMOKE

Applicable to: ALL

Ident.: PRO-ABN-AVNCS-M-00017405.0001001 / 21 MAR 16

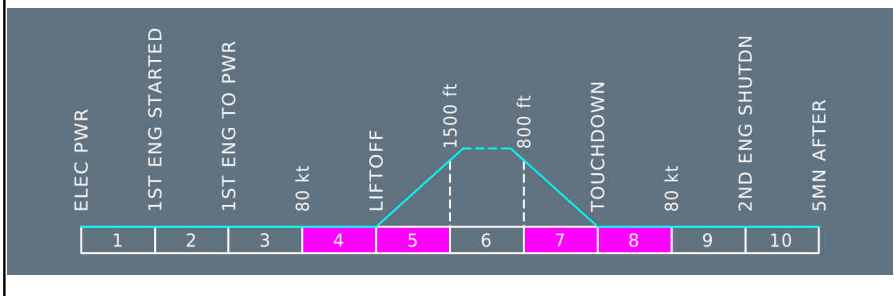
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when smoke in the ventilation extraction duct is detected.

Flight Phase Inhibition:



Ident.: PRO-ABN-AVNCS-M-00014922.0001001 / 22 MAR 17

L2

 The description of this procedure is included in the SMOKE/FUMES/AVNCS SMOKE procedure
 (Refer to procedure)

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

AVIONICS SMOKE

Intentionally left blank

BLEED MONITORING FAULT

Applicable to: ALL

Ident.: PRO-ABN-BLEED-L-00017385.0001001 / 21 MAR 16

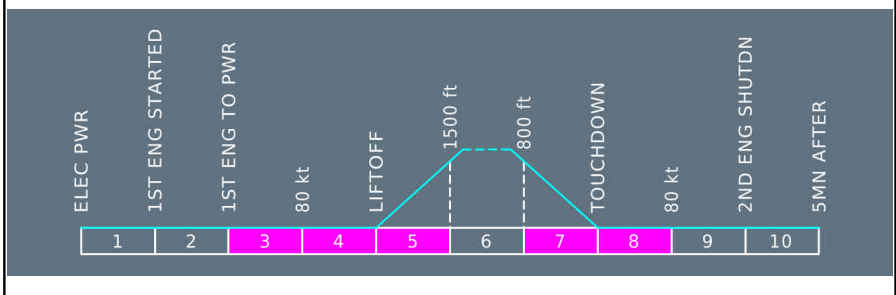
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when both BMC are failed.

Flight Phase Inhibition:



Ident.: PRO-ABN-BLEED-L-00011111.0001001 / 25 FEB 14

Crew awareness.

Ident.: PRO-ABN-BLEED-L-00011112.0001001 / 05 AUG 10

STATUS

INOP SYS

BMC 1 + 2

PROCEDURES
ABNORMAL AND EMERGENCY PROCEDURES
BLEED

BLEED MONIT SYS 1(2) FAULT

Applicable to: MSN 04392-07792

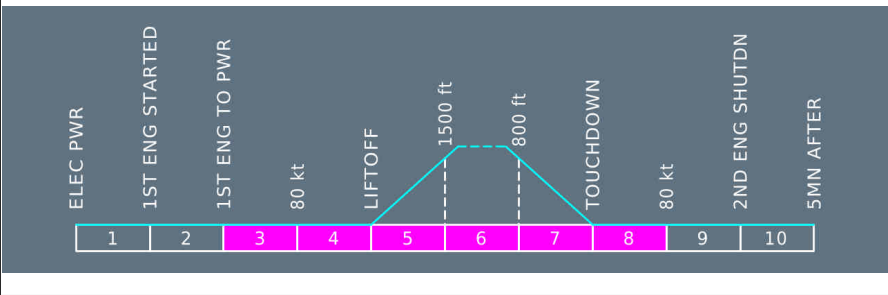
Ident.: PRO-ABN-BLEED-K-00017388.0002001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the BMC 1(2) is failed.

Flight Phase Inhibition:



Ident.: PRO-ABN-BLEED-K-00011109.0004001 / 25 FEB 14

Crew awareness.

Ident.: PRO-ABN-BLEED-K-00011110.0004001 / 17 MAR 11

STATUS

INOP SYS

BMC 1(2)

[MEM] LOSS OF BRAKING

Ident.: PRO-ABN-BRAKES-00011315.0002001 / 05 JUN 18

Applicable to: MSN 02719-07792

● **If no braking:**

REV..... MAX

L2 If needed, the flight crew may keep maximum reverse thrust until full aircraft stop.

L1 BRAKE PEDALS..... RELEASE

L2 When the flight crew sets the A/SKID & N/W STRG sw to OFF, the control of the braking system is transferred from the BSCU to the ABCU, and the alternate braking mode is activated. Consequently the PF should release the brake pedals before the PM selects the A/SKID off. This action avoids brutal braking application.
For information on the alternate braking mode, Refer to DSC-32-30-10 Braking Modes - Alternate Braking without Anti-Skid.

L1 A/SKID OFF..... ORDER

L2 The PF orders the PM to set the A/SKID & N/W STRG sw to OFF.

L1 A/SKID & N/W STRG..... OFF
BRAKE PEDALS..... PRESS
MAX BRK PR..... 1000 PSI

L2 The ABCU automatically limits the brake pressure to 1 000 PSI. Monitor brake pressure on the BRAKES PRESS indicator.

L1 ● **If still no braking:**

PARK BRAKE..... USE

Use short successive parking brake applications to stop the aircraft.

L2 For more information on the parking brake, Refer to DSC-32-30-10 Braking Modes - Parking Brake.

PROCEDURES
ABNORMAL AND EMERGENCY PROCEDURES
BRAKES

[MEM] LOSS OF BRAKING

Ident.: PRO-ABN-BRAKES-00011315.0001001 / 05 JUN 18

Applicable to: MSN 02155-02212

● **If no braking:**

REV..... MAX

[L2] If needed, the flight crew may keep maximum reverse thrust until full aircraft stop.

[L1] BRAKE PEDALS..... RELEASE

[L2] When the flight crew sets the A/SKID & N/W STRG sw to OFF, the alternate braking mode is activated. Consequently the PF should release the brake pedals before the PM selects the A/SKID off. This action avoids brutal braking application.

For information on the alternate braking mode, Refer to DSC-32-30-10 Braking Modes - Alternate Braking without Anti-Skid.

[L1] A/SKID OFF..... ORDER

[L2] The PF orders the PM to set the A/SKID & N/W STRG sw to OFF.

[L1] A/SKID & N/W STRG..... OFF

BRAKE PEDALS..... PRESS

MAX BRK PR..... 1000 PSI

[L2] Limit brake pressure to approximately 1 000 PSI. Monitor brake pressure on the BRAKES PRESS indicator.

[L1] ● **If still no braking:**

PARK BRAKE..... USE

Use short successive parking brake applications to stop the aircraft.

[L2] For more information on the parking brake, Refer to DSC-32-30-10 Braking Modes - Parking Brake.

[QRH] ASYMMETRIC BRAKING

Ident.: PRO-ABN-BRAKES-00011331.0001001 / 17 MAR 17

Applicable to: MSN 02719-07792

Apply this procedure when all brakes of one gear are released.

AVOID XWIND > 10 KT FROM SIDE OF AVAILABLE BRAKE

APPLY BRAKE PROGRESSIVELY ON AVAILABLE SIDE

USE RUDDER TO COUNTER LATERAL DEVIATION

- **If reverser inoperative on same side as inoperative brakes:** DO NOT USE REVERSERS

LDG DIST PROC.....APPLY

[QRH] RESIDUAL BRAKING

Ident.: PRO-ABN-BRAKES-00011318.0001001 / 17 MAR 17

Applicable to: ALL

- **In flight:**

BRAKE PEDALS.....PRESS SEVERAL TIMES

Press the brake pedals several times. This could zero a residual pressure on the alternate system.

- **If residual pressure remains:**

A/SKID & N/W STRG sel.....KEEP ON

- **For landing:**

AUTO/BRK.....MED

Using MED mode gives immediate priority to normal braking upon landing gear touchdown, which cancels residual alternate pressure.

- **If autobrake not available:**

APPLY BRAKING JUST AFTER TOUCHDOWN

POSSIBLE BRAKING ASYMMETRY

Note: *If tire damage is suspected after landing, Refer to LIM-LG Taxi with Deflated or Damaged Tires.*

BRAKES A/SKID N/Ws FAULT OR A/SKID N/Ws OFF

Applicable to: ALL

Ident.: PRO-ABN-BRAKES-J-00017807.0002001 / 12 MAY 23

ANNUNCIATIONS

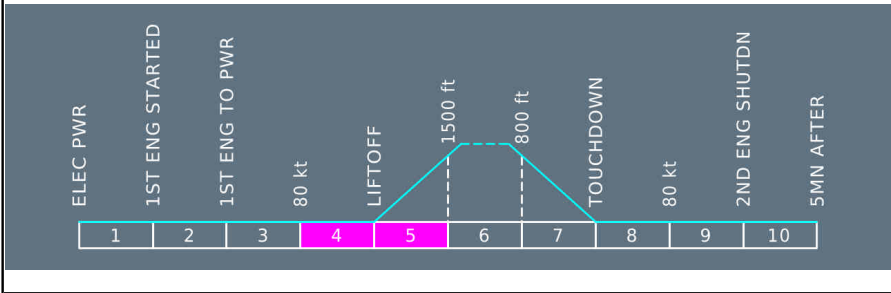
Triggering Conditions:

L2

This alert triggers when:

- There is a loss of normal brake system associated with **HYD Y SYS LO PR** ECAM alert, or
- Both BSCU channels are failed, or
- The A/SKID & N/W STRG sw is set to OFF.

Flight Phase Inhibition:



Ident.: PRO-ABN-BRAKES-J-00018571.0001001 / 05 MAR 19

MAX BRK PR..... 1000 PSI

L2

Monitor brake pressure on the BRAKES PRESS indicator. Limit brake pressure to approximately 1 000 PSI and, at low ground speed, adjust brake pressure as required. Avoid landing on a runway covered with ice (cold & dry).

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

BRAKES

BRAKES A/SKID N/WS FAULT OR A/SKID N/WS OFF (Cont'd)

Ident.: PRO-ABN-BRAKES-J-00018670.0003001 / 21 MAR 16

L12

STATUS

MAX BRK PR..... 1000 PSI

LDG DIST PROC..... APPLY

- **If Y SYS LO PR:**
 BRK Y ACCU PR ONLY
 CAT 3 SINGLE ONLY

 See ⁽¹⁾

INOP SYS

 CAT 3 DUAL
 ANTI SKID
 N/W STRG
 NORM BRK
 AUTO BRK

⁽¹⁾ Note: Automatic rollout is not permitted as specified in QRH (Refer to QRH/OPS Required Equipment for CAT2 and CAT3).

PROCEDURES
ABNORMAL AND EMERGENCY PROCEDURES
BRAKES

BRAKES ALTN BRK FAULT

Applicable to: MSN 02719-07792

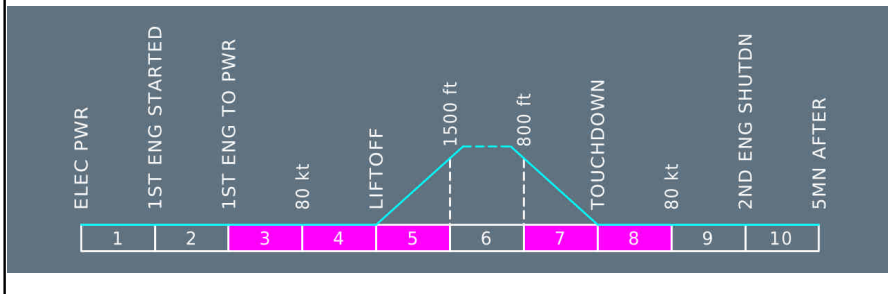
Ident.: PRO-ABN-BRAKES-R-00017816.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the alternate braking function is lost.

Flight Phase Inhibition:



Ident.: PRO-ABN-BRAKES-R-00018357.0001001 / 21 MAR 16

Crew awareness.

Ident.: PRO-ABN-BRAKES-R-00011328.0001001 / 05 AUG 10

STATUS

INOP SYS

ALTN BRK

BRAKES ALTN L(R) RELEASED

Applicable to: MSN 02719-07792

Ident.: PRO-ABN-BRAKES-S-00017817.0001001 / 21 MAR 16

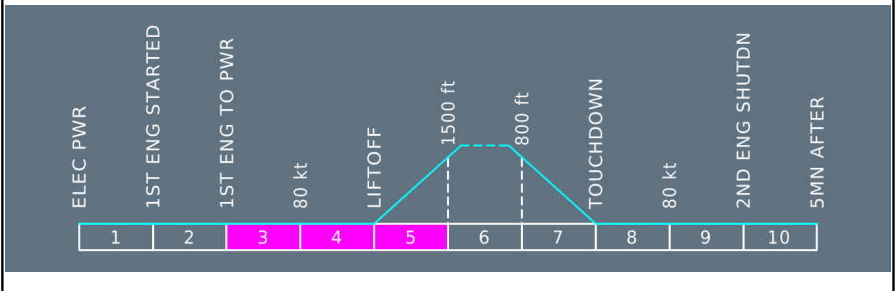
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the brakes of one gear is released.
 It is detected when the landing gear is downlocked, at least one engine is running, and alternate braking is active.

Flight Phase Inhibition:



Ident.: PRO-ABN-BRAKES-S-00011329.0001001 / 05 AUG 10

L2

As long as the normal braking system is available, braking is normal. In alternate braking mode, braking of all wheels on one gear is lost.

L1

● If normal braking is lost:

ASYM BRK PROC..... APPLY

Ident.: PRO-ABN-BRAKES-S-00011330.0001001 / 11 MAY 12

STATUS

● If normal braking is lost:

LDG DIST PROC.....APPLY

INOP SYS

ALTN L(R) BRK

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

BRAKES

BRAKES AUTO BRK FAULT

Applicable to: MSN 02155-02212

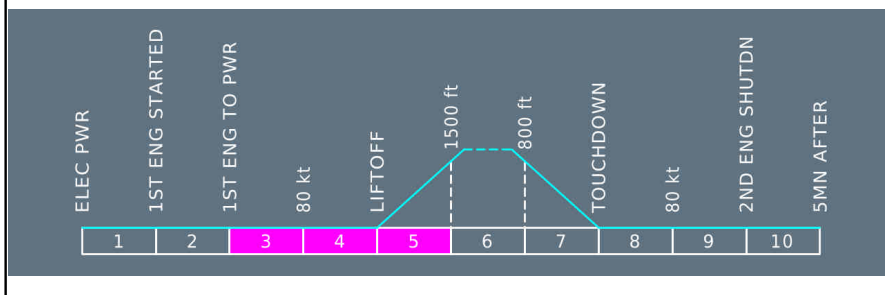
Ident.: PRO-ABN-BRAKES-N-00017806.0002001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

- L2** This alert triggers when the autobrake is failed, after being armed.

Flight Phase Inhibition:



Ident.: PRO-ABN-BRAKES-N-00018672.0001001 / 26 NOV 19

- L2** The **BRAKES AUTO BRK FAULT** alert may be due to a failure of the autobrake mode itself, or to a brake released condition. The flight crew should, therefore, be prepared to counter a possible slight lateral drift at landing, via the rudder.

- L1** ● If one brake released on one gear, or one brake released on each gear:
BRAKE RELEASED

Continued on the following page

BRAKES AUTO BRK FAULT (Cont'd)

Ident.: PRO-ABN-BRAKES-N-00011314.0001001 / 21 NOV 17

STATUS	
LDG DIST PROC..... APPLY INOP SYS CAT 3 DUAL AUTO BRK NORM BRK ⁽¹⁾ CAT 3 SINGLE ONLY	

⁽¹⁾ (NORM BRK is inoperative in case of failure causing the AUTO BRK FAULT caution to trigger with a switch to alternate braking (failures affecting the BSCU, the Normal Selector Valve, the Normal Servo Valve, or brake pedal transmitter unit).)

BRAKES AUTO BRK FAULT

Applicable to: MSN 02719-07792

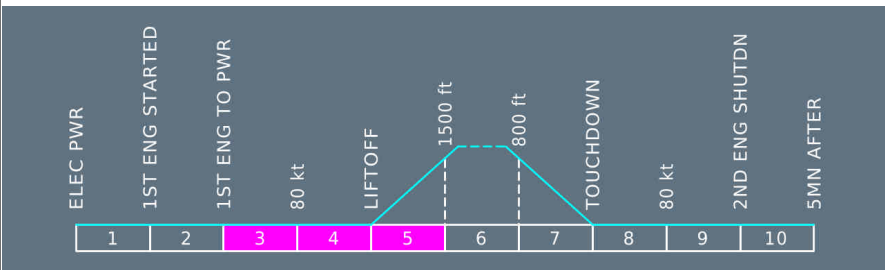
Ident.: PRO-ABN-BRAKES-N-00017806.0002001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2
 This alert triggers when the autobrake is failed, after being armed.

Flight Phase Inhibition:



Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

BRAKES

BRAKES AUTO BRK FAULT (Cont'd)

Ident.: PRO-ABN-BRAKES-N-00018672.0004001 / 21 MAR 16

Crew awareness.

Ident.: PRO-ABN-BRAKES-N-00011314.0004001 / 21 NOV 17

STATUS

INOP SYS

CAT 3 SINGLE ONLY

 CAT 3 DUAL
 AUTO BRK

BRAKES BRK Y ACCU LO PR

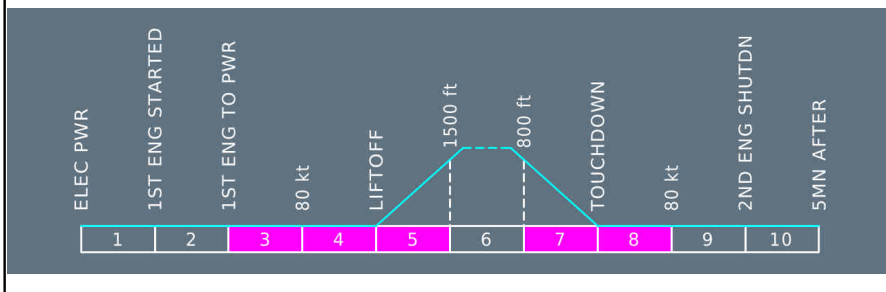
Applicable to: MSN 02719-07792

Ident.: PRO-ABN-BRAKES-T-00017820.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

[L2] This alert triggers when the yellow accumulator is in low pressure.

Flight Phase Inhibition:


Continued on the following page

BRAKES BRK Y ACCU LO PR (Cont'd)

Ident.: PRO-ABN-BRAKES-T-00011332.0002001 / 05 AUG 10

L2 The yellow electrical pump can be used to pressurize the accumulator. If the accumulator pressure is still low, chocks are required before Engine 1 shut down. This message is replaced on ground by **BRAKES PARK BRK LO PR** if parking brake is on and yellow hydraulic system pressure is low.

- L1** ● On ground:
- BEFORE ENG SHUT DOWN:
- CHOCKS CONSIDER

Ident.: PRO-ABN-BRAKES-T-00011333.0001001 / 05 AUG 10

STATUS	
● If Y SYS LO PR NORM BRK ONLY	<u>INOP SYS</u> BRK Y ACCU

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

BRAKES

BRAKES HOT

Applicable to: ALL

Ident.: PRO-ABN-BRAKES-M-00017786.0002001 / 21 MAR 16

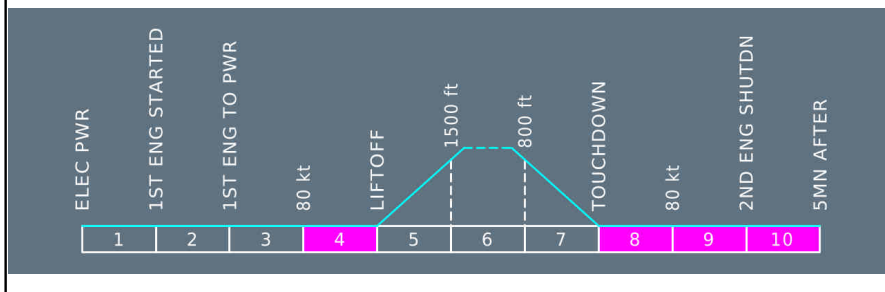
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when one brake temperature is above 300 °C. The alert disappears when the highest brake temperature is below 290 °C.

Flight Phase Inhibition:



Continued on the following page

BRAKES HOT (Cont'd)

Ident.: PRO-ABN-BRAKES-M-00018675.0008001 / 21 MAR 17

■ On ground:
PARK BRK: PREFER CHOCKS

L2 If the **BRAKES HOT** alert is still on when the aircraft is parked, the flight crew should not set the PARKING BRK ON.

L1 **BRK FAN**  **ON**

L2 Note: Before they select the brake fans  at the gate, the flight crew should first warn the ground personnel in order to avoid blowing carbon brake dust on them.

L1 **DELAY T.O. FOR COOL**

- L2**
- Delay takeoff, until the brake temperature is below 300 °C with the brake fans OFF, and 150 °C with the brake fans  ON
 - Refer to PRO-NOR-SOP-21 After Landing - Brake Temperature for brake temperature limitations requiring maintenance actions.

L1 **■ In flight:**

● IF PERF PERMITS:

MAX SPEED 250/.60
L/G DN FOR COOL

L2 If performance permits, the landing gear should be extended or, if already extended, it should remain so, to improve brake cooling.

L1 **● FOR L/G RETRACTION:**

MAX SPEED 220/.54

L2 Reduce speed for landing gear retraction, when the brake temperature is within limits.

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

BRAKES

BRAKES HOT (Cont'd)

Ident.: PRO-ABN-BRAKES-M-00011312.0001001 / 05 AUG 10

L12

STATUS

MAX SPEED..... 280/.67

 See ⁽¹⁾

- ⁽¹⁾ As long as the landing gear is extended, limit the speed to 280 kt/M 0.67.
 For landing gear retraction when the brake temperature is within limits, reduce the speed to 220 kt.

BRAKES NORM + ALTN FAULT

Applicable to: MSN 02719-07792

Ident.: PRO-ABN-BRAKES-Q-00017819.0001001 / 21 MAR 16

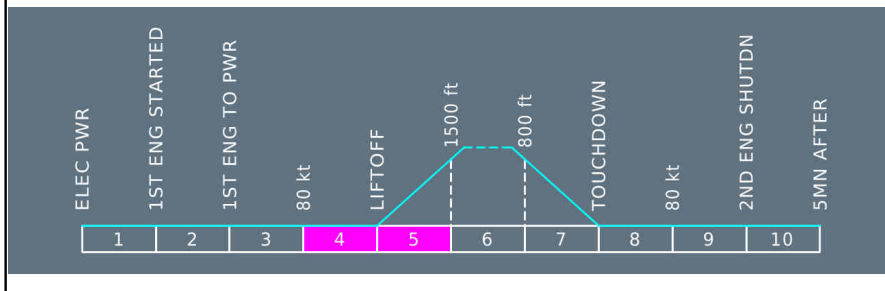
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the normal and alternate braking functions are lost. The parking brake is still available.

Flight Phase Inhibition:



Ident.: PRO-ABN-BRAKES-Q-00018358.0001001 / 21 MAR 16

PARK BRK ONLY

Continued on the following page

BRAKES NORM + ALTN FAULT (Cont'd)

Ident.: PRO-ABN-BRAKES-Q-00011325.0001001 / 09 NOV 21

STATUS	
PARK BRK ONLY	<u>INOP SYS</u>
LDG DIST PROC..... APPLY	CAT 3 DUAL
CAT 3 SINGLE ONLY	ANTI SKID
	N/W STRG ⁽¹⁾
	NORM BRK
	AUTO BRK
	ALTN BRK
⁽¹⁾ (If antiskid off or faulty and if yellow ACCU low pressure)	

BRAKES NORM BRK FAULT

Applicable to: MSN 02719-07792

Ident.: PRO-ABN-BRAKES-O-00017814.0002001 / 09 NOV 21

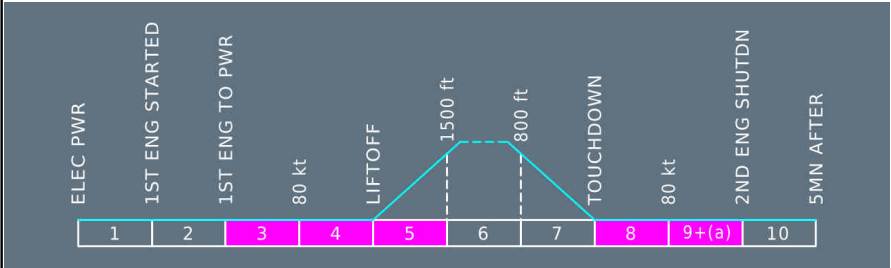
ANNUNCIATIONS

Triggering Conditions:

L2

 This alert triggers when the normal braking function is lost.

Flight Phase Inhibition:



Note: (a) Alert inhibited during the first 60 s of the flight phase 9.

Ident.: PRO-ABN-BRAKES-O-00018679.0001001 / 21 MAR 16

Crew awareness.

Ident.: PRO-ABN-BRAKES-O-00011321.0001001 / 09 NOV 17

STATUS

LDG DIST PROC..... APPLY

 ALTN Y BRK WITH A/SKID
 CAT 3 SINGLE ONLY

INOP SYS

 CAT 3 DUAL
 NORM BRK
 AUTO BRK

BRAKES PARK BRK FAULT

Applicable to: ALL

Ident.: PRO-ABN-BRAKES-X-00017823.0001001 / 21 MAR 16

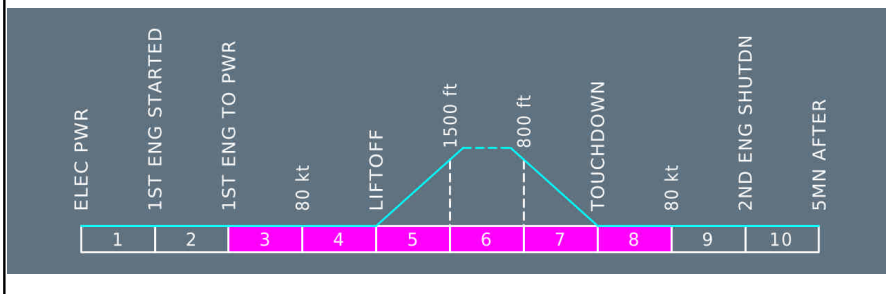
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when a discrepancy between the position of the parking brake handle and the applied parking brake pressure is detected.

Flight Phase Inhibition:



Ident.: PRO-ABN-BRAKES-X-00018359.0002001 / 20 MAY 16

● On ground:

- If PARKING BRK handle is OFF and parking brake pressure is still applied:

BRK PRESS STILL APPLIED

- If PARKING BRK handle is ON and no parking brake pressure is applied:

BRK PRESS RELEASED

PARK BRK..... OFF

- BEFORE ENG SHUT DOWN:

CHOCKS..... CONSIDER

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

BRAKES

BRAKES PARK BRK LO PR

Applicable to: MSN 02719-07792

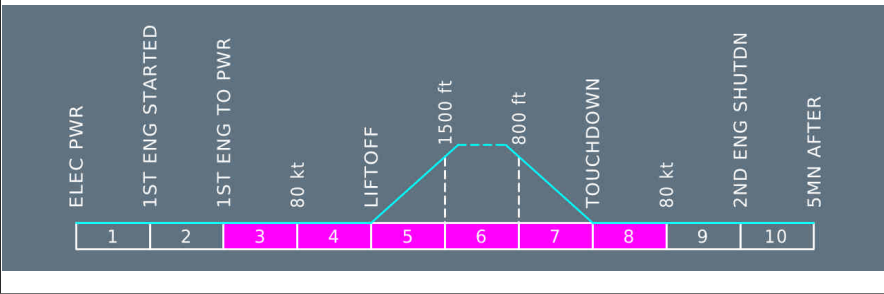
Ident.: PRO-ABN-BRAKES-U-00017821.0003001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the pressure in the yellow accumulator and hydraulic system is low and the parking brake is on.

Flight Phase Inhibition:



Ident.: PRO-ABN-BRAKES-U-00018572.0003001 / 21 MAR 16

L2 Chocks are required before Engine 1 shut down.

- L1**
- On ground:
 - BEFORE ENG SHUT DOWN:
 - CHOCKS CONSIDER

Ident.: PRO-ABN-BRAKES-U-00011335.0003001 / 05 AUG 10

STATUS

INOP SYS

NORM BRK ONLY

BRK Y ACCU

BRAKES PARK BRK ON

Applicable to: ALL

Ident.: PRO-ABN-BRAKES-Y-00017815.0001001 / 21 MAR 16

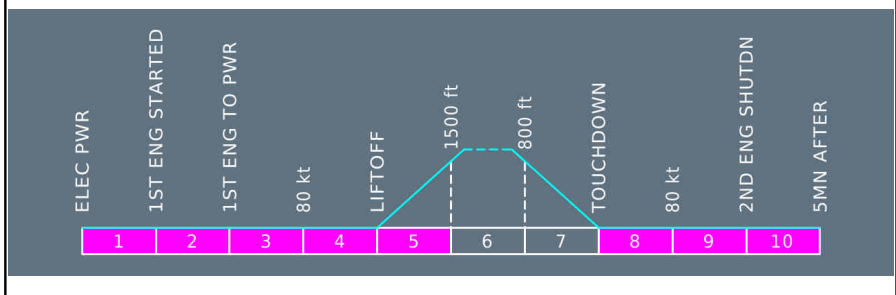
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the parking brake is ON in flight.

Flight Phase Inhibition:



Ident.: PRO-ABN-BRAKES-Y-00018360.0001001 / 21 MAR 16

PARK BRK..... **OFF**

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

BRAKES

BRAKES RELEASED

Applicable to: MSN 02719-07792

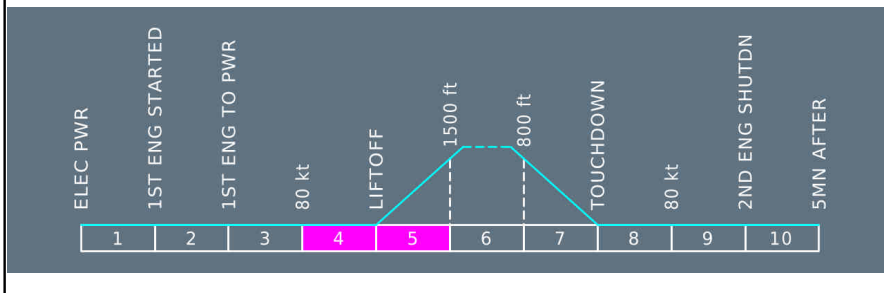
Ident.: PRO-ABN-BRAKES-P-00017813.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the brake of one wheel is released. It is detected when the landing gear is downlocked, at least one engine is running, and normal braking is active.

Flight Phase Inhibition:



Ident.: PRO-ABN-BRAKES-P-00018663.0001001 / 21 MAR 16

Crew awareness.

Ident.: PRO-ABN-BRAKES-P-00011323.0001001 / 21 NOV 17

STATUS

LDG DIST PROC..... APPLY

CAT 2 ONLY

INOP SYS

 CAT 3
 AUTO BRK

BRAKES SYS 1(2) FAULT

Applicable to: ALL

Ident.: PRO-ABN-BRAKES-L-00017812.0001001 / 21 MAR 16

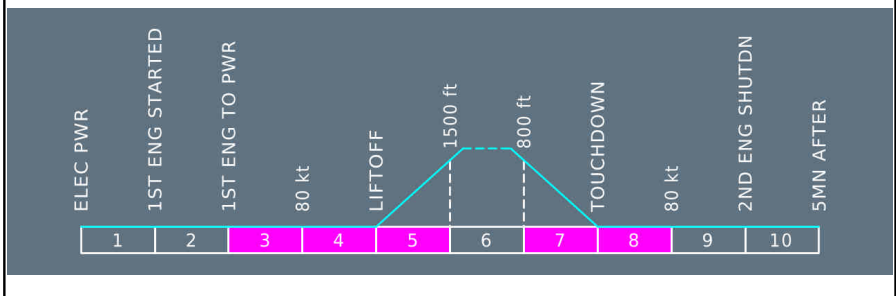
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when one BSCU channel is failed.

Flight Phase Inhibition:



Ident.: PRO-ABN-BRAKES-L-00011309.0001001 / 25 FEB 14

Crew awareness.

Ident.: PRO-ABN-BRAKES-L-00011310.0001001 / 05 AUG 10

STATUS

INOP SYS

BRK SYS 1(2)

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

BRAKES

Intentionally left blank

BRAKES-N/WS MINOR FAULT

Applicable to: MSN 02719-07792

Ident.: PRO-ABN-NWS-W-00017730.0001001 / 21 MAR 16

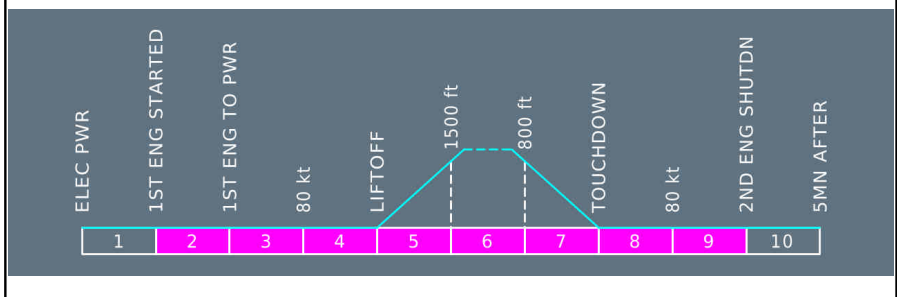
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when a minor fault of the nose wheel steering system is detected.

Flight Phase Inhibition:



Ident.: PRO-ABN-NWS-W-00011326.0001001 / 25 FEB 14

Crew awareness.

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

BRAKES-N/WS

Intentionally left blank

[QRH] CABIN OVERPRESSURE

Ident.: PRO-ABN-CAB_PR-00010761.0001001 / 17 MAR 17

Applicable to: ALL

Apply the following procedure (not displayed on ECAM) in case of total loss of cabin pressure control leading to overpressure.

PACK 1 OR 2.....OFF
 VENTILATION BLOWER..... OVRD
 VENTILATION EXTRACT..... OVRD

Cabin air is extracted overboard

ΔP FREQUENTLY MONITOR

● **If $\Delta P > 9$ PSI:**

LAND ASAP

PACK 1..... OFF
 PACK 2..... OFF

● **10 min before landing:**

PACK 1..... OFF
 PACK 2..... OFF
 VENTILATION BLOWER..... AUTO
 VENTILATION EXTRACT..... AUTO

● **Before door opening: CHECK ΔP ZERO**

CAB PR EXCESS CAB ALT

Applicable to: ALL

Ident.: PRO-ABN-CAB_PR-T-00017316.0005001 / 21 MAR 16

ANNUNCIATIONS

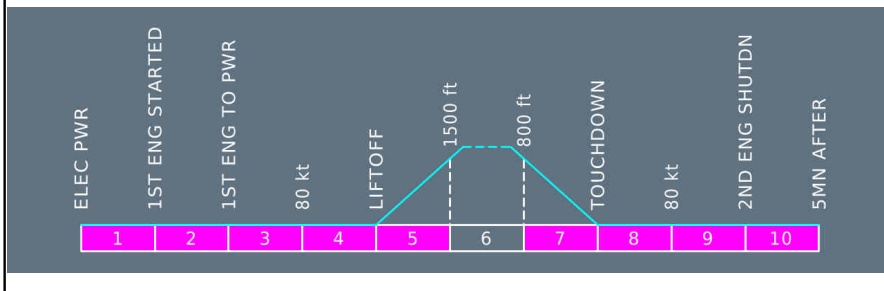
Triggering Conditions:

L2

This alert triggers when:

- In climb or descent, the cabin altitude is above the higher of:
 - 9 550 ft, or
 - 1 000 ft above the airfield pressure altitude.
- In cruise, the cabin altitude is above 9 550 ft.

Flight Phase Inhibition:



Continued on the following page

CAB PR EXCESS CAB ALT (Cont'd)

Ident.: PRO-ABN-CAB_PR-T-00018066.0005001 / 12 NOV 24

- If above FL 100:
 CREW OXY MASKS..... USE
- If below FL 160:
 DESCENT..... INITIATE
 CABIN CREW..... ADVISE
 MAX FL..... 100/MEA-MORA
- If above FL 160:
 SIGNS..... ON
 EMER DESCENT:
 DESCENT..... INITIATE
- If A/THR is not active:
 THR LEVERS..... IDLE
 SPD BRK..... FULL
- L2 *Extension of speedbrakes will significantly increase VLS.
 In order to avoid autopilot disconnection and automatic retraction of speedbrakes due to
 possible activation of angle of attack protection, allow the speed to increase before starting
 to use speedbrakes.*
- L1 SPD..... MAX/APPROPRIATE
- L2 *Descend at maximum appropriate speed. However, if structural damage is suspected use
 the flight controls with care and reduce speed as appropriate. The landing gear may be
 extended. In this case, speed must be reduced to VLO/VLE.*
- L1 ENG MODE SEL..... IGN
 ATC..... NOTIFY
- L2 *Notify ATC of the nature of the emergency, and state intention. The flight crew can
 communicate with the ATC using voice, or CPDLC when the voice contact cannot be
 established or has a poor quality.*
- L1 EMER DESCENT (PA)..... ANNOUNCE
- L2 *The flight crew must inform the cabin of emergency descent on the PA system.*
- L1 XPDR 7700..... CONSIDER
- L2 *Squawk 7700 unless otherwise specified by ATC.*
- L1 *Note: To save oxygen, set the oxygen diluter selector to N position.*

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

CAB PR

CAB PR EXCESS CAB ALT (Cont'd)

With the oxygen diluter left to 100 %, oxygen quantity may not be sufficient for the entire descent profile.

Ensure crew communication is established with oxygen masks. Avoid continuous use of the interphone to minimize the interference from the oxygen mask breathing noise.

MAX FL..... 100/MEA-MORA

● **IF CAB ALT > 14 000 FT:**

PAX OXY MASKS.....MAN ON

L2 This action confirms that the passenger oxygen masks are released.

L1 Note: When descent is established, and if time permits, check that the **OUTFLOW VALVES** are closed on the **CAB PRESS** SD page. If they are not closed and ΔP is positive, select the other CPC. If the **OUTFLOW VALVE** is still not closing, set the cabin pressure **MODE SEL** pb to **MAN** and adjust the **V/S CTL** sw, according to the table below:

Notify the cabin crew when the aircraft reaches a safe flight level, and when cabin oxygen is no more necessary.

TGT V/S : CLIMB 500 ft/min

TGT V/S : DESC 300 ft/min

A/C FL	CAB ALT TGT
390	8 000
350	7 000
300	5 500
250	3 000
< 200	0

Ident.: PRO-ABN-CAB_PR-T-00010755.0002001 / 22 DEC 14

STATUS

MAX FL.....100/MEA-MORA

CAB PR EXCES RESIDUAL PR

Applicable to: MSN 02719-07792

Ident.: PRO-ABN-CAB_PR-AE-00017328.0001001 / 21 MAR 16

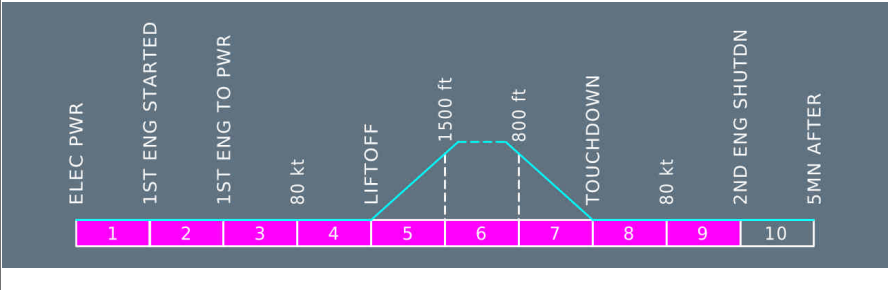
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the differential pressure is still above 2.5 hPa (0.036 PSI) 12 s after the last engine shutdown.

Flight Phase Inhibition:



The diagram shows a timeline of flight phases from 1 to 10. The alert is inhibited (greyed out) during phases 1 through 7 and phase 9. It is active (pink) during phases 8 and 10.

Phase	Event	Alert Status
1	ELEC PWR	Inhibited
2	1ST ENG STARTED	Inhibited
3	1ST ENG TO PWR	Inhibited
4	80 kt	Inhibited
5	LIFTOFF	Inhibited
6	1500 ft	Inhibited
7	800 ft	Inhibited
8	TOUCHDOWN	Active
9	80 kt	Inhibited
10	2ND ENG SHUTDN 5MN AFTER	Active

Ident.: PRO-ABN-CAB_PR-AE-00018790.0002001 / 21 MAR 16

PACK 1.....OFF

PACK 2.....OFF

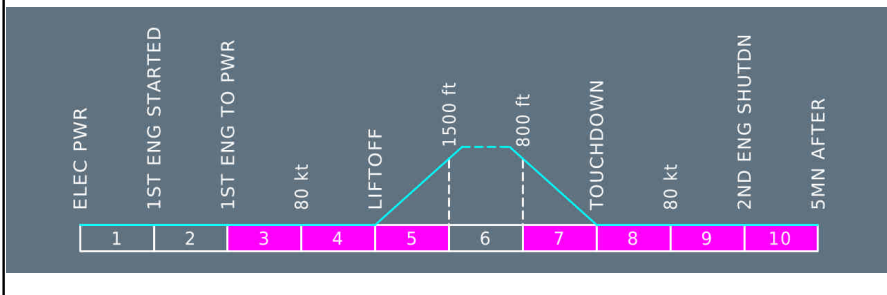
CABIN CREW.....ALERT

CAB PR LDG ELEV FAULT
Applicable to: ALL

Ident.: PRO-ABN-CAB_PR-AF-00017325.0001001 / 21 MAR 16

ANNUNCIATIONS
Triggering Conditions:

- L2** This alert triggers when the LDG ELEV selector is set to AUTO and the landing field elevation of the FMGS is not available.

Flight Phase Inhibition:


Ident.: PRO-ABN-CAB_PR-AF-00018936.0002001 / 21 MAR 16

LDG ELEV.....ADJUST

- L2** The flight crew must select the landing field elevation manually with the LDG ELEV selector. Refer to the LDG ELEV indication on the CRUISE page on the CAB PRESS SD page to adjust the required landing field elevation.

Note: If the landing is performed on QFE, set 0 ft on LDG ELEV selector.

CAB PR LO DIFF PR

Applicable to: ALL

Ident.: PRO-ABN-CAB_PR-AG-00017320.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

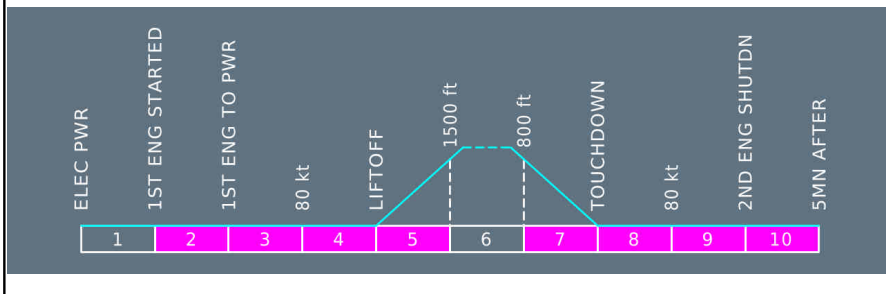
L2

This alert triggers when:

- The time to reach $\Delta P = 0$ is less than 1.5 min, and
- The time to reach $\Delta P = 0$ is less than the time for CAB ALT to reach landing field elevation +30 s, and
- The aircraft is at least 3 000 ft above the landing field elevation.

Note: The alert remains, when the aircraft descends within 3 000 ft of the landing field elevation.

Flight Phase Inhibition:



Ident.: PRO-ABN-CAB_PR-AG-00010762.0002001 / 05 AUG 10

EXPECT HI CAB RATE

A/C V/S.....REDUCE

L2

This line is not displayed in case of Emergency Descent due to Excessive Cabin Altitude.

CAB PR OFV NOT OPEN

Applicable to: ALL

Ident.: PRO-ABN-CAB_PR-AH-00017323.0002001 / 21 MAR 16

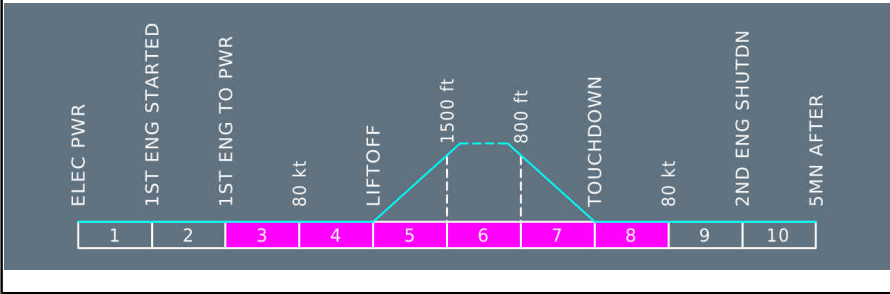
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers, on ground, when the outflow valve is not fully open (time delay 70 s).

Flight Phase Inhibition:



Ident.: PRO-ABN-CAB_PR-AH-00018802.0001001 / 06 NOV 25

3

MODE SEL.....MAN
 MAN V/S CTL.....FULL UP

L2

It may take 5 s in manual mode before the flight crew notices a change of the outflow valve position.

L1

● IF UNSUCCESSFUL :
 PACK 1.....OFF
 PACK 2.....OFF

CAB PR SAFETY VALVE OPEN

Applicable to: ALL

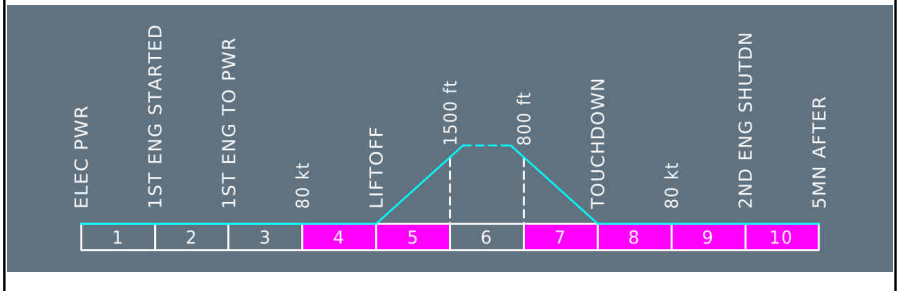
Ident.: PRO-ABN-CAB_PR-W-00017324.0001001 / 21 MAR 16

ANNUNCIATIONS
Triggering Conditions:

L2

This alert triggers:

- On ground, if the safety valve is not fully closed, or
- In flight, if the safety valve is not fully closed for more than 1 min.

Flight Phase Inhibition:


Ident.: PRO-ABN-CAB_PR-W-00018092.0002001 / 06 NOV 25

■ IF DIFF PR ABV 8 PSI:

 MODE SEL.....MAN
 MAN V/S CTL.....AS RQRD

L2

If overpressure is confirmed, reduce cabin ΔP.
It may take 5 s in manual mode before the flight crew notices a change of the outflow valve position.

L1

● IF UNSUCCESSFUL:

A/C FL.....REDUCE

■ IF DIFF PR BELOW 0 PSI:

EXPECT HI CAB RATE

A/C V/S.....REDUCE

Continued on the following page

CAB PR SAFETY VALVE OPEN (Cont'd)

Ident.: PRO-ABN-CAB_PR-W-00018093.0003001 / 28 MAY 20

STATUS
MAN CAB PR CTL

TGT V/S: CLIMB 500 FT/MIN

TGT V/S: DESC 300 FT/MIN

A/C FL

 390
 350
 300
 250
 < 200

CAB ALT TGT

 8 000
 7 000
 5 500
 3 000
 0

● DURING FINAL APPR :

MAN V/S CTL.....FULL UP

Note: When on intermediate approach (below airfield pressure altitude +2 500 ft), adjust $\Delta P = 0$.

CAUTION

 Check that ΔP is zero before opening the doors.

CAB PR SYS 1(2) FAULT

Applicable to: ALL

Ident.: PRO-ABN-CAB_PR-U-00017326.0001001 / 21 MAR 16

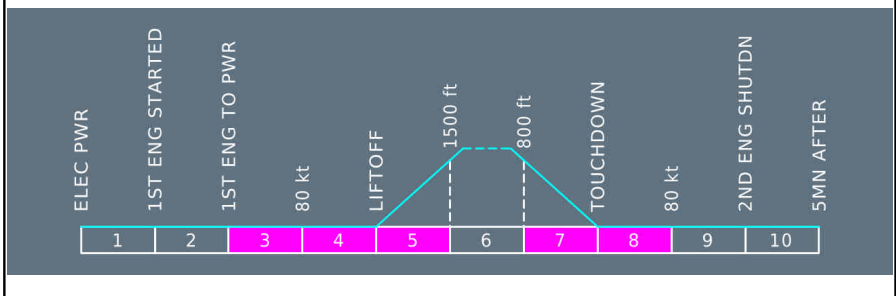
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the cabin pressure controller is failed.

Flight Phase Inhibition:



Ident.: PRO-ABN-CAB_PR-U-00010756.0001001 / 25 FEB 14

Crew awareness.

Ident.: PRO-ABN-CAB_PR-U-00010758.0001001 / 05 AUG 10

STATUS

INOP SYS

CAB PR 1 (2)

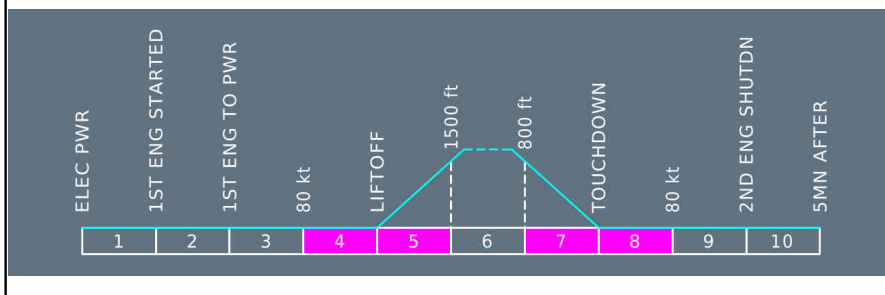
CAB PR SYS 1+2 FAULT

Applicable to: MSN 02155-02212

Ident.: PRO-ABN-CAB_PR-V-00017319.0001001 / 21 MAR 16

ANNUNCIATIONS
Triggering Conditions:

- L2** This alert triggers when both cabin pressure controllers are failed.

Flight Phase Inhibition:


Ident.: PRO-ABN-CAB_PR-V-00010759.0001001 / 06 NOV 25

- L2** Due to the slow closure of the outflow valve in manual pressurization mode and depending on the failure, the following procedure may not avoid the depressurization.

L1 **MODE SEL**..... **MAN**
MAN V/S CTL..... **AS RQRD**

- L2** - It may take 5 s in manual mode before the crew notices a change of the outflow valve position. Use the cabin V/S indication to confirm the outflow valve operation.
- Monitor cabin V/S and CAB ALT frequently and adjust as necessary. Maintain aircraft altitude at or above cabin altitude.
 - The two safety valves limit ΔP to 8.6 PSI.

Continued on the following page

CAB PR SYS 1+2 FAULT (Cont'd)

Ident.: PRO-ABN-CAB_PR-V-00018107.0003001 / 21 MAR 16

L12

STATUS
MAN CAB PR CTL

TGT V/S : CLIMB 500 FT/MIN

TGT V/S : DESC 300 FT/MIN

A/C FL

 390
 350
 300
 250
 < 200

CAB ALT TGT

 8 000
 7 000
 5 500
 3 000
 0

 ● **DURING FINAL APPR :**

V/S CTL.....FULL UP

When on intermediate approach (below airfield pressure altitude +2 500 ft), adjust $\Delta P = 0$.
CAUTION

 Check that ΔP is zero before opening the doors.

INOP SYS

CAB PR 1+2

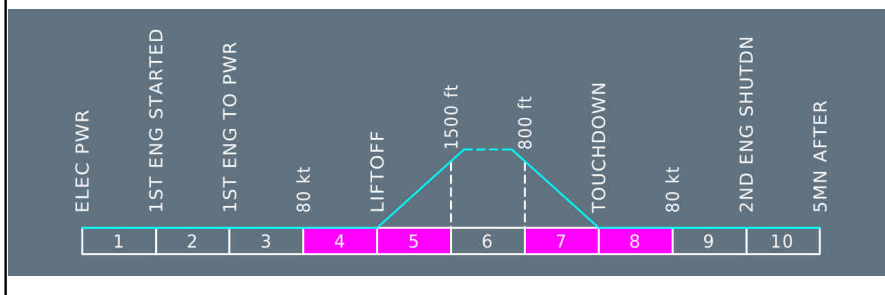
CAB PR SYS 1+2 FAULT

Applicable to: MSN 02719-07792

Ident.: PRO-ABN-CAB_PR-V-00017319.0001001 / 21 MAR 16

ANNUNCIATIONS
Triggering Conditions:

L2 This alert triggers when both cabin pressure controllers are failed.

Flight Phase Inhibition:


Ident.: PRO-ABN-CAB_PR-V-00010759.0003001 / 06 NOV 25

L2 Due to the slow closure of the outflow valve in manual pressurization mode and depending on the failure, the following procedure may not avoid the depressurization.

 L1 **MODE SEL**..... **MAN**
MAN V/S CTL..... **AS RQRD**

- Note:
- If the alert is triggered at the beginning of the cruise phase, the manual mode may not be available for few seconds, but no more than 120 s after takeoff.
 - It may take 5 s in manual mode before the flight crew notices a change of the outflow valve position. Use the cabin V/S indication to confirm the outflow valve operation.
 - Monitor cabin V/S and CAB ALT frequently and adjust as necessary. Maintain aircraft altitude at or above cabin altitude.
 - The two safety valves limit ΔP to 8.6 PSI.

Continued on the following page

CAB PR SYS 1+2 FAULT (Cont'd)

Ident.: PRO-ABN-CAB_PR-V-00018107.0003001 / 21 MAR 16

L12

STATUS
MAN CAB PR CTL

TGT V/S : CLIMB 500 FT/MIN

TGT V/S : DESC 300 FT/MIN

A/C FL

 390
 350
 300
 250
 < 200

CAB ALT TGT

 8 000
 7 000
 5 500
 3 000
 0

 ● **DURING FINAL APPR :**

V/S CTL.....FULL UP

When on intermediate approach (below airfield pressure altitude +2 500 ft), adjust $\Delta P = 0$.
CAUTION

 Check that ΔP is zero before opening the doors.

INOP SYS

CAB PR 1+2

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

CAB PR

Intentionally left blank

CARGO SMOKE FWD(AFT) BTL SQUIB FAULT

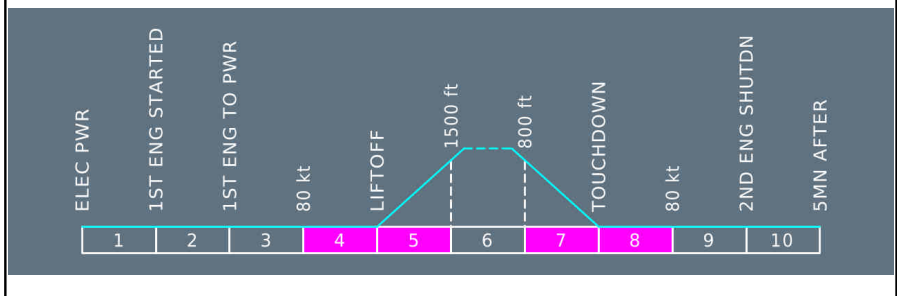
Applicable to: MSN 02155-02212

Ident.: PRO-ABN-CRG_SMOKE-I-00017415.0001001 / 21 MAR 16

ANNUNCIATIONS
Triggering Conditions:

L2

This alert triggers when FWD or AFT bottle squib is failed.

Flight Phase Inhibition:


Ident.: PRO-ABN-CRG_SMOKE-I-00018442.0001001 / 21 MAR 16

Crew awareness.

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

CARGO SMOKE

Intentionally left blank

C/B TRIPPED

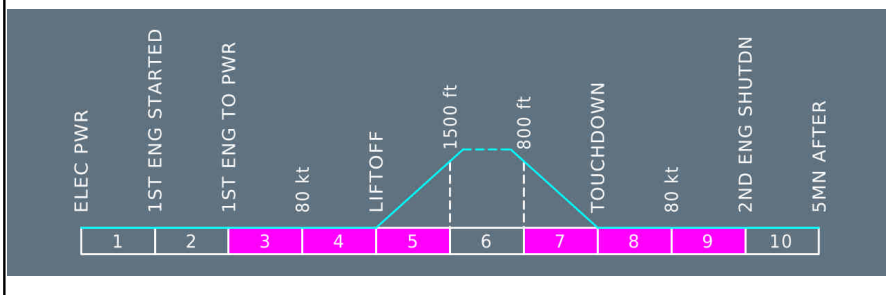
Applicable to: ALL

Ident.: PRO-ABN-C_B-Y-00017390.0001001 / 21 MAR 16

ANNUNCIATIONS
Triggering Conditions:

L2

This alert triggers when one C/B is tripped in the designated zone.

Flight Phase Inhibition:


Ident.: PRO-ABN-C_B-Y-00012551.0001001 / 13 MAY 25

Crew awareness.

- If one green C/B is tripped, one of the following messages appears after one minute, depending on the location of the affected C/B:

C/B TRIPPED ON OVHD PNL

C/B TRIPPED ON L(R) ELEC BAY

C/B TRIPPED REAR PNL J-M(N-R)(S-V)(W-Z)

- Note:
- If the C/B is tripped and not reengaged on ground, the **C/B TRIPPED** alerts will be computed and displayed again in flight one minute after passing 1 500 ft.
 - In flight, do not reengage a C/B that has tripped by itself, unless judged necessary for the safe continuation of the flight. Only one reengagement should be attempted.
 - On ground, do not reengage the C/B of the fuel pump(s) of any tank. For all other C/Bs, if agreed by the maintenance personnel, the flight crew may reengage a tripped C/B, provided that the cause of the tripped C/B is identified.

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

C/B

Intentionally left blank

COM ACARS FAULT

Applicable to: ALL

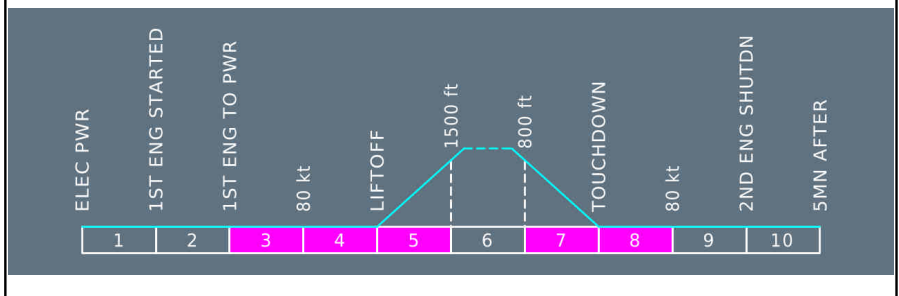
Ident.: PRO-ABN-COM-B-00016895.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when there is a failure of ACARS.

Flight Phase Inhibition:


Ident.: PRO-ABN-COM-B-00017538.0001001 / 21 MAR 16

Crew awareness.

Ident.: PRO-ABN-COM-B-00010037.0001001 / 05 AUG 10

STATUS

INOP SYS

ACARS

COM CIDS 1 + 2 FAULT

Applicable to: ALL

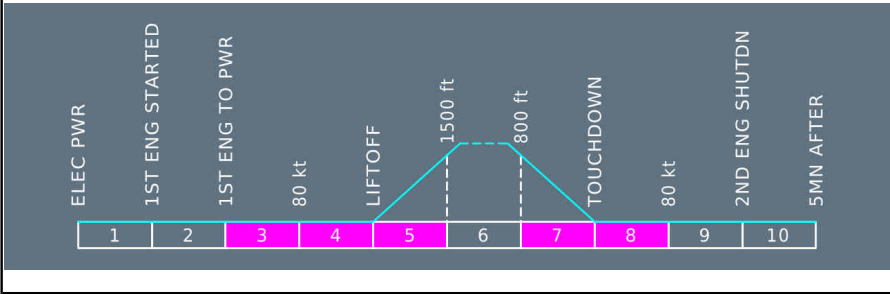
Ident.: PRO-ABN-COM-A-00016887.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when there is a total loss of CIDS.

Flight Phase Inhibition:



Ident.: PRO-ABN-COM-A-00010033.0001001 / 25 FEB 14

L2 Passenger address, cabin and service interphone, and passenger signs are inoperative.

L1 Crew awareness.

Ident.: PRO-ABN-COM-A-00010034.0001001 / 05 AUG 10

STATUS

INOP SYS

CIDS

COM HF 1(2) DATA FAULT

Applicable to: ALL

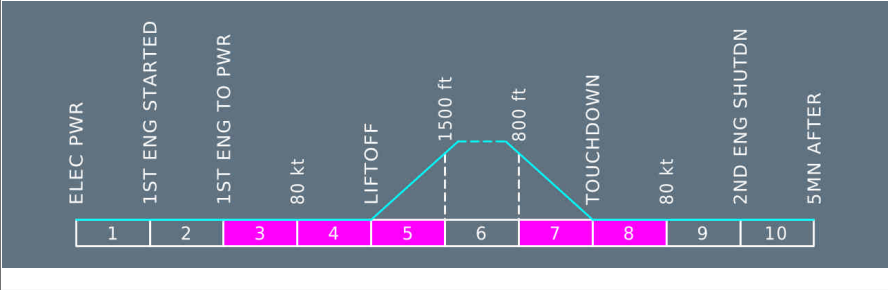
Ident.: PRO-ABN-COM-F-00016896.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when data communications via HF 1(2) are inoperative.

Flight Phase Inhibition:



The diagram shows a flight profile with 10 phases. Phases 3, 4, 5, 7, and 8 are highlighted in red, indicating when the alert is inhibited. The phases are: 1. ELEC PWR, 2. 1ST ENG STARTED, 3. 1ST ENG TO PWR, 4. 80 kt, 5. LIFTOFF, 6. 1500 ft, 7. 800 ft, 8. TOUCHDOWN, 9. 80 kt, 10. 2ND ENG SHUTDN, 11. 5MN AFTER.

Ident.: PRO-ABN-COM-F-00017499.0001001 / 21 MAR 16

Crew awareness.

Ident.: PRO-ABN-COM-F-00010045.0001001 / 12 MAY 25

STATUS

INOP SYS

HF 1(2) DATA

COM SATCOM DATA FAULT

Applicable to: ALL

Ident.: PRO-ABN-COM-D-00016899.0001001 / 21 MAR 16

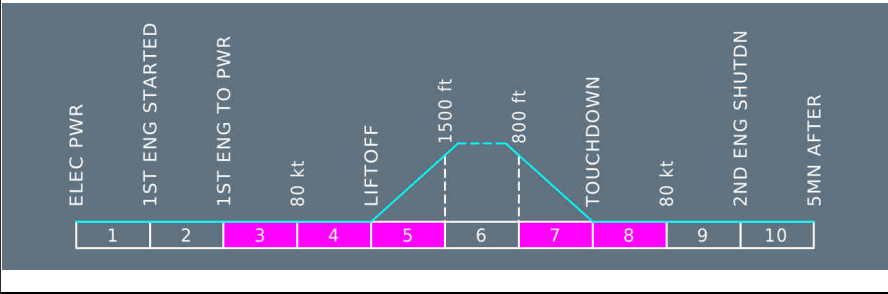
ANNUNCIATIONS

Triggering Conditions:

L2

 This alert triggers when the ACARS transmissions via SATCOM are lost.

Flight Phase Inhibition:



Ident.: PRO-ABN-COM-D-00017548.0001001 / 21 MAR 16

L2

 Telephone transmissions are still available. ACARS  communications are inoperative.

L1

 Crew awareness.

Ident.: PRO-ABN-COM-D-00010041.0001001 / 21 MAR 16

STATUS

INOP SYS

SATCOM DATA

COM SATCOM FAULT

Applicable to: ALL

Ident.: PRO-ABN-COM-C-00016894.0001001 / 21 MAR 16

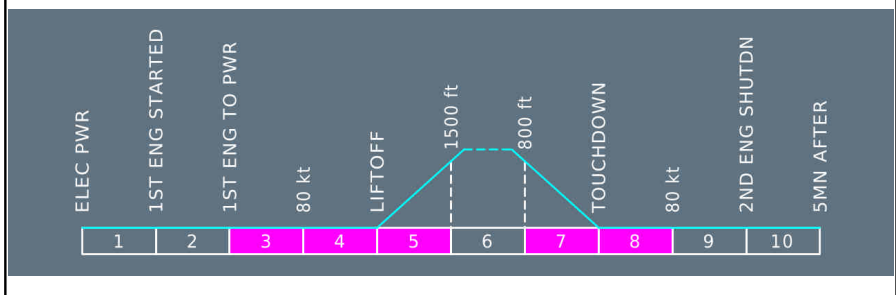
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the telephone and the ACARS  transmission are lost.

Flight Phase Inhibition:



Ident.: PRO-ABN-COM-C-00017500.0001001 / 21 MAR 16

L2

ACARS  and telephone communications are inoperative.

L1

Crew awareness.

Ident.: PRO-ABN-COM-C-00017502.0001001 / 21 MAR 16

STATUS

INOP SYS

SATCOM

COM SINGLE PTT STUCK

Applicable to: ALL

Ident.: PRO-ABN-COM-G-00016902.0001001 / 12 MAY 25

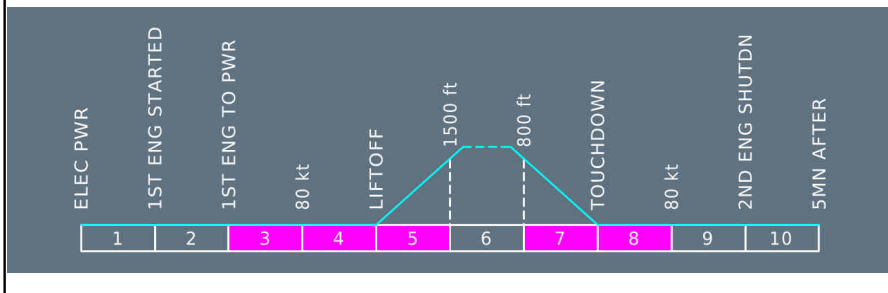
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when any PTT transmission selector is jammed in the transmit position for more than 40 s (VHF) or for more than 180 s (HF).

Flight Phase Inhibition:



Continued on the following page

COM SINGLE PTT STUCK (Cont'd)

Ident.: PRO-ABN-COM-G-00017503.0003001 / 03 APR 18

- **WITHIN 20 s:**
 ALL PTT.....CHECK RELEASED
 ACP1 VHF 1(2)(3) TX..... DESELECT
 ACP1 HF 1(2) TX..... DESELECT
 - **IF UNSUCCESSFUL:**
 ACP2 VHF 1(2)(3) TX.....DESELECT
 ACP2 HF 1(2) TX..... DESELECT
 - **IF UNSUCCESSFUL:**
 ACP3 VHF 1(2)(3) TX.....DESELECT
 ACP3 HF 1(2) TX..... DESELECT
- When the ACP linked to the faulty PTT is detected, the previous ECAM actions are replaced by the following ones:
- AUDIO SWTG.....DO NOT USE
- **ON AFFECTED ACP:**
 ALL TX KEYS..... DO NOT USE
 - **ON ALL OTHER ACP:**
 ALL TX KEYS.....AS RQRD

Ident.: PRO-ABN-COM-G-00014765.0001001 / 26 NOV 12

STATUS	
AUDIO SWTG..... DO NOT USE	<u>INOP SYS</u> SINGLE PTT

COM VHF 1(2)(3) /HF 1(2) EMITTING

Applicable to: ALL

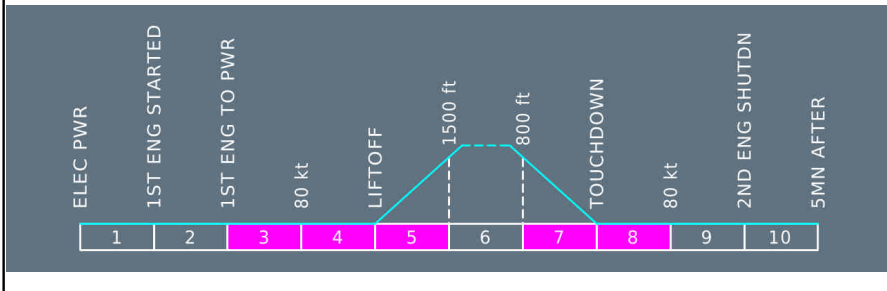
Ident.: PRO-ABN-COM-I-00016892.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

- L2** For VHF 1(2)(3) EMITTING, the alert triggers when the transmitter emits more than 30 s or 60 s depending on aircraft configuration.
 For HF 1(2) EMITTING, the alert triggers when the transmitter emits more than 60 s.

Flight Phase Inhibition:



Ident.: PRO-ABN-COM-I-00017549.0001001 / 12 MAY 25

- L2** 1. If any Push To Talk (PTT) transmission selector (sidestick PTT, hand mike PTT, or ACP PTT switch) is jammed in the transmit position, try to release it in order to remove the caution.
 2. If unsuccessful, deselect the identified failed VHF/HF transmission keys on the associated Audio Control Panel (ACP) to remove the caution. This ACP should only be used in reception mode. The associated PTT transmission selectors must not be used.

Note: In this case, the ACP of the unaffected side may be used to recover the deselected VHF/HF channel.

3. If no transmission key on the ACP is found in the "transmit" position, pull the affected VHF/HF C/B associated to the ECAM message : COM\HF1 C/B HA 14 on 49 VU, COM NAV\HF2 C/B L13 on 121 VU, COM\VHF\1 C/B G09 on 49 VU, COM NAV\VHF\2 C/B L04 on 121 VU, COM \VHF\3 C/B L05 on 121 VU.

COM VHF 3 DATA FAULT

Applicable to: ALL

Ident.: PRO-ABN-COM-E-00016897.0001001 / 21 MAR 16

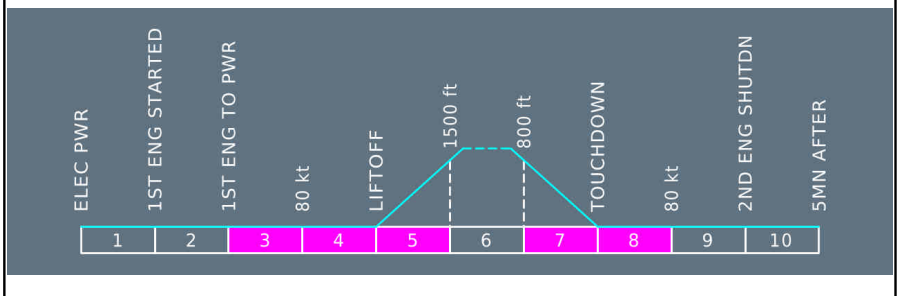
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when data communication via VHF 3 are inoperative.

Flight Phase Inhibition:



Ident.: PRO-ABN-COM-E-00017550.0001001 / 21 MAR 16

Crew awareness.

Ident.: PRO-ABN-COM-E-00010043.0001001 / 17 MAR 11

STATUS

INOP SYS

VHF 3 DATA

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

COM

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[QRH] TOO HOT COCKPIT AND CABIN TEMPERATURE IN FLIGHT

Ident.: PRO-ABN-COND-00010753.0002001 / 04 NOV 20

Applicable to: ALL

Apply the procedure if the cockpit and cabin temperature becomes too hot with the temperature selector at its maximum cold selection:

PACKS OUTLET TEMP [BLEED SD page]..... CHECK

- **If difference between both packs at or above 10 °C:**
 PACK WITH THE HIGHEST OUTLET TEMP OFF
A difference between both packs of 10 °C or greater than 10 °C may reflect a contamination of packs resulting in too hot cabin and cockpit air temperature. The situation may be alleviated by switching OFF the pack discharging the hottest air.

COND FWD CAB/AFT CAB/CKPT DUCT OVHT

Applicable to: MSN 02155-02212

Ident.: PRO-ABN-COND-F-00017295.0001001 / 21 MAR 16

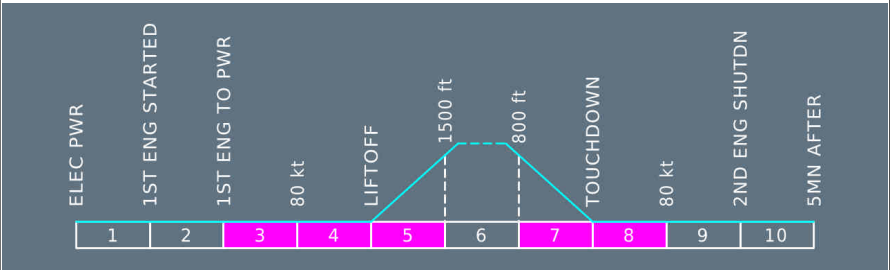
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the duct temperature rises above 88 °C.

Flight Phase Inhibition:



Continued on the following page

PROCEDURES
ABNORMAL AND EMERGENCY PROCEDURES
 COND

COND FWD CAB/AFT CAB/CKPT DUCT OVHT (Cont'd)

Ident.: PRO-ABN-COND-F-00010720.0002001 / 22 APR 16

- **WHEN DUCT TEMP < 70 DEG C (158 DEG F):**
HOT AIR.....OFF THEN ON
L2 *Hot air pressure regulating valve reopens.*

Ident.: PRO-ABN-COND-F-00018037.0001001 / 21 MAR 16

L12

STATUS

INOP SYS

- **If system not recovered:**
CAB TEMP BY PACK ONLY
Basic temperature regulation is by packs only (remains automatic).

HOT AIR
FWD CRG HEAT 

COND FWD CAB/AFT CAB/CKPT DUCT OVHT

Applicable to: MSN 02719-07792

Ident.: PRO-ABN-COND-F-00017295.0002001 / 21 MAR 16

ANNUNCIATIONS

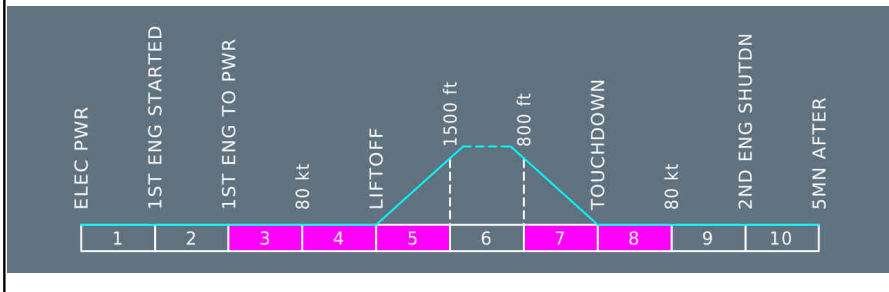
Triggering Conditions:

L2

This alert triggers when:

- The duct temperature rises above 88 °C, or
- The duct temperature rises above 80 °C four times during the same flight.

Flight Phase Inhibition:



Ident.: PRO-ABN-COND-F-00010720.0002001 / 22 APR 16

- **WHEN DUCT TEMP < 70 DEG C (158 DEG F):**

HOT AIR.....OFF THEN ON

L2

Hot air pressure regulating valve reopens.

Ident.: PRO-ABN-COND-F-00018037.0001001 / 21 MAR 16

L12

STATUS

INOP SYS

- **If system not recovered:**

CAB TEMP BY PACK ONLY
Basic temperature regulation is by packs only (remains automatic).

HOT AIR

 FWD CRG HEAT 

COND AFT CARGO DUCT OVHT

Applicable to: MSN 02155-02789, 03031-04392

Ident.: PRO-ABN-COND-G-00017339.0004001 / 06 NOV 25

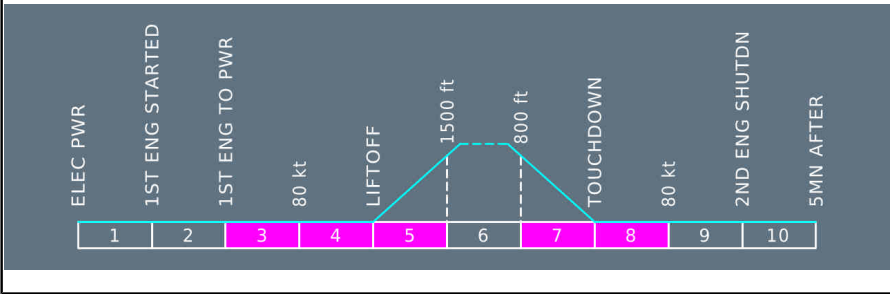
ANNUNCIATIONS

Triggering Conditions:

L2

 This alert triggers when the duct temperature in the aft cargo compartment rises above 88 °C.

Flight Phase Inhibition:



Ident.: PRO-ABN-COND-G-00018038.0006001 / 06 NOV 25

- **WHEN DUCT TEMP < 70 DEG C (158 DEG F):**
 HOT AIR.....OFF THEN ON

L2

 Hot air pressure regulating valve reopens.

Ident.: PRO-ABN-COND-G-00018039.0003001 / 06 NOV 25

L12

STATUS

- **If system not recovered:**
 CAB TEMP BY PACK ONLY
 Basic temperature regulation is by packs only (remains automatic).

INOP SYS

AFT CRG HEAT

COND FWD CARGO DUCT OVHT

Applicable to: MSN 05152-05746

Ident.: PRO-ABN-COND-G-00017339.0003001 / 06 NOV 25

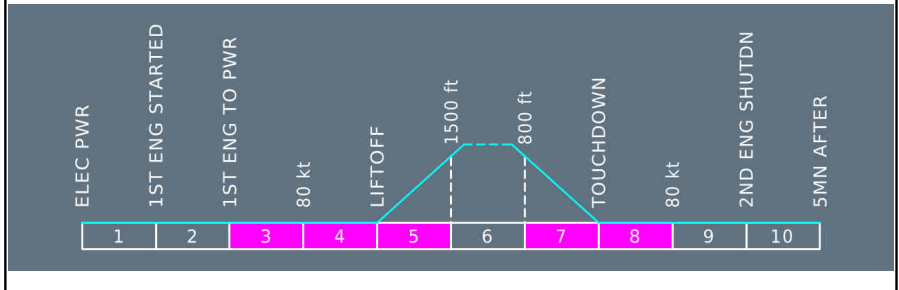
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the duct temperature in the forward cargo compartment rises above 88 °C.

Flight Phase Inhibition:



Ident.: PRO-ABN-COND-G-00018038.0006001 / 06 NOV 25

● WHEN DUCT TEMP < 70 DEG C (158 DEG F):

HOT AIR.....OFF THEN ON

L2

Hot air pressure regulating valve reopens.

Continued on the following page

COND FWD CARGO DUCT OVHT (Cont'd)

Ident.: PRO-ABN-COND-G-00018039.0002001 / 06 NOV 25

L12

STATUS

INOP SYS

● **If system not recovered:**
CAB TEMP BY PACK ONLY
Basic temperature regulation is by packs only (remains automatic).

FWD CRG HEAT

COND AFT CRG HEAT FAULT

Applicable to: MSN 02155-02789, 03031-04392

Ident.: PRO-ABN-COND-N-00017341.0004001 / 06 NOV 25

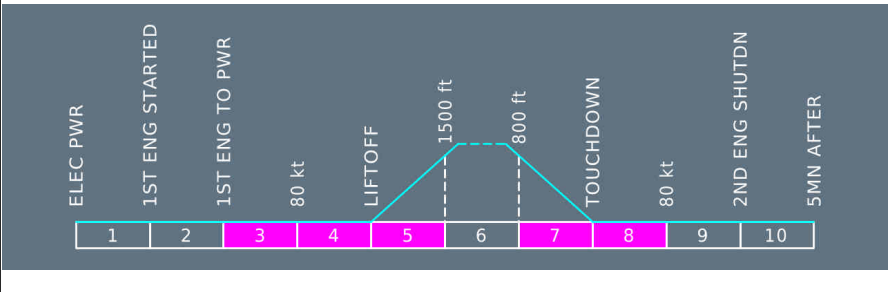
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers if the heating controller of the aft cargo compartment is failed.

Flight Phase Inhibition:



Continued on the following page

COND AFT CRG HEAT FAULT (Cont'd)

Ident.: PRO-ABN-COND-N-00018040.0002001 / 06 NOV 25

Crew awareness.

Ident.: PRO-ABN-COND-N-00018041.0003001 / 06 NOV 25

STATUS

INOP SYS

AFT CRG HEAT

COND FWD CRG HEAT FAULT

Applicable to: MSN 05152-05746

Ident.: PRO-ABN-COND-N-00017341.0003001 / 06 NOV 25

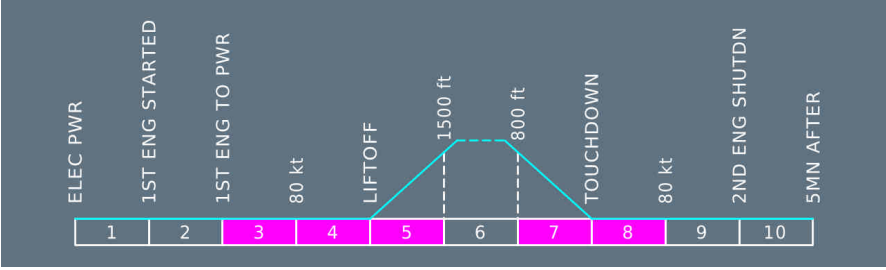
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers if the heating controller of the forward cargo compartment is failed.

Flight Phase Inhibition:



The diagram shows a flight profile across 10 phases. Phases 3, 4, 5, 6, 7, and 8 are highlighted in red. The profile starts at 80 kt, goes to 1500 ft, stays there until 800 ft, then descends to 80 kt. Vertical labels indicate: ELEC PWR (Phase 1), 1ST ENG STARTED (Phase 2), 1ST ENG TO PWR (Phase 3), 80 kt (Phase 4), LIFTOFF (Phase 5), 1500 ft (Phase 6), 800 ft (Phase 7), TOUCHDOWN (Phase 8), 80 kt (Phase 9), 2ND ENG SHUTDN (Phase 10), and 5MN AFTER (Phase 10).

Continued on the following page

COND FWD CRG HEAT FAULT (Cont'd)

13

Ident.: PRO-ABN-COND-N-00018040.0002001 / 06 NOV 25

Crew awareness.

14

Ident.: PRO-ABN-COND-N-00018041.0002001 / 06 NOV 25

STATUS

INOP SYS

FWD CRG HEAT

COND AFT CRG ISOL VALVE

Applicable to: MSN 02155-02789, 03031-04392, 07784-07792

15

Ident.: PRO-ABN-COND-M-00017335.0003001 / 06 NOV 25

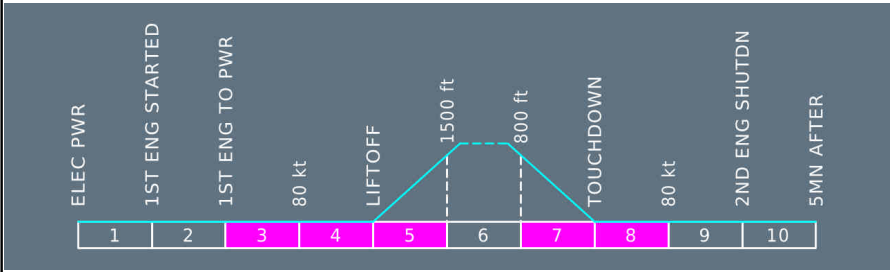
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers if the aft cargo isolation valve disagrees with the selected position.

Flight Phase Inhibition:



Continued on the following page

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES ABNORMAL AND EMERGENCY PROCEDURES COND
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COND AFT CRG ISOL VALVE (Cont'd)

16 Ident.: PRO-ABN-COND-M-00018042.0002001 / 06 NOV 25

Crew awareness.

17 Ident.: PRO-ABN-COND-M-00018043.0003001 / 06 NOV 25

STATUS

INOP SYS

AFT CRG HEAT 
FWD CRG HEAT 
AFT CRG VENT

**COND FWD(AFT) CRG ISOL VALVE **

Applicable to: MSN 02926-02944

18 Ident.: PRO-ABN-COND-M-00018042.0001001 / 21 MAR 16

Crew awareness.

COND FWD CRG ISOL VALVE

Applicable to: MSN 05152-05746

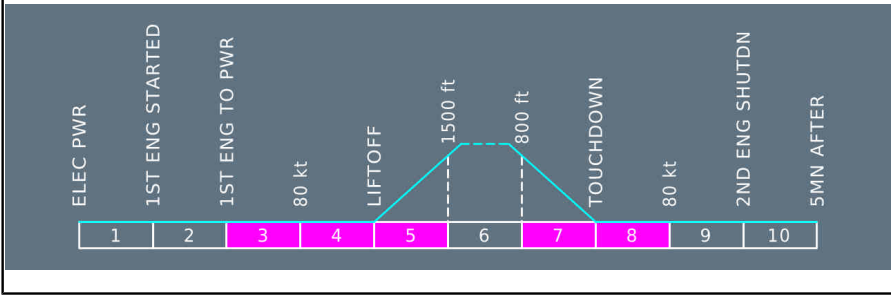
Ident.: PRO-ABN-COND-M-00017335.0002001 / 06 NOV 25

ANNUNCIATIONS

Triggering Conditions:

This alert triggers if the forward cargo isolation valve disagrees with the selected position.

Flight Phase Inhibition:



Ident.: PRO-ABN-COND-M-00018042.0002001 / 06 NOV 25

Crew awareness.

Ident.: PRO-ABN-COND-M-00018043.0002001 / 06 NOV 25

STATUS

INOP SYS

- AFT CRG HEAT 
 FWD CRG HEAT 
 FWD CRG VENT 

COND HOT AIR FAULT

Applicable to: ALL

Ident.: PRO-ABN-COND-I-00017296.0001001 / 03 NOV 22

ANNUNCIATIONS

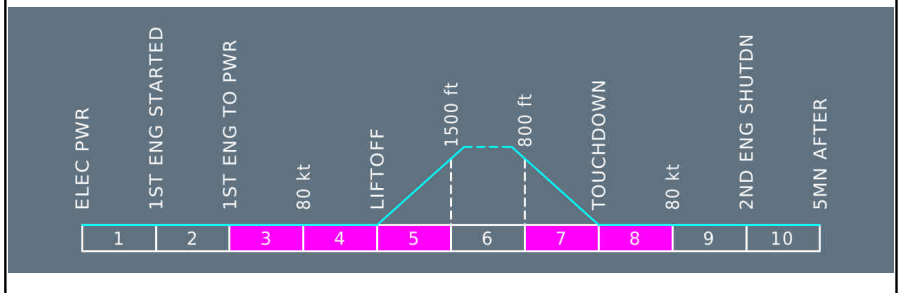
Triggering Conditions:

L2

This alert triggers when:

- The position of the hot air pressure regulating valve disagrees with the commanded position, or
- A duct overheat persists.

Flight Phase Inhibition:



Ident.: PRO-ABN-COND-I-00018940.0002001 / 03 NOV 22

- If HOT AIR not closed:

HOT AIR..... OFF

- If a duct overheat persists:

- IF HOT AIR STILL OPEN:

PACK 1..... OFF

PACK 2..... OFF

DES TO FL 100/MEA-MORA

L2

Descend to FL 100, or MEA-MORA, whichever is higher.

L1

- WHEN DIFF PR < 1 PSI AND FL BELOW 100:

RAM AIR..... ON

MAX FL..... 100/MEA-MORA

Continued on the following page

COND HOT AIR FAULT (Cont'd)

Ident.: PRO-ABN-COND-I-00018044.0001001 / 21 MAR 16

L12

STATUS

● **If HOT AIR closed only:**
CAB TEMP BY PACK ONLY
Basic temperature regulation by packs only (remains automatic).

INOP SYS
 PACK 1+2 (If PACKS OFF)
 HOT AIR
 FWD CRG HEAT 

COND L+R CAB FAN FAULT

Applicable to: ALL

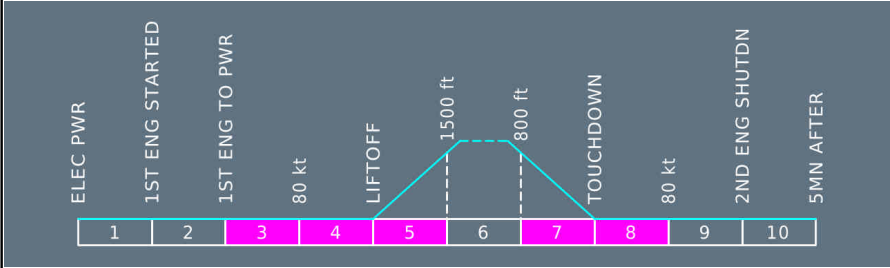
Ident.: PRO-ABN-COND-R-00017297.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

This alert triggers if both recirculation fans are failed.

Flight Phase Inhibition:



Ident.: PRO-ABN-COND-R-00018045.0001001 / 22 MAR 17

PACK FLOW.....HI

Continued on the following page

COND L+R CAB FAN FAULT (Cont'd)

Ident.: PRO-ABN-COND-R-00018046.0001001 / 21 MAR 16

STATUS

INOP SYS

L+R CAB FAN

COND LAV + GALLEY FAN FAULT

Applicable to: MSN 02155-02212

Ident.: PRO-ABN-COND-S-00017300.0001001 / 21 MAR 16

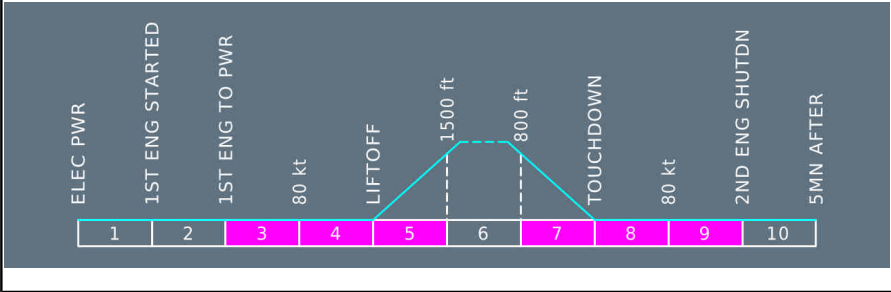
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers if the extraction fan of the lavatory and galley is failed.

Flight Phase Inhibition:



Ident.: PRO-ABN-COND-S-00010751.0002001 / 25 FEB 14

L2

Cabin zone temperature sensors are normally ventilated by the air extracted by the fan.
Therefore, cabin zone temperature regulation is lost.

L1

Crew awareness.

Continued on the following page

PIA A318/A319/A320/A321 FLEET

FCOM

← K to L →

PRO-ABN-COND P 13/20

09 FEB 26

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

COND

COND LAV + GALLEY FAN FAULT (Cont'd)

Ident.: PRO-ABN-COND-S-00010752.0002001 / 05 AUG 10

L12

STATUS

INOP SYS

CAB ZONE AT FIXED TEMP

GALLEY FAN

See ⁽¹⁾

- ⁽¹⁾
- Cabin zone inlet duct temperature is constant (15 °C or 59 °F).
 - Cockpit temperature regulation is normal.

COND LAV + GALLEY FAN FAULT

Applicable to: MSN 02719-07792

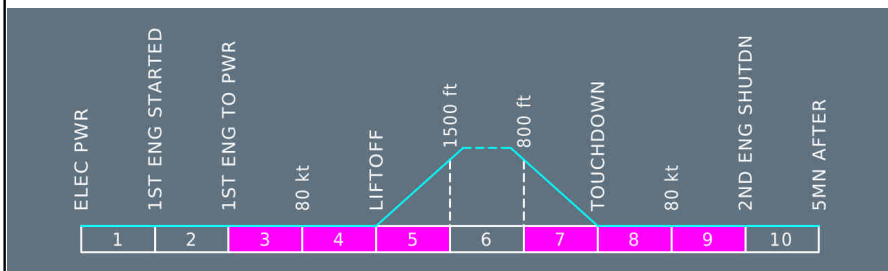
Ident.: PRO-ABN-COND-S-00017300.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers if the extraction fan of the lavatory and galley is failed.

Flight Phase Inhibition:



Continued on the following page

COND LAV + GALLEY FAN FAULT (Cont'd)

Ident.: PRO-ABN-COND-S-00010751.0002001 / 25 FEB 14

L2 Cabin zone temperature sensors are normally ventilated by the air extracted by the fan. Therefore, cabin zone temperature regulation is lost.

L1 Crew awareness.

Ident.: PRO-ABN-COND-S-00010752.0011001 / 05 AUG 10

L12
STATUS
INOP SYS
● If ACSC 2 is operative:
CAB TEMP CKPT CTL ONLY

- To adjust the cabin zone temperature, use the FWD CABIN and AFT CABIN zone temperature selectors (overhead panel). The selectors control the cabin duct temperature directly.
- Cockpit temperature regulation is normal.

● If ACSC 2 is inoperative:
CAB AT FIXED TEMP

- FWD CABIN and AFT CABIN zone temperature selectors are inoperative.
- To adjust the cabin zone temperature, use the COCKPIT zone temperature selector (overhead panel). Cabin duct temperature is the same as cockpit duct temperature.
- Cockpit temperature regulation is normal.

GALLEY FAN

 PACK 2 ⁽¹⁾

 COND CTL 2 ⁽¹⁾
⁽¹⁾ (If ACSC 2 is inoperative)

COND TRIM AIR SYS FAULT

Applicable to: ALL

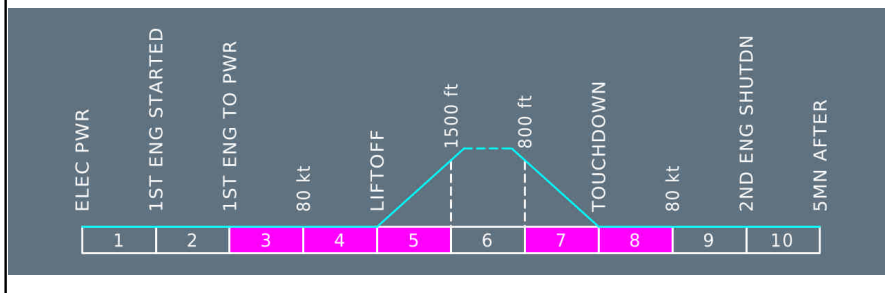
Ident.: PRO-ABN-COND-AI-00017305.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

- L2** This alert triggers when:
- One trim air valve is failed, or
 - There is an overpressure downstream of the hot air valve.

Flight Phase Inhibition:



Ident.: PRO-ABN-COND-AI-00010730.0001001 / 05 AUG 10

■ **One trim valve failed:**

A message corresponding to the affected valve is displayed:

AFT CAB TRIM VALVE
FWD CAB TRIM VALVE
CKPT TRIM VALVE

■ **High pressure detected downstream of the hot air pressure regulating valve:**

TRIM AIR HI PR

- L2** Note: If the warning and the TRIM AIR HI PR message are triggered when all trim air valves are closed (during the first 30 s after the packs are selected on, or in flight, if all zone heating demands are fulfilled), disregard them.

COND ZONE REGUL FAULT (PRIMARY CHANNEL FAILED)

Applicable to: MSN 02155-02212

Ident.: PRO-ABN-COND-P-00017309.0001001 / 21 MAR 16

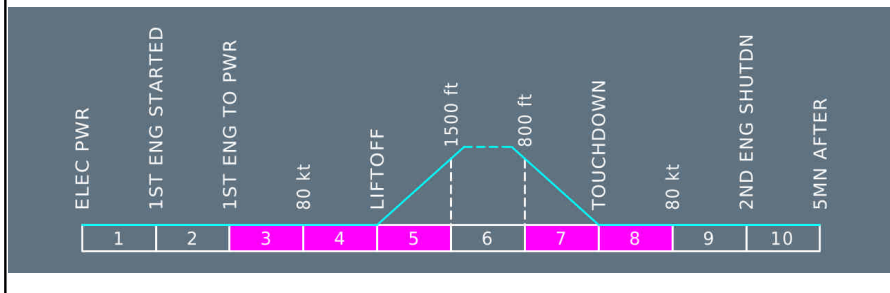
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the primary channel of the zone controller is failed.

Flight Phase Inhibition:



Ident.: PRO-ABN-COND-P-00010744.0001001 / 25 FEB 14

L2

The hot air pressure regulating valve and trim air valves close.

L1

Crew awareness.

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

COND

COND ZONE REGUL FAULT (Cont'd) (PRIMARY CHANNEL FAILED)

Ident.: PRO-ABN-COND-P-00018078.0001001 / 21 MAR 16

L12 STATUS

INOP SYS

CAB ZONE AT FIXED TEMP

FWD CRG HEAT 

See ⁽¹⁾

⁽¹⁾ The packs control zones to 24 °C (75 °F) via the zone controller secondary channel:

- Pack 1 controls the cockpit
- Pack 2 controls the cabin.

COND ZONE REGUL FAULT (PRIMARY AND SECONDARY CHANNELS FAILED)

Applicable to: MSN 02155-02212

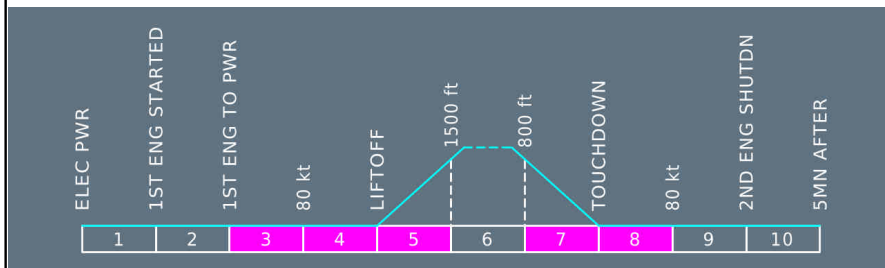
Ident.: PRO-ABN-COND-Q-00018304.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the primary and secondary channels of the zone controller are failed.

Flight Phase Inhibition:



Continued on the following page

COND ZONE REGUL FAULT (Cont'd)

(PRIMARY AND SECONDARY CHANNELS FAILED)

Ident.: PRO-ABN-COND-Q-00010746.0001001 / 25 FEB 14

L2

The hot air pressure regulating valve and trim air valves close.

L1

Crew awareness.

Ident.: PRO-ABN-COND-Q-00018081.0001001 / 21 MAR 16

L12

STATUS	
ENG 1 APPR IDLE ONLY ENG 2 APPR IDLE ONLY See ⁽¹⁾ PACKS AT FIXED TEMP See ⁽²⁾ ⁽¹⁾ As the FADEC no longer receives a bleed demand correction, only approach idle can be selected. ⁽²⁾ The packs are controlled to deliver a fixed temperature of 20 °C (68 °F) for pack 1, and 10 °C (50 °F) for pack 2.	
	INOP SYS ZONE REGUL FWD CRG HEAT 

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

COND

Intentionally left blank

CONFIG L(R) SIDESTICK FAULT
(BY TAKE OVER)

Applicable to: ALL

Ident.: PRO-ABN-CONFIG-AA-00018894.0001001 / 21 MAR 16

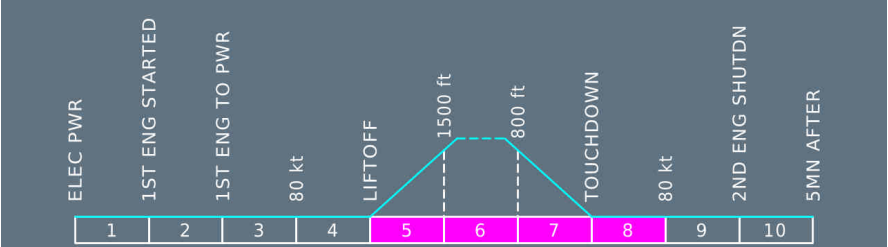
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the L or R sidestick is inoperative (takeover pb pressed more than 30 s) and when thrust levers are set at TO, or Flex TO, or when pressing T.O CONFIG pb.

Flight Phase Inhibition:



Ident.: PRO-ABN-CONFIG-AA-00018411.0001001 / 21 MAR 16

L(R) TAKEOVERDEPRESS

L2

The affected stick becomes operative.

PROCEDURES
ABNORMAL AND EMERGENCY PROCEDURES
CONFIG

CONFIG PARK BRK ON

Applicable to: ALL

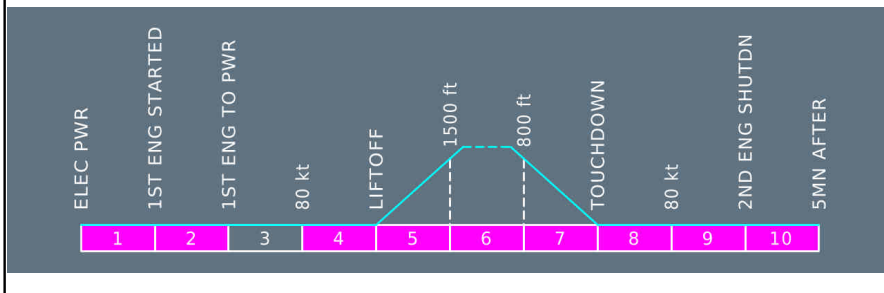
Ident.: PRO-ABN-CONFIG-Z-00017858.0002001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

- L2** This alert triggers when the parking brake is on and thrust levers are set at TO or FLXTO power position.

Flight Phase Inhibition:



Ident.: PRO-ABN-CONFIG-Z-00011302.0001001 / 05 AUG 10

- L2** Check that the parking brake handle is in the OFF position. If warning stays on, check that the brake pressure is at zero on the BRAKES PRESSURE indicator.

CONFIG PITCH TRIM NOT IN T.O RANGE

Applicable to: ALL

Ident.: PRO-ABN-CONFIG-AB-00018895.0001001 / 21 MAR 16

ANNUNCIATIONS

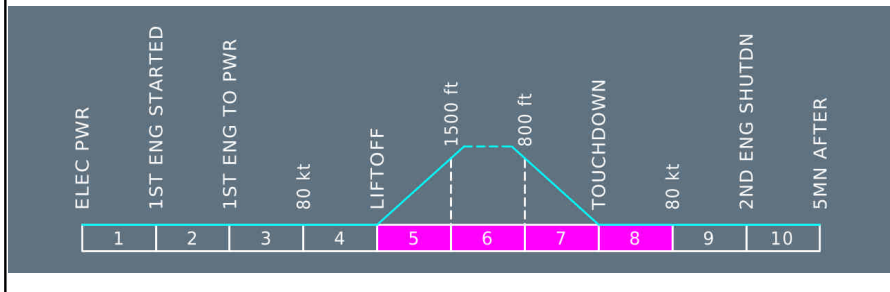
Triggering Conditions:

L2

If the PITCH TRIM is not in TO configuration, this alert triggers:

- when thrust levers are set at TO, or Flex TO, or
- when pressing T.O CONFIG pb.

Flight Phase Inhibition:



Ident.: PRO-ABN-CONFIG-AB-00011773.0001001 / 25 FEB 14

Crew awareness.

CONFIG RUD TRIM NOT IN T.O RANGE

Applicable to: ALL

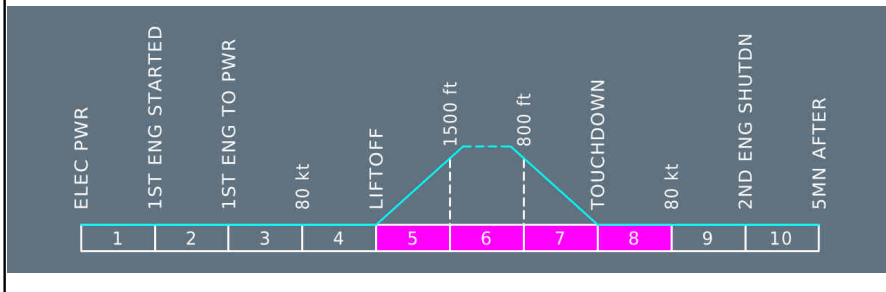
Ident.: PRO-ABN-CONFIG-AC-00018896.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

- L2** If the RUD TRIM is not in TO configuration, this alert triggers:
- when thrust levers are set at TO, or Flex TO, or
 - when pressing T.O CONFIG pb.

Flight Phase Inhibition:



Ident.: PRO-ABN-CONFIG-AC-00011776.0001001 / 25 FEB 14

Crew awareness.

CONFIG SLATS (FLAPS) NOT IN T.O CONFIG

Applicable to: ALL

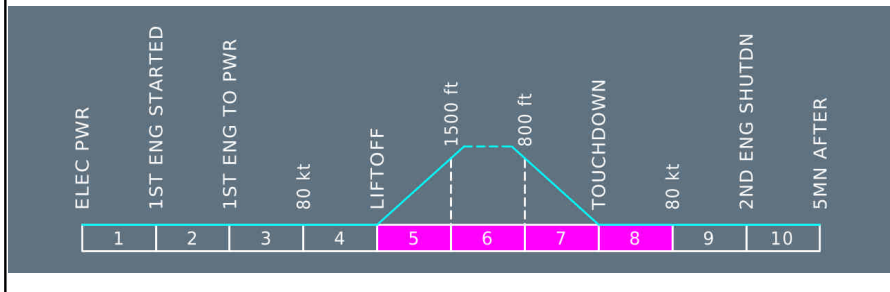
Ident.: PRO-ABN-CONFIG-AD-00018897.0001001 / 21 MAR 16

ANNUNCIATIONS
Triggering Conditions:

L2

If the slats or flaps are not in TO configuration, this alert triggers:

- when thrust levers are set at TO, or Flex TO, or
- when pressing T.O CONFIG pb.

Flight Phase Inhibition:


Ident.: PRO-ABN-CONFIG-AD-00011758.0001001 / 25 FEB 14

Crew awareness.

CONFIG SPD BRK NOT RETRACTED

Applicable to: ALL

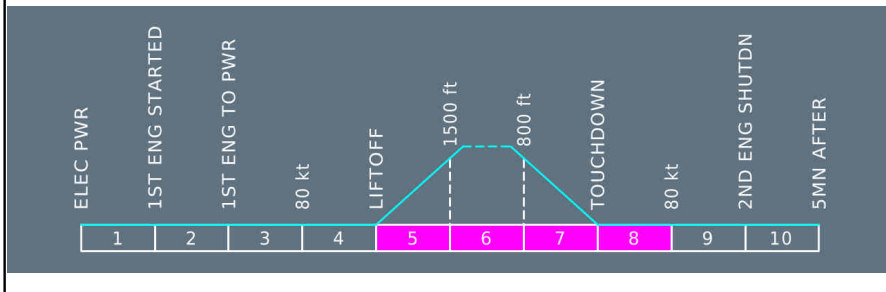
Ident.: PRO-ABN-CONFIG-AE-00018898.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

- L2** If the speed brakes are not retracted, this alert triggers:
- when thrust levers are set at TO, or Flex TO, or
 - when pressing T.O CONFIG pb.

Flight Phase Inhibition:



Ident.: PRO-ABN-CONFIG-AE-00011766.0001001 / 09 FEB 16

Crew awareness.

DATALINK ATC FAULT

Applicable to: MSN 02719-02789, 03031-03060, 05152-07792

Ident.: PRO-ABN-DATALINK-B-00017149.0001001 / 21 MAR 16

ANNUNCIATIONS

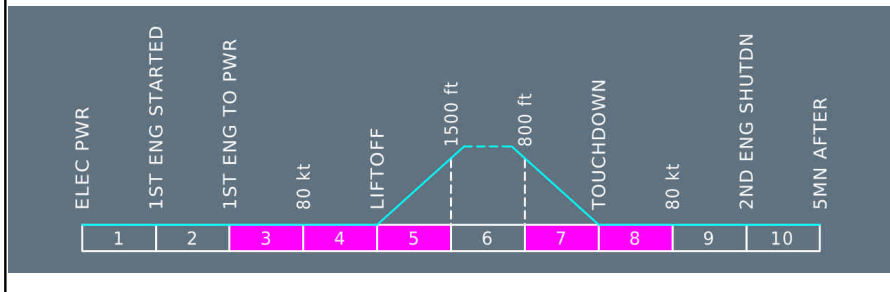
Triggering Conditions:

L2

This alert triggers when:

- The ATC datalink communications is failed, or
- The ATC datalink application is lost.

Flight Phase Inhibition:



Ident.: PRO-ABN-DATALINK-B-00018460.0001001 / 21 MAR 16

Crew awareness.

ATC COM VOICE ONLY

Ident.: PRO-ABN-DATALINK-B-00018461.0001001 / 21 MAR 16

STATUS

INOP SYS

ATC COM VOICE ONLY

DATALINK ATC

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

DATALINK

DATALINK ATSU FAULT

Applicable to: MSN 02155-02212, 02926-02944, 04392

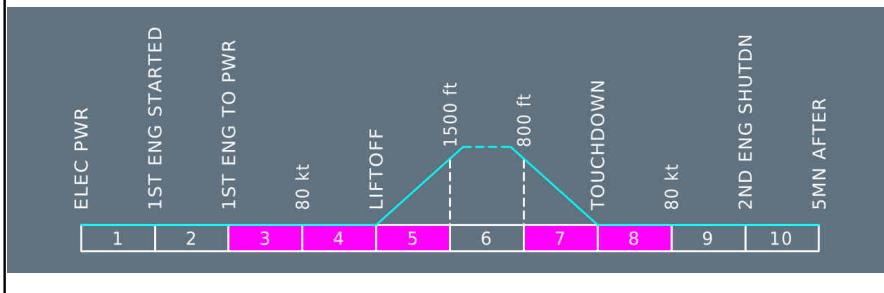
Ident.: PRO-ABN-DATALINK-A-00017150.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

- L2** This alert triggers when there is a failure in ATSU initialization associated with ATSU INIT FAULT ECAM message.

Flight Phase Inhibition:



Ident.: PRO-ABN-DATALINK-A-00018462.0001001 / 21 MAR 17

Crew awareness.

ATSU INIT FAULT

- L2** Displayed, in case of failure upon ATSU initialization. Refer to DSC-46-10-50 How to Initialize.

Ident.: PRO-ABN-DATALINK-A-00018463.0001001 / 21 MAR 16

STATUS

INOP SYS

ATSU
DATA COMPANY

DATALINK ATSU FAULT

Applicable to: MSN 02719-02789, 03031-03060, 05152-07792

Ident.: PRO-ABN-DATALINK-A-00017150.0001001 / 21 MAR 16

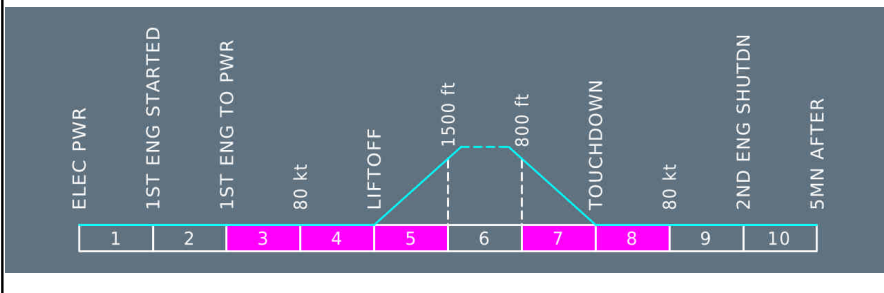
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when there is a failure in ATSU initialization associated with ATSU INIT FAULT ECAM message.

Flight Phase Inhibition:



Ident.: PRO-ABN-DATALINK-A-00018462.0001001 / 21 MAR 17

Crew awareness.

ATSU INIT FAULT

L2

Displayed, in case of failure upon ATSU initialization. Refer to DSC-46-10-50 How to Initialize.

Ident.: PRO-ABN-DATALINK-A-00018463.0002001 / 21 MAR 16

STATUS

ATC COM VOICE ONLY

INOP SYS

ATSU
 DATALINK ATC
 DATA COMPANY

DATALINK COMPANY FAULT

Applicable to: ALL

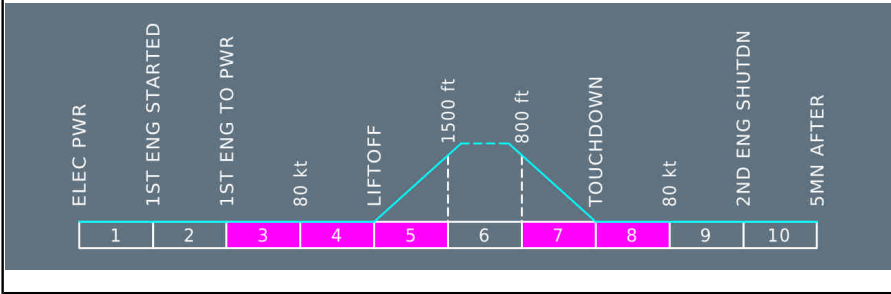
Ident.: PRO-ABN-DATALINK-C-00017151.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when there is a failure in the AOC datalink communications.

Flight Phase Inhibition:



Ident.: PRO-ABN-DATALINK-C-00018458.0001001 / 21 MAR 16

Crew awareness.

Ident.: PRO-ABN-DATALINK-C-00018459.0001001 / 21 MAR 16

STATUS

INOP SYS

DATA COMPANY

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES ABNORMAL AND EMERGENCY PROCEDURES DOOR
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[QRH] COCKPIT DOOR FAULT	
Ident.: PRO-ABN-DOOR-00009968.0003001 / 17 MAR 17	
Applicable to: ALL	
CKPT DOOR CONT [OVHD PANEL] CHECK ● If one or more STRIKE status light on: COCKPIT DOOR..... OPEN COCKPIT DOOR sw UNLOCK 10 s THEN NORM ● If two or more STRIKE status lights on: COCKPIT DOOR NOT INTRUSION PROOF. ● If two CHAN status lights on: Automatic latch release is not available, in case of cockpit decompression. ● If no status light on: TO UNLOCK THE DOOR: COCKPIT DOOR HANDLE AVAIL	

DOOR L(R)(FWD)(AFT) AVIONICS
 (IN FLIGHT)

Applicable to: ALL

Ident.: PRO-ABN-DOOR-A-00016888.0001001 / 21 MAR 16

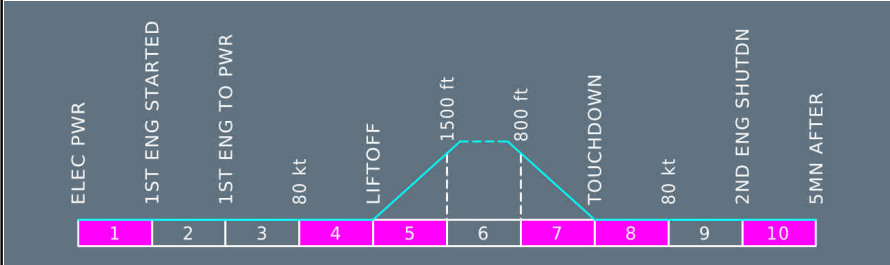
ANNUNCIATIONS

Triggering Conditions:

- L2

 This alert triggers when the L(R)(FWD)(AFT) avionics door is not detected closed by the proximity sensors.

Flight Phase Inhibition:



Ident.: PRO-ABN-DOOR-A-00018945.0004001 / 21 MAR 16

- L2

 No crew action required as long as cabin pressure is normal.

- L1

 ● IF ABN CAB V/S:

MAX FL.....100/MEA-MORA
- L2

 Limit maximum flight level to FL 100, MEA-MORA, or minimum obstacle clearance altitude. Avionics doors are of plug type. Therefore full depressurization is not recommended.

Ident.: PRO-ABN-DOOR-A-00018944.0003001 / 21 MAR 16

STATUS

- IF ABN CAB V/S:

MAX FL..... 100/MEA-MORA

DOOR L(R)(FWD)(AFT) AVIONICS (ON GROUND)

Applicable to: ALL

Ident.: PRO-ABN-DOOR-C-00019100.0001001 / 21 MAR 16

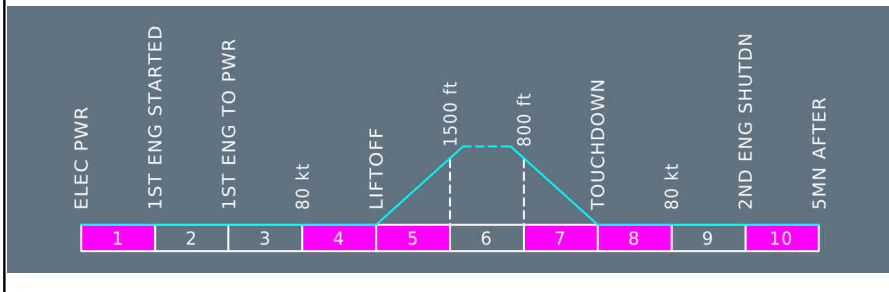
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the L(R)(FWD)(AFT) avionics door is not detected closed by the proximity sensors.

Flight Phase Inhibition:



Ident.: PRO-ABN-DOOR-C-00019096.0001001 / 21 MAR 16

Crew awareness.

DOOR L(R) FWD(AFT) CABIN
 (IN FLIGHT)

Applicable to: ALL

Ident.: PRO-ABN-DOOR-D-00019103.0001001 / 21 MAR 16

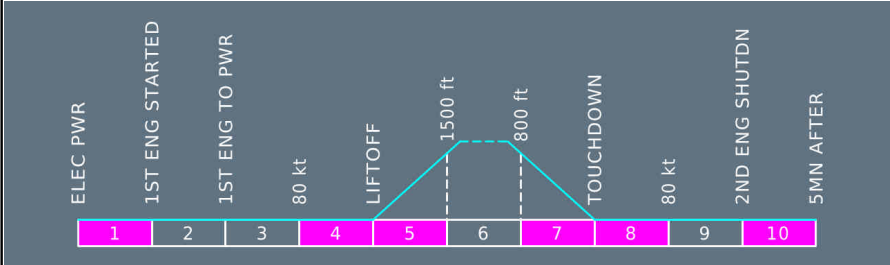
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the L(R) FWD(AFT) cabin door is not detected closed by the proximity sensors.

Flight Phase Inhibition:



Ident.: PRO-ABN-DOOR-D-00019101.0002001 / 21 MAR 16

No crew action required as long as cabin pressure is normal.

- IF ABN CAB V/S:
 MAX FL.....100/MEA-MORA

L2

Limit maximum flight level to FL 100, MEA-MORA, or minimum obstacle clearance altitude.
 If door warning is accompanied by abnormal increase of cabin altitude, flight crew must reduce cabin ΔP and altitude by descending.

Ident.: PRO-ABN-DOOR-D-00019104.0003001 / 21 MAR 16

STATUS

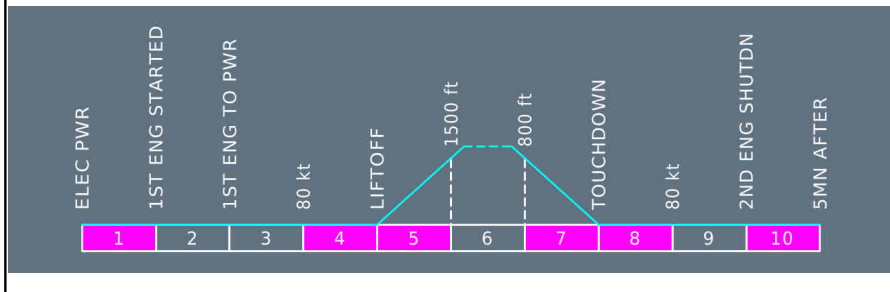
- IF ABN CAB V/S:
 MAX FL..... 100/MEA-MORA

DOOR L(R) FWD(AFT) CABIN
(ON GROUND)
Applicable to: ALL

Ident.: PRO-ABN-DOOR-E-00019106.0001001 / 21 MAR 16

ANNUNCIATIONS
Triggering Conditions:
L2

This alert triggers when the L(R) FWD(AFT) cabin door is not detected closed by the proximity sensors.

Flight Phase Inhibition:


Ident.: PRO-ABN-DOOR-E-00019102.0001001 / 21 MAR 16

L2

The crew may confirm a cabin door warning by checking the visual indicator on the door.

L1

Crew awareness.

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

DOOR

DOOR L(R) FWD(AFT) EMER EXIT (IN FLIGHT)

Applicable to: ALL

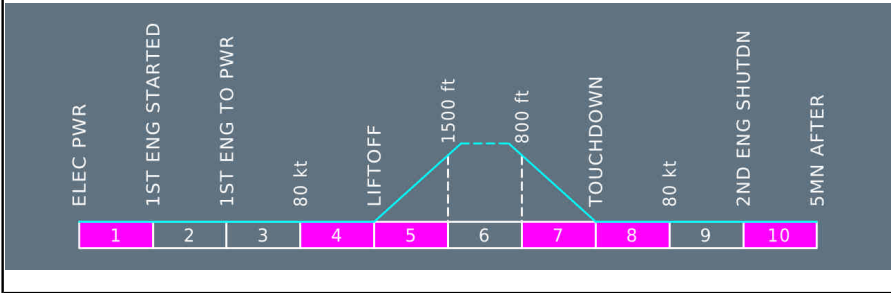
Ident.: PRO-ABN-DOOR-F-00019121.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

- L2
- This alert triggers when the L(R) FWD(AFT) emergency exit door is not detected closed by the proximity sensors.

Flight Phase Inhibition:



Ident.: PRO-ABN-DOOR-F-00019120.0003001 / 21 MAR 16

No crew action required as long as cabin pressure is normal.

● IF ABN CAB V/S:

MAX FL.....100/MEA-MORA

- L2
- Limit maximum flight level to FL 100, MEA-MORA, or minimum obstacle clearance altitude.
 If door warning is accompanied by abnormal increase of cabin altitude, flight crew must reduce cabin ΔP and altitude by descending.

Ident.: PRO-ABN-DOOR-F-00019122.0009001 / 21 MAR 16

STATUS

● IF ABN CAB V/S:

MAX FL..... 100/MEA-MORA

DOOR L(R) FWD(AFT) EMER EXIT (ON GROUND)

Applicable to: ALL

Ident.: PRO-ABN-DOOR-G-00019125.0001001 / 21 MAR 16

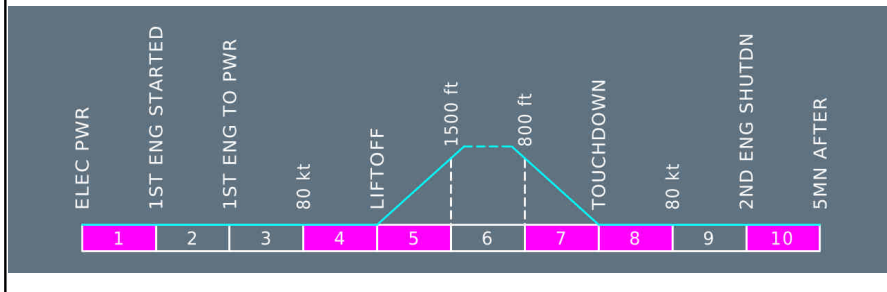
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the L(R) FWD(AFT) emergency exit door is not detected closed by the proximity sensors.

Flight Phase Inhibition:



Ident.: PRO-ABN-DOOR-G-00019124.0001001 / 21 MAR 16

L2

The crew may confirm an emergency exit door warning by checking the visual indicator on the door.

L1

Crew awareness.

DOOR FWD(AFT)(BULK) CARGO
 (IN FLIGHT)

Applicable to: ALL

Ident.: PRO-ABN-DOOR-B-00016890.0001001 / 21 MAR 16

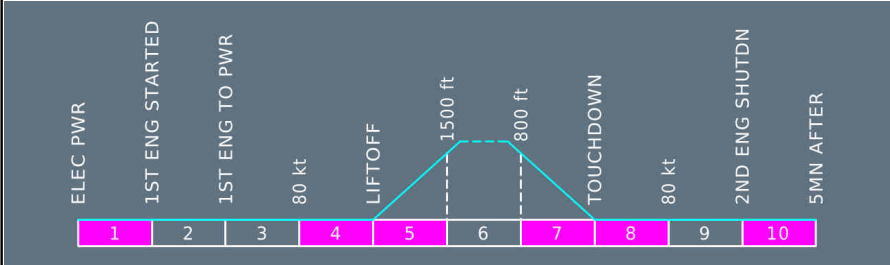
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the FWD(AFT)(BULK) cargo door is not detected closed by the proximity sensors.

Flight Phase Inhibition:



Ident.: PRO-ABN-DOOR-B-00019126.0002001 / 21 MAR 16

No crew action required as long as cabin pressure is normal.

- IF ABN CAB V/S:
 MAX FL.....100/MEA-MORA

L2

Limit maximum flight level to FL 100, MEA-MORA, or minimum obstacle clearance altitude.
 If door warning is accompanied by abnormal increase of cabin altitude, flight crew must reduce cabin ΔP and altitude by descending.

Ident.: PRO-ABN-DOOR-B-00018946.0003001 / 21 MAR 16

STATUS

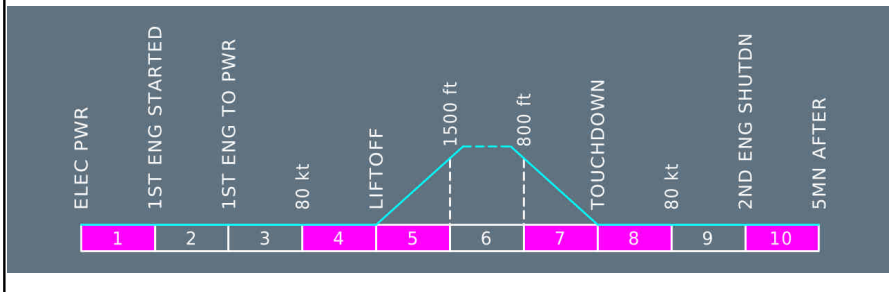
- IF ABN CAB V/S:
 MAX FL..... 100/MEA-MORA

DOOR FWD(AFT)(BULK) CARGO
(ON GROUND)
Applicable to: ALL

Ident.: PRO-ABN-DOOR-H-00019129.0001001 / 21 MAR 16

ANNUNCIATIONS
Triggering Conditions:
L2

This alert triggers when the FWD(AFT)(BULK) cargo door is not detected closed by the proximity sensors.

Flight Phase Inhibition:


Ident.: PRO-ABN-DOOR-H-00018947.0002001 / 21 MAR 16

L2

The crew may confirm a cargo door warning by checking the indication on the cargo door.

L1

Crew awareness.

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

DOOR

Intentionally left blank

[QRH] DISPLAY UNIT FAILURE

Ident.: PRO-ABN-EIS-00021170.0005001 / 13 MAY 25

Applicable to: MSN 07784-07792

■ If DU flashes:

This phenomenon may be due to Intermittent Electrical Power Supply Interruptions. One or a combination of the following occurs:

- Flashing of PFD, ND, ECAM DUs (blank screen or INVALID DATA message),
- Flashing of MCDU,
- Intermittent flight control law reversion.

■ If captain PFD, ND, ECAM DUs or MCDU 1 affected:

GEN 1.....OFF

■ If DUs flash continues :

GEN 1.....ON

■ If DUs flash stops :

KEEP GEN 1 OFF

Keep the generator OFF for the remainder of the flight.

RUD TRIM.....CHECK/RESET

Use the sideslip indication to reset the rudder trim if necessary. Intermittent Electrical Power Supply Interruptions may cause offset in the rudder trim.

APU START.....CONSIDER

■ If first officer PFD, ND, lower ECAM or MCDU 2 affected:

GEN 2.....OFF

■ If DUs flash continues:

GEN 2.....ON

■ If DUs flash stops:

KEEP GEN 2 OFF

Keep the generator OFF for the remainder of the flight.

RUD TRIM.....CHECK/RESET

Use the sideslip indication to reset the rudder trim if necessary. Intermittent Electrical Power Supply Interruptions may cause offset in the rudder trim.

APU START.....CONSIDER

■ If DU blank (with or without large F), or distorted, or brightness reduced to minimum:

DU brightness knob (affected DU).....OFF THEN ON

Continued on the following page

[QRH] DISPLAY UNIT FAILURE (Cont'd)

Display recovers after 10 s.

● **If DU not recovered:**

DU brightness knob (affected DU)..... AS RQRD

The DU can be switched off.

ECAM/ND XFR..... CONSIDER

PF D/ND XFR..... CONSIDER

■ **If INVALID DISPLAY UNIT message displayed:**

This may be caused by a DU failure.

WAIT AT LEAST 40 s FOR AUTOMATIC DU RECOVERY

● **If DU not recovered:**

DU brightness knob (affected DU)..... AS RQRD

The DU can be switched off.

■ **If INVALID DATA message displayed (not on all DUs):**

EIS DMC SWITCHING..... CONSIDER

● **If DU not recovered:**

DU brightness knob (affected DU)..... OFF THEN ON

■ **If INVALID DATA message displayed on all DUs:**

AP, A/THR AND MCDU NAVIGATION DATA AVAILABLE

WAIT AT LEAST 40 s FOR AUTOMATIC DU RECOVERY

● **If one or more DUs not recovered:**

DUs brightness knob (all affected DUs)..... OFF

WAIT AT LEAST 40 s

DUs brightness knob (one by one)..... ON

● **If INVALID DATA message displayed on all DUs, when switching a given DU back ON:**

FAULTY DU brightness knob..... OFF AND KEEP OFF

REPEAT PROCEDURE

Repeat the procedure starting at: If INVALID DATA message displayed on all DUs.

■ **If inversion of E/WD and SD:**

ECAM UPPER DISPLAY brightness knob..... OFF THEN ON

The same action on the ECAM LOWER DISPLAY brightness knob has the same effect.

[QRH] DISPLAY UNIT FAILURE

Ident.: PRO-ABN-EIS-00021170.0002001 / 13 MAY 25

Applicable to: MSN 02155-05746

■ **If DU flashes:**

This phenomenon may be due to Intermittent Electrical Power Supply Interruptions. One or a combination of the following occurs:

- Flashing of PFD, ND, ECAM DUs (blank screen or INVALID DATA message),
- Flashing of MCDU,
- Intermittent flight control law reversion.

■ **If captain PFD, ND, ECAM DUs or MCDU 1 affected:**

GEN 1.....OFF

■ **If DUs flash continues :**

GEN 1.....ON

■ **If DUs flash stops :**

KEEP GEN 1 OFF

Keep the generator OFF for the remainder of the flight.

RUD TRIM.....CHECK/RESET

Use the sideslip indication to reset the rudder trim if necessary. Intermittent Electrical Power Supply Interruptions may cause offset in the rudder trim.

APU START.....CONSIDER

■ **If first officer PFD, ND, lower ECAM or MCDU 2 affected:**

GEN 2.....OFF

■ **If DUs flash continues:**

GEN 2.....ON

■ **If DUs flash stops:**

KEEP GEN 2 OFF

Keep the generator OFF for the remainder of the flight.

RUD TRIM.....CHECK/RESET

Use the sideslip indication to reset the rudder trim if necessary. Intermittent Electrical Power Supply Interruptions may cause offset in the rudder trim.

APU START.....CONSIDER

■ **If DU blank (with or without large F), or distorted:**

DU brightness knob (affected DU).....AS RQRD

Continued on the following page

[QRH] DISPLAY UNIT FAILURE (Cont'd)

The DU can be switched off.

ECAM/ND XFR.....CONSIDER

PFD/ND XFR.....CONSIDER

■ **If INVALID DISPLAY UNIT message displayed:**

This may be caused by a DU failure.

WAIT AT LEAST 40 s FOR AUTOMATIC DU RECOVERY

● **If DU not recovered:**

DU brightness knob..... AS RQRD

The DU can be switched off.

■ **If INVALID DATA message displayed (not on all DUs):**

EIS DMC SWITCHING..... CONSIDER

● **If DU not recovered:**

DU brightness knob (affected DU)..... OFF THEN ON

■ **If INVALID DATA message displayed on all DUs:**

AP, A/THR AND MCDU NAVIGATION DATA AVAILABLE

WAIT AT LEAST 40 s FOR AUTOMATIC DU RECOVERY

● **If one or more DUs not recovered:**

DUs brightness knob (all affected DUs)..... OFF

WAIT AT LEAST 40 s

DUs brightness knob (one by one).....ON

● **If INVALID DATA message displayed on all DUs, when switching a given DU back ON:**

FAULTY DU brightness knob..... OFF AND KEEP OFF

REPEAT PROCEDURE

Repeat the procedure starting at: If INVALID DATA message displayed on all DUs.

■ **If inversion of E/WD and SD:**

ECAM UPPER DISPLAY brightness knob.....OFF THEN ON

The same action on the ECAM LOWER DISPLAY brightness knob has the same effect.

EIS DMC 1(2)(3) FAULT

Applicable to: ALL

Ident.: PRO-ABN-EIS-F-00017307.0002001 / 21 MAR 16

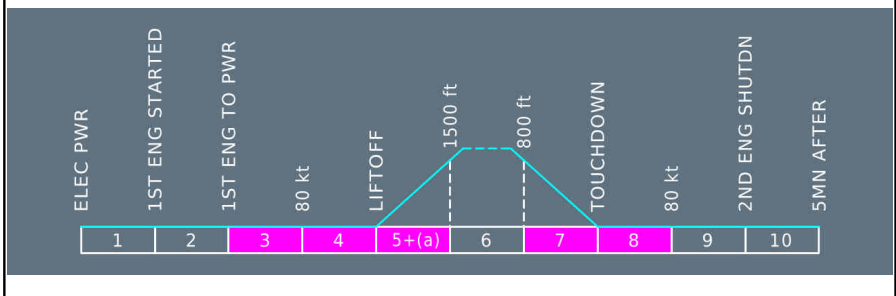
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when DMC 1, or DMC 2, or DMC 3 is failed.

Flight Phase Inhibition:


 L1 **Note:** (a) Inhibited only during first 15 s of Flight Phase 5.

Ident.: PRO-ABN-EIS-F-00010057.0002001 / 10 AUG 10

■ DMC 1

EIS DMC SWITCH CAPT 3

L2

DMC 3 replaces DMC 1.

L1

■ DMC 2

EIS DMC SWITCH..... F/O 3

L2

DMC 3 replaces DMC 2.

L1

■ DMC 3

Crew awareness.

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

EIS

EIS DMC 1(2)(3) FAULT (Cont'd)

Ident.: PRO-ABN-EIS-F-00010058.0001001 / 10 AUG 10

STATUS

INOP SYS

DMC 1(2)(3)

EIS DMC/FWC COM FAULT

Applicable to: ALL

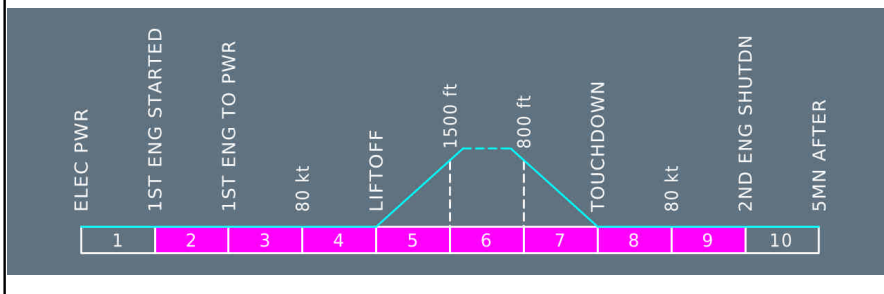
Ident.: PRO-ABN-EIS-I-00017317.0002001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

- [L2]** This alert triggers when at least one of the FWC detects the loss of both DMC1/3 and DMC2/3 busses.

Flight Phase Inhibition:



Ident.: PRO-ABN-EIS-I-00014308.0001001 / 25 FEB 14

Crew awareness.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES ABNORMAL AND EMERGENCY PROCEDURES ELEC
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[QRH] C/B TRIPPED

Ident.: PRO-ABN-ELEC-00012643.0001001 / 17 MAR 17

Applicable to: ALL

■ **On ground:**

Do not reengage the circuit breaker (C/B) of the fuel pump(s) of any tank. For all other C/B, if the flight crew coordinates the action with maintenance, the flight crew may reengage a tripped C/B, provided that the cause is identified.

■ **In flight:**

Do not reengage a circuit breaker (C/B), unless the captain judges it necessary to do so for the safe continuation of the flight. Only one reengagement should be attempted.

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

ELEC

[QRH] ELEC EMER CONFIG SYS REMAINING

Applicable to: MSN 02155-02212

ELEC EMER CONFIG SYS REMAINING	EMER GEN RUNNING	BAT ONLY	
		IN FLIGHT	ON THE GROUND

Ident.: PRO-ABN-ELEC-S-00018562.0008001 / 17 MAR 17

AIR COND PRESS	PRESS AUTO SYS 1	NORM	NORM	NORM
	MAN PRESS CTL	INOP	INOP	INOP ^(a)
	RAM AIR	NORM	NORM	NORM
	PACK VALVE 1	NORM	Closure Inop	Closure Inop
	PACK VALVE 2	Closure Inop	Closure Inop	Closure Inop ^(a)
	AVIONIC VENT	NORM	NORM	Partial
	AFT CRG ISOL VALVES	NORM	INOP	INOP
	AFT CRG HEAT	NORM	INOP	INOP

Ident.: PRO-ABN-ELEC-S-00012522.0001001 / 17 MAR 17

FMGS	FMGC (NAV FUNCTION)	N°1 only	Inop	Inop
	MCDU	N°1 only	Inop	Inop
	FAC	N°1 only	Inop	Inop
	FCU	ch 1 only	ch 1 only	ch 1 only

Ident.: PRO-ABN-ELEC-S-00018533.0002001 / 17 MAR 17

COM	VHF 1	NORM	NORM	NORM
	HF 1	NORM	INOP	INOP
	RMP 1	NORM	NORM	NORM
	ACP (CAPT, F/O)	NORM	NORM	NORM
	CIDS	NORM	NORM	NORM
	INTERPHONE	NORM	NORM	NORM
	CVR	NORM	INOP	INOP
	LOUDSPEAKER 1	NORM	NORM	NORM

Ident.: PRO-ABN-ELEC-S-00012524.0001001 / 17 MAR 17

EMER EQPT	CREW OXY	NORM	NORM ^(b)	NORM ^(b)
	PAX OXY mask release (auto + man)	NORM	INOP	INOP
	SLIDES ARM/WARN	NORM	NORM	NORM

Continued on the following page

PROCEDURES **ABNORMAL AND EMERGENCY PROCEDURES**

ELEC
Continued from the previous page

ELEC EMER CONFIG SYS REMAINING	EMER GEN RUNNING	BAT ONLY	
		IN FLIGHT	ON THE GROUND

Ident.: PRO-ABN-ELEC-S-00012525.0002001 / 17 MAR 17

FIRE	ENG 1 LOOP	A only	A only	A only
	ENG 2 LOOP	B only	B only	B only
	APU LOOP	INOP	INOP	INOP ^(a)
	CARGO SMOKE DET	ch 1 only	INOP	INOP
	ENG FIRE EXT.	Bottle 1 only	Bottle 1 only	Bottle 1 only
	APU FIRE EXT.	Squib A only	Squib A only	Squib A only
	CARGO FIRE EXT.	INOP	INOP	INOP ^(a)
	APU AUTO EXT.	INOP	INOP	INOP ^(a)

Ident.: PRO-ABN-ELEC-S-00018017.0001001 / 17 MAR 17

FLT CTL	ELAC	N°1 only	N°1 + N°2	N°1 + N°2 ^(d)
	SEC	N°1 only	N°1 only	N°1 only
	FCDC	N°1 only	INOP	INOP
	SFCC	N°1 only	N°1 only	N°1 only
	Flaps pos ind	NORM	NORM	NORM ^(c)

Ident.: PRO-ABN-ELEC-S-00018018.0001001 / 17 MAR 17

FUEL	LP VALVE	NORM	NORM	NORM
	FQI channel 1	NORM	INOP	INOP
	X FEED VALVE	NORM	INOP	INOP
	INTERTANK TRANSFER VALVE	NORM	INOP	INOP

Ident.: PRO-ABN-ELEC-S-00012528.0001001 / 17 MAR 17

HYD	FIRE VALVES	NORM	NORM	NORM
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Ident.: PRO-ABN-ELEC-S-00018539.0002001 / 17 MAR 17

ICE-RAIN	WING A.ICE	NORM	INOP	INOP
	ENG A.ICE VALVE	OPEN	OPEN	OPEN
	CAPT PITOT	NORM	NORM	NORM ^(c)
	CAPT AOA	NORM	INOP	INOP
	RAIN REPELLENT (CAPT) 	NORM	NORM	NORM

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

ELEC

Continued from the previous page

ELEC EMER CONFIG SYS REMAINING	EMER GEN RUNNING	BAT ONLY	
		IN FLIGHT	ON THE GROUND

Ident.: PRO-ABN-ELEC-S-00018538.0002001 / 17 MAR 17

EIS	PFD 1	NORM	NORM	NORM ^(c)
	ND 1	NORM	INOP	INOP
	ECAM upper disp.	NORM	NORM	NORM ^(c)
	DMC 1 or 3	NORM	NORM	NORM ^(c)
	SDAC 1, FWC 1	NORM	NORM	NORM ^(c)
	ECAM CONT. panel	NORM	NORM	NORM
FLT INS	CLOCKS	NORM	NORM	NORM

Ident.: PRO-ABN-ELEC-S-00018537.0001001 / 17 MAR 17

L/G	LGCIU SYS 1	NORM	NORM	NORM
	BRK PRESS IND	NORM	NORM	NORM
	PARK BRK	NORM	NORM	NORM

Ident.: PRO-ABN-ELEC-S-00012532.0001001 / 17 MAR 17

LIGHTS	EMER CKPT	NORM	NORM	NORM
	EMER CAB	NORM	NORM	NORM

Ident.: PRO-ABN-ELEC-S-00018550.0005001 / 17 MAR 17

NAV	IR	N°1 only ^(e)	N°1 only ^(e)	N°1 only ^(e)
	ADR	N°1 only	N°1 only	N°1 only
	ADF 	N°1 only	INOP	INOP
	VOR	N°1 only	N°1 only	N°1 only ^(c)
	MMR	N°1 only	N°1 only	N°1 only ^(c)
	DME	N°1 only	INOP	INOP
	DDRMI 	NORM	NORM	NORM ^(c)
	ATC	N°1 only	INOP	INOP
	ISIS	NORM	NORM	NORM

Ident.: PRO-ABN-ELEC-S-00018541.0002001 / 17 MAR 17

PNEU	ENG 1 BLEED	NORM	BMC 1 INOP	BMC 1 INOP
	ENG 2 BLEED	BMC 2 INOP	BMC 2 INOP	BMC 2 INOP
	APU BLEED	INOP	INOP	INOP ^(a)
	X BLEED (MAN CTL)	NORM	INOP	INOP

Ident.: PRO-ABN-ELEC-S-00018019.0002001 / 17 MAR 17

APU	ECB-STARTER	NORM ^(f)	NORM ^(g)	INOP ^(a)
	FUEL LP VALVE	NORM	NORM	NORM
	FUEL PUMP	NORM	NORM	NORM

Continued on the following page

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES ABNORMAL AND EMERGENCY PROCEDURES ELEC
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Continued from the previous page

ELEC EMER CONFIG SYS REMAINING	EMER GEN RUNNING	BAT ONLY	
		IN FLIGHT	ON THE GROUND

Ident.: PRO-ABN-ELEC-S-00018540.0002001 / 17 MAR 17

PWR PLT	FADEC	A+B ^(h)	A+B ^(h)	A+B ^(h)
	IGNITION	A only	A only	A only
	HP FUEL VALVE closure	NORM	NORM	NORM

Ident.: PRO-ABN-ELEC-S-00012537.0001001 / 17 MAR 17

MISC	MECH HORN	NORM	NORM	NORM
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- (a) *Restored, when speed is below 100 kt.*
- (b) *Crew supply solenoid valve inoperative.*
- (c) *Lost, when the speed is below 50 kt.*
- (d) *Lost, 30 s after the last engine shutdown.*
- (e) *IR 2 and IR 3 are lost 5 min after failure of main generators but if IR 3 replaces IR 1 (ATT-HDG selector at CAPT 3), IR 3 remains supplied.*
- (f) *For APU start only.*
- (g) *Not available for 45 s, after the loss of both engine generators.*
- (h) *Channels A and B are self powered above 10 % N2 for IAE or PW engines, 12 % N2 for CFM56 engines, or 8 % N2 for CFM LEAP-1A engines. If N2 is below these values, only Channel A is powered.*

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

ELEC

[QRH] ELEC EMER CONFIG SYS REMAINING

Applicable to: MSN 02719-02789, 03031-04392

ELEC EMER CONFIG SYS REMAINING	EMER GEN RUNNING	BAT ONLY	
		IN FLIGHT	ON THE GROUND

Ident.: PRO-ABN-ELEC-S-00018562.0015001 / 06 NOV 25

AIR COND PRESS	PRESS AUTO SYS 1	NORM	NORM	NORM
	MAN PRESS CTL	INOP	INOP	INOP ^(a)
	RAM AIR	NORM	NORM	NORM
	PACK VALVE 1	NORM ^(b) / Closure INOP ^(c)	Closure INOP	Closure INOP
	PACK VALVE 2	Closure INOP	Closure INOP	Closure INOP ^(a)
	AVIONIC VENT	NORM	NORM	Partial
	AFT CRG ISOL VALVES	NORM	INOP	INOP
	AFT CRG HEAT	NORM	INOP	INOP

Ident.: PRO-ABN-ELEC-S-00012522.0001001 / 17 MAR 17

FMGS	FMGC (NAV FUNCTION)	N°1 only	Inop	Inop
	MCDU	N°1 only	Inop	Inop
	FAC	N°1 only	Inop	Inop
	FCU	ch 1 only	ch 1 only	ch 1 only

Ident.: PRO-ABN-ELEC-S-00018533.0002001 / 17 MAR 17

COM	VHF 1	NORM	NORM	NORM
	HF 1	NORM	INOP	INOP
	RMP 1	NORM	NORM	NORM
	ACP (CAPT, F/O)	NORM	NORM	NORM
	CIDS	NORM	NORM	NORM
	INTERPHONE	NORM	NORM	NORM
	CVR	NORM	INOP	INOP
	LOUDSPEAKER 1	NORM	NORM	NORM

Ident.: PRO-ABN-ELEC-S-00012524.0001001 / 17 MAR 17

EMER EQPT	CREW OXY	NORM	NORM ^(d)	NORM ^(d)
	PAX OXY mask release (auto + man)	NORM	INOP	INOP
	SLIDES ARM/WARN	NORM	NORM	NORM

Continued on the following page

Continued from the previous page

ELEC EMER CONFIG SYS REMAINING	EMER GEN RUNNING	BAT ONLY	
		IN FLIGHT	ON THE GROUND

Ident.: PRO-ABN-ELEC-S-00012525.0002001 / 17 MAR 17

FIRE	ENG 1 LOOP	A only	A only	A only
	ENG 2 LOOP	B only	B only	B only
	APU LOOP	INOP	INOP	INOP ^(a)
	CARGO SMOKE DET	ch 1 only	INOP	INOP
	ENG FIRE EXT.	Bottle 1 only	Bottle 1 only	Bottle 1 only
	APU FIRE EXT.	Squib A only	Squib A only	Squib A only
	CARGO FIRE EXT.	INOP	INOP	INOP ^(a)
	APU AUTO EXT.	INOP	INOP	INOP ^(a)

Ident.: PRO-ABN-ELEC-S-00018017.0001001 / 17 MAR 17

FLT CTL	ELAC	N°1 only	N°1 + N°2	N°1 + N°2 ^(f)
	SEC	N°1 only	N°1 only	N°1 only
	FCDC	N°1 only	INOP	INOP
	SFCC	N°1 only	N°1 only	N°1 only
	Flaps pos ind	NORM	NORM	NORM ^(e)

Ident.: PRO-ABN-ELEC-S-00018018.0001001 / 17 MAR 17

FUEL	LP VALVE	NORM	NORM	NORM
	FQI channel 1	NORM	INOP	INOP
	X FEED VALVE	NORM	INOP	INOP
	INTERTANK TRANSFER VALVE	NORM	INOP	INOP

Ident.: PRO-ABN-ELEC-S-00012528.0001001 / 17 MAR 17

HYD	FIRE VALVES	NORM	NORM	NORM
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Ident.: PRO-ABN-ELEC-S-00018539.0002001 / 17 MAR 17

ICE-RAIN	WING A.ICE	NORM	INOP	INOP
	ENG A.ICE VALVE	OPEN	OPEN	OPEN
	CAPT PITOT	NORM	NORM	NORM ^(e)
	CAPT AOA	NORM	INOP	INOP
	RAIN REPELLENT (CAPT) 	NORM	NORM	NORM

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

ELEC

Continued from the previous page

ELEC EMER CONFIG SYS REMAINING	EMER GEN RUNNING	BAT ONLY	
		IN FLIGHT	ON THE GROUND

Ident.: PRO-ABN-ELEC-S-00018538.0002001 / 17 MAR 17

EIS	PFD 1	NORM	NORM	NORM ^(e)
	ND 1	NORM	INOP	INOP
	ECAM upper disp.	NORM	NORM	NORM ^(e)
	DMC 1 or 3	NORM	NORM	NORM ^(e)
	SDAC 1, FWC 1	NORM	NORM	NORM ^(e)
	ECAM CONT. panel	NORM	NORM	NORM
FLT INS	CLOCKS	NORM	NORM	NORM

Ident.: PRO-ABN-ELEC-S-00018537.0002001 / 17 MAR 17

L/G	LGCIU SYS 1	NORM	NORM	NORM
	BRK PRESS IND	NORM	NORM	NORM
	PARK BRK	NORM	NORM	NORM
	ABCU	NORM	NORM	NORM

Ident.: PRO-ABN-ELEC-S-00012532.0001001 / 17 MAR 17

LIGHTS	EMER CKPT	NORM	NORM	NORM
	EMER CAB	NORM	NORM	NORM

Ident.: PRO-ABN-ELEC-S-00018550.0005001 / 17 MAR 17

NAV	IR	N°1 only ^(g)	N°1 only ^(g)	N°1 only ^(g)
	ADR	N°1 only	N°1 only	N°1 only
	ADF 	N°1 only	INOP	INOP
	VOR	N°1 only	N°1 only	N°1 only ^(e)
	MMR	N°1 only	N°1 only	N°1 only ^(e)
	DME	N°1 only	INOP	INOP
	DDRMI 	NORM	NORM	NORM ^(e)
	ATC	N°1 only	INOP	INOP
	ISIS	NORM	NORM	NORM

Ident.: PRO-ABN-ELEC-S-00018541.0002001 / 17 MAR 17

PNEU	ENG 1 BLEED	NORM	BMC 1 INOP	BMC 1 INOP
	ENG 2 BLEED	BMC 2 INOP	BMC 2 INOP	BMC 2 INOP
	APU BLEED	INOP	INOP	INOP ^(a)
	X BLEED (MAN CTL)	NORM	INOP	INOP

Continued on the following page

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES ABNORMAL AND EMERGENCY PROCEDURES ELEC
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Continued from the previous page

ELEC EMER CONFIG SYS REMAINING	EMER GEN RUNNING	BAT ONLY	
		IN FLIGHT	ON THE GROUND

Ident.: PRO-ABN-ELEC-S-00018019.0002001 / 17 MAR 17

APU	ECB-STARTER	NORM ^(h)	NORM ⁽ⁱ⁾	INOP ^(a)
	FUEL LP VALVE	NORM	NORM	NORM
	FUEL PUMP	NORM	NORM	NORM

Ident.: PRO-ABN-ELEC-S-00018540.0002001 / 17 MAR 17

PWR PLT	FADEC	A+B ^(j)	A+B ^(j)	A+B ^(j)
	IGNITION	A only	A only	A only
	HP FUEL VALVE closure	NORM	NORM	NORM

Ident.: PRO-ABN-ELEC-S-00012537.0001001 / 17 MAR 17

MISC	MECH HORN	NORM	NORM	NORM
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- (a) *Restored, when speed is below 100 kt.*
- (b) *When L/G is up.*
- (c) *When L/G is down.*
- (d) *Crew supply solenoid valve inoperative.*
- (e) *Lost, when the speed is below 50 kt.*
- (f) *Lost, 30 s after the last engine shutdown.*
- (g) *IR 2 and IR 3 are lost 5 min after failure of main generators but if IR 3 replaces IR 1 (ATT-HDG selector at CAPT 3), IR 3 remains supplied.*
- (h) *For APU start only.*
- (i) *Not available for 45 s, after the loss of both engine generators.*
- (j) *Channels A and B are self powered above 10 % N2 for IAE or PW engines, 12 % N2 for CFM56 engines, or 8 % N2 for CFM LEAP-1A engines. If N2 is below these values, only Channel A is powered.*

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

ELEC

[QRH] ELEC EMER CONFIG SYS REMAINING

Applicable to: MSN 02926-02944

ELEC EMER CONFIG SYS REMAINING	EMER GEN RUNNING	BAT ONLY	
		IN FLIGHT	ON THE GROUND

Ident.: PRO-ABN-ELEC-S-00018562.0012001 / 06 NOV 25

AIR COND PRESS	PRESS AUTO SYS 1	NORM	NORM	NORM
	MAN PRESS CTL	INOP	INOP	INOP ^(a)
	RAM AIR	NORM	NORM	NORM
	PACK VALVE 1	NORM ^(b) / Closure INOP ^(c)	Closure INOP	Closure INOP
	PACK VALVE 2	Closure INOP	Closure INOP	Closure INOP ^(a)
	AVIONIC VENT	NORM	NORM	Partial

Ident.: PRO-ABN-ELEC-S-00012522.0001001 / 17 MAR 17

FMGS	FMGC (NAV FUNCTION)	N°1 only	Inop	Inop
	MCDU	N°1 only	Inop	Inop
	FAC	N°1 only	Inop	Inop
	FCU	ch 1 only	ch 1 only	ch 1 only

Ident.: PRO-ABN-ELEC-S-00018533.0002001 / 17 MAR 17

COM	VHF 1	NORM	NORM	NORM
	HF 1	NORM	INOP	INOP
	RMP 1	NORM	NORM	NORM
	ACP (CAPT, F/O)	NORM	NORM	NORM
	CIDS	NORM	NORM	NORM
	INTERPHONE	NORM	NORM	NORM
	CVR	NORM	INOP	INOP
	LOUDSPEAKER 1	NORM	NORM	NORM

Ident.: PRO-ABN-ELEC-S-00012524.0001001 / 17 MAR 17

EMER EQPT	CREW OXY	NORM	NORM ^(d)	NORM ^(d)
	PAX OXY mask release (auto + man)	NORM	INOP	INOP
	SLIDES ARM/WARN	NORM	NORM	NORM

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

ELEC

Continued from the previous page

ELEC EMER CONFIG SYS REMAINING	EMER GEN RUNNING	BAT ONLY	
		IN FLIGHT	ON THE GROUND

Ident.: PRO-ABN-ELEC-S-00012525.0002001 / 17 MAR 17

FIRE	ENG 1 LOOP	A only	A only	A only
	ENG 2 LOOP	B only	B only	B only
	APU LOOP	INOP	INOP	INOP ^(a)
	CARGO SMOKE DET	ch 1 only	INOP	INOP
	ENG FIRE EXT.	Bottle 1 only	Bottle 1 only	Bottle 1 only
	APU FIRE EXT.	Squib A only	Squib A only	Squib A only
	CARGO FIRE EXT.	INOP	INOP	INOP ^(a)
	APU AUTO EXT.	INOP	INOP	INOP ^(a)

Ident.: PRO-ABN-ELEC-S-00018017.0001001 / 17 MAR 17

FLT CTL	ELAC	N°1 only	N°1 + N°2	N°1 + N°2 ^(f)
	SEC	N°1 only	N°1 only	N°1 only
	FCDC	N°1 only	INOP	INOP
	SFCC	N°1 only	N°1 only	N°1 only
	Flaps pos ind	NORM	NORM	NORM ^(e)

Ident.: PRO-ABN-ELEC-S-00018018.0001001 / 17 MAR 17

FUEL	LP VALVE	NORM	NORM	NORM
	FQI channel 1	NORM	INOP	INOP
	X FEED VALVE	NORM	INOP	INOP
	INTERTANK TRANSFER VALVE	NORM	INOP	INOP

Ident.: PRO-ABN-ELEC-S-00012528.0001001 / 17 MAR 17

HYD	FIRE VALVES	NORM	NORM	NORM
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Ident.: PRO-ABN-ELEC-S-00018539.0002001 / 17 MAR 17

ICE-RAIN	WING A.ICE	NORM	INOP	INOP
	ENG A.ICE VALVE	OPEN	OPEN	OPEN
	CAPT PITOT	NORM	NORM	NORM ^(e)
	CAPT AOA	NORM	INOP	INOP
	RAIN REPELLENT (CAPT) 	NORM	NORM	NORM

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

ELEC

Continued from the previous page

ELEC EMER CONFIG SYS REMAINING	EMER GEN RUNNING	BAT ONLY	
		IN FLIGHT	ON THE GROUND

Ident.: PRO-ABN-ELEC-S-00018538.0002001 / 17 MAR 17

EIS	PFD 1	NORM	NORM	NORM ^(e)
	ND 1	NORM	INOP	INOP
	ECAM upper disp.	NORM	NORM	NORM ^(e)
	DMC 1 or 3	NORM	NORM	NORM ^(e)
	SDAC 1, FWC 1	NORM	NORM	NORM ^(e)
	ECAM CONT. panel	NORM	NORM	NORM
FLT INS	CLOCKS	NORM	NORM	NORM

Ident.: PRO-ABN-ELEC-S-00018537.0002001 / 17 MAR 17

L/G	LGCIU SYS 1	NORM	NORM	NORM
	BRK PRESS IND	NORM	NORM	NORM
	PARK BRK	NORM	NORM	NORM
	ABCU	NORM	NORM	NORM

Ident.: PRO-ABN-ELEC-S-00012532.0001001 / 17 MAR 17

LIGHTS	EMER CKPT	NORM	NORM	NORM
	EMER CAB	NORM	NORM	NORM

Ident.: PRO-ABN-ELEC-S-00018550.0005001 / 17 MAR 17

NAV	IR	N°1 only ^(g)	N°1 only ^(g)	N°1 only ^(g)
	ADR	N°1 only	N°1 only	N°1 only
	ADF 	N°1 only	INOP	INOP
	VOR	N°1 only	N°1 only	N°1 only ^(e)
	MMR	N°1 only	N°1 only	N°1 only ^(e)
	DME	N°1 only	INOP	INOP
	DDRMI 	NORM	NORM	NORM ^(e)
	ATC	N°1 only	INOP	INOP
	ISIS	NORM	NORM	NORM

Ident.: PRO-ABN-ELEC-S-00018541.0002001 / 17 MAR 17

PNEU	ENG 1 BLEED	NORM	BMC 1 INOP	BMC 1 INOP
	ENG 2 BLEED	BMC 2 INOP	BMC 2 INOP	BMC 2 INOP
	APU BLEED	INOP	INOP	INOP ^(a)
	X BLEED (MAN CTL)	NORM	INOP	INOP

Continued on the following page

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES ABNORMAL AND EMERGENCY PROCEDURES ELEC
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Continued from the previous page

ELEC EMER CONFIG SYS REMAINING	EMER GEN RUNNING	BAT ONLY	
		IN FLIGHT	ON THE GROUND

Ident.: PRO-ABN-ELEC-S-00018019.0002001 / 17 MAR 17

APU	ECB-STARTER	NORM ^(h)	NORM ⁽ⁱ⁾	INOP ^(a)
	FUEL LP VALVE	NORM	NORM	NORM
	FUEL PUMP	NORM	NORM	NORM

Ident.: PRO-ABN-ELEC-S-00018540.0002001 / 17 MAR 17

PWR PLT	FADEC	A+B ^(j)	A+B ^(j)	A+B ^(j)
	IGNITION	A only	A only	A only
	HP FUEL VALVE closure	NORM	NORM	NORM

Ident.: PRO-ABN-ELEC-S-00012537.0001001 / 17 MAR 17

MISC	MECH HORN	NORM	NORM	NORM
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- (a) *Restored, when speed is below 100 kt.*
- (b) *When L/G is up.*
- (c) *When L/G is down.*
- (d) *Crew supply solenoid valve inoperative.*
- (e) *Lost, when the speed is below 50 kt.*
- (f) *Lost, 30 s after the last engine shutdown.*
- (g) *IR 2 and IR 3 are lost 5 min after failure of main generators but if IR 3 replaces IR 1 (ATT-HDG selector at CAPT 3), IR 3 remains supplied.*
- (h) *For APU start only.*
- (i) *Not available for 45 s, after the loss of both engine generators.*
- (j) *Channels A and B are self powered above 10 % N2 for IAE or PW engines, 12 % N2 for CFM56 engines, or 8 % N2 for CFM LEAP-1A engines. If N2 is below these values, only Channel A is powered.*

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

ELEC

[QRH] ELEC EMER CONFIG SYS REMAINING

Applicable to: MSN 05152-05746

ELEC EMER CONFIG SYS REMAINING	EMER GEN RUNNING	BAT ONLY	
		IN FLIGHT	ON THE GROUND

Ident.: PRO-ABN-ELEC-S-00018562.0017001 / 06 NOV 25

AIR COND PRESS	PRESS AUTO SYS 1	NORM	NORM	NORM
	MAN PRESS CTL	INOP	INOP	INOP ^(a)
	RAM AIR	NORM	NORM	NORM
	PACK VALVE 1	NORM ^(b) / Closure INOP ^(c)	Closure INOP	Closure INOP
	PACK VALVE 2	Closure INOP	Closure INOP	Closure INOP ^(a)
	AVIONIC VENT	NORM	NORM	Partial
	FWD CRG ISOL VALVES	NORM	INOP	INOP
	FWD CRG HEAT	NORM	INOP	INOP

Ident.: PRO-ABN-ELEC-S-00012522.0001001 / 17 MAR 17

FMGS	FMGC (NAV FUNCTION)	N°1 only	Inop	Inop
	MCDU	N°1 only	Inop	Inop
	FAC	N°1 only	Inop	Inop
	FCU	ch 1 only	ch 1 only	ch 1 only

Ident.: PRO-ABN-ELEC-S-00018533.0002001 / 17 MAR 17

COM	VHF 1	NORM	NORM	NORM
	HF 1	NORM	INOP	INOP
	RMP 1	NORM	NORM	NORM
	ACP (CAPT, F/O)	NORM	NORM	NORM
	CIDS	NORM	NORM	NORM
	INTERPHONE	NORM	NORM	NORM
	CVR	NORM	INOP	INOP
	LOUDSPEAKER 1	NORM	NORM	NORM

Ident.: PRO-ABN-ELEC-S-00012524.0001001 / 17 MAR 17

EMER EQPT	CREW OXY	NORM	NORM ^(d)	NORM ^(d)
	PAX OXY mask release (auto + man)	NORM	INOP	INOP
	SLIDES ARM/WARN	NORM	NORM	NORM

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

ELEC

Continued from the previous page

ELEC EMER CONFIG SYS REMAINING	EMER GEN RUNNING	BAT ONLY	
		IN FLIGHT	ON THE GROUND

Ident.: PRO-ABN-ELEC-S-00012525.0002001 / 17 MAR 17

FIRE	ENG 1 LOOP	A only	A only	A only
	ENG 2 LOOP	B only	B only	B only
	APU LOOP	INOP	INOP	INOP ^(a)
	CARGO SMOKE DET	ch 1 only	INOP	INOP
	ENG FIRE EXT.	Bottle 1 only	Bottle 1 only	Bottle 1 only
	APU FIRE EXT.	Squib A only	Squib A only	Squib A only
	CARGO FIRE EXT.	INOP	INOP	INOP ^(a)
	APU AUTO EXT.	INOP	INOP	INOP ^(a)

Ident.: PRO-ABN-ELEC-S-00018017.0001001 / 17 MAR 17

FLT CTL	ELAC	N°1 only	N°1 + N°2	N°1 + N°2 ^(f)
	SEC	N°1 only	N°1 only	N°1 only
	FCDC	N°1 only	INOP	INOP
	SFCC	N°1 only	N°1 only	N°1 only
	Flaps pos ind	NORM	NORM	NORM ^(e)

Ident.: PRO-ABN-ELEC-S-00018018.0001001 / 17 MAR 17

FUEL	LP VALVE	NORM	NORM	NORM
	FQI channel 1	NORM	INOP	INOP
	X FEED VALVE	NORM	INOP	INOP
	INTERTANK TRANSFER VALVE	NORM	INOP	INOP

Ident.: PRO-ABN-ELEC-S-00012528.0001001 / 17 MAR 17

HYD	FIRE VALVES	NORM	NORM	NORM
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Ident.: PRO-ABN-ELEC-S-00018539.0002001 / 17 MAR 17

ICE-RAIN	WING A.ICE	NORM	INOP	INOP
	ENG A.ICE VALVE	OPEN	OPEN	OPEN
	CAPT PITOT	NORM	NORM	NORM ^(e)
	CAPT AOA	NORM	INOP	INOP
	RAIN REPELLENT (CAPT) 	NORM	NORM	NORM

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

ELEC

Continued from the previous page

ELEC EMER CONFIG SYS REMAINING	EMER GEN RUNNING	BAT ONLY	
		IN FLIGHT	ON THE GROUND

Ident.: PRO-ABN-ELEC-S-00018538.0002001 / 17 MAR 17

EIS	PFD 1	NORM	NORM	NORM ^(e)
	ND 1	NORM	INOP	INOP
	ECAM upper disp.	NORM	NORM	NORM ^(e)
	DMC 1 or 3	NORM	NORM	NORM ^(e)
	SDAC 1, FWC 1	NORM	NORM	NORM ^(e)
	ECAM CONT. panel	NORM	NORM	NORM
FLT INS	CLOCKS	NORM	NORM	NORM

Ident.: PRO-ABN-ELEC-S-00018537.0002001 / 17 MAR 17

L/G	LGCIU SYS 1	NORM	NORM	NORM
	BRK PRESS IND	NORM	NORM	NORM
	PARK BRK	NORM	NORM	NORM
	ABCU	NORM	NORM	NORM

Ident.: PRO-ABN-ELEC-S-00012532.0001001 / 17 MAR 17

LIGHTS	EMER CKPT	NORM	NORM	NORM
	EMER CAB	NORM	NORM	NORM

Ident.: PRO-ABN-ELEC-S-00018550.0005001 / 17 MAR 17

NAV	IR	N°1 only ^(g)	N°1 only ^(g)	N°1 only ^(g)
	ADR	N°1 only	N°1 only	N°1 only
	ADF 	N°1 only	INOP	INOP
	VOR	N°1 only	N°1 only	N°1 only ^(e)
	MMR	N°1 only	N°1 only	N°1 only ^(e)
	DME	N°1 only	INOP	INOP
	DDRMI 	NORM	NORM	NORM ^(e)
	ATC	N°1 only	INOP	INOP
	ISIS	NORM	NORM	NORM

Ident.: PRO-ABN-ELEC-S-00018541.0002001 / 17 MAR 17

PNEU	ENG 1 BLEED	NORM	BMC 1 INOP	BMC 1 INOP
	ENG 2 BLEED	BMC 2 INOP	BMC 2 INOP	BMC 2 INOP
	APU BLEED	INOP	INOP	INOP ^(a)
	X BLEED (MAN CTL)	NORM	INOP	INOP

Continued on the following page

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES ABNORMAL AND EMERGENCY PROCEDURES ELEC
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Continued from the previous page

ELEC EMER CONFIG SYS REMAINING	EMER GEN RUNNING	BAT ONLY	
		IN FLIGHT	ON THE GROUND

Ident.: PRO-ABN-ELEC-S-00018019.0002001 / 17 MAR 17

APU	ECB-STARTER	NORM ^(h)	NORM ⁽ⁱ⁾	INOP ^(a)
	FUEL LP VALVE	NORM	NORM	NORM
	FUEL PUMP	NORM	NORM	NORM

Ident.: PRO-ABN-ELEC-S-00018540.0002001 / 17 MAR 17

PWR PLT	FADEC	A+B ^(j)	A+B ^(j)	A+B ^(j)
	IGNITION	A only	A only	A only
	HP FUEL VALVE closure	NORM	NORM	NORM

Ident.: PRO-ABN-ELEC-S-00012537.0001001 / 17 MAR 17

MISC	MECH HORN	NORM	NORM	NORM
------	-----------	------	------	------

- (a) *Restored, when speed is below 100 kt.*
- (b) *When L/G is up.*
- (c) *When L/G is down.*
- (d) *Crew supply solenoid valve inoperative.*
- (e) *Lost, when the speed is below 50 kt.*
- (f) *Lost, 30 s after the last engine shutdown.*
- (g) *IR 2 and IR 3 are lost 5 min after failure of main generators but if IR 3 replaces IR 1 (ATT-HDG selector at CAPT 3), IR 3 remains supplied.*
- (h) *For APU start only.*
- (i) *Not available for 45 s, after the loss of both engine generators.*
- (j) *Channels A and B are self powered above 10 % N2 for IAE or PW engines, 12 % N2 for CFM56 engines, or 8 % N2 for CFM LEAP-1A engines. If N2 is below these values, only Channel A is powered.*

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

ELEC

[QRH] ELEC EMER CONFIG SYS REMAINING

Applicable to: MSN 07784-07792

ELEC EMER CONFIG SYS REMAINING	EMER GEN RUNNING	BAT ONLY	
		IN FLIGHT	ON THE GROUND

Ident.: PRO-ABN-ELEC-S-00018562.0013001 / 06 NOV 25

AIR COND PRESS	PRESS AUTO SYS 1	NORM	NORM	NORM
	MAN PRESS CTL	INOP	INOP	INOP ^(a)
	RAM AIR	NORM	NORM	NORM
	PACK VALVE 1	NORM ^(b) / Closure INOP ^(c)	Closure INOP	Closure INOP
	PACK VALVE 2	Closure INOP	Closure INOP	Closure INOP ^(a)
	AVIONIC VENT	NORM	NORM	Partial
	AFT CRG ISOL VALVES	NORM	INOP	INOP

Ident.: PRO-ABN-ELEC-S-00012522.0001001 / 17 MAR 17

FMGS	FMGC (NAV FUNCTION)	N°1 only	Inop	Inop
	MCDU	N°1 only	Inop	Inop
	FAC	N°1 only	Inop	Inop
	FCU	ch 1 only	ch 1 only	ch 1 only

Ident.: PRO-ABN-ELEC-S-00018533.0002001 / 17 MAR 17

COM	VHF 1	NORM	NORM	NORM
	HF 1	NORM	INOP	INOP
	RMP 1	NORM	NORM	NORM
	ACP (CAPT, F/O)	NORM	NORM	NORM
	CIDS	NORM	NORM	NORM
	INTERPHONE	NORM	NORM	NORM
	CVR	NORM	INOP	INOP
	LOUDSPEAKER 1	NORM	NORM	NORM

Ident.: PRO-ABN-ELEC-S-00012524.0001001 / 17 MAR 17

EMER EQPT	CREW OXY	NORM	NORM ^(d)	NORM ^(d)
	PAX OXY mask release (auto + man)	NORM	INOP	INOP
	SLIDES ARM/WARN	NORM	NORM	NORM

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

ELEC

Continued from the previous page

ELEC EMER CONFIG SYS REMAINING	EMER GEN RUNNING	BAT ONLY	
		IN FLIGHT	ON THE GROUND

Ident.: PRO-ABN-ELEC-S-00012525.0002001 / 17 MAR 17

FIRE	ENG 1 LOOP	A only	A only	A only
	ENG 2 LOOP	B only	B only	B only
	APU LOOP	INOP	INOP	INOP ^(a)
	CARGO SMOKE DET	ch 1 only	INOP	INOP
	ENG FIRE EXT.	Bottle 1 only	Bottle 1 only	Bottle 1 only
	APU FIRE EXT.	Squib A only	Squib A only	Squib A only
	CARGO FIRE EXT.	INOP	INOP	INOP ^(a)
	APU AUTO EXT.	INOP	INOP	INOP ^(a)

Ident.: PRO-ABN-ELEC-S-00018017.0001001 / 17 MAR 17

FLT CTL	ELAC	N°1 only	N°1 + N°2	N°1 + N°2 ^(f)
	SEC	N°1 only	N°1 only	N°1 only
	FCDC	N°1 only	INOP	INOP
	SFCC	N°1 only	N°1 only	N°1 only
	Flaps pos ind	NORM	NORM	NORM ^(e)

Ident.: PRO-ABN-ELEC-S-00018018.0001001 / 17 MAR 17

FUEL	LP VALVE	NORM	NORM	NORM
	FQI channel 1	NORM	INOP	INOP
	X FEED VALVE	NORM	INOP	INOP
	INTERTANK TRANSFER VALVE	NORM	INOP	INOP

Ident.: PRO-ABN-ELEC-S-00012528.0001001 / 17 MAR 17

HYD	FIRE VALVES	NORM	NORM	NORM
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Ident.: PRO-ABN-ELEC-S-00018539.0002001 / 17 MAR 17

ICE-RAIN	WING A.ICE	NORM	INOP	INOP
	ENG A.ICE VALVE	OPEN	OPEN	OPEN
	CAPT PITOT	NORM	NORM	NORM ^(e)
	CAPT AOA	NORM	INOP	INOP
	RAIN REPELLENT (CAPT) 	NORM	NORM	NORM

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

ELEC

Continued from the previous page

ELEC EMER CONFIG SYS REMAINING	EMER GEN RUNNING	BAT ONLY	
		IN FLIGHT	ON THE GROUND

Ident.: PRO-ABN-ELEC-S-00018538.0002001 / 17 MAR 17

EIS	PFD 1	NORM	NORM	NORM ^(e)
	ND 1	NORM	INOP	INOP
	ECAM upper disp.	NORM	NORM	NORM ^(e)
	DMC 1 or 3	NORM	NORM	NORM ^(e)
	SDAC 1, FWC 1	NORM	NORM	NORM ^(e)
	ECAM CONT. panel	NORM	NORM	NORM
FLT INS	CLOCKS	NORM	NORM	NORM

Ident.: PRO-ABN-ELEC-S-00018537.0002001 / 17 MAR 17

L/G	LGCIU SYS 1	NORM	NORM	NORM
	BRK PRESS IND	NORM	NORM	NORM
	PARK BRK	NORM	NORM	NORM
	ABCU	NORM	NORM	NORM

Ident.: PRO-ABN-ELEC-S-00012532.0001001 / 17 MAR 17

LIGHTS	EMER CKPT	NORM	NORM	NORM
	EMER CAB	NORM	NORM	NORM

Ident.: PRO-ABN-ELEC-S-00018550.0005001 / 17 MAR 17

NAV	IR	N°1 only ^(g)	N°1 only ^(g)	N°1 only ^(g)
	ADR	N°1 only	N°1 only	N°1 only
	ADF 	N°1 only	INOP	INOP
	VOR	N°1 only	N°1 only	N°1 only ^(e)
	MMR	N°1 only	N°1 only	N°1 only ^(e)
	DME	N°1 only	INOP	INOP
	DDRMI 	NORM	NORM	NORM ^(e)
	ATC	N°1 only	INOP	INOP
	ISIS	NORM	NORM	NORM

Ident.: PRO-ABN-ELEC-S-00018541.0002001 / 17 MAR 17

PNEU	ENG 1 BLEED	NORM	BMC 1 INOP	BMC 1 INOP
	ENG 2 BLEED	BMC 2 INOP	BMC 2 INOP	BMC 2 INOP
	APU BLEED	INOP	INOP	INOP ^(a)
	X BLEED (MAN CTL)	NORM	INOP	INOP

Continued on the following page

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES ABNORMAL AND EMERGENCY PROCEDURES ELEC
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Continued from the previous page

ELEC EMER CONFIG SYS REMAINING	EMER GEN RUNNING	BAT ONLY	
		IN FLIGHT	ON THE GROUND

Ident.: PRO-ABN-ELEC-S-00018019.0002001 / 17 MAR 17

APU	ECB-STARTER	NORM ^(h)	NORM ⁽ⁱ⁾	INOP ^(a)
	FUEL LP VALVE	NORM	NORM	NORM
	FUEL PUMP	NORM	NORM	NORM

Ident.: PRO-ABN-ELEC-S-00018540.0002001 / 17 MAR 17

PWR PLT	FADEC	A+B ^(j)	A+B ^(j)	A+B ^(j)
	IGNITION	A only	A only	A only
	HP FUEL VALVE closure	NORM	NORM	NORM

Ident.: PRO-ABN-ELEC-S-00012537.0001001 / 17 MAR 17

MISC	MECH HORN	NORM	NORM	NORM
------	-----------	------	------	------

- (a) *Restored, when speed is below 100 kt.*
- (b) *When L/G is up.*
- (c) *When L/G is down.*
- (d) *Crew supply solenoid valve inoperative.*
- (e) *Lost, when the speed is below 50 kt.*
- (f) *Lost, 30 s after the last engine shutdown.*
- (g) *IR 2 and IR 3 are lost 5 min after failure of main generators but if IR 3 replaces IR 1 (ATT-HDG selector at CAPT 3), IR 3 remains supplied.*
- (h) *For APU start only.*
- (i) *Not available for 45 s, after the loss of both engine generators.*
- (j) *Channels A and B are self powered above 10 % N2 for IAE or PW engines, 12 % N2 for CFM56 engines, or 8 % N2 for CFM LEAP-1A engines. If N2 is below these values, only Channel A is powered.*

ELEC AC BUS 1 FAULT

Applicable to: MSN 02155-02212

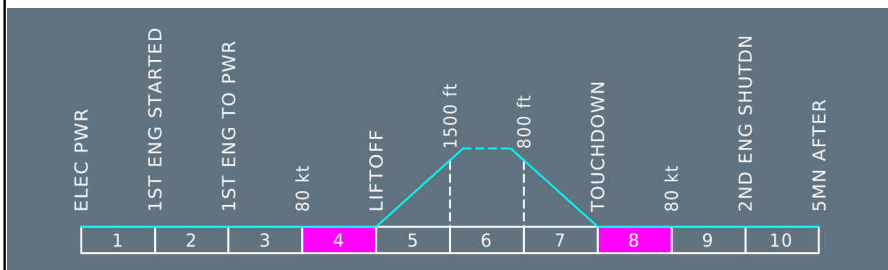
Ident.: PRO-ABN-ELEC-I-00017346.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the AC 1 busbar is not supplied.

Flight Phase Inhibition:



Continued on the following page

ELEC AC BUS 1 FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-I-00017853.0003001 / 01 MAR 18

L2 AC BUS 1 normally supplies the AC ESS BUS and, through TR1, the DC ESS BUS. In the case of an AC BUS 1 FAULT, both the AC and DC ESS BUS will be lost and therefore the AC ESS BUS FAULT and the DC ESS BUS FAULT will be displayed on the ECAM.

However, for aircraft equipped with AC ESS FEED Auto Switching , the AC ESS BUS and the DC ESS BUS will automatically recover, due to the fact that the AC BUS 2 will automatically supply the AC ESS BUS.

The flight crew can manually recover the AC ESS BUS and the DC ESS BUS by setting the AC ESS FEED pb-sw to ALTN, as requested by the AC ESS BUS FAULT ECAM procedure

L1 **BLOWER**..... **OVRD**

L2 *The avionics ventilation system is in the closed circuit configuration.
Air conditioning is added to the ventilation air.*

L1 **FUEL CONSUMPT INCRSD**
FMS PRED UNRELIABLE

ASSOCIATED PROCEDURES

WHEEL N.W. STEER FAULT

ASSOCIATED PROCEDURES

ENG 1 EPR MODE FAULT

This associated procedure is only applicable to aircraft equipped with IAE engines.

SECONDARY FAILURES

- * **AVNCS VENT**
- * **HYD**
- * **FUEL**
- * **F/CTL**

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

ELEC

ELEC AC BUS 1 FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-I-00017867.0026001 / 12 MAY 25

L12

STATUS

INOP SYS

See below

LDG DIST PROC..... APPLY

FUEL CONSUMPT INCRSD

 See ⁽¹⁾

FMS PRED UNRELIABLE

 See ⁽²⁾

SLATS SLOW

CAT 2 ONLY

INOP SYS

BLUE HYD

RA 1

STBY AOA

CAT 3

VENT BLOWER

 FWD CRG HEAT 

 GND COOL 

BRK SYS 1

GPWS

 ROW/ROP 

SPLR 3

CAPT TAT

L WSHLD HEAT

L+R TK PUMP 1

GALLEY FAN

 AFT CRG VENT 

MAIN GALLEY

DMC 3

LAV DET

GPWS TERR

ADR 3

STBY PITOT

L WNDW HEAT

 CTR TK PUMP 1 

 AFT CRG HEAT 

 FWD CRG VENT 

B ELEC PUMP

TCAS

REVERSER 1

 STEEP APPR 

Other INOP SYS

Left cabin fan

 ACARS  /ATSU 

 MCDU 3 

Printer

Hydraulic quantity indication

Radar 1

 Brake fans 5, 6, 7 and 8 

Engine 1 ignition B

 HF 1 

Partial galley

 ADF 1 

 HUD 

EVMU eng 1 and eng 2

COND Controller Lane A

 PVI 

Continued on the following page

ELEC AC BUS 1 FAULT (Cont'd)

Note: The warning may be caused by a sub BUS failure. Consequently, only a part of the above-listed systems may be lost.

- (1) This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.
- (2) Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable fuel penalty factor.

ELEC AC BUS 1 FAULT

Applicable to: MSN 02719-05746

Ident.: PRO-ABN-ELEC-I-00017346.0001001 / 21 MAR 16

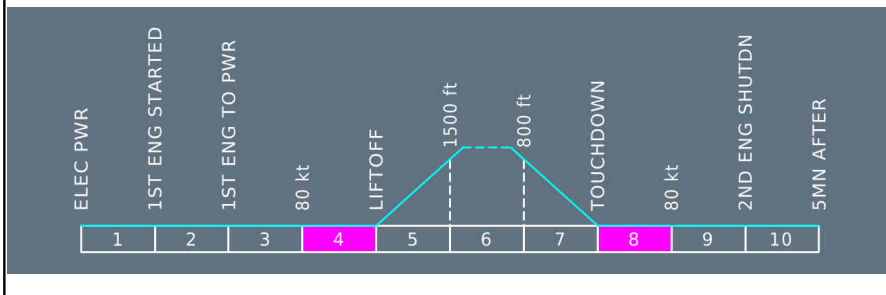
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the AC 1 busbar is not supplied.

Flight Phase Inhibition:



Continued on the following page

ELEC AC BUS 1 FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-I-00017853.0004001 / 01 MAR 18

[L2] AC BUS 1 normally supplies the AC ESS BUS and, through TR1, the DC ESS BUS. In the case of an AC BUS 1 FAULT, both the AC and DC ESS BUS will be lost and therefore the AC ESS BUS FAULT and the DC ESS BUS FAULT will be displayed on the ECAM.

However, for aircraft equipped with AC ESS FEED Auto Switching , the AC ESS BUS and the DC ESS BUS will automatically recover, due to the fact that the AC BUS 2 will automatically supply the AC ESS BUS.

The flight crew can manually recover the AC ESS BUS and the DC ESS BUS by setting the AC ESS FEED pb-sw to ALTN, as requested by the AC ESS BUS FAULT ECAM procedure

[L1] **BLOWER**..... **OVRD**

[L2] *The avionics ventilation system is in the closed circuit configuration.
Air conditioning is added to the ventilation air.*

[L1] **FUEL CONSUMPT INCRSD**
FMS PRED UNRELIABLE

ASSOCIATED PROCEDURES

ENG 1 EPR MODE FAULT

This associated procedure is only applicable to aircraft equipped with IAE engines.

SECONDARY FAILURES

- * **AVNCS VENT**
- * **HYD**
- * **FUEL**
- * **F/CTL**

Continued on the following page

ELEC AC BUS 1 FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-I-00017867.0028001 / 12 MAY 25

L12

STATUS

LDG DIST PROC..... APPLY

FUEL CONSUMPT INCRSD

 See ⁽¹⁾

FMS PRED UNRELIABLE

 See ⁽²⁾

SLATS SLOW

CAT 2 ONLY

INOP SYS

See below

INOP SYS

BLUE HYD

RA 1

STBY AOA

CAT 3

VENT BLOWER

 FWD CRG HEAT 

 GND COOL 

BRK SYS 1

GPWS

 ROW/ROP 

SPLR 3

CAPT TAT

L WSHLD HEAT

L+R TK PUMP 1

GALLEY FAN

 AFT CRG VENT 

MAIN GALLEY

DMC 3

LAV DET

GPWS TERR

ADR 3

STBY PITOT

L WNDW HEAT

 CTR TK PUMP 1 

 AFT CRG HEAT 

 FWD CRG VENT 

B ELEC PUMP

TCAS

REVERSER 1

 STEEP APPR 
Other INOP SYS

Left cabin fan

 ACARS  /ATSU 

 MCDU 3 

Printer

Partial galley

Radar 1

 Brake fans 5, 6, 7 and 8 

Engine 1 ignition B

COND Controller Lane A

 PVI 

 ADF 1 

 HUD 

EVMU eng 1 and eng 2

Hydraulic quantity indication

Continued on the following page

ELEC AC BUS 1 FAULT (Cont'd)

Note: The warning may be caused by a sub BUS failure. Consequently, only a part of the above-listed systems may be lost.

- (1) This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.
- (2) Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable fuel penalty factor.

ELEC AC BUS 1 FAULT

Applicable to: MSN 07784-07792

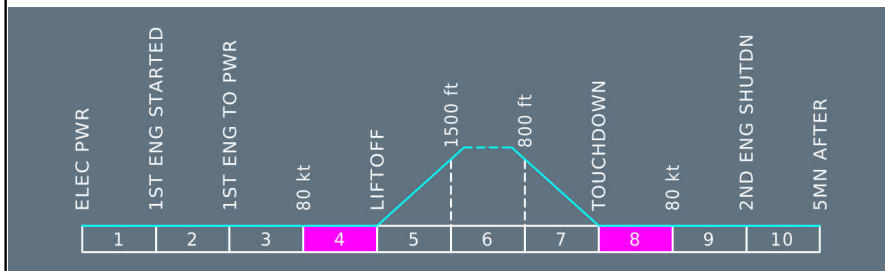
Ident.: PRO-ABN-ELEC-I-00017346.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the AC 1 busbar is not supplied.

Flight Phase Inhibition:



Continued on the following page

ELEC AC BUS 1 FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-I-00017853.0004001 / 01 MAR 18

L2 AC BUS 1 normally supplies the AC ESS BUS and, through TR1, the DC ESS BUS. In the case of an AC BUS 1 FAULT, both the AC and DC ESS BUS will be lost and therefore the AC ESS BUS FAULT and the DC ESS BUS FAULT will be displayed on the ECAM.

However, for aircraft equipped with AC ESS FEED Auto Switching , the AC ESS BUS and the DC ESS BUS will automatically recover, due to the fact that the AC BUS 2 will automatically supply the AC ESS BUS.

The flight crew can manually recover the AC ESS BUS and the DC ESS BUS by setting the AC ESS FEED pb-sw to ALTN, as requested by the AC ESS BUS FAULT ECAM procedure

L1 **BLOWER**..... **OVRD**

L2 *The avionics ventilation system is in the closed circuit configuration.
Air conditioning is added to the ventilation air.*

L1 **FUEL CONSUMPT INCRSD**
FMS PRED UNRELIABLE

ASSOCIATED PROCEDURES

ENG 1 EPR MODE FAULT

This associated procedure is only applicable to aircraft equipped with IAE engines.

SECONDARY FAILURES

- * **AVNCS VENT**
- * **HYD**
- * **FUEL**
- * **F/CTL**

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

ELEC

ELEC AC BUS 1 FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-I-00017867.0035001 / 12 MAY 25

L12

STATUS

LDG DIST PROC..... APPLY

FUEL CONSUMPT INCRSD

 See ⁽¹⁾

FMS PRED UNRELIABLE

 See ⁽²⁾

SLATS SLOW

CAT 2 ONLY

INOP SYS

See below

INOP SYS

BLUE HYD

RA 1

STBY AOA

CAT 3

GALLEY FAN

 AFT CRG VENT 

MAIN GALLEY

DMC 3

LAV DET

GPWS TERR

SPLR 3

CAPT TAT

L WSHLD HEAT

L+R TK PUMP 1

 AFT CRG HEAT 

 FWD CRG VENT 

B ELEC PUMP

TCAS

REVERSER 1

 STEEP APPR 

ADR 3

STBY PITOT

L WNDW HEAT

VENT BLOWER

 FWD CRG HEAT 

 GND COOL 

BRK SYS 1

GPWS

 ROW/ROP 

Other INOP SYS

Left cabin fan

 ACARS  /ATSU 

 MCDU 3 

Printer

Partial galley

Radar 1

 Brake fans 5, 6, 7 and 8 

Engine 1 ignition B

COND Controller Lane A

 PVI 

 ADF 1 

 HUD 

EVMU eng 1 and eng 2

Hydraulic quantity indication

Continued on the following page

ELEC AC BUS 1 FAULT (Cont'd)

Note: The warning may be caused by a sub BUS failure. Consequently, only a part of the above-listed systems may be lost.

- (1) This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.
- (2) Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable fuel penalty factor.

ELEC AC BUS 2 FAULT

Applicable to: MSN 02155-02212

Ident.: PRO-ABN-ELEC-J-00017348.0001001 / 21 MAR 16

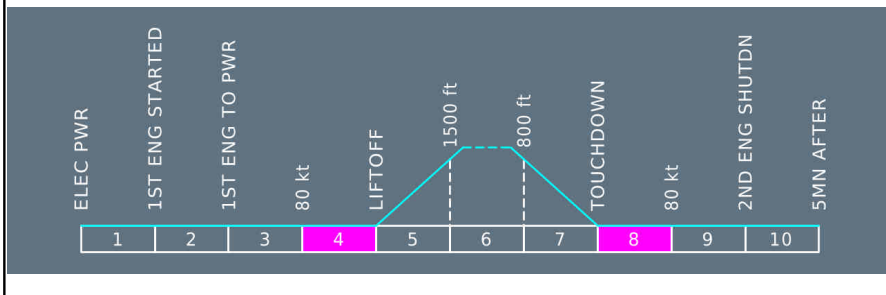
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the AC 2 busbar is not supplied.

Flight Phase Inhibition:



Continued on the following page →

ELEC AC BUS 2 FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-J-00017877.0002001 / 01 MAR 18

EXTRACT.....OVRD

- [L2]** The avionics ventilation system is in the closed circuit configuration.
 Air conditioning is added to the ventilation air.

[L1] ATC/XPDR.....SYS 1

ASSOCIATED PROCEDURES

L/G LGCIU 2 FAULT

ASSOCIATED PROCEDURES

ENG 2 EPR MODE FAULT

This associated procedure is only applicable to aircraft equipped with IAE engines.

SECONDARY FAILURES

- * AVNCS VENT
- * FUEL

Continued on the following page

ELEC AC BUS 2 FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-J-00017878.0004001 / 03 MAY 23

L12

STATUS

 ENG 2 APPR IDLE ONLY
 PACK 2 AT FIXED TEMP

 See ⁽¹⁾

 FLS  : F-APP+RAW ONLY

INOP SYS

See below

INOP SYS

 ADR 2
 FWC 2
 R WSHLD HEAT
 F/O PITOT
 R WNDW HEAT
 REVERSER 2
 PACK 2 REGUL
 RUD TRIM 2
 ACT PUMP 
 GPS 2 

 Y ELEC PUMP
 DMC 2
 LGCIU 2
 F/O AOA
 L+R TK PUMP 2
 VENT EXTRACT
 MAIN GALLEY
 CAT 2
 BRK SYS 2 /BSCU CH 2
 ATC 2 or ATC/XPDR 2

 SDAC 2
 RECORDER SYS (OR FDIU)
 RA 2
 F/O TAT
 RUD TRV LIM 2
 GND COOL 
 YAW DAMPER 2
 CTR TK PUMP 2 
 ILS 2 (OR LS 2 for aircraft equipped with MLS  /GLS  /FLS )
 GLS AUTOLAND 
Other INOP SYS

 Right cabin fan
 DME 2
 MCDU 2
 F/O PFD and ND
 HF 2 

 Brake fans 1, 2, 3 and 4 
 RADAR 2 
 ENG 2 ignition B
 QAR

 ADF 2 
 WXR 2 
 VOR 2
 ECAM lower DU

Note: The warning may be caused by a sub BUS failure. Consequently, only a part of the above-listed systems may be lost.

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

ELEC

ELEC AC BUS 2 FAULT (Cont'd)

- (1) Due to the loss of Pack 2 controller, the pack outlet temperature is controlled by the pack anti-ice valve and is stabilized to a temperature between 5 °C (41 °F) and 30 °C (86 °F) within a maximum of 6 min.

ELEC AC BUS 2 FAULT

Applicable to: MSN 02719-05746

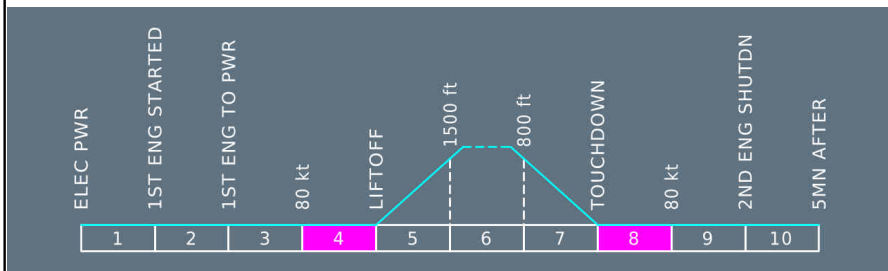
Ident.: PRO-ABN-ELEC-J-00017348.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

-  This alert triggers when the AC 2 busbar is not supplied.

Flight Phase Inhibition:



Continued on the following page

ELEC AC BUS 2 FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-J-00017877.0002001 / 01 MAR 18

EXTRACT.....
OVRD

- L2

The avionics ventilation system is in the closed circuit configuration.

Air conditioning is added to the ventilation air.

L1 ATC/XPDR.....
SYS 1

ASSOCIATED PROCEDURES

L/G LGCIU 2 FAULT

ASSOCIATED PROCEDURES

ENG 2 EPR MODE FAULT

This associated procedure is only applicable to aircraft equipped with IAE engines.

SECONDARY FAILURES

* AVNCS VENT

* FUEL

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

ELEC

ELEC AC BUS 2 FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-J-00017878.0005001 / 03 MAY 23

L12

STATUS

INOP SYS

See below

ENG 2 APPR IDLE ONLY
 FLS  : F-APP+RAW ONLY

INOP SYS

ADR 2
 FWC 2
 R WSHLD HEAT
 F/O PITOT
 R WNDW HEAT
 REVERSER 2
 PACK 2 REGUL
 RUD TRIM 2
 ACT PUMP 
 GPS 2 

Y ELEC PUMP
 DMC 2
 LGCIU 2
 F/O AOA
 L+R TK PUMP 2
 VENT EXTRACT
 MAIN GALLEY
 CAT 2
 BRK SYS 2 /BSCU CH 2
 ATC 2 or ATC/XPDR 2

SDAC 2
 RECORDER SYS (OR FDIU)
 RA 2
 F/O TAT
 RUD TRV LIM 2
 GND COOL 
 YAW DAMPER 2
 CTR TK PUMP 2 
 ILS 2 (OR LS 2 for aircraft equipped with MLS  /GLS  /FLS )
 GLS AUTOLAND 

Other INOP SYS

Right cabin fan
 DME 2
 MCDU 2
 F/O PFD and ND
 HF 2 

Brake fans 1, 2, 3 and 4 
 RADAR 2 
 ENG 2 ignition B
 QAR

ADF 2 
 WXR 2 
 VOR 2
 ECAM lower DU

Note: The warning may be caused by a sub BUS failure. Consequently, only a part of the above-listed systems may be lost.

ELEC AC BUS 2 FAULT

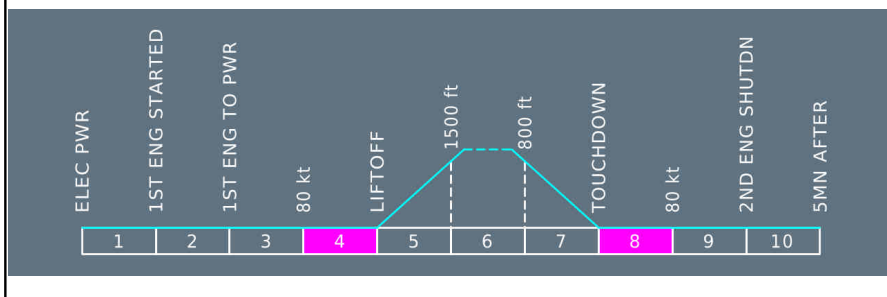
Applicable to: MSN 07784-07792

Ident.: PRO-ABN-ELEC-J-00017348.0001001 / 21 MAR 16

ANNUNCIATIONS
Triggering Conditions:

L2

This alert triggers when the AC 2 busbar is not supplied.

Flight Phase Inhibition:


Continued on the following page

ELEC AC BUS 2 FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-J-00017877.0002001 / 01 MAR 18

EXTRACT.....OVRD

- [L2]** The avionics ventilation system is in the closed circuit configuration.
 Air conditioning is added to the ventilation air.

[L1] ATC/XPDR.....SYS 1

ASSOCIATED PROCEDURES

L/G LGCIU 2 FAULT

ASSOCIATED PROCEDURES

ENG 2 EPR MODE FAULT

This associated procedure is only applicable to aircraft equipped with IAE engines.

SECONDARY FAILURES

- * AVNCS VENT
- * FUEL

Continued on the following page

ELEC AC BUS 2 FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-J-00017878.0007001 / 03 MAY 23

L12

STATUS

ENG 2 APPR IDLE ONLY
 FLS  : F-APP+RAW ONLY

INOP SYS

See below

INOP SYS

ADR 2
 FWC 2
 R WSHLD HEAT
 F/O PITOT
 R WNDW HEAT
 REVERSER 2
 MAIN GALLEY
 CAT 2
 ILS 2 (OR LS 2 for aircraft equipped
 with MLS  /GLS  /FLS )
 GLS AUTOLAND 

Y ELEC PUMP
 DMC 2
 LGCIU 2
 F/O AOA
 L+R TK PUMP 2
 VENT EXTRACT
 YAW DAMPER 2
 ACT PUMP 
 GPS 2 

SDAC 2
 RECORDER SYS (OR FDIU)
 RA 2
 F/O TAT
 RUD TRV LIM 2
 GND COOL 
 RUD TRIM 2
 BRK SYS 2 /BSCU CH 2
 ATC 2 or ATC/XPDR 2

Other INOP SYS

Right cabin fan
 DME 2
 MCDU 2
 F/O PFD and ND
 HF 2 

Brake fans 1, 2, 3 and 4 
 RADAR 2 
 ENG 2 ignition B
 QAR

ADF 2 
 WXR 2 
 VOR 2
 ECAM lower DU

The alert may be caused by a sub BUS failure. Consequently, only a part of the above-listed systems may be lost.

PROCEDURES
ABNORMAL AND EMERGENCY PROCEDURES
ELEC

ELEC AC ESS BUS ALTN

Applicable to: ALL

Ident.: PRO-ABN-ELEC-Z-00017356.0001001 / 21 MAR 16

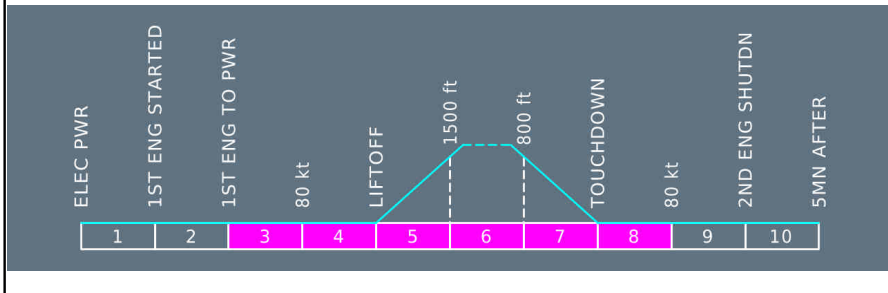
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the AC ESS busbar is supplied from the AC 2 busbar although the AC ESS FEED pb-sw is set to normal.

Flight Phase Inhibition:



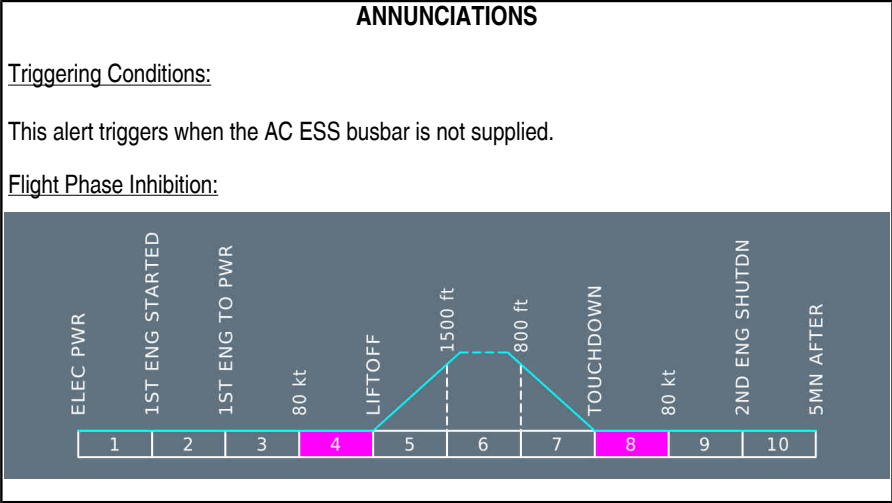
Ident.: PRO-ABN-ELEC-Z-00017893.0001001 / 21 MAR 16

Crew awareness.

ELEC AC ESS BUS FAULT

Applicable to: ALL

Ident.: PRO-ABN-ELEC-K-00017357.0001001 / 21 MAR 16



Ident.: PRO-ABN-ELEC-K-00012502.0002001 / 24 MAR 11

AC ESS FEED..... ALTN

L2

AC BUS 2 supplies AC ESS BUS.

L1

ATC/XPDR..... SYS 2

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

ELEC

ELEC AC ESS BUS FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-K-00018552.0014001 / 18 NOV 21

STATUS

INOP SYS

See below

INOP SYS

ADR 1
 CAPT PITOT
 SDAC 1
 GPWS
 RUD TRIM 1
 ATC 1 or ATC/XPDR 1

LS 1
 CAPT AOA
 FWC 1
 GPWS terr
 RUD TRV LIM 1

GPS 1
 CAT 2
 DMC 1
 YAW DAMPER 1
 GLS AUTOLAND 

Other INOP SYS

RMP's lighting (RMP's still operative)
 CVR
 CAPT PFD
 DDRMI 

VOR 1
 ECAM upper display
 DME 1
 HF 1

MCDU 1
 CAPT ND
 APU fuel pump
 Passenger oxygen masks (auto + manual)

Note: The warning may be caused by a sub BUS failure. As a result, only a part of the above-listed systems may be lost.

ELEC AC ESS BUS SHED

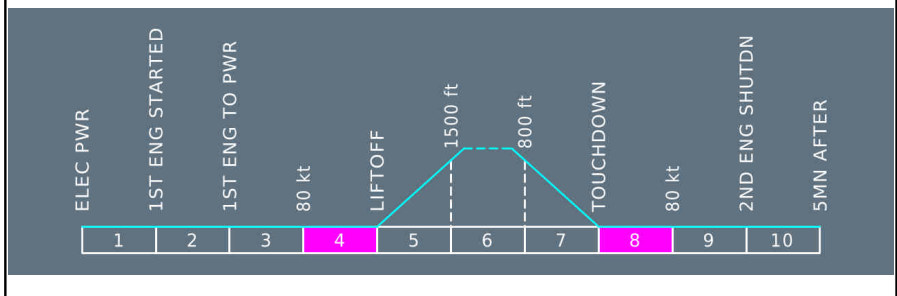
Applicable to: ALL

Ident.: PRO-ABN-ELEC-L-00017349.0001001 / 21 MAR 16

ANNUNCIATIONS
Triggering Conditions:

L2

This alert triggers when the AC SHED ESS busbar is not supplied.

Flight Phase Inhibition:


Ident.: PRO-ABN-ELEC-L-00012504.0002001 / 03 DEC 13

ATC/XPDR..... SYS 2

Continued on the following page

PROCEDURES
ABNORMAL AND EMERGENCY PROCEDURES

ELEC

ELEC AC ESS BUS SHED (Cont'd)

Ident.: PRO-ABN-ELEC-L-00018554.0004001 / 13 MAY 25

L12

STATUS

INOP SYS

CAPT AOA
ATC 1 or ATC/XPDR 1
See below

Other INOP SYS

MCDU 1
CVR
Passenger oxygen masks (auto
+ manual)
DME 1
CAPT AOA heat
APU fuel pump
CAPT ND
HF 1 

Note: The warning may be caused by a failure in a sub BUS. Consequently only a part of the systems listed above may be lost.

ELEC APU GEN FAULT

Applicable to: ALL

Ident.: PRO-ABN-ELEC-E-00017362.0001001 / 21 MAR 16

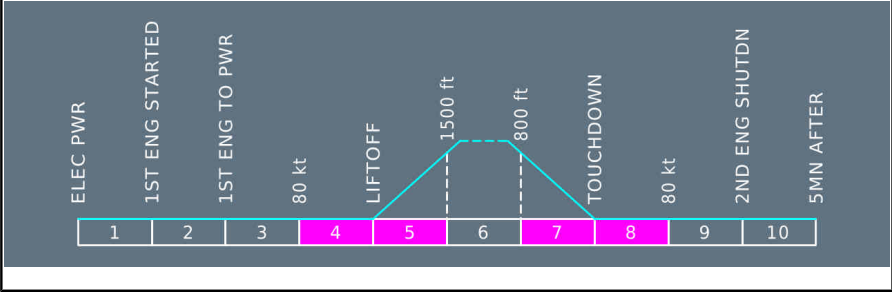
ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when:

- The protection trip is initiated by the associated GCU, or
- The line contactor is open with APU GEN pb-sw set to ON.

Flight Phase Inhibition:



Ident.: PRO-ABN-ELEC-E-00012490.0002001 / 18 MAR 11

APU GEN..... OFF THEN ON

● IF UNSUCCESSFUL:

APU GEN.....OFF

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

ELEC

ELEC APU GEN FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-E-00012491.0001001 / 18 MAR 11

STATUS

INOP SYS

 MAIN GALLEY ⁽¹⁾
 APU GEN

⁽¹⁾ (When only one GEN operating)

ELEC BAT 1(2) FAULT

Applicable to: ALL

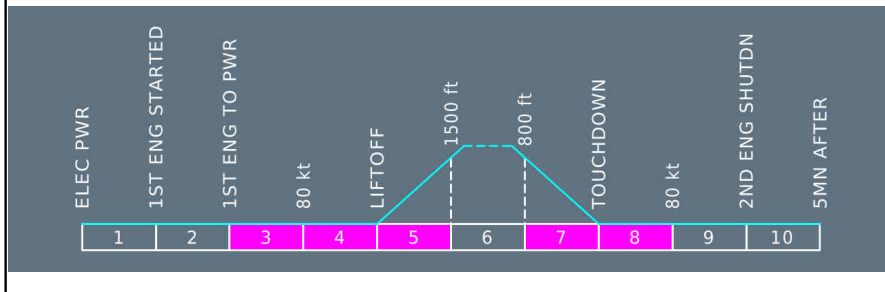
Ident.: PRO-ABN-ELEC-F-00017367.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

[L2] This alert triggers when the charging current increases at an abnormal rate.

Flight Phase Inhibition:



Ident.: PRO-ABN-ELEC-F-00017894.0001001 / 21 MAR 16

[L2] Battery contactor is opened automatically by the battery charge limiter.

[L1] Crew awareness.

Continued on the following page

ELEC BAT 1(2) FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-F-00017895.0001001 / 21 MAR 16	
STATUS	
APU BAT START NOT AVAIL	INOP SYS BAT 1(2)

ELEC BAT 1(2) OFF

Applicable to: ALL

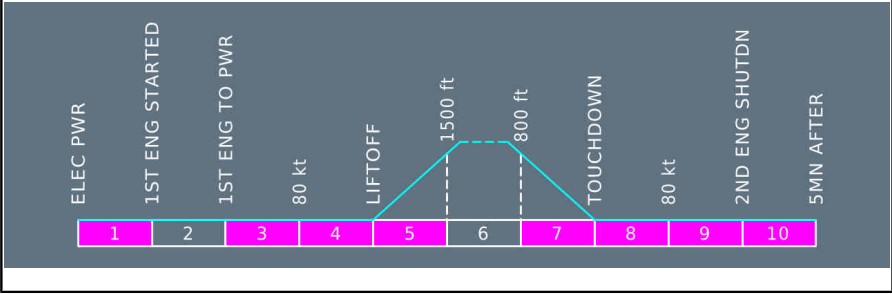
Ident.: PRO-ABN-ELEC-G-00017371.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the BAT 1(2) pb-sw is set to OFF and no failure is detected.

Flight Phase Inhibition:



Ident.: PRO-ABN-ELEC-G-00018943.0001001 / 21 MAR 16

Crew awareness.

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

ELEC

ELEC BAT 1(2) OFF (Cont'd)

Ident.: PRO-ABN-ELEC-G-00012495.0001001 / 19 AUG 10

STATUS

APU BAT START NOT AVAIL

ELEC BCL 1(2) FAULT

Applicable to: ALL

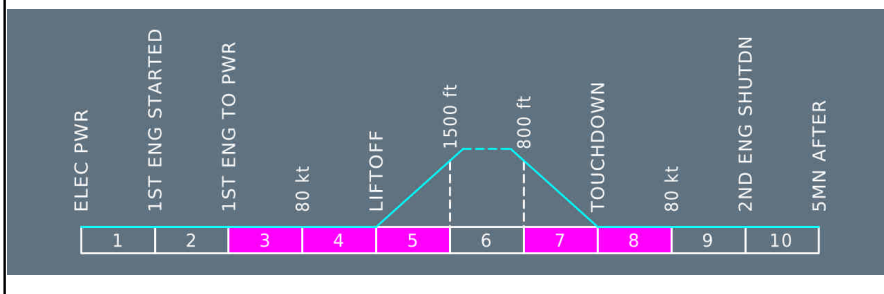
Ident.: PRO-ABN-ELEC-H-00017377.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

[L2] This alert triggers when the battery charge limiter 1(2) is failed.

Flight Phase Inhibition:



Ident.: PRO-ABN-ELEC-H-00012496.0001001 / 25 FEB 14

Crew awareness.

Continued on the following page

ELEC BCL 1(2) FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-H-00012497.0001001 / 19 AUG 10	
STATUS	
APU BAT START NOT AVAIL	INOP SYS BCL 1(2)

ELEC DC BAT BUS FAULT

Applicable to: MSN 02155-02789, 03031-04392

Ident.: PRO-ABN-ELEC-W-00017358.0001001 / 21 MAR 16

L2

ANNUNCIATIONS

Triggering Conditions:

This alert triggers when the DC BAT busbar is not supplied.

Flight Phase Inhibition:

ELEC PWR

1ST ENG STARTED

1ST ENG TO PWR

80 kt

LIFTOFF

1500 ft

800 ft

TOUCHDOWN

80 kt

2ND ENG SHUTDN

5MN AFTER

1

2

3

4

5

6

7

8

9

10

Ident.: PRO-ABN-ELEC-W-00012545.0001001 / 22 MAR 16

Crew awareness.

Continued on the following page

PROCEDURES
ABNORMAL AND EMERGENCY PROCEDURES

ELEC

ELEC DC BAT BUS FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-W-00012546.0009001 / 21 MAR 16

L12

APU BAT START NOT AVAIL

ECB is no longer supplied

STATUS

INOP SYS

APU FIRE DET

Other INOP SYS

APU ECB

Stick and rudder pedals lock
(by AP)

Forward (aft) cargo fire
extinguishing 

Fwd cargo heat controller 

Fwd cargo isol valves 

APU fuel LP valve

Manual pressure control

Note: *The warning may be caused by a sub BUS failure. Consequently, only a part of the above-listed systems may be lost.*

ELEC DC BAT BUS FAULT

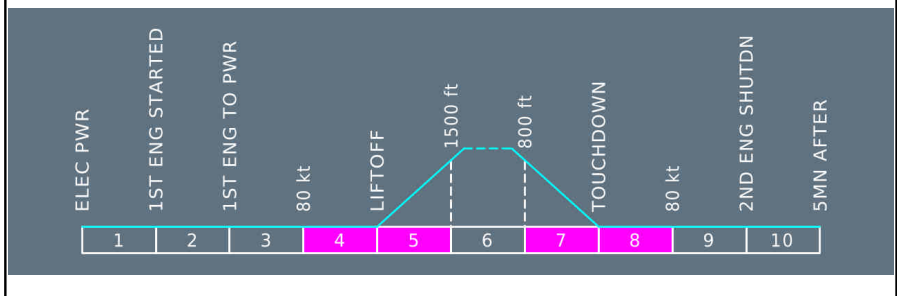
Applicable to: MSN 02926-02944

Ident.: PRO-ABN-ELEC-W-00017358.0001001 / 21 MAR 16

ANNUNCIATIONS
Triggering Conditions:

L2

This alert triggers when the DC BAT busbar is not supplied.

Flight Phase Inhibition:


Ident.: PRO-ABN-ELEC-W-00012545.0001001 / 22 MAR 16

Crew awareness.

Continued on the following page

ELEC DC BAT BUS FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-W-00012546.0002001 / 21 MAR 16

L12

STATUS

APU BAT START NOT AVAIL

ECB is no longer supplied

INOP SYS

APU FIRE DET

Other INOP SYS

APU ECB
Stick and rudder pedals lock
(by AP)
Forward (aft) cargo fire
extinguishing 
Forward (aft) cargo heat
controller 
Forward (aft) cargo isolation
valves 
APU fuel LP valve
Manual pressure control

Note: *The warning may
be caused by a
sub BUS failure.
Consequently,
only a part of
the above-listed
systems may be
lost.*

ELEC DC BAT BUS FAULT

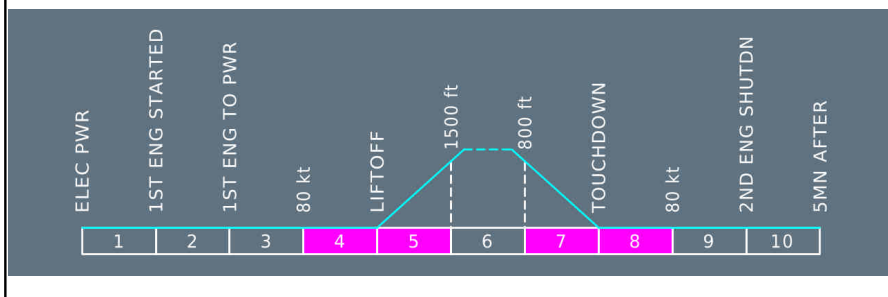
Applicable to: MSN 05152-05746

Ident.: PRO-ABN-ELEC-W-00017358.0001001 / 21 MAR 16

ANNUNCIATIONS
Triggering Conditions:

L2

This alert triggers when the DC BAT busbar is not supplied.

Flight Phase Inhibition:


Ident.: PRO-ABN-ELEC-W-00012545.0001001 / 22 MAR 16

Crew awareness.

Continued on the following page

PROCEDURES
ABNORMAL AND EMERGENCY PROCEDURES

ELEC

ELEC DC BAT BUS FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-W-00012546.0019001 / 21 MAR 16

L12

STATUS

APU BAT START NOT AVAIL

ECB is no longer supplied

INOP SYS

APU FIRE DET

Other INOP SYS

APU ECB
Stick and rudder pedals lock
(by AP)
Forward (aft) cargo fire
extinguishing 
AFT Cargo heat controller 
AFT Cargo isol valves 
APU fuel LP valve
Manual pressure control

Note: *The warning may
be caused by a
sub BUS failure.
Consequently,
only a part of
the above-listed
systems may be
lost.*

ELEC DC BAT BUS FAULT

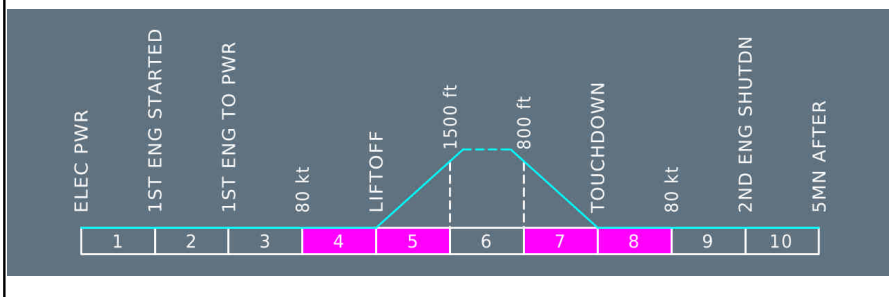
Applicable to: MSN 07784-07792

Ident.: PRO-ABN-ELEC-W-00017358.0001001 / 21 MAR 16

ANNUNCIATIONS
Triggering Conditions:

L2

This alert triggers when the DC BAT busbar is not supplied.

Flight Phase Inhibition:


Ident.: PRO-ABN-ELEC-W-00012545.0001001 / 22 MAR 16

Crew awareness.

Continued on the following page

ELEC DC BAT BUS FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-W-00012546.0006001 / 06 NOV 25

L12

5

APU BAT START NOT AVAIL
ECB is no longer supplied

STATUS

INOP SYS

APU FIRE DET

Other INOP SYS

- APU ECB
- Stick and rudder pedals lock
(by AP)
- Forward cargo fire extinguishing 
- AFT cargo fire extinguishing 
- Forward cargo heat controller 
- AFT cargo heat controller 
- Fwd cargo isol valves 
- APU fuel LP valve
- Manual pressure control

Note: *The warning may be caused by a sub BUS failure. Consequently, only a part of the above-listed systems may be lost.*

ELEC DC BUS 1 FAULT

Applicable to: MSN 02155-02212

Ident.: PRO-ABN-ELEC-M-00017350.0001001 / 21 MAR 16

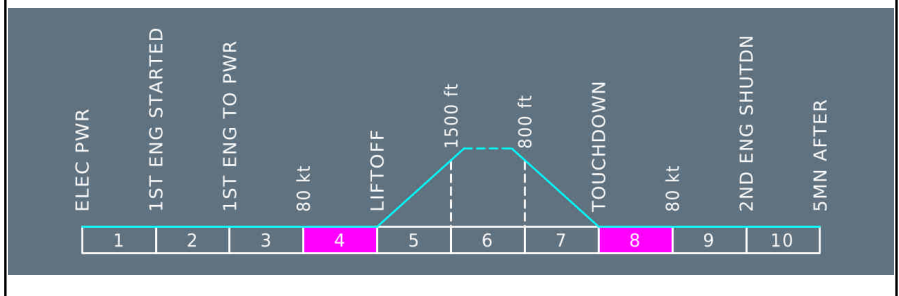
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the DC 1 busbar is not supplied.

Flight Phase Inhibition:



Ident.: PRO-ABN-ELEC-M-00012507.0001001 / 15 DEC 15

BLOWER.....OVRD
 EXTRACT.....OVRD

L2

The Air conditioning system provides ventilation to the avionics. This ventilation air is exhausted overboard.

L1

SECONDARY FAILURES

***AVNCS VENT**

Continued on the following page

ELEC DC BUS 1 FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-M-00018555.0026001 / 06 NOV 25

L12

STATUS

INOP SYS

See below

CAB ZONE AT FIXED TEMP

 See ⁽¹⁾

CAT 3 SINGLE ONLY

INOP SYS

 ACP 3
 L. WNDW HEAT
 GALLEY FAN
 BRAKES SYS 1
 CAT 3 DUAL

 CAPT STAT heat
 CTR TK PUMP 1 
 GND COOL 
 LAV DET

 L. WSHLD HEAT
 AVNCS VENT
 REVERSER 1
 PACK 1 REGUL

Other INOP SYS

 Left cab fan
 CFDIU
 L CTR TK XFR valve 
 Eng 1 oil press and qty ind.

 Zone controller primary channel
 VHF 3 
 Hot air
 TPIS 

 Sel cal
 RMP 3 
 Capt wiper
 Brake temps ind.

Note: The warning may be caused by a sub BUS failure. Consequently, only a part of the above-listed systems may be lost.

⁽¹⁾ Due to the loss of the galley fan, the Pack 1 controller, and the primary zone controller channel. (See associated procedures).

ELEC DC BUS 1 FAULT

Applicable to: MSN 02719-05746

Ident.: PRO-ABN-ELEC-M-00017350.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the DC 1 busbar is not supplied.

Flight Phase Inhibition:

Ident.: PRO-ABN-ELEC-M-00012507.0001001 / 15 DEC 15

BLOWER.....OVRD
 EXTRACT.....OVRD

L2

The Air conditioning system provides ventilation to the avionics. This ventilation air is exhausted overboard.

L1

SECONDARY FAILURES

*AVNCS VENT

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

ELEC

ELEC DC BUS 1 FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-M-00018555.0027001 / 06 NOV 25

STATUS

 CAB TEMP CKPT CTL ONLY
 CAT 3 SINGLE ONLY

INOP SYS
See below
INOP SYS

 ACP 3
 L. WNDW HEAT
 GALLEY FAN
 BRAKES SYS 1

 CAPT STAT heat
 CTR TK PUMP 1 
 GND COOL 
 LAV DET

 L. WSHLD HEAT
 AVNCS VENT
 REVERSER 1
 CAT 3 DUAL

Other INOP SYS

 Left cab fan
 CFDIU
 L CTR TK XFR valve 
 Eng 1 oil press and qty ind.

 COND controller lane A
 VHF 3 
 Hot air
 TPIS 

 Sel cal
 RMP 3 
 Capt wiper
 Brake temps ind.

Note: *The warning may be caused by a sub BUS failure. Consequently, only a part of the above-listed systems may be lost.*

ELEC DC BUS 1 FAULT

Applicable to: MSN 07784-07792

Ident.: PRO-ABN-ELEC-M-00017350.0001001 / 21 MAR 16

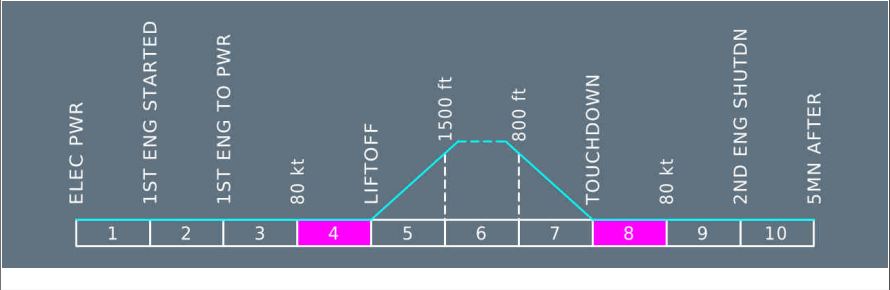
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the DC 1 busbar is not supplied.

Flight Phase Inhibition:



Ident.: PRO-ABN-ELEC-M-00012507.0001001 / 15 DEC 15

BLOWER.....OVRD
 EXTRACT.....OVRD

L2

The Air conditioning system provides ventilation to the avionics. This ventilation air is exhausted overboard.

L1

SECONDARY FAILURES

*AVNCS VENT

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

ELEC

ELEC DC BUS 1 FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-M-00018555.0029001 / 06 NOV 25

STATUS

INOP SYS

See below

CAB TEMP CKPT CTL ONLY
CAT 3 SINGLE ONLY

INOP SYS

ACP 3
L. WNDW HEAT
GND COOL 
LAV DET

CAPT STAT heat
AVNCS VENT
REVERSER 1
CAT 3 DUAL

L. WSHLD HEAT
GALLEY FAN
BRAKES SYS 1

Other INOP SYS

Left cab fan
CFDIU
L CTR TK XFR valve
Eng 1 oil press and qty ind.

COND controller lane A
VHF 3 
Hot air
TPIS 

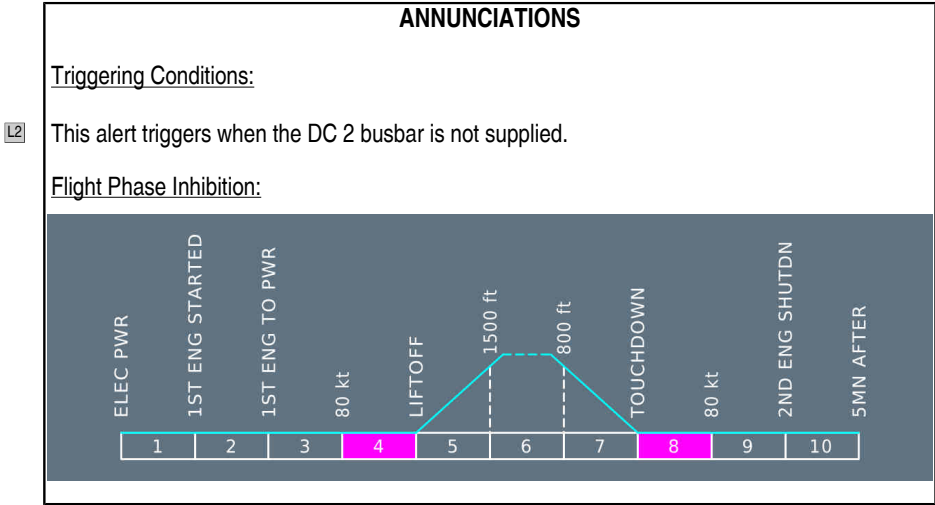
Sel cal
RMP 3 
Capt wiper
Brake temps ind.

Note: The warning may be caused by a sub BUS failure. Consequently, only a part of the above-listed systems may be lost.

ELEC DC BUS 2 FAULT

Applicable to: MSN 02155-02212

Ident.: PRO-ABN-ELEC-N-00017352.0001001 / 21 MAR 16



Ident.: PRO-ABN-ELEC-N-00017898.0009001 / 09 NOV 21

AIR DATA SWTG.....F/O 3

BARO REF.....CHECK

L2

Since one FCU channel is lost, crosscheck the barometer reference settings on the FCU and PFD.

L1

● If DC ESS BUS is failed:
 L/G GRVTY PROC.....APPLY

L2

Refer to PRO-ABN-LG [QRH] L/G GRAVITY EXTENSION.

L1

FUEL CONSUMPT INCRSD
FMS PRED UNRELIABLE

SECONDARY FAILURES

- * CAB PRESS
 * FUEL
 * WHEEL
 * F/CTL

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

ELEC

ELEC DC BUS 2 FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-N-00017899.0012001 / 06 NOV 25

L12

STATUS

● If ELEC DC ESS BUS FAULT:

L/G.....GRVTY EXTN

LDG DIST PROC.....APPLY

FUEL CONSUMPT INCRSD

 See ⁽³⁾

FMS PRED UNRELIABLE

 See ⁽⁴⁾

ENG 2 APPR IDLE ONLY

BOTH PFD ON SAME FAC

PACK 2 AT FIXED TEMP

● If ELEC DC ESS BUS FAULT:

L/G CONTROL NOT AVAIL

SLATS/FLAPS SLOW

CAT 3 SINGLE ONLY

INOP SYS

See below

INOP SYS

SPLR 1+2+5

VHF 2

R WNDW HEAT

CAT 3 DUAL

R TK PUMP 2

LGCIU 2

MAIN GALLEY

ENG 1 LOOP B

FCDC 2

 ELAC 2⁽¹⁾

F/O STAT

AP 2

FAC 2

CTR TK PUMP 2 <3>

REVERSER 2

Y ELEC PUMP (if selected ON)

ENG 2 LOOP A

 LGCIU 1 ⁽²⁾

SEC 2+3

R WSLHD HEAT

FCU 2

L TK PUMP 2

AUTO BRK

CAB PR 2

BRK SYS 2

PACK 2 REGUL

Other INOP SYS

SFCC 2

R cabin fan

F/O wiper

Continued on the following page

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES ABNORMAL AND EMERGENCY PROCEDURES ELEC
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ELEC DC BUS 2 FAULT (Cont'd)

F/O rain rplnt  Bleed X feed auto control zone controller sec channel Brake fan  Rudder trim ind	Eng 1 and 2 fire ext btl 2 RMP 2 CTR TK XFR valve R  Eng 2 oil low press and qty ind FMGC 2	BMC 2 FQI channel 2 SDCU  2 or CIDS 2 SMOKE DETECT  R loudspeaker CDLS
--	--	---

Note: *The warning may be caused by a sub BUS failure. Consequently, only a part of the above-listed systems may be lost.*

- (1) *Lost after 30 s, but recovered at landing gear extension.*
- (2) *(If ELEC DC ESS BUS FAULT)*
- (3) *This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.*
- (4) *Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable fuel penalty factor.*

ELEC DC BUS 2 FAULT

Applicable to: MSN 02719-05746

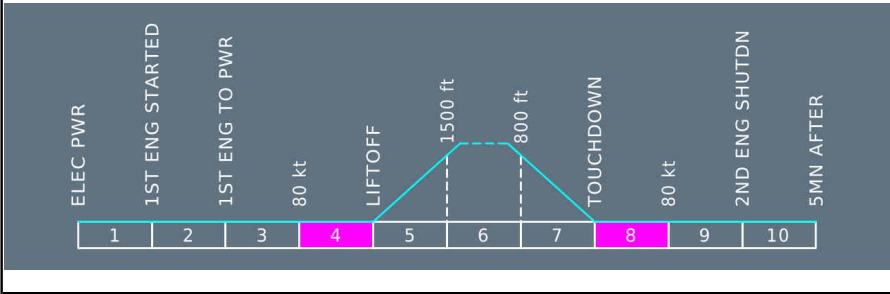
Ident.: PRO-ABN-ELEC-N-00017352.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the DC 2 busbar is not supplied.

Flight Phase Inhibition:



Ident.: PRO-ABN-ELEC-N-00017898.0009001 / 09 NOV 21

AIR DATA SWTG.....F/O 3
 BARO REF.....CHECK

L2 Since one FCU channel is lost, crosscheck the barometer reference settings on the FCU and PFD.

L1 ● If DC ESS BUS is failed:
 L/G GRVTY PROC.....APPLY

L2 Refer to PRO-ABN-LG [QRH] L/G GRAVITY EXTENSION.

L1 FUEL CONSUMPT INCRSD
 FMS PRED UNRELIABLE

SECONDARY FAILURES

- * CAB PRESS
 * FUEL
 * WHEEL
 * F/CTL

Continued on the following page

ELEC DC BUS 2 FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-N-00017899.0013001 / 06 NOV 25

L12		STATUS	
● If ELEC DC ESS BUS FAULT: L/G.....GRVTY EXTN LDG DIST PROC.....APPLY FUEL CONSUMPT INCRSD See ⁽³⁾ FMS PRED UNRELIABLE See ⁽⁴⁾ ENG 2 APPR IDLE ONLY BOTH PFD ON SAME FAC ● If ELEC DC ESS BUS FAULT: L/G CONTROL NOT AVAIL SLATS/FLAPS SLOW CAT 3 SINGLE ONLY		<u>INOP SYS</u> See below	
<u>INOP SYS</u>			
SPLR 1+2+5 VHF 2 R WNDW HEAT CAT 3 DUAL R TK PUMP 2 LGCIU 2 MAIN GALLEY ENG 1 LOOP B LGCIU 1 ⁽²⁾	ELAC 2 ⁽¹⁾ F/O STAT AP 2 FAC 2 CTR TK PUMP 2  REVERSER 2 Y ELEC PUMP (if selected ON) ENG 2 LOOP A	SEC 2+3 R WSLHD HEAT FCU 2 L TK PUMP 2 AUTO BRK CAB PR 2 BRK SYS 2 FCDC 2	
<u>Other INOP SYS</u>			
SFCC 2 F/O rain rplnt 	R cabin fan Eng 1 and 2 fire ext btl 2	F/O wiper BMC 2	

Continued on the following page

ELEC DC BUS 2 FAULT (Cont'd)

Bleed X feed auto control

 CTR TK XFR valve R 

 Eng 2 oil low press and qty ind
 FMGC 2

RMP 2

 SDCU  2 or CIDS 2 SMOKE

 DETECT 

 R loudspeaker
 CDLS

FQI channel 2

 Brake fan 

Rudder trim ind

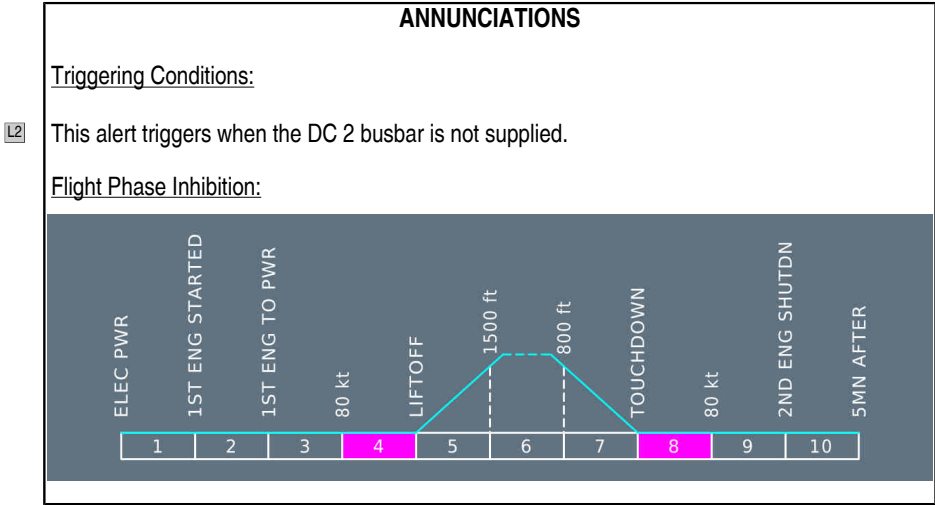
Note: The warning may be caused by a sub BUS failure. Consequently, only a part of the above-listed systems may be lost.

- (1) Lost after 30 s, but recovered at landing gear extension.
- (2) (If ELEC DC ESS BUS FAULT)
- (3) This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.
- (4) Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable fuel penalty factor.

ELEC DC BUS 2 FAULT

Applicable to: MSN 07784-07792

Ident.: PRO-ABN-ELEC-N-00017352.0001001 / 21 MAR 16



Ident.: PRO-ABN-ELEC-N-00017898.0009001 / 09 NOV 21

AIR DATA SWTG.....F/O 3
 BARO REF.....CHECK

- L2

Since one FCU channel is lost, crosscheck the barometer reference settings on the FCU and PFD.
- L1

● If DC ESS BUS is failed:
 L/G GRVTY PROC.....APPLY
- L2

Refer to PRO-ABN-LG [QRH] L/G GRAVITY EXTENSION.
- L1

FUEL CONSUMPT INCRSD
 FMS PRED UNRELIABLE

SECONDARY FAILURES

- * CAB PRESS
 * FUEL
 * WHEEL
 * F/CTL

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

ELEC

ELEC DC BUS 2 FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-N-00017899.0015001 / 06 NOV 25

L12

STATUS

● If **ELEC DC ESS BUS FAULT:**

L/G.....GRVTY EXTN

LDG DIST PROC.....APPLY

FUEL CONSUMPT INCRSD

See ⁽³⁾

FMS PRED UNRELIABLE

See ⁽⁴⁾

ENG 2 APPR IDLE ONLY

BOTH PFD ON SAME FAC

● If **ELEC DC ESS BUS FAULT:**

L/G CONTROL NOT AVAIL

SLATS/FLAPS SLOW

CAT 3 SINGLE ONLY

INOP SYS

See below

INOP SYS

SPLR 1+2+5

VHF 2

R WNDW HEAT

CAT 3 DUAL

R TK PUMP 2

REVERSER 2

Y ELEC PUMP (if selected ON)

ENG 2 LOOP A

ELAC 2⁽¹⁾

F/O STAT

AP 2

FAC 2

AUTO BRK

CAB PR 2

BRK SYS 2

FCDC 2

SEC 2+3

R WSLHD HEAT

FCU 2

L TK PUMP 2

LGCIU 2

MAIN GALLEY

ENG 1 LOOP B

LGCIU 1 ⁽²⁾

Other INOP SYS

SFCC 2

F/O rain rpnlt 

Bleed X feed auto control

R cabin fan

Eng 1 and 2 fire ext btl 2

RMP 2

F/O wiper

BMC 2

FQI channel 2

Continued on the following page

ELEC DC BUS 2 FAULT (Cont'd)

CTR TK XFR valve R

 SDCU  2 or CIDS 2 SMOKE

 Brake fan 

 Eng 2 oil low press and qty ind
 FMGC 2

 DETECT 
 R loudspeaker
 CDLS

Rudder trim ind

Note: The warning may be caused by a sub BUS failure. Consequently, only a part of the above-listed systems may be lost.

- (1) Lost after 30 s, but recovered at landing gear extension.
- (2) (If ELEC DC ESS BUS FAULT)
- (3) This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.
- (4) Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable fuel penalty factor.

ELEC DC BUS 1+2 FAULT

Applicable to: MSN 02155-02212

Ident.: PRO-ABN-ELEC-Q-00017353.0001001 / 21 MAR 16

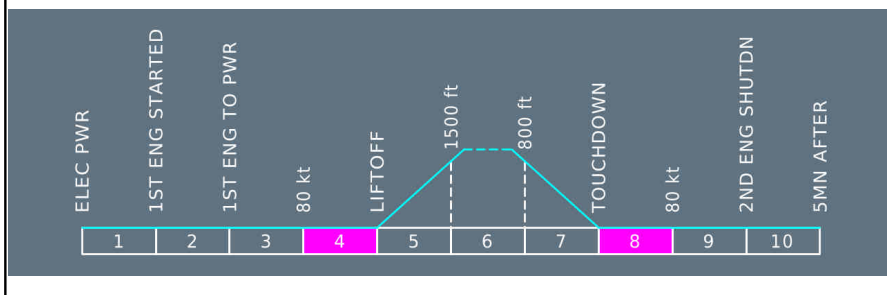
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the DC 1 and DC 2 busbars are not supplied.

Flight Phase Inhibition:



Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

ELEC

ELEC DC BUS 1+2 FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-Q-00018565.0004001 / 06 NOV 25

15 BLOWER.....OVRD
 EXTRACT.....OVRD
 BARO REF.....CHECK

L2 Crosscheck the barometer reference settings on the FCU and PFDs.

L1 FUEL CONSUMPT INCRSD
 FMS PRED UNRELIABLE
 MAX BRK PR.....1 000 PSI

L2 Brake pressure must be limited to approximately 1 000 PSI, since antiskid is lost.

L1

ASSOCIATED PROCEDURES

ELEC DC BAT BUS FAULT

SECONDARY FAILURES

- * CAB PRESS
- * AVNCS VENT
- * FUEL
- * AIR COND
- * BRAKES
- * F/CTL

Continued on the following page

ELEC DC BUS 1+2 FAULT (Cont'd)
Other INOP SYS

Selcal	Brake temp indication	Brake fans 
TPIS 	Capt and F/O wipers	Eng 1 and 2 oil pressure and quantity indication ⁽²⁾
Forward cargo isolation valves 	AFT cargo isolation valves 	Manual pressure control
VHF 3 	RMP 2	RMP 3 
CFDIU	Right loudspeakers	SFCC 2
APU ECB	Forward cargo heat controller 	AFT cargo heat controller 
CDLS	FMGC 2	Rudder trim indication
BMC 2	FQI channel 2	Eng 1 and 2 fire ext btl 2
X Bleed auto and manual control	Stick and rudder pedals lock (by AP)	Forward cargo fire extinguishing 
AFT cargo fire extinguishing 	SDCU  2 or CIDS 2 SMOKE	
	DETECT 	

Note: The warning may be caused by a failure in a sub BUS. Consequently, only a part of the above-listed systems may be lost.

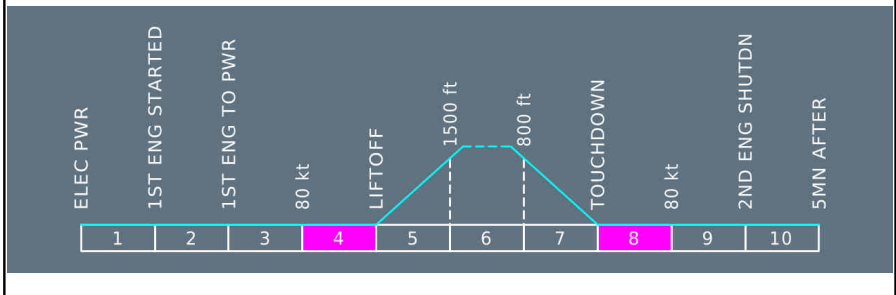
- (1) Lost after 30 s, but is recovered at landing gear extension.
- (2) (except for aircraft equipped with PW1100G engines)
- (3) This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.
- (4) Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable fuel penalty factor.

ELEC DC BUS 1+2 FAULT
Applicable to: MSN 02719-05746

Ident.: PRO-ABN-ELEC-Q-00017353.0001001 / 21 MAR 16

ANNUNCIATIONS
Triggering Conditions:
L2

This alert triggers when the DC 1 and DC 2 busbars are not supplied.

Flight Phase Inhibition:

Continued on the following page

ELEC DC BUS 1+2 FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-Q-00018565.0004001 / 06 NOV 25

BLOWER.....OVRD
 EXTRACT.....OVRD
 BARO REF.....CHECK

L2 Crosscheck the barometer reference settings on the FCU and PFDs.

L1 FUEL CONSUMPT INCRSD
 FMS PRED UNRELIABLE
 MAX BRK PR.....1 000 PSI

L2 Brake pressure must be limited to approximately 1 000 PSI, since antiskid is lost.

L1

ASSOCIATED PROCEDURES

ELEC **DC BAT BUS FAULT**

SECONDARY FAILURES

- * CAB PRESS
- * AVNCS VENT
- * FUEL
- * AIR COND
- * BRAKES
- * F/CTL

Continued on the following page

ELEC DC BUS 1+2 FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-Q-00018566.0018001 / 06 NOV 25

L12

STATUS

MAX BRK PR..... 1000 PSI

INOP SYS

LDG DIST PROC..... APPLY

See below

FUEL CONSUMPT INCRSD

See ⁽³⁾

FMS PRED UNRELIABLE

See ⁽⁴⁾

ENG 2 APPR IDLE ONLY

BOTH PFD ON SAME FAC

CTR TK FUEL UNUSABLE

APU BAT START NOT AVAIL

SLATS/FLAPS SLOW

CAT 3 SINGLE ONLY

 FLS  LIMITED TO F-APP+RAW

INOP SYS

SPLR 1+2+5

VHF 2

F/O STAT heat

WNDW HEAT

CAT 3 DUAL

ANTI SKID

AUTO BRK

CAB PRESS 2

 AFT CRG HEAT 

MAIN GALLEY

LAV DET

PACK 2

L TK PUMP 2

 ELAC 2⁽¹⁾

ACP 3

STBY STAT heat

AP 2

FAC 2

N/W STRG

LGCIU 2

AVNCS VENT

 FWD CRG HEAT 

Y ELEC PUMP

ENG 1 LOOP B

FCDC 2

R TK PUMP 2

SEC 2+3

CAPT STAT heat

WSHLD HEAT

FCU 2

SDCU

NORM BRK

REVERSER 1+2

GALLEY FAN

 GND COOL 

APU FIRE DET

ENG 2 LOOP A

CTR TK PUMPS

Continued on the following page

ELEC DC BUS 1+2 FAULT (Cont'd)
Other INOP SYS

Selcal	Brake temp indication	Brake fans 
TPIS 	Capt and F/O wipers	Eng 1 and 2 oil pressure and quantity indication ⁽²⁾
Forward cargo isolation valves 	AFT cargo isolation valves 	Manual pressure control
VHF 3 	RMP 2	RMP 3 
CFDIU	Right loudspeakers	SFCC 2
APU ECB	Forward cargo heat controller 	AFT cargo heat controller 
CDLS	FMGC 2	Rudder trim indication
BMC 2	FQI channel 2	Eng 1 and 2 fire ext btl 2
X Bleed auto and manual control	Stick and rudder pedals lock (by AP)	Forward cargo fire extinguishing 
AFT cargo fire extinguishing 	SDCU  2 or CIDS 2 SMOKE	
	DETECT 	

Note: The warning may be caused by a failure in a sub BUS. Consequently, only a part of the above-listed systems may be lost.

- ⁽¹⁾ Lost after 30 s, but is recovered at landing gear extension.
- ⁽²⁾ (except for aircraft equipped with PW1100G engines)
- ⁽³⁾ This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.
- ⁽⁴⁾ Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable fuel penalty factor.

ELEC DC BUS 1+2 FAULT

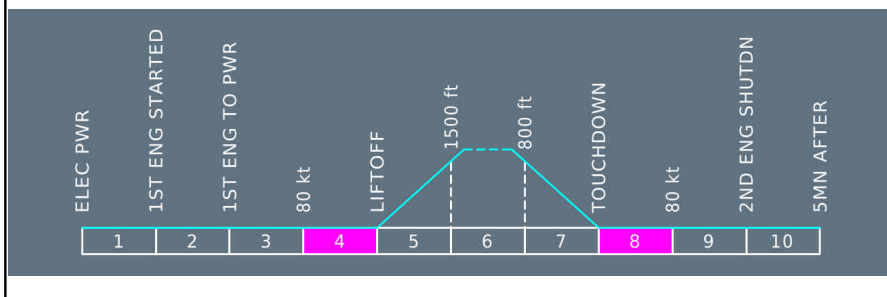
Applicable to: MSN 07784-07792

Ident.: PRO-ABN-ELEC-Q-00017353.0001001 / 21 MAR 16

ANNUNCIATIONS
Triggering Conditions:

L2

This alert triggers when the DC 1 and DC 2 busbars are not supplied.

Flight Phase Inhibition:


Continued on the following page

ELEC DC BUS 1+2 FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-Q-00018565.0004001 / 06 NOV 25

BLOWER..... OVRD
 EXTRACT..... OVRD
 BARO REF..... CHECK

L2 Crosscheck the barometer reference settings on the FCU and PFDs.

L1 FUEL CONSUMPT INCRSD
 FMS PRED UNRELIABLE
 MAX BRK PR..... 1 000 PSI

L2 Brake pressure must be limited to approximately 1 000 PSI, since antiskid is lost.

L1

ASSOCIATED PROCEDURES

ELEC **DC BAT BUS FAULT**

SECONDARY FAILURES

- * CAB PRESS
- * AVNCS VENT
- * FUEL
- * AIR COND
- * BRAKES
- * F/CTL

Continued on the following page

ELEC DC BUS 1+2 FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-Q-00018566.0020001 / 06 NOV 25

L12		STATUS	
MAX BRK PR..... 1000 PSI		INOP SYS	
LDG DIST PROC..... APPLY		See below	
FUEL CONSUMPT INCRSD			
See ⁽³⁾			
FMS PRED UNRELIABLE			
See ⁽⁴⁾			
ENG 2 APPR IDLE ONLY			
BOTH PFD ON SAME FAC			
CTR TK FUEL USABLE BY GRAVITY			
CTR TK FUEL: 2 T UNUSABLE			
APU BAT START NOT AVAIL			
SLATS/FLAPS SLOW			
CAT 3 SINGLE ONLY			
FLS  LIMITED TO F-APP+RAW			
INOP SYS			
SPLR 1+2+5	ELAC 2 ⁽¹⁾	SEC 2+3	
VHF 2	ACP 3	CAPT STAT heat	
F/O STAT heat	STBY STAT heat	WSHLD HEAT	
WNDW HEAT	AP 2	FCU 2	
CAT 3 DUAL	FAC 2	SDCU	
ANTI SKID	N/W STRG	NORM BRK	
AUTO BRK	LGCIU 2	REVERSER 1+2	
CAB PRESS 2	AVNCS VENT	GALLEY FAN	
AFT CRG HEAT 	FWD CRG HEAT 	GND COOL 	
MAIN GALLEY	Y ELEC PUMP	APU FIRE DET	
LAV DET	ENG 1 LOOP B	ENG 2 LOOP A	
PACK 2	FCDC 2	L TK PUMP 2	
R TK PUMP 2			

Continued on the following page

ELEC DC BUS 1+2 FAULT (Cont'd)
Other INOP SYS

Selcal	Brake temp indication	Brake fans 
TPIS 	Capt and F/O wipers	Eng 1 and 2 oil pressure and quantity indication ⁽²⁾
Forward cargo isolation valves 	AFT cargo isolation valves 	Manual pressure control
VHF 3 	RMP 2	RMP 3 
CFDIU	Right loudspeakers	SFCC 2
CTR TK XFR valves	APU ECB	Forward cargo heat controller 
AFT cargo heat controller 	CDLS	FMGC 2
Rudder trim indication	BMC 2	FQI channel 2
Eng 1 and 2 fire ext btl 2	X Bleed auto and manual control	Stick and rudder pedals lock (by AP)
Forward cargo fire extinguishing 	AFT cargo fire extinguishing 	SDCU  2 or CIDS 2 SMOKE DETECT 

Note: The warning may be caused by a failure in a sub BUS. Consequently, only a part of the above-listed systems may be lost.

- ⁽¹⁾ Lost after 30 s, but is recovered at landing gear extension.
- ⁽²⁾ (except for aircraft equipped with PW1100G engines)
- ⁽³⁾ This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.
- ⁽⁴⁾ Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable fuel penalty factor.

ELEC DC EMER CONFIG

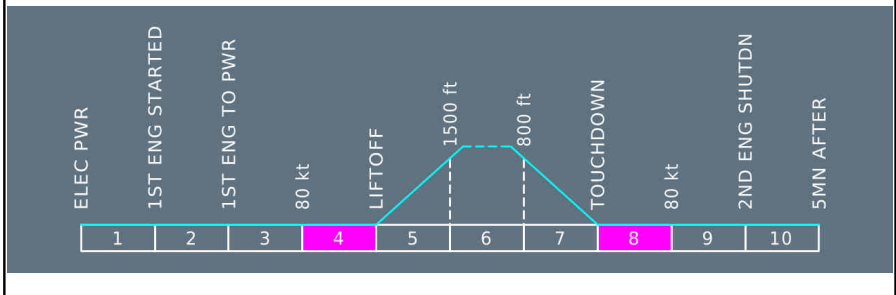
Applicable to: ALL

Ident.: PRO-ABN-ELEC-X-00017359.0001001 / 21 MAR 16

ANNUNCIATIONS
Triggering Conditions:

L2

This alert triggers when the DC 1, DC 2 and DC ESS busbars are not supplied.

Flight Phase Inhibition:


Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

ELEC

ELEC DC EMER CONFIG (Cont'd)

Ident.: PRO-ABN-ELEC-X-00018557.0007001 / 18 MAR 20

LAND ASAP

EMER ELEC PWR.....MAN ON

- [L2]** *The emergency generator supplies DC ESS BUS.
But, DC BUS 1, DC BUS 2, and DC BAT BUS are still not supplied.*

[L1] AVOID ICING CONDITIONS

- [L2]** *Windows, windshields heat, and static ports heat are lost.*

**[L1] FUEL CONSUMPT INCRSD
FMS PRED UNRELIABLE**

ASSOCIATED PROCEDURES

ELEC DC BUS 1 + 2 FAULT

BLOWER.....OVRD
EXTRACT.....OVRD
BARO REF.....CHECK

- [L2]** *Crosscheck the barometer reference settings on the FCU and PFDs.*

[L1] MAX BRK PR.....1 000 PSI

- [L2]** *Brake pressure must be limited to approximately 1 000 PSI, since antiskid is lost.*

**[L1] FUEL CONSUMPT INCRSD
FMS PRED UNRELIABLE**

ASSOCIATED PROCEDURES

ELEC DC BAT BUS FAULT

SECONDARY FAILURES

- * CAB PRESS
- * HYD
- * FUEL
- * AIR COND
- * BRAKES
- * WHEEL
- * F/CTL

Continued on the following page

ELEC DC EMER CONFIG (Cont'd)

Ident.: PRO-ABN-ELEC-X-00018558.0008001 / 18 MAR 20	
L12	STATUS MIN RAT SPEED..... 140 KT PROC: GRVTY FUEL FEEDING MAX BRK PR..... 1 000 PSI AVOID ICING CONDITIONS FUEL GRVTY FEED ● IF SEVERE ICE ACCRETION: MIN SPD..... VLS+10/G DOT <i><u>Note:</u> In the case of severe ice accretion, with wing anti-ice failed, the Angle-of-Attack (AOA) protections remain efficient.</i> LDG DIST PROC..... APPLY <i>Refer to the list of STATUS INFO of the ELEC DC BUS 1+2 BUS FAULT ECAM alert</i> See ⁽¹⁾ <u>INOP SYS</u> WING A. ICE <i>Refer to the list of INOP SYS ON ECAM of the ELEC DC BUS 1+2 FAULT ECAM alert</i> <i><u>Note:</u> To verify the other INOP SYS not displayed on the ECAM, Refer to PRO-ABN-ELEC ELEC DC BUS 1+2 FAULT - FWSPAGE and Refer to PRO-ABN-ELEC ELEC DC BAT BUS FAULT - FWSPAGE.</i>
	⁽¹⁾ <i><u>Note:</u> DC ESS BUS is lost when speed is below 100 kt. Therefore, all means of communication are lost because all ACPs are lost. To verify the list of STATUS INFO, Refer to PRO-ABN-ELEC ELEC DC BUS 1+2 FAULT - FWSPAGE.</i>

ELEC DC ESS BUS FAULT

Applicable to: MSN 02155-02212

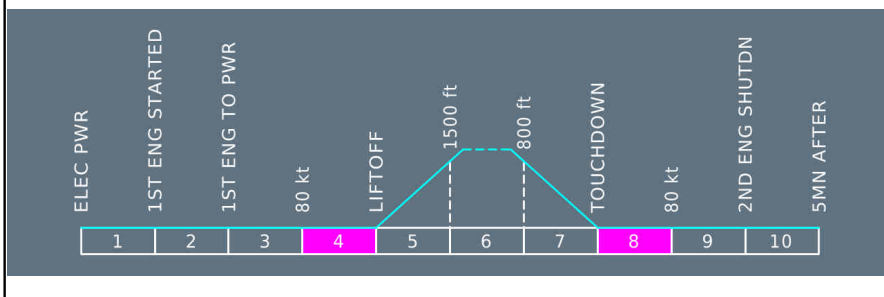
Ident.: PRO-ABN-ELEC-O-00017354.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the DC ESS busbar is not supplied.

Flight Phase Inhibition:



Continued on the following page

ELEC DC ESS BUS FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-O-00012511.0023001 / 09 NOV 21

VHF 2 OR 3.....USE
 AUDIO SWTG.....SELECT

L2 ACP 1 and 2 are lost. Therefore, set the AUDIO SWTG rotary selector to CAPT 3 or F/O 3 to recover communications.

L1 BARO REF.....CHECK

L2 Crosscheck the barometer reference settings on the FCU and the PFD.

L1 ● If DC BUS 2 is failed:
 L/G GRVTY PROC.....APPLY

L2 Refer to PRO-ABN-LG [QRH] L/G GRAVITY EXTENSION.

L1 GPWS.....OFF
 GALY & CAB.....OFF
 FUEL CONSUMPT INCRSD
 FMS PRED UNRELIABLE
 AVOID ICING CONDITIONS

ASSOCIATED PROCEDURES

NAV GPWS FAULT
 GPWS.....OFF

Note: To shut down the engines on ground, use the ENG FIRE pb-sw.

SECONDARY FAILURES

- * CAB PRESS
- * HYD
- * F/CTL

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

ELEC

ELEC DC ESS BUS FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-O-00018671.0053001 / 12 JUL 24

L12

STATUS

INOP SYS

See below

- If **ELEC DC BUS 2 FAULT**
 L/G GRVTY PROC..... APPLY
 LDG DIST PROC..... APPLY
 FUEL CONSUMPT INCRSD
 See ⁽²⁾
 FMS PRED UNRELIABLE
 See ⁽³⁾
 ENG 1 APPR IDLE ONLY
 ENG 2 APPR IDLE ONLY
 BOTH PFD ON SAME FAC
- If **ELEC DC BUS 2 FAULT**
 L/G CONTROL NOT AVAIL
 SLATS/FLAPS SLOW
 CAT 3 SINGLE ONLY

INOP SYS

B HYD	SPLR 3	VHF 1
ACP 1+2	WING A. ICE	AP 1
A/THR	FCU 1	FAC 1
L TK PUMP 1	R TK PUMP 1	REV 2
ENG 2 START	CAB PR 1	STEEP APPR 
VENT EXTRACT	B ELEC PUMP	ENG 1 LOOP A
ENG 2 LOOP B	FCDC 1	ROW/ROP 

Other INOP SYS

BRK PRESS indicator	Flight interphone	EIU 2 ⁽¹⁾
Capt rain repellent 	Avionics air cond valve	Standby compass light

Continued on the following page

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES ABNORMAL AND EMERGENCY PROCEDURES ELEC
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ELEC DC ESS BUS FAULT (Cont'd)

HP fuel shutoff valves	SFCC 1	RMP 1
Hyd fire valves Eng 1 and 2	Ram air inlet	ECAM Control Panel
Left loudspeaker	DC SHED ESS BUS	

Note: 1. The warning may be caused by a sub BUS failure. Consequently, only a part of the above-listed systems may be lost.

2. Even if the ECAM Status page displays **CAT 3 SINGLE ONLY**, the real landing capability of the aircraft is CAT 2, due to the inoperative A/THR (Refer to QRH/OPS Required Equipment for CAT2 and CAT3). Once the approach mode is armed, the FMA displays the correct landing capability **CAT 2**.

- (1) Autothrust, eng start and reverser inop.
- (2) This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.
- (3) Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable fuel penalty factor.

ELEC DC ESS BUS FAULT

Applicable to: MSN 02719-02789, 03031-07792

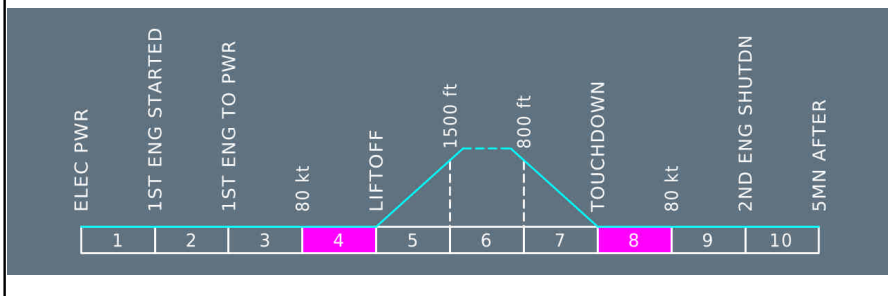
Ident.: PRO-ABN-ELEC-O-00017354.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the DC ESS busbar is not supplied.

Flight Phase Inhibition:



Continued on the following page

ELEC DC ESS BUS FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-O-00012511.0023001 / 09 NOV 21

VHF 2 OR 3.....
USE

AUDIO SWTG.....
SELECT

L2

ACP 1 and 2 are lost. Therefore, set the AUDIO SWTG rotary selector to CAPT 3 or F/O 3 to recover communications.

L1 BARO REF.....
CHECK

L2

Crosscheck the barometer reference settings on the FCU and the PFD.

L1

● If DC BUS 2 is failed:
L/G GRVTY PROC.....

APPLY

L2

Refer to PRO-ABN-LG [QRH] L/G GRAVITY EXTENSION.

L1 GPWS.....
OFF

GALY & CAB.....
OFF

FUEL CONSUMPT INCRSD

FMS PRED UNRELIABLE

AVOID ICING CONDITIONS

ASSOCIATED PROCEDURES

NAV GPWS FAULT

GPWS.....
OFF

Note: To shut down the engines on ground, use the ENG FIRE pb-sw.

SECONDARY FAILURES

- * CAB PRESS
 - * HYD
 - * F/CTL

Continued on the following page

ELEC DC ESS BUS FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-O-00018671.0051001 / 12 JUL 24

L12

STATUS

- If **ELEC DC BUS 2 FAULT**
 L/G GRVTY PROC..... APPLY
 LDG DIST PROC..... APPLY

FUEL CONSUMPT INCRSD

 See ⁽²⁾

FMS PRED UNRELIABLE

 See ⁽³⁾

ENG 1 APPR IDLE ONLY

ENG 2 APPR IDLE ONLY

BOTH PFD ON SAME FAC

- If **ELEC DC BUS 2 FAULT**
 L/G CONTROL NOT AVAIL
 SLATS/FLAPS SLOW
 CAT 3 SINGLE ONLY

INOP SYS

See below

INOP SYS

 B HYD
 ACP 1+2
 A/THR
 L TK PUMP 1
 ENG 2 START
 VENT EXTRACT
 ENG 2 LOOP B
 ROW/ROP 

 SPLR 3
 WING A. ICE
 FCU 1
 R TK PUMP 1
 CAB PR 1
 B ELEC PUMP
 FCDC 1

 VHF 1
 AP 1
 FAC 1
 REV 2
 STEEP APPR 
 ENG 1 LOOP A
 ALTN BRK

Other INOP SYS

BRK PRESS indicator

Flight interphone

 EIU 2 ⁽¹⁾
Continued on the following page

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES ABNORMAL AND EMERGENCY PROCEDURES ELEC
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ELEC DC ESS BUS FAULT (Cont'd)

Capt rain repellent  HP fuel shutoff valves Hyd fire valves Eng 1 and 2 Left loudspeaker	Avionics air cond valve SFCC 1 Ram air inlet DC SHED ESS BUS	Standby compass light RMP 1 ECAM Control Panel
<u>Note:</u> 1. The warning may be caused by a sub BUS failure. Consequently, only a part of the above-listed systems may be lost. 2. Even if the ECAM Status page displays CAT 3 SINGLE ONLY, the real landing capability of the aircraft is CAT 2, due to the inoperative A/THR (Refer to QRH/OPS Required Equipment for CAT2 and CAT3). Once the approach mode is armed, the FMA displays the correct landing capability CAT 2. (1) Autothrust, eng start and reverser inop. (2) This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft. (3) Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable fuel penalty factor.		

ELEC DC ESS BUS FAULT

Applicable to: MSN 02926-02944

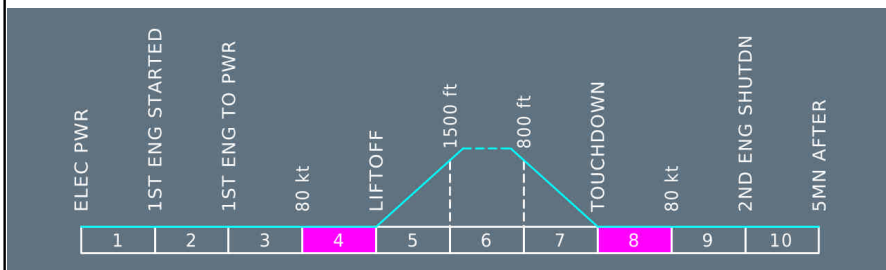
Ident.: PRO-ABN-ELEC-O-00017354.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the DC ESS busbar is not supplied.

Flight Phase Inhibition:



Continued on the following page

ELEC DC ESS BUS FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-O-00012511.0028001 / 15 MAY 25

VHF 2 OR 3.....USE

L2 *The audio cards of the AMU are lost. Since all cockpit mikes and headsets are connected to the AMU, all audio means of communication (VHF, HF  and SATCOM ) are lost. The use of VHF 2 or 3 does not allow the recovery of communications.*

L1 AUDIO SWTG.....SELECT
 BARO REF.....CHECK

L2 *Crosscheck the barometer reference settings on the FCU and the PFD.*

L1 ● **If DC BUS 2 is failed:**
 L/G GRVTY PROC.....APPLY

L2 *Refer to PRO-ABN-LG [QRH] L/G GRAVITY EXTENSION.*

L1 GPWS.....OFF
 GALY & CAB.....OFF
 FUEL CONSUMPT INCRSD
 FMS PRED UNRELIABLE
 AVOID ICING CONDITIONS

ASSOCIATED PROCEDURES

NAV GPWS FAULT
 GPWS.....OFF

Note: *To shut down the engines on ground, use the ENG FIRE pb-sw.*

SECONDARY FAILURES

- * CAB PRESS
- * HYD
- * F/CTL

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

ELEC

ELEC DC ESS BUS FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-O-00018671.0051001 / 12 JUL 24

L12

STATUS

INOP SYS

See below

- If **ELEC DC BUS 2 FAULT**
 L/G GRVTY PROC..... APPLY
 LDG DIST PROC..... APPLY

FUEL CONSUMPT INCRSD

See ⁽²⁾

FMS PRED UNRELIABLE

See ⁽³⁾

ENG 1 APPR IDLE ONLY

ENG 2 APPR IDLE ONLY

BOTH PFD ON SAME FAC

- If **ELEC DC BUS 2 FAULT**
 L/G CONTROL NOT AVAIL

SLATS/FLAPS SLOW

CAT 3 SINGLE ONLY

INOP SYS

B HYD

ACP 1+2

A/THR

L TK PUMP 1

ENG 2 START

VENT EXTRACT

ENG 2 LOOP B

ROW/ROP

SPLR 3

WING A. ICE

FCU 1

R TK PUMP 1

CAB PR 1

B ELEC PUMP

FCDC 1

VHF 1

AP 1

FAC 1

REV 2

STEEP APPR

ENG 1 LOOP A

ALTN BRK

Other INOP SYS

BRK PRESS indicator

Flight interphone

EIU 2 ⁽¹⁾

Continued on the following page

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES ABNORMAL AND EMERGENCY PROCEDURES ELEC
--	--

ELEC DC ESS BUS FAULT (Cont'd)

Capt rain repellent  HP fuel shutoff valves Hyd fire valves Eng 1 and 2 Left loudspeaker	Avionics air cond valve SFCC 1 Ram air inlet DC SHED ESS BUS	Standby compass light RMP 1 ECAM Control Panel
<u>Note:</u> 1. The warning may be caused by a sub BUS failure. Consequently, only a part of the above-listed systems may be lost. 2. Even if the ECAM Status page displays CAT 3 SINGLE ONLY, the real landing capability of the aircraft is CAT 2, due to the inoperative A/THR (Refer to QRH/OPS Required Equipment for CAT2 and CAT3). Once the approach mode is armed, the FMA displays the correct landing capability CAT 2. (1) Autothrust, eng start and reverser inop. (2) This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft. (3) Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable fuel penalty factor.		

ELEC DC ESS BUS SHED

Applicable to: ALL

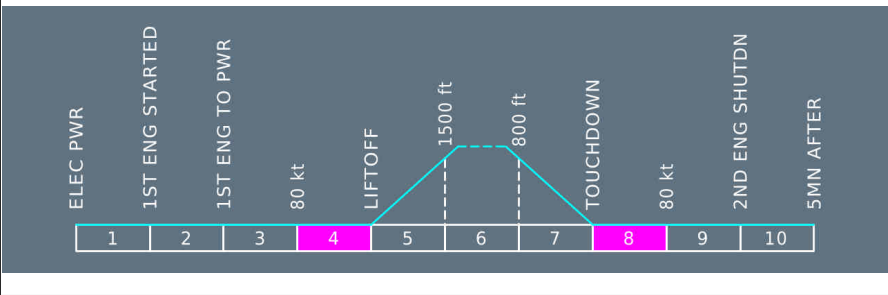
Ident.: PRO-ABN-ELEC-P-00017355.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the DC SHED ESS busbar is not supplied.

Flight Phase Inhibition:



Ident.: PRO-ABN-ELEC-P-00012513.0001001 / 30 MAR 12

EXTRACT **OVRD**

L2 Cooling air is supplied by the air conditioning system, without overboard extraction.

L1 **AVOID ICING CONDITIONS**

SECONDARY FAILURES

***AVNCS VENT**

Continued on the following page

ELEC DC ESS BUS SHED (Cont'd)

Ident.: PRO-ABN-ELEC-P-00018561.0005001 / 06 NOV 25

L12

29

STATUS

AVOID ICING CONDITIONS

- **IF SEVERE ICE ACCRETION**
- MIN SPD.....VLS + 10/G DOT
- MANEUVER WITH CARE
- LDG DIST PROC.....APPLY

BOTH PFD ON SAME FAC
CAT 3 SINGLE ONLY

INOP SYS

- WING A. ICE
- AP 1
- CAT 3 DUAL
- FAC 1
- VENT EXTRACT
- AFT CRG HEAT 
- FWD CRG HEAT 
- AFT CRG VENT 
- FWD CRG VENT 
- FCDC 1
- ROW/ROP 

See below

Other INOP SYS

- Passenger oxygen mask (auto drop out)
- X BLEED valve man ctl
- FMGC 1
- STBY ALTI vib
- FQI channel 1
- BMC 1
- SDCU  1 or CIDS 1 SMOKE
- DETECT 

Note: *The warning may be caused by a failure in a sub BUS. Consequently only a part of the systems listed above may be lost.*

Continued on the following page

ELEC DC ESS BUS SHED (Cont'd)

ELEC EMER CONFIG

Applicable to: MSN 02155-02212

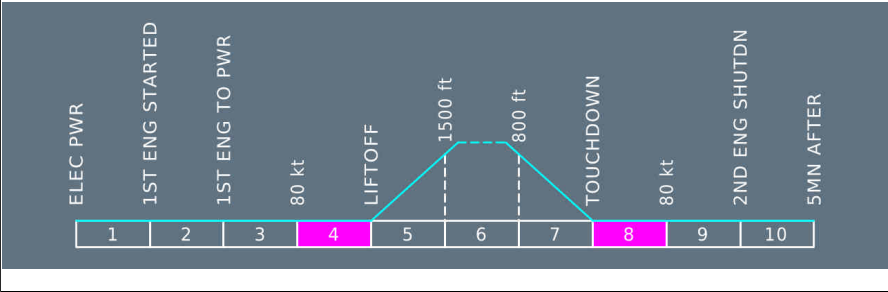
Ident.: PRO-ABN-ELEC-R-00018283.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the AC 1 and AC 2 busbars are not supplied.

Flight Phase Inhibition:



Continued on the following page

ELEC EMER CONFIG (Cont'd)

Ident.: PRO-ABN-ELEC-R-00018642.0006001 / 15 MAY 25

LAND ASAP

MIN RAT SPEED.....140 KT

CAUTION

The RAT is able to supply the EMER GEN down to 125 kt, however it may not be able to supply the EMER GEN during flare at these speeds.

GEN 1 + 2.....OFF THEN ON

Note: Turn off then on all generators one after the other.

● **IF UNSUCCESSFUL:**

BUS TIE.....OFF

L2 Setting BUS TIE pb-sw to OFF segregates both generator channels.

L1 GEN 1 + 2.....OFF THEN ON

Note:

- Turn off then on all generators one after the other
- If any generator reset is successful, reset both FACs.

EMER ELEC PWR.....MAN ON

L2 This line is displayed if the emergency generator is not in line.

L1 ENG MODE SEL.....IGN

L2 Engines are fed by gravity only.

L1 VHF1/HF1 <3> /ATC1.....USE

L2 Only VHF 1, HF 1 and ATC 1 are supplied in the electrical emergency configuration.

L1 Note: The flight crew can recover FMGC 1, which is lost temporarily, through the MCDU MENU page.

FUEL GRVTY FEED

L2 Engines are fed by gravity only. Avoid negative Gs.

L1 PROC : GRVTY FUEL FEEDING

L2 Apply GRVTY FUEL FEEDING procedure (Refer to PRO-ABN-FUEL [QRH] GRAVITY FUEL FEEDING).

L1 FAC 1.....OFF THEN ON

L2 The rudder trim is recovered, although no indication is available.

L1 BUS TIE.....AUTO

L2 Setting BUS TIE pb-sw to AUTO enables the APU to take an available electrical channel.

Continued on the following page

ELEC EMER CONFIG (Cont'd)

[L1] **APU (IF AVAIL)**..... **START**

- [L2] APU start is not available for 45 s after the loss of both engine generators. This 45 s delay prevents any interference with emergency generator coupling.
 If the APU is available, the APU may be started below FL 250.

[L1] **BLOWER + EXTRACT**..... **OVRD**

- [L2] Cooling air is supplied by the air conditioning system and exhausted overboard through the extract valve.

[L1] **FUEL CONSUMPT INCRSD**
FMS PRED UNRELIABLE

Note: On IAE powered aircraft, the **ENG 1(2) EPR MODE FAULT N1 DEGRADED MODE** alert is displayed.

ASSOCIATED PROCEDURES

F/CTL ALTN LAW
(PROT LOST)

Refer to PRO-ABN-F_CTL F/CTL ALTN LAW - ANNUNCIATION

Continued on the following page

ELEC EMER CONFIG (Cont'd)

Ident.: PRO-ABN-ELEC-R-00018643.0045001 / 02 MAY 24

L12

STATUS

MIN RAT SPEED..... 140 KT
 MAX SPEED..... 320 KT
 MAX BRK PR..... 1 000 PSI
 FUEL GRVTY FEED
 AVOID NEGATIVE G FACTOR

- Note:
1. Windshield heat and window heat are lost.
 2. Probe heating is lost except for pitot on CM1 side and AOA.
 3. Engine anti-ice is permanently on.
 4. In the case of discrepancies between airspeed indications on CM1 PFD and on STBY indicator, disregard the STBY indication (probe not de-iced).

APPR PROC

FOR LDG.....FLAP LVR 3

This line is replaced by "FOR LDG: FLAP LVR 3" when CONF 3 is selected, as a reminder.

APPR SPD..... VREF +10/140 KT

The approach speed must be at least equal to the minimum RAT speed (140 kt).

LDG DIST PROC..... APPLY

FUEL CONSUMPT INCRSD

See ⁽²⁾

FMS PRED UNRELIABLE

See ⁽³⁾

ALTN LAW: PROT LOST
 WHEN L/G DN: DIRECT LAW

See ⁽⁴⁾

INOP SYS

F/CTL PROT
 REVERSER 1+2
 ADR 2+3
 IR 2+3
 RA 1+2
 SPLR 1+2+5
 ELAC 2
 SEC 2+3
 A/CALL OUT
 AP 1+2
 A/THR
 FMGC 2
 FUEL PUMPS
 ANTI SKID
 N/W STRG
 CAT 2
 STEEP APPR 

See ⁽¹⁾

Continued on the following page

ELEC EMER CONFIG (Cont'd)

SLATS/FLAPS SLOW

FLS  LIMITED TO F-APP + RAW

See ⁽⁵⁾

- ⁽¹⁾ For other systems' status: Refer to the "ELEC EMER CONFIG SYS REMAINING" table.
- ⁽²⁾ This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.
- ⁽³⁾ Note: Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.
- ⁽⁴⁾ Note: At landing gear extension, flight controls revert to direct law in pitch, as well as in roll (Refer to PRO-ABN-F_CTL F/CTL DIRECT LAW).
- ⁽⁵⁾ Note:
1. In ELEC EMER configuration, the center tank fuel is unusable.
 2. For go-around procedure, Refer to PRO-ABN-ELEC ELEC ESS BUSES ON BAT.

ELEC EMER CONFIG

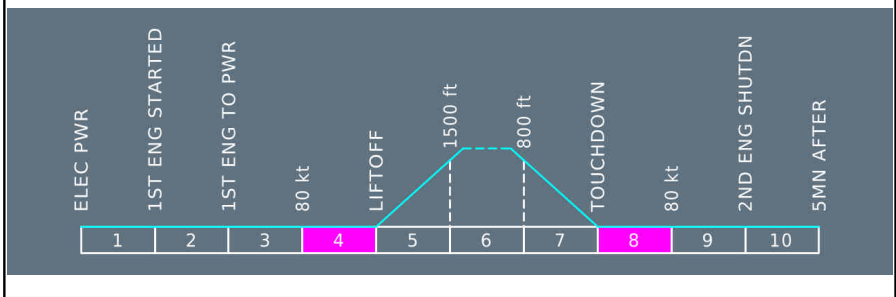
Applicable to: MSN 02719-05746

Ident.: PRO-ABN-ELEC-R-00018283.0001001 / 21 MAR 16

ANNUNCIATIONS
Triggering Conditions:

L2

This alert triggers when the AC 1 and AC 2 busbars are not supplied.

Flight Phase Inhibition:


Continued on the following page

ELEC EMER CONFIG (Cont'd)

Ident.: PRO-ABN-ELEC-R-00018642.0006001 / 15 MAY 25

LAND ASAP

MIN RAT SPEED.....140 KT

CAUTION The RAT is able to supply the EMER GEN down to 125 kt, however it may not be able to supply the EMER GEN during flare at these speeds.

GEN 1 + 2..... OFF THEN ON

Note: Turn off then on all generators one after the other.

● **IF UNSUCCESSFUL:**

BUS TIE..... OFF

L2 Setting BUS TIE pb-sw to OFF segregates both generator channels.

L1 GEN 1 + 2..... OFF THEN ON

Note: - Turn off then on all generators one after the other
 - If any generator reset is successful, reset both FACs.

EMER ELEC PWR..... MAN ON

L2 This line is displayed if the emergency generator is not in line.

L1 ENG MODE SEL..... IGN

L2 Engines are fed by gravity only.

L1 VHF1/HF1 /ATC1..... USE

L2 Only VHF 1, HF 1 and ATC 1 are supplied in the electrical emergency configuration.

L1 Note: The flight crew can recover FMGC 1, which is lost temporarily, through the MCDU MENU page.

FUEL GRVTY FEED

L2 Engines are fed by gravity only. Avoid negative Gs.

L1 **PROC : GRVTY FUEL FEEDING**

L2 Apply GRVTY FUEL FEEDING procedure (Refer to PRO-ABN-FUEL [QRH] GRAVITY FUEL FEEDING).

L1 FAC 1..... OFF THEN ON

L2 The rudder trim is recovered, although no indication is available.

L1 BUS TIE..... AUTO

L2 Setting BUS TIE pb-sw to AUTO enables the APU to take an available electrical channel.

Continued on the following page

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES ABNORMAL AND EMERGENCY PROCEDURES ELEC
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	ELEC EMER CONFIG (Cont'd)	
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L1 APU (IF AVAIL) START
L2 <i>APU start is not available for 45 s after the loss of both engine generators. This 45 s delay prevents any interference with emergency generator coupling. If the APU is available, the APU may be started below FL 250.</i>
L1 BLOWER + EXTRACT OVRD
L2 <i>Cooling air is supplied by the air conditioning system and exhausted overboard through the extract valve.</i>
L1 FUEL CONSUMPT INCRSD FMS PRED UNRELIABLE
<i>Note: On IAE powered aircraft, the ENG 1(2) EPR MODE FAULT N1 DEGRADED MODE alert is displayed.</i>
ASSOCIATED PROCEDURES F/CTL ALTN LAW (PROT LOST) <i>Refer to PRO-ABN-F_CTL F/CTL ALTN LAW - ANNUNCIATION</i>

Continued on the following page

ELEC EMER CONFIG (Cont'd)

Ident.: PRO-ABN-ELEC-R-00018643.0038001 / 02 MAY 24

L12

STATUS

MIN RAT SPEED..... 140 KT
 MAX SPEED..... 320 KT
 MAX BRK PR..... 1 000 PSI
 FUEL GRVTY FEED
 AVOID NEGATIVE G FACTOR

In the case of discrepancies between airspeed indications on CM1 PFD and on STBY indicator, disregard the STBY indication (probe not de-iced).

APPR PROC

FOR LDG..... FLAP LVR 3

This line is replaced by "FOR LDG: FLAP LVR 3" when CONF 3 is selected, as a reminder.

APPR SPD..... VREF +10/140 KT

The approach speed must be at least equal to the minimum RAT speed (140 kt).

LDG DIST PROC..... APPLY

FUEL CONSUMPT INCRSD

See ⁽²⁾

FMS PRED UNRELIABLE

See ⁽³⁾

ALTN LAW: PROT LOST

WHEN L/G DN: DIRECT LAW

See ⁽⁴⁾

SLATS/FLAPS SLOW

FLS  LIMITED TO F-APP + RAW

See ⁽⁵⁾

INOP SYS

F/CTL PROT
 REVERSER 1+2
 ADR 2+3
 IR 2+3
 RA 1+2
 SPLR 1+2+5
 ELAC 2
 SEC 2+3
 A/CALL OUT
 AP 1+2
 A/THR
 FMGC 2
 FUEL PUMPS
 ANTI SKID
 N/W STRG
 CAT 2
 STEEP APPR 

See ⁽¹⁾

⁽¹⁾ For other systems' status: Refer to the "ELEC EMER CONFIG SYS REMAINING" table.

Continued on the following page

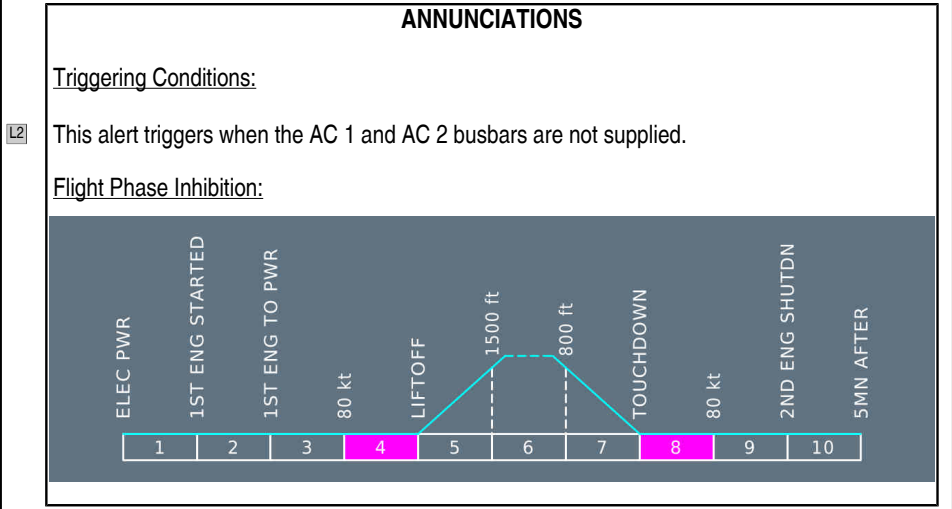
ELEC EMER CONFIG (Cont'd)

- (2) This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.
- (3) Note: Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.
- (4) Note: At landing gear extension, flight controls revert to direct law in pitch, as well as in roll (Refer to PRO-ABN-F_CTL F/CTL DIRECT LAW).
- (5) Note: In ELEC EMER configuration, the center tank fuel is unusable.

ELEC EMER CONFIG

Applicable to: MSN 07784-07792

Ident.: PRO-ABN-ELEC-R-00018283.0001001 / 21 MAR 16



Continued on the following page

ELEC EMER CONFIG (Cont'd)

Ident.: PRO-ABN-ELEC-R-00018642.0006001 / 15 MAY 25

LAND ASAP

MIN RAT SPEED.....140 KT

CAUTION The RAT is able to supply the EMER GEN down to 125 kt, however it may not be able to supply the EMER GEN during flare at these speeds.

GEN 1 + 2..... OFF THEN ON

Note: Turn off then on all generators one after the other.

● **IF UNSUCCESSFUL:**

BUS TIE..... OFF

L2 Setting BUS TIE pb-sw to OFF segregates both generator channels.

L1 GEN 1 + 2..... OFF THEN ON

Note: - Turn off then on all generators one after the other
 - If any generator reset is successful, reset both FACs.

EMER ELEC PWR..... MAN ON

L2 This line is displayed if the emergency generator is not in line.

L1 ENG MODE SEL..... IGN

L2 Engines are fed by gravity only.

L1 VHF1/HF1 /ATC1..... USE

L2 Only VHF 1, HF 1 and ATC 1 are supplied in the electrical emergency configuration.

L1 Note: The flight crew can recover FMGC 1, which is lost temporarily, through the MCDU MENU page.

FUEL GRVTY FEED

L2 Engines are fed by gravity only. Avoid negative Gs.

L1 **PROC : GRVTY FUEL FEEDING**

L2 Apply GRVTY FUEL FEEDING procedure (Refer to PRO-ABN-FUEL [QRH] GRAVITY FUEL FEEDING).

L1 FAC 1..... OFF THEN ON

L2 The rudder trim is recovered, although no indication is available.

L1 BUS TIE..... AUTO

L2 Setting BUS TIE pb-sw to AUTO enables the APU to take an available electrical channel.

Continued on the following page

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES ABNORMAL AND EMERGENCY PROCEDURES ELEC
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	ELEC EMER CONFIG (Cont'd)	
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L1	APU (IF AVAIL).....	START
L2	APU start is not available for 45 s after the loss of both engine generators. This 45 s delay prevents any interference with emergency generator coupling. If the APU is available, the APU may be started below FL 250.	
L1	BLOWER + EXTRACT.....	OVRD
L2	Cooling air is supplied by the air conditioning system and exhausted overboard through the extract valve.	
L1	FUEL CONSUMPT INCRSD FMS PRED UNRELIABLE <u>Note:</u> On IAE powered aircraft, the ENG 1(2) EPR MODE FAULT N1 DEGRADED MODE alert is displayed.	
ASSOCIATED PROCEDURES		
F/CTL ALTN LAW (PROT LOST) <i>Refer to PRO-ABN-F_CTL F/CTL ALTN LAW - ANNUNCIATION</i>		

Continued on the following page

ELEC EMER CONFIG (Cont'd)

Ident.: PRO-ABN-ELEC-R-00018643.0042001 / 02 MAY 24

L12

STATUS

MIN RAT SPEED..... 140 KT
 MAX SPEED..... 320 KT
 MAX BRK PR..... 1 000 PSI
 FUEL GRVTY FEED
 AVOID NEGATIVE G FACTOR

In the case of discrepancies between airspeed indications on CM1 PFD and on STBY indicator, disregard the STBY indication (probe not de-iced).

APPR PROC

FOR LDG..... FLAP LVR 3

This line is replaced by "FOR LDG: FLAP LVR 3" when CONF 3 is selected, as a reminder.

APPR SPD..... VREF +10/140 KT

The approach speed must be at least equal to the minimum RAT speed (140 kt).

LDG DIST PROC..... APPLY

FUEL CONSUMPT INCRSD

See ⁽²⁾

FMS PRED UNRELIABLE

See ⁽³⁾

ALTN LAW: PROT LOST

WHEN L/G DN: DIRECT LAW

See ⁽⁴⁾

SLATS/FLAPS SLOW

FLS  LIMITED TO F-APP + RAW

See ⁽⁵⁾

INOP SYS

F/CTL PROT
 REVERSER 1+2
 ADR 2+3
 IR 2+3
 RA 1+2
 SPLR 1+2+5
 ELAC 2
 SEC 2+3
 A/CALL OUT
 AP 1+2
 A/THR
 FMGC 2
 FUEL PUMPS
 ANTI SKID
 N/W STRG
 CAT 2

See ⁽¹⁾

⁽¹⁾ For other systems' status: Refer to the "ELEC EMER CONFIG SYS REMAINING" table.

Continued on the following page

ELEC EMER CONFIG (Cont'd)

- (2) This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.
- (3) Note: Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.
- (4) Note: At landing gear extension, flight controls revert to direct law in pitch, as well as in roll (Refer to PRO-ABN-F_CTL F/CTL DIRECT LAW).
- (5) Note: In ELEC EMER configuration, the center tank fuel can be transferred to the wing tanks through the jet pumps by gravity, except the last two tons.

ELEC EMER GEN 1 LINE OFF

Applicable to: ALL

Ident.: PRO-ABN-ELEC-AB-00017382.0001001 / 21 MAR 16

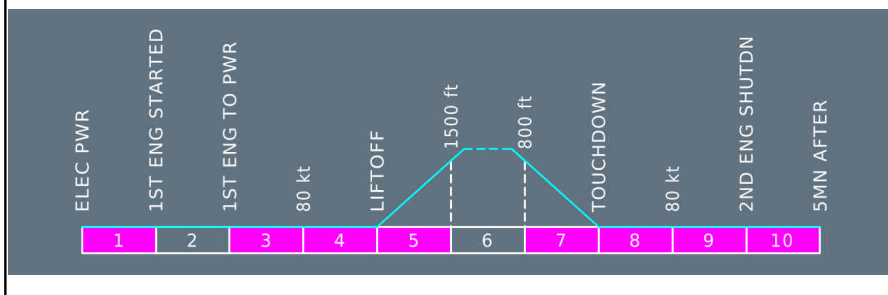
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the GEN 1 LINE pb-sw is abnormally set to OFF position.

Flight Phase Inhibition:



Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

ELEC

ELEC EMER GEN 1 LINE OFF (Cont'd)

Ident.: PRO-ABN-ELEC-AB-00012550.0001001 / 25 FEB 14

[L2] With the GEN 1 LINE pb-sw (on the EMER ELEC PWR panel) in the OFF position, the GEN 1 line contactor is open and GEN 2 supplies the AC BUS 1 channel.

[L1] Crew awareness.

[L2] Set the GEN 1 LINE pb-sw to ON.

ELEC ESS BUSES ON BAT

Applicable to: ALL

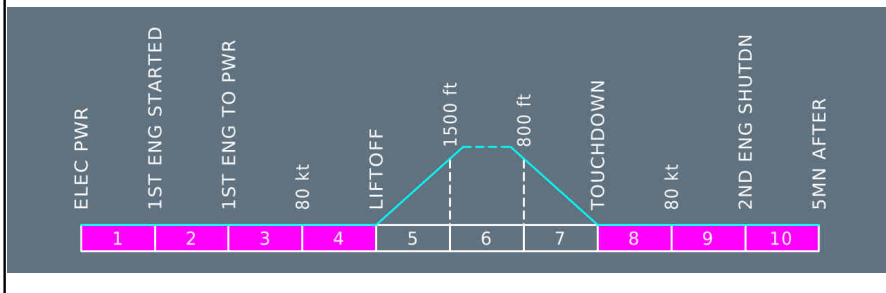
Ident.: PRO-ABN-ELEC-AA-00018284.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

[L2] This alert triggers when the DC ESS and AC ESS busbars are supplied by the batteries.

Flight Phase Inhibition:



Continued on the following page

ELEC ESS BUSES ON BAT (Cont'd)

Ident.: PRO-ABN-ELEC-AA-00018021.0002001 / 21 MAR 16

L2

AC ESS BUS is supplied via the static inverter.

L1

MIN RAT SPEED.....140 KT

LAND ASAP

L2

Displayed, if the RAT is extended.

L1

EMER ELEC PWR.....MAN ON

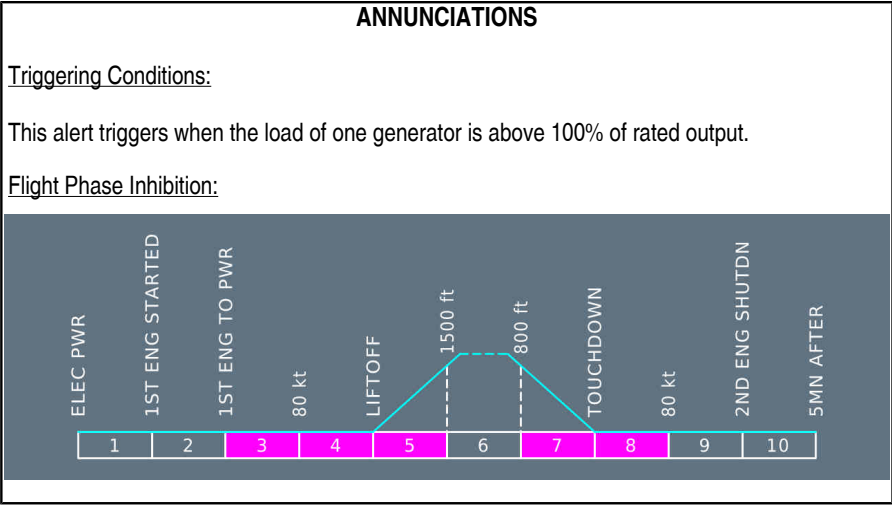
L2

ESS BUSES are supplied by the emergency generator

ELEC GEN 1(2) OR APU GEN OVERLOAD

Applicable to: ALL

Ident.: PRO-ABN-ELEC-T-00017363.0001001 / 21 MAR 16



Ident.: PRO-ABN-ELEC-T-00018023.0002001 / 21 MAR 16

GALY/CAB.....OFF

Continued on the following page

ELEC GEN 1(2) OR APU GEN OVERLOAD (Cont'd)

Ident.: PRO-ABN-ELEC-T-00018024.0002001 / 21 MAR 16

STATUS

INOP SYS

GALY/CAB

ELEC GEN 1(2) FAULT

Applicable to: ALL

Ident.: PRO-ABN-ELEC-B-00017360.0001001 / 21 MAR 16

ANNUNCIATIONS

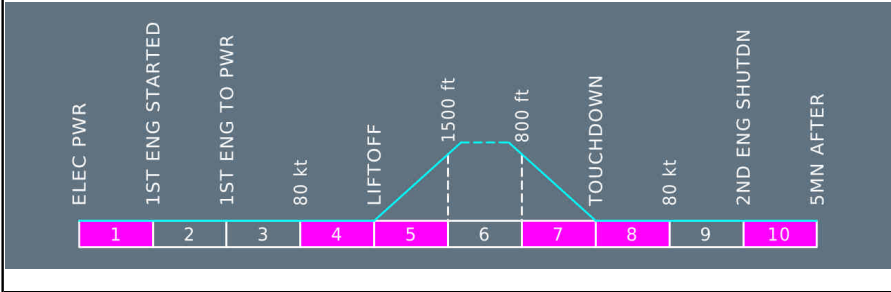
Triggering Conditions:

L2

This alert triggers when:.

- The protection trip is initiated by the associated GCU, or
 - The line contactor is open with the associated GEN pb-sw set to ON.

Flight Phase Inhibition:



Ident.: PRO-ABN-ELEC-B-00018025.0001001 / 21 MAR 16

GEN (AFFECTED).....OFF THEN ON
 ● IF UNSUCCESSFUL:
 GEN (AFFECTED).....OFF

Continued on the following page

ELEC GEN 1(2) FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-B-00018026.0001001 / 21 MAR 16

L12

STATUS

INOP SYS

MAIN GALLEY ⁽¹⁾
GEN 1(2)
CAT 3 DUAL

Note: If available, the APU may be started, and the APU GEN used.

CAT 3 SINGLE ONLY

⁽¹⁾ (only if APU GEN is not online)

ELEC GEN 1(2) OFF

Applicable to: ALL

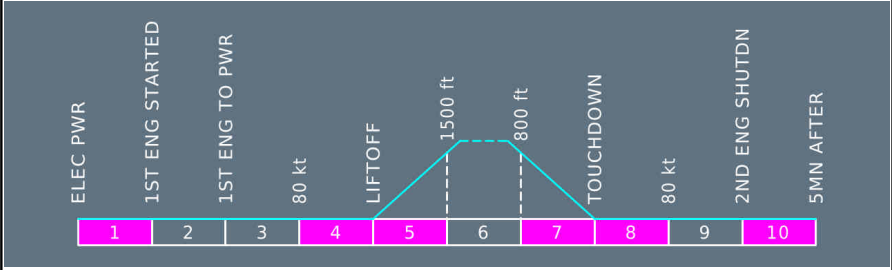
Ident.: PRO-ABN-ELEC-C-00017361.0002001 / 22 APR 16

L2

ANNUNCIATIONS

Triggering Conditions:
This alert triggers when the GEN 1(2) pb-sw is set to OFF and no failure is detected.

Flight Phase Inhibition:



The diagram shows a flight profile across 10 phases. The alert is inhibited (indicated by a red line) from Phase 1 to Phase 7. The phases are: 1. ELEC PWR, 2. 1ST ENG STARTED, 3. 1ST ENG TO PWR, 4. 80 kt, 5. LIFTOFF, 6. 1500 ft, 7. 800 ft, 8. TOUCHDOWN, 9. 80 kt, 10. 2ND ENG SHUTDN, 11. 5MN AFTER.

Continued on the following page

PROCEDURES
ABNORMAL AND EMERGENCY PROCEDURES

ELEC

ELEC GEN 1(2) OFF (Cont'd)

Ident.: PRO-ABN-ELEC-C-00018027.0001001 / 21 MAR 16

L2 Turn the affected GEN ON.

L1 Crew awareness.

Ident.: PRO-ABN-ELEC-C-00018028.0001001 / 21 MAR 16

STATUS

INOP SYS

CAT 3 SINGLE ONLY

MAIN GALLEY ⁽¹⁾
GEN 1(2)
CAT 3 DUAL

⁽¹⁾ (only if APU GEN is not online)

ELEC IDG 1(2) DISCONNECTED

Applicable to: ALL

Ident.: PRO-ABN-ELEC-D-00017366.0002001 / 24 MAR 20

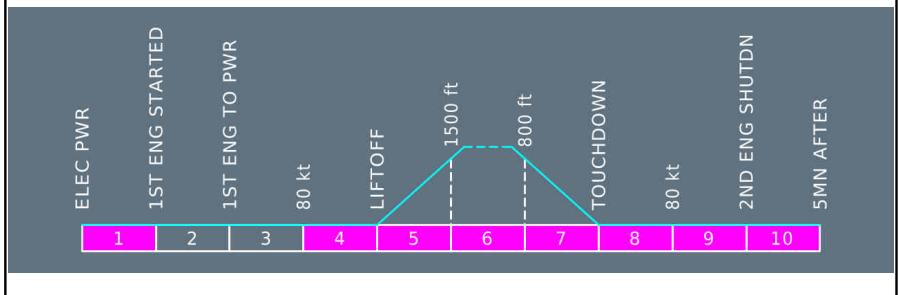
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the IDG 1(2) is disconnected.

Flight Phase Inhibition:



Ident.: PRO-ABN-ELEC-D-00018029.0001001 / 21 MAR 16

Crew awareness.

Ident.: PRO-ABN-ELEC-D-00018030.0001001 / 21 MAR 16

L12

STATUS

Note: If available, the APU may be started, and the APU GEN used.

CAT 3 SINGLE ONLY

INOP SYS

MAIN GALLEY ⁽¹⁾
 GEN 1(2)
 CAT 3 DUAL

⁽¹⁾ (only if APU GEN is not online)

ELEC IDG 1(2) OIL LO PR/OVHT

Applicable to: ALL

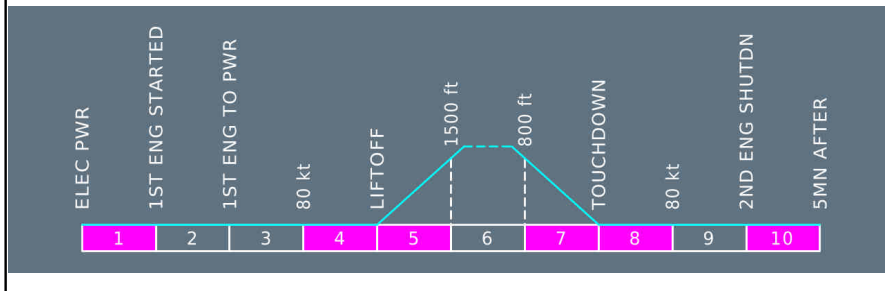
Ident.: PRO-ABN-ELEC-A-00018285.0001001 / 25 SEP 17

ANNUNCIATIONS

Triggering Conditions:

- L2** The alert **ELEC IDG 1(2) OIL LO PR** triggers when the IDG 1(2) oil pressure is low.
 The alert **ELEC IDG 1(2) OIL OVHT** triggers when the IDG 1(2) outlet oil temperature rises above 180 °C.

Flight Phase Inhibition:



Ident.: PRO-ABN-ELEC-A-00018031.0001001 / 03 MAY 23

IDG (AFFECTED).....OFF

- L2** If the associated engine is running, the IDG must be disconnected from the engine at or above idle to prevent damage to the disconnect mechanism.
- L1 Note:** The IDG disconnection is inhibited, when the engine is stopped or below idle.
 Press the IDG pb-sw until the GEN FAULT light comes on. However, do not press for more than 3 s, to avoid damage to the disconnect solenoid.
 The IDG FAULT light goes off, when the IDG is disconnected.
- L2** When the IDG is disconnected before takeoff, the oil temperature of the affected IDG may reach a higher value than during normal operations, but without exceeding 150 °C.

Continued on the following page

ELEC IDG 1(2) OIL LO PR/OVHT (Cont'd)

Ident.: PRO-ABN-ELEC-A-00018032.0001001 / 21 MAR 16

L12

STATUS

Note: If available, the APU may be started and the APU GEN used.

CAT 3 SINGLE ONLY

INOP SYS

MAIN GALLEY ⁽¹⁾
GEN 1(2)
CAT 3 DUAL

⁽¹⁾ (only if APU GEN is not online)

ELEC STATIC INV FAULT

Applicable to: ALL

Ident.: PRO-ABN-ELEC-AC-00017380.0001001 / 21 MAR 16

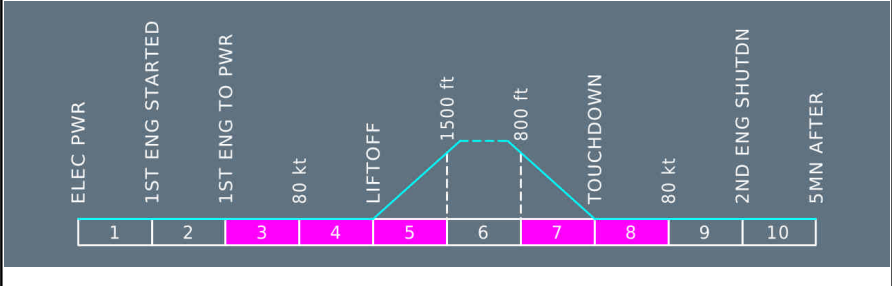
L2

ANNUNCIATIONS

Triggering Conditions:

The alert triggers when the static inverter is failed.

Flight Phase Inhibition:



Ident.: PRO-ABN-ELEC-AC-00012549.0001001 / 25 FEB 14

Crew awareness.

PIA A318/A319/A320/A321 FLEET

FCOM

← Z to AA

PRO-ABN-ELEC P 121/122

09 FEB 26

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

ELEC

ELEC TR 1(2) FAULT

Applicable to: ALL

Ident.: PRO-ABN-ELEC-U-00017373.0001001 / 21 MAR 16

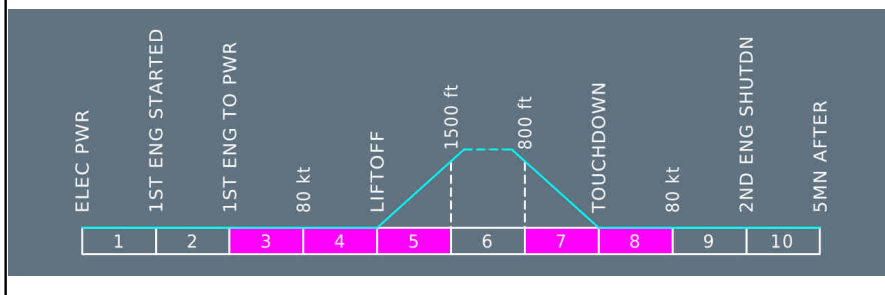
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the TR 1(2) is failed.

Flight Phase Inhibition:



Ident.: PRO-ABN-ELEC-U-00012541.0001001 / 25 FEB 14

Crew awareness.

Ident.: PRO-ABN-ELEC-U-00018531.0001001 / 21 MAR 16

STATUS

INOP SYS

CAT 3 SINGLE ONLY

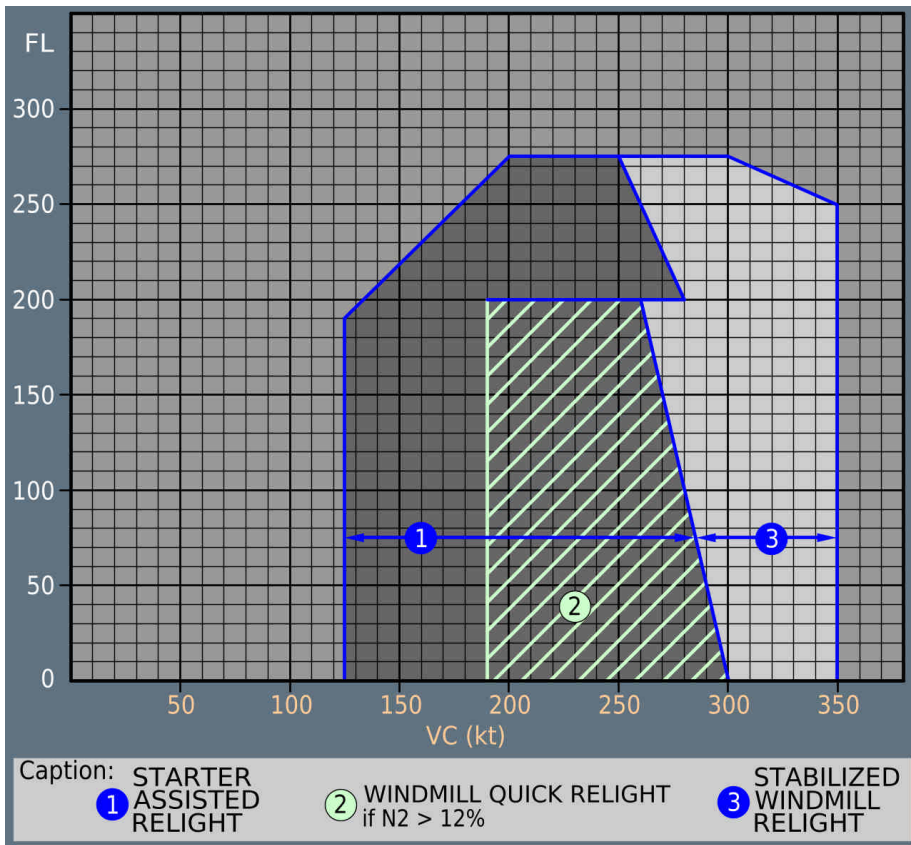
TR 1(2)
CAT 3 DUAL

**[QRH] ENG RELIGHT
IN FLIGHT**

Ident.: PRO-ABN-ENG-00012594.0001001 / 17 MAR 17

Applicable to: MSN 02719-02789, 02944-03060

Engine Relight Envelope



Caption:

1 STARTER
ASSISTED
RELIGHT

2 WINDMILL QUICK RELIGHT
if N2 > 12%

3 STABILIZED
WINDMILL
RELIGHT

ENG MASTER (affected engine)..... OFF
THR LEVER (affected engine)..... Check IDLE
ENG MODE sel..... IGN
X BLEED..... OPEN

Continued on the following page

[QRH] ENG RELIGHT (Cont'd) IN FLIGHT

If outside the windmilling start envelope, the FADEC will open the starter valve.

WING ANTI ICE (for starter assist).....OFF
 ENG MASTER (affected engine).....ON
 ENG PARAMETERS (N2, EGT).....MONITOR

Engine light up should be achieved within 30 s after fuel flow increases.

AUTOMATIC START ABORT NOT AVAIL

Be aware that, unlike the procedure for auto start on ground, the crew must take appropriate action in case of an abnormal start.

Monitor N2. If uncertain about successful relight, move the thrust lever forward and check engine response.

- **If ENG 1(2) START FAULT - ENG STALL triggers, and ENG parameters normal:**
DISREGARD ECAM ALERT

■ **When idle reached:**

ENG MODE sel.....NORM
 TCAS MODE sel TA/RA

*Check that the selector is at TA/RA since, if the **ENG SHUT DOWN** procedure (Refer to PRO-ABN-ENG ENG 1(2) SHUT DOWN) has been applied, the TCAS mode selector may have been set to the TA position.*

X BLEED.....AUTO
 Affected SYS.....RESTORE

■ **If no relight:**

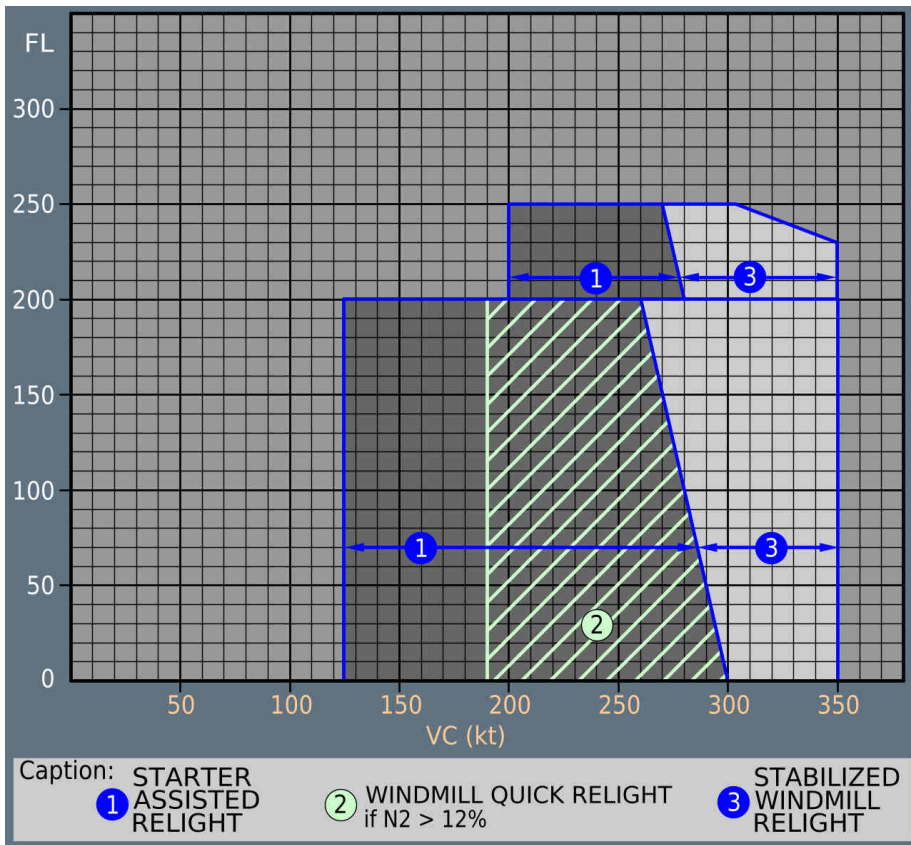
ENG MASTER (affected engine).....OFF
Wait 30 s before attempting a new start (to drain the engine).

**[QRH] ENG RELIGHT
IN FLIGHT**

Ident.: PRO-ABN-ENG-00012594.0012001 / 17 MAR 17

Applicable to: MSN 02926

Engine Relight Envelope



ENG MASTER (affected engine)..... OFF
THR LEVER (affected engine)..... Check IDLE
ENG MODE sel..... IGN
X BLEED..... OPEN

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

ENG

[QRH] ENG RELIGHT (Cont'd) IN FLIGHT

If outside the windmilling start envelope, the FADEC will open the starter valve.

WING ANTI ICE (for starter assist).....OFF
 ENG MASTER (affected engine).....ON
 ENG PARAMETERS (N2, EGT).....MONITOR

Engine light up should be achieved within 30 s after fuel flow increases.

AUTOMATIC START ABORT NOT AVAIL

Be aware that, unlike the procedure for auto start on ground, the crew must take appropriate action in case of an abnormal start.

Monitor N2. If uncertain about successful relight, move the thrust lever forward and check engine response.

■ **When idle reached:**

ENG MODE sel.....NORM
 TCAS MODE sel TA/RA

*Check that the selector is at TA/RA since, if the **ENG SHUT DOWN** procedure (Refer to PRO-ABN-ENG ENG 1(2) SHUT DOWN) has been applied, the TCAS mode selector may have been set to the TA position.*

X BLEED.....AUTO
 Affected SYS.....RESTORE

■ **If no relight:**

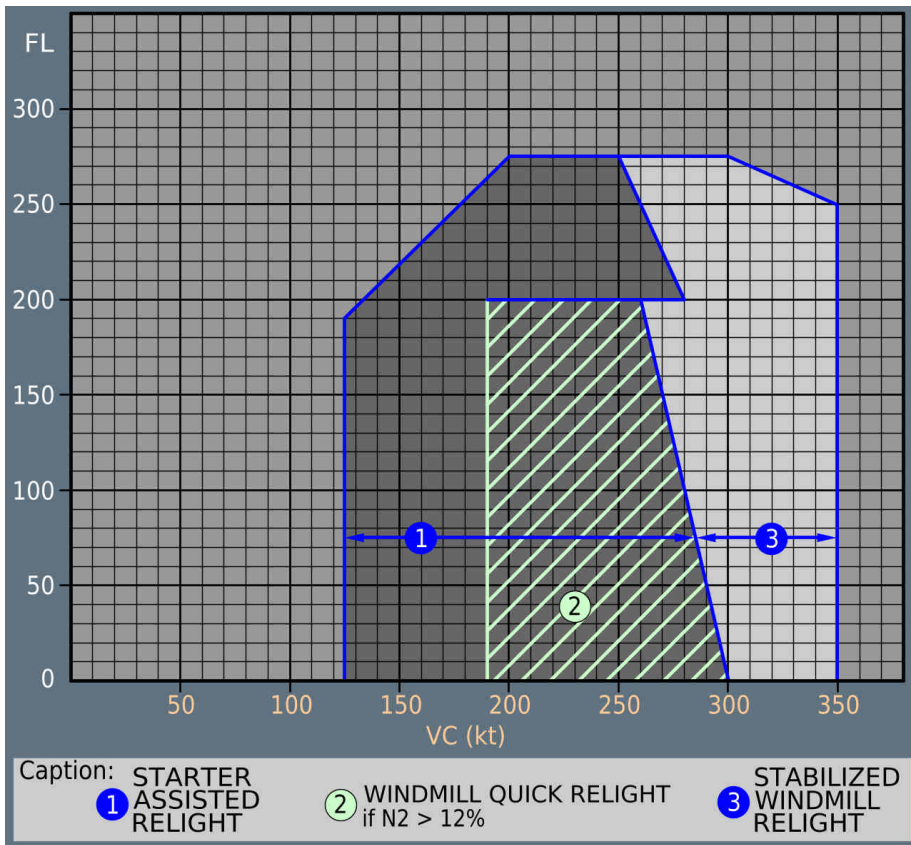
ENG MASTER (affected engine).....OFF
Wait 30 s before attempting a new start (to drain the engine).

**[QRH] ENG RELIGHT
IN FLIGHT**

Ident.: PRO-ABN-ENG-00012594.0015001 / 17 MAR 17

Applicable to: MSN 02155-02212

Engine Relight Envelope



ENG MASTER (affected engine)..... OFF
THR LEVER (affected engine)..... Check IDLE
ENG MODE sel..... IGN
X BLEED..... OPEN

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

ENG

[QRH] ENG RELIGHT (Cont'd) IN FLIGHT

If outside the windmilling start envelope, the FADEC will open the starter valve.

WING ANTI. ICE (for starter assist).....OFF
 ENG MASTER (affected engine).....ON
 ENG PARAMETERS (N2, EGT).....MONITOR

Engine light up should be achieved within 30 s after fuel flow increases.

AUTOMATIC START ABORT NOT AVAIL

Be aware that, unlike the procedure for auto start on ground, the crew must take appropriate action in case of an abnormal start.

Monitor N2. If uncertain about successful relight, move the thrust lever forward and check engine response.

- **If ENG 1(2) START FAULT - ENG STALL triggers, and ENG parameters normal:**
 DISREGARD ECAM ALERT

- **When idle reached (ENG AVAIL):**

ENG MODE sel.....NORM
 TCAS MODE sel TA/RA

*Check that the selector is at TA/RA since, if the **ENG SHUT DOWN** procedure (Refer to PRO-ABN-ENG ENG 1(2) SHUT DOWN) has been applied, the TCAS mode selector may have been set to the TA position.*

X BLEED.....AUTO
 Affected SYS.....RESTORE

- **If no relight:**

ENG MASTER (affected engine).....OFF

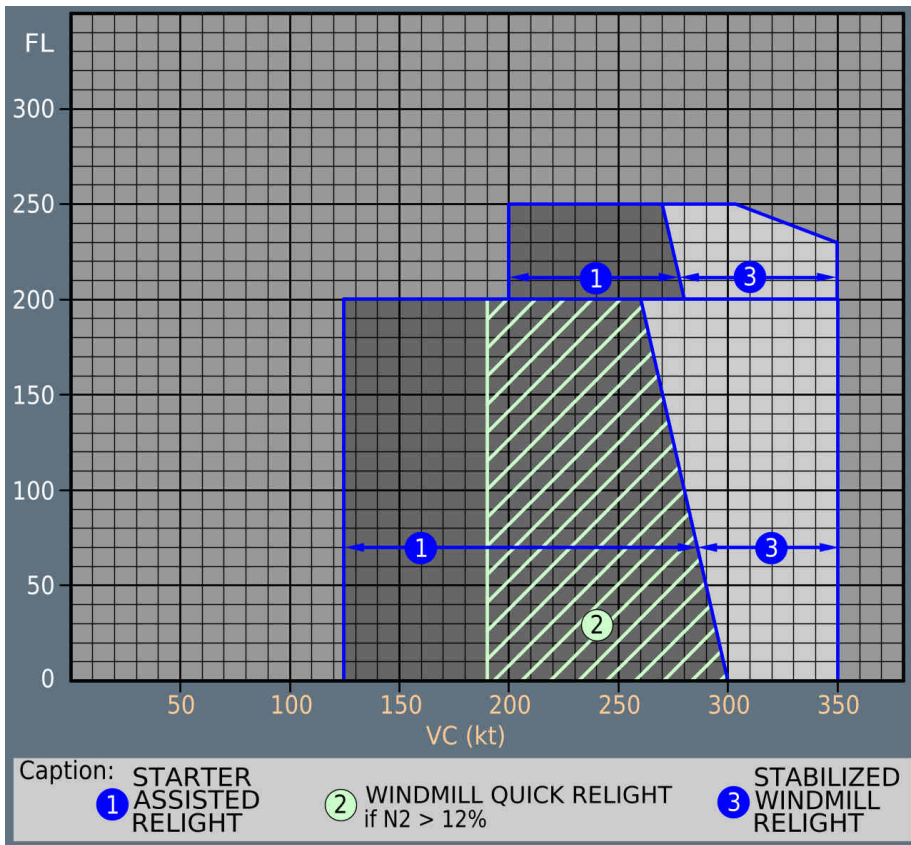
Wait 30 s before attempting a new start (to drain the engine).

**[QRH] ENG RELIGHT
IN FLIGHT**

Ident.: PRO-ABN-ENG-00012594.0026001 / 17 MAR 17

Applicable to: MSN 04392-07792

Engine Relight Envelope



ENG MASTER (affected engine)..... OFF
 THR LEVER (affected engine)..... Check IDLE
 ENG MODE sel..... IGN
 X BLEED..... OPEN

Continued on the following page

[QRH] ENG RELIGHT (Cont'd) IN FLIGHT

If outside the windmilling start envelope, the FADEC will open the starter valve.

WING ANTI ICE (for starter assist).....	OFF
ENG MASTER (affected engine).....	ON
ENG PARAMETERS (N2, EGT).....	MONITOR

Engine light up should be achieved within 30 s after fuel flow increases.

AUTOMATIC START ABORT NOT AVAIL

Be aware that, unlike the procedure for auto start on ground, the crew must take appropriate action in case of an abnormal start.

Monitor N2. If uncertain about successful relight, move the thrust lever forward and check engine response.

■ **When idle reached (ENG AVAIL):**

ENG MODE sel.....	NORM
TCAS MODE sel 	TA/RA

*Check that the selector is at TA/RA since, if the **ENG SHUT DOWN** procedure (Refer to PRO-ABN-ENG ENG 1(2) SHUT DOWN) has been applied, the TCAS mode selector may have been set to the TA position.*

X BLEED.....	AUTO
Affected SYS.....	RESTORE

■ **If no relight:**

ENG MASTER (affected engine).....	OFF
-----------------------------------	-----

Wait 30 s before attempting a new start (to drain the engine).

[QRH] ALL ENG FAIL

Applicable to: MSN 02155-02789, 02944-03060

Ident.: PRO-ABN-ENG-AT-00017524.0005001 / 17 MAR 17

- L2** The flight crew must apply this paper procedure when required by the **ENG ALL ENGINES FAILURE** ECAM alert.

During the application of the ALL ENGINES FAILURE paper procedure:

- If one or more engines relight, apply the corresponding ECAM procedure instead, or
- If none of the engines relights, continue to apply the ALL ENGINES FAILURE paper procedure. If there is sufficient time, clear both the ECAM alerts and the ECAM STATUS page.

 The purpose of the **ENG ALL ENGINES FAILURE** ECAM procedure is to secure both the automatic extension of the RAT and the automatic connection of the emergency generator.

The ALL ENGINES FAILURE paper procedure includes a fuel quantity check to determine if either of the following applies:

- Engine relight can be attempted, or
- Engine relight cannot be attempted.

If engine relight can be attempted, the flight crew can attempt successive engine relights. First without the APU bleed (windmill start), then with the APU bleed, if available.

If engine relight cannot be attempted, the flight crew must apply the procedure for forced landing or ditching.

- L1** First apply the following actions of the **ENG ALL ENGINES FAILURE** ECAM procedure (if not already applied):

LAND ASAP

EMER ELEC PWR MAN ON pb.....PRESS

- L2** Set the EMER ELEC PWR pb to MAN ON to enable both the RAT extension and the emergency generator connection.

- L1** OPT RELIGHT SPD..... 300/0.77

Ident.: PRO-ABN-ENG-AT-00017541.0005001 / 17 MAR 17

L2
PITCH TARGET IN CASE OF SPEED INDICATION FAILURE

Gross Weight	Pitch (°)
At or below 50 000 kg / 110 000 lb	-4.5
60 000 kg / 132 000 lb	-3.5
70 000 kg / 154 000 lb	-2.5

Continued on the following page

[QRH] ALL ENG FAIL (Cont'd)

Ident.: PRO-ABN-ENG-AT-00017543.0005001 / 21 MAY 24

APU (below FL 250)..... START
 THR LEVERS..... IDLE
 FAC 1..... OFF THEN ON

[L2] FAC 1 reset enables the recovery of characteristics speed displayed on the PFD. FAC 1 reset enables also rudder trim recovery, even if no indication is available.

[L1] GLIDING DISTANCE : 2 NM / 1000 FT

AT 300 KT: 2 NM / 1000 FT (500 FT/NM) NO WIND

Flight Level	FL 200	FL 300	FL 400
Distance (NM)	40	60	80

DIVERSION.....INITIATE

[L2] Check if there is an accessible runway, or determine the most appropriate area for a forced landing or ditching.

[L1] Then, as long as none of the engines relights, apply the following paper procedure. If there is sufficient time, clear all ECAM alerts, and clear the ECAM STATUS page.

VHF1/HF1 /ATC1.....USE
 ATC.....NOTIFY
 CABIN CREW.....NOTIFY
 SIGNS.....ON
 CREW OXY MASK (FL > 100).....USE
 FUEL QUANTITY.....CHECK

Ident.: PRO-ABN-ENG-AT-00021154.0001001 / 17 MAR 17

● If engine relight can be attempted:

Refer to PRO-ABN-ENG [QRH] ALL ENG FAIL - If engine relight can be attempted.

● If engine relight cannot be attempted:

Refer to PRO-ABN-ENG [QRH] ALL ENG FAIL - If engine relight cannot be attempted.

Continued on the following page

[QRH] ALL ENG FAIL (Cont'd)

Ident.: PRO-ABN-ENG-AT-00017544.0010001 / 12 NOV 24

● **If engine relight can be attempted:**

ENG MODE sel..... IGN

● **Approaching or below FL 270: Windmill Relight**

ALL ENG MASTERS..... OFF 30 S THEN ON

ENGs RELIGHT..... TRY REGULARLY

L2

Windmill relight attempts can be repeated until successful, or until the APU bleed is available.

L1

APU (below FL 250)..... START

● **If APU available and windmill relight not successful : Starter Assisted Relight below FL 200**

ALL ENG MASTERS..... OFF

OPTIMUM SPEED: GREEN DOT (*Refer to QRH/OPS Operating Speeds*)

L2

Green dot speed is the optimum speed for starter-assisted relight with the APU bleed.

L1

WING ANTI ICE..... OFF

APU BLEED..... ON

ENGINE RELIGHT (one at a time)

ALL ENG MASTERS..... OFF

ENG MASTER 1 or 2..... ON

ENG PARAMETERS (N2, EGT)..... MONITOR AT LEAST 30S

● **If relight not successful**

ALL ENG MASTERS..... OFF

FOR SAME ENGINE RELIGHT..... WAIT 30S

ENGINE RELIGHT (one at a time)..... TRY REGULARLY

SPEED BRAKES AVAILABLE

L2

Speed brakes remain available. If necessary, extend the speed brakes to increase the descent rate.

L1

● **When below 10 000 ft AGL:**

PREPARE CABIN AND COCKPIT

L2

- *Secure loose equipment*
- *Prepare survival equipment*
- *Fasten belts and shoulder harnesses.*

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

ENG

[QRH] ALL ENG FAIL (Cont'd)

[L1]	RAM AIR.....	ON
[L2]	Switch the RAM AIR on, in order to ensure entire depressurization of the aircraft and to provide fresh air to the cabin. There is fresh air ventilation in the cockpit and cabin only when the differential pressure is below 1 PSI.	
[L1]	BARO REF (if avail).....	SET
	COMMERCIAL 	OFF
	GALLEY 	OFF
	GALY & CAB 	OFF
	ELT  (when conditions permit).....	ON
	ENGs RELIGHT.....	TRY REGULARLY

USE RUDDER WITH CARE

● **If ditching anticipated:**

Refer to PRO-ABN-ENG [QRH] ALL ENG FAIL - If ditching anticipated.

● **If forced landing anticipated:**

Refer to PRO-ABN-ENG [QRH] ALL ENG FAIL - If forced landing anticipated.

Continued on the following page

[QRH] ALL ENG FAIL (Cont'd)

Ident.: PRO-ABN-ENG-AT-00021158.0001001 / 31 AUG 17

● If engine relight cannot be attempted:

(It includes the cases of no fuel remaining or engine damage)

 OPTIMUM SPEED: GREEN DOT (*Refer to QRH/OPS Operating Speeds*)

L2 Green dot speed is the optimum speed to glide as far as possible, in the event of an all engines failure.

L1 GLIDING DISTANCE : 2.5 NM / 1000 FT

GLIDING DISTANCE AT GREEN DOT: 2.5 NM / 1000 FT (400 FT/NM) NO WIND

Flight Level	FL 200	FL 300	FL 400
Distance (NM)	50	75	100

APU (below FL 250)..... START

WING ANTI ICE.....OFF

APU BLEED (below FL 200)..... ON

SPEED BRAKES AVAILABLE

L2 Speed brakes remain available. If necessary, extend the speed brakes to increase the descent rate.

L1 ● **When below 10 000 ft AGL:**
 PREPARE CABIN AND COCKPIT

- L2**
- Secure loose equipment
 - Prepare survival equipment
 - Fasten belts and shoulder harnesses.

L1 RAM AIR..... ON

L2 Switch the RAM AIR on, in order to ensure entire depressurization of the aircraft and to provide fresh air to the cabin. There is fresh air ventilation in the cockpit and cabin only when the differential pressure is below 1 PSI.

L1

BARO REF (if avail)..... SET

COMMERCIAL OFF

GALLEY OFF

GALY & CAB OFF

ELT  (when conditions permit)..... ON

USE RUDDER WITH CARE

Continued on the following page

PROCEDURES**ABNORMAL AND EMERGENCY PROCEDURES**

ENG

[QRH] ALL ENG FAIL (Cont'd)**● If ditching anticipated:***Refer to PRO-ABN-ENG [QRH] ALL ENG FAIL - If ditching anticipated.***● If forced landing anticipated:***Refer to PRO-ABN-ENG [QRH] ALL ENG FAIL - If forced landing anticipated.**Continued on the following page*

[QRH] ALL ENG FAIL (Cont'd)

Ident.: PRO-ABN-ENG-AT-00017529.0002001 / 06 NOV 25

● If ditching anticipated:

MIN RAT SPEED: 140 KT

GPWS SYS.....OFF

GPWS TERR.....OFF

L2

Set the SYS pb-sw and the TERR pb-sw to off in order to avoid nuisance warnings.

L1

● At appropriate altitude (above 3 000 ft AGL), configure aircraft for ditching.

FOR LDG.....FLAP LVR 2

L2

Only slats extend, and slowly.

L1

KEEP LANDING GEAR UP

VAPP..... DETERMINE

Gross Weight	40 t / 90 klb	50 t / 110 klb	60 t / 130 klb	70 t / 155 klb	80 t / 175 klb	90 t / 200 klb	95 t / 210 klb
VAPP (kt)	150 kt	150 kt	163 kt	173 kt	183 kt	193 kt	198 kt

● At 2 000 ft AGL:

CABIN CREW.....NOTIFY FOR DITCHING

DITCHING pb.....ON

L2

Ditch the aircraft parallel to the swell. If that causes a strong crosswind, ditch the aircraft into the wind.

L1

● At 500 ft AGL:

BRACE FOR IMPACT.....ORDER

TOUCH DOWN AT MIN V/S

TARGET PITCH ATT 11 °

● At touchdown:

ALL ENG MASTERS.....OFF

APU MASTER SW.....OFF

● After ditching:

ATC (VHF 1).....NOTIFY

ALL FIRE pb (ENGs & APU).....PUSH

ALL AGENT (ENGs & APU).....DISCH

L2

Engine agent 2 is not available.

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

ENG

[QRH] ALL ENG FAIL (Cont'd)

- | | |
|----|--|
| L1 | EVACUATION.....INITIATE |
| L2 | <i>Make a short and precise announcement to order the emergency evacuation.
Press the EVAC COMMAND pb .</i> |

Continued on the following page

[QRH] ALL ENG FAIL (Cont'd)

Ident.: PRO-ABN-ENG-AT-00017530.0002001 / 15 MAY 25

● If forced landing anticipated:

DESCENT SLOPE (CONF 2, L/G DOWN) : 1.6 NM / 1000 FT (600 FT/NM)

MIN RAT SPEED: 140 KT

GPWS SYS..... OFF

GPWS TERR..... OFF

L2 Set the SYS pb-sw and the TERR pb-sw to off in order to avoid nuisance warnings.

L1 ● At appropriate altitude (above 3 000 ft AGL), configure aircraft for landing:

FOR LDG..... FLAP LVR 2

L2 Only slats extend, and slowly.

L1 VAPP..... DETERMINE

Gross Weight	40 t / 90 klb	50 t / 110 klb	60 t / 130 klb	70 t / 155 klb	80 t / 175 klb	90 t / 200 klb	95 t / 210 klb
VAPP (kt)	150 kt	150 kt	163 kt	173 kt	183 kt	193 kt	198 kt

● When in CONF 2 and VAPP:

GRAVITY GEAR EXTN handcrank..... PULL AND TURN

L2 Flight controls revert to direct law at landing gear extension. To ensure correct aircraft trimming for approach, extend the landing gear only when the aircraft is in CONF 2 and at VAPP.

L1 MAN PITCH TRIM NOT AVAILABLE

L2 Disregard the "USE MAN PITCH TRIM" message on the PFD.

L1 ● When L/G downlocked:

L/G lever..... DOWN

APPROACH SPEED..... ADJUST

L2 Adjust the speed to the above-mentioned VAPP. However, to reach the landing field or runway, it is possible to increase the approach speed.

L1 SPLRs..... ARM

MAX BRK PR : 1 000 PSI

● At 2 000 ft AGL:

CABIN CREW..... NOTIFY FOR LANDING

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

ENG

[QRH] ALL ENG FAIL (Cont'd)

- **At 500 ft AGL:**
 BRACE FOR IMPACT.....ORDER

 - **At touchdown:**
 ALL ENG MASTERS.....OFF
 APU MASTER SW.....OFF
 BRAKES ON ACCU ONLY

 - **When aircraft stopped:**
 PARKING BRK.....ON
 ATC (VHF 1).....NOTIFY
 ALL FIRE pb (ENGs & APU).....PUSH
 ALL AGENT (ENGs & APU).....DISCH
- Engine agent 2 is not available.*
- If evacuation required:**
 EVACUATION.....INITIATE
- Make a short and precise announcement to order the emergency evacuation.
 Press the EVAC COMMAND pb .*
- If evacuation not required:**
 CABIN CREW and PASSENGERS (PA).....NOTIFY

[QRH] ALL ENG FAIL

Applicable to: MSN 02926, 04392-07792

Ident.: PRO-ABN-ENG-AT-00017524.0005001 / 17 MAR 17

- L2** The flight crew must apply this paper procedure when required by the **ENG ALL ENGINES FAILURE** ECAM alert.

During the application of the ALL ENGINES FAILURE paper procedure:

- If one or more engines relight, apply the corresponding ECAM procedure instead, or
- If none of the engines relights, continue to apply the ALL ENGINES FAILURE paper procedure. If there is sufficient time, clear both the ECAM alerts and the ECAM STATUS page.

 The purpose of the **ENG ALL ENGINES FAILURE** ECAM procedure is to secure both the automatic extension of the RAT and the automatic connection of the emergency generator.

The ALL ENGINES FAILURE paper procedure includes a fuel quantity check to determine if either of the following applies:

- Engine relight can be attempted, or
- Engine relight cannot be attempted.

If engine relight can be attempted, the flight crew can attempt successive engine relights. First without the APU bleed (windmill start), then with the APU bleed, if available.

If engine relight cannot be attempted, the flight crew must apply the procedure for forced landing or ditching.

- L1** First apply the following actions of the **ENG ALL ENGINES FAILURE** ECAM procedure (if not already applied):

LAND ASAP

EMER ELEC PWR MAN ON pb.....PRESS

- L2** Set the EMER ELEC PWR pb to MAN ON to enable both the RAT extension and the emergency generator connection.

- L1** OPT RELIGHT SPD..... 300/0.77

Ident.: PRO-ABN-ENG-AT-00017541.0005001 / 17 MAR 17

L2
PITCH TARGET IN CASE OF SPEED INDICATION FAILURE

Gross Weight	Pitch (°)
At or below 50 000 kg / 110 000 lb	-4.5
60 000 kg / 132 000 lb	-3.5
70 000 kg / 154 000 lb	-2.5

Continued on the following page

[QRH] ALL ENG FAIL (Cont'd)

Ident.: PRO-ABN-ENG-AT-00017543.0005001 / 21 MAY 24

APU (below FL 250)..... START
THR LEVERS..... IDLE
FAC 1..... OFF THEN ON

[L2]

FAC 1 reset enables the recovery of characteristics speed displayed on the PFD. FAC 1 reset enables also rudder trim recovery, even if no indication is available.

[L1]

GLIDING DISTANCE : 2 NM / 1000 FT

AT 300 KT: 2 NM / 1000 FT (500 FT/NM) NO WIND			
Flight Level	FL 200	FL 300	FL 400
Distance (NM)	40	60	80

DIVERSION.....INITIATE

[L2]

Check if there is an accessible runway, or determine the most appropriate area for a forced landing or ditching.

[L1]

Then, as long as none of the engines relights, apply the following paper procedure. If there is sufficient time, clear all ECAM alerts, and clear the ECAM STATUS page.

VHF1/HF1 /ATC1.....USE
ATC.....NOTIFY
CABIN CREW.....NOTIFY
SIGNS.....ON
CREW OXY MASK (FL > 100).....USE
FUEL QUANTITY.....CHECK

Ident.: PRO-ABN-ENG-AT-00021154.0001001 / 17 MAR 17

- If engine relight can be attempted:
Refer to PRO-ABN-ENG [QRH] ALL ENG FAIL - If engine relight can be attempted.
- If engine relight cannot be attempted:
Refer to PRO-ABN-ENG [QRH] ALL ENG FAIL - If engine relight cannot be attempted.

Continued on the following page

[QRH] ALL ENG FAIL (Cont'd)

Ident.: PRO-ABN-ENG-AT-00017544.0012001 / 12 NOV 24

● **If engine relight can be attempted:**

ENG MODE sel..... IGN

● **Approaching or below FL 250: Windmill Relight**

APU..... START

ALL ENG MASTERS..... OFF 30 S THEN ON

ENGs RELIGHT..... TRY REGULARLY

L2

Windmill relight attempts can be repeated until successful, or until the APU bleed is available.

L1

● **If APU available and windmill relight not successful : Starter Assisted Relight below FL 200**

ALL ENG MASTERS..... OFF

OPTIMUM SPEED: GREEN DOT (*Refer to QRH/OPS Operating Speeds*)

L2

Green dot speed is the optimum speed for starter-assisted relight with the APU bleed.

L1

WING ANTI ICE..... OFF

APU BLEED..... ON

ENGINE RELIGHT (one at a time)

ALL ENG MASTERS..... OFF

ENG MASTER 1 or 2..... ON

ENG PARAMETERS (N2, EGT)..... MONITOR AT LEAST 30S

● **If relight not successful**

ALL ENG MASTERS..... OFF

FOR SAME ENGINE RELIGHT..... WAIT 30S

ENGINE RELIGHT (one at a time)..... TRY REGULARLY

SPEED BRAKES AVAILABLE

L2

Speed brakes remain available. If necessary, extend the speed brakes to increase the descent rate.

L1

● **When below 10 000 ft AGL:**

PREPARE CABIN AND COCKPIT

L2

- *Secure loose equipment*
- *Prepare survival equipment*
- *Fasten belts and shoulder harnesses.*

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

ENG

[QRH] ALL ENG FAIL (Cont'd)

[L1]	RAM AIR.....	ON
[L2]	Switch the RAM AIR on, in order to ensure entire depressurization of the aircraft and to provide fresh air to the cabin. There is fresh air ventilation in the cockpit and cabin only when the differential pressure is below 1 PSI.	
[L1]	BARO REF (if avail).....	SET
	COMMERCIAL 	OFF
	GALLEY 	OFF
	GALY & CAB 	OFF
	ELT  (when conditions permit).....	ON
	ENGs RELIGHT.....	TRY REGULARLY

USE RUDDER WITH CARE

- **If ditching anticipated:**

Refer to PRO-ABN-ENG [QRH] ALL ENG FAIL - If ditching anticipated.

- **If forced landing anticipated:**

Refer to PRO-ABN-ENG [QRH] ALL ENG FAIL - If forced landing anticipated.

Continued on the following page

[QRH] ALL ENG FAIL (Cont'd)

Ident.: PRO-ABN-ENG-AT-00021158.0001001 / 31 AUG 17

● If engine relight cannot be attempted:

(It includes the cases of no fuel remaining or engine damage)

 OPTIMUM SPEED: GREEN DOT (*Refer to QRH/OPS Operating Speeds*)

L2 Green dot speed is the optimum speed to glide as far as possible, in the event of an all engines failure.

L1 GLIDING DISTANCE : 2.5 NM / 1000 FT

GLIDING DISTANCE AT GREEN DOT: 2.5 NM / 1000 FT (400 FT/NM) NO WIND

<i>Flight Level</i>	<i>FL 200</i>	<i>FL 300</i>	<i>FL 400</i>
<i>Distance (NM)</i>	50	75	100

APU (below FL 250)..... START

WING ANTI ICE.....OFF

APU BLEED (below FL 200)..... ON

SPEED BRAKES AVAILABLE

L2 Speed brakes remain available. If necessary, extend the speed brakes to increase the descent rate.

L1 ● **When below 10 000 ft AGL:**
 PREPARE CABIN AND COCKPIT

- L2**
- Secure loose equipment
 - Prepare survival equipment
 - Fasten belts and shoulder harnesses.

L1 RAM AIR..... ON

L2 Switch the RAM AIR on, in order to ensure entire depressurization of the aircraft and to provide fresh air to the cabin. There is fresh air ventilation in the cockpit and cabin only when the differential pressure is below 1 PSI.

L1

BARO REF (if avail)..... SET

COMMERCIAL OFF

GALLEY OFF

GALY & CAB OFF

ELT  (when conditions permit)..... ON

USE RUDDER WITH CARE

Continued on the following page

PROCEDURES**ABNORMAL AND EMERGENCY PROCEDURES**

ENG

[QRH] ALL ENG FAIL (Cont'd)**● If ditching anticipated:***Refer to PRO-ABN-ENG [QRH] ALL ENG FAIL - If ditching anticipated.***● If forced landing anticipated:***Refer to PRO-ABN-ENG [QRH] ALL ENG FAIL - If forced landing anticipated.**Continued on the following page*

[QRH] ALL ENG FAIL (Cont'd)

Ident.: PRO-ABN-ENG-AT-00017529.0002001 / 06 NOV 25

● If ditching anticipated:

MIN RAT SPEED: 140 KT

GPWS SYS.....OFF

GPWS TERR.....OFF

L2 Set the SYS pb-sw and the TERR pb-sw to off in order to avoid nuisance warnings.

● At appropriate altitude (above 3 000 ft AGL), configure aircraft for ditching.

L1 FOR LDG.....FLAP LVR 2

L2 Only slats extend, and slowly.

L1 KEEP LANDING GEAR UP

VAPP..... DETERMINE

Gross Weight	40 t / 90 klb	50 t / 110 klb	60 t / 130 klb	70 t / 155 klb	80 t / 175 klb	90 t / 200 klb	95 t / 210 klb
VAPP (kt)	150 kt	150 kt	163 kt	173 kt	183 kt	193 kt	198 kt

● At 2 000 ft AGL:

CABIN CREW.....NOTIFY FOR DITCHING

DITCHING pb.....ON

L2 Ditch the aircraft parallel to the swell. If that causes a strong crosswind, ditch the aircraft into the wind.

● At 500 ft AGL:

L1 BRACE FOR IMPACT.....ORDER

TOUCH DOWN AT MIN V/S

TARGET PITCH ATT 11 °

● At touchdown:

ALL ENG MASTERS.....OFF

APU MASTER SW.....OFF

● After ditching:

L2 ATC (VHF 1).....NOTIFY

ALL FIRE pb (ENGs & APU).....PUSH

ALL AGENT (ENGs & APU).....DISCH

Engine agent 2 is not available.

Continued on the following page

[QRH] ALL ENG FAIL (Cont'd)

- | | |
|---|---|
| <div style="border: 1px solid black; padding: 2px; width: 20px; text-align: center;">L1</div> | EVACUATION.....INITIATE |
| <div style="border: 1px solid black; padding: 2px; width: 20px; text-align: center;">L2</div> | <p><i>Make a short and precise announcement to order the emergency evacuation.</i></p> <p><i>Press the EVAC COMMAND pb .</i></p> |

Continued on the following page

[QRH] ALL ENG FAIL (Cont'd)

Ident.: PRO-ABN-ENG-AT-00017530.0002001 / 15 MAY 25

● If forced landing anticipated:

DESCENT SLOPE (CONF 2, L/G DOWN) : 1.6 NM / 1000 FT (600 FT/NM)

MIN RAT SPEED: 140 KT

GPWS SYS..... OFF

GPWS TERR..... OFF

L2

Set the SYS pb-sw and the TERR pb-sw to off in order to avoid nuisance warnings.

L1

● At appropriate altitude (above 3 000 ft AGL), configure aircraft for landing:

FOR LDG..... FLAP LVR 2

L2

Only slats extend, and slowly.

L1

VAPP..... DETERMINE

Gross Weight	40 t / 90 klb	50 t / 110 klb	60 t / 130 klb	70 t / 155 klb	80 t / 175 klb	90 t / 200 klb	95 t / 210 klb
VAPP (kt)	150 kt	150 kt	163 kt	173 kt	183 kt	193 kt	198 kt

● When in CONF 2 and VAPP:

GRAVITY GEAR EXTN handcrank..... PULL AND TURN

L2

Flight controls revert to direct law at landing gear extension. To ensure correct aircraft trimming for approach, extend the landing gear only when the aircraft is in CONF 2 and at VAPP.

L1

MAN PITCH TRIM NOT AVAILABLE

L2

Disregard the "USE MAN PITCH TRIM" message on the PFD.

L1

● When L/G downlocked:

L/G lever..... DOWN

APPROACH SPEED..... ADJUST

L2

Adjust the speed to the above-mentioned VAPP. However, to reach the landing field or runway, it is possible to increase the approach speed.

L1

SPLRs..... ARM

MAX BRK PR : 1 000 PSI

● At 2 000 ft AGL:

CABIN CREW..... NOTIFY FOR LANDING

Continued on the following page

[QRH] ALL ENG FAIL (Cont'd)

- **At 500 ft AGL:**
 BRACE FOR IMPACT..... ORDER

 - **At touchdown:**
 ALL ENG MASTERS..... OFF
 APU MASTER SW..... OFF
 BRAKES ON ACCU ONLY

 - **When aircraft stopped:**
 PARKING BRK..... ON
 ATC (VHF 1)..... NOTIFY
 ALL FIRE pb (ENGs & APU)..... PUSH
 ALL AGENT (ENGs & APU)..... DISCH
- Engine agent 2 is not available.*
- If evacuation required:**
 EVACUATION..... INITIATE
- Make a short and precise announcement to order the emergency evacuation.
 Press the EVAC COMMAND pb .*
- If evacuation not required:**
 CABIN CREW and PASSENGERS (PA)..... NOTIFY

[QRH] ENG 1(2) STALL

Ident.: PRO-ABN-ENG-00015730.0001001 / 07 NOV 25

19 Applicable to: ALL

20

The crew must apply this procedure when instructed by ECAM, or if they detect an engine stall before FADEC:

■ On Ground:

THR LEVER (affected engine).....IDLE
 ENG MASTER (affected engine).....OFF

■ In Flight:

THR LEVER (affected engine).....IDLE
 ENG PARAMETERS (affected engine).....CHECK

■ If abnormal ENG parameters:

ENG MASTER (AFFECTED ENGINE)..... OFF

Note: If the flight crew suspects that the stall was transient, they can consider an engine relight.

■ If normal ENG parameters:

ENG ANTI ICE (affected engine).....ON

Operation of ENG and WING ANTI ICE will increase the stall margin but EGT increases accordingly.

THR LEVER (affected engine)..... SLOWLY MOVE FORWARD

● If stall recurs:

THR LEVER (affected engine)..... MOVE BACKWARD
Reduce thrust and operate below the thrust threshold where stall recurs.

● If stall does not recur:

CONTINUE NORMAL ENGINE OPERATION

[QRH] ENGINE TAILPIPE FIRE

Ident.: PRO-ABN-ENG-00017781.0001001 / 17 MAR 17

Applicable to: ALL

Internal engine fire may be encountered during engine start or engine shutdown.
 Internal engine fire may be seen by the ground crew, or the EGT may fail to decrease after the
 ENG MASTER lever is set to OFF.

CAUTION External fire agents can cause severe corrosive damage. Consider the use of
 external fire agents only if the following procedure does not stop engine tailpipe
 fire.

ENG MASTER (affected engine) OFF

Note: Do not press the engine fire pushbutton, since this would cut off the FADEC power supply,
 which would prevent motoring sequence.

ENG MAN START pb (affected engine)..... OFF

ESTABLISH AIR BLEED PRESS

Select the APU, or opposite BLEED, to motor the engine.

 If APU BLEED is not available, and the opposite engine is shut down, connect external pneumatic
 power (if readily available).

BEACON ON

ENG MODE sel..... CRANK

ENG MAN START pb (affected engine)..... ON

 For aircraft equipped with IAE or PW6000 engines, the start valve automatically reopens, when N2
 is below 10 %.

 For aircraft equipped with CFM 56-5A/5B engines, the start valve automatically reopens, when N2
 is below 20 %

 For aircraft equipped with CFM LEAP-1A engines, the start valve automatically reopens, when N2
 is below approximately 60 %

● **When fire stopped:**

ENG MAN START pb (affected engine).....OFF

ENG MODE sel.....NORM

Maintenance action is due.

[QRH] HIGH ENGINE VIBRATION

Ident.: PRO-ABN-ENG-00012294.0011001 / 18 NOV 21

Applicable to: ALL

The engine vibrations ($N1 \geq 6$ units, $N2 \geq 4.3$ units) are mainly a guideline for the flight crew to closely monitor engine parameters.

High engine vibrations alone do not require an engine in-flight shutdown.

Note:

- High $N1$ vibrations are generally associated with airframe vibrations
- High $N2$ vibrations can occur without airframe vibrations
- High engine vibrations may be associated with cockpit and cabin smoke, and/or the smell of burning. This may be due to the contact of the compressor blade tip with associated seals.

ENG PARAMETERS CHECK

L2 Check engine parameters and especially EGT. Crosscheck with other engine. Report in maintenance log.

L1 ■ If icing suspected:

L2 An increase of engine vibrations in icing conditions with or without engine anti-ice may be due to fan blades and/or spinner icing. Icing may be suspected if $N1$ vibrations occur without other engine parameters variation.

L1 A/THR OFF
THRUST (one engine at a time)..... IDLE THEN INCREASE $N1 > 80\%$

Reduce thrust to idle if flight conditions permit.

If ENG ANTI ICE is off, switch it ON **at idle fan speed**, one engine after the other with approximately 30 s interval.

To shed ice, it may be necessary to perform several thrust variations between idle and a thrust compatible with the flight phase. For efficient ice shedding, thrust should be increased to at least 80 % $N1$ if flight conditions permit.

After each thrust variation, vibrations should decrease, indicating the progress of the ice shedding.

When the ice is shed, vibrations should return to normal and the flight crew can resume normal engine operation.

■ If no icing:

THRUST (affected engine)..... REDUCE

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

ENG

[QRH] HIGH ENGINE VIBRATION (Cont'd)

If flight conditions permit, reduce the thrust to maintain vibrations level below the ECAM triggering threshold. If the vibrations indication does not decrease following thrust reduction, this may indicate other problems on the engine.

- **After landing, if vibrations continue: SHUT DOWN ENGINE WHEN POSSIBLE**

[QRH] ON GROUND - NON ENG SHUTDOWN AFTER ENG MASTER OFF

Ident.: PRO-ABN-ENG-00020795.0001001 / 30 MAR 18

Applicable to: ALL

The normal procedure to shut down an engine is to set the ENG MASTER lever to OFF. In the case where the engine does not shut down as expected, use the following procedure:

ECAM FUEL PAGE.....SELECT
 LP FUEL VALVE POSITION (affected engine).....CHECK

■ **If LP fuel valve closed (cross line amber):**

NO CREW ACTION

■ **If LP fuel valve open:**

ENG FIRE pb-sw (affected engine).....PRESS

Using the ENG FIRE pb-sw will force the LP fuel valve to close. The engine will shut down after a time delay.

GROUND CREW.....NOTIFY

IN BOTH CASES, ENGINE WILL SHUT DOWN AFTER A TIME DELAY UP TO 2 MIN 30 S

The engine shuts down when the remaining fuel between the LP fuel valve and the nozzles is burned. The time delay for engine shutdown depends on airport altitude and fuel recirculation system operation.

[QRH] ONE ENGINE INOPERATIVE - CIRCLING APPROACH

Ident.: PRO-ABN-ENG-00010682.0072001 / 15 MAY 25

Applicable to: MSN 05746-07792

MAXIMUM WEIGHT FOR CIRCLING IN CONF 3 WITH GEAR DOWN (1000 KG)								
OAT (°C)	AIRPORT ELEVATION (feet)							
	0	2 000	4 000	6 000	8 000	10 000	12 000	14 000
0	78.0	74.0	66.0	64.0	54.0	51.0	48.0	41.0
5	78.0	74.0	66.0	64.0	54.0	51.0	48.0	41.0
10	78.0	74.0	66.0	64.0	54.0	51.0	48.0	41.0
15	78.0	74.0	66.0	64.0	54.0	51.0	48.0	41.0
20	78.0	74.0	66.0	64.0	54.0	51.0	48.0	41.0
25	78.0	74.0	66.0	64.0	54.0	51.0	48.0	41.0
30	78.0	74.0	66.0	64.0	54.0	51.0	48.0	
35	76.0	71.0	66.0	62.0	54.0	51.0		
40	73.0	69.0	65.0	60.0				
45	71.0	67.0	62.0					
50	68.0	64.0						
55	66.0							

- If aircraft weight above maximum weight for circling in CONF 3 with gear down:

DELAY GEAR EXTENSION TO MAINTAIN LEVEL FLIGHT

The aircraft cannot maintain level flight, in CONF 3 and with the landing gear down.

FOR LDG : FLAP LVR 3

CONF 3 is preferred, to minimize a configuration change in short final.

GPWS LDG FLAP 3.....ON

Note:

- If circling below 750 ft RA, "L/G GEAR NOT DOWN" alert will trigger. The pilot can cancel the aural warning by pressing the EMER CANC pb.
- If the landing gear is not downlocked at 500 ft RA, GPWS "TOO LOW GEAR" aural alert will trigger.

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

ENG

[QRH] ONE ENGINE INOPERATIVE - CIRCLING APPROACH

Ident.: PRO-ABN-ENG-00010682.0004001 / 15 MAY 25

Applicable to: MSN 02155-02789, 03031-05253

MAXIMUM WEIGHT FOR CIRCLING IN CONF 3 WITH GEAR DOWN (1000 KG)								
OAT (°C)	AIRPORT ELEVATION (feet)							
	0	2 000	4 000	6 000	8 000	10 000	12 000	14 000
0	77	76	69	63	58	53	48	45
5	77	76	69	63	58	53	48	45
10	77	76	69	63	58	53	48	45
15	77	76	69	63	58	53	48	45
20	77	76	69	63	58	53	48	45
25	77	75	69	63	58	53	48	45
30	77	72	68	63	58	53	48	
35	74	70	66	63	56	51		
40	71	67	63	59				
45	69	65	61					
50	67	63						
55	64							

● **If aircraft weight above maximum weight for circling in CONF 3 with gear down:**

DELAY GEAR EXTENSION TO MAINTAIN LEVEL FLIGHT

The aircraft cannot maintain level flight, in CONF 3 and with the landing gear down.

FOR LDG : FLAP LVR 3

CONF 3 is preferred, to minimize a configuration change in short final.

GPWS LDG FLAP 3.....ON

Note: - If circling below 750 ft RA, "L/G GEAR NOT DOWN" alert will trigger. The pilot can cancel the aural warning by pressing the EMER CANC pb.
 - If the landing gear is not downlocked at 500 ft RA, GPWS "TOO LOW GEAR" aural alert will trigger.

[QRH] ONE ENGINE INOPERATIVE - CIRCLING APPROACH

Ident.: PRO-ABN-ENG-00010682.0024001 / 15 MAY 25

Applicable to: MSN 02926-02944

MAXIMUM WEIGHT FOR CIRCLING IN CONF 3 WITH GEAR DOWN (1000 KG)								
OAT (°C)	AIRPORT ELEVATION (feet)							
	0	2 000	4 000	6 000	8 000	10 000	12 000	14 000
0	75.5	73	70.5	68	65	63	60.5	56
5	75.5	73	70.5	68	65	63	58.5	54
10	75.5	73	70.5	68	64.5	60.5	56	51.5
15	75.5	73	70.5	67	62.5	58	53.5	49
20	75.5	73	69	64.5	60	55	51	46.5
25	75	71.5	67	62	57	53	48.5	44
30	73.5	69.5	64.5	59.5	55	50.5	46	
35	72	67	62	57	52.5	48.5		
40	69.5	64.5	59.5	55				
45	67	62	57.5					
50	64.5	59.5						
55	61.5							

- If aircraft weight above maximum weight for circling in CONF 3 with gear down:

DELAY GEAR EXTENSION TO MAINTAIN LEVEL FLIGHT

The aircraft cannot maintain level flight, in CONF 3 and with the landing gear down.

FOR LDG : FLAP LVR 3

CONF 3 is preferred, to minimize a configuration change in short final.

GPWS LDG FLAP 3.....ON

- Note:
- If circling below 750 ft RA, "L/G GEAR NOT DOWN" alert will trigger. The pilot can cancel the aural warning by pressing the EMER CANC pb.
 - If the landing gear is not downlocked at 500 ft RA, GPWS "TOO LOW GEAR" aural alert will trigger.

[QRH] ONE ENGINE INOPERATIVE - STRAIGHT-IN APPROACH

Ident.: PRO-ABN-ENG-00010681.0001001 / 15 MAY 25

Applicable to: ALL

- If NO level off expected during final approach:
DELAY CONF FULL UNTILL ESTABLISHED ON FINAL DESCENT
- If level off expected during final approach:
FOR LDG : FLAP LVR 3

ENG ALL ENGINES FAILURE

Applicable to: ALL

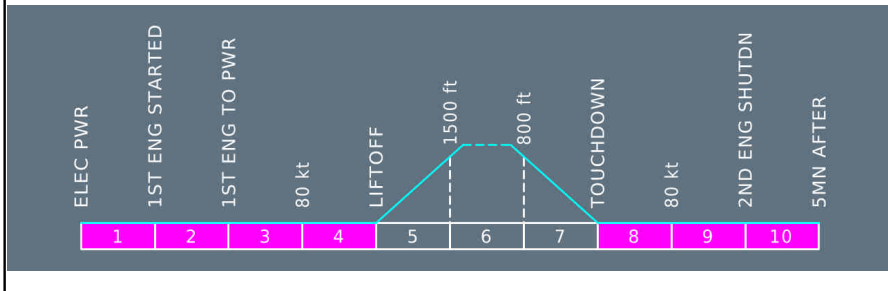
Ident.: PRO-ABN-ENG-AS-00017096.0001001 / 29 JUN 16

ANNUNCIATIONS

Triggering Conditions:

[L2] This alert triggers when all engines are failed in flight.

Flight Phase Inhibition:



Continued on the following page

ENG ALL ENGINES FAILURE (Cont'd)

Ident.: PRO-ABN-ENG-AS-00015739.0005001 / 12 MAY 23

L2 The **ENG ALL ENGINES FAILURE** ECAM alert inhibits the **ELEC EMER CONFIG** ECAM alert, and provides the flight crew with an associated procedure to immediately apply in the case of a failure of all engines. The purpose of the **ENG ALL ENGINES FAILURE** ECAM procedure is to secure both the automatic extension of the RAT and the automatic connection of the emergency generator. Then, the **ENG ALL ENGINES FAILURE** ECAM procedure specifies that the flight crew must apply the ALL ENGINES FAILURE QRH procedure.

L1 **LAND ASAP**
EMER ELEC PWR MAN ON PB.....PRESS

L2 Set the EMER ELEC PWR pb to MAN ON to enable both the RAT extension and the emergency generator connection.

L1 **OPT RELIGHT SPD.....300/0.77**

L2 In the case of a speed indication failure due to volcanic ash, the pitch attitude for optimum relight is provided in the QRH procedure.

Ident.: PRO-ABN-ENG-AS-00017523.0004001 / 21 MAY 24

APU (BELOW FL 250).....START
THR LEVERS.....IDLE
FAC 1.....OFF THEN ON

L2 FAC 1 reset enables the recovery of characteristics speed displayed on the PFD. FAC 1 reset enables also rudder trim recovery, even if no indication is available.

L1 **GLDG DIST: 2NM/1000FT**
DIVERSION.....INITIATE

L2 Check if there is an accessible runway, or determine the most appropriate area for a forced landing or ditching.

L1 **ALL ENG FAIL PROC.....APPLY**

L2 Refer to PRO-ABN-ENG [QRH] ECAM - OPT Relight SPD.

The QRH procedure provides the landing configuration and the approach speed for a ditching and a forced landing.

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

ENG

ENG ALL ENGINES FAILURE (Cont'd)

Ident.: PRO-ABN-ENG-AS-00028879.0018001 / 13 MAY 25

ASSOCIATED PROCEDURES

F/CTL ALTN LAW
(PROT LOST)

Refer to PRO-ABN-F_CTL F/CTL ALTN LAW - ANNUNCIATION

Continued on the following page

ENG ALL ENGINES FAILURE (Cont'd)

26 Ident.: PRO-ABN-ENG-AS-00019673.0034001 / 06 NOV 25

L12

STATUS

 MIN RAT SPEED..... 140 KT
 MAX SPEED 320/0.77
 MAX BRK PR..... 1000 PSI
 MANEUVER WITH CARE
 FUEL GRVTY FEED
 AVOID NEGATIVE G FACTOR

INOP SYS

See below

APPR PROC

FOR LDG.....FLAP LVR 2

 This line is replaced by "FOR LDG : FLAP LVR 2" when
 CONF 2 is selected, as a reminder.

 ● **WHEN CONF 2 AND VAPP:**

L/G GRVTY EXTN..... AS RQRD

 Refer to PRO-ABN-LG [QRH] L/G GRAVITY
 EXTENSION. Being stabilized at VAPP before selecting
 the gear down enables the aircraft to be trimmed for
 approach.

 ALTN LAW: PROT LOST
 WHEN L/G DN: DIRECT LAW

 See ⁽¹⁾

BRK Y ACCU PR ONLY

 See ⁽²⁾

SLATS SLOW

 FLS  LIMITED TO F-APP + RAW

INOP SYS

G+Y HYD

R AIL

IR 2+3

F/CTL PROT

REVERSER 1+2

RA 1+2

STABILIZER

ADR 2+3

SPLR 1+2+4+5

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

ENG

ENG ALL ENGINES FAILURE (Cont'd)

ELAC 2	SEC 2+3	FLAPS
YAW DAMPER	A/CALL OUT	AP 1+2
A/THR	FUEL PUMPS	ANTI SKID
N/W. STEER	CAT 2	GLS AUTOLAND 
L/G RETRACT	CAB PR 1+2	PACK 1+2

- (1) At landing gear extension, control reverts to direct law in pitch as well as in roll (Refer to PRO-ABN-F_CTL F/CTL DIRECT LAW).
- (2) 7 full brake applications are available.

ENG FUEL CONTAMINATED

Applicable to: MSN 02155-05746

Ident.: PRO-ABN-ENG-DX-00023769.0007001 / 18 NOV 21

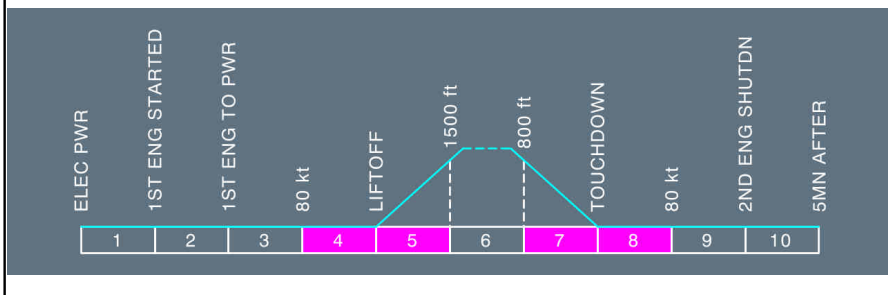
ANNUNCIATIONS

Triggering Conditions:

- [L2]** The **ENG FUEL CONTAMINATED** alert triggers 10 s after the following combination of alerts:
- Both **ENG 1 FUEL FILTER CLOG** and **ENG 2 FUEL FILTER CLOG** alerts, or
 - Both **ENG 1 FUEL CTL FAULT** and **ENG 2 FUEL CTL FAULT** alerts.

Note: The combination of alerts **ENG 1 FUEL FILTER CLOG** and **ENG 2 FUEL FILTER CLOG** is inhibited as soon as **ENG FUEL CONTAMINATED** triggers.

Flight Phase Inhibition:



Continued on the following page

ENG FUEL CONTAMINATED (Cont'd)

28 Ident.: PRO-ABN-ENG-DX-00023770.0004001 / 25 FEB 20

LAND ASAP
■ On ground:

THR LEVERS.....IDLE

■ In flight:
● If autothrust on:

A/THR.....OFF

FUEL MODE SEL.....MAN

● If fuel X feed ON:

FUEL X FEED.....OFF

CTR TK PUMP 1.....OFF

CTR TK PUMP 2.....OFF

X FEED.....DO NOT OPEN

CTR TK UNUSABLE

A/THR.....DO NOT USE

AVOID RAPID THRUST CHANGES

MOVE THR LVR ONE BY ONE

29 Ident.: PRO-ABN-ENG-DX-00023771.0003001 / 25 FEB 20

STATUS
● In flight:

X FEED.....DO NOT OPEN

A/THR.....DO NOT USE

● In flight or after landing:

AVOID RAPID THRUST CHANGES

MOVE THR LVR ONE BY ONE

CTR TANK FUEL UNUSABLE

 ACT  UNUSABLE

ENG FUEL CONTAMINATED

Applicable to: MSN 07784-07792

Ident.: PRO-ABN-ENG-DX-00023769.0007001 / 18 NOV 21

ANNUNCIATIONS

Triggering Conditions:

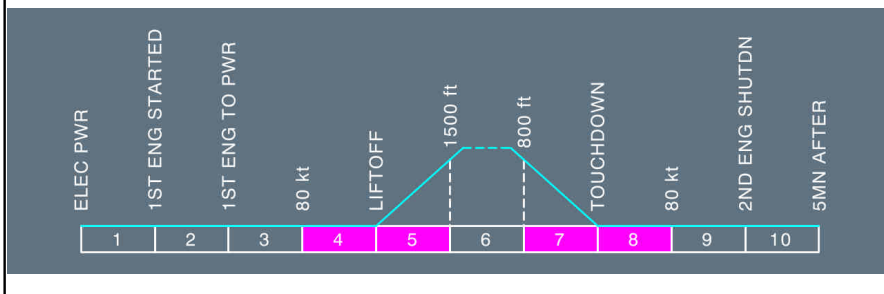
[L2]

 The **ENG FUEL CONTAMINATED** alert triggers 10 s after the following combination of alerts:

- Both **ENG 1 FUEL FILTER CLOG** and **ENG 2 FUEL FILTER CLOG** alerts, or
- Both **ENG 1 FUEL CTL FAULT** and **ENG 2 FUEL CTL FAULT** alerts.

Note: The combination of alerts **ENG 1 FUEL FILTER CLOG** and **ENG 2 FUEL FILTER CLOG** is inhibited as soon as **ENG FUEL CONTAMINATED** triggers.

Flight Phase Inhibition:



Continued on the following page

ENG FUEL CONTAMINATED (Cont'd)

31 Ident.: PRO-ABN-ENG-DX-00023770.0005001 / 25 FEB 20

LAND ASAP
■ On ground:

THR LEVERS.....IDLE

■ In flight:
● If autothrust on:

A/THR.....OFF

FUEL MODE SEL.....MAN

● If fuel X feed ON:

FUEL X FEED.....OFF

CTR TK L XFR.....OFF

CTR TK R XFR.....OFF

X FEED.....DO NOT OPEN

CTR TK UNUSABLE

A/THR.....DO NOT USE

AVOID RAPID THRUST CHANGES

MOVE THR LVR ONE BY ONE

32 Ident.: PRO-ABN-ENG-DX-00023771.0003001 / 25 FEB 20

STATUS
● In flight:

X FEED.....DO NOT OPEN

A/THR.....DO NOT USE

● In flight or after landing:

AVOID RAPID THRUST CHANGES

MOVE THR LVR ONE BY ONE

CTR TANK FUEL UNUSABLE

 ACT  UNUSABLE

ENG 1(2) BLEED STATUS FAULT
 (IN FLIGHT)

Applicable to: ALL

Ident.: PRO-ABN-ENG-W-00017963.0001001 / 21 MAR 16

ANNUNCIATIONS

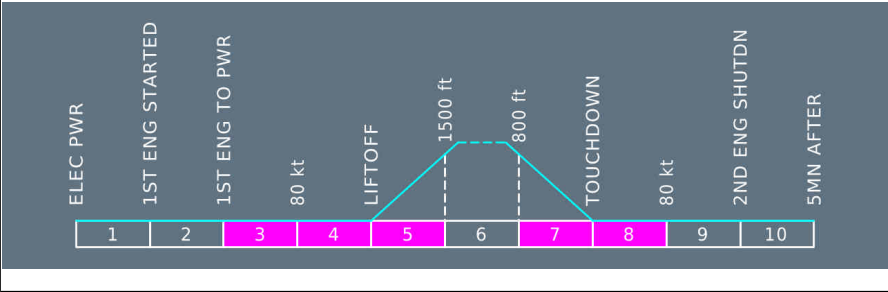
Triggering Conditions:

- L2

This alert triggers when the status of one of the following valves is not received by the FADEC active channel:

 - Bleed valves, or
 - Pack valves, or
 - Wing and engine anti ice valves, or
 - Cross-bleed valve.

Flight Phase Inhibition:



Ident.: PRO-ABN-ENG-W-00018707.0001001 / 21 MAR 16

- If ENG ANTI ICE on:
 ENG MODE SEL.....IGN

Ident.: PRO-ABN-ENG-W-00012303.0001001 / 17 AUG 10

STATUS

ENG 1(2) HI GND IDLE

ENG 1(2) BLEED STATUS FAULT
(ON GROUND)

Applicable to: ALL

Ident.: PRO-ABN-ENG-V-00017965.0001001 / 21 MAR 16

ANNUNCIATIONS

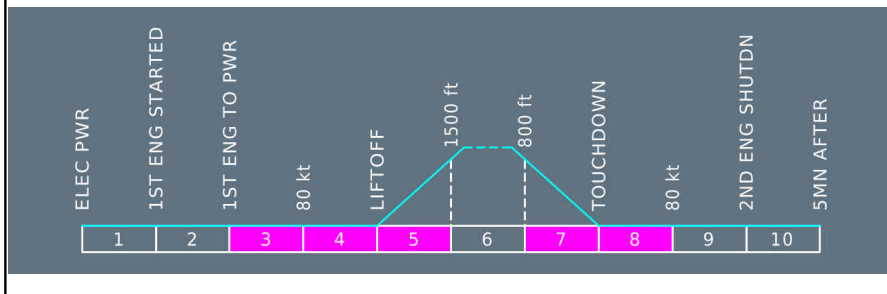
Triggering Conditions:

L2

This alert triggers when the status of one of the following valves is not received by the FADEC active channel:

- Bleed valves, or
- Pack valves, or
- Wing and engine anti ice valves, or
- Cross-bleed valve.

Flight Phase Inhibition:



Continued on the following page

ENG 1(2) BLEED STATUS FAULT (Cont'd)
(ON GROUND)

Ident.: PRO-ABN-ENG-V-00018708.0003001 / 25 FEB 20

- ENG (AFFECTED) HI GND IDLE

FADEC increases minimum idle as if valves were opened.

● If engine anti-ice ON:

ENG MODE SEL.....IGN

When ENG anti ice is ON, there is no automatic selection of continuous relight since FADEC does not know position of engine anti ice valves position.

● BEFORE T.O.:

PACK (ASSOCIATED SIDE).....OFF

Associated pack must be closed to reduce risk of excessive EGT.
- Ident.: PRO-ABN-ENG-V-00012301.0001001 / 28 MAY 20
- | STATUS | |
|----------------------------|--|
| ENG (AFFECTED) HI GND IDLE | |
- | | |
|-------------------------------|----------------------|
| PIA A318/A319/A320/A321 FLEET | PRO-ABN-ENG P 46/118 |
| FCOM | 09 FEB 26 |

← L

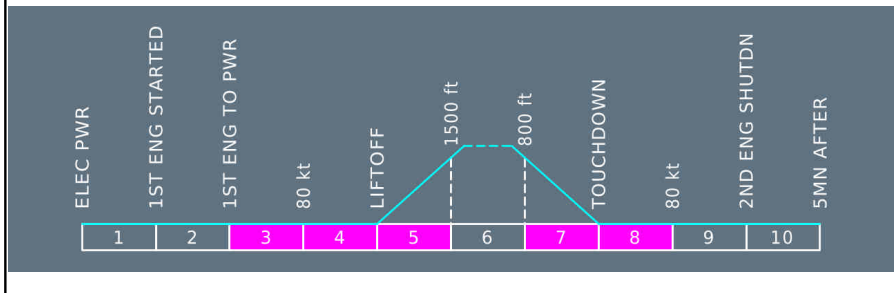
ENG 1+2 COMPRESSOR VANE
Applicable to: ALL

Ident.: PRO-ABN-ENG-CY-00017907.0003001 / 31 AUG 17

ANNUNCIATIONS
Triggering Conditions:

L2

This alert triggers when there is a loss of the redundancy (i.e. one channel is detected faulty) of the compressor vane (i.e. VBV, VSV) control system on both engines. The control of the compressor vane is still fully operative on both engines.

Flight Phase Inhibition:


Ident.: PRO-ABN-ENG-CY-00017757.0002001 / 31 AUG 17

Crew awareness.

ENG 1(2) COMPRESSOR VANE

Applicable to: ALL

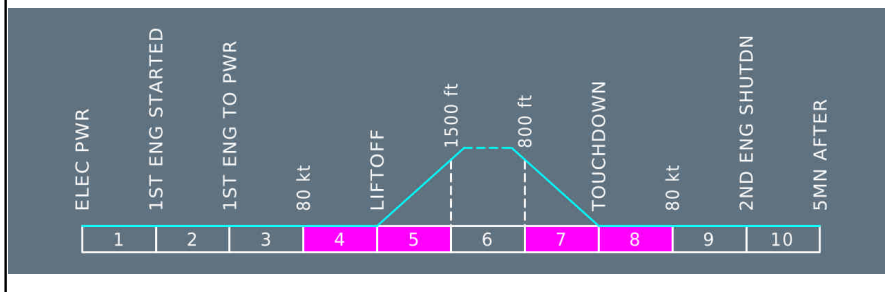
Ident.: PRO-ABN-ENG-N-00017966.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

- L2** This alert triggers when either Variable Bleed Valve (VBV) or Variable Stator Vane (VSV) is failed.

Flight Phase Inhibition:



Ident.: PRO-ABN-ENG-N-00017655.0003001 / 06 NOV 23

- **On ground, before takeoff:**
 - THR LEVERS (AFFECTED)..... IDLE
 - ENG MASTER (AFFECTED)..... OFF

Depending on the type of failure, one of the following two messages is displayed:

AVOID RAPID THR CHANGES

- L2** If the A/THR is engaged, adjust the thrust levers to align with the thrust lever commands with actual N1 and disconnect A/THR.

- L1** ENG (AFFECTED) SLOW RESPONSE

Continued on the following page

ENG 1(2) COMPRESSOR VANE (Cont'd)

Ident.: PRO-ABN-ENG-N-00012155.0001001 / 17 AUG 10

	STATUS
AVOID RAPID THR CHANGES ENG (affected) SLOW RESPONSE	

ENG 1(2) CTL VALVE FAULT

Applicable to: ALL

Ident.: PRO-ABN-ENG-Q-00017967.0004001 / 06 NOV 23

ANNUNCIATIONS

L2

Triggering Conditions:

- The BSV fails, or
- The TBV fails, or
- The RACC system fails.

This alert triggers when:

- The BSV fails, or
- The TBV fails, or
- The RACC system fails.

Flight Phase Inhibition:

Ident.: PRO-ABN-ENG-Q-00018709.0001001 / 21 MAR 16

MAX N2.....96 %

L2

Retard associated thrust lever to limit N2 to 96 %.

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

ENG

ENG 1(2) CTL VALVE FAULT (Cont'd)

Ident.: PRO-ABN-ENG-Q-00012233.0001001 / 17 AUG 10

STATUS

MAX ENG (AFFECTED) N2.....96 %

ENG 1(2) EIU FAULT

Applicable to: ALL

Ident.: PRO-ABN-ENG-B-00017970.0002001 / 30 MAR 18

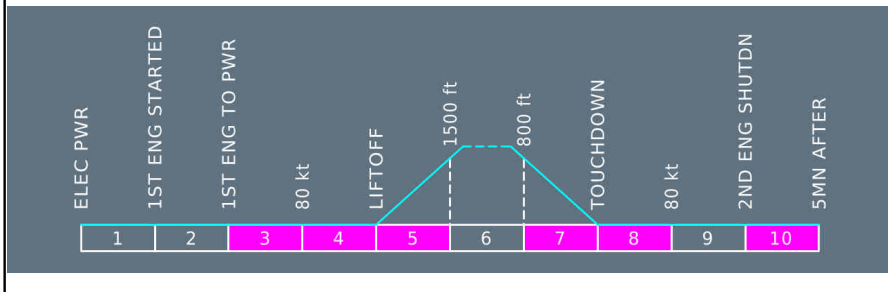
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the data bus between the EIU and ECU is failed.

Flight Phase Inhibition:



Continued on the following page

ENG 1(2) EIU FAULT (Cont'd)

Ident.: PRO-ABN-ENG-B-00017658.0001001 / 21 MAR 16

Crew awareness.

L2 The following consequences affect the aircraft when this alert is triggered:

- Affected engine start is lost
- Autothrust control is lost
- Thrust reverser on the affected engine is lost
- When idle is selected, only approach idle is available
- Bleed corrections on N1 limit are lost
- Continuous ignition is on (in flight).

37 Ident.: PRO-ABN-ENG-B-00017659.0006001 / 03 DEC 19

L12

STATUS
INOP SYS

- **In flight:**
ENG (AFFECTED) HI IDLE
ENG 1(2) APPR IDLE ONLY
Minimum idle is lost.

 A/THR
 REVERSER 1(2)
 ENG 1(2) START

ENG 1(2) FADEC A(B) FAULT

Applicable to: ALL

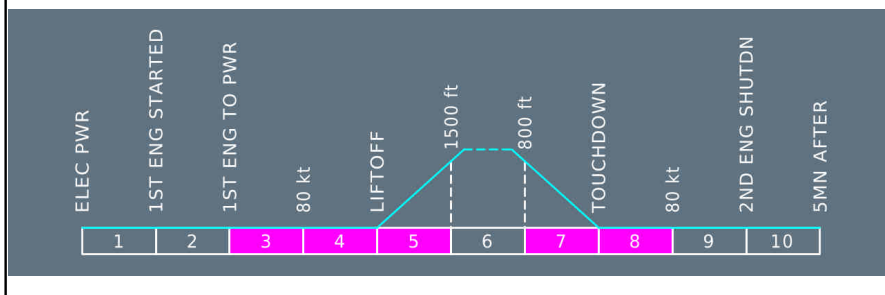
Ident.: PRO-ABN-ENG-AZ-00017972.0002001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the associated FADEC channel is lost.

Flight Phase Inhibition:



Ident.: PRO-ABN-ENG-AZ-00017661.0001001 / 12 NOV 24

Crew awareness.

Note: Some cases of spurious FADEC fault have been experienced at engine start on ground. The flight crew can consider the alert as spurious if it disappears after the application of the reset procedure. (Refer to QRH/ABN-02 ENG 1(2) FADEC A(B) FAULT).

ENG 1(2) FADEC ALTERNATOR

Applicable to: ALL

Ident.: PRO-ABN-ENG-BA-00017974.0001001 / 21 MAR 16

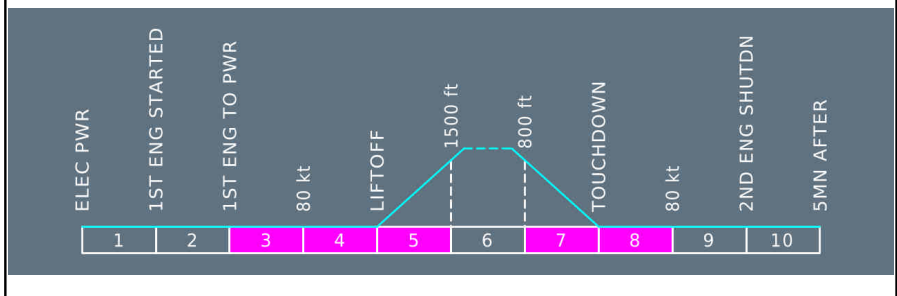
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the electrical auto supply for the FADEC system is lost.

Flight Phase Inhibition:



Ident.: PRO-ABN-ENG-BA-00017662.0001001 / 21 MAR 16

Crew awareness.

ENG 1(2) FADEC FAULT

Applicable to: ALL

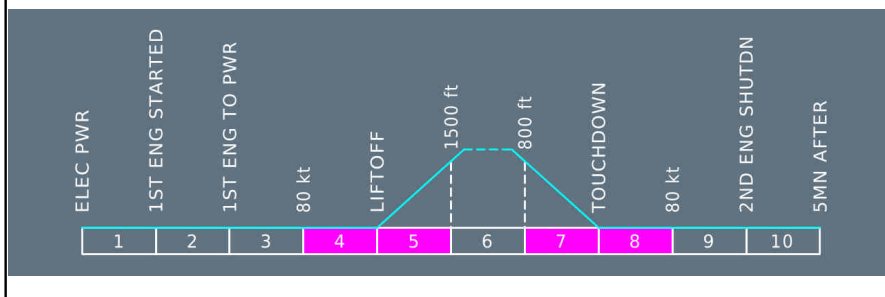
Ident.: PRO-ABN-ENG-BC-00017975.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when both FADEC channels are lost.

Flight Phase Inhibition:



Continued on the following page

ENG 1(2) FADEC FAULT (Cont'd)

Ident.: PRO-ABN-ENG-BC-00017663.0008001 / 03 MAY 23

■ On ground:

 THR LEVER (AFFECTED)..... IDLE
 ENG (AFFECTED) PARAMETERS.....CHECK

L2

Due to the fact that engine indications are abnormal (e.g. lost or frozen), the flight crew must check the engine status on other system pages (e.g. HYD SD page, ELEC SD page or BLEED SD page).

L1

● IF ABN ENG OPERATION:

ENG MASTER (AFFECTED)..... OFF

■ In flight:

 THR LEVER (AFFECTED)..... IDLE
 ENG (AFFECTED) PARAMETERS.....CHECK

L2

Due to the fact that engine indications are abnormal (e.g. lost or frozen), the flight crew must check the engine status on other system pages (e.g. HYD SD page, ELEC SD page or BLEED SD page).

L1

● IF ABN ENG OPERATION:

ENG MASTER (AFFECTED)..... OFF

L12

ASSOCIATED PROCEDURES
ENG 1(2) SHUT DOWN
Refer to PRO-ABN-ENG ENG 1(2) SHUT DOWN.

ENG 1(2) FADEC HI TEMP

Applicable to: ALL

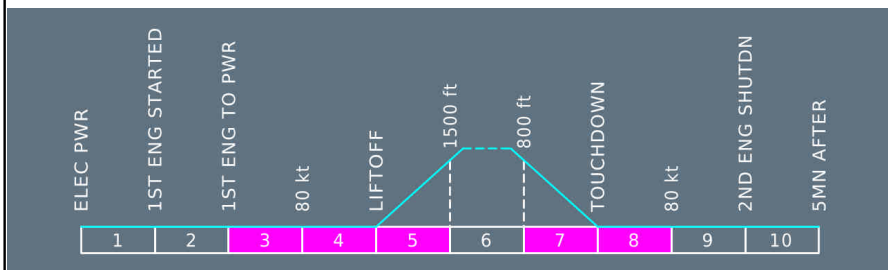
Ident.: PRO-ABN-ENG-BD-00017976.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when high temperature is detected by one or both channels.

Flight Phase Inhibition:



Continued on the following page

ENG 1(2) FADEC HI TEMP (Cont'd)

Ident.: PRO-ABN-ENG-BD-00017664.0004001 / 21 MAR 17

- If the ECU TEMP is above 105 °C:

FADEC OVHT

L2

Reducing engine power should decrease temperature in the ECU area.

If overheating is severe enough, ECU failure could result in a significant loss of engine functions.

L1

- On the ground:

 THR LEVER (AFFECTED)..... IDLE
 ENG MASTER (ASSOCIATED ENGINE).....OFF
 ENG MODE SEL.....NORM
 FADEC GND PWR..... CHECK OFF

- In flight:

ENG (AFFECTED) PARAMETERS.....CHECK

- IF ABN ENG OPERATION:

 THR LEVER (AFFECTED)..... IDLE
 ENG MASTER (ASSOCIATED ENGINE)..... OFF

L12

ASSOCIATED PROCEDURES
ENG 1(2) SHUT DOWN

(Refer to PRO-ABN-ENG ENG 1(2) SHUT DOWN).

ENG 1(2) FAIL

Applicable to: ALL

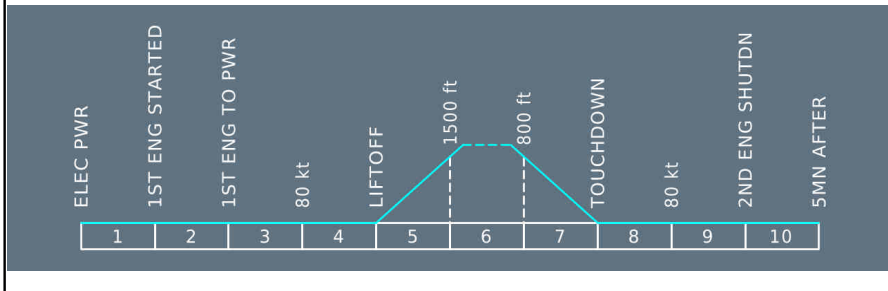
Ident.: PRO-ABN-ENG-BJ-00017982.0002001 / 06 JUN 16

ANNUNCIATIONS

Triggering Conditions:

- L2** This alert triggers when the engine core speed is below idle, with the ENG MASTER lever set to ON, and ENG FIRE pb not pushed.

Flight Phase Inhibition:



Continued on the following page

ENG 1(2) FAIL (Cont'd)
LAND ASAP
Before takeoff or after landing:

THR LEVER (AFFECTED ENGINE)..... IDLE

ENG MASTER (AFFECTED ENGINE)..... OFF

IF DAMAGE:

ENG FIRE P/B (AFFECTED ENGINE)..... PUSH

AGENT 1..... DISCH

IF NO DAMAGE:

L2 For CFM engines, if conditions permit, do not restart the engine. A new engine start would erase FADEC troubleshooting data.

L1 ENG (AFFECTED) RELIGHT..... CONSIDER

L2 If no damage, a new start sequence may be initiated.

L12

ASSOCIATED PROCEDURES
ENG 1(2) SHUT DOWN

Apply the ENG SHUT DOWN procedure (Refer to PRO-ABN-ENG ENG 1(2) SHUT DOWN), if damage or if engine relight is unsuccessful.

 L1 **In flight:**

L2 ENG MODE SEL..... IGN

L2 Selection of continuous ignition confirms the immediate relight attempt made by the FADEC.

L1

During initial climb:

L2 L/G..... UP

THR LEVER (AFFECTED ENGINE)..... IDLE

 L2 In the case of GPWS (EGPWS $\leq$) alerts, reduce speed with care below VLS with flaps extended (at light weights VMCA may be reached before α_{Max}) when applying the GPWS (EGPWS $\leq$) procedure.

L1

IF NO ENG RELIGHT AFTER 30 S:

L2 The 30 s countdown starts as soon as the ENG 1(2) FAIL alert is triggered.

L1 ENG MASTER (AFFECTED ENGINE)..... OFF

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

ENG

ENG 1(2) FAIL (Cont'd)

■ IF DAMAGE:

ENG FIRE P/B (AFFECTED ENGINE).....PUSH
 AGENT 1 (AFTER 10 SECONDS IN FLIGHT)..... DISCH

L12

ASSOCIATED PROCEDURES

ENG 1(2) SHUT DOWN

L2

Apply the ENG SHUT DOWN procedure (Refer to PRO-ABN-ENG ENG 1(2) SHUT DOWN), if damage or if engine relight is unsuccessful.

If high vibration occurs and continues after engine shutdown, reduce airspeed and descent to a safe altitude.

Attempt to determine and use a practical airspeed and altitude for minimum vibrations.

L1

■ IF NO DAMAGE:

ENG (AFFECTED) RELIGHT..... CONSIDER

L2

Apply ENG RELIGHT (in flight) procedure (Refer to PRO-ABN-ENG [QRH] ENG RELIGHT IN FLIGHT).

ENG 1(2) FIRE
(IN FLIGHT)

Applicable to: ALL

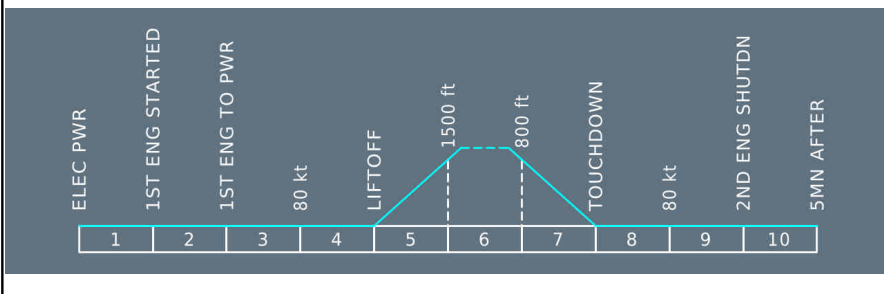
Ident.: PRO-ABN-ENG-DQ-00017401.0001001 / 21 MAR 16

ANNUNCIATIONS
Triggering Conditions:

L2

This alert triggers when:

- Fire is detected by both loops, or
- Fire is detected by one loop when the other loop is faulty, or
- A rupture occurs in both loops within 5 s.

Flight Phase Inhibition:


Continued on the following page

ENG 1(2) FIRE (Cont'd)
(IN FLIGHT)

Ident.: PRO-ABN-ENG-DQ-00018190.0002001 / 21 MAR 17

LAND ASAP

THR LEVER (AFFECTED)..... IDLE
ENG MASTER (AFFECTED)..... OFF

L2 LP and HP valves close.

L1 ENG FIRE P/B (AFFECTED)..... PUSH

L2 When pushed:

- Aural warning stops
- The light remains on, until the fire is extinguished, regardless of the position of the ENG FIRE pb-sw
- FADEC is no longer supplied.

L1 AGENT 1 AFTER 10 S..... DISCH

L2 The 10 s delay allows N1 to decrease, reducing nacelle ventilation, and thereby increasing the effect of the agent.
Automatic countdown on the ECAM.

L1 ATC..... NOTIFY

L2 Notify ATC of the nature of the emergency, and state intentions

L1 ● IF FIRE AFTER 30 S:

AGENT 2..... DISCH

L2 Discharge the second agent, if the fire warning remains 30 s after the discharge of the first agent.

L12

ASSOCIATED PROCEDURES

ENG 1(2) SHUTDOWN

Do not attempt to restart the engine.

For the ENG SHUTDOWN procedure, see the ENG section (Refer to PRO-ABN-ENG ENG 1(2) SHUT DOWN).

ENG 1(2) FIRE
(ON GROUND)

Applicable to: ALL

Ident.: PRO-ABN-ENG-DR-00018553.0001001 / 21 MAR 16

ANNUNCIATIONS

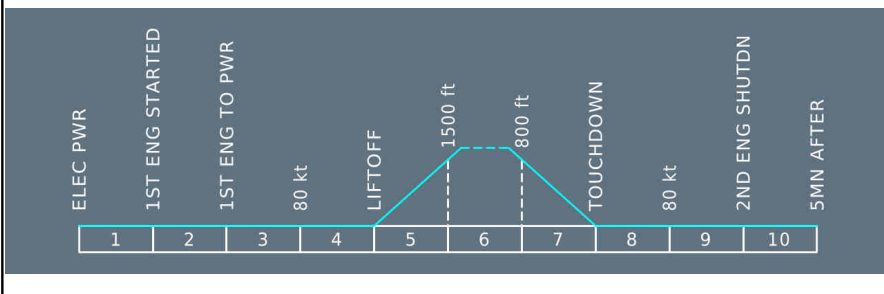
Triggering Conditions:

L2

This alert triggers when:

- Fire is detected by both loops, or
- Fire is detected by one loop when the other loop is faulty, or
- A rupture occurs in both loops within 5 s.

Flight Phase Inhibition:



Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

ENG

ENG 1(2) FIRE (Cont'd)

(ON GROUND)

Ident.: PRO-ABN-ENG-DR-00018192.0004001 / 14 FEB 17

THR LEVERS..... IDLE

L2 Full reverse may be used to stop the aircraft.

L1 ● **WHEN A/C IS STOPPED:**
 PARKING BRK..... ON
 ATC (VHF 1)..... NOTIFY

L2 Notify ATC of the nature of the emergency, and state intentions.
 Only VHF 1 is available on batteries.

L1 CABIN CREW (PA)..... ALERT
 ENG MASTER (AFFECTED)..... OFF

L2 Associated LP and HP valves close.

L1 ENG FIRE P/B (AFFECTED)..... PUSH

L2 When pushed:
 - Aural warning stops
 - The light remains on, until the fire is extinguished, regardless of the position of the ENG FIRE pb-sw
 - FADEC is no longer supplied.

L1 AGENT 1+2..... DISCH
 EMER EVAC PROC..... APPLY

L2 Refer to PRO-ABN-MISC [QRH] EMER EVAC or Refer to QRH/ABN-25 EMER EVAC

ENG 1(2) FIRE DET FAULT

Applicable to: ALL

Ident.: PRO-ABN-ENG-DO-00020838.0001001 / 03 NOV 21

ANNUNCIATIONS

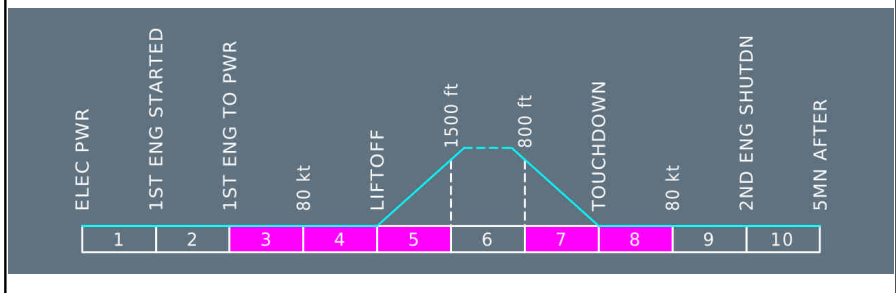
Triggering Conditions:

L2

This alert triggers when:

- Both loops fail with more than 5 s between both failures, or
- The FDU is failed.

Flight Phase Inhibition:



Ident.: PRO-ABN-ENG-DO-00020837.0001001 / 17 MAR 17

Crew awareness.

Ident.: PRO-ABN-ENG-DO-00020839.0001001 / 17 MAR 17

STATUS

INOP SYS

FIRE DET 1(2)

ENG 1(2) FIRE LOOP A(B) FAULT

Applicable to: ALL

Ident.: PRO-ABN-ENG-DP-00020841.0001001 / 03 NOV 21

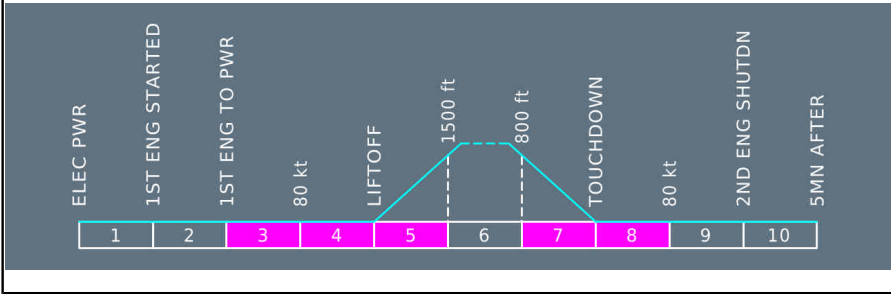
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when one loop is failed.

Flight Phase Inhibition:



Ident.: PRO-ABN-ENG-DP-00020840.0001001 / 17 MAR 17

L2

Crew awareness.

Ident.: PRO-ABN-ENG-DP-00020842.0001001 / 17 MAR 17

STATUS

INOP SYS

ENG 1(2) LOOP A(B)

ENG 1(2) FUEL CTL FAULT

Applicable to: ALL

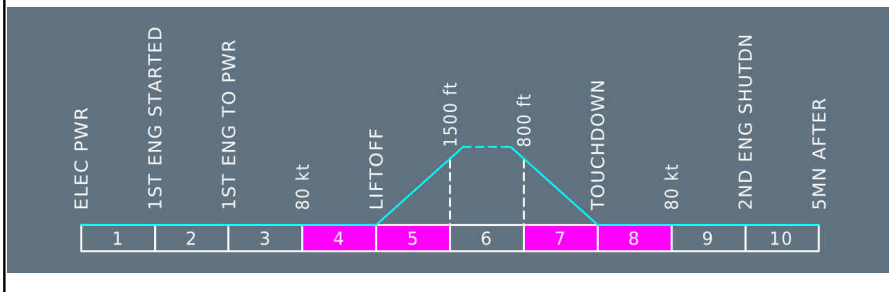
Ident.: PRO-ABN-ENG-O-00017983.0001001 / 21 MAR 16

ANNUNCIATIONS
Triggering Conditions:

L2

This alert triggers when:

- The Fuel Metering Valve (FMV) position is failed, or
- The FMV command is failed, or
- The FMV position feedback is failed.

Flight Phase Inhibition:


Ident.: PRO-ABN-ENG-O-00017679.0003001 / 06 NOV 23

● On ground, before takeoff:

THR LEVER (AFFECTED)..... IDLE

ENG MASTER (AFFECTED)..... OFF

AVOID RAPID THR CHANGES

L2 If the A/THR is engaged, adjust the thrust levers to align the thrust lever commands with actual N1 and disconnect A/THR.

L1 ENG (AFFECTED) SLOW RESPONSE

L2 Depending on the type of failure, one of the above two messages is displayed.

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

ENG

ENG 1(2) FUEL CTL FAULT (Cont'd)

Ident.: PRO-ABN-ENG-O-00017681.0001001 / 21 MAR 16

STATUS

AVOID RAPID THR CHANGES or

ENG (affected) SLOW RESPONSE

ENG 1(2) FUEL FILTER CLOG

Applicable to: ALL

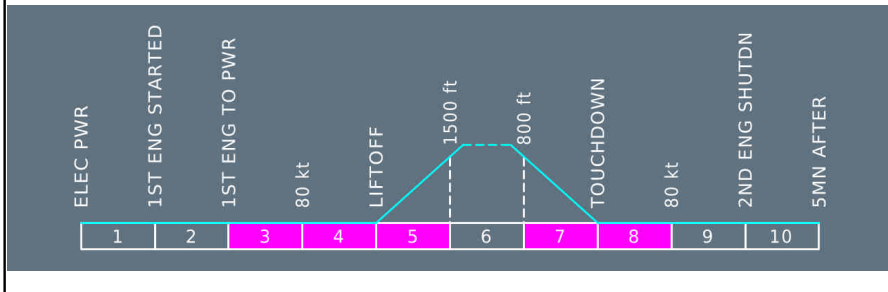
Ident.: PRO-ABN-ENG-BK-00017984.0002001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

^[2] This alert triggers when the fuel filter is clogged.

Flight Phase Inhibition:



Ident.: PRO-ABN-ENG-BK-00012068.0001001 / 16 JAN 18

Crew awareness.

^[2] Maintenance action is due. The fuel filter is bypassed and short term engine operation is not affected. Dual fuel filter clog is likely an indication of Fuel contamination.

ENG 1(2) FUEL RETURN VALVE

Applicable to: ALL

Ident.: PRO-ABN-ENG-BP-00017986.0001001 / 12 NOV 24

ANNUNCIATIONS

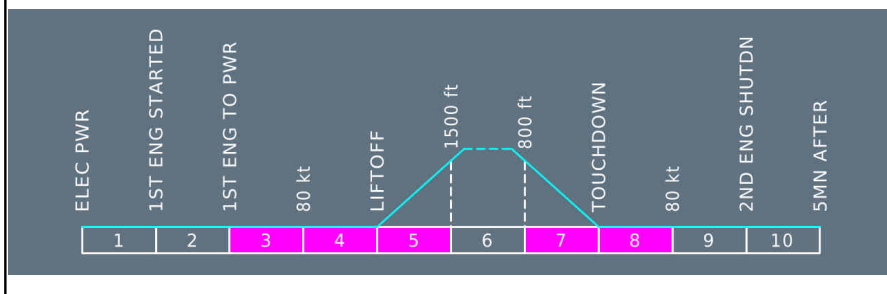
Triggering Conditions:

L2

This alert triggers when:

- The fuel return valve failed in the closed position, or
- The fuel return valve failed in the open position.

Flight Phase Inhibition:



Ident.: PRO-ABN-ENG-BP-00012277.0001001 / 12 NOV 24

- If the fuel return valve failed in the closed position:

VALVE NOT OPEN

- If the fuel return valve failed in the open position:

VALVE NOT CLOSED

Crew awareness.

ENG 1(2) HIGH VIBRATION

Applicable to: ALL

Ident.: PRO-ABN-ENG-BW-00018167.0003001 / 25 FEB 20

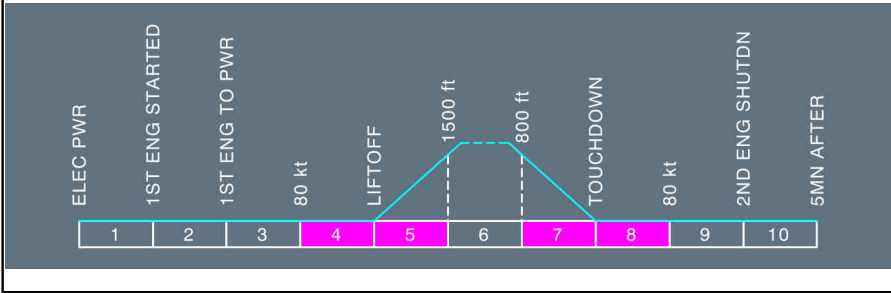
ANNUNCIATIONS

Triggering Conditions:

- This alert triggers when:

 - N1 vibrations are above 6 units, or
 - N2 vibrations are above 4.3 units.

Flight Phase Inhibition:



Ident.: PRO-ABN-ENG-BW-00018722.0002001 / 25 FEB 20

- At takeoff:

Crew awareness.

■ In all other flight phases:

HI ENG VIB PROC..... APPLY

ENG 1(2) HP FUEL VALVE

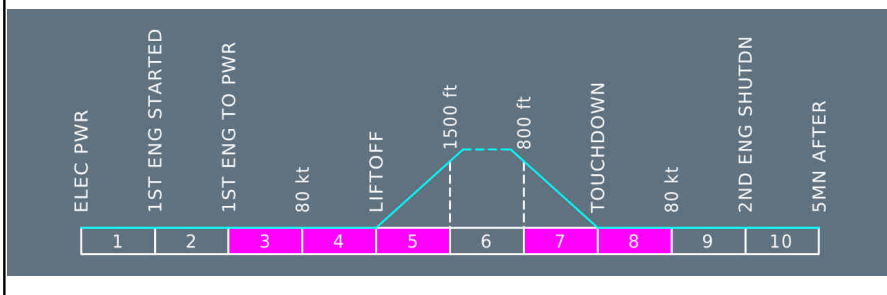
Applicable to: ALL

Ident.: PRO-ABN-ENG-BY-00017955.0001001 / 13 MAY 16

ANNUNCIATIONS
Triggering Conditions:

L2

This alert triggers when HP fuel valve is failed in closed or open position.

Flight Phase Inhibition:


Ident.: PRO-ABN-ENG-BY-00012096.0001001 / 13 MAY 16

- HP fuel valve failed closed, and associated engine below idle:

HP FUEL VALVE NOT OPEN

- On the ground:

MAN START (IF MAN START PERFORMED).....OFF

ENG MASTER (AFFECTED).....OFF

- HP fuel valve failed open, and associated engine below idle

or

- HP fuel valve failed closed, and associated engine at or above idle:

HP FUEL POS SWT FAULT

ENG 1(2) IGN FAULT (IGN A OR B FAULT)

Applicable to: ALL

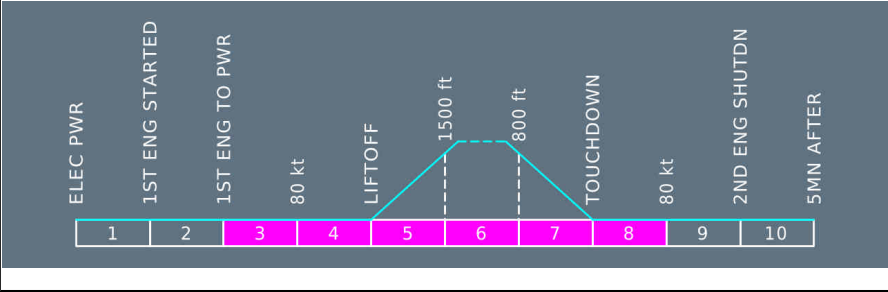
Ident.: PRO-ABN-ENG-J-00017956.0002001 / 20 APR 17

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when ignition circuit A or B is failed.

Flight Phase Inhibition:



Ident.: PRO-ABN-ENG-J-00012134.0001001 / 25 FEB 14

Crew awareness.

Ident.: PRO-ABN-ENG-J-00012136.0001001 / 17 AUG 10

STATUS

INOP SYS

ENG 1(2) IGN A (B)

ENG 1(2) IGN FAULT (IGN A+B FAULT)

Applicable to: ALL

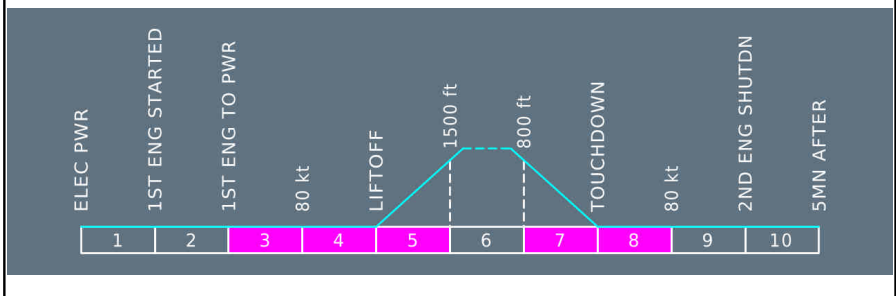
Ident.: PRO-ABN-ENG-K-00017957.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when both ignition circuits are failed.

Flight Phase Inhibition:


Ident.: PRO-ABN-ENG-K-00012139.0001001 / 12 JAN 11

AVOID ADVERSE CONDITIONS

Ident.: PRO-ABN-ENG-K-00012141.0001001 / 12 JAN 11

STATUS

INOP SYS

ENG 1(2) IGN

ENG 1(2) LOW N1 (ON GROUND)

Applicable to: ALL

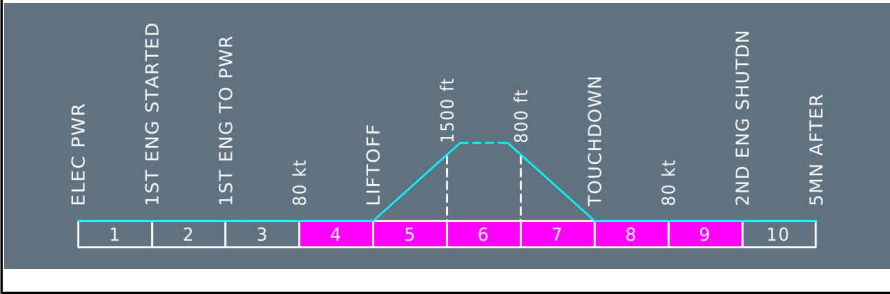
Ident.: PRO-ABN-ENG-CA-00017958.0003001 / 13 MAY 16

ANNUNCIATIONS

Triggering Conditions:

This alert triggers when N1 rotation is failed during start.

Flight Phase Inhibition:



Ident.: PRO-ABN-ENG-CA-00012101.0004001 / 16 NOV 11

No N1 rotation during start.

- IF CONFIRMED:

THR LEVER (AFFECTED)..... IDLE

ENG MASTER (AFFECTED)..... OFF

ENG 1(2) N1 OR N2 OR EGT OR FF DISCREPANCY

Applicable to: ALL

Ident.: PRO-ABN-ENG-CC-00017959.0001001 / 21 MAR 16

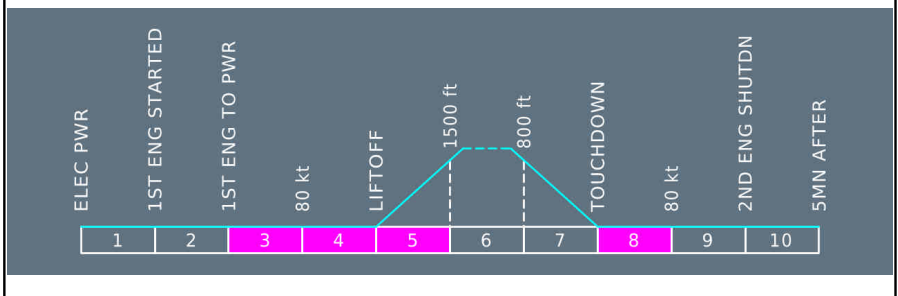
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when a discrepancy between real and displayed values is detected.

Flight Phase Inhibition:



Ident.: PRO-ABN-ENG-CC-00017696.0001001 / 21 MAR 16

L2

The upper ECAM upper displays a CHECK (or CHK) message below the affected indication. Normal indication may be recovered by switching from DMC 1 to DMC 3. If unsuccessful, and if both thrust levers are at the same position, crosscheck with the opposite parameter.

L1

Crew awareness.

ENG 1(2) N1/N2/EGT OVER LIMIT

Applicable to: ALL

Ident.: PRO-ABN-ENG-CD-00018006.0002001 / 21 MAR 16

ANNUNCIATIONS

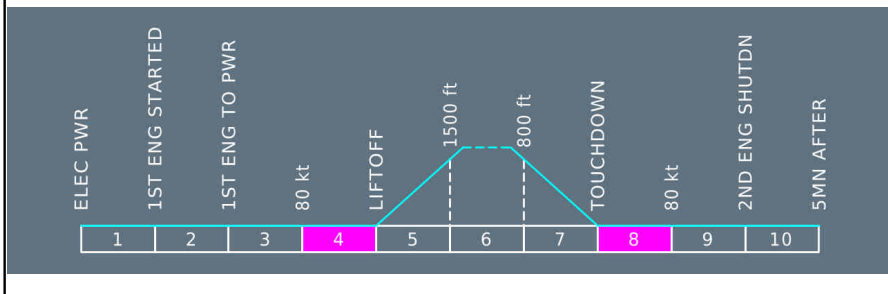
Triggering Conditions:

L2

This alert triggers when:

- N1 is above 104 %, or
- N2 is above 105 %, or
- EGT is above 725 °C during start, or above 950 °C when the thrust levers are at TOGA or FLX/MCT position, or 915 °C in the other cases.

Flight Phase Inhibition:



Continued on the following page

ENG 1(2) N1/N2/EGT OVER LIMIT (Cont'd)

Ident.: PRO-ABN-ENG-CD-00012079.0013001 / 21 MAR 17

■ **Max pointer indication:**

- L2** EGT between 915 °C and 950 °C (except during takeoff, alpha floor activation, or reverse selected), or EGT between 950 °C and 970 °C, or
N1 between 104.0 % and 105.8 % or
N2 between 105.0 % and 105.8 %

L1 THR LEVER (OF AFFECTED ENGINE).....BELOW LIMIT

L2 Normal operation may be resumed and maintained until next landing. Report in maintenance log.

L1 ■ **Max pointer indication:**

- L2** EGT above 970 °C or
N1 above 105.8 % or
N2 above 105.8 %

L1 THR LEVER (OF AFFECTED ENGINE)..... IDLE
ENG MASTER (OF AFFECTED ENGINE)..... OFF

L2 If conditions do not permit engine shutdown land ASAP using the minimum thrust required to sustain safe flight.

L12

ASSOCIATED PROCEDURES

ENG 1(2) SHUT DOWN

Apply the **ENG SHUT DOWN** procedure (Refer to PRO-ABN-ENG ENG 1(2) SHUT DOWN).

ENG 1(2) OIL FILTER CLOG

Applicable to: ALL

Ident.: PRO-ABN-ENG-CF-00017964.0002001 / 21 MAR 16

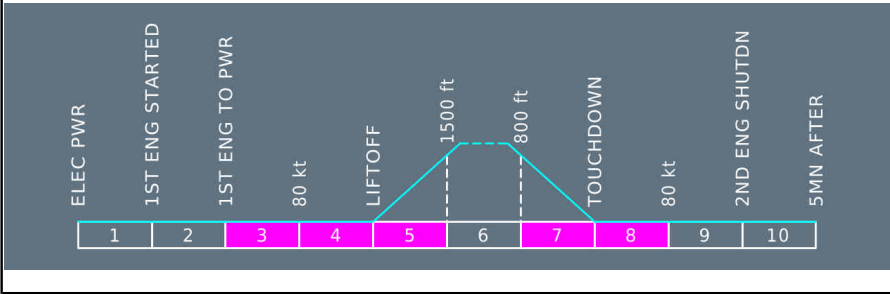
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the oil filter is clogged.

Flight Phase Inhibition:



43

Ident.: PRO-ABN-ENG-CF-00012078.0007001 / 30 MAR 18

OIL PARAMETERS..... MONITOR

L2

Maintenance action is due, except if the caution is temporarily displayed during cold engine start with engine oil temperature lower than 40 °C.

ENG 1(2) OIL HI TEMP

Applicable to: ALL

Ident.: PRO-ABN-ENG-CH-00017969.0001001 / 21 MAR 16

ANNUNCIATIONS

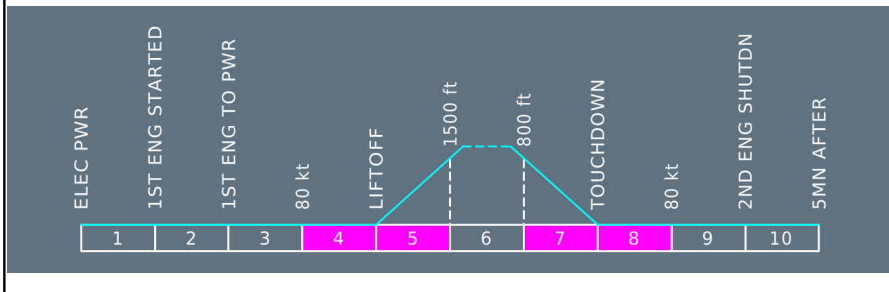
Triggering Conditions:

L2

This alert triggers when the oil temperature is:

- Between 140 °C and 155 °C for more than 15 min, or
- Above 155 °C.

Flight Phase Inhibition:



Ident.: PRO-ABN-ENG-CH-00017822.0002001 / 26 NOV 19

THR LEVER (AFFECTED ENGINE)..... IDLE
 ENG MASTER (AFFECTED ENGINE)..... OFF

L2 Operation above the maximum temperature requires engine shutdown.

L12

ASSOCIATED PROCEDURES

ENG 1 (2) SHUT DOWN

Apply the **ENG 1(2) SHUT DOWN** procedure (Refer to PRO-ABN-ENG ENG 1(2) SHUT DOWN).

ENG 1(2) OIL LO PR

Applicable to: ALL

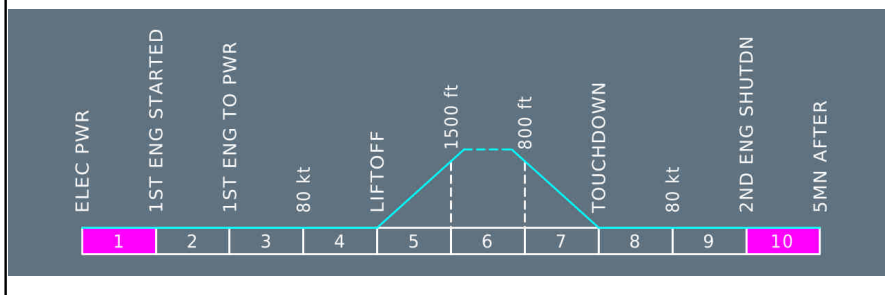
Ident.: PRO-ABN-ENG-CI-00018002.0006001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when oil pressure is below 13 PSI.

Flight Phase Inhibition:



Ident.: PRO-ABN-ENG-CI-00018796.0001001 / 26 NOV 19

L2 Check oil pressure indication on ENG SD page.

L1 ● **IF OIL PR < 13 PSI**
 THR LEVER (OF AFFECTED ENGINE)..... IDLE
 ENG MASTER (OF AFFECTED ENGINE)..... OFF

L12

ASSOCIATED PROCEDURES

ENG 1(2) SHUT DOWN

Apply ENG 1(2) SHUT DOWN procedure (Refer to PRO-ABN-ENG ENG 1(2) SHUT DOWN).

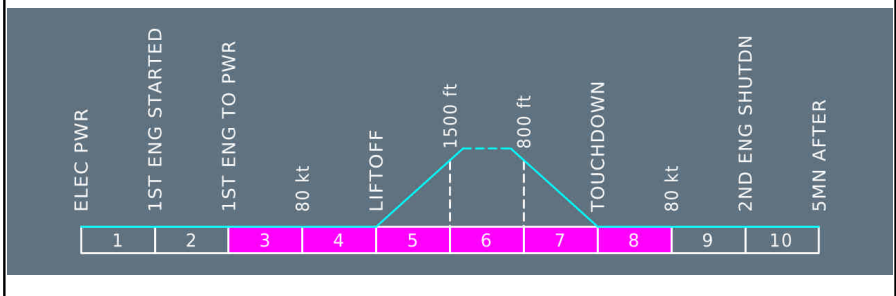
Note: If oil pressure is indicated red on ENG SD page without the ENG 1(2) OIL LO PR alert, it can be assumed that the oil pressure transducer is faulty. Flight crew may continue engine operation while monitoring other engine parameters.

ENG 1(2) ONE TLA FAULT
Applicable to: ALL

Ident.: PRO-ABN-ENG-CM-00017977.0001001 / 03 MAY 23

ANNUNCIATIONS
Triggering Conditions:
L2

This alert triggers when one position detector of a TLA is failed.

Flight Phase Inhibition:


Ident.: PRO-ABN-ENG-CM-00012144.0001001 / 25 FEB 14

Crew awareness.

ENG 1(2) OVSPD PROT FAULT

Applicable to: ALL

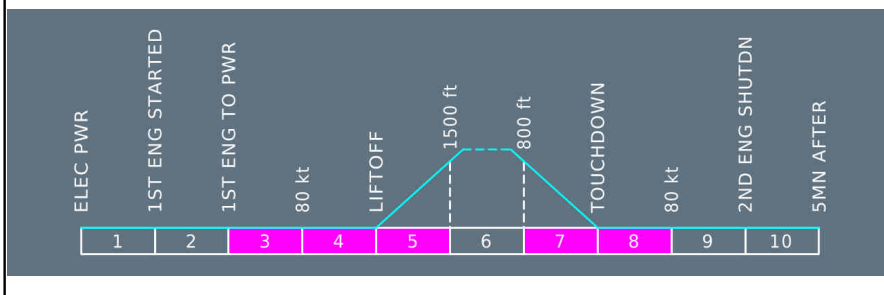
Ident.: PRO-ABN-ENG-CN-00017980.0003001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the overspeed protection is lost.

Flight Phase Inhibition:



Ident.: PRO-ABN-ENG-CN-00012166.0001001 / 25 FEB 14

Crew awareness.

L12 Note: If the warning appears during engine start, shut down the engine. Restart the engine. If the warning still appears, maintenance action is due.

ENG 1(2) PROBES FAULT

Applicable to: ALL

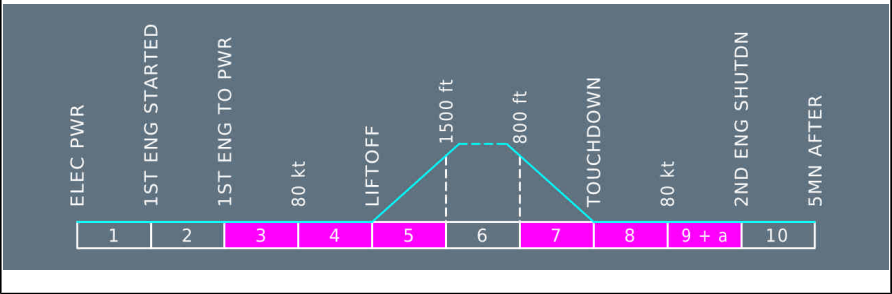
Ident.: PRO-ABN-ENG-CO-00017981.0003001 / 06 JUN 16

L2

Triggering Conditions:

This alert triggers when T12, P0, or PT2 data are unavailable on both channels.

Flight Phase Inhibition:



Note: (a) Alert inhibited during the first 60 seconds of the flight phase 9.

Ident.: PRO-ABN-ENG-CO-00018734.0001001 / 21 MAR 16

Crew awareness.

ENG 1(2) REV INHIBITED

Applicable to: ALL

Ident.: PRO-ABN-ENG-G-00017987.0004001 / 21 MAR 16

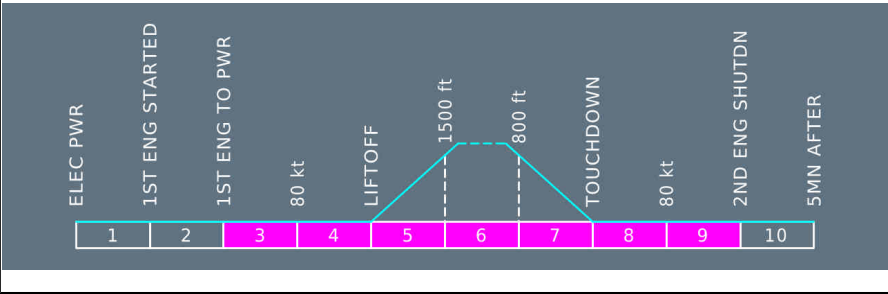
ANNUNCIATIONS

Triggering Conditions:

L2

 This alert triggers when the reverser is inhibited by maintenance action.

Flight Phase Inhibition:



Ident.: PRO-ABN-ENG-G-00012111.0001001 / 25 FEB 14

L2

 Reverse is inhibited by maintenance action.

L1

 Crew awareness.

Ident.: PRO-ABN-ENG-G-00012113.0001001 / 30 MAR 12

STATUS

INOP SYS

REVERSER 1(2)

ENG 1(2) REV ISOL FAULT

Applicable to: ALL

Ident.: PRO-ABN-ENG-CP-00017989.0001001 / 21 MAR 16

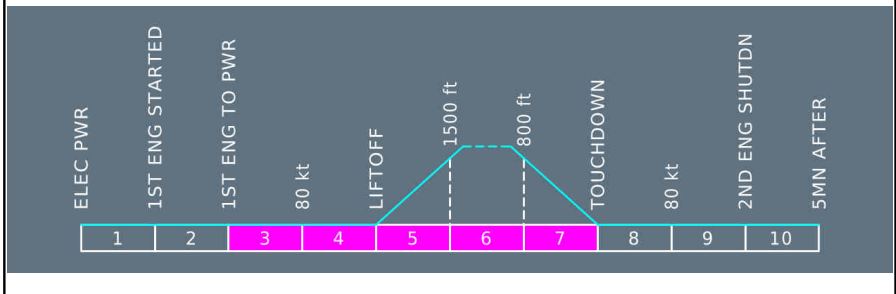
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the thrust reverser shut off valve is failed in open position.

Flight Phase Inhibition:



Ident.: PRO-ABN-ENG-CP-00018735.0001001 / 21 MAR 16

Crew awareness.

ENG 1(2) REV PRESSURIZED

Applicable to: ALL

Ident.: PRO-ABN-ENG-CR-00017992.0001001 / 13 MAY 16

ANNUNCIATIONS

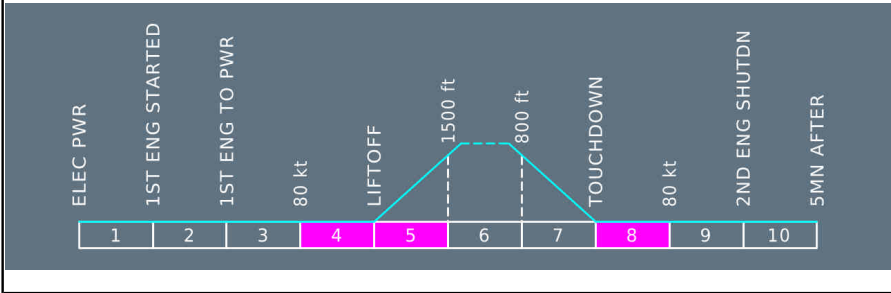
Triggering Conditions:

- L2

This alert triggers when thrust reverser system is pressurized while:

 - For CFM engines: The reverser doors are stowed and locked, or
 - For IAE and PW engines: There is no reverse deployment order.

Flight Phase Inhibition:



Ident.: PRO-ABN-ENG-CR-00017702.0003001 / 30 MAR 18

THR LEVER 1(2).....IDLE

- L2

If flight conditions permit, reduce the thrust of the affected engine to IDLE as a precautionary measure.

ENG REV SET

Applicable to: ALL

Ident.: PRO-ABN-ENG-DA-00017905.0001001 / 21 MAR 16

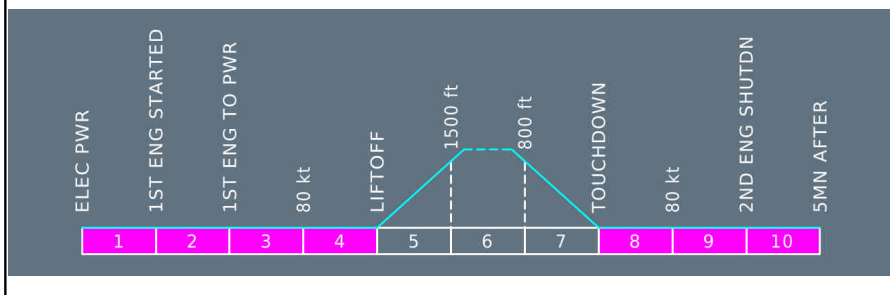
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the reverse thrust is selected in flight.

Flight Phase Inhibition:



Ident.: PRO-ABN-ENG-DA-00017776.0001001 / 21 MAR 16

THR LEVER (AFFECTED ENGINE)..... FWD THR

ENG 1(2) REV SWITCH FAULT

Applicable to: ALL

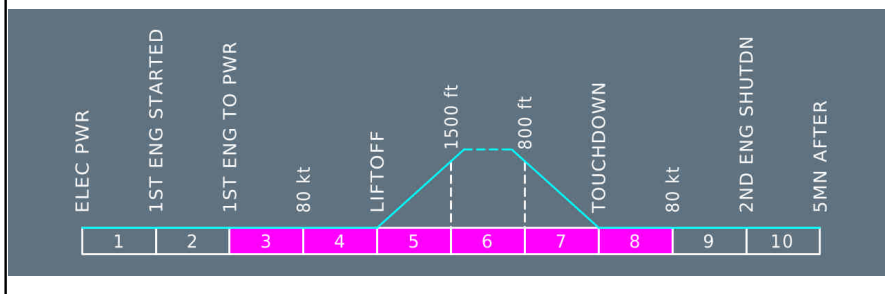
Ident.: PRO-ABN-ENG-CS-00017870.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the reverser permission switch is failed.

Flight Phase Inhibition:



Ident.: PRO-ABN-ENG-CS-00012098.0001001 / 25 FEB 14

Crew awareness.

ENG 1(2) REVERSE UNLOCKED

Applicable to: ALL

Ident.: PRO-ABN-ENG-CT-00017871.0004001 / 18 NOV 21

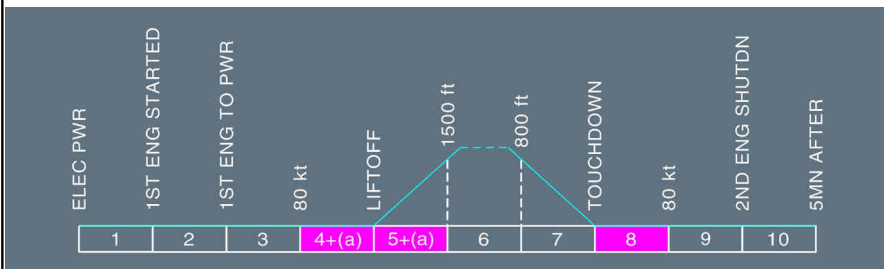
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when one or more reverser doors are not locked in stowed position in flight, or on ground with no deploy order.

Flight Phase Inhibition:



Other Inhibition:

(a) The alert is inhibited in the flight phase 4 and for the first 15 s of flight phase 5, except if the engine thrust is automatically set to idle.

Continued on the following page

ENG 1(2) REVERSE UNLOCKED (Cont'd)

Ident.: PRO-ABN-ENG-CT-00012084.0007001 / 09 JAN 18

[L2] One or more reverser doors are not stowed.

If N1 is above 70 %, the auto-restow function is inhibited in flight and on ground.

 [L1] ■ **On ground:**

ENG 1(2) AT IDLE

[L2] Only displayed, if the FADEC automatically sets the engine at idle (i.e. when 4 reverser doors are not stowed, or 1, 2, or 3 reverser doors are not stowed with the reverser pressurized).

 [L1] THR LEVER (AFFECTED ENGINE)..... IDLE
 ENG MASTER (AFFECTED ENGINE)..... OFF

 ■ **In flight:**
LAND ASAP

ENG 1(2) AT IDLE

[L2] Only displayed, if the engine is automatically set at idle.

 [L1] THR LEVER (AFFECTED ENGINE)..... IDLE
 MAX SPEED..... 300/78

 ● **IF BUFFET:**

 MAX SPEED 240 KT
 ENG MASTER (AFFECTED ENGINE)..... OFF

 ● **If reverser is actually deployed:**

 RUD TRIM FULL R (L)
 CONTROL HDG WITH ROLL

[L12]

ASSOCIATED PROCEDURES

 ENG 1(2) **SHUT DOWN**

 Apply the **ENG SHUT DOWN** procedure (Refer to PRO-ABN-ENG ENG 1(2) SHUT DOWN).

ENG 1(2) REVERSER FAULT

Applicable to: ALL

Ident.: PRO-ABN-ENG-A-00017872.0001001 / 21 MAR 16

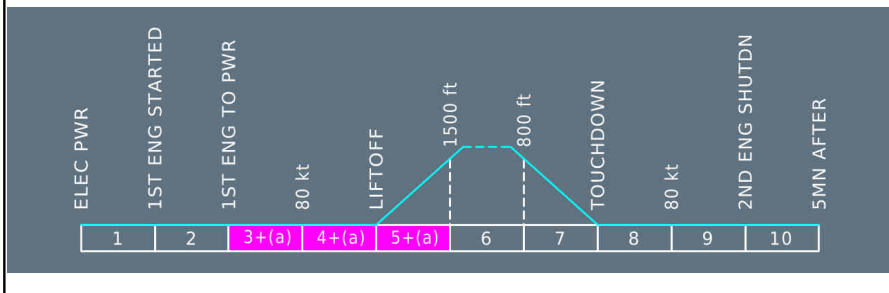
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the thrust reverser on one engine is failed (due to system components or inputs).

Flight Phase Inhibition:



Note: (a) Alert not inhibited in the flight phases 3, 4, 5, if engine thrust is automatically set to idle.

Ident.: PRO-ABN-ENG-A-00017703.0003001 / 21 MAR 16

- If reverser position fault with reverser pressurized:

LAND ASAP

ENG 1(2) AT IDLE

L2

Thrust of the affected engine is locked at idle.

L1

THR LEVER 1(2)..... IDLE

L2

Set thrust lever of affected engine at idle.

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

ENG

ENG 1(2) REVERSER FAULT (Cont'd)

Ident.: PRO-ABN-ENG-A-00012070.0001001 / 17 AUG 10

STATUS

INOP SYS

REVERSER 1(2)

ENG SAT ABOVE FLEX TEMP

Applicable to: ALL

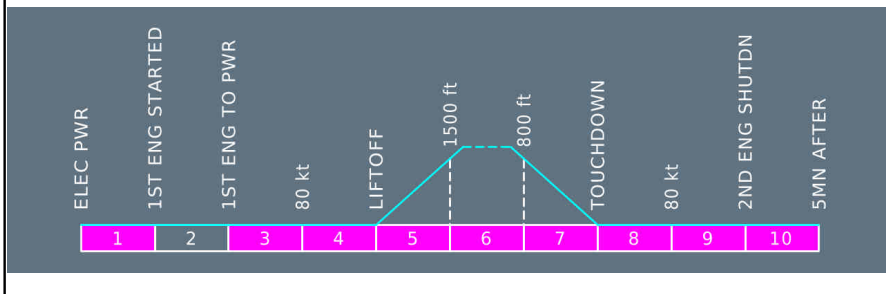
Ident.: PRO-ABN-ENG-DB-00017904.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

12 This alert is triggered when the SAT is above the FLEX TEMP.

Flight Phase Inhibition:



Ident.: PRO-ABN-ENG-DB-00014243.0004001 / 30 MAR 12

T.O DATA.....CHECK

ENG 1(2) SENSOR FAULT

Applicable to: ALL

Ident.: PRO-ABN-ENG-R-00017873.0001001 / 21 MAR 16

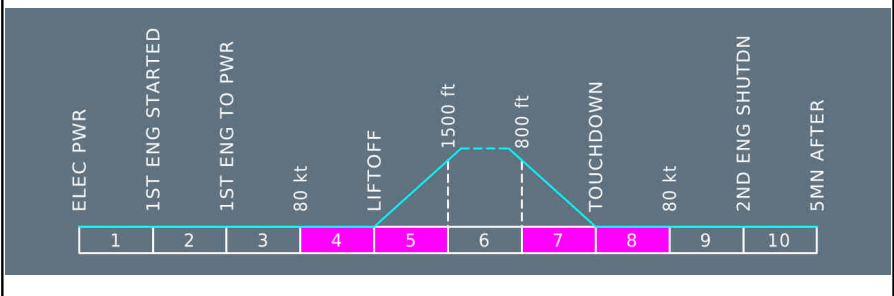
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when PS3 or T25 or T3 or N1 or N2 data is unavailable on both channels.

Flight Phase Inhibition:



Ident.: PRO-ABN-ENG-R-00012235.0003001 / 06 NOV 23

L2

PS3, T25, T3, N1, N2 data not available on both ECU channels.

L1

■ On ground, before takeoff:

THR LEVER (AFFECTED)..... IDLE

ENG MASTER (AFFECTED)..... OFF

■ In flight:

AVOID RAPID THR CHANGES

L2

If the A/THR is engaged, adjust the thrust levers to align the thrust lever commands with actual N1 and disconnect A/THR.

Ident.: PRO-ABN-ENG-R-00017707.0001001 / 21 MAR 16

STATUS

AVOID RAPID THR CHANGES.

ENG 1(2) SHUT DOWN

Applicable to: ALL

Ident.: PRO-ABN-ENG-I-00017874.0001001 / 21 MAR 16

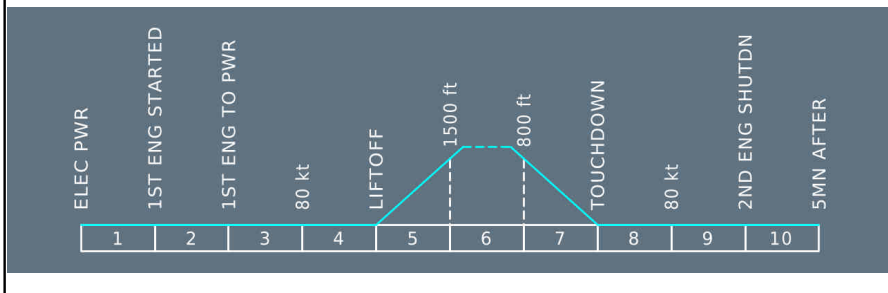
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when ENG master is at off in phases 3 to 8, or ENG FIRE pb is pushed in phases 1, 2, 9 and 10.

Flight Phase Inhibition:



Continued on the following page

ENG 1(2) SHUT DOWN (Cont'd)

Ident.: PRO-ABN-ENG-I-00017837.0011001 / 18 NOV 21

LAND ASAP
● If wing anti-ice ON:
■ If ELEC EMER CONFIG:

PACK 1 OFF

L2

In ELEC EMER CONFIG, only PACK 1 pb-sw can be set to off.

L1

■ If not ELEC EMER CONFIG:

PACK (AFFECTED SIDE) OFF

L2

One pack must be closed when wing anti-ice is in use due to precooler performance.

L1

● If ENG FIRE pb not pushed:

X BLEED (IF ENG FIRE PB NOT PUSHED) OPEN

L2

X BLEED selector must be opened to have symmetrical wing anti-icing.

L1

ENG MODE SEL IGN

L2

Continuous ignition is selected, in order to protect the remaining engine.

L1

● During initial climb:

L/G UP

● IF NO FUEL LEAK:

IMBALANCE MONITOR

TCAS MODE SEL TA

● If REV unlocked:
● IF BUFFET:

MAX SPEED 240 KT

● If ENG FIRE pb-sw pushed:

X BLEED SHUT

WING ANTI ICE OFF

AVOID ICING CONDITIONS

SECONDARY FAILURES

* HYD

* ELEC

Continued on the following page

PROCEDURES**ABNORMAL AND EMERGENCY PROCEDURES**

ENG

ENG 1(2) SHUT DOWN (Cont'd)

| * AIR BLEED

Note: In some conditions, with full asymmetric power, the aircraft may be control-limited before reaching the protection system limit. Therefore, in extreme conditions, where low speed may be advantageous (GPWS, WINDSHEAR, etc.), reduce speed with care below VLS and respect the minimum control speed.

Continued on the following page

ENG 1(2) SHUT DOWN (Cont'd)

Ident.: PRO-ABN-ENG-I-00017852.0024001 / 17 NOV 20

L12

STATUS

- If ENG 1(2) FIRE pb-sw pushed:
 AVOID ICING CONDITIONS
 - IF SEVERE ICE ACCRETION:
 MIN SPD..... VLS + 10/G DOT
 MANEUVER WITH CARE
 LDG DIST PROC..... APPLY
- If REV unlocked:
 MAX SPEED.....300/0.78

APPR PROC

- If REV unlocked:
 - 4 doors not stowed (CFM) or reverser deployed (IAE/PW):
 - IF BUFFET:
 FOR LDG..... FLAP LVR 1
This line is replaced by "FOR LDG: FLAP LVR 1" when CONF 1 is selected, as a reminder.
 APPR SPD.....VREF + 55 KT
 RUD TRIM.....5 DEG R(L)
When committed to land, set 5 ° rudder trim towards the engine running.
 A/THR.....OFF
 GPWS FLAP MODE..... OFF
 - WHEN LDG ASSURED:
 L/G.....DOWN
 - AT 800 FT AGL:
 TARGET SPD..... VREF + 40 KT

INOP SYS

CAT 3 DUAL
 ENG 1(2) BLEED
 PACK 1(2)
 MAIN GALLEY
 GEN 1(2)
 G ENG 1 PUMP or
 Y ENG 2 PUMP
 WING A. ICE ⁽¹⁾
 AFT CRG HEAT 
 STEEP APPR 

Continued on the following page

ENG 1(2) SHUT DOWN (Cont'd)

LDG DIST PROC.....APPLY

- 1, 2, or 3 doors not stowed (CFM), or reverser detected unlocked (IAE/PW):

- IF BUFFET:

FOR LDG..... FLAP LVR 3

This line is replaced by "FOR LDG: FLAP LVR 3" when CONF 3 is selected, as a reminder.

GPWS LDG FLAP 3..... ON

This line is displayed when flaps are in CONF 3.

APPR SPD.....VREF + 10 KT

LDG DIST PROC.....APPLY

- If WING A/ICE off and ENG 1(2) FIRE pb-sw not pressed:

- IF PERF PERMITS:

X BLEED.....OPEN

If no obstacle constraint exists, open the XBLEED.

To determine the single engine gross ceiling, use the performance application of the EFB.

- For A321 aircraft:

ECON FLOW.....ON

 AFT CRG HOT AIR OFF

The ECON FLOW must be selected ON, and the aft cargo heat  must be selected OFF, due to precooler performance.

- IF NO ENG 1(2) DAMAGE:

CONSIDER ENG 1(2) RELIGHT

CAT 3 SINGLE ONLY

ONE PACK ONLY IF WAI ON

 See ⁽²⁾

⁽¹⁾ (if affected ENG FIRE pb-sw pushed)

⁽²⁾ Note: 1. If available, the APU may be started and the APU GEN used.
 2. If the ENG 1 FIRE pb-sw is pushed, APU bleed must not be used.

Continued on the following page

ENG 1(2) SHUT DOWN (Cont'd)

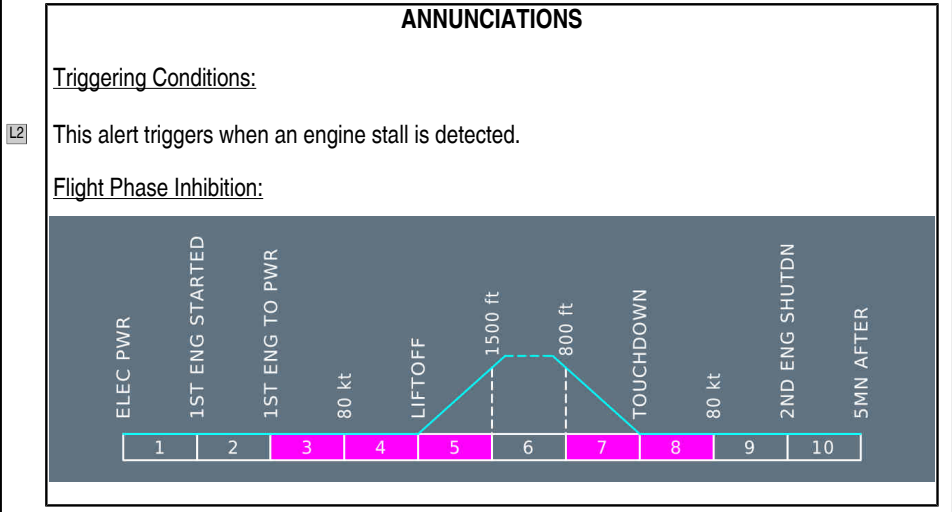
3. If ENG 2 FIRE pb-sw is pushed, APU bleed may be used, provided the X BLEED rotary selector is set to SHUT.

4. After landing, the Fuel Used value of the engine shut down in flight, becomes incorrect.

ENG 1(2) STALL

Applicable to: ALL

Ident.: PRO-ABN-ENG-Z-00017876.0001001 / 21 MAR 16



Continued on the following page

ENG 1(2) STALL (Cont'd)

Ident.: PRO-ABN-ENG-Z-00017749.0005001 / 17 MAR 17

This alert is triggered when FADEC detects an engine stall. Indications of an engine stall include varying degrees of abnormal engine noises/bangs, accompanied by flame from the engine exhaust (and possibly from the engine inlet in severe case), fluctuating performance parameters, vibration, sluggish or no thrust lever response, high EGT and/or a rapid EGT rise when thrust lever is advanced. Engine stalls must be reported for maintenance action.

- On Ground:

THR LEVER (AFFECTED ENGINE)..... IDLE

ENG MASTER (AFFECTED ENGINE)..... OFF
- In Flight:

THR LEVER (AFFECTED ENGINE)..... IDLE

ENG PARAMETERS (AFFECTED ENGINE)..... CHECK

ENG 1(2) STALL PROC..... APPLY

Ident.: PRO-ABN-ENG-Z-00017748.0001001 / 03 MAY 23

STATUS

- In flight:

CONSIDER ENG 1(2) RELIGHT

ENG 1(2) START FAULT

Applicable to: ALL

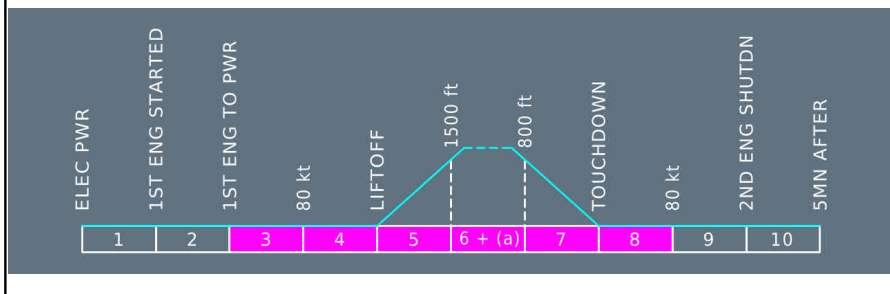
Ident.: PRO-ABN-ENG-AD-00017995.0001001 / 13 MAY 16

ANNUNCIATIONS
Triggering Conditions:

L2

This alert triggers when start fault due to:

- No light up, or
- Engine stall, or
- Engine overtemperature (above 725 °C), or
- Starter time exceeded, or
- Low start air pressure, or
- Thrust lever not at idle.

Flight Phase Inhibition:


Note: Alert inhibited in the flight phase 6, only if it is due to thrust lever not at idle.

Continued on the following page

ENG 1(2) START FAULT (Cont'd)

Ident.: PRO-ABN-ENG-AD-00012100.0005001 / 05 MAR 19

■ ENG 1(2) IGNITION FAULT:

L2 The engine does not start within the 18 s that follow the ignition start.

L1

● In flight:

ENG MASTER (AFFECTED)..... OFF

L2

Wait 30 s before attempting a new start (to drain the engine).

L1

● On the ground (auto start) :

L2

If the engine does not start, the FADEC can attempt an additional engine restart. After any start attempt that is not successful, a dry crank phase automatically occurs. The ECAM displays the following message:

L1

NEW START IN PROGRESS

● When the final dry cranking process is finished:

ENG MASTER (AFFECTED)..... OFF

L2

Following starter cooldown, the pilot must decide whether to attempt auto or manual start, or to report the no start condition for appropriate maintenance action.

L1

● On the ground (manual start):

ENG MASTER (AFFECTED)..... OFF

MAN START (AFFECTED)..... OFF

MODE SEL..... CRANK

MAN START (AFFECTED)..... ON

L2

Note: ECAM does not display the last two lines of the above procedure.

Dry crank the engine for 30 s. The start valve automatically reopens when N2 is below 20 %.

After the starter cools, and for any subsequent attempt to start the engine, the flight crew must perform a manual start, or must report the "no start condition" to maintenance for appropriate action.

L1

■ ENG 1(2) STALL, ENG 1(2) EGT OVERLIMIT:

● In flight:

ENG MASTER (AFFECTED)..... OFF

L2

Wait 30 s before attempting a new start (to drain the engine).

Continued on the following page

ENG 1(2) START FAULT (Cont'd)

L1

● On ground (auto start):

L2

If the FADEC detects a stall or a potential EGT overheat, the FADEC will reduce the fuel schedule in stages, if necessary, to achieve a normal condition. The following message will be displayed on the ECAM:

L1

NEW START IN PROGRESS
● If restart not possible:

L2

If normal conditions cannot be achieved, the FADEC shuts off fuel and turn off ignition.

L1

ENG MASTER (AFFECTED).....OFF

L2

- The fuel metering valve and starter air valve are automatically closed. Both igniters are turned off
- Setting **ENG MASTER** to **OFF** confirms automatic start abort
- In case of **ENG STALL**, consider making a **XBLEED** start, if pressure is low.

L1

● On ground (manual start):
ENG MASTER (AFFECTED).....OFF
MAN START (AFFECTED).....OFF
MODE SEL.....CRANK
MAN START (AFFECTED).....ON

L2

Note: ECAM does not display the last two lines of the above procedure.

Dry crank the engine for 30 s. The start valve automatically reopens when N2 is below 20 %.

After the starter cools, and for any subsequent attempt to start the engine, the flight crew must perform a manual start, or must report the "no start condition" to maintenance for appropriate action.

L1

■ STARTER TIME EXCEEDED:
MAN START (IF MANUAL START IS PERFORMED).....OFF
ENG MASTER (AFFECTED).....OFF
■ LO START AIR PRESS:
BLEED AIR SUPPLY.....CHECK
■ THR LEVER NOT AT IDLE:
THR LEVER.....IDLE

ENG 1(2) START VALVE FAULT

Applicable to: ALL

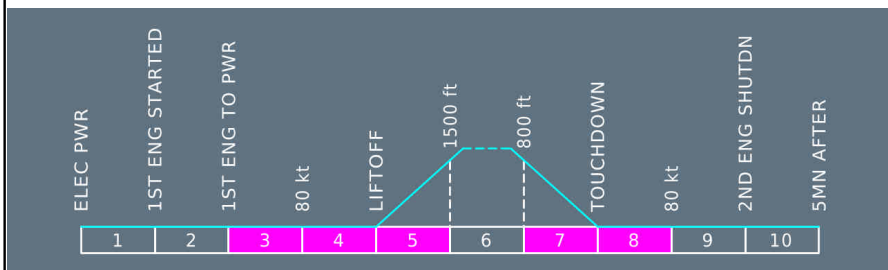
Ident.: PRO-ABN-ENG-D-00017932.0002001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the start valve is stuck in closed or open position.

Flight Phase Inhibition:



Continued on the following page

ENG 1(2) START VALVE FAULT (Cont'd)

Ident.: PRO-ABN-ENG-D-00018010.0017001 / 13 MAY 25

■ START VALVE NOT CLOSED

L2 Remove all bleed sources supplying the faulty start valve.

 L1 APU BLEED (IF ENG 1 AFFECTED)..... OFF
 X BLEED..... SHUT

L2 This action line is only displayed if ENG 2 is affected or if ENG 1 is affected with ENG 2 supplying bleed through the X BLEED.

 L1 ● In flight:
 ENG BLEED (AFFECTED)..... OFF
 MAN START (IF MAN START PERFORMED)..... OFF
 WING ANTI ICE..... OFF
 AVOID ICING CONDITIONS

 ● On ground:
 MAN START (IF MAN START PERFORMED)..... OFF
 ENG MASTER (AFFECTED)..... OFF

L2 On ground, consider application of "START VALVE MANUAL OPERATION" procedure (Refer to PRO-NOR-SUP-ENG Engine Start Valve Manual Operation).

 L1 ■ **START VALVE NOT OPEN**

Note: The **ENG 1(2) START VALVE FAULT - START VALVE NOT OPEN** alert may spuriously trigger following an engine failure. In this case, the flight crew can disregard the alert.

 ● If opposite engine running:
 X BLEED..... OPEN

 ● If APU AVAIL below FL 200:
 APU BLEED..... ON

 ● IF UNSUCCESSFUL:
 MAN START (IF MAN START PERFORMED)..... OFF
 ENG MASTER (AFFECTED) (IF AUTO START PERFORMED)..... OFF

L2 MAN START procedure is useless since in both cases, the start valve is controlled by FADEC.

On ground, consider application of "START VALVE MANUAL OPERATION" procedure (Refer to PRO-NOR-SUP-ENG Engine Start Valve Manual Operation).

Continued on the following page

ENG 1(2) START VALVE FAULT (Cont'd)

Ident.: PRO-ABN-ENG-D-00012091.0002001 / 17 MAR 17

STATUS

AVOID ICING CONDITIONS

INOP SYS

● **IF SEVERE ICE ACCRETION**

WING A.ICE (In flight)

MIN SPD.....VLS + 10/G DOT
MANEUVER WITH CARE

● **In flight:**

LDG DIST PROC.....APPLY

ENG 1(2) THR LEVER ABV IDLE

Applicable to: ALL

Ident.: PRO-ABN-ENG-CW-00017922.0002001 / 21 MAR 16

ANNUNCIATIONS

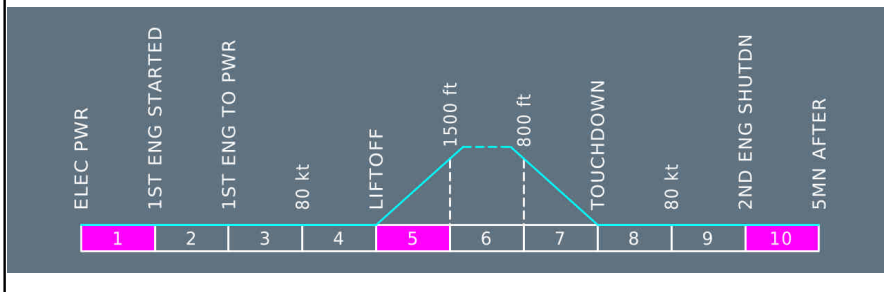
Triggering Conditions:

L2

This alert triggers when:

- One thrust lever is above idle while the other thrust lever is in the reverse detent at landing.
- One thrust lever is above idle while the other thrust lever is at idle, at reverser deselection during landing roll.

Flight Phase Inhibition:



Continued on the following page

ENG 1(2) THR LEVER ABV IDLE (Cont'd)

Ident.: PRO-ABN-ENG-CW-00018748.0002001 / 21 MAR 16

- L2

The repetitive "RETARD-RETARD" synthetic voice is triggered at landing.

L1

THR LEVER (AFFECTED ENGINE).....IDLE

ENG 1(2) THR LEVER DISAGREE

Applicable to: ALL

Ident.: PRO-ABN-ENG-L-00017999.0004001 / 06 SEP 16

ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when a discrepancy between both resolvers of a thrust lever is detected.

Flight Phase Inhibition:

ELEC PWR
1ST ENG STARTED
1ST ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
2ND ENG SHUTDN
5MN AFTER

1	2	3	4 + (a)	5 + (a)	6	7	8	9	10
---	---	---	---------	---------	---	---	---	---	----

Note: (a) Alert not inhibited in the flight phases 4 and 5, if the FADEC automatically selects IDLE thrust.

Continued on the following page

ENG 1(2) THR LEVER DISAGREE (Cont'd)

Ident.: PRO-ABN-ENG-L-00012146.0017001 / 02 MAY 17

[L2] Both Thrust Lever Angle (TLA) sensors not in agreement on one engine.

[L1]

LAND ASAP

- **On ground (if both TLA not at TOGA or FLX/MCT or if only one TLA is at TOGA or FLX/MCT and the other is below IDLE):**

ENG (AFFECTED) IDLE POWER ONLY.

[L2] *In that situation, the FADEC automatically selects IDLE.*

[L1] THR LEVER (AFFECTED)..... IDLE

- **During take-off (if both TLA are above IDLE):**

ENG (AFFECTED) TO, FLX, OR DRT TO 

[L2] *If both TLA are above IDLE, the FADEC automatically selects TO, FLX TO, or DRT TO  thrust until thrust reduction, after which the maximum available thrust is CLB.*

- [L1]** ■ **In cruise (with slats retracted):**

AVAIL MAX POWER : CLB

[L2] *In flight, if the failure occurs while the thrust lever is between idle and MCT, and if the slats are not extended, (or when MN > 0.55, if the onside EIU is failed) the FADEC selects the larger TLA power limited to CLB.*

[L1] A/THR (IF ENGAGED)KEEP ON
A/THR (IF NOT ENGAGED AND IF SLATS ARE NOT EXTENDED) ON

[L2] *With A/THR engaged, thrust is automatically managed between IDLE and higher TLA position.*

- [L1]** ■ **In approach (with slats extended):**

ENG (AFFECTED) AT IDLE (WHEN SLATS ARE EXTENDED FOR APPROACH)..

[L2] *If TLA at, or below, MCT and if the slats are extended for approach, (or when MN < 0.47, if the onside EIU is failed).*

[L1] THR LEVER (AFFECTED)..... IDLE

Continued on the following page

ENG 1(2) THR LEVER DISAGREE (Cont'd)

Ident.: PRO-ABN-ENG-L-00018067.0013001 / 28 MAY 20

L12

STATUS
INOP SYS

ENG 1(2) THR

- If TLA at, or below MCT:
 - If EIU of affected engine is failed:
 - **WHEN MN < 0.47:**
ENG 1(2) AT IDLE
For any case of thrust lever disagree (TO, FLEX, or between Idle and MCT), the FADEC will command idle thrust for the approach. It is independent of the autothrust condition. The affected engine's thrust remains definitively at idle, even for go-around.
 - If EIU of affected engine is operative:
 - If slats not extended:
 - **WHEN SLATS OUT:**
ENG 1(2) AT IDLE
For any case of thrust lever disagree (TO, FLEX, or between Idle and MCT), the FADEC will command idle thrust for the approach. It is independent of the autothrust condition. The affected engine's thrust remains definitively at idle, even for go-around.
- In flight, if the TLA is at, or below MCT and if the approach phase is not selected:
ENG 1(2) AVAIL MAX PWR: CLB
- In flight, if the TLA is at, or below MCT:
ON GND ENG 1(2) MAX PWR: IDLE
At aircraft touchdown, the FADEC automatically selects IDLE thrust.

ENG 1(2) THR LEVER FAULT

Applicable to: ALL

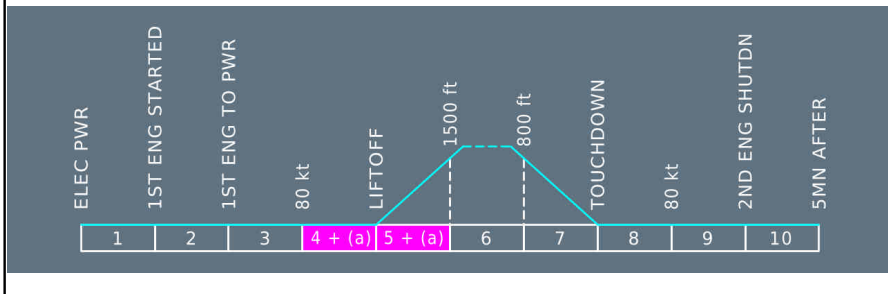
Ident.: PRO-ABN-ENG-M-00018000.0003001 / 01 JUN 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when both resolvers on one thrust lever are failed.

Flight Phase Inhibition:



Note: (a) Alert not inhibited in flight phases 4 and 5 if the FADEC automatically selects IDLE thrust.

Continued on the following page

ENG 1(2) THR LEVER FAULT (Cont'd)

Ident.: PRO-ABN-ENG-M-00018069.0009001 / 21 MAR 16

LAND ASAP

■ **On the ground:**

ENG (AFFECTED) IDLE POWER ONLY.

L2 Idle power is automatically selected by FADEC.

If associated thrust reverser is already deployed, FADEC commands restow.

L1 **THR LEVER (AFFECTED)..... IDLE**

■ **In flight:**

L2

If the selected thrust lever position at the time of fault detection is:

TO or FLEX: FADEC freezes TO or FLEX TO thrust until slat retraction. At slat retraction it selects CLB thrust.

Between IDLE and MCT: in manual thrust setting mode, engine rating freezes at CLB, or IDLE with slats extended (or MN < 0.47 if the FADEC no longer receives the slats position due to EIU failure). It is possible to activate autothrust. If selected, autothrust mode manages thrust between idle and CLB.

L1 **ENG (AFFECTED) AT IDLE**

L2

For any case of thrust lever fault (TO, FLEX or between IDLE and MCT) the FADEC will command idle thrust for the approach when slats are extended (or when MN < 0.47 if associated EIU is failed). It is independant of the autothrust condition. Thrust of affected engine remains definitively at idle even for go around.

L1 **THR LEVER (AFFECTED) IDLE**

L2

When slats are extended or MN < 0.47, if on side EIU is failed.

L1

■ **A/THR engaged:**

A/THR..... KEEP ON

■ **A/THR not engaged:**

ENG (AFFECTED) HI PWR IN MAN THR.

L2

Inhibited when the FADEC commands the affected engine at IDLE.

L1

● **BEFORE SLATS IN:**

A/THR ON

HI PWR ONLY

L2

If thrust lever angle failed in TO or flex position.

Continued on the following page

ENG 1(2) THR LEVER FAULT (Cont'd)

Ident.: PRO-ABN-ENG-M-00012152.0002001 / 04 NOV 21

L12

STATUS
INOP SYS
● If TLA at, or below MCT:
■ If EIU of affected engine is failed:
● WHEN MN < 0.47:
ENG 1(2) AT IDLE

For any case of thrust lever fault (TO, FLEX, or between idle and MCT), the FADEC will command idle thrust for the approach. It is independent of the autothrust condition. The affected engine's thrust remains definitively at idle, even for go-around.

■ If EIU of affected engine is operative:
● If slats not extended:
● WHEN SLATS OUT:
ENG 1(2) AT IDLE

For any case of thrust lever fault (TO, FLEX, or between idle and MCT), the FADEC will command idle thrust for the approach. It is independent of the autothrust condition. The affected engine's thrust remains definitively at idle, even for go-around.

● In flight, if the TLA is at, or below MCT:
ON GND ENG 1(2) MAX PWR: IDLE

At aircraft touchdown, the FADEC automatically selects IDLE thrust.

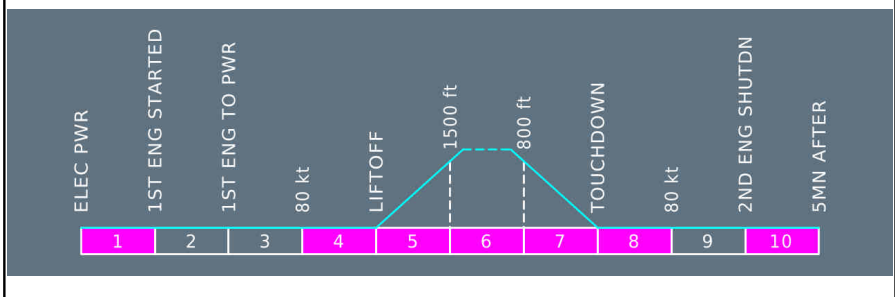
**REVERSER 1(2)
ENG 1(2) THR**

ENG THR LEVERS NOT SET
Applicable to: ALL

Ident.: PRO-ABN-ENG-DD-00017892.0001001 / 21 MAR 16

ANNUNCIATIONS
Triggering Conditions:
L2

This alert triggers when the levers position does not correspond to TO power mode.

Flight Phase Inhibition:

Continued on the following page

ENG THR LEVERS NOT SET (Cont'd)

Ident.: PRO-ABN-ENG-DD-00017863.0007001 / 12 NOV 25

[L2] At least one FADEC engaged a takeoff thrust mode that is not in accordance with the position of the thrust levers.

[L1] Note:

1. The takeoff thrust mode is engaged when the flight crew sets the thrust levers at or above the CL position.
2. The flex takeoff thrust mode is armed only if the flight crew entered a FLEX TO TEMP on the MCDU that is above the OAT.

■ If the flex mode is not armed, and the flight crew sets the thrust levers at or below the MCT/FLX position:

THR LEVERS..... TOGA

[L2] The automatic TOGA function will activate and the FADEC will automatically select the maximum available thrust (TOGA) only when all of the following conditions occur:

- The thrust levers are set to the MCT/FLX detent (and not below)
- The flight crew does not set the thrust levers to the TOGA detent within 5 s after the alert triggers.

[L1] ■ If the flex mode is armed, and the flight crew sets the thrust levers below the MCT/FLX position:

THR LEVERS MCT/FLX

ENG THRUST LOCKED

Applicable to: ALL

Ident.: PRO-ABN-ENG-DE-00017888.0001001 / 21 MAR 16

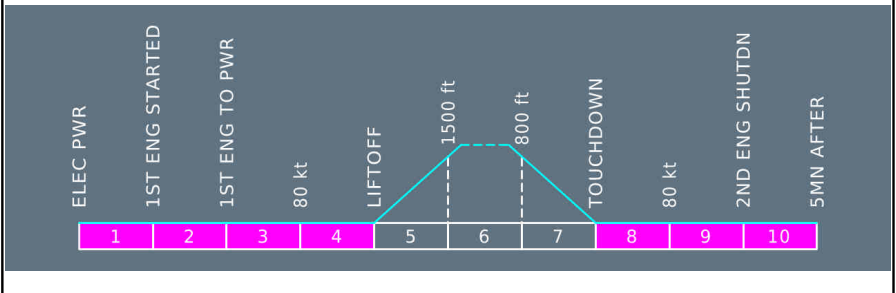
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when thrust levers are not moved within 5 s, following an involuntary disconnection of the A/THR (or disconnection through the FCU pb).

Flight Phase Inhibition:



Ident.: PRO-ABN-ENG-DE-00017865.0002001 / 21 MAR 16

THR LEVERS.....MOVE

ENG TYPE DISAGREE

Applicable to: ALL

Ident.: PRO-ABN-ENG-DF-00017881.0001001 / 21 MAR 16

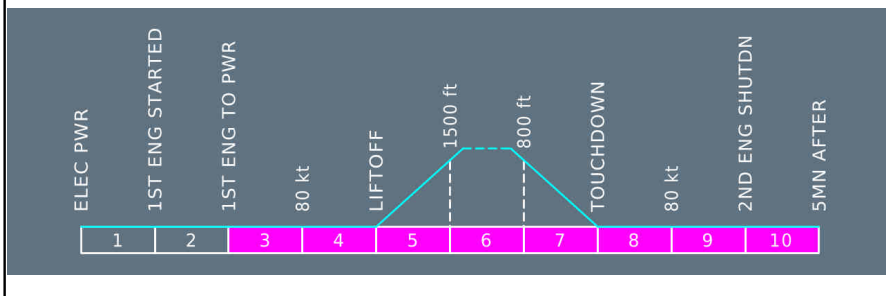
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when a rating discrepancy between two engines is detected.

Flight Phase Inhibition:



Ident.: PRO-ABN-ENG-DF-00017868.0001001 / 21 MAR 16

Crew awareness.

ENG VIB SYS FAULT

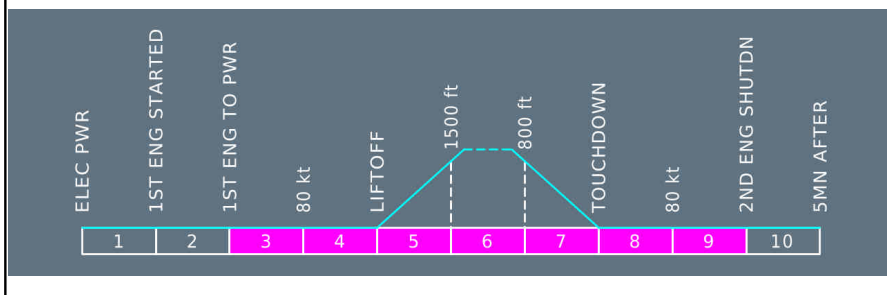
Applicable to: ALL

Ident.: PRO-ABN-ENG-DG-00017879.0001001 / 21 MAR 16

ANNUNCIATIONS
Triggering Conditions:

L2

This alert triggers when the vibration detection system is failed.

Flight Phase Inhibition:


Ident.: PRO-ABN-ENG-DG-00012074.0001001 / 25 FEB 14

Crew awareness.

Intentionally left blank

[QRH] LANDING WITH SLATS OR FLAPS JAMMED

Ident.: PRO-ABN-F_CTL-00010683.0001001 / 15 MAY 25

Applicable to: ALL

LDG DIST PROC.....APPLY

Determine flap lever position for landing

● Repeat the following until landing configuration is reached:

SPD SEL..... VFE NEXT - 5 kt

AT VFE NEXT: SELECT FLAPS LEVER ONE STEP DOWN

- Note:
- **OVERSPEED** alert, and VLS displayed on the PFD, are computed according to the current flaps/slats position
 - VFE and VFE NEXT are displayed on the PFD according to the FLAPS lever position. If not displayed, use the placard speeds
 - In some cases, the recommended speed for go-around requested by the procedure might be slightly above the VFE displayed on PFD as the VFE is linked to the S/F lever position. The **OVERSPEED** alert will not be triggered as it takes into account the current slat/flap position.
 - If VLS is greater than VFE NEXT (overweight landing case), the FLAPS lever can be set in the required next position, while the speed is reduced to follow VLS reduction as surfaces extend. The VFE warning threshold should not be triggered. In this case, disconnect the A/THR. A/THR can be re-engaged when the landing configuration is established.

● When in landing CONF and in final approach:

DECELERATE TO CALCULATED VAPP

The flight crew must use and keep the selected speed.

DO NOT USE AP BELOW 500 ft AGL

● For Go-around:

		MAX SPEED				
Slats	Flaps	F = 0	0 < F ≤ 1	1 < F ≤ 2	2 < F ≤ 3	F > 3
S = 0	NO LIMITATION		215 kt	200 kt	185 kt	177 kt
0 < S < 1	230 kt					(Not allowed)
S = 1						
1 < S ≤ 3	200 kt			200 kt	185 kt	177 kt
S > 3	177 kt			177 kt	177 kt	177 kt

Continued on the following page

[QRH] LANDING WITH SLATS OR FLAPS JAMMED (Cont'd)

■ **If SLATS FAULT:**

● **For circuit:**

MAINTAIN SLATS/FLAPS CONFIGURATION

Recommended speed: MAX SPEED - 10 kt

● **For diversion:**

SELECT FLAPS LEVER 0

Recommended speed for flaps retraction: between MAX SPEED - 10 kt and MAX SPEED.

Recommended diversion speed: MAX SPEED - 10 kt.

INCREASED FUEL CONSUMPTION

■ **If FLAPS FAULT:**

● **For circuit:**

MAINTAIN SLATS/FLAPS CONFIGURATION

Recommended speed: MAX SPEED - 10 kt

● **If HYD G+Y SYS LO PR:**

MAINTAIN SPEED CLOSE TO VAPP

● **For diversion:**

■ **If FLAPS jammed at 0:**

SELECT FLAPS LEVER 0

Recommended speed for slats retraction: between MAX SPEED - 10 kt and MAX SPEED

USE NORMAL OPERATING SPEEDS

● **If HYD G+Y SYS LO PR:**

MAINTAIN AT LEAST THE HIGHER OF VAPP OR VLS

■ **If FLAPS jammed > 0:**

MAINTAIN SLAT/FLAP CONFIGURATION

Recommended speed for diversion: MAX SPEED - 10 kt

Note: In the case of go-around with CONF FULL selected, the L/G NOT DOWN warning is triggered at landing gear retraction.

Continued on the following page

[QRH] LANDING WITH SLATS OR FLAPS JAMMED (Cont'd)

- If **HYD G+Y SYS LO PR**:
MAINTAIN SPEED CLOSE TO VAPP
INCREASED FUEL CONSUMPTION

CAUTION For flight with SLATS or FLAPS extended, fuel consumption is increased.
Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table.

[QRH] RUDDER JAM

Ident.: PRO-ABN-F_CTL-00011807.0001001 / 26 NOV 19

Applicable to: ALL

L2 Rudder jamming may be detected by undue (and adverse) pedal movement during rolling maneuvers.

This is because the yaw damper orders can no longer be sent to the rudder, but are fed back to the pedals.

Use F/CTL SD page for a visual check of the rudder position.

L1 LDG DIST PROC.....APPLY

● **For approach:**

AVOID LANDING WITH CROSSWIND FROM THE SIDE WHERE THE RUDDER IS DEFLECTED

MAX CROSSWIND FOR LDG: 15 kt

AUTO BRK.....DO NOT USE

L2 Do not use the autobrake, so as not to delay the application of differential braking at landing roll.

L1 FOR LANDING.....USE NORMAL CONF
SPEED AND TRAJECTORY.....STABILIZE ASAP

● **For landing:**

DIFFERENTIAL BRAKING.....USE ASAP

REVERSER: SYMMETRIC USE ONLY

L2 Use nosewheel steering handle below 70 kt.

[QRH] STABILIZER JAM

Ident.: PRO-ABN-F_CTL-00011806.0001001 / 15 MAY 25

Applicable to: ALL

- [L2] The ELACs may not detect a stabilizer jam when the pitch trim wheel is jammed.
 The flight control normal law remains active in this case and there is no ECAM warning.
 Apply the following procedure.
- [L1] AP OFF
 MAN PITCH TRIM CHECK
- [L2] *The pitch trim wheel may not be fully jammed, the force needed may be higher than pre-takeoff manual setting.*
- [L1] ● **If MAN PITCH TRIM available:**
 TRIM FOR NEUTRAL ELEV
- [L2] *If manual pitch trim is available, trim to maintain the elevator at the zero position (indications on F/CTL SD page).*
- [L1] ● **If MAN PITCH TRIM not available:**
 FOR LDG FLAP LVR 3
- [L2] *Do not select CONF FULL, so as not to degrade the handling qualities.*
- [L1] GPWS LDG FLAP 3 ON
 CAT 1 ONLY

F/CTL AIL SERVO FAULT

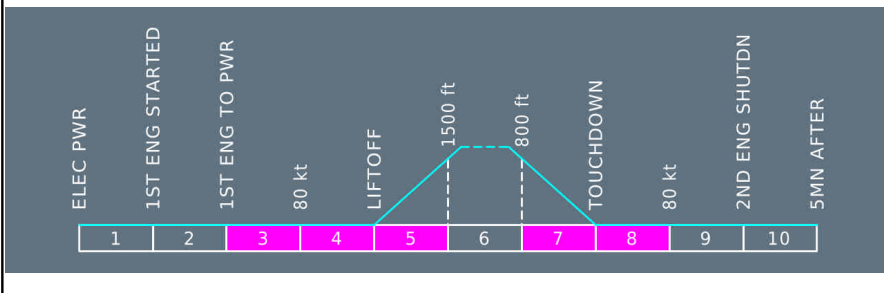
Applicable to: ALL

Ident.: PRO-ABN-F_CTL-AF-00016986.0001001 / 21 MAR 16

ANNUNCIATIONS
Triggering Conditions:

L2

This alert triggers when there is a loss of one servojack on one aileron, or loss of one or both ELAC 1 rudder pedal transducers.

Flight Phase Inhibition:


Ident.: PRO-ABN-F_CTL-AF-00018412.0001001 / 21 MAR 16

Crew awareness.

F/CTL ALTN LAW

Applicable to: MSN 02155-05253

Ident.: PRO-ABN-F_CTL-K-00016965.0001001 / 21 MAR 16

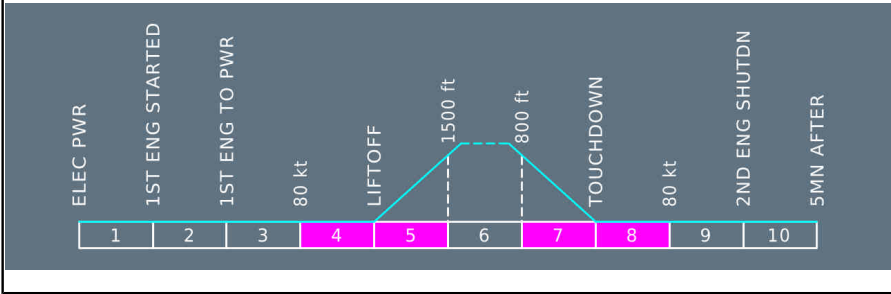
ANNUNCIATIONS

Triggering Conditions:

L2

 This alert triggers when alternate laws are active.

Flight Phase Inhibition:



Ident.: PRO-ABN-F_CTL-K-00018413.0001001 / 12 MAY 25

L2

 Refer to *Reconfiguration Control Laws* for flight characteristics.
 Depending on the failure, the AP may be available.

L1

(PROT LOST)

L2

 All protections, except maneuver protections, are lost. Depending on the failure, static stability may be introduced.

L1

Note: Always respect stall warnings when applying the TAWS alerts procedures.

MAX SPEED.....320 KT

L2

 Maximum speed is 320/.77 if dual hydraulic system low pressure.
 This line is inhibited if DBUS  is in use.

L1

 ● If L or R elevator fails:
 SPD BRK..... DO NOT USE

Continued on the following page

F/CTL ALTN LAW (Cont'd)

Ident.: PRO-ABN-F_CTL-K-00018414.0019001 / 13 MAY 25

L12

STATUS

- **If dual hydraulic system low pressure:**
 MAX SPEED.....320/.77
- **In all other cases:**
 MAX SPEED.....320 KT
- **If L or R elevator fault:**
 SPD BRK..... DO NOT USE

INOP SYS

F/CTL PROT
 STEEP APPR 

APPR PROC

FOR LDG.....FLAP LVR 3
*This line is replaced by “FOR LDG: FLAP LVR 3” when
 CONF 3 is selected, as a reminder.*

GPWS LDG FLAP 3.....ON
 APPR SPD : VREF + 10 KT
 LDG DIST PROC..... APPLY

ALTN LAW : PROT LOST

- **If AP engaged:**
 WHEN L/G DN AND AP OFF :
DIRECT LAW
- **If no AP engaged:**
 WHEN L/G DN : **DIRECT LAW**

See ⁽¹⁾

⁽¹⁾ Note: At landing gear extension, flight control reverts to direct law in both pitch and roll (depending on aircraft configuration, the control remains in alternate law in the case of yaw damper loss or both FACs failure. Refer to DSC-27-20-20 Flight Controls Law Reconfiguration). Refer to PRO-ABN-F_CTL F/CTL DIRECT LAW.

F/CTL ALTN LAW

Applicable to: MSN 05746-07792

Ident.: PRO-ABN-F_CTL-K-00016965.0001001 / 21 MAR 16

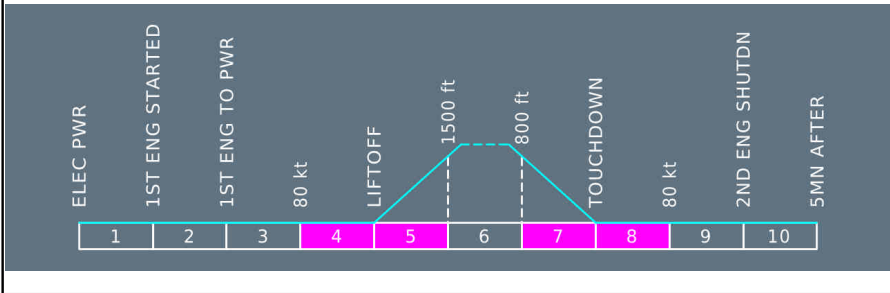
ANNUNCIATIONS

Triggering Conditions:

L2

 This alert triggers when alternate laws are active.

Flight Phase Inhibition:



Ident.: PRO-ABN-F_CTL-K-00018413.0001001 / 12 MAY 25

L2

 Refer to *Reconfiguration Control Laws* for flight characteristics.
 Depending on the failure, the AP may be available.

L1

 (PROT LOST)

L2

 All protections, except maneuver protections, are lost. Depending on the failure, static stability may be introduced.

L1

 Note: Always respect stall warnings when applying the TAWS alerts procedures.

MAX SPEED.....320 KT

L2

 Maximum speed is 320/.77 if dual hydraulic system low pressure.
 This line is inhibited if DBUS  is in use.

L1

 ● If L or R elevator fails:
 SPD BRK.....DO NOT USE

Continued on the following page

F/CTL ALTN LAW (Cont'd)

Ident.: PRO-ABN-F_CTL-K-00018414.0020001 / 13 MAY 25

L12

STATUS

- If dual hydraulic system low pressure:

MAX SPEED.....
320/.77
- In all other cases:

MAX SPEED.....
320 KT
- If L or R elevator fault:

SPD BRK.....
DO NOT USE

APPR PROC

FOR LDG.....FLAP LVR 3

This line is replaced by “FOR LDG: FLAP LVR 3” when CONF 3 is selected, as a reminder.

GPWS LDG FLAP 3.....ON

APPR SPD : VREF + 10 KT

LDG DIST PROC..... APPLY

ALTN LAW : PROT LOST

- If AP engaged:
 WHEN L/G DN AND AP OFF :
DIRECT LAW
- If no AP engaged:
 WHEN L/G DN : **DIRECT LAW**

See ⁽¹⁾

INOP SYS

F/CTL PROT
STEEP APPR <⚠>

⁽¹⁾ **Note:** At landing gear extension, flight control reverts to direct law in both pitch and roll (depending on aircraft configuration, the control remains in alternate law in the case of yaw damper loss or both FACs failure. Refer to DSC-27-20-20 Flight Controls Law Reconfiguration). Refer to PRO-ABN-F_CTL F/CTL DIRECT LAW.

F/CTL DIRECT LAW

Applicable to: ALL

Ident.: PRO-ABN-F_CTL-J-00016964.0001001 / 21 MAR 16

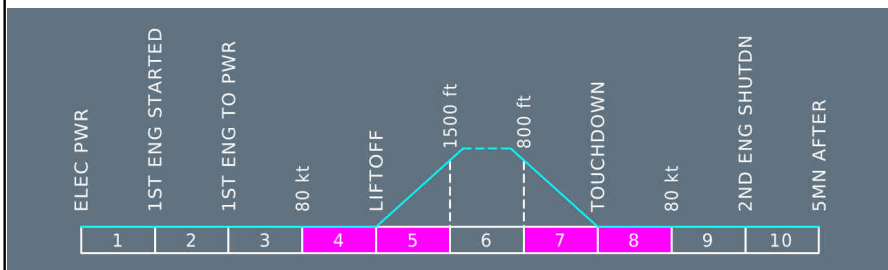
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when direct law is active.

Flight Phase Inhibition:



Continued on the following page

F/CTL DIRECT LAW (Cont'd)

Ident.: PRO-ABN-F_CTL-J-00018420.0001001 / 06 NOV 25

L2 The PFD displays **USE MAN PITCH TRIM**. Refer to DSC-27-20-20 Direct Law

L1 Note: In the case of GPWS (EGPWS ) alerts, since protections are lost, respect stall warning when applying the GPWS (EGPWS ) procedure.

MAX SPEED.....320/.77

L2 Speed is limited, due to the loss of high-speed protection. Do not exceed M 0.77, so as not to degrade handling qualities.

L1 **MAN PITCH TRIM**..... **USE**

L2 Automatic trim is inoperative in direct law.

L1 **MANEUVER WITH CARE**

L2 Use small control inputs at high speed, since in direct law the controls are powerful. Use of manual thrust is recommended. Avoid large thrust changes.

L1 **USE SPD BRK WITH CARE**

L2 At high Mach numbers, use speed brakes with care to avoid too strong nose up changes.

Continued on the following page

F/CTL DIRECT LAW (Cont'd)

Ident.: PRO-ABN-F_CTL-J-00018422.0008001 / 24 MAR 20

L12

STATUS

INOP SYS

MAX SPEED..... 320/.77
 MANEUVER WITH CARE
 USE SPD BRK WITH CARE

F/CTL PROT
 STEEP APPR

APPR PROC

FOR LDG..... FLAPS LVR 3
*This line is replaced by "FOR LDG : FLAP LVR 3" when
 CONF 3 is selected, as a reminder.*

GPWS LDG FLAP 3..... ON
This line is displayed when flaps are in CONF 3.

MAN PITCH TRIM..... USE
 APPR SPD..... VREF + 10 KT
 LDG DIST PROC..... APPLY

DIRECT LAW

F/CTL ELAC 1(2) FAULT
(ONE COMPUTER FAILED)

Applicable to: ALL

Ident.: PRO-ABN-F_CTL-F-00016960.0001001 / 21 MAR 16

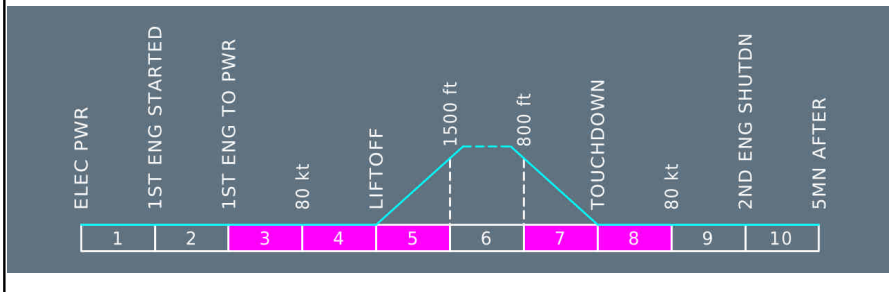
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when there is a failure of ELAC (FAULT It on ELAC pb), or when one sidestick transducer is faulty.

Flight Phase Inhibition:



Ident.: PRO-ABN-F_CTL-F-00018425.0006001 / 12 MAY 23

ELAC (AFFECTED)..... OFF THEN ON

L2

- Note:**
1. In some sidestick transducer failure cases, ELAC 1(2) FAULT is triggered without the procedure, and FAULT light on associated pb does not come on.
 2. If the ELAC 1 computer is reset on ground the pitch trim returns to the ground setting position (0 °).

L1

● IF UNSUCCESSFUL:

ELAC (AFFECTED)..... OFF

L2

Functions are performed by other ELAC.

L1

FUEL CONSUMPT INCRSD
FMS PRED UNRELIABLE

Continued on the following page

F/CTL ELAC 1(2) FAULT (Cont'd)
(ONE COMPUTER FAILED)

Ident.: PRO-ABN-F_CTL-F-00018426.0003001 / 17 MAY 21

L12

STATUS

INOP SYS

CAT 3 SINGLE ONLY
FUEL CONSUMPT INCRSD

ELAC 1(2)
CAT 3 DUAL

 See ⁽¹⁾

FMS PRED UNRELIABLE

 See ⁽²⁾

- ⁽¹⁾ This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.
- ⁽²⁾ Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.

F/CTL ELAC 1(2) FAULT (BOTH COMPUTERS FAILED)

Applicable to: ALL

Ident.: PRO-ABN-F_CTL-G-00018899.0001001 / 21 MAR 16

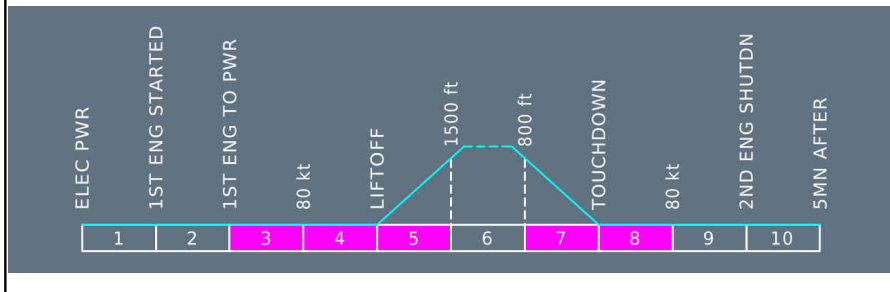
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when there is a failure of ELAC (FAULT It on ELAC pb), or when one sidestick transducer is faulty.

Flight Phase Inhibition:


Continued on the following page

F/CTL ELAC 1(2) FAULT (Cont'd)
(BOTH COMPUTERS FAILED)

Ident.: PRO-ABN-F_CTL-G-00018433.0009001 / 03 MAY 23

ELAC 1..... OFF THEN ON

Note: If the ELAC 1 computer is reset on ground, the pitch trim returns to the ground setting position (0 °).

ELAC 2..... OFF THEN ON

● **If both ELAC FAULT remain:**

ELAC 1..... OFF

ELAC 2..... OFF

L2

The steering handwheel remains available to steer the aircraft during taxi.

L1

ASSOCIATED PROCEDURES

F/CTL ALTN LAW
(PROT LOST)

L2

Pitch and roll normal laws are lost: *Refer to PRO-ABN-F_CTL F/CTL ALTN LAW*. THS motor 1 and both ailerons are lost. LAF  is degraded and uses spoilers only.

L1

MAX SPEED..... 320 KT

FUEL CONSUMPT INCRSD
FMS PRED UNRELIABLE

Continued on the following page

F/CTL ELAC 1(2) FAULT (Cont'd)
(BOTH COMPUTERS FAILED)

Ident.: PRO-ABN-F_CTL-G-00018434.0012001 / 17 MAY 21

L12

STATUS	
MAX SPEED..... 320 KT APPR PROC FOR LDG.....FLAP LVR 3 <i>This line is replaced by “FOR LDG : FLAP LVR 3” when CONF 3 is selected, as a reminder.</i> GPWS LDG FLAP 3.....ON <i>This line is displayed when flaps are in CONF 3.</i> APPR SPD.....VREF + 10 KT LDG DIST PROC..... APPLY ALTN LAW: PROT LOST WHEN L/G DOWN: DIRECT LAW See ⁽¹⁾ FUEL CONSUMPT INCRSD See ⁽²⁾ FMS PRED UNRELIABLE See ⁽³⁾	INOP SYS F/CTL PROT L+R AIL ELAC 1 ELAC 2 AP 1+2 CAT 2 STEEP APPR 
(1) <u>Note:</u> At landing gear extension, control reverts to direct law in pitch, as well as in roll (Refer to PRO-ABN-F_CTL F/CTL DIRECT LAW). (2) This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft. (3) <u>Note:</u> Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.	

F/CTL ELAC 1(2) PITCH FAULT
 (ONE COMPUTER FAILED)

Applicable to: ALL

Ident.: PRO-ABN-F_CTL-H-00016977.0001001 / 28 NOV 19

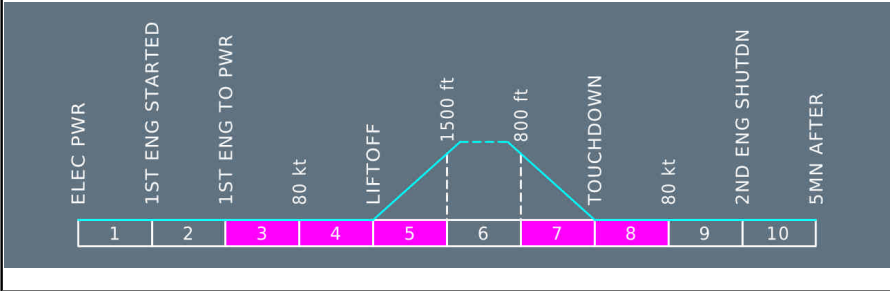
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when there is a failure of pitch channel in ELAC 1(2).

Flight Phase Inhibition:



Ident.: PRO-ABN-F_CTL-H-00018447.0001001 / 28 NOV 19

Crew awareness.

Ident.: PRO-ABN-F_CTL-H-00018448.0002001 / 18 NOV 21

STATUS

INOP SYS

CAT 3 SINGLE ONLY

ELAC 1(2) PITCH
 CAT 3 DUAL

F/CTL ELAC PITCH FAULT

Applicable to: ALL

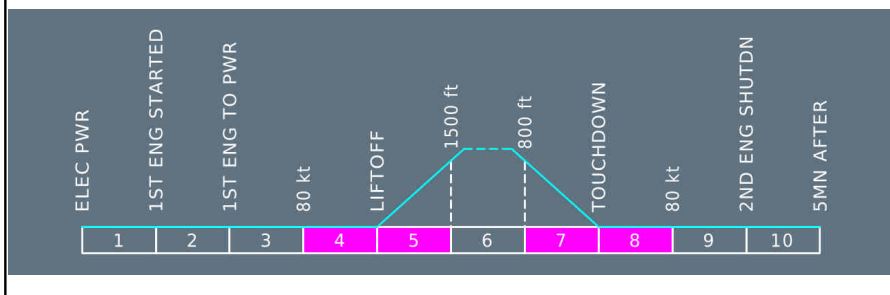
8 Ident.: PRO-ABN-F_CTL-AT-00024839.0001001 / 18 NOV 21

ANNUNCIATIONS

Triggering Conditions:

L2

This triggers when there is a failure of pitch channel in ELAC 1 and 2.

Flight Phase Inhibition:


9 Ident.: PRO-ABN-F_CTL-AT-00024843.0001001 / 12 MAY 25

ASSOCIATED PROCEDURES

F/CTL ALTN LAW

(PROT LOST)

Refer to PRO-ABN-F_CTL F/CTL ALTN LAW - ANNUNCIATION
Continued on the following page

F/CTL ELAC PITCH FAULT (Cont'd)

Ident.: PRO-ABN-F_CTL-AT-00024845.0001001 / 18 NOV 21

L12

STATUS
INOP SYS
APPR PROC

FOR LDG.....FLAP LVR 3

 This line is replaced by "FOR LDG : FLAP LVR 3" when
 CONF 3 is selected, as a reminder.

GPWS LDG FLAP 3.....ON

This line is displayed when flaps are in CONF 3.

LDG DIST PROC.....APPLY

ALTN LAW: PROT LOST

WHEN L/G DN: DIRECT LAW

 See ⁽¹⁾

 F/CTL PROT
 ELAC PITCH
 AP 1+2
 A/THR
 CAT 2

⁽¹⁾ Note: At landing gear extension, control reverts to direct law in pitch, as well as in roll (Refer to PRO-ABN-F_CTL F/CTL DIRECT LAW).

F/CTL ELEV REDUND DEGRDD

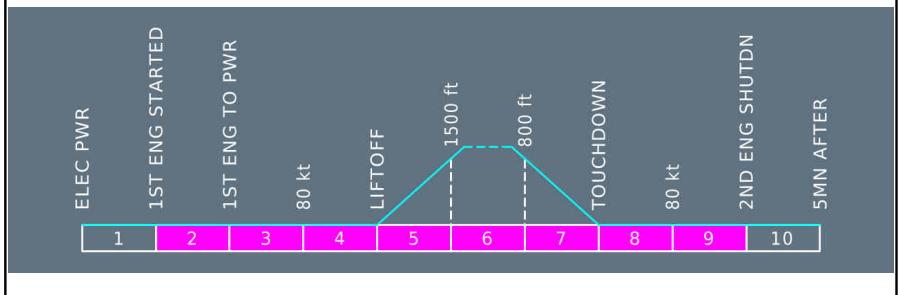
Applicable to: ALL

11 Ident.: PRO-ABN-F_CTL-AS-00023753.0001001 / 03 MAR 20

ANNUNCIATIONS
Triggering Conditions:

L2

This alert triggers when an elevator control of SEC 1 or SEC 2 is failed.

Flight Phase Inhibition:


12 Ident.: PRO-ABN-F_CTL-AS-00023754.0001001 / 03 MAR 20

L2

Maintenance action is due.

L1

Crew awareness.

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

F/CTL

F/CTL ELEV SERVO FAULT

Applicable to: ALL

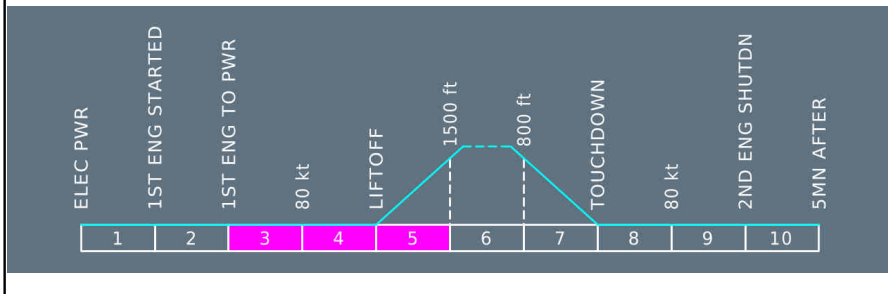
Ident.: PRO-ABN-F_CTL-P-00016979.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when there is a loss of one servojack on one elevator.

Flight Phase Inhibition:



Ident.: PRO-ABN-F_CTL-P-00018449.0001001 / 21 MAR 16

Crew awareness.

CAUTION Do not use speedbrakes above 350 kt/M 0.82 (VMO/MMO).

Ident.: PRO-ABN-F_CTL-P-00018450.0001001 / 21 MAR 16

STATUS

CAT 3 SINGLE ONLY

INOP SYS

CAT 3 DUAL

F/CTL FCDC 1(2) FAULT

Applicable to: ALL

Ident.: PRO-ABN-F_CTL-L-00016981.0001001 / 21 MAR 16

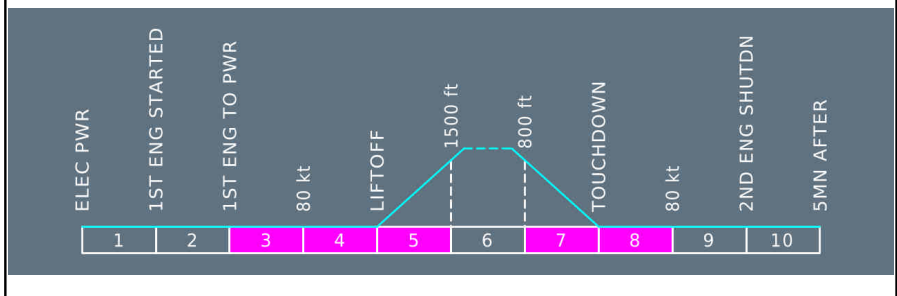
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when there is a failure of one FCDC.

Flight Phase Inhibition:



Ident.: PRO-ABN-F_CTL-L-00011777.0001001 / 25 FEB 14

Crew awareness.

Ident.: PRO-ABN-F_CTL-L-00011778.0001001 / 18 AUG 10

STATUS

INOP SYS

FCDC 1(2)

F/CTL FCDC 1+2 FAULT

Applicable to: ALL

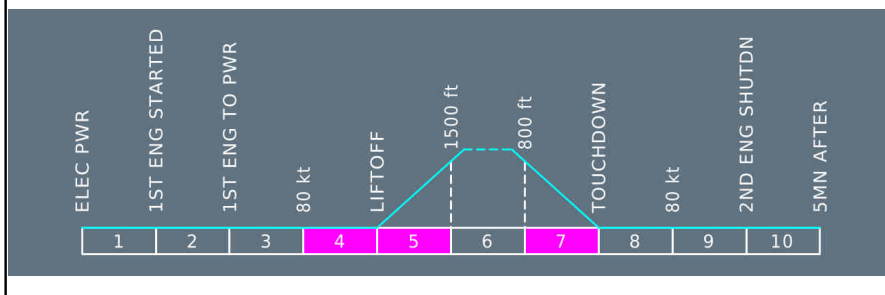
Ident.: PRO-ABN-F_CTL-M-00016963.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when there is a failure of both FCDCs.

Flight Phase Inhibition:



Ident.: PRO-ABN-F_CTL-M-00011779.0001001 / 18 AUG 10

MONITOR F/CTL OVHD PNL

L2 F/CTL data on ECAM is lost.

Control laws remains normal.

Note: When both FCDCs fails:

- F/CTL warning are not available on the ECAM.
- Stall warning may be triggered as in alternate or direct law (it may occur at speeds greater than $V_{\alpha \max}$).
- Bank and pitch limits are no longer displayed on the PFD.
- $V_{\alpha \text{ prot}}$, $V_{\alpha \max}$ are lost on the PFD.
- V_{sw} , displayed on the PFD, corresponds to the stall warning of the alternate or direct law.

Continued on the following page

F/CTL FCDC 1+2 FAULT (Cont'd)

Ident.: PRO-ABN-F_CTL-M-00018451.0001001 / 12 MAY 25

F/CTL INDICATIONS LOST

STATUS

INOP SYS

FCDC 1 + 2
STEEP APPR 
BKUP SPD 

F/CTL FLAP ATTACH SENSOR

Applicable to: ALL

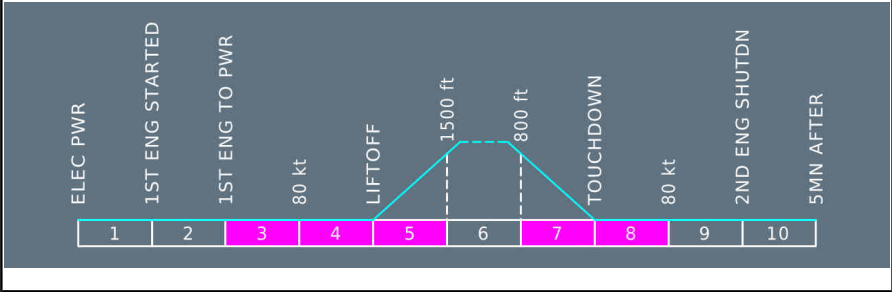
Ident.: PRO-ABN-F_CTL-AH-00016989.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

This alert triggers when there is failure of flap attachment's failure detection sensor.

Flight Phase Inhibition:



Ident.: PRO-ABN-F_CTL-AH-00018453.0001001 / 21 MAR 16

Crew awareness.

F/CTL FLAPS FAULT/LOCKED

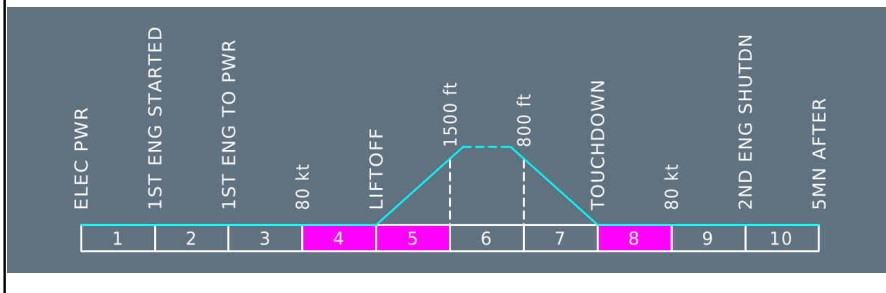
Applicable to: ALL

Ident.: PRO-ABN-F_CTL-A-00022643.0001001 / 05 MAR 19

ANNUNCIATIONS
Triggering Conditions:

L2

The FLAPS FAULT alert triggers when both flaps channels fail.
 The FLAPS LOCKED alert triggers when the flaps wing tip brakes activate.

Flight Phase Inhibition:


Continued on the following page

F/CTL FLAPS FAULT/LOCKED (Cont'd)

Ident.: PRO-ABN-F_CTL-A-00011744.0004001 / 12 MAY 25

 ● **If flaps locked:**

WING TIP BRK ON OR ALIGNMENT FAULT

MAX SPEED.....REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED

L2

Limit speed to the VFE corresponding to the next flap position.

L1

 ● **If flaps not locked:**

 ● **WHEN SPD BELOW VFE:**

FLAPS LEVER.....RECYCLE

L2

Return to the previous selection, then back to the desired position.

L1

 ● **If flaps extended:**

FUEL CONSUMPT INCRSD

FMS PRED UNRELIABLE

 ● **If unsuccessful:**

Refer to PRO-ABN-F_CTL [QRH] Landing with Slats or Flaps Jammed

The autopilot may be used down to 500 ft AGL. As it is not tuned for abnormal configurations, its behavior can be less than optimum and must be monitored.

Continued on the following page

F/CTL FLAPS FAULT/LOCKED (Cont'd)

Ident.: PRO-ABN-F_CTL-A-00018456.0006001 / 06 NOV 25

L12

STATUS

MAX SPEED..... REFER
 TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED

- If flaps extended:
 FUEL CONSUMPT INCRSD

APPR PROC

S/F JAMMED PROC..... APPLY

Refer to QRH/ABN-20 Landing with Slats or Flaps Jammed
 or Refer to PRO-ABN-F_CTL [QRH] Landing with Slats or
 Flaps Jammed.

- If FLAPS ≤ 3:
 FOR LDG FLAP LVR 3
 This line is replaced by "FOR LDG : FLAP LVR 3" when
 CONF 3 is selected, as a reminder.

- If FLAPS > 3:
 FLAPS.....KEEP CONF FULL

- If FLAPS < 3:
 GPWS FLAP MODE OFF

- If FLAPS ≥ 3:
 GPWS LDG FLAP 3..... ON

APPR SPD..... REFER
 TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED
 LDG DIST PROC..... APPLY

ENG 1 APPR IDLE ONLY
 ENG 2 APPR IDLE ONLY

- If flaps extended:
 FMS PRED UNRELIABLE

INOP SYS

FLAPS
 AP 1+2 ⁽¹⁾
 A/THR ⁽¹⁾
 CAT 2 ⁽¹⁾
 GLS AUTOLAND <⚠
 STEEP APPR <⚠

Other INOP SYS

FD 1+2 ⁽¹⁾

Continued on the following page

F/CTL FLAPS FAULT/LOCKED (Cont'd)

Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.

⁽¹⁾ (If both flap channels fault.)

F/CTL FLAP LVR NOT ZERO

Applicable to: ALL

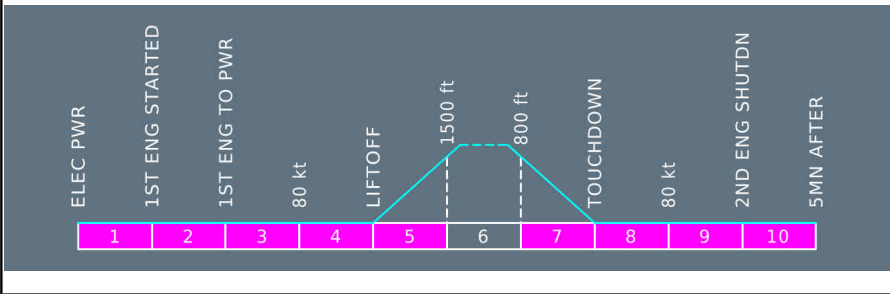
Ident.: PRO-ABN-F_CTL-AI-00018902.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the FLAP lever is not in the zero position, and the aircraft is above 22 000 ft.

Flight Phase Inhibition:



Ident.: PRO-ABN-F_CTL-AI-00018454.0001001 / 21 MAR 16

Crew awareness.

F/CTL FLAP SYS 1(2) FAULT

Applicable to: ALL

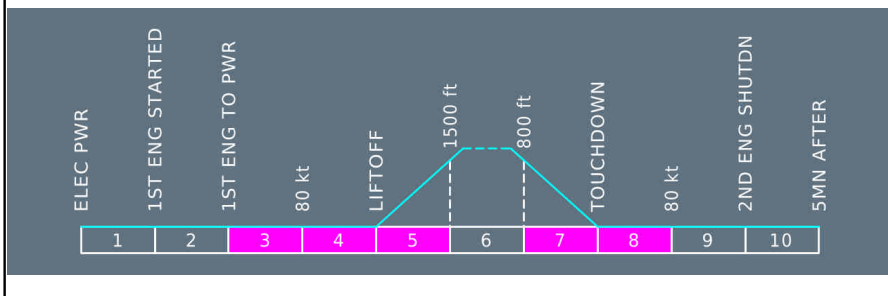
Ident.: PRO-ABN-F_CTL-E-00016990.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when there is failure of flap channel in one SFCC.

Flight Phase Inhibition:



Ident.: PRO-ABN-F_CTL-E-00011753.0002001 / 25 FEB 14

Crew awareness.

Continued on the following page

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES ABNORMAL AND EMERGENCY PROCEDURES F/CTL
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F/CTL FLAP SYS 1(2) FAULT (Cont'd)

Ident.: PRO-ABN-F_CTL-E-00011754.0002001 / 09 MAY 23

	STATUS
APPR PROC ● If F/CTL FLAP SYS 1 FAULT: GPWS FLAP MODE.....OFF <i>Note:</i> The flap position signal to GPWS is lost. In consequence, modes 2A and 4B that require flap information, are also lost. If the flight crew sets the GPWS FLAP MODE pb-sw to OFF when the airspeed is above 250 kt, the FAULT light of the GPWS SYS pb-sw comes on. ENG 1(2) APPR IDLE ONLY FLAPS SLOW	

F/CTL FLAP/MCDU DISAGREE

Applicable to: MSN 02926-02944, 07784-07792

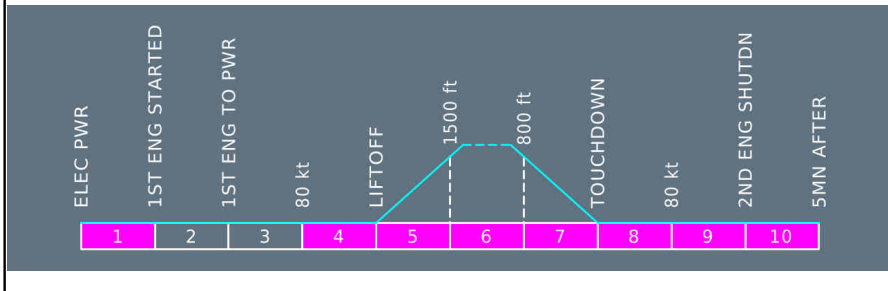
Ident.: PRO-ABN-F_CTL-AG-00016987.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

- L2** This alert triggers at phase 2 when T.O CONFIG TEST pb is pressed, or at phase 3, if the FLAPS lever position and the FLAPS position entered in the FMS are different.

Flight Phase Inhibition:



Ident.: PRO-ABN-F_CTL-AG-00018452.0011001 / 21 MAR 16

Crew awareness.

F/CTL FLAPS/SLATS FAULT/LOCKED

Ident.: PRO-ABN-F_CTL-00018457.0001001 / 15 MAY 25

Applicable to: ALL

MAX SPEED					
Flaps ⁽¹⁾ Slats ⁽¹⁾	F = 0	0 < F ≤ 1	1 < F ≤ 2	2 < F ≤ 3	F > 3
S = 0	NO LIMITATION	215 kt	200 kt	185 kt	Not allowed (177 kt)
0 < S < 1	230 kt				
S = 1					
1 < S ≤ 3	200 kt				177 kt
S > 3					

⁽¹⁾ Slats/Flaps position displayed on the upper ECAM display.

APPR SPD						
Flaps ⁽¹⁾ Slats ⁽¹⁾	F = 0	0 < F < 1	1 ≤ F < 2	2 ≤ F < 3	F = 3	F > 3
S = 0	VREF +60 (Appr) VREF +50 (Touch Down)	VREF +45	VREF +30	VREF +25	VREF +25	Not allowed
0 < S < 1						
1 ≤ S ≤ 3						
S > 3	VREF +25		VREF +15	VREF +10	VREF +10	VREF +10 VREF +5

⁽¹⁾ Slats/Flaps position displayed on the upper ECAM display.

CAUTION

For flight with SLATS or FLAPS extended, fuel consumption is increased. Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table.

F/CTL GND SPLR 5 FAULT

Applicable to: ALL

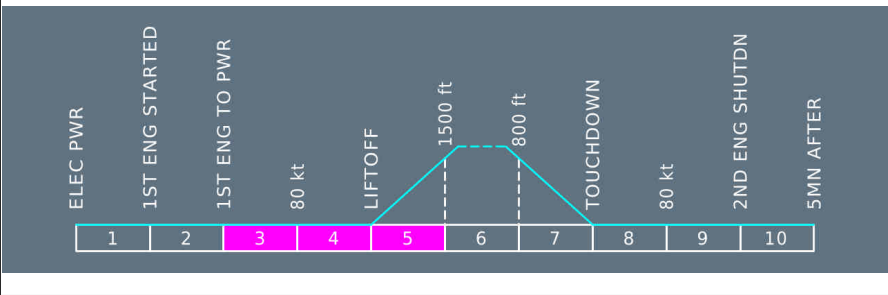
Ident.: PRO-ABN-F_CTL-Z-00016967.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when there is a loss of ground spoiler function in SEC 2.

Flight Phase Inhibition:



Ident.: PRO-ABN-F_CTL-Z-00018903.0001001 / 21 MAR 16

Crew awareness.

Ident.: PRO-ABN-F_CTL-Z-00014253.0001001 / 23 MAY 12

L12

STATUS

LDG DIST PROC.....APPLY

INOP SYS

GND SPLR 5

F/CTL GND SPLR 1+2(3+4) FAULT

Applicable to: ALL

Ident.: PRO-ABN-F_CTL-S-00016968.0001001 / 09 MAY 23

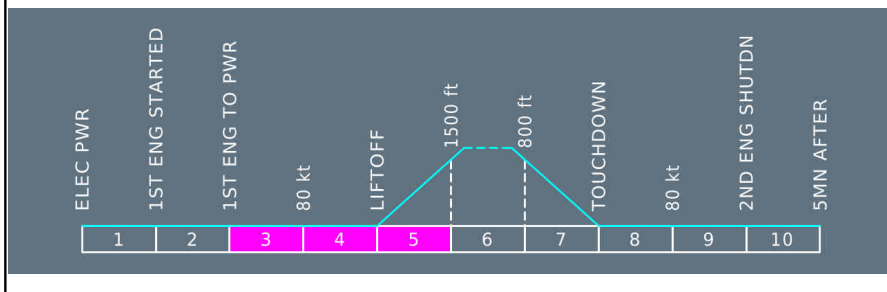
ANNUNCIATIONS

Triggering Conditions:

L2

- GND SPLR FAULT :
Loss of ground spoiler function in SEC 1+3, or 1+2, or 2+3, or 1+2+3.
If ground spoiler function is lost in SEC (1+2) or (1+3), one reverser is inoperative.
If ground spoiler function is lost in SEC (1+2+3), both reversers are inoperative.
In any case, the autobrake function is lost.
- GND SPLR 1+2(3+4) FAULT:
Loss of ground spoiler function in SEC 3 (or 1).

Flight Phase Inhibition:



Ident.: PRO-ABN-F_CTL-S-00018466.0001001 / 21 MAR 16

Crew awareness.

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

F/CTL

F/CTL GND SPLR 1+2(3+4) FAULT (Cont'd)

Ident.: PRO-ABN-F_CTL-S-00011793.0002001 / 04 NOV 20

STATUS

LDG DIST PROC..... APPLY

INOP SYS

GND SPLR (Affected)
AUTO BRK ⁽¹⁾

⁽¹⁾ (If **F/CTL GND SPLR FAULT** is triggered)

F/CTL GND SPLR NOT ARMED

Applicable to: ALL

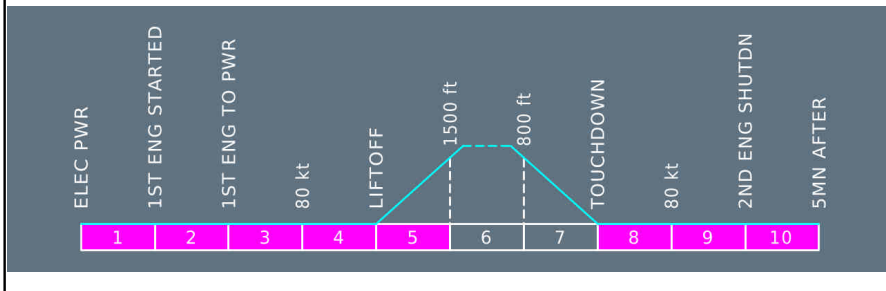
Ident.: PRO-ABN-F_CTL-AJ-00016966.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when ground spoilers are not armed before landing.

Flight Phase Inhibition:



Ident.: PRO-ABN-F_CTL-AJ-00018905.0001001 / 21 MAR 16

Crew awareness.

F/CTL L(R) AIL FAULT

Applicable to: ALL

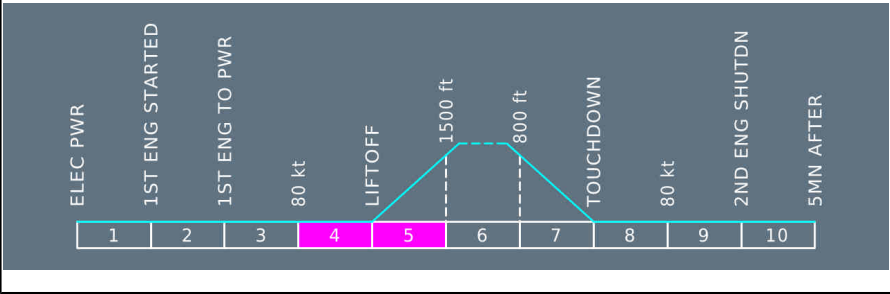
Ident.: PRO-ABN-F_CTL-N-00016975.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when there is a loss of both servojacks on one aileron.

Flight Phase Inhibition:



The diagram shows a flight profile with 10 phases. A red line indicates the inhibition period. The phases are: 1. ELEC PWR, 2. 1ST ENG STARTED, 3. 1ST ENG TO PWR, 4. 80 kt, 5. LIFTOFF, 6. 1500 ft, 7. 800 ft, 8. TOUCHDOWN, 9. 80 kt, 10. 2ND ENG SHUTDN, 11. 5MN AFTER. The inhibition period is from phase 5 to phase 8.

Ident.: PRO-ABN-F_CTL-N-00018474.0002001 / 12 MAY 25

FUEL CONSUMPT INCRSD
FMS PRED UNRELIABLE

● If both ailerons fail:

ASSOCIATED PROCEDURES

F/CTL ALTN LAW
(PROT LOST)
Refer to PRO-ABN-F_CTL F/CTL ALTN LAW - ANNUNCIATION

Continued on the following page

PIA A318/A319/A320/A321 FLEET
FCOM

X →

PRO-ABN-F_CTL P 37/74
09 FEB 26

F/CTL L(R) AIL FAULT (Cont'd)

Ident.: PRO-ABN-F_CTL-N-00011783.0003001 / 17 MAY 21

L12

STATUS

INOP SYS

FUEL CONSUMPT INCRSD

See ⁽¹⁾

FMS PRED UNRELIABLE

See ⁽²⁾

L (R) AIL

⁽¹⁾ This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.

⁽²⁾ Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.

F/CTL L(R) ELEV FAULT

Applicable to: ALL

Ident.: PRO-ABN-F_CTL-Q-00016974.0001001 / 06 NOV 23

ANNUNCIATIONS

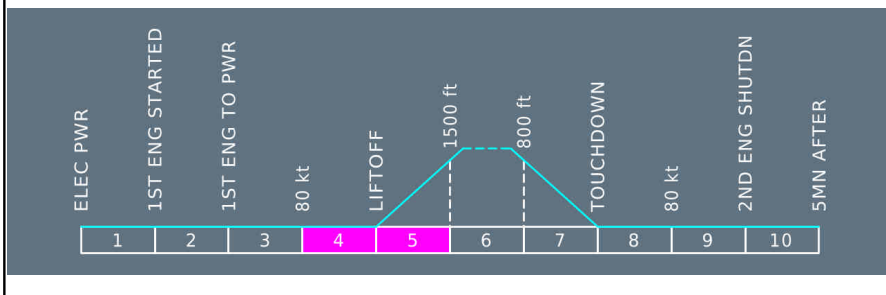
Triggering Conditions:

L2

This alert triggers when:

- The ELAC2 and SEC2 are not able to control the LH (RH) elevator servocontrol powered by the green (yellow) hydraulic system and the ELAC1 and SEC1 are not able to control the LH (RH) elevator servocontrol powered by the blue hydraulic system or,
- In the case of elevator oscillation protection activation by the ELAC.

Flight Phase Inhibition:



Continued on the following page

F/CTL L(R) ELEV FAULT (Cont'd)

15 Ident.: PRO-ABN-F_CTL-Q-00018484.0006001 / 12 MAY 25

MANEUVER WITH CARE
● FOR GO-AROUND:
MAX PITCH 15 DEG
THR LVR..... TOGA THEN MCT

[L2] This line is not displayed if one engine is inoperative.

[L1]

ASSOCIATED PROCEDURES
F/CTL ALTN LAW
(PROT LOST)
Refer to PRO-ABN-F_CTL F/CTL ALTN LAW - ANNUNCIATION

Note: If the L(R) elevator fails, the ELACs lose pitch control through the elevator. Therefore, the SECs control pitch in alternate law. This is not the case, if the right elevator is lost, due to the failure of B+Y hydraulic circuits. Pitch normal law remains active in ELAC.

Continued on the following page

F/CTL L(R) ELEV FAULT (Cont'd)

Ident.: PRO-ABN-F_CTL-Q-00018490.0028001 / 03 MAR 20

L12

STATUS

MAX SPEED..... 320 KT
 MANEUVER WITH CARE
 SPD BRK.....DO NOT USE
 ● **FOR GO-AROUND**
 MAX PITCH 15 DEG
 THR LVR.....TOGA THEN MCT
This line is not displayed if one engine is inoperative.

INOP SYS

F/CTL PROT
 L (R) ELEV
 ELAC PITCH
 AP 1+2
 CAT 2
 GLS AUTOLAND 
 STEEP APPR 

APPR PROC

FOR LDG.....FLAP LVR 3
*This line is replaced by “FOR LDG : FLAP LVR 3” when
 CONF 3 is selected, as a reminder.*
 GPWS LDG FLAP 3.....ON
Will be displayed, when flaps in CONF 3.
 APPR SPD.....VREF+10 KT
 LDG DIST PROC..... APPLY

ALTN LAW: PROT LOST
 WHEN L/G DN: DIRECT LAW
 See ⁽¹⁾

⁽¹⁾ At landing gear extension, control reverts to direct law in pitch, as well as in roll.Refer to PRO-ABN-F_CTL F/CTL DIRECT LAW.

F/CTL L+R ELEV FAULT

Applicable to: ALL

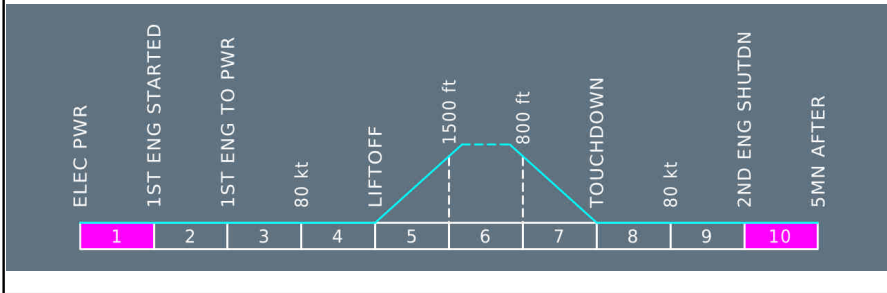
Ident.: PRO-ABN-F_CTL-O-00016958.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when both elevators are lost.

Flight Phase Inhibition:



Ident.: PRO-ABN-F_CTL-O-00018491.0001001 / 22 MAR 17

MAX SPEED.....320/.77

L2 Due to loss of high speed protections.

L1 **MAN PITCH TRIM**.....USE

L2 Only manual trim is available for pitch control.

L1 **SPD BRK**.....DO NOT USE

L2 Do not use speed brakes, because it is difficult to control the induced pitch moment with manual pitch trim only.

Continued on the following page

F/CTL L+R ELEV FAULT (Cont'd)	
--------------------------------------	--

Ident.: PRO-ABN-F_CTL-O-00018492.0026001 / 24 MAR 20	
L12 STATUS MAX SPEED..... 320/.77 SPD BRK.....DO NOT USE INOP SYS L+R ELEV ELAC PITCH AP 1+2 CAT 2 GLS AUTOLAND  STEEP APPR  APPR PROC FOR LDG.....FLAP LVR 3 <i>This line is replaced by “FOR LDG : FLAP LVR 3” when CONF 3 is selected, as a reminder</i> GPWS LDG FLAP 3.....ON <i>This line is displayed when flaps are in CONF 3.</i> MAN PITCH TRIM.....USE APPR SPD.....VREF + 10 KT LDG DIST PROC.....APPLY PITCH MECH BACK UP ROLL DIRECT LAW	

F/CTL L(R) SIDESTICK FAULT

Applicable to: ALL

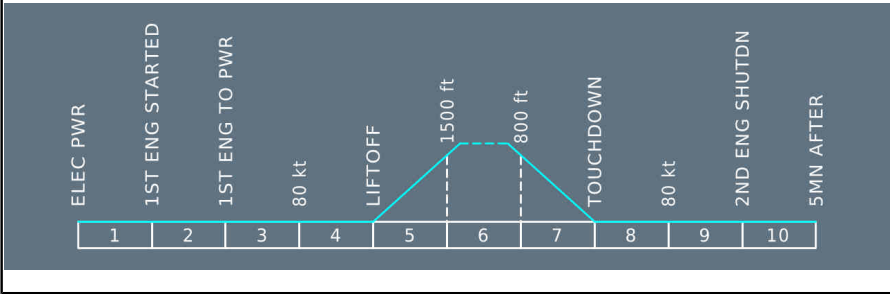
Ident.: PRO-ABN-F_CTL-Y-00016959.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when transducers, on pitch or roll axis, are failed on one sidestick.

Flight Phase Inhibition:



Ident.: PRO-ABN-F_CTL-Y-00011756.0001001 / 25 FEB 14

Crew awareness.

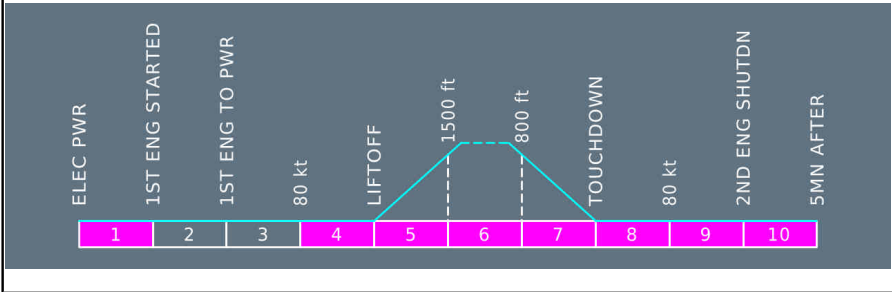
Ident.: PRO-ABN-F_CTL-Y-00014250.0001001 / 30 MAR 12

STATUS

INOP SYS

L(R) SIDESTICK

F/CTL PITCH TRIM/MCDU/CG DISAGREE (Cont'd)



Ident.: PRO-ABN-F_CTL-AL-00018906.0025001 / 06 AUG 18

- Crew awareness.
- 1. The flight crew checks the LOADSHEET data, the FMS entries and the trim setting.

F/CTL PITCH TRIM/MCDU/CG DISAGREE

Applicable to: MSN 04392

Ident.: PRO-ABN-F_CTL-AL-00016956.0003001 / 28 MAY 20

ANNUNCIATIONS

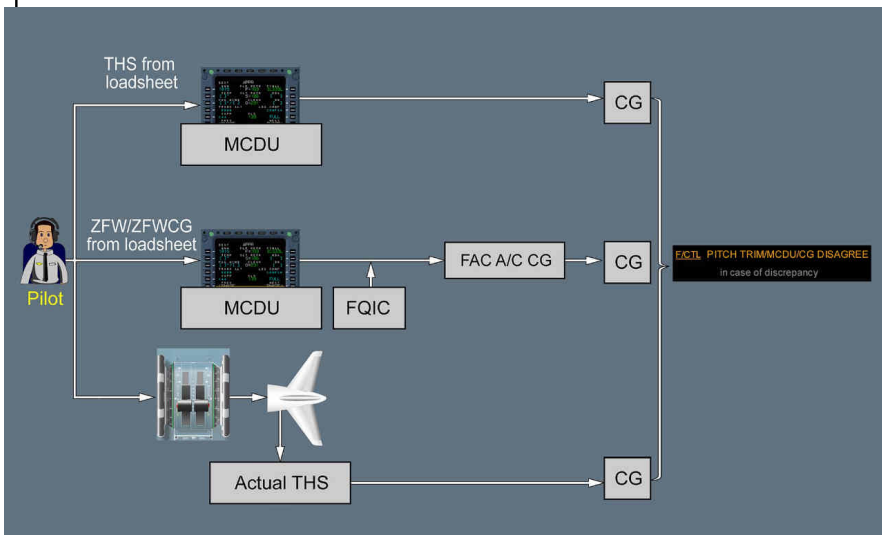
Triggering Conditions:

L2

When the TO CONFIG pb on the ECP is pressed, or when the thrust levers are set to FLEX or TOGA, there is a discrepancy between:

- The actual pitch trim value from THSA
- The pitch trim value calculated by the FAC, based on the CG
- The pitch trim value entered by crew in the MCDU.

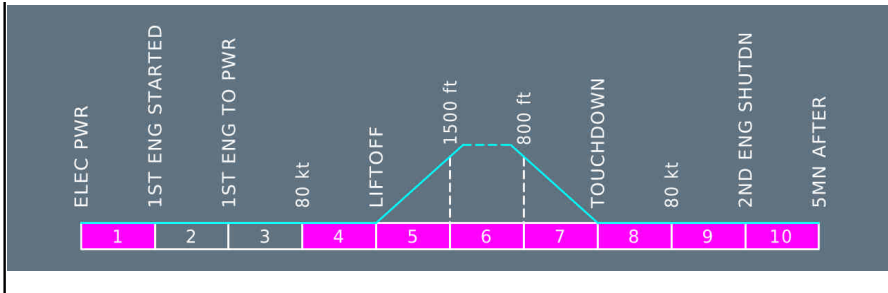
Pitch Trim / MCDU /CG Disagree



Flight Phase Inhibition:

Continued on the following page

F/CTL PITCH TRIM/MCDU/CG DISAGREE (Cont'd)



F/CTL SEC 1(2)(3) FAULT

Applicable to: ALL

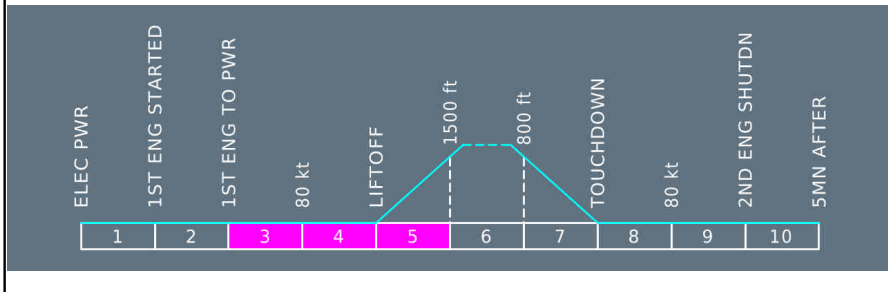
Ident.: PRO-ABN-F_CTL-I-00016961.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when there is a failure of one SEC.

Flight Phase Inhibition:



Continued on the following page

F/CTL SEC 1(2)(3) FAULT (Cont'd)

Ident.: PRO-ABN-F_CTL-I-00018502.0002001 / 12 MAY 25

SEC 1(2)(3).....OFF THEN ON

● **IF UNSUCCESSFUL:**

SEC 1(2)(3).....OFF

L2 Associated spoilers are lost.

L1 ● **If SEC 1 fails:**

SPD BRK.....DO NOT USE

L2 VLS would not be corrected, if speed brakes 2 extend (no speed brake position sent to FACs).

L1 ● **If all SECs fail:**

ASSOCIATED PROCEDURES

F/CTL ALTN LAW
(PROT LOST)

Refer to PRO-ABN-F_CTL F/CTL ALTN LAW - ANNUNCIATION

Continued on the following page

F/CTL SEC 1(2)(3) FAULT (Cont'd)

Ident.: PRO-ABN-F_CTL-I-00018504.0013001 / 18 NOV 21

L12

STATUS

INOP SYS

● **If SEC 1 is affected:**

SPD BRK..... DO NOT USE

● **If SEC 1+2+3 fail:**

FOR LDG..... FLAP LVR 3

*This line is replaced by "FOR LDG : FLAP LVR 3" when
CONF 3 is selected, as a reminder.*

APPR SPD..... VREF + 10KT

LDG DIST PROC..... APPLY

If SEC 1+2+3 fail:

ALTN LAW: PROT LOST

CAT 3 SINGLE ONLY

● **If AP engaged:**

WHEN L/G DN AND AP OFF: DIRECT LAW

● **If no AP engaged:**

WHEN L/G DN: DIRECT LAW

See ⁽⁵⁾

F/CTL PROT ⁽¹⁾

SPLR (associated)

SEC (affected)

REVERSER 1(2) ⁽²⁾

AUTO BRK ⁽³⁾

STEEP APPR ⁽⁴⁾

CAT 3 DUAL ⁽¹⁾

⁽¹⁾ (If SEC 1+2+3 fail.)

⁽²⁾ (If SEC 1+2(1+3) fail, reverser 1(2) is not available for landing.)

⁽³⁾ (If at least 2 SECs fail.)

⁽⁴⁾ (If F/CTL SEC 1 FAULT.)

⁽⁵⁾ Note: If SEC 1+2+3 fail, the LGCIU information can no longer be sent to the ELAC. For the activation of DIRECT law, the ELAC uses the condition "slats and flaps in CONF 2" instead of "landing gear down".

F/CTL SIDESTICK PRIORITY

Applicable to: ALL

Ident.: PRO-ABN-F_CTL-AM-00016983.0001001 / 21 MAR 16

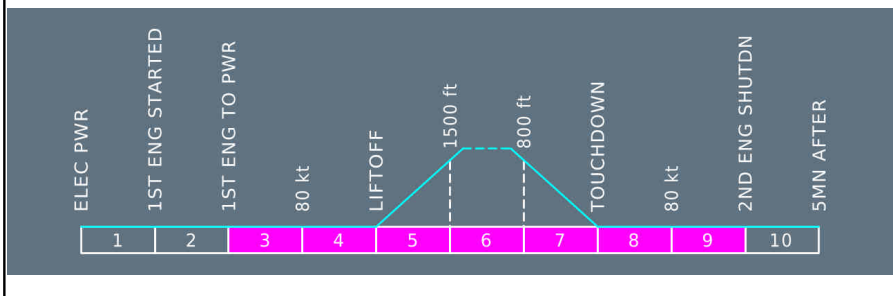
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when there is failure in a sidestick priority logic circuit.

Flight Phase Inhibition:



Continued on the following page

F/CTL SIDESTICK PRIORITY (Cont'd)

Ident.: PRO-ABN-F_CTL-AM-00018509.0001001 / 21 MAR 16

CHECK PRIORITY LOGIC

[L2] Check the integrity of flight control priority, as follows (not displayed on ECAM) :

[L1] ELAC 1..... OFF THEN ON

[L2] Note: When the ELAC 1 computer is reset on ground, the pitch trim returns to the ground setting position (0 °).

[L1] ELAC 2..... OFF THEN ON

[L2] ■ **If the warning disappears:**
CAPT TAKE OVER pb..... PRESS (at least 3 seconds)

Check that the :

- Aural "priority left" message is activated.
- F/O red arrow light is on.

CAPT TAKE OVER pb.....RELEASE
F/O TAKE OVER pb.....PRESS (at least 3 seconds)

Check that the:

- Aural "priority right" message is activated
- CAPT red arrow light is on.

F/O TAKE OVER pb..... RELEASE

Check that the warning does not reappear.

Note: There is no need to move the sidestick for the check.

■ **If the warning does not disappear, or if the warning reappears after the above check:**

Maintenance action is due.

F/CTL SLAT(FLAP) TIP BRK FAULT

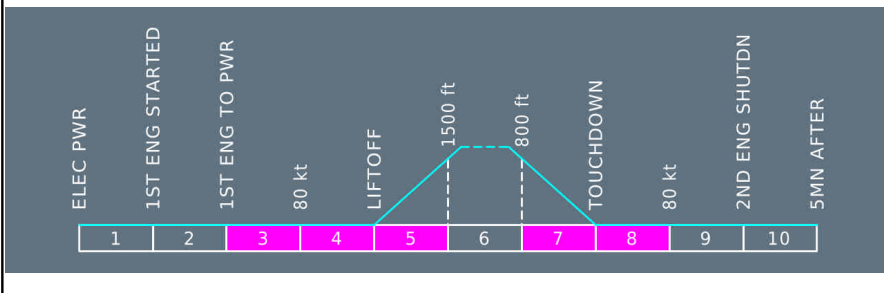
Applicable to: ALL

Ident.: PRO-ABN-F_CTL-AN-00016996.0001001 / 21 MAR 16

ANNUNCIATIONS
Triggering Conditions:

L2

This alert triggers when there is failure of one wing tip brake on slats or flaps, or failure of one wing tip brake solenoid on slats, or flaps.

Flight Phase Inhibition:


Ident.: PRO-ABN-F_CTL-AN-00018510.0001001 / 21 MAR 16

Crew awareness.

F/CTL SLATS AND FLAPS FAULT IN CONF 0

Applicable to: MSN 02155-05746

Ident.: PRO-ABN-F_CTL-C-00018511.0001001 / 22 MAR 17

FLAPS LEVER.....RECYCLE

- If both slat channels fail:

ASSOCIATED PROCEDURES
F/CTL ALTN LAW
 (PROT LOST)

MAX SPEED..... 320 KT

Continued on the following page

F/CTL SLATS AND FLAPS FAULT IN CONF 0 (Cont'd)

19 Ident.: PRO-ABN-F_CTL-C-00018512.0012001 / 24 MAR 20

L12

STATUS

MAX SPEED..... 320 KT

ALTN LAW: PROT LOST

APPR PROC

FOR LDG..... FLAP LVR 1

Note: With FLAPS lever set at 1, AP/FD GO AROUND mode is available.
 This line is replaced by "FOR LDG : FLAP LVR 1" when CONF 1 is selected, as a reminder.

CTR TK PUMPS..... OFF

GPWS FLAP MODE..... OFF

APPR SPD..... VREF + 60 KT

Note: Approach with A/THR in selected mode is recommended.

● If both slat channels fail:

WHEN L/G DN: DIRECT LAW

Note: At landing gear extension, control reverts to direct law in pitch, as well as in roll. Refer to PRO-ABN-F_CTL F/CTL DIRECT LAW.

● AT 300 FT AGL:

TARGET SPD..... VREF + 50 KT

Note: Reduce speed between 500 ft and 300 ft to reach VREF +50 kt at runway threshold and disconnect A/THR as the target speed may be below VLS.

LDG DIST PROC..... APPLY

INOP SYS

 F/CTL PROT ⁽¹⁾

SLATS

FLAPS

 AP 1+2 ⁽²⁾

 A/THR ⁽²⁾

 CAT 2 ⁽²⁾

 STEEP APPR 

 FD 1+2 ⁽³⁾

Continued on the following page

F/CTL SLATS AND FLAPS FAULT IN CONF 0 (Cont'd)

- **Only in case of FLAPS FAULT:**
 - ENG 1 APPR IDLE ONLY
 - ENG 2 APPR IDLE ONLY

(1) (If both slat channels fail.)

(2) (If both slat or flap channels fail.)

(3) (If both slat or flap channels fail. Not displayed on ECAM)

F/CTL SLATS AND FLAPS FAULT IN CONF 0

Applicable to: MSN 07784-07792

Ident.: PRO-ABN-F_CTL-C-00018511.0001001 / 22 MAR 17

FLAPS LEVER.....**RECYCLE**

- **If both slat channels fail:**

———— **ASSOCIATED PROCEDURES** ————

F/CTL ALTN LAW

(PROT LOST)

MAX SPEED..... **320 KT**

Continued on the following page

F/CTL SLATS AND FLAPS FAULT IN CONF 0 (Cont'd)

Ident.: PRO-ABN-F_CTL-C-00018512.0013001 / 24 MAR 20

L12

STATUS

INOP SYS

● If both slat channels fail:

MAX SPEED.....320 KT

ALTN LAW: PROT LOST

APPR PROC

FOR LDG.....FLAP LVR 1

Note: With FLAPS lever set at 1, AP/FD GO AROUND mode is available.

This line is replaced by "FOR LDG : FLAP LVR 1" when CONF 1 is selected, as a reminder.

GPWS FLAP MODE..... OFF

APPR SPD..... VREF + 60 KT

Note: Approach with A/THR in selected mode is recommended.

 F/CTL PROT ⁽¹⁾

SLATS

FLAPS

 AP 1+2 ⁽²⁾

 A/THR ⁽²⁾

 CAT 2 ⁽²⁾

 STEEP APPR 

 FD 1+2 ⁽³⁾

● If both slat channels fail:

WHEN L/G DN: DIRECT LAW

Note: At landing gear extension, control reverts to direct law in pitch, as well as in roll. Refer to PRO-ABN-F_CTL F/CTL DIRECT LAW.

● AT 300 FT AGL:

TARGET SPD..... VREF + 50 KT

Note: Reduce speed between 500 ft and 300 ft to reach VREF +50 kt at runway threshold and disconnect A/THR, as the target speed may be below VLS.

LDG DIST PROC.....APPLY

Continued on the following page

F/CTL SLATS AND FLAPS FAULT IN CONF 0 (Cont'd)

- Only in case of **FLAPS FAULT**:
ENG 1 APPR IDLE ONLY
ENG 2 APPR IDLE ONLY
- (1) (If both slat channels fail.)

(2) (If both slat or flap channels fail.)

(3) (If both slat or flap channels fail. Not displayed on ECAM.)

F/CTL SLATS FAULT/LOCKED

Applicable to: MSN 02155-05746

Ident.: PRO-ABN-F_CTL-B-00022652.0001001 / 05 MAR 19

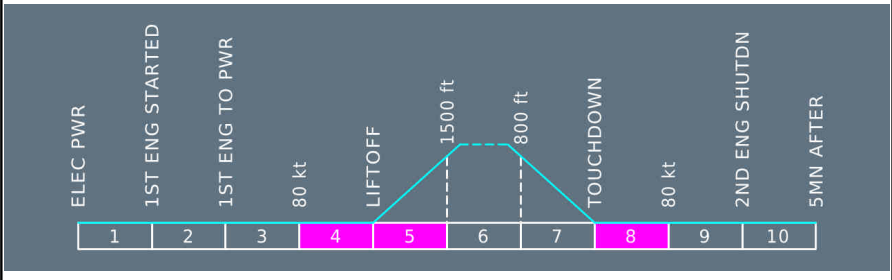
ANNUNCIATIONS

Triggering Conditions:

The SLATS FAULT alert triggers when there is a failure of both slats channels.

The SLATS LOCKED alert triggers when the slats wing tip brakes are activated.

Flight Phase Inhibition:



The diagram shows a flight profile across 10 phases. The y-axis represents altitude and speed. Key points are: ELEC PWR (Phase 1), 1ST ENG STARTED (Phase 2), 1ST ENG TO PWR (Phase 3), 80 kt (Phase 4), LIFTOFF (Phase 5), 1500 ft (Phase 6), 800 ft (Phase 7), TOUCHDOWN (Phase 8), 80 kt (Phase 9), 2ND ENG SHUTDN (Phase 10), and 5MN AFTER (Phase 10). The flight path is a solid line from LIFTOFF to TOUCHDOWN, with dashed lines for 1500 ft and 800 ft. The area under the flight path is shaded blue. The phases are numbered 1 to 10 in a bar at the bottom.

Continued on the following page

F/CTL SLATS FAULT/LOCKED (Cont'd)

Ident.: PRO-ABN-F_CTL-B-00018517.0013001 / 12 MAY 25

 ● **If slats locked:**
WING TIP BRK ON
MAX SPEED..... REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED

[L2] Speed is limited to the VFE corresponding to the next slat position.

 [L1] ● **If slats not locked:**

 ● **WHEN SPD BELOW VFE:**
FLAPS LEVER.....RECYCLE

[L2] Return to the previous selection, then back to the desired position.

 [L1] ● **If slats not at zero:**
FUEL MODE SEL..... MAN

[L2] To allow CTR TK feeding.

 [L1] **CTR TK PUMPS**..... AS RQRD

[L2] Set CTR TK PUMPS pb to OFF when CTR TK is empty or during approach.

 [L1] ● **If slats extended:**
FUEL CONSUMPT INCRSD
FMS PRED UNRELIABLE

 ● **If unsuccessful:**

[L2] Refer to PRO-ABN-F_CTL [QRH] Landing with Slats or Flaps Jammed.

The autopilot may be used down to 500 ft AGL. As it is not tuned for the abnormal configurations, its behavior could be less than optimum and must be monitored.

[L1]

ASSOCIATED PROCEDURES

F/CTL ALTN LAW
(PROT LOST)

Refer to PRO-ABN-F_CTL F/CTL ALTN LAW - ANNUNCIATION

Note: If **F/CTL SLATS FAULT** due to dual slat channels failure, flight controls revert to alternate law.

Continued on the following page

F/CTL SLATS FAULT/LOCKED (Cont'd)

Ident.: PRO-ABN-F_CTL-B-00018518.0012001 / 03 NOV 21

L12

STATUS
INOP SYS
APPR PROC

 S/F JAMMED PROC..... APPLY
 FOR LDG..... FLAP LVR 3

*This line is replaced by "FOR LDG: FLAP LVR 3" when
 CONF 3 is selected, as a reminder.*

 CTR TK PUMPS..... OFF
 GPWS LDG FLAP 3..... ON

This line is displayed when flaps are in CONF 3.

 APPR SPD..... REFER
 TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED
 LDG DIST PROC..... APPLY

CTR TK FEED: MAN ONLY

- If both slat channels fail, or for A318 and A319 if slats are locked in clean configuration and flaps are at, or above, CONF 2:

 ALTN LAW: PROT LOST
 WHEN L/G DN: DIRECT LAW

Note: At landing gear extension, control reverts to direct law in pitch, as well as in roll. Refer to PRO-ABN-F_CTL F/CTL DIRECT LAW.

FUEL CONSUMPT INCRSD

 See ⁽³⁾
FMS PRED UNRELIABLE

 See ⁽⁴⁾

 F/CTL PROT ⁽¹⁾
 SLATS
 AP 1+2 ⁽¹⁾
 A/THR ⁽¹⁾
 CAT 2 ⁽¹⁾
 STEEP APPR  ⁽¹⁾
 GLS AUTOLAND 
 FD 1+2 ⁽²⁾
⁽¹⁾ (If both slat channels fail.)

⁽²⁾ (If both slat channels fail. Not displayed on ECAM.)

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

F/CTL

F/CTL SLATS FAULT/LOCKED (Cont'd)

- (3) *This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.*
- (4) *Disregard FMS fuel predictions. Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable fuel penalty factor.*

F/CTL SLATS FAULT/LOCKED

Applicable to: MSN 07784-07792

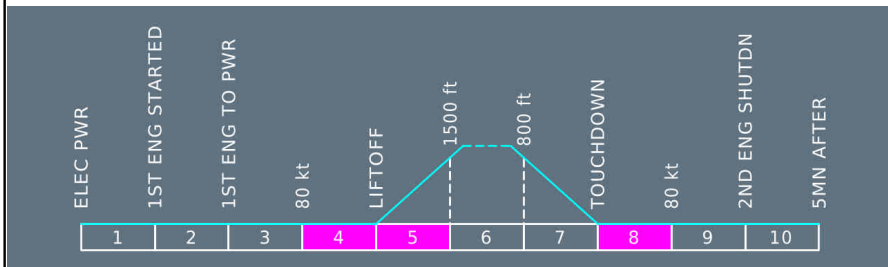
Ident.: PRO-ABN-F_CTL-B-00022652.0001001 / 05 MAR 19

ANNUNCIATIONS

Triggering Conditions:

- L2** The SLATS FAULT alert triggers when there is a failure of both slats channels.
 The SLATS LOCKED alert triggers when the slats wing tip brakes are activated.

Flight Phase Inhibition:



Continued on the following page

F/CTL SLATS FAULT/LOCKED (Cont'd)

Ident.: PRO-ABN-F_CTL-B-00018517.0016001 / 12 MAY 25

● If slats locked:
WING TIP BRK ON
MAX SPEED.....REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED

L2 Speed is limited to the VFE corresponding to the next slat position.

L1 ● If slats not locked:
● WHEN SPD BELOW VFE:
FLAPS LEVER.....**RECYCLE**
L2 Return to the previous selection, then back to the desired position.

L1 ● If slats extended:
FUEL CONSUMPT INCRSD
FMS PRED UNRELIABLE
● If unsuccessful:
L2 Refer to PRO-ABN-F_CTL [QRH] Landing with Slats or Flaps Jammed.

The autopilot may be used down to 500 ft AGL. As it is not tuned for the abnormal configurations, its behavior could be less than optimum and must be monitored.

L1
ASSOCIATED PROCEDURES
F/CTL ALTN LAW
(PROT LOST)

Refer to PRO-ABN-F_CTL F/CTL ALTN LAW - ANNUNCIATION

Note: If **F/CTL SLATS FAULT** due to dual slat channels failure, flight controls revert to alternate law.

Continued on the following page

F/CTL SLATS FAULT/LOCKED (Cont'd)

Ident.: PRO-ABN-F_CTL-B-00018518.0014001 / 10 MAY 21

L12

STATUS

APPR PROC

S/F JAMMED PROC.....APPLY
 FOR LDG.....FLAP LVR 3

*This line is replaced by "FOR LDG : FLAP LVR 3" when
 CONF 3 is selected, as a reminder.*

GPWS LDG FLAP 3.....ON

This line is displayed when flaps are in CONF 3.

APPR SPD.....REFER
 TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED
 LDG DIST PROC.....APPLY

- If both slat channels fail, or for A319 and A321 if slats are locked in clean configuration and flaps are at, or above, CONF 2:

ALTN LAW: PROT LOST
 WHEN L/G DN: DIRECT LAW

Note: At landing gear extension, control reverts to direct law in pitch, as well as in roll. Refer to PRO-ABN-F_CTL F/CTL DIRECT LAW.

FUEL CONSUMPT INCRSD

See ⁽³⁾

FMS PRED UNRELIABLE

See ⁽⁴⁾

INOP SYS

F/CTL PROT ⁽¹⁾

SLATS

AP 1+2 ⁽¹⁾

A/THR ⁽¹⁾

CAT 2 ⁽¹⁾

STEEP APPR  ⁽¹⁾

GLS AUTOLAND  ⁽¹⁾

FD 1+2 ⁽²⁾

⁽¹⁾ (If both slat channels fail.)

⁽²⁾ (If both slat channels fail. Not displayed on ECAM.)

⁽³⁾ This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.

Continued on the following page

F/CTL SLATS FAULT/LOCKED (Cont'd)

(4) Disregard FMS fuel predictions. Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable fuel penalty factor.

F/CTL SLAT SYS 1(2) FAULT

Applicable to: ALL

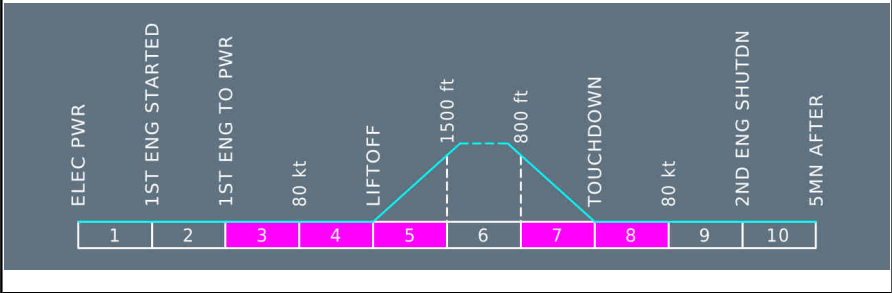
Ident.: PRO-ABN-F_CTL-D-00016995.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when there is failure of slat channel in one SFCC.

Flight Phase Inhibition:



Ident.: PRO-ABN-F_CTL-D-00011751.0001001 / 25 FEB 14

Crew awareness.

Ident.: PRO-ABN-F_CTL-D-00011752.0001001 / 18 AUG 10

STATUS

SLATS SLOW

F/CTL SPD BRK 2 (3+4) FAULT

Applicable to: ALL

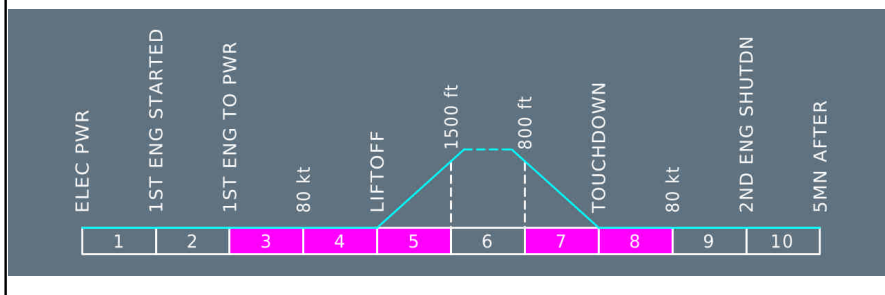
Ident.: PRO-ABN-F_CTL-W-00016980.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when speedbrake lever transducers to SEC 3 (1) failed.

Flight Phase Inhibition:



Ident.: PRO-ABN-F_CTL-W-00018519.0001001 / 21 MAR 16

● If SPD BRK 3+4 affected:

SPD BRK..... DO NOT USE

L2 Do not use speedbrakes since it is not efficient to use only surfaces n° 2, and would active the SPD BRK DISAGREE caution.

Ident.: PRO-ABN-F_CTL-W-00018520.0001001 / 20 MAY 25

STATUS

● If SPD BRK 3+4 affected:

SPD BRK..... DO NOT USE

APPR PROC

LDG DIST PROC..... APPLY

INOP SYS

SPD BRK (affected)
 STEEP APPR  ⁽¹⁾

⁽¹⁾ (if SPD BRK 3 and 4 are affected)

F/CTL SPD BRK DISAGREE (SURFACES 3+4 AFFECTED)

Applicable to: ALL

Ident.: PRO-ABN-F_CTL-T-00016970.0001001 / 21 MAR 16

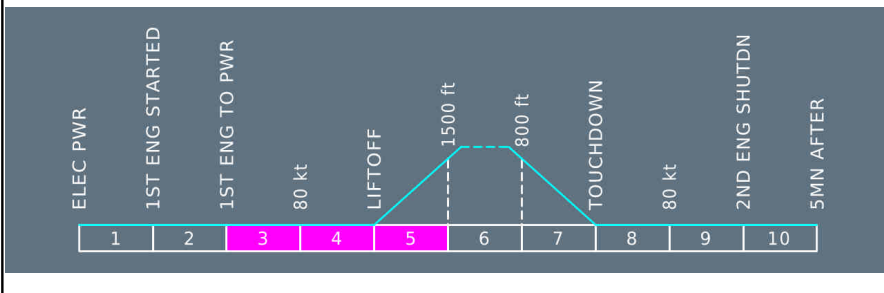
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when there is a position disagree between surfaces and lever position.

Flight Phase Inhibition:



Ident.: PRO-ABN-F_CTL-T-00018521.0001001 / 21 MAR 16

SPD BRK LEVER.....RETRACT
 SPD BRK.....DO NOT USE

Ident.: PRO-ABN-F_CTL-T-00018522.0001001 / 21 MAR 16

STATUS

SPD BRK.....DO NOT USE

INOP SYS

 SPD BRK 3+4
 STEEP APPR 

F/CTL SPD BRK DISAGREE
(SURFACES 2+3+4 AFFECTED)

Applicable to: ALL

Ident.: PRO-ABN-F_CTL-U-00018907.0001001 / 21 MAR 16

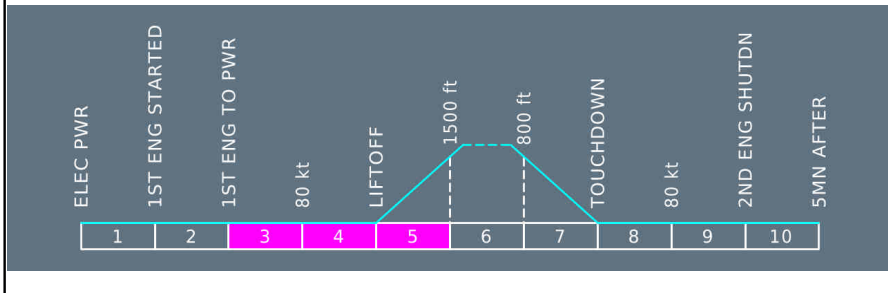
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when there is a position disagree between surfaces and lever position.

Flight Phase Inhibition:



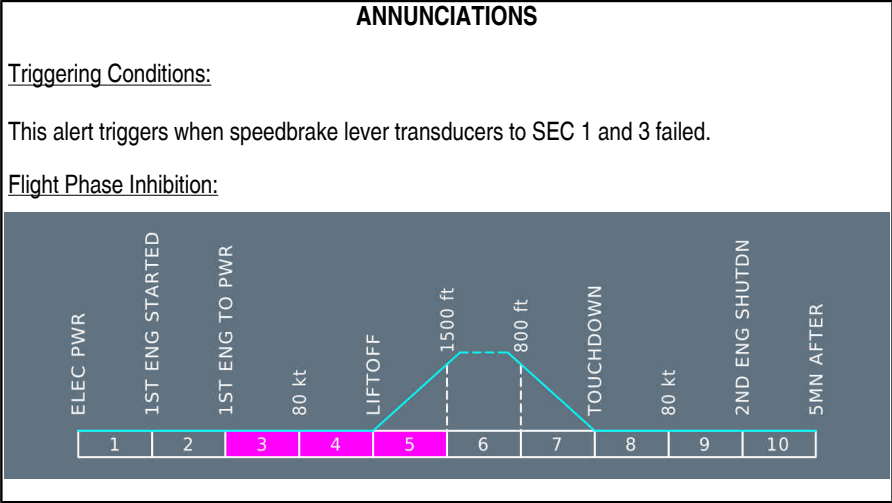
Ident.: PRO-ABN-F_CTL-U-00018523.0001001 / 21 MAR 16

SPD BRK LEVER.....RETRACT

F/CTL SPD BRK FAULT

Applicable to: ALL

Ident.: PRO-ABN-F_CTL-V-00016971.0001001 / 21 MAR 16



Ident.: PRO-ABN-F_CTL-V-00018534.0001001 / 21 MAR 16

L2 In addition, associated ground spoilers are available only through reverse selection.

L1 Crew awareness.

Ident.: PRO-ABN-F_CTL-V-00018535.0002001 / 22 MAR 17

STATUS

SPD BRK.....DO NOT USE

INOP SYS
STEEP APPR ⚠ (1)

(1) (if SPD BRK 3 or 4 are affected)

F/CTL SPD BRK STILL OUT

Applicable to: ALL

Ident.: PRO-ABN-F_CTL-AO-00016972.0002001 / 03 MAY 23

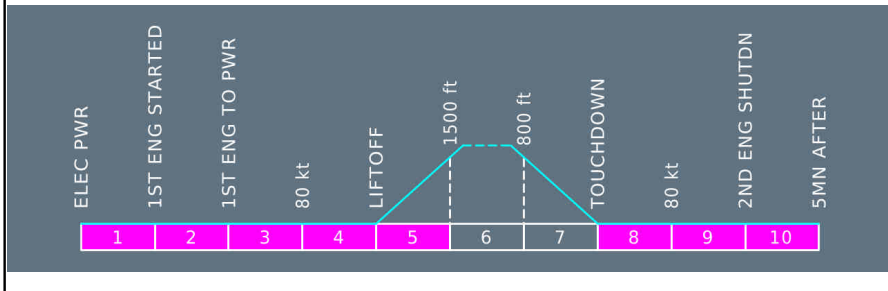
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the **SPEED BRK** memo is displayed for more than 30 s.
For more information about the **SPEED BRK** memo display, *Refer to DSC-27-20-30 SPEED BRK.*

Flight Phase Inhibition:



Ident.: PRO-ABN-F_CTL-AO-00011810.0014001 / 25 FEB 14

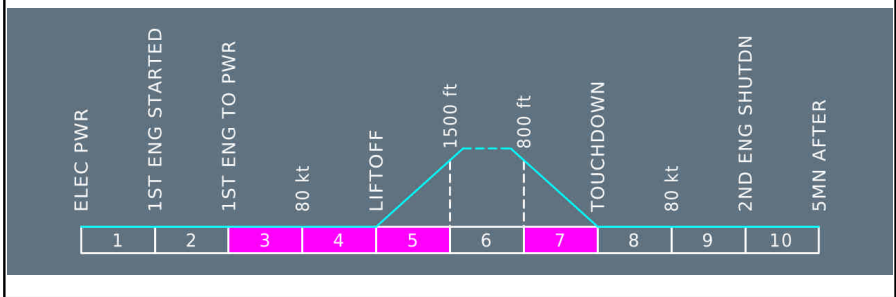
Crew awareness.

F/CTL SPLR FAULT
Applicable to: ALL

Ident.: PRO-ABN-F_CTL-R-00016976.0001001 / 21 MAR 16

ANNUNCIATIONS
Triggering Conditions:
L2

This alert triggers when there is a loss of one or more spoilers.

Flight Phase Inhibition:

Continued on the following page

F/CTL SPLR FAULT (Cont'd)

Ident.: PRO-ABN-F_CTL-R-00018536.0003001 / 12 MAY 25

[L2] Note: If heavy vibrations are felt, CONF 3 may be used for landing in order to reduce the buffeting.

[L1] ● If one or more spoilers are fully extended:

Due to the increased drag, the flight crew may need to descend. Maintain the highest cruise FL possible which enables to fly at optimum speed.

OPT SPD..... G DOT+10KT

[L2] GDOT speed +10 kt aims to minimize fuel consumption. However, if buffet is encountered at GDOT speed +10 kt, increase speed to fly out of buffet condition.

[L1] AP DO NOT USE

[L2] Depending on the failed spoiler position, the AP may not have enough authority to counteract the roll induced by spoiler runaway.

[L1] ● If spoilers 3+4 affected:

SPD BRK..... DO NOT USE

[L2] Do not use speedbrakes, since using only surfaces N° 2 is not efficient and would trigger the **F/CTL SPD BRK DISAGREE** alert.

[L1] ● If one or more spoilers are extended:

FUEL CONSUMPT INCRSD

FMS PRED UNRELIABLE

● If all spoilers are failed:

ASSOCIATED PROCEDURES

F/CTL ALTN LAW
(PROT LOST)

Refer to PRO-ABN-F_CTL F/CTL ALTN LAW - ANNUNCIATION

Continued on the following page

F/CTL SPLR FAULT (Cont'd)

24 Ident.: PRO-ABN-F_CTL-R-00018544.0008001 / 17 MAY 21

L12

STATUS

- If one or more spoilers are fully extended:
AP..... DO NOT USE
- If spoilers 3+4 affected:
SPD BRK..... DO NOT USE

INOP SYS

 SPLR (affected)
 SPD BRK ⁽¹⁾
 STEEP APPR <34° (2)

APPR PROC

- If one or more spoilers are fully extended:
 In clean configuration, if VLS is above VFE_{NEXT}, the flight crew should deselect A/THR, decelerate to VFE_{NEXT}, and select CONF 1 when below VFE_{NEXT}. When established at CONF 1, the flight crew can reengage the A/THR and use managed speed again.
 FOR LDG..... FLAP LVR 3
This line is replaced by "FOR LDG : FLAP LVR 3" when CONF 3 is selected, as a reminder.
 GPWS LDG FLAP 3 ON
This line is displayed when flaps are in CONF 3.
 APPR SPD.....VREF + 10 KT
 LDG DIST PROC..... APPLY

FUEL CONSUMPT INCRSD

 See ⁽³⁾
FMS PRED UNRELIABLE

 See ⁽⁴⁾
⁽¹⁾ (If spoilers 2+3+4 affected)

⁽²⁾ (if spoilers 3 and/or 4 affected)

⁽³⁾ This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

F/CTL

F/CTL SPLR FAULT (Cont'd)

(4) Note: Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.

F/CTL STABILIZER JAM

Applicable to: ALL

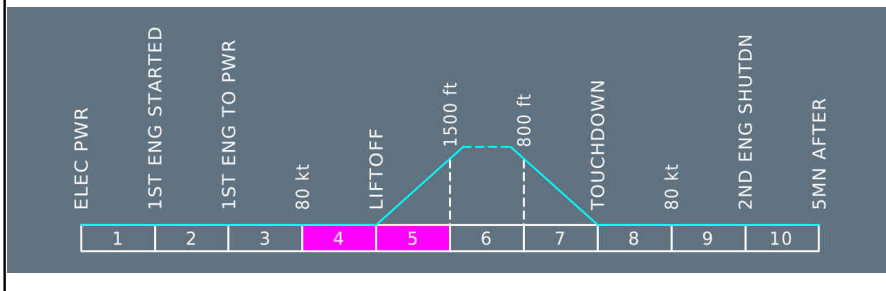
Ident.: PRO-ABN-F_CTL-X-00016973.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when there is a loss of the electrical control of the stabilizer (with or without jamming of the stabilizer).

Flight Phase Inhibition:



Continued on the following page

F/CTL STABILIZER JAM (Cont'd)

Ident.: PRO-ABN-F_CTL-X-00018545.0003001 / 12 MAY 25

L2 When the Flight Control Computers detect a loss of electrical control of the stabilizer, pitch control law reverts to alternate law. Depending on the type of failure, the MAN PITCH TRIM may still be available.

L1 **MAN PITCH TRIM**..... **CHECK**

L2 *The force needed on the PITCH TRIM wheel may be higher than during pre-takeoff manual setting.*

L1 ● **IF MAN TRIM AVAIL:**

TRIM FOR NEUTRAL ELEV

L2 *If manual pitch trim is available, trim to maintain the elevator at the zero position (indications on F/CTL SD page).*

L1 **MANEUVER WITH CARE**

● **FOR GO-AROUND:**

MAX PITCH 15 DEG

THR LVR..... **TOGA THEN MCT**

L2 *This line is not displayed if one engine is inoperative.*

L1

ASSOCIATED PROCEDURES

F/CTL ALTN LAW
(PROT LOST)

Refer to PRO-ABN-F_CTL F/CTL ALTN LAW - ANNUNCIATION

Continued on the following page

F/CTL STABILIZER JAM (Cont'd)

Ident.: PRO-ABN-F_CTL-X-00018546.0014001 / 03 MAR 20

L12

STATUS

MAX SPEED..... 320 KT

MANEUVER WITH CARE

● **FOR GO-AROUND**

MAX PITCH 15 DEG

THR LVR.....TOGA THEN MCT

This line is not displayed if one engine is inoperative.

APPR PROC:

FOR LDG.....FLAP LVR 3

This line is replaced by "FOR LDG : FLAP LVR 3" when CONF 3 is selected, as a reminder.

GPWS LDG FLAP 3.....ON

Will be displayed when flaps in CONF 3

● **IF MAN TRIM NOT AVAIL:**

● **WHEN CONF 3 AND VAPP:**

L/G..... DN

Landing gear extension is delayed, in order to delay the switching to direct law.

APPR SPD..... VREF + 10 KT

LDG DIST PROC..... APPLY

ALTN LAW: PROT LOST

WHEN L/G DN: DIRECT LAW

At landing gear extension, control reverts to direct law in pitch, as well as in roll. Refer to PRO-ABN-F_CTL F/CTL DIRECT LAW.

INOP SYS

F/CTL PROT

STABILIZER

ELAC PITCH

AP 1 + 2

CAT 2

GLS AUTOLAND

STEEP APPR

[QRH] FUEL IMBALANCE

Ident.: PRO-ABN-FUEL-00011257.0002001 / 10 MAY 21

Applicable to: MSN 02155-05746

FOB..... CHECK

Note: Compare the FOB + FU, with the FOB at departure.

If the difference is significant, or if the FOB + FU decreases, suspect a fuel leak.

CAUTION

A fuel imbalance may indicate a fuel leak.

Do not apply this procedure, if a fuel leak is suspected.

Refer to PRO-ABN-FUEL [QRH] FUEL LEAK.

FUEL X FEED..... ON

CTR TK PUMP 1..... OFF

CTR TK PUMP 2..... OFF

● **On lighter side:**

FUEL PUMPS..... OFF

● **When fuel balanced:**

ALL FUEL PUMPS..... ON

FUEL X FEED..... OFF

Note: There is no requirement to correct an imbalance, until the ECAM fuel advisory is displayed.

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

FUEL

[QRH] FUEL IMBALANCE

Ident.: PRO-ABN-FUEL-00011257.0003001 / 17 MAR 17

Applicable to: MSN 07784-07792

FOB..... CHECK

Compare the FOB + FU, with the FOB at departure.

If the difference is significant, or if the FOB + FU decreases, suspect a fuel leak.

CAUTION

A fuel imbalance may indicate a fuel leak.

Do not apply this procedure, if a fuel leak is suspected.

Refer to PRO-ABN-FUEL [QRH] FUEL LEAK.

FUEL X FEED..... ON

CTR TK L XFR..... OFF

CTR TK R XFR..... OFF

● On lighter side:

FUEL PUMPS..... OFF

● When fuel balanced:

FUEL PUMPS..... ON

CTR TK L XFR..... ON

CTR TK R XFR..... ON

FUEL X FEED..... OFF

Note: *There is no requirement to correct an imbalance, until the ECAM fuel advisory is displayed.*

[QRH] FUEL LEAK

Ident.: PRO-ABN-FUEL-00018665.0003001 / 28 MAY 20

Applicable to: MSN 02155-05746

A fuel leak may be detected, if:

- The sum of FOB and FU is significantly less than FOB at engine start or is decreasing, or
- A passenger observes fuel spray from engine/pylon or wingtip/sharklet, or
- The total fuel quantity is decreasing at an abnormal rate, or
- A fuel imbalance is developing, or
- Fuel quantity in a tank is decreasing too fast (leak from engine/pylon, or hole in a tank), or
- The Fuel flow is excessive, N1 is low (leak from engine), or
- Fuel is smelt in the cabin, or
- The destination EFOB turns to amber on the F-PLN (or on the FUEL PRED) page, or
- "DEST EFOB BELOW MIN" appears on the MCDU scratchpad.

If visibility permits, leak source may be identified by a visual check from the cabin.

WHEN A LEAK IS CONFIRMED
LAND ASAP
■ Leak from engine/pylon confirmed by excessive fuel flow, low N1, or visual check:

 THR LEVER (affected engine).....IDLE
 ENG MASTER (affected engine).....OFF
 FUEL X FEED.....AS RQRD

If the leak stops, the crossfeed valve can now be opened to re-balance fuel quantity, or to enable use of fuel from both wings.

DO NOT RESTART AFFECTED ENGINE

■ Leak from engine/pylon not confirmed or leak not located:

Stop any fuel transfer, and then monitor the depletion rate of each inner tank, to determine if the leak is from an engine or a wing, or from the Center tank, or the APU feeding line.

FUEL X FEED.....MAINTAIN CLOSED

The crossfeed valve must remain closed to prevent the leak from affecting both sides.

CTR TK PUMP 1.....OFF

CTR TK PUMP 2.....OFF

Each engine is fed via its associated inner tank only.

INNER TANK FUEL QUANTITIES.....MONITOR

Monitor the depletion rate of each inner tank.
Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

FUEL

[QRH] FUEL LEAK (Cont'd)

- If one inner tank depletes faster than other by at least 300 kg (660 lb) in less than 30 min:

An engine leak may still be suspected. Therefore:

THR LEVER (engine on leaking side)..... IDLE
 ENG MASTER (engine on leaking side)..... OFF
 CTR TK PUMP 1..... ON
 CTR TK PUMP 2..... ON
 FUEL LEAK..... MONITOR

- If leak stops:

ENGINE LEAK CONFIRMED

FUEL X FEED..... AS RQRD

DO NOT RESTART AFFECTED ENGINE

- If leak continues (after engine shutdown):

WING LEAK SUSPECTED

ENGINE RESTART..... CONSIDER

CAUTION

Do not apply the FUEL IMBALANCE procedure. Approach and landing can be done, even with one full wing/one empty wing.

- If both inner tanks deplete at a similar rate:

LEAK FROM CENTER TANK OR APU FEEDING LINE SUSPECTED

- If fuel smell in cabin:

APU..... OFF

This prevents additional fuel loss through the APU feeding line.

- When fuel quantity in one inner tank less than 3 000 kg (6 600 lb):

CTR TK PUMP 1..... ON

CTR TK PUMP 2..... ON

- For landing: DO NOT USE REVERSERS

[QRH] FUEL LEAK

Ident.: PRO-ABN-FUEL-00018665.0006001 / 28 MAY 20

Applicable to: MSN 07784-07792

A fuel leak may be detected, if:

- The sum of FOB and FU is significantly less than FOB at engine start or is decreasing, or
- A passenger observes fuel spray from engine/pylon or wingtip/sharklet, or
- The total fuel quantity is decreasing at an abnormal rate, or
- A fuel imbalance is developing, or
- Fuel quantity in a tank is decreasing too fast (leak from engine/pylon, or hole in a tank), or
- A tank is overflowing (due to pipe rupture in a tank), or
- The Fuel flow is excessive, N1 is low (leak from engine), or
- Fuel is smelt in the cabin, or
- The destination EFOB turns to amber on the F-PLN (or on the FUEL PRED) page, or
- "DEST EFOB BELOW MIN" appears on the MCDU scratchpad.

If visibility permits, leak source may be identified by a visual check from the cabin.

WHEN A LEAK IS CONFIRMED
LAND ASAP
■ Leak from engine/pylon confirmed by excessive fuel flow, low N1, or visual check:

 THR LEVER (affected engine).....IDLE
 ENG MASTER (affected engine).....OFF
 FUEL X FEED.....AS RQRD

If the leak stops, the crossfeed valve can now be opened to re-balance fuel quantity, or to enable use of fuel from both wings.
DO NOT RESTART AFFECTED ENGINE
■ Leak from engine/pylon not confirmed or leak not located:

Stop any fuel transfer, and then monitor the depletion rate of each inner tank, to determine if the leak is from an engine or a wing, or from the Center tank, or the APU feeding line.

FUEL X FEED.....MAINTAIN CLOSED

The crossfeed valve must remain closed to prevent the leak from affecting both sides.

CTR TK L XFR.....OFF

CTR TK R XFR.....OFF

Each engine is fed via its associated inner tank only.

INNER TANK FUEL QUANTITIES.....MONITOR

Continued on the following page

[QRH] FUEL LEAK (Cont'd)

Monitor the depletion rate of each inner tank.

- **If one inner tank depletes faster than other by at least 300 kg (660 lb) in less than 30 min :**

An engine leak may still be suspected. Therefore:

THR LEVER (engine on leaking side)..... IDLE
 ENG MASTER (engine on leaking side)..... OFF
 FUEL LEAK..... MONITOR

- **If leak stops:**

ENGINE LEAK CONFIRMED

CTR TK L XFR..... ON
 CTR TK R XFR..... ON
 FUEL X FEED..... AS RQRD
 DO NOT RESTART AFFECTED ENGINE

- **If leak continues (after engine shutdown):**

WING LEAK SUSPECTED

ENGINE RESTART..... CONSIDER
 CTR TK XFR (non-leaking side)..... ON

CAUTION

Do not apply the FUEL IMBALANCE procedure. Approach and landing can be done, even with one full wing/one empty wing.

- **If both inner tanks deplete at a similar rate:**

LEAK FROM CENTER TANK OR APU FEEDING LINE SUSPECTED

- **If fuel smell in cabin:**

APU..... OFF
This prevents additional fuel loss through the APU feeding line.

- **When fuel quantity in one inner tank less than 3 000 kg (6 600 lb):**

CTR TK L XFR..... ON
 CTR TK R XFR..... ON

- **For landing: DO NOT USE REVERSERS**

[QRH] FUEL OVERREAD

Ident.: PRO-ABN-FUEL-00022322.0003001 / 02 MAY 24

Applicable to: ALL

The flight crew can suspect a fuel over read if:

- The sum of FOB and FU is significantly more than FOB at engine start, or is increasing
- There is an abnormal difference between the fuel on board and the expected flight plan fuel
- The total fuel quantity abnormally increases
- The destination EFOB abnormally increases.

FOB / F. USED.....CHECK

● If discrepancy confirmed:
FUEL QTY UNRELIABLE
L2 *FOB must be considered unreliable even if the last two digits of the FOB indications are not dashed on the FUEL SD page and E/WD.*
L1 **COMPUTE FOB FROM INITIAL FOB - F. USED**
INSERT COMPUTED FOB IN FMS FUEL PRED PAGE
L2 *Press the FUEL PRED key on the MCDU console and insert the computed FOB value in the [4R] field (or [3R] field depending on the FMS standard).*
L1 **FMS FUEL PREDICTIONS COMPUTED FROM FUEL FLOW**
L2 *FMS fuel predictions (including FOB and GW) are now computed from the inserted FOB and the fuel flow sensors only. Fuel quantity sensors are no longer used for the FMS fuel predictions.*
L1 **FUEL LO LVL ALERTS REMAIN RELIABLE**
L2 *Fuel low level alerts remain reliable as they are computed from independent sensors.*
L1 **Maintenance action is due before next flight.**

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

FUEL

[QRH] GRAVITY FUEL FEEDING

Ident.: PRO-ABN-FUEL-00011261.0001001 / 17 MAR 17

Applicable to: ALL

ENG MODE SEL.....IGN

AVOID NEGATIVE G FACTOR

MAX FL: GRAVITY FEED CEILING

- Current FL if flight time above FL 300 > 30 min.
- FL 300 if flight time above FL 300 < 30 min.
- Highest of FL 150 or 7 000 ft above takeoff airport if FL 300 never exceeded.
- FL 100 for JET B.

● **When reaching gravity feed ceiling:**

FUEL X FEED..... OFF

● **If no fuel leak and with one engine running (fed by gravity):**

FUEL X FEED..... ON

BANK ANGLE..... 1° WING DOWN ON LIVE ENG SIDE

The fuel from the wing tank on the engine running side is used.

RUDDER TRIM.....USE

Use rudder trim to maintain constant course and neutral stick.

● **When fuel imbalance reaches 1 000 kg (2 200 lb):**

BANK ANGLE.....2° or 3° WING DOWN ON LIVE ENG SIDE

Use fuel from the opposite wing tank, until fuel imbalance is reduced to 0.

FUEL ACT XFR FAULT

Applicable to: ALL

Ident.: PRO-ABN-FUEL-R-00016820.0001001 / 21 MAR 16

ANNUNCIATIONS

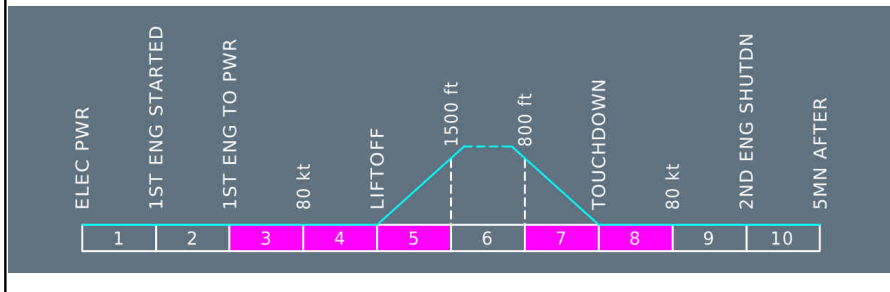
Triggering Conditions:

L2

This alert triggers when:

- The ACT quantity > 250 kg (550 lb) and
- The CTR TK quantity < 3 000 kg (6 600 lb).

Flight Phase Inhibition:



Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

FUEL

FUEL ACT XFR FAULT (Cont'd)

Ident.: PRO-ABN-FUEL-R-00017614.0001001 / 21 MAR 16

ACT.....FWD

● **IF NECESSARY:**

DESCEND TO FL270



Note: - ACT transfer rate depends on altitude and on remaining ACT fuel quantity.
 - If ACT transfer is uncertain, set the ACT pb to AUTO to avoid pump dry running.
 - ACT pb can be set back to FWD at lower Flight Level to recover remaining ACT fuel.



● **WHEN ACT EMPTY:**

ACT.....AUTO

● For A321 aircraft equipped with 1 ACT :

ACT UNUSABLE (IF AUTOMATIC AND MANUAL MODES ARE FAILED)

● For aircraft equipped with 2 ACTs :

● **IF NO XFR:**

ACT UNUSABLE

PROC.....APPLY

Ident.: PRO-ABN-FUEL-R-00011267.0001001 / 13 AUG 10

STATUS

INOP SYS

● **If automatic and manual mode are failed:**

ACT UNUSABLE

ACT XFR

FUEL ACT PUMP LO PR 

Applicable to: ALL

Ident.: PRO-ABN-FUEL-BB-00016811.0001001 / 21 MAR 16

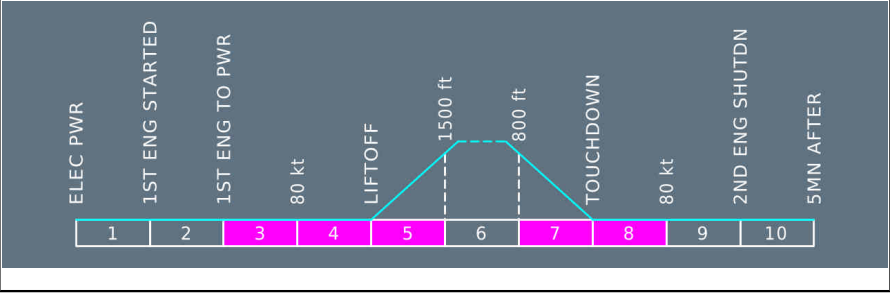
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the ACT pump is in low pressure.

Flight Phase Inhibition:



Ident.: PRO-ABN-FUEL-BB-00018877.0001001 / 21 MAR 16

ACT LO LVL

L2

Note: Displayed if ACT is empty.

L1

ACT.....OFF

PIA A318/A319/A320/A321 FLEET	PRO-ABN-FUEL P 11/54
FCOM	09 FEB 26

PROCEDURES
ABNORMAL AND EMERGENCY PROCEDURES
FUEL

FUEL APU LP VALVE FAULT

Applicable to: ALL

Ident.: PRO-ABN-FUEL-BC-00016826.0001001 / 21 MAR 16

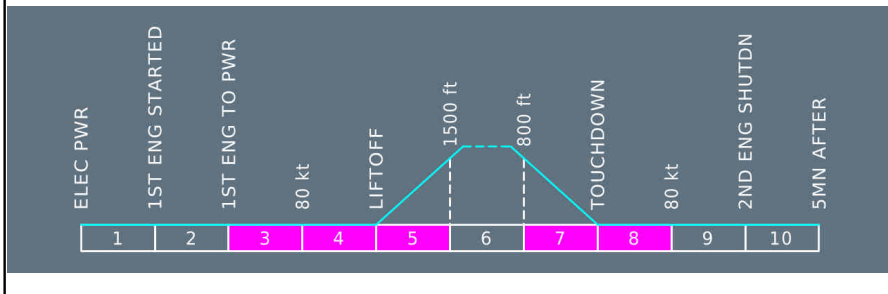
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the valve position disagrees with the selected position.

Flight Phase Inhibition:



Ident.: PRO-ABN-FUEL-BC-00017633.0002001 / 21 MAR 16

Crew awareness.

FUEL AUTO FEED FAULT

Applicable to: MSN 02155-05746

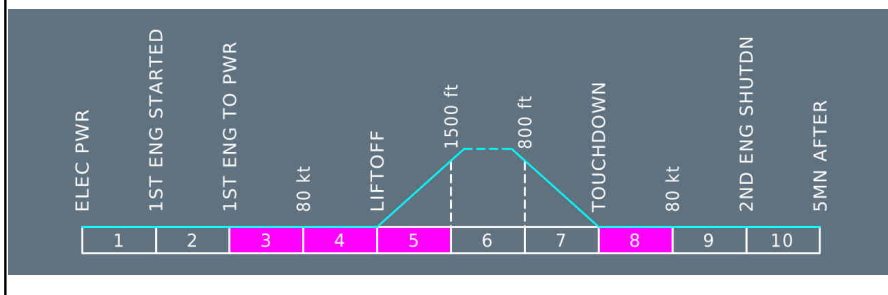
Ident.: PRO-ABN-FUEL-Q-00016698.0001001 / 21 MAR 16

ANNUNCIATIONS
Triggering Conditions:

L2

This alert triggers when:

- CTR TK quantity > 250 kg (550 lb) and left or right wing tanks quantity < 5 000 kg (11 000 lb), or
- CTR TK pumps do not stop after slat extension or CTR TK level is low.

Flight Phase Inhibition:


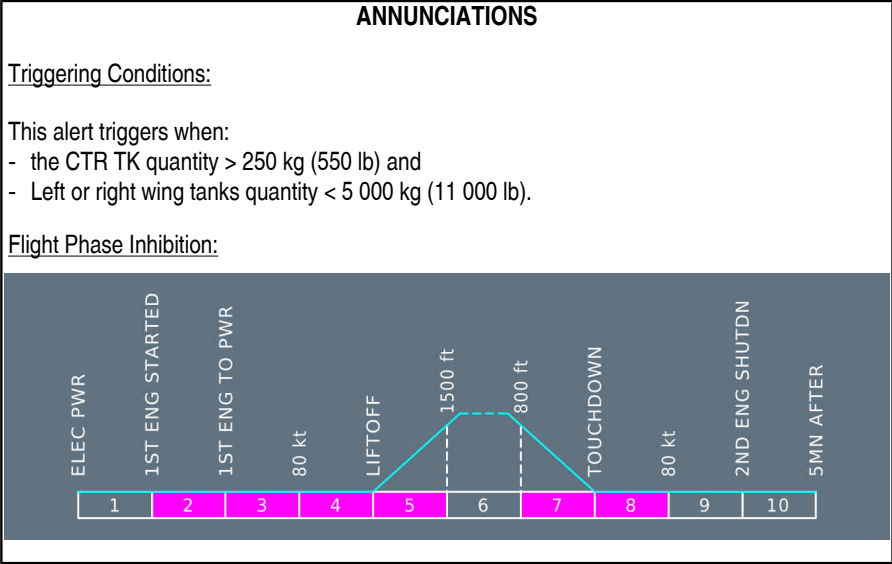
Continued on the following page

FUEL AUTO FEED FAULT (Cont'd)	
Ident.: PRO-ABN-FUEL-Q-00017666.0001001 / 21 MAR 16	
FUEL MODE SEL.....	MAN
L2 The center tank pumps will run and feed the engines.	
L1 ■ Fuel in one wing tank < 5 000 kg (11 000 lb) and in center tank > 250 kg (550 lb):	
CTR TK PUMP 1.....	ON
CTR TK PUMP 2.....	ON
L2 When the center tank is empty, CTR TK PUMP LO PR alert will come on. For aircraft equipped with CFM engines only: If the center tank is not empty at slat extension, CTR TK PUMPS should be switched OFF. This action will prevent a possible wing tank overflow on ground, due to IDG fuel recirculation.	
L1 ■ CTR TK PUMPS running after slat extension, or LO LVL in center tank:	
CTR TK PUMP 1.....	OFF
CTR TK PUMP 2.....	OFF
Ident.: PRO-ABN-FUEL-Q-00018882.0001001 / 21 MAR 16	
STATUS	
CTR TK FEED : MAN ONLY	

FUEL AUTO TRANSFER FAULT

Applicable to: MSN 07784-07792

Ident.: PRO-ABN-FUEL-O-00016830.0001001 / 21 MAR 16



Ident.: PRO-ABN-FUEL-O-00011223.0001001 / 31 AUG 17

FUEL MODE SEL.....MAN

L2

The center tank transfer valves open.

L1

CTR TK L XFR.....ON

CTR TK R XFR.....ON

L2

The flight crew should select the CTR TK L+R XFR pb-switches OFF when the center tank is empty, and/or when the wing tanks are full to prevent overflow.

Ident.: PRO-ABN-FUEL-O-00011225.0001001 / 13 NOV 13

STATUS	
CTR TK FEED : MAN ONLY	

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

FUEL

FUEL CTR L(R) XFR FAULT

Applicable to: MSN 07784-07792

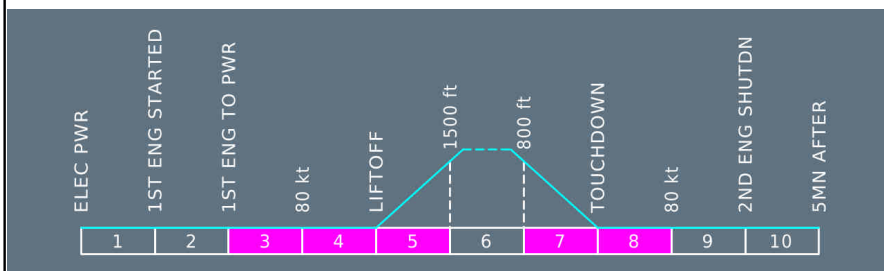
Ident.: PRO-ABN-FUEL-X-00016835.0001001 / 07 NOV 22

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when either center transfer valve is failed.

Flight Phase Inhibition:



Continued on the following page

FUEL CTR L(R) XFR FAULT (Cont'd)

Ident.: PRO-ABN-FUEL-X-00018886.0001001 / 07 NOV 22

■ If valve not fully closed:

CTR TK L(R) XFR..... OFF

● IF UNSUCCESSFUL and if the center tank is not empty:

FUEL X FEED..... ON

L(R) TK PUMP 1..... OFF

L(R) TK PUMP 2..... OFF

L2

Since fuel does not transfer from the center tank to L(R) inner/wing tank, both engines are fed by R(L) inner/wing tank.

L1

Note: **FUEL L(R) TK PUMP 1 + 2 LO PR** triggers.

● When the center tank is empty (automatic recall of the warning):

L(R) TK PUMP 1..... ON

L(R) TK PUMP 2..... ON

FUEL X FEED..... OFF

■ If valve not fully open:

FUEL MODE SEL..... MAN

● IF UNSUCCESSFUL and if the center tank is not empty:

FUEL X FEED..... ON

L(R) TK PUMP 1..... OFF

L(R) TK PUMP 2..... OFF

L2

Since fuel does not transfer from the center tank to L(R) inner/wing tank, both engines are fed by R(L) inner/wing tank.

L1

Note: **FUEL L(R) TK PUMP 1 + 2 LO PR** triggers.

● When the center tank is empty (automatic recall of the warning):

L (R) TK PUMP 1..... ON

L (R) TK PUMP 2..... ON

FUEL X FEED..... OFF

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

FUEL

FUEL CTR L(R) XFR FAULT (Cont'd)

Ident.: PRO-ABN-FUEL-X-00014902.0008001 / 16 MAY 24

STATUS

INOP SYS

- If CTR TK not at low level:
CTR TK FEED : MAN ONLY

L(R) TK PUMPS ⁽¹⁾
 CTR TK L(R) XFR ⁽²⁾

- ⁽¹⁾ (If CTR TK not at low level)
⁽²⁾ (If CTR TK XFR valve fails closed)

FUEL CTR L + R XFR FAULT (VALVES NOT FULLY CLOSED)

Applicable to: MSN 07784-07792

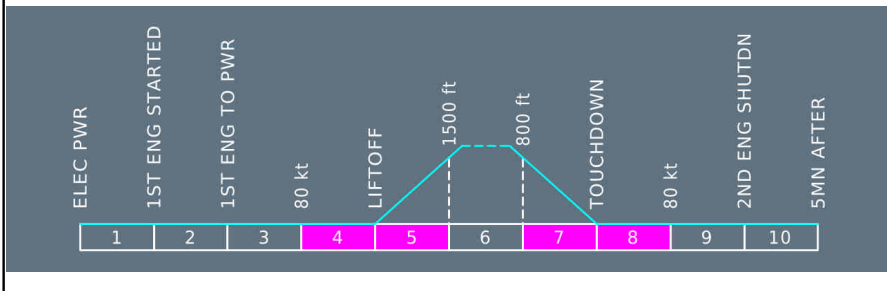
Ident.: PRO-ABN-FUEL-Z-00016838.0001001 / 28 JUL 16

ANNUNCIATIONS

Triggering Conditions:

- L2 This alert triggers when both center transfer valves are failed in open position.

Flight Phase Inhibition:



Continued on the following page

FUEL CTR L + R XFR FAULT (Cont'd)
(VALVES NOT FULLY CLOSED)

Ident.: PRO-ABN-FUEL-Z-00014908.0008001 / 13 NOV 13

CTR TK L XFR.....OFF

CTR TK R XFR.....OFF

Ident.: PRO-ABN-FUEL-Z-00014907.0008001 / 13 NOV 13

STATUS

INOP SYS

CTR TK XFR

FUEL CTR L + R XFR FAULT
(VALVES NOT FULLY OPEN)

Applicable to: MSN 07784-07792

Ident.: PRO-ABN-FUEL-AA-00018051.0003001 / 28 JUL 16

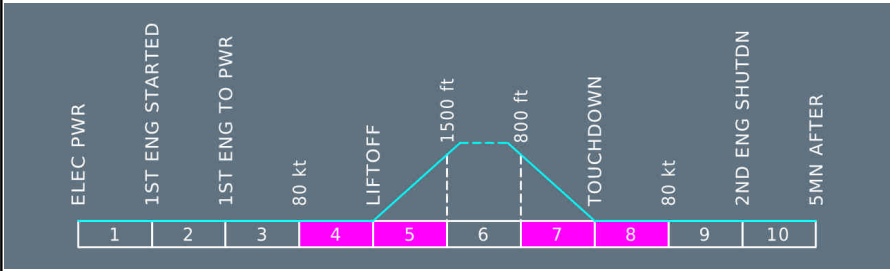
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when both center transfer valves are failed in closed position.

Flight Phase Inhibition:



The diagram shows a flight profile across 10 phases. Phases 1-4 are inhibited (grey). Phases 5-8 are active (pink). The profile starts at 80 kt, rises to 1500 ft at phase 5, stays at 1500 ft through phase 6, descends to 800 ft at phase 7, and reaches TOUCHDOWN at phase 8. Phases 9 and 10 are inhibited (grey).

Phase	1	2	3	4	5	6	7	8	9	10
Event	ELEC PWR	1ST ENG STARTED	1ST ENG TO PWR	80 kt	LIFTOFF	1500 ft	800 ft	TOUCHDOWN	80 kt	2ND ENG SHUTDN
Status	Inhibited	Inhibited	Inhibited	Inhibited	Active	Active	Active	Active	Inhibited	Inhibited

Continued on the following page

PROCEDURES
ABNORMAL AND EMERGENCY PROCEDURES
FUEL

FUEL CTR L + R XFR FAULT (Cont'd)
(VALVES NOT FULLY OPEN)

Ident.: PRO-ABN-FUEL-AA-00014903.0012001 / 13 NOV 13

FUEL MODE SEL.....MAN

● **IF UNSUCCESSFUL:**

CTR AVAIL BY GRAVITY

L2 If the center tank transfer valves are not fully open, the center tank fuel may be used by gravity.

L1 **2 T (4400 LBS) UNUSABLE**

Ident.: PRO-ABN-FUEL-AA-00014904.0011001 / 16 MAY 24

STATUS

INOP SYS

CTR TK USABLE BY GRAVITY
CTR TK FUEL: 2 T (4400 LBS) UNUSABLE
CTR TK FEED : MAN ONLY

CTR TK XFR

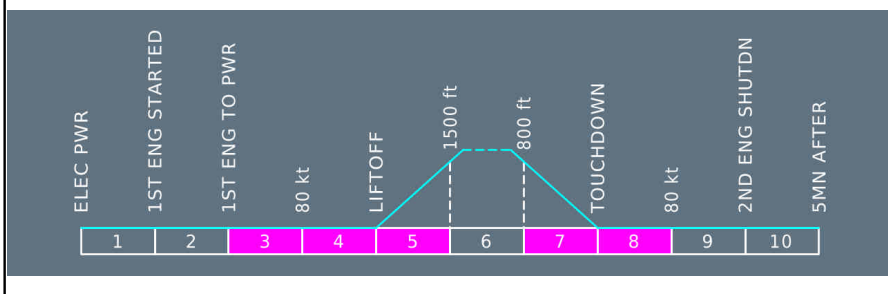
FUEL CTR TK PUMP 1(2) LO PR

Applicable to: MSN 02155-05746

Ident.: PRO-ABN-FUEL-M-00016843.0001001 / 21 MAR 16

ANNUNCIATIONS

Flight Phase Inhibition:



Continued on the following page

FUEL CTR TK PUMP 1(2) LO PR (Cont'd)

Ident.: PRO-ABN-FUEL-M-00018914.0003001 / 21 MAR 16

- **IF NO FUEL LEAK:**

FUEL X FEED.....
ON

CTR TK PUMP (AFFECTED).....
OFF

L2 A fuel imbalance may occur, if the performance of the pumps of one wing is different from that of the other wing, and the CTR TK PUMP that is not affected stops automatically because:

- The L(R) INR TK is full, or
- The CTR TK is empty.

In this case, apply the FUEL IMBALANCE procedure, as required.

- L1 ● **WHEN CTR TK EMPTY:**

FUEL X FEED.....
OFF
- L2 When the CTR TK is empty, the X FEED pb-sw must be turned off, to avoid a possible fuel imbalance.

Ident.: PRO-ABN-FUEL-M-00018918.0002001 / 21 MAR 16

STATUS	
● WHEN CTR TK EMPTY: FUEL X FEED..... OFF	INOP SYS CTR TK PUMP 1(2)

FUEL CTR TK PUMPS LO PR

Applicable to: MSN 02155-05746

Ident.: PRO-ABN-FUEL-N-00016845.0001001 / 21 MAR 16

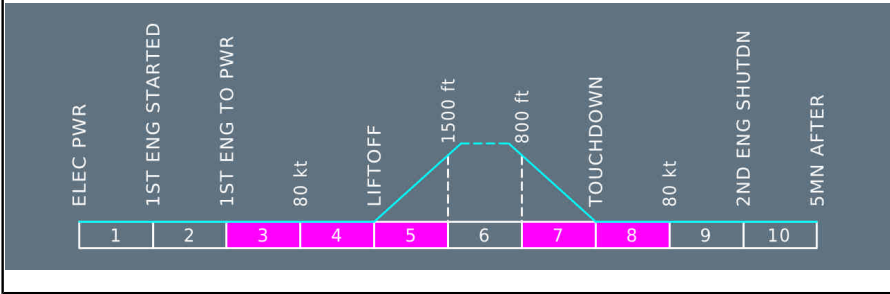
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the pressure of the CTR TK pumps is low.

Flight Phase Inhibition:



Ident.: PRO-ABN-FUEL-N-00011221.0003001 / 17 MAY 24

L2

Set FUEL CTR TK MODE SEL pb-sw to MAN, to avoid the possible triggering of the **FUEL CTR TK PUMPS OFF** ECAM alert.

L1

CTR TK PUMP 1..... OFF
CTR TK PUMP 2..... OFF
FUEL X FEED..... OFF
CTR TK UNUSABLE

L2

Gravity feeding from the center tank is not possible (no by-pass valve fitted on the center tank pumps).

Ident.: PRO-ABN-FUEL-N-00011222.0001001 / 13 AUG 10

STATUS

INOP SYS

CTR TK FUEL UNUSABLE

CTR TK PUMPS

FUEL CTR TK PUMPS OFF

Applicable to: MSN 02155-05746

Ident.: PRO-ABN-FUEL-BE-00016846.0001001 / 21 MAR 16

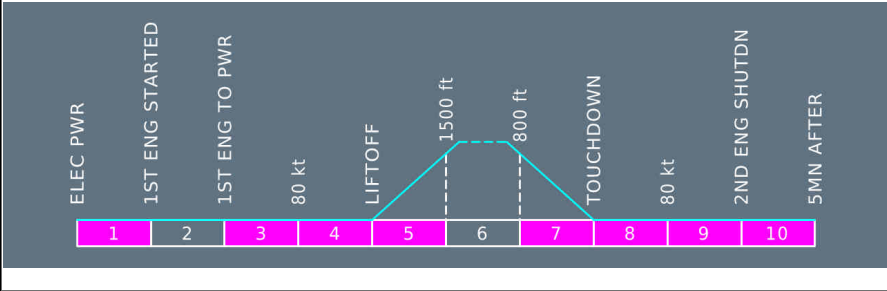
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when both CTR TK PUMP 1 pb-sw and CTR TK PUMP 2 pb-sw are at OFF with no failure.

Flight Phase Inhibition:



Ident.: PRO-ABN-FUEL-BE-00011260.0002001 / 10 JAN 11

L2

The center tank pumps pushbuttons are OFF , with slats retracted.

L1

CTR TK PUMP 1..... ON
 CTR TK PUMP 2..... ON

FUEL CTR TK XFR OFF

Applicable to: MSN 07784-07792

Ident.: PRO-ABN-FUEL-BF-00016847.0001001 / 21 MAR 16

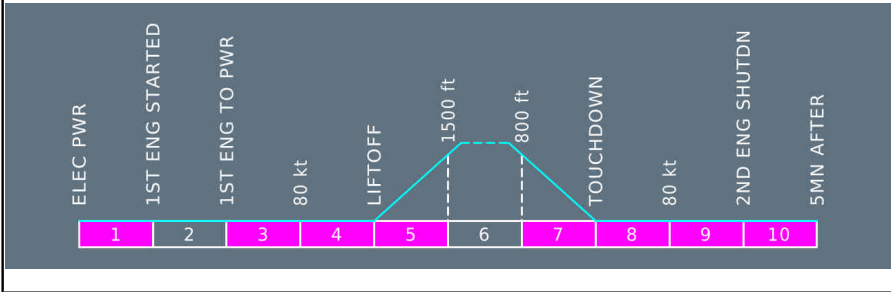
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when both CTR TK L XFR pb-sw and CTR TK R XFR pb-sw at OFF when the system is in automatic mode.

Flight Phase Inhibition:



Ident.: PRO-ABN-FUEL-BF-00011239.0001001 / 13 AUG 10

L2

Center tank transfer valves pushbuttons at off.

L1

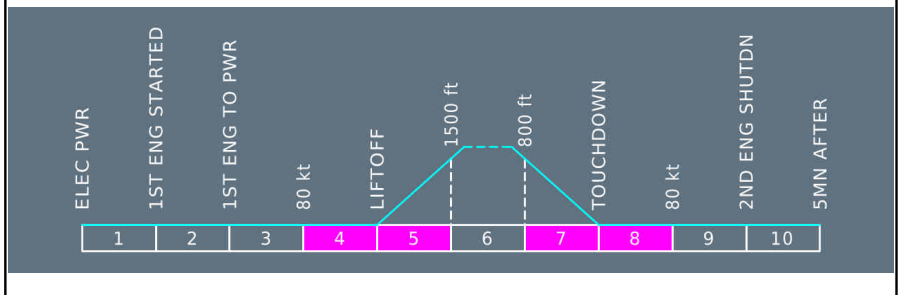
CTR TK L XFR..... ON
 CTR TK R XFR..... ON

FUEL ENG 1(2) LP VALVE FAULT
Applicable to: ALL

1 Ident.: PRO-ABN-FUEL-BT-00024813.0001001 / 19 NOV 21

ANNUNCIATIONS
Triggering Conditions:
L2

This alert triggers when the valve position disagrees with the selected position.

Flight Phase Inhibition:


2 Ident.: PRO-ABN-FUEL-BT-00024818.0001001 / 19 NOV 21

Crew awareness.

FUEL F. USED/FOB DISAGREE

Applicable to: MSN 02926-02944, 05152-07792

Ident.: PRO-ABN-FUEL-BH-00016816.0002001 / 21 MAR 16

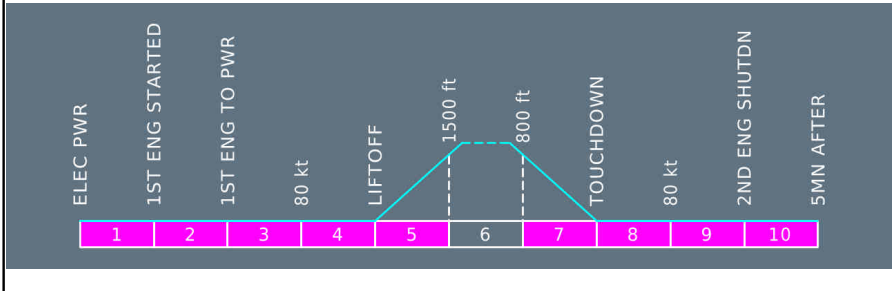
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the difference between the initial FOB and the actual FOB + fuel used is significant.

Flight Phase Inhibition:



Ident.: PRO-ABN-FUEL-BH-00017634.0005001 / 30 MAR 18

- If current FOB + FUEL USED is more than initial FOB:
OVERREAD PROC.....APPLY
- If current FOB + FUEL USED is less than initial FOB:
FUEL LEAK PROC.....APPLY

FUEL FQI CH 1(2) FAULT

Applicable to: ALL

Ident.: PRO-ABN-FUEL-BI-00016817.0001001 / 21 MAR 16

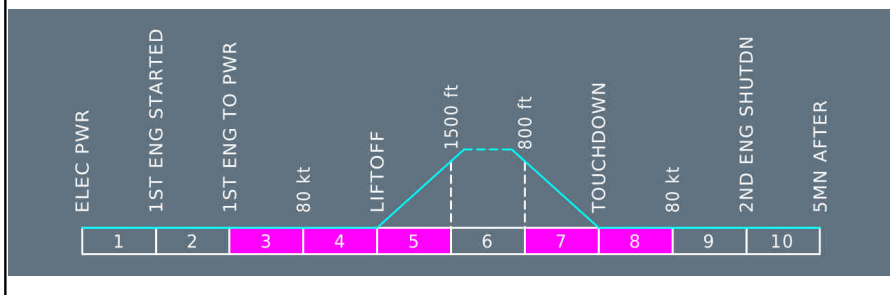
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when a FQI channel is failed.

Flight Phase Inhibition:



Ident.: PRO-ABN-FUEL-BI-00011216.0001001 / 25 FEB 14

Crew awareness.

FUEL FQI CH 1+2 FAULT

Applicable to: ALL

Ident.: PRO-ABN-FUEL-BW-00023773.0001001 / 09 APR 20

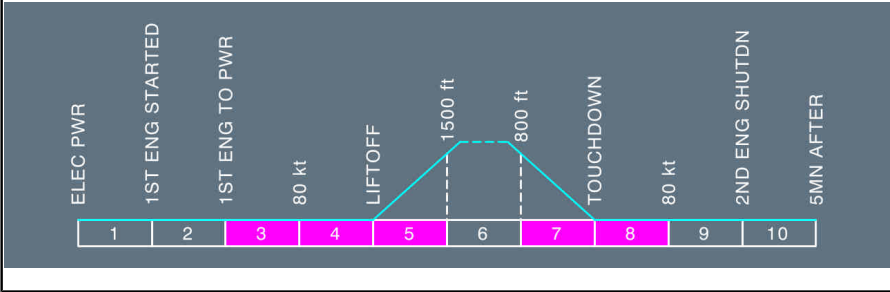
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when both FQI channels are failed.

Flight Phase Inhibition:



Ident.: PRO-ABN-FUEL-BW-00023774.0001001 / 12 NOV 24

FQI 1+2.....RESET

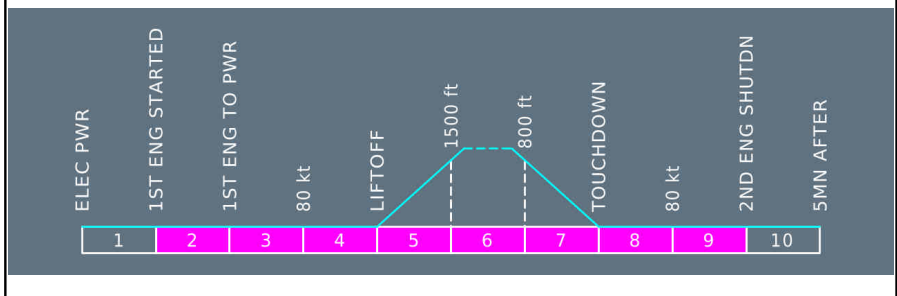
FUEL IDG 1(2) COOL FAULT

Applicable to: MSN 02719-07792

Ident.: PRO-ABN-FUEL-BK-00016821.0001001 / 21 MAR 17

ANNUNCIATIONS
Triggering Conditions:
L2

This alert triggers when equipment related to the fuel recirculation command is failed.

Flight Phase Inhibition:


Ident.: PRO-ABN-FUEL-BK-00011262.0001001 / 25 FEB 14

L2

Maintenance action is due.

L1

Crew awareness.

PROCEDURES
ABNORMAL AND EMERGENCY PROCEDURES
FUEL

FUEL FUEL INERTING SYS FAULT

Applicable to: MSN 04392-07792

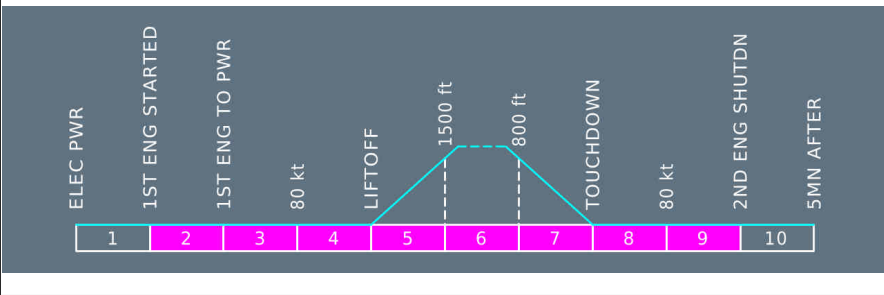
Ident.: PRO-ABN-FUEL-U-00016823.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the fuel inerting system is failed.

Flight Phase Inhibition:



Ident.: PRO-ABN-FUEL-U-00014390.0002001 / 25 FEB 14

Crew awareness.

Ident.: PRO-ABN-FUEL-U-00014391.0002001 / 30 MAR 12

STATUS

INOP SYS

FUEL INERT

FUEL L (R) OUTER (INNER) TK HI TEMP

Applicable to: MSN 02155-02212

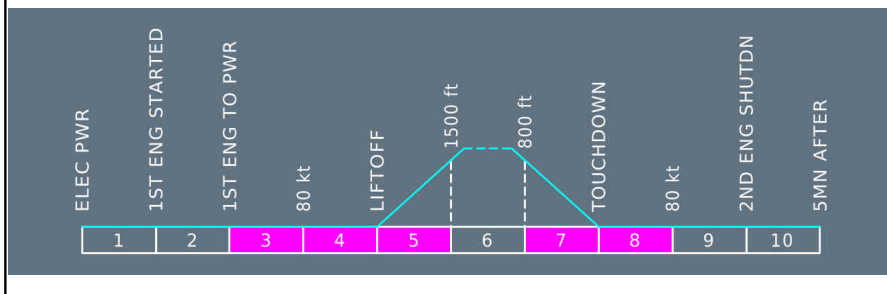
Ident.: PRO-ABN-FUEL-BL-00016825.0001001 / 21 MAR 16

ANNUNCIATIONS
Triggering Conditions:

L2

This alert triggers when the fuel temperature:

- In outer cell, is above 55 °C on ground
- In outer cell, is above 60 °C in flight
- In inner cell, is above 45 °C on ground
- In inner cell, is above 54 °C in flight.

Flight Phase Inhibition:


Continued on the following page

FUEL L (R) OUTER (INNER) TK HI TEMP (Cont'd)

Ident.: PRO-ABN-FUEL-BL-00011214.0001001 / 10 MAY 21

This caution may spuriously trigger due to interference from communication equipment. Therefore, the flight crew should wait 2 min while the fuel temperature measurement is updated. After 2 min, if the ECAM caution has not disappeared, the flight crew must apply the following procedure:

GALLEY..... **OFF**

[L2] *Reducing electrical loads reduce heat emitted by IDG.*

[L1] ■ **On the ground:**

■ **If the fuel temperature reaches 55° C in outer tank or 45° C in inner tank:**

LIMITED TAXI TIME

Note: Monitor fuel temperature. Takeoff may be performed until the fuel temperature reaches 60°C in the outer tank or 54°C in the inner tank.

■ **If the fuel temperature reaches 60° C in outer tank or 54° C in inner tank:**

DELAY T.O.

ENG MASTER (AFFECTED SIDE)..... **OFF**

■ **In flight:**

ENG F. FLOW (AFFECTED SIDE)..... **INCREASE**

[L2] *Disconnect autothrust. Adjust the thrust lever to increase fuel flow through the IDG oil heat exchanger and decrease the temperature of the fuel returning to the outer cell.*

[L1] ● **IF TEMP ABV 65° C in outer cell or 57° C in inner cell:**

APU..... **AS RQRD**

[L2] *APU if available may be started and APU GEN used to allow IDG disconnection.*

[L1] ● **If opposite GEN avail:**

IDG (AFFECTED SIDE)..... **OFF**

FUEL L (R) OUTER (INNER) TK HI TEMP

Applicable to: MSN 02719-07792

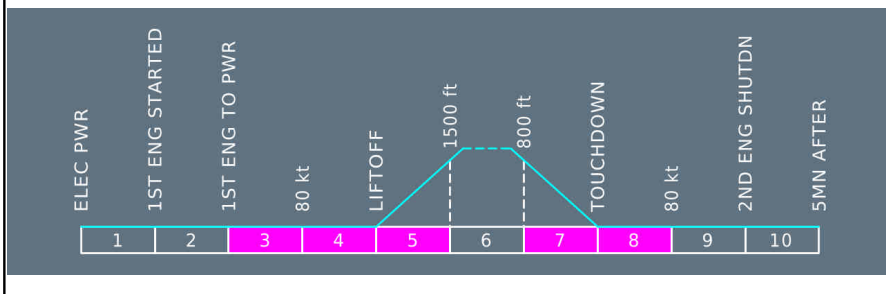
Ident.: PRO-ABN-FUEL-BL-00016825.0001001 / 21 MAR 16

ANNUNCIATIONS
Triggering Conditions:

L2

This alert triggers when the fuel temperature:

- In outer cell, is above 55 °C on ground
- In outer cell, is above 60 °C in flight
- In inner cell, is above 45 °C on ground
- In inner cell, is above 54 °C in flight.

Flight Phase Inhibition:


Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

FUEL

FUEL L (R) OUTER (INNER) TK HI TEMP (Cont'd)

Ident.: PRO-ABN-FUEL-BL-00011214.0005001 / 10 MAY 21

GALLEY OFF

[L2] Reducing electrical loads reduce heat emitted by IDG.

[L1] ■ On the ground:

■ If the fuel temperature reaches 55° C in outer tank or 45° C in inner tank:

LIMITED TAXI TIME

Note: Monitor fuel temperature. Takeoff may be performed until the fuel temperature reaches 60° C in the outer tank or 54° C in the inner tank.

■ If the fuel temperature reaches 60° C in outer tank or 54° C in inner tank:

DELAY T.O.

ENG MASTER (AFFECTED SIDE) OFF

■ In flight:

ENG F. FLOW (AFFECTED SIDE) INCREASE

[L2] Disconnect autothrust. Adjust the thrust lever to increase fuel flow through the IDG oil heat exchanger and decrease the temperature of the fuel returning to the outer cell.

[L1] ● IF TEMP ABV 65° C in outer cell or 57° C in inner cell:

APU AS RQRD

[L2] APU if available may be started and APU GEN used to allow IDG disconnection.

[L1] ● If opposite GEN avail:

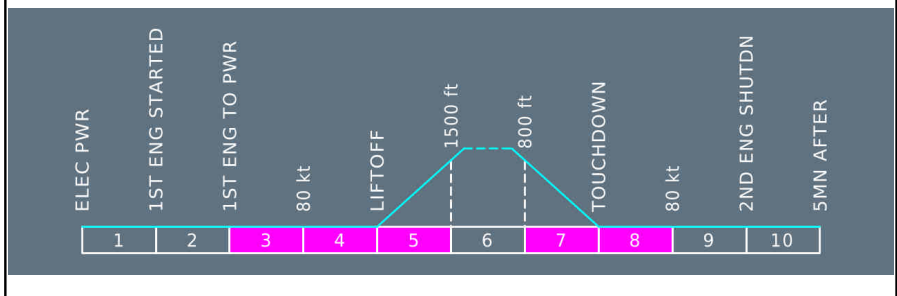
IDG (AFFECTED SIDE) OFF

FUEL L (R) OUTER (INNER) TK LO TEMP
Applicable to: ALL

Ident.: PRO-ABN-FUEL-BM-00016827.0001001 / 21 MAR 16

ANNUNCIATIONS
Triggering Conditions:
L2

This alert triggers when the fuel temperature is approximately below -43 °C.

Flight Phase Inhibition:


Ident.: PRO-ABN-FUEL-BM-00011208.0001001 / 25 FEB 14

■ On the ground before takeoff:
DELAY T.O
L2

Do not takeoff until temperatures are within limits.

L1
■ In flight:

Crew awareness.

L2

Consider descending to a lower altitude and/or increasing Mach to increase TAT.

FUEL L (R) OUTER XFR CLOSED

Applicable to: ALL

Ident.: PRO-ABN-FUEL-V-00016829.0001001 / 21 MAR 16

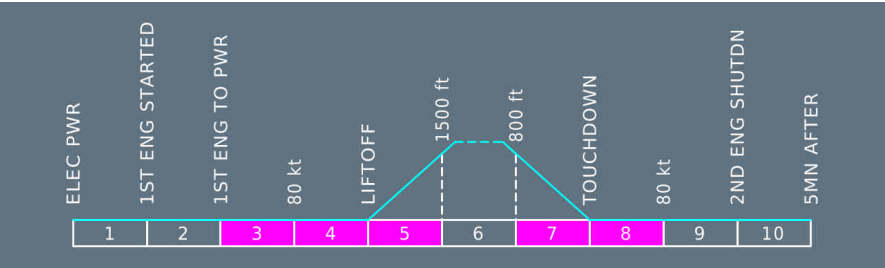
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when both transfer valves remain closed after inner tank reaches the low level.

Flight Phase Inhibition:



Ident.: PRO-ABN-FUEL-V-00014879.0006001 / 07 MAR 13

Note: When fuel quantity in affected wing reaches low level, corresponding FUEL WING TK LO LVL warning is triggered.

L (R) OUTER TK UNUSABLE

Ident.: PRO-ABN-FUEL-V-00014881.0006001 / 07 MAR 13

STATUS

L (R) OUTER TK UNUSABLE

FUEL L (R) OUTER XFR OPEN

Applicable to: ALL

Ident.: PRO-ABN-FUEL-W-00016831.0001001 / 21 MAR 16

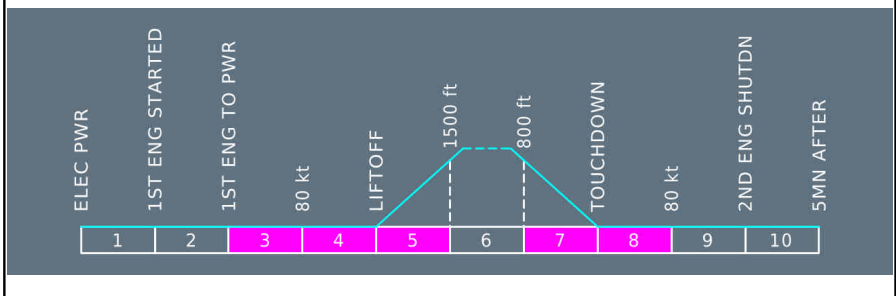
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when either transfer valve opens before inner tank reaches low level.

Flight Phase Inhibition:



Ident.: PRO-ABN-FUEL-W-00014882.0006001 / 25 FEB 14

Crew awareness.

Ident.: PRO-ABN-FUEL-W-00014883.0006001 / 07 MAR 13

STATUS

INOP SYS

L (R) CELL VALVE

FUEL L (R) TK PUMP 1(2) LO PR

Applicable to: ALL

Ident.: PRO-ABN-FUEL-D-00016832.0001001 / 21 MAR 16

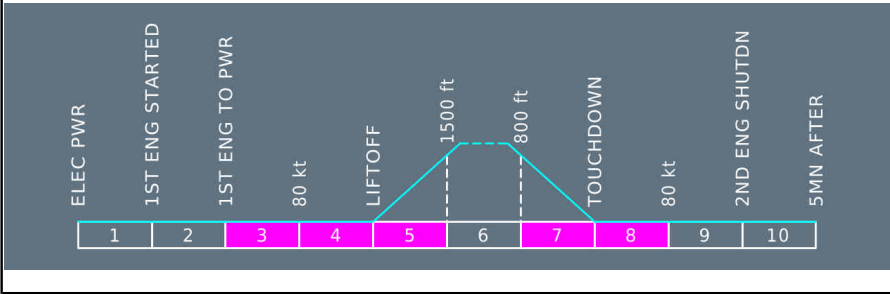
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the pressure of one tank pump is low.

Flight Phase Inhibition:



Ident.: PRO-ABN-FUEL-D-00011177.0002001 / 13 AUG 10

TK PUMP (AFFECTED).....OFF

L2

Note: Aircraft altitude must be limited to 35 000 ft if a single fuel pump feeds both engines with hot JET B (JP4) fuel (fuel temperature above 30 °C).

Ident.: PRO-ABN-FUEL-D-00011178.0001001 / 13 AUG 10

STATUS

INOP SYS

TK PUMP (affected)

FUEL L (R) TK PUMP 1 + 2 LO PR

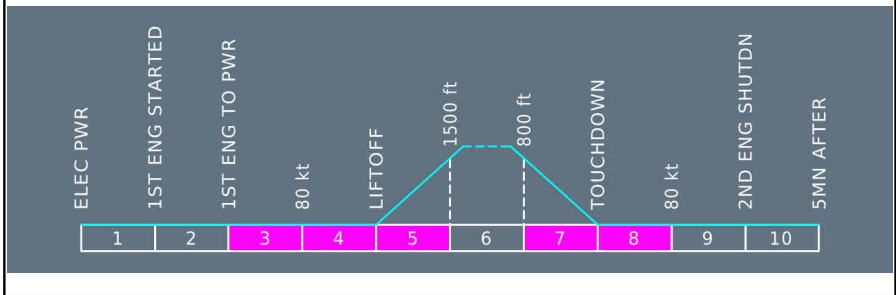
Applicable to: MSN 07784-07792

Ident.: PRO-ABN-FUEL-A-00016833.0001001 / 21 MAR 16

ANNUNCIATIONS
Triggering Conditions:

L2

This alert triggers when the pressure of the tank pumps is low.

Flight Phase Inhibition:


Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

FUEL

FUEL L (R) TK PUMP 1 + 2 LO PR (Cont'd)

6Ident.: PRO-ABN-FUEL-A-00017636.0002001 / 19 NOV 21

- **IF NO FUEL LEAK:**
 FUEL X FEED (IF ABOVE FL150)..... ON

ENG MODE selector.....IGN

[L2] *The selection of continuous relight protects against flame-out, caused by possible fuel supply surging.*

- [L1] TK PUMP 1 (AFFECTED).....OFF
- TK PUMP 2 (AFFECTED).....OFF

- **WHEN TK (affected) FUEL RQRD:**
 TK (AFFECTED) FEED..... GRVTY ONLY

[L2] *Refer to PRO-ABN-FUEL [QRH] GRAVITY FUEL FEEDING.*

Fuel from the affected tank may be used immediately if there is no ceiling limitation for gravity fuel feeding.

- [L1] FUEL X FEED (IF BELOW FL150).....OFF

- **If FUEL X FEED off:**

[L2] As long as fuel X feed is closed, associated engine is fed by gravity only.

- [L1] **PROC: GRVTY FUEL FEEDING**

[L2] *Refer to PRO-ABN-FUEL [QRH] GRAVITY FUEL FEEDING.*

- [L1] **AVOID NEG G LOAD**

[L2] *Avoiding negative g load will prevent fuel surging and therefore reduce the risk of engine malfunction.*

7Ident.: PRO-ABN-FUEL-A-00018926.0002001 / 19 NOV 21

STATUS

- **If FUEL X FEED off:**
 PROC: GRVTY FUEL FEEDING
 AVOID NEG G LOAD

 TK (AFFECTED) GRVTY FEED ONLY

INOP SYS

TK PUMPS (affected)

FUEL L (R) TK PUMP 1 + 2 LO PR
(CENTER TANK EMPTY)

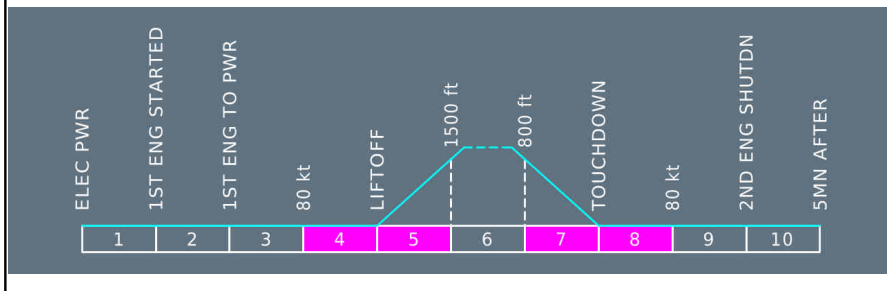
Applicable to: MSN 02155-05746

Ident.: PRO-ABN-FUEL-C-00018184.0005001 / 24 MAR 20

ANNUNCIATIONS
Triggering Conditions:

L2

This alert triggers when the pressure of the tank pumps is low.

Flight Phase Inhibition:


Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

FUEL

FUEL L (R) TK PUMP 1 + 2 LO PR (Cont'd)

(CENTER TANK EMPTY)

9Ident.: PRO-ABN-FUEL-C-00017648.0005001 / 19 NOV 21

- **IF NO FUEL LEAK:**
 - FUEL X FEED (IF ABOVE FL150)..... ON
 - ENG MODE selector.....IGN
- [L2] *The selection of continuous relight protects against flame-out, caused by possible fuel supply surging.*
- [L1] TK PUMP 1 (AFFECTED).....OFF
- TK PUMP 2 (AFFECTED).....OFF
- **WHEN TK (affected) FUEL RQRD:**
 - TK (AFFECTED) FEED..... GRVTY ONLY
- [L2] *Refer to PRO-ABN-FUEL [QRH] GRAVITY FUEL FEEDING.*
Fuel from the affected tank may be used immediately if there is no ceiling limitation for gravity fuel feeding.
- [L1] FUEL X FEED (IF BELOW FL150).....OFF
- **If FUEL X FEED off:**
 - [L2] As long as fuel X feed is closed, associated engine is fed by gravity only.
 - [L1] **PROC: GRVTY FUEL FEEDING**
 - [L2] *Refer to PRO-ABN-FUEL [QRH] GRAVITY FUEL FEEDING.*
 - [L1] **AVOID NEG G LOAD**
 - [L2] *Avoiding negative g load will prevent fuel surging and therefore reduce the risk of engine malfunction.*

10Ident.: PRO-ABN-FUEL-C-00011175.0003001 / 19 NOV 21

STATUS

- **If FUEL X FEED off:**
 - PROC:GRVTY FUEL FEEDING
 - AVOID NEG G LOAD
 - TK (AFFECTED) GRVTY FEED ONLY

INOP SYS

TK PUMPS (affected)

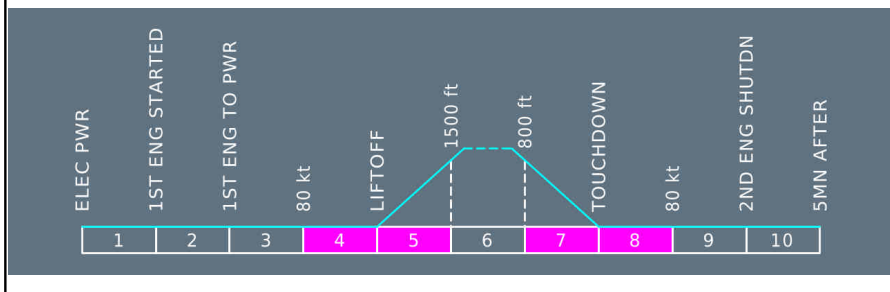
FUEL L (R) TK PUMP 1 + 2 LO PR
(CENTER TANK NOT EMPTY)

Applicable to: MSN 02155-05746

Ident.: PRO-ABN-FUEL-B-00018196.0004001 / 24 MAR 20

ANNUNCIATIONS
Triggering Conditions:

L2 This alert triggers when the pressure of the tank pumps is low.

Flight Phase Inhibition:


Ident.: PRO-ABN-FUEL-B-00011170.0003001 / 26 JUL 12

FUEL MODE SEL (IF CTR TK NOT FEEDING).....MAN

 L2 Setting **FUEL MODE SEL** pb-sw to **MAN** will allow center tank pumps to run.

If the center tank is not empty at slat extension, CTR TK PUMPS should be switched OFF. This action will prevent a possible wing tank overflow on ground, due to IDG fuel recirculation.

 L1 **TK PUMP 1 (AFFECTED).....OFF**
TK PUMP 2 (AFFECTED).....OFF
● WHEN TK (affected) FUEL RQRD:

L2 Apply the GRVTY FUEL FEEDING procedure, (Refer to PRO-ABN-FUEL [QRH] GRAVITY FUEL FEEDING).

 L1 **TK (AFFECTED) FEED.....GRVTY ONLY**
PROC: GRVTY FUEL FEEDING

Continued on the following page

FUEL L (R) TK PUMP 1 + 2 LO PR (Cont'd)
(CENTER TANK NOT EMPTY)

Ident.: PRO-ABN-FUEL-B-00011171.0001001 / 13 AUG 10

STATUS

PROC:GRVTY FUEL FEEDING

TK (AFFECTED) GRVTY FEED ONLY

CTR TK FEED: MAN ONLY

INOP SYS

TK PUMPS (affected)

FUEL L (R) WING TK LO LVL

Applicable to: ALL

Ident.: PRO-ABN-FUEL-E-00016837.0001001 / 21 MAR 16

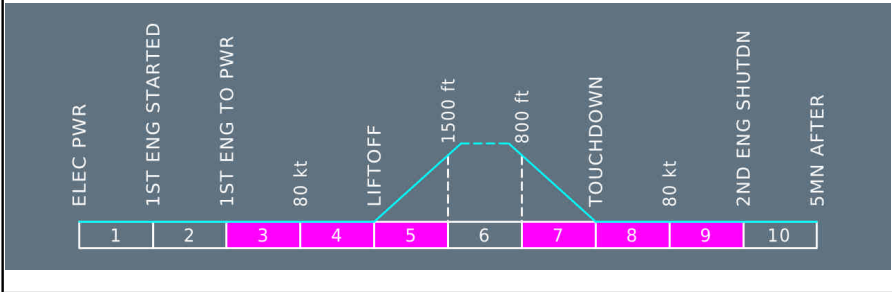
ANNUNCIATIONS

Triggering Conditions:

2

 This alert triggers when left or right wing tanks quantity is below 750 kg (1 650 lb). This alert is triggered by sensors getting dry and is independent from the fuel quantity indications.

Flight Phase Inhibition:



Continued on the following page

FUEL L (R) WING TK LO LVL (Cont'd)

Ident.: PRO-ABN-FUEL-E-00018927.0003001 / 30 MAR 18

- If center tank not empty:

FUEL MODE SEL.....MAN
- IF NO FUEL LEAK:

FUEL X FEED.....ON

TK PUMP 1 (ON SIDE WITH LO LVL).....OFF

TK PUMP 2 (ON SIDE WITH LO LVL).....OFF

L2

Note: TK PUMP 1+2 LO PR warning will be triggered on side with LO LVL.

Ident.: PRO-ABN-FUEL-E-00018928.0001001 / 21 MAR 16

- STATUS

INOP SYS

TK PUMPS
- If center tank not empty:

CTR TK FEED: MAN ONLY

FUEL L + R WING TK LO LVL

Applicable to: MSN 02155-05746

Ident.: PRO-ABN-FUEL-BO-00016810.0001001 / 21 MAR 16

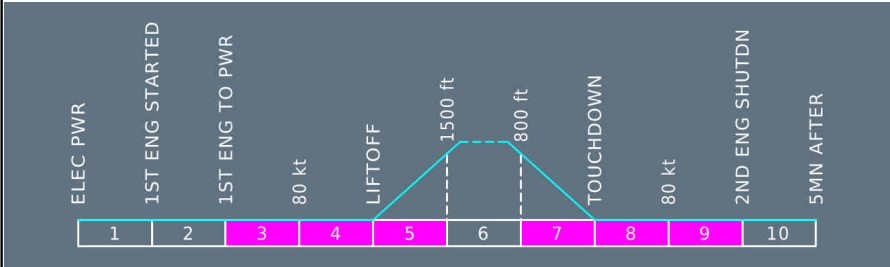
ANNUNCIATIONS

Triggering Conditions:

L2

 This alert triggers when the low level is detected in both wing inner tanks. The alert is triggered by sensors getting dry and is independent from the fuel quantity indications.

Flight Phase Inhibition:



Ident.: PRO-ABN-FUEL-BO-00018673.0003001 / 13 MAY 25

LAND ASAP

FUEL MODE SEL (IF CENTER TANK NOT EMPTY).....MAN
 LEFT TK PUMPS 1+2.....ON
 CTR TK PUMPS 1+2.....ON
 RIGHT TK PUMPS 1+2.....ON

L2

 All pumps in the center tank and in the wing tanks will run.

L1

■ IF NO FUEL LEAK:

FUEL X FEED.....ON

■ IF GRVTY FEED:

FUEL X FEED.....OFF

Continued on the following page

FUEL L + R WING TK LO LVL (Cont'd)

Ident.: PRO-ABN-FUEL-BO-00028069.0001001 / 16 MAY 24	
● If CTR TK not empty: CTR TK FEED : MAN ONLY	STATUS

FUEL L + R WING TK LO LVL

Applicable to: MSN 07784-07792

Ident.: PRO-ABN-FUEL-BO-00016810.0001001 / 21 MAR 16

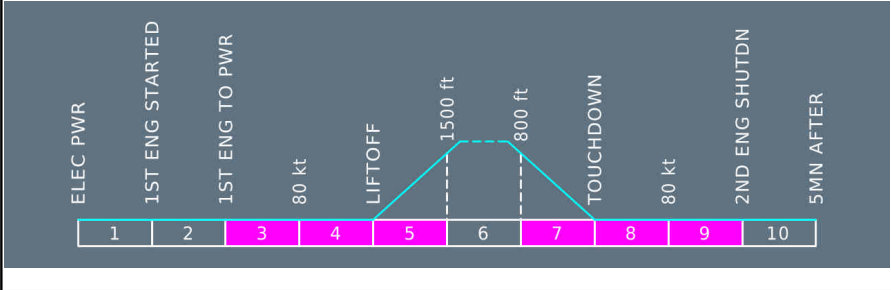
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the low level is detected in both wing inner tanks. The alert is triggered by sensors getting dry and is independent from the fuel quantity indications.

Flight Phase Inhibition:



The diagram shows a timeline of flight phases from 1 to 10. Phases 1-4 are blue, 5-7 are red, and 8-10 are blue. A red line indicates the fuel low level alert is active from phase 5 to 7. Vertical dashed lines mark 1500 ft and 800 ft altitudes. Labels above the timeline include: ELEC PWR, 1ST ENG STARTED, 1ST ENG TO PWR, 80 kt, LIFTOFF, 1500 ft, 800 ft, TOUCHDOWN, 80 kt, 2ND ENG SHUTDN, and 5MN AFTER.

Continued on the following page

PROCEDURES
ABNORMAL AND EMERGENCY PROCEDURES
FUEL

FUEL L + R WING TK LO LVL (Cont'd)

Ident.: PRO-ABN-FUEL-BO-00018673.0004001 / 13 MAY 25

LAND ASAP

FUEL MODE SEL (IF CENTER TANK NOT EMPTY).....MAN
LEFT TK PUMPS 1+2.....ON
CTR TK L+R XFR.....ON
RIGHT TK PUMPS 1+2.....ON

 The transfer valves of the center tank will open, and all pumps in the wing tanks will run.

 **IF NO FUEL LEAK:**
FUEL X FEED.....ON

IF GRVTY FEED:
FUEL X FEED.....OFF

Ident.: PRO-ABN-FUEL-BO-00028069.0001001 / 16 MAY 24

STATUS

● If CTR TK not empty:
CTR TK FEED : MAN ONLY

FUEL L (R) WING TK OVERFLOW

Applicable to: MSN 05152-05746

Ident.: PRO-ABN-FUEL-P-00016818.0002001 / 21 MAR 16

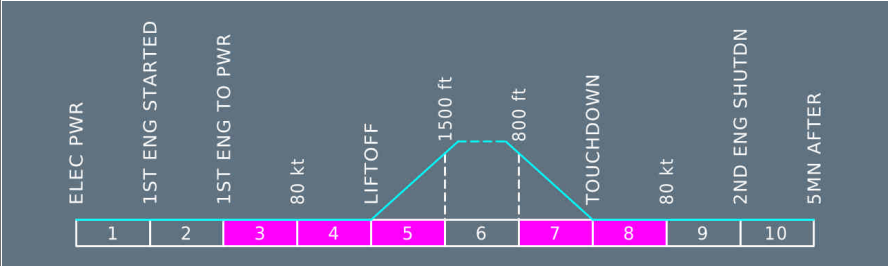
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when an overflow of the tank is detected.

Flight Phase Inhibition:



Ident.: PRO-ABN-FUEL-P-00018938.0003001 / 21 MAR 16

FUEL X FEED.....OFF
 FUEL MODE SEL.....AUTO
 CTR TK PUMP 1(2).....OFF

L2

When the CTR TK PUMP 1(2) is ON, fuel from the center tank can be used to cool the IDG 1(2) and recirculate into the left (right) outer tank. Switching the CTR TK PUMP 1(2) OFF enables to stop this fuel recirculation.

L1

EXPECT FUEL IMBALANCE

Ident.: PRO-ABN-FUEL-P-00018980.0002001 / 21 MAR 16

STATUS

INOP SYS

CTR TK PUMP 1(2)

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

FUEL

FUEL L (R) WING TK OVERFLOW

Applicable to: MSN 07784-07792

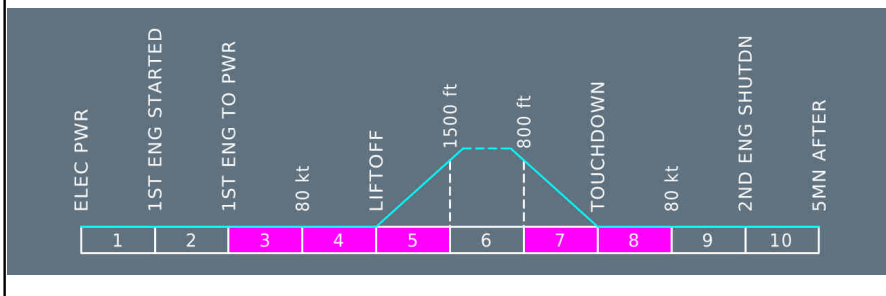
Ident.: PRO-ABN-FUEL-P-00016818.0002001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when an overflow of the tank is detected.

Flight Phase Inhibition:



Continued on the following page

FUEL L (R) WING TK OVERFLOW (Cont'd)

Ident.: PRO-ABN-FUEL-P-00018938.0001001 / 03 NOV 21

CTR TK L(R) XFR.....OFF

L2

If this action is successful, it will take up to 5 min for this ECAM alert to be removed. This is the necessary time for the overflow sensor to become dry again.

L1

● IF UNSUCCESSFUL

L2

Turn off both L(R) wing tank pumps to stop the fuel transfer from the center tank to the L(R) wing tank.

As a result, both engines are fed by the wing tank with the running fuel pumps until the center tank is empty. The FUEL L(R) WING TK OVERFLOW alert may remain displayed until the center tank is empty.

L1

FUEL X FEED.....ON
L(R) TK PUMP 1.....OFF
L(R) TK PUMP 2.....OFF

● When center tank empty:
L(R) TK PUMP 1.....ON
L(R) TK PUMP 2.....ON
FUEL X FEED.....OFF

Ident.: PRO-ABN-FUEL-P-00018980.0001001 / 21 MAR 16

STATUS	
	INOP SYS CTR TK L (R) XFR

PROCEDURES
ABNORMAL AND EMERGENCY PROCEDURES
FUEL

FUEL LO LVL DET FAULT

Applicable to: MSN 02719-07792

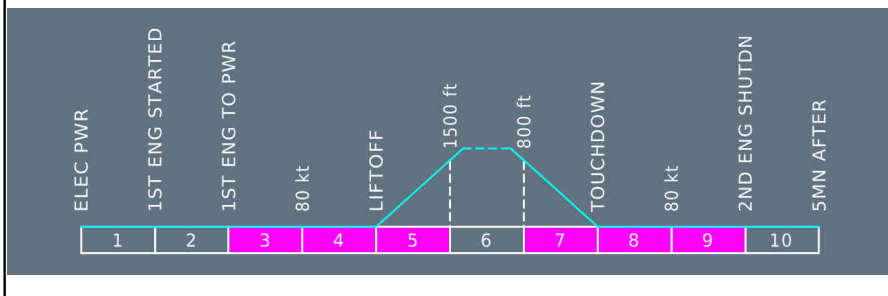
Ident.: PRO-ABN-FUEL-BQ-00016840.0002001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when both low level sensors are failed.

Flight Phase Inhibition:



Ident.: PRO-ABN-FUEL-BQ-00011263.0001001 / 25 FEB 14

L2 Maintenance action is due.

L1 Crew awareness.

FUEL X FEED VALVE FAULT

Applicable to: ALL

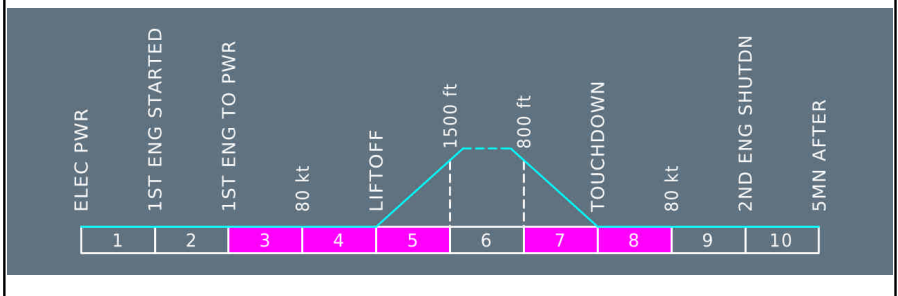
Ident.: PRO-ABN-FUEL-J-00016842.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the valve position disagrees with the selected position.

Flight Phase Inhibition:


Ident.: PRO-ABN-FUEL-J-00011206.0001001 / 25 FEB 14

L2

If valve failed open, maintain fuel balance with selective use of pumps.

If valve failed closed and if unable to maintain an acceptable balance, land as soon as possible.

L1

Crew awareness.

Ident.: PRO-ABN-FUEL-J-00011207.0001001 / 13 AUG 10

STATUS

INOP SYS

FUEL X FEED

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

FUEL

Intentionally left blank

FWS AUDIO DEGRADED

Applicable to: ALL

1 Ident.: PRO-ABN-FWS-A-00024990.0001001 / 18 NOV 21

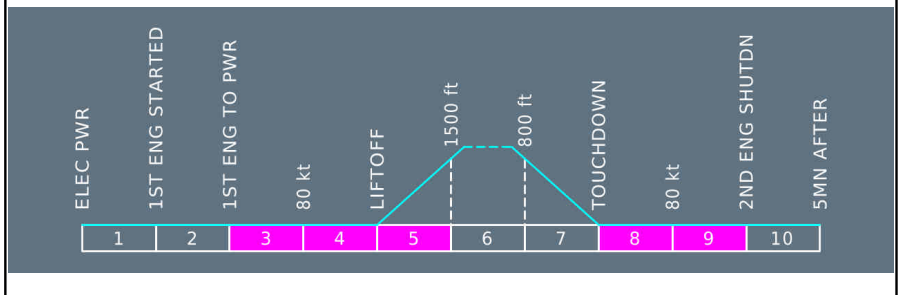
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when synthetic voice is lost for more than 4 s.

Flight Phase Inhibition:



2 Ident.: PRO-ABN-FWS-A-00024991.0001001 / 18 NOV 21

AUDIO CALLOUT LOST
SYNTH VOICE MSG LOST

FWS AUDIO REDUND LOST ON FWC 1(2)

Applicable to: ALL

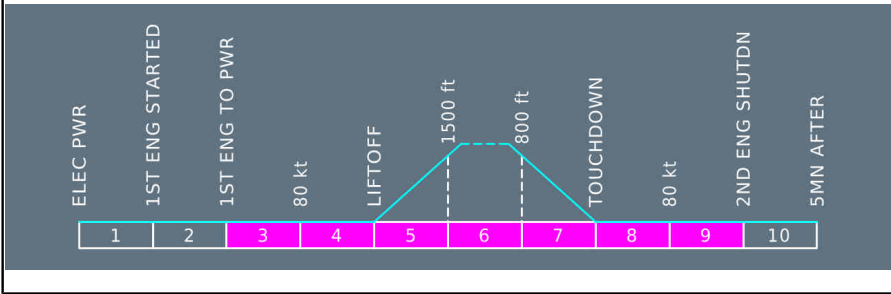
Ident.: PRO-ABN-FWS-B-00024988.0001001 / 18 NOV 21

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when synthetic voice is lost on FWC 1(2).

Flight Phase Inhibition:



Ident.: PRO-ABN-FWS-B-00024989.0001001 / 18 NOV 21

Crew awareness.

FWS FWC 1 + 2 FAULT

Applicable to: ALL

Ident.: PRO-ABN-FWS-H-00017311.0001001 / 21 MAR 16

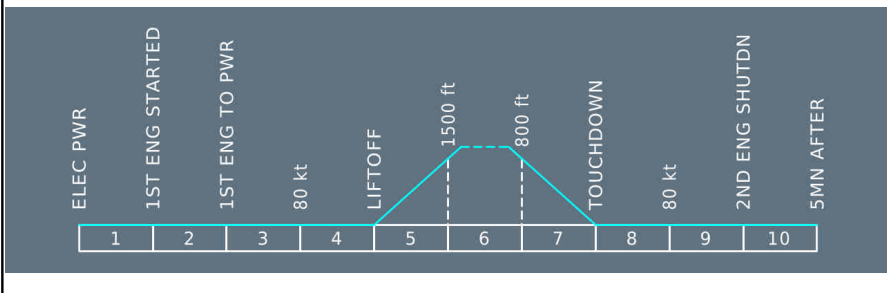
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when both FWC 1 and FWC 2 are failed, or when the communication between the FWC and the EIS is lost.

Flight Phase Inhibition:



Ident.: PRO-ABN-FWS-H-00010055.0001001 / 14 FEB 13

 MONITOR SYS
 MONITOR OVERHEAD PANEL

NOT AVAILABLE

 ECAM WARN
 ALTI ALERT
 STATUS
 A/CALL OUT
 MEMO

Continued on the following page

FWS FWC 1 + 2 FAULT (Cont'd)

Ident.: PRO-ABN-FWS-H-00010056.0001001 / 14 FEB 13

[L2]

Other INOP SYS

CAT2

ECAM Cautions and Warnings, aural warnings, master caution and warning lights are lost. ECAM system pages are still available. therefore check regularly (more often than usual) cockpit panels for local warnings and ECAM system pages for system checks. Check the general status of the systems for the DES/APPR preparation.

FWS FWC 1(2) FAULT

Applicable to: ALL

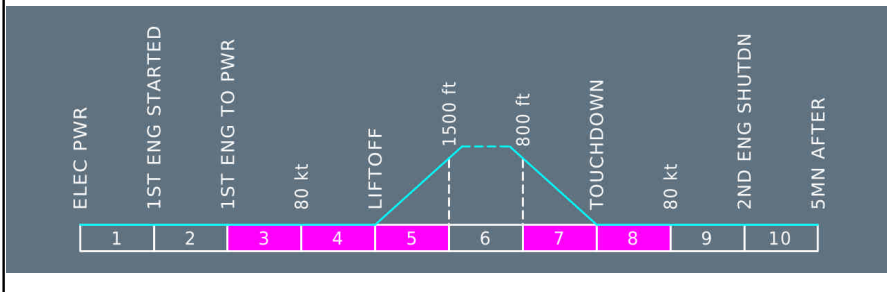
Ident.: PRO-ABN-FWS-G-00017310.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

[L2] This alert triggers when either FWC 1 or, FWC 2 is failed.

Flight Phase Inhibition:



Ident.: PRO-ABN-FWS-G-00010059.0001001 / 10 AUG 10

Crew awareness.

Continued on the following page

FWS FWC 1(2) FAULT (Cont'd)

Ident.: PRO-ABN-FWS-G-00010060.0001001 / 10 AUG 10

CAT 3 SINGLE ONLY

STATUS

INOP SYS

CAT 3 DUAL
FWC 1(2)

FWS OEB/FWC DISCREPANCY

Applicable to: ALL

Ident.: PRO-ABN-FWS-J-00017314.0002001 / 21 MAR 16

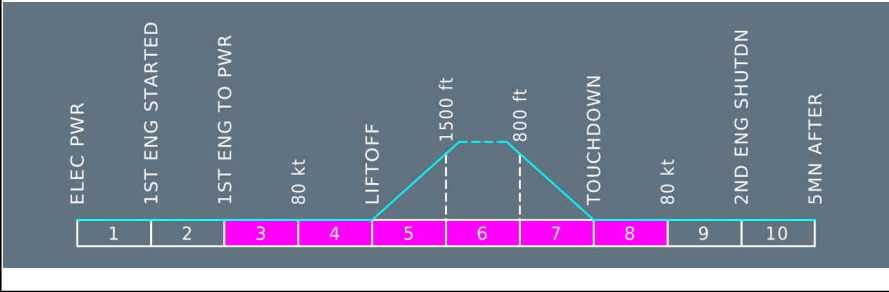
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when FWC1 and FWC2 do not have the same OEBs listed in their OEB reminder database.

Flight Phase Inhibition:



Ident.: PRO-ABN-FWS-J-00010050.0001001 / 10 AUG 10

OEB DATABASE.....XCHECK

L2

This action is normally performed by maintenance.

FWS SDAC 1 + 2 FAULT

Applicable to: ALL

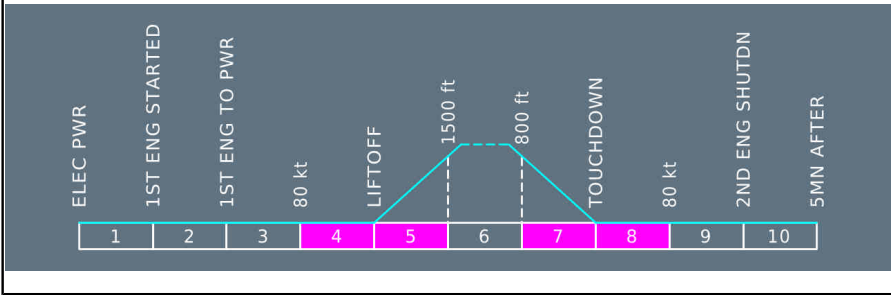
Ident.: PRO-ABN-FWS-E-00017306.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when both SDAC 1 and SDAC 2 are failed.

Flight Phase Inhibition:



Ident.: PRO-ABN-FWS-E-00010053.0001001 / 04 SEP 18

MONITOR OVERHEAD PANEL

L2 Some of amber cautions are lost.

L1 Aircraft status on the ECAM STATUS page is lost.

L2 All red warnings, engine and fuel parameters, and slat/flap positions are available on ECAM upper DU.

L1 **ECAM ENG FUEL F/CTL WHEEL (L/G POS IND) SYS PAGES AVAIL.**

Ident.: PRO-ABN-FWS-E-00010054.0002001 / 10 AUG 10

STATUS

INOP SYS

SDAC 1 + 2

FWS SDAC 1(2) FAULT

Applicable to: ALL

Ident.: PRO-ABN-FWS-D-00017308.0001001 / 21 MAR 16

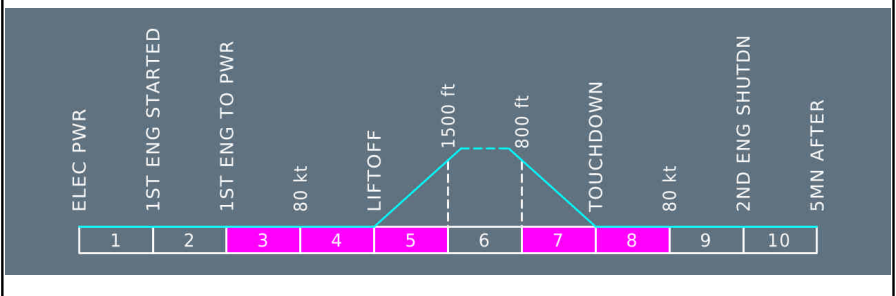
ANNUNCIATIONS

Triggering Conditions:

L2

This alerts triggers when either SDAC 1 or, SDAC 2 is failed.

Flight Phase Inhibition:



Ident.: PRO-ABN-FWS-D-00010051.0001001 / 25 FEB 14

Crew awareness.

Ident.: PRO-ABN-FWS-D-00010052.0001001 / 10 AUG 10

L12

STATUS

INOP SYS

SDAC 1(2)

Note: Although the ECAM may display some symbols and/or parameters in amber, this does not always signify that additional systems are failed.

FWS SLAT (FLAP) SYNCHRO FAULT

Applicable to: ALL

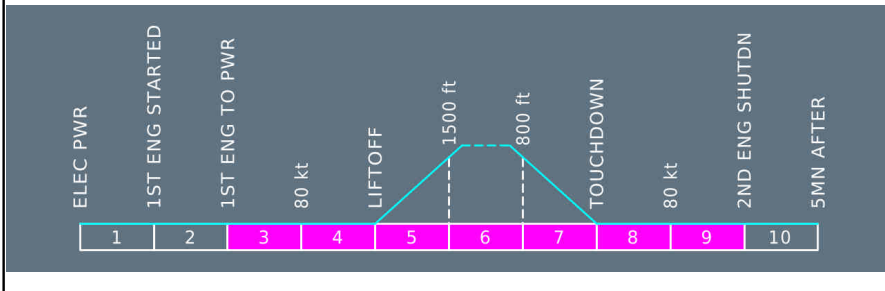
Ident.: PRO-ABN-FWS-K-00024805.0002001 / 18 NOV 21

ANNUNCIATIONS

Triggering Conditions:

This alert triggers when slat (flap) position from IPPU 1 and IPPU 2 is detected invalid or erroneous.

Flight Phase Inhibition:



Ident.: PRO-ABN-FWS-K-00024809.0002001 / 18 NOV 21

Crew awareness.

HYD B ELEC PUMP LO PR OR OVHT

Applicable to: ALL

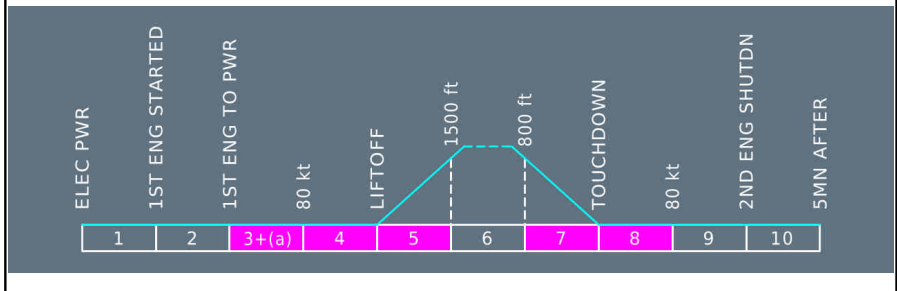
Ident.: PRO-ABN-HYD-T-00017137.0001001 / 21 MAR 16

ANNUNCIATIONS
Triggering Conditions:

L2

 LO PR: This alert triggers when the pump outlet pressure ≤ 1450 PSI (the alert resets if pressure ≥ 1750 PSI).

OVHT: This alert triggers when the blue electric pump overheats.

Flight Phase Inhibition:


Note: (a) The Flight Phase Inhibition 3 is only available for HYD B ELEC PUMP OVHT.

Ident.: PRO-ABN-HYD-T-00011661.0002001 / 27 NOV 12

 BLUE ELEC PUMP OFF
 FUEL CONSUMPT INCRSD
 FMS PRED UNRELIABLE

ASSOCIATED PROCEDURES
B SYS LO PR

 FUEL CONSUMPT INCRSD
 FMS PRED UNRELIABLE

SECONDARY FAILURES

*F/CTL

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

HYD

HYD B ELEC PUMP LO PR OR OVHT (Cont'd)

Ident.: PRO-ABN-HYD-T-00018313.0003001 / 21 MAR 17

L12

STATUS

APPR PROC

HYD LO PR

● IF BLUE OVHT OUT:

BLUE ELEC PUMP..... AUTO

LDG DIST PROC..... APPLY

FUEL CONSUMPT INCRSD

See ⁽¹⁾

FMS PRED UNRELIABLE

See ⁽²⁾

SLATS SLOW

CAT 3 SINGLE ONLY

INOP SYS

BLUE HYD

SPLR 3

CAT 3 DUAL

B ELEC PUMP

STEEP APPR 

⁽¹⁾ This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.

⁽²⁾ Disregard FMS fuel predictions and refer to QRH/OPS Operational Data - Fuel Penalty Factors Tables in order to find the applicable Fuel Penalty Factor.

HYD B RSVR LO AIR PR

Applicable to: ALL

Ident.: PRO-ABN-HYD-A-00017106.0001001 / 21 MAR 16

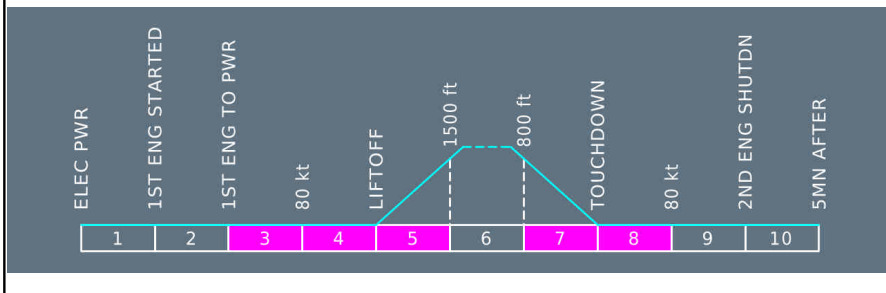
ANNUNCIATIONS

Triggering Conditions:

L2

 This alert triggers when the reservoir air pressure ≤ 22 PSI (the alert resets if pressure ≥ 25 PSI.)

Flight Phase Inhibition:



Ident.: PRO-ABN-HYD-A-00011602.0002001 / 05 MAR 13

● IF PRESS FLUCTUATES:

BLUE ELEC PUMPOFF

ASSOCIATED PROCEDURES

B SYS LO PR

 FUEL CONSUMPT INCRSD
 FMS PRED UNRELIABLE

SECONDARY FAILURES

*F/CTL

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

HYD

HYD B RSVR LO AIR PR (Cont'd)

Ident.: PRO-ABN-HYD-A-00018312.0003001 / 17 MAY 21

L12

STATUS

APPR PROC

The probability of cavitation increases with altitude. Therefore, it may be possible to restore the system after descending to a lower altitude.

HYD LO PR

BLUE ELEC PUMP.....AUTO

● **If sys not recovered:**

LDG DIST PROC.....APPLY

FUEL CONSUMPT INCRSD

See ⁽¹⁾

FMS PRED UNRELIABLE

See ⁽²⁾

SLATS SLOW

CAT 3 SINGLE ONLY

INOP SYS

BLUE HYD

SPLR 3

CAT 3 DUAL

B ELEC PUMP

STEEP APPR 

⁽¹⁾ This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.

⁽²⁾ Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.

HYD B RSVR LO LVL

Applicable to: ALL

Ident.: PRO-ABN-HYD-C-00017144.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2

 The alert triggers when the fluid quantity < 2.4 l (0.63 US Gal).

Flight Phase Inhibition:

Ident.: PRO-ABN-HYD-C-00011606.0002001 / 05 MAR 13

BLUE ELEC PUMP OFF

ASSOCIATED PROCEDURES

B SYS LO PR

FUEL CONSUMPT INCRSD
 FMS PRED UNRELIABLE

SECONDARY FAILURES

*F/CTL

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

HYD

HYD B RSVR LO LVL (Cont'd)

Ident.: PRO-ABN-HYD-C-00018314.0003001 / 17 MAY 21

L12

STATUS

INOP SYS

LDG DIST PROC..... APPLY

FUEL CONSUMPT INCRSD

See ⁽¹⁾

FMS PRED UNRELIABLE

See ⁽²⁾

SLATS SLOW

CAT 3 SINGLE ONLY

BLUE HYD

SPLR 3

CAT 3 DUAL

EMER GEN

B ELEC PUMP

STEEP APPR 

⁽¹⁾ This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.

⁽²⁾ Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.

HYD B RSVR OVHT

Applicable to: ALL

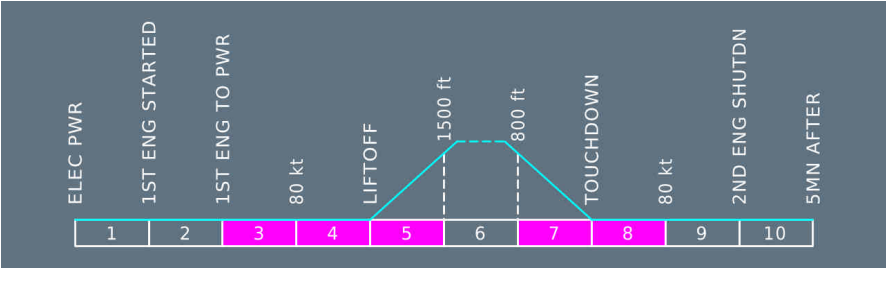
Ident.: PRO-ABN-HYD-B-00017108.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the fluid temperature $\geq 93^{\circ}\text{C}$ (the alert resets if temperature $\leq 88^{\circ}\text{C}$).

Flight Phase Inhibition:



The diagram shows a 10-phase flight profile. Phases 1-4 are white, 5-8 are pink, and 9-10 are white. Vertical labels indicate flight events: ELEC PWR (Phase 1), 1ST ENG STARTED (Phase 2), 1ST ENG TO PWR (Phase 3), 80 kt (between 3 and 4), LIFTOFF (between 4 and 5), 1500 ft (between 5 and 6), 800 ft (between 6 and 7), TOUCHDOWN (between 7 and 8), 80 kt (between 8 and 9), 2ND ENG SHUTDN (between 9 and 10), and 5MN AFTER (Phase 10).

Ident.: PRO-ABN-HYD-B-00011604.0002001 / 05 MAR 13

BLUE ELEC PUMP OFF

ASSOCIATED PROCEDURES

B SYS LO PR

FUEL CONSUMPT INCRSD
FMS PRED UNRELIABLE

SECONDARY FAILURES

*F/CTL

Continued on the following page

HYD B RSVR OVHT (Cont'd)

Ident.: PRO-ABN-HYD-B-00018315.0003001 / 17 MAY 21

L12

STATUS

APPR PROC

HYD LO PR

- **IF BLUE OVHT OUT:**
 BLUE ELEC PUMP..... AUTO
- **If sys not recovered:**
 LDG DIST PROC..... APPLY

FUEL CONSUMPT INCRSD

 See ⁽¹⁾

FMS PRED UNRELIABLE

 See ⁽²⁾

SLATS SLOW

CAT 3 SINGLE ONLY

INOP SYS

BLUE HYD
 SPLR 3
 CAT 3 DUAL
 B ELEC PUMP
 STEEP APPR 

⁽¹⁾ This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.

⁽²⁾ Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.

HYD G ENG 1 PUMP LO PR
(PTU OPERATIVE)

Applicable to: ALL

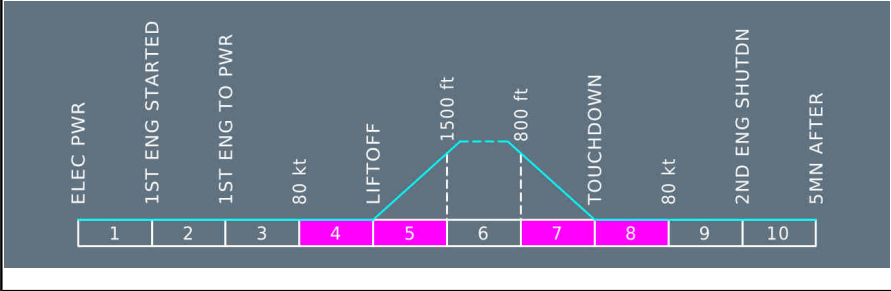
Ident.: PRO-ABN-HYD-N-00017136.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the pump outlet pressure $\leq 1\ 750$ PSI (the alert resets if pressure $\geq 2\ 200$ PSI).

Flight Phase Inhibition:



Ident.: PRO-ABN-HYD-N-00011648.0001001 / 18 AUG 10

GREEN ENG 1 PUMP.....OFF

Ident.: PRO-ABN-HYD-N-00011649.0001001 / 17 MAR 11

STATUS

INOP SYS

G ENG 1 PUMP

PIA A318/A319/A320/A321 FLEET

FCOM

E

PRO-ABN-HYD P 9/76

09 FEB 26

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

HYD

HYD G ENG 1 PUMP LO PR (PTU INOPERATIVE)

Applicable to: MSN 02155-02212

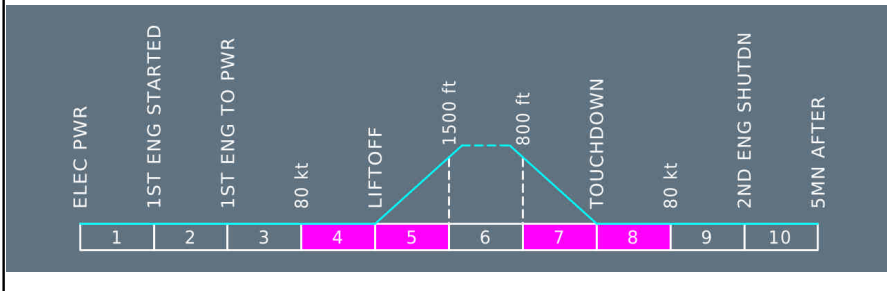
Ident.: PRO-ABN-HYD-P-00018805.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

- L2** This alert triggers when the pump outlet pressure ≤ 1 750 PSI (the alert resets if pressure ≥ 2 200 PSI).

Flight Phase Inhibition:



Ident.: PRO-ABN-HYD-P-00011652.0001001 / 18 AUG 10

GREEN ENG 1 PUMP OFF

ASSOCIATED PROCEDURES

G SYS LO PR

SECONDARY FAILURES

*WHEEL
*F/CTL

Continued on the following page

HYD G ENG 1 PUMP LO PR (Cont'd)
(PTU INOPERATIVE)

Ident.: PRO-ABN-HYD-P-00018316.0006001 / 06 NOV 25

L12

STATUS	
	INOP SYS
L/G GRVTY PROC.....APPLY <i>Refer to PRO-ABN-LG [QRH] L/G GRAVITY EXTENSION.</i> FUEL CONSUMPT INCRSD <i>See ⁽³⁾</i> FMS PRED UNRELIABLE <i>See ⁽⁴⁾</i> ALTN Y BRK WITH A/SKID SLATS/FLAPS SLOW CAT 3 SINGLE	GREEN HYD SPLR 1+5 CAT 3 DUAL N/W STRG AUTO BRK ⁽¹⁾ NORM BRK L/G RETRACT REVERSER 1 PTU G ENG 1 PUMP YAW DAMPER 1 ⁽²⁾

⁽¹⁾ (In flight, or on ground with at least one engine running)

⁽²⁾ (In flight, or on ground with both engines running)

⁽³⁾ This message triggers when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.

⁽⁴⁾ Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

HYD

HYD G ENG 1 PUMP LO PR (PTU INOPERATIVE)

Applicable to: MSN 02719-07792

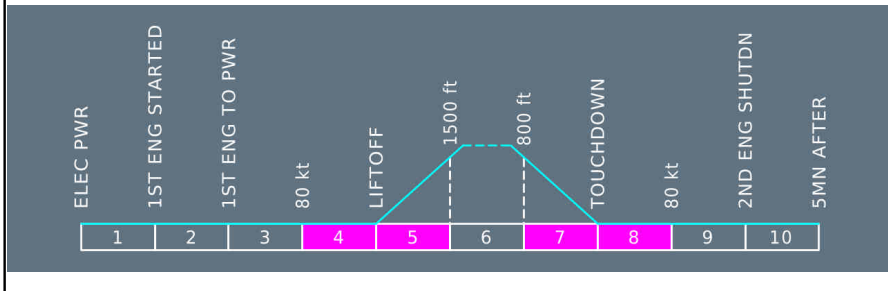
Ident.: PRO-ABN-HYD-P-00018805.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

- L2** This alert triggers when the pump outlet pressure ≤ 1750 PSI (the alert resets if pressure ≥ 2200 PSI).

Flight Phase Inhibition:



Ident.: PRO-ABN-HYD-P-00011652.0001001 / 18 AUG 10

GREEN ENG 1 PUMP OFF

ASSOCIATED PROCEDURES

G SYS LO PR

SECONDARY FAILURES

*WHEEL
*F/CTL

Continued on the following page

HYD G ENG 1 PUMP LO PR (Cont'd) (PTU INOPERATIVE)

Ident.: PRO-ABN-HYD-P-00018316.0008001 / 06 NOV 25
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L12

STATUS	
	INOP SYS
L/G GRVTY PROC.....APPLY Refer to PRO-ABN-LG [QRH] L/G GRAVITY EXTENSION. FUEL CONSUMPT INCRSD See ⁽³⁾ FMS PRED UNRELIABLE See ⁽⁴⁾ ALTN Y BRK WITH A/SKID SLATS/FLAPS SLOW CAT 3 SINGLE	GREEN HYD SPLR 1+5 CAT 3 DUAL AUTO BRK ⁽¹⁾ NORM BRK L/G RETRACT REVERSER 1 PTU G ENG 1 PUMP YAW DAMPER 1 ⁽²⁾
⁽¹⁾ (In flight, or on ground with at least one engine running) ⁽²⁾ (In flight, or on ground with both engines running) ⁽³⁾ This message triggers when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft. ⁽⁴⁾ Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.	

HYD G RSVR LO AIR PR

Applicable to: MSN 02155-02212

Ident.: PRO-ABN-HYD-D-00017104.0001001 / 21 MAR 16

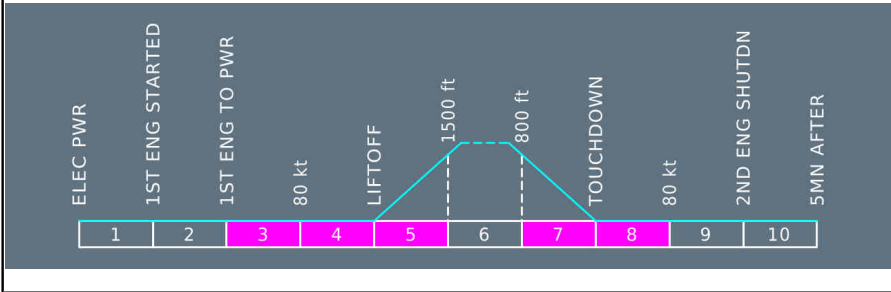
ANNUNCIATIONS

Triggering Conditions:

L2

 This alert triggers when the reservoir air pressure ≤ 22 PSI (the alert resets if air pressure ≥ 25 PSI).

Flight Phase Inhibition:



Ident.: PRO-ABN-HYD-D-00011609.0002001 / 05 MAR 13

- IF PRESS FLUCTUATES:

PTU..... OFF
 GREEN ENG 1 PUMP..... OFF

G ENG 1 PUMP LO PR

ASSOCIATED PROCEDURES

G SYS LO PR

FUEL CONSUMPT INCRSD
 FMS PRED UNRELIABLE

SECONDARY FAILURES

*WHEEL
 *F/CTL

Continued on the following page

HYD G RSVR LO AIR PR (Cont'd)

Ident.: PRO-ABN-HYD-D-00018317.0012001 / 15 MAY 25

L12

STATUS
INOP SYS
APPR PROC
HYD LO PR

The probability of cavitation increases with altitude.
 Therefore, it may be possible to restore the system after
 descending to a lower altitude.

GREEN ENG 1 PUMP..... ON
● IF HYD NOT RECOVERED:
L/G GRVTY PROC..... APPLY

Refer to PRO-ABN-LG [QRH] L/G GRAVITY
 EXTENSION

LDG DIST PROC.....APPLY
FUEL CONSUMPT INCRSD

 See ⁽³⁾
FMS PRED UNRELIABLE

 See ⁽⁴⁾
ALTN Y BRK WITH A/SKID
SLATS/FLAPS SLOW
CAT 3 SINGLE ONLY

GREEN HYD

SPLR 1 + 5

CAT 3 DUAL

N/W STRG

 AUTO BRK ⁽¹⁾

NORM BRK

L/G RETRACT

REVERSER 1

 YAW DAMPER 1 ⁽²⁾

⁽¹⁾ (In flight, or on ground with at least one engine running)

⁽²⁾ (In flight, or on ground with both engines running)

⁽³⁾ This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.

⁽⁴⁾ Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.

HYD G RSVR LO AIR PR

Applicable to: MSN 02719-07792

Ident.: PRO-ABN-HYD-D-00017104.0001001 / 21 MAR 16

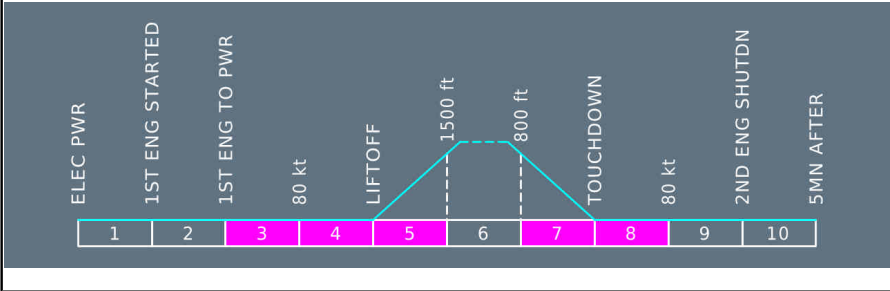
ANNUNCIATIONS

Triggering Conditions:

L2

 This alert triggers when the reservoir air pressure ≤ 22 PSI (the alert resets if air pressure ≥ 25 PSI).

Flight Phase Inhibition:



Ident.: PRO-ABN-HYD-D-00011609.0002001 / 05 MAR 13

- IF PRESS FLUCTUATES:
 PTU..... OFF
 GREEN ENG 1 PUMP..... OFF

G ENG 1 PUMP LO PR

ASSOCIATED PROCEDURES

G SYS LO PR

FUEL CONSUMPT INCRSD
 FMS PRED UNRELIABLE

SECONDARY FAILURES

*WHEEL
 *F/CTL

Continued on the following page

HYD G RSVR LO AIR PR (Cont'd)

Ident.: PRO-ABN-HYD-D-00018317.0011001 / 15 MAY 25

L12

STATUS	
<u>APPR PROC</u> HYD LO PR The probability of cavitation increases with altitude. Therefore, it may be possible to restore the system after descending to a lower altitude. GREEN ENG 1 PUMP..... ON ● IF HYD NOT RECOVERED: L/G GRVTY PROC..... APPLY <i>Refer to PRO-ABN-LG [QRH] L/G GRAVITY EXTENSION</i> LDG DIST PROC.....APPLY FUEL CONSUMPT INCRSD <i>See ⁽³⁾</i> FMS PRED UNRELIABLE <i>See ⁽⁴⁾</i> ALTN Y BRK WITH A/SKID SLATS/FLAPS SLOW CAT 3 SINGLE ONLY	<u>INOP SYS</u> GREEN HYD SPLR 1 + 5 CAT 3 DUAL AUTO BRK ⁽¹⁾ NORM BRK L/G RETRACT REVERSER 1 YAW DAMPER 1 ⁽²⁾
⁽¹⁾ <i>(In flight, or on ground with at least one engine running)</i> ⁽²⁾ <i>(In flight, or on ground with both engines running)</i> ⁽³⁾ <i>This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.</i> ⁽⁴⁾ <i>Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.</i>	

HYD G RSVR LO LVL

Applicable to: MSN 02155-02212

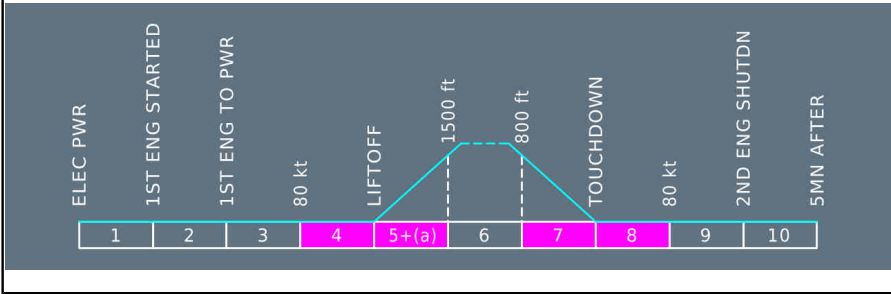
Ident.: PRO-ABN-HYD-F-00017142.0002001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the fluid quantity < 3.5 l (0.92 US Gal).

Flight Phase Inhibition:



L1 Note: The HYD G RSVR LO LVL alert is inhibited for the first 15 s of flight phase 5.

Ident.: PRO-ABN-HYD-F-00011614.0002001 / 05 MAR 13

PTU.....OFF
 GREEN ENG 1 PUMP.....OFF
 G ENG 1 PUMP LO PR

ASSOCIATED PROCEDURES

G SYS LO PR

FUEL CONSUMPT INCRSD
 FMS PRED UNRELIABLE

SECONDARY FAILURES

*WHEEL
 *F/CTL

Continued on the following page

HYD G RSVR LO LVL (Cont'd)

Ident.: PRO-ABN-HYD-F-00018320.0013001 / 06 NOV 25

L12

STATUS
INOP SYS

L/G GRVTY PROC.....APPLY

Refer to PRO-ABN-LG [QRH] L/G GRAVITY EXTENSION

LDG DIST PROC..... APPLY

FUEL CONSUMPT INCRSD
See ⁽³⁾
FMS PRED UNRELIABLE
See ⁽⁴⁾
ALTN Y BRK WITH A/SKID
SLATS/FLAPS SLOW
CAT 3 SINGLE ONLY

GREEN HYD

SPLR 1 + 5

CAT 3 DUAL

N/W STRG

 AUTO BRK ⁽¹⁾

NORM BRK

L/G RETRACT

REVERSER 1

 YAW DAMPER 1 ⁽²⁾
⁽¹⁾ (In flight, or on ground with at least one engine running)

⁽²⁾ (In flight, or on ground with both engines running)

⁽³⁾ This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.

⁽⁴⁾ Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.

HYD G RSVR LO LVL

Applicable to: MSN 02719-07792

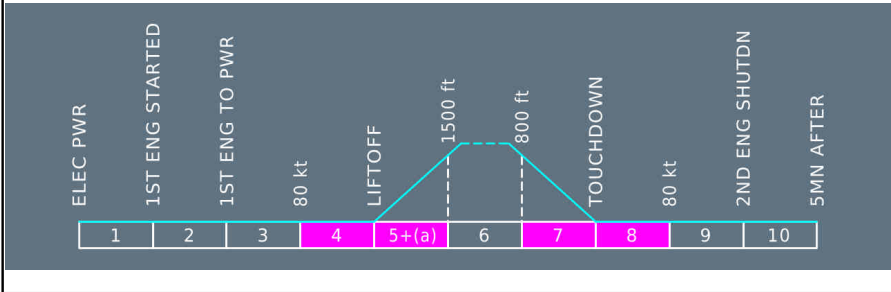
Ident.: PRO-ABN-HYD-F-00017142.0002001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the fluid quantity < 3.5 l (0.92 US Gal).

Flight Phase Inhibition:



L1 Note: The HYD G RSVR LO LVL alert is inhibited for the first 15 s of flight phase 5.

Ident.: PRO-ABN-HYD-F-00011614.0002001 / 05 MAR 13

PTU.....OFF
 GREEN ENG 1 PUMP.....OFF
 G ENG 1 PUMP LO PR

ASSOCIATED PROCEDURES

G SYS LO PR

FUEL CONSUMPT INCRSD
 FMS PRED UNRELIABLE

SECONDARY FAILURES

*WHEEL
 *F/CTL

Continued on the following page

HYD G RSVR LO LVL (Cont'd)

Ident.: PRO-ABN-HYD-F-00018320.0015001 / 06 NOV 25

L12

STATUS

INOP SYS

L/G GRVTY PROC.....APPLY

Refer to PRO-ABN-LG [QRH] L/G GRAVITY EXTENSION

LDG DIST PROC.....APPLY

FUEL CONSUMPT INCRSD

 See ⁽³⁾

FMS PRED UNRELIABLE

 See ⁽⁴⁾

ALTN Y BRK WITH A/SKID

SLATS/FLAPS SLOW

CAT 3 SINGLE ONLY

GREEN HYD

SPLR 1 + 5

CAT 3 DUAL

 AUTO BRK ⁽¹⁾

NORM BRK

L/G RETRACT

REVERSER 1

 YAW DAMPER 1 ⁽²⁾
⁽¹⁾ (In flight, or on ground with at least one engine running)

⁽²⁾ (In flight, or on ground with both engines running)

⁽³⁾ This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.

⁽⁴⁾ Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.

HYD G RSVR OVHT

Applicable to: MSN 02155-02212

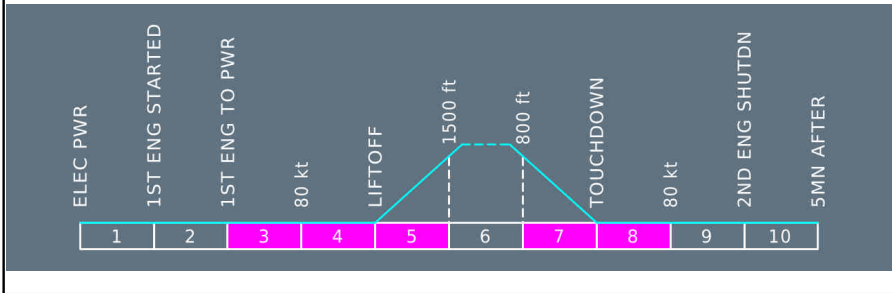
Ident.: PRO-ABN-HYD-E-00017107.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the fluid temperature $\geq 93^{\circ}\text{C}$ (the alert resets if temperature $\leq 88^{\circ}\text{C}$).

Flight Phase Inhibition:



Ident.: PRO-ABN-HYD-E-00011612.0002001 / 05 MAR 13

PTU..... OFF
 GREEN ENG 1 PUMP..... OFF
 G ENG 1 PUMP LO PR

ASSOCIATED PROCEDURES

G SYS LO PR

FUEL CONSUMPT INCRSD
 FMS PRED UNRELIABLE

SECONDARY FAILURES

*WHEEL
 *F/CTL

Continued on the following page

HYD G RSVR OVHT (Cont'd)

Ident.: PRO-ABN-HYD-E-00018321.0012001 / 15 MAY 25

L12	
APPR PROC	STATUS
HYD LO PR ● IF GREEN OVHT OUT: GREEN ENG 1 PUMP.....ON ● IF HYD NOT RECOVERED: L/G GRVTY PROC.....APPLY <i>Refer to PRO-ABN-LG [QRH] L/G GRAVITY EXTENSION</i> LDG DIST PROC.....APPLY FUEL CONSUMPT INCRSD <i>See ⁽³⁾</i> FMS PRED UNRELIABLE <i>See ⁽⁴⁾</i> SLATS/FLAPS SLOW CAT 3 SINGLE ONLY	<u>INOP SYS</u> GREEN HYD SPLR 1 + 5 CAT 3 DUAL N/W STRG AUTO BRK ⁽¹⁾ NORM BRK L/G RETRACT REVERSER 1 YAW DAMPER 1 ⁽²⁾
⁽¹⁾ (In flight, or on ground with at least one engine running) ⁽²⁾ (In flight, or on ground with both engines running) ⁽³⁾ This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft. ⁽⁴⁾ Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.	

HYD G RSVR OVHT

Applicable to: MSN 02719-07792

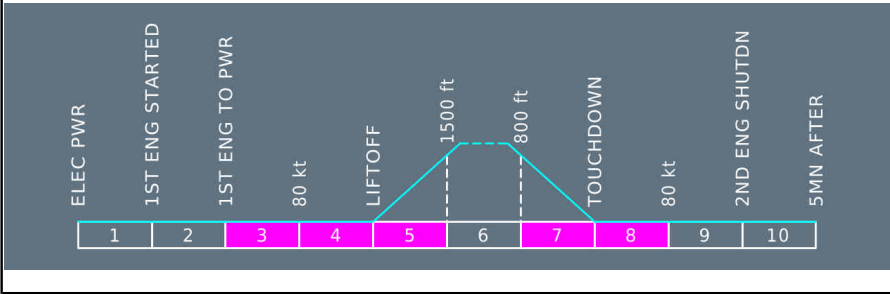
Ident.: PRO-ABN-HYD-E-00017107.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the fluid temperature $\geq 93^{\circ}\text{C}$ (the alert resets if temperature $\leq 88^{\circ}\text{C}$).

Flight Phase Inhibition:



Ident.: PRO-ABN-HYD-E-00011612.0002001 / 05 MAR 13

PTU..... OFF
 GREEN ENG 1 PUMP..... OFF
 G ENG 1 PUMP LO PR

ASSOCIATED PROCEDURES

G SYS LO PR

FUEL CONSUMPT INCRSD
 FMS PRED UNRELIABLE

SECONDARY FAILURES

*WHEEL
 *F/CTL

Continued on the following page

HYD G RSVR OVHT (Cont'd)

Ident.: PRO-ABN-HYD-E-00018321.0011001 / 15 MAY 25

L12

STATUS

INOP SYS

APPR PROC

HYD LO PR

- **IF GREEN OVHT OUT:**
GREEN ENG 1 PUMP.....ON
- **IF HYD NOT RECOVERED:**
L/G GRVTY PROC.....APPLY
*Refer to PRO-ABN-LG [QRH] L/G GRAVITY
EXTENSION*
LDG DIST PROC.....APPLY

FUEL CONSUMPT INCRSD

See ⁽³⁾

FMS PRED UNRELIABLE

See ⁽⁴⁾

**ALTN Y BRK WITH A/SKID
SLATS/FLAPS SLOW
CAT 3 SINGLE ONLY**

GREEN HYD
SPLR 1 + 5
CAT 3 DUAL
AUTO BRK ⁽¹⁾
NORM BRK
L/G RETRACT
REVERSER 1
YAW DAMPER 1 ⁽²⁾

⁽¹⁾ (In flight, or on ground with at least one engine running)

⁽²⁾ (In flight, or on ground with both engines running)

⁽³⁾ This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.

⁽⁴⁾ Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.

HYD Y ELEC PUMP LO PR OR OVHT

Applicable to: MSN 02155-02212

Ident.: PRO-ABN-HYD-M-00017133.0001001 / 21 MAR 16

ANNUNCIATIONS

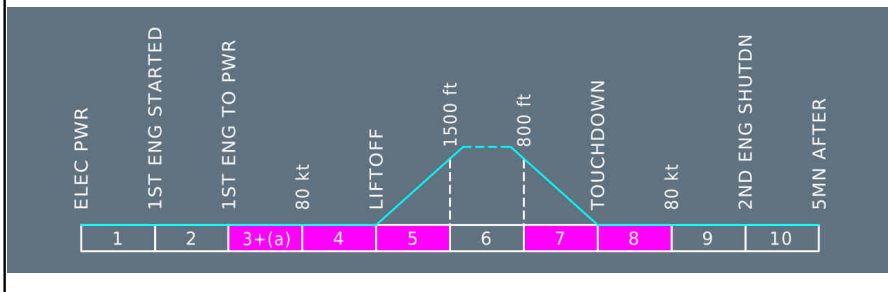
Triggering Conditions:

L2 LO PR: This alert triggers when the yellow system pressure ≤ 1450 PSI (the alert resets if pressure ≥ 1750 PSI) with:

- Y ELEC PUMP pb at ON
- Y ENG PUMP and PTU not available.

OVHT: This alert triggers when the yellow electric pump overheats.

Flight Phase Inhibition:



Note: (a) The Flight Phase Inhibition 3 is only available for HYD Y ELEC PUMP OVHT.

Continued on the following page

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES ABNORMAL AND EMERGENCY PROCEDURES HYD
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HYD Y ELEC PUMP LO PR OR OVHT (Cont'd)

Ident.: PRO-ABN-HYD-M-00019032.0003001 / 21 MAR 16

YELLOW ELEC PUMP..... OFF

ASSOCIATED PROCEDURES

Y SYS LO PR
BRK Y ACCU PR MONITOR

L2

This check is recommended to cover the case of a pipe rupture, which could lead to the simultaneous loss of the hydraulic system and the accumulator fluid. If this occurs, the loss of the accumulator should be observed on the indicator within 10 min. In that case: The only remaining braking means is the normal braking using green pressure, the parking brake should not be used since it is not available and the chocks should be in place before engine 1 shutdown.

L1

FUEL CONSUMPT INCRSD
FMS PRED UNRELIABLE

SECONDARY FAILURES

*F/CTL

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

HYD

HYD Y ELEC PUMP LO PR OR OVHT (Cont'd)

Ident.: PRO-ABN-HYD-M-00018322.0003001 / 13 MAY 25

L12

STATUS

APPR PROC

HYD LO PR

● IF YELLOW OVHT OUT:

YELLOW ENG 2 PUMP.....ON

The above line is only displayed, in case of an electrical pump overheat.

LDG DIST PROC..... APPLY

FUEL CONSUMPT INCRSD

See ⁽¹⁾

FMS PRED UNRELIABLE

See ⁽²⁾

FLAPS SLOW

CAT 3 SINGLE ONLY

INOP SYS

YELLOW HYD
 SPLR 2+4
 CAT 3 DUAL
 REVERSER 2
 Y ELEC PUMP
 YAW DAMPER 2

⁽¹⁾ This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.

⁽²⁾ Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.

HYD Y ELEC PUMP LO PR OR OVHT

Applicable to: MSN 02719-07792

Ident.: PRO-ABN-HYD-M-00017133.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

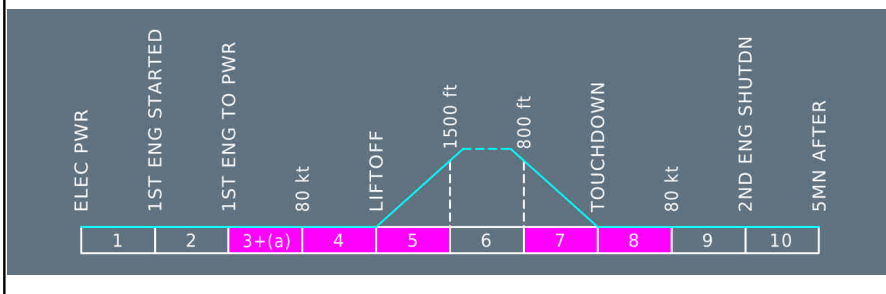
L2

LO PR: This alert triggers when the yellow system pressure $\leq 1\ 450$ PSI (the alert resets if pressure $\geq 1\ 750$ PSI) with:

- Y ELEC PUMP pb at ON
- Y ENG PUMP and PTU not available.

OVHT: This alert triggers when the yellow electric pump overheats.

Flight Phase Inhibition:



Note: (a) The Flight Phase Inhibition 3 is only available for HYD Y ELEC PUMP OVHT.

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

HYD

HYD Y ELEC PUMP LO PR OR OVHT (Cont'd)

Ident.: PRO-ABN-HYD-M-00019032.0003001 / 21 MAR 16

YELLOW ELEC PUMP..... OFF

ASSOCIATED PROCEDURES

Y SYS LO PR

BRK Y ACCU PR MONITOR

- [L2]** *This check is recommended to cover the case of a pipe rupture, which could lead to the simultaneous loss of the hydraulic system and the accumulator fluid. If this occurs, the loss of the accumulator should be observed on the indicator within 10 min. In that case: The only remaining braking means is the normal braking using green pressure, the parking brake should not be used since it is not available and the chocks should be in place before engine 1 shutdown.*

[L1] FUEL CONSUMPT INCRSD
FMS PRED UNRELIABLE

SECONDARY FAILURES

***F/CTL**

Continued on the following page

HYD Y ELEC PUMP LO PR OR OVHT (Cont'd)

Ident.: PRO-ABN-HYD-M-00018322.0004001 / 13 MAY 25

L12

STATUS
APPR PROC
HYD LO PR
● IF YELLOW OVHT OUT:
YELLOW ENG 2 PUMP.....ON
The above line is only displayed, in case of an electrical pump overheat.
LDG DIST PROC..... APPLY
FUEL CONSUMPT INCRSD

 See ⁽¹⁾
FMS PRED UNRELIABLE

 See ⁽²⁾
FLAPS SLOW
CAT 3 SINGLE ONLY
INOP SYS

 YELLOW HYD
 SPLR 2+4
 CAT 3 DUAL
 N/W STRG
 REVERSER 2
 Y ELEC PUMP
 YAW DAMPER 2
 STEEP APPR <⚠

⁽¹⁾ This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.

⁽²⁾ Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.

HYD Y ENG 2 PUMP LO PR
 (PTU OPERATIVE)

Applicable to: ALL

Ident.: PRO-ABN-HYD-O-00017135.0001001 / 21 MAR 16

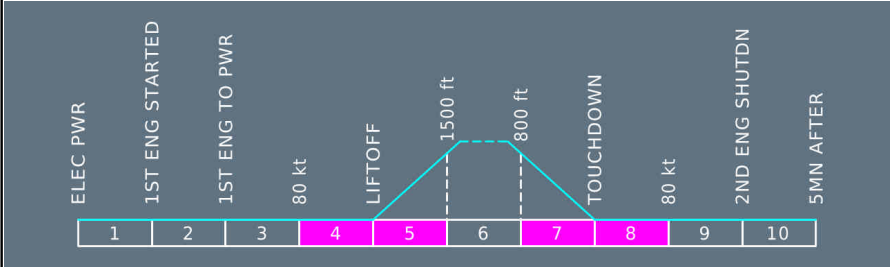
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the pump outlet pressure $\leq 1\ 750$ PSI (the alert resets if pressure $\geq 2\ 200$ PSI).

Flight Phase Inhibition:



Ident.: PRO-ABN-HYD-O-00011650.0001001 / 18 AUG 10

YELLOW ENG 2 PUMP.....OFF

Ident.: PRO-ABN-HYD-O-00011651.0001001 / 18 AUG 10

STATUS

INOP SYS

Y ENG 2 PUMP

HYD Y ENG 2 PUMP LO PR (PTU INOPERATIVE)

Applicable to: MSN 02155-02212

Ident.: PRO-ABN-HYD-Q-00018806.0001001 / 21 MAR 16

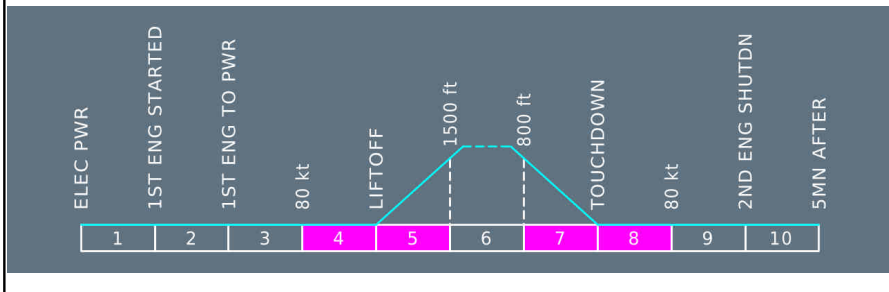
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the pump outlet pressure ≤ 1750 PSI (the alert resets if pressure ≥ 200 PSI).

Flight Phase Inhibition:



Ident.: PRO-ABN-HYD-Q-00011654.0001001 / 18 AUG 10

YELLOW ENG 2 PUMP.....OFF

ASSOCIATED PROCEDURES

Y SYS LO PR

L2

Note: If yellow system is affected, the yellow electrical pump may be used.

L1

SECONDARY FAILURES

*F/CTL

Continued on the following page

HYD Y ENG 2 PUMP LO PR (Cont'd)

(PTU INOPERATIVE)

Ident.: PRO-ABN-HYD-Q-00018323.0005001 / 06 NOV 25

L12

STATUS

INOP SYS

LDG DIST PROC..... APPLY

FUEL CONSUMPT INCRSD

See ⁽²⁾

FMS PRED UNRELIABLE

See ⁽³⁾

FLAPS SLOW

CAT 3 SINGLE

See ⁽⁴⁾

YELLOW HYD

SPLR 2+4

CAT 3 DUAL

REVERSER 2

PTU

Y ENG 2 PUMP

YAW DAMPER 2 ⁽¹⁾

STEEP APPR 

- ⁽¹⁾ (In flight, or on ground with both engines running)
- ⁽²⁾ This message triggers when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.
- ⁽³⁾ Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.
- ⁽⁴⁾ Note: Following a yellow hydraulic system failure, the parking brake may be inoperative due to a yellow accumulator low pressure.

HYD Y ENG 2 PUMP LO PR (PTU INOPERATIVE)

Applicable to: MSN 02719-07792

Ident.: PRO-ABN-HYD-Q-00018806.0001001 / 21 MAR 16

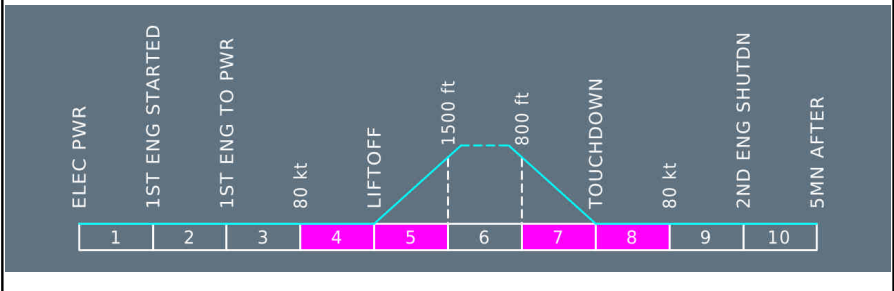
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the pump outlet pressure ≤ 1750 PSI (the alert resets if pressure ≥ 200 PSI).

Flight Phase Inhibition:



Ident.: PRO-ABN-HYD-Q-00011654.0001001 / 18 AUG 10

YELLOW ENG 2 PUMPOFF

ASSOCIATED PROCEDURES

Y SYS LO PR

L2

Note: If yellow system is affected, the yellow electrical pump may be used.

L1

SECONDARY FAILURES

*F/CTL

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

HYD

HYD Y ENG 2 PUMP LO PR (Cont'd)

(PTU INOPERATIVE)

Ident.: PRO-ABN-HYD-Q-00018323.0006001 / 06 NOV 25

L12

STATUS

INOP SYS

LDG DIST PROC..... APPLY

FUEL CONSUMPT INCRSD

 See ⁽²⁾

FMS PRED UNRELIABLE

 See ⁽³⁾

FLAPS SLOW

CAT 3 SINGLE

 See ⁽⁴⁾

YELLOW HYD

SPLR 2+4

CAT 3 DUAL

N/W STRG

REVERSER 2

PTU

Y ENG 2 PUMP

 YAW DAMPER 2 ⁽¹⁾

 STEEP APPR 

⁽¹⁾ (In flight, or on ground with both engines running)

⁽²⁾ This message triggers when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.

⁽³⁾ Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.

⁽⁴⁾ Note: Following a yellow hydraulic system failure, the parking brake may be inoperative due to a yellow accumulator low pressure.

HYD Y RSVR LO AIR PR

Applicable to: MSN 02155-02212

Ident.: PRO-ABN-HYD-G-00017105.0001001 / 21 MAR 16

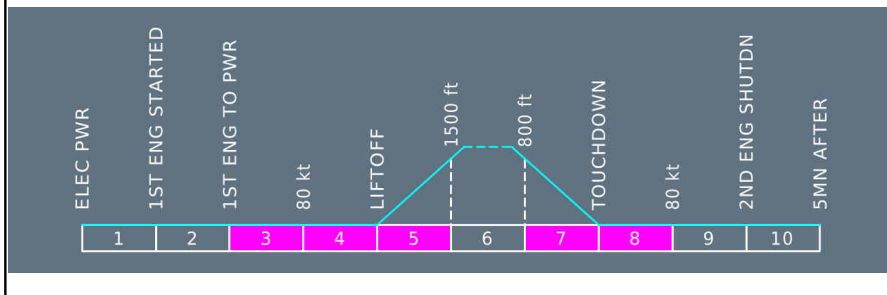
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the reservoir air pressure ≤ 22 PSI (the alert resets if pressure ≥ 25 PSI).

Flight Phase Inhibition:


Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

HYD

HYD Y RSVR LO AIR PR (Cont'd)

Ident.: PRO-ABN-HYD-G-00011626.0003001 / 27 NOV 12

● IF PRESS FLUCTUATES:

PTU.....	OFF
YELLOW ENG 2 PUMP.....	OFF
YELLOW ELEC PUMP.....	OFF

BRK Y ACCU PR MONITOR

- [L2] *This check is recommended to cover the case of a pipe rupture, which could lead to the simultaneous loss of the hydraulic system and the accumulator fluid. If this occurs, the loss of the accumulator should be observed on the indicator within 10 min. In that case : The only remaining braking means is normal braking, using green pressure. The parking brake should not be used since, it is not available. And, the chocks should be in place before Engine 1 shutdown.*

[L1] Y ENG 2 PUMP LO PR

ASSOCIATED PROCEDURES

Y SYS LO PR

 FUEL CONSUMPT INCRSD
 FMS PRED UNRELIABLE

SECONDARY FAILURES

*F/CTL

Continued on the following page

HYD Y RSVR LO AIR PR (Cont'd)

Ident.: PRO-ABN-HYD-G-00018324.0010001 / 15 MAY 25

L12

	STATUS
APPR PROC HYD LO PR The probability of cavitation increases with altitude. Therefore, it may be possible to restore the system after descending to a lower altitude. YELLOW ENG 2 PUMP..... ON ● If sys not recovered: LDG DIST PROC.....APPLY FUEL CONSUMPT INCRSD See ⁽²⁾ FMS PRED UNRELIABLE See ⁽³⁾ FLAPS SLOW CAT 3 SINGLE	INOP SYS YELLOW HYD SPLR 2 + 4 CAT 3 DUAL REVERSER 2 YAW DAMPER 2 ⁽¹⁾

⁽¹⁾ (In flight, or on ground with both engines running)

⁽²⁾ This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.

⁽³⁾ Disregard FMS fuel predictions and refer to QRH/OPS Operational Data - Fuel Penalty Factors Tables in order to find the applicable Fuel Penalty Factor.

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

HYD

HYD Y RSVR LO AIR PR

Applicable to: MSN 02719-07792

Ident.: PRO-ABN-HYD-G-00017105.0001001 / 21 MAR 16

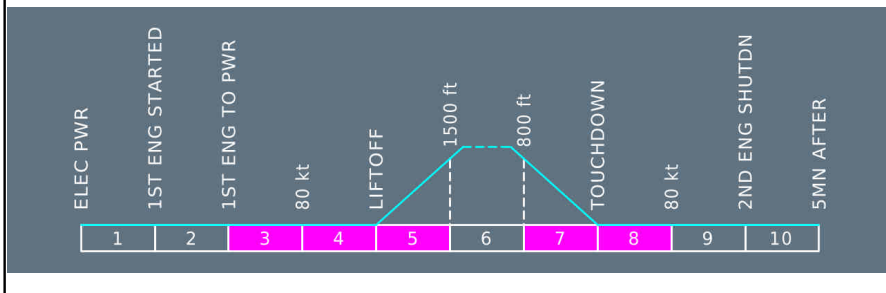
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the reservoir air pressure ≤ 22 PSI (the alert resets if pressure ≥ 25 PSI).

Flight Phase Inhibition:



Continued on the following page

HYD Y RSVR LO AIR PR (Cont'd)

Ident.: PRO-ABN-HYD-G-00011626.0003001 / 27 NOV 12

● IF PRESS FLUCTUATES:

 PTU..... OFF
 YELLOW ENG 2 PUMP..... OFF
 YELLOW ELEC PUMP..... OFF

BRK Y ACCU PR MONITOR

L2 This check is recommended to cover the case of a pipe rupture, which could lead to the simultaneous loss of the hydraulic system and the accumulator fluid. If this occurs, the loss of the accumulator should be observed on the indicator within 10 min. In that case : The only remaining braking means is normal braking, using green pressure. The parking brake should not be used since, it is not available. And, the chocks should be in place before Engine 1 shutdown.

L1 Y ENG 2 PUMP LO PR
ASSOCIATED PROCEDURES
Y SYS LO PR

 FUEL CONSUMPT INCRSD
 FMS PRED UNRELIABLE

SECONDARY FAILURES

*F/CTL

Continued on the following page

HYD Y RSVR LO AIR PR (Cont'd)

Ident.: PRO-ABN-HYD-G-00018324.0009001 / 15 MAY 25

L12

STATUS

INOP SYS

APPR PROC

HYD LO PR

The probability of cavitation increases with altitude.
 Therefore, it may be possible to restore the system after
 descending to a lower altitude.

YELLOW ENG 2 PUMP ON

● If sys not recovered:

LDG DIST PROC.....APPLY

FUEL CONSUMPT INCRSD

See ⁽²⁾

FMS PRED UNRELIABLE

See ⁽³⁾

FLAPS SLOW

CAT 3 SINGLE

YELLOW HYD

SPLR 2 + 4

CAT 3 DUAL

N/W STRG

REVERSER 2

YAW DAMPER 2 ⁽¹⁾

STEEP APPR 

⁽¹⁾ (In flight, or on ground with both engines running)

⁽²⁾ This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.

⁽³⁾ Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.

HYD Y RSVR LO LVL

Applicable to: MSN 02155-02212

Ident.: PRO-ABN-HYD-I-00017143.0002001 / 06 SEP 16

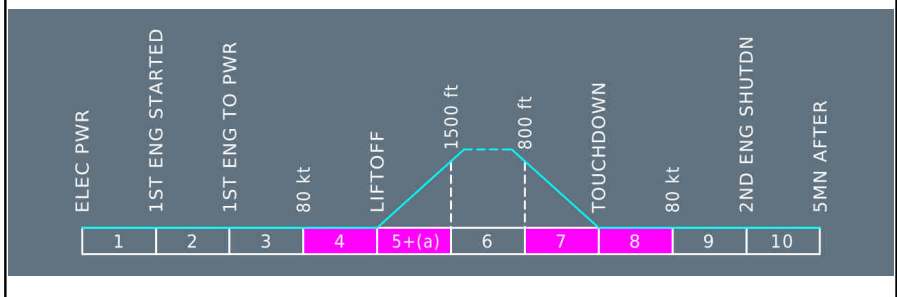
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the fluid quantity < 3.5 l (0.92 US Gal).

Flight Phase Inhibition:



L1

Note: (a) The HYD Y RSVR LO LVL alert is inhibited for the first 15 s of flight phase 5.

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

HYD

HYD Y RSVR LO LVL (Cont'd)

Ident.: PRO-ABN-HYD-I-00011631.0003001 / 05 MAR 13

PTU..... OFF
 YELLOW ENG 2 PUMP..... OFF
 YELLOW ELEC PUMP..... OFF
 BRK Y ACCU PR MONITOR

- [L2] *This check is recommended to cover the case of a pipe rupture, which could lead to the simultaneous loss of the hydraulic system and the accumulator fluid. If this occurs, the loss of the accumulator should be observed on the indicator within 10 min. In that case: The only remaining braking means is normal braking, using green pressure. The parking brake should not be used since, it is not available. And, the chocks should be in place before Engine 1 shutdown.*

[L1] Y ENG 2 PUMP LO PR

ASSOCIATED PROCEDURES

Y SYS LO PR

FUEL CONSUMPT INCRSD
 FMS PRED UNRELIABLE

SECONDARY FAILURES

*F/CTL

Continued on the following page

HYD Y RSVR LO LVL (Cont'd)

13
Ident.: PRO-ABN-HYD-I-00018326.0009001 / 15 MAY 25

L12

STATUS

LDG DIST PROC..... APPLY

FUEL CONSUMPT INCRSD

See ⁽²⁾

FMS PRED UNRELIABLE

See ⁽³⁾

FLAPS SLOW

CAT 3 SINGLE

See ⁽⁴⁾

INOP SYS

YELLOW HYD

SPLR 2 + 4

CAT 3 DUAL

REVERSER 2

CARGO DOOR

YAW DAMPER 2 ⁽¹⁾

⁽¹⁾ (In flight, or on ground with both engines running)
⁽²⁾ This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.
⁽³⁾ Disregard FMS fuel predictions and refer to QRRH/OPS Operational Data - Fuel Penalty Factors Tables in order to find the applicable Fuel Penalty Factor.
⁽⁴⁾ Note: Following a yellow hydraulic system failure, the parking brake may be inoperative due to a yellow accumulator low pressure.

PIA A318/A319/A320/A321 FLEET	PRO-ABN-HYD P 45/76
FCOM	← N 09 FEB 26

HYD Y RSVR LO LVL

Applicable to: MSN 02719-07792

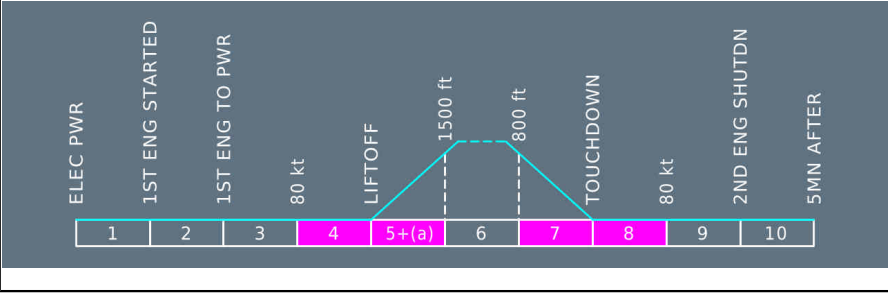
Ident.: PRO-ABN-HYD-I-00017143.0002001 / 06 SEP 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the fluid quantity < 3.5 l (0.92 US Gal).

Flight Phase Inhibition:



L1 Note: (a) The HYD Y RSVR LO LVL alert is inhibited for the first 15 s of flight phase 5.

Continued on the following page

HYD Y RSVR LO LVL (Cont'd)

Ident.: PRO-ABN-HYD-I-00011631.0003001 / 05 MAR 13

	PTU.....	OFF
	YELLOW ENG 2 PUMP.....	OFF
	YELLOW ELEC PUMP.....	OFF
	BRK Y ACCU PR MONITOR	

L2 This check is recommended to cover the case of a pipe rupture, which could lead to the simultaneous loss of the hydraulic system and the accumulator fluid. If this occurs, the loss of the accumulator should be observed on the indicator within 10 min. In that case: The only remaining braking means is normal braking, using green pressure. The parking brake should not be used since, it is not available. And, the chocks should be in place before Engine 1 shutdown.

L1 **Y ENG 2 PUMP LO PR**

ASSOCIATED PROCEDURES

Y SYS LO PR

FUEL CONSUMPT INCRSD

FMS PRED UNRELIABLE

SECONDARY FAILURES

*F/CTL

Continued on the following page

HYD Y RSVR LO LVL (Cont'd)

Ident.: PRO-ABN-HYD-I-00018326.0008001 / 15 MAY 25

L12

STATUS

INOP SYS

LDG DIST PROC..... APPLY

FUEL CONSUMPT INCRSD

 See ⁽²⁾

FMS PRED UNRELIABLE

 See ⁽³⁾

FLAPS SLOW

CAT 3 SINGLE

 See ⁽⁴⁾

YELLOW HYD

SPLR 2 + 4

CAT 3 DUAL

N/W STRG

REVERSER 2

CARGO DOOR

 YAW DAMPER 2 ⁽¹⁾

 STEEP APPR 

- ⁽¹⁾ (In flight, or on ground with both engines running)
- ⁽²⁾ This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.
- ⁽³⁾ Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.
- ⁽⁴⁾ Note: Following a yellow hydraulic system failure, the parking brake may be inoperative due to a yellow accumulator low pressure.

HYD Y RSVR OVHT

Applicable to: MSN 02155-02212

Ident.: PRO-ABN-HYD-H-00017109.0001001 / 21 MAR 16

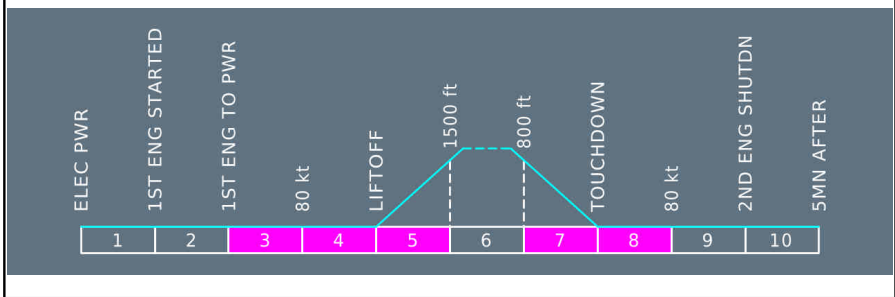
ANNUNCIATIONS

Triggering Conditions:

L2

 This alert triggers when the fluid temperature $\geq 93^{\circ}\text{C}$ (the alert resets if temperature $\leq 88^{\circ}\text{C}$).

Flight Phase Inhibition:



Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

HYD

HYD Y RSVR OVHT (Cont'd)

Ident.: PRO-ABN-HYD-H-00011629.0003001 / 05 MAR 13

PTU..... OFF
 YELLOW ENG 2 PUMP..... OFF
 YELLOW ELEC PUMP..... OFF
 BRK Y ACCU PR MONITOR

- [L2] This check is recommended to cover the case of a pipe rupture, which could lead to the simultaneous loss of the hydraulic system and the accumulator fluid. If this occurs, the loss of the accumulator should be observed on the indicator within 10 min. In that case: The only remaining braking means is normal braking, using green pressure. The parking brake should not be used since, it is not available. And, the chocks should be in place before Engine 1 shutdown.

[L1] Y ENG 2 PUMP LO PR

ASSOCIATED PROCEDURES

Y SYS LO PR

FUEL CONSUMPT INCRSD
 FMS PRED UNRELIABLE

SECONDARY FAILURES

*F/CTL

Continued on the following page

HYD Y RSVR OVHT (Cont'd)

15

Ident.: PRO-ABN-HYD-H-00018327.0010001 / 15 MAY 25

L12

STATUS

INOP SYS

APPR PROC

HYD LO PR

● IF YELLOW OVHT OUT:

YELLOW ENG 2 PUMP.....ON

● If not recovered:

LDG DIST PROC.....APPLY

FUEL CONSUMPT INCRSD

See ⁽²⁾

FMS PRED UNRELIABLE

See ⁽³⁾

FLAPS SLOW

CAT 3 SINGLE

(1) (In flight, or on ground with both engines running)

(2) This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.

(3) Disregard FMS fuel predictions and refer to QRH/OPS Operational Data - Fuel Penalty Factors Tables in order to find the applicable Fuel Penalty Factor.

PIA A318/A319/A320/A321 FLEET	PRO-ABN-HYD P 51/76
FCOM	09 FEB 26

← O

HYD Y RSVR OVHT

Applicable to: MSN 02719-07792

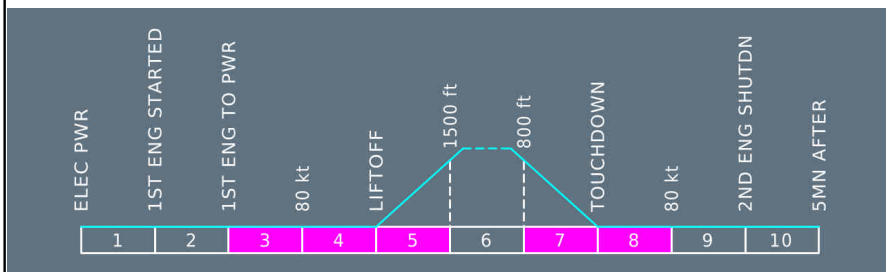
Ident.: PRO-ABN-HYD-H-00017109.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the fluid temperature $\geq 93^{\circ}\text{C}$ (the alert resets if temperature $\leq 88^{\circ}\text{C}$).

Flight Phase Inhibition:


Continued on the following page

HYD Y RSVR OVHT (Cont'd)

Ident.: PRO-ABN-HYD-H-00011629.0003001 / 05 MAR 13

PTU.....OFF
 YELLOW ENG 2 PUMP.....OFF
 YELLOW ELEC PUMP.....OFF
 BRK Y ACCU PR MONITOR

L2 This check is recommended to cover the case of a pipe rupture, which could lead to the simultaneous loss of the hydraulic system and the accumulator fluid. If this occurs, the loss of the accumulator should be observed on the indicator within 10 min. In that case: The only remaining braking means is normal braking, using green pressure. The parking brake should not be used since, it is not available. And, the chocks should be in place before Engine 1 shutdown.

L1 Y ENG 2 PUMP LO PR

ASSOCIATED PROCEDURES
Y SYS LO PR

FUEL CONSUMPT INCRSD
 FMS PRED UNRELIABLE

SECONDARY FAILURES

*F/CTL

Continued on the following page

HYD Y RSVR OVHT (Cont'd)

Ident.: PRO-ABN-HYD-H-00018327.0009001 / 15 MAY 25

L12

STATUS

INOP SYS

APPR PROC

HYD LO PR

- **IF YELLOW OVHT OUT:**
 YELLOW ENG 2 PUMPON
- **If not recovered:**
 LDG DIST PROCAPPLY

FUEL CONSUMPT INCRSD

 See ⁽²⁾

FMS PRED UNRELIABLE

 See ⁽³⁾

FLAPS SLOW

CAT 3 SINGLE

YELLOW HYD

SPLR 2 + 4

CAT 3 DUAL

N/W STRG

REVERSER 2

 YAW DAMPER 2 ⁽¹⁾

 STEEP APPR 

⁽¹⁾ (In flight, or on ground with both engines running)

⁽²⁾ This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.

⁽³⁾ Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.

HYD B+Y SYS LO PR

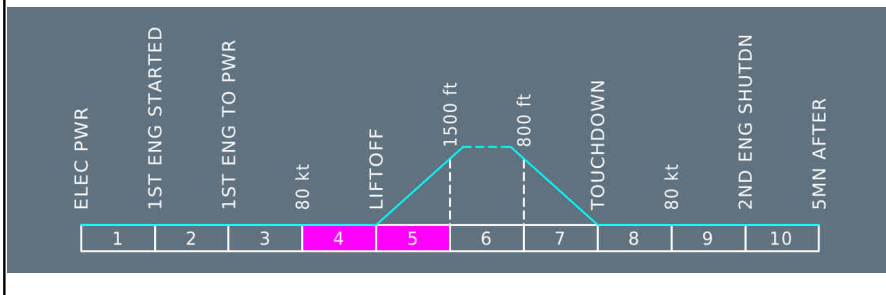
Applicable to: MSN 02155-02212

Ident.: PRO-ABN-HYD-L-00018917.0001001 / 21 MAR 16

ANNUNCIATIONS
Triggering Conditions:

L2

 This alert triggers when the blue and yellow systems pressure ≤ 1450 PSI (the alert resets if pressure ≥ 1750 PSI).

Flight Phase Inhibition:


Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

HYD

HYD B+Y SYS LO PR (Cont'd)

17 Ident.: PRO-ABN-HYD-L-00018727.0004001 / 16 APR 19

Note: If the yellow hydraulic system is lost due to low level, the “HYD PTU FAULT” ECAM message may appear, and requests that the flight crew switches the PTU off.

LAND ASAP

- If yellow sys lost by ENG 2 PUMP LO PR:
 YELLOW ELEC PUMP ON
- If blue sys lost by ELEC PUMP LO PR:
 RAT MAN ON
 MIN RAT SPD 140 KT
- AFFECTED PUMPS OFF
 MAX SPEED 320/0.77

L2 Note: Flight controls remain in normal law.

L1 MANEUVER WITH CARE

- **FOR GO-AROUND**
 MAX PITCH 15 DEG
 THR LVR TOGA THEN MCT

L2 This line is not displayed if one engine is inoperative

L1 FUEL CONSUMPT INCRSD FMS PRED UNRELIABLE

SECONDARY FAILURES

*F/CTL

Continued on the following page

HYD B+Y SYS LO PR (Cont'd)

Ident.: PRO-ABN-HYD-L-00018342.0027001 / 13 MAY 25

L12

STATUS

MIN RAT SPD..... 140 KT

*This line is displayed if the RAT is out and in the case of **HYD B ELEC PUMP LO PR**.*

MAX SPEED..... 320/0.77

MANEUVER WITH CARE

SPD BRK..... DO NOT USE

● FOR GO-AROUND:

MAX PITCH 15 DEG

THR LVR..... TOGA THEN MCT

This line is not displayed if one engine is inoperative.
APPR PROC
DUAL HYD LO PR
● If system lost by RSVR LO AIR PR:

In approach, system lost by RSVR LO AIR PR may be recovered at low altitude.

RELATED PUMP..... ON

● If system lost by RSVR OVHT:

 In approach, system lost by RSVR OVHT may be recovered if **OVHT** indication disappears.

● IF BLUE OVHT OUT:

BLUE ELEC PUMP..... AUTO

● IF YELLOW OVHT OUT:

YELLOW ENG 2 PUMP..... ON

● IF HYD NOT RECOVERED:
● For A321 aircraft:

FOR LDG..... FLAP LVR 3

INOP SYS

B+Y HYD

R ELEV

SPLR 2+3+4

SPD BRK

AP 1+2

 CARGO DOOR ⁽¹⁾

REVERSER 2

B ELEC PUMP

 EMER GEN ⁽²⁾

YAW DAMPER 2

CAT 2

 GLS AUTOLAND 

 STEEP APPR 

Continued on the following page

HYD B+Y SYS LO PR (Cont'd)

This line is replaced by "FOR LDG: FLAP LVR 3" when CONF 3 is selected, as a reminder.

GPWS LDG FLAP 3.....ON

● **If L/G is not downlocked:**

L/G GRVTY PROC.....APPLY

Landing gear is extended by gravity to preserve green system integrity. Refer to PRO-ABN-LG [QRH] L/G GRAVITY EXTENSION.

● **For A321 aircraft:**

APPR SPD.....VREF + 10 KT

LDG DIST PROC.....APPLY

FUEL CONSUMPT INCRSD

See ⁽³⁾

FMS PRED UNRELIABLE

See ⁽⁴⁾

SLATS/FLAPS SLOW

See ⁽⁵⁾

⁽¹⁾ (If HYD Y RSVR LO LVL)

⁽²⁾ (If HYD B RSVR LO LVL)

⁽³⁾ This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.

⁽⁴⁾ Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.

⁽⁵⁾ Note: Following a yellow hydraulic system failure, the parking brake may be inoperative due to yellow accumulator low pressure.

HYD B+Y SYS LO PR

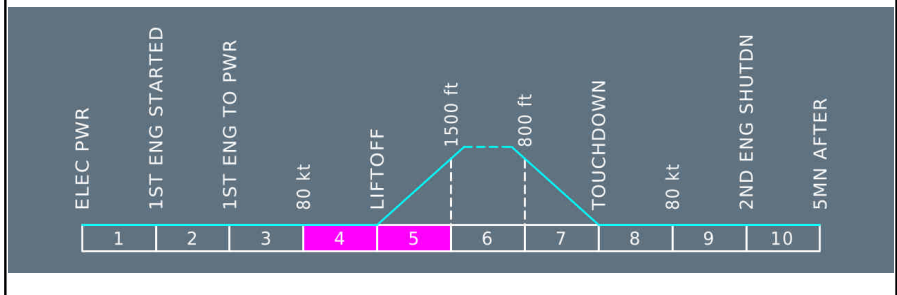
Applicable to: MSN 02719-07792

Ident.: PRO-ABN-HYD-L-00018917.0001001 / 21 MAR 16

ANNUNCIATIONS
Triggering Conditions:

L2

 This alert triggers when the blue and yellow systems pressure ≤ 1450 PSI (the alert resets if pressure ≥ 1750 PSI).

Flight Phase Inhibition:


Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

HYD

HYD B+Y SYS LO PR (Cont'd)

19 Ident.: PRO-ABN-HYD-L-00018727.0004001 / 16 APR 19

Note: If the yellow hydraulic system is lost due to low level, the “HYD PTU FAULT” ECAM message may appear, and requests that the flight crew switches the PTU off.

LAND ASAP

- If yellow sys lost by ENG 2 PUMP LO PR:

YELLOW ELEC PUMP ON

- If blue sys lost by ELEC PUMP LO PR:

RAT MAN ON

MIN RAT SPD 140 KT

AFFECTED PUMPS OFF

MAX SPEED 320/0.77

L2 Note: Flight controls remain in normal law.

L1 MANEUVER WITH CARE

- FOR GO-AROUND

MAX PITCH 15 DEG

THR LVR TOGA THEN MCT

L2 This line is not displayed if one engine is inoperative

L1 FUEL CONSUMPT INCRSD

FMS PRED UNRELIABLE

SECONDARY FAILURES

*F/CTL

Continued on the following page

	HYD B+Y SYS LO PR (Cont'd)	
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Ident.: PRO-ABN-HYD-L-00018342.0025001 / 13 MAY 25

L12

STATUS

MIN RAT SPD..... 140 KT
*This line is displayed if the RAT is out and in the case of HYD
B ELEC PUMP LO PR.*

MAX SPEED..... 320/0.77
 MANEUVER WITH CARE
 SPD BRK.....DO NOT USE

- **FOR GO-AROUND:**
MAX PITCH 15 DEG
THR LVR..... TOGA THEN MCT

This line is not displayed if one engine is inoperative.

APPR PROC

DUAL HYD LO PR

- **If system lost by RSVR LO AIR PR:**

In approach, system lost by RSVR LO AIR PR may be recovered at low altitude.

RELATED PUMP..... ON

- **If system lost by RSVR OVHT:**

In approach, system lost by RSVR OVHT may be recovered if OVHT indication disappears.

- **IF BLUE OVHT OUT:**
BLUE ELEC PUMP.....AUTO
- **IF YELLOW OVHT OUT:**
YELLOW ENG 2 PUMP..... ON

- **IF HYD NOT RECOVERED:**

- **For A321 aircraft:**
FOR LDG.....FLAP LVR 3

INOP SYS

B+Y HYD
R ELEV
SPLR 2+3+4
SPD BRK
AP 1+2
N/W STRG
ALTN BRK
CARGO DOOR ⁽¹⁾
REVERSER 2
B ELEC PUMP
EMER GEN ⁽²⁾
YAW DAMPER 2
CAT 2
GLS AUTOLAND 
STEEP APPR 

Continued on the following page

HYD B+Y SYS LO PR (Cont'd)

This line is replaced by "FOR LDG: FLAP LVR 3"
 when CONF 3 is selected, as a reminder.

GPWS LDG FLAP 3.....ON

● If L/G is not downlocked:

L/G GRVTY PROC.....APPLY

Landing gear is extended by gravity to preserve
 green system integrity. Refer to PRO-ABN-LG [QRH]
 L/G GRAVITY EXTENSION.

● For A321 aircraft:

APPR SPD.....VREF + 10 KT

LDG DIST PROC.....APPLY

FUEL CONSUMPT INCRSD

See ⁽³⁾

FMS PRED UNRELIABLE

See ⁽⁴⁾

SLATS/FLAPS SLOW

See ⁽⁵⁾

⁽¹⁾ (If HYD Y RSVR LO LVL)

⁽²⁾ (If HYD B RSVR LO LVL)

⁽³⁾ This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.

⁽⁴⁾ Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.

⁽⁵⁾ Note: Following a yellow hydraulic system failure, the parking brake may be inoperative due to yellow accumulator low pressure.

HYD G+B SYS LO PR

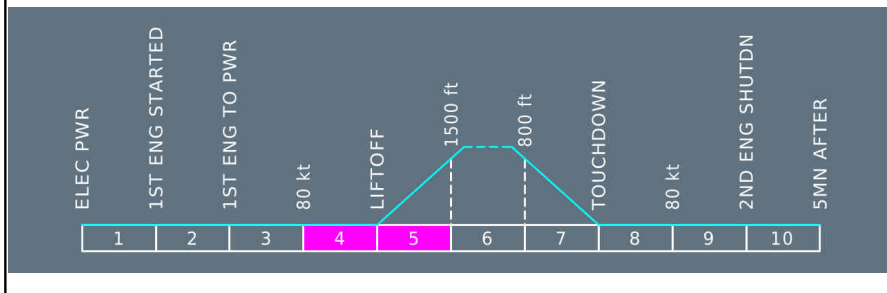
Applicable to: MSN 02155-02212

Ident.: PRO-ABN-HYD-J-00018920.0001001 / 21 MAR 16

ANNUNCIATIONS
Triggering Conditions:

L2

 This alert triggers when the green and blue systems pressure ≤ 1450 PSI (the alert resets if pressure ≥ 1750 PSI).

Flight Phase Inhibition:


Continued on the following page

HYD G+B SYS LO PR (Cont'd)

Ident.: PRO-ABN-HYD-J-00018349.0008001 / 13 MAY 25

[L2] If the green hydraulic system is lost due to low level, the HYD PTU FAULT alert may appear, and requests the flight crew to switch the PTU off.

[L1] **LAND ASAP**

● If HYD B ELEC PUMP LO PR:

■ If the RAT is not out:

RAT MAN ON

■ If the RAT is out:

MIN RAT SPD 140 KT

AFFECTED PUMPS OFF

MANEUVER WITH CARE

● FOR GO-AROUND

MAX PITCH 15 DEG

THR LVR TOGA THEN MCT

[L2] *This line is not displayed if one engine is inoperative.*

[L1] FUEL CONSUMPT INCRSD

FMS PRED UNRELIABLE

— ASSOCIATED PROCEDURES —

F/CTL ALTN LAW

(PROT LOST)

Refer to PRO-ABN-F_CTL F/CTL ALTN LAW - ANNUNCIATION

HYD G SYS LO PR

If blue system recovered.

SECONDARY FAILURES

*WHEEL

*F/CTL

Continued on the following page

HYD G+B SYS LO PR (Cont'd)

Ident.: PRO-ABN-HYD-J-00018350.0053001 / 13 MAY 25

L12

STATUS

MIN RAT SPD..... 140 KT

*This line is displayed if the RAT is out and in the case of **HYD B ELEC PUMP LO PR**.*

MAX SPEED..... 320/0.77

MANEUVER WITH CARE

SPD BRK..... DO NOT USE

● FOR GO-AROUND

MAX PITCH 15 DEG

THR LVR..... TOGA THEN MCT

This line is not displayed if one engine is inoperative.

FUEL CONSUMPT INCRSD

 See ⁽¹⁾
APPR PROC
DUAL HYD LO PR
● If system lost by RSVR LO AIR PR:

RELATED PUMPS..... ON

● If system lost by RSVR OVHT:
● IF BLUE OVHT OUT:

BLUE ELEC PUMP..... AUTO

● IF GREEN OVHT OUT:

GREEN ENG 1 PUMP..... ON

● IF HYD NOT RECOVERED:

S/F JAMMED PROC..... APPLY

A/THR..... OFF

Select the target speed on the FCU. Due to the loss of flaps and some flight control surfaces, the A/THR may not satisfactorily maintain speed.
INOP SYS

G+B HYD

F/CTL PROT

L ELEV

L+R AIL

SPLR 1+3+5

SLATS

AP 1+2

N/W STRG

AUTO BRK

NORM BRK

L/G RETRACT

REVERSER 1

 EMER GEN ⁽²⁾

G ENG 1 PUMP

B ELEC PUMP

YAW DAMPER 1

CAT 2

 GLS AUTOLAND 

 STEEP APPR 

Continued on the following page

HYD G+B SYS LO PR (Cont'd)

FOR LDG..... FLAP LVR 3

This line is replaced by "FOR LDG: FLAP LVR 3" when CONF 3 is selected, as a reminder.

GPWS LDG FLAP 3..... ON

● If L/G is not downlocked:

- WHEN SPD 200 KT (displayed when slats are retracted):

L/G GRVTY PROC..... APPLY

Note: Refer to PRO-ABN-LG [QRH] L/G GRAVITY EXTENSION

Extend the landing gear at 200 kt to revert sooner in direct law. This provides, below 200 kt, a better pitch control than in alternate law with one elevator lost and all slats lost.

APPR SPD..... VREF + 25 KT

Approach speed must be increased due to the loss of ailerons and slats.

LDG DIST PROC..... APPLY

ALTN LAW: PROT LOST
WHEN L/G DN: DIRECT LAW

See ⁽³⁾

FMS PRED UNRELIABLE

See ⁽⁴⁾

FLAPS SLOW

⁽¹⁾ This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.

⁽²⁾ (If HYD B RSVR LO LVL)

⁽³⁾ At landing gear extension, control reverts to direct law in pitch, as well as in roll (Refer to PRO-ABN-F_CTL F/CTL DIRECT LAW).

⁽⁴⁾ Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.

HYD G+B SYS LO PR

Applicable to: MSN 02719-07792

Ident.: PRO-ABN-HYD-J-00018920.0001001 / 21 MAR 16

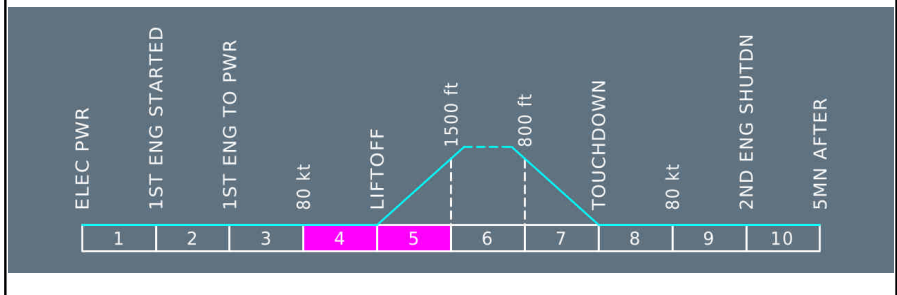
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the green and blue systems pressure ≤ 1450 PSI (the alert resets if pressure ≥ 1750 PSI).

Flight Phase Inhibition:


Continued on the following page

HYD G+B SYS LO PR (Cont'd)

Ident.: PRO-ABN-HYD-J-00018349.0008001 / 13 MAY 25

[L2] If the green hydraulic system is lost due to low level, the **HYD PTU FAULT** alert may appear, and requests the flight crew to switch the PTU off.

[L1] **LAND ASAP**

● If **HYD B ELEC PUMP LO PR**:

■ If the RAT is not out:

RAT MAN ON

■ If the RAT is out:

MIN RAT SPD 140 KT

AFFECTED PUMPS OFF

MANEUVER WITH CARE

● FOR GO-AROUND

MAX PITCH 15 DEG

THR LVR TOGA THEN MCT

[L2] *This line is not displayed if one engine is inoperative.*

[L1] FUEL CONSUMPT INCRSD

FMS PRED UNRELIABLE

ASSOCIATED PROCEDURES

F/CTL ALTN LAW

(PROT LOST)

Refer to PRO-ABN-F_CTL F/CTL ALTN LAW - ANNUNCIATION

HYD G SYS LO PR

If blue system recovered.

SECONDARY FAILURES

*WHEEL

*F/CTL

Continued on the following page

HYD G+B SYS LO PR (Cont'd)

Ident.: PRO-ABN-HYD-J-00018350.0057001 / 13 MAY 25

L12

STATUS

MIN RAT SPD..... 140 KT

*This line is displayed if the RAT is out and in the case of **HYD B ELEC PUMP LO PR**.*

MAX SPEED..... 320/0.77

MANEUVER WITH CARE

SPD BRK..... DO NOT USE

● FOR GO-AROUND

MAX PITCH 15 DEG

THR LVR..... TOGA THEN MCT

This line is not displayed if one engine is inoperative.

FUEL CONSUMPT INCRSD

 See ⁽¹⁾
APPR PROC
DUAL HYD LO PR
● If system lost by RSVR LO AIR PR:

RELATED PUMPS..... ON

● If system lost by RSVR OVHT:
● IF BLUE OVHT OUT:

BLUE ELEC PUMP..... AUTO

● IF GREEN OVHT OUT:

GREEN ENG 1 PUMP..... ON

● IF HYD NOT RECOVERED:

S/F JAMMED PROC..... APPLY

A/THR..... OFF

Select the target speed on the FCU. Due to the loss of flaps and some flight control surfaces, the A/THR may not satisfactorily maintain speed.
INOP SYS

G+B HYD

F/CTL PROT

L ELEV

L+R AIL

SPLR 1+3+5

SLATS

AP 1+2

AUTO BRK

NORM BRK

L/G RETRACT

REVERSER 1

 EMER GEN ⁽²⁾

G ENG 1 PUMP

B ELEC PUMP

YAW DAMPER 1

CAT 2

 GLS AUTOLAND 

 STEEP APPR 

Continued on the following page

HYD G+B SYS LO PR (Cont'd)

FOR LDG..... FLAP LVR 3

This line is replaced by "FOR LDG: FLAP LVR 3" when CONF 3 is selected, as a reminder.

GPWS LDG FLAP 3..... ON

● If L/G is not downlocked:

- WHEN SPD 200 KT (displayed when slats are retracted):

L/G GRVTY PROC..... APPLY

Note: Refer to PRO-ABN-LG [QRH] L/G GRAVITY EXTENSION

Extend the landing gear at 200 kt to revert sooner in direct law. This provides, below 200 kt, a better pitch control than in alternate law with one elevator lost and all slats lost.

APPR SPD..... VREF + 25 KT

Approach speed must be increased due to the loss of ailerons and slats.

LDG DIST PROC..... APPLY

ALTN LAW: PROT LOST

WHEN L/G DN: DIRECT LAW

See ⁽³⁾

FMS PRED UNRELIABLE

See ⁽⁴⁾

FLAPS SLOW

⁽¹⁾ This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.

⁽²⁾ (If HYD B RSVR LO LVL)

⁽³⁾ At landing gear extension, control reverts to direct law in pitch, as well as in roll (Refer to PRO-ABN-F_CTL F/CTL DIRECT LAW).

⁽⁴⁾ Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.

HYD G+Y SYS LO PR

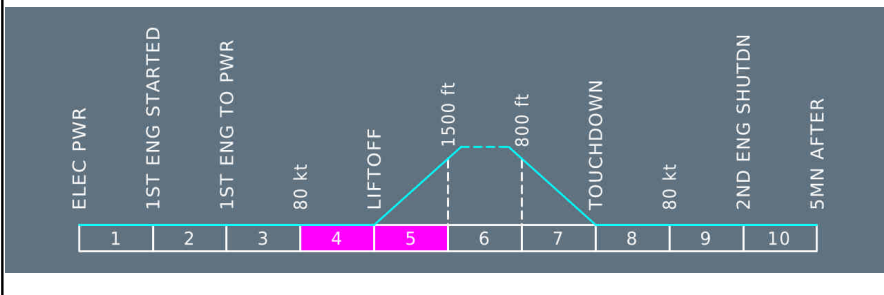
Applicable to: ALL

Ident.: PRO-ABN-HYD-K-00018921.0001001 / 21 MAR 16

ANNUNCIATIONS
Triggering Conditions:

L2

 This alert triggers when the green and yellow systems pressure ≤ 1450 PSI (the alert resets if pressure ≥ 1750 PSI).

Flight Phase Inhibition:


Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

HYD

HYD G+Y SYS LO PR (Cont'd)

25 Ident.: PRO-ABN-HYD-K-00018352.0006001 / 13 MAY 25

LAND ASAP

PTU.....OFF

AFFECTED PUMPS.....OFF

- If **HYD Y ENG 2 PUMP LO PR**
 YELLOW ELEC PUMP.....ON

MANEUVER WITH CARE

- **FOR GO-AROUND**
 MAX PITCH 15 DEG
 THR LVR.....TOGA THEN MCT

[L2] This line is not displayed if one engine is inoperative.

 [L1] FUEL CONSUMPT INCRSD
 FMS PRED UNRELIABLE

ASSOCIATED PROCEDURES

F/CTL ALTN LAW
 (PROT LOST)

Refer to PRO-ABN-F_CTL F/CTL ALTN LAW - ANNUNCIATION

HYD G SYS LO PR

If yellow system recovered.

SECONDARY FAILURES

 *F/CTL
 *WHEEL

Continued on the following page

HYD G+Y SYS LO PR (Cont'd)

Ident.: PRO-ABN-HYD-K-00018353.0040001 / 13 MAY 25

L12

STATUS

 MAX SPEED..... 320/0.77
 MAX BRK PR..... 1 000 PSI
 MANEUVER WITH CARE

 ● **FOR GO-AROUND**

MAX PITCH 15 DEG

THR LVR..... TOGA THEN MCT

This line is not displayed if one engine is inoperative.
APPR PROC
DUAL HYD LO PR

 ● **If system lost by RSVR LO AIR PR:**

RELATED PUMP..... ON

 ● **If system lost by RSVR OVHT:**

 ● **IF GREEN OVHT OUT:**

GREEN ENG 1 PUMP..... ON

 ● **IF YELLOW OVHT OUT:**

YELLOW ENG 2 PUMP..... ON

 ● **IF HYD NOT RECOVERED:**

S/F JAMMED PROC..... APPLY

FOR LDG..... FLAP LVR 3

*This line is replaced by "FOR LDG: FLAP LVR 3" when
 CONF 3 is selected, as a reminder.*

GPWS FLAP MODE..... OFF

 ● **If L/G is not downlocked:**

 ● **WHEN CONF 3 AND VAPP:**

L/G GRVTY PROC..... APPLY

*Refer to PRO-ABN-LG [QRH] L/G GRAVITY
 EXTENSION. Being stabilized at VAPP, before*
INOP SYS
G+Y HYD

F/CTL PROT

STABILIZER

REVERSER 1+2

SPLR 1+2+ 4+5

FLAPS

LAF <⊗>

YAW DAMPER

AP 1+2

ANTI SKID

N/W STRG

NORM BRK

AUTO BRK

L/G RETRACT

 CARGO DOOR ⁽¹⁾

CAT 2

GLS AUTOLAND <⊗>

STEEP APPR <⊗>

Continued on the following page

HYD G+Y SYS LO PR (Cont'd)

selecting the gear down, enables the aircraft to be trimmed for approach.

APPR SPD..... VREF + 25 KT

Approach speed must be increased, due to the loss of flaps.

LDG DIST PROC..... APPLY

ALTN LAW: PROT LOST

WHEN L/G DN: DIRECT LAW

See ⁽²⁾

BRK Y ACCU PR ONLY

See ⁽³⁾

FUEL CONSUMPT INCRSD

See ⁽⁴⁾

FMS PRED UNRELIABLE

See ⁽⁵⁾

SLATS SLOW

See ⁽⁶⁾

⁽¹⁾ (If HYD Y RSVR LO LVL)

⁽²⁾ At landing gear extension, control reverts to direct law in pitch, as well as in roll (Refer to PRO-ABN-F_CTL F/CTL DIRECT LAW).

⁽³⁾ 7 full brake applications are available.

⁽⁴⁾ This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.

⁽⁵⁾ Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.

⁽⁶⁾ Note: Following a yellow hydraulic system failure, the parking brake may be inoperative due to yellow accumulator low pressure.

HYD PTU FAULT

Applicable to: ALL

Ident.: PRO-ABN-HYD-R-00017140.0001001 / 21 MAR 16

ANNUNCIATIONS

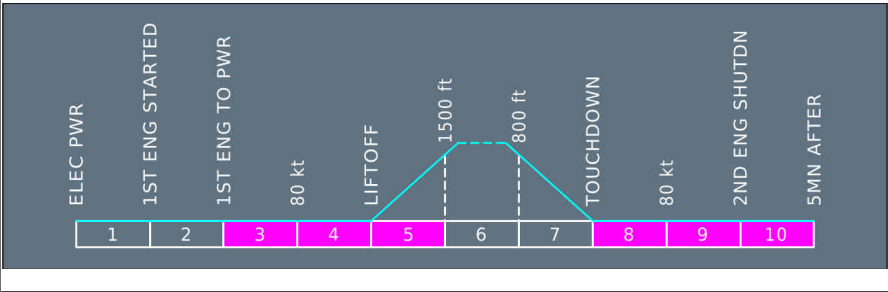
Triggering Conditions:

L2

This alert triggers when:

- On ground, PTU does not run if the differential pressure is higher than 650 PSI between G and Y system, or
- In flight, PTU at AUTO position does not run when G or Y reservoir level is low, and G or Y system pressure is low.

Flight Phase Inhibition:



Ident.: PRO-ABN-HYD-R-00011657.0001001 / 13 MAY 25

- If green or yellow reservoir low level and system low press:
 PTU..... OFF

Ident.: PRO-ABN-HYD-R-00011658.0001001 / 18 AUG 10

STATUS

INOP SYS

PTU

HYD RAT FAULT

Applicable to: ALL

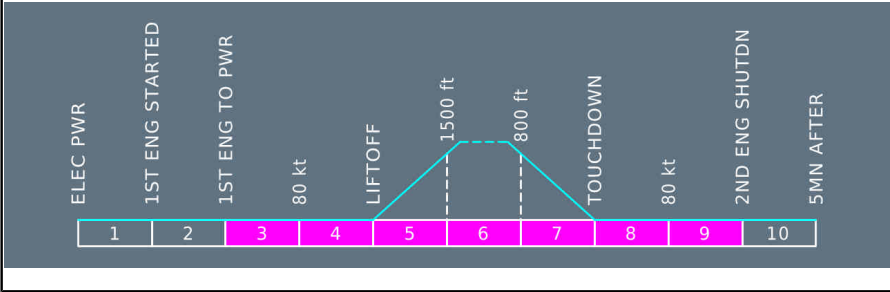
Ident.: PRO-ABN-HYD-S-00017141.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

- L2
- This alert triggers when:
- The RAT is not fully stowed, or
 - Pressure is present in the RAT stowing actuator, or
 - The RAT pump is not available.

Flight Phase Inhibition:



Ident.: PRO-ABN-HYD-S-00011659.0001001 / 16 NOV 11

Crew awareness.

Ident.: PRO-ABN-HYD-S-00011660.0001001 / 18 AUG 10

STATUS

INOP SYS

RAT

PROCEDURES
ABNORMAL AND EMERGENCY PROCEDURES

L/G

[QRH] LANDING WITH ABNORMAL L/G**Applicable to: ALL**

Ident.: PRO-ABN-LG-AD-00018650.0002001 / 17 MAR 17

The procedure is intended for use when the nose or main landing gear fail to extend and/or lock down following the application of the L/G GRVTY EXTN procedure.

It is preferable to use any available landing gear, rather than carry out a belly landing.

Under these circumstances, a hard surface runway landing is recommended.

Full advantage should be taken of any foam, spread on the runway.

CAUTION

Do not apply this procedure if at least one green triangle is displayed on each landing gear on the WHEEL SD page. This is sufficient to confirm that the landing gear is downlocked. Disregard any possible GPWS "TOO LOW GEAR" aural alert.

Continued on the following page

[QRH] LANDING WITH ABNORMAL L/G (Cont'd)

Ident.: PRO-ABN-LG-AD-00018651.0002001 / 13 MAY 25

CABIN CREW.....NOTIFY

Notify the cabin crew of the nature of the emergency encountered and state intentions. Specify the amount of available preparation time.

ATC.....NOTIFY

Notify ATC of the nature of the emergency and state intentions.

GALY & CAB.....OFF

CONSIDER FUEL REDUCTION
This reduces VREF and, consequently, the load factor at impact and the energy to be dissipated.
LDG DIST AFFECTED
Landing distance is increased up to 70 % compared to the distance computed without failure.
● If NOSE L/G abnormal:

SHIFT CG AFT IF POSSIBLE

- 10 pax from front to rear moves the CG roughly 4 % aft
- 10 pax from mid to rear moves the CG roughly 2.5 % aft.

● If one MAIN L/G abnormal:

FUEL DISTRIBUTION.....CONSIDER

Open the fuel X-FEED valve and switch off the pumps on the side with landing gear normally extended.

OXYGEN CREW SUPPLY.....OFF

SIGNS.....ON

CABIN and COCKPIT (LOOSE EQPT).....SECURE

Continued on the following page

[QRH] LANDING WITH ABNORMAL L/G (Cont'd)

Ident.: PRO-ABN-LG-AD-00018652.0001001 / 17 MAR 17

● For approach:

GPWS SYS.....OFF

L/G lever..... CHECK DOWN

GRVTY GEAR EXTN handcrank..... TURN BACK TO NORMAL

Rotating three turns back to normal may, in certain cases, pressurize the landing gear down actuators, thereby reducing the probability of gear collapse after touchdown.

DO NOT ARM AUTOBRAKE

Manual braking will enable better pitch and roll control. Moreover, with at least one main landing gear in the abnormal position the autobrake cannot be activated (ground spoilers not armed).

EMER EXIT LT.....ON

CABIN REPORT.....OBTAIN

A/SKID & N/W STRG.....OFF

With one main landing gear not extended, the reference speed used by the anti-skid to detect a wheel blockage is not correctly initialized. As a result, the anti-skid must be switched off to prevent permanent brake release.

MAX BRAKE PR : 1 000 PSI

Modulate the brake pressure to 1 000 PSI because the anti-skid is off.

● If one or both MAIN L/G abnormal: DO NOT ARM GROUND SPOILERS

To keep as much roll authority as possible for maintaining the wings level.

Ground spoiler extension would prevent spoilers from acting as roll surfaces.

RAM AIR.....ON

To ensure full depressurization of the aircraft before impact.

DOME LT.....DIM

Set the dome light to DIM to ensure that there is a light source after both engines are shut down after landing, in order to see and read the BRAKE PRESS indicator.

● At 500 ft AGL:

BRACE FOR IMPACT.....ORDER

Continued on the following page

[QRH] LANDING WITH ABNORMAL L/G (Cont'd)

Ident.: PRO-ABN-LG-AD-00018654.0001001 / 17 MAR 17

● At flare, touchdown and rollout:

Engines should be shut down sufficiently early to ensure fuel is shut off before the nacelles impact, but sufficiently late to ensure adequate hydraulic supplies for the flight controls. Engine pumps continue to supply adequate hydraulic pressure for 30 s after engine shutdown. DO NOT USE REVERSE

● If NOSE L/G abnormal:

KEEP NOSE UP

After touchdown, keep the nose off the runway by the use of the elevator. Then, lower the nose on to the runway before elevator control is lost.

BRAKES..... SMOOTHLY APPLY

Adapt braking to the efficiency of the elevator.

BEFORE NOSE IMPACT : ALL ENG MASTERS OFF

● If one MAIN L/G abnormal:

AT TOUCHDOWN : ALL ENG MASTERS OFF

KEEP AFFECTED SIDE WING UP

Use roll control, as necessary, to maintain the unsupported wing up as long as possible.

● If both MAIN L/G abnormal:

DURING FLARE : ALL ENG MASTERS OFF

MIN PITCH ATT : 6 °

Continued on the following page

[QRH] LANDING WITH ABNORMAL L/G (Cont'd)

Ident.: PRO-ABN-LG-AD-00018655.0001001 / 09 MAY 17

● When aircraft stopped:

 PARK BRK.....ON
 ALL FIRE pb (ENGs & APU).....PUSH
 ALL AGENT (ENGs & APU).....DISCH

■ If evacuation required:

EVACUATION.....INITIATE

Make a short and precise announcement to order the emergency evacuation.
Press the EVAC COMMAND pb <E> .
■ If evacuation not required:

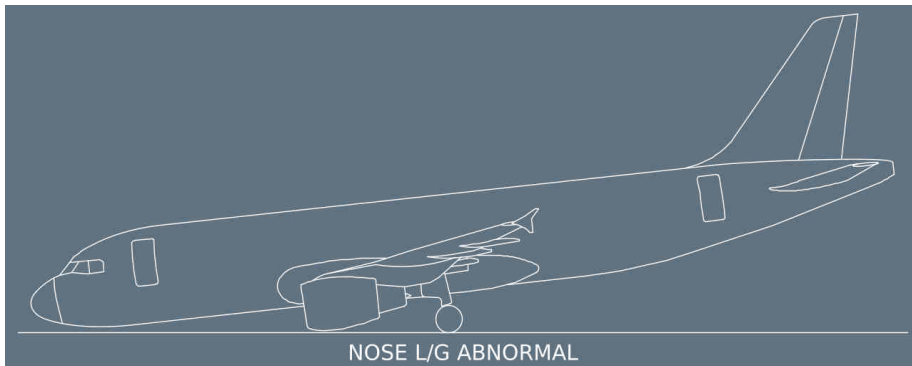
CABIN CREW and PASSENGERS (PA).....NOTIFY

Ensure that all the landing gears are secured before initiating the disembarkation (before switching OFF the seat belts signs).
Continued on the following page

[QRH] LANDING WITH ABNORMAL L/G (Cont'd)

Ident.: PRO-ABN-LG-AD-00018711.0001001 / 17 MAR 17

REFERENCE AIRCRAFT ATTITUDE AFTER IMPACT



[QRH] L/G GRAVITY EXTENSION

Ident.: PRO-ABN-LG-00011286.0010001 / 05 MAY 22

Applicable to: MSN 02155-02212

CAUTION

Do not apply this procedure if at least one green triangle is displayed on each landing gear on the **WHEEL SD** page. This is sufficient to confirm that the landing gear is downlocked. Disregard any possible GPWS "TOO LOW GEAR" aural alert.

■ If **L/G GEAR NOT DOWNLOCKED** alert was displayed and IF TIME PERMITS:

The landing gear recycling can be attempted up to 4 times, if necessary. These additional attempts should enable the successful pressurized extension of the landing gear and avoid a landing gear extension by gravity.

L/G lever.....UP

WAIT L/G UNLOCKED

L/G lever.....DOWN

WAIT AT LEAST 60 s

● If unsuccessful:

REPEAT UP TO THREE TIMES

● If unsuccessful after 4 attempts:

WAIT AT LEAST 120 s

L/G GRVTY PROC.....APPLY

See "In all other cases" condition below.

■ In all other cases:

GRAVITY GEAR EXTN handcrank.....PULL AND TURN

Rotate the handle clockwise 3 turns until reaching the mechanical stop, even if resistance is felt.

L/G lever.....DOWN

The landing gear lever should be confirmed in the DOWN position for the following reasons:

- To extinguish the **UNLK** lights on the LDG GEAR indicator panel
- To avoid the **L/G CTL** message on the **WHEEL SD** page
- To minimize the risk of landing gear retraction on the ground, due to an unknown system fault, when the free-fall system is reset.

GEAR DOWN indications (if available).....CHECK

*The **L/G LGCIU 2 FAULT** or **BRAKES SYS 1(2) FAULT** alert may be spuriously triggered after a gravity extension.*

Continued on the following page

[QRH] L/G GRAVITY EXTENSION (Cont'd)

- Note:
1. Depending on aircraft speed, the display may show the landing gear doors in the amber transit position.
 2. In the event of gravity extension caused by the failure of both LGCIUs, indications of the landing gears position on the ECAM are lost. LDG GEAR lights on the LDG GEAR indicator panel remain available, if LGCIU 1 is electrically supplied.
 3. If the three green downlock arrows are not illuminated, it may indicate that the handcrank did not reach the mechanical stop. Check that the handcrank is firmly against the mechanical stop.

N/W STEERING NOT AVAILABLE
■ If successful:
DO NOT RESET LDG GEAR GRVTY EXTN

Do not reset the free-fall system. This will avoid undesirable effects such as further loss of fluid, in the event of a leak, or possible landing gear unlock, in the event of a gear selector valve jammed in the UP position.

Note: The free-fall system may be reset in flights used for training purpose. If the green hydraulic system is available, reset of the free-fall system enables the landing gear doors closure and the nosewheel steering operation.
 The flight crew should not reset the free-fall system on the ground after the flight.

■ If unsuccessful:

LDG WITH ABNORMAL L/G PROC..... APPLY

Refer to PRO-ABN-LG [QRH] Landing with Abnormal L/G.

[QRH] L/G GRAVITY EXTENSION

Ident.: PRO-ABN-LG-00011286.0011001 / 13 MAY 25

Applicable to: MSN 02719-07792

CAUTION

Do not apply this procedure if at least one green triangle is displayed on each landing gear on the **WHEEL SD** page. This is sufficient to confirm that the landing gear is downlocked. Disregard any possible GPWS "TOO LOW GEAR" aural alert.

■ If **L/G GEAR NOT DOWNLOCKED** alert was displayed and IF TIME PERMITS:

The landing gear recycling can be attempted up to 4 times, if necessary. These additional attempts should enable the successful pressurized extension of the landing gear and avoid a landing gear extension by gravity.

L/G lever.....UP

WAIT L/G UNLOCKED

L/G lever.....DOWN

WAIT AT LEAST 60 s

● If unsuccessful:

REPEAT UP TO THREE TIMES

● If unsuccessful after 4 attempts:

WAIT AT LEAST 120 s

L/G GRVTY PROC.....APPLY

See "In all other cases" condition below.

■ In all other cases:

GRAVITY GEAR EXTN handcrank.....PULL AND TURN

Rotate the handle clockwise 3 turns until reaching the mechanical stop, even if resistance is felt.

L/G lever.....DOWN

The landing gear lever should be confirmed in the DOWN position for the following reasons:

- To extinguish the **UNLK** lights on the LDG GEAR indicator panel
- To avoid the **L/G CTL** message on the **WHEEL SD** page
- To minimize the risk of landing gear retraction on the ground, due to an unknown system fault, when the free-fall system is reset.

GEAR DOWN indications (if available).....CHECK

*The **L/G LGCIU 2 FAULT** or **BRAKES SYS 1(2) FAULT** alert may be spuriously triggered after a gravity extension.*

Continued on the following page

[QRH] L/G GRAVITY EXTENSION (Cont'd)

- Note:
1. Depending on aircraft speed, the display may show the landing gear doors in the amber transit position.
 2. In the event of gravity extension caused by the failure of both LGCIUs, indications of the landing gears position on the ECAM are lost. LDG GEAR lights on the LDG GEAR indicator panel remain available, if LGCIU 1 is electrically supplied.
 3. If the three green downlock arrows are not illuminated, it may indicate that the handcrank did not reach the mechanical stop. Check that the handcrank is firmly against the mechanical stop.

■ If successful:

DO NOT RESET LDG GEAR GRVTY EXTN

Do not reset the free-fall system. This will avoid undesirable effects such as further loss of fluid, in the event of a leak, or possible landing gear unlock, in the event of a gear selector valve jammed in the UP position.

Note: The free-fall system may be reset in flights used for training purpose. If the green hydraulic system is available, reset of the free-fall system enables the landing gear doors closure.
 The flight crew should not reset the free-fall system on the ground after the flight.

■ If unsuccessful:

LDG WITH ABNORMAL L/G PROC..... APPLY

Refer to PRO-ABN-LG [QRH] Landing with Abnormal L/G.

L/G DOORS NOT CLOSED

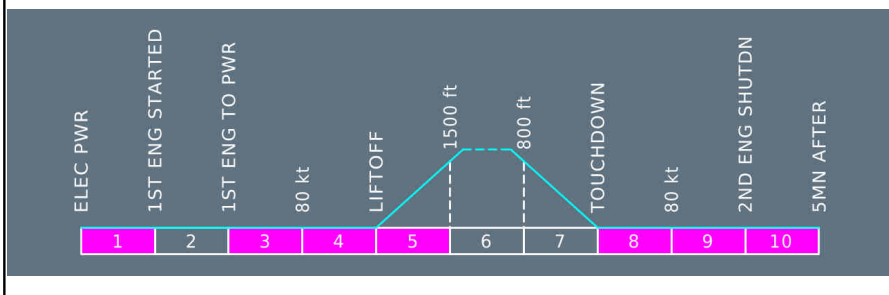
Applicable to: ALL

Ident.: PRO-ABN-LG-D-00017734.0001001 / 21 MAR 16

ANNUNCIATIONS
Triggering Conditions:

L2

This alert triggers when one gear door is not unlocked.

Flight Phase Inhibition:


Ident.: PRO-ABN-LG-D-00011287.0004001 / 09 NOV 21

● If the L/G lever is UP:

● WHEN SPD < 220/0.54:

L/G..... RECYCLE

L2

Note: To recycle the landing gear, the flight crew must perform the following actions:

1. Move the landing gear lever down
2. Wait for the landing gear to downlock and for the landing gear doors to close.
Simultaneously monitor the WHEEL page on the System Display (SD)
3. Move the landing gear lever up.
The active LGCIU changes when the landing gear is recycled.

L1

● IF UNSUCCESSFUL:

MAX SPEED..... 250/0.60

FUEL CONSUMPT INCRSD

FMS PRED UNRELIABLE

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

L/G

L/G DOORS NOT CLOSED (Cont'd)

Ident.: PRO-ABN-LG-D-00011288.0002001 / 17 MAR 17

L12

STATUS

MAX SPEED..... 250/.60

INOP SYS

FUEL CONSUMPT INCRSD

L/G DOOR

See ⁽¹⁾

FMS PRED UNRELIABLE

See ⁽²⁾

⁽¹⁾ This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.

⁽²⁾ Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.

L/G GEAR NOT DOWN

Applicable to: ALL

Ident.: PRO-ABN-LG-AA-00017859.0001001 / 21 MAR 16

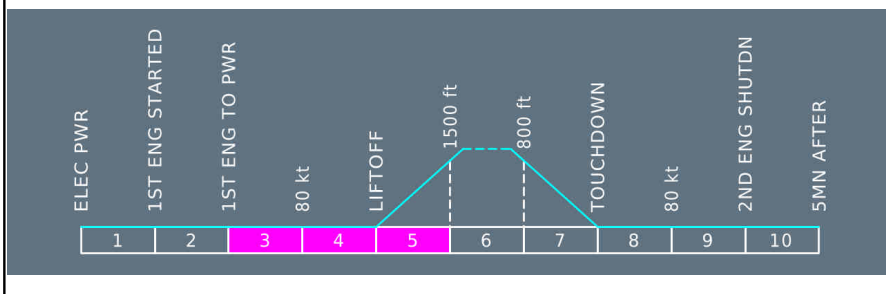
ANNUNCIATIONS
Triggering Conditions:

L2

This alert triggers when:

1. L/G is not downlocked and radio height is lower than 750 ft and both engines N1 lower than 75% (or if engine shutdown N1 of remaining engine lower than 97%) or
2. L/G is not downlocked and radio height is lower than 750 ft and both engines are not at T.O power and flaps at 1, 2, 3 or FULL or
3. L/G is not downlocked and flaps at 3 or FULL and both radio altimeters are failed.

Note: In the cases 2 and 3 above, the aural warning can only be cancelled by the emergency cancel pushbutton.

Flight Phase Inhibition:


Ident.: PRO-ABN-LG-AA-00018573.0002001 / 21 MAR 16

L2

When this warning appears, the red arrow on the instrument panel comes on.

L1

Crew awareness.

L/G GEAR NOT DOWNLOCKED

Applicable to: MSN 02155-02212

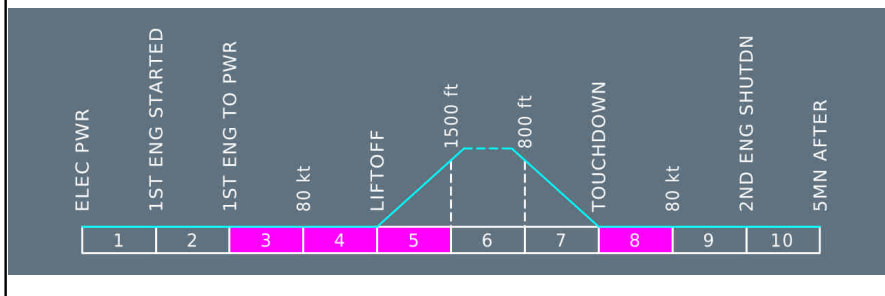
Ident.: PRO-ABN-LG-C-00017860.0002001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

- L2** This alert triggers when one gear is not downlocked and L/G is selected down.

Flight Phase Inhibition:



Ident.: PRO-ABN-LG-C-00011284.0003001 / 09 NOV 21

- L2** This warning appears if the landing gear sequence is not completed after 30 s.

L1 L/G..... RECYCLE

- L2** Note: To recycle the landing gear, the flight crew must perform the following actions:

1. Move the landing gear lever up
 2. Wait for the landing gear to uplock and for the landing gear doors to close.
Simultaneously monitor the WHEEL page on the System Display (SD)
 3. Move the landing gear lever down.
- The active LGCIU changes when the landing gear is recycled.

- L1** ● IF UNSUCCESSFUL AFTER 120 s:

L/G GRVTY PROC.....APPLY

- L2** Rotate the handle clockwise about 3 turns until reaching the mechanical stop. Refer to PRO-ABN-LG [QRH] L/G GRAVITY EXTENSION.

Continued on the following page

L/G GEAR NOT DOWNLOCKED (Cont'd)

Ident.: PRO-ABN-LG-C-00011285.0001001 / 03 NOV 22

L12

STATUS

L/G..... GRVTY EXTN

If gravity extension unsuccessful, Refer to PRO-ABN-LG [QRH] Landing with Abnormal L/G.

INOP SYS

N.W. STEER

See ⁽¹⁾

⁽¹⁾ As nose gear doors remain open, hydraulic power for nosewheel steering is lost.

L/G GEAR NOT DOWNLOCKED

Applicable to: MSN 02719-07792

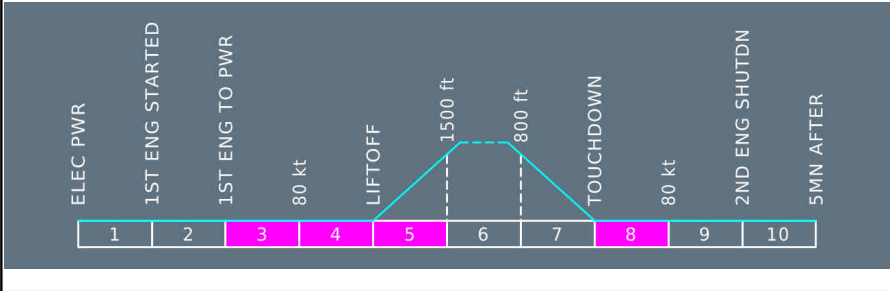
Ident.: PRO-ABN-LG-C-00017860.0002001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when one gear is not downlocked and L/G is selected down.

Flight Phase Inhibition:



Continued on the following page

L/G GEAR NOT DOWNLOCKED (Cont'd)

Ident.: PRO-ABN-LG-C-00011284.0003001 / 09 NOV 21

[L2] This warning appears if the landing gear sequence is not completed after 30 s.

[L1] L/G..... RECYCLE

 [L2] **Note:** To recycle the landing gear, the flight crew must perform the following actions:

1. Move the landing gear lever up
2. Wait for the landing gear to uplock and for the landing gear doors to close.
Simultaneously monitor the WHEEL page on the System Display (SD)
3. Move the landing gear lever down.
The active LGCIU changes when the landing gear is recycled.

 [L1] ● **IF UNSUCCESSFUL AFTER 120 s:**
 L/G GRVTY PROC..... APPLY

[L2] Rotate the handle clockwise about 3 turns until reaching the mechanical stop. Refer to PRO-ABN-LG [QRH] L/G GRAVITY EXTENSION.

Ident.: PRO-ABN-LG-C-00011285.0003001 / 03 NOV 22

 [L12] **STATUS**

L/G..... GRVTY EXTN

If gravity extension unsuccessful, Refer to PRO-ABN-LG [QRH] Landing with Abnormal L/G.

L/G GEAR NOT UNLOCKED

Applicable to: ALL

Ident.: PRO-ABN-LG-B-00017736.0001001 / 21 MAR 16

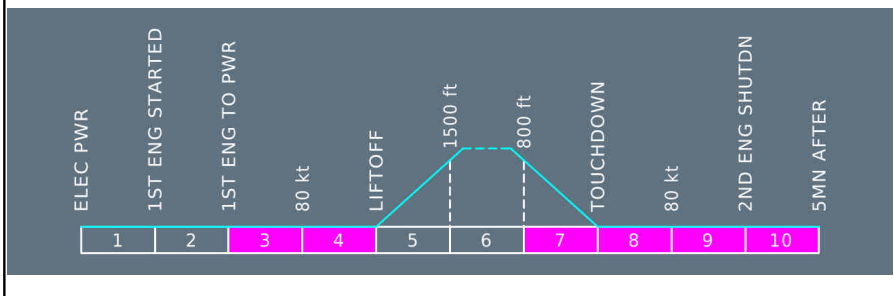
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when one gear is not unlocked and L/G is not selected down.

Flight Phase Inhibition:


Continued on the following page

L/G GEAR NOT UNLOCKED (Cont'd)

Ident.: PRO-ABN-LG-B-00011061.0004001 / 09 NOV 21

L2 This warning appears if the landing gear sequence is not completed after 30 s.

L1 ■ **If L/G doors closed:**

AVOID EXCESS G FACTOR

L2 *Because the gear rests on the doors, avoid excessive load factors in order not to damage door structure.*

L1 ■ **If L/G doors not closed and shock absorber fault:**

MAX SPEED..... 220/0.54

L/G..... DOWN

MAX SPEED..... 280/0.67

■ **If L/G doors not closed and no shock absorber fault:**

MAX SPEED..... 220/0.54

L/G..... RECYCLE

L2 Note: To recycle the landing gear, the flight crew must perform the following actions:

1. Move the landing gear lever down
 2. Wait for the landing gear to downlock and for the landing gear doors to close.
Simultaneously monitor the WHEEL page on the System Display (SD)
 3. Move the landing gear lever up.
- The active LGCIU changes when the landing gear is recycled.

L1 ● **IF UNSUCCESSFUL:**

L/G..... DOWN

MAX SPEED..... 280/0.67

FUEL CONSUMPT INCRSD

FMS PRED UNRELIABLE

Continued on the following page

L/G GEAR NOT UNLOCKED (Cont'd)

Ident.: PRO-ABN-LG-B-00018687.0002001 / 17 NOV 20

L12	STATUS	<u>INOP SYS</u>	
MAX SPEED..... 280/.67			L/G RETRACT
FUEL CONSUMPT INCRSD			
FMS PRED UNRELIABLE			
See ⁽¹⁾			
⁽¹⁾ If the flight is continued (to destination or to alternate) with landing gear extended: - Disregard FMS fuel predictions. Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor - Disregard FMS altitude and speed predictions. Time predictions are only valid in cruise - Do not use the managed speed mode (except in approach) - Do not use the CLB and the DES autopilot modes.			

L/G GEAR UPLOCK FAULT

Applicable to: ALL

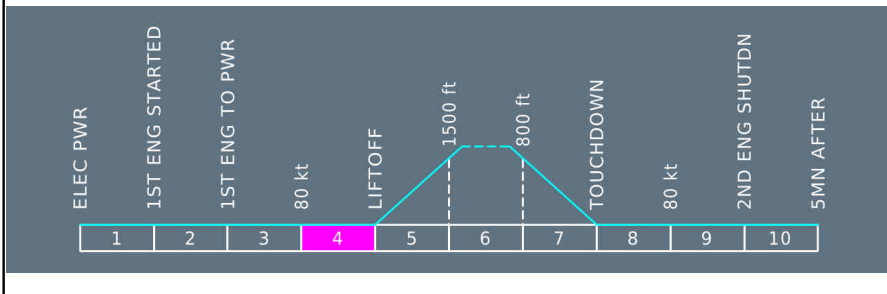
Ident.: PRO-ABN-LG-E-00017737.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when one gear uplock is engaged with corresponding gear downlocked.

Flight Phase Inhibition:



Ident.: PRO-ABN-LG-E-00011289.0002001 / 27 NOV 12

L/G.....KEEP DOWN

L2 The landing gear must be left down to avoid structural damage, because the uplock device will stay in the locked position.

L1 MAX SPEED.....280/.67

FUEL CONSUMPT INCRSD

FMS PRED UNRELIABLE

Continued on the following page

L/G GEAR UPLOCK FAULT (Cont'd)

Ident.: PRO-ABN-LG-E-00018719.0002001 / 17 NOV 20

L12

STATUS

MAX SPEED..... 280/.67 INOP SYS L/G..... KEEP DOWN L/G RETRACT FUEL CONSUMPT INCRSD <i>See ⁽¹⁾</i> FMS PRED UNRELIABLE <i>See ⁽²⁾</i>		
--	--	--

⁽¹⁾ This message triggers when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.

⁽²⁾ If the flight is continued (to destination or to alternate) with landing gear extended:

- Disregard FMS fuel predictions. Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor
- Disregard FMS altitude and speed predictions. Time predictions are only valid in cruise
- Do not use the managed speed mode (except in approach)
- Do not use the CLB and the DES autopilot modes.

L/G LGCIU 1(2) FAULT

Applicable to: ALL

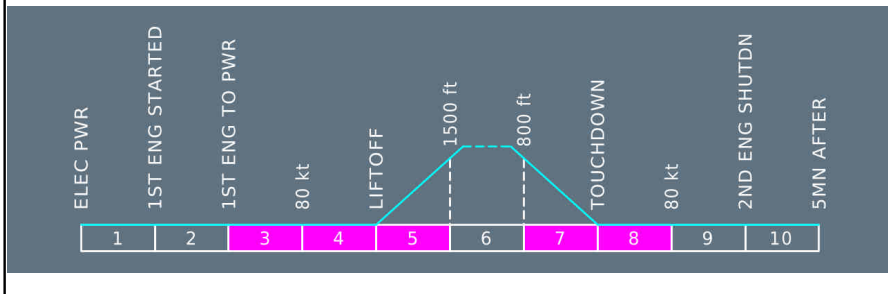
Ident.: PRO-ABN-LG-G-00018059.0002001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when LGCIU 1(2) is failed.

Flight Phase Inhibition:



Ident.: PRO-ABN-LG-G-00018681.0002001 / 21 MAR 16

● If LGCIU 1 is failed:

GPWS SYS.....OFF

L2 GPWS receives "L/G in up position" information even if the landing gear is down.

Set the GPWS SYS pb-sw to OFF in order to prevent untimely warnings during the approach.

Continued on the following page

L/G LGCIU 1(2) FAULT (Cont'd)

Ident.: PRO-ABN-LG-G-00018682.0001001 / 05 MAY 22

L12

STATUS
INOP SYS
ENG 1(2) APPR IDLE ONLY

 See ⁽²⁾

 LGCIU 1(2)
 REVERSER 1(2)
 GPWS ⁽¹⁾

- Note:
1. The partial spoiler extension at landing when only one main landing gear is compressed is not available. The spoilers extend normally on ground when wheel speed is higher than 72 kt.
 2. Depending on the LGCIU failure, only a part of the above systems may be lost.

⁽¹⁾ (When GPWS is set to OFF)

⁽²⁾ When idle is selected on ground with slats extended, only approach idle is available.

L/G LGCIU 1+2 FAULT

Applicable to: MSN 02155-02212

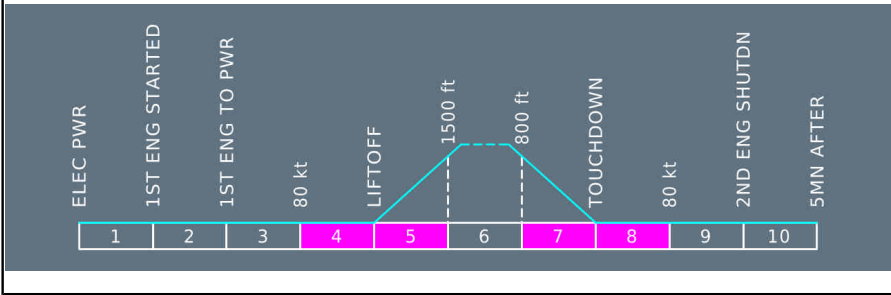
Ident.: PRO-ABN-LG-V-00017739.0002001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when both LGCIUs are failed.

Flight Phase Inhibition:



Ident.: PRO-ABN-LG-V-00018683.0003001 / 09 NOV 21

L2 Normal landing gear control and position indications are lost. LDG GEAR lights on LDG GEAR control panel remain available if LGCIU 1 is electrically supplied.

L1 L/G GRVTY PROC..... **APPLY**

L2 Refer to PRO-ABN-LG [QRH] L/G GRAVITY EXTENSION.

L1 GPWS SYS..... **OFF**

L2 As LGCIU 1 is lost, GPWS receives “L/G in up position” information even if the landing gear is down.

Set the GPWS SYS pb-sw to OFF in order to prevent untimely warnings during approach.

Continued on the following page

L/G LGCIU 1+2 FAULT (Cont'd)

Ident.: PRO-ABN-LG-V-00018684.0010001 / 06 MAY 24

L12

STATUS
INOP SYS
● If HYD G+B SYS LO PR:
FOR LDG..... FLAP LVR 3
*This line is replaced by "FOR LDG: FLAP LVR 3" when
 CONF 3 is selected, as a reminder.*
L/G..... GRVTY EXTN
Refer to QRH/ABN-24 L/G Gravity Extension.
L/G CONTROL NOT AVAIL
ENG 1 APPR IDLE ONLY
ENG 2 APPR IDLE ONLY

REVERSER 1+2

 AP 1+2 ⁽¹⁾

 CAT 2 ⁽¹⁾

A/THR

N/W STRG

 GLS AUTOLAND 

LGCIU 1

LGCIU 2

 GPWS ⁽²⁾

 ROW/ROP 

- Note:**
1. The partial spoiler extension at landing when only one main landing gear is compressed is not available. The spoilers extend normally on ground when wheel speed is higher than 72 kt.
 2. Regardless the landing gear position, if the flight crew activates the wing anti-ice, the wing anti-ice system will operate for 30 s only. After this 30 s of operation, no ECAM or AURAL alert will trigger to inform flight crew of the loss of the wing anti-ice system. The WING ANTI-ICE pb-sw ON light remains illuminated, despite the loss of the wing anti-ice system.

⁽¹⁾ (Except in LAND mode)

⁽²⁾ (When GPWS is set to OFF)

L/G LGCIU 1+2 FAULT

Applicable to: MSN 02719-05746

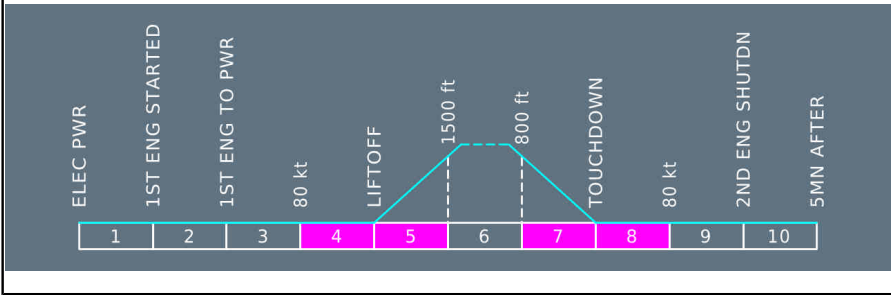
Ident.: PRO-ABN-LG-V-00017739.0002001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when both LGCIUs are failed.

Flight Phase Inhibition:



Ident.: PRO-ABN-LG-V-00018683.0003001 / 09 NOV 21

L2 Normal landing gear control and position indications are lost. LDG GEAR lights on LDG GEAR control panel remain available if LGCIU 1 is electrically supplied.

L1 L/G GRVTY PROC..... **APPLY**

L2 Refer to PRO-ABN-LG [QRH] L/G GRAVITY EXTENSION.

L1 GPWS SYS..... **OFF**

L2 As LGCIU 1 is lost, GPWS receives “L/G in up position” information even if the landing gear is down.
 Set the GPWS SYS pb-sw to OFF in order to prevent untimely warnings during approach.

Continued on the following page

L/G LGCIU 1+2 FAULT (Cont'd)

Ident.: PRO-ABN-LG-V-00018684.0009001 / 06 MAY 24

L12	STATUS	INOP SYS
● If HYD G+B SYS LO PR: FOR LDG..... FLAP LVR 3 <i>This line is replaced by “FOR LDG: FLAP LVR 3” when CONF 3 is selected, as a reminder.</i> L/G..... GRVTY EXTN <i>Refer to QRH/ABN-24 L/G Gravity Extension.</i> L/G CONTROL NOT AVAIL ENG 1 APPR IDLE ONLY ENG 2 APPR IDLE ONLY	REVERSER 1+2 AP 1+2 ⁽¹⁾ CAT 2 ⁽¹⁾ A/THR GLS AUTOLAND  LGCIU 1 LGCIU 2 GPWS ⁽²⁾ ROW/ROP 	
Note: 1. The partial spoiler extension at landing when only one main landing gear is compressed is not available. The spoilers extend normally on ground when wheel speed is greater than 72 kt. 2. Regardless the landing gear position, if the flight crew activates the wing anti-ice, the wing anti-ice system will operate for 30 s only. After this 30 s of operation, no ECAM or AURAL alert will trigger to inform flight crew of the loss of the wing anti-ice system. The WING ANTI-ICE pb-sw ON light remains illuminated, despite the loss of the wing anti-ice system.		
(1) (Except in LAND mode)		
(2) (When GPWS is set to OFF)		

L/G LGCIU 1+2 FAULT

Applicable to: MSN 07784-07792

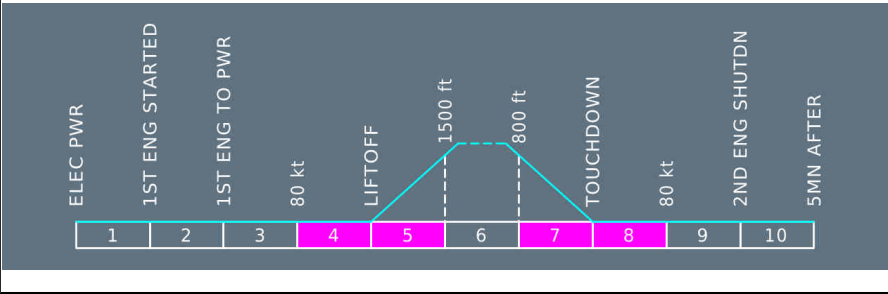
Ident.: PRO-ABN-LG-V-00017739.0002001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when both LGCIUs are failed.

Flight Phase Inhibition:



Ident.: PRO-ABN-LG-V-00018683.0003001 / 09 NOV 21

L2 Normal landing gear control and position indications are lost. LDG GEAR lights on LDG GEAR control panel remain available if LGCIU 1 is electrically supplied.

L1 L/G GRVTY PROC..... **APPLY**

L2 Refer to *PRO-ABN-LG [QRH] L/G GRAVITY EXTENSION*.

L1 GPWS SYS..... **OFF**

L2 As LGCIU 1 is lost, GPWS receives “L/G in up position” information even if the landing gear is down.

Set the GPWS SYS pb-sw to OFF in order to prevent untimely warnings during approach.

Continued on the following page

L/G LGCIU 1+2 FAULT (Cont'd)

Ident.: PRO-ABN-LG-V-00018684.0013001 / 06 MAY 24

L12

STATUS
INOP SYS
● If HYD G+B SYS LO PR:
FOR LDG..... FLAP LVR 3
*This line is replaced by "FOR LDG: FLAP LVR 3" when
 CONF 3 is selected, as a reminder.*
L/G..... GRVTY EXTN
Refer to QRH/ABN-24 L/G Gravity Extension.
L/G CONTROL NOT AVAIL
ENG 1 APPR IDLE ONLY
ENG 2 APPR IDLE ONLY
REVERSER 1+2
LGCIU 1
LGCIU 2
GPWS ⁽¹⁾
ROW/ROP 

- Note:
1. The partial spoiler extension at landing when only one main landing gear is compressed is not available. The spoilers extend normally on ground when wheel speed is higher than 72 kt.
 2. Regardless the landing gear position, if the flight crew activates the wing anti-ice, the wing anti-ice system will operate for 30 s only. After this 30 s of operation, no ECAM or AURAL alert will trigger to inform flight crew of the loss of the wing anti-ice system. The WING ANTI-ICE pb-sw ON light remains illuminated, despite the loss of the wing anti-ice system.

⁽¹⁾ (When GPWS is set to OFF)

L/G SHOCK ABSORBER FAULT
(SHOCK ABSORBER EXTENDED ON GROUND)

Applicable to: ALL

Ident.: PRO-ABN-LG-AB-00017733.0001001 / 21 MAR 16

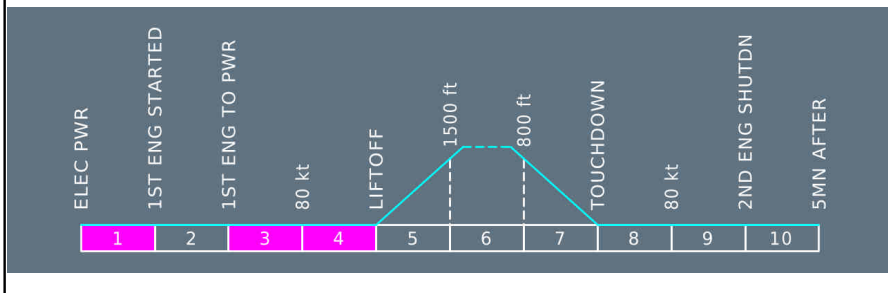
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when one shock absorber is not compressed after landing.

Flight Phase Inhibition:



Ident.: PRO-ABN-LG-AB-00011056.0001001 / 25 FEB 14

Crew awareness.

L/G SHOCK ABSORBER FAULT (SHOCK ABSORBER NOT EXTENDED AFTER LIFTOFF)

Applicable to: ALL

Ident.: PRO-ABN-LG-A-00018062.0001001 / 21 MAR 16

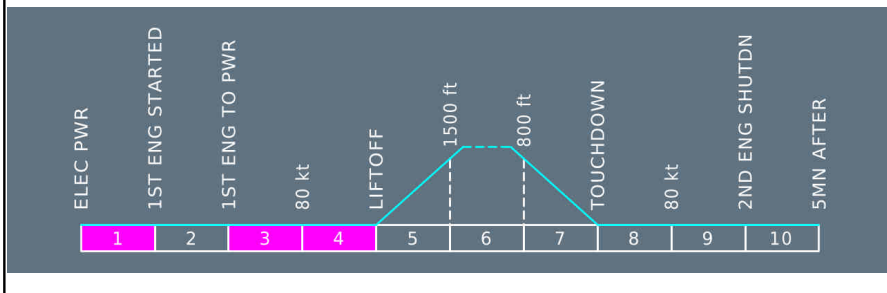
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when one shock absorber is not extended when airborne.

Flight Phase Inhibition:



Ident.: PRO-ABN-LG-A-00011058.0003001 / 25 FEB 14

■ Shock absorber not extended after liftoff and L/G unlocked :

Crew awareness.

■ Shock absorber not extended after liftoff and L/G not unlocked :

MAX SPEED..... 280/.67

■ If L/G lever still down :

L/G..... **KEEP DOWN**

■ If L/G lever selected up :

L/G..... **DOWN**
FUEL CONSUMPT INCRSD
FMS PRED UNRELIABLE
Continued on the following page

L/G SHOCK ABSORBER FAULT (Cont'd)

(SHOCK ABSORBER NOT EXTENDED AFTER LIFTOFF)

Ident.: PRO-ABN-LG-A-00011059.0003001 / 17 NOV 20

L12

STATUS

● **If L/G not unlocked:**

MAX SPEED.....280/.67
 L/G.....KEEP DOWN

INOP SYS

L/G RETRACT

FUEL CONSUMPT INCRSD

FMS PRED UNRELIABLE

See ⁽¹⁾

⁽¹⁾

If the flight is continued (to destination or to alternate) with landing gear extended:

- Disregard FMS fuel predictions. Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor
- Disregard FMS altitude and speed predictions. Time predictions are only valid in cruise
- Do not use the managed speed mode (except in approach)
- Do not use the CLB and the DES autopilot modes.

Note: In few cases, autothrust and autopilot may also be lost.

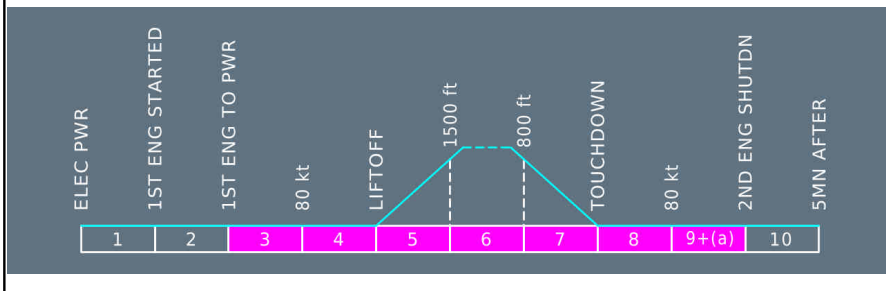
If WHEEL N.W. STEER FAULT is also displayed, then the nose wheels may be at maximum deflection. (Turned 90 ° from center.) During landing, delay nose wheel touchdown for as long as possible.

L/G SYS DISAGREE
Applicable to: ALL

Ident.: PRO-ABN-LG-AC-00017861.0003001 / 09 NOV 21

ANNUNCIATIONS
Triggering Conditions:
L2

This alert triggers when LGCIU 1 and LGCIU 2 detect a discrepancy between the landing gear positions.

Flight Phase Inhibition:


Note: (a) Alert inhibited during the first 60 s of the flight phase 9.

Ident.: PRO-ABN-LG-AC-00018664.0002001 / 21 MAR 16

Crew awareness.

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

L/G

Intentionally left blank

[MEM] EMER DESCENT

Ident.: PRO-ABN-MISC-00012092.0001001 / 17 MAR 17

Applicable to: ALL

CREW OXY MASKS.....	USE
SIGNS.....	ON
EMER DESCENT.....	INITIATE

● If A/THR not active:

THR LEVERS.....	IDLE
-----------------	------

SPD BRK.....	FULL
--------------	------

● When descent established:

SPEED..... MAX/APPROPRIATE

● If structural damage suspected: MANEUVER WITH CARE

CONSIDER L/G EXTENSION

ENG MODE SEL..... IGN

ATC..... NOTIFY

Notify ATC of the nature of the emergency, and state intention. The flight crew can communicate with the ATC using voice, or CPDLC when the voice contact cannot be established or has poor quality.

EMER DESCENT (PA)..... ANNOUNCE

The flight crew must inform the cabin of emergency descent on the PA system.

ATC XPDR 7700..... CONSIDER

Squawk 7700 unless otherwise specified by ATC.

CREW OXY MASKS DILUTION..... NORM

- To save oxygen, set the oxygen diluter selector to the N position
- If the oxygen diluter selector remains set to 100 %, oxygen quantity may be insufficient to cover the entire emergency descent profile
- Ensure that crew communication is established with oxygen masks. Avoid the continuous use of the interphone to minimize interference with the breathing noise in the oxygen mask.

MAX FL: 100/MEA-MORA

● If CAB ALT above 14 000 ft:

OXYGEN PAX MASK MAN ON..... PRESS

This action confirms that the passenger oxygen masks are released.

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

MISC

[MEM] EMER DESCENT (Cont'd)

Note: Notify the cabin crew, when the aircraft reaches a safe flight level, and when cabin oxygen is no more necessary.

[MEM] STALL RECOVERY

Ident.: PRO-ABN-MISC-00013768.0002001 / 12 NOV 24

Applicable to: ALL

As soon as any stall indication (could be aural warning, "STALL STALL" red message on PFD, buffet, etc.) is recognized, apply the immediate actions:

NOSE DOWN PITCH CONTROL..... APPLY

This will reduce angle of attack

Note: In the case of lack of pitch down authority, reducing thrust may be necessary.

BANK..... WINGS LEVEL

● **When out of stall (no longer stall indications) :**

THRUST.....INCREASE SMOOTHLY AS NEEDED

Note: In the case of one engine inoperative, progressively compensate the thrust asymmetry with rudder.

SPEEDBRAKES.....CHECK RETRACTED
FLIGHT PATH..... RECOVER SMOOTHLY

● **If in clean configuration and below 20 000 ft :**

FLAPS 1..... SELECT

Note: If a risk of ground contact exists, once clearly out of stall (no longer stall indications), establish smoothly a positive climb gradient.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES ABNORMAL AND EMERGENCY PROCEDURES MISC
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[MEM] STALL WARNING AT LIFTOFF	
Ident.: PRO-ABN-MISC-00013769.0001001 / 10 MAY 21	
Applicable to: ALL	
If stall warnings trigger at liftoff, apply the following immediate actions:	
THRUST	TOGA
At the same time:	
PITCH ATTITUDE.....	15 °
BANK.....	WINGS LEVEL

[QRH] BOMB ON BOARD

Ident.: PRO-ABN-MISC-00012095.0004001 / 05 MAY 22

Applicable to: ALL

COCKPIT PROCEDURES
BACKGROUND

To avoid the activation of an altitude-sensitive bomb, the cabin altitude should not exceed the value at which the bomb has been discovered.

To reduce the effects of the explosion, the aircraft should fly as long as possible with approximately 1 PSI differential pressure, to help the blast go outwards. 1 PSI differential pressure corresponds to a 2 500 ft difference between the aircraft and the cabin altitude. These conditions are achieved by using the manual pressure control.

PROCEDURE

The following procedure assumes that it is initiated during climb or cruise:

First, maintain the cabin altitude using manual pressure mode.

While maintaining the cabin altitude, descend the aircraft to the cabin altitude + 2 500 ft and maintain delta P at 1 PSI.

During further steps of descent, maintain delta P at 1 PSI using the cabin V/S target selector.

During the approach, use automatic pressure mode in order to reduce the differential pressure to zero at touchdown.

If flight conditions are different, the crew should adapt the procedure, bearing in mind the above-mentioned principles (background paragraph).

CKPT/CAB COM.....ESTABLISH

■ If landing and evacuation possible within 30 min:

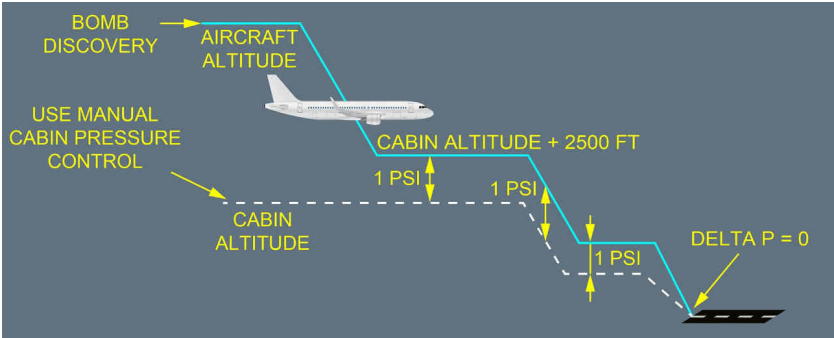
ATC/COMPANY.....NOTIFY

EVAC.....PREPARE

Continued on the following page

[QRH] BOMB ON BOARD (Cont'd)

■ If landing and evacuation NOT possible within 30 min:



AIRCRAFT (IF CLIMBING).....LEVEL OFF
 CABIN PRESS MODE SEL.....MAN

L2 *The purpose is to immediately prevent the cabin altitude from increasing, in order to avoid the activation of an altitude-sensitive bomb.*

L1 **MAINTAIN CAB ALT**

L2 *Use MAN V/S CTL sw to maintain the cabin altitude at the value it had when the bomb was discovered.*

L1 **ATC/COMPANY.....NOTIFY**

L2 *To obtain expert advice from explosive specialists.*

L1 **TRGT SPEED: PREFER LO IAS**

Low speed could reduce the consequences of possible structural damage, if the bomb explodes.

DESCENT TO CAB ALT + 2 500 ft or MEA - MORA.....INITIATE

L2 *Descending to 2 500 ft above the cabin altitude gives a cabin differential pressure of approximately 1 PSI, which helps to ensure that the blast goes outwards, if the bomb explodes.*

L1 **AVOID SHARP MANEUVERS**

L2 *Which might result in the bomb moving.*

L1 **MAINTAIN CAB ALT**

L2 *Use MAN V/S CTL sw to maintain the cabin altitude. Initially brief UP input should be required; but, be careful not to increase the cabin altitude.*

Continued on the following page

[QRH] BOMB ON BOARD (Cont'd)

L1

● When at CAB ALT + 2 500 ft:

MAINTAIN 1 PSI ΔP

L2

Use MAN V/S CTL sw to adjust delta P to 1 PSI. Brief DN input should be initially required to set 0 ft/min cabin vertical speed.

L1

GALY & CAB..... OFF

FUEL RESERVES..... DETERMINE

When flying at cabin altitude + 2 500 ft, fuel consumption in CONF 1, with landing gear down, will be about 2.1 times that consumed in clean configuration.

● When bomb secured at the LRBL or cannot be moved:

Least Risk Bomb Location (LRBL) is the center of the RH aft cabin door

EMER EXIT LT..... ON

L2

To recover minimum cabin lighting when the COMMERCIAL pb is OFF

L1

COMMERCIAL..... OFF

● If fuel permits:

FLAPS..... AT LEAST CONF 1

L/G lever (except for flight over water)..... DOWN

L2

The detonation could damage the landing systems. Therefore, if fuel permits, configure the aircraft for landing as soon as possible. Reducing the speed will minimize stress on the aircraft structure.

L1

USE NORMAL CONF FOR LANDING

DURING FURTHER DESCENT: MAINTAIN MAX 1 PSI ΔP

Use MAN V/S CTL sw to DN to adjust delta P to 1 PSI.

● During approach:

CABIN PRESS MODE SEL..... AUTO

L2

This allows CPC to automatically control the cabin altitude to 0 during final approach.

L1

● When aircraft on ground and stopped in a remote area (if possible):

Refer to PRO-ABN-MISC [QRH] EMER EVAC.

CABIN PROCEDURES

If a suspect device is found in the cabin:

WARNING Do not cut or disconnect any wires and do not open or attempt to gain entry to internal components of a closed or concealed suspect device. Any attempt may

Continued on the following page

[QRH] BOMB ON BOARD (Cont'd)

result in an explosion. Booby-trapped closed devices have been used on aircraft in the past.

WARNING Alternate locations must not be used without consulting with an aviation explosives security specialist. Never take a suspect device to the flight deck.

CAUTION The least risk bomb location for the aircraft structure and systems is center of the RH aft cabin door.

EOD PERSONNEL ON BOARD.....CHECK

L2 Announce "Is there any EOD personnel on board ?". By using the initials, only persons familiar with EOD (Explosive Ordnance Disposal) will be made aware of the problem.

L1 DO NOT OPEN THE BOMB
 DO NOT CUT BOMB'S WIRES
 SECURE BOMB AGAINST SLIPPING
 PROTECT BOMB AGAINST SHOCKS

L2 Secure in the attitude found and do not lift before having checked for an anti-lift ignition device.

L1 PASSENGERS..... LEAD AWAY FROM BOMB

L2 Move passengers at least 4 seat rows away from the bomb location. On full flights, it may be necessary to double up passengers to achieve standoff from the suspect device. Passengers near the bomb should protect their heads with pillows, blankets. All passengers must remain seated with seatbelts on and, if possible, head below the top of the head rest. Seat backs and tray tables should be in their full upright position. Service items may need to be collected in order to secure tray tables.

L1 PORTABLE ELECTRONIC DEVICES..... SWITCH OFF

L2 The cabin crews must command passengers to switch off all portable electronic devices.

L1 BOMB.....CHECK NO ANTI-LIFT DEVICE

L2 To check for an anti-lift switch or lever, slide a string or stiff card, (such as the emergency information card) under the bomb, without disturbing the bomb. If the string or card cannot be slipped under the bomb, it may indicate that an anti-lift switch or lever is present and that the bomb cannot be moved. If a card is used and can be slid under the bomb, leave it under the bomb and move together with the bomb. If it is not possible to move the bomb, then it should be surrounded with a single thin sheet of plastic (e. g. trash bag), then with wetted materials, and other blast attenuation materials such as seat cushions and soft carry-on baggage. Move personnel as far away from the bomb location as possible.

Continued on the following page

[QRH] BOMB ON BOARD (Cont'd)

[L1] EMERGENCY EQUIPMENT..... REMOVE AND STOW

[L2] *Emergency equipment (PBE, fire extinguisher, etc.) located close to the LRBL must be removed and stowed in alternate location.*

[L1] GALLEY/IFE POWER..... OFF

[L2] *All galley and IFE equipment located close to the LRBL must be switched off.*

[L1] ● **If the bomb can be moved:**
 RH AFT CABIN DOOR SLIDE..... DISARM
 LEAST RISK BOMB LOCATION (LRBL)..... PREPARE

[L2] *Build up a platform of solid baggage against the door up to about 25 cm (10 in) below the middle of the door.
 On top of this, build up at least 25 cm (10 in) of wetted material such as blankets and pillows. Place a single thin sheet of plastic (e.g. trash bag) on top of the wetted materials. This prevents any possible short circuit.*

CAUTION	DO NOT OMIT THE PLASTIC SHEETS, AS THE SUSPECT DEVICE COULD GET WET AND POSSIBLY SHORT CIRCUIT ELECTRONIC COMPONENTS CAUSING INADVERTENT DEVICE ACTIVATION.
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[L1] BOMB INDICATION LINE..... POSITION

Note: *A bomb location indicator line is a 6 to 8 ft (1.8 to 2.4 m) (e.g. neckties, headset cord, or belts connected together) preferably of contrasting color, that helps the responding bomb squad find the precise location of the suspect device within the LRBL stack once constructed.*

Position the bomb indication line from the location on the platform where you will place the suspect device, EXTENDING outward into the aisle.

BOMB..... MOVE TO LRBL

[L2] *Carefully carry in the attitude found and place on top of the wetted materials in the same attitude and as close to the door structure as possible.*

CAUTION	<i>Ensure that the suspect device, when placed on the stack against the door, is above the slide pack but not against the door handle, and if possible, avoid placement in the view port.</i>
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[L1] LEAST RISK BOMB LOCATION (LRBL)..... COMPLETE

[L2] *Place an additional single thin sheet of plastic over the bomb.*

Continued on the following page

[QRH] BOMB ON BOARD (Cont'd)

CAUTION DO NOT OMIT THE PLASTIC SHEETS, AS THE SUSPECT DEVICE COULD GET WET AND POSSIBLY SHORT CIRCUIT ELECTRONIC COMPONENTS CAUSING INADVERTENT DEVICE ACTIVATION.

L1

Build up at 25 cm (10 in) of wetted material around the sides and on top of the bomb. DO NOT PLACE ANYTHING BETWEEN THE BOMB AND THE DOOR, AND MINIMIZE AIRSPACE AROUND THE BOMB.

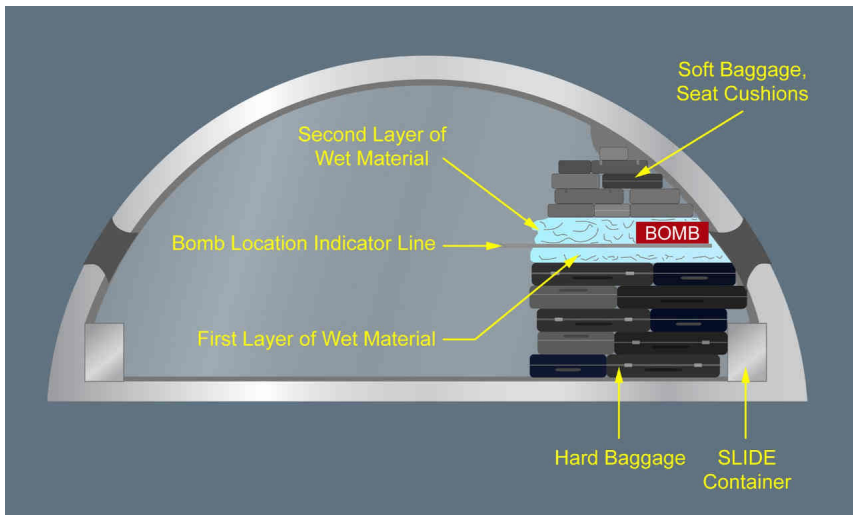
L2

The idea is to build up a protective surrounding of the bomb so that the explosive force is directed in the only unprotected area into the door structure. Fill the area around the bomb with seat cushions and other soft materials such as hand luggage (saturated with water or any other nonflammable liquid) up to the cabin ceiling, compressing as much as possible. Secure the LRBL stack in place using belt, ties or other appropriate materials. The more material stacked around the bomb, the less the damage will be.

L1

USE ONLY SOFT MATERIAL. AVOID USING MATERIALS CONTAINING ANY INFLAMMABLE LIQUID AND ANY METAL OBJECTS WHICH COULD BECOME DANGEROUS PROJECTILES.

LRBL STACK



Continued on the following page

[QRH] BOMB ON BOARD (Cont'd)

PASSENGERS..... MOVE/ADVISE

[L2]

Move passengers at least 4 seat rows away from the least risk bomb location (RH aft cabin door). On full flights, it may be necessary to double up passengers to achieve standoff from the suspect device.

Passengers near the bomb should protect their heads with pillows, blankets. All passengers must remain seated with seatbelts on and, if possible, head below the top of the head rest. Seat backs and tray tables must be in their full upright position.

[L1]

CABIN CREW..... NOTIFY COCKPIT CREW

[L2]

Cabin crew notify the flight crew that the bomb is secured at the LRBL.

[L1]

EVACUATION/DISEMBARKATION..... EXECUTE

[L2]

Evacuate through normal and emergency exits on the opposite side of the "bomb" location. Do not use the door just opposite the "bomb".

Use all available airport facilities to disembark without delay.

[QRH] COCKPIT WINDSHIELD / WINDOW ARCING

Ident.: PRO-ABN-MISC-00012099.0001001 / 17 MAR 17

Applicable to: ALL

Affected WINDOW / WINDSHIELD ANTI-ICE C/B..... PULL

Pull the circuit breaker of the affected window/windshield heating system, in case of:

- *Electrical arcing of the cockpit windshield/window, or*
- *Burning smell or smoke identified as coming from the bottom right corner of CAPT windshield or bottom left corner of the F/O windshield.*

On the rear C/B panel:

- *ANTI-ICE L WSHLD AF10 C/B [123VU],*
- *ANTI-ICE R WSHLD AF03 C/B [123VU],*
- *ANTI-ICE/WINDOWS L X14 C/B [122VU],*
- *ANTI-ICE/WINDOWS R W14 C/B [122VU].*

[QRH] COCKPIT WINDSHIELD / WINDOW CRACKED

Ident.: PRO-ABN-MISC-00012097.0001001 / 06 NOV 25

Applicable to: ALL

 SHOULDERS HARNESS..... FASTEN
 TOUCH THE CRACK WITH A PEN (OR CAREFULLY WITH FINGERNAIL)

■ If no crack on cockpit side:

NO LIMITATION

The inner ply is not affected. Therefore, the window/windshield is still able to sustain the differential pressure up to the maximum flight level.
■ If cracks on cockpit side:

CREW OXY MASKS..... USE

MAX FL: 230 / MEA-MORA

The inner ply is affected. The flight crew is not able to easily determine if other plies are affected. Descend to FL 230/MEA and reduce differential pressure to 5 PSI .

Note: The maximum flight level is restricted to FL 230/MEA to obtain ΔP 5 PSI , without resulting in an excessive cabin altitude and an EXCESS CAB ALT warning.

 The following procedure enables maintaining ΔP 5 PSI in manual cabin pressure mode.

CAB PRESS MODE SEL..... MAN

DISREGARD THE CAB ALT TARGET TABLE DISPLAYED ON THE ECAM

MAN V/S CTL.....AS RQRD

 SET THE CABIN ALTITUDE ACCORDING TO THE TABLE BELOW TO MAINTAIN ΔP 5 PSI

FL	100	150	200	230
CABIN ALTITUDE	0	3 000	6 000	8 000

● When ΔP is 5 PSI:

CREW OXY MASKS.....REMOVE

● Below FL 100:

CAB PRESS MODE SEL.....AUTO

Note: Due to the increased noise level, pay particular attention to visual warnings.

● If visibility not sufficient for approach due to damage:

CONSIDER AUTOLAND

● For approach, if AUTOLAND not available:

CAB PRESS MODE SEL.....MAN

Continued on the following page



A318/A319/A320/A321
FLIGHT CREW
OPERATING MANUAL

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

MISC

[QRH] COCKPIT WINDSHIELD / WINDOW CRACKED (Cont'd)

MAN V/S CTL.....FULL UP
MAX SPEED: 200 kt
PF SLIDING WINDOW..... OPEN

[QRH] DITCHING

Ident.: PRO-ABN-MISC-00022090.0015001 / 05 MAR 19

2 Applicable to: ALL

This procedure applies when engines are running.

 If engines are not running, *Refer to PRO-ABN-ENG [QRH] ALL ENG FAIL - If ditching anticipated procedure, which includes the ditching procedure when the engines are failed.*

 ATC.....NOTIFY
 ATC XPDR 7700..... CONSIDER
 PREPARE CABIN AND COCKPIT

L2 Notify the cabin crew of the nature of the emergency and indicate intentions.

Specify the available time, in order to:

- Secure loose equipment
- Prepare survival equipment
- Lock belts and shoulder harnesses.

 L1 GPWS SYS..... OFF
 GPWS TERR..... OFF

L2 Set both the SYS pb-sw and the TERR pb-sw to OFF, in order to prevent nuisance warnings.

 L1 SIGNS..... ON
 EMER EXIT LT..... ON
 COMMERCIAL..... OFF
 LDG ELEV..... SELECT 00
 BARO..... SET
 DISREGARD NORM C/Ls
 ELT  (when conditions permit)..... ON

● For approach and ditching:

KEEP LANDING GEAR UP

SLATS / FLAPS..... MAX AVAIL

FOR FLARE: TARGET PITCH 11 ° & MIN V/S

● At 2 000 ft AGL:

CAB PRESS MODE SEL..... CHECK AUTO

L2 The outflow valve remains open, if the MODE SEL pb is not set to AUTO.

 L1 ALL BLEEDS (ENGs & APU)..... OFF
 CABIN CREW..... NOTIFY FOR DITCHING
 DITCHING pb..... ON

Continued on the following page

[QRH] DITCHING (Cont'd)

[L2] The ditching direction mainly depends on the wind direction, and on the state of the sea. These factors may be considered as follows :

1. Wind direction :

This may be determined by observing of the waves, which move and break downwind. Spray from the wave tops is also a reliable indicator.

2. Wind speed :

The following guidelines can be used to evaluate wind speed :

A few white crests	8-17 kt
Many white crests	17-26 kt
Streaks of foam along the water	23-35 kt
Spray from the waves	35-43 kt

3. Sea state :

This is best determined from a height of 500 to 1 000 ft.

At a lower altitude, the swell direction may be less obvious than the wave direction, even though the waves are much smaller.

4. When there is no swell, align into the wind. In the presence of swell, and provided that drift does not exceed 10 °, ditch parallel to the swell and as nearly into wind as possible. If drift exceeds 10 °, ditch into the wind. The presence of drift on touchdown is not dangerous, but every effort should be made to minimize roll.

[L1] ● **At 500 ft AGL:**
 BRACE FOR IMPACT..... ORDER

● **At touchdown:**
 ALL ENG MASTERS..... OFF
 APU MASTER SW.....OFF

● **After ditching:**
 ATC (VHF 1).....NOTIFY

[L2] With both engines and APU shut down, only VHF 1 is supplied.

[L1] ALL FIRE pb (ENGs & APU).....PUSH
 ALL AGENTS (ENGs and APU).....DISCH
 EVACUATION..... INITIATE

[L2] After impact, the lowest point of the passenger exits (aft door) remains above the waterline for more than 7 min.

[QRH] EMER EVAC

Ident.: PRO-ABN-MISC-00012083.0001001 / 09 MAY 17

Applicable to: ALL

Apply this procedure when considering an emergency evacuation, or when required by the ECAM.
 Carefully analyze the situation before deciding to evacuate passengers. However do not waste valuable time.

AIRCRAFT / PARKING BRK..... STOP / ON
 ATC (VHF1)..... NOTIFY

Notify ATC of the nature of the emergency, and state intentions.

Only VHF 1 is available on batteries.

CABIN CREW (PA)..... ALERT

Make a short and precise announcement to warn that an emergency evacuation may be required.

Δ P (only if MAN CAB PR has been used)..... CHECK ZERO

If Δ P is not at zero, MODE selector on MAN and V/S CTL FULL UP, to fully open the outflow valve.

● **If Δ P not at zero:**

CAB PR MODE SEL..... MAN

V/S CTL..... FULL UP

ALL ENG MASTER..... OFF

Associated LP and HP valves close.

ALL FIRE pb (ENGs & APU)..... PUSH

ALL AGENTS (ENGs & APU)..... AS RQRD

Engine Agent 2 is not available.

The use of agents is required if the ENG FIRE or APU FIRE is displayed.

■ **If evacuation required:**

EVACUATION..... INITIATE

Make a short and precise announcement to order the emergency evacuation.

Press the EVAC COMMAND pb .

■ **If evacuation not required:**

CABIN CREW AND PASSENGERS (PA)..... NOTIFY

[QRH] EMER LANDING
ALL ENG FAILURE

Ident.: PRO-ABN-MISC-00015075.0009001 / 15 MAY 25

Applicable to: ALL

Apply the following if not able to maintain altitude after the loss of thrust near the ground.

■ If ditching anticipated:

 APU..... START
 L/G LEVER.....CHECK UP
 FOR LDG.....FLAP LVR 2

L2 *Only slats extend, and slowly.*
L1 VAPP.....DETERMINE

Weight	40 t / 90 klb	50 t / 110 klb	60 t / 130 klb	70 t / 155 klb	80 t / 175 klb	90 t / 200 klb	95 t / 210 klb
VAPP	150 kt	150 kt	163 kt	173 kt	183 kt	193 kt	198 kt

DITCHING pb..... ON

L2 *Ditch the aircraft parallel to the swell. If that causes a strong crosswind, ditch the aircraft into the wind.*
L1

- **At 500 ft AGL or below:**
 BRACE FOR IMPACT.....ORDER

● For flare:

 TOUCH DOWN AT MIN V/S
 TARGET PITCH ATT 11 °

● At touchdown:

 ALL ENG MASTERS.....OFF
 APU MASTER SW.....OFF
 EMER EVAC PROC.....APPLY

L2 *Refer to PRO-ABN-MISC [QRH] EMER EVAC*
L1
■ If forced landing anticipated:
 APU..... START
 FOR LDG.....FLAP LVR 2

L2 *Only slats extend, and slowly.*
L1 VAPP.....DETERMINE

Weight	40 t	50 t	60 t	70 t	80 t	90 t	95 t
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Continued on the following page

[QRH] EMER LANDING (Cont'd)							
ALL ENG FAILURE							
	/ 90 klb	/ 110 klb	/ 130 klb	/ 155 klb	/ 175 klb	/ 200 klb	/ 210 klb
VAPP	150 kt	150 kt	163 kt	173 kt	183 kt	193 kt	198 kt
GND SPLRs..... ARM ● At 1 000 ft AGL at the latest: GRAVITY GEAR EXTN handcrank..... PULL AND TURN L2 Flight controls revert to direct law at landing gear extension. To ensure correct aircraft trimming for approach, extend the landing gear only when the aircraft is in CONF 2 and at VAPP. Disregard the "USE MAN PITCH TRIM" message on the PFD, because the stabilizer is jammed, due to not sufficient hydraulic power. L1 ● When L/G downlocked: L/G LEVER..... DOWN ● At 500 ft AGL or below: BRACE FOR IMPACT..... ORDER ● For flare: TOUCH DOWN AT MIN V/S ● At touchdown: ALL ENG MASTERS..... OFF APU MASTER SW..... OFF EMER EVAC PROC..... APPLY L2 Refer to PRO-ABN-MISC [QRH] EMER EVAC							

[QRH] FORCED LANDING

Ident.: PRO-ABN-MISC-00022092.0010001 / 05 JUN 18

Applicable to: ALL

This procedure applies when engines are running.

If engines are not running, *Refer to PRO-ABN-ENG [QRH] ALL ENG FAIL - If forced landing anticipated* procedure, which includes the forced landing procedure when the engines are failed.

ATC.....NOTIFY
 ATC XPDR 7700..... CONSIDER
 PREPARE CABIN AND COCKPIT

[L2] Notify the cabin crew of the nature of the emergency and indicate intentions.

Specify the available time, in order to:

- Secure loose equipment
- Prepare survival equipment
- Lock belts and shoulder harnesses.

[L1] GPWS SYS..... OFF
 GPWS TERR..... OFF

[L2] Set both the SYS pb-sw and the TERR pb-sw to OFF, in order to prevent nuisance warnings.

[L1] SIGNS.....ON
 EMER EXIT LT..... ON
 COMMERCIAL.....OFF
 LDG ELEV..... SET

[L2] If not known, select an approximate value.

[L1] BARO..... SET
 DISREGARD NORM C/Ls
 ELT  (when conditions permit)..... ON

● **For approach and landing:**

RAM AIR.....ON

[L2] Switch the RAM AIR on, in order to ensure entire depressurization of the aircraft on the ground.

[L1] L/G lever..... DOWN
 SLATS / FLAPS.....MAX AVAIL
 GND SPLR.....ARM

MAX BRK PR: 1000 PSI

● **At 2 000 ft AGL:**

CABIN CREW.....NOTIFY FOR LANDING

Continued on the following page

[QRH] FORCED LANDING (Cont'd)

- **At 500 ft AGL:**
 BRACE FOR IMPACT..... ORDER
- **At touchdown:**
 ALL ENG MASTERS.....OFF
 APU MASTER SW.....OFF
 BRAKES ON ACCU ONLY
- **When aircraft stopped:**
 PARKING BRK..... ON
 ATC (VHF 1).....NOTIFY
- L2** *With both engines and APU shut down, only VHF 1 is supplied.*
- L1** ALL FIRE pb (ENGs & APU).....PUSH
 ALL AGENTS (ENGs & APU)..... DISCH
- **If evacuation required:**
 EVACUATION..... INITIATE
- L2** *Make a short and precise announcement to order the emergency evacuation.
 Press the EVAC COMMAND pb .*
- L1** ■ **If evacuation not required:**
 CABIN CREW AND PASSENGERS (PA)..... NOTIFY

[QRH] OVERWEIGHT LANDING

Ident.: PRO-ABN-MISC-00023093.0001001 / 15 MAY 25

Applicable to: ALL

 FLAP LVR FULL FOR LANDING UNLESS SPECIFIED BY ABN PROC OR LIMITED BY LANDING
 PERF

LDG DIST PROC.....APPLY

 ● **For approach:**

PACK 1.....OFF OR SUPPLIED BY APU

PACK 2.....OFF OR SUPPLIED BY APU

 [L2] *The selection of the PACKS to OFF (or to APU BLEED) increases the maximum thrust available from the engines, in the case of a go-around.*

 [L1] ● **If landing CONF other than FULL: USE CONF 1+F FOR GO AROUND**

SPEED AT RUNWAY THRESHOLD : VLS

 [L2] *This speed target is applicable to manual landing and autoland. Reduce the speed to reach VLS at the runway threshold.*

[L1] MINIMIZE V/S AT TOUCHDOWN

 [L2] *Touch down as smoothly as possible to reduce the V/S. The maximum touchdown V/S should not exceed 360 ft/min. The main landing gears must touch down as symmetrically as possible.*

 [L1] ● **For landing:**

INCREASE FLARE HEIGHT

USE MAX REVERSE ASAP

 [L2] *It is recommended to use the reverse as soon as possible, in order to limit the braking action.*

 [L1] ● **After nosewheel touchdown: APPLY BRAKES AS NECESSARY**

 [L2] *It is recommended that the flight crew uses the maximum available runway length to limit the braking energy.*

 [L1] ● **When landing completed:**

 BRAKE FANS  ON

 [L2] *Be prepared for tire deflation, if temperature exceed 800 °C.*

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES ABNORMAL AND EMERGENCY PROCEDURES MISC
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[QRH] SEVERE TURBULENCE

Ident.: PRO-ABN-MISC-10-00002202.0001001 / 17 MAR 17

Applicable to: ALL

Whenever possible, avoid areas with known or forecasted severe turbulence. If turbulence is unavoidable, aim to keep the speed in the region of the target speed given in this section, so as to provide the best protection against the effect of gust on the structural limits, whilst maintaining an adequate margin above VLS.

Sufficient buffet margin exists at optimum altitude. In order to further increase the margin to buffet onset, consider descending to a lower altitude.

Severe turbulence is defined as turbulence that causes large, abrupt changes in altitude and/or attitude. It usually causes large variations in airspeed. Occupants are forced violently against their seat belts and loose objects will move around the aircraft.

If severe turbulence occurs during a flight, the flight crew must make a logbook entry in order to initiate maintenance action.

Note: Recommendations for severe turbulence are also applicable to extreme turbulence.

Ident.: PRO-ABN-MISC-10-00002203.0001001 / 22 FEB 17

Applicable to: ALL

Before the aircraft enters an area where turbulence is expected:

- All loose equipment must be secured in the cockpit and in the cabin
- The flight crew must set the SEAT BELTS sw to ON.

Ident.: PRO-ABN-MISC-10-00002301.0001001 / 09 DEC 09

Applicable to: ALL

Keep the autopilot ON.

When thrust changes become excessive : Disconnect Autothrust.

For approach : Use A/THR for managed speed.

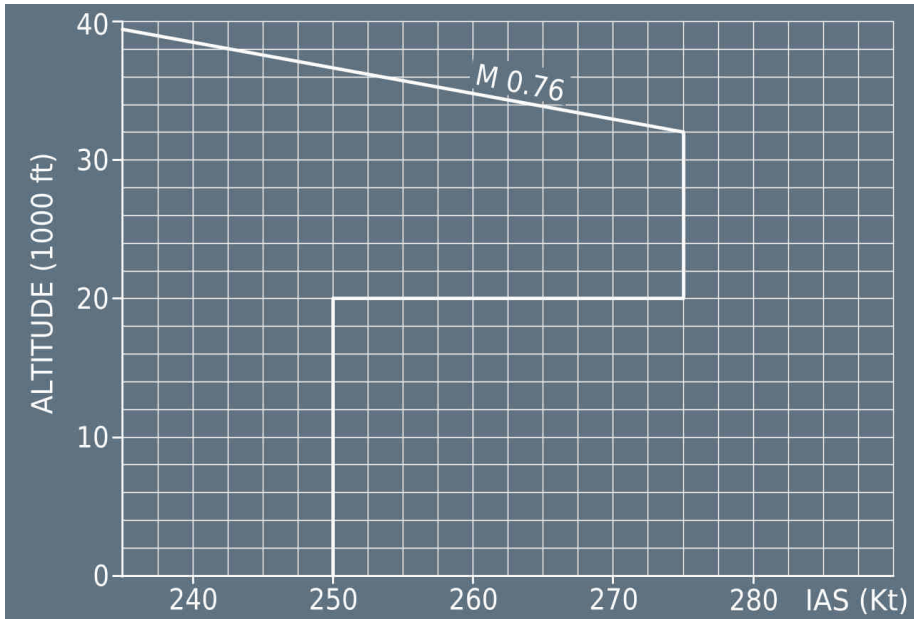
Ident.: PRO-ABN-MISC-10-00002208.0002001 / 22 MAY 12

Applicable to: ALL

Set the thrust to give the recommended speed (*Refer to PRO-ABN-MISC [QRH] Thrust Setting (N1) for Recommended Speed*). This thrust setting attempts to obtain, in stabilized conditions, the speed for turbulence penetration given in the graph below.

Only change thrust in case of an extreme variation in airspeed, and do not chase your Mach or airspeed.

A transient increase is preferable to a loss of speed, that decreases buffet margins and is difficult to recover.



[QRH] THRUST SETTING (N1) FOR RECOMMENDED SPEED

Ident.: PRO-ABN-MISC-10-00007380.0144001 / 06 NOV 23

Applicable to: MSN 02155-02789, 03031-05253

SEVERE TURBULENCE										
N1 SETTING FOR RECOMMENDED TURBULENCE SPEED (%)										
FL	SPD or Mach	WEIGHT (1 000 kg)								
		44	48	52	56	60	64	68	72	76
390	0.76	80.1	81.0	82.0	83.1	-	-	-	-	-
370	0.76	79.1	79.9	80.7	81.6	82.6	83.6	-	-	-
350	0.76	78.8	79.3	80.0	80.7	81.5	82.4	83.3	84.3	-
330	0.76	78.8	79.4	79.8	80.4	81.0	81.8	82.6	83.4	84.3
320	275	78.9	79.4	79.9	80.3	80.9	81.5	82.2	83.0	83.9
310	275	78.1	78.6	79.2	79.8	80.3	80.9	81.6	82.3	83.1
290	275	76.6	77.1	77.6	78.2	78.9	79.6	80.3	81.0	81.7
270	275	75.1	75.6	76.1	76.7	77.3	78.0	78.7	79.6	80.5
250	275	73.5	74.0	74.5	75.2	75.8	76.5	77.2	78.0	78.8

Continued on the following page

Continued from the previous page

SEVERE TURBULENCE										
N1 SETTING FOR RECOMMENDED TURBULENCE SPEED (%)										
FL	SPD or Mach	WEIGHT (1 000 kg)								
		44	48	52	56	60	64	68	72	76
200	275	69.9	70.3	70.7	71.2	71.8	72.4	73.0	73.7	74.4
150	250	61.9	62.6	63.3	64.1	64.9	65.9	66.9	68.0	68.9
100	250	58.3	59.0	59.6	60.2	61.0	61.8	62.6	63.5	64.5
50	250	54.3	54.9	55.6	56.3	57.1	58.0	59.0	60.0	60.8

Ident.: PRO-ABN-MISC-10-00007380.0071001 / 14 DEC 12

Applicable to: MSN 05746-07792

SEVERE TURBULENCE										
N1 SETTING FOR RECOMMENDED TURBULENCE SPEED (%)										
FL	SPD or Mach	WEIGHT (1000 KG)								
		44	48	52	56	60	64	68	72	76
390	.76	79.8	80.6	81.5	82.4	-	-	-	-	-
370	.76	79.0	79.6	80.3	81.1	82.0	82.8	-	-	-
350	.76	78.7	79.2	79.7	80.4	81.1	81.9	82.7	83.5	-
330	.76	78.8	79.3	79.7	80.2	80.8	81.4	82.0	82.8	83.5
310	275	78.0	78.5	79.0	79.6	80.1	80.6	81.2	81.8	82.5
290	275	76.5	76.9	77.4	78.0	78.5	79.2	79.9	80.5	81.2
270	275	75.0	75.5	75.9	76.4	77.0	77.6	78.3	79.0	79.9
250	275	73.4	73.9	74.4	74.9	75.5	76.2	76.8	77.5	78.2
200	275	69.8	70.2	70.6	71.1	71.6	72.1	72.7	73.3	74.0
150	250	61.8	62.4	63.0	63.8	64.6	65.4	66.4	67.4	68.4
100	250	58.2	58.8	59.4	60.0	60.7	61.5	62.5	63.5	64.5
50	250	54.2	54.8	55.4	56.1	56.8	57.7	58.8	60.0	60.8

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

MISC

Ident.: PRO-ABN-MISC-10-00007380.0066001 / 16 NOV 11

Applicable to: MSN 02926-02944

SEVERE TURBULENCE										
SPEED AND THRUST SETTING FOR RECOMMENDED TURBULENCE SPEED										
FL	SPD or Mach	GROSS WEIGHT (1000 KG)								
		44	48	52	56	60	64	68	72	76
		N1 %								
390	0.76	80.1	81.0	82.0	83.1	—	—	—	—	—
370	0.76	79.1	79.9	80.7	81.6	82.6	83.6	—	—	—
350	0.76	78.8	79.3	80.0	80.7	81.5	82.4	83.3	84.3	—
330	0.76	78.8	79.4	79.8	80.4	81.0	81.8	82.6	83.4	84.3
320	275	78.8	79.4	79.8	80.4	81.0	81.6	82.3	83.1	83.9
310	275	78.1	78.6	79.2	79.8	80.3	80.9	81.6	82.3	83.1
290	275	76.6	77.1	77.6	78.2	78.9	79.6	80.3	81.0	81.7
270	275	75.1	75.6	76.1	76.7	77.3	78.0	78.7	79.6	80.5
250	275	73.5	74.0	74.5	75.2	75.8	76.5	77.2	78.0	78.8
200	275	69.9	70.3	70.7	71.2	71.8	72.4	73.0	73.7	74.4
150	250	61.9	62.6	63.3	64.1	64.9	65.9	66.9	68.0	68.9
100	250	58.3	59.0	59.6	60.2	61.0	61.8	62.6	63.5	64.5
50	250	54.3	54.9	55.6	56.3	57.1	58.0	59.0	60.0	60.8

Ident.: PRO-ABN-MISC-10-00007386.0001001 / 09 JUN 15

Applicable to: ALL

If the flight crew flies the aircraft manually:

- The flight crew may expect large variations in altitude, but should not chase altitude.
- The flight crew should consider descending to or below OPT FL, in order to increase the margin to buffet.

[QRH] TAILSTRIKE

Ident.: PRO-ABN-MISC-00012273.0001001 / 04 JUN 19

Applicable to: ALL

LAND ASAP

MAX FL: 100 / MEA-MORA

500 ft/min should be targeted for the climb, to minimize pressure changes, and for passenger and crew comfort. Similarly, the rate of descent must be limited to about 1 000 ft/min, except for the final approach that must be performed normally.

Notify the ATC of the aircraft's rate of climb.

RAM AIR..... ON
 PACK 1..... OFF
 PACK 2..... OFF

[QRH] VOLCANIC ASH ENCOUNTER

Ident.: PRO-ABN-MISC-00012176.0004001 / 06 NOV 25

4 Applicable to: ALL

5 180° TURN.....INITIATE

The performance of a 180 ° turn will usually enable the aircraft to exit the volcanic ash clouds as quickly as possible, because volcanic ash clouds can extend for hundreds of nautical miles.

ATC.....NOTIFY

Note: *Electrostatic conditions may cause communication problems.*

A/THR..... OFF

This prevents the autothrust from generating thrust variations.

THRUST (IF CONDS PERMIT)..... REDUCE

Reduced thrust minimizes ash ingestion.

If altitude permits, reduce thrust to idle. This maximizes engine surge margin and lowers engine turbine temperature.

CREW OXY MASKS..... USE / 100 % / EMER

CABIN CREW.....NOTIFY

OXYGEN PASSENGER MASK MAN ON..... AS RQRD

Depending on contamination.

ENG ANTI ICE..... ON

WING ANTI ICE..... ON

PACK FLOW..... HI

Maximum air bleed gives the engines additional stall margin.

 AFT CARGO ISOL VALVES  OFF

 FWD CARGO ISOL VALVES  OFF

Note: *To prevent a cargo smoke warning being triggered*

ENGINE PARAMETERS..... MONITOR

Monitor particularly EGT. If EGT exceeds limits, it may become necessary to consider a precautionary engine shutdown and engine restart in flight.

Note: *In the case of precautionary shutdown:*

- restart when clear of the volcanic ash cloud
- Upon restart, the engine may accelerate very slowly. Do not misinterpret this as a failure to start

Continued on the following page

[QRH] VOLCANIC ASH ENCOUNTER (Cont'd)

- Consider that the compressor and turbine blades have been eroded and avoid sudden changes in thrust. Fuel flow and EGT may increase.

AIRSPEED INDICATIONS.....MONITOR

If airspeed is unreliable or lost, Refer to PRO-ABN-NAV UNRELIABLE SPEED INDICATION - Memory Items.

Note: If both engines flame out and speed indications are lost, Refer to ALL ENGINES FAILURE procedure to get the required pitch attitude for the optimum relight speed. In case of engine failure, switch off the wing anti ice before engine restart.

- If visibility not sufficient for approach due to windshield damage:

CONSIDER AUTOLAND

- For approach, if AUTOLAND is not available:

CAB PRESS MODE SEL.....MAN

MAN V/S CTL.....FULL UP

Due to the increased noise level, pay particular attention to visual warnings.

MAX SPEED: 200 kt

PF SLIDING WINDOW..... OPEN

[MEM] UNRELIABLE SPEED INDICATION

Applicable to: MSN 02155-02212

Ident.: PRO-ABN-NAV-AM-00017720.0002001 / 17 MAR 17

● **If the safe conduct of the flight is impacted:**

AP..... OFF
A/THR..... OFF
FD..... OFF

PITCH/THRUST:

Below THRUST RED ALT..... 15° / TOGA

Above THRUST RED ALT and Below FL 100..... 10° / CLB

Above THRUST RED ALT and Above FL 100..... 5° / CLB

FLAPS (if CONF 0(1)(2)(3))..... MAINTAIN CURRENT CONF

FLAPS (if CONF FULL)..... SELECT CONF 3 AND MAINTAIN

SPEEDBRAKES..... CHECK RETRACTED

L/G..... UP

When at, or above MSA or Circuit Altitude: Level off for troubleshooting.

1 Ident.: PRO-ABN-NAV-AM-00017722.0002001 / 07 NOV 25

● **To level off:**

AP..... OFF
A/THR..... OFF
FD..... OFF
SPEEDBRAKES..... CHECK RETRACTED
PITCH/THRUST TABLE..... APPLY

Refer to QRH for Pitch/Thrust tables.

FLYING TECHNIQUE TO STABILIZE SPEED

Stabilize the altitude. When altitude is stabilized:

- If the pitch is above the target pitch, increase the thrust and maintain the altitude.
- If the pitch is below the target pitch, decrease the thrust and maintain the altitude.

When the pitch reaches the target pitch, adjust the thrust to keep this target pitch.

Continued on the following page

[MEM] UNRELIABLE SPEED INDICATION (Cont'd)

Ident.: PRO-ABN-NAV-AM-00017724.0002001 / 17 MAR 17

● **When flight path is stabilized:**

AP.....	OFF
A/THR.....	OFF
FD.....	OFF
SPEEDBRAKES.....	CHECK RETRACTED
FLIGHT PATH.....	KEEP STABILIZED

RESPECT STALL WARNING

Ident.: PRO-ABN-NAV-AM-00017725.0001001 / 15 MAY 25

AFFECTED ADR IDENTIFICATION

PROBE/WINDOW HEAT.....ON
 ALL SPEED INDICATIONS.....CROSSCHECK
ADR3 and STBY speeds use the data of the same probe.

■ **If at least one ADR confirmed reliable:**

RELIABLE AIR DATA.....	USE
UNRELIABLE ADR pb(s).....	OFF

■ **If affected ADR(s) cannot be identified, or all ADRs affected:**

KEEP ONE ADR ON
 TWO ADR pbs..... OFF

This prevents the flight control laws from using two coherent but unreliable ADR data.

ATC/XPDR.....	ALT RPTG OFF
FOR LDG.....	FLAP LVR 3
APP SPD	VLS +10 kt
LDG DIST PROC.....	APPLY

● **For flight continuation: USE PITCH/THRUST TABLES**

Continued on the following page

[MEM] UNRELIABLE SPEED INDICATION (Cont'd)

2 Ident.: PRO-ABN-NAV-AM-00017726.0002001 / 07 NOV 25

CLIMB

Refer to QRH for Pitch/Thrust tables.

CRUISE**FLYING TECHNIQUE TO STABILIZE SPEED**

Stabilize the altitude. When altitude is stabilized:

- If the pitch is above the target pitch, increase the thrust and maintain the altitude
- If the pitch is below the target pitch, decrease the thrust and maintain the altitude.

When the pitch reaches the target pitch, adjust the thrust to keep this target pitch.

Refer to QRH for Pitch/Thrust tables.

Note: If the failure is due to radome destruction, the drag will increase and therefore N1 must be increased by 5 %. Fuel flow will increase by about 27 %.

DESCENT

Refer to QRH for Pitch/Thrust tables.

INITIAL / INTERMEDIATE APPROACH

APPLY FLYING TECHNIQUE TO STABILIZE SPEED

Refer to QRH for Pitch/Thrust tables.

FINAL APPROACH AT -3° DESCENT FLIGHT PATH

Refer to QRH for Pitch/Thrust tables.

[MEM] UNRELIABLE SPEED INDICATION

Applicable to: MSN 02719-05746

Ident.: PRO-ABN-NAV-AM-00017722.0002001 / 17 MAR 17

● **If the safe conduct of the flight is impacted:**

AP..... OFF
 A/THR..... OFF
 FD..... OFF

PITCH/THRUST:

Below THRUST RED ALT..... 15° / TOGA
 Above THRUST RED ALT and Below FL 100..... 10° / CLB
 Above THRUST RED ALT and Above FL 100..... 5° / CLB
 FLAPS (if CONF 0(1)(2)(3))..... MAINTAIN CURRENT CONF
 FLAPS (if CONF FULL)..... SELECT CONF 3 AND MAINTAIN
 SPEEDBRAKES..... CHECK RETRACTED
 L/G..... UP

When at, or above MSA or Circuit Altitude: Level off for troubleshooting.

Ident.: PRO-ABN-NAV-AM-00017722.0002001 / 07 NOV 25

● **To level off:**

AP..... OFF
 A/THR..... OFF
 FD..... OFF
 SPEEDBRAKES..... CHECK RETRACTED
 PITCH/THRUST TABLE..... APPLY

Refer to QRH for Pitch/Thrust tables.

FLYING TECHNIQUE TO STABILIZE SPEED

Stabilize the altitude. When altitude is stabilized:

- If the pitch is above the target pitch, increase the thrust and maintain the altitude.
- If the pitch is below the target pitch, decrease the thrust and maintain the altitude.

When the pitch reaches the target pitch, adjust the thrust to keep this target pitch.

Continued on the following page

[MEM] UNRELIABLE SPEED INDICATION (Cont'd)

Ident.: PRO-ABN-NAV-AM-00017724.0002001 / 17 MAR 17

- **When flight path is stabilized:**

AP.....OFF

A/THR.....OFF

FD.....OFF

SPEEDBRAKES.....CHECK RETRACTED

FLIGHT PATH.....KEEP STABILIZED

RESPECT STALL WARNING

Continued on the following page

[MEM] UNRELIABLE SPEED INDICATION (Cont'd)

Ident.: PRO-ABN-NAV-AM-00017725.0003001 / 15 NOV 22

AFFECTED ADR IDENTIFICATION

 PROBE/WINDOW HEAT.....ON
 ALL SPEED INDICATIONS.....CROSSCHECK

ADR3 and STBY speeds use the data of the same probe.

■ **If at least one ADR confirmed reliable:**

 RELIABLE AIR DATA.....USE
 UNRELIABLE ADR pb(s).....OFF

■ **If affected ADR(s) cannot be identified, or all ADRs affected:**

● **When above FL 250:**

 KEEP ONE ADR ON
 TWO ADR pbs..... OFF

This prevents the flight control laws from using two coherent but unreliable ADR data.

ATC/XPDR.....ALT RPTG OFF

● **For flight continuation: USE PITCH/THRUST TABLES**

● **When below FL 250, if speed still unreliable:**

ALL ADR pbs..... OFF

All ADRs must be switched OFF to replace the PFD's normal speed scale and altitude indication by the BUSS and GPS altitude indication.

SPEED.....FLY THE GREEN

Note: *If the BUSS does not react to longitudinal stick input when flying the green area of the speed scale, the flight crew must disregard the BUSS and use pitch/thrust tables.*

ATC/XPDR.....ALT RPTG OFF

NAV ADR 1+2+3 FAULT ECAM PROCEDURE.....APPLY

Continued on the following page

[MEM] UNRELIABLE SPEED INDICATION (Cont'd)

Ident.: PRO-ABN-NAV-AM-00017726.0002001 / 07 NOV 25

CLIMB

Refer to QRH for Pitch/Thrust tables.

CRUISE**FLYING TECHNIQUE TO STABILIZE SPEED**

Stabilize the altitude. When altitude is stabilized:

- If the pitch is above the target pitch, increase the thrust and maintain the altitude
- If the pitch is below the target pitch, decrease the thrust and maintain the altitude.

When the pitch reaches the target pitch, adjust the thrust to keep this target pitch.

Refer to QRH for Pitch/Thrust tables.

Note: *If the failure is due to radome destruction, the drag will increase and therefore N1 must be increased by 5 %. Fuel flow will increase by about 27 %.*

DESCENT

Refer to QRH for Pitch/Thrust tables.

INITIAL / INTERMEDIATE APPROACH

APPLY FLYING TECHNIQUE TO STABILIZE SPEED

Refer to QRH for Pitch/Thrust tables.

FINAL APPROACH AT -3° DESCENT FLIGHT PATH

Refer to QRH for Pitch/Thrust tables.

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

NAV

[MEM] UNRELIABLE SPEED INDICATION

Applicable to: MSN 07784-07792

Ident.: PRO-ABN-NAV-AM-00017720.0002001 / 17 MAR 17

● **If the safe conduct of the flight is impacted:**

AP OFF
 A/THR OFF
 FD OFF

PITCH/THRUST:

Below THRUST RED ALT 15° / TOGA
 Above THRUST RED ALT and Below FL 100 10° / CLB
 Above THRUST RED ALT and Above FL 100 5° / CLB
 FLAPS (if CONF 0(1)(2)(3)) MAINTAIN CURRENT CONF
 FLAPS (if CONF FULL) SELECT CONF 3 AND MAINTAIN
 SPEEDBRAKES CHECK RETRACTED
 L/G UP

When at, or above MSA or Circuit Altitude: Level off for troubleshooting.

Continued on the following page

[MEM] UNRELIABLE SPEED INDICATION (Cont'd)

Ident.: PRO-ABN-NAV-AM-00017722.0026001 / 07 NOV 25

● **To level off:**

AP.....OFF
A/THR.....OFF
FD.....OFF
SPEEDBRAKES.....CHECK RETRACTED

■ **Below FL 250:**

BKUP SPD/ALT pb.....USE

This action is reversible.

SPEED.....FLY THE GREEN

Note: *If the BUSS does not react to longitudinal stick input when flying the green area of the speed scale, the flight crew must disregard the BUSS and use pitch/thrust tables.*

■ **Above FL 250:**

PITCH/THRUST TABLE.....APPLY

Refer to QRH for Pitch/Thrust tables.

FLYING TECHNIQUE TO STABILIZE SPEED

Stabilize the altitude. When altitude is stabilized:

- If the pitch is above the target pitch, increase the thrust and maintain the altitude.
- If the pitch is below the target pitch, decrease the thrust and maintain the altitude.

When the pitch reaches the target pitch, adjust the thrust to keep this target pitch.

Continued on the following page

[MEM] UNRELIABLE SPEED INDICATION (Cont'd)

Ident.: PRO-ABN-NAV-AM-00017724.0005001 / 09 APR 20

● **When flight path is stabilized:**

AP.....OFF
A/THR.....OFF
FD.....OFF
SPEEDBRAKES.....CHECK RETRACTED

● **Below FL 250:**

BKUP SPD/ALT pb.....USE

This action is reversible.

SPEED.....FLY THE GREEN

Note: *If the BUSS does not react to longitudinal stick input when flying the green area of the speed scale, the flight crew must disregard the BUSS and use pitch/thrust tables.*

● **Above FL 250:**

FLIGHT PATH.....KEEP STABILIZED

Continued on the following page

[MEM] UNRELIABLE SPEED INDICATION (Cont'd)

Ident.: PRO-ABN-NAV-AM-00017725.0005001 / 15 NOV 22

AFFECTED ADR IDENTIFICATION

 PROBE/WINDOW HEAT.....ON
 ALL SPEED INDICATIONS.....CROSSCHECK

ADR3 and STBY speeds use the data of the same probe.
■ If at least one ADR confirmed reliable:

 RELIABLE AIR DATA.....USE
 UNRELIABLE ADR pb(s).....OFF

■ If affected ADR(s) cannot be identified, or all ADRs affected:

 KEEP ONE ADR ON
 TWO ADR pbs.....OFF

This prevents the flight control laws from using two coherent but unreliable ADR data.

ATC/XPDR.....ALT RPTG OFF

● When above FL 250:

USE PITCH/THRUST TABLES

● When below FL 250, if speed still unreliable:

BKUP SPD/ALT pb.....USE

This action is reversible.

SPEED.....FLY THE GREEN

Note: *If the BUSS does not react to longitudinal stick input when flying the green area of the speed scale, the flight crew must disregard the BUSS and use pitch/thrust tables.*

Continued on the following page

[MEM] UNRELIABLE SPEED INDICATION (Cont'd)

Ident.: PRO-ABN-NAV-AM-00017726.0002001 / 07 NOV 25

CLIMB

Refer to QRH for Pitch/Thrust tables.

CRUISE**FLYING TECHNIQUE TO STABILIZE SPEED**

Stabilize the altitude. When altitude is stabilized:

- If the pitch is above the target pitch, increase the thrust and maintain the altitude
- If the pitch is below the target pitch, decrease the thrust and maintain the altitude.

When the pitch reaches the target pitch, adjust the thrust to keep this target pitch.

Refer to QRH for Pitch/Thrust tables.

Note: *If the failure is due to radome destruction, the drag will increase and therefore N1 must be increased by 5 %. Fuel flow will increase by about 27 %.*

DESCENT

Refer to QRH for Pitch/Thrust tables.

INITIAL / INTERMEDIATE APPROACH

APPLY FLYING TECHNIQUE TO STABILIZE SPEED

Refer to QRH for Pitch/Thrust tables.

FINAL APPROACH AT -3° DESCENT FLIGHT PATH

Refer to QRH for Pitch/Thrust tables.

[QRH] ADR 1+2+3 FAULT
Applicable to: MSN 02155-02212

Ident.: PRO-ABN-NAV-C-00017828.0001001 / 17 MAR 17

In case of a triple ADR failure, ECAM only displays dual ADR alerts.

 All dual ADR alerts trigger: **NAV ADR 1+2 FAULT**, and **NAV ADR 1+3 FAULT**, and **NAV ADR 2+3 FAULT**.

L2 Note: In case of a simultaneous ADR and IR (same ADIRU) failure, apply the ADR FAULT procedure prior to the IR FAULT procedure.

L1 ALL ADR pbs..... OFF
 STBY INST.....USE
 DISREGARD ECAM ACTIONS FOR AIR DATA SWTG AND ATC
Air data switching and ATC have no effect.
 TCAS & ATC ALT RPTG INOP

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

NAV

[QRH] ADR 1+2+3 FAULT (Cont'd)

Ident.: PRO-ABN-NAV-C-00021399.0009001 / 17 MAR 17

EXPECT ALTN LAW

FL	390	370	350	330	310	290	280 and below
MAX SPEED (kt)	252	265	278	290	305	315	320

This table provides IAS/MACH 0.82 relationship at or above FL 280.

USE RUDDER WITH CARE

At slats extension, full rudder travel authority is recovered.

WHEN L/G DOWN: DIRECT LAW

At landing gear extension, flight controls revert to direct law in pitch and in roll.

CABIN PRESS MODE SEL..... MAN

MAN V/S CTL..... AS RQRD

Target CAB PRESS V/S:

- Climb: 500 ft/min
- Descent: 300 ft/min

AIRCRAFT CRZ FL	CAB ALT TARGET (ft)
410	8000
350	7000
300	5500
250	3000
<200	0

Continued on the following page

[QRH] ADR 1+2+3 FAULT (Cont'd)

Ident.: PRO-ABN-NAV-C-00021262.0001001 / 15 MAY 25

● For approach:

CAT 1 ONLY

FOR LDG : FLAP LVR 3

GPWS LDG FLAP 3.....ON

LDG DIST PROC.....APPLY

● For L/G GRVTY EXTN:

LDG GEAR GRVTY EXTN handcrank.....PULL AND TURN

● When L/G downlocked:

L/G lever.....DOWN

GEAR DOWN indications.....CHECK

L/G DOORS REMAIN OPEN

● During final approach:

MAN V/S CTL.....FULL UP

● Before door opening: CHECK ΔP ZERO
Continued on the following page

[QRH] ADR 1+2+3 FAULT (Cont'd)

Ident.: PRO-ABN-NAV-C-00016863.0002001 / 15 MAY 25

STATUS

MAX SPEED..... 320/0.82
MANEUVER WITH CARE
RUD WITH CARE ABV 160 KT
See ⁽¹⁾

APPR PROC

FOR LDG.....FLAP LVR 3
Do not select CONF FULL, so as not to degrade handling qualities.
GPWS LDG FLAP 3.....ON
APPR SPD..... VREF +10 KT
LDG DIST PROC..... APPLY

Note: As the landing gear safety valve is closed, landing gear extension must be performed by gravity (Refer to PRO-ABN-LG [QRH] L/G GRAVITY EXTENSION).

WHEN L/G DN : DIRECT LAW

At landing gear extension, control reverts to direct law in pitch, as well as in roll.

● **DURING FINAL APPR**

MAN V/S CTL.....FULL UP

Note: In case of a go-around, respect the maximum speed of 215 kt in CONF 1+F, due to loss of flap auto retraction to CONF 1.

CAUTION	Check that the outflow valve is fully open and that cabin altitude is at airfield elevation before opening the doors.
----------------	---

INOP SYS

F/CTL PROT
WINDSHEAR DET
GPWS
ADR 1+2+3
AP 1+2
A/THR
RUD TRV LIM 1+2
CAB PR 1+2
YAW DAMPER
ATC/XPDR 1
ATC/XPDR 2
STEEP APPR 
ROW/ROP 

Other INOP SYS

ATC ALTI MODE
TCAS 
L/G RETRACT
RAT AUTOMATIC EXTENSION
CAT 2

Continued on the following page

[QRH] ADR 1+2+3 FAULT (Cont'd)

- ⁽¹⁾ *The rudder travel limit value is frozen at the moment when the failure occurs. Therefore, to prevent damage to the aircraft structure, use the rudder with care, when the speed is above 160 kt. At slats' extension, full rudder travel authority is recovered.*

[QRH] ALL ADR OFF

Ident.: PRO-ABN-NAV-00012464.0020001 / 15 MAY 25

Applicable to: MSN 02719-04392, 07784-07792

 Apply this QRH procedure when requested by the **NAV ADR 1+2+3 FAULT** ECAM alert.

SPEED.....FLY THE GREEN

Fly within the green area of the speed scale to ensure safe flight.
For slats/flaps retraction, it is better to fly at the top of the green area of the speed scale.

Note: If the BUSS does not react to longitudinal stick input when flying the green area of the speed scale, the flight crew must disregard the BUSS and use pitch/thrust tables.

PFD ALTITUDE: GPS

TCAS & ATC ALT RPTG INOP

CABIN PRESS MODE SEL.....MAN

MAN V/S CTL.....AS QRDR

Target CAB PRESS V/S:

- Climb: 500 ft/min
- Descent: 300 ft/min

AIRCRAFT CRZ FL	CAB ALT TARGET (ft)
410	8000
350	7000
300	5500
250	3000
<200	0

LDG DIST PROC.....APPLY

● For approach:

SPEED.....FLY THE GREEN

Before extending the slats/flaps, it is better to fly at the bottom of the speed scale green area, and to be in straight flight.

FOR LDG.....FLAP LVR 3

GPWS LDG FLAP 3.....ON

APPR SPEED: BUSS TARGET SPEED

During approach, BUSS TARGET SPEED (green triangle) indicates VAPP.

● When flap 2:

LDG GEAR GRVTY EXTN handcrank.....PULL AND TURN

Continued on the following page

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES ABNORMAL AND EMERGENCY PROCEDURES NAV
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	[QRH] ALL ADR OFF (Cont'd)	
	● When landing gear downlocked: L/G lever..... DOWN GEAR DOWN indications..... CHECK L/G DOORS REMAIN OPEN ● During final approach: MAN V/S CTL..... FULL UP ● Before door opening: CHECK ΔP ZERO	

[QRH] ALL ADR OFF

Ident.: PRO-ABN-NAV-00012464.0026001 / 15 MAY 25

Applicable to: MSN 05152-05746

 Apply this QRH procedure when requested by the **NAV ADR 1+2+3 FAULT** ECAM alert.

SPEED.....FLY THE GREEN

Fly within the green area of the speed scale to ensure safe flight.
For slats/flaps retraction, it is better to fly at the top of the green area of the speed scale.

Note: If the BUSS does not react to longitudinal stick input when flying the green area of the speed scale, the flight crew must disregard the BUSS and use pitch/thrust tables.

WHEN ALL ADR OFF BOTH FMS LOST

BACK UP NAV.....USE

Revert to Back Up Nav via the NAV B/UP prompt on the MCDU MENU page.

USE RMP FOR NAVAID TUNING

PFD ALTITUDE: GPS

TCAS & ATC ALT RPTG INOP

CABIN PRESS MODE SEL.....MAN

MAN V/S CTL.....AS RQRD

Target CAB PRESS V/S:

- Climb: 500 ft/min
- Descent: 300 ft/min

AIRCRAFT CRZ FL	CAB ALT TARGET (ft)
410	8000
350	7000
300	5500
250	3000
<200	0

LDG DIST PROC.....APPLY

● For approach:

SPEED.....FLY THE GREEN

Before extending the slats/flaps, it is better to fly at the bottom of the speed scale green area, and to be in straight flight.

FOR LDG.....FLAP LVR 3

GPWS LDG FLAP 3.....ON

Continued on the following page

[QRH] ALL ADR OFF (Cont'd)

APPR SPEED: BUSS TARGET SPEED

During approach, BUSS TARGET SPEED (green triangle) indicates VAPP.

● **When flap 2:**

LDG GEAR GRVTY EXTN handcrank.....PULL AND TURN

● **When landing gear downlocked:**

L/G lever.....DOWN

GEAR DOWN indications.....CHECK

L/G DOORS REMAIN OPEN

● **During final approach:**

MAN V/S CTL.....FULL UP

● **Before door opening: CHECK ΔP ZERO**

[QRH] IR ALIGNMENT IN ATT MODE

Ident.: PRO-ABN-NAV-00012425.0006001 / 04 NOV 20

Applicable to: MSN 04392-07792

If IR alignment is lost, the navigation mode is inoperative (red ATT flag on PFD and red HDG flag on ND).

Aircraft attitude and heading may be recovered by applying the following procedure:

IR (affected) MODE SEL.....ATT

KEEP SPEED, HEADING, AND FL CONSTANT FOR 30 s

FMS DATA page.....SELECT

The DATA INDEX page is displayed

IRS MONITOR key.....PRESS

[SET HDG key] A/C HDG.....ENTER

CROSSCHECK HEADING REGULARLY WITH STBY COMPASS AND UPDATE AS REQUIRED

[QRH] IR ALIGNMENT IN ATT MODE

Ident.: PRO-ABN-NAV-00012425.0002001 / 04 NOV 20

Applicable to: MSN 02155-03060

If IR alignment is lost, the navigation mode is inoperative (red ATT flag on PFD and red HDG flag on ND).

Aircraft attitude and heading may be recovered by applying the following procedure:

IR (affected) MODE SEL.....ATT

ALIGN light on during 30 s.

ATT MODE displayed on CDU.

KEEP SPEED, HEADING, AND FL CONSTANT FOR 30 s

■ **For alignment through MCDU:**

FMS DATA page.....SELECT

The DATA INDEX page is displayed

IRS MONITOR key.....PRESS

[SET HDG key] A/C HDG.....ENTER

■ **For alignment through ADIRS panel:**

DISPLAY SYS sel.....SELECT AFFECTED SYS

DISPLAY DATA sel.....HDG

● **If “H” written on the “5” key of ADIRS panel:**

H Key.....PRESS

Degree marker, zero decimal point, ENT and CLR lights come on.

A/C HEADING.....ENTER

A/C HEADING.....INSERT

ENT key.....PRESS

Example : to enter heading 320 °, dial 3, 2, 0, 0 then press ENT.

Heading will be displayed on the associated ND.

“HDG-ATT MODE” will be displayed on CDU.

CROSSCHECK HEADING REGULARLY WITH STBY COMPASS AND UPDATE AS REQUIRED

NAV ADR 1(2)(3) FAULT

Applicable to: ALL

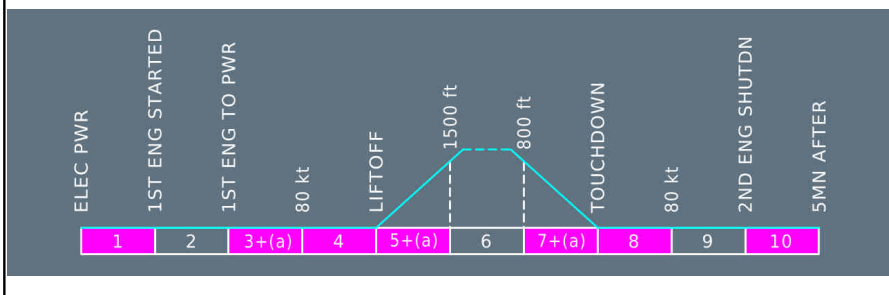
Ident.: PRO-ABN-NAV-A-00018111.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the ADR 1(2)(3) is failed.

Flight Phase Inhibition:


Note: (a) Not inhibited in flight phase 3 in the case of **NAV ADR 3 FAULT** while the ADR 3 is in use.

Not inhibited in flight phases 3, 5, and 7 in the case of **NAV ADR 1(2) FAULT**.

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

NAV

NAV ADR 1(2)(3) FAULT (Cont'd)

Ident.: PRO-ABN-NAV-A-00017302.0003001 / 13 MAY 25

Note: In case of simultaneous failure of ADR and IR (same ADIRU), apply ADR FAULT procedure before IR FAULT procedure.

■ **NAV ADR 1 FAULT:**

AIR DATA SWTG.....CAPT 3

[L2] Select ADR 3 to captain side.

[L1] ADR 1 P/B..... OFF

[L2] Due to the fact that the enhanced functions of the EGPWS  or the predictive functions of the GPWS (for aircraft equipped with T2CAS  or T3CAS ) are inhibited, the GPWS TERR FAULT light and the GPWS SYS FAULT light come on. If this occurs, the flight crew should switch off the GPWS TERR pb-sw and the GPWS SYS pb-sw.

[L1] ■ **NAV ADR 2 FAULT:**

AIR DATA SWTG..... F/O 3

[L2] Select ADR 3 to first officer side.

[L1] ADR 2 P/B..... OFF

BARO REF..... CHECK

[L2] If ADR 2 fails, both baro reference channels are driven by the same FCU channel. Consequently the baro reference displays must be checked.

[L1] ■ **NAV ADR 3 FAULT:**

ADR 3 P/B..... OFF

● If ADR 3 in use:

AIR DATA SWTG..... NORM

Ident.: PRO-ABN-NAV-A-00017505.0001001 / 21 MAR 16

STATUS

INOP SYS

CAT 3 SINGLE ONLY

ADR 1(2)(3)
 CAT 3 DUAL
 GPWS ⁽¹⁾

⁽¹⁾ (in case of ADR 1 FAULT only)

NAV ADR 1+2(1+3)(2+3) FAULT

Applicable to: MSN 02155-02212

Ident.: PRO-ABN-NAV-B-00018113.0001001 / 21 MAR 16

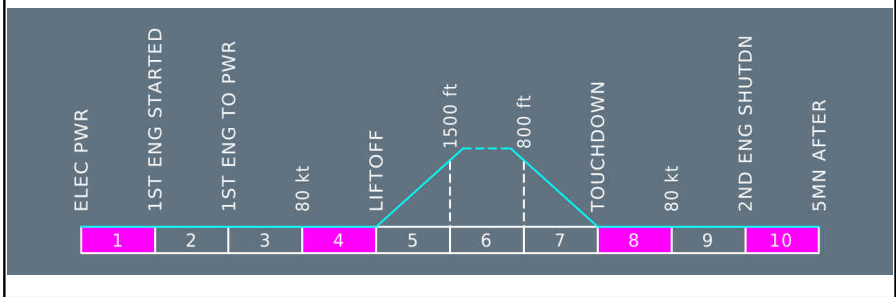
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when two ADRs are failed.

Flight Phase Inhibition:



Continued on the following page

NAV ADR 1+2(1+3)(2+3) FAULT (Cont'd)

Ident.: PRO-ABN-NAV-B-00017147.0006001 / 13 MAY 25

[L2] Flight control normal laws are lost. Pitch alternate law preserves the neutral static stability. All protections, except maneuver protections are lost.

[L1] Note: In the case of a simultaneous ADR and IR (same ADIRU) failure, apply the ADR FAULT procedure prior to the IR FAULT procedure.

■ If **NAV ADR 1+2 FAULT**:

AIR DATA SWTG.....CAPT 3

[L2] Set ADR 3 (if available) to the captain's side.

[L1] ADR (AFFECTED) P/B.....OFF

[L2] In the case of **NAV ADR 1+2 FAULT**, the GPWS TERR FAULT light and the GPWS SYS FAULT light illuminate. This occurs because the enhanced functions of the EGPWS  or the predictive functions of the GPWS (for aircraft equipped with T2CAS  or T3CAS ) are inhibited. If this occurs, the flight crew should switch off the GPWS TERR pb-sw and the GPWS SYS pb-sw.

[L1] Note: In the case of **NAV ADR 1+2 FAULT**, check speed is below VFE of CONF 1+F (Refer to LIM-AG-SPD Maximum Flaps/Slats Speeds) before selecting FLAPS 1. Because ADR 1+2 parameters are lost, the SFCCs will set CONF 1+F instead of CONF 1.

ASSOCIATED PROCEDURES

F/CTL ALTN LAW (PROT LOST)

Refer to PRO-ABN-F_CTL F/CTL ALTN LAW - ANNUNCIATION

■ If **NAV ADR 1+3(2+3) FAULT**:

[L2] Air data information is lost on one PFD and on the associated HUD .

[L1] Note: In the case of **NAV ADR 1+3 FAULT**, the landing gear safety valve is controlled closed:

- Landing gear retraction is inoperative
- Landing gear extension must be performed by gravity.

AIR DATA SWTG.....NORM

ATC/XPDR (IF ADR 1 FAILED).....SYS 2

ATC/XPDR (IF ADR 2 FAILED).....SYS 1

Continued on the following page

NAV ADR 1+2(1+3)(2+3) FAULT (Cont'd)

ADR (AFFECTED) P/B..... OFF

L2

In the case of **NAV ADR 1+3 FAULT**, the GPWS TERR FAULT light and the GPWS SYS FAULT light illuminate. This occurs because the enhanced functions of the EGPWS  or the predictive functions of the GPWS (for aircraft equipped with T2CAS  or T3CAS ) are inhibited. If this occurs, the flight crew should switch off the GPWS TERR pb-sw and the GPWS SYS pb-sw.

L1

- If **NAV ADR 2+3 FAULT** and **ANTI ICE CAPT AOA**:
AVOID ICING CONDITIONS

ASSOCIATED PROCEDURES

F/CTL ALTN LAW
(PROT LOST)

Refer to PRO-ABN-F_CTL F/CTL ALTN LAW - ANNUNCIATION

Continued on the following page

NAV ADR 1+2(1+3)(2+3) FAULT (Cont'd)

Ident.: PRO-ABN-NAV-B-00017397.0017001 / 24 MAR 20

L12

STATUS

MAX SPEED..... 320 KT

APPR PROC

FOR LDG..... FLAP LVR 3

This line is replaced by "FOR LDG : FLAP LVR 3" when CONF3 is selected, as a reminder.

GPWS LDG FLAP 3..... ON

This line is displayed when flaps are in CONF 3.

● If NAV ADR 1+3 FAULT:

L/G..... GRVTY EXTN

Refer to PRO-ABN-LG [QRH] L/G GRAVITY EXTENSION

APPR SPD..... VREF + 10 KT

LDG DIST PROC..... APPLY

ALTN LAW : PROT LOST

WHEN L/G DN : DIRECT LAW

Note: At L/G extension, control reverts to direct law in pitch and roll (Refer to PRO-ABN-F_CTL F/CTL DIRECT LAW).

 FLS  LIMITED TO F-APP + RAW

Note: Due to the fact that the enhanced functions of the EGPWS  or the predictive functions of the GPWS (for aircraft equipped with T2CAS  or T3CAS ) are inhibited, the GPWS TERR FAULT light and the GPWS SYS FAULT light come on in the case of a NAV ADR 1+3 FAULT. If this occurs, the flight crew should switch off the GPWS TERR pb-sw and the GPWS SYS pb-sw.

INOP SYS

F/CTL PROT

ADR 1+2(2+3)(1+3)

AP 1+2

A/THR

 ATC/XPDR 1 ⁽¹⁾

ATC/XPDR 2 (if ADR 2 fails)

 RUD TRV LIM 1(2) ⁽²⁾

 GPWS ⁽¹⁾

 N.W. STEER ⁽³⁾

CAT 2

 GLS AUTOLAND 

 STEEP APPR 

 ROW/ROP 

Continued on the following page

NAV ADR 1+2(1+3)(2+3) FAULT (Cont'd)

- (1) (if ADR 1 fails)
- (2) (if NAV ADR 1+3 (2+3) FAULT)
- (3) (if NAV ADR 1+3 FAULT)

NAV ADR 1+2(1+3)(2+3) FAULT

Applicable to: MSN 02719-07792

Ident.: PRO-ABN-NAV-B-00018113.0001001 / 21 MAR 16

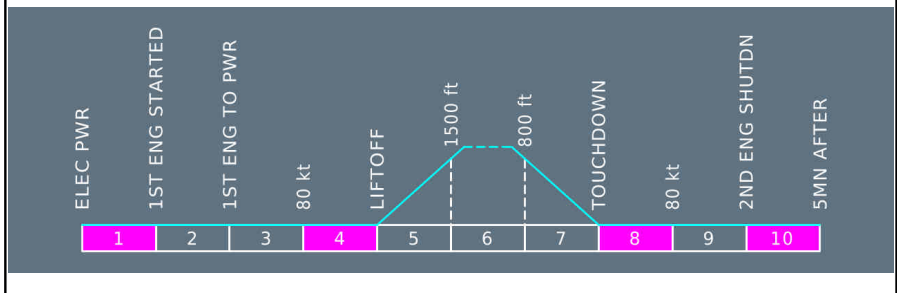
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when two ADRs are failed.

Flight Phase Inhibition:



Continued on the following page

NAV ADR 1+2(1+3)(2+3) FAULT (Cont'd)

10 Ident.: PRO-ABN-NAV-B-00017147.0006001 / 13 MAY 25

[L2] Flight control normal laws are lost. Pitch alternate law preserves the neutral static stability. All protections, except maneuver protections are lost.

[L1] Note: In the case of a simultaneous ADR and IR (same ADIRU) failure, apply the ADR FAULT procedure prior to the IR FAULT procedure.

■ If **NAV ADR 1+2 FAULT**:

AIR DATA SWTG.....CAPT 3

[L2] Set ADR 3 (if available) to the captain's side.

[L1] ADR (AFFECTED) P/B.....OFF

[L2] In the case of **NAV ADR 1+2 FAULT**, the GPWS TERR FAULT light and the GPWS SYS FAULT light illuminate. This occurs because the enhanced functions of the EGPWS  or the predictive functions of the GPWS (for aircraft equipped with T2CAS  or T3CAS ) are inhibited. If this occurs, the flight crew should switch off the GPWS TERR pb-sw and the GPWS SYS pb-sw.

[L1] Note: In the case of **NAV ADR 1+2 FAULT**, check speed is below VFE of CONF 1+F (Refer to LIM-AG-SPD Maximum Flaps/Slats Speeds) before selecting FLAPS 1. Because ADR 1+2 parameters are lost, the SFCCs will set CONF 1+F instead of CONF 1.

ASSOCIATED PROCEDURES

F/CTL ALTN LAW (PROT LOST)

Refer to PRO-ABN-F_CTL F/CTL ALTN LAW - ANNUNCIATION

■ If **NAV ADR 1+3(2+3) FAULT**:

[L2] Air data information is lost on one PFD and on the associated HUD .

[L1] Note: In the case of **NAV ADR 1+3 FAULT**, the landing gear safety valve is controlled closed:

- Landing gear retraction is inoperative
- Landing gear extension must be performed by gravity.

AIR DATA SWTG.....NORM

ATC/XPDR (IF ADR 1 FAILED).....SYS 2

ATC/XPDR (IF ADR 2 FAILED).....SYS 1

Continued on the following page

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES ABNORMAL AND EMERGENCY PROCEDURES NAV
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NAV ADR 1+2(1+3)(2+3) FAULT (Cont'd)

ADR (AFFECTED) P/B.....OFF

L2

In the case of NAV ADR 1+3 FAULT, the GPWS TERR FAULT light and the GPWS SYS FAULT light illuminate. This occurs because the enhanced functions of the EGPWS or the predictive functions of the GPWS (for aircraft equipped with T2CAS or T3CAS) are inhibited. If this occurs, the flight crew should switch off the GPWS TERR pb-sw and the GPWS SYS pb-sw.

- L1
- If NAV ADR 2+3 FAULT and ANTI ICE CAPT AOA:
AVOID ICING CONDITIONS

ASSOCIATED PROCEDURES

F/CTL ALTN LAW
(PROT LOST)

Refer to PRO-ABN-F_CTL F/CTL ALTN LAW - ANNUNCIATION

Continued on the following page

NAV ADR 1+2(1+3)(2+3) FAULT (Cont'd)

Ident.: PRO-ABN-NAV-B-00017397.0019001 / 24 MAR 20

L12

STATUS

MAX SPEED..... 320 KT

APPR PROC

FOR LDG..... FLAP LVR 3

This line is replaced by "FOR LDG : FLAP LVR 3" when CONF 3 is selected, as a reminder.

GPWS LDG FLAP 3..... ON

This line is displayed when flaps are in CONF 3.

● If NAV ADR 1+3 FAULT:

L/G..... GRVTY EXTN

Refer to PRO-ABN-LG [QRH] L/G GRAVITY EXTENSION

APPR SPD..... VREF + 10 KT

LDG DIST PROC..... APPLY

ALTN LAW : PROT LOST

WHEN L/G DN : DIRECT LAW

Note: At L/G extension, control reverts to direct law in pitch and roll (Refer to PRO-ABN-F_CTL F/CTL DIRECT LAW).

 FLS  LIMITED TO F-APP + RAW

Note: Due to the fact that the enhanced functions of the EGPWS  or the predictive functions of the GPWS (for aircraft equipped with T2CAS  or T3CAS ) are inhibited, the GPWS TERR FAULT light and the GPWS SYS FAULT light come on in the case of a NAV ADR 1+3 FAULT. If this occurs, the flight crew should switch off the GPWS TERR pb-sw and the GPWS SYS pb-sw.

INOP SYS

F/CTL PROT

ADR 1+2(2+3)(1+3)

AP 1+2

A/THR

 ATC/XPDR 1 ⁽¹⁾

ATC/XPDR 2 (if ADR 2 fails)

 RUD TRV LIM 1(2) ⁽²⁾

 GPWS ⁽¹⁾

CAT 2

 GLS AUTOLAND 

 STEEP APPR 

 ROW/ROP 

Continued on the following page

NAV ADR 1+2(1+3)(2+3) FAULT (Cont'd)

- (1)
(if ADR 1 fails)

(2)
(if NAV ADR 1+3 (2+3) FAULT)

NAV ADR 1+2+3 FAULT

Applicable to: MSN 02719-05746

Ident.: PRO-ABN-NAV-X-00018114.0001001 / 21 MAR 16

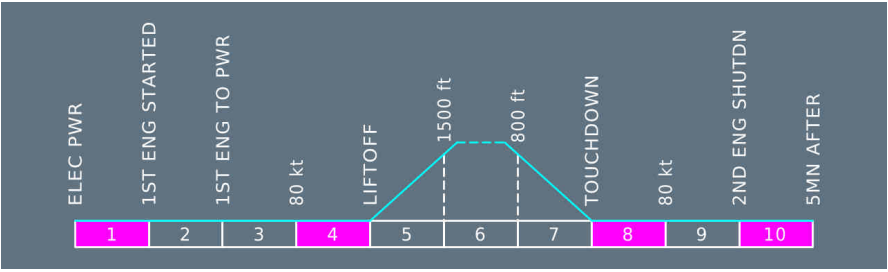
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the three ADRs are failed.

Flight Phase Inhibition:



Continued on the following page

NAV ADR 1+2+3 FAULT (Cont'd)

Ident.: PRO-ABN-NAV-X-00017497.0003001 / 13 MAY 25

[L2] This procedure requires to turn off the three ADRs, and to use the Back Up Speed Scale (BUSS) and GPS altitude.

[L1] Note: In case of a simultaneous ADR and IR (same ADIRU) failure, apply the ADR FAULT procedure prior to the IR FAULT procedure.

AP+FD..... OFF
 A/THR..... OFF
 PROBE/WINDOW HEAT..... ON
 ADR 1+2+3 P/B..... OFF

[L2] In the case of **NAV ADR 1+2+3 FAULT**, the GPWS TERR FAULT light and the GPWS SYS FAULT light illuminate. This occurs because the enhanced functions of the EGPWS or or the predictive functions of the GPWS (for aircraft equipped with T2CAS or or T3CAS or) are inhibited. If this occurs, the flight crew should switch off the GPWS TERR pb-sw and the GPWS SYS pb-sw.

[L1] Note: The STALL WARNING remains operative.

SPD..... FLY THE GREEN

[L2] Fly the green area of the speed scale to ensure safe flight.

[L1] Note: If the BUSS does not react to longitudinal stick input when flying the green area of the speed scale, the flight crew must disregard the BUSS and use pitch/thrust table.

STBY INST.....MAY BE UNREL

[L2] ADR3 and STBY speeds use the data of the same probes. Therefore, standby instrument must be used with care.

[L1] ALL ADR OFF PROC.....APPLY

[L2] Refer to PRO-ABN-NAV [QRH] ALL ADR OFF.

[L1]

ASSOCIATED PROCEDURES
F/CTL ALTN LAW
(PROT LOST)

Refer to PRO-ABN-F_CTL F/CTL ALTN LAW - ANNUNCIATION

Continued on the following page

NAV ADR 1+2+3 FAULT (Cont'd)

Ident.: PRO-ABN-NAV-X-00016858.0016001 / 18 NOV 21

L12

STATUS

MANEUVER WITH CARE

SPD BRK.....DO NOT USE

STBY INST..... MAY BE UNREL

APPR PROC

FOR LDG.....FLAP LVR 3

*This line is replaced by “FOR LDG: FLAP LVR 3” when
CONF 3 is selected, as a reminder.*

LDG.....GRVTY EXTN

ALTN LAW: PROT LOST

WHEN L/G DN: DIRECT LAW

See ⁽¹⁾

INOP SYS

REAC W/S DET

PRED W/S DET 

F/CTL PROT

ADR 1+2+3

STEEP APPR 

RUD TRV LIM

AP 1+2

A/THR

CAB PR 1+2

GPWS

GPWS TERR 

ATC/XPDR 1

ATC/XPDR 2

ROW/ROP 

⁽¹⁾ Note: *At landing gear extension, control reverts to direct law in pitch, as well as in roll (Refer to PRO-ABN-F_CTL F/CTL DIRECT LAW).*

NAV ADR 1+2+3 FAULT

Applicable to: MSN 07784-07792

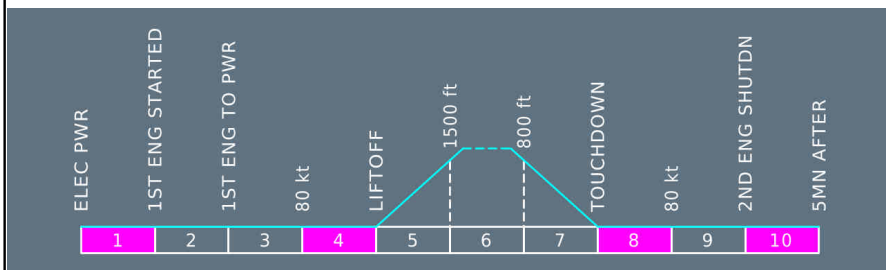
Ident.: PRO-ABN-NAV-X-00018114.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the three ADRs are failed.

Flight Phase Inhibition:



Continued on the following page

NAV ADR 1+2+3 FAULT (Cont'd)

Ident.: PRO-ABN-NAV-X-00017497.0006001 / 13 MAY 25

L2 This procedure requires to turn off the three ADRs, and to use the BackUp Speed Scale (BUSS) and GPS altitude.

L1 Note: In case of a simultaneous ADR and IR (same ADIRU) failure, apply the ADR FAULT procedure prior to the IR FAULT procedure.

AP+FD..... OFF
 A/THR..... OFF
 PROBE/WINDOW HEAT..... ON
 CAPT BKUP SPD/ALT..... ON
 F/O BKUP SPD/ALT..... ON
 ADR 1+2+3 P/B..... OFF

L2 In the case of **NAV ADR 1+2+3 FAULT**, the GPWS TERR FAULT light and the GPWS SYS FAULT light illuminate. This occurs because the enhanced functions of the EGPWS  or the predictive functions of the GPWS (for aircraft equipped with T2CAS  or T3CAS ) are inhibited. If this occurs, the flight crew should switch off the GPWS TERR pb-sw and the GPWS SYS pb-sw.

L1 Note: The STALL WARNING remains operative.

SPD..... FLY THE GREEN

L2 Fly the green area of the speed scale to ensure safe flight.

L1 Note: If the BUSS does not react to longitudinal stick input when flying the green area of the speed scale, the flight crew must disregard the BUSS and use pitch/thrust table.

● **IF AOA DISAGREE:**

BKUP SPD/ALT..... DO NOT USE
 STBY INST..... MAY BE UNREL

L2 ADR3 and STBY speeds use the data of the same probes. Therefore, standby instrument must be used with care.

L1 ALL ADR OFF PROC..... APPLY

L2 Refer to PRO-ABN-NAV [QRH] ALL ADR OFF.

L1

ASSOCIATED PROCEDURES

F/CTL ALTN LAW
(PROT LOST)

Continued on the following page

NAV ADR 1+2+3 FAULT (Cont'd)

Refer to PRO-ABN-F_CTL F/CTL ALTN LAW - ANNUNCIATION

13 Ident.: PRO-ABN-NAV-X-00016858.0011001 / 18 NOV 21

L12

STATUS

MANEUVER WITH CARE

SPD BRK DO NOT USE

GA THR: TOGA ONLY

STBY INST MAY BE UNREL

● If AOA disagree:

BKUP SPD/ALT DO NOT USE

APPR PROC

FOR LDG FLAP LVR 3

*This line is replaced by "FOR LDG: FLAP LVR 3" when
CONF 3 is selected, as a reminder.*

LDG GRVTY EXTN

ALTN LAW: PROT LOST

WHEN L/G DN: DIRECT LAW

 See ⁽¹⁾

INOP SYS

REAC W/S DET

 PRED W/S DET 

F/CTL PROT

ADR 1+2+3

 STEEP APPR 

RUD TRV LIM

AP 1+2

A/THR

 GA SOFT 

CAB PR 1+2

ATC/XPDR 1

ATC/XPDR 2

GPWS

 GPWS TERR 

 ROW/ROP 

⁽¹⁾ Note: At landing gear extension, control reverts to direct law in pitch, as well as in roll (Refer to PRO-ABN-F_CTL F/CTL DIRECT LAW).

NAV ADR DISAGREE

Applicable to: MSN 02155-05746

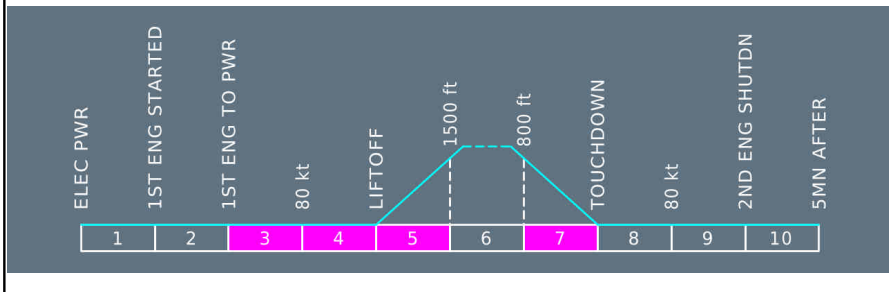
Ident.: PRO-ABN-NAV-U-00018110.0001001 / 21 MAR 16

ANNUNCIATIONS
Triggering Conditions:

L2

This alert triggers when the following conditions occur:

- The ELAC rejected an ADR, or an ADR is faulty
- The speed or the Angle Of Attack (AOA) from the two remaining ADRs are different.

Flight Phase Inhibition:


Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

NAV

NAV ADR DISAGREE (Cont'd)

Ident.: PRO-ABN-NAV-U-00017130.0006001 / 13 MAY 25

L2 The alternate law activates, and protections are lost.

L1 **AIR SPD**.....X CHECK

L2 Check airspeed information on both PFDs, and on the standby airspeed indicator.

L1 ■ **IF NO SPD DISAGREE:**

AOA DISCREPANCY

■ **IF SPD DISAGREE:**

UNREL SPD PROC.....APPLY

To determine the faulty ADR, Refer to PRO-ABN-NAV UNRELIABLE SPEED INDICATION - Memory Items.

ASSOCIATED PROCEDURES

F/CTL ALTN LAW (PROT LOST)

Refer to PRO-ABN-F_CTL F/CTL ALTN LAW - ANNUNCIATION

Continued on the following page

NAV ADR DISAGREE (Cont'd)

Ident.: PRO-ABN-NAV-U-00017131.0008001 / 09 APR 20

L12

STATUS	
MAX SPEED..... 320 KT <u>APPR PROC</u> FOR LDG.....FLAP LVR 3 <i>This line is replaced by "FOR LDG: FLAP LVR 3" when CONF 3 is selected, as a reminder.</i> GPWS LDG FLAP 3.....ON <i>This line is displayed when flaps are in CONF 3.</i> APPR SPD.....VREF + 10 KT LDG DIST PROC.....APPLY ALTN LAW: PROT LOST WHEN L/G DN: DIRECT LAW See ⁽¹⁾	<u>INOP SYS</u> F/CTL PROT STEEP APPR 
⁽¹⁾ <u>Note:</u> At landing gear extension, control reverts to direct law in pitch, as well as in roll (Refer to PRO-ABN-F_CTL F/CTL DIRECT LAW).	

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

NAV

NAV ADR DISAGREE

Applicable to: MSN 07784-07792

Ident.: PRO-ABN-NAV-U-00018110.0001001 / 21 MAR 16

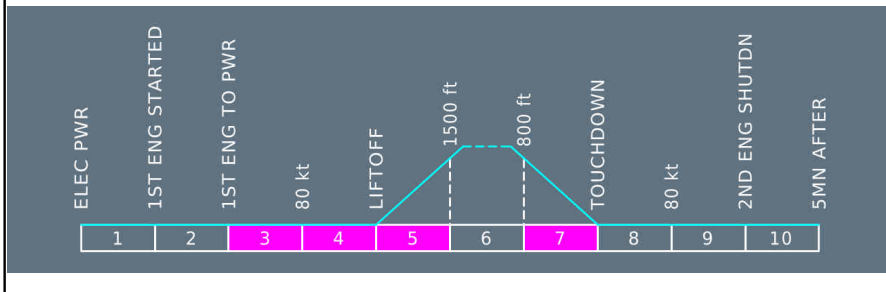
ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the following conditions occur:

- The ELAC rejected an ADR, or an ADR is faulty
- The speed or the Angle Of Attack (AOA) from the two remaining ADRs are different.

Flight Phase Inhibition:



Continued on the following page

NAV ADR DISAGREE (Cont'd)

Ident.: PRO-ABN-NAV-U-00017130.0005001 / 13 MAY 25

L2

 The alternate law activates, and protections are lost.

L1

 AIR SPD..... X CHECK

L2

 Check airspeed information on both PFDs, and on the standby airspeed indicator.

L1

■ **IF NO SPD DISAGREE:**

AOA DISCREPANCY

BKUP SPD/ALT..... DO NOT USE

■ **IF SPD DISAGREE:**

UNREL SPD PROC..... APPLY

To determine the faulty ADR, Refer to PRO-ABN-NAV UNRELIABLE SPEED INDICATION - Memory Items.

ASSOCIATED PROCEDURES

F/CTL ALTN LAW
(PROT LOST)

Refer to PRO-ABN-F_CTL F/CTL ALTN LAW - ANNUNCIATION

Continued on the following page

NAV ADR DISAGREE (Cont'd)

Ident.: PRO-ABN-NAV-U-00017131.0015001 / 18 NOV 21

L12

STATUS

INOP SYS

MAX SPEED..... 320 KT

● IF AOA DISAGREE:

BKUP SPD/ALT..... DO NOT USE

F/CTL PROT

APPR PROC

FOR LDG..... FLAP LVR 3

This line is replaced by "FOR LDG: FLAP LVR 3" when CONF 3 is selected, as a reminder.

GPWS LDG FLAP 3..... ON

This line is displayed when flaps are in CONF 3.

APPR SPD..... VREF + 10 KT

LDG DIST PROC..... APPLY

ALTN LAW: PROT LOST

WHEN L/G DN: DIRECT LAW

 See ⁽¹⁾

⁽¹⁾ Note: At landing gear extension, control reverts to direct law in pitch, as well as in roll (Refer to PRO-ABN-F_CTL F/CTL DIRECT LAW).

NAV ADS-B RPTG 1(2) FAULT

Applicable to: MSN 02155-03060, 05152-07792

Ident.: PRO-ABN-NAV-AL-00018118.0001001 / 21 MAR 16

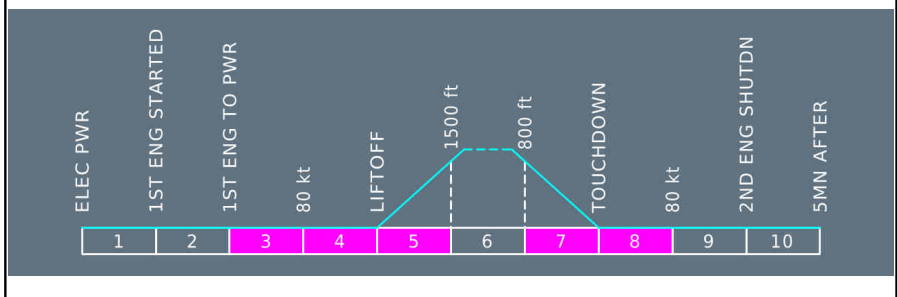
ANNUNCIATIONS

Triggering Conditions:

L2

The Automatic Dependent Surveillance-Broadcast (ADS-B) function is failed.

Flight Phase Inhibition:



Ident.: PRO-ABN-NAV-AL-00015758.0001001 / 08 AUG 14

ATC/XPDR.....SYS 2(1)

Ident.: PRO-ABN-NAV-AL-00015760.0001001 / 08 AUG 14

STATUS

INOP SYS

ADS-B RPTG 1(2)

NAV ALT DISCREPANCY

Applicable to: ALL

Ident.: PRO-ABN-NAV-BI-00024168.0001001 / 21 JAN 21

ANNUNCIATIONS

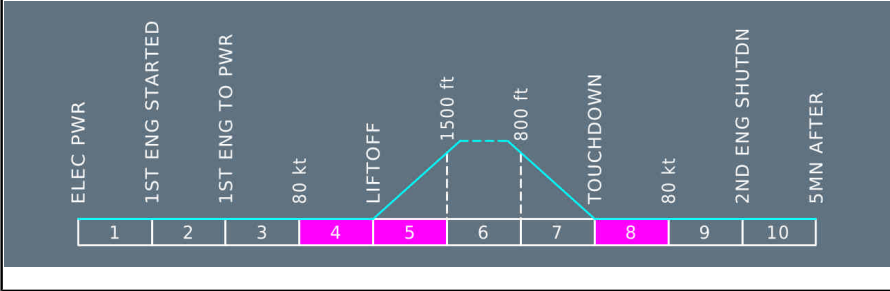
Triggering Conditions:

- L2

 This alert triggers when the difference between the altitude displayed on the CAPT and F/O PFDs is greater than:

 - 500 ft, if STD reference is selected
 - 250 ft, if QNH or QFE reference is selected.

Flight Phase Inhibition:



Ident.: PRO-ABN-NAV-BI-00024169.0001001 / 21 JAN 21

This alert is associated with **CHEK ALT** message on PFD.

ALT.....X CHECK

L2

 Crosscheck with the standby altimeter.

L1

 AIR DATA SWTG.....AS RQRD

L2

 Select ADR 3 to the faulty side.

NAV AOA DISAGREE

Applicable to: MSN 02155-05746

Ident.: PRO-ABN-NAV-BG-00023416.0001001 / 09 APR 20

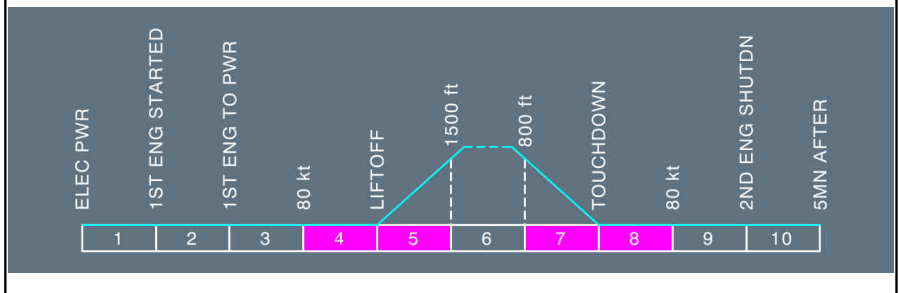
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when ELAC detected a discrepancy between the angles of attack.

Flight Phase Inhibition:



Ident.: PRO-ABN-NAV-BG-00023417.0001001 / 09 APR 20

Crew awareness.

PROCEDURES
ABNORMAL AND EMERGENCY PROCEDURES

NAV

NAV AOA DISAGREE

Applicable to: MSN 07784-07792

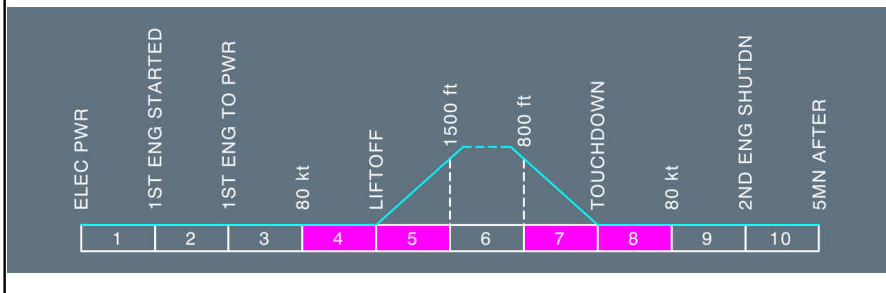
22Ident.: PRO-ABN-NAV-BG-00023416.0001001 / 09 APR 20

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when ELAC detected a discrepancy between the angles of attack.

Flight Phase Inhibition:



23Ident.: PRO-ABN-NAV-BG-00023417.0003001 / 09 APR 20

BKUP SPD/ALT..... DO NOT USE

24Ident.: PRO-ABN-NAV-BG-00023418.0001001 / 21 JAN 21

STATUS

INOP SYS

BKUP SPD

NAV CAPT(F/O)(STBY) AOA FAULT

Applicable to: ALL

Ident.: PRO-ABN-NAV-V-00018124.0001001 / 21 MAR 16

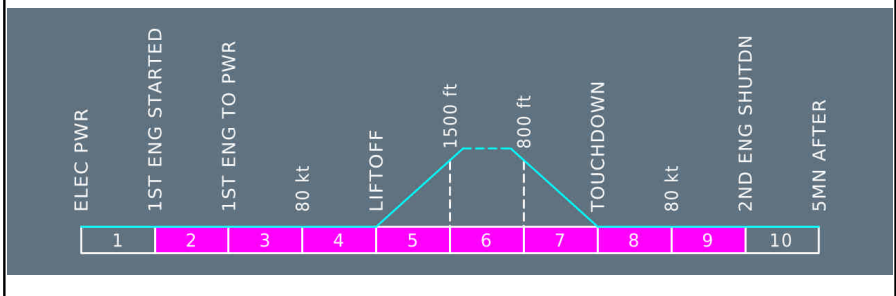
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the CAPT(F/O)(STBY) Angle Of Attack (AOA) sensor is failed.

Flight Phase Inhibition:



Ident.: PRO-ABN-NAV-V-00012458.0003001 / 25 FEB 14

Crew awareness.

Ident.: PRO-ABN-NAV-V-00012459.0003001 / 19 JUN 12

STATUS

INOP SYS

CAPT (F/O) (STBY)
 AOA

NAV ATC/XPDR 1(2) FAULT

Applicable to: MSN 02155-03060, 05152-07792

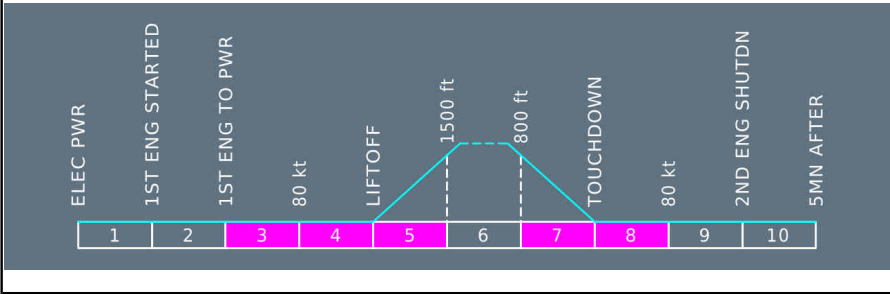
Ident.: PRO-ABN-NAV-Z-00018119.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the related transponder fails.

Flight Phase Inhibition:



Ident.: PRO-ABN-NAV-Z-00013539.0001001 / 18 JAN 17

ATC/XPDR.....SYS 2(1)

Note: In case of flight in RVSM airspace, select AP1 if SYS1 is used and AP2 if SYS2 is used.

Ident.: PRO-ABN-NAV-Z-00013541.0002001 / 08 AUG 14

STATUS

INOP SYS

ATC/XPDR 1(2)
 ADS-B RPTG 1(2)

NAV ATC/XPDR 1+2 FAULT

Applicable to: MSN 02155-03060, 05152-07792

Ident.: PRO-ABN-NAV-AA-00018120.0001001 / 21 MAR 16

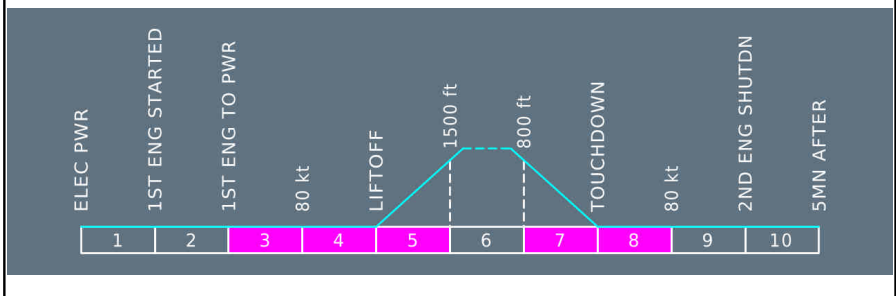
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when both transponders fail.

Flight Phase Inhibition:



Ident.: PRO-ABN-NAV-AA-00013542.0001001 / 25 FEB 14

Crew awareness.

Ident.: PRO-ABN-NAV-AA-00013543.0002001 / 08 AUG 14

STATUS

INOP SYS

TCAS
 ATC/XPDR 1
 ATC/XPDR 2
 ADS-B RPTG 1
 ADS-B RPTG 2

NAV ATC/XPDR STBY

Applicable to: MSN 02155-03060, 05152-07792

Ident.: PRO-ABN-NAV-AP-00018121.0001001 / 21 MAR 16

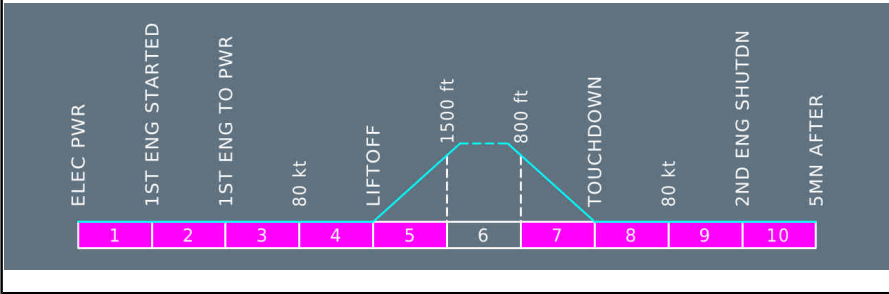
ANNUNCIATIONS

Triggering Conditions:

L2

 This alert triggers when the flight crew sets the ATC transponder on STBY in flight.

Flight Phase Inhibition:



Ident.: PRO-ABN-NAV-AP-00013545.0001001 / 25 FEB 14

Crew awareness.

NAV ATT DISCREPANCY

Applicable to: ALL

Ident.: PRO-ABN-NAV-AQ-00018122.0001001 / 21 MAR 16

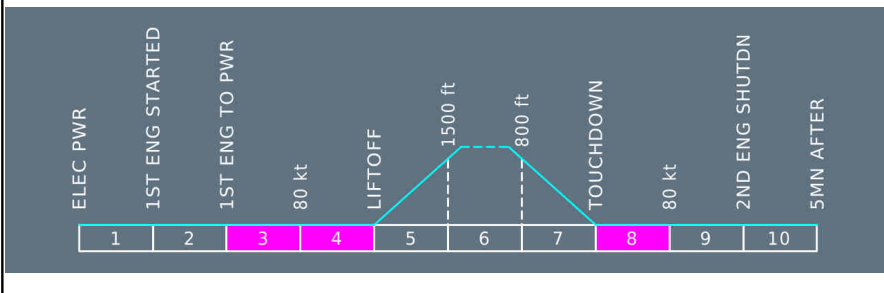
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the difference between the roll or pitch angle displayed on the CAPT and F/O PFDs is greater than 5 °.

Flight Phase Inhibition:



Ident.: PRO-ABN-NAV-AQ-00012410.0001001 / 19 AUG 10

ATT..... X CHECK

L2

Crosscheck with standby horizon.

L1

ATT HDG SWTG..... AS RQRD

L2

Select IR 3 (if available) to faulty side.

NAV BARO REF DISCREPANCY

Applicable to: ALL

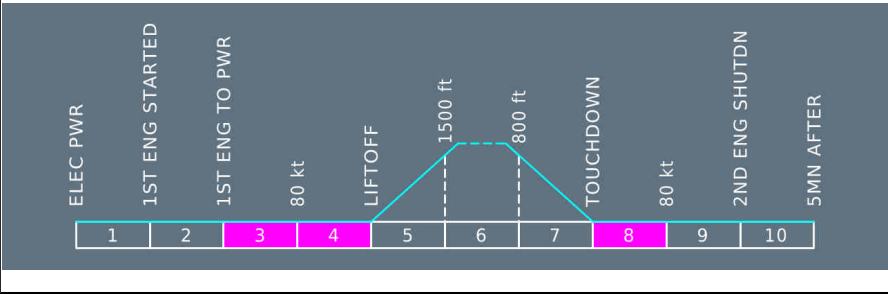
Ident.: PRO-ABN-NAV-AR-00018123.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the BARO reference is not the same on CAPT and F/O sides.

Flight Phase Inhibition:



Ident.: PRO-ABN-NAV-AR-00012413.0001001 / 16 NOV 11

BARO REF **X CHECK**

L2 Crosscheck the barometric reference selection, captain side versus first officer side.

NAV BARO VALUE DISAGREE

Applicable to: ALL

Ident.: PRO-ABN-NAV-BA-00022266.0001001 / 27 FEB 18

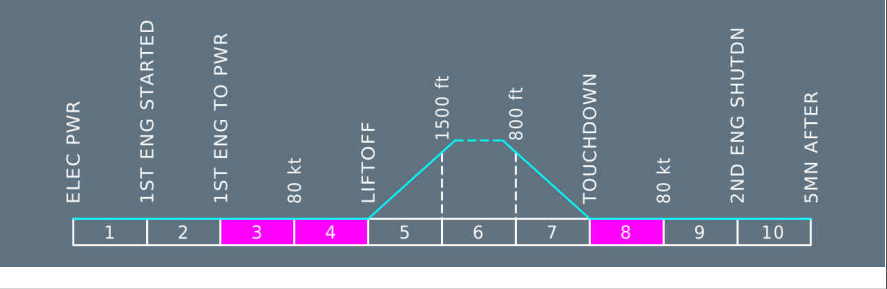
L2

ANNUNCIATIONS

Triggering Conditions:

This alert triggers when there is a difference between the barometer value selections on the FCU control panels.

Flight Phase Inhibition:



Ident.: PRO-ABN-NAV-BA-00022267.0001001 / 27 FEB 18

BARO REF VALUE.....X CHECK

NAV BKUP SPD/ALT ON CAPT(F/O) PFD

Applicable to: MSN 07784-07792

Ident.: PRO-ABN-NAV-AY-00020395.0001001 / 20 MAR 17

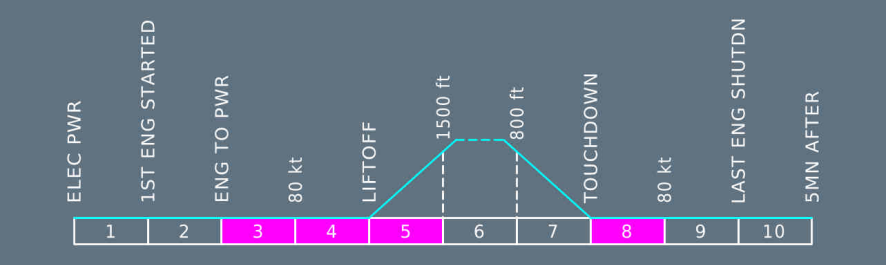
ANNUNCIATIONS

Triggering Conditions:

L2

 This alert triggers when the BKUP SPD/ALT is activated on the CAPT PFD or on the F/O PFD and the AP and/or FD of the same side is engaged.

Flight Phase Inhibition:



Ident.: PRO-ABN-NAV-AY-00020394.0001001 / 20 MAR 17

AP1(2).....DO NOT USE
 FD1(2).....DO NOT USE

NAV BKUP SPD/ALT ON CAPT+F/O PFD

Applicable to: MSN 07784-07792

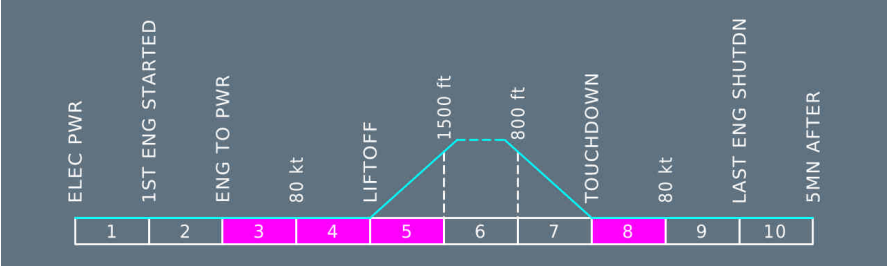
Ident.: PRO-ABN-NAV-AZ-00020396.0001001 / 20 MAR 17

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the BKUP SPD/ALT is activated on CAPT and F/O PFDs at the same time.

Flight Phase Inhibition:



Ident.: PRO-ABN-NAV-AZ-00020398.0003001 / 21 JAN 21

IF AIR DATA RELIABLE (AT LEAST ONE):
 RELIABLE AIR DATA.....USE

IF ALL AIR DATA UNREL:
 UNREL SPD PROC.....APPLY

NAV FM/GPS POS DISAGREE

Applicable to: ALL

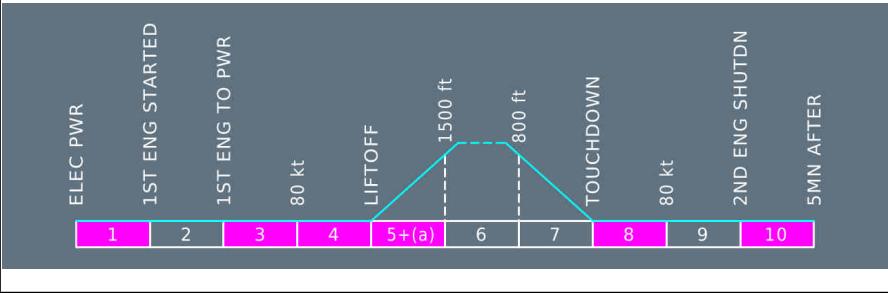
Ident.: PRO-ABN-NAV-AG-00017090.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

This alert triggers when the FM and GPS positions disagree.

Flight Phase Inhibition:



Note: (a) Alert inhibited only for the first 15 s in flight phase 5.

Ident.: PRO-ABN-NAV-AG-00017148.0001001 / 07 NOV 25

A/C POS.....CHECK

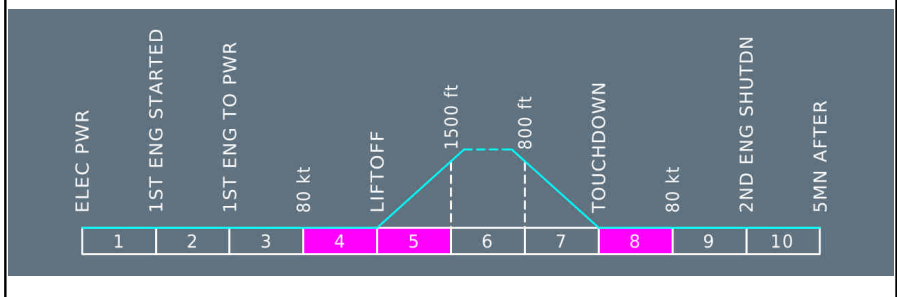
Use the FMS POSITION/MONITOR page. For the remainder of the flight, consider periodic NAV ACCURACY check.

NAV GPS 1(2) FAULT
Applicable to: ALL

Ident.: PRO-ABN-NAV-L-00018144.0001001 / 10 MAY 21

ANNUNCIATIONS
Triggering Conditions:
L2

This alert triggers when the GPS 1(2) is failed.

Flight Phase Inhibition:


Ident.: PRO-ABN-NAV-L-00017127.0001001 / 21 MAR 16

Crew awareness.

Ident.: PRO-ABN-NAV-L-00017128.0001001 / 21 MAR 16

STATUS

 ● If both GPS FAULT
 FLS  LIMITED TO F-APP + RAW

INOP SYS

GPS 1(2)

PROCEDURES
ABNORMAL AND EMERGENCY PROCEDURES

NAV

NAV GPWS FAULT

Applicable to: ALL

Ident.: PRO-ABN-NAV-N-00018129.0002001 / 21 MAR 16

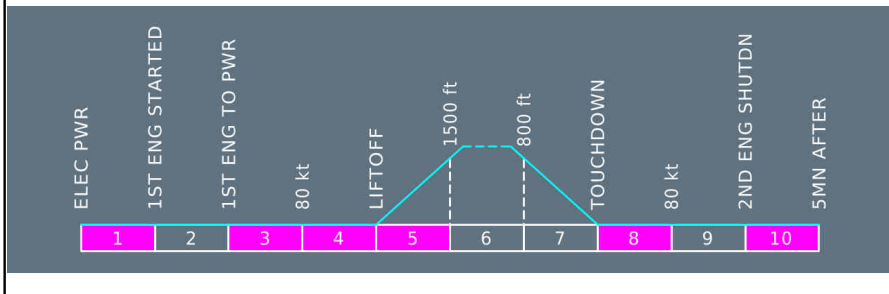
ANNUNCIATIONS

Triggering Conditions:

L2

This alerts triggers when the GPWS fails.

Flight Phase Inhibition:



Ident.: PRO-ABN-NAV-N-00012443.0001001 / 21 MAY 24

GPWS SYS..... **OFF**

L2

This line remains displayed, even after the GPWS SYS pb-sw has been switched OFF.

Ident.: PRO-ABN-NAV-N-00012444.0001001 / 19 AUG 10

STATUS

INOP SYS

GPWS

NAV GPWS TERR DET FAULT

Applicable to: ALL

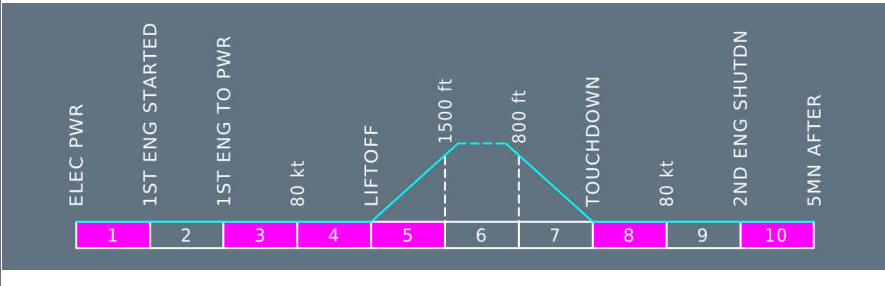
Ident.: PRO-ABN-NAV-AS-00018130.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

This alert triggers when the enhanced TCF and TAD modes of the EGPWS  or the predictive function of the GPWS (for aircraft equipped with T2CAS  or T3CAS ) are inoperative.

Flight Phase Inhibition:



Ident.: PRO-ABN-NAV-AS-00017542.0001001 / 21 MAR 16

GPWS TERR.....OFF

The basic GPWS mode 1 to mode 5 are still operative if SYS pb-sw lights FAULT or OFF are not illuminated.

Ident.: PRO-ABN-NAV-AS-00019752.0001001 / 01 JUN 16

STATUS

INOP SYS

GPWS TERR
 ROW/ROP 

NAV HDG DISCREPANCY

Applicable to: MSN 02155-03060

Ident.: PRO-ABN-NAV-AT-00018131.0001001 / 21 MAR 16

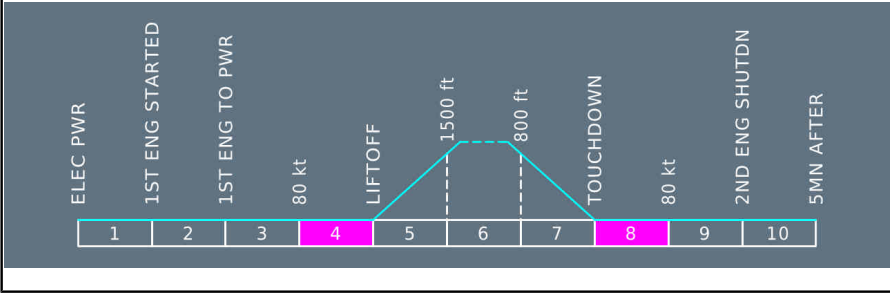
ANNUNCIATIONS

Triggering Conditions:

- L2

This alert triggers when the difference between the headings on the CAPT and F/O displays (PFD and ND) is greater than 5 °.

Flight Phase Inhibition:



Ident.: PRO-ABN-NAV-AT-00012409.0001001 / 19 AUG 10

HDG.....X CHECK

- L2

Compare the 3 IR headings on ADIRS CDU or crosscheck with standby compass.

L1

ATT HDG SWTG.....AS RQRD

- L2

Select IR 3 (if available) to faulty side.

NAV HDG DISCREPANCY

Applicable to: MSN 04392-07792

Ident.: PRO-ABN-NAV-AT-00018131.0001001 / 21 MAR 16

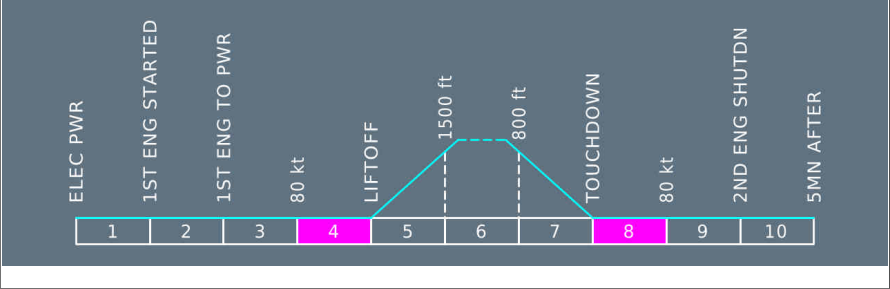
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the difference between the headings on the CAPT and F/O displays (PFD and ND) is greater than 5 °.

Flight Phase Inhibition:



Ident.: PRO-ABN-NAV-AT-00012409.0003001 / 19 AUG 10

HDG.....X CHECK

L2 Compare the 3 IR headings on MCDU or crosscheck with standby compass.

L1 ATT HDG SWTG.....AS RQRD

L2 Select IR 3 (if available) to faulty side.

NAV IAS DISCREPANCY

Applicable to: ALL

Ident.: PRO-ABN-NAV-W-00018146.0003001 / 21 MAR 16

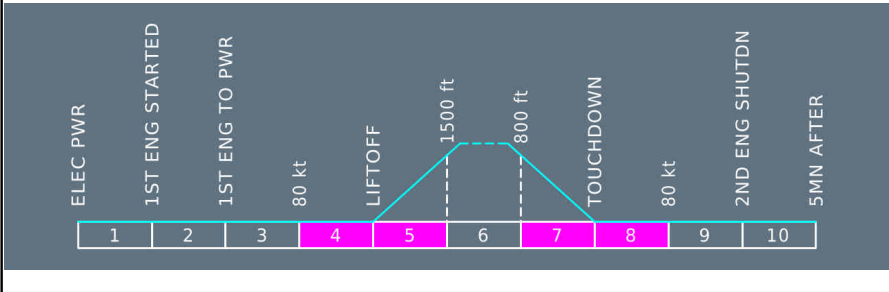
ANNUNCIATIONS

Triggering Conditions:

L2

 This alert triggers when the speed displayed on the CAPT and F/O PFDs are different.

Flight Phase Inhibition:



Ident.: PRO-ABN-NAV-W-00017528.0001001 / 21 MAR 16

AIR SPD.....X CHECK
 AIR DATA SWTG.....AS RQRD

Ident.: PRO-ABN-NAV-W-00017525.0001001 / 21 MAR 16

STATUS

INOP SYS

CAT 3 SINGLE ONLY

CAT 3 DUAL

NAV ILS 1(2)(1+2) FAULT

Applicable to: ALL

Ident.: PRO-ABN-NAV-M-00018138.0001001 / 21 MAR 16

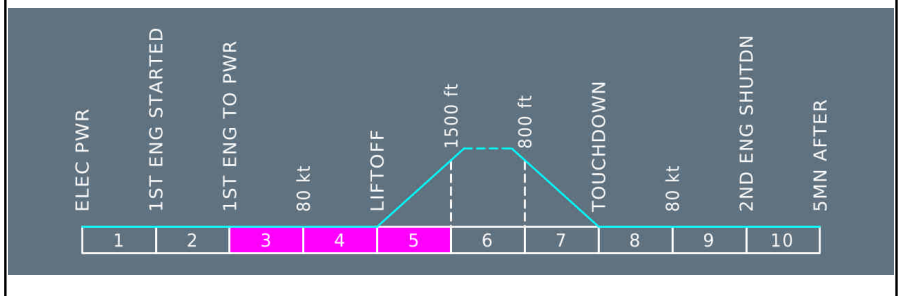
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the ILS 1(2)(1+2) is failed.

Flight Phase Inhibition:



Ident.: PRO-ABN-NAV-M-00017125.0001001 / 21 MAR 16

Crew awareness.

Ident.: PRO-ABN-NAV-M-00017126.0002001 / 21 MAR 16

STATUS

INOP SYS

ILS 1(2)(1+2)

CAT 2 ⁽¹⁾

GPWS ⁽²⁾

⁽¹⁾ (If ILS 1 FAULT or if ILS 2 FAULT)

⁽²⁾ (if ILS 1 FAULT on ground or if ILS 1+2 FAULT)

NAV IR 1(2)(3) FAULT

Applicable to: ALL

Ident.: PRO-ABN-NAV-D-00018140.0001001 / 21 MAR 16

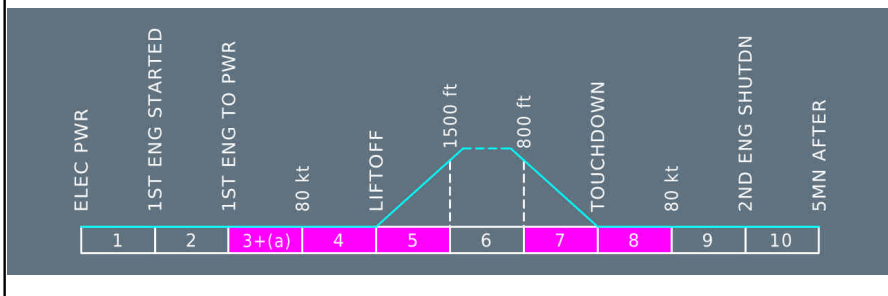
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the IR 1(2)(3) is failed.

Flight Phase Inhibition:



Note: (a) Alert not inhibited in flight phase 3 in the case of **NAV IR 3 FAULT** while the ADR 3 is in use.

Alert not inhibited in flight phase 3 in the case of **NAV IR 1(2) FAULT**.

Continued on the following page

NAV IR 1(2)(3) FAULT (Cont'd)

Ident.: PRO-ABN-NAV-D-00017521.0003001 / 21 MAR 16

- L2

Note: *In case of a simultaneous ADR and IR (same ADIRU) failure, apply the ADR FAULT procedure before the IR FAULT procedure.*
- L1

■ **IR 1 FAULT:**

ATT HDG SWTG..... CAPT 3

ATC/XPDR..... SYS 2

■ **IR 2 FAULT:**

ATT HDG SWTG..... F/O 3

ATC/XPDR..... SYS 1

■ **IR 3 FAULT:**

ATT HDG SWTG (IF IR 3 IN USE)..... NORM
- L2

This line is not displayed on the ECAM.

Ident.: PRO-ABN-NAV-D-00017123.0001001 / 18 NOV 21

L12

IR MAY BE AVAIL IN ATT

Refer to PRO-ABN-NAV [QRH] IR ALIGNMENT IN ATT MODE

CAT 3 SINGLE ONLY

STATUS

INOP SYS

IR 1(2)(3)

CAT 3 DUAL

GPWS TERR  ⁽¹⁾

ROW/ROP  ⁽¹⁾

TCAS ⁽¹⁾

See ⁽²⁾

⁽¹⁾ *(In case of an IR 1 fault)*

⁽²⁾ *In Case of an IR 1 fault, the TCAS may be inoperative (depending on the TCAS manufacturer). If the IR 1 is available in ATT mode, the TCAS can be recovered by entering the aircraft magnetic heading into the CDU, as per the IR ALIGNMENT IN ATT MODE procedure.*

NAV IR 1+2(1+3)(2+3) FAULT

Applicable to: ALL

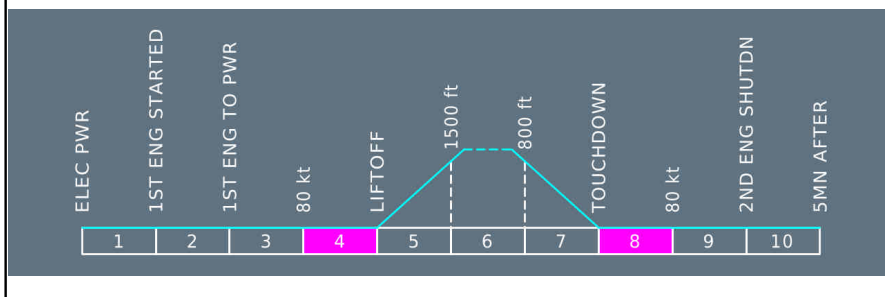
Ident.: PRO-ABN-NAV-E-00018139.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when IR 1+2(1+3)(2+3) are failed.

Flight Phase Inhibition:



Continued on the following page

NAV IR 1+2(1+3)(2+3) FAULT (Cont'd)

Ident.: PRO-ABN-NAV-E-00017111.0004001 / 13 MAY 25

Note: In the case of a simultaneous ADR and IR (same ADIRU) failure, apply the ADR FAULT procedure prior to the IR FAULT procedure.

■ If **NAV IR 1+2 FAULT:**

ATT HDG SWTG..... CAPT 3

L2 Set IR 3 (if available) on the CAPT side.
 Attitude information is lost on the FO PFD.

L1 ■ If **NAV IR 1+3(2+3) FAULT:**

ATT HDG SWTG..... NORM

L2 Attitude information is lost on one side (CAPT or FO).

L1

ASSOCIATED PROCEDURES

F/CTL ALTN LAW
(PROT LOST)

Refer to PRO-ABN-F_CTL F/CTL ALTN LAW - ANNUNCIATION

Continued on the following page

NAV IR 1+2(1+3)(2+3) FAULT (Cont'd)

Ident.: PRO-ABN-NAV-E-00016864.0011001 / 24 MAR 20

L12

STATUS

MAX SPEED..... 320 KT

APPR PROC

FOR LDG.....FLAP LVR 3

This line is replaced by “FOR LDG: FLAP LVR 3” when CONF 3 is selected, as a reminder.

GPWS LDG FLAP 3.....ON

This line is displayed when flaps are in CONF 3.

APPR SPD.....VREF + 10 KT

LDG DIST PROC.....APPLY

ALTN LAW : PROT LOST

WHEN L/G DN : DIRECT LAW

Note: At landing gear extension, control reverts to direct law, in pitch, as well as in roll (Refer to PRO-ABN-F_CTL F/CTL DIRECT LAW).

IR (AFFECTED) MAY BE AVAIL IN ATT

Refer to PRO-ABN-NAV [QRH] IR ALIGNMENT IN ATT MODE

 FLS  LIMITED TO F-APP + RAW

Note: If IR 1 fails, the TCAS may be inoperative (depending on the TCAS manufacturer). If IR 1 is available in ATT mode, the TCAS can be recovered by entering the aircraft magnetic heading into the CDU, as per IR ALIGNMENT IN ATT MODE procedure.

INOP SYS

F/CTL PROT
 IR 1+2(1+3)(2+3)
 AP 1+2
 A/THR
 YAW DAMPER 1 ⁽¹⁾
 YAW DAMPER 2 ⁽²⁾
 GPWS TERR  (If IR 1 fails)
 TCAS
 CAT 2
 GLS AUTOLAND 
 STEEP APPR 
 ROW/ROP 

⁽¹⁾ (If NAV IR 1+3 FAULT)
⁽²⁾ (If NAV IR 2+3 FAULT)

NAV IR DISAGREE

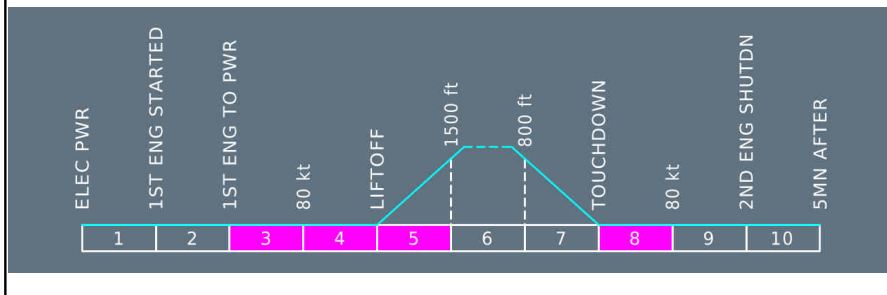
Applicable to: ALL

Ident.: PRO-ABN-NAV-G-00018147.0001001 / 21 MAR 16

ANNUNCIATIONS
Triggering Conditions:

L2

This alert triggers when one IR is failed, and the information received from the two remaining IRs is different.

Flight Phase Inhibition:


Continued on the following page

NAV IR DISAGREE (Cont'd)

Ident.: PRO-ABN-NAV-G-00016851.0001001 / 09 MAY 25

[L2] Direct law becomes active. All protections (pitch and roll) are lost.

[L1] **ATT**.....X CHECK

[L2] Use the standby horizon to determine the faulty IR.

[L1] ● **IF DISAGREE CONFIRMED:**
FAULTY IR..... OFF

- [L2]
- If the ADIRS Control Panel has the IR pb, turn off the faulty IR using the associated IR pb.
 - If the ADIRS Control Panel does not have the IR pb, set the ADIRS selector to OFF. This action will also switch off the associated ADR.

[L1] **ELAC 2**.....OFF THEN ON
ELAC 1.....OFF THEN ON

Note: When the ELAC 1 computer is reset on ground, the pitch trim returns to the ground setting position (0 °).
 After corrective action (faulty IR switched off and ELACs reset), pitch alternate law with reduced protections is recovered.

ASSOCIATED PROCEDURES

F/CTL ALTN LAW (PROT LOST)

Refer to PRO-ABN-F_CTL F/CTL ALTN LAW - ANNUNCIATION

- If disagree not confirmed (both IRs remain on):

ASSOCIATED PROCEDURES

F/CTL DIRECT LAW (PROT LOST)

Refer to PRO-ABN-F_CTL F/CTL DIRECT LAW - ANNUNCIATION

Continued on the following page

NAV IR DISAGREE (Cont'd)

Ident.: PRO-ABN-NAV-G-00016852.0007001 / 24 MAR 20

L12
STATUS

MAX SPEED..... 320 KT

APPR PROC

FOR LDG.....FLAP LVR 3

This line is replaced by “FOR LDG: FLAP LVR 3” when CONF 3 is selected, as a reminder.

GPWS LDG FLAP 3.....ON

This line is displayed when flaps are in CONF 3.

APPR SPD..... VREF + 10 KT

LDG DIST PROC..... APPLY

ALTN LAW: PROT LOST

WHEN L/G DN: DIRECT LAW

See ⁽¹⁾

INOP SYS

F/CTL PROT

STEEP APPR 

⁽¹⁾ Note: At landing gear extension, flight controls revert to direct law in pitch, as well as in roll (Refer to PRO-ABN-F_CTL F/CTL DIRECT LAW).

NAV IR NOT ALIGNED

Applicable to: ALL

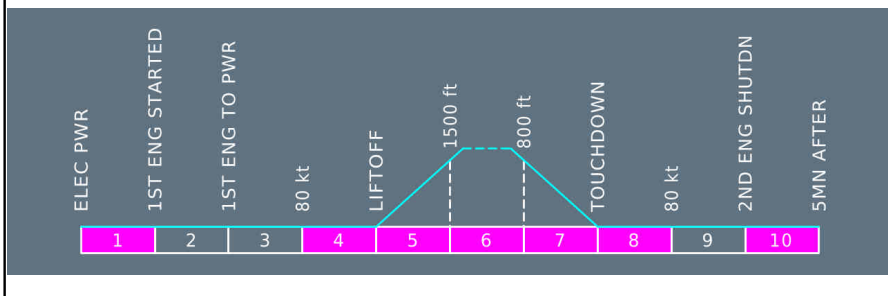
Ident.: PRO-ABN-NAV-AU-00018141.0002001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when there is a problem during IR alignment.

Flight Phase Inhibition:



Ident.: PRO-ABN-NAV-AU-00012570.0001001 / 19 AUG 10

L2 This caution is available in Phase 2 (after first engine start, until takeoff)

L1 **POSITION DISAGREE**
POSITION MISSING
PRESENT POS.....INSERT
EXCESS MOTION
IR 1 (2) (3) (1+2) (2+3) (1+2+3) IN ALIGN

NAV LS TUNING DISAGREE

Applicable to: MSN 02155-03060, 05152-07792

Ident.: PRO-ABN-NAV-AI-00018151.0001001 / 21 MAR 16

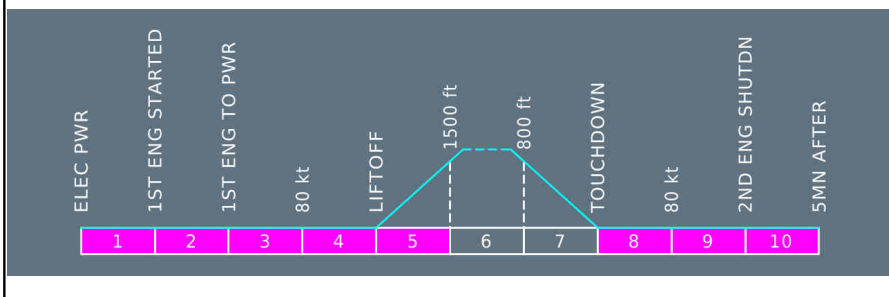
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the tuning of MMR 1 and MMR 2 are different.

Flight Phase Inhibition:



Ident.: PRO-ABN-NAV-AI-00018932.0004001 / 21 MAR 16

Crew awareness.

L2

When the alert is triggered, the AP/FD:

- Inhibits APPR mode arming, or
- Disarms the APPR mode if already armed, or
- Reverts to basic AP/FD modes if APPR mode already engaged.

Ident.: PRO-ABN-NAV-AI-00014337.0001001 / 29 MAR 12

STATUS

INOP SYS

CAT 2

NAV PRED W/S DET FAULT ⚠️

Applicable to: ALL

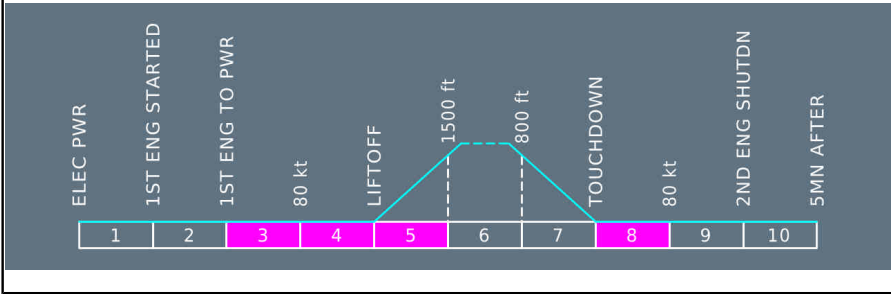
Ident.: PRO-ABN-NAV-F-00018855.0002001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the predictive function is lost.

Flight Phase Inhibition:



Ident.: PRO-ABN-NAV-F-00018853.0001001 / 21 MAR 16

Crew awareness.

Ident.: PRO-ABN-NAV-F-00018854.0001001 / 21 MAR 16

STATUS

INOP SYS

PRED W/S DET

NAV RA 1 AND 2 FAULT (DUAL RA FAILURE)

Applicable to: ALL

Ident.: PRO-ABN-NAV-J-00018403.0001001 / 21 MAR 16

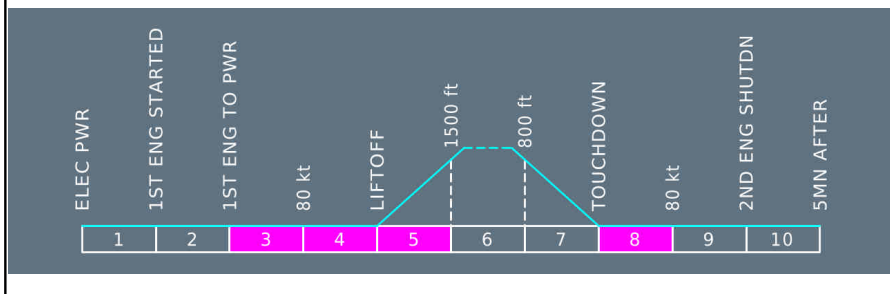
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when both RAs are failed.

Flight Phase Inhibition:



Ident.: PRO-ABN-NAV-J-00012432.0001001 / 25 FEB 14

Crew awareness.

Continued on the following page

NAV RA 1 AND 2 FAULT (Cont'd)

(DUAL RA FAILURE)

Ident.: PRO-ABN-NAV-J-00016850.0007001 / 13 MAY 25

L12

STATUS

INOP SYS

APPR PROC

FOR LDG.....FLAP LVR 3

*This line is replaced by “FOR LDG: FLAP LVR 3” when
 CONF 3 is selected, as a reminder.*

 GPWS LDG FLAP 3.....ON
 APPR SPD.....VREF+10 KT
 LDG DIST PROC.....APPLY

WHEN L/G DN : DIRECT LAW

 See ⁽¹⁾

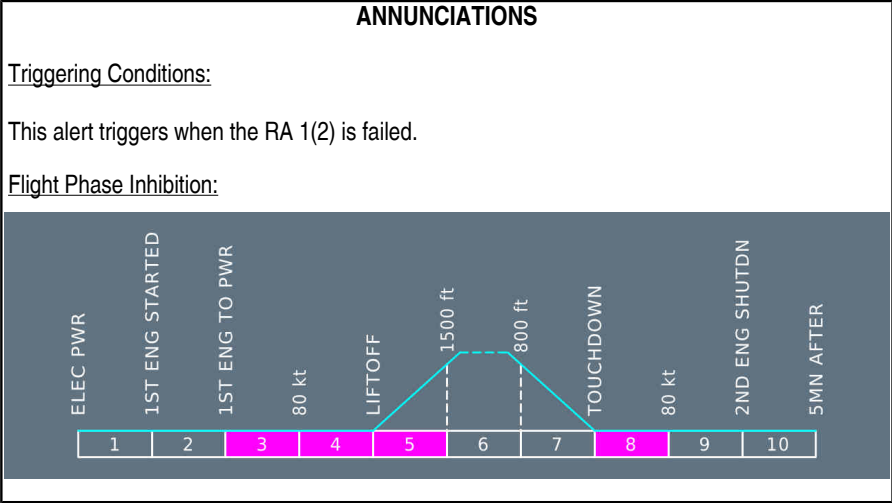
 RA 1+2
 A/CALL OUT
 GPWS
 CAT 2
 GLS AUTOLAND 
 REAC W/S DET
 TCAS
 ROW/ROP 

- ⁽¹⁾
- Note:
1. At landing gear extension, flight controls revert to direct law in both pitch and roll
 (Refer to PRO-ABN-F_CTL F/CTL DIRECT LAW).
 2. LOC*, LOC, F-LOC* , and F-LOC  modes are available via the LOC pb. G/S*,
 G/S, F-G/S* , and F-G/S  modes are not available.

NAV RA 1(2) FAULT

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

Ident.: PRO-ABN-NAV-I-00018135.0001001 / 21 MAR 16



Ident.: PRO-ABN-NAV-I-00012430.0001001 / 25 FEB 14

Crew awareness.

Ident.: PRO-ABN-NAV-I-00016849.0001001 / 06 NOV 25

33

CAT 2 ONLY

STATUS

INOP SYS

STEEP APPR ⚠
RA 1(2)
CAT 3
GPWS (If RA 1 fault)

NAV RA 1(2) FAULT

Applicable to: MSN 02926-02944, 04392, 07784-07792

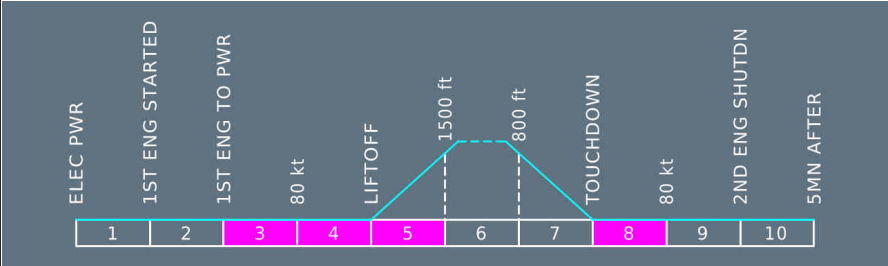
Ident.: PRO-ABN-NAV-I-00018135.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the RA 1(2) is failed.

Flight Phase Inhibition:



The chart shows the inhibition of the RA 1(2) alert across 10 flight phases. The alert is inhibited (pink background) during phases 3, 4, 5, 7, and 8. The alert is active (grey background) during phases 1, 2, 6, 9, and 10. Key events marked on the timeline include: ELEC PWR (Phase 1), 1ST ENG STARTED (Phase 2), 1ST ENG TO PWR (Phase 3), 80 kt (between Phase 3 and 4), LIFTOFF (Phase 4), 1500 ft (between Phase 4 and 5), 800 ft (between Phase 5 and 6), TOUCHDOWN (Phase 7), 80 kt (between Phase 7 and 8), 2ND ENG SHUTDN (Phase 9), and 5MN AFTER (Phase 10).

Ident.: PRO-ABN-NAV-I-00012430.0001001 / 25 FEB 14

Crew awareness.

Ident.: PRO-ABN-NAV-I-00016849.0002001 / 06 NOV 25

STATUS

CAT 2 ONLY

INOP SYS

STEEP APPR 

RA 1(2)

CAT 3

NAV RA DEGRADED

Applicable to: ALL

Ident.: PRO-ABN-NAV-AV-00018134.0001001 / 21 MAR 16

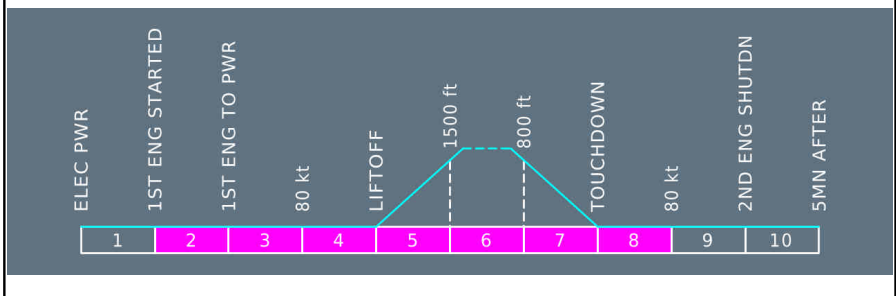
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the height that RA 1 and RA 2 provide are significantly different.

Flight Phase Inhibition:



Ident.: PRO-ABN-NAV-AV-00018933.0001001 / 21 MAR 16

Crew awareness.

NAV TCAS FAULT

Applicable to: ALL

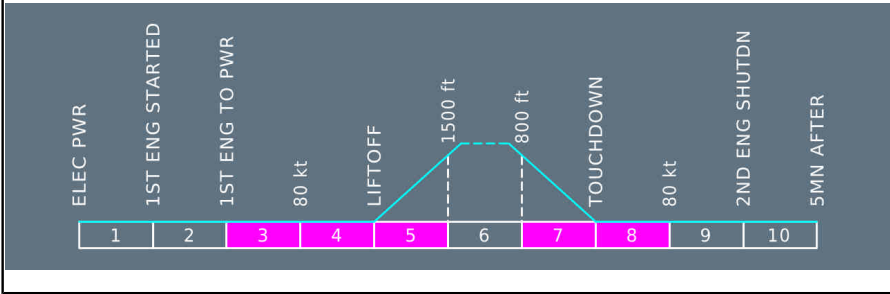
Ident.: PRO-ABN-NAV-K-00018397.0002001 / 16 MAY 24

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when there is an internal failure of the TCAS.

Flight Phase Inhibition:



Ident.: PRO-ABN-NAV-K-00012434.0001001 / 16 MAY 24

Crew awareness.

Ident.: PRO-ABN-NAV-K-00012435.0001001 / 16 MAY 24

STATUS

INOP SYS

TCAS

NAV TCAS STBY

Applicable to: ALL

Ident.: PRO-ABN-NAV-AW-00018133.0001001 / 21 MAR 16

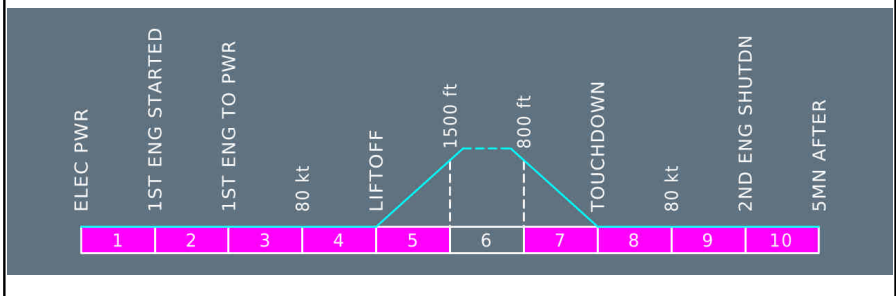
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the flight crew sets the TCAS on STBY in flight.

Flight Phase Inhibition:



Ident.: PRO-ABN-NAV-AW-00018847.0001001 / 21 MAR 16

Crew awareness.

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

NAV

NAV L(R) CAPT(F/O) STATIC FAULT

Applicable to: MSN 05746-07792

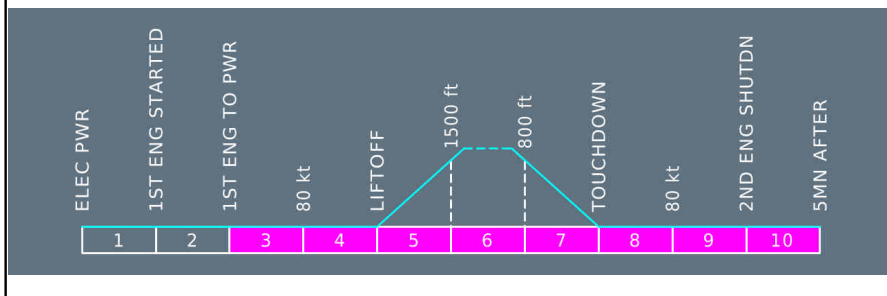
Ident.: PRO-ABN-NAV-AJ-00018132.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the left(right) CAPT(F/O) static pressure probe is lost.

Flight Phase Inhibition:



Ident.: PRO-ABN-NAV-AJ-00015067.0001001 / 08 AUG 13

IAS/ALTI MAY BE UNREL

Ident.: PRO-ABN-NAV-AJ-00015068.0001001 / 08 AUG 13

STATUS

INOP SYS

 CAPT(F/O) (R)(L) STAT
 CAPT PROBES ⁽¹⁾
 F/O PROBES ⁽²⁾

- ⁽¹⁾ ((If the CAPT AOA and STAT are failed, and the heating systems of the CAPT PITOT and TAT are lost), or (If all the heating systems of the CAPT PROBES are lost))
- ⁽²⁾ ((If the F/O AOA and STAT are failed, and the heating systems of the F/O PITOT and TAT are lost), or (If all the heating systems of the F/O PROBES are lost))

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES ABNORMAL AND EMERGENCY PROCEDURES NAV
STALL WARNING	
Ident.: PRO-ABN-NAV-00013994.0002001 / 21 MAR 17 Applicable to: ALL When the threshold is reached, permanent aural and visual alerts (“STALL, STALL” synthetic voice then cricket, "STALL STALL" red message on PFD) are triggered until a correct angle-of-attack is recovered (<i>Refer to PRO-ABN-MISC [MEM] Stall Recovery</i>).	

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

NAV

Intentionally left blank

OVERSPEED

Applicable to: ALL

Ident.: PRO-ABN-OVERSPEED-AX-00018108.0001001 / 20 APR 17

ANNUNCIATIONS

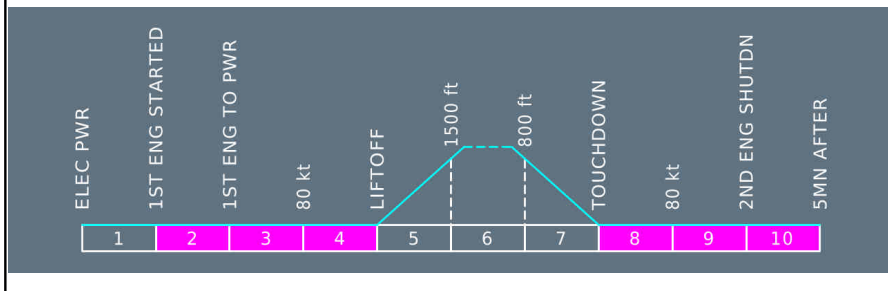
Triggering Conditions:

L2

This alert triggers when:

- The aircraft speed/mach is greater than VMO + 4 kt/MMO + 0.006, or
- The aircraft speed is greater than VLE + 4 kt, with L/G not unlocked or L/G doors not closed, or
- The aircraft speed is greater than VFE + 4 kt, with slats and/or flaps extended.

Flight Phase Inhibition:



Ident.: PRO-ABN-OVERSPEED-AX-00016848.0001001 / 21 MAR 16

VMO/MMO..... 350/.82

L2 (235/0.60 in case of dispatch with landing gear down).

L1 VLE..... 280/.67

VFE.....SEE BELOW

CONF	VFE
FULL	177
3	185
2	200
1+F	215
1	230

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

OVERSPEED

Intentionally left blank

RECORDER CVR FAULT

Applicable to: MSN 07784-07792

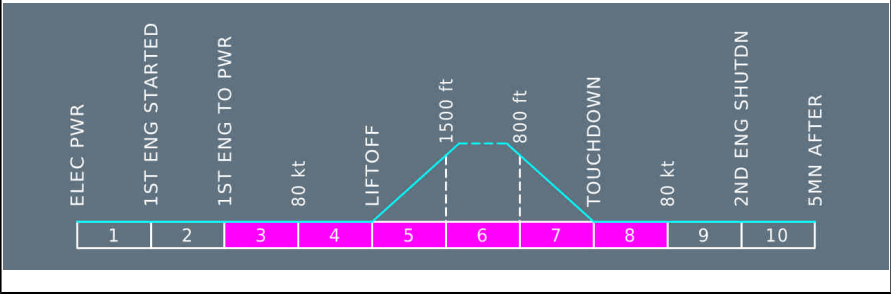
Ident.: PRO-ABN-RECORDER-C-00017318.0002001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the CVR is failed.

Flight Phase Inhibition:



Ident.: PRO-ABN-RECORDER-C-00013630.0002001 / 25 FEB 14

Crew awareness.

Ident.: PRO-ABN-RECORDER-C-00013631.0002001 / 29 MAR 12

STATUS

INOP SYS

CVR

RECORDER DFDR FAULT

Applicable to: ALL

Ident.: PRO-ABN-RECORDER-A-00017312.0001001 / 21 MAR 16

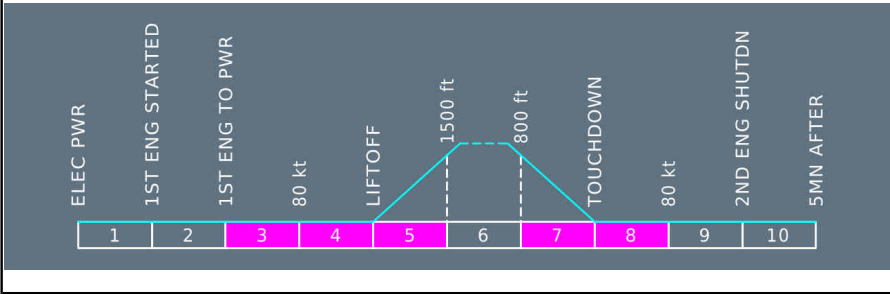
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the DFDR is failed.

Flight Phase Inhibition:



Ident.: PRO-ABN-RECORDER-A-00010046.0001001 / 10 AUG 10

Crew awareness.

Ident.: PRO-ABN-RECORDER-A-00010047.0001001 / 10 AUG 10

STATUS

INOP SYS

DFDR

RECORDER SYS FAULT

Applicable to: ALL

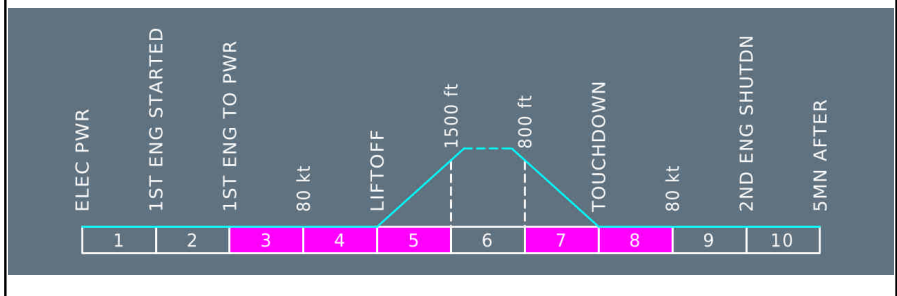
Ident.: PRO-ABN-RECORDER-B-00017313.0002001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the FDIU is failed.

Flight Phase Inhibition:


Ident.: PRO-ABN-RECORDER-B-00010048.0002001 / 10 AUG 10

Crew awareness.

Ident.: PRO-ABN-RECORDER-B-00010049.0002001 / 10 AUG 10

STATUS

INOP SYS

RECORDER SYS

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

RECORDER

Intentionally left blank

SEVERE ICE DETECTED

Applicable to: MSN 02719-02789, 03031-04392

Ident.: PRO-ABN-SEVERE_ICE-AB-00017188.0001001 / 21 MAR 16

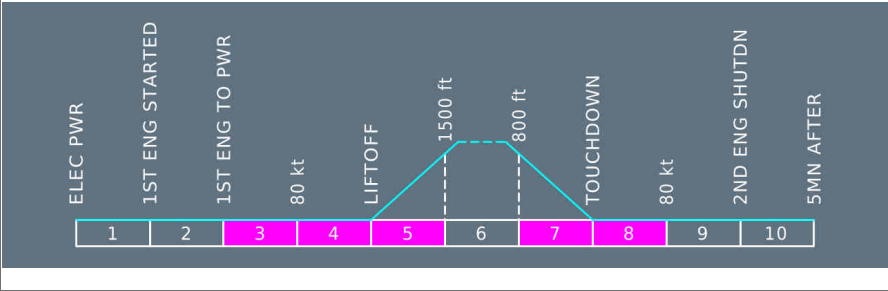
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when heavy ice is detected in flight above 1 500 ft (with TAT<10 °C) and the WING ANTI ICE pb-sw is set to OFF.

Flight Phase Inhibition:



Ident.: PRO-ABN-SEVERE_ICE-AB-00018892.0003001 / 04 JUN 19

WING ANTI ICE.....ON
 ENG MODE SEL.....IGN

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

SEVERE ICE

Intentionally left blank

[QRH] SMOKE / FUMES / AVNCS SMOKE

Applicable to: MSN 02155-02789, 03031-04392

Ident.: PRO-ABN-SMOKE-D-00012212.0004001 / 15 NOV 21

This procedure includes all the steps of the **AVIONICS SMOKE** procedure.

Apply this procedure when:

- The flight (cabin) crew suspect that smoke/fumes are coming from any of the following:
 - The avionics
 - The air conditioning
 - The cabin equipment
- The **AVIONICS SMOKE** alert is triggered.
- There is a smell of smoke/fumes in the cockpit:
 - If the smell is similar to that of orange peels, suspect a toxic leak of rain repellent fluid.
 - If the smell is similar to that of pine needles, suspect a non-toxic leak.

If any other ECAM SMOKE alert triggers (CARGO, ...), the crew must first apply the ECAM procedure, then consider applying this procedure.

Note that these ECAM alerts may be caused by another source, that should usually first be detected by the flight crew/cabin crew/avionics smoke detectors.

The following explains the layout of this procedure:

- The procedure lines above the boxed items indicate the actions that the flight crew must immediately perform, if smoke/fumes are detected (with or without ECAM activation and regardless of the smoke/fumes source). These immediate actions correspond to the most common steps to be taken in smoke/fumes cases. In all cases, the flight crew must also be prepared to immediately perform a diversion. However, this diversion may be avoided if the smoke/fumes source is obvious, accessible and extinguishable or confirmed isolated (after completion of the immediate actions).
- The boxed items indicate the actions that the flight crew must consider, if at any time during the remainder of the procedure but always after the initial steps:
 - Smoke/fumes become the greatest threat and removal of smoke/fumes is required, and/or
 - The situation becomes critical and can no longer be controlled.
- The procedure lines below the boxed items indicate the actions that the flight crew must perform, as soon as they suspect a source of smoke/fumes. The actions will depend on whether the smoke/fumes are coming from the avionics, and/or air conditioning, and/or cabin equipment.

LAND ASAP

IF PERCEPTIBLE SMOKE/FUMES APPLY IMMEDIATELY:

If smoke/fumes are confirmed, the following procedure must be applied.

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

SMOKE

[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)

OXY MASK / GOGGLE (if required).....USE/100%/EMERG

Ensure crew communication is established. Avoid continuous use of the interphone to minimize interference from the oxygen mask breathing noise.

Turn the emergency knob to remove condensation or smoke/fumes from the mask.

VENTILATION BLOWER.....OVRD

VENTILATION EXTRACT.....OVRD

Avionics ventilation air is extracted overboard.

CAB FANS.....OFF

To prevent smoke/fumes from entering the cockpit and cabin.

GALY & CAB.....OFF

SIGNS.....ON

CKPT / CABIN COM.....ESTABLISH

Communication must be established with the cabin crew in order to follow up on the smoke/fumes origin and dissipation.

● **If smoke/fumes source immediately obvious, accessible, and extinguishable:**

FAULTY EQPT.....ISOLATE

● **If smoke/fumes source not immediately isolated:**

DIVERSION.....INITIATE

DESCENT TO FL 100 / MEA-MORA.....INITIATE

● **At ANY TIME of the procedure, if smoke/fumes become the GREATEST THREAT:**

REMOVAL OF SMOKE / FUMES.....CONSIDER

Refer to PRO-ABN-SMOKE [QRH] REMOVAL OF SMOKE / FUMES

ELEC EMER CONFIG.....CONSIDER

Refer to PRO-ABN-SMOKE [QRH] SMOKE / FUMES / AVNCS SMOKE - ELEC EMER CONFIG

● **At ANY TIME of the procedure, if situation becomes UNMANAGEABLE:**

IMMEDIATE LANDING.....CONSIDER

Depending on the situation, the Captain can consider an overweight landing, a tailwind landing, a ditching, a forced landing, etc.

L2

Continued on the following page

[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)

L1 Guidelines to determine smoke/fumes source:

- If smoke/fumes initially come out of the ventilation outlets, the crew may suspect AIR COND SMOKE. In addition, very shortly thereafter, several **SMOKE** alerts (cargo, lavatory, avionics) will be triggered. The displayed ECAM procedures must be applied.
- After an ENG or APU failure, smoke/fumes may come from the faulty item via the bleed system and be perceived in the cockpit and/or cabin. In such a case, it will be recirculated throughout the aircraft, until it completely disappears from the air conditioning system.
- If only the **AVIONICS SMOKE** alert is triggered, the crew may suspect avionics smoke.
- If smoke/fumes are detected while an equipment is declared faulty, the crew may suspect that smoke/fumes are coming from this equipment.
- Avionics or forward galley smoke/fumes may be smelt, or may enter in the cockpit before ECAM alert activation.

Continued on the following page

PROCEDURES
ABNORMAL AND EMERGENCY PROCEDURES
SMOKE
[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)

Ident.: PRO-ABN-SMOKE-D-00012214.0007001 / 15 NOV 21

● If AIR COND smoke/fumes suspected:

 APU BLEED..... OFF
 VENTILATION BLOWER and EXTRACT..... AUTO

Note: When both VENTILATION BLOWER and VENTILATION EXTRACT are in the OVRD position, a single pack may not be able to maintain the cabin pressure.

CARGO AFT ISOL VALVE..... OFF

To prevent a cargo smoke/fumes warning from being triggered due to cabin smoke/fumes.

PACK 1..... OFF

● If smoke/fumes continue:

 PACK 1..... ON
 PACK 2..... OFF

● If smoke/fumes persist:

PACK 2..... ON

Restore normal configuration if PACK 2 is not suspected to cause smoke/fumes.

VENTILATION BLOWER..... OVRD

VENTILATION EXTRACT..... OVRD

REMOVAL OF SMOKE / FUMES..... CONSIDER

Refer to PRO-ABN-SMOKE [QRH] REMOVAL OF SMOKE / FUMES

● If CABIN EQPT smoke/fumes suspected:
● If smoke/fumes continue:

 EMER EXIT LIGHT..... ON
 COMMERCIAL..... OFF
 SMOKE / FUMES DISSIPATION..... CHECK
 FAULTY EQPT..... SEARCH / ISOLATE

Once the cabin has been secured, try to find the smoke/fumes source and isolate it.

Cabin lights, reading lights, passenger systems, galleys have dedicated control C/B in the cabin or cockpit.

● If smoke/fumes persist or if faulty equipment confirmed isolated:

COMMERCIAL..... NORM

REMOVAL OF SMOKE / FUMES..... CONSIDER

Refer to PRO-ABN-SMOKE [QRH] REMOVAL OF SMOKE / FUMES

Continued on the following page

[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)	
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Ident.: PRO-ABN-SMOKE-D-00012215.0001001 / 15 NOV 21
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- **If smoke/fumes source cannot be determined and persist or AVNCS / ELECTRICAL smoke/fumes suspected:**
 ELEC EMER CONFIG..... CONSIDER
Refer to the end of the procedure to set ELEC EMER CONFIG.
- **If smoke/fumes disappear within 5 min:**
 NORMAL VENTILATION..... RESTORE

Continued on the following page

[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)

Ident.: PRO-ABN-SMOKE-D-00012565.0019001 / 17 MAR 17

TO SET ELEC EMER CONFIG

EMER ELEC GEN 1 LINE..... OFF

GEN 1 LINE contactor opens. GEN 1 remains running and supplies one fuel pump in each wing tank. AC BUS 1 is supplied by GEN 2 through the bus tie contactor.

EMER ELEC PWR.....MAN ON

RAT is extended and the EMER GEN is connected to the aircraft network. Check emergency generator parameters on the ELEC SD page (displayed automatically).

● **When EMER GEN AVAIL:**

APU GEN..... OFF

GEN 2..... OFF

ELEC EMER CONFIG

Two different procedures can be displayed on the ECAM, depending on whether the AVIONICS SMOKE ECAM caution is triggered or not before the flight crew sets the electrical emergency configuration.

■ **If AVIONICS SMOKE not triggered:**

APPLY ELEC EMER CONFIG PROCEDURE, BUT DO NOT RESET GEN, EVEN IF REQUESTED BY ECAM

● **At 3 min or 2 000 ft AAL before landing:**

Restore all generators only 3 min before landing or at 2 000 ft AAL to recover normal braking, while minimizing possible reactivation of a smoke source.

GEN 2..... ON

EMER ELEC GEN 1 LINE..... ON

● **When aircraft stopped:**

ALL GENs..... OFF

■ **If AVIONICS SMOKE triggered:**

The ECAM displays a specific ELEC EMER CONFIG procedure. The flight crew must apply the following ECAM procedure.

MIN RAT SPEED..... 140 KT

Note: *The electrical configuration is the same as for loss of both generators (except that one fuel pump in each wing tank remains supplied).*

Continued on the following page

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES ABNORMAL AND EMERGENCY PROCEDURES SMOKE
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[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)	
	VHF 1 / HF 1 / ATC 1..... USE Only VHF 1, HF 1 and ATC 1 are supplied in this configuration. Notify the ATC of the nature of the emergency, and state intentions. If there is no contact with the ATC, switch to code A7700, or transmit a distress message on one of the emergency frequencies. FAC 1..... OFF THEN ON Rudder trim is recovered, despite the fact that no indication is available. ● At 3 min or 2 000 ft AAL before landing: Restore all generators only 3 min before landing or at 2 000 ft AAL to recover normal braking, while minimizing possible reactivation of a smoke source. GEN 2..... ON EMER ELEC GEN 1 LINE..... ON F/CTL ALTN LAW (PROT LOST) Flight control normal laws and associated protections are lost. Only the load factor limitation, and the high and low speed stability remain (ALTN law with reduced protection). MAX SPEED.....320 KT

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

SMOKE

[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)

Ident.: PRO-ABN-SMOKE-D-00012217.0057001 / 15 MAY 25

ECAM lower display is not available. STATUS SD page is displayed on the upper ECAM display, as long as the STATUS pb is pressed.

L12

STATUS

MIN RAT SPEED..... 140 KT
 MAX SPEED..... 320 KT
 MAX BRK PR..... 1000 PSI

FOR LDG..... FLAP LVR 3
 GPWS LDG FLAP 3..... ON
 APPR SPD..... VREF +10 KT
 LDG DIST PROC..... APPLY

ENG 1+2 APPR IDLE ONLY
 ENG 1+2 N1 DEGRADED MODE
 (IAE-powered aircraft)

ALTN LAW: PROT LOST
 WHEN L/G DN: DIRECT LAW
 CTR TK FUEL UNUSABLE
 FUEL CONSUMPT INCRSD

This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.

FMS PRED UNRELIABLE

Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.

SLATS/FLAPS SLOW

- After recovery of normal electrical supply, the following STATUS will be displayed:

MAX SPEED..... 320 KT
 APPR SPD..... VREF +10 KT
 LDG DIST PROC..... APPLY

INOP SYS

*Refer to PRO-ABN-ELEC-[QRH]
 ELEC EMER CONFIG SYS
 REMAINING.*

Continued on the following page

[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)

APPR PROC

● **3 MN/2000 FT BEFORE LDG:**

GEN 2..... ON

EMER ELEC GEN 1 LINE..... ON

● **WHEN A/C IS STOPPED:**

ALL GEN..... OFF

ALTN LAW: PROT LOST

See ⁽¹⁾

WHEN L/G DN: DIRECT LAW

See ⁽²⁾

⁽¹⁾ *Flight controls remain in alternate law, due to the loss of IR 2 and 3.*

⁽²⁾ *At landing gear extension, control reverts to direct law in pitch, as well as in roll (Refer to PRO-ABN-F_CTL F/CTL DIRECT LAW).*

[QRH] SMOKE / FUMES / AVNCS SMOKE

Applicable to: MSN 02926-02944

Ident.: PRO-ABN-SMOKE-D-00012212.0004001 / 15 NOV 21

This procedure includes all the steps of the **AVIONICS SMOKE** procedure.

Apply this procedure when:

- The flight (cabin) crew suspect that smoke/fumes are coming from any of the following:
 - The avionics
 - The air conditioning
 - The cabin equipment
- The **AVIONICS SMOKE** alert is triggered.
- There is a smell of smoke/fumes in the cockpit:
 - If the smell is similar to that of orange peels, suspect a toxic leak of rain repellent fluid.
 - If the smell is similar to that of pine needles, suspect a non-toxic leak.

If any other ECAM SMOKE alert triggers (CARGO, ...), the crew must first apply the ECAM procedure, then consider applying this procedure.

Note that these ECAM alerts may be caused by another source, that should usually first be detected by the flight crew/cabin crew/avionics smoke detectors.

The following explains the layout of this procedure:

- The procedure lines above the boxed items indicate the actions that the flight crew must immediately perform, if smoke/fumes are detected (with or without ECAM activation and regardless of the smoke/fumes source). These immediate actions correspond to the most common steps to be taken in smoke/fumes cases. In all cases, the flight crew must also be prepared to immediately perform a diversion. However, this diversion may be avoided if the smoke/fumes source is obvious, accessible and extinguishable or confirmed isolated (after completion of the immediate actions).
- The boxed items indicate the actions that the flight crew must consider, if at any time during the remainder of the procedure but always after the initial steps:
 - Smoke/fumes become the greatest threat and removal of smoke/fumes is required, and/or
 - The situation becomes critical and can no longer be controlled.
- The procedure lines below the boxed items indicate the actions that the flight crew must perform, as soon as they suspect a source of smoke/fumes. The actions will depend on whether the smoke/fumes are coming from the avionics, and/or air conditioning, and/or cabin equipment.

LAND ASAP

IF PERCEPTIBLE SMOKE/FUMES APPLY IMMEDIATELY:

If smoke/fumes are confirmed, the following procedure must be applied.

Continued on the following page

[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)

OXY MASK / GOGGLE (if required).....USE/100%/EMERG

Ensure crew communication is established. Avoid continuous use of the interphone to minimize interference from the oxygen mask breathing noise.

Turn the emergency knob to remove condensation or smoke/fumes from the mask.

VENTILATION BLOWER..... OVRD

VENTILATION EXTRACT..... OVRD

Avionics ventilation air is extracted overboard.

CAB FANS.....OFF

To prevent smoke/fumes from entering the cockpit and cabin.

GALY & CAB.....OFF

SIGNS.....ON

CKPT / CABIN COM..... ESTABLISH

Communication must be established with the cabin crew in order to follow up on the smoke/fumes origin and dissipation.

● **If smoke/fumes source immediately obvious, accessible, and extinguishable:**

FAULTY EQPT..... ISOLATE

● **If smoke/fumes source not immediately isolated:**

DIVERSION..... INITIATE

DESCENT TO FL 100 / MEA-MORA..... INITIATE

● **At ANY TIME of the procedure, if smoke/fumes become the GREATEST THREAT:**

REMOVAL OF SMOKE / FUMES..... CONSIDER

Refer to PRO-ABN-SMOKE [QRH] REMOVAL OF SMOKE / FUMES

ELEC EMER CONFIG..... CONSIDER

Refer to PRO-ABN-SMOKE [QRH] SMOKE / FUMES / AVNCS SMOKE - ELEC EMER CONFIG

● **At ANY TIME of the procedure, if situation becomes UNMANAGEABLE:**

IMMEDIATE LANDING..... CONSIDER

Depending on the situation, the Captain can consider an overweight landing, a tailwind landing, a ditching, a forced landing, etc.

L2

Continued on the following page

PROCEDURES**ABNORMAL AND EMERGENCY PROCEDURES****SMOKE****[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)****[L1]**

Guidelines to determine smoke/fumes source:

- If smoke/fumes initially come out of the ventilation outlets, the crew may suspect AIR COND SMOKE. In addition, very shortly thereafter, several SMOKE alerts (cargo, lavatory, avionics) will be triggered. The displayed ECAM procedures must be applied.
- After an ENG or APU failure, smoke/fumes may come from the faulty item via the bleed system and be perceived in the cockpit and/or cabin. In such a case, it will be recirculated throughout the aircraft, until it completely disappears from the air conditioning system.
- If only the **AVIONICS SMOKE** alert is triggered, the crew may suspect avionics smoke.
- If smoke/fumes are detected while an equipment is declared faulty, the crew may suspect that smoke/fumes are coming from this equipment.
- Avionics or forward galley smoke/fumes may be smelt, or may enter in the cockpit before ECAM alert activation.

Continued on the following page

[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)

Ident.: PRO-ABN-SMOKE-D-00012214.0004001 / 15 NOV 21

● **If AIR COND smoke/fumes suspected:**

APU BLEED.....OFF
VENTILATION BLOWER and EXTRACT.....AUTO

Note: When both VENTILATION BLOWER and VENTILATION EXTRACT are in the OVRD position, a single pack may not be able to maintain the cabin pressure.

PACK 1..... OFF

● **If smoke/fumes continue:**

PACK 1..... ON
PACK 2.....OFF

● **If smoke/fumes persist:**

PACK 2..... ON

Restore normal configuration if PACK 2 is not suspected to cause smoke/fumes.

VENTILATION BLOWER.....OVRD

VENTILATION EXTRACT..... OVRD

REMOVAL OF SMOKE / FUMES..... CONSIDER

Refer to PRO-ABN-SMOKE [QRH] REMOVAL OF SMOKE / FUMES

● **If CABIN EQPT smoke/fumes suspected:**

● **If smoke/fumes continue:**

EMER EXIT LIGHT.....ON

COMMERCIAL.....OFF

SMOKE / FUMES DISSIPATION..... CHECK

FAULTY EQPT..... SEARCH / ISOLATE

Once the cabin has been secured, try to find the smoke/fumes source and isolate it.

Cabin lights, reading lights, passenger systems, galleys have dedicated control C/B in the cabin or cockpit.

● **If smoke/fumes persist or if faulty equipment confirmed isolated:**

COMMERCIAL..... NORM

REMOVAL OF SMOKE / FUMES..... CONSIDER

Refer to PRO-ABN-SMOKE [QRH] REMOVAL OF SMOKE / FUMES

Continued on the following page

PROCEDURES
ABNORMAL AND EMERGENCY PROCEDURES
SMOKE

[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)

Ident.: PRO-ABN-SMOKE-D-00012215.0001001 / 15 NOV 21

- **If smoke/fumes source cannot be determined and persist or AVNCS / ELECTRICAL smoke/fumes suspected:**
ELEC EMER CONFIG..... CONSIDER
Refer to the end of the procedure to set ELEC EMER CONFIG.
- **If smoke/fumes disappear within 5 min:**
NORMAL VENTILATION..... RESTORE

Continued on the following page

[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)

Ident.: PRO-ABN-SMOKE-D-00012565.0019001 / 17 MAR 17

TO SET ELEC EMER CONFIG

EMER ELEC GEN 1 LINE..... OFF

GEN 1 LINE contactor opens. GEN 1 remains running and supplies one fuel pump in each wing tank. AC BUS 1 is supplied by GEN 2 through the bus tie contactor.

EMER ELEC PWR..... MAN ON

RAT is extended and the EMER GEN is connected to the aircraft network. Check emergency generator parameters on the ELEC SD page (displayed automatically).

● When EMER GEN AVAIL:

APU GEN..... OFF

GEN 2..... OFF

ELEC EMER CONFIG

Two different procedures can be displayed on the ECAM, depending on whether the AVIONICS SMOKE ECAM caution is triggered or not before the flight crew sets the electrical emergency configuration.

■ If AVIONICS SMOKE not triggered:

APPLY ELEC EMER CONFIG PROCEDURE, BUT DO NOT RESET GEN, EVEN IF REQUESTED BY ECAM

● At 3 min or 2 000 ft AAL before landing:

Restore all generators only 3 min before landing or at 2 000 ft AAL to recover normal braking, while minimizing possible reactivation of a smoke source.

GEN 2..... ON

EMER ELEC GEN 1 LINE..... ON

● When aircraft stopped:

ALL GENs..... OFF

■ If AVIONICS SMOKE triggered:

The ECAM displays a specific ELEC EMER CONFIG procedure. The flight crew must apply the following ECAM procedure.

MIN RAT SPEED..... 140 KT

Note: *The electrical configuration is the same as for loss of both generators (except that one fuel pump in each wing tank remains supplied).*

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

SMOKE

[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)

VHF 1 / HF 1 / ATC 1..... USE

Only VHF 1, HF 1 and ATC 1 are supplied in this configuration. Notify the ATC of the nature of the emergency, and state intentions. If there is no contact with the ATC, switch to code A7700, or transmit a distress message on one of the emergency frequencies.

FAC 1..... OFF THEN ON

Rudder trim is recovered, despite the fact that no indication is available.

● **At 3 min or 2 000 ft AAL before landing:**

Restore all generators only 3 min before landing or at 2 000 ft AAL to recover normal braking, while minimizing possible reactivation of a smoke source.

GEN 2..... ON

EMER ELEC GEN 1 LINE..... ON

F/CTL ALTN LAW (PROT LOST)

Flight control normal laws and associated protections are lost. Only the load factor limitation, and the high and low speed stability remain (ALTN law with reduced protection).

MAX SPEED..... 320 KT

Continued on the following page

[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)

Ident.: PRO-ABN-SMOKE-D-00012217.0057001 / 15 MAY 25

ECAM lower display is not available. STATUS SD page is displayed on the upper ECAM display, as long as the STATUS pb is pressed.

L12

STATUS

 MIN RAT SPEED..... 140 KT
 MAX SPEED..... 320 KT
 MAX BRK PR..... 1000 PSI

 FOR LDG..... FLAP LVR 3
 GPWS LDG FLAP 3..... ON
 APPR SPD..... VREF +10 KT
 LDG DIST PROC..... APPLY

 ENG 1+2 APPR IDLE ONLY
 ENG 1+2 N1 DEGRADED MODE
 (IAE-powered aircraft)

 ALTN LAW: PROT LOST
 WHEN L/G DN: DIRECT LAW
 CTR TK FUEL UNUSABLE
 FUEL CONSUMPT INCRSD

This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.

FMS PRED UNRELIABLE

Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.

SLATS/FLAPS SLOW

- **After recovery of normal electrical supply, the following STATUS will be displayed:**

 MAX SPEED..... 320 KT
 APPR SPD..... VREF +10 KT
 LDG DIST PROC..... APPLY

INOP SYS

*Refer to PRO-ABN-ELEC-[QRH]
 ELEC EMER CONFIG SYS
 REMAINING.*

Continued on the following page

PROCEDURES
ABNORMAL AND EMERGENCY PROCEDURES
SMOKE
[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)
APPR PROC
● 3 MN/2000 FT BEFORE LDG:

GEN 2..... ON

EMER ELEC GEN 1 LINE..... ON

● WHEN A/C IS STOPPED:

ALL GEN..... OFF

ALTN LAW: PROT LOST

 See ⁽¹⁾

WHEN L/G DN: DIRECT LAW

 See ⁽²⁾
⁽¹⁾ Flight controls remain in alternate law, due to the loss of IR 2 and 3.

⁽²⁾ At landing gear extension, control reverts to direct law in pitch, as well as in roll (Refer to PRO-ABN-F_CTL F/CTL DIRECT LAW).

[QRH] SMOKE / FUMES / AVNCS SMOKE

Applicable to: MSN 05152-05746

Ident.: PRO-ABN-SMOKE-D-00012212.0004001 / 15 NOV 21

This procedure includes all the steps of the **AVIONICS SMOKE** procedure.

Apply this procedure when:

- The flight (cabin) crew suspect that smoke/fumes are coming from any of the following:
 - The avionics
 - The air conditioning
 - The cabin equipment
- The **AVIONICS SMOKE** alert is triggered.
- There is a smell of smoke/fumes in the cockpit:
 - If the smell is similar to that of orange peels, suspect a toxic leak of rain repellent fluid.
 - If the smell is similar to that of pine needles, suspect a non-toxic leak.

If any other ECAM SMOKE alert triggers (CARGO, ...), the crew must first apply the ECAM procedure, then consider applying this procedure.

Note that these ECAM alerts may be caused by another source, that should usually first be detected by the flight crew/cabin crew/avionics smoke detectors.

The following explains the layout of this procedure:

- The procedure lines above the boxed items indicate the actions that the flight crew must immediately perform, if smoke/fumes are detected (with or without ECAM activation and regardless of the smoke/fumes source). These immediate actions correspond to the most common steps to be taken in smoke/fumes cases. In all cases, the flight crew must also be prepared to immediately perform a diversion. However, this diversion may be avoided if the smoke/fumes source is obvious, accessible and extinguishable or confirmed isolated (after completion of the immediate actions).
- The boxed items indicate the actions that the flight crew must consider, if at any time during the remainder of the procedure but always after the initial steps:
 - Smoke/fumes become the greatest threat and removal of smoke/fumes is required, and/or
 - The situation becomes critical and can no longer be controlled.
- The procedure lines below the boxed items indicate the actions that the flight crew must perform, as soon as they suspect a source of smoke/fumes. The actions will depend on whether the smoke/fumes are coming from the avionics, and/or air conditioning, and/or cabin equipment.

LAND ASAP

IF PERCEPTIBLE SMOKE/FUMES APPLY IMMEDIATELY:

If smoke/fumes are confirmed, the following procedure must be applied.

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

SMOKE

[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)

OXY MASK / GOGGLE (if required).....USE/100%/EMERG

Ensure crew communication is established. Avoid continuous use of the interphone to minimize interference from the oxygen mask breathing noise.

Turn the emergency knob to remove condensation or smoke/fumes from the mask.

VENTILATION BLOWER.....OVRD

VENTILATION EXTRACT.....OVRD

Avionics ventilation air is extracted overboard.

CAB FANS.....OFF

To prevent smoke/fumes from entering the cockpit and cabin.

GALY & CAB.....OFF

SIGNS.....ON

CKPT / CABIN COM.....ESTABLISH

Communication must be established with the cabin crew in order to follow up on the smoke/fumes origin and dissipation.

● **If smoke/fumes source immediately obvious, accessible, and extinguishable:**

FAULTY EQPT.....ISOLATE

● **If smoke/fumes source not immediately isolated:**

DIVERSION.....INITIATE

DESCENT TO FL 100 / MEA-MORA.....INITIATE

● **At ANY TIME of the procedure, if smoke/fumes become the GREATEST THREAT:**

REMOVAL OF SMOKE / FUMES.....CONSIDER

Refer to PRO-ABN-SMOKE [QRH] REMOVAL OF SMOKE / FUMES

ELEC EMER CONFIG.....CONSIDER

Refer to PRO-ABN-SMOKE [QRH] SMOKE / FUMES / AVNCS SMOKE - ELEC EMER CONFIG

● **At ANY TIME of the procedure, if situation becomes UNMANAGEABLE:**

IMMEDIATE LANDING.....CONSIDER

Depending on the situation, the Captain can consider an overweight landing, a tailwind landing, a ditching, a forced landing, etc.

L2

Continued on the following page

[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)

L1 Guidelines to determine smoke/fumes source:

- If smoke/fumes initially come out of the ventilation outlets, the crew may suspect AIR COND SMOKE. In addition, very shortly thereafter, several **SMOKE** alerts (cargo, lavatory, avionics) will be triggered. The displayed ECAM procedures must be applied.
- After an ENG or APU failure, smoke/fumes may come from the faulty item via the bleed system and be perceived in the cockpit and/or cabin. In such a case, it will be recirculated throughout the aircraft, until it completely disappears from the air conditioning system.
- If only the **AVIONICS SMOKE** alert is triggered, the crew may suspect avionics smoke.
- If smoke/fumes are detected while an equipment is declared faulty, the crew may suspect that smoke/fumes are coming from this equipment.
- Avionics or forward galley smoke/fumes may be smelt, or may enter in the cockpit before ECAM alert activation.

Continued on the following page

PROCEDURES
ABNORMAL AND EMERGENCY PROCEDURES
SMOKE
[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)

Ident.: PRO-ABN-SMOKE-D-00012214.0005001 / 15 NOV 21

● If AIR COND smoke/fumes suspected:

 APU BLEED..... OFF
 VENTILATION BLOWER and EXTRACT..... AUTO

Note: When both VENTILATION BLOWER and VENTILATION EXTRACT are in the OVRD position, a single pack may not be able to maintain the cabin pressure.

CARGO FWD ISOL VALVE..... OFF

To prevent a cargo smoke/fumes warning from being triggered due to cabin smoke/fumes.

PACK 1..... OFF

● If smoke/fumes continue:

 PACK 1..... ON
 PACK 2..... OFF

● If smoke/fumes persist:

PACK 2..... ON

Restore normal configuration if PACK 2 is not suspected to cause smoke/fumes.

VENTILATION BLOWER..... OVRD

VENTILATION EXTRACT..... OVRD

REMOVAL OF SMOKE / FUMES..... CONSIDER

Refer to PRO-ABN-SMOKE [QRH] REMOVAL OF SMOKE / FUMES

● If CABIN EQPT smoke/fumes suspected:
● If smoke/fumes continue:

EMER EXIT LIGHT..... ON

COMMERCIAL..... OFF

SMOKE / FUMES DISSIPATION..... CHECK

FAULTY EQPT..... SEARCH / ISOLATE

Once the cabin has been secured, try to find the smoke/fumes source and isolate it.

Cabin lights, reading lights, passenger systems, galleys have dedicated control C/B in the cabin or cockpit.

● If smoke/fumes persist or if faulty equipment confirmed isolated:

COMMERCIAL..... NORM

REMOVAL OF SMOKE / FUMES..... CONSIDER

Refer to PRO-ABN-SMOKE [QRH] REMOVAL OF SMOKE / FUMES

Continued on the following page

[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)	
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Ident.: PRO-ABN-SMOKE-D-00012215.0001001 / 15 NOV 21

- **If smoke/fumes source cannot be determined and persist or AVNCS / ELECTRICAL smoke/fumes suspected:**
 ELEC EMER CONFIG..... CONSIDER
Refer to the end of the procedure to set ELEC EMER CONFIG.
- **If smoke/fumes disappear within 5 min:**
 NORMAL VENTILATION..... RESTORE

Continued on the following page

[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)

Ident.: PRO-ABN-SMOKE-D-00012565.0019001 / 17 MAR 17

TO SET ELEC EMER CONFIG

EMER ELEC GEN 1 LINE..... OFF

GEN 1 LINE contactor opens. GEN 1 remains running and supplies one fuel pump in each wing tank. AC BUS 1 is supplied by GEN 2 through the bus tie contactor.

EMER ELEC PWR.....MAN ON

RAT is extended and the EMER GEN is connected to the aircraft network. Check emergency generator parameters on the ELEC SD page (displayed automatically).

● **When EMER GEN AVAIL:**

APU GEN..... OFF

GEN 2..... OFF

ELEC EMER CONFIG

Two different procedures can be displayed on the ECAM, depending on whether the AVIONICS SMOKE ECAM caution is triggered or not before the flight crew sets the electrical emergency configuration.

■ **If AVIONICS SMOKE not triggered:**

APPLY ELEC EMER CONFIG PROCEDURE, BUT DO NOT RESET GEN, EVEN IF REQUESTED BY ECAM

● **At 3 min or 2 000 ft AAL before landing:**

Restore all generators only 3 min before landing or at 2 000 ft AAL to recover normal braking, while minimizing possible reactivation of a smoke source.

GEN 2..... ON

EMER ELEC GEN 1 LINE..... ON

● **When aircraft stopped:**

ALL GENs..... OFF

■ **If AVIONICS SMOKE triggered:**

The ECAM displays a specific ELEC EMER CONFIG procedure. The flight crew must apply the following ECAM procedure.

MIN RAT SPEED..... 140 KT

Note: *The electrical configuration is the same as for loss of both generators (except that one fuel pump in each wing tank remains supplied).*

Continued on the following page

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES ABNORMAL AND EMERGENCY PROCEDURES SMOKE
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[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)	
	VHF 1 / HF 1 / ATC 1..... USE Only VHF 1, HF 1 and ATC 1 are supplied in this configuration. Notify the ATC of the nature of the emergency, and state intentions. If there is no contact with the ATC, switch to code A7700, or transmit a distress message on one of the emergency frequencies. FAC 1..... OFF THEN ON Rudder trim is recovered, despite the fact that no indication is available. ● At 3 min or 2 000 ft AAL before landing: Restore all generators only 3 min before landing or at 2 000 ft AAL to recover normal braking, while minimizing possible reactivation of a smoke source. GEN 2..... ON EMER ELEC GEN 1 LINE..... ON F/CTL ALTN LAW (PROT LOST) Flight control normal laws and associated protections are lost. Only the load factor limitation, and the high and low speed stability remain (ALTN law with reduced protection). MAX SPEED.....320 KT

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

SMOKE

[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)

Ident.: PRO-ABN-SMOKE-D-00012217.0057001 / 15 MAY 25

ECAM lower display is not available. STATUS SD page is displayed on the upper ECAM display, as long as the STATUS pb is pressed.

L12

STATUS

MIN RAT SPEED..... 140 KT
 MAX SPEED..... 320 KT
 MAX BRK PR..... 1000 PSI

FOR LDG..... FLAP LVR 3
 GPWS LDG FLAP 3..... ON
 APPR SPD..... VREF +10 KT
 LDG DIST PROC..... APPLY

ENG 1+2 APPR IDLE ONLY
 ENG 1+2 N1 DEGRADED MODE
 (IAE-powered aircraft)

ALTN LAW: PROT LOST
 WHEN L/G DN: DIRECT LAW
 CTR TK FUEL UNUSABLE
 FUEL CONSUMPT INCRSD

This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.

FMS PRED UNRELIABLE

Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.

SLATS/FLAPS SLOW

- After recovery of normal electrical supply, the following STATUS will be displayed:

MAX SPEED..... 320 KT
 APPR SPD..... VREF +10 KT
 LDG DIST PROC..... APPLY

INOP SYS

*Refer to PRO-ABN-ELEC-[QRH]
 ELEC EMER CONFIG SYS
 REMAINING.*

Continued on the following page

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES ABNORMAL AND EMERGENCY PROCEDURES SMOKE
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[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)	
APPR PROC ● 3 MN/2000 FT BEFORE LDG: GEN 2..... ON EMER ELEC GEN 1 LINE..... ON ● WHEN A/C IS STOPPED: ALL GEN..... OFF ALTN LAW: PROT LOST See ⁽¹⁾ WHEN L/G DN: DIRECT LAW See ⁽²⁾	
⁽¹⁾ Flight controls remain in alternate law, due to the loss of IR 2 and 3. ⁽²⁾ At landing gear extension, control reverts to direct law in pitch, as well as in roll (Refer to PRO-ABN-F_CTL F/CTL DIRECT LAW).	

[QRH] SMOKE / FUMES / AVNCS SMOKE

Applicable to: MSN 07784-07792

Ident.: PRO-ABN-SMOKE-D-00012212.0004001 / 15 NOV 21

This procedure includes all the steps of the **AVIONICS SMOKE** procedure.

Apply this procedure when:

- The flight (cabin) crew suspect that smoke/fumes are coming from any of the following:
 - The avionics
 - The air conditioning
 - The cabin equipment
- The **AVIONICS SMOKE** alert is triggered.
- There is a smell of smoke/fumes in the cockpit:
 - If the smell is similar to that of orange peels, suspect a toxic leak of rain repellent fluid.
 - If the smell is similar to that of pine needles, suspect a non-toxic leak.

If any other ECAM SMOKE alert triggers (CARGO, ...), the crew must first apply the ECAM procedure, then consider applying this procedure.

Note that these ECAM alerts may be caused by another source, that should usually first be detected by the flight crew/cabin crew/avionics smoke detectors.

The following explains the layout of this procedure:

- The procedure lines above the boxed items indicate the actions that the flight crew must immediately perform, if smoke/fumes are detected (with or without ECAM activation and regardless of the smoke/fumes source). These immediate actions correspond to the most common steps to be taken in smoke/fumes cases. In all cases, the flight crew must also be prepared to immediately perform a diversion. However, this diversion may be avoided if the smoke/fumes source is obvious, accessible and extinguishable or confirmed isolated (after completion of the immediate actions).
- The boxed items indicate the actions that the flight crew must consider, if at any time during the remainder of the procedure but always after the initial steps:
 - Smoke/fumes become the greatest threat and removal of smoke/fumes is required, and/or
 - The situation becomes critical and can no longer be controlled.
- The procedure lines below the boxed items indicate the actions that the flight crew must perform, as soon as they suspect a source of smoke/fumes. The actions will depend on whether the smoke/fumes are coming from the avionics, and/or air conditioning, and/or cabin equipment.

LAND ASAP

IF PERCEPTIBLE SMOKE/FUMES APPLY IMMEDIATELY:

If smoke/fumes are confirmed, the following procedure must be applied.

Continued on the following page

[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)

OXY MASK / GOGGLE (if required).....USE/100%/EMERG

Ensure crew communication is established. Avoid continuous use of the interphone to minimize interference from the oxygen mask breathing noise.
Turn the emergency knob to remove condensation or smoke/fumes from the mask.

VENTILATION BLOWER..... OVRD

VENTILATION EXTRACT..... OVRD

Avionics ventilation air is extracted overboard.

CAB FANS.....OFF

To prevent smoke/fumes from entering the cockpit and cabin.

GALY & CAB.....OFF

SIGNS.....ON

CKPT / CABIN COM..... ESTABLISH

Communication must be established with the cabin crew in order to follow up on the smoke/fumes origin and dissipation.
● If smoke/fumes source immediately obvious, accessible, and extinguishable:

FAULTY EQPT..... ISOLATE

● If smoke/fumes source not immediately isolated:

DIVERSION..... INITIATE

DESCENT TO FL 100 / MEA-MORA..... INITIATE

● At ANY TIME of the procedure, if smoke/fumes become the GREATEST THREAT:

REMOVAL OF SMOKE / FUMES..... CONSIDER

Refer to PRO-ABN-SMOKE [QRH] REMOVAL OF SMOKE / FUMES

ELEC EMER CONFIG..... CONSIDER

Refer to PRO-ABN-SMOKE [QRH] SMOKE / FUMES / AVNCS SMOKE - ELEC EMER CONFIG
● At ANY TIME of the procedure, if situation becomes UNMANAGEABLE:

IMMEDIATE LANDING..... CONSIDER

Depending on the situation, the Captain can consider an overweight landing, a tailwind landing, a ditching, a forced landing, etc.

L2

Continued on the following page

PROCEDURES**ABNORMAL AND EMERGENCY PROCEDURES****SMOKE****[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)****[L1]**

Guidelines to determine smoke/fumes source:

- If smoke/fumes initially come out of the ventilation outlets, the crew may suspect AIR COND SMOKE. In addition, very shortly thereafter, several SMOKE alerts (cargo, lavatory, avionics) will be triggered. The displayed ECAM procedures must be applied.
- After an ENG or APU failure, smoke/fumes may come from the faulty item via the bleed system and be perceived in the cockpit and/or cabin. In such a case, it will be recirculated throughout the aircraft, until it completely disappears from the air conditioning system.
- If only the **AVIONICS SMOKE** alert is triggered, the crew may suspect avionics smoke.
- If smoke/fumes are detected while an equipment is declared faulty, the crew may suspect that smoke/fumes are coming from this equipment.
- Avionics or forward galley smoke/fumes may be smelt, or may enter in the cockpit before ECAM alert activation.

Continued on the following page

[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)

Ident.: PRO-ABN-SMOKE-D-00012214.0007001 / 15 NOV 21

● If AIR COND smoke/fumes suspected:

 APU BLEED.....OFF
 VENTILATION BLOWER and EXTRACT.....AUTO

Note: When both VENTILATION BLOWER and VENTILATION EXTRACT are in the OVRD position, a single pack may not be able to maintain the cabin pressure.

CARGO AFT ISOL VALVE.....OFF

To prevent a cargo smoke/fumes warning from being triggered due to cabin smoke/fumes.

PACK 1.....OFF

● If smoke/fumes continue:

PACK 1.....ON

PACK 2.....OFF

● If smoke/fumes persist:

PACK 2.....ON

Restore normal configuration if PACK 2 is not suspected to cause smoke/fumes.

VENTILATION BLOWER.....OVRD

VENTILATION EXTRACT.....OVRD

REMOVAL OF SMOKE / FUMES.....CONSIDER

Refer to PRO-ABN-SMOKE [QRH] REMOVAL OF SMOKE / FUMES

● If CABIN EQPT smoke/fumes suspected:
● If smoke/fumes continue:

EMER EXIT LIGHT.....ON

COMMERCIAL.....OFF

SMOKE / FUMES DISSIPATION.....CHECK

FAULTY EQPT.....SEARCH / ISOLATE

Once the cabin has been secured, try to find the smoke/fumes source and isolate it.

Cabin lights, reading lights, passenger systems, galleys have dedicated control C/B in the cabin or cockpit.

● If smoke/fumes persist or if faulty equipment confirmed isolated:

COMMERCIAL.....NORM

REMOVAL OF SMOKE / FUMES.....CONSIDER

Refer to PRO-ABN-SMOKE [QRH] REMOVAL OF SMOKE / FUMES

Continued on the following page

PROCEDURES
ABNORMAL AND EMERGENCY PROCEDURES

SMOKE

[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)

Ident.: PRO-ABN-SMOKE-D-00012215.0001001 / 15 NOV 21

- **If smoke/fumes source cannot be determined and persist or AVNCS / ELECTRICAL smoke/fumes suspected:**
ELEC EMER CONFIG..... CONSIDER
Refer to the end of the procedure to set ELEC EMER CONFIG.
- **If smoke/fumes disappear within 5 min:**
NORMAL VENTILATION..... RESTORE

Continued on the following page

[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)

Ident.: PRO-ABN-SMOKE-D-00012565.0019001 / 17 MAR 17

TO SET ELEC EMER CONFIG

EMER ELEC GEN 1 LINE..... OFF

GEN 1 LINE contactor opens. GEN 1 remains running and supplies one fuel pump in each wing tank. AC BUS 1 is supplied by GEN 2 through the bus tie contactor.

EMER ELEC PWR..... MAN ON

RAT is extended and the EMER GEN is connected to the aircraft network. Check emergency generator parameters on the ELEC SD page (displayed automatically).

● When EMER GEN AVAIL:

APU GEN..... OFF

GEN 2..... OFF

ELEC EMER CONFIG

Two different procedures can be displayed on the ECAM, depending on whether the AVIONICS SMOKE ECAM caution is triggered or not before the flight crew sets the electrical emergency configuration.

■ If AVIONICS SMOKE not triggered:

APPLY ELEC EMER CONFIG PROCEDURE, BUT DO NOT RESET GEN, EVEN IF REQUESTED BY ECAM

● At 3 min or 2 000 ft AAL before landing:

Restore all generators only 3 min before landing or at 2 000 ft AAL to recover normal braking, while minimizing possible reactivation of a smoke source.

GEN 2..... ON

EMER ELEC GEN 1 LINE..... ON

● When aircraft stopped:

ALL GENs..... OFF

■ If AVIONICS SMOKE triggered:

The ECAM displays a specific ELEC EMER CONFIG procedure. The flight crew must apply the following ECAM procedure.

MIN RAT SPEED..... 140 KT

Note: *The electrical configuration is the same as for loss of both generators (except that one fuel pump in each wing tank remains supplied).*

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

SMOKE

[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)

VHF 1 / HF 1 / ATC 1..... USE

Only VHF 1, HF 1 and ATC 1 are supplied in this configuration. Notify the ATC of the nature of the emergency, and state intentions. If there is no contact with the ATC, switch to code A7700, or transmit a distress message on one of the emergency frequencies.

FAC 1..... OFF THEN ON

Rudder trim is recovered, despite the fact that no indication is available.

● **At 3 min or 2 000 ft AAL before landing:**

Restore all generators only 3 min before landing or at 2 000 ft AAL to recover normal braking, while minimizing possible reactivation of a smoke source.

GEN 2..... ON

EMER ELEC GEN 1 LINE..... ON

F/CTL ALTN LAW (PROT LOST)

Flight control normal laws and associated protections are lost. Only the load factor limitation, and the high and low speed stability remain (ALTN law with reduced protection).

MAX SPEED..... 320 KT

Continued on the following page

[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)

Ident.: PRO-ABN-SMOKE-D-00012217.0064001 / 06 NOV 23

ECAM lower display is not available. STATUS SD page is displayed on the upper ECAM display, as long as the STATUS pb is pressed.

L12

STATUS

 MIN RAT SPEED..... 140 KT
 MAX SPEED..... 320 KT
 MAX BRK PR..... 1000 PSI

 FOR LDG.....FLAP LVR 3
 GPWS LDG FLAP 3..... ON
 APPR SPD..... VREF +10 KT
 LDG DIST PROC..... APPLY

 ENG 1+2 APPR IDLE ONLY
 ALTN LAW: PROT LOST
 WHEN L/G DN: DIRECT LAW
 FUEL CONSUMPT INCRSD

This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.

FMS PRED UNRELIABLE

Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.

SLATS/FLAPS SLOW

- **After recovery of normal electrical supply, the following STATUS will be displayed:**

 MAX SPEED..... 320 KT
 APPR SPD..... VREF +10 KT
 LDG DIST PROC..... APPLY

APPR PROC

- **3 MN/2000 FT BEFORE LDG:**

GEN 2..... ON

INOP SYS

*Refer to PRO-ABN-ELEC-[QRH]
ELEC EMER CONFIG SYS
REMAINING.*

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

SMOKE

[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)

EMER ELEC GEN 1 LINE..... ON

● **WHEN A/C IS STOPPED:**

ALL GEN..... OFF

ALTN LAW: PROT LOST

See ⁽¹⁾

WHEN L/G DN: DIRECT LAW

See ⁽²⁾

⁽¹⁾ Flight controls remain in alternate law, due to the loss of IR 2 and IR 3.

⁽²⁾ At landing gear extension, control reverts to direct law in pitch, as well as in roll (Refer to PRO-ABN-F_CTL F/CTL DIRECT LAW).

[QRH] REMOVAL OF SMOKE / FUMES

Ident.: PRO-ABN-SMOKE-00012218.0001001 / 05 MAY 22

Applicable to: MSN 02155-02212

Apply this [QRH] **REMOVAL OF SMOKE / FUMES** procedure, if smoke/fumes become the greatest threat when applying the [QRH] **SMOKE / FUMES / AVNCS SMOKE** procedure.

EMER EXIT LIGHT..... ON

■ If fuel vapors:

CAB FANS..... ON

The recirculating air ventilates the air mixer bay and other fuselage area. This prevents fuel vapors from accumulating and the risk of explosion. Passenger health is not affected.

PACK 1..... OFF

PACK 2..... OFF

■ If no fuel vapors:

CAB FANS..... OFF

To prevent smoke/fumes from entering the cockpit and cabin.

PACK FLOW..... HI

To provide maximum airflow from the packs.

Do not shut down the air conditioning packs, and do not reduce ventilation in an attempt to smother the fire.

Do not deploy oxygen masks, if fire is suspected in the cabin.

LDG ELEV..... 10 000 ft / MEA-MORA

DESCENT TO FL 100 / MEA-MORA..... INITIATE

The most effective means of smoke/fumes removal is use of ram air. Therefore, descent is initiated to FL 100 or the MEA-MORA, while the cabin altitude is increased to 10 000 ft or the MEA-MORA.

The increase in cabin altitude also reduces, at least temporarily, the smoke/fumes concentration.

Cabin depressurization starts, when descent is initiated.

ATC..... NOTIFY

SMOKE / FUMES / AVNCS SMOKE PROC..... CONTINUE

Refer to PRO-ABN-SMOKE [QRH] SMOKE / FUMES / AVNCS SMOKE - GENERAL

● At FL 100 or MEA-MORA:
● If in ELEC EMER CONFIG:

APU MASTER sw ON

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

SMOKE

[QRH] REMOVAL OF SMOKE / FUMES (Cont'd)

In electrical emergency configuration, when the APU MASTER sw is ON, the battery contactors will automatically close for a maximum of 3 min. This will enable the flight crew to manually control the outflow valve that is powered by the DC BAT BUS.

PACK 1..... OFF

PACK 2..... OFF

In electrical emergency configuration, the PACK 2 flow control valve cannot close because it is not electrically supplied. Therefore PACK 2 remains operative even when PACK 2 pb is set to OFF.

CABIN PRESS MODE SEL.....MAN

MAN V/S CTL..... FULL UP

RAM AIR.....ON

At FL 100, or MEA-MORA, it is possible to open the RAM AIR valve when ΔP is 1 PSI or below. Opening the RAM AIR enables flying with both packs OFF.

APU MASTER sw..... OFF

● **If smoke/fumes persist:**

If there is smoke/fumes in the cockpit, open the cockpit window to evacuate the smoke/fumes.

MAX SPEED: 200 kt

COCKPIT DOOR..... OPEN

HEADSETS..... ON

PM SLIDING WINDOW..... OPEN

● **When window open:**

NON-AFFECTED PACK(s).....ON

VISUAL WARNINGS (noisy cockpit)..... MONITOR

Due to the increased noise level, pay particular attention to visual warnings.

SMOKE / FUMES / AVNCS SMOKE PROC..... CONTINUE

Refer to PRO-ABN-SMOKE [QRH] SMOKE / FUMES / AVNCS SMOKE - GENERAL

[QRH] REMOVAL OF SMOKE / FUMES

Ident.: PRO-ABN-SMOKE-00012218.0003001 / 05 MAY 22

Applicable to: MSN 02719-07792

Apply this [QRH] **REMOVAL OF SMOKE / FUMES** procedure, if smoke/fumes become the greatest threat when applying the [QRH] **SMOKE / FUMES / AVNCS SMOKE** procedure.

EMER EXIT LIGHT..... ON

■ If fuel vapors:

CAB FANS..... ON

The recirculating air ventilates the air mixer bay and other fuselage area. This prevents fuel vapors from accumulating and the risk of explosion. Passenger health is not affected.

PACK 1..... OFF

PACK 2..... OFF

■ If no fuel vapors:

CAB FANS..... OFF

To prevent smoke/fumes from entering the cockpit and cabin.

PACK FLOW..... HI

To provide maximum airflow from the packs.

Do not shut down the air conditioning packs, and do not reduce ventilation in an attempt to smother the fire.

Do not deploy oxygen masks, if fire is suspected in the cabin.

LDG ELEV..... 10 000 ft / MEA-MORA

DESCENT TO FL 100 / MEA-MORA..... INITIATE

The most effective means of smoke/fumes removal is use of ram air. Therefore, descent is initiated to FL 100 or the MEA-MORA, while the cabin altitude is increased to 10 000 ft or the MEA-MORA.

The increase in cabin altitude also reduces, at least temporarily, the smoke/fumes concentration.

Cabin depressurization starts, when descent is initiated.

ATC..... NOTIFY

SMOKE / FUMES / AVNCS SMOKE PROC..... CONTINUE

Refer to PRO-ABN-SMOKE [QRH] SMOKE / FUMES / AVNCS SMOKE - GENERAL

● At FL 100 or MEA-MORA:
● If in ELEC EMER CONFIG:

APU MASTER sw..... ON

Continued on the following page

[QRH] REMOVAL OF SMOKE / FUMES (Cont'd)

In electrical emergency configuration, when the APU MASTER sw is ON, the battery contactors will automatically close for a maximum of 3 min. This will enable the flight crew to manually control the outflow valve that is powered by the DC BAT BUS.

PACK 1..... OFF
 PACK 2..... OFF
 CABIN PRESS MODE SEL.....MAN
 MAN V/S CTL..... FULL UP
 RAM AIR..... ON

At FL 100, or MEA-MORA, it is possible to open the RAM AIR valve when ΔP is 1 PSI or below. Opening the RAM AIR enables flying with both packs OFF.

APU MASTER sw..... OFF

● **If smoke/fumes persist:**

If there is smoke/fumes in the cockpit, open the cockpit window to evacuate the smoke/fumes.

MAX SPEED: 200 kt

COCKPIT DOOR..... OPEN

HEADSETS..... ON

PM SLIDING WINDOW..... OPEN

● **When window open:**

NON-AFFECTED PACK(s)..... ON

VISUAL WARNINGS (noisy cockpit)..... MONITOR

Due to the increased noise level, pay particular attention to visual warnings.

SMOKE / FUMES / AVNCS SMOKE PROC..... CONTINUE

Refer to PRO-ABN-SMOKE [QRH] SMOKE / FUMES / AVNCS SMOKE - GENERAL

[QRH] SMOKE / FIRE FROM LITHIUM BATTERY

Ident.: PRO-ABN-SMOKE-00016024.0001001 / 15 NOV 21

Applicable to: ALL

If necessary, transfer control to the flight crewmember seated on the opposite side of the fire.

 CKPT / CAB COM..... ESTABLISH
 STORAGE AFTER Li BAT FIRE cabin procedure.....REQUEST INITIATION

● If flames:

 OXY MASK / GOGGLE (PF).....USE / 100% / EMERG
 SMOKE HOOD (PM).....USE
 FIRE EXTINGUISHER.....USE

● If no flames or when flames extinguished:
■ If not possible to remove device from the cockpit:

 WATER or NON-ALCOHOLIC LIQUID.....POUR ON DEVICE
 DEVICE.....MONITOR

■ If possible to remove device from the cockpit:

DEVICE.....TRANSFER TO CABIN

● At ANY TIME of the procedure, if SMOKE becomes the GREATEST THREAT:

 REMOVAL OF SMOKE / FUMES procedure.....CONSIDER
Refer to PRO-ABN-SMOKE [QRH] REMOVAL OF SMOKE / FUMES.
● At ANY TIME of the procedure, if situation becomes UNMANAGEABLE:

 IMMEDIATE LANDING.....CONSIDER
Depending on the situation, the Captain can consider an overweight landing, a tailwind landing, a ditching, a forced landing, etc.

L2

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

SMOKE

SMOKE AFT CARGO SMOKE

Applicable to: ALL

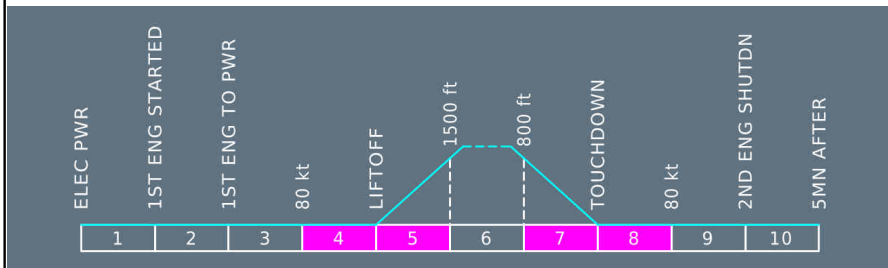
Ident.: PRO-ABN-SMOKE-O-00018698.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

 This alert triggers when smoke in the AFT cargo compartment is detected.

Flight Phase Inhibition:



Continued on the following page

SMOKE AFT CARGO SMOKE (Cont'd)

Ident.: PRO-ABN-SMOKE-O-00018589.0007001 / 12 NOV 24

LAND ASAP
AFT ISOL VALVE OFF

L2 If AFT ISOL VALVE  is not automatically closed.

L1 **CAB FANS**OFF

■ On ground:
● IF AFT CRG CLOSED:
L2

Order the ground crew not to open the door of the affected cargo compartment, unless the passengers have disembarked and fire services are present. Also ensure that the AFT cargo door is closed before discharging the extinguishing agent.

L1
AGENT DISCH

Note: Expect the **SMOKE AFT CARGO SMOKE** alert to remain after agent discharge, even if the smoke source is extinguished. Gases from the smoke source still remain, and smoke detectors are also sensitive to the extinguishing agent.

● BEFORE OPEN CRG DOORS:
PAX DISEMBARK

■ In flight:
AGENT DISCH

Note: Expect the **SMOKE AFT CARGO SMOKE** alert to remain after agent discharge, even if the smoke source is extinguished. Gases from the smoke source still remain, and smoke detectors are also sensitive to the extinguishing agent.

● WHEN ON GROUND BEFORE OPEN CRG DOORS:
PAX DISEMBARK

Note: 1. For aircraft equipped with AFT Cargo Ventilation , and when ventilation is required for livestock transportation, the normal cargo ventilation may be recovered if:

- The warning is displayed temporarily
- The agent is not discharged.

To recover the normal ventilation: AIR COND/AFT CARGO/VENT/CTL & MONG C/B (S20 on 122VU, or C7 on 49VU) PULL then PUSH

2. On ground, the warning may be triggered due to a high level of humidity or insecticide spraying.

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

SMOKE

SMOKE AFT CARGO SMOKE (Cont'd)

If the smoke is not visually confirmed and the warning is no more displayed:

- Deactivate the smoke detection system, by pulling the SDCU  C/Bs (C06 on 49VU or T17 on 122VU for channel 1 and T18 on 122VU for channel 2)
- Reset the cargo ventilation system, by pulling and pushing the AIR COND/AFT CARGO/VENT/CTL & MONG C/B (S20 on 122VU, or C7 on 49VU)
- At cargo doors closure, reactivate SDCU  1 and 2.

Ident.: PRO-ABN-SMOKE-O-00018590.0003001 / 16 JUL 19

STATUS

INOP SYS

■ In flight:

- WHEN ON GROUND BEFORE OPEN CRG DOORS:

PAX..... DISEMBARK

L+R CAB FAN 

AFT CRG VENT 

AFT CRG HEAT 

■ On ground:

- BEFORE OPEN CRG DOORS:

PAX..... DISEMBARK

SMOKE AFT CRG DET FAULT

Applicable to: ALL

Ident.: PRO-ABN-SMOKE-P-00018699.0001001 / 21 MAR 16

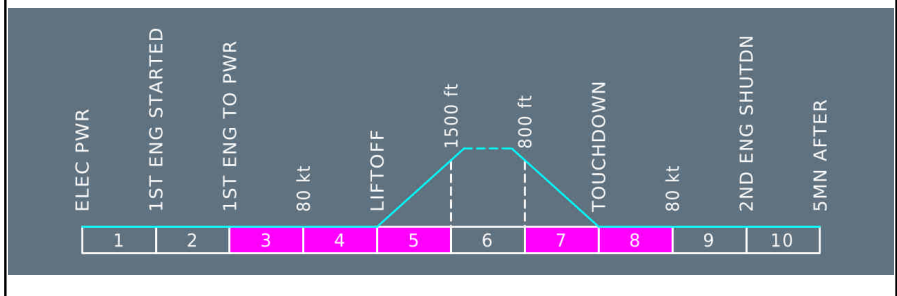
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the AFT smoke detection is failed.

Flight Phase Inhibition:



Ident.: PRO-ABN-SMOKE-P-00018592.0001001 / 21 MAR 16

● **IF NO LIVE STOCK:**

AFT ISOL VALVE  **OFF**

Ident.: PRO-ABN-SMOKE-P-00018593.0001001 / 21 MAR 16

STATUS

INOP SYS

AFT CRG DET 

SMOKE FWD CARGO SMOKE

Applicable to: ALL

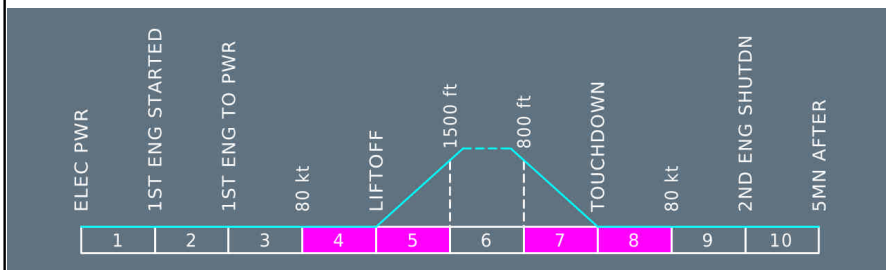
Ident.: PRO-ABN-SMOKE-E-00017408.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

 This alert triggers when smoke in the FWD cargo compartment is detected.

Flight Phase Inhibition:



Continued on the following page

SMOKE FWD CARGO SMOKE (Cont'd)

Ident.: PRO-ABN-SMOKE-E-00018287.0005001 / 12 NOV 24

LAND ASAP
FWD ISOL VALVE  **OFF**
L2 If FWD ISOL VALVE  is not automatically closed.

L1 **CAB FANS** **OFF**
■ On ground:
● IF FWD CRG CLOSED:
L2 Order the ground crew not to open the door of the affected cargo compartment, unless the passengers have disembarked and fire services are present. Also ensure that the FWD Cargo Door is closed before discharging the extinguishing agent.

L1 **AGENT** **DISCH**

Note: Expect the **SMOKE FWD CARGO SMOKE** alert to remain after agent discharge, even if the smoke source is extinguished. Gases from the smoke source still remain, and smoke detectors are also sensitive to the extinguishing agent.

● BEFORE OPEN CRG DOORS:
PAX **DISSEMBARK**
■ In flight:
AGENT **DISCH**

Note: Expect the **SMOKE FWD CARGO SMOKE** alert to remain after agent discharge, even if the smoke source is extinguished. Gases from the smoke source still remain, and smoke detectors are also sensitive to the extinguishing agent.

● WHEN ON GROUND BEFORE OPEN CRG DOORS:
PAX **DISSEMBARK**

Note: 1. For aircraft equipped with FWD Cargo Ventilation , and when ventilation is required for livestock transportation, the normal cargo ventilation may be recovered if:

- The warning is displayed temporarily
- The agent is not discharged.

To recover the normal ventilation: AIR COND/FWD CARGO/VENT/CTL & MONG C/B (T20 on 122VU, or C8 on 49VU) PULL then PUSH

2. On ground, the warning may be triggered due to a high level of humidity or insecticide spraying.

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

SMOKE

SMOKE FWD CARGO SMOKE (Cont'd)

If the smoke is not visually confirmed and the warning is no more displayed:

- Deactivate the smoke detection system, by pulling the SDCU  C/Bs (C06 on 49VU or T17 on 122VU for channel 1 and T18 on 122VU for channel 2)
- Reset the cargo ventilation system, by pulling and pushing the AIR COND/FWD CARGO/VENT/CTL & MONG C/B (T20 on 122VU, or C8 on 49VU)
- At cargo doors closure, reactivate SDCU  1 and 2.

Ident.: PRO-ABN-SMOKE-E-00018588.0002001 / 06 OCT 17

STATUS

■ In flight:

- WHEN ON GROUND BEFORE OPEN CRG DOORS:

PAX..... DISEMBARK

■ On ground:

- BEFORE OPEN CRG DOORS:

PAX..... DISEMBARK

INOP SYS

FWD CRG VENT 

FWD CRG HEAT 

SMOKE FWD(AFT) CRG BTL 1(2) FAULT

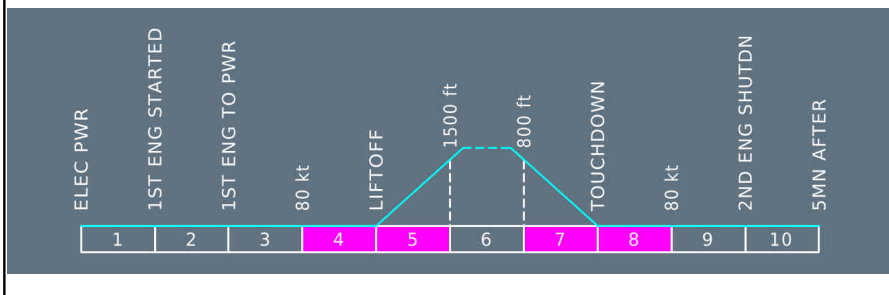
Applicable to: MSN 02719-07792

Ident.: PRO-ABN-SMOKE-L-00017414.0001001 / 21 MAR 16

ANNUNCIATIONS
Triggering Conditions:
L2

This alert triggers when:

- FWD or AFT bottle 1 (2)  squib is failed, or
- FWD or AFT bottle 1 (2)  is at low pressure.

Flight Phase Inhibition:


Ident.: PRO-ABN-SMOKE-L-00018325.0001001 / 21 MAR 16

L2

If bottle 1 is lost, fire extinguishing capability is lost in the FWD(AFT) cargo compartment.
 If bottle 2 is lost, agent concentration will not be ensured after fire extinguishing.

L1

Crew awareness.

PROCEDURES
ABNORMAL AND EMERGENCY PROCEDURES
SMOKE

SMOKE FWD CRG DET FAULT

Applicable to: ALL

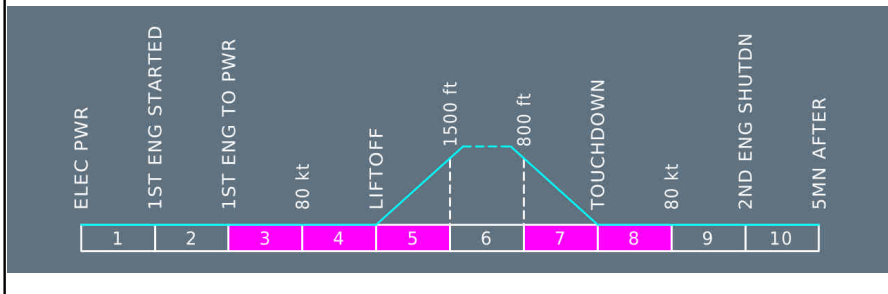
Ident.: PRO-ABN-SMOKE-F-00017689.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

 This alert triggers when the FWD smoke detection is failed.

Flight Phase Inhibition:



Ident.: PRO-ABN-SMOKE-F-00018336.0001001 / 21 MAR 16

● **IF NO LIVE STOCK:**

FWD ISOL VALVE  **OFF**

Ident.: PRO-ABN-SMOKE-F-00018337.0001001 / 21 MAR 16

STATUS

INOP SYS

FWD CRG DET 

SMOKE DET FAULT

Applicable to: ALL

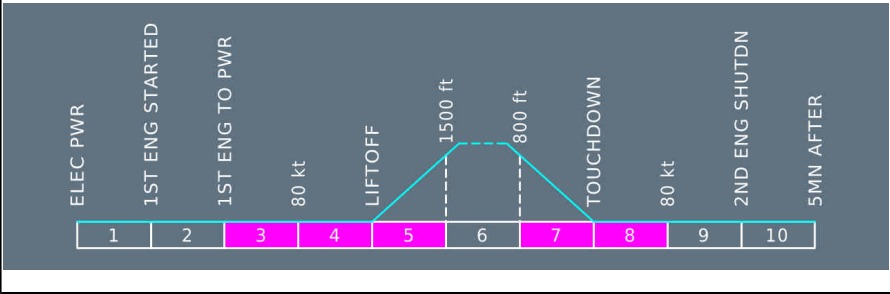
Ident.: PRO-ABN-SMOKE-G-00017400.0002001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when both SDCU or CIDS-SDF  are failed.

Flight Phase Inhibition:



Ident.: PRO-ABN-SMOKE-G-00018423.0002001 / 21 MAR 16

● IF NO LIVE STOCK:

FWD ISOL VALVE OFF
AFT ISOL VALVE OFF

PAX SYS OFF

Ident.: PRO-ABN-SMOKE-G-00012226.0011001 / 01 APR 11

STATUS

INOP SYS

SMOKE DET

PROCEDURES
ABNORMAL AND EMERGENCY PROCEDURES

SMOKE

SMOKE LAVATORY DET FAULT

Applicable to: MSN 02155-02212

Ident.: PRO-ABN-SMOKE-H-00017407.0001001 / 21 MAR 16

ANNUNCIATIONS

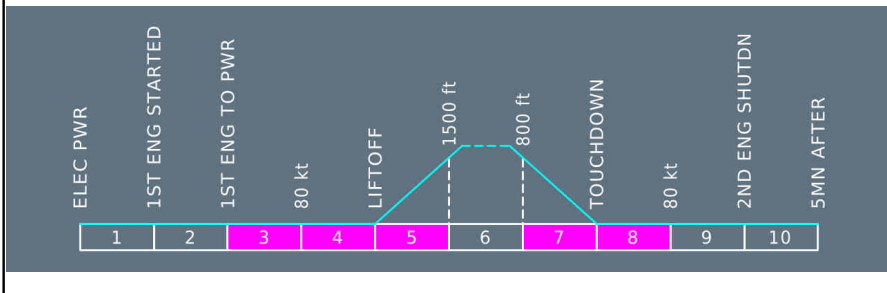
Triggering Conditions:

L2

This alert triggers when:

- Lavatory smoke detection is failed, or
- Lavatory and galley fan are failed.

Flight Phase Inhibition:



Ident.: PRO-ABN-SMOKE-H-00018724.0001001 / 21 MAR 16

Crew awareness.

Ident.: PRO-ABN-SMOKE-H-00012228.0001001 / 18 AUG 10

STATUS

INOP SYS

LAV DET

SMOKE LAVATORY DET FAULT

Applicable to: MSN 02719-07792

Ident.: PRO-ABN-SMOKE-H-00017407.0002001 / 21 MAR 16

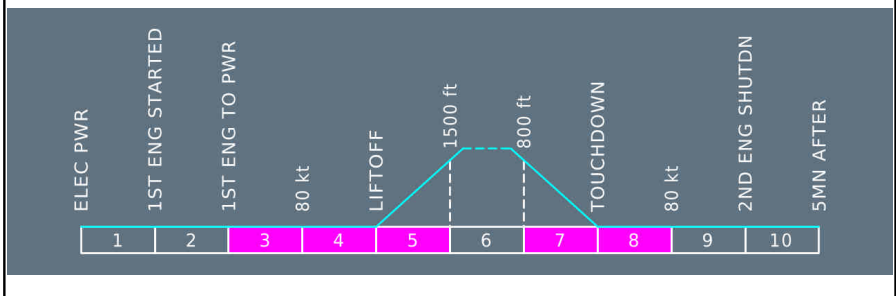
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the lavatory smoke detection is failed.

Flight Phase Inhibition:



Ident.: PRO-ABN-SMOKE-H-00018724.0001001 / 21 MAR 16

Crew awareness.

Ident.: PRO-ABN-SMOKE-H-00012228.0001001 / 18 AUG 10

STATUS

INOP SYS

LAV DET

SMOKE LAVATORY SMOKE

Applicable to: ALL

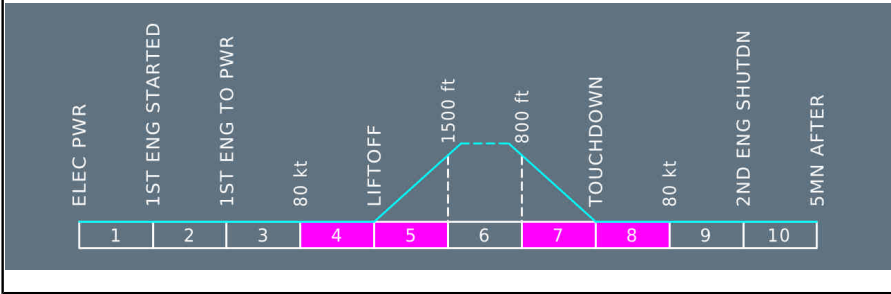
Ident.: PRO-ABN-SMOKE-N-00017406.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when smoke in one of the lavatory is detected.

Flight Phase Inhibition:



Ident.: PRO-ABN-SMOKE-N-00018427.0002001 / 21 MAR 17

L2 Communication must be established with the cabin crew in order to follow up on the smoke origin and dissipation.
 Consider applying the SMOKE/FUMES/AVNCS SMOKE QRH procedure.

L1 CKPT/CAB COM.....ESTABLISH

[MEM] TAWS CAUTION

Applicable to: ALL

Ident.: PRO-ABN-SURV-AA-00028345.0001001 / 15 NOV 24

- **"TERRAIN TERRAIN" - "TOO LOW TERRAIN" - "TERRAIN AHEAD" - "CAUTION TERRAIN" - "OBSTACLE AHEAD" - "CAUTION OBSTACLE"**

■ During night or IMC conditions:

Simultaneously:

AP.....	OFF
PITCH.....	PULL UP

Pull up to full backstick and maintain in that position.

THRUST LEVERS.....	TOGA
SPEED BRAKE LEVER.....	CHECK RETRACTED
BANK.....	WINGS LEVEL or ADJUST

L2

Aircraft obtains the best climb performance when the wings are as level as possible. The flight crew can adjust bank while climbing, provided that turning is the safest action.

L1
Note: For some airports, the operator may define a specific procedure.

DO NOT CHANGE CONFIGURATION (SLATS/FLAPS, GEAR) UNTIL CLEAR OF OBSTACLE.
--

■ During daylight and VMC conditions, with terrain and obstacles clearly in sight:

FLIGHT PATH.....	ADJUST
------------------	--------

L2

Adjust pitch, bank and thrust to silence the alert.

L1
Note: For some airports, the operator may define a specific procedure.

Continued on the following page

[MEM] TAWS CAUTION (Cont'd)

Ident.: PRO-ABN-SURV-AA-00028346.0001001 / 15 NOV 24

● **"SINK RATE"**

■ **Above 1 000 ft AAL IMC or above 500 ft AAL VMC:**

FLIGHT PATH..... ADJUST

L2 Adjust pitch and thrust to silence the alert.

L1 ■ **Below 1 000 ft AAL IMC or below 500 ft AAL VMC:**

GO-AROUND..... CONSIDER

● **"DON'T SINK"**

FLIGHT PATH..... ADJUST

L2 Adjust pitch and thrust to silence the alert.

Ident.: PRO-ABN-SURV-AA-00028347.0001001 / 15 NOV 24

● **"TOO LOW GEAR" or "TOO LOW FLAPS"**

GO-AROUND..... PERFORM

Ident.: PRO-ABN-SURV-AA-00028348.0001001 / 15 NOV 24

● **"GLIDESLOPE"**

■ **Above 1 000 ft AAL IMC or above 500 ft AAL VMC:**

FLIGHT PATH..... ADJUST

L2 Adjust pitch and thrust to reduce the vertical deviation from the glideslope.

L1 ● **When conditions require a deliberate approach below glideslope:**

G/S MODE..... OFF

■ **Below 1 000 ft AAL IMC or below 500 ft AAL VMC:**

GO-AROUND..... CONSIDER

[MEM] TAWS WARNING

Ident.: PRO-ABN-SURV-00028349.0001001 / 15 NOV 24

Applicable to: ALL

● If the TAWS triggers one of the PULL UP alerts:

L2 "PULL UP" or "TERRAIN AHEAD PULL UP" or "TERRAIN TERRAIN PULL UP" or "OBSTACLE AHEAD PULL UP" or "OBSTACLE OBSTACLE PULL UP"

L1 Simultaneously:

AP.....	OFF
PITCH.....	PULL UP

Pull up to full backstick and maintain in that position.

THRUST LEVERS.....	TOGA
SPEED BRAKE LEVER.....	CHECK RETRACTED
BANK.....	WINGS LEVEL or ADJUST

L2 Aircraft obtains the best climb performance when the wings are as level as possible. The flight crew can adjust bank while climbing, provided that turning is the safest action.
 Some PULL UP aural alerts may be followed by the "AVOID TERRAIN" or "AVOID OBSTACLE" aural alert. In this case, the flight crew must adjust bank as necessary.

L1 DO NOT CHANGE CONFIGURATION (SLATS/FLAPS, GEAR) UNTIL CLEAR OF OBSTACLE.

PROCEDURES
ABNORMAL AND EMERGENCY PROCEDURES

SURV

[MEM] TCAS CAUTION - TRAFFIC ADVISORY

Ident.: PRO-ABN-SURV-00025023.0002001 / 16 MAY 22

Applicable to: MSN 07784-07792

[L2] If the AP/FD **TCAS** mode is available, the **TCAS** mode arms on FMA.

[L1] **TCAS** mode..... **CHECK ARMED**

[L2] If the AP/FD **TCAS** mode does not arm, the flight crew must be prepared to disconnect the AP in the case of a RA, and manually follow the TCAS guidances.

[L1] ● **If the A/THR is off:**
AUTOTHRUST.....ON

[L2] It is recommended to set the A/THR to ON in order to avoid the **AUTO FLT A/THR LIMITED** alert at the automatic A/THR activation that occurs in the case of a RA.

[L1] Do not perform a maneuver based on a TA alone.

[MEM] TCAS CAUTION - TRAFFIC ADVISORY

Ident.: PRO-ABN-SURV-00025023.0001001 / 16 MAY 22

Applicable to: MSN 02155-05746

Do not perform a maneuver based on a TA alone.

[MEM] TCAS WARNING - RESOLUTION ADVISORY

Ident.: PRO-ABN-SURV-00012455.0031001 / 16 MAY 22

Applicable to: MSN 07784-07792

Always follow RA orders, even if this results in crossing the intruder altitude, because these orders ensure the best altitude separation.

CAUTION

Be aware that the intruder may have a TCAS, and may maneuver in response to a coordinated RA order. Therefore, not following an RA order could compromise safe separation.

■ If the AP/FD TCAS mode is available:

L2

The flight crew applies this procedure, when a RA is triggered, and the AP/FD TCAS mode engages. The AP/FD TCAS mode follows the RA orders.

L1

● All RA, except any CLIMB RA during approach in CONF 3 or FULL:
● If the AP is OFF:

FD ORDERS..... FOLLOW

The AP can be engaged.

VERTICAL SPEED.....MONITOR

L2

If a preventive RA was triggered: check that the vertical speed remains out of the red area of the vertical speed scale.

If a corrective RA was triggered: check that the vertical speed gets out of the red area, and remains in the green area of the vertical speed scale.

L1

CAUTION

If for any reason during a RA, the aircraft vertical speed does not reach the green area of the vertical speed scale, the PF should disconnect the AP, and override the FD orders, in order to lead the aircraft vertical speed out of the red area of the vertical speed scale. If necessary, the PF must use the full speed range between $V_{\alpha max}$ and V_{MAX} .

● Any CLIMB RA during approach in CONF 3 or FULL:

GO-AROUND..... PERFORM

L2

The AP/FD TCAS mode disengages (the AP/FD does no longer follows the RA orders).

L1

Follow the SRS GA mode.

VERTICAL SPEED.....MONITOR

Continued on the following page

[MEM] TCAS WARNING - RESOLUTION ADVISORY (Cont'd)

L2

Check that the vertical speed remains out of the red area of the vertical speed scale and take over if necessary.

L1

Respect stall, GPWS or windshear warnings.

ATC.....	NOTIFY
----------	--------

● **When the “CLEAR OF CONFLICT” aural alert sounds:**

L2

The AP/FD **TCAS** mode, if engaged, disengages.

L1

AP/FD.....	MONITOR/FOLLOW
ATC.....	NOTIFY
LATERAL AND VERTICAL GUIDANCE.....	ADJUST

L2

The flight crew should engage an appropriate vertical mode, or adjust the vertical speed target, in accordance with the latest ATC clearance.

L1

SPEED.....	ADJUST
------------	--------

L2

The flight crew should adjust the speed target, and revert to managed speed, as appropriate.

L1

■ **If the AP/FD **TCAS** mode is not available:**

L2

The flight crew applies this procedure, when a RA is triggered, and the AP/FD **TCAS** mode does not engage.

L1

● **All RA, except CLIMB RA during approach in CONF 3 or FULL:**

AP (if engaged).....	OFF
BOTH FDs.....	OFF

Respond promptly and smoothly.

VERTICAL SPEED.....	ADJUST or MAINTAIN
---------------------	--------------------

L2

Adjust or maintain the vertical speed as required, to reach the green area and/or avoid the red area of the vertical speed scale.

L1

***Note:** Avoid excessive maneuvers while attempting to maintain the vertical speed just outside the red area of the vertical speed scale, and within the green area. If necessary, use the full speed range between V_{max} and V_{MAX}.*

● **Any CLIMB RA during approach in CONF 3 or FULL:**

GO-AROUND.....	PERFORM
----------------	---------

Continued on the following page

[MEM] TCAS WARNING - RESOLUTION ADVISORY (Cont'd)

Follow the **SRS** GA mode.

VERTICAL SPEED.....MONITOR

L2

Check that the vertical speed remains out of the red area of the vertical speed scale and take over if necessary.

L1

Respect stall, GPWS or windshear warnings.

ATC.....NOTIFY

● When the “CLEAR OF CONFLICT” aural alert sounds:

ATC.....NOTIFY

LATERAL AND VERTICAL GUIDANCE.....ADJUST

L2

Adjust the lateral and vertical guidance to resume normal navigation, in accordance with ATC clearance.

L1

AP/FD.....AS RQRD

L2

If necessary, reengage the AP/FD.

[MEM] TCAS WARNING - RESOLUTION ADVISORY

Ident.: PRO-ABN-SURV-00012455.0022001 / 16 MAY 22

Applicable to: MSN 02155-05746

Always follow RA orders, even if this results in crossing the intruder altitude, because these orders ensure the best altitude separation.

CAUTION Be aware that the intruder may have a TCAS, and may maneuver in response to a coordinated RA order. Therefore, not following an RA order could compromise safe separation.

■ **All RA, except any CLIMB RA during approach in CONF 3 or FULL:**

AP (if engaged).....	OFF
BOTH FDs.....	OFF

Respond promptly and smoothly.

VERTICAL SPEED.....	ADJUST or MAINTAIN
---------------------	--------------------

L2

Adjust or maintain the vertical speed as required, to reach the green area and/or avoid the red area of vertical speed scale.

L1

Note: Avoid excessive maneuvers while attempting to maintain the vertical speed just outside the red area of the vertical speed scale, and within the green area. If necessary, use the full speed range between $V_{\alpha max}$ and V_{MAX} .

■ **Any CLIMB RA during approach in CONF 3 or FULL:**

GO-AROUND.....	PERFORM
----------------	---------

Follow the SRS GA mode.

VERTICAL SPEED.....	MONITOR
---------------------	---------

L2

Check that the vertical speed remains out of the red area of the vertical speed scale and take over if necessary.

L1

Respect stall, GPWS, or windshear warnings.

ATC.....	NOTIFY
----------	--------

● **When the "CLEAR OF CONFLICT" aural alert sounds:**

ATC.....	NOTIFY
LATERAL AND VERTICAL GUIDANCE.....	ADJUST

L2

Adjust the lateral and vertical guidance to resume normal navigation, in accordance with ATC clearance.

Continued on the following page

PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES ABNORMAL AND EMERGENCY PROCEDURES SURV
[MEM] TCAS WARNING - RESOLUTION ADVISORY (Cont'd)	
L1 L2	AP/FD.....AS RQRD If necessary, reengage the AP/FD.

[MEM] WINDSHEAR WARNING - REACTIVE WINDSHEAR

Ident.: PRO-ABN-SURV-00012271.0002001 / 12 NOV 24

Applicable to: ALL

If windshear is detected, a **WINDSHEAR** message is displayed on one or both PFDs. An associated aural WINDSHEAR alert sounds three times.

If the systems or the flight crew detect windshear, apply the following procedure:

■ At Takeoff:

- L2 During the takeoff roll, "**WINDSHEAR, WINDSHEAR, WINDSHEAR**" alert is inhibited. Windshear recognition is based on the flight crew observation.

L1 ● Before V1:

If there are significant variations in airspeed, and in airspeed trend below the indicated V1, reject the takeoff.

- L2 *If windshear occurs during the takeoff roll, the aircraft may reach V1 later (or sooner) than expected. The flight crew should ensure that there is sufficient runway remaining to stop the aircraft, if necessary.*

L1 ● After V1:

THR LEVERS.....	TOGA
REACHING VR.....	ROTATE
SRS ORDERS.....	FOLLOW

If necessary, the flight crew may apply full backstick.

Note: *If the FD bars are not displayed, move toward an initial pitch attitude of 17.5 °. Then, if necessary, to prevent a loss of altitude, increase the pitch attitude.*

■ When airborne, during initial climb, or at landing:

THR LEVERS AT TOGA.....	SET OR CONFIRM
AP (if engaged).....	KEEP ON
SRS ORDERS.....	FOLLOW

If necessary, the flight crew may apply full backstick.

Note: 1. The autopilot disengages if the angle of attack value goes above alpha prot.
 2. If the FD bars are not displayed, move toward an initial pitch attitude of 17.5 °.
 Then, if necessary, to prevent a loss of altitude, increase the pitch attitude.

DO NOT CHANGE CONFIGURATION (SLATS/FLAPS, GEAR) UNTIL OUT OF WINDSHEAR.

CAREFULLY MONITOR FLIGHT PATH AND SPEED.

Continued on the following page

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES ABNORMAL AND EMERGENCY PROCEDURES SURV
[MEM] WINDSHEAR WARNING - REACTIVE WINDSHEAR (Cont'd) WHEN OUT OF WINDSHEAR, SMOOTHLY RECOVER NORMAL CLIMB.	

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

SURV

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VENT AVNCS SYS FAULT

Applicable to: ALL

Ident.: PRO-ABN-VENT-AA-00017332.0001001 / 21 MAR 16

ANNUNCIATIONS

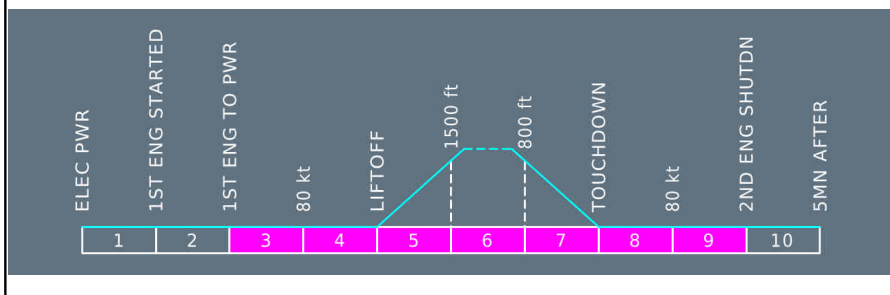
Triggering Conditions:

L2

This alert triggers when:

- The power up test is not satisfactory, or
- The AEVC is not supplied, or
- The valve position disagrees with the commanded position.

Flight Phase Inhibition:



Ident.: PRO-ABN-VENT-AA-00018047.0001001 / 21 MAR 16

Crew awareness.

Ident.: PRO-ABN-VENT-AA-00010775.0001001 / 05 AUG 10

STATUS

INOP SYS

 AVNCS VENT
 VENT BLOWER ⁽¹⁾
 VENT EXTRACT ⁽¹⁾

⁽¹⁾ (If AEVC not supplied)

VENT BLOWER FAULT

Applicable to: MSN 02155-04392, 05162-07784

Ident.: PRO-ABN-VENT-X-00017329.0001001 / 21 MAR 16

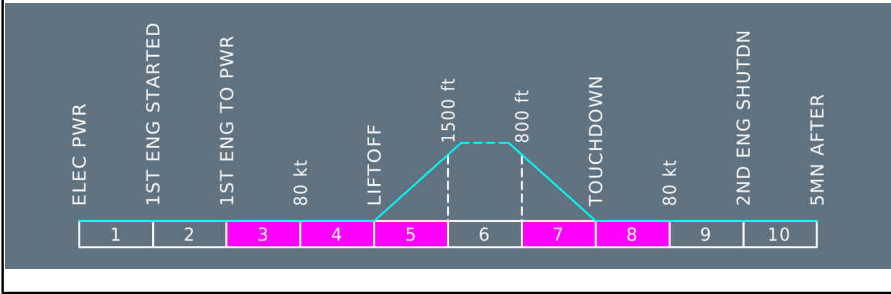
ANNUNCIATIONS

Triggering Conditions:

L2

The alert triggers when the blowing pressure is low or there is a duct overheat.

Flight Phase Inhibition:



Ident.: PRO-ABN-VENT-X-00010768.0005001 / 12 APR 16

■ If NO DC ESS BUS FAULT:

BLOWER.....

OVRD

L2

The ventilation system is in closed circuit configuration and air from air conditioning is added to the ventilation air.

L1 ■ If DC ESS BUS FAULT:

LAND ASAP

Ident.: PRO-ABN-VENT-X-00010769.0006001 / 03 NOV 22

STATUS

INOP SYS

VENT BLOWER

VENT BLOWER FAULT

Applicable to: MSN 05152, 07792

Ident.: PRO-ABN-VENT-X-00017329.0002001 / 03 NOV 21

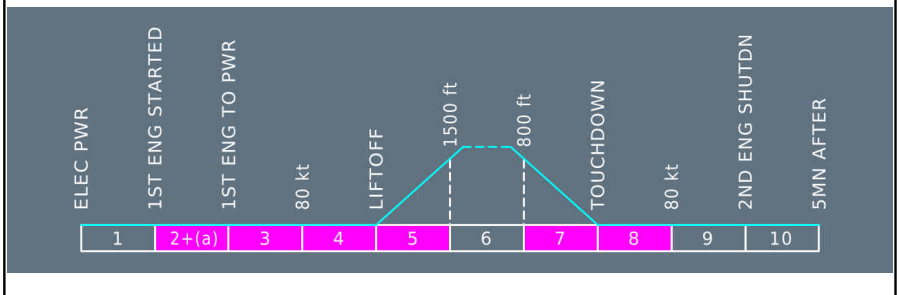
ANNUNCIATIONS

Triggering Conditions:

L2

The alert triggers when the blowing pressure is low or there is a duct overheat.

Flight Phase Inhibition:



Note: (a) Alert inhibited during 10 min after pressing the T.O CONFIG pb in flight phase 2.

Ident.: PRO-ABN-VENT-X-00010768.0005001 / 12 APR 16

■ **If NO DC ESS BUS FAULT:**

BLOWER.....OVRD

L2

The ventilation system is in closed circuit configuration and air from air conditioning is added to the ventilation air.

L1

■ **If DC ESS BUS FAULT:**

LAND ASAP

Continued on the following page

VENT BLOWER FAULT (Cont'd)

Ident.: PRO-ABN-VENT-X-00010769.0006001 / 03 NOV 22

STATUS

INOP SYS

VENT BLOWER

VENT EXTRACT FAULT

Applicable to: ALL

Ident.: PRO-ABN-VENT-Y-00017330.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the extract pressure is low.

Flight Phase Inhibition:

Ident.: PRO-ABN-VENT-Y-00010770.0001001 / 05 AUG 10

EXTRACT
OVRD

L2 The ventilation system is in closed circuit configuration and air from air conditioning is added to the ventilation air.

Continued on the following page

VENT EXTRACT FAULT (Cont'd)

Ident.: PRO-ABN-VENT-Y-00010771.0002001 / 03 NOV 22

STATUS

INOP SYS

VENT EXTRACT

VENT SKIN VALVE FAULT

Applicable to: MSN 02155-04392, 05162-07784

Ident.: PRO-ABN-VENT-Z-00017331.0001001 / 21 MAR 16

L2

ANNUNCIATIONS

Triggering Conditions:

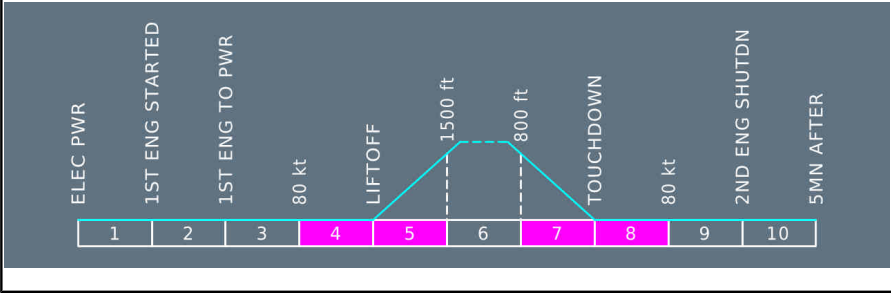
This alert triggers when:

- The extract valve is fully open in phase 3, or

- The extract valve is fully open in flight, or

- The inlet valve is not fully closed in flight.

Flight Phase Inhibition:



The diagram shows a 10-phase flight profile. Phases 1-3 are green, 4-8 are pink, and 9-10 are green. A pink line indicates the inhibition period from 80 kt to 800 ft. Vertical dashed lines mark 1500 ft and 800 ft. Labels above the phases include: ELEC PWR, 1ST ENG STARTED, 1ST ENG TO PWR, 80 kt, LIFTOFF, 1500 ft, 800 ft, TOUCHDOWN, 80 kt, 2ND ENG SHUTDN, and 5MN AFTER.

Continued on the following page

VENT SKIN VALVE FAULT (Cont'd)

Ident.: PRO-ABN-VENT-Z-00018941.0003001 / 21 MAY 24

● If INLET valve not fully closed:

Crew awareness.

[L2] No action is required, since there is a non return valve in the air inlet.

 [L1] **● If EXTRACT valve affected:**

BLOWER.....OVRD

EXTRACT.....OVRD

 [L2] *These actions send additional closure signals to the inlet and extract valves.
 The weather radar image on both NDs may be lost, in case of insufficient ventilation.*

 [L1] **● IF UNSUCCESSFUL:**

MAX FL..... 100/MEA-MORA

CAB PR MODE SEL..... MAN

■ If cabin differential pressure above 1 PSI:

MAN V/S CTL..... UP

TGT V/S : CLIMB 1000 FT/MIN

 [L2] *The aircraft is manually depressurized.
 It may take 10 s in manual mode before the crew notices a change of the outflow valve position.*

 [L1] **■ If cabin differential pressure below 1 PSI or invalid:**

MAN V/S CTL..... FULL UP

 [L2] *The aircraft is manually depressurized.
 It may take 10 s in manual mode before the crew notices a change of the outflow valve position.*
Continued on the following page

VENT SKIN VALVE FAULT (Cont'd)

Ident.: PRO-ABN-VENT-Z-00018942.0003001 / 21 MAR 16

STATUS	
MAX FL: 100/MEA-MORA MAN CAB PR CTL TGT V/S: CLIMB 500 FT/MIN TGT V/S: DESC 300 FT/MIN A/C FL 390 350 300 250 < 200 CAB ALT TGT 8 000 7 000 5 500 3 000 0	INOP SYS AVNCS VALVE

VENT SKIN VALVE FAULT

Applicable to: MSN 05152, 07792

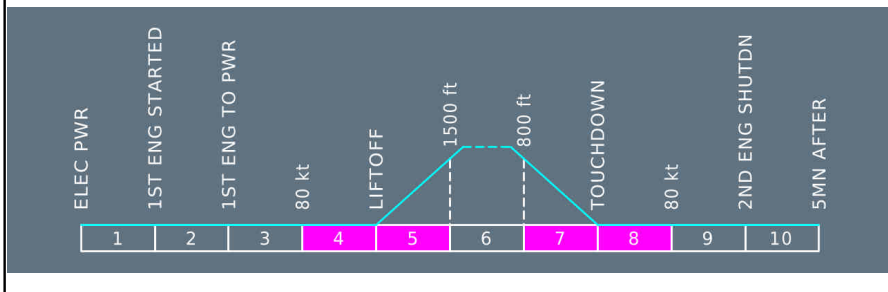
Ident.: PRO-ABN-VENT-Z-00017331.0002001 / 03 NOV 21

ANNUNCIATIONS
Triggering Conditions:

L2

This alert triggers when:

- The extract valve is fully open 5s after pressing the T.O CONFIG pb in phase 2, or
- The extract valve is neither fully closed nor partially open 25s after pressing the T.O CONFIG pb in phase 2, or
- The inlet valve is not fully closed 25s after pressing the T.O CONFIG pb in phase 2, or
- The extract valve is fully open in phase 3, or
- The extract valve is fully open in flight, or
- The inlet valve is not fully closed in flight.

Flight Phase Inhibition:


Continued on the following page

VENT SKIN VALVE FAULT (Cont'd)

Ident.: PRO-ABN-VENT-Z-00018941.0003001 / 21 MAY 24

● **If INLET valve not fully closed:**

Crew awareness.

L2 No action is required, since there is a non return valve in the air inlet.

L1 ● **If EXTRACT valve affected:**

BLOWER.....OVRD
EXTRACT..... OVRD

L2 These actions send additional closure signals to the inlet and extract valves.
The weather radar image on both NDs may be lost, in case of insufficient ventilation.

L1 ● **IF UNSUCCESSFUL:**

MAX FL..... 100/MEA-MORA
CAB PR MODE SEL..... MAN

■ **If cabin differential pressure above 1 PSI:**

MAN V/S CTL..... UP
TGT V/S : CLIMB 1000 FT/MIN

L2 The aircraft is manually depressurized.
It may take 10 s in manual mode before the crew notices a change of the outflow valve position.

L1 ■ **If cabin differential pressure below 1 PSI or invalid:**

MAN V/S CTL..... FULL UP

L2 The aircraft is manually depressurized.
It may take 10 s in manual mode before the crew notices a change of the outflow valve position.

Continued on the following page



A318/A319/A320/A321
FLIGHT CREW
OPERATING MANUAL

PROCEDURES
ABNORMAL AND EMERGENCY PROCEDURES
VENT

VENT SKIN VALVE FAULT (Cont'd)

Ident.: PRO-ABN-VENT-Z-00018942.0003001 / 21 MAR 16

STATUS

MAX FL: 100/MEA-MORA

INOP SYS

MAN CAB PR CTL

AVNCS VALVE

TGT V/S: CLIMB 500 FT/MIN

TGT V/S: DESC 300 FT/MIN

A/C FL

CAB ALT TGT

390

8 000

350

7 000

300

5 500

250

3 000

< 200

0

[QRH] WHEEL TIRE DAMAGE SUSPECTED

Ident.: PRO-ABN-WHEEL-00019841.0002001 / 12 SEP 17

Applicable to: ALL

LDG DIST PROC.....APPLY

Performance impact of one burst tire is equivalent to one brake released.

TAXI WITH CARE

Refer to LIM-LG Taxi with Deflated or Damaged Tires

WHEEL HYD SEL FAULT

Applicable to: MSN 02155-02212

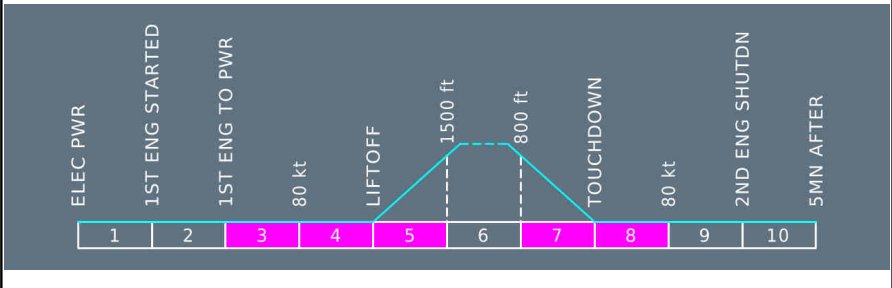
Ident.: PRO-ABN-WHEEL-AE-00017810.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the brake normal selector valve is failed, or the NWS selector valve is at open position.

Flight Phase Inhibition:



The diagram shows a flight profile with various phases and altitudes. The phases are labeled vertically: ELEC PWR, 1ST ENG STARTED, 1ST ENG TO PWR, 80 kt, LIFTOFF, 1500 ft, 800 ft, TOUCHDOWN, 80 kt, 2ND ENG SHUTDN, and 5MN AFTER. Below these labels is a horizontal timeline with 10 numbered boxes. Boxes 3, 4, 5, 6, 7, and 8 are highlighted in pink, indicating the flight phases where the alert is inhibited.

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

WHEEL

WHEEL HYD SEL FAULT (Cont'd)

Ident.: PRO-ABN-WHEEL-AE-00018363.0001001 / 21 MAR 16

- [L2]** - If the normal brake selector valve is failed open, full green hydraulic pressure is present at normal servovalves' entry.
Nosewheel steering remains available.
- On ground, do not tow the aircraft with the green hydraulic system pressurized: If the steering selector valve is failed open, nosewheel steering remains pressurized, and so towing may either break the towbar shear pin, or the nose gear (if towbarless towing).
 - If the steering selector valve is failed open, setting A/SKID & N/W STRG sw to OFF will cause the nosewheel to go to maximum deflection.

[L1] A/SKID & N/W STRG.....KEEP ON

[L2] As long as antiskid is operative, brake pressure is regulated by normal servovalves.

WHEEL HYD SEL FAULT

Applicable to: MSN 02719-07792

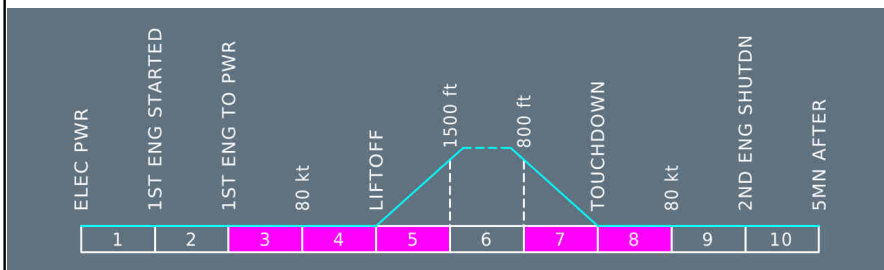
Ident.: PRO-ABN-WHEEL-AE-00017810.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

- [L2]** This alert triggers when the brake normal selector valve is failed, or the NWS selector valve is at open position.

Flight Phase Inhibition:



Continued on the following page

WHEEL HYD SEL FAULT (Cont'd)

Ident.: PRO-ABN-WHEEL-AE-00018363.0003001 / 21 MAR 16

- L2** - If the normal brake selector valve is failed open, full green hydraulic pressure is present at normal servovalves' entry.
Nosewheel steering remains available.
- On ground, do not tow the aircraft with the yellow hydraulic system pressurized: If the steering selector valve is failed open, nosewheel steering remains pressurized, and so towing may either break the towbar shear pin, or the nose gear (if towbarless towing).
 - If the steering selector valve is failed open, setting A/SKID & N/W STRG sw to OFF will cause the nosewheel to go to maximum deflection.

L1 A/SKID & N/W STRG.....**KEEP ON**

L2 As long as antiskid is operative, brake pressure is regulated by normal servovalves.

WHEEL N/W STRG FAULT

Applicable to: **ALL**

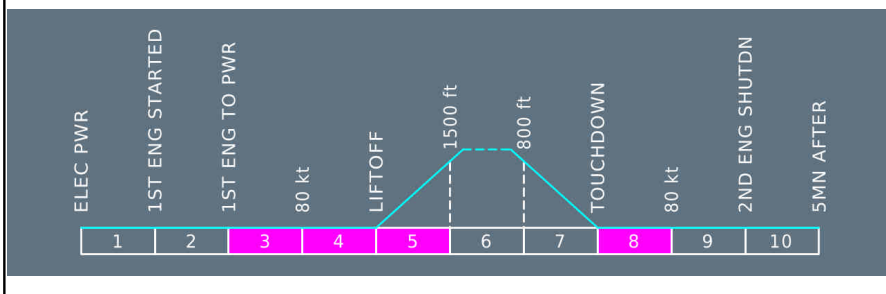
Ident.: PRO-ABN-WHEEL-AF-00017744.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the nose wheel steering system is failed.

Flight Phase Inhibition:



Continued on the following page

PROCEDURES
ABNORMAL AND EMERGENCY PROCEDURES
WHEEL
WHEEL N/W STRG FAULT (Cont'd)

Ident.: PRO-ABN-WHEEL-AF-00018712.0001001 / 21 MAR 16

Crew awareness.

Ident.: PRO-ABN-WHEEL-AF-00018713.0001001 / 21 MAR 16

L12

STATUS
INOP SYS
CAT 3 SINGLE ONLY
CAT 3 DUAL
N/W STRG

 See ⁽¹⁾

- ⁽¹⁾ Note:
1. If the **L/G SHOCK ABSORBER FAULT** is also displayed, then the nose wheels may be at maximum deflection (turned 90 ° from center). During landing, delay nose wheel touchdown as long as possible.
 2. Automatic rollout is not permitted (Refer to QRH/OPS Required Equipment for CAT2 and CAT3).

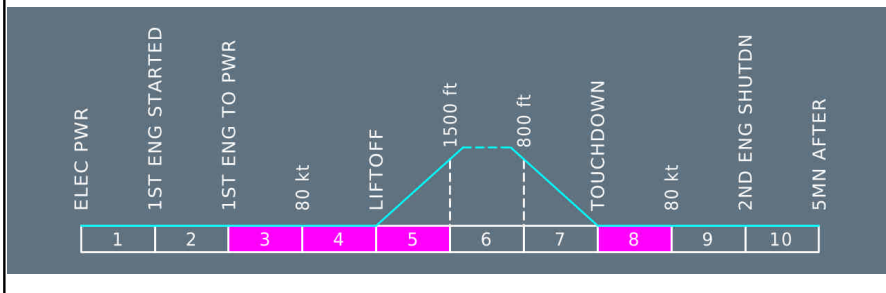
WHEEL TYRE LO PR
Applicable to: ALL

Ident.: PRO-ABN-WHEEL-AG-00017824.0003001 / 21 MAR 16

ANNUNCIATIONS
Triggering Conditions:
L2

This alert triggers when one of the following cases occurs:

- One tire pressure is below:
 - 74% of nominal pressure between liftoff and engines shutdown, or
 - 89% of nominal pressure in other cases.
- There is difference of pressure between two wheels of the same axle that is above:
 - 21% of nominal pressure between liftoff and engines shutdown, or
 - 15% of nominal pressure in other cases.

Flight Phase Inhibition:


Ident.: PRO-ABN-WHEEL-AG-00018714.0001001 / 21 MAR 16

Crew awareness.

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

WHEEL

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WING A.ICE L(R) HI PR

Applicable to: ALL

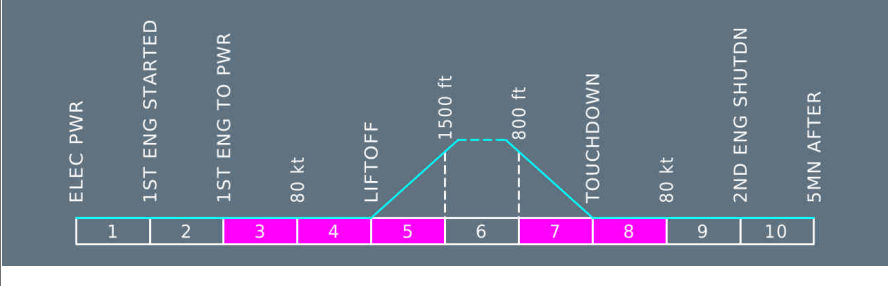
Ident.: PRO-ABN-W_A_ICE-Q-00017161.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

This alert triggers when the WING ANTI ICE pb-sw is set to ON and the pressure sensor (downstream of the valve) indicates a high pressure in the duct.

Flight Phase Inhibition:



Ident.: PRO-ABN-W_A_ICE-Q-00018328.0001001 / 21 MAR 16

THRUST LIM PENALTY

Ident.: PRO-ABN-W_A_ICE-Q-00018330.0001001 / 21 MAR 16

STATUS

THRUST LIM PENALTY

INOP SYS
 WAI REGUL

WING A.ICE L(R) VALVE OPEN
(FAILURE DETECTED IN FLIGHT)

Applicable to: ALL

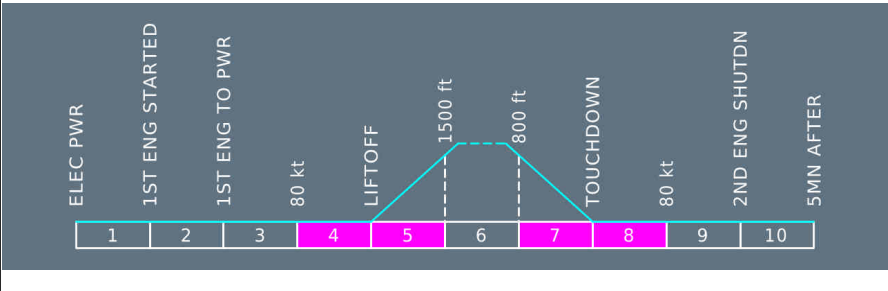
Ident.: PRO-ABN-W_A_ICE-N-00017160.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

- L2** This alert triggers when the WING ANTI ICE pb-sw is set to OFF and one wing anti ice valve remains open, in flight.

Flight Phase Inhibition:



Ident.: PRO-ABN-W_A_ICE-N-00018331.0001001 / 21 MAR 16

WAI AVAIL IN FLT
WING ANTI ICE.....AS RQRD

- L2** Wing anti-ice is available if needed and anyway is continually on, on failed side.

L1 THRUST LIM PENALTY

- **After landing (automatic recall):**
ENG BLEED (AFFECTED SIDE)..... OFF
X BLEED (IF NOT CLOSED)..... SHUT
APU BLEED (IF LEFT WING AFFECTED)..... OFF
WING ANTI ICE..... OFF

Continued on the following page

WING A.ICE L(R) VALVE OPEN (Cont'd)
(FAILURE DETECTED IN FLIGHT)

Ident.: PRO-ABN-W_A_ICE-N-00018332.0001001 / 21 MAR 16

STATUS

- **In flight:**
THRUST LIM PENALTY
WAI AVAIL IN FLT

INOP SYS

ENG 1(2) BLEED (On ground only)
PACK 1(2) (On ground only)

WING A.ICE L(R) VALVE OPEN
(FAILURE DETECTED ON GROUND)

Applicable to: ALL

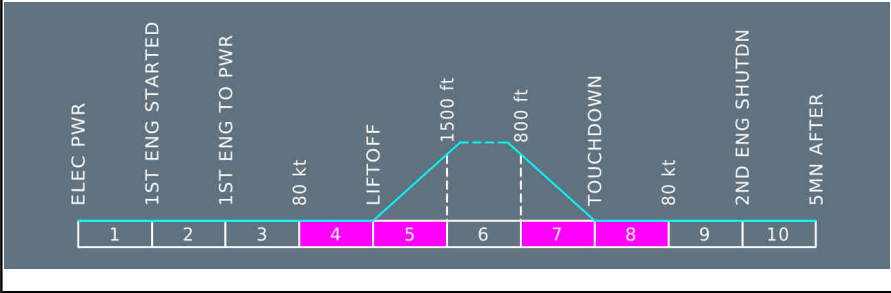
Ident.: PRO-ABN-W_A_ICE-M-00017495.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the WING ANTI ICE pb-sw is set to OFF and one wing anti ice valve remains open, on ground.

Flight Phase Inhibition:



The diagram shows a flight profile across 10 phases. Phases 1-3 are inhibited (grey). Phases 4-8 are active (pink). Phases 9-10 are inhibited (grey). The profile includes labels for ELEC PWR, 1ST ENG STARTED, 1ST ENG TO PWR, 80 kt, LIFTOFF, 1500 ft, 800 ft, TOUCHDOWN, 80 kt, 2ND ENG SHUTDN, and 5MN AFTER.

Continued on the following page

PIA A318/A319/A320/A321 FLEET

FCOM

← B to C →

PRO-ABN-W_A_ICE P 3/8

09 FEB 26

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

WING A.ICE

WING A.ICE L(R) VALVE OPEN (Cont'd)

(FAILURE DETECTED ON GROUND)

Ident.: PRO-ABN-W_A_ICE-M-00018333.0001001 / 21 MAR 16

WING ANTI ICE..... OFF
 ENG BLEED (AFFECTED SIDE)..... OFF
 X BLEED (IF NOT CLOSED)..... SHUT
 APU BLEED (IF LEFT WING AFFECTED AND IF APU RUNNING)..... OFF
 WAI AVAIL IN FLT

■ **After takeoff when above 1 500 ft (automatic recall):**

WAI AVAIL IN FLT
 ENG BLEED (AFFECTED SIDE)..... ON
 WING ANTI ICE..... AS RQRD

L2 *Wing anti ice is available if needed and anyway is continually on, on failed side.*

L1 **THRUST LIM PENALTY**

■ **After landing (automatic recall):**

WING ANTI ICE..... OFF
 ENG BLEED (AFFECTED SIDE)..... OFF
 X BLEED (IF NOT CLOSED)..... SHUT
 APU BLEED (IF LEFT WING AFFECTED)..... OFF

Ident.: PRO-ABN-W_A_ICE-M-00018334.0001001 / 21 MAR 16

STATUS

INOP SYS

● **Before takeoff:**

WAI AVAIL IN FLT

● **In flight:**

THRUST LIM PENALTY

ENG 1 (2) BLEED (On ground only)

PACK 1 (2) (On ground only)

WING A.ICE L(R) WING LO PR

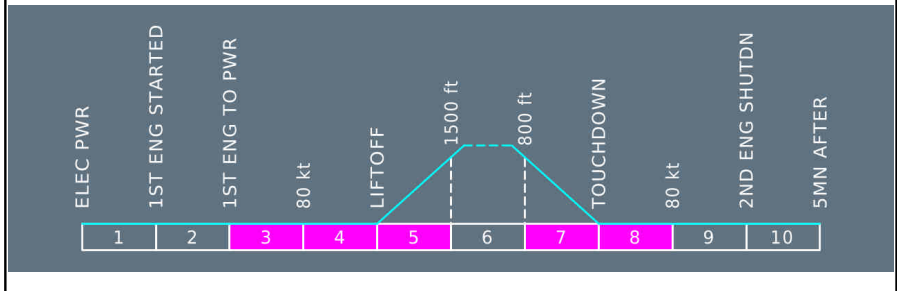
Applicable to: ALL

1 Ident.: PRO-ABN-W_A_ICE-R-00023800.0001001 / 24 MAR 20

ANNUNCIATIONS
Triggering Conditions:

L2

This alert triggers when the WING ANTI ICE pb-sw is set to ON and the pressure sensor (downstream of the valve) detects a low pressure in the duct.

Flight Phase Inhibition:


2 Ident.: PRO-ABN-W_A_ICE-R-00023801.0001001 / 24 MAR 20

THRUST..... INCREASE

● IF UNSUCCESSFUL:

WING ANTI ICE..... OFF

AVOID ICING CONDITIONS

Continued on the following page

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

WING A.ICE

WING A.ICE L(R) WING LO PR (Cont'd)

Ident.: PRO-ABN-W_A_ICE-R-00023802.0001001 / 24 MAR 20

STATUS

AVOID ICING CONDITIONS

● IF SEVERE ICE ACCRETION

MIN SPD..... VLS + 10 / G DOT

MANEUVER WITH CARE

LDG DIST PROC.....APPLY

INOP SYS

WING A.ICE

WING A.ICE OPEN ON GND

Applicable to: ALL

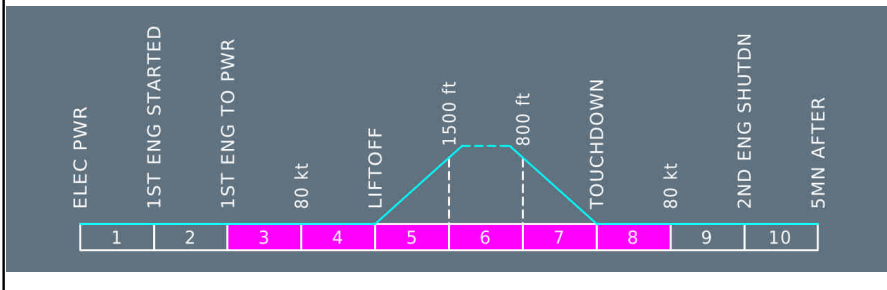
Ident.: PRO-ABN-W_A_ICE-O-00017158.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

- [2] This alert triggers when the aircraft is on ground and the wing anti ice valves remain open for more than 35 s after the WING ANTI ICE pb-sw is set to ON.

Flight Phase Inhibition:



Ident.: PRO-ABN-W_A_ICE-O-00018311.0001001 / 21 MAR 16

WING ANTI ICE..... OFF

Continued on the following page

WING A.ICE OPEN ON GND (Cont'd)

Ident.: PRO-ABN-W_A_ICE-O-00018335.0001001 / 21 MAR 16	
STATUS	
WAI AVAIL IN FLT	

WING A.ICE SYS FAULT

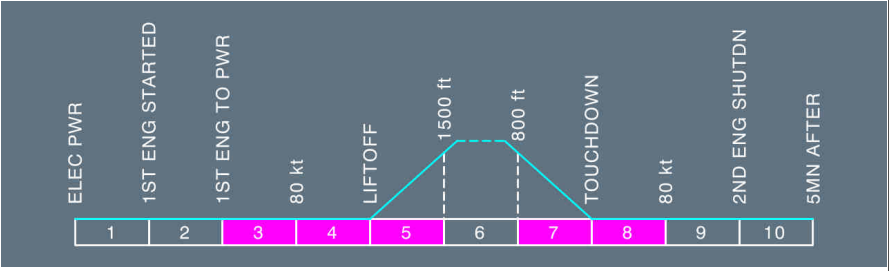
Applicable to: ALL
Ident.: PRO-ABN-W_A_ICE-AB-00024062.0002001 / 24 MAR 20

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the WING ANTI ICE pb-sw is set to ON and one wing anti ice valve remains closed.

Flight Phase Inhibition:



ELEC PWR	1ST ENG STARTED	1ST ENG TO PWR	80 kt	LIFTOFF	1500 ft	800 ft	TOUCHDOWN	80 kt	2ND ENG SHUTDN	5MN AFTER
1	2	3	4	5	6	7	8	9	10	

Continued on the following page

PIA A318/A319/A320/A321 FLEET

FCOM

← E to F →

PRO-ABN-W_A_ICE P 7/8

09 FEB 26

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

WING A.ICE

WING A.ICE SYS FAULT (Cont'd)

Ident.: PRO-ABN-W_A_ICE-AB-00024063.0002001 / 24 MAR 20

- **If one engine or one bleed is not operative:**

X BLEED..... OPEN

L2 Note: The affected pack has to be selected OFF due to precooler performance.

- L1 ■ **If both engines and both bleeds are operative:**

WING ANTI ICE..... OFF

AVOID ICING CONDITIONS

Ident.: PRO-ABN-W_A_ICE-AB-00024064.0002001 / 24 MAR 20

STATUS

- **If both engines and both bleeds are operative:**

AVOID ICING CONDITIONS

- **IF SEVERE ICE ACCRETION**

MIN SPD..... VLS +10/G DOT

MANEUVER WITH CARE

Note: - In the case of severe ice accretion and with failed wing anti-ice, the AOA protections remain efficient,
 - Avoid large roll inputs at high AOA and high thrust setting. In the case of abnormal response in pitch or roll, release the backstick and reduce thrust.

LDG DIST PROC..... APPLY

INOP SYS

WING ANTI ICE ⁽¹⁾

⁽¹⁾ (If both engines and both bleeds are operative)

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GENERAL

Ident.: PRO-ABN-90-00010415.0001001 / 15 OCT 12

Applicable to: ALL

A successful outcome for an emergency situation depends, first of all, upon each crew member's perfect knowledge and execution of the duties assigned to him.

The captain should check frequently that all crew members know exactly their assigned positions and their specific duties, as well as the duties of the other crew members, in case of an abnormal or an emergency condition.

Since it is not possible to cover all the situations that may occur, the captain will be responsible for adapting the following instructions to obtain the best coordination of the emergency operation. Should it be physically impossible for the captain to carry out his duties, another crew member will substitute for him according to the chain of command. The procedures in this manual are AIRBUS procedures and should be considered to be a reference.

COCKPIT-ASSIGNED DUTIES FOR EVACUATION

Ident.: PRO-ABN-90-00010416.0001001 / 03 NOV 21

Applicable to: ALL

■ **If it is NOT POSSIBLE to reach the passenger cabin:**

The flight crew member should evacuate the aircraft via the cockpit clearview windows, by using the escape ropes.

On ground, each flight crew member must help passengers, and direct them away from the aircraft.

■ **If it is POSSIBLE to reach the passenger cabin:**

CAPT	- Is the last person to leave the cockpit: Proceeds to the cabin, and helps with passenger evacuation, as necessary - Is the last person to leave the aircraft: Checks that all persons have evacuated the aircraft - Evacuates the aircraft, via the rear door, or any other available exit, if the flight crew cannot reach the rear door. - On ground, the flight crew takes command of operations until rescue units arrive.
F/O	- Proceeds to the cabin, and takes the emergency equipment. - Evacuates the aircraft, using any available exit. - Helps passengers on ground, and directs them away from the aircraft.

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

DETAILED COCKPIT EVACUATION PROCEDURE

COMMUNICATIONS

Ident.: PRO-ABN-90-00010418.0001001 / 27 FEB 18

Applicable to: ALL

1. EMERGENCY CALL

FROM	TO	COMMUNICATION METHOD(S)	REMARKS
COCKPIT	CABIN	- Press EMER pb-sw on the CALLS panel, or - Passenger Address (PA) System: "PURSER TO COCKPIT PLEASE!"	Purser must immediately go to the cockpit.
CABIN	COCKPIT	- Interphone: "PRIO CAPT"	Any cabin crewmember can make such a call. The cockpit crew must reply.

2. EMERGENCY ALERT

FROM	TO	COMMUNICATION METHOD(S)	REMARKS
COCKPIT	CABIN	- PA System: "ATTENTION CREW! AT STATIONS!"	The cockpit crew makes a short and precise announcement to warn that an emergency evacuation may soon be required. Cabin crews must proceed to their emergency stations.

3. NOTIFICATION TO PASSENGERS

FROM	TO	COMMUNICATION METHOD(S)	REMARKS
COCKPIT	CABIN	- SIGNS ON - PA System	For psychological reasons, the cockpit crew should be the first to inform of an intended emergency landing.
PURSER	CABIN	- CABIN LIGHTS 100 % - PA System	Purser informs passengers that they have to pay special attention to these warnings: - "FINISH PREPARATION" - "BRACE FOR IMPACT" - "EVACUATE, EVACUATE"

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4. FINISH PREPARATION			
FROM	TO	COMMUNICATION METHOD(S)	REMARKS
COCKPIT	CABIN	- Passenger Address (PA) System: "FINISH PREPARATION"	The cockpit crew gives this order a short time before an emergency landing.

5. BRACE FOR IMPACT			
FROM	TO	COMMUNICATION METHOD(S)	REMARKS
COCKPIT	CABIN	- PA System: "BRACE FOR IMPACT!"	The cockpit crew announces to brace for impact approximately 1 min before landing.

6. INITIATE EVACUATION (RESTRICTED EXITS)			
FROM	TO	COMMUNICATION METHOD(S)	REMARKS
COCKPIT	CABIN	- PA System: "EVACUATE, EVACUATE" - Activate EVAC signals 	The cockpit crew orders an immediate evacuation, and the cabin crew directs passengers to all available exits.
CABIN	COCKPIT AND CABIN	- EVAC SIGNAL SYSTEM  on FWD ATTND panel (FAP) - PA System or megaphone	Used by the cabin crew, if there is no signal or order from the cockpit, and if it is unmistakably clear that the aircraft must be evacuated.
CABIN	CABIN	- Verbal	The cabin crew stands up and shouts: - "SEATBELTS OFF!" - "LEAVE EVERYTHING!" - "GET OUT!" - "COME THIS WAY!"

7. EVACUATION NOT REQUIRED			
FROM	TO	COMMUNICATION METHOD(S)	REMARKS
COCKPIT	CABIN	- PA System: "CABIN CREW and PASSENGERS REMAIN SEATED!"	When the Captain decides that an evacuation is not required, the cockpit crew makes an immediate announcement to this effect.

ON GROUND EVACUATION

Applicable to: ALL

Ident.: PRO-ABN-90-A-00010419.0001001 / 16 JAN 18

COCKPIT CREW PROCEDURES

The cockpit crew notifies the cabin crew of the nature of the emergency, and states intentions. The cockpit crew uses the Passenger Address system to make an appropriate announcement, such as: "EVACUATE, EVACUATE", and presses the EVAC COMMAND pb.

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

DETAILED COCKPIT EVACUATION PROCEDURE

COCKPIT EVACUATION THROUGH WINDOW

Applicable to: ALL

Ident.: PRO-ABN-90-B-00010421.0001001 / 05 AUG 10

OPENING THE SLIDING WINDOW

HANDLE..... PUSH DOWN AND PULL BACK

Pulling the handle backwards, opens the sliding window.

Ident.: PRO-ABN-90-B-00010422.0001001 / 24 NOV 15

COCKPIT EVACUATION WITH ESCAPE ROPE

ESCAPE ROPE STOWAGE.....OPEN

The escape rope stowage is located above the sliding window, on either side of the overhead panel.

ESCAPE ROPE.....UNROLL

Unroll the escape rope, and throw it through the window.

SEAT..... STEP ON

ESCAPE ROPE.....GRASP

Grasp the escape rope firmly with both hands, and slide down along the rope.

PROCEDURES

NORMAL PROCEDURES

Intentionally left blank

PRO-NOR-SOP Standard Operating Procedures

PRO-NOR-SOP-01 General Information

Foreword..... A

PRO-NOR-SOP-02 Flight Preparation

GPS PRIMARY Availability (If Installed)..... A

PRO-NOR-SOP-03 Safety Exterior Inspection

Safety Exterior Inspection..... A

PRO-NOR-SOP-04 Preliminary Cockpit Preparation

General..... A

Aircraft Setup..... B

Batteries Check/External Power..... C

APU Fire Test/APU Start..... D

ADIRS..... E

ADIRS..... F

Cockpit Lights..... G

EFB/ACARS (If Installed) Initialization..... H

AIRCRAFT ACCEPTANCE..... I

Preliminary Performance Determination..... J

Before Walkaround..... K

PRO-NOR-SOP-05 Exterior Walkaround

General..... A

Exterior Walkaround..... B

PRO-NOR-SOP-06 Cockpit Preparation

General..... A

Flow Pattern..... B

Overhead Panel..... C

CTR Instrument Panel..... D

Pedestal..... E

ATC Datalink Communication..... F

FMGS Preparation..... G

Glareshield..... H

Lateral Consoles..... I

Instrument Panels..... J

Continued on the following page

Continued from the previous page

ECAM Control Panel.....	K
ADIRS.....	L
Fuel on Board.....	M
Departure Briefing.....	N
PC Dedicated to Maintenance	O
Cockpit Preparation Checklist.....	P

PRO-NOR-SOP-07 Before Pushback or Start

Before Pushback/Start Clearance.....	A
At Pushback/Start Clearance.....	B

PRO-NOR-SOP-08 Engine Start

Automatic Engine Start.....	A
Ground Run Up - Danger Areas.....	B

PRO-NOR-SOP-09 After Start

After Start (All Engines Taxi at Departure).....	A
After Start (One Engine Taxi At Departure).....	B

PRO-NOR-SOP-10 Taxi

All Engines Taxi at Departure.....	A
One Engine Taxi At Departure.....	B

PRO-NOR-SOP-10B Departure Change

Departure Change.....	A
-----------------------	---

PRO-NOR-SOP-11 Before Takeoff

Before Takeoff.....	A
---------------------	---

PRO-NOR-SOP-12 Takeoff

Takeoff.....	A
--------------	---

PRO-NOR-SOP-13 After Takeoff

After Takeoff.....	A
--------------------	---

PRO-NOR-SOP-14 Climb

Climb.....	A
------------	---

PRO-NOR-SOP-15 Cruise

Cruise.....	A
-------------	---

PRO-NOR-SOP-16 Descent Preparation

Descent Preparation.....	A
--------------------------	---

Continued on the following page

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES PRELIMINARY PAGES - TABLE OF CONTENTS
--	---

Continued from the previous page

PRO-NOR-SOP-17 Descent

Descent Initiation.....	A
Descent Monitoring.....	B
² Descent Adjustment.....	C
Approach Checklist.....	D

PRO-NOR-SOP-18 Approach

³ PRO-NOR-SOP-18-A Approach General

Introduction.....	A
I Cross-Reference Table.....	B
Flying Reference.....	C
Stabilization Criteria.....	D
Approach Speed Technique.....	E
Discontinued Approach.....	F

PRO-NOR-SOP-18-B Aircraft Configuration Management

Initial Approach.....	A
Intermediate/Final Approach.....	B

PRO-NOR-SOP-18-C Aircraft Guidance Management

Approach using LOC G/S Guidance.....	A
Approach using FINAL APP Guidance.....	B
Approach using FINAL APP Guidance for RNP(VPT).....	C
Approach using FPA Guidance.....	D
I Circling Approach.....	E
RNAV Visual Approach.....	F
Visual Approach.....	G

PRO-NOR-SOP-19 Landing

I Manual Landing.....	A
Autoland.....	B

PRO-NOR-SOP-20 Go-Around

Go Around with FD.....	A
------------------------	---

PRO-NOR-SOP-21 After Landing

After Landing.....	A
--------------------	---

PRO-NOR-SOP-21B One Engine Taxi At Arrival

One Engine Taxi At Arrival.....	A
---------------------------------	---

Continued on the following page

Continued from the previous page

PRO-NOR-SOP-22 Parking

Parking.....	A
--------------	---

PRO-NOR-SOP-23 Securing the Aircraft

Securing the Aircraft.....	A
----------------------------	---

PRO-NOR-SCO Standard Callouts

Communications and Standard Terms.....	A
Checklist Callouts.....	B
Actions Commanded by PF.....	C
FMA.....	D
Altitude.....	E
Flaps or Gear Callouts.....	F
Flight Parameters.....	G
PF/PM Duties Transfer.....	H
Summary for Each Phase.....	I

PRO-NOR-TSK Tasksharing

General Information.....	A
Safety Exterior Inspection.....	B
Preliminary Cockpit Preparation.....	C
Cockpit Preparation.....	D
Before Pushback or Start.....	E
Engine Start.....	F
After Start (All Engine Taxi at Departure).....	G
After Start (One Engine Taxi at Departure).....	H
All Engine Taxi at Departure.....	I
All Engine Taxi at departure.....	J
All Engine Taxi at Departure.....	K
One Engine Taxi At Departure.....	L
DEPARTURE CHANGE.....	M
Before Takeoff.....	N
Takeoff.....	O
After Takeoff.....	P
Climb.....	Q
Cruise.....	R
Descent Preparation.....	S
Descent.....	T
Approach.....	U

Continued on the following page

Continued from the previous page

	Manual Landing.....	V
	Automatic Landing.....	W
	Automatic landing.....	X
I	GO AROUND With FD ON.....	Y
	After Landing.....	Z
	One Engine Taxi At Arrival.....	AA
	Parking.....	AB
I	Securing the Aircraft.....	AC

PRO-NOR-SUP Supplementary Procedures

PRO-NOR-SUP-SUP Supplementary Procedures Menu

I	5	Supplementary Procedures.....	A
---	---	-------------------------------	---

PRO-NOR-SUP-ADVWXR Adverse Weather

I	6	Airframe Deicing/Anti-Icing Procedure on Ground.....	A
		Ground Operations in Cold Weather Conditions.....	B
		Ground Operations in Heavy Rain.....	C
		Engine Operations on Ground in Icing Conditions.....	D
		Minimum Speed with Ice Accretion.....	E
I	7	Operations on Contaminated Airports.....	F
	8	Operations with Volcanic Ash, Sand or Dust.....	G
		Securing the Aircraft for Cold Soak.....	H
		For Draining Water Procedure.....	I
		Water System Draining.....	J

PRO-NOR-SUP-ENG Engines

	Manual Engine Start.....	A
	Engine Start with an Air Start Unit.....	B
	Crossbleed Engine Start.....	C
	Engine Start Valve Manual Operation.....	D
	Engine Ventilation (Dry Cranking).....	E

PRO-NOR-SUP-FUEL Fuel

	Refueling.....	A
	Refueling with One Engine Running.....	B
I	Ground Fuel Transfer.....	C
	Defueling.....	D

PRO-NOR-SUP-GPSINT GPS Interference

I	GPS Interference.....	A
---	-----------------------	---

Continued on the following page

PROCEDURES

NORMAL PROCEDURES

PRELIMINARY PAGES - TABLE OF CONTENTS

Continued from the previous page

PRO-NOR-SUP-LG L/G

PRO-NOR-SUP-LG-LG_DN Flight With Landing Gear Down

9 Flight With Landing Gear Down..... A

PRO-NOR-SUP-LG-LG Operation with Nosewheel Steering Offset

Operation with Nosewheel Steering Offset..... A

PRO-NOR-SUP-MISC Miscellaneous

PRO-NOR-SUP-MISC-E Flight Without Cabin Pressurization

Flight Without Cabin Pressurization..... A

PRO-NOR-SUP-MISC-A High Altitude Airport Operations

High Altitude Airport Operations..... A

PRO-NOR-SUP-MISC-C Operations at QNH above 1050 hPa (31.00 inHg)

General..... A

Procedures..... B

PRO-NOR-SUP-MISC-F Operations with QFE Barometric Reference

Introduction..... A

Design Specificities..... B

Procedures..... C

PRO-NOR-SUP-MISC-D Pushback with Power Push Unit

Pushback with Power Push Unit Via the Main Landing Gear..... A

PRO-NOR-SUP-SURV Surveillance

Automatic Dependent Surveillance - Broadcast (ADS-B)..... A

Enhanced Ground Proximity Warning System (EGPWS)..... B

PRO-NOR-SRP Systems Related Procedures

PRO-NOR-SRP-01 FMS

PRO-NOR-SRP-01-05 Introduction

Introduction..... A

PRO-NOR-SRP-01-10 Cockpit Preparation

FMGS Initialization..... A

Flight Plan Initialization..... B

FMGS Data Insertion..... C

FMGS Re-Initialization After a Canceled Flight..... D

Continued on the following page

*Continued from the previous page***PRO-NOR-SRP-01-15 Before Pushback or Start**

Change of Runway.....	A
TAKEOFF FROM INTERSECTION.....	B

PRO-NOR-SRP-01-20 Taxi

FCU Selection for Takeoff.....	A
FMA Mode Check.....	B
Selecting a Navigation Display.....	C
Selecting Takeoff Displays for Pilot's and Copilot's MCDU.....	D

PRO-NOR-SRP-01-30 Takeoff

Monitoring the Takeoff.....	A
PRESELECTING A HDG OR A TRK.....	B
Normal Takeoff Profile.....	C
No Flight Director Takeoff.....	D
TAKEOFF WITH NO V2 ENTRY.....	E
Takeoff Using the Localizer of the Opposite Runway.....	F

PRO-NOR-SRP-01-40 Climb

Monitoring the Climb Phase.....	A
Expedite Climb.....	B
Immediate Return to Origin Airport.....	C

PRO-NOR-SRP-01-50 Cruise

Reaching Cruise Flight Level.....	A
Monitoring the Navigation Accuracy.....	B
Monitoring the Fuel Predictions.....	C
Entering a Step Climb or a Step Descent.....	D
Immediate Change of Level in Cruise.....	E
Preparation for Descent and Approach.....	F

PRO-NOR-SRP-01-60 Descent

DESCENT INITIATION.....	A
Descent Monitoring.....	B
Expedite Descent (If installed).....	C
Monitoring the Navigation in the Terminal Control Area.....	D
Too Steep Path.....	E
Holding Pattern.....	F
MANUAL TERMINATION.....	G

Continued on the following page

Continued from the previous page

PRO-NOR-SRP-01-70 Approach

Initial Approach.....	A
ILS/MLS/GLS/FLS/SLS Approach.....	B
Switching from Non ILS to ILS Approach.....	C
Landing Categories.....	D
Warnings for ILS Approach.....	E

PRO-NOR-SRP-01-80 Go-Around

MONITORING THE GO-AROUND.....	A
Go-Around Profile.....	B
Missed Approach: Try Again.....	C
Missed Approach: Divert.....	D
Task Sharing During a Go-Around.....	E

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS
--	---

Localization Title	Toc Index	ID	Reason
PRO-NOR-PLP-TOC FMGS Preparation		1	Documentation update: Deletion of "FMGS Preparation - QNH AT DESTINATION PRE-ENTRY (PERF/APPR PAGE) (00025235)".
			Documentation update: Deletion of "FMGS Preparation - QNH AT DESTINATION PRE-ENTRY (PERF/APPR PAGE) (00025235.0001001)".
PRO-NOR-PLP-TOC Descent Adjustment		2	Documentation update: Deletion of "Descent Adjustment - BARO Ref (00011546.0002001)".
			Simplification of configuration management
PRO-NOR-PLP-TOC Approach General		3	Documentation update: Deletion of "Cross-Reference Table (00014489.0001001)".
PRO-NOR-PLP-TOC Summary for Each Phase		4	Documentation update: Deletion of "Summary for Each Phase - Approach and Landing (00011925.0001001)".
PRO-NOR-PLP-TOC Supplementary Procedures		5	Documentation update: Deletion of "Miscellaneous (00020254)".
			Documentation update: Deletion of "Miscellaneous (00020254.0001001)".
PRO-NOR-PLP-TOC Airframe Deicing/Anti-Icing Procedure on Ground		6	Documentation update: Deletion of "Before Fluid Spraying (00020694.0003001)".
PRO-NOR-PLP-TOC Operations on Contaminated Airports		7	Documentation update: Deletion of "Undue Alerts (00020726.0002001)".
PRO-NOR-PLP-TOC Operations with Volcanic Ash, Sand or Dust		8	Documentation update: Deletion of "Landing (00020742.0002001)".
			Documentation update: Deletion of "Taxi (00020736.0002001)".
			Documentation update: Deletion of "After Takeoff (00020738.0001001)".
PRO-NOR-PLP-TOC Flight With Landing Gear Down		9	Documentation update: Deletion of "Flight With Gear Down - abnormal procedures (00025310.0017001)".
PRO-NOR-SOP-04 APU Fire Test/Start - APU Start	D	1	Removal of action line "ALL WHITE LIGHTS...OFF" because this action should be perform during overhead panel scan sequence in the cockpit preparation phase.
			Layout modification. No technical change.
			Documentation update: Deletion of information.
PRO-NOR-SOP-04 ADIRS	F	2	Documentation update: Addition of "ADIRS" documentary unit
PRO-NOR-SOP-04 ACARS /AOC Initialization	H	3	Layout modification. No technical change.
PRO-NOR-SOP-04 ACARS /AOC Initialization	H	4	Layout modification. No technical change.
PRO-NOR-SOP-04 FMGS Pre-Initialization - General	H	5	Layout modification. No technical change.

Continued on the following page

PROCEDURES

NORMAL PROCEDURES

PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS

Continued from the previous page

Localization Title	Toc Index	ID	Reason
PRO-NOR-SOP-04 Preliminary Performance Determination	J	6	Addition of wording "CDL" in order to in accordance with the action line.
PRO-NOR-SOP-06 Cargo Heat	C	1	Layout modification. No technical change.
PRO-NOR-SOP-06 Cargo Heat	C	2	Documentation update: Deletion of text.
PRO-NOR-SOP-06 Cargo Heat	C	3	Wording enhancement of the actions to be in accordance with the cockpit layout.
PRO-NOR-SOP-06 FMGS Initialization - General	G	4	Update of the content related to the EFB. The objective is to provide a generic documentation, applicable to all types of EFBs.
PRO-NOR-SOP-06 FMGS Initialization - FM Database Validity	G	5	Update of the sentence in order to inform the flight crew to select AIRAC Cycle #2 before the first flight of the day.
PRO-NOR-SOP-06 FMGS Initialization - NAVAID Deselection	G	6	Removal of the types of NAVAIDs in order to be more generic.
PRO-NOR-SOP-06 FMGS Data Insertion - Takeoff Data Insertion (PERF TAKEOFF PAGE)	G	7	Clarification of the note associated to the T.O shift setting.
PRO-NOR-SOP-06 Glareshield - EFIS Control Panel	H	8	Removal of the information related to QFE operations. If the QFE option is installed, QFE procedures are moved to the new supplementary procedure.
PRO-NOR-SOP-06 PC Dedicated to Maintenance ✈	O	9	Transformation of the information into an action line to be in accordance with the Airbus authoring policy.
PRO-NOR-SOP-09 After Start - Flow Pattern	A	1	Documentation update: Deletion of information.
PRO-NOR-SOP-09 After Start - Pitch Trim	A	2	Wording enhancement. No technical change.
PRO-NOR-SOP-09 After Start - Thrust Setting	A	3	Addition of an action to check the appropriate thrust selection of flex or derate thrust on the Engine/Warning Display.
PRO-NOR-SOP-09 After Start - Flow Pattern	B	4	Update the word "PITCH TRIM handwheel" to PITCH TRIM wheel" to make it clear and consistent within the manual.
PRO-NOR-SOP-09 After Start - APU	B	5	Documentation update: Addition of "After Start - Thrust Setting" documentary unit
			Wording enhancement. No technical change.
			Addition of an action to check the appropriate thrust selection of flex or derate thrust on the Engine/Warning Display.
			Administrative update: No technical change.

Continued on the following page

Continued from the previous page

Localization Title	Toc Index	ID	Reason
PRO-NOR-SOP-09 After Start - Flaps Lever	B	6	Addition of the recommendation related to flap management on ground in icing conditions to be consistent with the procedure for all engines taxi at departure.
PRO-NOR-SOP-09 After Start - Pitch Trim	B	7	Update the word "PITCH TRIM handwheel" to PITCH TRIM wheel" to make it clear and consistent within the manual.
PRO-NOR-SOP-09 After Start - Thrust Setting	B	8	Documentation update: Addition of "After Start - Thrust Setting" documentary unit
PRO-NOR-SOP-10 Taxi - AFS/Flight Instruments	A	1	Layout modification. No technical change.
PRO-NOR-SOP-10 Taxi - ENG Mode Selector	A	2	Wording enhancement. No technical change.
			Documentation update: Deletion of information.
PRO-NOR-SOP-10 Taxi - ENG Mode Selector	B	3	Wording enhancement. No technical change.
PRO-NOR-SOP-13 After Takeoff - Anti-Ice Protection	A	1	Update of the content to highlight the importance of the operation of the engine anti-ice system.
			Wording enhancement. No technical change.
PRO-NOR-SOP-14 Climb - Anti Ice Protection	A	1	Update of the content to highlight the importance of the operation of the engine anti-ice system
			Documentation update: Deletion of information.
PRO-NOR-SOP-16 Descent Preparation - Barometric Reference	A	1	Removal of the information related to QFE operations. If the QFE option is installed, QFE procedures are moved to the new supplementary procedure.
PRO-NOR-SOP-16 Descent Preparation - FMGS - PERF APPR - PERF GO AROUND	A	2	Documentation update: Deletion of information.
			Removal of the information related to QFE operations. If the QFE option is installed, QFE procedures are moved to the new supplementary procedure.
			Wording enhancement. No technical change.
PRO-NOR-SOP-16 Descent Preparation - FMGS - PERF APPR - PERF GO AROUND	A	3	Removal of the information related to QFE operations. If the QFE option is installed, QFE procedures are moved to the new supplementary procedure.
			Wording enhancement. No technical change.
			Documentation update: Deletion of information.
PRO-NOR-SOP-18-A Cross-Reference Table	B	1	Documentation update: Addition of "Cross-Reference Table" documentary unit
PRO-NOR-SOP-18-A Cross-Reference Table	B	2	Update to the content in order to add the RNP(VPT) procedure.
PRO-NOR-SOP-18-C Approach using LOC G/S Guidance - Final Approach	A	1	Update of the link to refer to the limitation of minimum height with autopilot function.

Continued on the following page

PROCEDURES

NORMAL PROCEDURES

PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS

Continued from the previous page

Localization Title	Toc Index	ID	Reason
PRO-NOR-SOP-18-C Approach using FINAL APP Guidance - At Entered Minimum	B	2	The tasksharing is modified to clarify that the action is performed by the PM upon request of the PF.
PRO-NOR-SOP-18-C Approach using FINAL APP Guidance - At Entered Minimum	B	3	The tasksharing is modified to clarify that the action is performed by the PM upon request of the PF.
PRO-NOR-SOP-18-C Approach using FINAL APP Guidance for RNP(VPT) - General	C	4	Documentation update: Addition of "Approach using FINAL APP Guidance for RNP(VPT) - General" documentary unit
PRO-NOR-SOP-18-C Approach using FINAL APP Guidance for RNP(VPT) - Aircraft Equipment	C	5	Documentation update: Addition of "Approach using FINAL APP Guidance for RNP(VPT) - Aircraft Equipment" documentary unit
PRO-NOR-SOP-18-C Approach using FINAL APP Guidance for RNP(VPT) - Flight Preparation	C	6	Documentation update: Addition of "Approach using FINAL APP Guidance for RNP(VPT) - Flight Preparation" documentary unit
PRO-NOR-SOP-18-C Approach using FINAL APP Guidance for RNP(VPT) - Descent Preparation	C	7	Documentation update: Addition of "Approach using FINAL APP Guidance for RNP(VPT) - Descent Preparation" documentary unit
PRO-NOR-SOP-18-C Approach using FINAL APP Guidance for RNP(VPT) - Descent	C	8	Documentation update: Addition of "Approach using FINAL APP Guidance for RNP(VPT) - Descent" documentary unit
PRO-NOR-SOP-18-C Approach using FINAL APP Guidance for RNP(VPT) - Descent Preparation	C	9	Documentation update: Addition of "Approach using FINAL APP Guidance for RNP(VPT) - Descent Preparation" documentary unit
PRO-NOR-SOP-18-C Approach using FINAL APP Guidance for RNP(VPT) - At the latest at the Minimum Use Height of the AP	C	10	Documentation update: Addition of "Approach using FINAL APP Guidance for RNP(VPT) - At the latest at the Minimum Use Height of the AP" documentary unit
PRO-NOR-SOP-18-C Approach using FINAL APP Guidance for RNP(VPT) - At the latest at the Minimum Use Height of the AP	C	11	Documentation update: Addition of "Approach using FINAL APP Guidance for RNP(VPT) - At the latest at the Minimum Use Height of the AP" documentary unit
PRO-NOR-SOP-18-C	C	12	Documentation update: Addition of "Approach using FINAL APP Guidance for RNP(VPT) - Management of Degraded Navigation" documentary unit

Continued on the following page

Continued from the previous page

Localization Title	Toc Index	ID	Reason
Approach using FINAL APP Guidance for RNP(VPT) - Management of Degraded Navigation			
PRO-NOR-SOP-18-C Circling Approach - Circling Approach	E	13	Update of the task sharing of action line "LANDING C/L...COMPLETE" from "PF-PM" to "BOTH" to be in accordance with the task sharing definition. Documentation update: Deletion of information. Removal of the action "FDs OFF...ORDER" to standardize the actions on the FD at minimum.
PRO-NOR-SOP-19 Landing - Flare	A	1	Addition of the reference to the landing callouts. Layout modification. No technical change.
PRO-NOR-SOP-23 Securing the Aircraft - Securing the Aircraft Checklist	A	1	Update of the tasksharing to clarify that CM2 should perform these actions.
PRO-NOR-SOP-23 Securing the Aircraft - Electronic Flight Bag (EFB)	A	2	Update of the task sharing from "PF-PM" to "CM1-CM2" to be consistent with the tasksharing of the Securing the Aircraft phase.
PRO-NOR-SCO Checklist Callouts	B	1	Removal of "CROSSCHECKED" callout because this callout is no longer used in the normal checklist. Documentation update: Deletion of text.
PRO-NOR-SCO Summary for Each Phase - Approach and Landing	I	2	Documentation update: Addition of "Summary for Each Phase - Approach and Landing" documentary unit
PRO-NOR-TSK Preliminary Cockpit Preparation - APU FIRE TEST/APU START	C	1	Update wording from "RMP" to "RMP 1 and 2" to be in accordance with the SOP.
PRO-NOR-TSK Preliminary Cockpit Preparation - EFB/ACARS /AOC Initialization	C	2	Layout modification. No technical change.
PRO-NOR-TSK Preliminary Cockpit Preparation - EFB/ACARS /AOC Initialization	C	3	Layout modification. No technical change.
PRO-NOR-TSK Cockpit Preparation - Pedestal	D	4	Update of the action line for the operation of ATC SYS 2.
PRO-NOR-TSK Cockpit Preparation - Pedestal	D	5	Update of the action line for the operation of ATC SYS 2.
PRO-NOR-TSK	D	6	Transformation of the information into an action line to be in accordance with the Airbus authoring policy.

Continued on the following page

PROCEDURES

NORMAL PROCEDURES

PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS

Continued from the previous page

Localization Title	Toc Index	ID	Reason
Cockpit Preparation - LATERAL CONSOLE AND PF/PM INSTRUMENT PANELS			
PRO-NOR-TSK Before Pushback or Start - BEFORE PUSHBACK/START CLEARANCE	E	7	Addition of action lines "ZFW/ZFWCG...CHECK/REVISE" and "ZFW/ZFWCG...CROSSCHECK". Wording enhancement. No technical change.
PRO-NOR-TSK BEFORE PUSHBACK OR START - At Pushback/Start Clearance	E	8	Correction of a typo.
PRO-NOR-TSK After Start (All Engine Taxi at Departure)	G	9	Addition of an action to check the appropriate thrust selection of flex or derate thrust on the Engine/Warning Display. Documentation update: Deletion of information. Layout modification. No technical change. Addition of action line "RUD TRIM RESET pb...PRESS". Update the word "PITCH TRIM" to PITCH TRIM wheel" to make it clear and consistent within the manual.
PRO-NOR-TSK After Start (One Engine Taxi at Departure)	H	10	Addition of an action to check the appropriate thrust selection of flex or derate thrust on the Engine/Warning Display. Documentation update: Deletion of information. Documentation update: Information "N.00027743.0001001.021" moved from "N.00027743.0001001.020" to "N.00027743.0001001.013" Documentation update: Information "N.00027743.0001001.023" moved from "N.00027743.0001001.022" to "N.00027743.0001001.020" Layout modification. No technical change. Documentation update: Information "N.00027743.0001001.015" moved from "N.00027743.0001001.013" to "N.00027743.0001001.008" Addition of action line "RUD TRIM RESET pb...PRESS". Update the word "PITCH TRIM" to PITCH TRIM wheel" to make it clear and consistent within the manual. Documentation update: Information "N.00027743.0001001.009" moved from "N.00027743.0001001.008" to "N.00027743.0001001.005"
PRO-NOR-TSK One Engine Taxi At Departure	L	11	Documentation update: Deletion of information. Addition of action line "BRAKES PRESSURE...CHECK AT ZERO". Layout modification and wording enhancement in order to better illustrate the weather radar control panel.

Continued on the following page

Continued from the previous page

Localization Title	Toc Index	ID	Reason
PRO-NOR-TSK One Engine Taxi At Departure	L	12	Addition of action line "BRAKES PRESSURE...CHECK AT ZERO".
PRO-NOR-TSK One Engine Taxi At Departure	L	13	Addition of action line "BRAKES PRESSURE...CHECK AT ZERO".
PRO-NOR-TSK Before Takeoff	N	14	Layout modification. No technical change.
PRO-NOR-TSK After Takeoff	P	15	Wording enhancement. No technical change.
PRO-NOR-TSK Climb	Q	16	Wording enhancement. No technical change.
PRO-NOR-TSK Descent Preparation	S	17	Wording enhancement. No technical change.
PRO-NOR-TSK Approach using FINAL APP Guidance for RNP(VPT)	U	18	Documentation update: Addition of "Approach using FINAL APP Guidance for RNP(VPT)" documentary unit
PRO-NOR-TSK GO AROUND With FD ON	Y	19	Wording enhancement. No technical change.
PRO-NOR-TSK Securing the Aircraft	AC	20	Update of the tasksharing to clarify that CM2 should perform these actions.
			Documentation update: Information "N.00024930.0003001.028" moved from "N.00024930.0003001.026" to "N.00024930.0003001.037"
			Layout modification. No technical change.
			Documentation update: Deletion of information.
PRO-NOR-TSK Securing the Aircraft	AC	21	Layout modification. No technical change.
			Documentation update: Deletion of information.
			Update of the tasksharing to clarify that CM2 should perform these actions.
			Documentation update: Information "N.00024930.0002001.034" moved from "N.00024930.0002001.024" to "N.00024930.0002001.045"
PRO-NOR-SUP-SUP Miscellaneous	A	1	Documentation update: Addition of "Miscellaneous" documentary unit
PRO-NOR-SUP-SUP Miscellaneous	A	2	Documentation update: Addition of "Miscellaneous" documentary unit
PRO-NOR-SUP-SUP Miscellaneous	A	3	Documentation update: Addition of "Miscellaneous" documentary unit
PRO-NOR-SUP-ADVWXR Before Fluid Spraying	A	2	Documentation update: Deletion of information.
			Update of DITCHING pb to DITCHING pb-sw.

Continued on the following page

PROCEDURES

NORMAL PROCEDURES

PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS

Continued from the previous page

Localization Title	Toc Index	ID	Reason
			Addition of a comment and a note in order to ensure the correct operation of the Ditching function and that the DITCHING pb-sw is set back to off after the fluid spraying. Replacement of the AEVC C/B by a link towards the applicable reset procedure in the QRH. Note moved to within the DITCHING pb-sw action. No technical change. Documentation update: Information "N.00020694.0001001.078" moved from "N.00020694.0001001.076" to "N.00020694.0001001.093"
PRO-NOR-SUP-ADVWXR Upon Completion of the Spraying Operation	A	3	Correction of the title of the procedure. No technical change.
PRO-NOR-SUP-ADVWXR Upon Completion of the Spraying Operation	A	4	Information layer changed from L1 to L2. No technical change. Addition of a comment and a note in order to ensure the correct operation of the Ditching function and that the DITCHING pb-sw is set back to off after the fluid spraying. Update of DITCHING pb to DITCHING pb-sw.
PRO-NOR-SUP-ADVWXR After Start	B	5	Addition of information in order to warn the flight crew not to move any flight controls if deice/anti-ice is needed.
PRO-NOR-SUP-ADVWXR Undue Alerts	F	7	Addition of a new alert to be in accordance with the latest system logic. Layout modification. No technical change.
PRO-NOR-SUP-ADVWXR After Takeoff	G	9	Documentation update: Addition of "After Takeoff" documentary unit
PRO-NOR-SUP-FUEL Ground Fuel Transfer	C	1	Addition of the action CTR TK MODE SEL pb-sw and of a note to prevent fuel overfill and spillage, and for consistency with the procedure outlined in the AMM procedure for refueling on ground. Documentation update: Deletion of information.
PRO-NOR-SUP-GPSINT Cockpit Effects Header - Guidance	A	1	Documentation update: Addition of "Cockpit Effects Header - Guidance" documentary unit
PRO-NOR-SUP-GPSINT Cockpit Effects - RAAS	A	2	Documentation update: Addition of "Cockpit Effects - RAAS" documentary unit
PRO-NOR-SUP-GPSINT GPS Interference - Erroneous GNSS data - WXR	A	4	Documentation update: Addition of "GPS Interference - Erroneous GNSS data - WXR" documentary unit
PRO-NOR-SUP-GPSINT GPS Interference - Persistent Effects - GPWS	A	5	Documentation update: Addition of "GPS Interference - Persistent Effects - GPWS" documentary unit
PRO-NOR-SUP-GPSINT	A	6	Documentation update: Addition of "GPS Interference - Within the Interference Area - General" documentary unit

Continued on the following page

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS
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Continued from the previous page

Localization Title	Toc Index	ID	Reason
GPS Interference - Within the Interference Area - General			
PRO-NOR-SUP-MISC-A Operation Above 8 000 ft and up to 9 200 ft	A	2	Removal of the recommendation to clear the CAB PR EXCESS CAB ALT ECAM alert under certain conditions during descent and on ground in order to comply with OEB 61 and the general ECAM philosophy. Documentation update: Deletion of information.
PRO-NOR-SUP-MISC-C Descent Preparation	B	1	Layout modification. No technical change.
PRO-NOR-SUP-MISC-F Introduction	A	1	Documentation update: Addition of "Introduction" documentary unit
PRO-NOR-SUP-MISC-F Design Specificities	B	2	Documentation update: Addition of "Design Specificities" documentary unit
PRO-NOR-SUP-MISC-F Cockpit Preparation	C	3	Documentation update: Addition of "Cockpit Preparation" documentary unit
PRO-NOR-SUP-MISC-F Climb	C	4	Documentation update: Addition of "Climb" documentary unit
PRO-NOR-SUP-MISC-F Descent Preparation	C	5	Documentation update: Addition of "Descent Preparation" documentary unit
PRO-NOR-SUP-MISC-F Descent	C	6	Documentation update: Addition of "Descent" documentary unit
PRO-NOR-SOP-17 Descent Adjustment - BARO Ref	C	1	Effectivity update: The information now applies to all MSN.
PRO-NOR-SUP-ADVWXR Before Fluid Spraying	A	1	Effectivity update: The information now applies to all MSN.
PRO-NOR-SUP-ADVWXR Undue Alerts	F	6	Effectivity update: The information now applies to all MSN.
PRO-NOR-SUP-ADVWXR Taxi	G	8	Effectivity update: The information now applies to all MSN.
PRO-NOR-SUP-ADVWXR Landing	G	10	Effectivity update: The information now applies to all MSN.
PRO-NOR-SUP-LG-LG_DN Flight With Gear Down - abnormal procedures	A	1	Effectivity update: The information now also applies to MSN 03031, 04392.
PRO-NOR-SUP-MISC-A Operation Above 8 000 ft and up to 9 200 ft	A	1	Effectivity update: The information now applies to all MSN.

PROCEDURES

NORMAL PROCEDURES

PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES STANDARD OPERATING PROCEDURES - GENERAL INFORMATION
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FOREWORD

Ident.: PRO-NOR-SOP-01-00010142.0001001 / 05 DEC 17

Applicable to: ALL

The procedures contained in this Chapter are recommended by Airbus, and are consistent with the other Chapters of this manual.

The Authorities do not certificate Standard Operating Procedures. The manufacturer presents them herein as the best way to proceed, from a technical and operational standpoint. They are continually updated and the revisions take into account Operator input, as well as manufacturer experience. In addition, Operators may amend them, as needed. However, the manufacturer recommends that Operators using the FCOM as onboard operational manual submit suggested changes to expedite publication, and maintain consistency of the manual. The Operator should note that they may rewrite this Chapter, at their own responsibility; this could, however, make it difficult to update the manual and keep it consistent with the other Chapters.

The following sections contain expanded information on normal procedures.

Standard Operating Procedures consist of inspections, preparations, and normal procedures. All items of a given procedure are listed in a sequence that follows a standardized scan of the cockpit panels, unless that sequence goes against the action priority logic, to ensure that all actions are performed in the most efficient way.

These procedures assume that all systems are operating normally, and that all automatic functions are used normally.

Standard Operating Procedures consider that both pilots use Electronic Flight Bag (EFB). Airbus recommends operating with two EFBs in order to reduce the risk of erroneous inputs.

The FCOM also contains normal procedures that are non-routine procedures in the Supplementary Procedures chapter and in the Special Operations chapter.

PROCEDURES

NORMAL PROCEDURES

STANDARD OPERATING PROCEDURES - GENERAL INFORMATION

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES STANDARD OPERATING PROCEDURES - FLIGHT PREPARATION
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GPS PRIMARY AVAILABILITY (IF INSTALLED)
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Ident.: PRO-NOR-SOP-02-00014998.0002001 / 06 NOV 23

Applicable to: ALL

- **For RNP1/RNP2/RNP4 operations, RNP APCH/RNAV(GNSS) approaches, and RNP AR/RNAV(RNP)  approaches:**

GPS PRIMARY availability is demonstrated to be available 100 % of the time with 24 healthy satellites.

If required by operational regulation, for specific conditions (e.g. RNP AR/RNAV(RNP), mountainous terrain, or less than 24 satellites) an appropriate Ground-Based Prediction Program should be used to check the GPS PRIMARY availability for each intended procedure (arrival, departure, and alternate if required).

PROCEDURES

NORMAL PROCEDURES

STANDARD OPERATING PROCEDURES - FLIGHT PREPARATION

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 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES STANDARD OPERATING PROCEDURES - SAFETY EXTERIOR INSPECTION
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SAFETY EXTERIOR INSPECTION

Applicable to: ALL

Ident.: PRO-NOR-SOP-03-A-00010153.0001001 / 24 NOV 23

GENERAL

Safety exterior inspections ensure that the aircraft and the external environment of the aircraft are safe for operation. When the flight crew arrives at the aircraft, they must check for, or be informed of any obstructions near the aircraft, engineering activity, or refueling activity, etc.

Ident.: PRO-NOR-SOP-03-A-00010154.0001001 / 05 MAY 22

WHEEL CHOCKS

WHEEL CHOCKS..... CHECK | CM2

L2 *If the wheel chocks are not in position, the flight crew must check that the parking brake is set with sufficient accumulator pressure.*

Ident.: PRO-NOR-SOP-03-A-00010155.0001001 / 05 MAY 22

LANDING GEAR DOORS

LANDING GEAR DOORS.....CHECK POSITION | CM2

WARNING
If any landing gear door is open, do not pressurize the hydraulic systems until clearance is obtained from ground personnel.

Ident.: PRO-NOR-SOP-03-A-00010156.0001001 / 05 MAY 22

APU AREA

APU AREA..... CHECK | CM2

L2 *Observe that the APU inlet and outlet are clear.*

PROCEDURES

NORMAL PROCEDURES

STANDARD OPERATING PROCEDURES
- SAFETY EXTERIOR INSPECTION

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES STANDARD OPERATING PROCEDURES - PRELIMINARY COCKPIT PREPARATION
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GENERAL

Ident.: PRO-NOR-SOP-04-00010164.0001001 / 08 NOV 21
Applicable to: ALL

Items marked by asterisks (*) are the only steps to be completed after a transit stop without flight crew change. Otherwise, the new flight crew performs all the items.

The flight crew performs the preliminary cockpit preparation to ensure that all required safety checks are completed.

The safety checks prevent the inadvertent operation of aircraft systems, danger to the aircraft, and danger to the personnel.

AIRCRAFT SETUP

Ident.: PRO-NOR-SOP-04-A-00021906.0001001 / 08 NOV 21
Applicable to: ALL

GENERAL

WARNING

Do not pressurize the hydraulic systems until clearance is obtained from ground personnel.

Ident.: PRO-NOR-SOP-04-A-00010165.0001001 / 08 NOV 21
Applicable to: ALL

ENG

ENG 1, 2 MASTER LEVERS.....	OFF	CM2
ENG MODE selector.....	NORM	CM2

AIRCRAFT POWER UP - WEATHER RADAR

Ident.: PRO-NOR-SOP-04-A-00011188.0003001 / 14 NOV 23
Applicable to: MSN 04392-05746

WEATHER RADAR

* WXR/PWS sw	OFF	CM2
* CAPT DISPLAY mode selector	OFF	CM2
* F/O DISPLAY mode selector	OFF	CM2
* GAIN knob	AUTO	CM2
* TURB sw	AUTO	CM2

Ident.: PRO-NOR-SOP-04-A-00011188.0001001 / 08 NOV 21
Applicable to: MSN 02155-03060, 07784-07792

WEATHER RADAR

* RADAR sw	OFF	CM2
* WINDSHEAR / PWS sw 	OFF	CM2

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES STANDARD OPERATING PROCEDURES - PRELIMINARY COCKPIT PREPARATION
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- * GAIN knob

AUTO/CAL

CM2
- * MODE selector

AS RQRD

CM2

Ident.: PRO-NOR-SOP-04-A-00010166.0001001 / 08 NOV 21

Applicable to: ALL

- L/G
- L/G lever.....

DOWN

CM2

Ident.: PRO-NOR-SOP-04-A-00010167.0001001 / 08 NOV 21

Applicable to: ALL

- WIPERS
- Both WIPER selectors.....

OFF

CM2

BATTERIES CHECK/EXTERNAL POWER
Ident.: PRO-NOR-SOP-04-00010168.0001001 / 08 NOV 21 Applicable to: ALL

- If the aircraft has not been electrically supplied for 6 h or more, perform the following check:

BAT 1 pb-sw and BAT 2 pb-sw.....

CHECK OFF

CM2

BAT 1 and 2 VOLTAGE.....

CHECK ABOVE 25.5 V

CM2

L2

Battery voltage above 25.5 V ensures a charge above 50 %.
- L1

■ If the battery voltage is at or below 25.5 V:

A charging cycle of about 20 min is required.

BAT 1 pb-sw and BAT 2 pb-sw.....

AUTO

CM2

EXT PWR pb-sw.....

ON

CM2

L2

Check on ELEC SD page, that the battery contactor is closed and the batteries are charging.
- L1

● After 20 min:

BAT 1 pb-sw and BAT 2 pb-sw.....

OFF

CM2

BAT 1 and 2 VOLTAGE.....

CHECK ABOVE 25.5 V

CM2

BAT 1 pb-sw and BAT 2 pb-sw.....

AUTO

CM2
- L2

■ If the battery voltage is above 25.5 V:

BAT 1 pb-sw and BAT 2 pb-sw.....

AUTO

CM2

If the APU is started on batteries only, it should be started within 30 min after the selection of batteries to AUTO (35 min after battery selection to AUTO, the battery charge is less than 25 % of maximum capacity).
- PIA A318/A319/A320/A321 FLEET

PRO-NOR-SOP-04 P 2/14

FCOM

← B to C →

09 FEB 26

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES STANDARD OPERATING PROCEDURES - PRELIMINARY COCKPIT PREPARATION
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- L1

■ If the aircraft has been electrically supplied during the last 6 h:

BAT 1 pb-sw and BAT 2 pb-sw.....AUTO | CM2

● If the **AVAIL** light is on:

EXT PWR pb-sw.....ON | CM2

APU FIRE TEST/APU START

Applicable to: ALL

Ident.: PRO-NOR-SOP-04-C-00025088.0001001 / 12 NOV 24

- RMP

RMP 1 and 2.....CHECK ON | CM2

Green NAV light.....CHECK OFF | CM2

SEL light.....CHECK OFF | CM2

COM FREQUENCIES.....TUNE | CM2
- L2

Use VHF 1 for ATC (only VHF 1 is available in emergency electrical configuration), VHF 2 for ATIS and company frequencies. VHF 3 is normally devoted to ACARS.

Ident.: PRO-NOR-SOP-04-C-00026388.0001001 / 12 NOV 24

- ACP

INT knob PRESS OUT/VOLUME CHECK | CM2
- L2

Ensure sure that INT volume is turned up, to enable contact with the ground crew.
- L1

VHFCHECK | CM2
- L2

Check transmission and reception.
- L1

HF (if required for flight).....CHECK | CM2
- L2

Check transmission and reception.

CAUTION

- Do not transmit on HF during refueling operations (i.e. refueling, defueling, fuel transfer)
- Only perform HF radio checks when appropriate (i.e. no personnel in the immediate vicinity).

Ident.: PRO-NOR-SOP-04-C-00010170.0001001 / 08 NOV 21

- APU FIRE

WARNING

The automatic shutdown of the APU and the discharge of the APU fire extinguisher bottle may occur if the flight crew presses the APU FIRE test pb for more than 3 seconds.

APU FIRE pb-sw.....CHECK IN and GUARDED | CM2

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES STANDARD OPERATING PROCEDURES - PRELIMINARY COCKPIT PREPARATION
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APU AGENT light	CHECK OFF	CM2
APU FIRE TEST pb.....	PRESS and MAINTAIN	CM2

TEST RESULT

Check that the APU fire detection and extinguishing system is operative:

- **APU FIRE** warning on (if AC power available):
 - ECAM
 - CRC
 - MASTER WARN light
- APU **FIRE** pb-sw lighted red (lighted partially if AC power not available)
- **SQUIB** light and **DISCH** light on

Ident.: PRO-NOR-SOP-04-C-00010171.0015001 / 06 NOV 25

APU START

■ **If the EXT PWR pb light is ON:**

APU MASTER SW pb-sw.....	ON	CM2
APU START pb-sw.....	ON	CM2

Note: Wait at least 3 s before selecting APU START pb-sw.

L2 For more information on the APU start, Refer to DSC-49-20 Overhead Panel - Illustration.

For more information on APU starter limitations and APU operations during refueling:

- Refer to LIM-APU APU Start
- Refer to LIM-APU APU Start/Shutdown during Refueling/Defueling.

L1 * EXT PWR pb..... AS RQRD | CM2

L2 The flight crew should keep ON the external power units to reduce the APU load, particularly in hot weather conditions.

■ **If the EXT PWR pb light is off:**

APU MASTER SW pb-sw.....	ON	CM2
APU START pb-sw.....	ON	CM2

Note: Wait at least 3 s before selecting APU START pb-sw.

L2 For more information on the APU start, Refer to DSC-49-20 Overhead Panel - Illustration.

For more information on APU starter limitations and APU operations during refueling:

- Refer to LIM-APU APU Start
- Refer to LIM-APU APU Start/Shutdown during Refueling/Defueling.

PROCEDURES

NORMAL PROCEDURES

 STANDARD OPERATING PROCEDURES
 - PRELIMINARY COCKPIT PREPARATION

L1

● When the APU is **AVAIL**:

APU BLEED pb-sw.....ON | CM2

L2

Do not use APU BLEED, if the ground personnel confirms that a LP or HP ground air unit is connected to the aircraft.

To determine if an HP ground air unit is connected, the flight crew should also check on the BLEED SD page, if there is pressure in the bleed air system.

For more information on the use of APU BLEED, Refer to FCTM/PR-NP-SOP-40 Use of APU Bleed.

L1

X BLEED selector..... AUTO | CM2

COCKPIT TEMP rotary selector and CABIN TEMP rotary selector.....AS RQRD | CM2

L2

Full range temperature $24 \pm 6^{\circ}\text{C}$ ($75 \pm 11^{\circ}\text{F}$).

ADIRS

Ident.: PRO-NOR-SOP-04-00011159.0009001 / 03 NOV 22

 Applicable to: **ALL**

Impacted by TDU: 00022626 ADIRS

ADIRS

* ALL IR MODE selector.....NAV | CM2

L2

Align or realign IRS as appropriate. Refer to FCTM/PR-NP-SOP-40 ADIRS Operations.

L1

L2

A complete IRS alignment must be performed in the following cases:

- Before the first flight of the day, or
- When there is a crew change, or
- When the departure airport is located between latitudes 2° north and 2° south, or
- When the GPS is not available and the NAVAID coverage is poor on the expected route, or
- When the GPS is not available and the expected flight time is more than 3 h.

A fast IRS alignment must be performed if a complete IRS alignment is not necessary and the difference between the IRS position and the FM&C position is at or above 5 NM (see MCDU POSITION MONITOR page).

To perform an alignment, the aircraft must be stopped on ground. Do not align IRS during engine start, or while the engines are running. In the case of aircraft movement during the IRS alignment, the flight crew must perform a new full alignment.

ADIRS

2 Ident.: TDU / PRO-NOR-SOP-04-00022626.0014001 / 03 NOV 22

 Applicable to: **ALL**

Impacted DU: 00011159 ADIRS

PROCEDURES

NORMAL PROCEDURES

STANDARD OPERATING PROCEDURES
 - PRELIMINARY COCKPIT PREPARATION

ADIRS

* All IR MODE selectors..... NAV | CM2

L2 Align or realign IRS as appropriate. Refer to FCTM/PR-NP-SOP-40 ADIRS Operations.

L1 Note: With some dedicated FWC standards, some systems that depend on ADIRS data might generate the following spurious alerts until at least one IR mode selector is switched to NAV:

- **AUTO FLT RUD TRV LIM SYS** potentially associated with **CAT 2 / CAT 3 / CAT 3 DUAL / GLS AUTOLAND INOP SYS**
- **COM SATCOM FAULT.**

L2 A complete IRS alignment must be performed in the following cases:

- Before the first flight of the day, or
- When there is a crew change, or
- When the departure airport is located between latitudes 2 ° north and 2 ° south, or
- When the GPS is not available and the NAVAID coverage is poor on the expected route, or
- When the GPS is not available and the expected flight time is more than 3 h.

A fast IRS alignment must be performed if a complete IRS alignment is not necessary and the difference between the IRS position and the FMGC position is at or above 5 NM (see MCDU POSITION MONITOR page).

To perform an alignment, the aircraft must be stopped on ground. Any aircraft movement will automatically restart the IRS alignment.

Do not align IRS during engine start, or while the engines are running.

COCKPIT LIGHTS

Ident.: PRO-NOR-SOP-04-00010172.0002001 / 08 NOV 21

Applicable to: ALL

COCKPIT LIGHTS

* COCKPIT LIGHTS..... AS RQRD | CM1-CM2

L2 Set INT LT, FLOOD LT, INTEG LT (included glareshield and FCU).

EFB/ACARS (IF INSTALLED) INITIALIZATION

Ident.: PRO-NOR-SOP-04-B-00021913.0001001 / 14 NOV 24

Applicable to: ALL

EFB START

ALL EFB..... START | CM1-CM2

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES STANDARD OPERATING PROCEDURES - PRELIMINARY COCKPIT PREPARATION
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- In accordance with the Operator's policy or if required by operational regulation:
EFB Version and Database.....CHECK | CM1-CM2

L2

Check that all EFB software versions and the associated databases are in accordance with the reference authorized by the EFB Administrator. This check is necessary, unless a specific procedure is established as per the Operator's policy, in order to ensure that the correct version is onboard.

Ident.: PRO-NOR-SOP-04-B-00026475.0001001 / 07 NOV 25

Applicable to: ALL

3

4

ACARS /AOC **INITIALIZATION**

- * ACARS/AOC INITIALIZE | CM1

L2

Initialize ACARS if not done automatically, as per company policy.

Ident.: PRO-NOR-SOP-04-B-00014422.0001001 / 07 NOV 25

Applicable to: ALL

5

FMGS PRE-INITIALIZATION

Perform FMGS Pre-Initialization in the case of ACARS /AOC operations or EFB operations when a synchronization with the avionics is available.

At electrical power-up, the FMGSs and FCU run through various internal tests. Allow enough time (3 min) for tests' completion, and do not start to press pushbuttons until the tests are over. If the "PLEASE WAIT" message appears, do not press any MCDU key until the message clears.

Ident.: PRO-NOR-SOP-04-B-00014423.0001001 / 08 NOV 21

Applicable to: ALL

- * ENGINE & AIRCRAFT TYPE..... CHECK | CM1

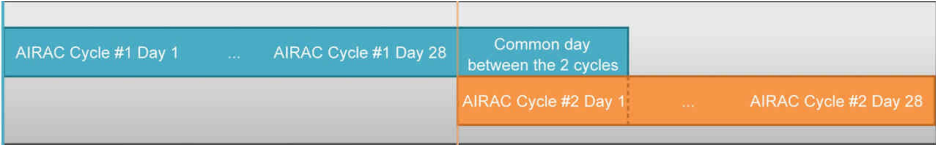
EFB/ACARS INIT - FMGS PRE-INITIALIZATION - FM DATABASE VALIDITY

Ident.: PRO-NOR-SOP-04-B-00014424.0001001 / 08 NOV 21

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

- * FM database validity.....CHECK | CM1
- Check DATA BASE validity and stored WPT/NAVAIDS/RWY/ROUTES, if any. If applicable, review the stored data for deletion decision.

- On Honeywell FMS, the double AIRAC cycle of the NDB has one day in common (AIRAC Cycle #1 Day 29 / AIRAC Cycle #2 Day 1). From Day 2 of AIRAC Cycle #2, the active database is no longer valid and the message "CHECK DATA BASE CYCLE" will be triggered.
On the common day, select AIRAC Cycle #2 prior to the first flight of the day.



Ident.: PRO-NOR-SOP-04-B-00014424.0002001 / 08 NOV 21

Applicable to: MSN 02926-02944, 04392, 07784-07792

- * FM database validity.....CHECK | CM1
- Check DATA BASE validity and stored WPT/NAVAIDS/RWY/ROUTES, if any. If applicable, review the stored data for deletion decision.

- On Thales FMS, if the "CHECK DATA BASE CYCLE" message triggers, the active database is no longer valid. Therefore, on Day 1 of AIRAC Cycle #2, select AIRAC Cycle #2 prior to the first flight of the day.



Ident.: PRO-NOR-SOP-04-B-00014425.0001001 / 08 NOV 21

Applicable to: ALL

- * FLT NBR.....INSERT/CHECK | CM1
- ☐ Insert FLT NBR only if the company flight plan is not received via ACARS.

☐ * FROM/TO.....INSERT/CHECK | CM1

☐ Insert FROM/TO only if the company flight plan is not received via ACARS.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES STANDARD OPERATING PROCEDURES - PRELIMINARY COCKPIT PREPARATION
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Ident.: PRO-NOR-SOP-04-B-00021927.0001001 / 14 NOV 24
Applicable to: ALL

EFB INITIALIZATION

* EFB.....INITIALIZE | CM1-CM2

[L2] Check the EFB initialization:

- ACFT TYPE and ACFT REG
- FLT NBR and FROM/TO in agreement with the FMS INIT A page.

If the synchronization with the avionics is available, the flight crew synchronizes the EFB with the avionics to retrieve initialization information.

If the synchronization with the avionics is not available, the flight crew manually enters the above mentioned data in the EFB.

AIRCRAFT ACCEPTANCE

Ident.: PRO-NOR-SOP-04-00021915.0001001 / 14 NOV 24
Applicable to: ALL

* RCL pbPRESS 3 s | CM1

[L2] This action recalls all the warnings that the flight crew cleared or cancelled during the last flight.

[L1]* LOGBOOK AND MEL/CDL ITEMS.....CHECK | BOTH

[L2]- Check the deferred items list

- Crosscheck with ECAM recall.

All flight crew members:

- Check and discuss the technical condition of the aircraft (deferred items list)
- Check and discuss the MEL items (including the associated operational procedures, if any) and the CDL items. This includes the acceptability of the MEL and CDL items and the influence on the flight plan
- In icing conditions with OAT at +3 °C (37 °F) or below, check the taxi-in time of the previous flight in icing conditions with OAT at +3 °C (37 °F) or below recorded in the logbook. This time will be used to determine the remaining taxi-out time before the next engine acceleration for ice shedding (Refer to PRO-NOR-SUP-ADVWXR Engine Operations on Ground in Icing Conditions).

[L1] AIRCRAFT CONFIGURATION SUMMARY.....CHECK | BOTH

[L2] For awareness of the current aircraft configuration, both flight crewmembers discuss together the optional installed aircraft systems and functions, and their influence on the ongoing flight.

[L1]* OEB.....CHECK | BOTH

[L2] All flight crewmembers review and discuss together all OEBs and associated procedures applicable to the aircraft.

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES STANDARD OPERATING PROCEDURES - PRELIMINARY COCKPIT PREPARATION
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Any flight crewmember who operates at the flight deck at any time during the on-going flight should be aware of the applicable OEB(s).

L1 * AIRCRAFT ACCEPTANCE.....PERFORM | CM1

Note: The aircraft acceptance can be performed later, but must be completed at the end of the Cockpit Preparation.

PRELIMINARY PERFORMANCE DETERMINATION

Ident.: PRO-NOR-SOP-04-00021916.0001001 / 06 NOV 25
Applicable to: ALL

For more information, Refer to FCTM/PR-NP-SOP-PRELIMINARY COCKPIT PREPARATION-Preliminary Takeoff Performance Computation.

6 Each flight crewmember independently computes the preliminary performance data in accordance with the technical condition of the aircraft and/or any other criteria that may affect the aircraft performance (e.g. NOTAM, runway condition, aircraft configuration).

* AIRFIELD DATA.....OBTAIN |CM1-CM2

L2 Obtain data needed for initializing the system, preparing the cockpit and for preliminary takeoff performance computation. The airfield data should include: RUNWAY IN USE, ALTIMETER SETTING, and WEATHER DATA.

L1 ● If an EFB application for load and trim sheet is used:
* PRELIMINARY LOADING..... COMPUTE AND CROSSCHECK |CM1-CM2

● If dispatch under MEL or CDL and in accordance with the logbook:
* MEL/CDL ITEMS..... CHECK |CM1-CM2

L2 Check that the EFB takes into account the MEL and CDL items.

L1 * NAVIGATION CHARTS.....PREPARE | BOTH

L2 Prepare the necessary charts and verify that both flight crewmembers refer to the same chart reference.

L1 * PRELIMINARY TAKEOFF PERF DATA.....COMPUTE |CM1-CM2

- L2** Both flight crewmembers discuss together and decide all of the following:
- RWY to be used
 - RWY intersection
 - Flaps setting
 - Use of anti-ice
 - Use of packs
 - Takeoff thrust setting options (FLEX, TOGA, DERATE).

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES STANDARD OPERATING PROCEDURES - PRELIMINARY COCKPIT PREPARATION
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The PF and the PM independently compute the preliminary takeoff performance data.

- L1 * PRELIMINARY TAKEOFF PERF DATA..... CROSSCHECK | BOTH
- L2 The PF and the PM compare and ensure that the computations are the same.

BEFORE WALKAROUND

Ident.: PRO-NOR-SOP-04-E-00021917.0001001 / 02 MAY 24
Applicable to: ALL

ECAM PAGES

- On the **DOOR SD** page:
 - * OXY.....CHECK PRESSURE | PM
 - If the OXY pressure is half boxed in amber:
 - MIN FLT CREW OXY CHART..... CHECK PRESSURE | PM
 - L2 Verify that the pressure is sufficient for the scheduled flight (Refer to LIM-OXY Minimum Flight Crew Oxygen Pressure).
- L1 ● On the **HYD SD** page:
 - * RESERVOIR FLUID LEVEL..... CHECK WITHIN NORMAL RANGE | PM
 - Note: The volume of the hydraulic fluid in the reservoirs may change due to environmental conditions. Therefore if the OAT is above 20 °C, a fluid level above the normal range (up to half of the normal range) is acceptable, else contact maintenance to determine if service is required.
- On the **ENG SD** page:
 - * ENG OIL QUANTITY..... CHECK | PM
 - L2 Check that the oil quantity is above the minimum. Refer to LIM-ENG Oil.

Ident.: PRO-NOR-SOP-04-E-00010173.0001001 / 08 NOV 21
Applicable to: ALL

F/CTL

- FLAPS.....CHECK POSITION | PM
- L2 Check the upper ECAM display to confirm that the FLAPS position agrees with the handle position.
- L1 * SPEEDBRAKE lever..... CHECK RETRACTED and DISARMED | PM

WARNING If flight control surface positions do not agree with the control handle positions, check with the maintenance crew before applying hydraulic power.

PROCEDURES

NORMAL PROCEDURES

STANDARD OPERATING PROCEDURES
 - PRELIMINARY COCKPIT PREPARATION

Ident.: PRO-NOR-SOP-04-E-00010174.0001001 / 08 NOV 21

Applicable to: ALL

PARKING BRAKE

- * ACCU PRESS indicator.....CHECK | PM
- L2** *The ACCU PRESS indication must be in the green band. If required use the electric pump on yellow hydraulic system to recharge the brake accumulator.*
- L1** * PARK BRK handle..... ON | PM
- L2** *When one brake temperature is above 500 °C (or 350 °C with brake fans  ON), avoid applying the parking brake, unless operationally necessary.*
- L1** * BRAKES PRESS indicator.....CHECK | PM
- L2** *Check for normal indications.*

WARNING Yellow and green hydraulic systems are pressurized from yellow electric pump.
 Get ground crew clearance before using the electric pump.

Ident.: PRO-NOR-SOP-04-E-00010175.0001001 / 08 NOV 21

Applicable to: MSN 02155-02212

ALTERNATE BRAKING SYSTEM

Note: *The purpose of this check is to verify, the efficiency of the alternate braking system (absence of “spongy pedals”).*

- Y ELEC PUMP pb-sw.....CHECK OFF | PM
- CHOCKS..... CHECK IN PLACE | PM
- PARK BRK handle..... OFF | PM
- BRAKE PEDALS..... PRESS | PM
- L2** *Apply maximum pressure on both pedals.*
- L1** BRAKE PRESSURE (on BRAKE press indicator).....CHECK | PM
- L2** *Pressure must build up without delay symmetrically on left and right sides for the same application simultaneously applied on left and right pedals. With full pedal deflection, the pressure must be between 2 000 and 2 700 PSI.*
- L1** BRAKE PEDALS..... RELEASE | PM
- PARK BRK handle..... ON | PM
- L2** *The parking brake must be on during the exterior inspection to allow the flight crew to check brake wear indicators.*

PROCEDURES

NORMAL PROCEDURES

STANDARD OPERATING PROCEDURES
- PRELIMINARY COCKPIT PREPARATION

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES STANDARD OPERATING PROCEDURES - EXTERIOR WALKAROUND
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GENERAL

Ident.: PRO-NOR-SOP-05-00010360.0001001 / 05 MAY 22

Applicable to: ALL

The exterior walkaround ensures that the general condition of the aircraft is satisfactory and that the visible aircraft components and equipment are safe for the flight:

- There is no impact damage to the structure
- There is no evident fuel, oil, or hydraulic leak
- All ground access doors are closed
- All covers are removed (e.g. pitot covers, AOA covers, etc.).

The flight crew must perform a complete walkaround before each flight.

The parking brake must be set to ON during the exterior walkaround, in order to enable the flight crew to check brake wear indicators.

WARNING	If any landing gear door is open, do not apply hydraulic power until clearance is obtained from ground personnel.
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PROCEDURES

NORMAL PROCEDURES

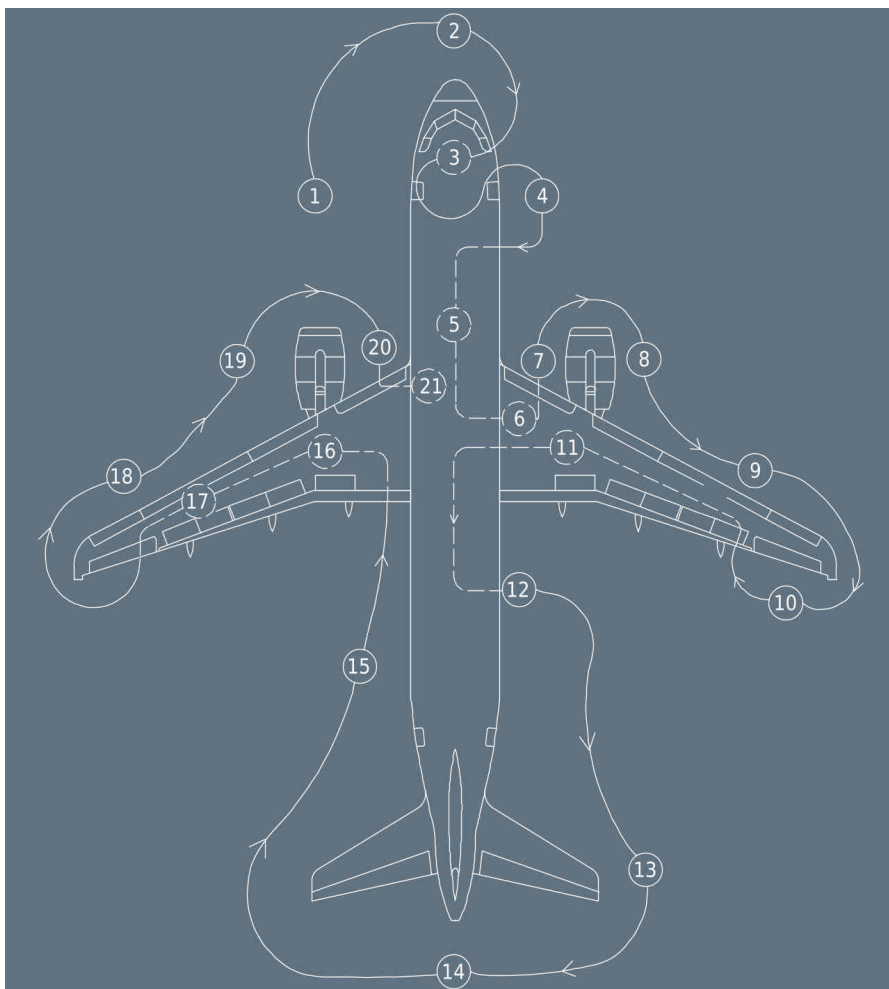
STANDARD OPERATING PROCEDURES - EXTERIOR WALKAROUND

EXTERIOR WALKAROUND

Ident.: PRO-NOR-SOP-05-A-00010361.0001001 / 04 MAY 15

Applicable to: ALL

SCHEMATIC



(1) Refer to PRO-NOR-SOP-05 Exterior Walkaround - LH FWD Fuselage

- (2) Refer to PRO-NOR-SOP-05 Exterior Walkaround - Nose Section
- (3) Refer to PRO-NOR-SOP-05 Exterior Walkaround - Nose L/G
- (4) Refer to PRO-NOR-SOP-05 Exterior Walkaround - RH FWD Fuselage
- (5) Refer to PRO-NOR-SOP-05 Exterior Walkaround - Lower Center Fuselage
- (6) Refer to PRO-NOR-SOP-05 Exterior Walkaround - RH Center Wing
- (7) Refer to PRO-NOR-SOP-05 Exterior Walkaround - ENG 2 LH Side
- (8) Refer to PRO-NOR-SOP-05 Exterior Walkaround - ENG 2 RH Side
- (9) Refer to PRO-NOR-SOP-05 Exterior Walkaround - RH Wing Leading Edge
- (10) Refer to PRO-NOR-SOP-05 Exterior Walkaround - RH Wing Trailing Edge
- (11) Refer to PRO-NOR-SOP-05 Exterior Walkaround - RH L/G and Fuselage
- (12) Refer to PRO-NOR-SOP-05 Exterior Walkaround - RH AFT Fuselage
- (13) Refer to PRO-NOR-SOP-05 Exterior Walkaround - TAIL
- (14) Refer to PRO-NOR-SOP-05 Exterior Walkaround - APU
- (15) Refer to PRO-NOR-SOP-05 Exterior Walkaround - LH AFT Fuselage
- (16) Refer to PRO-NOR-SOP-05 Exterior Walkaround - LH Landing Gear
- (17) Refer to PRO-NOR-SOP-05 Exterior Walkaround - LH Wing Trailing Edge
- (18) Refer to PRO-NOR-SOP-05 Exterior Walkaround - LH Wing Leading Edge
- (19) Refer to PRO-NOR-SOP-05 Exterior Walkaround - ENG 1 LH Side
- (20) Refer to PRO-NOR-SOP-05 Exterior Walkaround - ENG 1 RH Side
- (21) Refer to PRO-NOR-SOP-05 Exterior Walkaround - LH Center Wing

Ident.: PRO-NOR-SOP-05-A-00010363.0001001 / 09 NOV 21

Applicable to: ALL

LH FWD FUSELAGE

AOA probes.....CHECK CONDITION
 F/O and CAPT static ports..... CLEAR
 Avionics equipment vent air inlet valve.....CHECK CONDITION
 Oxygen bay..... CLOSED
 Oxygen overboard discharge indicator(s)..... GREEN
 Toilet servicing door  CLOSED

Ident.: PRO-NOR-SOP-05-A-00010364.0001001 / 09 NOV 21

Applicable to: ALL

NOSE SECTION

Pitot probes.....CHECK CONDITION
 STBY static ports.....CLEAR
 TAT probes.....CHECK CONDITION
 Radome and latches.....CHECK CONDITION/LATCHED
 FWD avionics compartment door.....CLOSED
 Ground electrical power door (if not required).....CLOSED

Ident.: PRO-NOR-SOP-05-A-00010365.0001001 / 09 NOV 21

Applicable to: ALL

NOSE L/G

Nose wheel chocks.....IN PLACE
 Wheels and tires.....CHECK CONDITION
 Nose gear structure.....CHECK CONDITION
 Taxi, Takeoff and Runway Turnoff lights.....CHECK CONDITION
 Hydraulic lines and electrical wires.....CHECK CONDITION
 Wheel well.....CHECK
 Safety pin.....REMOVED

Ident.: PRO-NOR-SOP-05-A-00010366.0001001 / 09 NOV 21

Applicable to: ALL

RH FWD FUSELAGE

RH + Aft avionic compartment doors.....CLOSED
 Avionic equipment vent air outlet valve.....CHECK CONDITION
 F/O and CAPT static ports.....CLEAR
 AOA probe.....CHECK CONDITION
 FWD cargo door and selector panel.....CHECK

Ident.: PRO-NOR-SOP-05-A-00010367.0001001 / 24 NOV 23

Applicable to: ALL

LOWER CENTER FUSELAGE

Fresh water drain door.....CLOSED
 Potable water service door.....CLOSED
 Antennas.....CHECK CONDITION
 Drain mast.....CHECK CONDITION
 Emergency ram air inlet flap.....CHECK CONDITION
 LP and HP ground connection doors (if not required).....CLOSED

Anticollision light.....CHECK CONDITION
 CTR TK magnetic fuel level.....FLUSH
 Pack air intakes and outlets..... CLEAR

Ident.: PRO-NOR-SOP-05-A-00010368.0001001 / 09 NOV 21

Applicable to: ALL

RH CENTER WING

Yellow hydraulic bay door.....CLOSED
 Fuel panel.....CLOSED
 Tank magnetic fuel level(s).....FLUSH
 Fuel water drain valve(s)..... NO LEAK
 Landing light.....CHECK CONDITION
 Wing leading edge ventilation intake <3d> CLEAR
 Slat 1.....CHECK CONDITION

EXTERIOR WALKAROUND - ENG 2 LH SIDE

Ident.: PRO-NOR-SOP-05-A-00010370.0020001 / 09 NOV 21

Applicable to: MSN 02155-02719, 02789-03060, 05152-07792

ENG 2 LH SIDE

Oil fill access door.....CLOSED
 Thrust reversers..... CLOSED/LATCHED
 Fan cowl doors..... CLOSED/LATCHED/FLAG REMOVED
 Drain mast..... CHECK CONDITION/NO LEAK
 Engine inlet and fan blades..... CHECK CONDITION
 Safety pin..... REMOVED

Ident.: PRO-NOR-SOP-05-A-00010370.0015001 / 09 NOV 21

Applicable to: MSN 02758, 04392

ENG 2 LH SIDE

Oil fill access door.....CLOSED
 Thrust reversers..... CLOSED/LATCHED
 Fan cowl doors..... CLOSED/LATCHED/FLAG REMOVED
 Drain mast..... CHECK CONDITION/NO LEAK
 Engine inlet and fan blades..... CHECK CONDITION

PROCEDURES**NORMAL PROCEDURES****STANDARD OPERATING PROCEDURES - EXTERIOR WALKAROUND****EXTERIOR WALKAROUND - ENG 2 RH SIDE**

Ident.: PRO-NOR-SOP-05-A-00010371.0014001 / 09 NOV 21

Applicable to: MSN 02155-02719, 02789-03060, 05152-07792

ENG 2 RH SIDE

Vent inlet..... CLEAR
Pressure-relief/Start valve handle access door..... CLOSED
Thrust reversers..... CLOSED/LATCHED
Fan cowl doors..... CLOSED/LATCHED/FLAG REMOVED
Turbine exhaust CLEAR
Pylon/access panel.....CHECK CONDITION/CLOSED
Safety pin..... REMOVED

Ident.: PRO-NOR-SOP-05-A-00010371.0006001 / 09 NOV 21

Applicable to: MSN 02758, 04392

ENG 2 RH SIDE

Vent inlet..... CLEAR
Pressure-relief/Start valve handle access door..... CLOSED
Thrust reversers..... CLOSED/LATCHED
Fan cowl doors..... CLOSED/LATCHED/FLAG REMOVED
Turbine exhaust CLEAR
Pylon/access panel.....CHECK CONDITION/CLOSED

Ident.: PRO-NOR-SOP-05-A-00010372.0001001 / 09 NOV 21

Applicable to: ALL

RH WING LEADING EDGE

Slats 2, 3, 4, 5..... CHECK CONDITION
Tank magnetic fuel level(s).....FLUSH
Fuel water drain valve(s)..... NO LEAK
Refuel coupling.....CLOSED
Surge tank air inlet..... CLEAR
Fuel ventilation overpressure disc..... INTACT
Navigation and Strobe lights..... CHECK CONDITION
Wing tip/Sharklet.....CHECK CONDITION

Ident.: PRO-NOR-SOP-05-A-00010373.0001001 / 09 NOV 21

Applicable to: ALL

RH WING TRAILING EDGE

Static dischargers.....CHECK CONDITION

Control surfaces..... CHECK CONDITION
 Flaps and fairings..... CHECK CONDITION
 Antennas on top of fuselage..... CHECK CONDITION

Ident.: PRO-NOR-SOP-05-A-00010374.0001001 / 22 NOV 21

Applicable to: ALL

RH L/G AND FUSELAGE

Chocks..... REMOVED
 Wheels and tires..... CHECK CONDITION
 Brakes and brake wear indicators..... CHECK CONDITION
 Torque link damper..... CHECK CONDITION
 Hydraulic lines..... CHECK
 Landing gear structure..... CHECK
 Downlock springs..... CHECK
 Safety pin..... REMOVED
 Ground hydraulic connection yellow..... CLOSED
 Drain mast  CHECK CONDITION
 Shroud fuel drain..... CHECK CONDITION/NO LEAK

Ident.: PRO-NOR-SOP-05-A-00010375.0001001 / 24 NOV 23

Applicable to: ALL

RH AFT FUSELAGE

VHF 2 and RA Antennas..... CHECK CONDITION
Check that the RA antennas are clean.
 Cargo door and selector panel..... CHECK
 Bulk door  (if not required)..... CLOSED
 Toilet service access door..... CLOSED
 Outflow valve..... CHECK CONDITION
 Drain mast CHECK CONDITION
 Flight recorder access door CLOSED
 Pax oxygen discharge indicator  GREEN

Ident.: PRO-NOR-SOP-05-A-00010376.0001001 / 06 MAY 22

Applicable to: ALL

TAIL

Stabilizer, elevator, fin and rudder..... CHECK CONDITION
 Static dischargers..... CHECK
 Lower fuselage structure (tail impact on runway)..... CHECK CONDITION

Ident.: PRO-NOR-SOP-05-A-00010377.0001001 / 09 NOV 21

Applicable to: ALL

APU

Access doors (if not required).....CLOSED
Air intake.....CHECK CONDITION
Drain.....CHECK CONDITION/NO LEAK
Oil cooler air outletCLEAR
Exhaust.....CLEAR
Navigation light.....CHECK CONDITION
Fire extinguisher overpressure indication (red disc)..... IN PLACE

Ident.: PRO-NOR-SOP-05-A-00010378.0001001 / 09 NOV 21

Applicable to: ALL

LH AFT FUSELAGE

Stabilizer, elevator, fin and rudder.....CHECK CONDITION
Potable water service door..... CLOSED
Ground hydraulic connection blue door.....CLOSED
Ground hydraulic connection green and reservoir filling door..... CLOSED

Ident.: PRO-NOR-SOP-05-A-00010379.0001001 / 09 NOV 21

Applicable to: ALL

LH LANDING GEAR

Chocks..... REMOVED
Wheels and tires.....CHECK CONDITION
Brakes and brake wear indicators.....CHECK CONDITION
Torque link damper.....CHECK CONDITION
Hydraulic lines.....CHECK
Landing gear structure.....CHECK
Downlock springs.....CHECK
Safety pin.....REMOVED

Ident.: PRO-NOR-SOP-05-A-00010380.0001001 / 09 NOV 21

Applicable to: ALL

LH WING TRAILING EDGE

Flaps and fairing.....CHECK CONDITION
Control surfaces.....CHECK CONDITION
Static dischargers.....CHECK CONDITION
Antennas on top of fuselage.....CHECK CONDITION

Ident.: PRO-NOR-SOP-05-A-00010381.0001001 / 09 NOV 21

Applicable to: ALL

LH WING LEADING EDGE

Wing tip/Sharklet..... CHECK CONDITION
 Navigation and Strobe lights..... CHECK CONDITION
 Surge tank air inlet..... CLEAR
 Fuel ventilation overpressure disc..... INTACT
 Fuel water drain valve(s)..... NO LEAK
 Tank magnetic fuel level(s)..... FLUSH
 Slats 2, 3, 4, 5..... CHECK CONDITION

EXTERIOR WALKAROUND - ENG 1 LH SIDE

Ident.: PRO-NOR-SOP-05-A-00010384.0015001 / 09 NOV 21

Applicable to: MSN 02155-02719, 02789-03060, 05152-07792

ENG 1 LH SIDE

Oil fill access door..... CLOSED
 Thrust reversers..... CLOSED/LATCHED
 Fan cowl doors..... CLOSED/LATCHED/FLAG REMOVED
 Drain mast..... CHECK CONDITION/NO LEAK
 Engine inlet and fan blades..... CHECK CONDITION
 Safety pin..... REMOVED
 Pylon/access panel..... CHECK CONDITION/CLOSED

Ident.: PRO-NOR-SOP-05-A-00010384.0007001 / 09 NOV 21

Applicable to: MSN 02758, 04392

ENG 1 LH SIDE

Oil fill access door..... CLOSED
 Thrust reversers..... CLOSED/LATCHED
 Fan cowl doors..... CLOSED/LATCHED/FLAG REMOVED
 Drain mast..... CHECK CONDITION/NO LEAK
 Engine inlet and fan blades..... CHECK CONDITION
 Pylon/access panel..... CHECK CONDITION/CLOSED

PROCEDURES

NORMAL PROCEDURES

STANDARD OPERATING PROCEDURES - EXTERIOR WALKAROUND

EXTERIOR WALKAROUND - ENG 1 RH SIDE

Ident.: PRO-NOR-SOP-05-A-00010386.0015001 / 09 NOV 21

Applicable to: MSN 02155-02719, 02789-03060, 05152-07792

ENG 1 RH SIDE

Vent inlet..... CLEAR
 Pressure relief/Start valve handle access door..... CLOSED
 Thrust reversers..... CLOSED/LATCHED
 Fan cowl doors..... CLOSED/LATCHED/FLAG REMOVED
 Turbine exhaust..... CLEAR
 Safety pin..... REMOVED

Ident.: PRO-NOR-SOP-05-A-00010386.0007001 / 09 NOV 21

Applicable to: MSN 02758, 04392

ENG 1 RH SIDE

Vent inlet..... CLEAR
 Pressure relief/Start valve handle access door..... CLOSED
 Thrust reversers..... CLOSED/LATCHED
 Fan cowl doors..... CLOSED/LATCHED/FLAG REMOVED
 Turbine exhaust..... CLEAR

Ident.: PRO-NOR-SOP-05-A-00010387.0001001 / 09 NOV 21

Applicable to: ALL

LH CENTER WING

Slat 1.....CHECK CONDITION
 Wing leading edge ventilation intake  CLEAR
 Fuel water drain valve(s)..... NO LEAK
 Tank magnetic fuel level(s).....FLUSH
 Landing lights.....CHECK CONDITION
 Hydraulic reservoir pressurization door..... CLOSED
 RAT doors..... CLOSED

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES STANDARD OPERATING PROCEDURES - COCKPIT PREPARATION
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GENERAL

Ident.: PRO-NOR-SOP-06-00011153.0001001 / 09 NOV 21

Applicable to: ALL

Items marked by asterisks (*) are the only steps to be completed after a transit stop without flight crew change. Otherwise, the new flight crew performs all the items.

The PF and PM should perform the cockpit preparation, in accordance with the defined panel scan sequence and tasksharing.

The PF prepares the overhead panel, the center instrument panel and the pedestal while the PM performs the external walkaround. When both flight crewmembers are seated and the PM checked the FMS, both flight crewmembers continue the cockpit preparation.

WARNING	Do not pressurize the hydraulic systems until clearance is obtained from ground personnel.
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PROCEDURES

NORMAL PROCEDURES

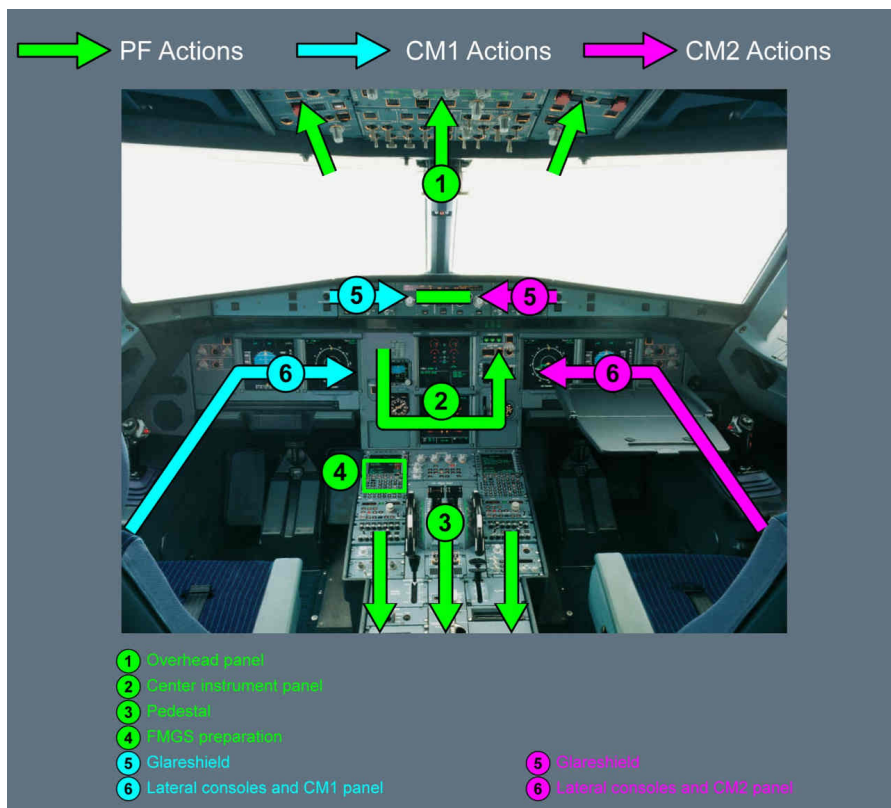
STANDARD OPERATING PROCEDURES - COCKPIT PREPARATION

FLOW PATTERN

Ident.: PRO-NOR-SOP-06-00020280.0001001 / 24 NOV 23

Applicable to: ALL

COCKPIT PREPARATION FLOW PATTERN



OVERHEAD PANEL

Ident.: PRO-NOR-SOP-06-A-00011155.0001001 / 24 NOV 23
 Applicable to: ALL

- WHITE LIGHTS ON THE OVERHEAD PANEL**
- **As a general rule, during the scan sequence of the overhead panel:**
 - * ALL WHITE LIGHTS (except MAINTENANCE panel)..... OFF | PF
- Note:*
- Depending on Operators policy, some lights may be kept ON during the cockpit preparation
 - During the scan of the overhead panel, check also that the only amber lights are the GEN FAULT lights.

OVERHEAD PANEL - RCDR

Ident.: PRO-NOR-SOP-06-A-00015476.0001001 / 24 NOV 23
 Applicable to: MSN 02155-05746

- RCDR**
- * RCDR GND CTL pb-sw..... ON | PF
- L2 *In order to perform the test, ensure that the PARK BRK is on.*
- L1 LOUDSPEAKER VOLUME knob..... OFF (BOTH SIDES) | PF
- ACP INT/RAD sw (ACP1 and ACP2).....SET to INT | PF
- INTERPHONE VOLUME RECEPTION knob (ACP1 and ACP2).....RELEASE | PF
- L2 *Turn down the volume to the minimum.*
- L1 CVR TEST pb.....PRESS AND MAINTAIN | PF
- L2 *The CVR test is successful when an audio test signal is heard through the loudspeakers and the CVR TEST pb is pressed and maintained.*
- Depending on the CVR model, the audio test signal is:*
- For CVR 30 min:
 - A continuous tone, or
 - A short tone.
 - For CVR 120 min:
 - A short tone, or
 - A short tone and a beep every 4 s, or
 - Two short tones and a beep every 4 s.
- The audio test signal stops when the CVR TEST pb is released.*

PROCEDURES

NORMAL PROCEDURES

STANDARD OPERATING PROCEDURES - COCKPIT PREPARATION

L1

- Note:
- The flight crew may also hear an acoustic feedback (i.e. Larsen effect) during the test. The test is still valid even if this acoustic feedback (i.e. Larsen effect) is heard
 - If the flight crew cannot hear the audio test signal through the loudspeakers, and if the CVR maintenance headset (22RK headset) is available, the flight crew can perform the CVR TEST through the CVR maintenance headset
 - If an acoustic feedback (i.e. Larsen effect) is still heard, the flight crew can perform the CVR TEST using the 22RK headset and with the parking brake set to off. Before setting the parking brake to off, the flight crew must ensure that chocks are in place or brakes are applied. Set the parking brake to on when the CVR TEST is achieved
 - If no 22RK headset is available, the Larsen effect can also be reduced by preventing the cockpit ambient microphone from picking up the ambient sound (i.e. by temporarily covering it during the test).

Ident.: PRO-NOR-SOP-06-A-00015476.0002001 / 24 NOV 23

Applicable to: MSN 07784-07792

RCDR

* RCDR GND CTL pb-sw..... ON | PF

L2 In order to perform the test, ensure that the PARK BRK is on.

L1 LOUDSPEAKER VOLUME knob..... OFF (BOTH SIDES) | PF
 ACP INT/RAD sw (ACP1 and ACP2).....SET to INT | PF
 INTERPHONE VOLUME RECEPTION knob (ACP1 and ACP2).....RELEASE | PF

L2 Reduce the volume to the minimum.

L1 CVR TEST pb.....PRESS AND MAINTAIN | PF

L2 The CVR test is successful when an audio test signal is heard through the loudspeakers and the CVR TEST pb is pressed and maintained.

Depending on the CVR model, the audio test signal is:

- For CVR 30 min:
 - A continuous tone, or
 - A short tone.
- For CVR 120 min:
 - A short tone, or
 - A short tone and a beep every 4 s, or
 - Two short tones and a beep every 4 s.

The audio test signal stops when the CVR TEST pb is released.

L1

Note: The flight crew can perform the CVR test through the CVR maintenance headset, if:

- The flight crew cannot hear the audio test signal through the loudspeakers
- The CVR maintenance headset is available.

Ident.: PRO-NOR-SOP-06-A-00011158.0001001 / 09 NOV 21
 Applicable to: ALL

EVAC

CAPT & PURS/CAPT sw	AS RQRD	PF
---------------------------	---------	----

L2

Set the CAPT & PURS/CAPT sw on the EVAC panel as per Company Policy.

Ident.: PRO-NOR-SOP-06-A-00011160.0001001 / 09 NOV 21
 Applicable to: ALL

EXTERIOR LIGHTS

STROBE sw.....	AUTO	PF
BEACON sw.....	OFF	PF
NAV & LOGO sw.....	AS RQRD	PF

L2

Set to NAV & LOGO 1 , as required, to turn on the navigation and logo lights (NAV & LOGO LT 2 is used only when NAV & LOGO LT 1 fails).

REMAINING EXTERIOR LIGHTS.....	AS RQRD	PF
--------------------------------	---------	----

Ident.: PRO-NOR-SOP-06-A-00011161.0001001 / 24 NOV 23
 Applicable to: ALL

SIGNS

* SIGNS panel.....	SET	PF
--------------------	-----	----

L2

- Set the SEAT BELTS sw to ON when refueling is complete. For more information, Refer to CCOM/13-130 REFUELING/DEFUELING PROCEDURE WITH PASSENGERS ON BOARD.
 - Set the EMER EXIT LT sw to ARM
 - Set the other switches, as required.

L1

Note: If the CIDS has been programmed (option) for a non-smoking flight, NO SMOKING or NO PORTABLE/ELEC DEVICE signs are permanently on, with the EXIT sw or NO SMOKING sw or NO PORTABLE/ELEC DEVICE sw at AUTO.

Ident.: PRO-NOR-SOP-06-A-00010176.0001001 / 09 NOV 21
 Applicable to: ALL

PROBE/WINDOW HEAT

PROBE/WINDOW HEAT pb-sw.....	AUTO	PF
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 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES STANDARD OPERATING PROCEDURES - COCKPIT PREPARATION
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Ident.: PRO-NOR-SOP-06-A-00011162.0001001 / 09 NOV 21

Applicable to: ALL

CABIN PRESS

LDG ELEV knob.....

AUTO

PF

Ident.: PRO-NOR-SOP-06-A-00011163.0010001 / 09 NOV 21

Applicable to: ALL

AIR COND

* PACK FLOW selector.....

AS RQRD

PF

L2

Select:

LO : If the number of occupants is below 141.

HI : For abnormally hot and humid conditions.

NORM : For all other normal operating cases.

If the APU is supplying, pack controllers select HI flow automatically, independent of the selector position.

Ident.: PRO-NOR-SOP-06-A-00011164.0001001 / 24 NOV 23

Applicable to: ALL

ELEC

ELEC pb (on the ECAM Control Panel).....

PRESS

PF

BAT 1 pb-sw and BAT 2 pb-sw.....

OFF then AUTO

PF

L2

This action initiates a charging cycle of the batteries.

L1

10 s after setting all BAT pb-sw to AUTO, check on the **ELEC** SD page that the current charge of the battery is below 60 A, and is decreasing.

● If the charge of at least one battery is not below 60 A:

Wait until the end of the charging cycle of the batteries and perform this check again.

OVERHEAD PANEL - FUEL

Ident.: PRO-NOR-SOP-06-A-00011166.0003001 / 17 MAY 24

Applicable to: MSN 07784-07792

FUEL

CAUTION

If the FUEL CTR TK MODE SEL pb-sw is unduly left in the MAN position on ground, when the CTR TK L XFR pb-sw and CTR TK R XFR pb-sw are not in the OFF position: There is a possibility of fuel spillage. In this configuration, the center tank fuel transfer will not stop when the wing tanks become full.

* FUEL CTR TK MODE SEL pb-sw.....

CHECK AUTO

PF

Ident.: PRO-NOR-SOP-06-A-00011166.0002001 / 17 MAY 24
Applicable to: MSN 02155-05746

FUEL

■ If the center tank is less than 200 kg (440 lb) for the flight:

Apply the following procedure, if your airline is affected by FUEL CTR TK PUMPS LO PR cautions on ground or in flight when the center tank is less than 200 kg (440 lb):

* FUEL CTR TK MODE SEL pb-sw.....

MAN

PF

* CTR TK PUMP 1 pb-sw and CTR TK PUMP 2 pb-sw.....

OFF

PF

■ If the center tank is NOT less than 200 kg (440 lb) for the flight:

CAUTION

If the FUEL CTR TK MODE SEL pb is unduly left in the MAN position on ground, when the CTR TK PUMP 1 pb & CTR TK PUMP 2 pb are not in the OFF position: There is a possibility of fuel spillage, if there are any hidden failures.

* FUEL CTR TK MODE SEL pb.....

CHECK AUTO

PF

Ident.: PRO-NOR-SOP-06-A-00011167.0001001 / 03 NOV 21
Applicable to: ALL

ENG 1 - ENG 2 FIRE

ENG 1 FIRE pb-sw and ENG 2 FIRE pb-sw.....

CHECK IN and GUARDED

PF

AGENT 1 light and AGENT 2 light

CHECK OFF

PF

ENG 1 TEST pb.....

PRESS and MAINTAIN

PF

L2

The flight crew should maintain the TEST pb pressed during the time of the test.

L1

ENG 2 TEST pb.....

PRESS and MAINTAIN

PF

L2

The flight crew should maintain the TEST pb pressed during the time of the test.

L1

TEST RESULT

Check that ENG 1 FIRE and ENG 2 FIRE detection and extinguishing systems are operative:

- The CRC sounds

- The MASTER WARN lights flash

- The ECAM displays the ENG 1 FIRE, ENG 2 FIRE alerts

- All ENG FIRE pb-sw come on red

- All SQUIB lights of the AGENT pb come on

- All DISCH lights of the AGENT pb come on

- All FIRE lights on the ENG MASTER panel come on.

PIA A318/A319/A320/A321 FLEET

FCOM

← C →

PRO-NOR-SOP-06 P 7/24

09 FEB 26

PROCEDURES

NORMAL PROCEDURES

STANDARD OPERATING PROCEDURES - COCKPIT PREPARATION

Ident.: PRO-NOR-SOP-06-A-00011169.0001001 / 09 NOV 21

Applicable to: ALL

AUDIO SWITCHING PANEL

AUDIO SWITCHING selector NORM | PF

Ident.: PRO-NOR-SOP-06-A-00010178.0001001 / 06 NOV 25

Applicable to: ALL

AFT CARGO HEAT

TEMPERATURE selector AS RQRD | PF

FWD CARGO HEAT

TEMPERATURE selector AS RQRD | PF

Ident.: PRO-NOR-SOP-06-A-00011174.0001001 / 24 NOV 23

Applicable to: ALL

THIRD OCCUPANT AUDIO CONTROL PANEL

PA (3rd occupant)..... RECEPT | PF

- L2**
- This action enables to record the cabin attendant announcements on the CVR
 - For proper recording, set volume at or above medium range.

Ident.: PRO-NOR-SOP-06-A-00011176.0001001 / 10 MAY 22

Applicable to: ALL

MAINTENANCE PANEL

ALL LIGHTS.....CHECK | PF

CTR INSTRUMENT PANEL

Applicable to: ALL

Ident.: PRO-NOR-SOP-06-B-00011184.0001001 / 09 NOV 21

ISIS

* ISIS.....CHECK | PF

- L2**
- Adjust brightness, check IAS, altimeter readings, altimeter settings and attitude display.
 - Check no flags - Reset attitude, if necessary.

Note: Use of the ISIS bugs function is not recommended (Refer to DSC-34-NAV-20 Bugs Function)

Ident.: PRO-NOR-SOP-06-B-00011185.0009001 / 09 NOV 21

CLOCK

* CLOCK..... CHECK/SET | PF

L2 Note: 1. If the date is incorrect, set the date manually then set and keep the clock mode to internal (INT) mode for the whole flight.

 2. To comply with the time precision requirement (+/-1 s UTC) for ATC datalink communication, the flight crew must either:

- Use the clock in GPS mode, or

- Use the clock in INT mode and synchronize the clock with the GPS at least one time per day. This synchronization ensures that the UTC time drift is below +/- 1 s UTC.

For more information on the setting of the clock, Refer to DSC-31-55-10 General.

For more information on the use of the internal (INT) mode, Refer to DSC-31-55-20 Operation in Internal Mode.

Ident.: PRO-NOR-SOP-06-B-00011186.0001001 / 09 NOV 21

NOSEWHEEL STEERING

* A/SKID & N/W STRG sw..... ON | PF

PEDESTAL

Applicable to: ALL

Ident.: PRO-NOR-SOP-06-C-00011202.0001001 / 12 NOV 24

RMP

RMP 1 and 2.....	CHECK ON	PF
Green NAV light.....	CHECK OFF	PF
SEL light.....	CHECK OFF	PF
COM FREQUENCIES.....	TUNE	PF

L2 Use VHF 1 for ATC (only VHF 1 is available in emergency electrical configuration), VHF 2 for ATIS and company frequencies. VHF 3 is normally devoted to ACARS.

Ident.: PRO-NOR-SOP-06-C-00011187.0001001 / 09 NOV 21

ACP

INT knob	PRESS OUT/VOLUME CHECK	PF
----------------	------------------------	----

L2 Ensure sure that INT volume is turned up, to enable contact with the ground crew.

L1 VHF	CHECK	PF
---------------------	-------	----

L2 Check transmission and reception.

- L1

HF (if required for flight).....CHECK

PF
- L2

Check transmission and reception.

CAUTION

- Do not transmit on HF during refueling operations (i.e. refueling, defueling, fuel transfer)
- Only perform HF radio checks when appropriate (i.e. no personnel in the immediate vicinity).

Ident.: PRO-NOR-SOP-06-C-00011191.0001001 / 24 NOV 23

COCKPIT DOOR

If required by local Airworthiness Authorities:

- ANN LT selector.....TEST

PF
- L2

Check that the OPEN and FAULT lights (on the pedestal), and the three LED lights (on the overhead panel) come on.
- L1

ANN LT selector.....BRT

PF
- L2

Check that all lights go off.
- L1

COCKPIT DOOR.....CHECK CORRECT OPERATION

PF
- L2

- Set the COCKPIT DOOR sw to the UNLOCK position. Check that the door opens, and that the OPEN light comes on
 - Then, with the door fully open, release the COCKPIT DOOR sw (check that it returns to NORM position). Close the door. Check that it is locked, and that the OPEN indication goes off.
- L1

COCKPIT DOOR MECHANICAL OVERRIDE handle.....CHECK

PF
- L2

Check that the door opens normally, and that it closes when the mechanical override is used.
- L1

* COCKPIT DOOR sw.....NORM

PF

Ident.: PRO-NOR-SOP-06-C-00011189.0001001 / 22 NOV 21

SWITCHING PANEL

- All selectors.....CHECK NORM

PF

Ident.: PRO-NOR-SOP-06-C-00011192.0001001 / 24 NOV 23

ENG

- *

THRUST leversIDLE

PF
- *

ENG MASTER leversOFF

PF
- *

ENG MODE selector.....NORM

PF

Ident.: PRO-NOR-SOP-06-C-00011195.0001001 / 03 NOV 22

PARKING BRK

* ACCU PRESS indicator.....

L2 The ACCU PRESS indication must be in the green band. If required, use the electric pump on yellow hydraulic system to recharge the brake accumulator.

L1

WARNING Yellow and green hydraulic systems are pressurized from yellow electric pump. Get ground crew clearance before using the electric pump.

CHECK | PF

* PARK BRK handle.....

* BRAKES PRESS indicator.....

L2 Check for normal indications.

L1

CHECK ON | PF

CHECK | PF

● If brakes are hot and chocks are in place:

* PARK BRK handleOFF | PF

L2 Releasing the parking brake prevents the critical structures from being exposed to high temperature levels for an extended time. However, if operational conditions require (e.g. slippery tarmac), the parking brake may remain applied.

Ident.: PRO-NOR-SOP-06-C-00011198.0001001 / 22 NOV 21

GRAVITY GEAR EXTN

GRAVITY GEAR EXTN.....

CHECK STOWED | PF

ATC

* ATC.....

* TCAS.....

L2 To prevent possible interference to radar surveillance systems, TCAS should not be selected before the holding point/lining up.

L1 ALT RPTG.....

* ATC SYS 1/2.....

L2 For RVSM operations (Refer to PRO-SPO-50 Required Equipments/Functions for RVSM), select SYS 1 if AP 1 is used, and SYS 2 if AP 2 is used. Only system 1 is available in emergency electrical configuration.

STBY | PF

STBY | PF

ON | PF

SELECT | PF

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ATC DATALINK COMMUNICATION

Ident.: PRO-NOR-SOP-06-00013746.0002001 / 13 MAY 25
Applicable to: MSN 02719-02789, 03031-03060, 05152-07792

* MSG.....ERASE | PF

 This avoids confusing CPDLC messages from the previous flight with the ones of the current flight.

FMGS PREPARATION

Ident.: PRO-NOR-SOP-06-D-00011226.0001001 / 12 NOV 25
Applicable to: ALL

GENERAL

At electrical power-up, the FMGSs and FCU run through various internal tests. Allow enough time (3 min) for tests' completion, and do not start to press pushbuttons until the tests are over. If the "PLEASE WAIT" message appears, do not press any MCDU key until the message clears.

In the case of ACARS /AOC operations, or EFB operations (when a synchronization with the avionics is available), the following actions are already performed in the section "FMGS Pre-Initialization" of the PRELIMINARY COCKPIT PREPARATION procedure and do not need to be performed again:

- ENGINE & AIRCRAFT TYPE check
- FM database validity check
- Flight plan initialization:
 - FLT NBR insertion
 - FROM/TO insertion

Refer to PRO-NOR-SOP-04 EFB/ACARS Init - FMGS Pre-Initialization - General.

Ident.: PRO-NOR-SOP-06-D-00011227.0001001 / 09 NOV 21
Applicable to: ALL

ENGINE AND AIRCRAFT TYPE

* ENGINE & AIRCRAFT TYPE.....CHECK | PF

 Press the DATA key, and display the STATUS page (if not displayed).

FMGS PREPARATION - FM DATABASE VALIDITY

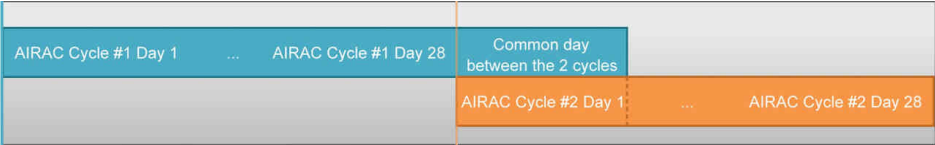
Ident.: PRO-NOR-SOP-06-D-00011228.0001001 / 06 NOV 25
Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

5 **FM DATABASE VALIDITY**

- * FM database validity..... CHECK | PF
- L2

- Check database validity and stored WPT/NAVAIDS/RWY/ROUTES, if any. If applicable, review the stored data for deletion decision.

- On Honeywell FM, the double AIRAC cycle of the NDB has one day in common (AIRAC Cycle #1 Day 29 / AIRAC Cycle #2 Day 1). From Day 2 of AIRAC Cycle #2, the active database is no longer valid and the message **CHECK DATA BASE CYCLE** will be triggered.
On the common day, select AIRAC Cycle #2 prior to the first flight of the day.



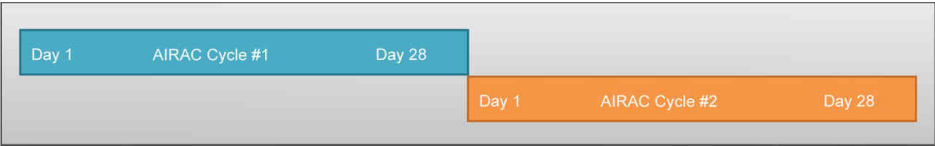
Ident.: PRO-NOR-SOP-06-D-00011228.0002001 / 09 NOV 21
Applicable to: MSN 02926-02944, 04392, 07784-07792

FM DATABASE VALIDITY

- * FM database validity..... CHECK | PF
- L2

- Check DATA BASE validity and stored WPT/NAVAIDS/RWY/ROUTES, if any. If applicable, review the stored data for deletion decision.

- On Thales FMS, if the "CHECK DATA BASE CYCLE" message triggers, the active database is no longer valid. Therefore, on Day 1 of AIRAC Cycle #2, select AIRAC Cycle #2 prior to the first flight of the day.



PROCEDURES

NORMAL PROCEDURES

STANDARD OPERATING PROCEDURES - COCKPIT PREPARATION

Ident.: PRO-NOR-SOP-06-D-00026846.0001001 / 24 NOV 23

Applicable to: ALL

IDLE / PERF FACTOR

* IDLE / PERF FACTOR.....CHECK | PF

L2 Refer to DSC-22_20-10-40-30 Procedure to Modify the PERF and IDLE Factors (on Ground only).

Ident.: PRO-NOR-SOP-06-D-00011229.0001001 / 06 NOV 25

Applicable to: ALL

6 NAVAID DESELECTION

* NAVAID DESELECTION.....AS RQRD | PF

L2 If NOTAMs warn of any unreliable or unserviceable NAVAID, access the SELECTED NAVAIDS page, and deselect the related NAVAID.

Ident.: PRO-NOR-SOP-06-D-00011231.0003001 / 09 NOV 21

Applicable to: ALL

FLIGHT PLAN INITIALIZATION

* FLIGHT PLAN INITIALIZATION.....COMPLETE | PF

- L2
- Press the INIT key
 - Insert CO RTE or city pair, and check FROM/TO
 - Check/modify ALTN/CO RTE
 - Enter flight number

Note: For ATC needs, the crew should enter exactly the entire flight number, as shown on the ICAO flight plan, without inserting any space, on the MCDU INIT page.

- Enter (and/or check) cost index
- Enter intended initial CRZ FL, or check if it was already supplied by the database. Modify it, if necessary, taking into account ATC constraints or expected gross weight
- Check and modify CRZ FL TEMP and tropopause level to agree with forecast
- Enter (and/or check) the expected ground temperature for take off (GND TEMP) 
- PRESS IRS INIT prompt
- Check alignment latitude/longitude.

FMGS PREPARATION - ADIRS POSITION INITIALIZATION Ident.: PRO-NOR-SOP-06-D-00011232.0011001 / 09 NOV 21 Applicable to: MSN 02926-02944

ADIRS POSITION INITIALIZATION

* ADIRS POSITION INITIALIZATION.....AS APPROPRIATE | PF

L2 *Confirm or insert position coordinates for the IRS alignment. Refer to FCTM/PR-NP-SOP-60 FMGS Preparation.*

L1

- Between latitude 73 ° and 82 °, the IRS alignment should last at least 15 min.
 After the start of the IRS alignment procedure, wait 15 min. Then press the ALIGN IRS prompt.

Ident.: PRO-NOR-SOP-06-D-00011232.0001001 / 09 NOV 21 Applicable to: MSN 02155-02789, 03031-07792
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ADIRS POSITION INITIALIZATION

* ADIRS POSITION INITIALIZATION.....AS APPROPRIATE | PF

L2 *Confirm or insert position coordinates for the IRS alignment. Refer to FCTM/PR-NP-SOP-60 FMGS Preparation.*

IRS Alignment Based on GPS  Position available:
 The position initialization is automatic. The position for the initialization of the IRS is the GPS position. However, the flight crew can manually override the automatic position initialization. The IRS crosschecks the flight crew's manual entry with the GPS position.

IRS Alignment Based on GPS  Position not available:
 Apply the manual position initialization procedure.

Ident.: PRO-NOR-SOP-06-D-00011233.0015001 / 24 NOV 23 Applicable to: ALL

ACTIVE F-PLN CHECK

* F-PLN A page.....COMPLETE AND CHECK | PF

L2 *If CO RTE has been inserted, the F-PLN should automatically include the preferential or most probable takeoff runway, approach and landing runway, associated SIDs, STARs, transition and en-route waypoints. However, some databases will only include departure and arrival airport IDENTs and en-route waypoints.*

PROCEDURES

NORMAL PROCEDURES

STANDARD OPERATING PROCEDURES - COCKPIT PREPARATION

The flight crew must check, modify, or insert (as applicable) the F-PLN in the following order according to the data given by ATIS, ATC, or MET:

- Lateral revision at departure airport. Select RWY, then SID, then TRANS using scroll keys

Note: On the MCDU departure page, select only a runway associated with an ILS or NO NAVAIDS.

- Lateral revision at WPT for ROUTE modification if needed. For more information on lateral revision, Refer to DSC-22_20-10-30-10 Lateral Revisions.
- Vertical revision. Check or enter climb speed limit and speed constraints according to ATC clearance. Enter step altitude, as appropriate.

L1 * WINDS.....AS APPROPRIATE | PF

L2 Choose between trip wind or forecast wind for CLB, CRZ and DES phases. For more detail, Refer to DSC-22_20-10-30-23 Wind - Temperature - QNH - Entering the Trip Wind and Temperature During F-PLN Initialization.

L1 * F-PLN.....CHECK | PF

- L2**
- Check the F-PLN using F-PLN page and ND PLAN mode versus the computer (paper) flight plan or navigation chart
 - Check DIST TO DEST along the F-PLN. Compare it with the total distance computed for the flight with the computer (paper) flight plan.

Ident.: PRO-NOR-SOP-06-D-00011234.0001001 / 09 NOV 21

Applicable to: ALL

SECONDARY F-PLN

* SECONDARY FLIGHT PLAN.....AS APPROPRIATE | PF

L2 This is routinely a copy of the active flight plan. However, consideration may be given to the following:

- Copy the active F-PLN, but modify it at a suitable WPT for an immediate return to the departure airfield in the event of, for example, engine failure
- If weather is below landings minima at the departure airfield, the secondary flight plan should be that required for a diversion immediately after takeoff
- If there is a chance of a change in runway or SID during taxi, prepare for it by copying the active flight plan and making the necessary modifications.

Ident.: PRO-NOR-SOP-06-D-00011235.0001001 / 09 NOV 21
Applicable to: ALL

RADIO NAV

* RADIO NAV.....CHECK | PF

L2 - Check the VOR, ILS / GLS / MLS , and ADF tuned by the FMGC

- Modify them if required, and check that the correct identifier is displayed on the ND and PFD (VOR, ILS / GLS / MLS). If unsatisfactory, go through the audio check. For GLS / MLS , no audio check is necessary.

L1 **CAUTION** Do not enter an IDENT or channel associated with a MLS .

Ident.: PRO-NOR-SOP-06-D-00011238.0003001 / 09 NOV 21
Applicable to: ALL

GROSS WEIGHT INSERTION (INIT B PAGE):

* ZFW/ZFWCG.....INSERT | PF

* BLOCK FUEL.....INSERT | PF

CAUTION The characteristic speeds displayed on the MCDU (green dot, F, S, VLS) are computed from the ZFW and ZFWCG entered by the crew on the MCDU. Therefore, this data must be carefully checked (Captain's responsibility).

- The flight crew should insert the weights after completing all other insertions. This is to avoid cycles of prediction computations at each change in flight plan, constraints, etc

- If ZFW and ZFWCG are unavailable, it is acceptable to enter the expected values in order to obtain predictions. Similarly, the flight crew may enter the expected fuel on board, if refueling has not been completed at that time

- If ZFW, ZFWCG, and BLOCK FUEL are inserted, the FMS will provide all predictions, as well as the EXTRA fuel, if any.

Ident.: PRO-NOR-SOP-06-D-00011240.0001001 / 06 NOV 25
Applicable to: ALL

7 TAKEOFF DATA INSERTION (PERF TAKEOFF PAGE):

The PF inserts the takeoff data in the PERF TAKEOFF page of the MCDU.

* T.O SHIFT.....INSERT AS RQRD | PF

L2 If the aircraft takes off from an intersection, insert a T.O shift value in order to:

- Increase awareness of the runway length reduction

- Ensure accurate TOS2 monitoring before the engines are set to takeoff power.

L1 * V1, VR, V2.....INSERT | PF

* FLX TO TEMP.....INSERT | PF

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES STANDARD OPERATING PROCEDURES - COCKPIT PREPARATION
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- | | | |
|-----------------------------|--------------|----|
| * THR RED/ACC altitude..... | SET or CHECK | PF |
| * ENG OUT ACC altitude..... | SET or CHECK | PF |
| * FLAPS/THS reminder..... | INSERT | PF |

L2
The THS can be left blank until the loadsheet is received. When entered in the MCDU, the THS value will be used to trigger the F/CTL PITCH TRIM/MCDU/CG DISAGREE alert.

Ident.: PRO-NOR-SOP-06-D-00011243.0001001 / 09 NOV 21
Applicable to: ALL

CLIMB, CRUISE, DESCENT, SPEED PRESELECTION

- | | | |
|----------------------|---------|----|
| * PRESET SPEEDS..... | AS RQRD | PF |
|----------------------|---------|----|

L2
If the flight is cleared for a close-in turn or close-in altitude constraint, the flight crew may preselect green dot speed on the PERF CLB page. Once the CLB phase is active, the preselected speed will be displayed in the FCU speed window and on the PFD (blue symbol). Once the turn is completed or the altitude cleared, the pilot will resume the managed speed profile by pressing the SPD selector on the FCU.
Similarly the pilot may select a CRZ MACH number on the PERF CRZ page (constant CRZ Mach segment, for example). When the CRZ phase is active, the preselected CRZ MACH number will be displayed in the FCU speed window and on the PFD. When ECON MACH number may be resumed, the crew presses the FCU SPD selector.
In either of the above cases, the pilot may cancel the CLB or CRZ preselected SPD/MACH prior to activating the related phase, by selecting ECON on the PERF CLB or CRZ pages.
SPD LIM is defaulted to 250 kt below 10 000 ft in the managed speed profile. This may be either cleared or modified on the VERT REV page at the origin (or a climb waypoint).

FMGS PREPARATION - CHECK OF FMGS PREPARATION

Ident.: PRO-NOR-SOP-06-D-00015496.0002001 / 14 NOV 24
Applicable to: MSN 02155-02212

CHECK OF FMGS PREPARATION:

- | | | |
|------------------------|------------|----|
| * FMS PREPARATION..... | CROSSCHECK | PM |
|------------------------|------------|----|

L2
After the PF prepares the FMS, the PM checks all the data entered in the FMS. This check includes a crosscheck between:

- Waypoints of the expected departure route that include constraints
- Waypoints of the flight plan and the computerized flight plan
- Initial cruise altitude and the computerized flight plan
- Total track miles and the computerized flight plan
- Fuel remaining at destination and the computerized flight plan
- Performance data displayed on the PM's EFB with the FMS PERF TAKE OFF page. This includes modifications of the THR RED /ACCEL / EO ACCEL settings, if applicable
- TRANS ALT in the FMS PERF TAKE OFF page

- QNH field in the FMS PERF APPR page
- Setup of the SEC flight plan.

- L1

L2

The PM should have the same mental image of the intended departure procedure, trajectory, and constraints than the PF. The PM should check with the PF if anything is not clear.
- L1

* EFB/MCDU GREEN DOT.....COMPARE | PM
- L2

The PM compares the Green Dot speed computed by the FMGS and the Green Dot speed computed by the EFB takeoff performance application. A discrepancy indicates a difference in the TOW used in both systems (EFB/FMGS).

Ident.: PRO-NOR-SOP-06-D-00015496.0001001 / 14 NOV 24
Applicable to: MSN 02719-07792

CHECK OF FMGS PREPARATION:

- L1

L2

* FMS PREPARATION.....CROSSCHECK | PM
- L2

After the PF prepares the FMS, the PM checks all the data entered in the FMS. This check includes a crosscheck between:

 - Waypoints of the expected departure route that include constraints
 - Waypoints of the flight plan and the computerized flight plan
 - Initial cruise altitude and the computerized flight plan
 - Total track miles and the computerized flight plan
 - Fuel remaining at destination and the computerized flight plan
 - Performance data displayed on the PM's EFB with the FMS PERF TAKE OFF page. This includes modifications of the THR RED/ACCEL/EO ACCEL settings, if applicable
 - TRANS ALT in the FMS PERF TAKE OFF page
 - Setup of the SEC flight plan.
- L1

L2
- The PM should have the same mental image of the intended departure procedure, trajectory, and constraints as the PF. The PM should check with the PF if anything is not clear.
- L1

* EFB/MCDU GREEN DOT.....COMPARE | PM
- L2

The PM compares the Green Dot speed computed by the FMGS and the Green Dot speed computed by the EFB takeoff performance application. A discrepancy indicates a difference in the TOW used in both systems (EFB/FMGS).

GLARESHIELD

Applicable to: ALL

Ident.: PRO-NOR-SOP-06-E-00020832.0003001 / 07 NOV 25

8EFIS CONTROL PANEL

- * BAROMETRIC REFERENCE.....SET/CROSSCHECK

BOTH

L2

- Set QNH on the EFIS control panel and on the standby altimeter

- Check the barometric reference and altitude indications on the PFDs and on the standby altimeter.

The maximum difference is:

±20 ft between both PFDs

And depending on the aircraft configuration:

±100 ft between ISIS  and PFDs, or

±300 ft between mechanical standby altimeter and PFDs.

L1

* FD.....CHECK ON

PF-PM

* LS pb.....AS RQRD

PF-PM

* ND MODE and RANGEAS RQRD

PF-PM

* ADF  /VOR sw.....AS RQRD

PF-PM

L2

Display VOR and ADF  pointers as required.

Ident.: PRO-NOR-SOP-06-E-00011248.0001001 / 13 MAY 24

FCU

- * SPD/MACH window.....DASHED

PF

* HDG-V/S / TRK-FPA pb.....HDG-V/S

PF
- Note: During takeoff, it is recommended to use HDG-V/S as flying reference. If TRK-FPA is selected, the flying reference does not revert to HDG-V/S. In this case, the FD orders are not appropriate for takeoff roll and rotation.
- * ALT window.....INITIAL EXPECTED CLEARANCE ALTITUDE

PF

Note: Do not engage the autothrust on ground, as it may generate the **AUTO FLT A/THR OFF** warning at engine start.

LATERAL CONSOLES

Ident.: PRO-NOR-SOP-06-00011249.0002001 / 24 NOV 23
Applicable to: ALL

WARNING	To prevent hearing damage to the ground crew connected to the intercom system, inform them that a loud noise may be heard in the headset when performing the oxygen mask test.
----------------	--

- **On the mask stowage box of each occupied station:**
OXYGEN MASK TEST..... PERFORM | PF-PM

L2

For a detailed test of the mask, Refer to DSC-35-20-30 How to Test the Mask.
- L1

● **On the ECAM DOOR/OXY SD page:**
REGUL LO OR indication.....CHECK NOT DISPLAYED | PF-PM

Note:

The crew must perform this check after having checked all masks. It ensures that the LP valve is open (due to residual pressure between the LP valve and the oxygen masks, an LP valve failed in the closed position may not be detected during the oxygen mask test).

INSTRUMENT PANELS

Ident.: PRO-NOR-SOP-06-00011252.0001001 / 14 NOV 24
Applicable to: MSN 02155-03060, 05152-05746

- PFD and ND brightness knob.....AS RQRD | PF-PM

L2

Check the ND outer ring is set to maximum brightness (radar/terrain display).
- L1

LOUDSPEAKER knobSET | PF-PM

L2

Set the LOUDSPEAKER knob around the 1 o'clock position.
- L1

* PFD.....CHECK | PF-PM

L2

- Check PFD/ND not transferred.
 - Check for correct display, when ATT and HDG are available.
 - Check IAS, FMA, initial target ALT, altimeter readings, VSI, altimeter settings, heading and attitude display.
- L1

* ND.....CHECK | PF-PM

L2

- Check for correct display.
 - Crosscheck MAG HDG indications on the ND and DDRMI.
 - Check heading, initial waypoint, VOR/ADF  indications.

PROCEDURES

NORMAL PROCEDURES

STANDARD OPERATING PROCEDURES - COCKPIT PREPARATION

INSTRUMENT PANELS

Ident.: PRO-NOR-SOP-06-00011252.0002001 / 14 NOV 24

Applicable to: MSN 04392, 07784-07792

- PFD and ND brightness knob.....AS RQRD | PF-PM
- L2** Check the ND outer ring is set to maximum brightness (radar/terrain display).
- L1** LOUDSPEAKER knobSET | PF-PM
- L2** Set the LOUDSPEAKER knob around the 1 o'clock position.
- L1** * PFD.....CHECK | PF-PM
- L2** - Check PFD/ND not transferred.
- Check for correct display, when ATT and HDG are available.
 - Check IAS, FMA, initial target ALT, altimeter readings, VSI, altimeter settings, heading and attitude display.
- L1** * ND.....CHECK | PF-PM
- L2** - Check for correct display.
- Check heading, initial waypoint, VOR/ADF  indications.

ECAM CONTROL PANEL

Ident.: PRO-NOR-SOP-06-00011190.0001001 / 09 NOV 21

Applicable to: ALL

- * PRESS pb.....PRESS | PF
- L2** Check that the CAB PRESS SD page displays LDG ELEV **AUTO**, to confirm the correct position of the LDG ELEV knob.
- L1** * STS pb.....PRESS | PF
- L2** Check that INOP SYS display is compatible with MEL.
- If a message is displayed in MAINTENANCE STATUS, Refer to MMEL/MI-00-08 ECAM and MAINTENANCE STATUS.

ADIRS

Ident.: PRO-NOR-SOP-06-00011253.0002001 / 09 NOV 21

Applicable to: ALL

- * IRS ALIGN.....CHECK | PM
- L2** On the POSITION MONITOR page, check that the IRS are in NAV mode, and check that the distance between each IRS and the FMS position is lower than 5 NM. Select ND in ROSE NAV or ARC mode, and confirm that the aircraft position is consistent with the position of the airport, the SID and the surrounding NAVAIDs.

FUEL ON BOARD

Ident.: PRO-NOR-SOP-06-00024944.0001001 / 24 NOV 23
Applicable to: ALL

- * FUEL ON BOARD.....CHECK | PF-PM
- L2

- Check that ECAM FOB corresponds to the block fuel of the computerized flight plan

- On FUEL SD page, check that the fuel is correctly balanced

- Crosscheck that the sum of the FOB recorded at the end of the last flight and the fuel uplift (if any) is consistent with the current FOB. If an abnormal difference is found, a maintenance action is due.

FOB after refueling	Abnormal difference above
Up to 6 t (13 200 lb)	400 kg (900 lb)
Between 6 t (13 200 lb) and 12 t (26 500 lb)	500 kg (1 100 lb)
More than 12 t (26 500 lb)	600 kg (1 300 lb)

DEPARTURE BRIEFING

Ident.: PRO-NOR-SOP-06-00011256.0001001 / 09 NOV 21
Applicable to: ALL

- * DEPARTURE BRIEFING.....PERFORM | BOTH

PC DEDICATED TO MAINTENANCE

Ident.: PRO-NOR-SOP-06-00011258.0001001 / 06 NOV 25
Applicable to: ALL

- 9 * PC DEDICATED TO MAINTENANCE CHECK STOWED | PF
- L2

Check that the Personal Computer (PC) dedicated to maintenance use and located in front of lower stowage at RH rear corner is stowed.

Check that the light of its manual switch is off. If not, switch it off.

Check that its associated printer located in front of RH rear of the cockpit is stowed.

COCKPIT PREPARATION CHECKLIST

Ident.: PRO-NOR-SOP-06-00024949.0001001 / 18 NOV 24
Applicable to: ALL

- * COCKPIT PREPARATION C/L.....COMPLETE | BOTH

PROCEDURES

NORMAL PROCEDURES

STANDARD OPERATING PROCEDURES - COCKPIT PREPARATION

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES STANDARD OPERATING PROCEDURES - BEFORE PUSHBACK OR START
--	--

BEFORE PUSHBACK/START CLEARANCE

Applicable to: ALL

Ident.: PRO-NOR-SOP-07-A-00021624.0001001 / 24 NOV 23

LOADSHEET

- FINAL LOADSHEET..... CHECK | PF-PM
- L2** Both crew members carefully check the Load and Trim Sheet, particularly for gross errors. Make sure that the load sheet data is correct (e.g. correct flight, correct aircraft, dry operating index, configuration, Fuel on Board, etc.).
- L1** ZFW/ZFWCG.....CHECK/REVISE | PF
- L2** The PF compares the ZFW and the ZFWCG with the previously-entered data, and adjust if necessary.
- L1** ZFW/ZFWCG.....CROSSCHECK | PM
- L2** The PM crosschecks the ZFW and the ZFWCG entered in the FMS.
- Check that the takeoff CG is within Load and Trim Sheet operational limits.

Ident.: PRO-NOR-SOP-07-A-00011255.0009001 / 24 NOV 23

FUEL

- FUEL ON BOARD.....CHECK | PF-PM
- L2** - Check that ECAM FOB corresponds to the computerized flight plan
- On the FUEL SD page, check that the FOB corresponds to the loadsheet.

Ident.: PRO-NOR-SOP-07-A-00010189.0002001 / 14 NOV 24

TAKEOFF DATA

- **If takeoff conditions changed:**
- L2** For more information, Refer to FCTM/PR-NP-SOP-BEFORE PUSHBACK OR START-Takeoff Data.
- L1** FINAL TAKEOFF PERF DATA..... RECOMPUTE | PF-PM
- L2** The PF and the PM independently compute again the takeoff performance data.
- L1** FMS TAKEOFF DATA..... REVISE | PF
- L2** The PF revises the takeoff data in the FMS.
If the flight crew uses an optimum configuration option for the computation, they should pay specific attention to any change of the configuration of the slats/flaps at takeoff.
- L1** FMS REVISED TAKEOFF PERF DATA.....CROSSCHECK | PM
- L2** The PM crosschecks the performance data displayed on the PM's EFB with the FMS PERF TAKE OFF page.

PROCEDURES

NORMAL PROCEDURES

STANDARD OPERATING PROCEDURES - BEFORE PUSHBACK OR START

- L1** EFB/MCDU GREEN DOT.....COMPARE | PM
- L2** *The PM compares Green Dot speed computed by the FMGS and the Green Dot speed computed by the EFB takeoff performance application. A discrepancy indicates a difference in the TOW used in both systems (EFB/FMGS).*

Ident.: PRO-NOR-SOP-07-A-00010190.0001001 / 24 NOV 23

SEATING POSITION

SEATS, SEAT BELTS, HARNESSSES, RUDDER PEDALS, ARMRESTS..... | PF-PM
 ADJUST

- L2** *The seat is correctly adjusted when the flight crew's eyes are aligned with the red and white balls.*

Ident.: PRO-NOR-SOP-07-A-00010192.0001001 / 22 NOV 21

MCDU

FMS PERF TO page..... SELECT | PF

- L2** *It is recommended to display the PERF TO page on the PF side.*

L1 FMS F-PLN page.....SELECT | PM

- L2** *It is recommended to display the F-PLN page on the PM side.*

Ident.: PRO-NOR-SOP-07-A-00010193.0001001 / 22 NOV 21

AIR CONDITIONING UNITS

AIR CONDITIONING UNITS.....CHECK DISCONNECTED | PM

ELEC

EXT PWR pb.....CHECK **AVAIL** | PM

WARNING

Disconnection of the external power with the EXT PWR pb ON may cause injury to the ground engineer. Request disconnection of the external power only with the EXT PWR pb AVAIL.

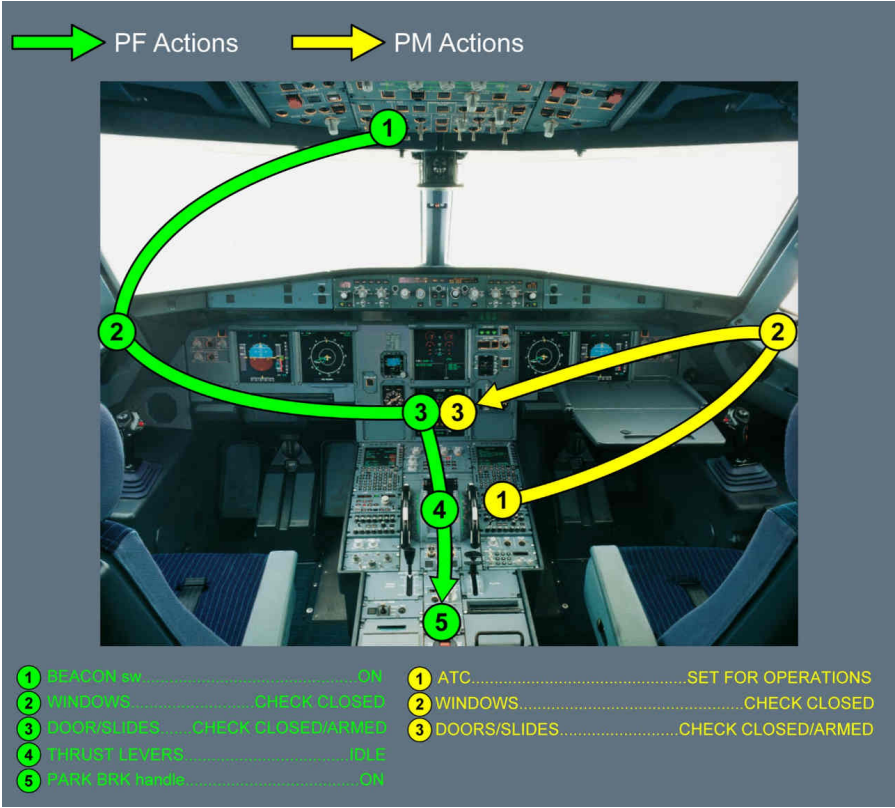
EXT PWR DISCONNECTION.....REQUEST | PM

AT PUSHBACK/START CLEARANCE

Ident.: PRO-NOR-SOP-07-B-00024996.0001001 / 24 NOV 23

Applicable to: ALL

BEFORE START FLOW PATTERN



Ident.: PRO-NOR-SOP-07-B-00010197.0001001 / 22 NOV 21

Applicable to: ALL

PUSHBACK/START CLEARANCE

PUSHBACK/START CLEARANCE.....OBTAIN | PM

L2 Obtain ATC pushback/start clearance and ground crew clearance.

PROCEDURES

NORMAL PROCEDURES

STANDARD OPERATING PROCEDURES
 - BEFORE PUSHBACK OR START

Ident.: PRO-NOR-SOP-07-B-00010200.0001001 / 24 NOV 23

Applicable to: **ALL**

EXTERIOR LIGHTS

BEACON sw.....ON | PF

L2 When cleared for start or pushback, set the BEACON sw to ON.

Ident.: PRO-NOR-SOP-07-B-00015568.0001001 / 22 NOV 21

Applicable to: **ALL**

ATC

ATC.....SET FOR OPERATION | PM

L2 ATC is set in accordance with airport requirements.

Ident.: PRO-NOR-SOP-07-B-00010199.0002001 / 22 NOV 21

Applicable to: **ALL**

WINDOWS AND DOORS

WINDOWS and DOORS.....CHECK CLOSED | PF-PM

- L2**
- To ensure that the sliding window is correctly closed and locked, push the handle of the sliding window fully forward to the closed position, and check that the red indicator is visible
 - Check, on the ECAM lower display, that all the aircraft doors are closed
 - When required by local airworthiness authorities, check that the cockpit door is closed and locked (no cockpit door open/fault indication).

If entry is requested, identify the person requesting entry before unlocking the door. With the cockpit door sw on NORM position, the cockpit door is closed and locked. If entry is requested from the cabin, and if no further action is performed by the pilot, the cabin crew will be able to unlock the door by using the emergency access procedure. Except for crew entry/exit, the cockpit door should remain closed until engine shutdown.

L1 SLIDES.....CHECK ARMED | PF-PM

L2 Check, on the ECAM lower display, that all slides are armed.

Ident.: PRO-NOR-SOP-07-B-00010201.0001001 / 22 NOV 21

Applicable to: **ALL**

THRUST LEVERS

THRUST LEVERS.....IDLE | PF

CAUTION

The engines start regardless of the thrust lever position. If the thrust levers are not set to IDLE, then thrust rapidly increases to the corresponding thrust lever position, causing a hazardous situation.

Ident.: PRO-NOR-SOP-07-B-00016807.0001001 / 22 NOV 21
 Applicable to: ALL

ACCU PRESSURE

ACCU PRESS indicator..... CHECK | PF

L2 *The ACCU PRESS indication must be in the green band. If required, use the electric pump on yellow hydraulic system to recharge the brake accumulator.*

L1 **WARNING** Yellow and green hydraulic systems are pressurized from yellow electric pump. Get ground crew clearance before using the electric pump.

Ident.: PRO-NOR-SOP-07-B-00010202.0002001 / 18 NOV 24
 Applicable to: ALL

PARKING BRAKE AND NOSEWHEEL STEERING

● **If pushback is not required:**

PARK BRK handle..... ON | PF

BRAKES PRESS indicator..... CHECK | PF

L2 *Check for normal indications.*

L1 BEFORE START C/L..... COMPLETE | BOTH

AT PUSHBACK/START CLEARANCE - NW STRG DISC

Ident.: PRO-NOR-SOP-07-B-00010198.0001001 / 18 NOV 24
 Applicable to: MSN 02155-02212

● **If pushback is required:**

NW STRG DISC MEMO..... CHECK DISPLAYED | PF

L2 *In the case of pushback (towbarless or conventional), the nosewheel steering selector bypass pin must be in the tow position. The **NW STRG DISC** memo on the ECAM indicates this position.*

L1 **CAUTION** *If the ECAM does not display the **NW STRG DISC** memo, but the ground crew confirms that the tow pin is in the towing position, do not start the engines during pushback in order to avoid possible damage to the nose landing gear upon green hydraulic pressurization. To dispatch the aircraft in such a case, Refer to MMEL/MI-32-51 NWS Electrical Deactivation Box.*

L2 *In the case of a powerpush by the main landing gear, the nosewheel steering selector should remain in the normal position to steer the aircraft (Refer to PRO-NOR-SUP-MISC-D Pushback with Power Push Unit via the Main Landing Gear - Procedure 1/2).*

L1 BEFORE START C/L..... COMPLETE | BOTH

PROCEDURES

NORMAL PROCEDURES

STANDARD OPERATING PROCEDURES - BEFORE PUSHBACK OR START

PARK BRK handle.....OFF | PF

CAUTION Do not use the brakes during pushback, unless required due to an emergency.

● **When pushback is completed:**

PARK BRK handle.....ON | PF
 BRAKE PRESS indicator.....CHECK | PF

- L2 Check for normal indications.
 Ask the ground crew for towbar disconnection.

Ident.: PRO-NOR-SOP-07-B-00010198.0002001 / 18 NOV 24
 Applicable to: MSN 02719-07792

● **If pushback is required:**

NW STRG DISC MEMO.....CHECK DISPLAYED | PF

- L2 In the case of pushback (towbarless or conventional), the nosewheel steering selector bypass pin must be in the tow position. The **NW STRG DISC** memo on the ECAM indicates this position.

- L1 **CAUTION** If the ECAM does not display the **NW STRG DISC** memo, but the ground crew confirms that the tow pin is in the towing position, do not start the engines during pushback in order to avoid possible damage to the nose landing gear upon yellow hydraulic pressurization.
 To dispatch the aircraft in such a case, Refer to MMEL/MI-32-51 NWS Electrical Deactivation Box.

- L2 In the case of a powerpush by the main landing gear, the nosewheel steering selector should remain in the normal position to steer the aircraft (Refer to PRO-NOR-SUP-MISC-D Pushback with Power Push Unit via the Main Landing Gear - Procedure 1/2).

L1 BEFORE START C/L.....COMPLETE | BOTH
 PARK BRK handle.....OFF | PF

CAUTION Do not use the brakes during pushback, unless required due to an emergency.

● **When pushback is completed:**

PARK BRK handle.....ON | PF
 BRAKE PRESS indicator.....CHECK | PF

- L2 Check for normal indications.
 Ask the ground crew for towbar disconnection.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES STANDARD OPERATING PROCEDURES - ENGINE START
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AUTOMATIC ENGINE START

Ident.: PRO-NOR-SOP-08-00010162.0060001 / 14 NOV 24
Applicable to: MSN 02155-02212, 04392-07792

If, during the engine start, the ground crew reports a fuel leak from the engine drain mast, run the engine at idle for 5 min. If the leak disappears during these 5 min, the aircraft can be dispatched without maintenance action. If the leak is still present after 5 min, shut down the engine and request the maintenance personnel to investigate the leakage source.

THRUST levers.....IDLE | PF

CAUTION	<i>The engines start regardless of the thrust lever position. If the thrust levers are not set to IDLE, then thrust rapidly increases to the corresponding thrust lever position, causing a hazardous situation.</i>
----------------	--

ENG MODE selector..... IGN/START | PF

 The lower ECAM displays the ENG SD page.

 ENGINE 1 START.....ANNOUNCE | PF

- **After all amber crosses and messages have disappeared on the engine parameters (upper ECAM display) and ENG SD page:**

ENG 1 MASTER lever.....ON | PF

- Note:
- Parameter callouts are not mandatory.
 - In case the electrical power supply is interrupted during the start sequence (indicated by the loss of ECAM DUs), abort the start by setting to OFF the ENG 1 MASTER lever. Then, perform a 30 s dry crank.

ON ECAM UPPER DISPLAY	ON ECAM LOWER DISPLAY
N2 increases	Corresponding start valve in line. Bleed pressure indication green. Oil pressure increases.
At 16 % N2	Indication of the active igniter (A or B).
At 22 % N2 - FF increases 15 s (maximum) after fuel is on - EGT increases - N1 increases	
At 50 % N2	Start valve starts closing. (It is fully closed between 50 % and 56 % N2). Igniter indication off.

- **When idle is reached (AVAIL indication is displayed):**

ENG IDLE PARAMETERS.....CHECK | PF

At ISA sea level : N1 about 19.5 %

N2 about 58.5 %

EGT about 390 °C

FF about 275 kg/h (600 lb/h)

Grey background on N2 indication disappears.
- **In the case of all engine taxi at departure:**

ENGINE 2 START.....ANNOUNCE | PF

ENG 2 MASTER lever.....ON | PF

Apply the same procedure as indicated for engine 1.
- L2

Both pack valves reopen with 30 s delay after the second engine N2 is above 50 %.
- L1

Note: A PTU FAULT is triggered, if the last engine is started within 40 s following the end of the cargo doors operation. Refer to PRO-ABN-HYD HYD PTU FAULT.

AUTOMATIC ENGINE START
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Ident.: PRO-NOR-SOP-08-00010162.0002001 / 14 NOV 24
 Applicable to: MSN 02719-03060

- If, during the engine start, the ground crew reports a fuel leak from the engine drain mast, run the engine at idle for 5 min. If the leak disappears during these 5 min, the aircraft can be dispatched without maintenance action. If the leak is still present after 5 min, shut down the engine and request the maintenance personnel to investigate the leakage source.
- THRUST levers.....

IDLE |

PF
- CAUTION

The engines start regardless of the thrust lever position. If the thrust levers are not set to IDLE, then thrust rapidly increases to the corresponding thrust lever position, causing a hazardous situation.
- ENG MODE selector.....

IGN/START |

PF
- L2

The lower ECAM displays the ENG SD page.
- L1

ENGINE 1 START.....ANNOUNCE |

PF

- **After all amber crosses and messages have disappeared on the engine parameters (upper ECAM display) and ENG SD page:**

ENG 1 MASTER lever.....ON | PF

- Note:
- Parameter callouts are not mandatory.
 - In case the electrical power supply is interrupted during the start sequence (indicated by the loss of ECAM DUs), abort the start by setting to OFF the ENG 1 MASTER lever. Then, perform a 30 s dry crank.
 - CFM Eng 56–5–B1/2 or CFM Eng 56–5–B4/2 engines accelerate slowly from 50 % N2 to idle. Start abort is not required as long as N2 is increasing.

ON ECAM UPPER DISPLAY	ON ECAM LOWER DISPLAY
N2 increases	Corresponding start valve inline. Bleed pressure indication green. Oil pressure increases.
At 16 % N2	Indication of the active igniter (A or B).
At 22 % N2 - FF increases ⁽¹⁾ 15 s (maximum) after fuel is on - EGT increases - N1 increases	
At 50 % N2	Start valve starts closing. (It is fully closed between 50 % and 56 % N2). Igniter indication off.

⁽¹⁾ With the current ECU standard, the FF indication may be crossed up to approximately 200 kg/h (440 lb/h).

ENG IDLE PARAMETERS.....CHECK | PF

At ISA sea level : N1 about 19.5 %
 N2 about 58.5 %
 EGT about 390 °C
 FF about 275 kg/h (600 lb/h)

Grey background on N2 indication disappears.

- **In the case of all engine taxi at departure:**
- ENGINE 2 START.....ANNOUNCE | PF
- ENG 2 MASTER lever.....ON | PF

Apply the same procedure as indicated for engine 1.

L2 Both pack valves reopen with 30 s delay after the second engine N2 is above 50 %.

PROCEDURES

NORMAL PROCEDURES

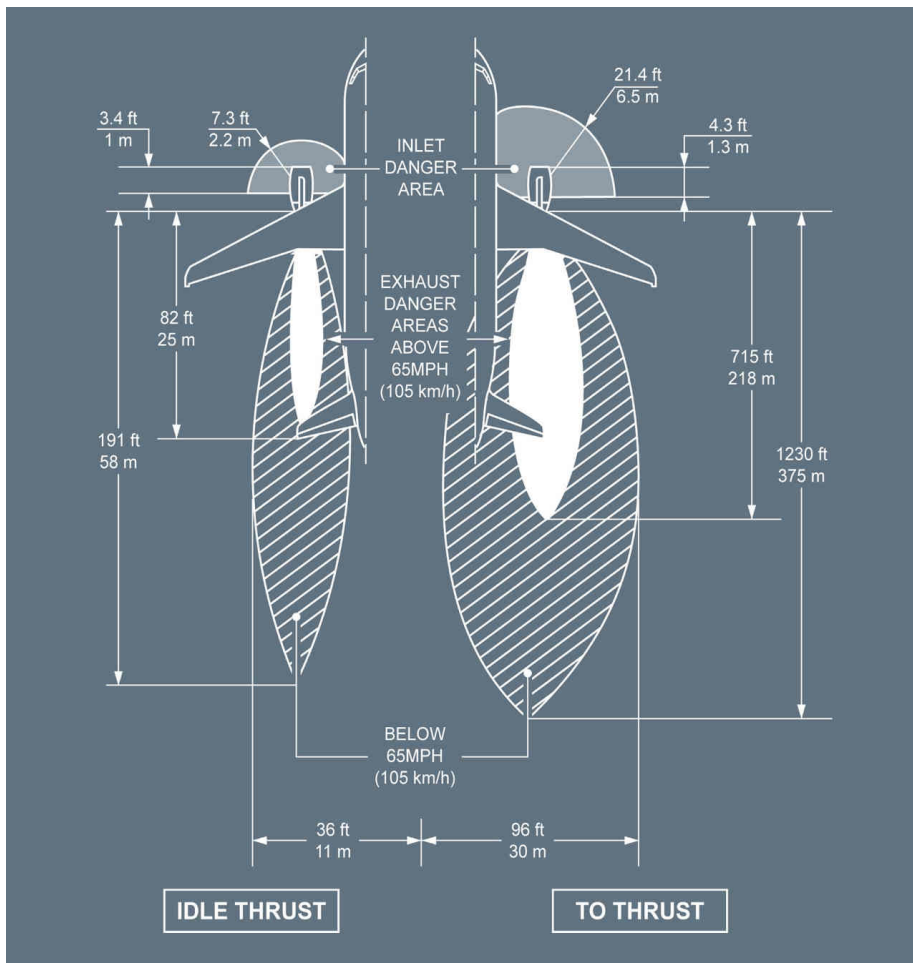
STANDARD OPERATING PROCEDURES - ENGINE START

- L1** Note: A PTU FAULT is triggered, if the last engine is started within 40 s following the end of the cargo doors operation. Refer to PRO-ABN-HYD HYD PTU FAULT.

GROUND RUN UP - DANGER AREAS

Ident.: PRO-NOR-SOP-08-00010163.0006001 / 06 JAN 16

Applicable to: ALL



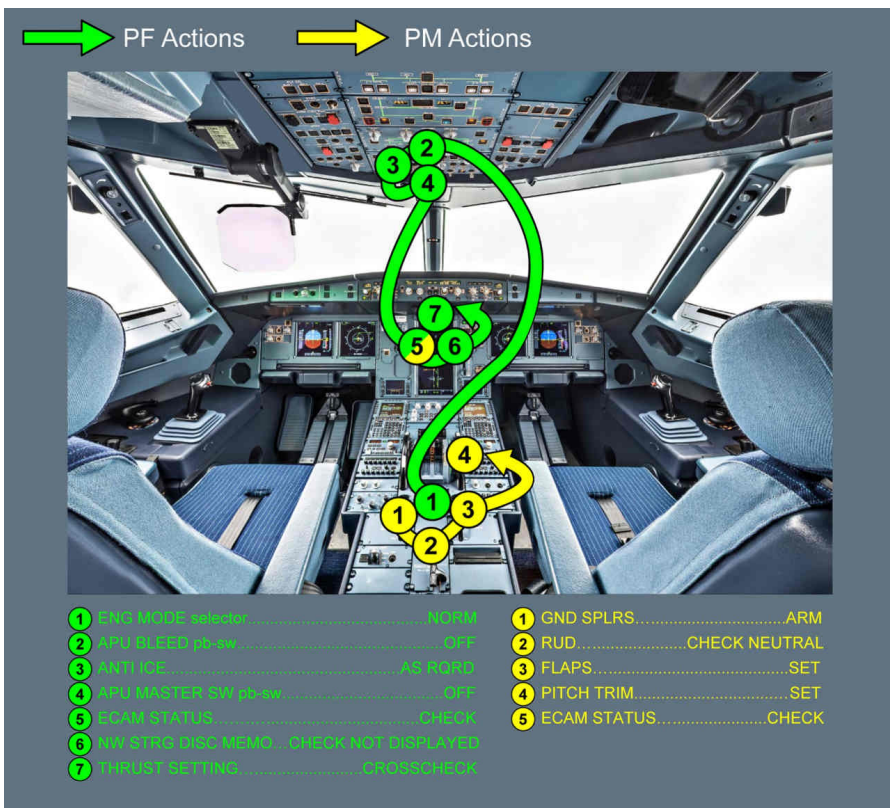
AFTER START (ALL ENGINES TAXI AT DEPARTURE)

Ident.: PRO-NOR-SOP-09-A-00020074.0001001 / 06 NOV 25

Applicable to: ALL

1 AFTER START FLOW PATTERN

When all engines are started, the PF sets the ENG MODE selector to NORM to permit normal pack operation. At this time, the After Start flow pattern begins.



PROCEDURES

NORMAL PROCEDURES

STANDARD OPERATING PROCEDURES - AFTER START

AFTER START - ENG MODE SELECTOR

Ident.: PRO-NOR-SOP-09-A-00010210.0001001 / 09 NOV 21

Applicable to: MSN 07784-07792

ENG MODE SELECTOR

ENG MODE selector.....NORM | PF

L2 For additional information on the automatic starting sequence, Refer to DSC-70-80-40 Sequence of the Automatic Start.

L1 After start, to avoid thermal shock, the pilot should operate the engine at idle or near idle for at least 2 min before advancing the thrust lever to high power. Taxi time at idle may be included in the warm-up period.

Ident.: PRO-NOR-SOP-09-A-00010210.0002001 / 09 NOV 21

Applicable to: MSN 02155-05746

ENG MODE SELECTOR

ENG MODE selector.....NORM | PF

L2 For additional information on the automatic starting sequence, Refer to DSC-70-80-40 Sequence of the Automatic Start.

L1 After start, to avoid thermal shock, the pilot should operate the engine at idle or near idle for at least 2 min before advancing the thrust lever to high power. Taxi time at idle may be included in the warm-up period.

The last engine started must run for at least 2 min before takeoff initiation, to ensure that takeoff is not initiated before the center tank pumps test is finished, since takeoff on center tank is prohibited.

Ident.: PRO-NOR-SOP-09-A-00010211.0001001 / 09 NOV 21

Applicable to: ALL

APU BLEED

APU BLEED pb-sw.....OFF | PF

L2 - This action enables to avoid ingestion of engine exhaust gases.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES STANDARD OPERATING PROCEDURES - AFTER START
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Ident.: PRO-NOR-SOP-09-A-00010212.0005001 / 03 NOV 22
Applicable to: ALL

ANTI ICE

CAUTION

In icing conditions (*Refer to LIM-ICE_RAIN Definition of Icing Conditions*), the flight crew must turn on the engine anti-ice and should not wait until seeing ice building up.

ENG 1 and 2 ANTI ICE pb-sw.....AS RQRD | PF
Turn on engine anti-ice during all ground operation, when icing conditions exist or are anticipated.

Ident.: PRO-NOR-SOP-09-A-00010213.0001001 / 09 NOV 21
Applicable to: ALL

WING ANTI ICE pb-sw.....AS RQRD | PF
On ground when wing anti-ice is switched on, the anti-ice valves open for about 30 s for self-test sequence, then close as long as the aircraft is on ground.

Ident.: PRO-NOR-SOP-09-A-00010214.0001001 / 09 NOV 21
Applicable to: ALL

APU

- If the APU is not required:**
APU MASTER SW pb-sw.....OFF | PF

Ident.: PRO-NOR-SOP-09-A-00010215.0001001 / 09 NOV 21
Applicable to: ALL

GROUND SPOILERS

GND SPLRS.....ARM | PM

Ident.: PRO-NOR-SOP-09-A-00010216.0001001 / 03 NOV 22
Applicable to: ALL

RUDDER TRIM

RUD TRIM RESET pb.....PRESS | PM
L2 *Press the RESET pb on the RUDDER TRIM panel.*

L1 RUD TRIM.....CHECK NEUTRAL | PM
Note: After the reset, the flight crew may observe an indication of up to 0.3 ° (L or R) in the RUD TRIM position indication.

Ident.: PRO-NOR-SOP-09-A-00010217.0001001 / 09 NOV 21

Applicable to: ALL

FLAPS

FLAPS lever.....	SET FOR TAKEOFF	PM
FLAPS.....	CHECK POSITION	PM

L2 Check the position of the flaps on the ECAM upper display.

L1 ● If taxiing in icing conditions with rain, slush or snow:

Maintain the flaps retracted until the aircraft reaches the holding point of the takeoff runway.

This action prevents contamination of the slats/flaps mechanism.

Ident.: PRO-NOR-SOP-09-A-00010218.0001001 / 07 NOV 25

Applicable to: ALL

2 PITCH TRIM

PITCH TRIM wheel.....	SET	PM
-----------------------	-----	----

L2 Set takeoff CG on PITCH TRIM wheel.

Ident.: PRO-NOR-SOP-09-A-00010220.0001001 / 18 NOV 24

Applicable to: ALL

ECAM STATUS

ECAM STATUS.....	CHECK	BOTH
------------------	-------	------

L2 The PM checks and the PF crosschecks that there is no status reminder (STS) on the E/WD.
 If STS appears on the E/WD, press the STATUS pb to display the STATUS page.

Ident.: PRO-NOR-SOP-09-A-00015495.0001001 / 09 NOV 21

Applicable to: ALL

N/W STEER DISC MEMO

NW STRG DISC MEMO.....	CHECK NOT DISPLAYED	PF
------------------------	---------------------	----

3 Ident.: PRO-NOR-SOP-09-A-00029242.0001001 / 06 NOV 25

Applicable to: ALL

THRUST SETTING

THRUST SETTING.....	CROSSCHECK	PF
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L2 The PF crosschecks the thrust setting (e.g. FLEX temperature) displayed on the E/WD with the FMS PERF page.

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES STANDARD OPERATING PROCEDURES - AFTER START
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Ident.: PRO-NOR-SOP-09-A-00010221.0001001 / 09 NOV 21
Applicable to: ALL

GROUND CREW

CLEAR TO DISCONNECT.....ANNOUNCE | PF

L2

The ground crew:

- Removes the chocks
- Disconnects the interphone
- Makes the hand signal on the left or right side.

Ident.: PRO-NOR-SOP-09-A-00010222.0001001 / 18 NOV 24
Applicable to: ALL

AFTER START CHECKLIST

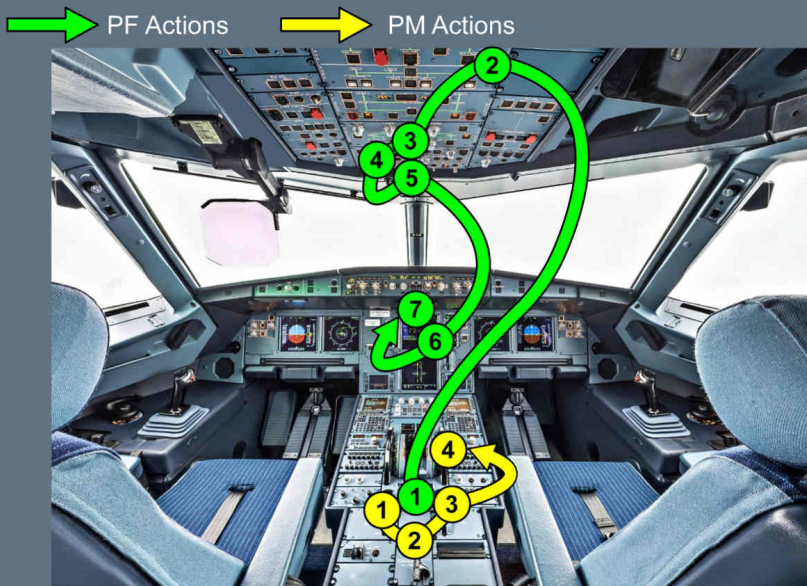
AFTER START C/L.....COMPLETE | BOTH

AFTER START (ONE ENGINE TAXI AT DEPARTURE)

Ident.: PRO-NOR-SOP-09-B-00027745.0001001 / 06 NOV 25
Applicable to: ALL

4 AFTER START FLOW PATTERN

When the engine 1 is started, the PF sets the ENG MODE selector to NORM to permit normal pack operation. At this time, the After Start flow pattern begins.



- 1 ENG MODE selector NORM
- 2 YELLOW BLEED VALVE ON
- 3 APU MASTER SW OFF
- 4 ENG 1 MASTER SW AS NORM
- 5 APU MASTER SW KEEP ON
- 6 MIN STNG ENG BLEND CHECK NOT DISPLAYED
- 7 THRUST SETTING PROGRESSIVE

- 1 GND SPLRS ARM
- 2 RUD CHECK NEUTRAL
- 3 FLAPS SET
- 4 PITCH TRIM SET

AFTER START - ENG MODE SELECTOR

Ident.: PRO-NOR-SOP-09-B-00027746.0001001 / 14 NOV 24

Applicable to: MSN 07784-07792

ENG MODE SELECTOR

ENG MODE selector.....NORM | PF

L2 For additional information on the automatic starting sequence, Refer to DSC-70-80-40 Sequence of the Automatic Start.

L1 After start, to avoid thermal shock, the pilot should operate the engine at idle or near idle for at least 2 min before advancing the thrust lever to high power. Taxi time at idle may be included in the warm-up period.

Ident.: PRO-NOR-SOP-09-B-00027746.0002001 / 14 NOV 24
Applicable to: MSN 02155-05746

ENG MODE SELECTOR

ENG MODE selector.....NORM | PF

L2

For additional information on the automatic starting sequence, Refer to DSC-70-80-40 Sequence of the Automatic Start.

L1

After start, to avoid thermal shock, the pilot should operate the engine at idle or near idle for at least 2 min before advancing the thrust lever to high power. Taxi time at idle may be included in the warm-up period.
The last engine started must run for at least 2 min before takeoff initiation, to ensure that takeoff is not initiated before the center tank pumps test is finished, since takeoff on center tank is prohibited.

Ident.: PRO-NOR-SOP-09-B-00027801.0001001 / 14 NOV 24
Applicable to: ALL

HYDRAULIC

YELLOW ELEC PUMP pb-sw.....ON | PF

L2

This avoids running the PTU.

Ident.: PRO-NOR-SOP-09-B-00027749.0001001 / 14 NOV 24
Applicable to: ALL

APU BLEED

APU BLEED pb-sw.....OFF | PF

L2

This action enables to avoid ingestion of engine exhaust gases.

Ident.: PRO-NOR-SOP-09-B-00027750.0005001 / 14 NOV 24
Applicable to: ALL

ENG 1 ANTI ICE

CAUTION

In icing conditions (*Refer to LIM-ICE_RAIN Definition of Icing Conditions*), the flight crew must turn on the engine anti-ice and should not wait until seeing ice building up.

ENG 1 ANTI ICE pb-sw.....AS RQRD | PF
Turn on engine anti-ice during all ground operations, when icing conditions exist or are anticipated.

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES STANDARD OPERATING PROCEDURES - AFTER START
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Ident.: PRO-NOR-SOP-09-B-00027751.0001001 / 06 OCT 25

Applicable to: ALL

5

APU

APU MASTER SW pb-sw..... KEEP ON | PF

L2

Keep the APU running, in order to provide power to the engine fire extinguisher bottles.

Ident.: PRO-NOR-SOP-09-B-00027752.0001001 / 14 NOV 24

Applicable to: ALL

GROUND SPOILERS

GND SPLRS..... ARM | PM

Ident.: PRO-NOR-SOP-09-B-00027753.0001001 / 14 NOV 24

Applicable to: ALL

RUDDER TRIM

RUD TRIM RESET pb.....PRESS | PM

L2

Press the RESET pb on the RUDDER TRIM panel.

L1

RUD TRIM.....CHECK NEUTRAL | PM

Note:

After the reset, the flight crew may observe an indication of up to 0.3 ° (L or R) in the RUD TRIM position indication.

Ident.: PRO-NOR-SOP-09-B-00027754.0001001 / 06 NOV 25

Applicable to: ALL

6

FLAPS

FLAPS lever..... SET FOR TAKEOFF | PM

FLAPS.....CHECK POSITION | PM

L2

Check the position of the flaps on the ECAM upper display.

L1

● If taxiing in icing conditions with rain, slush or snow:

Maintain the flaps retracted until the aircraft reaches the holding point of the takeoff runway.

This action prevents contamination of the slats/flaps mechanism.

Ident.: PRO-NOR-SOP-09-B-00027755.0001001 / 07 NOV 25

Applicable to: ALL

7

PITCH TRIM

PITCH TRIM wheel.....SET | PM

L2

Set takeoff CG on PITCH TRIM wheel.

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES STANDARD OPERATING PROCEDURES - AFTER START
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Ident.: PRO-NOR-SOP-09-B-00027756.0001001 / 14 NOV 24
Applicable to: ALL

N/W STEER DISC MEMO
NW STRG DISC MEMO..... CHECK NOT DISPLAYED | PF

8
Ident.: PRO-NOR-SOP-09-B-00029244.0001001 / 06 NOV 25
Applicable to: ALL

THRUST SETTING
THRUST SETTING.....CROSSCHECK | PF

L2
The PF crosschecks the thrust setting (e.g. FLEX temperature) displayed on the E/WD with the FMS PERF page.

Ident.: PRO-NOR-SOP-09-B-00027757.0001001 / 14 NOV 24
Applicable to: ALL

GROUND CREW
CLEAR TO DISCONNECT.....ANNOUNCE | PF

L2
The ground crew:

- Removes the chocks
- Disconnects the interphone
- Makes the hand signal on the left or right side.

PROCEDURES

NORMAL PROCEDURES

STANDARD OPERATING PROCEDURES - AFTER START

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ALL ENGINES TAXI AT DEPARTURE

Ident.: PRO-NOR-SOP-10-A-00010226.0001001 / 09 NOV 21
 Applicable to: ALL

TAXI CLEARANCE

TAXI clearance..... OBTAIN | PM

Ident.: PRO-NOR-SOP-10-A-00010227.0001001 / 09 NOV 21
 Applicable to: ALL

EXTERIOR LIGHTS

L2 During taxi, the PF may request the PM to set the exterior lights.

L1 NOSE sw..... TAXI | PF

● **When crossing a runway:**

STROBE sw..... ON | PF

RWY TURN OFF sw..... ON | PF

Ident.: PRO-NOR-SOP-10-A-00010228.0001001 / 09 NOV 21
 Applicable to: ALL

PARK BRK

PARK BRK handle..... OFF | PF

BRAKES PRESSURE..... CHECK AT ZERO | PF

L2 *The flight crew may observe slight residual pressure on the triple indicator for a short period of time.*

TAXI - BRAKES

Ident.: PRO-NOR-SOP-10-A-00010231.0001001 / 14 NOV 24
 Applicable to: MSN 02155-02212

BRAKES

CAUTION If the aircraft was parked in wet conditions for a long time, the first brake application at low speed is less effective.

BRAKE PEDALS..... PRESS | PF

BRAKES CHECK | PF

BRK FAN pb-sw AS RQRD | PM

L2 *If an arc is displayed above the brake temperature on the WHEEL SD page, set to ON the BRK FAN pb-sw.*

L1 BRAKES PRESSURE..... CHECK AT ZERO | PM

Ident.: PRO-NOR-SOP-10-A-00010231.0002001 / 14 NOV 24

Applicable to: MSN 02719-07792

BRAKES

CAUTION

If the aircraft was parked in wet conditions for a long time, the first brake application at low speed is less effective.

BRAKE PEDALS.....PRESS

BRAKESCHECK

BRK FAN pb-sw <34AS RQRD

PF

PF

PM

L2

If an arc is displayed above the brake temperature on the WHEEL SD page, set to ON the BRK FAN pb-sw.

Ident.: PRO-NOR-SOP-10-A-00010243.0001001 / 18 NOV 24

Applicable to: ALL

FLIGHT CONTROLS

FLIGHT CONTROLS.....CHECK

BOTH

L2

Check the flight controls at a convenient stage, before or during taxi.

Ident.: PRO-NOR-SOP-10-A-00010244.0001001 / 09 NOV 21

Applicable to: ALL

ATC CLEARANCE

ATC clearance.....CONFIRM

PM

Ident.: PRO-NOR-SOP-10-A-00015301.0001001 / 06 NOV 25

Applicable to: ALL

AFS/FLIGHT INSTRUMENTS

CLEARED ALTITUDE ON FCU.....CHECK

PM

L2

On the PFD, crosscheck and confirm the cleared altitude.

L1

HGD ON FCU.....IF REQUIRED, PRESET

PM

L2

If a heading is required by the ATC after takeoff, in the case of a radar vector departure, preset the heading on the FCU. NAV mode will be disarmed.
RWY TRK mode will keep the aircraft on the runway track.

L1

BOTH FD.....CHECK ON

PFD/ND.....CHECK

PM

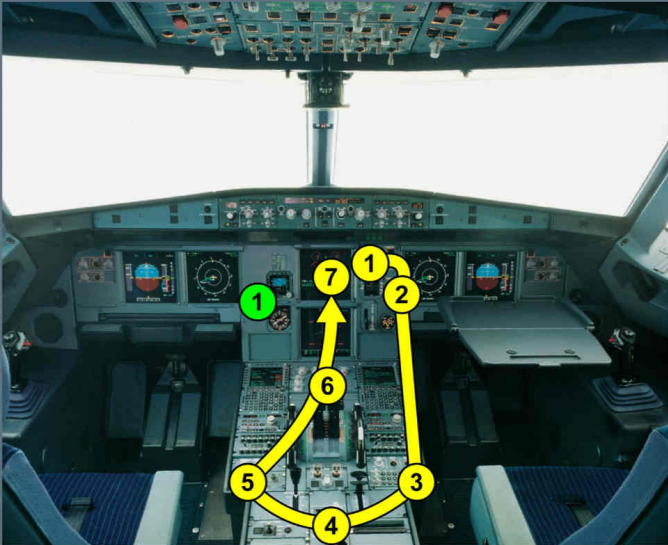
PF-PM

L2

Check that the PFD (e.g. airspeeds, initial target altitude, heading, FMA modes) and the ND indications (SID) are in accordance with the departure.

Ident.: PRO-NOR-SOP-10-A-00020075.0001001 / 14 NOV 24
 Applicable to: ALL

 PF Actions
  PM Actions




 TWR/RVR (UN/MD) AS RQRD


 AUTO BRK MAX pb-sw ON


 TERR ON ND AS RQRD


 SQUAWK CONFIRM/SET


 ENG MODE selector AS RQRD


 RADAR/PWS ON/AUTO


 T.O CONFIG pb TEST


 T.O MEMO CHECK NO BLUE

Ident.: PRO-NOR-SOP-10-A-00010264.0001001 / 09 NOV 21
 Applicable to: ALL

AUTO BRK

AUTO BRK MAX pb-sw..... ON | PM

PROCEDURES

NORMAL PROCEDURES

STANDARD OPERATING PROCEDURES - TAXI

Ident.: PRO-NOR-SOP-10-A-00010254.0001001 / 14 NOV 24

Applicable to: ALL

TERR ON ND

TERR ON ND.....AS RQRD | PF-PM

^{L2} Consider selecting the radar display on the PF side, and TERR ON ND on the PM side only.

Ident.: PRO-NOR-SOP-10-A-00010252.0001001 / 24 NOV 23

Applicable to: ALL

ATC

ATC CODE/MODE.....CONFIRM/SET FOR TAKEOFF | PM

Ident.: PRO-NOR-SOP-10-A-00010397.0004001 / 06 NOV 25

Applicable to: ALL

² ENG MODE SELECTOR

ENG MODE selector.....AS RQRD | PM

^{L2} Select IGN, if:

- There is standing water on the runway, or
- Heavy rain is falling, or
- Heavy rain or severe turbulence is expected after takeoff.

Ident.: TDU / PRO-NOR-SOP-10-A-00015299.0002001 / 03 NOV 22

Applicable to: MSN 02155-03060

Impacted DU: 00015298 Taxi - Radar

WEATHER RADAR

RADAR.....ON | PM

^{L2} To check the departure path, set the MULTISCAN sw to MAN. The flight crew can then set the radar to the AUTO position.

Gain must be manually set to +4, when MULTISCAN sw is set to AUTO and when flying below FL 200.

- L1** Note:
1. If the weather display is ambiguous or unexpected, in order to better analyze the weather situation, use manual tilt according to standard technique.
 2. In particular below FL 200, for situations with low-level weather, weather with low reflectivity or in front of suspected active cells, the flight crew should switch to MAN mode and adjust the tilt setting downward until the weather is detected or the ground clutter appears on the upper part of the display.
 3. In addition, the flight crew may increase the manual gain control to display lower reflectivity targets. The manual gain control can be increased in both AUTO and MAN modes to display lower levels of weather. In both cases, ground clutter may also be displayed as a result of low settings and/or increased gain.

PREDICTIVE WINDSHEAR SYSTEM  AUTO | PM

TAXI - RADAR

Ident.: PRO-NOR-SOP-10-A-00015298.0002001 / 03 NOV 22

Applicable to: MSN 02155-03060

Impacted by TDU: 00015299 Taxi - Radar

WEATHER RADAR

RADAR..... ON | PM

- L2** To check the departure path, set the MULTISCAN sw to MAN. The flight crew can then set the radar to the AUTO position.

L1 PREDICTIVE WINDSHEAR SYSTEM  AUTO | PM

Ident.: PRO-NOR-SOP-10-A-00015298.0002001 / 03 NOV 22

Applicable to: MSN 07784-07792

WEATHER RADAR

RADAR..... ON | PM

- L2** To check the departure path, set the MULTISCAN sw to MAN. The flight crew can then set the radar to the AUTO position.

L1 PREDICTIVE WINDSHEAR SYSTEM  AUTO | PM

Ident.: PRO-NOR-SOP-10-A-00015298.0005001 / 03 NOV 22

Applicable to: MSN 04392-05746

WEATHER RADAR

WXR/PWS (1 or 2 )..... ON | PM

RADAR CAPT DISPLAY mode sel..... ALL | PM

- L2** 30 s are necessary for the 3D buffer of the radar to be filled.

PROCEDURES

NORMAL PROCEDURES

STANDARD OPERATING PROCEDURES - TAXI

- L1** RADAR F/O DISPLAY mode sel..... ALL | PM
- L2** 30 s are necessary for the 3D buffer of the radar to be filled.

Ident.: PRO-NOR-SOP-10-A-00010268.0001001 / 09 NOV 21

Applicable to: ALL

FINAL CHECK

- T.O CONFIG pb..... TEST | PM
- L2** Press the T.O CONFIG pb on the ECP, and check that the EWD displays the **T.O CONFIG NORMAL** memo.
- L1** T.O MEMO.....CHECK NO BLUE | PM
- L2** Check that the EWD does not display any blue line in the T.O memo section.
- L1** CABIN REPORT..... RECEIVE | PF-PM
- L2** Check **CABIN READY**  in the EWD, or obtain the cabin report from the purser.

Ident.: PRO-NOR-SOP-10-A-00024948.0001001 / 18 NOV 24

Applicable to: ALL

TAXI CHECKLIST

- TAXI C/L.....COMPLETE | BOTH

ONE ENGINE TAXI AT DEPARTURE

Ident.: PRO-NOR-SOP-10-B-00027783.0001001 / 14 NOV 24

Applicable to: ALL

TAXI CLEARANCE

- When the ground crew makes the hand signal:
TAXI clearance.....OBTAIN | PM

Ident.: PRO-NOR-SOP-10-B-00027785.0001001 / 14 NOV 24

Applicable to: ALL

EXTERIOR LIGHTS

- L2** During taxi, the PF may request the PM to set the exterior lights.
- L1** NOSE sw..... TAXI | PF
- RWY TURN OFF sw..... ON | PF

Ident.: PRO-NOR-SOP-10-B-00027786.0001001 / 14 NOV 24
 Applicable to: ALL

PARK BRK

PARK BRK handle.....	OFF		PF
BRAKES PRESSURE.....	CHECK AT ZERO		PF

L2
The flight crew may observe slight residual pressure on the triple indicator for a short period of time.

TAXI - BRAKES

Ident.: PRO-NOR-SOP-10-B-00027787.0001001 / 14 NOV 24
 Applicable to: MSN 02155-02212

BRAKES

CAUTION

If the aircraft was parked in wet conditions for a long time, the first brake application at low speed is less effective.

BRAKE PEDALS.....	PRESS		PF
BRAKES	CHECK		PF
BRK FAN pb-sw	AS RQRD		PM

L2
If an arc is displayed above the brake temperature on the WHEEL SD page, set to ON the BRK FAN pb-sw.

L1

BRAKES PRESSURE.....	CHECK AT ZERO		PM
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Ident.: PRO-NOR-SOP-10-B-00027787.0002001 / 14 NOV 24
 Applicable to: MSN 02719-07792

BRAKES

CAUTION

If the aircraft was parked in wet conditions for a long time, the first brake application at low speed is less effective.

BRAKE PEDALS.....	PRESS		PF
BRAKES	CHECK		PF
BRK FAN pb-sw	AS RQRD		PM

L2
If an arc is displayed above the brake temperature on the WHEEL SD page, set to ON the BRK FAN pb-sw.

PROCEDURES

NORMAL PROCEDURES

STANDARD OPERATING PROCEDURES - TAXI

Ident.: PRO-NOR-SOP-10-B-00027789.0001001 / 14 NOV 24

Applicable to: ALL

ATC CLEARANCE

ATC clearance..... CONFIRM | PM

Ident.: PRO-NOR-SOP-10-B-00027790.0001001 / 14 NOV 24

Applicable to: ALL

AFS/FLIGHT INSTRUMENTS

CLEARED ALTITUDE ON FCU.....CHECK | PM

L2 On the PFD, crosscheck and confirm the cleared altitude.

L1 HDG ON FCU..... IF REQUIRED, PRESET | PM

 L2 If a heading is required by the ATC after takeoff, in the case of a radar vector departure, preset the heading on the FCU. NAV mode will be disarmed.
 RWY TRK mode will keep the aircraft on the runway track.

 L1 BOTH FD.....CHECK ON | PM
 PFD/ND.....CHECK | PF-PM

L2 Check that the PFD (e.g. airspeeds, initial target altitude, heading, FMA modes) and the ND indications (SID) are in accordance with the departure.

Ident.: PRO-NOR-SOP-10-B-00028305.0001001 / 14 NOV 24

Applicable to: ALL

SECOND ENGINE START FLOW PATTERN

First Part

→ PM Actions

- ① YELLOW ELEC PUMP pb-swOFF
- ② APU BLEED pb-swON
- ③ ENG 2 thrust leverIDLE
- ④ ENG MODE selectorIGN/START
- ⑤ ENG 2 MASTER leverON
- ⑥ ENG 2 IDLE PARAMETERS CHECK
- ⑦ CHRONOSTART

PROCEDURES

NORMAL PROCEDURES

STANDARD OPERATING PROCEDURES - TAXI

Second Part

→ PF Actions

→ PM Actions



① ECAM STATUS.....CHECK

- ① ENG MODE selector.....NORM
- ② APU BLEED pb-sw.....OFF
- ③ ANTI ICE.....AS RQRD
- ④ APU MASTER SW pb-sw.....AS RQRD
- ⑤ ECAM STATUS.....CHECK

SECOND ENGINE START		
● When taxiing in a straight line:		
<i>Note:</i> - During the engine start, a slight jerk forward may occur if the brakes are applied while the aircraft is moving. - Maintain taxi in a straight line during at least 5 s after the selection of the ENG 2 master lever to ON, in order to ensure that the PTU automatic test is completed. - The second engine must be started soon enough before takeoff, in order to take into account the engine start time and ensure the applicable engine warm-up time (Refer to PRO-NOR-SOP-09 After Start - ENG Mode Selector).		
	ENG 2 START.....	ORDER | PF
	YELLOW ELEC PUMP pb-sw.....	OFF | PM
L2	The yellow electric pump must be set to OFF to enable the PTU automatic test during engine 2 start.	
L1	APU BLEED pb-sw.....	ON | PM
	ENG 2 THRUST lever.....	IDLE | PM
	CAUTION The engine starts regardless of the thrust lever position. If the thrust lever is not set to IDLE, then thrust rapidly increases to the corresponding thrust lever position, causing a hazardous situation.	
	ENG MODE selector.....	IGN/START | PM
● 10 s after APU bleed ON:		
	ENG 2 START.....	ANNOUNCE | PM
	ENG 2 MASTER lever.....	ON | PM
L2	Wait 10 s before the ENG 2 start, in order to ensure that the bleed system valves are no longer in transit. This prevents ENG 1 stall.	
L1	● When idle is reached (AVAIL indication  is displayed):	
	ENG 2 IDLE PARAMETERS.....	CHECK | PM
L2	Fore more information, Refer to PRO-NOR-SOP-08 Automatic Engine Start.	
L1	CHRONO.....	START | PM
L2	Start the chronometer in order to monitor the warm-up time of engine 2.	

Ident.: PRO-NOR-SOP-10-B-00027782.0001001 / 14 NOV 24
 Applicable to: ALL

ENG MODE SELECTOR

ENG MODE selector.....NORM | PM

Ident.: PRO-NOR-SOP-10-B-00027807.0001001 / 14 NOV 24
 Applicable to: ALL

APU BLEED

APU BLEED pb-sw.....OFF | PM

Ident.: PRO-NOR-SOP-10-B-00027810.0003001 / 14 NOV 24
 Applicable to: ALL

ANTI ICE

CAUTION	In icing conditions (<i>Refer to LIM-ICE_RAIN Definition of Icing Conditions</i>), the flight crew must turn on the engine anti-ice and should not wait until seeing ice building up.
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ENG 1 AND 2 ANTI ICE pb-sw.....AS RQRD | PM
Turn on engine anti-ice during all ground operations, when icing conditions exist or are anticipated.
 WING ANTI ICE pb-sw.....AS RQRD | PM
On ground when wing anti-ice is switched on, the anti-ice valves open for about 30 s for self-test sequence, then close as long as the aircraft is on ground.

Ident.: PRO-NOR-SOP-10-B-00027809.0001001 / 14 NOV 24
 Applicable to: ALL

APU

- **If the APU is not required:**
 APU MASTER SW pb-sw.....OFF | PM

Ident.: PRO-NOR-SOP-10-B-00027811.0001001 / 14 NOV 24
 Applicable to: ALL

ECAM STATUS

ECAM STATUS.....CHECK | BOTH
L2 *The PM checks and the PF crosschecks that there is no status reminder (STS) on the E/WD. If STS appears on the E/WD, press the STATUS pb to display the STATUS page.*

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES STANDARD OPERATING PROCEDURES - TAXI
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Ident.: PRO-NOR-SOP-10-B-00027902.0001001 / 14 NOV 24
Applicable to: ALL

AFTER START CHECKLIST

AFTER START C/L.....COMPLETE | BOTH

Ident.: PRO-NOR-SOP-10-B-00027788.0002001 / 14 NOV 24
Applicable to: ALL

FLIGHT CONTROLS

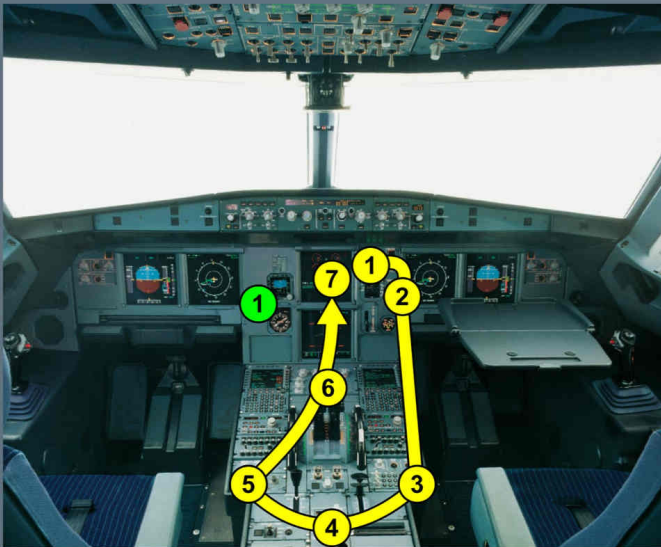
FLIGHT CONTROLS.....CHECK | BOTH

Ident.: PRO-NOR-SOP-10-B-00027791.0001001 / 14 NOV 24

Applicable to: ALL

TAXI FLOW PATTERN

→ PF Actions → PM Actions



① TERR ON MD.....AS RQRD

① AUTO BRK MAX pb-sw.....ON

② TERR ON MD.....AS RQRD

③ SQUAWK.....CONFIRM/SET

④ ENG MODE selector.....AS RQRD

⑤ RADAR/PWS.....ON/AUTO

⑥ T.O CONFIG pb.....TEST

⑦ T.O MEMO.....CHECK NO BLUE

Ident.: PRO-NOR-SOP-10-B-00027792.0001001 / 14 NOV 24

Applicable to: ALL

AUTO BRK

AUTO BRK MAX pb-sw..... ON | PM

Ident.: PRO-NOR-SOP-10-B-00027793.0001001 / 14 NOV 24
 Applicable to: ALL

TERR ON ND
 TERR ON ND.....AS RQRD | PF-PM
 L2 Consider selecting the radar display on the PF side, and TERR ON ND on the PM side only.

Ident.: PRO-NOR-SOP-10-B-00027794.0001001 / 14 NOV 24
 Applicable to: ALL

ATC
 ATC CODE/MODE..... CONFIRM/SET FOR TAKEOFF | PM

Ident.: PRO-NOR-SOP-10-B-00027796.0003001 / 06 NOV 25
 Applicable to: ALL

3 ENG MODE SELECTOR
 ENG MODE selector.....AS RQRD | PM
 L2 Select IGN, if:
 | - There is standing water on the runway, or
 - Heavy rain is falling, or
 - Heavy rain or severe turbulence is expected after takeoff.

TAXI - RADAR

 Ident.: PRO-NOR-SOP-10-B-00027798.0002001 / 14 NOV 24
 Applicable to: MSN 02155-03060
 Impacted by TDU: 00027799 Taxi - Radar

WEATHER RADAR
 RADAR..... ON | PM
 L2 To check the departure path, set the MULTISCAN sw to MAN. The flight crew can then set the radar to the AUTO position.

L1 PREDICTIVE WINDSHEAR SYSTEM  AUTO | PM

 Ident.: PRO-NOR-SOP-10-B-00027798.0002001 / 14 NOV 24
 Applicable to: MSN 07784-07792

WEATHER RADAR
 RADAR..... ON | PM
 L2 To check the departure path, set the MULTISCAN sw to MAN. The flight crew can then set the radar to the AUTO position.

L1 PREDICTIVE WINDSHEAR SYSTEM  AUTO | PM

Ident.: PRO-NOR-SOP-10-B-00027798.0004001 / 14 NOV 24
 Applicable to: MSN 04392-05746

WEATHER RADAR

- WXR/PWS (1 or 2 )..... ON | PM
 RADAR CAPT DISPLAY mode sel..... ALL | PM
- L2 30 s are necessary for the 3D buffer of the radar to be filled.
- L1 RADAR F/O DISPLAY mode sel..... ALL | PM
- L2 30 s are necessary for the 3D buffer of the radar to be filled.

Ident.: TDU / PRO-NOR-SOP-10-B-00027799.0002001 / 14 NOV 24
 Applicable to: MSN 02155-03060
 Impacted DU: 00027798 Taxi - Radar

WEATHER RADAR

- RADAR..... ON | PM
- L2 To check the departure path, set the MULTISCAN sw to MAN. The flight crew can then set the radar to the AUTO position.
 Gain must be manually set to +4, when MULTISCAN sw is set to AUTO and when flying below FL 200.
- L1 Note:
 1. If the weather display is ambiguous or unexpected, in order to better analyze the weather situation, use manual tilt according to standard technique.
 2. In particular below FL 200, for situations with low-level weather, weather with low reflectivity or in front of suspected active cells, the flight crew should switch to MAN mode and adjust the tilt setting downward until the weather is detected or the ground clutter appears on the upper part of the display.
 3. In addition, the flight crew may increase the manual gain control to display lower reflectivity targets. The manual gain control can be increased in both AUTO and MAN modes to display lower levels of weather. In both cases, ground clutter may also be displayed as a result of low settings and/or increased gain.

PREDICTIVE WINDSHEAR SYSTEM  AUTO | PM

Ident.: PRO-NOR-SOP-10-B-00027800.0001001 / 14 NOV 24
 Applicable to: ALL

FINAL CHECK

- T.O CONFIG pb..... TEST | PM
- L2 Press the T.O CONFIG pb on the ECP, and check that the E/WD displays the **T.O CONFIG NORMAL** memo.

- L1

T.O MEMO.....CHECK NO BLUE

PM
- L2

Check that the E/WD does not display any blue line in the T.O memo section.
- L1

CABIN REPORT.....RECEIVE

PF-PM
- L2

Check **CABIN READY**  in the E/WD, or obtain the cabin report from the purser.

Ident.: PRO-NOR-SOP-10-B-00027812.0001001 / 14 NOV 24

Applicable to: ALL

TAXI CHECKLIST

TAXI C/L.....COMPLETE

BOTH

PROCEDURES

NORMAL PROCEDURES

STANDARD OPERATING PROCEDURES - TAXI

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES STANDARD OPERATING PROCEDURES - DEPARTURE CHANGE
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DEPARTURE CHANGE

Ident.: PRO-NOR-SOP-10B-00010248.0001001 / 18 NOV 24
Applicable to: ALL

L2 For more information, *Refer to FCTM/PR-NP-SOP-106 Departure Change.*

L1 DEPARTURE CHANGE

- | | | |
|-----------|---|-------|
| L2 | FINAL TAKEOFF PERF DATA.....RECOMPUTE | PF-PM |
| | <i>The PF and the PM independently compute again the takeoff performance data.</i> | |
| L1 | FMS .....REVISE | PM |
| L2 | <i>The PM revises the FMS as necessary, including the takeoff data, runway and/or SID, as applicable. Carefully confirm that the ATC clearance agrees with the FMS, if NAV mode is to be used.</i> | |
| | <i>If the flight crew uses an optimum configuration option for the computation, they should pay specific attention to any change of the configuration of the slats/flaps at takeoff.</i> | |
| L1 | REVISED FMS.....CROSSCHECK | PF |
| L2 | <i>The PF crosschecks the revised FMS, as applicable. The PF crosschecks the performance data displayed on the PF's EFB with the FMS PERF TAKE OFF page.</i> | |
| L1 | EFB/MCDU GREEN DOT.....COMPARE | PF |
| L2 | <i>The PF compares Green Dot speed computed by the FMGS and the Green Dot speed computed by the EFB takeoff performance application. A discrepancy indicates a difference in the TOW used in both systems (EFB/FMGS).</i> | |
| L1 | FLAPS lever.....SET | PM |
| L2 | <i>Select takeoff position.</i> | |
| L1 | FCU ALT.....SET | PM |
| L2 | <i>On the PFD, crosscheck and confirm the cleared altitude.</i> | |
| L1 | T.O CONFIG pb.....TEST | PM |
| L2 | <i>Press the T.O CONFIG pb on the ECP, and check that the EWD displays the T.O CONFIG NORMAL memo.</i> | |
| L1 | RE-BRIEFING.....PERFORM | BOTH |
| | DEPARTURE CHANGE C/L.....COMPLETE | BOTH |

PROCEDURES

NORMAL PROCEDURES

STANDARD OPERATING PROCEDURES - DEPARTURE CHANGE

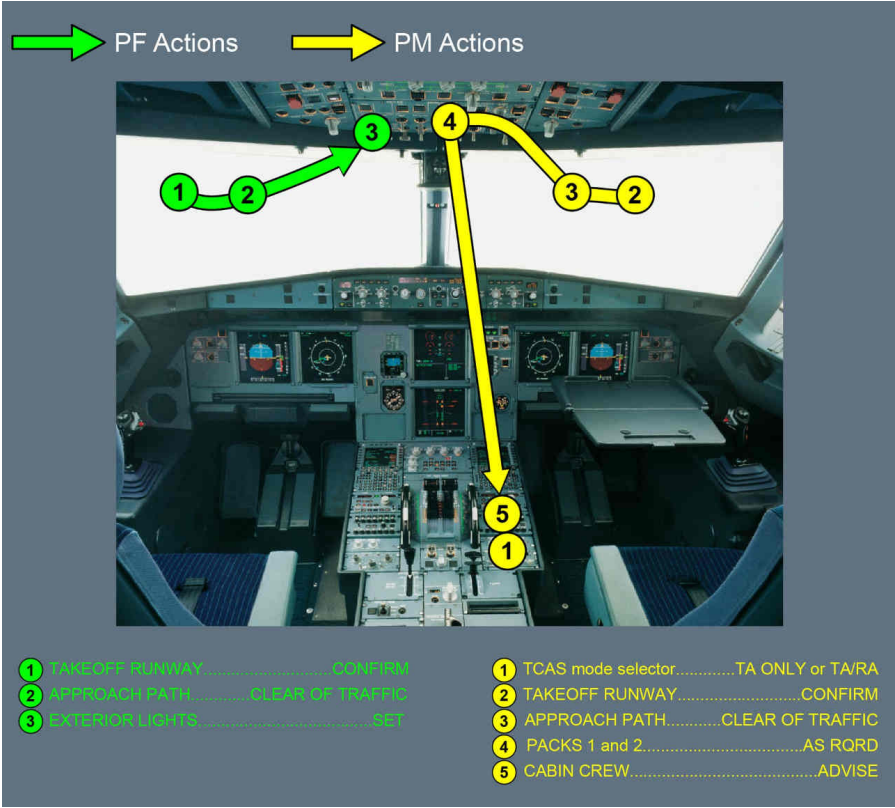
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BEFORE TAKEOFF

Ident.: PRO-NOR-SOP-11-A-00025026.0001001 / 09 NOV 21

Applicable to: ALL

LINE-UP FLOW PATTERN



Ident.: PRO-NOR-SOP-11-A-00010396.0001001 / 15 NOV 21

Applicable to: ALL

BRAKE FANS

- If the brake fans are set to ON:
 BRAKE TEMPERATURE.....CHECK | PM

PROCEDURES

NORMAL PROCEDURES

STANDARD OPERATING PROCEDURES - BEFORE TAKEOFF

■ If the temperature of one brake is at or more than 150 °C:

TAKEOFF.....DELAY | PM

L2

*This prevents the display of the **BRAKES HOT** alert when the BRAKE FAN is set to OFF.*

L1

■ If the temperature of all brakes is below 150 °C:

BRAKE FAN pb.....OFF | PM

Ident.: PRO-NOR-SOP-11-A-00010388.0001001 / 15 NOV 21

Applicable to: ALL

LINE-UP CLEARANCE

LINE-UP CLEARANCE.....OBTAIN | PM

Ident.: PRO-NOR-SOP-11-A-00010389.0001001 / 09 NOV 21

Applicable to: ALL

TCAS

TCAS Mode selector.....TA or TA/RA | PM

L2

The flight crew should use the TA/RA mode as the default mode of the TCAS.
The flight crew may use the TA ONLY mode in specific airports, and for specific procedures (identified by Operators) that may provide resolution advisories that are neither wanted nor appropriate (e.g. closely-spaced parallel or converging runways).

Ident.: PRO-NOR-SOP-11-A-00010393.0001001 / 18 NOV 24

Applicable to: ALL

TAKEOFF RUNWAY

TAKEOFF RUNWAY.....CONFIRM | BOTH

L2

Confirm that the line up is performed on the intended runway and from the intended intersection.
Useful aids are:

- The runway markings

- The runway lights

Be careful that in low visibility, edge lights could be mixed up with the center line lights.

- The ILS signal

If the runway is ILS equipped, the flight crew can press the ILS pb (or LS pb): the LOC deviation should be centered after line up

- The runway symbol on the ND

- The Runway Awareness and Advisory System .

Ident.: PRO-NOR-SOP-11-A-00010390.0001001 / 09 NOV 21
Applicable to: ALL

APPROACH PATH CLEAR OF TRAFFIC

APPROACH PATH.....CLEAR OF TRAFFIC | PF-PM

L2 Check that the approach path is clear of traffic, visually and using TCAS display on the ND.

Ident.: TDU / PRO-NOR-SOP-11-A-00014740.0001001 / 09 NOV 21
Applicable to: MSN 05746-07792
Impacted DU: 00010392 Before Takeoff - Exterior Lights

EXTERIOR LIGHTS

STROBE sw..... ON | PF

L2 Set the STROBE sw to ON to cross or enter a runway.
The PF can request the PM to set the exterior lights.

L1 Note: The flight crew can switch off the strobe lights if the lights cause any visual trouble during the flight.

BEFORE TAKEOFF - EXTERIOR LIGHTS

Ident.: PRO-NOR-SOP-11-A-00010392.0002001 / 09 NOV 21
Applicable to: MSN 05746-07792
Impacted by TDU: 00014740 Before Takeoff - Exterior Lights

EXTERIOR LIGHTS

STROBE sw..... ON | PF

L2 Set the STROBE sw to ON to cross or enter a runway.
The PF can request the PM to set the exterior lights.

Ident.: PRO-NOR-SOP-11-A-00010392.0002001 / 09 NOV 21
Applicable to: MSN 02155-05253

EXTERIOR LIGHTS

STROBE sw..... ON | PF

L2 Set the STROBE sw to ON to cross or enter a runway.
The PF can request the PM to set the exterior lights.

Ident.: PRO-NOR-SOP-11-A-00010391.0001001 / 09 NOV 21
Applicable to: ALL

PACKS

PACK 1 pb-sw and PACK 2 pb-sw.....AS RQRD | PM

L2 Consider selecting packs OFF, or APU bleed ON.

PROCEDURES

NORMAL PROCEDURES

STANDARD OPERATING PROCEDURES - BEFORE TAKEOFF

This will improve performance when using TOGA thrust.

In the case of a FLEX takeoff, selecting packs OFF or APU bleed ON will reduce takeoff EGT, and thus reduce maintenance costs.

The use of FLEX thrust may reduce maintenance costs. The effect is particularly significant with the first degrees of FLEX.

Use of APU bleed is not authorized, if wing anti-ice is to be used.

Ident.: PRO-NOR-SOP-11-A-00010394.0001001 / 09 NOV 21

Applicable to: ALL

SLIDING TABLE/EFB

SLIDING TABLE..... STOW | PF-PM

ALL EFB transmitting mode..... AS RQRD | PF-PM

L2 *In accordance with the Operator's policy or, as required by operational regulations.*

L1 ALL EFB (with no mounted equipment)..... STOW | PF-PM

L2 *In flight, both flight crewmembers should not use EFB applications at the same time.*

Ident.: PRO-NOR-SOP-11-A-00010399.0001001 / 09 NOV 21

Applicable to: ALL

CABIN CREW

CABIN CREW.....ADVISE | PM

L2 *Advise the cabin crew that takeoff is imminent.*

Ident.: PRO-NOR-SOP-11-A-00010400.0001001 / 18 NOV 24

Applicable to: ALL

LINE-UP CHECKLIST

LINE-UP C/L..... COMPLETE | BOTH

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES STANDARD OPERATING PROCEDURES - TAKEOFF
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TAKEOFF

Applicable to: ALL

Ident.: PRO-NOR-SOP-12-A-00022130.0001001 / 09 NOV 21

TAKEOFF CLEARANCE

TAKEOFF CLEARANCE.....	OBTAIN	PM
------------------------	--------	----

Ident.: PRO-NOR-SOP-12-A-00022129.0001001 / 09 NOV 21

EXTERIOR LIGHTS

NOSE sw.....	T.O	PF
RWY TURN OFF sw.....	ON	PF
LAND sw.....	ON	PF

Ident.: PRO-NOR-SOP-12-A-00011560.0006001 / 10 MAY 22

THRUST SETTING

The below procedure is the standard takeoff procedure. However, rolling takeoff is permitted.

TAKEOFF.....	ANNOUNCE	PF
THRUST.....	50 % N1 (1.05 EPR)	PF

● **If the crosswind is at or below 20 kt and there is no tailwind:**

SIDESTICK.....	HALF FORWARD	PF
----------------	--------------	----

L2 *To counter the nose-up effect of setting engine takeoff thrust, apply half forward sidestick until the airspeed reaches 80 kt. Release the sidestick gradually to reach neutral at 100 kt.*

BRAKES.....	RELEASE	PF
-------------	---------	----

THRUST LEVERS.....	FLX or TOGA	PF
--------------------	-------------	----

L2 *Once the thrust levers are set to FLX or TOGA detent, the Captain maintains the hand on the thrust levers until the aircraft reaches V1.*

L1 ● **In the case of tailwind, or if crosswind is above 20 kt:**

SIDESTICK.....	FULL FORWARD	PF
----------------	--------------	----

L2 *To counter the nose-up effect of setting engine takeoff thrust, apply full forward sidestick until the airspeed reaches 80 kt. Release the sidestick gradually to reach neutral at 100 kt.*

BRAKES.....	RELEASE	PF
-------------	---------	----

THRUST LEVERS.....	FLX or TOGA	PF
--------------------	-------------	----

L2 - Increase thrust rapidly to about 70 % N1 (1.15 EPR) then progressively to reach takeoff thrust by 40 kt ground speed

- Once the thrust levers are set to FLX or TOGA detent, the Captain maintains the hand on the thrust levers until the aircraft reaches V1.

PROCEDURES

NORMAL PROCEDURES

STANDARD OPERATING PROCEDURES - TAKEOFF

L1

Note: ENG SD page replaces WHEEL SD page on the ECAM lower display.

CHRONO.....	START	PM
DIRECTIONAL CONTROL.....	USE RUDDER	PF

L2

At 130 kt (wheel speed), the connection between nosewheel steering and the rudder pedals is removed. Therefore, in strong crosswinds, more rudder input will be required at this point to prevent the aircraft from turning into the wind.

L1

PFD/ND.....	MONITOR	PM
-------------	---------	----

L2

*If **GPS PRIMARY LOST**, check on the ND the FMS position: i.e. that the aircraft is on the runway centerline.*

Ident.: PRO-NOR-SOP-12-A-00011561.0001001 / 09 NOV 21

BELOW 80 KT

TAKEOFF THRUST.....	CHECK	PM
---------------------	-------	----

L2

Check that the actual N1/EPR of the individual engines has reached the N1/EPR rating limit, before the aircraft reaches 80 kt. Check EGT.

L1

THRUST SET.....	ANNOUNCE	PM
PFD and ENG indications.....	MONITOR	PM

L2

Scan airspeed, N1/EPR, and EGT throughout the takeoff.

Ident.: PRO-NOR-SOP-12-A-00024950.0001001 / 09 NOV 21

AT 80 KT

SIDESTICK.....	RELEASE	PF
----------------	---------	----

L2

Release the sidestick gradually to reach neutral at 100 kt.

Ident.: PRO-NOR-SOP-12-A-00011562.0001001 / 09 NOV 21

AT 100 KT

ONE HUNDRED KNOTS.....	ANNOUNCE	PM
100 KT.....	CROSSCHECK	PF

L2

- *The PF crosschecks and confirms the speed indicated on the PFD*
- *Below 100 kt, the Captain may decide to abort the takeoff, depending on the circumstances*
- *Above 100 kt, rejecting the takeoff is a more serious matter.*

Ident.: PRO-NOR-SOP-12-A-00011563.0001001 / 09 NOV 21

AT V1

V1.....	ANNOUNCE	PM
---------	----------	----

Ident.: PRO-NOR-SOP-12-A-00011564.0001001 / 09 NOV 21

AT VR

ROTATION ORDER

ROTATION.....PERFORM

PM

PF

L2

- At VR, initiate the rotation to achieve a continuous rotation with a rate of about 3 °/s, towards a pitch attitude 15 ° (12.5 °, one engine is failed)
- Minimize the lateral inputs on ground and during the rotation, to avoid spoiler extension
- In strong crosswind conditions, small lateral stick inputs may be used, if necessary, to aim at maintaining wings level
- After lift-off, follow the SRS pitch command bar.

L1

CAUTION

If a tailstrike occurs, avoid flying at an altitude requiring a pressurized cabin, and return to the originating airport for damage assessment.

Ident.: PRO-NOR-SOP-12-A-00011565.0001001 / 09 NOV 21

WHEN POSITIVE CLIMB

POSITIVE CLIMB.....ANNOUNCE

PM

L2

Announce positive climb, when the vertical speed indication is positive and radio altitude has increased.

L1

L/G UP.....

L/G lever.....

AP.....

ORDER

SELECT UP

AS RQRD

PF

PM

PF

L2

Above 100 ft AGL, AP 1 or 2 may be engaged.

Ident.: PRO-NOR-SOP-12-A-00011566.0002001 / 09 NOV 21

AT THRUST REDUCTION ALTITUDE

THRUST LEVERS.....CL

PF

L2

Move the thrust levers to the CL detent, when the flashing **LVR CLB** prompt appears on the FMA. A/THR is now active.

L1

PACK 1 and 2 (if applicable).....

ON

PM

L2

Select PACK 1 on after CLB thrust reduction.

Select PACK 2, at least 10 s after PACK 1 is selected on, for passenger comfort.

L1

Note: 1. Selecting pack on before reducing takeoff thrust would result in an EGT increase

2. If packs are not switched on after the takeoff phase, an ECAM caution will be triggered.

PIA A318/A319/A320/A321 FLEET	← A →	PRO-NOR-SOP-12 P 3/6
FCOM		17 AUG 22

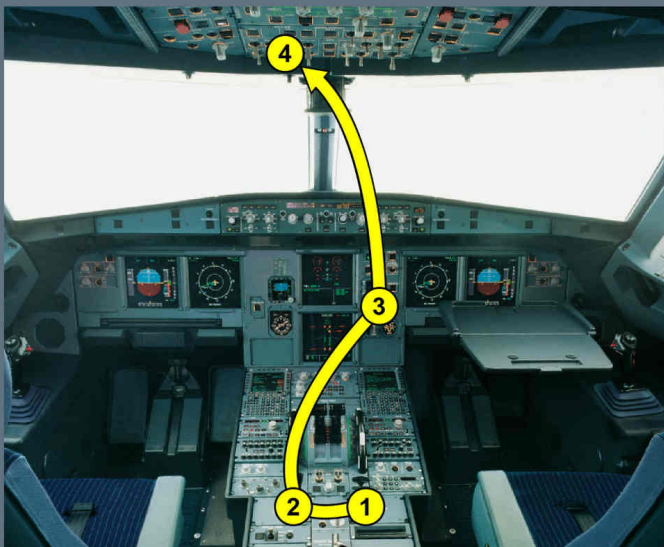
Ident.: PRO-NOR-SOP-12-A-00011568.0001001 / 09 NOV 21

ABOVE ACCELERATION ALTITUDE (OR ONCE IN CLIMB PHASE)

L2 The following procedure ensures that the aircraft is correctly accelerating toward climb speed.

L1 ACCELERATION FLOW PATTERN

→ PM Actions



- ① FLAPS ZERO.....SELECT
- ② GND SPLRS.....DISARM
- ③ L/G.....CHECK UP
- ④ EXTERIOR LIGHTS.....SET

● **At F speed:**

FLAPS 1.....	ORDER	PF
FLAPS 1.....	SELECT	PM

● **At S speed:**

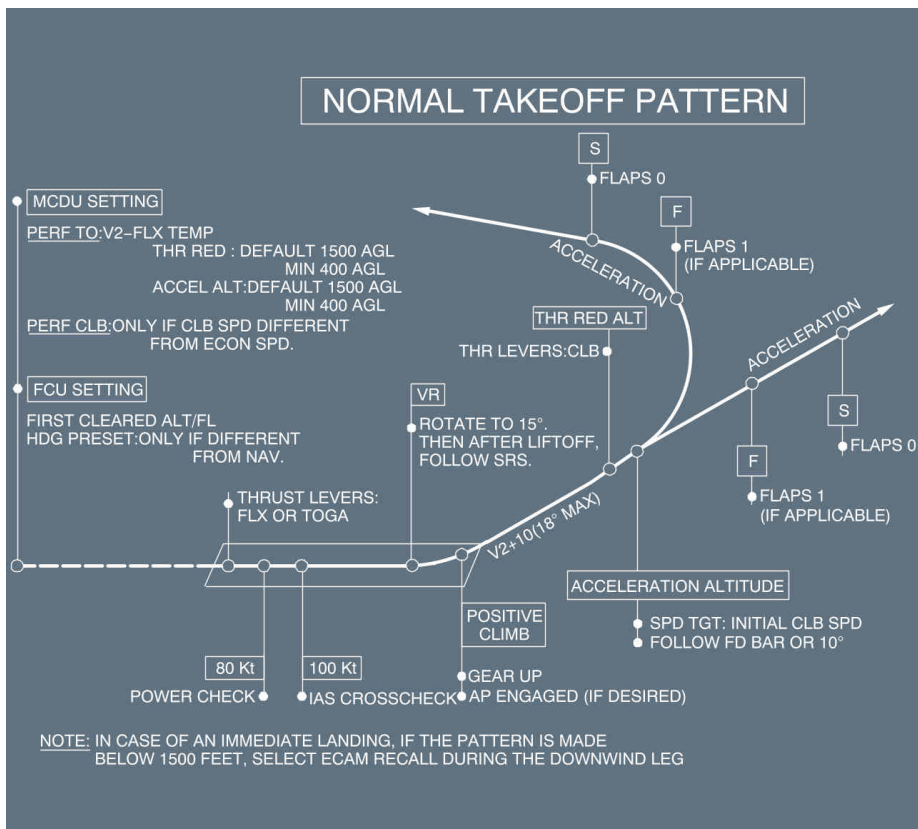
FLAPS 0.....	ORDER	PF
FLAPS 0.....	SELECT	PM

GND SPLRS.....	DISARM	PM
L/G.....	CHECK UP	PM
NOSE sw.....	OFF	PM
RWY TURN OFF sw.....	OFF	PM
OTHER EXTERIOR LIGHTS.....	AS RQRD	PM

L2

The flight crew can maintain the LAND sw set to ON, according to airline policy or regulatory recommendations.

Ident.: PRO-NOR-SOP-12-A-00011570.0001001 / 18 DEC 12



PROCEDURES

NORMAL PROCEDURES

STANDARD OPERATING PROCEDURES - TAKEOFF

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AFTER TAKEOFF

Applicable to: ALL

Ident.: PRO-NOR-SOP-13-A-00010157.0001001 / 09 NOV 21

APU

● **If the APU was used to supply the air conditioning during takeoff:**

APU BLEED pb-sw.....	OFF	PM
APU MASTER SW pb-sw.....	OFF	PM

Ident.: PRO-NOR-SOP-13-A-00010158.0001001 / 09 NOV 21

ENG MODE SELECTOR

ENG MODE selector.....	AS RQRD	PM
------------------------	---------	----

L2 *Select IGN/START, if severe turbulence or heavy rain is encountered.*

Ident.: PRO-NOR-SOP-13-A-00010159.0001001 / 09 NOV 21

TCAS 

● **If the takeoff was performed with TA only:**

TCAS mode selector.....	TA/RA	PM
-------------------------	-------	----

Ident.: PRO-NOR-SOP-13-A-00010160.0002001 / 06 NOV 25

ANTI ICE

CAUTION	In icing conditions (<i>Refer to LIM-ICE_RAIN Definition of Icing Conditions</i>), the flight crew must turn on the engine anti-ice and should not wait until seeing ice building up.
----------------	---

ENG 1 and 2 ANTI ICE pb-sw.....	AS RQRD	PM
---------------------------------	---------	----

L2 *Engine anti-ice must be set to ON when icing conditions exist or are anticipated, except during climb and cruise when the SAT is below -40 °C (-40 °F).*

WING ANTI ICE pb-sw.....	AS RQRD	PM
--------------------------	---------	----

L2 *When icing conditions are encountered:*

- The flight crew may turn on the wing anti-ice to prevent ice accretion on the wing leading edge
- The flight crew must turn on the wing anti-ice if there is evidence of ice accretion, such as ice on the visual indicator, or on the wipers, or with the **SEVERE ICE DETECTED**  alert. This is to remove any ice accumulation from the wing leading edge.

PROCEDURES

NORMAL PROCEDURES

STANDARD OPERATING PROCEDURES - AFTER TAKEOFF

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CLIMB

Ident.: PRO-NOR-SOP-14-A-00024995.0002001 / 24 NOV 23

Applicable to: ALL

INITIAL CLIMB

Normal vertical mode is **CLB** or **OP CLB** with managed speed active.

PF MCDU.....PERF CLB | PF

- L2 - PF MCDU should be showing the PERF CLB page (allowing PF to monitor when the aircraft will reach the FCU selected altitude) but the flight crew may select other pages such as F-PLN page as may be tactically necessary
- The PROG page displays OPT FL and REC MAX FL. It is worth noting that this OPT FL is a function of the Cl.
- The displayed REC MAX FL gives the aircraft at least a 0.3 g buffet margin. The flight crew may enter a cruise flight level above this level into the MCDU and the FMGS will accept it, provided that it does not exceed the level at which the margin is reduced to 0.2 g.

L1 PM MCDU..... F-PLN | PM

- L2 PM MCDU should be showing the F-PLN page (allowing the flight crew to enter any ATC long-term revisions to the lateral or vertical flight plan).

L1

CLIMB SPEED MODIFICATIONS

- **If ATC, turbulence or operational considerations lead to a speed change:**

Select the new speed with FCU SPD knob and pull.

Speed target is now “selected”.

To return to managed speed mode, push FCU SPD knob.

The speed target is now “managed”.

Note: The best speed (and rate of climb) for long-term situations lies between Green Dot speed and ECON speed. At high altitude, acceleration from Green Dot to ECON speed can take a long time.

EXPEDITE CLIMB

- **If ATC requires a rapid climb through a particular level:**

Push the EXPED pb on the FCU.

The target speed is now Green Dot speed. Check FMA: **THR CLB/EXP CLB/NAV**.

PROCEDURES

NORMAL PROCEDURES

STANDARD OPERATING PROCEDURES - CLIMB

Note: Use the Expedite function  only for short-term tactical situations. For the best overall economy fly at ECON IAS.

To return to ECON CLB speed:

Push ALT knob

Check FMA: **THR CLB/CLB/NAV**.

CLIMB - AT THE TRANSITION ALTITUDE

Ident.: PRO-NOR-SOP-14-A-00025005.0001001 / 14 NOV 23

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

Impacted by TDU: 00025011 Climb - At the Transition Altitude

AT THE TRANSITION ALTITUDE

BAROMETRIC REFERENCE..... SET STD/CROSSCHECK | BOTH

- L2** - At the transition altitude, the barometric setting flashes on the PFD. The flight crew should set STD on the EFIS CP and on the standby altimeter.
- Crosscheck the barometric settings and the altitude indications.

Ident.: PRO-NOR-SOP-14-A-00025005.0001001 / 14 NOV 23

Applicable to: MSN 02926-02944, 04392, 07784-07792

AT THE TRANSITION ALTITUDE

BAROMETRIC REFERENCE..... SET STD/CROSSCHECK | BOTH

- L2** - At the transition altitude, the barometric setting flashes on the PFD. The flight crew should set STD on the EFIS CP and on the standby altimeter.
- Crosscheck the barometric settings and the altitude indications.

Ident.: TDU / PRO-NOR-SOP-14-A-00025011.0001001 / 14 NOV 23

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

Impacted DU: 00025005 Climb - At the Transition Altitude

AT THE TRANSITION ALTITUDE

BAROMETRIC REFERENCE..... SET STD/CROSSCHECK | BOTH

- L2** - At the transition altitude, the barometric setting flashes on the PFD. The flight crew should set STD on the EFIS CP and on the standby altimeter
- Crosscheck the barometric settings and the altitude indications.

L1 ***Note:** When STD is set on the EFIS control panel, the transponder does not transmit to the ATC, the standard barometric reference but the last QNH or QFE previously selected. The transmitted aircraft altitude is not affected. Only the FCU selected altitude, if used by the ATC, may be misinterpreted.
Upon ATC notification of an incorrect barometric reference value, the flight crew can manually select a barometric reference of 1 013 hPa and set again STD on the EFIS control panel.*

Ident.: PRO-NOR-SOP-14-A-00025007.0002001 / 22 NOV 21
Applicable to: ALL

CLIMB

CRZ FL..... SET AS RQRD | PF

L2 - If ATC clears the aircraft to its intended CRZ FL or above, there is no need to modify the CRZ FL entered in the INIT A page during cockpit preparation. The MCDU will automatically take into account a higher CRZ FL selected with the FCU ALT knob.
- If ATC limits CRZ FL to a lower level than the one entered in the INIT A page (or present on the PROG page) the flight crew must insert this lower CRZ FL in the PROG page.
Otherwise there is no transition into CRZ phase: the managed speed targets and Mach are not modified, and SOFT ALT mode is not available. In that case, the FMA will display: **MACH/ALT/NAV** instead of **MACH/ALT CRZ/NAV**.

Ident.: PRO-NOR-SOP-14-A-00010258.0001001 / 06 NOV 25
Applicable to: ALL

1 ANTI ICE

CAUTION

In icing conditions (Refer to LIM-ICE_RAIN Definition of Icing Conditions), the flight crew must turn on the engine anti-ice and should not wait until seeing ice building up.

ENG 1 and 2 ANTI ICE pb-sw.....AS RQRD | PM

L2 Engine anti-ice must be set to ON when icing conditions exist or are anticipated, except during climb and cruise when the SAT is below -40 °C (-40 °F).

Ident.: TDU / PRO-NOR-SOP-14-A-00013047.0003001 / 24 NOV 23
Applicable to: MSN 02155-03060
Impacted DU: 00010259 Climb - Radar

RADAR

RADAR.....ADJUST AS APPROPRIATE | PF

Gain must be manually set to +4, when MULTISCAN sw is set to AUTO and when flying below FL 200.

PROCEDURES

NORMAL PROCEDURES

STANDARD OPERATING PROCEDURES - CLIMB

- Note:
1. If the weather is good, or not significant, in order to check that the radar is operating correctly: down tilt until displaying ground echoes.
 2. If the weather display is ambiguous or unexpected, in order to better analyze the weather situation, use manual tilt according to standard technique.
 3. In particular below FL 200, for situations with low-level weather, weather with low reflectivity or in front of suspected active cells, the flight crew should switch to Manual mode and adjust the tilt setting downward until the weather is detected or the ground clutter appears on the upper part of the display.
 4. In addition, the flight crew may increase the manual gain control to display lower reflectivity targets. The manual gain control can be increased in both AUTO and Manual modes to display lower levels of weather. In both cases, ground clutter may also be displayed as a result of low settings and/or increased gain.

CLIMB - RADAR

Ident.: PRO-NOR-SOP-14-A-00010259.0002001 / 24 NOV 23

Applicable to: MSN 02155-03060

Impacted by TDU: 00013047 Climb - Radar

RADAR

RADAR.....ADJUST AS APPROPRIATE | PF

Ident.: PRO-NOR-SOP-14-A-00010259.0002001 / 24 NOV 23

Applicable to: MSN 04392-07792

RADAR

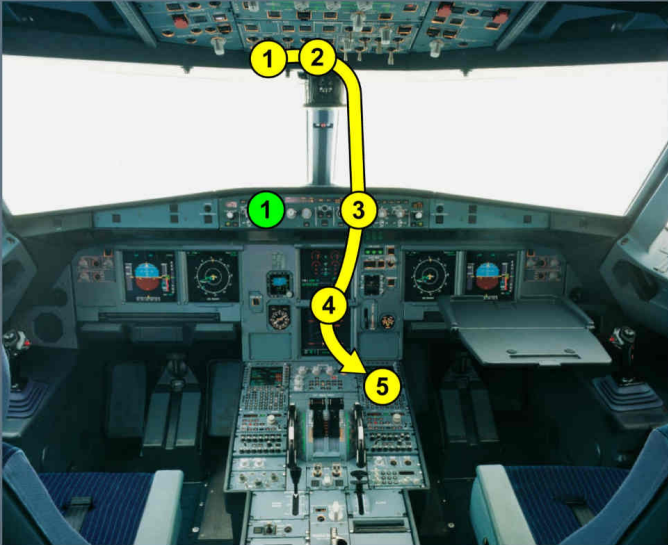
RADAR.....ADJUST AS APPROPRIATE | PF

Ident.: PRO-NOR-SOP-14-A-00020076.0001001 / 24 NOV 23
 Applicable to: ALL

AT 10 000 FT AAL FLOW PATTERN


 PF Actions


 PM Actions



1
 PF EFIS OPTIONS.....AS RQRD

1
 LAND sw.....RETRACT

2
 SEAT BELT sw.....AS RQRD

2
 SEAT BELT sw.....AS RQRD

3
 EFIS OPTIONS.....AS RQRD

3
 EFIS OPTIONS.....AS RQRD

4
 ECAM MEMO.....REVIEW

4
 ECAM MEMO.....REVIEW

5
 NAV AIDS/SEC F-PLAN/OPT FL/REC MAX FL.....CHECK

5
 NAV AIDS/SEC F-PLAN/OPT FL/REC MAX FL.....CHECK

EFIS Option:
 The PF will select CSTR for grid MORA
 The PM will select ARPT.

Ident.: PRO-NOR-SOP-14-A-00010260.0001001 / 09 NOV 21
 Applicable to: ALL

AT 10 000 FT AAL

LAND sw.....	RETRACT	PM
SEAT BELTS sw.....	AS RQRD	PM

PROCEDURES

NORMAL PROCEDURES

STANDARD OPERATING PROCEDURES - CLIMB

	EFIS OPTIONS.....	AS RQRD	PF-PM
L2	<i>Select CSTR on one side, for grid MORA (if available), and ARPT on the other side.</i>		
L1	ECAM MEMO.....	REVIEW	PM
	NAVAIDS.....	CLEAR	PM
L2	<i>Clear manually tuned VORs from RAD NAV page.</i>		
L1	SEC F-PLN page.....	AS RQRD	PM
L2	<i>Recopy the active flight plan in the secondary if an immediate return flight plan has been constructed previously.</i>		
L1	OPT FL/REC MAX FL.....	CHECK	PM
L2	<i>On the FMS PROG page, check the optimum and recommended maximum flight levels.</i>		

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES STANDARD OPERATING PROCEDURES - CRUISE
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CRUISE

Ident.: PRO-NOR-SOP-15-A-00010287.0001001 / 09 NOV 21 Applicable to: ALL
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ECAM

- L2

L1

L2

In cruise, the tasksharing is left to the flight crew's appreciation.

ECAM MEMO..... REVIEW

SD PAGES..... REVIEW

Periodically review system display pages and, in particular:

ENG : Oil pressure and temperature

BLEED : BLEED parameters

ELEC : Parameters, GEN loads

HYD : A slight decrease in quantity is normal.
Fluid contraction during cold soak can be expected.
Green system is lower than on ground, following landing gear retraction.

FUEL : Fuel distribution

COND : Duct temperature, compared with zone temperature.
Avoid large differences for passenger comfort.

F/CTL : Note any unusual control surface position

DOOR : Oxygen pressure.

PF-PM
PF-PM

Ident.: PRO-NOR-SOP-15-A-00010288.0001001 / 09 NOV 21 Applicable to: ALL
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FLIGHT PROGRESS

FLIGHT PROGRESS.....	CHECK	PF-PM
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Monitor flight progress in the conventional way.

WHEN OVERFLYING A MANUALLY ENTERED WAYPOINT

- Check track and distance to the next waypoint
- Check the wind and update it if the current wind is significantly different.

PROCEDURES

NORMAL PROCEDURES

STANDARD OPERATING PROCEDURES - CRUISE

WHEN OVERFLYING THE WAYPOINT, OR AT LEAST EVERY 30 MIN

Check FUEL:

- Check FOB (ECAM) and fuel prediction (FMGC), and compare with the computerized flight or use the performance application of the EFB
- Check that there is no fuel leak
- Check that the sum of the fuel on board and the fuel used is consistent with the fuel on board at departure:
 - If the value is abnormally negative, suspect a fuel leak
 - If the value is abnormally positive, suspect a fuel quantity overread.

CAUTION

This check must also be performed each time a FUEL IMBALANCE procedure is necessary. Perform the check before applying the FUEL IMBALANCE procedure.
 If a fuel leak is confirmed, apply the FUEL LEAK procedure.

Ident.: PRO-NOR-SOP-15-A-00010289.0001001 / 09 NOV 21

Applicable to: ALL

STEP FLIGHT LEVEL

STEP FLIGHT LEVEL.....AS APPROPRIATE | PF-PM

Ident.: PRO-NOR-SOP-15-A-00010290.0001001 / 24 NOV 23

Applicable to: ALL

NAVIGATION ACCURACY

● If GPS PRIMARY LOST:

NAVIGATION ACCURACY..... MONITOR | PF-PM

L2

Check on FMS PROGRESS page that the required navigation accuracy is appropriate according to the flown airspace. For more information, Refer to PRO SPO 51 PBN.

Ident.: TDU / PRO-NOR-SOP-15-A-00013068.0006001 / 09 NOV 21

Applicable to: MSN 02155-03060

Impacted DU: 00010291 Cruise - Radar Tilt

RADAR

RADARADJUST AS APPROPRIATE | PF

Gain must be manually set to +4, when MULTISCAN sw is set to AUTO and when flying below FL 200.

Note:

1. If the weather is good, or not significant, in order to check that the radar is operating correctly: Down tilt until displaying ground echoes
2. If the weather display is ambiguous or unexpected, in order to better analyze the weather situation, use manual tilt according to standard technique
3. In particular below FL 200, for situations with low-level weather, weather with low reflectivity or in front of suspected active cells, the flight crew should switch to Manual mode and adjust the tilt setting downward until the weather is detected or the ground clutter appears on the upper part of the display
4. In addition, the flight crew may increase the manual gain control to display lower reflectivity targets. The manual gain control can be increased in both AUTO and Manual modes to display lower levels of weather. In both cases, ground clutter may also be displayed as a result of low settings and/or increased gain.

CRUISE - RADAR TILT

Ident.: PRO-NOR-SOP-15-A-00010291.0002001 / 09 NOV 21
 Applicable to: MSN 02155-03060
 Impacted by TDU: 00013068 Cruise - Radar Tilt

RADAR

RADARADJUST AS APPROPRIATE | PF

Ident.: PRO-NOR-SOP-15-A-00010291.0002001 / 09 NOV 21
 Applicable to: MSN 04392-07792

RADAR

RADARADJUST AS APPROPRIATE | PF

Ident.: PRO-NOR-SOP-15-A-00010296.0001001 / 09 NOV 21
 Applicable to: ALL

OXYGEN MASKS

● If the oxygen mask has been used:

OXYGEN MASKCHECK | PF-PM

L2 Check that the oxygen mask has been properly stowed, Refer to DSC-35-20-10 General.

PROCEDURES

NORMAL PROCEDURES

STANDARD OPERATING PROCEDURES - CRUISE

Intentionally left blank

DESCENT PREPARATION

Ident.: PRO-NOR-SOP-16-A-00011551.0001001 / 22 NOV 21

Applicable to: ALL

DESCENT PREPARATION

Descent preparation and arrival briefing should be completed before top of descent.

Ident.: PRO-NOR-SOP-16-A-00011552.0006001 / 14 NOV 24

Applicable to: ALL

LANDING INFORMATION

WEATHER AND LANDING INFORMATION.....OBTAIN | PM

L2 *Check the weather reports and runway conditions at destination and alternate airports. Airfield data, if any, should include the runway to be used for arrival.*

When the aircraft operates in low OAT conditions, consider altitude corrections for low temperature.

L1 *Note: When icing conditions with OAT at +3 °C (37 °F) or below are expected at destination or alternate airports, consider to perform engine ice shedding on ground during taxi-in (Refer to PRO-NOR-SUP-ADVWXR Engine Operations on Ground in Icing Conditions).*

NAVIGATION CHARTS.....PREPARE | BOTH

L2 *Prepare the charts for arrival navigation and for the expected approach procedure and verify that both flight crewmembers refer to the same chart reference.*

Ident.: PRO-NOR-SOP-16-A-00027480.0002001 / 07 NOV 25

Applicable to: ALL

BAROMETRIC REFERENCE

BAROMETRIC REFERENCE.....PRESET | PM

L2 *Preset the QNH on the ISIS.*

Ident.: PRO-NOR-SOP-16-A-00011548.0001001 / 15 NOV 21

Applicable to: ALL

ECAM

ECAM STATUS.....CHECK | PM

L2

- Check that there is no status reminder on the upper ECAM display
- If there is a status reminder, check the aircraft STATUS
- Check the STATUS page before completing the landing distance and the arrival briefing.

Take particular note of any degradation in landing capability, or any other aspect affecting the approach and landing.

Ident.: PRO-NOR-SOP-16-A-00014394.0001001 / 14 NOV 24

Applicable to: ALL

LANDING PERFORMANCE

LANDING CONDITIONS.....CONFIRM | PF-PM

Check if the landing conditions changed compared with the landing distance computation at dispatch, or with a previous computation (e.g. runway, weather conditions, in-flight failure affecting performance, diversion).

L2 Check that the EFB takes into account the MEL and CDL items.

For more information, Refer to FCTM/PR-NP-SOP-160 Landing Performance.

L1 ● If landing conditions changed:

LANDING PERF DATA.....COMPUTE | PF-PM

L2 The PF and the PM independently compute the landing distance performance data, based on the new conditions at arrival.

L1 Note:

1. If the weather conditions are expected to change at the landing airport, or in the event of significant precipitation, the flight crew should consider a second calculation of the in-flight landing distance with the worst possible runway condition
2. The selection of REV MAX is the standard practice for landing.
However, on DRY runways the flight crew may select REV IDLE.
On WET runways (runway surface condition GOOD), the flight crew may select REV IDLE, if all the following conditions are satisfied:

- A landing distance assessment has been made with the following parameters:
 - MEDIUM TO POOR landing performance level for the in-flight landing distance computation
 - No reverser credit.
- The result of this landing distance assessment is within the LDA.

LANDING PERF DATA.....CROSSCHECK | BOTH

L2 Both flight crewmembers compare their EFB to ensure that the computations are the same.

Ident.: PRO-NOR-SOP-16-A-00020100.0001001 / 09 NOV 21

Applicable to: ALL

FMS

ARRIVAL page.....COMPLETE/CHECK | PF

L2 Insert APPR, STAR, APPR VIA and TRANS if applicable. (Access by lateral revision at destination.)

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L1 F-PLN A page..... CHECK | PF

- L2**
- Check that the F-PLN agrees with the planned approach and missed approach
 - Check the F-PLN (approach and Missed Approach tracks and distances) vs. the approach charts, using the ND in PLAN mode as necessary
 - Check speed constraints. Add new speed constraints if required.
 - Check altitude constraints. Add new altitude constraints if required.

Note: The FMS may have deleted the altitude constraints that are at or above the CRZ FL, or at or above any previous lower CRZ FL in the case of step climbs (Refer to DSC-22_20-10-30-20 Vertical Constraints (Speed, Altitude, Time)).

In that case,

- Insert again the affected procedures (STAR, APPR VIA or TRANS)
The FMS keeps the altitude constraints that are below the CRZ FL, and deletes again the altitude constraints that are above current CRZ FL. The FMS may also delete the altitude constraints that are at current CRZ FL, and the altitude constraint windows that have a constraint at or above current CRZ FL.
- Manually enter the altitude constraints that are below current CRZ FL using the MCDU Vertical Revision pages.

It is not possible to enter an altitude constraint at the CRZ FL.

In the case of an "AT" or "AT OR ABOVE" altitude constraint at the CRZ FL, the flight crew must select the DES mode only after the aircraft reaches the position of the altitude constraint to prevent an early descent.

- In all cases, do not modify the final approach (FAF to runway or MAP), including altitude constraints
- Identify the position and the altitude of Final Descent Point (FDP) and check the value of the FPA after this FDP
- If a TOO STEEP PATH message is displayed after the FDP, do not use FINAL APP guidance for approach
- Identify the Missed Approach Point.

Ident.: PRO-NOR-SOP-16-A-00020103.0001001 / 14 NOV 24

Applicable to: ALL

RAD NAV page..... CHECK | PF

- L2**
- Set the nav aids, as required, and check the VOR/ADF  idents on the NDs and the ILS/MLS  /GLS  /SLS  idents on the PFDs
 - For an ILS approach, check the frequency and the course
 - For an approach using GLS  /SLS  , check the channel and the course

PROCEDURES

NORMAL PROCEDURES

STANDARD OPERATING PROCEDURES - DESCENT PREPARATION

- If a VOR/DME exists close to the airfield, select it and enter its ident in the BRG/DIST field of the PROG page, for NAV accuracy monitoring during descent
- When the flight plan calls for an NDB approach, the system automatically tunes the ADF , only when the aircraft is passing the first fix of the approach. Therefore, it is convenient to manually tune the ADF  earlier (before activating the approach phase).

L1 SELECTED NAVAID page.....CHECK/MODIFY | PF

Ident.: PRO-NOR-SOP-16-A-00028237.0001001 / 14 NOV 24

Applicable to: ALL

PROG page.....CONSIDER | PF

- L2** For energy management and position monitoring during descent, insert the reference waypoint, the landing runway threshold or a NAVAID in the BRG/DIST field.

Ident.: PRO-NOR-SOP-16-A-00020101.0001001 / 09 NOV 21

Applicable to: ALL

DES WIND page.....CHECK | PF

Enter winds for descent before T/D.

Note: With DPO , as the idle thrust margins are reduced, accurate winds have to be entered to be able to follow the computed vertical profile and thus maximize the benefits of DPO .
 . Refer to DSC-22_20-10-40-10 Descent Profile Optimization (if installed).

PERF CRUISE page.....CHECK | PF

Modify the cabin descent rate if different pressure rate is required.

PERF DES page.....CHECK | PF

Prior to descent, access PERF DES page and check ECON MACH/SPD. If a speed other than ECON is required, insert that MACH or SPD into the ECON field. This new MACH or SPD is now the one for the descent path and T/D computation, and it will be used for the managed speed descent profile (instead of ECON).

- L2** A speed limit of 250 kt below 10 000 ft is the defaulted speed, in the managed speed descent profile. The flight crew may delete or modify it if necessary on the VERT REV at DEST page.

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DESCENT PREPARATION - FMGS - PERF APPR - PERF GO AROUND

Ident.: PRO-NOR-SOP-16-A-00020102.0002001 / 07 NOV 25

Applicable to: MSN 02926-02944

2 PERF APPR page.....COMPLETE/CHECK | PF

- Enter the QNH, temperature, and wind at destination.

L12

Note: Insert the average wind given by the ATC or ATIS. Do not insert the gust value. During approach, the Ground Speed Mini function (managed speed mode) takes into account the instantaneous gust.

For more information, Refer to Ground Speed Mini Function.

For example, if the wind is 15020G35KT, insert 150/20.

- Insert the minimum.

Note: To avoid the aircraft to descend below the published minimum during go-around, due to aircraft inertia during pull-up, some Authorities may require Operators to add a specific number of feet to the published minimum.

CAUTION

If the QNH altimeter setting is used for an aircraft with the QFE option , Refer to DSC-22_20-30-20 QNH Use for Aircraft Equipped with QFE Option.

Note: Changing the RWY or the type of approach automatically erases the previous minimum.

Note: After the activation of the SEC F-PLN, check the VAPP, and modify if necessary.

- Check or modify the landing configuration. Always select the landing configuration on the PERF APPR page: CONF FULL or CONF 3 is the normal landing configuration. CONF 3 should be considered, depending on the available runway length and go-around performance, or if windshear/severe turbulence is considered possible during approach.
If the predicted tailwind at landing is more than 10 kt, Refer to LIM-AG-OPS Tailwind Landing for the recommended/required landing configuration.
- Check or modify the transition altitude/flight level.

PERF GO AROUND page.....CHECK/MODIFY | PF

 Check THR RED ALT and ACC ALT, and modify, if necessary.

Ident.: PRO-NOR-SOP-16-A-00020102.0001001 / 07 NOV 25

Applicable to: MSN 02155-02789, 03031-07792

3 PERF APPR page..... COMPLETE/CHECK | PF

- Enter the QNH, temperature, and wind at destination.

L12

Note: Insert the average wind given by the ATC or ATIS. Do not insert the gust value. During approach, the Ground Speed Mini function (managed speed mode) takes into account the instantaneous gust.

For more information, Refer to Ground Speed Mini Function.

For example, if the wind is 15020G35KT, insert 150/20.

- Insert the minimum.

Note: To avoid the aircraft to descend below the published minimum during go-around, due to aircraft inertia during pull-up, some Authorities may require Operators to add a specific number of feet to the published minimum.

CAUTION

If the QNH altimeter setting is used for an aircraft with the QFE option , Refer to DSC-22_20-30-20 QNH Use for Aircraft Equipped with QFE Option.

Note: Changing the RWY or the type of approach automatically erases the previous minimum.

Note: After the activation of the SEC F-PLN, check the VAPP, and modify if necessary.

- Check or modify the landing configuration. Always select the landing configuration on the PERF APPR page: CONF FULL or CONF 3 is the normal landing configuration. CONF 3 should be considered, depending on the available runway length and go-around performance, or if windshear/severe turbulence is considered possible during approach.
- Check or modify the transition altitude/flight level.

PERF GO AROUND page..... CHECK/MODIFY | PF

L2 Check THR RED ALT and ACC ALT, and modify, if necessary.

Ident.: PRO-NOR-SOP-16-A-00028300.0001001 / 14 NOV 24

Applicable to: ALL

FUEL PRED page.....CHECK | PF

L2 On the FUEL PRED page, check EFOB for destination, for the alternate and the extra fuel.

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Ident.: PRO-NOR-SOP-16-A-00020104.0001001 / 09 NOV 21
Applicable to: ALL

SEC F-PLN page.....AS RQRD | PF

[L2] *Before the top of descent, the SEC F-PLN should either be set to an alternate runway for destination, or to the landing runway in case of circling. In all cases, routing to the alternate should be available. If there is a last-minute runway change, then the flight crew only needs to activate the secondary F-PLN , without forgetting to check/set the new minimum and nav aids.*

Ident.: PRO-NOR-SOP-16-A-00023278.0001001 / 09 NOV 21
Applicable to: ALL

FMS PREPARATION.....CROSSCHECK | PM

[L2] *After the PF prepares the FMS, the PM checks all the data entered in the FMS. The PM should have the same mental image of the intended arrival and approach procedure, trajectory, and constraints than the PF. The PM should check with the PF if anything is not clear.*

For more information, *Refer to FCTM/PR-NP-SOP-160 Landing Performance.*

Ident.: PRO-NOR-SOP-16-A-00011554.0001001 / 05 MAY 22
Applicable to: ALL

GPWS LDG FLAP 3 pb-sw.....AS RQRD | PF

[L2] *If the flight crew plans on landing in FLAPS 3 configuration, the GPWS LDG FLAP 3 pb-sw should be set to ON.*

Ident.: PRO-NOR-SOP-16-A-00015490.0001001 / 09 NOV 21
Applicable to: ALL

LANDING ELEVATION

LDG ELEV CHECK | PF

[L2] *Check that the **LDG ELEV** **AUTO** is displayed on the CRUISE page, and check the associated value.*

Ident.: PRO-NOR-SOP-16-A-00011556.0001001 / 09 NOV 21
Applicable to: ALL

AUTOBRAKE

AUTO BRK.....AS RQRD | PF

Use of autobrake is preferable.

Use of MAX mode is not recommended at landing.

On short or contaminated runways, use MED mode.

On long runways, LO mode is recommended.

[L2] *For more information, Refer to FCTM/PR-NP-SOP-160 Brakes Oxidation.*

PROCEDURES

NORMAL PROCEDURES

STANDARD OPERATING PROCEDURES - DESCENT PREPARATION

[L1] Note: If, on very long runways, the flight crew anticipates that braking will not be needed, use of the autobrake is not necessary.

Firmly press the appropriate pushbutton, according to the runway length and condition, and check that the related ON light comes on.

Ident.: PRO-NOR-SOP-16-A-00011555.0001001 / 09 NOV 21

Applicable to: **ALL**

ARRIVAL BRIEFING

ARRIVAL BRIEFING.....PERFORM | BOTH

Ident.: TDU / PRO-NOR-SOP-16-A-00013353.0003001 / 09 NOV 21

Applicable to: **MSN 02155-03060**

Impacted DU: 00011545 Descent Preparation - Radar

RADAR

RADAR.....ADJUST AS APPROPRIATE | PF

Gain must be manually set to +4, when MULTISCAN sw is set to AUTO and when flying below FL 200.

- Note:
1. If the weather is good, or not significant, in order to check that the radar is operating correctly: Down tilt until displaying ground echoes
 2. If the weather display is ambiguous or unexpected, in order to better analyze the weather situation, use manual tilt according to standard technique
 3. In particular below FL 200, for situations with low-level weather, weather with low reflectivity or in front of suspected active cells, the flight crew should switch to Manual mode and adjust the tilt setting downward until the weather is detected or the ground clutter appears on the upper part of the display
 4. In addition, the flight crew may increase the manual gain control to display lower reflectivity targets. The manual gain control can be increased in both AUTO and Manual modes to display lower levels of weather. In both cases, ground clutter may also be displayed as a result of low settings and/or increased gain.

DESCENT PREPARATION - RADAR

Ident.: PRO-NOR-SOP-16-A-00011545.0001001 / 09 NOV 21

Applicable to: **MSN 02155-03060**

Impacted by TDU: 00013353 Descent Preparation - Radar

RADAR

RADAR.....ADJUST AS APPROPRIATE | PF

Ident.: PRO-NOR-SOP-16-A-00011545.0001001 / 09 NOV 21
 Applicable to: MSN 04392-07792

RADAR

RADAR.....ADJUST AS APPROPRIATE | PF

Ident.: PRO-NOR-SOP-16-A-00011558.0004001 / 13 MAY 25
 Applicable to: ALL

ANTI ICE

CAUTION In icing conditions (*Refer to LIM-ICE_RAIN Definition of Icing Conditions*), the flight crew must turn on the engine anti-ice and should not wait until seeing ice building up.

ENG 1 and 2 ANTI ICE pb-sw.....AS RQRD | PM

L2 *Engine anti-ice must be set to ON before and during descent, even if the SAT is below -40 °C (-40 °F).*

When ENG ANTI ICE is ON, the FADEC selects a higher idle thrust which gives better protection against flame-out.

L1 WING ANTI ICE pb-sw.....AS RQRD | PM

L2 *When icing conditions are encountered:*

- The flight crew may turn on the wing anti-ice to prevent ice accretion on the wing leading edge
- The flight crew must turn on the wing anti-ice if there is evidence of ice accretion, such as ice on the visual indicators, or on the wipers, or with the **SEVERE ICE DETECTED**  alert. This is to remove any ice accumulation from the wing leading edge.

ANTI ICE ON reduces the descent path angle (when the engines are at idle). The flight crew can compensate for this by increasing the descent speed, or by extending up to half speed brakes.

Ident.: PRO-NOR-SOP-16-A-00011557.0001001 / 09 NOV 21
 Applicable to: ALL

DESCENT CLEARANCE

DESCENT CLEARANCE.....OBTAIN | PM

CLEARED ALTITUDE ON FCU.....SET | PF

L2 *When the flight crew obtains the ATC clearance, they should set the cleared altitude (FL) on the FCU taking into account the safe altitudes.*

If the lowest safe altitude is above the cleared altitude, check with the ATC to determine if this constraint applies.

If the ATC confirms that this constraint applies, set the safe altitude on the FCU until it is safe to reach the cleared altitude.

PROCEDURES

NORMAL PROCEDURES

STANDARD OPERATING PROCEDURES - DESCENT PREPARATION

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DESCENT INITIATION

Ident.: PRO-NOR-SOP-17-00011541.0001001 / 09 NOV 21

Applicable to: ALL

DESCENT INITIATION

DESCENT..... INITIATE | PF

L2 The standard method to initiate the descent is to engage the **DES** mode at the T/D computed by the FMS.

L1 For more information on T/D and profile computation, *Refer to FCTM/PR-NP-SOP-170 Computation Principles.*

■ If ATC requires an early descent:

Use the **DES** mode.

The **DES** mode guides the aircraft down to a lower vertical speed, in order to converge with the required descent path (the flight crew may use a V/S of 1 000 ft/min).

■ If ATC delays the descent:

Beyond the T/D, the **T/D REACHED** or **DECELERATE** message appears on the PFD and MCDU. This suggests that the flight crew should reduce the speed toward Green Dot speed with ATC permission.

When cleared for descent, engage **DES** mode with the managed speed active.

DESCENT MONITORING

Ident.: PRO-NOR-SOP-17-00011542.0003001 / 12 NOV 24

Applicable to: ALL

DESCENT MONITORING

PF MCDU..... PROG/PERF DES | PF

L2 *PF MCDU should be set to PROG or PERF DES page:*

- *PROG page in order to get VDEV or RQD DIST TO LAND/DIRECT DIST TO DEST information*
- *PERF DES page in order to get predictions down to any inserted altitude in **DES/OP DES** modes and EXP mode .*

L1 PM MCDU..... F-PLN | PM

DESCENT..... MONITOR/ADJUST | PF

L2 *Refer to PRO-NOR-SRP-01-60 Descent Monitoring - DES Mode Engaged.*

PROCEDURES

NORMAL PROCEDURES

STANDARD OPERATING PROCEDURES - DESCENT

- When flying in **NAV** mode, use the **DES** mode
 - Monitor the VERT DEV
The VERT DEV appears on the PFD and on the PROG page.
 - Monitor the FMA when the aircraft reaches the level-off symbol (i.e.  or )

Note: The NDs display a level-off symbol  along the flight path. The position of this symbol is based on the current active modes: i.e. AP/FD and A/THR. MCDU predictions assume a return to the lateral F-PLN and descent flight path. When the lateral mode is changed from **NAV** to **HDG/TRK**, the vertical mode reverts to **V/S** or **FPA**. The V/S or FPA will be the current value at the time of mode reversion.

- Monitor the predicted descent point after the next level-off.
- From time to time during stabilized descent, the flight crew may select FPA to check that the remaining distance to destination is approximately the altitude change required divided by the FPA in degrees
- $FPA (^{\circ}) = \Delta FL / DIST (NM)$.

DESCENT ADJUSTMENT

Applicable to: ALL

Ident.: PRO-NOR-SOP-17-A-00011543.0001001 / 09 NOV 21

DESCENT ADJUSTMENT

RATE of DESCENT..... ADJUST, AS RQRD | PF

L2

To increase the rate of descent, increase the descent speed by using the selected speed, if comfort and the ATC permit. It is more cost-effective (Time/Fuel) than using the speed brakes:

- Maintain a high speed as long as possible, provided that the ATC permits to fly above the speed limits
- If the aircraft is high and at high speed, it is more efficient to keep the high speed until **ALT*** then to decelerate at level-off, instead of combining descent and deceleration
- If the aircraft goes below the desired profile, use the selected speed and the V/S mode to adjust the rate of descent.

In the **OP DES** mode, the flight crew can use the speed brakes to increase the rate of descent. The flight crew can also use the speed brakes to maintain the required rate of descent, when engine anti-ice is used.

In the **DES** mode, if the aircraft is on, or below the flight path and the ATC requires a higher rate of descent, do not use the speed brakes because the rate of descent is imposed by the planned

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES STANDARD OPERATING PROCEDURES - DESCENT
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flight path. Therefore, the A/THR may increase thrust to compensate for the increase in drag. In this case, use the **OP DES** mode with speed brakes.

Ident.: PRO-NOR-SOP-17-A-00011547.0001001 / 15 NOV 21

TERRAIN ON ND

TERR ON ND.....AS RQRD | PF-PM

- L2
- In mountainous areas, consider displaying terrain on ND
 - If use of radar is required, consider selecting the radar display on the PF side, and TERR ON ND on the PM side only
 - If NAV ACCURACY is LOW, do not use TERR ON ND.

Ident.: PRO-NOR-SOP-17-A-00011546.0001001 / 14 NOV 23

1

BAROMETRIC REFERENCE

- **When the aircraft approaches the transition level, and when cleared for an altitude:**
BAROMETRIC REFERENCE.....SET/CROSSCHECK | BOTH

- L2
- Set QNH on the EFIS control panel and on the standby altimeter
 - Crosscheck the barometric reference settings and the altitude indications.

L1

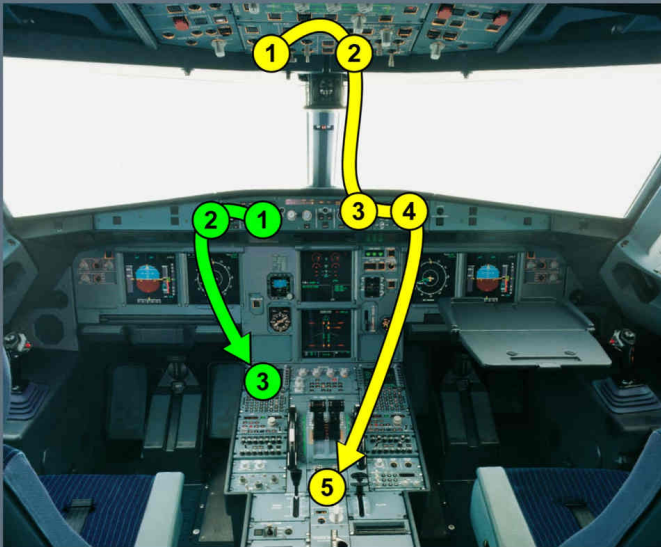
Note: The flight crew must take into account any QNH change on the EFIS control panels, standby altimeter and on the FMS PERF APPR page.
The flight crew should pay attention to a barometric reference that significantly differs from the one used for approach preparation. That could be the symptom of a barometric reference error. In this case the flight crew should consider the confirmation of the barometric reference from all available sources.

Ident.: PRO-NOR-SOP-17-A-00020073.0001001 / 12 NOV 24

AT 10 000 FT AAL FLOW PATTERN

→ PF Actions

→ PM Actions



- ① EFIS option pb.....CSTR
- ② LAND sw.....ON
- ③ SEAT BELT sw.....ON
- ④ EFIS option pb.....CSTR
- ⑤ ILS/LS pb.....AS RQRD

- ① LAND sw.....ON
- ② SEAT BELT sw.....ON
- ③ EFIS option pb.....CSTR
- ④ ILS/LS pb.....AS RQRD
- ⑤ ENG MODE selector.....AS RQRD

Ident.: PRO-NOR-SOP-17-A-00021715.0003001 / 24 NOV 23

AT 10 000 FT AAL

LAND sw.....ON | PM

L2 LAND lights may be switched ON, depending on the airline policy or regulatory recommendation.

L1 SEAT BELTS sw.....ON | PM

EFIS option pb.....CSTR | PF-PM

L2 Select CSTR on both sides.

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES STANDARD OPERATING PROCEDURES - DESCENT
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L1 LS pb.....AS RQRD | PF-PM

L2 Press the LS pb, if one of the following approaches is planned:

- ILS, GLS , MLS 
- ILS G/S out, LOC only or LOC B/C 
- Approach with the FLS function 
- Approach with the SLS function 

The flight crew checks that:

- Deviation scales are displayed on the PFD
- The IDENT is properly displayed on the PFD.

L1 NAVAIDS.....AS RQRD/CHECK | PF

L2 Ensure that appropriate NAVAIDS are tuned and identified.
For NDB approaches, manually select the reference NAVAID.

Ident.: PRO-NOR-SOP-17-A-00015500.0001001 / 09 NOV 21

ENG MODE selector.....AS RQRD | PM

L2 Select IGN if the runway is covered with standing water, or if heavy rain or severe turbulence is expected during approach or go-around area.

Ident.: PRO-NOR-SOP-17-A-00015501.0001001 / 24 NOV 23

● **If GPS PRIMARY LOST:**

NAVIGATION ACCURACY.....MONITOR | PF

L2 Check on FMS PROGRESS page that the required navigation accuracy is appropriate according to the flown airspace. For more information, Refer to PRO SPO 51 PBN.

APPROACH CHECKLIST

Ident.: PRO-NOR-SOP-17-00014491.0001001 / 18 NOV 24

Applicable to: ALL

APPROACH CHECKLIST

APPROACH C/L.....COMPLETE | BOTH

PROCEDURES

NORMAL PROCEDURES

STANDARD OPERATING PROCEDURES - DESCENT

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES STANDARD OPERATING PROCEDURES - APPROACH
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Approach General

INTRODUCTION

Ident.: PRO-NOR-SOP-18-A-00014490.0001001 / 12 MAY 22

Applicable to: ALL

The APPROACH section provides the standard operating procedures for the following approach types:

- ILS / MLS  / GLS  approaches
- Conventional approaches: VOR, VOR-DME, NDB, NDB-DME
- Approaches based on a LOC signal without any G/S signal: LOC ONLY, ILS G/S OUT, LOC B/C
- RNAV approaches including:
 - RNAV(GNSS) approaches with LNAV or LNAV/VNAV minima (with FLS )
 - RNAV(GNSS) approaches with LPV or LP minima (with SLS )
 - RNAV(RNP) approaches for which Authorization is Required (AR) - If capability installed.

Note: In relation to the names in the ICAO PBN Manual:

- "RNP APCH operations" corresponds to RNAV(GNSS) approaches
- "RNP AR APCH operations" corresponds to RNAV(RNP) approaches.

CROSS-REFERENCE TABLE

¹ Ident.: PRO-NOR-SOP-18-A-00014489.0010001 / 06 NOV 25

Applicable to: MSN 02155-02212, 04392-07792

This table provides Guidance Modes that may be used depending on the Approach Types.

	Guidance Modes per Approach Types				
	LOC G/S	FINAL APP	LOC FPA	NAV FPA	TRK FPA
ILS / MLS  / GLS 	<i>Refer to APPR using LOC G/S</i>	N/A	N/A	N/A	N/A
LOC ONLY ILS G/S OUT	N/A	N/A	<i>Refer to APPR using FPA Guidance</i>	N/A	N/A
LOC B/C	N/A	N/A	N/A	N/A	<i>Refer to APPR using FPA Guidance</i>
RNP or RNAV(GNSS) with LNAV/VNAV minima	N/A	<i>Refer to APPR using FINAL APP</i>	N/A	Not Authorized	Not Authorized

Continued on the following page

PROCEDURES

NORMAL PROCEDURES

STANDARD OPERATING PROCEDURES - APPROACH

Continued from the previous page

	Guidance Modes per Approach Types				
	LOC G/S	FINAL APP	LOC FPA	NAV FPA	TRK FPA
RNP or RNAV(GNSS) with LNAV minima	N/A	<i>Refer to APPR using FINAL APP⁽¹⁾</i>	N/A	<i>Refer to APPR using FPA Guidance</i>	Not Authorized
RNP or RNAV(GNSS) with LPV minima	N/A	Not Authorized	N/A	Not Authorized	Not Authorized
VOR VOR-DME NDB NDB-DME	N/A	<i>Refer to APPR using FINAL APP⁽¹⁾</i>	N/A	<i>Refer to APPR using FPA Guidance</i>	<i>Refer to APPR using FPA Guidance</i>
RNP(VPT)	N/A	<i>Refer to APPR using FINAL APP for RNP(VPT)</i>	N/A	Not Authorized	Not Authorized

⁽¹⁾ The FINAL APP is the recommended guidance mode for this type of approach.

For Visual Approach, *Refer to Visual Approach*

For Circling Approach, *Refer to Circling Approach*

Note: The names of the approach and departure charts evolve. For convenience purposes the Cross-Reference table provides both names.
 RNP is equivalent to RNAV(GNSS).

CROSS-REFERENCE TABLE

Ident.: PRO-NOR-SOP-18-A-00014489.0003001 / 06 NOV 25

Applicable to: MSN 02719-03060

2

This table provides Guidance Modes that may be used depending on the Approach Types.

	Guidance Modes per Approach Types				
	LOC G/S	FINAL APP	LOC FPA or LOC B/C FPA	NAV FPA	TRK FPA
ILS / MLS  / GLS 	<i>Refer to APPR using LOC G/S</i>	N/A	N/A	N/A	N/A
LOC ONLY ILS G/S OUT LOC B/C	N/A	N/A	<i>Refer to APPR using FPA Guidance</i>	N/A	N/A

Continued on the following page

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES STANDARD OPERATING PROCEDURES - APPROACH
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Continued from the previous page

	Guidance Modes per Approach Types				
	LOC G/S	FINAL APP	LOC FPA or LOC B/C FPA	NAV FPA	TRK FPA
RNP or RNAV(GNSS) with LNAV/VNAV minima	N/A	<i>Refer to APPR using FINAL APP</i>	N/A	Not Authorized	Not Authorized
RNP or RNAV(GNSS) with LNAV minima	N/A	<i>Refer to APPR using FINAL APP⁽¹⁾</i>	N/A	<i>Refer to APPR using FPA Guidance</i>	Not Authorized
RNP or RNAV(GNSS) with LPV minima	N/A	Not Authorized	N/A	Not Authorized	Not Authorized
VOR VOR-DME NDB NDB-DME	N/A	<i>Refer to APPR using FINAL APP⁽¹⁾</i>	N/A	<i>Refer to APPR using FPA Guidance</i>	<i>Refer to APPR using FPA Guidance</i>
RNP(VPT)	N/A	<i>Refer to APPR using FINAL APP for RNP(VPT)</i>	N/A	Not Authorized	Not Authorized

⁽¹⁾ The FINAL APP is the recommended guidance mode for this type of approach.

For Visual Approach, *Refer to Visual Approach*

For Circling Approach, *Refer to Circling Approach*

Note: The names of the approach and departure charts evolve. For convenience purposes the Cross-Reference table provides both names.
RNP is equivalent to RNAV(GNSS).

FLYING REFERENCE

Ident.: PRO-NOR-SOP-18-A-00014488.0001001 / 29 MAY 13

Applicable to: ALL

Use the following recommended flying reference:

- In vertical managed modes: HDG-V/S reference associated with the FD crossbars
- In vertical selected modes: TRK-FPA reference associated with FPD.

PROCEDURES**NORMAL PROCEDURES**

STANDARD OPERATING PROCEDURES - APPROACH

STABILIZATION CRITERIA

Ident.: PRO-NOR-SOP-18-A-00014487.0001001 / 09 FEB 18

Applicable to: MSN 02155-02789, 03031-07792

The stabilization height is defined as one of the following:

- 1 000 ft above airfield elevation (AAL) in Instrument Meteorological Conditions (IMC), or
- 500 ft above airfield elevation (AAL) in Visual Meteorological Conditions (VMC), or
- Any other height defined in Operator policies or regulations.

In order for the approach to be stabilized, all of the following conditions must be satisfied before, or at the stabilization height:

- The aircraft is on the correct lateral and vertical flight path
- The aircraft is in the desired landing configuration
- The thrust is stabilized, usually above idle, and the aircraft is at target speed for approach

Note: In IMC, a later speed and thrust stabilization can be acceptable provided that:

- It is in accordance with Operator policies and regulations
- The aircraft is in deceleration toward the target approach speed
- The flight crew stabilizes speed and thrust as soon as possible and not later than 500 ft AAL.

- The flight crew does not detect any excessive flight parameter deviation.

If one of the above-mentioned conditions is not satisfied, the flight crew must initiate a go-around, unless they estimate that only small corrections are required to recover stabilized approach conditions.

STABILIZATION CRITERIA

Ident.: PRO-NOR-SOP-18-A-00014487.0002001 / 09 FEB 18

Applicable to: MSN 02926-02944

The stabilization height is defined as one of the following:

- 1 000 ft above airfield elevation (AAL) in Instrument Meteorological Conditions (IMC), or
- 500 ft above airfield elevation (AAL) in Visual Meteorological Conditions (VMC), or
- Any other height defined in Operator policies or regulations.

In order for the approach to be stabilized, all of the following conditions must be satisfied before, or at the stabilization height:

- The aircraft is on the correct lateral and vertical flight path
- The aircraft is in the desired landing configuration

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES STANDARD OPERATING PROCEDURES - APPROACH
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- The thrust is stabilized, usually above idle, and the aircraft is at target speed for approach

Note: In IMC, a later speed and thrust stabilization can be acceptable provided that:

- It is in accordance with Operator policies and regulations
- The aircraft is in deceleration toward the target approach speed
- The flight crew stabilizes speed and thrust as soon as possible and not later than 500 ft AAL.

- The flight crew does not detect any excessive flight parameter deviation.

If one of the above-mentioned conditions is not satisfied, the flight crew must initiate a go-around, unless they estimate that only small corrections are required to recover stabilized approach conditions.

Note: If the predicted tailwind at landing is greater than 10 kt, decelerated approach is not permitted, and the aircraft speed should be stabilized at around VREF + 5 kt in final.

APPROACH SPEED TECHNIQUE

Ident.: PRO-NOR-SOP-18-A-00014485.0001001 / 24 NOV 23

Applicable to: ALL

DECELERATED APPROACH

The decelerated approach with FD or AP/FD guidance is the standard flying technique for ILS / MLS  / GLS  approaches and approaches using FLS , SLS  or FINAL APP guidance.

EARLY STABILIZED APPROACH

Under certain circumstances, the flight crew may decide to reduce the speed down to VAPP in the landing configuration by the FDP (approach via selected guidance, high glide path angle, low altitude intermediate approach, etc.). In order to obtain a valuable deceleration pseudo waypoint and to ensure a timely deceleration, the flight crew should enter VAPP as a speed constraint at the FDP.

DISCONTINUED APPROACH

Ident.: PRO-NOR-SOP-18-A-00015226.0001001 / 12 MAY 22

Applicable to: ALL

In order to discontinue an approach when the aircraft is at or above the altitude selected on the FCU, the flight crew can either:

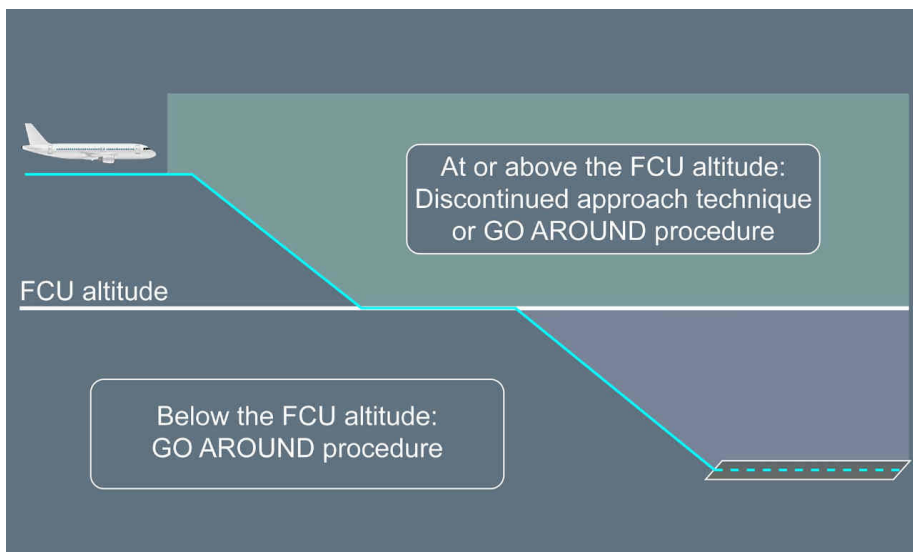
- Apply the GO AROUND procedure, or
- Apply the discontinued approach technique.

When the aircraft is below the FCU altitude, the flight crew must apply the GO AROUND procedure.

PROCEDURES

NORMAL PROCEDURES

STANDARD OPERATING PROCEDURES - APPROACH



- **If at or above the FCU altitude:**

Announce "CANCEL APPROACH".

To disarm any AP/FD approach mode, press APPR pb or LOC pb.

Note: Valid only for ILS / MLS  / GLS  / FLS  / SLS  or FINAL APP guidance.

Select lateral mode as required (NAV or HDG mode).

Select vertical mode as required (level off or adjust V/S).

Select SPEED and adjust.

- **If F-PLN has no destination anymore:**

Perform a LAT REV at the last waypoint and redefine the destination in the NEW DEST field.

- Note:
1. The FMS does not automatically string the previous flown approach in the active F-PLN when the aircraft overflies the last waypoint. The FMS has no more destination in the F-PLN.
 2. Because the thrust levers are not set to TOGA detent, the FMS remains in approach phase.

Aircraft Configuration Management

INITIAL APPROACH

Ident.: PRO-NOR-SOP-18-B-A-00014494.0001001 / 29 MAY 13
Applicable to: ALL

GENERAL

The initial approach procedure described here is a general guidance whatever the type of approach expected.

Ident.: PRO-NOR-SOP-18-B-A-00014493.0001001 / 09 NOV 21
Applicable to: ALL

INITIAL APPROACH

- F-PLN SEQUENCING.....ADJUST

PF

L2

-

A good clue to monitor the proper F-PLN sequencing is the TO waypoint on the upper right side of the ND, which should remain meaningful

-

In NAV mode, the F-PLN will sequence automatically

-

In HDG or TRK mode, the F-PLN will sequence automatically only if the aircraft flies close to the F-PLN route.
- L1

APPROACH PHASE.....CHECK/ACTIVATE

BOTH

L2

-

If the aircraft overflies the DECEL pseudo waypoint in NAV mode, the APPR phase activates automatically

-

If the aircraft is in HDG or TRK mode, approximately 15 NM from touchdown, activate and confirm APPR phase on the PERF DES page.
- L1

MANAGED SPEED.....CHECK

PF

L2

If ATC requires a particular speed, use selected speed. When the ATC speed constraint no longer applies, return to managed speed.
- L1

FLIGHT PATH.....MONITOR

PF

L2

-

In NAV mode, use V/DEV information on the PFD and PROG page

-

In HDG or TRK mode, use the energy circle on ND representing the required distance to land.

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES STANDARD OPERATING PROCEDURES - APPROACH
---	--

L1

SPEED BRAKES lever.....AS RQRD

|

PF

- L2

- If the flight crew uses the speed brakes to increase the rate of deceleration or to increase the rate of descent, the VLS will increase as well:

 - The flight crew should ensure that appropriate speed margin exists before the extension of the speed brakes
 - If the speed brakes are extended, the flight crew should ensure that appropriate speed margin exists before the beginning of a turn.

This will avoid the activation of the Alpha-Floor protection.

Note: In clean configuration, the VLS with speed brakes fully extended may be more than Green Dot speed or VFE FLAP 1.

Ident.: TDU / PRO-NOR-SOP-18-B-A-00014648.0003001 / 09 NOV 21

Applicable to: MSN 02155-03060

Impacted DU: 00014647 Initial Approach - Radar

RADAR

RADAR.....ADJUST AS APPROPRIATE

|

PF

L2

- Gain must be manually set to +4 when MULTISCAN selector is set to AUTO and when flying below FL 200

- If the weather is good, or not significant, in order to check that the radar is operating correctly: down tilt under displaying ground echoes

- If the weather display is ambiguous or unexpected, in order to better analyze the weather situation, use manual tilt according to standard technique

- In particular below FL 200, for situations with low level weather, weather with low reflectivity or in front of suspected active cells, the flight crew should switch to manual mode and adjust the tilt setting downward until the weather is detected or the ground clutter appears on the upper part of the display

- In addition, the flight crew may increase the manual gain control to display lower reflectivity targets. The manual gain control can be increased in both AUTO and manual modes to display lower levels of weather. In both cases, ground clutter may also be displayed as a result of low settings and/or increased gain.

INITIAL APPROACH - RADAR

Ident.: PRO-NOR-SOP-18-B-A-00014647.0001001 / 09 NOV 21

Applicable to: MSN 02155-03060

Impacted by TDU: 00014648 Initial Approach - Radar

RADAR

RADAR.....ADJUST AS APPROPRIATE

|

PF

Ident.: PRO-NOR-SOP-18-B-A-00014647.0001001 / 09 NOV 21
 Applicable to: MSN 04392-07792

RADAR

RADAR.....ADJUST AS APPROPRIATE | PF

Ident.: PRO-NOR-SOP-18-B-A-00014492.0001001 / 24 NOV 23
 Applicable to: ALL

NAVIGATION ACCURACY

● If **GPS PRIMARY LOST**:
 NAVIGATION ACCURACY..... MONITOR | PM

L2 *Check on FMS PROGRESS page that the required navigation accuracy is appropriate according to the flown airspace. For more information, Refer to PRO SPO 51 PBN.*

INTERMEDIATE/FINAL APPROACH

Ident.: PRO-NOR-SOP-18-B-B-00014501.0001001 / 29 MAY 13
 Applicable to: ALL

GENERAL

The intermediate and final approach procedure described here is general guidance whatever the type of approach expected.

Ident.: PRO-NOR-SOP-18-B-B-00014500.0001001 / 09 NOV 21
 Applicable to: ALL

AT GREEN DOT SPEED

CAUTION

The flight crew should avoid extended flight in icing conditions with the slats extended.

FLAPS 1..... ORDER | PF
 FLAPS 1.....SELECT | PM

L2 - *FLAPS 1 should be selected more than 3 NM before the Final Descent Point*
 - *Check the aircraft deceleration toward S speed*
 - *For decelerated approaches, the aircraft must reach or be established on the final descent with FLAPS 1 and S speed at or above 2 000 ft AGL*
 - *If the aircraft does not decelerate on the flight path or aircraft speed is significantly higher than S speed, extend the landing gear in order to slow down. The use of speed brakes is possible. However, the flight crew should be aware that the use of speed brakes causes an increase in VLS.*

- L1

L2

TCAS Mode selector.....TA or TA/RA

 - *FAA recommends to select TA only mode:*
 - *In the case of known nearby traffic which is in visual contact*
 - *At particular airports and during particular procedures identified by an Operator as having a significant potential for unwanted or inappropriate resolution advisories (e.g. closely-spaced parallel runways, converging runway, low terrain along the final approach, etc.).*

PM

PM

Ident.: PRO-NOR-SOP-18-B-B-00014499.0001001 / 09 NOV 21
 Applicable to: ALL

AT 2 000 FT AGL MINIMUM

- L2

FLAPS 2..... ORDER

FLAPS 2.....SELECT

 - *Check the aircraft deceleration toward F speed*
 - *For ILS, MLS , GLS , SLS , FLS , if the aircraft intercepts the flight path below 2 000 ft AGL, select FLAPS 2 at one dot below the flight path*
 - *If the aircraft speed is significantly higher than F speed on the flight path, or the aircraft does not decelerate on the flight path, extend the landing gear in order to slow down the aircraft. The use of speed brakes is not recommended*
 - *When the speed brakes are deployed, extending the flaps beyond FLAPS 1 may induce a slight roll movement, and in calm conditions a small lateral control asymmetry may remain until disturbed by a control input or by an atmospheric disturbance.*

PF

PM

Ident.: PRO-NOR-SOP-18-B-B-00014498.0001001 / 24 NOV 23
 Applicable to: ALL

WHEN FLAPS ARE AT 2

- L2

L1

L/G DOWN ORDER

L/G lever.....SELECT DOWN

AUTO BRK CONFIRM

If the runway conditions have changed from the arrival briefing, consider another braking mode.

GROUND SPOILERSARM

PF

PM

PM

PM

EXTERIOR LIGHTS

- NOSE sw..... T.O

RWY TURN OFF sw..... ON

PM

PM

WHEN LANDING GEAR IS DOWN		
	FLAPS 3.....ORDER	PF
	FLAPS 3.....SELECT	PM
	ECAM <u>WHEEL</u> SD page CHECK	PM
L2	Check for three green indications on the landing gear indicator panel. At least one green triangle on each landing gear strut on the <u>WHEEL</u> SD page is sufficient to indicate that the landing gear is downlocked. Rely also on the LDG GEAR DN LDG MEMO message to confirm that the landing gear is downlocked.	
L1	● If residual pressure is indicated on the triple indicator: RESIDUAL BRAKING PROC.....APPLY	PF
	FLAPS FULL.....ORDER	PF
	FLAPS FULL.....SELECT	PM
L2	- Retract the speed brakes before selecting FLAPS FULL to prevent a pitch down when the speed brakes automatically retract - Check that the aircraft decelerates to VAPP - Check correct TO waypoint on the ND.	
L1	A/THR.....CHECK IN SPEED MODE OR OFF	PM
	WING ANTI ICE pb-sw.....OFF	PM
L2	Switch the WING ANTI ICE pb-sw to ON, only in severe icing conditions.	
L1	SLIDING TABLE.....STOW	PF-PM
	ALL EFB (with no mounted equipment).....STOW	PF-PM
	LDG MEMO.....CHECK NO BLUE	PM
	CABIN REPORT.....RECEIVE	PF-PM
L2	Check CABIN READY  in the EWD, or obtain the cabin report from the purser.	
L1	LANDING C/L.....COMPLETE	BOTH
	CABIN CREW.....ADVISE	PM
L2	Advise the cabin crew that landing is imminent.	

- L1

L2

FLIGHT PARAMETERS.....MONITOR

 - The PF announces any FMA modification
 - The PM calls out, if:
 - The speed goes lower than the speed target -5 kt , or more than the speed target +10 kt
 - The pitch attitude goes lower than -2.5 °, or more than +10 ° nose up
 - The bank angle becomes more than 7 °
 - The descent rate becomes more than 1 000 ft/min.
 - Following PM flight parameter exceedance callout, the suitable PF response will be:
 - Acknowledge the PM callout, for proper crew coordination purposes
 - Take immediate corrective action to control the exceeded parameter back into the defined stabilized conditions
 - Assess whether stabilized conditions will be recovered early enough prior to landing, otherwise initiate a go-around.

PM

Ident.: PRO-NOR-SOP-18-B-B-00014497.0002001 / 18 NOV 24
 Applicable to: MSN 02719-07792

WHEN LANDING GEAR IS DOWN

- | | | |
|--|--------------------------------------|----|
| | FLAPS 3.....ORDER | PF |
| | FLAPS 3.....SELECT | PM |
| | ECAM <u>WHEEL</u> SD page .....CHECK | PM |
- L2

Check for three green indications on the landing gear indicator panel. At least one green triangle on each landing gear strut on the WHEEL SD page is sufficient to indicate that the landing gear is downlocked. Rely also on the LDG GEAR DN LDG MEMO message to confirm that the landing gear is downlocked.

L1

● **If residual pressure is indicated on the triple indicator:**

RESIDUAL BRAKING PROC.....APPLY

PF

L2

Due to the accomplishment of the alternate braking functional test after the landing gear is downlocked, brief brake pressure indications may be observed on BRAKES PRESS.

L1	FLAPS FULL.....ORDER FLAPS FULL.....SELECT	PF PM
--	---	---

L2

- Retract the speed brakes before selecting FLAPS FULL to prevent a pitch down when the speed brakes automatically retract
 - Check that the aircraft decelerates to VAPP
 - Check correct TO waypoint on the ND.

L1	A/THR.....CHECK IN SPEED MODE OR OFF WING ANTI ICE pb-sw.....OFF	PM PM
--	---	---

L2

Switch the WING ANTI ICE pb-sw to ON, only in severe icing conditions.
- | | |
|-------------------------------|------------------------|
| PIA A318/A319/A320/A321 FLEET | PRO-NOR-SOP-18-B P 6/8 |
| FCOM | 20 AUG 25 |

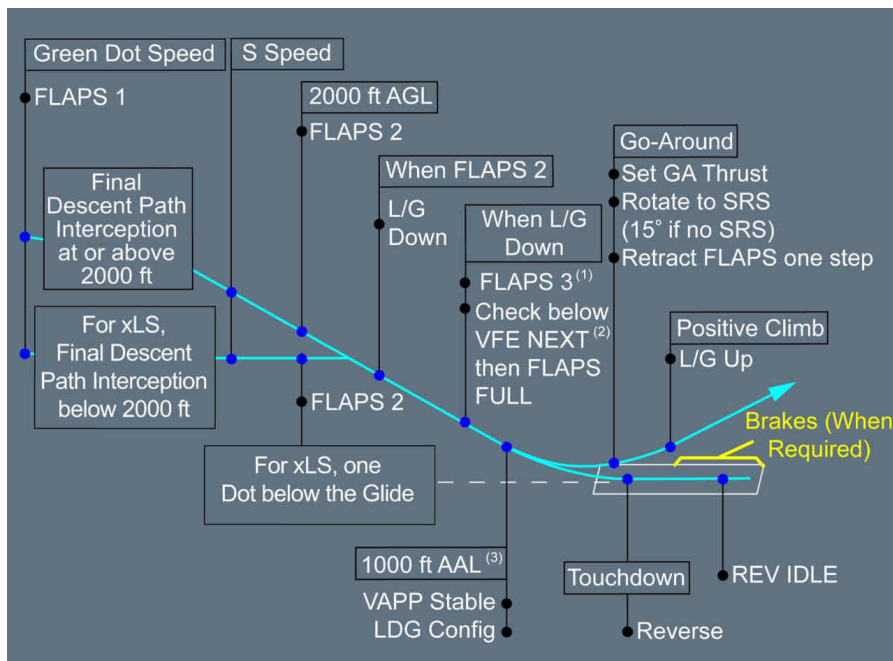
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 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES STANDARD OPERATING PROCEDURES - APPROACH
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L1	SLIDING TABLE.....	STOW	PF-PM
	ALL EFB (with no mounted equipment).....	STOW	PF-PM
	LDG MEMO.....	CHECK NO BLUE	PM
	CABIN REPORT.....	RECEIVE	PF-PM
L2	Check CABIN READY  in the EWD, or obtain the cabin report from the purser.		
L1	LANDING C/L.....	COMPLETE	BOTH
	CABIN CREW.....	ADVISE	PM
L2	Advise the cabin crew that landing is imminent.		
L1	FLIGHT PARAMETERS.....	MONITOR	PM
L2	- The PF announces any FMA modification - The PM calls out, if: • The speed goes lower than the speed target -5 kt , or more than the speed target +10 kt • The pitch attitude goes lower than -2.5 ° , or more than +10 ° nose up • The bank angle becomes more than 7 ° • The descent rate becomes more than 1 000 ft/min. - Following PM flight parameter exceedance callout, the suitable PF response will be: • Acknowledge the PM callout, for proper crew coordination purposes • Take immediate corrective action to control the exceeded parameter back into the defined stabilized conditions • Assess whether stabilized conditions will be recovered early enough prior to landing, otherwise initiate a go-around.		

Ident.: PRO-NOR-SOP-18-B-B-00014495.0001001 / 12 NOV 24

Applicable to: ALL

PATTERN (DECELERATED)


Note: This approach assumes the uses of managed speed.

If not, select speed manually:

S after FLAPS 1 selection

F after FLAPS 2 selection

VAPP after LDG FLAPS selection.

Note: If earlier stabilization at VAPP is required, start deceleration at higher altitude.

- Note:
1. The change in FLAPS setting is almost continuous and takes into account the extension time of the surfaces. However, the flight crew must consider VFE NEXT that appears on the PFD in some cases (e.g. heavy aircraft).
 2. To minimize FLAPS wear, extend FLAPS at VFE -15 kt when possible.
 3. 1 000 ft AAL minimum IMC, 500 ft AAL minimum VMC, or in accordance with the airline policy and regulations.

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Aircraft Guidance Management

APPROACH USING LOC G/S GUIDANCE

Applicable to: ALL

Ident.: PRO-NOR-SOP-18-C-A-00014508.0001001 / 12 MAY 22

GENERAL

The following items are to be performed in addition to previous SOP chapters for approach flown with ILS / MLS  / GLS  / SLS .

Ident.: PRO-NOR-SOP-18-C-A-00020896.0001001 / 09 NOV 21

DESCENT PREPARATION

APPROACH MINIMUM.....DETERMINE | PF

- L2 - For CAT II, CAT III approaches, always choose the lowest achievable minimum. The approach minimum is limited by:
 - Crew qualification
 - Airline Operating Manual requirement
 - Aircraft technical status
 - Airport status
- For CAT III with no DH, the flight crew should enter NO in the DH field of the MCDU to avoid false "HUNDRED ABOVE" or "MINIMUM" auto callouts which would not be applicable.

L1 ARRIVAL BRIEFING.....PERFORM | BOTH

- L2 For CAT II, CAT III approaches, review the following items on top of the usual briefing:
 - Task sharing and callouts
 - Management of degraded guidance
 - Low visibility procedures at the airport.

INITIAL/INTERMEDIATE APPROACH

APPR pb on FCU.....PRESS

PF

- L2
- Press the APPR pb when:
- Cleared for the approach
 - On the intercept trajectory for the final approach course
 - LOC deviation is available.

This arms the **LOC** and **G/S** modes

- LOC and/or G/S capture modes will engage no sooner than 3 s after being armed.

L1

Note: In **NAV** mode, the aircraft may leave the F-PLN to capture the LOC.

L3

ICAO defines the envelope where the quality of the G/S signal ensures a normal capture. This envelope is within 10 NM, $\pm 8^\circ$ of the centerline of the ILS glide path and up to 1.75θ and down to 0.3θ (θ = nominal glide path angle). When arming the approach well outside of the normal G/S capture envelope, a spurious **G/S*** engagement may occur due to a wrong G/S deviation signal. Whenever the flight crew notices the pitch movement, or the spurious **G/S***, or the trajectory deviation, the flight crew will immediately disconnect the AP, if engaged, to re-establish a normal attitude and will disengage APPR mode. It is then recommended to arm/rearm APPR (ILS) mode within the normal capture zone.

L1

BOTH APs.....ENGAGE

PF

- L2
- When APPR mode is selected, AP1 and AP2 should be engaged
 - Above 5 000 ft AGL, the FMA displays **CAT 1** or **APPR1** for approach with SLS 
 - Below 5 000 ft AGL, the FMA displays the correct approach capability for the intended approach.

L1

LOC.....	CHECK ARMED	PF
G/S.....	CHECK ARMED	PF
LOC CAPTURE.....	MONITOR	PF
G/S CAPTURE.....	MONITOR	PF
GO-AROUND ALTITUDE.....	SET	BOTH

GLIDE INTERCEPTION FROM ABOVE

The following procedure must only be applied when established on the localizer. The flight crew must react without delay to meet the stabilization criteria.

In order to get the best rate of descent when cleared by ATC and below the limiting speeds, the flight crew should lower the landing gear and select flaps as required (at least CONF 2 should be selected to ensure that the aircraft speed will not increase).

- **If above the glideslope:**

APPR MODE	ARM / CHECK ARMED		PF
LOC.....	CHECK ENGAGED		PF
FCU ALTITUDE.....	SET ABOVE A/C ALTITUDE		PF
V/S MODE.....	SELECT		PF

- L2

 - Select V/S 1 500 ft/min initially. V/S in excess of 2 000 ft/min will result in the speed increasing towards VFE
 - When reaching VFE, the AP maintains VFE and reduces the V/S without mode reversion.

Ident.: PRO-NOR-SOP-18-C-A-00014511.0002001 / 06 NOV 25

1 FINAL APPROACH

FLIGHT PARAMETERS.....	MONITOR		PM
------------------------	---------	--	----

- L2

The PM calls out if excessive deviation occurs:
 - LOC: ½ dot
 - G/S: ½ dot.

For additional information on the associated standard callouts, Refer to PRO-NOR-SCO Approach.

- L1

AT 350 ft RA

LAND mode.....	CHECK ENGAGED/ANNOUNCE		PF
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- L2

*If no **LAND** mode, autoland is not authorized.*

L1

FOR CAT I, CAT II, CAT III WITH DH APPROACH

- L2

***Note:** LPV approaches (with SLS ) are considered as approach with CAT 1 minima.*

- L1

AT ENTERED MINIMUM +100 ft

ONE HUNDRED ABOVE.....	MONITOR OR ANNOUNCE		PM
------------------------	---------------------	--	----

AT ENTERED MINIMUM

MINIMUM.....	MONITOR OR ANNOUNCE		PM
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Below minimum, the visual references must be the primary reference until landing.
 For more information regarding transition to visual references, *Refer to FCTM/PR-NP-SOP-250 Transition to Visual References.*

- **If visual references are sufficient:**

CONTINUE.....	ANNOUNCE		PF
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PROCEDURES

NORMAL PROCEDURES

STANDARD OPERATING PROCEDURES - APPROACH

AP AS RQRD | PF

For Minimum Use Height of the AP, Refer to LIM-AFS-10 Autopilot Function.

For Manual Landing and Autoland procedure, Refer to PRO-NOR-SOP-19 Landing - Flare.

Note: In the case of **CAT 1** or **APPR1** (SLS ) approach capability displayed on FMA, at 150 ft AGL, if the AP is still engaged, the message **DISCONNECT AP FOR LDG** pulses on the FMA to remind the flight crew that automatic landing is not available.

■ **If visual references are not sufficient:**

GO-AROUND ANNOUNCE | PF

Initiate a go-around.

FOR CAT III WITHOUT DH APPROACH

At 100 ft (Alert Height) if no failure

CONTINUE ANNOUNCE | PF

Ident.: PRO-NOR-SOP-18-C-A-00021062.0002001 / 03 NOV 22

MANAGEMENT OF DEGRADED GUIDANCE

EARLY/UNTIMELY FLARE MODE ENGAGEMENT

- Perform a go-around (thrust levers set to TOGA), or
- Disconnect AP, set both FDs to OFF and continue the approach using raw data or external visual references.

In association to an early/untimely **FLARE** mode engagement on the FMA, the following effects may occur:

- On the PFD:
 - The RA height indication may be frozen at a positive or negative value
 - Discrepancies between both PFDs may happen on the following indications:
 - RA heights
 - FD orders
 - FMA indications when both APs are engaged.
- Warnings and/or Callouts:
 - Untimely activation of the **AUTOLAND** warning (*Refer to DSC-22_30-80-10 Autoland Warning Light*)
 - Untimely TAWS alerts
 - Untimely or absence of "RETARD" callout
 - Untimely **L/G GEAR NOT DOWN** alert
 - Absence or interruption of RA automatic callout (height announcement).
- On the SD: A pulsing cabin differential pressure advisory may appear on the CAB PRESS SD page.

Note: *This ECAM advisory has no consequence on the real cabin pressure.*

FOR CAT II, CAT III APPROACHES:

- **Apply the following strategy in the case of:**
 - Amber caution (single chime), or
 - Landing capability degradation below the approach category defined during the briefing.

● Above 1 000 ft AGL:	
ECAM/QRH PROCEDURE.....	COMPLETE
APPROACH AND LANDING CAPABILITY.....	CHECK
REQUIRED EQUIPMENT.....	CHECK
	BOTH BOTH PM

L2

For more information, Refer to QRH/OPS Required Equipment for CAT2 and CAT3.

L1

- **If required:**

RVR.....	CHECK	PM
DH.....	ADJUST	PM
ARRIVAL BRIEFING.....	UPDATE	BOTH
- **If the flight crew does not complete all the above actions at 1 000 ft:**

GO-AROUND.....	PERFORM	PF
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PROCEDURES

NORMAL PROCEDURES

STANDARD OPERATING PROCEDURES - APPROACH

- Below 1 000 ft **AGL**:

- If external visual references are not sufficient:

GO-AROUND..... PERFORM | PF

- Below 100 ft (Alert Height) for **CAT3 DUAL**:

The automatic approach may be continued unless the **AUTOLAND** warning is triggered.

- In the case of **AUTOLAND** warning:

- If visual references are not sufficient:

GO-AROUND..... PERFORM | PF

- If visual references are sufficient:

The approach may be continued manually.

APPROACH USING FINAL APP GUIDANCE

Ident.: PRO-NOR-SOP-18-C-C-00014521.0002001 / 29 MAY 13

Applicable to: ALL

GENERAL

The following items are to be performed in addition to previous SOP chapters in the following cases:

- RNAV(GNSS) approaches with LNAV and LNAV/VNAV minima
- Conventional approaches based on VOR or NDB using FINAL APP guidance.

Ident.: PRO-NOR-SOP-18-C-C-00014522.0003001 / 09 SEP 14

Applicable to: ALL

AIRCRAFT EQUIPMENT

For RNAV(GNSS) approaches, *Refer to PRO-SPO-51 RNP APCH / RNAV(GNSS) - Required RNP APCH Equipment*

Ident.: PRO-NOR-SOP-18-C-C-00015860.0001001 / 09 SEP 14

Applicable to: ALL

FLIGHT PREPARATION

For RNAV(GNSS) approaches, GPS PRIMARY availability should be confirmed.

Refer to PRO-NOR-SOP-02 GPS PRIMARY Availability (If Installed)

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Ident.: PRO-NOR-SOP-18-C-C-00014524.0002001 / 14 NOV 24

Applicable to: ALL

DESCENT PREPARATION

- WEATHER AND LANDING INFORMATION.....OBTAIN | PM
- L2** - The FMS vertical profile does not take into account the effect of low OAT. Therefore, vertical managed guidance:
- Must not be used when the actual OAT is below the minimum temperature indicated on the approach chart or defined by the Operator, or
 - May not be used when temperature corrections are required (**FINAL APP** mode may not engage)
- For RNAV (GNSS) approach with LNAV VNAV minima, use of QNH from a remote station is prohibited.
- L1** F-PLN A page..... CHECK | PF-PM
- L2** - If a **TOO STEEP PATH** is displayed after the FDP, do not use FINAL APP guidance for approach. Use **NAV FPA**, **TRK FPA** or **FLS**  for approach
- 0.1 degree of difference between the MCDU and the charted final vertical path is acceptable
 - 1 degree of difference between the MCDU and the charted final lateral track is acceptable.
- Note: A higher lateral track value can be acceptable if the navigation database has been validated to exclude potential coding error
- 3 degree of difference between the MCDU and the charted final lateral track is acceptable for conventional radio NAVAID approach.
- L1** GO-AROUND STRATEGY..... REVIEW | PF
- L2** The briefing should include a review of the "Management of Degraded Navigation" chapter.

Ident.: PRO-NOR-SOP-18-C-C-00014525.0003001 / 18 NOV 24

Applicable to: ALL

DESCENT

- At 10 000 ft AAL:**
- NAV ACCURACY.....CHECK | PF
- L2** If NAV accuracy is **LOW**, use **TRK FPA** mode for approach (Refer to APPR using FPA guidance).
- L1** ● For RNAV(GNSS) approach:
- GPS PRIMARY.....CHECK | PF
- L2** **GPS PRIMARY** must be available on at least one FMS.

PROCEDURES

NORMAL PROCEDURES

STANDARD OPERATING PROCEDURES - APPROACH

- L1** BAROMETRIC REFERENCE.....SET/CROSSCHECK | BOTH
- L2** *The vertical guidance requires a precise BARO setting. The maximum acceptable difference between altimeters is 100 ft.*

Ident.: PRO-NOR-SOP-18-C-C-00014526.0002001 / 24 NOV 23

Applicable to: ALL

INITIAL/INTERMEDIATE/FINAL APPROACH

- POSITION..... MONITOR | PF
- L2** *Check that ATC clearances enable the aircraft to fly through the capture area of the vertical profile. After a radar vectoring, consider a DIR TO RDL IN to sequence the F-PLN.*
- L1** APPR pb on FCU.....PRESS | PF
- L2** *Press the APPR pb when all of the following conditions are satisfied:*
- *The aircraft is cleared for approach*
 - *TO waypoint is the FDP.*
- L1** APP NAV.....CHECK ARMED or ENGAGED | PF
- FINAL**.....CHECK ARMED | PF
- L2** - *Check that the V/DEV scale is displayed on the PFD.*
- *At the FDP, a blue arrow on ND indicates that **FINAL APP** engagement conditions are satisfied.*

L1 At the Final Descent Point:

- FINAL APP**.....CHECK ENGAGED | PF
- GO-AROUND ALTITUDE.....SET | BOTH
- FLIGHT PARAMETERS.....MONITOR | PM
- L2** - *Monitor XTK error on ND*
- *Monitor V/DEV on PFD*
- *Check altitude crossing at FAF and waypoints of the final approach, as published on the chart*
- *If approaching on a conventional radio NAVAID procedure, monitor the lateral and vertical guidance using raw data*
- *The PM calls out if excessive deviation occurs:*
- *XTK > 0.1 NM*
 - *V/DEV > ½ dot*
- On the vertical scale, one dot corresponds to 100 ft. Therefore ½ dot is 50 ft.*
- For additional information on the associated standard callouts, Refer to PRO-NOR-SCO Flight Parameters in Approach.*

Ident.: PRO-NOR-SOP-18-C-C-00015015.0001001 / 09 NOV 21

Applicable to: ALL

AT ENTERED MINIMUM +100 FT

ONE HUNDRED ABOVE.....MONITOR OR ANNOUNCE | PM

APPROACH USING FINAL APP GUIDANCE - AT ENTERED MINIMUM

Ident.: PRO-NOR-SOP-18-C-C-00014527.0012001 / 06 NOV 25

Applicable to: MSN 02155-03060, 05152-07792

2 AT ENTERED MINIMUM

MINIMUM.....MONITOR OR ANNOUNCE | PM

L2 *Below minimum, the visual references must be the primary references until landing.*
For more information regarding transition to visual references, Refer to FCTM/PR-NP-SOP-250 Transition to Visual References.

L1 **■ If visual references are sufficient:**

CONTINUE..... ANNOUNCE | PF

At the latest at the MAP or Minimum Use Height of the AP (whichever occurs first):

AP..... OFF | PF

- L2**

 - For Minimum Use Height of the AP, Refer to LIM-AFS-10 Autopilot Function
 - At 150 ft AGL, if the AP is still engaged, the message **DISCONNECT AP FOR LDG** pulses on the FMA to remind the flight crew that automatic landing is not available.

L1 FD..... AS RQRD | PM

L2 *If needed, the PF orders the PM to set both FDs off.*

L1

CAUTION

- From minima down to the MAP, the FD provides an additional guidance.
- The FD must be switched off if the guidance is not relevant or not followed
- After the MAP, disregard the FD as it reverts to HDG V/S.

■ If visual references are not sufficient:

GO-AROUND.....ANNOUNCE | PF

L2 *Initiate a go-around.*

Ident.: PRO-NOR-SOP-18-C-C-00014527.0011001 / 06 NOV 25

Applicable to: MSN 04392

3 AT ENTERED MINIMUM

MINIMUM.....MONITOR OR ANNOUNCE | PM

L2 *Below minimum, the visual references must be the primary references until landing.*

PROCEDURES

NORMAL PROCEDURES

STANDARD OPERATING PROCEDURES - APPROACH

For more information regarding transition to visual references, Refer to FCTM/PR-NP-SOP-250 Transition to Visual References.

L1

■ If visual references are sufficient:

CONTINUE..... ANNOUNCE | PF

At the latest at the MAP or Minimum Use Height of the AP (whichever occurs first):

AP.....OFF | PF

L2

- For Minimum Use Height of the AP, Refer to LIM-AFS-10 Autopilot Function
- The AP will automatically disengage at the MAP
- At 150 ft AGL, if the AP is still engaged, the message **DISCONNECT AP FOR LDG** pulses on the FMA to remind the flight crew that automatic landing is not available.

L1

FD..... AS RQRD | PM

L2

If needed, the PF orders the PM to set both FDs off.

L1

CAUTION

- From minima down to the MAP, the FD provides an additional guidance. The FD must be switched off if the guidance is not relevant or not followed
- After the MAP, disregard the FD as it reverts to HDG V/S.

■ If visual references are not sufficient:

GO-AROUND..... ANNOUNCE | PF

L2

Initiate a go-around.

Ident.: PRO-NOR-SOP-18-C-C-00014528.0002001 / 03 NOV 21

Applicable to: ALL

MANAGEMENT OF DEGRADED NAVIGATION

● For VOR and NDB approaches, be prepared to continue the approach with reference to appropriate raw data by reverting to:

- **NAV-FPA**, if the vertical guidance is not satisfactory
- **TRK-FPA**, if the lateral guidance is not satisfactory.

● For RNAV(GNSS) approaches with LNAV minima:

- Use the appropriate remaining AP/FD in the following cases:
 - **GPS PRIMARY LOST** on one ND
 - **NAV ACCUR DOWNGRAD** on one ND.
- Discontinue the approach in the following cases, if external visual references are not sufficient to proceed visually:
 - **GPS PRIMARY LOST** on both NDs
 - **XTK > 0.3 NM**
 - **NAV FM/GPS POS DISAGREE**
 - **NAV ACCUR DOWNGRAD** on both NDs.
- Be prepared to continue the approach by reverting to **NAV-FPA**, if the vertical guidance is not satisfactory.

● For RNAV(GNSS) approaches with LNAV/VNAV minima:

- Use the appropriate remaining AP/FD in the following cases:
 - **GPS PRIMARY LOST** on one ND
 - **NAV ACCUR DOWNGRAD** on one ND.
- Discontinue the approach in the following cases, if external visual references are not sufficient to proceed visually:
 - **GPS PRIMARY LOST** on both NDs
 - **XTK > 0.3 NM**
 - **NAV FM/GPS POS DISAGREE**
 - **NAV ACCUR DOWNGRAD** on both NDs.
- Discontinue the approach in the case of deviation of 75 ft below the vertical path (V/DEV > ¾ dot).

APPROACH USING FINAL APP GUIDANCE FOR RNP(VPT)

⁴Ident.: PRO-NOR-SOP-18-C-I-00029180.0002001 / 06 NOV 25

Applicable to: ALL

GENERAL

RNP(VPT) are instrument flight procedures composed of an instrument path followed by a visual path defined by waypoints.

On the visual path, the aircraft navigates using the RNAV system, but the position is monitored by visual references to the ground, obstacle and other traffic.

PROCEDURES**NORMAL PROCEDURES****STANDARD OPERATING PROCEDURES - APPROACH**

RNP(VPT) approach must be stored and retrievable from the Navigation Database.

In addition, the following items are to be performed in the case of RNP(VPT) approaches using FINAL APP.

The procedures of the paragraph below are generic guidelines for RNP(VPT) approaches. These procedures may be tailored by the airline for specific airfields according to their OPS approval.

5 Ident.: PRO-NOR-SOP-18-C-I-00029181.0002001 / 06 NOV 25

Applicable to: ALL

AIRCRAFT EQUIPMENT

- One FMGC
- Two IRS
- One MCDU
- One FD
- One PFD on the PF side
- Two NDs (the temporary display of ND information via the PFD/ND switch is permitted on PM side)
- Two FCU channels
- 1 GPS or 1 DME receiver to update FM position

Additional requirement if indicated on the approach chart.

6 Ident.: PRO-NOR-SOP-18-C-I-00029182.0002001 / 06 NOV 25

Applicable to: ALL

FLIGHT PREPARATION

For RNP(VPT) approaches with GNSS required, GPS PRIMARY availability should be confirmed.

Refer to GPS PRIMARY Availability (If Installed)

7 Ident.: PRO-NOR-SOP-18-C-I-00029134.0002001 / 06 NOV 25

Applicable to: ALL

DESCENT PREPARATION

WEATHER AND LANDING INFORMATION.....OBTAIN | PM

- L2** - The FMS vertical profile does not take into account the effect of low OAT. Therefore, vertical managed guidance:
- Must not be used when the actual OAT is below the minimum temperature indicated on the approach chart or defined by the Operator, or
 - May not be used when temperature corrections are required (FINAL APP mode may not engage).
- Verify that wind is within limits
- Use of QNH from a remote station is prohibited.

L1 F-PLN A page.....CHECK | PF-PM

L2 If a **TOO STEEP PATH** is displayed after the FDP, FINAL APP guidance cannot be used. Select another approach.

L1 PROG page.....COMPLETE | PF-PM

L2 Check/insert the RNP value in the 6L field.

L1 PERF APPR page.....CHECK | PF-PM

Note: For approach data insertion in the FMS, keep the BARO field empty on the PERF APPR page.

GO-AROUND STRATEGY.....REVIEW | PF

L2 The arrival briefing should include a review of the "Management of Degraded Navigation" chapter Refer to PRO-NOR-SOP-18-C Approach using FINAL APP Guidance for RNP(VPT) - Management of Degraded Navigation.

The identification of the Visual Fix point and the required visual reference at and from the Visual Fix point are to be included in the briefing.

8 Ident.: PRO-NOR-SOP-18-C-I-00029183.0002001 / 06 NOV 25

Applicable to: ALL

DESCENT

At 10 000 ft AAL:

NAV ACCURACY.....CHECK | PF

L2 Check the navigation accuracy on the PROG page.

L1 ● if GNSS is required by the chart:

GPS PRIMARY.....CHECK | PF

L2 GPS PRIMARY must be available on at least one FMS.

- L1** BAROMETRIC REFERENCE.....SET/CROSSCHECK | BOTH
- L2** *The vertical guidance requires a precise BARO setting. The maximum acceptable difference between altimeters is 100 ft.*

9 Ident.: PRO-NOR-SOP-18-C-I-00029184.0002001 / 06 NOV 25

Applicable to: ALL

INITIAL/INTERMEDIATE/FINAL

- FD or AP/FD..... USE FOR APPROACH | PF
- L2** *The use of FD or AP/FD provides the required navigation accuracy.*

L1 At Visual Fix:

- **If visual references are sufficient:**
 CONTINUE..... ANNOUNCE | PF
 - **If visual references are not sufficient:**
 GO-AROUND..... ANNOUNCE | PF
- L2** *Initiate a go-around*

L1 Before the Final Descent Point:

- APPR pb on FCU..... PRESS | PF
- L2** *Press the APPR pb when all of the following conditions are satisfied:*
- The aircraft is cleared for approach
 - TO waypoint is the final descent point.
- If Visual Fix is the Final Descent Point, press before the Visual Fix.*
- L1** APP NAV..... CHECK ARMED or ENGAGED | PF
- FINAL**..... CHECK ARMED | PF
- L2** - Check that the V/DEV scale is displayed on the PFD
- At the FDP, a blue arrow on ND indicates that FINAL APP engagement conditions are met.

L1 At the Final Descent Point:

- FINAL APP**..... CHECK ENGAGED | PF
- GO-AROUND ALTITUDE..... SET | BOTH
- FLIGHT PARAMETERS..... MONITOR | PM
- L2** - Check altitude crossing at waypoints of the final approach, as published on the chart
- Monitor XTK on ND

- Monitor V/DEV on PFD
 - The PM calls out if excessive deviation occurs:
 - XTK reaches 0.1 NM
 - V/DEV reaches ½ dot.
On the vertical scale, one dot corresponds to 100 ft. Therefore, ½ dot is 50 ft.
- For additional information on the associated standard callouts, Refer to Approach.

APPROACH USING FINAL APP GUIDANCE FOR RNP(VPT) - AT THE LATEST AT THE MINIMUM USE HEIGHT OF THE AP

10 Ident.: PRO-NOR-SOP-18-C-I-00029185.0006001 / 06 NOV 25
Applicable to: MSN 04392

AT THE LATEST AT THE MINIMUM USE HEIGHT OF THE AP

- AP..... OFF | PF
- L2

 - For Minimum Use Height of the AP, Refer to Autopilot Function.
 - The AP will automatically disengage at the runway threshold.
 - At 150 ft AGL, if the AP is still engaged, the message **DISCONNECT AP FOR LDG** pulses on the FMA to remind the flight crew that automatic landing is not available.
- L1

FD.....AS RQRD | PM
- L2

If needed, the PF orders the PM to set both FDs off.
- L1

CAUTION
 - The FD provides an additional guidance. The FD must be switched off if the guidance is not relevant or not followed
 - After the threshold, disregard the FD as it reverts to HDG V/S.

11 Ident.: PRO-NOR-SOP-18-C-I-00029185.0004001 / 06 NOV 25
Applicable to: MSN 02155-03060, 05152-07792

AT THE LATEST AT THE MINIMUM USE HEIGHT OF THE AP

- AP..... OFF | PF
- L2

 - For Minimum Use Height of the AP, Refer to Autopilot Function.
 - At 150 ft AGL, if the AP is still engaged, the message **DISCONNECT AP FOR LDG** pulses on the FMA to remind the flight crew that automatic landing is not available.
- L1

FD.....AS RQRD | PM
- L2

If needed, the PF orders the PM to set both FDs off.

L1

CAUTION

- The FD provides an additional guidance. The FD must be switched off if the guidance is not relevant or not followed
- After the threshold, disregard the FD as it reverts to HDG V/S.

12 Ident.: PRO-NOR-SOP-18-C-I-00029186.0002001 / 06 NOV 25

Applicable to: ALL

MANAGEMENT OF DEGRADED NAVIGATION
● Before the Visual Fix:

Discontinue the approach in the following cases, if external visual references are not sufficient to proceed visually:

- NAV FM/GPS POS DISAGREE
- GPS PRIMARY LOST on both NDs

● After the Visual Fix

In the following cases, revert to TRK-FPA:

- XTK > 1 RNP
- NAV FM/GPS POS DISAGREE
- NAV ACCUR DOWNGRAD on both NDs

The use of the AP and FD is at the discretion of the flight crew.

The decision to go-around is at the discretion of the flight crew depending on the circumstances.

APPROACH USING FPA GUIDANCE

Ident.: PRO-NOR-SOP-18-C-E-00014561.0002001 / 24 NOV 23

Applicable to: ALL

GENERAL

The following items are to be performed in addition to previous SOP chapters in the following cases:

- RNAV(GNSS) approaches with LNAV minima using mixed NAV FPA guidance
- RNAV(GNSS) approaches with LP minima (with SLS ) using mixed LOC FPA guidance
- Conventional approaches based on VOR and NDB using selected TRK FPA or mixed NAV FPA guidance
- ILS G/S OUT, LOC ONLY and LOC B/C  approaches.

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The approach is flown in **TRK FPA** when:

- The approach is not stored in the database, or
- NAV accuracy is LOW.

Ident.: PRO-NOR-SOP-18-C-E-00014560.0003001 / 09 SEP 14

Applicable to: ALL

AIRCRAFT EQUIPMENT

For RNAV(GNSS) approaches, *Refer to PRO-SPO-51 RNP APCH / RNAV(GNSS) - Required RNP APCH Equipment*

Ident.: PRO-NOR-SOP-18-C-E-00015861.0001001 / 09 SEP 14

Applicable to: ALL

FLIGHT PREPARATION

For RNAV(GNSS) approaches, GPS PRIMARY availability should be confirmed.
Refer to PRO-NOR-SOP-02 GPS PRIMARY Availability (If Installed)

Ident.: PRO-NOR-SOP-18-C-E-00014558.0002001 / 14 NOV 24

Applicable to: ALL

DESCENT PREPARATION

F-PLN A page..... CHECK | PF-PM

- L2** - If a **TOO STEEP PATH** message is displayed after the FDP, disregard the V/DEV or yoyo information on the PFD
- For approaches using **NAV FPA**:
- 1 degree of difference between the MCDU and the charted final lateral track is acceptable.

Note: A higher lateral track value can be acceptable if the navigation database has been validated to exclude potential coding error.

- 3 degree of difference between the MCDU and the charted final lateral track is acceptable for conventional radio NAVAID approach
- In all other cases, use **TRK FPA** mode for approach.

L1 GO-AROUND STRATEGY..... REVIEW | PF

- L2** The briefing should include a review of the "Management of Degraded Navigation" chapter.

Ident.: PRO-NOR-SOP-18-C-E-00014557.0003001 / 18 NOV 24

Applicable to: ALL

DESCENT

At 10 000 ft AAL:

PROCEDURES

NORMAL PROCEDURES

STANDARD OPERATING PROCEDURES - APPROACH

NAV ACCURACY.....CHECK | PF

L2 If NAV accuracy is **LOW**, use **TRK** mode for approach.

L1 ● For RNAV(GNSS) approach:

GPS PRIMARY.....CHECK | PF

L2 **GPS PRIMARY** must be available on at least one FMS.

L1 BAROMETRIC REFERENCE.....SET/CROSSCHECK | BOTH

L2 The vertical guidance requires a precise BARO setting.

APPROACH USING FPA GUIDANCE - INITIAL/INTERMEDIATE/FINAL APPROACH

Ident.: PRO-NOR-SOP-18-C-E-00014556.0002001 / 24 NOV 23

Applicable to: MSN 02155-02212, 04392-07792

INITIAL/INTERMEDIATE/FINAL APPROACH

LATERAL GUIDANCE MODE.....SET FOR APPROACH | PF

L2 Arm **NAV** or **LOC** mode as appropriate.

L1 ● For LOC ONLY, ILS G/S OUT, or LP (with SLS ) approaches:

LOC pb-sw.....PRESS | PF

L2 Press the LOC pb-sw when:

- Cleared for the approach
- On the intercept trajectory for the final approach course
- LOC deviation is available.

L1 **Note:** In **NAV** mode, the aircraft may leave the F-PLN to capture the LOC.

LOC.....CHECK ARMED | PF

CAUTION Do not press the APPR pb

● For LOC B/C approaches:

TRK FPA MODE.....USE FOR APPROACH | PF

L2 For back course localizer approaches, Refer to FCTM/PR-NP-SOP-190-GUI Back Course Localizer Approach.

L1 LATERAL PATH.....INTERCEPT | PF

L2 Monitor **NAV** or **LOC** engagement as appropriate.

L1 TRK FPA pb (Bird).....SELECT | PF

FPA FOR FINAL APPROACH.....SET | PF

At 0.3 NM from the Final Descent Point:

FPA selector.....PULL | PF

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FPA MODE.....	CHECK ENGAGED PF
L2 Check that NAV FPA , TRK FPA or LOC FPA is engaged.	
L1 POSITION/FLIGHT PATH MONITOR/ADJUST GO-AROUND ALTITUDE.....	| PF BOTH
L2 Set when below the go-around altitude to avoid not expected altitude capture.	
L1 FLIGHT PARAMETERS.....	MONITOR | PM
L2 - Crosscheck distances versus altitudes as published on the charts - If approaching on a conventional radio NAVAID procedure, monitor the lateral and vertical guidance using raw data - For approaches using NAV FPA, monitor XTK error on ND to check the lateral guidance - The PM calls out if excessive lateral deviation occurs: • Approach using NAV mode: XTK is more than 0.1 NM • Approach using LOC mode: LOC ½ dot • Approach using TRK mode: ■ VOR: ½ dot or 2.5 ° ■ NDB: 5 ° Refer to PRO-NOR-SCO Flight Parameters in Approach.	

Ident.: PRO-NOR-SOP-18-C-E-00014556.0003001 / 24 NOV 23

Applicable to: MSN 02719-03060

INITIAL/INTERMEDIATE/FINAL APPROACH

LATERAL GUIDANCE MODE.....	SET FOR APPROACH | PF
L2 Arm NAV , LOC or LOC B/C mode as appropriate.	
L1 ● For LOC only, ILS G/S out, LOC B/C or LP approaches (with SLS ): LOC pb-sw.....	| PRESS | PF
L2 Press the LOC pb-sw when: - Cleared for the approach - On the intercept trajectory for the final approach course - LOC deviation is available.	
L1 Note: In NAV mode, the aircraft may leave the F-PLN to capture the LOC. LOC (LOC B/C) CHECK ARMED | PF	
L2 For back course localizer approaches, Refer to FCTM/PR-NP-SOP-190-GUI Back Course Localizer Approach.	
L1 LATERAL PATH.....	INTERCEPT | PF
L2 Monitor NAV , LOC or LOC B/C engagement as appropriate.	
L1 TRK FPA pb (Bird).....	SELECT | PF

PROCEDURES

NORMAL PROCEDURES

STANDARD OPERATING PROCEDURES - APPROACH

FPA FOR FINAL APPROACH.....SET | PF

At 0.3 NM from the Final Descent Point:

FPA selector PULL | PF

FPA MODE..... CHECK ENGAGED | PF

L2 Check that **NAV FPA, TRK FPA, LOC FPA** or **LOC B/C FPA** is engaged.

L1 POSITION/FLIGHT PATH MONITOR/ADJUST | PF

GO-AROUND ALTITUDE..... SET | BOTH

L2 Set when below the go-around altitude to avoid not expected altitude capture.

L1 FLIGHT PARAMETERS.....MONITOR | PM

- L2**
- Crosscheck distances versus altitudes as published on the charts
 - If approaching on a conventional radio NAVAID procedure, monitor the lateral and vertical guidance using raw data
 - For approaches using **NAV FPA**, monitor XTK error on ND to check the lateral guidance
 - The PM calls out if excessive lateral deviation occurs:
 - Approach using **NAV** mode: XTK is more than 0.1 NM
 - Approach using **LOC** or **LOC B/C** mode: LOC ½ dot
 - Approach using **TRK** mode:
 - VOR: ½ dot or 2.5 °
 - NDB: 5 °

Refer to PRO-NOR-SCO Flight Parameters in Approach.

Ident.: PRO-NOR-SOP-18-C-E-00015017.0001001 / 09 NOV 21

Applicable to: ALL

AT ENTERED MINIMUM +100 FT

ONE HUNDRED ABOVE.....MONITOR OR ANNOUNCE | PM

Ident.: PRO-NOR-SOP-18-C-E-00014555.0014001 / 09 NOV 21

Applicable to: ALL

AT ENTERED MINIMUM

MINIMUM.....MONITOR OR ANNOUNCE | PM

- L2** Below minimum, the visual references must be the primary references until landing.
 For more information regarding transition to visual references, Refer to FCTM/PR-NP-SOP-250 Transition to Visual References.

- L1** ■ If visual references are sufficient:

CONTINUE..... ANNOUNCE | PF

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	AP.....OFF	PF
L2	At 150 ft AGL, if the AP is still engaged, the message DISCONNECT AP FOR LDG pulses on the FMA to remind the flight crew that automatic landing is not available.	
L1	FD.....OFF	PM
L2	The PF orders the PM to set both FDs OFF.	
L1	RUNWAY TRACK.....CHECK/SET	PM
L2	If needed, the PF orders the PM to set the runway track.	
L1	■ If visual references are not sufficient: GO-AROUND.....ANNOUNCE	
L2	Initiate a go-around.	

Ident.: PRO-NOR-SOP-18-C-E-00014554.0002001 / 03 NOV 21

Applicable to: ALL

MANAGEMENT OF DEGRADED NAVIGATION

- For VOR and NDB approaches in **NAV-FPA**, if lateral guidance is not satisfactory:
 - Be prepared to continue the approach with reference to appropriate raw data by reverting to **TRK-FPA**.
- For RNAV(GNSS) approaches, with LNAV minima:
 - Use the appropriate remaining AP/FD in the following cases:
 - **GPS PRIMARY LOST** on one ND
 - **NAV ACCUR DOWNGRAD** on one ND.
 - Discontinue the approach in the following cases, if external visual references are not sufficient to proceed visually:
 - **GPS PRIMARY LOST** on both NDs
 - XTK > 0.3 NM
 - **NAV FM/GPS POS DISAGREE**
 - **NAV ACCUR DOWNGRAD** on both NDs.

CIRCLING APPROACH

Applicable to: ALL

Ident.: PRO-NOR-SOP-18-C-F-00014570.0001001 / 29 MAY 13

GENERAL

The circling approach is the visual phase of an instrument approach to bring an aircraft into position for landing on a runway which is not suitably located for a straight-in approach.

PROCEDURES

NORMAL PROCEDURES

STANDARD OPERATING PROCEDURES - APPROACH

CAUTION

The flight crew must conduct the flight within the circling area, while maintaining required visual references at all times.

Ident.: PRO-NOR-SOP-18-C-F-00014569.0001001 / 24 NOV 23

APPROACH PREPARATION

For a circling approach, the approach preparation should include the following additional items in the FMS programming:

F-PLN

INSTRUMENT APPROACH..... INSERT | PF

L2 On the *ARRIVAL* page, insert the instrument approach preceding the circling.

L1 F SPEED CONSTRAINT AT FAF..... INSERT | PF

L2 Insert F speed as constraint at FAF since the circling approach will be flown in *CONF 3*, landing gear down and F speed.

L1 SEC F-PLN

F-PLN..... COPY ACTIVE | PF

L2 On the *SEC INDEX* page, select *COPY ACTIVE* in order to make a copy of the active F-PLN.

L1 LANDING RUNWAY..... REVISE | PF

L2 - On the *SEC F-PLN ARRIVAL* page, insert appropriate landing runway
 - Keep the F-PLN discontinuity.

Ident.: PRO-NOR-SOP-18-C-F-00014568.0001001 / 24 NOV 23

INSTRUMENT APPROACH

The flight crew flies an early stabilized approach at F speed, configuration 3 and landing gear down.

Ident.: PRO-NOR-SOP-18-C-F-00014567.0001001 / 06 NOV 25

13 CIRCLING APPROACH

● At the Circling MDA(H) at the latest:

LEVEL OFF..... PERFORM | PF

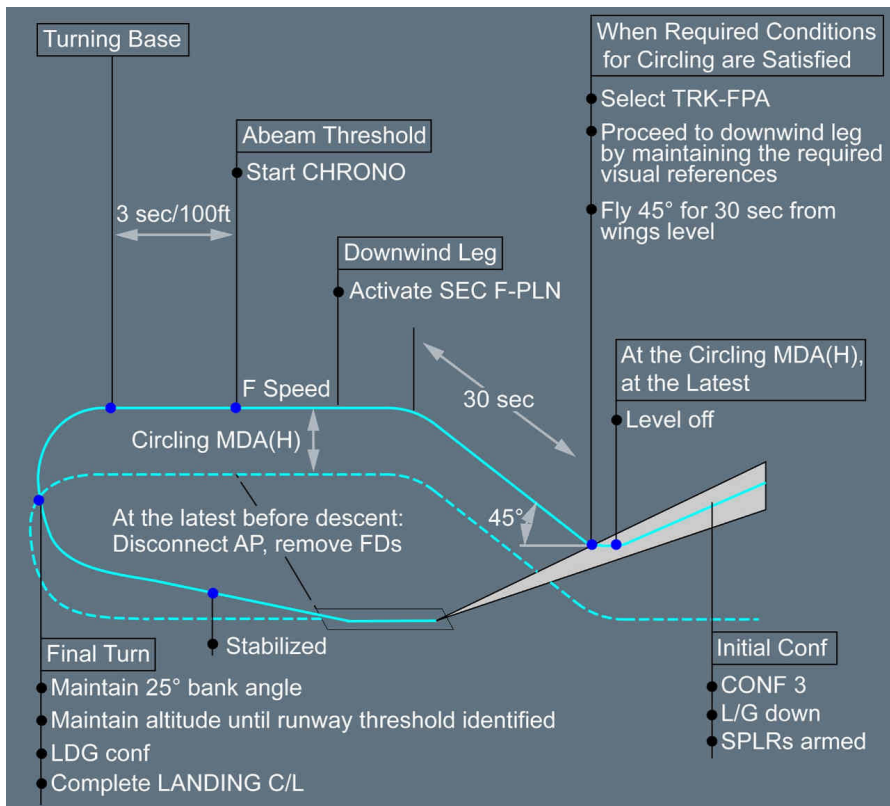
● At MAP, if the flight crew does not obtain required visual reference:

GO AROUND..... PERFORM | PF

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	● If the flight crew obtains required visual references:		
	TRK FPA.....	SELECT	PF
L2	<i>Select a track 45 ° away from final approach course (or as required by the published procedure).</i>		
L1	● When wings are level:		
	CHRONO.....	START	PF
	● After 30 s:		
	DOWNWIND TRACK.....	SELECT	PF
L2	<i>Select the downwind track parallel to the landing runway.</i>		
L1	● During the downwind leg:		
	ACTIVATE SEC F-PLN.....	ORDER	PF
	SEC F-PLN.....	ACTIVE	PM
	● When the aircraft is abeam the landing runway threshold:		
	CHRONO.....	START	PM
L2	<i>The time from abeam threshold to the beginning of the base turn depends on the height above touchdown: Approximately 3 s/100 ft.</i>		
L1	BASE TURN.....	PERFORM	PF
L2	<i>Initially maintain 25 ° bank angle and maintain the altitude until the visual references for the intended runway are distinctly visible and identifiable.</i>		
L1	● When appropriate:		
	FLAPS FULL.....	ORDER	PF
	FLAPS FULL.....	SELECT	PM
	● When the aircraft is fully configured for landing:		
	LANDING C/L.....	COMPLETE	BOTH
	● At the latest before starting the descent toward the runway:		
	AP.....	OFF	PF
	FDs.....	OFF	PM
L2	<i>The PF orders the PM to set both FDs off.</i>		
L1	● At any time during the circling procedure, if the required visual references are lost:		
	GO AROUND.....	PERFORM	PF
L2	<i>Initiate a go-around following the missed approach of the initial instrument approach (unless otherwise specified).</i>		

CIRCLING APPROACH PATTERN



RNAV VISUAL APPROACH

Applicable to: ALL

Ident.: PRO-NOR-SOP-18-C-G-00016048.0001001 / 23 DEC 14

GENERAL

The aircraft navigates using the RNAV system, but the position is monitored by visual reference to the ground, obstacles and other traffic.

RNAV visual approach must be stored and retrievable from the Navigation Database.

Ident.: PRO-NOR-SOP-18-C-G-00016049.0001001 / 23 DEC 14

EQUIPMENT REQUIRED

- 1 FMS
- 1 GPS or 2 DME to update FM position
- Additional requirement if indicated on the approach chart.

Ident.: PRO-NOR-SOP-18-C-G-00016050.0001001 / 04 JUN 19

FMGC GUIDANCE MODE**● If no required accuracy is published:**

The use of FMGC guidance mode is at flight crew discretion.

● If RNAV 1 or RNP 1 is required on the published approach chart:

The flight crew should use adequate FMGC guidance modes.

Note: The use of lateral and vertical managed guidance modes reduces the crew workload and improves energy management.

For RNAV VISUAL approach including RF legs, *Refer to FCTM/PR-NP-SP-30 General* for RF leg flying technique.

Ident.: PRO-NOR-SOP-18-C-G-00016051.0001001 / 23 DEC 14

DESCENT PREPARATION

For approach data insertion in the FMS, keep the BARO/MDA field empty on the PERF APPR Page.

Ident.: PRO-NOR-SOP-18-C-G-00016052.0001001 / 23 DEC 14

DESCENT

For RNAV VISUAL approaches requiring GPS, check that GPS PRIMARY is available on at least 1 FMS.

Ident.: PRO-NOR-SOP-18-C-G-00016053.0001001 / 21 MAR 17

FINAL APPROACH

The flight crew must disconnect the AP at the latest at the Minimum Use Height of the AP.
Refer to LIM-AFS-10 Autopilot Function

PROCEDURES**NORMAL PROCEDURES**

STANDARD OPERATING PROCEDURES - APPROACH

VISUAL APPROACH

VISUAL APPROACH - GENERAL

Ident.: PRO-NOR-SOP-18-C-H-00014574.0001001 / 24 NOV 23

Applicable to: MSN 02155-02789, 03031-07792

GENERAL

Perform the approach on a nominal 3 ° glideslope using visual references. Approach is to be stabilized by 500 ft AAL on the correct approach path, in the landing configuration, at VAPP.

Method:

- The AP is not used
- Both FDs are OFF
- The use of FPV is recommended
- The use of A/THR is recommended with managed speed.

Keep in mind the possible risk of optical illusions due to hindered night vision.

Ident.: PRO-NOR-SOP-18-C-H-00014574.0002001 / 24 NOV 23

Applicable to: MSN 02926-02944

GENERAL

Perform the approach on a nominal 3 ° glideslope using visual references. Approach is to be stabilized by 500 ft AAL on the correct approach path, in the landing configuration, at VAPP.

Method:

- The AP is not used
- Both FDs are OFF
- The use of FPV is recommended
- The use of A/THR is recommended with managed speed.

Keep in mind the possible risk of optical illusions due to hindered night vision.

Note: If the forecasted tailwind at landing is more than 10 kt, decelerated approach is not allowed, and the speed should be stabilized around VREF + 5 kt in final.

Ident.: PRO-NOR-SOP-18-C-H-00014573.0001001 / 08 AUG 13

Applicable to: ALL

INITIAL/INTERMEDIATE APPROACH

The flight plan selected on the MCDU should include the selection of the landing runway. The downwind leg may also be part of the flight plan. This may be a useful indication of the aircraft position in the circuit on the ND.

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However, visual references must be used.

Therefore, at the beginning of the downwind leg:

Manually ACTIVATE APPR

Select FDs to OFF

Select TRK FPA to have FPV displayed

Check A/THR active.

Extend the downwind leg to 3 s/100 ft ($\pm$ 1 s/1 kt of headwind / tailwind).

Turn into base leg with a maximum of 30 ° of bank. Descent with approximate FPA, in FLAPS 2, at F speed.

Ident.: PRO-NOR-SOP-18-C-H-00014572.0001001 / 24 NOV 23

Applicable to: ALL

FINAL APPROACH

The speed trend arrow and FPV help the flight crew make timely and correct thrust settings (if in manual thrust), and approach path corrections.

Avoid descent through the correct approach path with idle thrust. (Late recognition of this situation without a prompt thrust increase may lead to considerable speed decay and altitude loss).

Ensure that the aircraft is stabilized on the final descent path at VAPP (or ground speed mini) in the landing configuration with the thrust stabilized (usually above idle) at 500 ft AAL or as restricted by Operator policies/regulations.

If the aircraft is not stabilized, the flight crew must initiate a go around, unless they think that only small corrections are necessary to rectify minor deviations from stabilized conditions due, amongst others, to external perturbations.

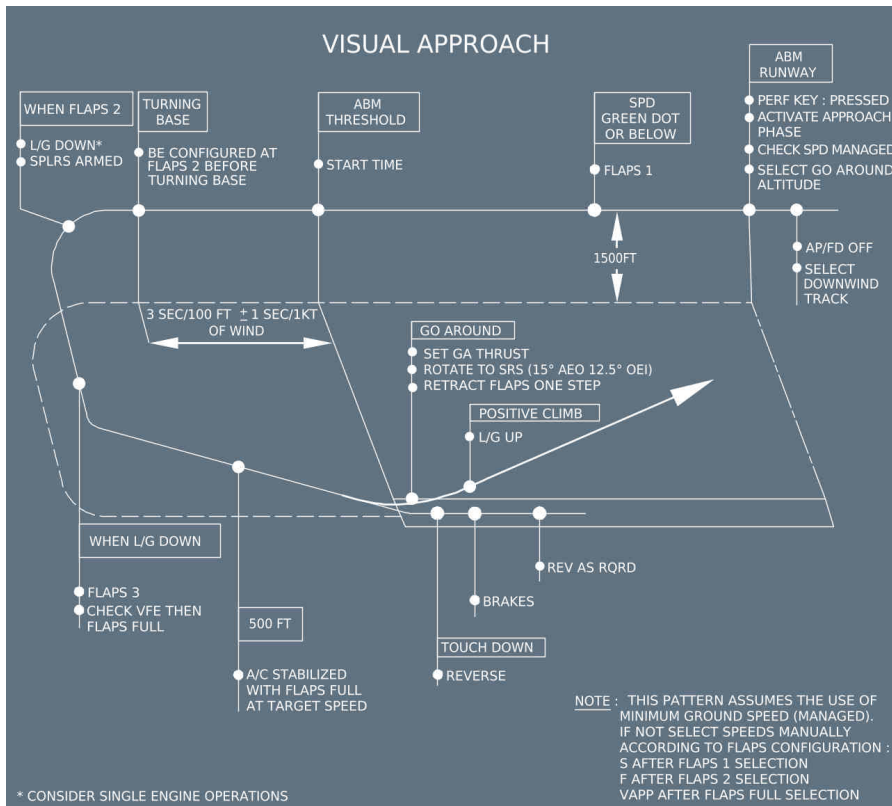
Avoid any tendency to “duck under” in the late stages of the approach.

Avoid destabilizing the approach in the last 100 ft AGL, in order to have the best chance of performing a good touchdown at the desired position.

Ident.: PRO-NOR-SOP-18-C-H-00014571.0001001 / 08 DEC 14

Applicable to: ALL

VISUAL APPROACH (1 OR 2 ENGINES) PATTERN



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MANUAL LANDING

Ident.: PRO-NOR-SOP-19-A-00025032.0001001 / 09 NOV 21
Applicable to: ALL

FOR MANUAL LANDING

AP..... OFF | PF

Ident.: PRO-NOR-SOP-19-A-00010351.0011001 / 12 NOV 25
Applicable to: ALL

- 1
FLARE
- AROUND 30 ft RA:**
In a stabilized approach, the flare height is approximately 30 ft.

FLARE..... PERFORM | PF
ATTITUDE..... MONITOR | PM

For more information about the callouts during landing, Refer to Landing callouts.

BOTH THRUST LEVERS..... IDLE | PF
- L2
Move both thrust levers to the IDLE detent, and begin a gentle progressive flare to enable the aircraft to touch down without a prolonged float.
If the autothrust is engaged, it automatically disconnects when both thrust levers are set to the IDLE detent.
At 20 ft, an automatic "RETARD" callout will trigger, as a reminder.
- L1
Note: Ground spoilers extension is inhibited if one or more thrust levers remain above the IDLE detent.

LANDING - AT TOUCHDOWN

Ident.: PRO-NOR-SOP-19-A-00010352.0001001 / 24 NOV 23
Applicable to: MSN 04392

- AT TOUCHDOWN
- As soon as the main landing gear touches down:**
DEROTATION..... INITIATE | PF

BOTH THRUST LEVERS.....REV MAX or REV IDLE | PF
- L2
The flight crew must select reverse thrust immediately after main landing gear touchdown.
- L1
Note: As soon as the flight crew selects reverse thrust, they must perform a full-stop landing.

PROCEDURES

NORMAL PROCEDURES

STANDARD OPERATING PROCEDURES - LANDING

The flight crew must immediately select REV MAX, if any of the following occurs at any time during the landing:

- An emergency
- The deceleration is not as expected
- A failure affects the landing performance
- A long flare or a long touchdown
- An unexpected tailwind.

A small pitch up may occur during thrust reversers deployment before nose landing gear touchdown. However, the flight crew can easily control this pitch up.

GND SPLRS.....CHECK/ANNOUNCE | PM

L2 Check that the **WHEEL** SD page displays the ground spoilers extended after touchdown.

If no ground spoilers are extended:

- Check that both thrust levers are set to IDLE detent
- Set both thrust reverser levers to MAX REV, and fully press the brake pedals.

L1 Note: If ground spoilers are not armed, ground spoilers extend at reverse thrust selection.

REVERSERS.....CHECK/ANNOUNCE | PM

- L2**
- Check that the E/WD displays the expected reverser deployment (i.e. **REV**)
 - If reverser(s) do not deploy as expected, one of the main deceleration means is lost. The flight crew should consider adapting the available deceleration means to stop the aircraft.

L1 DIRECTIONAL CONTROL.....ENSURE | PF

- L2**
- Ensure directional control. Use the rudder pedals for directional control
 - During rollout, avoid sidestick inputs (either lateral or longitudinal)
 - If the flight crew encounters directional control problems, they should reduce the thrust to REV IDLE until directional control is acceptable.

L1 Note: Do not use the nosewheel steering control handle before reaching taxi speed.

● If autobrake is selected:

AUTOBRAKE.....MONITOR | PM

L2 During all the rollout, the PM monitors the blue light on the autobrake panel, and calls out if the autobrake mode disengages.

If no ground spoilers are extended, the autobrake will not activate.

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- L1** ● **If landing without autobrake:**
BRAKES..... AS RQRD | PF
- L2** - Although the green hydraulic system supplies the braking system, if pedals are pressed rapidly, a brake pressure indication appears briefly on the BRAKE PRESS indicator
- Braking may begin before the nosewheel touches down, if required for performance reasons. However, when comfort is the priority, the flight crew should delay braking until the nosewheel touches down.
- L1** DECELERATION..... CHECK/ANNOUNCE | PM
- L2** The flight crew feels the deceleration and checks the speed trend on the PFD to confirm the deceleration.

Ident.: PRO-NOR-SOP-19-A-00010352.0008001 / 24 NOV 23

Applicable to: MSN 02155-03060, 05152-07792

AT TOUCHDOWN

- **As soon as the main landing gear touches down:**
DEROTATION..... INITIATE | PF
- BOTH THRUST LEVERS..... REV MAX or REV IDLE | PF
- L2** The flight crew must select reverse thrust immediately after main landing gear touchdown.
- L1** Note: As soon as the flight crew selects reverse thrust, they must perform a full-stop landing.
- The flight crew must immediately select REV MAX, if any of the following occurs at any time during the landing:
- An emergency
 - The deceleration is not as expected
 - A failure affects the landing performance
 - A long flare or a long touchdown
 - An unexpected tailwind.
- A small pitch up may occur during thrust reversers deployment before nose landing gear touchdown. However, the flight crew can easily control this pitch up.
- GND SPLRS..... CHECK/ANNOUNCE | PM
- L2** Check that the WHEEL SD page displays the ground spoilers extended after touchdown.
- If no ground spoilers are extended:
- Check that both thrust levers are set to IDLE detent
 - Set both thrust reverser levers to MAX REV, and fully press the brake pedals.
- L1** Note: If ground spoilers are not armed, ground spoilers extend at reverse thrust selection.

PROCEDURES

NORMAL PROCEDURES

STANDARD OPERATING PROCEDURES - LANDING

REVERSERS.....CHECK/ANNOUNCE | PM

- L2** - Check that the E/WD displays the expected reverser deployment (i.e. **REV**)
- If reverser(s) do not deploy as expected, one of the main deceleration means is lost. The flight crew should consider adapting the available deceleration means to stop the aircraft.

L1 DIRECTIONAL CONTROL.....ENSURE | PF

- L2** - Ensure directional control. Use the rudder pedals for directional control
- During rollout, avoid sidestick inputs (either lateral or longitudinal)
- If the flight crew encounters directional control problems, they should reduce the thrust to **REV IDLE** until directional control is acceptable.

L1 *Note:* Do not use the nosewheel steering control handle before reaching taxi speed.

● **If autobrake is selected:**

AUTO BRK.....CHECK/ANNOUNCE | PM

- L2** Check and announce **BRK LO** or **BRK MED** on the FMA.
- If no ground spoilers are extended, the autobrake will not activate.

L1 AUTOBRAKE.....MONITOR | PM

- L2** During all the rollout, the PM monitors that the FMA displays **BRK LO** or **BRK MED**, and calls out if the autobrake mode disengages.

L1 ● **If landing without autobrake:**

BRAKES.....AS RQRD | PF

- L2** - Although the green hydraulic system supplies the braking system, if pedals are pressed rapidly, a brake pressure indication appears briefly on the BRAKE PRESS indicator
- Braking may begin before the nosewheel touches down, if required for performance reasons. However, when comfort is the priority, the flight crew should delay braking until the nosewheel touches down.

L1 DECELERATION.....CHECK/ANNOUNCE | PM

- L2** The flight crew feels the deceleration and checks the speed trend on the PFD to confirm the deceleration.

Ident.: PRO-NOR-SOP-19-A-00010353.0001001 / 05 MAY 22

Applicable to: ALL

AT 70 KT

SEVENTY KNOTS.....ANNOUNCE | PM

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BOTH THRUST LEVERS..... REV IDLE | PF

- L2** *It is recommended to reduce thrust when passing 70 kt. However, high levels of reverse thrust may be used in order to control aircraft speed in the case of an emergency.*

L1 **CAUTION** *Avoid the use of high levels of reverse thrust at low airspeed, unless required due to an emergency. The distortion of the airflow, caused by gases reentering the compressor, can cause engine stalls that may result in excessive EGT.*

Ident.: PRO-NOR-SOP-19-A-00010354.0001001 / 09 NOV 21
Applicable to: ALL

AT TAXI SPEED

REVERSERS..... STOW | PF

- L2** - *When the aircraft reaches the taxi speed, and before it leaves the runway, stow the reversers.*
- *On snow-covered grounds, the reversers should be stowed when the aircraft speed reaches 25 kt.*
- *When deselecting the reversers, be careful not to apply forward thrust by moving the thrust levers beyond the FWD IDLE position.*

L1 **CAUTION** *Except in an emergency, do not use the reverse thrust to control the aircraft speed while on taxiways.*

L2 *On taxiways, the use of reversers, even restricted to idle thrust, would have the following effects:*
- *The engines may ingest fine sand and debris that may be detrimental to the engines and airframe systems.*
- *On snow-covered areas, snow will recirculate into the air inlet, and may cause an engine flameout or rollback.*

Ident.: PRO-NOR-SOP-19-A-00010355.0001001 / 05 MAY 22
Applicable to: ALL

BEFORE 20 KT

AUTO BRK..... DISENGAGE | PF

- L2** *Disengage the autobrake to avoid some brake jerks at low speed.*
The flight crew should use brake pedals to disengage the autobrake.

AUTOLAND

Ident.: PRO-NOR-SOP-19-B-00020897.0001001 / 20 MAR 17
Applicable to: ALL

The following items must be performed in addition to previous *Refer to PRO-NOR-SOP-APPROACH USING LOC G/S.*

Ident.: PRO-NOR-SOP-19-B-00020898.0001001 / 09 NOV 21

Applicable to: ALL

AT 350 FT RA

LAND ON FMA.....CHECK/ANNOUNCE | PF
 ILS/GLS  /MLS  COURSE ON PFD.....CHECK | PF

L2 If the ILS / GLS  course pointer and the runway track differ by more than 5 °, perform a go-around, or a manual landing if visual references are sufficient.

Ident.: PRO-NOR-SOP-19-B-00020899.0001001 / 09 NOV 21

Applicable to: ALL

AT 40 FT RA

FLARE ON FMA.....CHECK/ANNOUNCE | PM

L2 If the FMA does not display **FLARE**, perform a go-around, or a manual landing if visual references are sufficient.

L1 FLARE.....MONITOR | PF

Ident.: PRO-NOR-SOP-19-B-00020900.0001001 / 09 NOV 21

Applicable to: ALL

AT 30 FT RA

THR IDLE ON FMA.....CHECK | PM
 THRUST IDLE.....CHECK | PM

L2 Monitor thrust reduction.

Ident.: PRO-NOR-SOP-19-B-00020901.0001001 / 24 NOV 23

Applicable to: ALL

AT 10 FT RA

L2 An automatic "RETARD" callout triggers.

L1 BOTH THRUST LEVERS.....IDLE | PF

L2 The autothrust disconnects.

L1 LATERAL GUIDANCE.....MONITOR | PF

L2 Monitor the lateral guidance by using external references.

AUTOLAND - AT TOUCH DOWN

Ident.: PRO-NOR-SOP-19-B-00020902.0008001 / 03 MAY 23

Applicable to: MSN 02155-03060, 05152-07792

AT TOUCHDOWN

Note: In the case of NWS or Anti-Skid failure, set the AP OFF at touchdown.

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ROLL OUT ON FMA..... CHECK/ANNOUNCE PM BOTH THRUST LEVERSREV MAX or REV IDLE PF	
L2 <i>The flight crew must select reverse thrust immediately after main landing gear touchdown.</i>	
L1 <i>Note:</i> As soon as the flight crew selects reverse thrust, they must perform a full-stop landing. The flight crew must immediately select REV MAX, if any of the following occurs at any time during the landing:	
- An emergency - The deceleration is not as expected - A failure affects the landing performance - A long flare or a long touchdown - An unexpected tailwind.	
A small pitch up may occur during thrust reversers deployment before nose landing gear touchdown. However, the auto-flight system will control this pitch up.	
GND SPLRS CHECK/ANNOUNCE | PM	
L2 <i>Check that the WHEEL SD page displays the ground spoilers extended after touchdown.</i>	
If no ground spoilers are extended:	
- Check that all thrust levers are set to IDLE detent - Set both thrust reverser levers to MAX REV, and fully press the brake pedals.	
L1 <i>Note:</i> If ground spoilers are not armed, ground spoilers extend at reverse thrust selection.	
REVERSERS CHECK/ANNOUNCE | PM	
L2 - Check that the ECAM E/WD displays the expected reverser deployment (i.e. REV) - If reverser(s) do not deploy as expected, one of the main deceleration means is lost. The flight crew should consider adapting the available deceleration means to stop the aircraft.	
L1 DIRECTIONAL CONTROL MONITOR/ENSURE | PF	
L2 - Monitor directional control, if the rollout is automatic - Ensure directional control, if rollout is manual. Use rudder pedals for directional control. - During rollout, avoid sidestick inputs (either lateral or longitudinal) - If the flight crew encounters directional control problems, they should reduce the thrust to REV IDLE until directional control is satisfactory.	
L1 <i>Do not use the nosewheel steering control handle before reaching taxi speed.</i>	
● If autobrake is selected:	
AUTO BRK CHECK/ANNOUNCE | PM	
L2 <i>Check and announce BRK LO or BRK MED on the FMA.</i>	
<i>If no ground spoilers are extended, the autobrake is not activated.</i>	

PROCEDURES

NORMAL PROCEDURES

STANDARD OPERATING PROCEDURES - LANDING

- L1** AUTOBRAKE.....MONITOR | PM
- L2** *During all the rollout, the PM monitors that the FMA displays **BRK LO** or **BRK MED**, and calls out if the autobrake mode disengages.*
- L1** ● **If landing without autobrake:**
- BRAKES..... AS RQRD | PF
- L2** - *Although the green hydraulic system supplies the braking system, if pedals are pressed rapidly, a brake pressure indication appears briefly on the BRAKE PRESS indicator*
- *Braking may begin before the nosewheel has touched down, if required for performance reasons. However, when comfort is the priority, the flight crew should delay braking until the nosewheel has touched down.*
- L1** DECELERATION..... CHECK/ANNOUNCE | PM
- L2** *The flight crew feels the deceleration. The flight crew checks the speed trend on the PFD to confirm the deceleration.*

Ident.: PRO-NOR-SOP-19-B-00020902.0001001 / 03 MAY 23

Applicable to: MSN 04392

AT TOUCHDOWN

Note: In the case of NWS or Anti-Skid failure, set the AP OFF at touchdown.

ROLL OUT ON FMA..... CHECK/ANNOUNCE | PM

BOTH THRUST LEVERS.....REV MAX or REV IDLE | PF

L2 *The flight crew must select reverse thrust immediately after main landing gear touchdown.*

L1 Note: As soon as the flight crew selects reverse thrust, they must perform a full-stop landing.

The flight crew must immediately select REV MAX, if any of the following occurs at any time during the landing:

- *An emergency*
- *The deceleration is not as expected*
- *A failure affects the landing performance*
- *A long flare or a long touchdown*
- *An unexpected tailwind.*

A small pitch up may occur during thrust reversers deployment before nose landing gear touchdown. However, the auto-flight system will control this pitch up.

GND SPLRS..... CHECK/ANNOUNCE | PM

L2 Check that the WHEEL SD page displays the ground spoilers extended after touchdown.

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES STANDARD OPERATING PROCEDURES - LANDING
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If no ground spoilers are extended:

- Check that all thrust levers are set to IDLE detent
- Set both thrust reverser levers to MAX REV, and fully press the brake pedals.

L1 Note: If ground spoilers are not armed, ground spoilers extend at reverse thrust selection.

REVERSERS.....CHECK/ANNOUNCE | PM

- L2**
- Check that the ECAM E/WD displays the expected reverser deployment (i.e. **REV**)
 - If reverser(s) do not deploy as expected, one of the main deceleration means is lost. The flight crew should consider adapting the available deceleration means to stop the aircraft.

L1 DIRECTIONAL CONTROL.....MONITOR/ENSURE | PF

- L2**
- Monitor directional control, if the rollout is automatic
 - Ensure directional control, if rollout is manual. Use rudder pedals for directional control.
 - During rollout, avoid sidestick inputs (either lateral or longitudinal)
 - If the flight crew encounters directional control problems, they should reduce the thrust to REV IDLE until directional control is satisfactory.

L1 Do not use the nosewheel steering control handle before reaching taxi speed.

● **If autobrake is selected:**

AUTOBRAKE.....MONITOR | PM

- L2**
- During all the rollout, the PM monitors the blue light on the autobrake panel, and calls out if the autobrake mode disengages.
- If no ground spoilers are extended, the autobrake is not activated.

L1 ● **If landing without autobrake:**

BRAKES.....AS RQRD | PF

- L2**
- Although the green hydraulic system supplies the braking system, if pedals are pressed rapidly, a brake pressure indication appears briefly on the BRAKE PRESS indicator
 - Braking may begin before the nosewheel has touched down, if required for performance reasons. However, when comfort is the priority, the flight crew should delay braking until the nosewheel has touched down.

L1 DECELERATION.....CHECK/ANNOUNCE | PM

- L2**
- The flight crew feels the deceleration. The flight crew checks the speed trend on the PFD to confirm the deceleration.

Ident.: PRO-NOR-SOP-19-B-00020904.0001001 / 09 NOV 21

Applicable to: ALL

AT 70 KT

SEVENTY KNOTS.....	ANNOUNCE	PM
BOTH THRUST LEVERS.....	REV IDLE	PF

L2 *It is better to reduce thrust when passing 70 kt. However, high levels of reverse thrust may be used in order to control aircraft speed in the case of an emergency.*

L1 **CAUTION** *Avoid the use of high levels of reverse thrust at low airspeed, unless required due to an emergency. The distortion of the airflow, caused by gases reentering the compressor, can cause engine stalls that may result in excessive EGT.*

Ident.: PRO-NOR-SOP-19-B-00020905.0001001 / 24 NOV 23

Applicable to: ALL

BEFORE 20 KT

AUTO BRK.....	DISENGAGE	PF
---------------	-----------	----

L2 *Disengage autobrake before 20 kt to avoid some brake jerks at low speed.
The flight crew should use brake pedals to disengage the autobrake.*

Ident.: PRO-NOR-SOP-19-B-00020906.0001001 / 24 NOV 23

Applicable to: ALL

END OF ROLL OUT

BOTH REVERSER LEVERS.....	STOW	PF
---------------------------	------	----

L2

- When the aircraft reaches the taxi speed, and before it leaves the runway, stow the reversers.
- On snow-covered grounds, the reversers should be stowed when the aircraft speed reaches 25 kt.
- When deselecting the reversers, be careful not to apply forward thrust by moving the thrust levers beyond the FWD IDLE position.

L1 **CAUTION** *Except in an emergency, do not use the reverse thrust to control the aircraft speed while on taxiways.*

L2 *On taxiways, the use of reversers, even restricted to idle thrust, would have the following effects:*

- The engines may ingest fine sand and debris that may be detrimental to the engines and airframe systems.
- On snow-covered areas, snow will recirculate into the air inlet, and may cause an engine flameout or rollback.

L1 AP.....	OFF	PF
-------------------	-----	----

L2 *Disengage the APs at the end of the roll out (before leaving the runway at the latest).*

GO AROUND WITH FD

GO AROUND WITH FD - GO AROUND INITIATION

Ident.: PRO-NOR-SOP-20-A-00011576.0006001 / 24 NOV 23

Applicable to: MSN 02926-02944

Simultaneously apply the following three actions:

THRUST LEVERS.....	TOGA	|	PF
--------------------	------	--	----

[L2] *If TOGA thrust is not required, set the thrust levers to TOGA detent then retard the thrust levers as required. This enables to engage the GO-AROUND phase, with associated AP/FD modes. The flight crew may use CL detent to have benefit of A/THR.*

[L1] Note: *If the thrust levers are not set briefly to TOGA detent, the FMS does not engage the GO-AROUND phase, and flying over, or close to the airport will sequence the Destination waypoint in the F-PLN.*

ROTATION.....	PERFORM	|	PF
---------------	---------	--	----

[L2] *Initiate rotation towards 15 ° of pitch with all engines operative (approximately 12.5 ° if one engine is out) to get a positive rate of climb, then follow the SRS Flight Director orders. When near the ground, avoid excessive rotation rate in order to prevent a tail strike.*

[L1] GO AROUND FLIGHT PARAMETERS..... FLAPS..... FMA.....	ANNOUNCE MONITOR RETRACT ONE STEP CHECK/ANNOUNCE	| | | |	PF PM PM PF
--	---	--	--

[L2] *The following modes are displayed: MAN TOGA / SRS / GA TRK / A/THR.*

[L1] POSITIVE CLIMB L/G UP L/G lever..... NAV or HDG mode..... GO AROUND ALTITUDE.....	ANNOUNCE ORDER SELECT UP AS RQRD CHECK	 	PM PF PM PF PM
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Ident.: PRO-NOR-SOP-20-A-00011576.0014001 / 24 NOV 23

Applicable to: MSN 02155-02789, 03031-07792

Simultaneously apply the following three actions:

THRUST LEVERS.....	TOGA	|	PF
--------------------	------	--	----

[L2] *If TOGA thrust is not required, set the thrust levers to TOGA detent then retard the thrust levers as required. This enables to engage the GO-AROUND phase, with associated AP/FD modes. The flight crew may use CL detent to have benefit of A/THR.*

PROCEDURES

NORMAL PROCEDURES

STANDARD OPERATING PROCEDURES - GO-AROUND

[L1] Note: If the thrust levers are not set briefly to TOGA detent, the FMS does not engage the GO-AROUND phase, and flying over, or close to the airport will sequence the Destination waypoint in the F-PLN.

ROTATION.....PERFORM | PF

[L2] Initiate rotation towards 15 ° of pitch with all engines operative (approximately 12.5 ° if one engine is out) to get a positive rate of climb, then follow the SRS Flight Director orders.
 When near the ground, avoid excessive rotation rate in order to prevent a tail strike.

[L1] GO AROUNDANNOUNCE | PF
 FLIGHT PARAMETERS..... MONITOR | PM
 FLAPS..... RETRACT ONE STEP | PM
 FMA.....CHECK/ANNOUNCE | PF

[L2] The following modes are displayed: **MAN TOGA** / **SRS** / **GA TRK** or **NAV** / **A/THR**.
 Depending on the guidance modes during approach, **NAV** mode is either automatically armed or automatically engaged.

[L1] POSITIVE CLIMBANNOUNCE | PM
 L/G UPORDER | PF
 L/G lever..... SELECT UP | PM
 NAV or HDG mode..... AS RQRD | PF
 GO AROUND ALTITUDE.....CHECK | PM

Ident.: PRO-NOR-SOP-20-A-00011579.0002001 / 09 NOV 23

Applicable to: ALL

AT GO-AROUND THRUST REDUCTION ALTITUDE

THRUST LEVERS.....CL | PF

[L2] **LVR CLB** flashing on FMA.

Ident.: PRO-NOR-SOP-20-A-00011581.0001001 / 09 NOV 21

Applicable to: ALL

AT GO-AROUND ACCELERATION ALTITUDE

SPEED..... MONITOR | PF

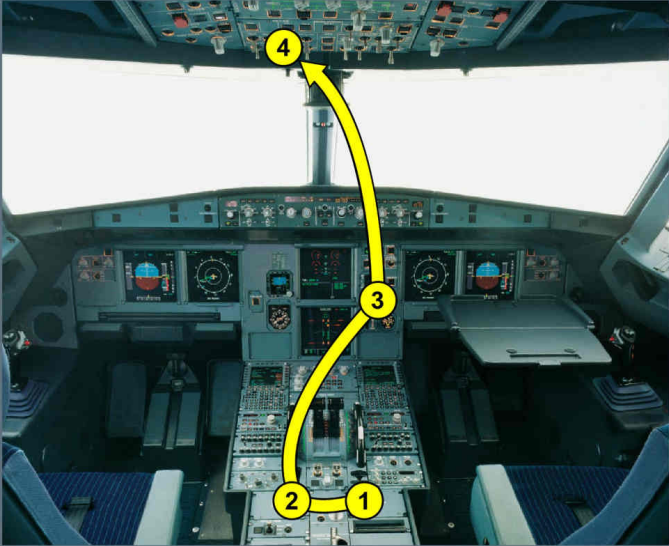
[L2] Monitor that the target speed increases to green dot.

[L1] ● If the target speed does not increase to green dot:

FCU ALT.....CHECK | PF
 ALT knob..... PULL | PF

ACCELERATION FLOW PATTERN


PM Actions



- 1 FLAPS ZERO.....SELECT
- 2 GND SPLRS.....DISARM
- 3 L/G.....CHECK UP
- 4 EXTERIOR LIGHTS.....SET

- **At F speed:**
 FLAPS 1.....ORDER
 FLAPS 1.....SELECT
- **At S speed:**
 FLAPS 0.....ORDER
 FLAPS 0.....SELECT
 GND SPLRS.....DISARM
 L/G.....CHECK UP
 NOSE sw.....OFF
 RWY TURN OFF sw.....OFF
- PF
PM
PF
PM
PM
PM
PM
PM

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OTHER EXTERIOR LIGHTS.....AS RQRD

|

PM

L2

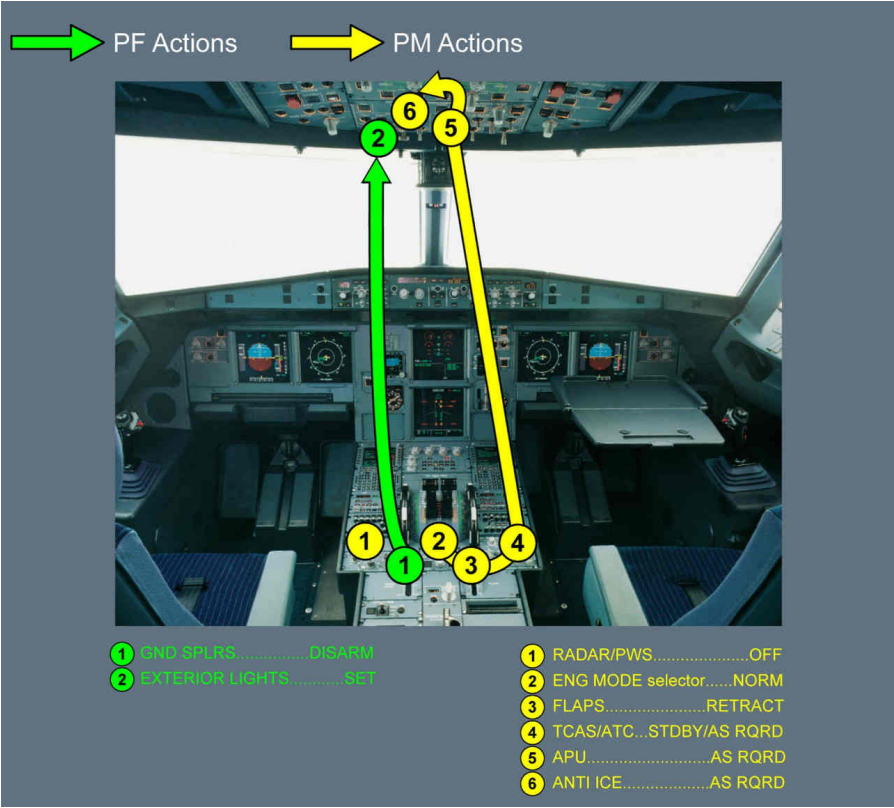
The flight crew can maintain the LAND selector set to ON, according to airline policy or regulatory recommendations.

AFTER LANDING

Ident.: PRO-NOR-SOP-21-A-00020077.0001001 / 24 NOV 23

Applicable to: ALL

AFTER LANDING FLOW PATTERN



Ident.: PRO-NOR-SOP-21-A-00011841.0001001 / 09 NOV 21

Applicable to: ALL

GROUND SPOILERS

- When the runway is vacated:
 GRND SPLRS.....DISARM | PF

Ident.: PRO-NOR-SOP-21-A-00011840.0001001 / 24 NOV 23

Applicable to: ALL

EXTERIOR LIGHTS

L2 During taxi, the PF may request the PM to set the exterior lights.

L1 LAND sw..... RETRACT | PF

● **When leaving the runway:**

STROBE sw..... AUTO | PF

NOSE sw..... TAXI | PF

● **When crossing a runway:**

STROBE sw..... ON | PF

OTHER EXTERIOR LIGHTS..... AS RQRD | PF

Ident.: PRO-NOR-SOP-21-A-00011842.0001001 / 24 NOV 23

Applicable to: MSN 02155-03060, 07784-07792

RADAR

RADAR..... OFF | PM

Ident.: PRO-NOR-SOP-21-A-00011843.0001001 / 24 NOV 23

Applicable to: MSN 02155-03060, 07784-07792

PREDICTIVE WINDSHEAR

PREDICTIVE WINDSHEAR SYSTEM..... OFF | PM

Switching the radar and predictive windshear system to OFF after landing avoids risk of radiating persons at the gate area.

Ident.: PRO-NOR-SOP-21-A-00013145.0001001 / 09 NOV 21

Applicable to: MSN 04392-05746

RADAR/PREDICTIVE WINDSHEAR

WXR/PWS switch..... OFF | PM

CAPT DISPLAY mode selector..... OFF | PM

F/O DISPLAY mode selector..... OFF | PM

L2 *Switching the radar and radar display to OFF after landing avoids risk of radiating persons at the gate area.*

Ident.: PRO-NOR-SOP-21-A-00011844.0001001 / 09 NOV 21

Applicable to: ALL

ENG MODE SELECTOR

ENG MODE selector..... NORM | PM

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AFTER LANDING - FLAPS

Ident.: PRO-NOR-SOP-21-A-00011845.0002001 / 09 NOV 21

Applicable to: MSN 07784-07792

FLAPS

FLAPS.....RETRACT | PM

L2

- Set the FLAPS lever to 0.
- If the approach was performed in icing conditions, or if the runway was contaminated with slush or snow, do not retract the flaps until after engine shutdown, and after the ground crew confirmed that flaps and slats are clear of obstruction due to ice.
- On ground, hot weather conditions may cause overheating to be detected around the bleed ducts in the wings, resulting in **AIR L(R) WING LEAK** alert. Such warnings may be avoided during transit by keeping the slats in CONF 1, when the OAT is above 30 °C.

Ident.: PRO-NOR-SOP-21-A-00011845.0001001 / 09 NOV 21

Applicable to: MSN 02155-05746

FLAPS

FLAPS.....RETRACT | PM

L2

- Set the FLAPS lever to 0.
- If the approach was performed in icing conditions, or if the runway was contaminated with slush or snow, do not retract the flaps until after engine shutdown, and after the ground crew confirmed that flaps and slats are clear of obstruction due to ice.
- On ground, hot weather conditions may cause overheating to be detected around the bleed ducts in the wings, resulting in **AIR L (R) WING LEAK** alert. Such warnings may be avoided during transit by keeping the slats in CONF 1, when the OAT is above 30 °C.
- To avoid damage on the RTL (Rudder Travel Limit Unit) mechanical stop, the SLATS/FLAPS should be retracted before all ADIRS are set to OFF simultaneously.

Ident.: PRO-NOR-SOP-21-A-00011846.0001001 / 09 NOV 21

Applicable to: ALL

TCAS

TCAS.....STBY | PM

Ident.: PRO-NOR-SOP-21-A-00011847.0001001 / 09 NOV 21
 Applicable to: **ALL**

ATC

ATC..... AS RQRD

PM

L2 *ATC is set in accordance with airport requirements.*

Ident.: PRO-NOR-SOP-21-A-00011848.0001001 / 24 NOV 23
 Applicable to: **ALL**

APU

APU..... AS RQRD

PM

Note: *In the case of one engine taxi, start the APU before shutting down one engine, in order to provide power to the engine fire extinguisher bottles, and avoid electrical transients and load shedding (e.g. galley and IFE).*

- **If the APU is used:**

APU MASTER SW pb-sw..... ON

PM

APU START pb-sw..... ON

PM

Ident.: PRO-NOR-SOP-21-A-00011849.0005001 / 03 NOV 22
 Applicable to: **ALL**

ANTI ICE

CAUTION

In icing conditions (*Refer to LIM-ICE_RAIN Definition of Icing Conditions*), the flight crew must turn on the engine anti-ice and should not wait until seeing ice building up.

ENG ANTI ICE..... AS RQRD

PM

L2 *If engine anti-ice is used, carefully control taxi speed, particularly on wet or slippery surfaces because ground idle is increased*

Ident.: PRO-NOR-SOP-21-A-00011850.0001001 / 09 NOV 21
 Applicable to: ALL

- BRAKE TEMPERATURE**
- BRAKE TEMPERATURE.....MONITOR | PM
- L2

- Check brake temperature for discrepancies and high temperature on the WHEEL SD page
 - Maintenance action is due in the following cases:

 - The temperature difference between two brakes of a gear is more than 150 °C, and the temperature of one of these brakes is above or equal to 600 °C, or
 - The temperature difference between two brakes of a gear is more than 150 °C, and the temperature of one of these brakes is below or equal to 60 °C, or
 - The difference between the average temperature of the left gear brakes and right brakes is above or equal to 200 °C, or
 - The temperature of one brake exceeds 900 °C.
- L1

BRK FAN pb-sw.....AS RQRD | PM
- L2

When the turnaround time is short or if the temperature of any brake is likely to exceed 500 °C, use the brake fans without delay. In other cases, the flight crew should delay brake fans selection to 5 min after landing, or approaching the gate, whichever occurs first.
 For more information, Refer to FCTM/PR-NP-SOP-270 Use of Brake Fans.

Ident.: PRO-NOR-SOP-21-A-00011851.0001001 / 18 NOV 24
 Applicable to: ALL

- AFTER LANDING CHECKLIST**
- AFTER LANDING C/L.....COMPLETE | BOTH
- L2

Ensure that the after-landing checks are completed, after the aircraft has cleared the runway.

PROCEDURES

NORMAL PROCEDURES

STANDARD OPERATING PROCEDURES - AFTER LANDING

Intentionally left blank

ONE ENGINE TAXI AT ARRIVAL

Ident.: PRO-NOR-SOP-21B-00026831.0005001 / 24 NOV 23
 Applicable to: ALL

- **No less than 3 min after high thrust operations:**
 COOLING TIME ELAPSED.....ANNOUNCE | PM

Note: The flight crew should operate the engines at or near idle thrust for a cooling period of 3 min before engine shutdown, in order to thermally stabilize the engines.

Idle reverse thrust and normal thrust to maneuver during taxi (i.e. at or near idle), are not considered as high thrust operations. Therefore, both of the following applies:

- If the flight crew used idle reverse thrust for landing and normal thrust to maneuver during taxi after landing, the cooling period starts when the flight crew retards the thrust lever during the flare
- If the flight crew used maximum reverse thrust for landing, the cooling period starts when the flight crew sets the thrust lever to idle reverse during the landing rollout.

Before engine shutdown, routine cooling periods that last less than the recommended time, can result in engine degradation.

- **When taxiing in a straight line:**
 ENG 2 SHUTDOWN.....ORDER | PF

Note: During engine shutdown, a slight jerk forward may occur if the brakes are applied while the aircraft is moving.

- L2

APU START pb-sw.....CHECK **AVAIL** | PM
 Before the flight crew shuts down Engine 2, they must check that the **AVAIL** light of the APU START pb-sw is on.

- L1

ENG 2 ANTI ICE pb-sw.....OFF | PM
- ENG 2 MASTER lever.....OFF | PM

CAUTION	If JP4 fuel is used at ambient temperatures higher than 10°C, dry motor the ENG 2 for 2 min after ENG 2 shutdown. This dry motor period should start approximately 90s after the ENG 2 MASTER lever is selected OFF.
----------------	--

- L2

ENGINE 2 PARAMETERS.....CHECK | PM
 Check that the Engine 2 parameters decrease.

- L1

YELLOW ELEC PUMP pb-sw.....ON | PM
- L2

This avoids running the PTU.

PROCEDURES

NORMAL PROCEDURES

STANDARD OPERATING PROCEDURES - ONE ENGINE TAXI AT ARRIVAL

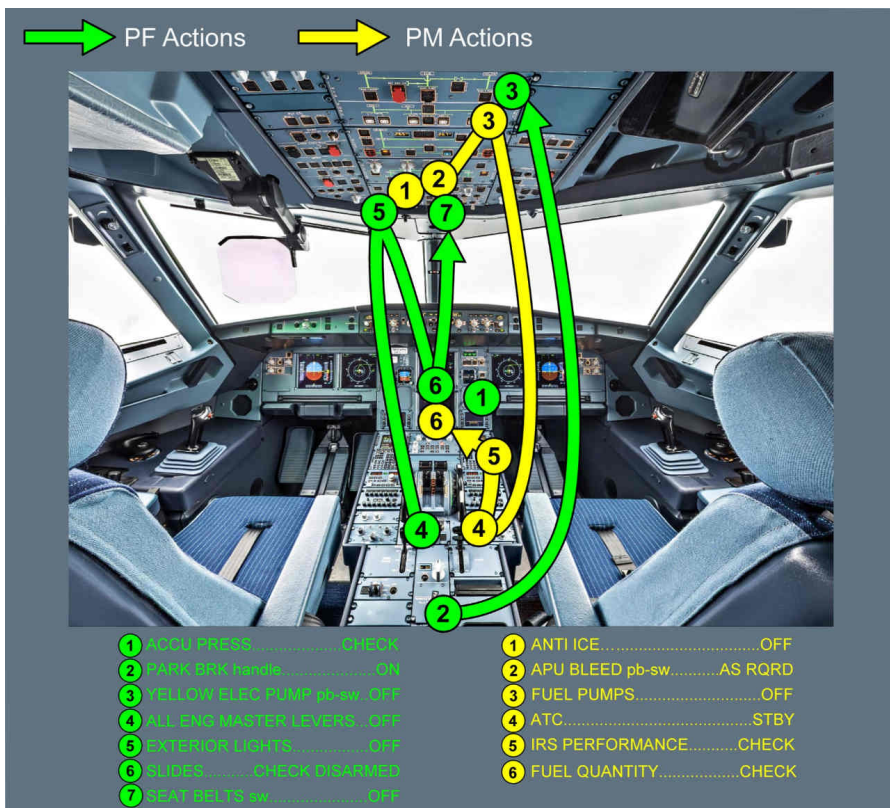
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PARKING

Ident.: PRO-NOR-SOP-22-A-00025015.0001001 / 24 NOV 23

Applicable to: ALL

PARKING FLOW PATTERN



Ident.: PRO-NOR-SOP-22-A-00011853.0003001 / 12 NOV 24

Applicable to: ALL

PARKING BRAKE

ACCU PRESS indicator.....CHECK | PF

- L2** The ACCU PRESS indication must be in the green band. In case of low accumulator pressure, chocks are required before engine 1 shutdown.

PROCEDURES

NORMAL PROCEDURES

STANDARD OPERATING PROCEDURES - PARKING

- L1** PARK BRK handle..... ON | PF
- L2** *If the temperature of one brake is above 500 °C (or above 350 °C with the brake fans  ON), avoid applying the parking brake, unless operationally necessary.*
- L1** BRAKES PRESS indicator.....CHECK | PF

CAUTION Keep the brake pedals pressed, until both needles of the brakes pressure indicator are above the green area, to avoid inadvertent movement of the aircraft.

Ident.: PRO-NOR-SOP-22-A-00011854.0001001 / 09 NOV 21

Applicable to: ALL

ANTI-ICE

ANTI-ICE.....OFF | PM

Ident.: PRO-NOR-SOP-22-A-00011855.0001001 / 24 NOV 23

Applicable to: ALL

APU BLEED

APU BLEED pb-sw..... AS RQRD | PM

- L2** *If the APU is used, set the APU BLEED pb-sw to ON immediately before engine shutdown to prevent engine exhaust fumes from entering the air conditioning.*

Ident.: PRO-NOR-SOP-22-A-00026845.0001001 / 24 NOV 23

Applicable to: ALL

HYDRAULIC

YELLOW ELEC PUMP pb-sw.....OFF | PF

- L2** *In the case of one engine taxi, set the YELLOW ELEC PUMP pb-sw to OFF before Engine 1 shutdown.*

Ident.: PRO-NOR-SOP-22-A-00011856.0004001 / 24 NOV 23

Applicable to: ALL

ENGINES

● If the APU is not used:

EXT PWR pb.....CHECK **AVAIL** | PF

EXT PWR pb..... ON | PF

● If the APU is used:

APU START pb-sw..... CHECK **AVAIL** | PF

- **No less than 3 min after high thrust operations:**
All ENG MASTER levers..... OFF | PF

CAUTION

If JP4 fuel is used at ambient temperatures higher than 10 °C, dry motor the engines for 2 min after engine shutdown. This dry motor period should start approximately 90 s after the flight crew set the ENG MASTER lever to OFF.

L2

The DOOR/OXY SD page is displayed on the lower ECAM display.

L1

Note: The flight crew should operate the engines at or near idle thrust for a cooling period of 3 min before engine shutdown, in order to thermally stabilize the engines.

Idle reverse thrust and normal thrust to maneuver during taxi (i.e. at or near idle), are not considered as high thrust operations. Therefore, both of the following applies:

- If the flight crew used idle reverse thrust for landing and normal thrust to maneuver during taxi after landing, the cooling period starts when the flight crew retards the thrust lever during the flare
- If the flight crew used maximum reverse thrust for landing, the cooling period starts when the flight crew sets the thrust lever to idle reverse during the landing rollout.

Before engine shutdown, routine cooling periods that last less than the recommended time, can result in engine degradation.

ENGINE PARAMETERS..... CHECK | PF

L2

Check that engine parameters decrease.

Ident.: PRO-NOR-SOP-22-A-00011859.0001001 / 09 NOV 21
Applicable to: ALL

EXTERIOR LIGHTS

WING sw.....OFF | PF
BEACON sw..... OFF | PF

L2

Turn off the beacon lights when all engines spooled down.

L1

OTHER EXTERIOR LIGHTS..... AS RQRD | PF

PARKING - FUEL PUMPS

Ident.: PRO-NOR-SOP-22-A-00011862.0001001 / 09 NOV 21
Applicable to: MSN 02155-05746

FUEL

FUEL PUMPS.....OFF | PM

PROCEDURES

NORMAL PROCEDURES

STANDARD OPERATING PROCEDURES - PARKING

Ident.: PRO-NOR-SOP-22-A-00011862.0002001 / 09 NOV 21

Applicable to: MSN 07784-07792

FUEL

FUEL PUMPS/ CTR XFR VALVES.....OFF | PM

L2 Switch off the fuel pumps and the center tank transfer valves.

Ident.: PRO-NOR-SOP-22-A-00011858.0001001 / 09 NOV 21

Applicable to: ALL

SLIDES

SLIDES.....CHECK DISARMED | PF

 L2 Check slides disarmed on the DOOR/OXY SD page. Warn the cabin crew, if any slide is not disarmed.

Ident.: PRO-NOR-SOP-22-A-00011864.0001001 / 09 NOV 21

Applicable to: ALL

ATC

ATC.....STBY | PM

Ident.: PRO-NOR-SOP-22-A-00011860.0001001 / 09 NOV 21

Applicable to: ALL

SEAT BELTS

SEAT BELTS sw.....OFF | PF

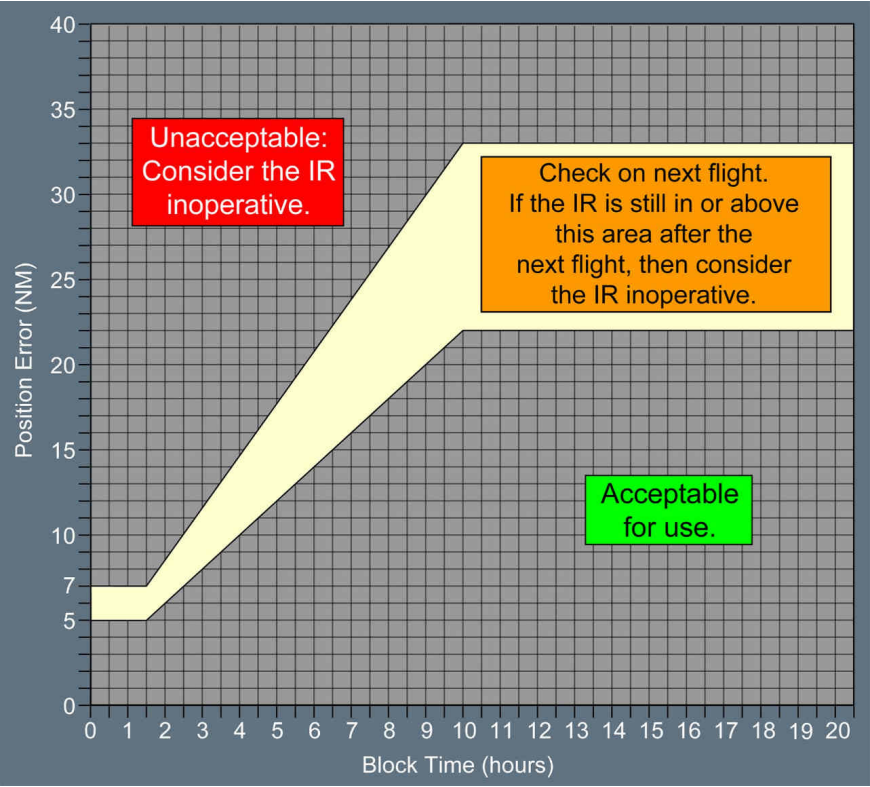
Ident.: PRO-NOR-SOP-22-A-00011865.0001001 / 24 NOV 23

Applicable to: ALL

IRS PERFORMANCE

IRS PERFORMANCE.....CHECK | PM

 On the POSITION/MONITOR page, check that the deviation does not exceed the following:



Note: *The block time is equal to the accumulated block times, for each flight performed, since the last IRS alignment.*

Ident.: PRO-NOR-SOP-22-A-00011857.0001001 / 09 NOV 21
Applicable to: ALL

GROUND CONTACT

GROUND CONTACT.....ESTABLISH | PF

- L2
- The flight crew should establish communication with the ground crew
 - Check that chocks are in place.

PROCEDURES

NORMAL PROCEDURES

STANDARD OPERATING PROCEDURES - PARKING

Ident.: PRO-NOR-SOP-22-A-00011866.0001001 / 09 NOV 21

Applicable to: ALL

FUEL QUANTITY

FUEL QUANTITY.....CHECK | PM

- L2** Check that the sum of the fuel on board and the fuel used is consistent with the fuel on board at departure. If the flight crew detects a discrepancy that is not usual, maintenance action is due.

Ident.: PRO-NOR-SOP-22-A-00011869.0002001 / 03 NOV 22

Applicable to: ALL

PARKING BRK

PARK BRK handle.....AS RQRD | PF

- L2** The parking brake should be released after chocks are in place, if a temperature of one brake is above 300 °C (or above 150 °C with brake fans  ON).
 Releasing the parking brake prevents the critical structures from being exposed to high temperature levels for an extended time. However, if operational conditions require (e.g. slippery tarmac), the parking brake may remain applied.
 The flight crew should not press the brake pedals before releasing the parking brake. However, the flight crew must be prepared to press the brake pedals after parking brake release, if necessary.
 When parking with a flat tire on the nose gear, keep the parking brake on, to avoid aircraft yawing at parking brake release.

Ident.: PRO-NOR-SOP-22-A-00011868.0001001 / 05 MAY 22

Applicable to: ALL

BRAKE FANS

 BRK FAN  pb.....AS RQRD | PM

- L2** Turn off the brake fans when they are no longer necessary.

Ident.: PRO-NOR-SOP-22-A-00011873.0001001 / 18 NOV 24

Applicable to: ALL

PARKING CHECKLIST

PARKING C/L.....COMPLETE | BOTH

Ident.: PRO-NOR-SOP-22-A-00022328.0001001 / 03 NOV 22

Applicable to: ALL

LOGBOOK

STATUS page.....CHECK | CM1

- L2** Press the STS pb (ECAM control panel).

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES STANDARD OPERATING PROCEDURES - PARKING
--	--

L1

LOGBOOK.....COMPLETE

|

CM1

L2

Complete the logbook according to the STATUS page.

Ident.: PRO-NOR-SOP-22-A-00014395.0001001 / 14 NOV 24
Applicable to: ALL

EFB

ALL EFB transmitting mode.....AS RQRD

|

PF-PM

L2

In accordance with the Operator's policy or as required by operational regulations.

L1

EFB.....CLOSE FLIGHT

|

PF-PM

Ident.: PRO-NOR-SOP-22-A-00011874.0001001 / 13 AUG 10
Applicable to: ALL

REPORT SEVERE ICING CONDITIONS

Report severe icing conditions in the log book, requiring inspections of the fan accoustic panels of the engines during the walkaround.

Ident.: PRO-NOR-SOP-22-A-00011870.0001001 / 09 NOV 21
Applicable to: ALL

DISPLAY UNITS

DUs.....DIM

|

PF-PM

L2

Dim EFIS, ECAM and MCDU display units.

PROCEDURES

NORMAL PROCEDURES

STANDARD OPERATING PROCEDURES - PARKING

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SECURING THE AIRCRAFT

Ident.: PRO-NOR-SOP-23-A-00010336.0001001 / 09 NOV 21 Applicable to: ALL
--

GENERAL

The flight crew should apply the following procedure as per company policy, when the last passenger left the aircraft and the securing of the aircraft is intended.

Airbus recommends performing the following procedure when the aircraft is left unattended: i.e. no qualified flight crew or ground crew are in the cockpit to supervise and monitor the aircraft systems.

Prior to performing this check, the following SUP Adverse Weather procedures should be taken into account when appropriate:

- Securing the aircraft for cold soak (*Refer to PRO-NOR-SUP-ADVWXR Securing the Aircraft for Cold Soak*).
- Water system draining (*Refer to PRO-NOR-SUP-ADVWXR For Draining Water Procedure - Introduction*).
- Ground operations in heavy rain (*Refer to PRO-NOR-SUP-ADVWXR Ground Operations in Heavy Rain*).
- Operations on contaminated airports (*Refer to PRO-NOR-SUP-ADVWXR Parking*).
- Operations with volcanic ash, sand or dust (*Refer to PRO-NOR-SUP-ADVWXR Securing the Aircraft*).

Ident.: PRO-NOR-SOP-23-A-00010337.0001001 / 22 NOV 21 Applicable to: ALL
--

PARK BRK

PARK BRK handle..... CHECK ON | CM1

 *Keep the parking brake on to reduce hydraulic leak rate in the brake accumulator.*

Ident.: PRO-NOR-SOP-23-A-00010338.0001001 / 09 NOV 21 Applicable to: ALL
--

OXYGEN CREW SUPPLY

OXYGEN CREW SUPPLY pb.....OFF | CM2

Ident.: PRO-NOR-SOP-23-A-00010339.0001001 / 09 NOV 21

Applicable to: ALL

ADIRS

All IR MODE selectors..... OFF | CM1

L2 After the shutdown off the ADIRS, wait at least 10 s before turning off the electrical supply, in order to ensure that the ADIRS memorize the latest data.

Ident.: PRO-NOR-SOP-23-A-00010340.0001001 / 09 NOV 21

Applicable to: ALL

EXTERIOR LIGHTS

EXTERIOR LIGHTS..... OFF | CM2

Ident.: PRO-NOR-SOP-23-A-00010341.0001001 / 09 NOV 21

Applicable to: ALL

MAINTENANCE BUS

MAINT BUS sw..... AS RQRD | CM2

L2 Should electrical power be required for the crew or servicing personnel, consider setting the overhead MAINT BUS sw (in the forward cabin) to the ON position, prior to setting aircraft power to off.

Ident.: PRO-NOR-SOP-23-A-00010342.0001001 / 09 NOV 21

Applicable to: ALL

APU BLEED

APU BLEED pb-sw..... OFF | CM2

Ident.: PRO-NOR-SOP-23-A-00010344.0001001 / 09 NOV 21

Applicable to: ALL

EXTERNAL POWER

EXT PWR pb..... AS RQRD | CM2

Ident.: PRO-NOR-SOP-23-A-00024947.0001001 / 09 NOV 21

Applicable to: ALL

APU

APU MASTER SW pb-sw..... OFF | CM2

L2 Turn off the APU after all passengers disembarked.

SECURING THE AIRCRAFT - EMER LIGHTS AND SIGNS

Ident.: PRO-NOR-SOP-23-A-00010343.0001001 / 14 NOV 23

Applicable to: MSN 02155-05746

EMER LIGHTS AND SIGNS

EMER EXIT LT sw.....	OFF	CM2
SIGNS sw.....	OFF	CM2

Ident.: PRO-NOR-SOP-23-A-00010343.0004001 / 09 NOV 21

Applicable to: MSN 07784-07792

EMER LIGHTS AND SIGNS

EMER EXIT LT sw.....	OFF	CM2
NO PORTABLE/ELEC DEVICE sw.....	OFF	CM2

Ident.: PRO-NOR-SOP-23-A-00010345.0001001 / 09 NOV 21

Applicable to: ALL

BAT

BAT 1 pb-sw and BAT 2 pb-sw.....	OFF	CM2
----------------------------------	-----	-----

L2

Wait until the APU flap is fully closed (about 2 min after the APU AVAIL light goes out) before switching off the batteries. Switching the batteries off before the APU flap is closed may cause smoke in the cabin during the next flight.
 If the batteries are off while the APU is running, APU fire extinguishing is not available.

Ident.: PRO-NOR-SOP-23-A-00026355.0001001 / 24 NOV 23

Applicable to: ALL

WINDOWS

WINDOWS.....	CHECK CLOSED	CM1-CM2
--------------	--------------	---------

L2

To ensure that the sliding window is correctly closed and locked, push the handle of the sliding window fully forward to the closed position, and verify that the red indicator is visible.

Ident.: PRO-NOR-SOP-23-A-00010346.0001001 / 06 NOV 25

Applicable to: ALL

1 SECURING THE AIRCRAFT CHECKLIST

SECURING THE AIRCRAFT C/L.....	COMPLETE	CM2
--------------------------------	----------	-----

Ident.: PRO-NOR-SOP-23-A-00014412.0001001 / 06 NOV 25
Applicable to: ALL

2 **ELECTRONIC FLIGHT BAG**

EFB APPLICATIONS.....	CLOSE	CM1-CM2
ALL EFB.....	SWITCH OFF	CM1-CM2

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--	--

COMMUNICATIONS AND STANDARD TERMS

Ident.: PRO-NOR-SCO-00011900.0001001 / 13 AUG 10

Applicable to: ALL

Standard phraseology is essential to ensure effective crew communication. The phraseology should be concise and exact. The following Chapter lists the callouts that should be used as standard. They supplement the callouts identified in the SOP.

These standard Airbus callouts are also designed to promote situational awareness, and to ensure crew understanding of systems and their use in line operation.

CHECKLIST CALLOUTS

Ident.: PRO-NOR-SCO-00011901.0001001 / 06 NOV 25

Applicable to: ALL

- “CHECK”: A command for the other pilot to check an item.
- “CHECKED”: A response that an item has been checked.

If a checklist needs to be interrupted, announce: “HOLD CHECKLIST AT ____” and “RESUME CHECKLIST AT ____” for the continuation.

Upon completion of a checklist announce: “__CHECKLIST COMPLETE”.

ACTIONS COMMANDED BY PF

Applicable to: ALL

Ident.: PRO-NOR-SCO-A-00011902.0001001 / 13 AUG 10

GENERAL

The following commands do not necessarily initiate a guidance mode change, eg.: selected to managed/managed to selected. The intent is to ensure clear, consistent, standard communication between crewmembers.

All actions performed on the FCU and MCDU must be checked on the PFD and ND (eg.: “FL 350 blue”, “FL 200 magenta”). Ensure that the correct FCU knob is used, then verify indications on the PFD/ND.

Ident.: PRO-NOR-SCO-A-00011904.0001001 / 09 JUN 15

SET

The “SET” command means using an FCU knob to set a value, but not to change a mode. SET is accomplished by only rotating the appropriate selection knob.

PROCEDURES**NORMAL PROCEDURES**

STANDARD CALLOUTS

Example:

- "SET GO AROUND ALTITUDE __ FT"
- "SET FL __"
- "SET HDG __"

Ident.: PRO-NOR-SCO-A-00011905.0001001 / 20 DEC 10

MANAGE/PULL

The "MANAGE" command means pushing an FCU knob to engage, or arm, a managed mode or target.

The "PULL" command means pulling an FCU knob to engage a selected mode or target. Example:

- "PULL HDG 090" (HDG/TRK knob is pulled and turned).
- "MANAGE NAV" (HDG/TRK knob is pushed).
- "FL 190 PULL" (ALT knob is turned and pulled).
- "FL 190 MANAGE" (ALT knob is turned and pushed).
- "PULL SPEED 250 KNOTS" (SPD/MACH knob is pulled and turned).
- "MANAGE SPEED" (SPD/MACH knob is pushed).

*Note: If the value was previously set, there is no requirement to repeat the figure.
Simply call e.g. PULL HDG: PULL SPEED: FL PULL.*

The VS/FPA knob has no managed function. The standard callouts for the use of this knob are as follows:

V/S Plus (or Minus) 700 PULL, or

FPA Minus 3 ° PULL (V/S/FPA knob is turned and pulled)

PUSH TO LEVEL OFF (V/S/FPA knob is pushed)

Ident.: PRO-NOR-SCO-A-00011906.0001001 / 13 AUG 10

ARM

The "ARM __" command means arming a system by pushing the specified FCU button.

e.g. : "ARM APPROACH"

e.g. : "ARM LOC."

Ident.: PRO-NOR-SCO-A-00011907.0001001 / 13 AUG 10

ON/OFF

The simple ON or OFF command is used for the autopilot, flight directors, autothrust and the bird (flight path vector).

e.g.: BIRD ON (The HDG-V/S / TRK-FPA pb is pushed.)

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--	--

FMA

Ident.: PRO-NOR-SCO-00011908.0001001 / 23 DEC 14

Applicable to: ALL

The PF should call out any FMA change, unless specified differently (e.g. CAT II & III task sharing).

Therefore, the PF should announce:

- All armed modes with the associated color (e.g. blue, magenta): "G/S blue", "LOC blue".
- All active modes without the associated color (e.g. green, white): "NAV", "ALT".

The PM should check and respond, "CHECKED" to all FMA changes called out by the PF.

ALTITUDE

Ident.: PRO-NOR-SCO-00011909.0001001 / 23 DEC 14

Applicable to: ALL

The PM calls out "one thousand to go" when passing 1 000 ft before the cleared altitude or FL, and the PF calls out "checked".

FLAPS OR GEAR CALLOUTS

Applicable to: ALL

Ident.: PRO-NOR-SCO-B-00011910.0001001 / 23 DEC 14

FLAPS' CALLOUTS

FLAPS' CONFIGURATION	CALLOUT
1	"FLAPS ONE"
1 + F	"FLAPS ONE"
0	"FLAPS ZERO"

The reply will be given when selecting the new flap position.

e.g.:

	CALLOUT	REMARK
PF	"FLAPS ONE"	
PM	"SPEED CHECKED"	PM checks the speed: - Above the S or F speed and accelerating (Takeoff) - Below VFE next and decelerating (Approach)
	"FLAPS ONE"	PM selects the FLAPS lever position and replies after checking the blue number on the ECAM flaps indicator to confirm the correct selection has been made.

PROCEDURES

NORMAL PROCEDURES

STANDARD CALLOUTS

Ident.: PRO-NOR-SCO-B-00011911.0001001 / 23 DEC 14

GEAR CALLOUTS

	CALLOUT	REMARKS
PF	"GEAR UP (DOWN)"	
PM	"GEAR UP (DOWN)"	The PM selects the L/G lever position and replies after checking the red lights on the LDG GEAR indicator to confirm gear operation.

FLIGHT PARAMETERS

Applicable to: ALL

Ident.: PRO-NOR-SCO-C-00011912.0001001 / 14 NOV 24

APPROACH

During approach, the PM announces:

- "SPEED" if the speed decreases below the speed target -5 kt or increases above the speed target +10 kt.
- "SINK RATE" when the descent rate exceeds 1 000 ft/min
- "BANK" when bank angle becomes greater than 7 °
- "PITCH" when pitch attitude becomes lower than -2.5 ° or higher than +10 °
- "LOC" or "GLIDE" when either localizer or glide slope deviation is:
 - ½ dot LOC
 - ½ dot G/S.
- "CROSS TRACK" when the XTK is greater than 0.1 NM
- "V/DEV" when the vertical deviation is greater than ½ dot
- "COURSE" when greater than ½ dot or 2.5 ° (VOR) or 5 ° (ADF ).
- "___ FT HIGH (LOW)" at altitude checks points.

Note: The PM announces the attitude deviations until landing.

Ident.: PRO-NOR-SCO-C-00021570.0001001 / 22 MAR 17

LANDING

During landing, the PM announces:

- "PITCH PITCH", if the pitch attitude approaches the tail strike pitch limit indicator , or reaches 10 °
- "BANK BANK", if the bank angle reaches 7 °.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES STANDARD CALLOUTS
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Ident.: PRO-NOR-SCO-C-00011913.0001001 / 22 MAR 17

GO-AROUND

During a go-around, the PM announces:

- "BANK", if the bank angle becomes greater than 7 °
- "PITCH", if the pitch attitude becomes greater than 20 ° up or less than 10 ° up
- "SINK RATE", if there is no climb rate.

PF/PM DUTIES TRANSFER

Ident.: PRO-NOR-SCO-00011914.0001001 / 23 DEC 14

Applicable to: ALL

To transfer control, flight crewmembers must use the following callouts:

- To give control: The pilot calls out "YOU HAVE CONTROL". The other pilot accepts this transfer by calling out "I HAVE CONTROL", before assuming PF duties.
- To take control: The pilot calls out "I HAVE CONTROL". The other pilot accepts this transfer by calling out "YOU HAVE CONTROL", before assuming PM duties.

SUMMARY FOR EACH PHASE

Ident.: PRO-NOR-SCO-D-00011917.0001001 / 23 DEC 14

Applicable to: ALL

TO REMOVE GROUND SUPPLY		
EVENT	PF or PM	GND Mech
Initial ground contact	GROUND (from) COCKPIT	COCKPIT (from) GROUND
External __ disconnection	REMOVE EXTERNAL __	EXTERNAL__ REMOVED

Ident.: PRO-NOR-SCO-D-00011919.0001001 / 22 NOV 21

Applicable to: ALL

PUSHBACK/ENGINE START		
EVENT	PF	GND Mech.
When ready for pushback, and pushback clearance received from ATC	GROUND (from) COCKPIT, CLEARED FOR PUSH	COCKPIT (from) GROUND, RELEASE BRAKES
Start of push	BRAKES RELEASED READY TO PUSH	
When ready to start engines	CLEAR TO START ? STARTING ENG(S)__	CLEAR TO START

Continued on the following page

PROCEDURES

NORMAL PROCEDURES

STANDARD CALLOUTS

Continued from the previous page

PUSHBACK/ENGINE START		
EVENT	PF	GND Mech.
When pushback completed	BRAKES SET	SET BRAKES
When ready to disconnect (after engine started, and parameters are stabilized)	CLEAR TO DISCONNECT (hand signals on left/right)	DISCONNECTING (hand signals on left/right)

SUMMARY FOR EACH PHASE - TAXI

Ident.: PRO-NOR-SCO-D-00011921.0001001 / 22 NOV 21

Applicable to: MSN 02155-02212

TAXI		
EVENT	PF	PM
When taxi clearance obtained	CLEAR LEFT (RIGHT) SIDE	CLEAR RIGHT (LEFT) SIDE
Brake transfer check	BRAKE CHECK	PRESSURE ZERO
Flight control check (can be done before start of taxi)	FLIGHT CONTROL CHECK	
1. Elevators		FULL UP, FULL DOWN, NEUTRAL
2. Ailerons/Spoilers		FULL LEFT, FULL RIGHT, NEUTRAL
3. Rudder ⁽¹⁾	RUDDER	FULL LEFT, FULL RIGHT, NEUTRAL

⁽¹⁾ The PM should follow pedal movement with his/her feet

Ident.: PRO-NOR-SCO-D-00011921.0002001 / 22 NOV 21

Applicable to: MSN 02719-07792

TAXI		
EVENT	PF	PM
When taxi clearance obtained	CLEAR LEFT (RIGHT) SIDE	CLEAR RIGHT (LEFT) SIDE
Brake check	BRAKE CHECK	
Flight control check (the check is possible before the start of taxi)	FLIGHT CONTROL CHECK	
1. Elevators		FULL UP, FULL DOWN, NEUTRAL
2. Ailerons/Spoilers		FULL LEFT, FULL RIGHT, NEUTRAL
3. Rudder ⁽¹⁾	RUDDER	FULL LEFT, FULL RIGHT, NEUTRAL

⁽¹⁾ The PM should follow pedal movement with his/her feet

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES STANDARD CALLOUTS
--	---

Ident.: PRO-NOR-SCO-D-00011922.0001001 / 09 NOV 21

Applicable to: ALL

EVENT	TAKEOFF	
	PF	PM
Setting thrust levers to initial stabilization value	TAKEOFF	
Before passing 80 kt		THRUST SET
At 100 kt	CHECKED	ONE HUNDRED KNOTS
At V1		V1
At VR		ROTATE
Gear retraction	GEAR UP	POSITIVE CLIMB
		GEAR UP
If AP is engaged by PM	AP 1(2) ON	

Ident.: PRO-NOR-SCO-D-00011924.0001001 / 10 MAY 22

Applicable to: ALL

ALTIMETER SETTING CHANGES TO/FROM QNH/QFE-STD		
EVENT	PF	PM
Barometric setting change and subsequent altimeter cross-check	SET STANDARD (SET QNH/QFE)	STANDARD (QNH/QFE) CROSS-CHECKED PASSING FL__(__FT) NOW
	CHECKED	

²Ident.: PRO-NOR-SCO-D-00011925.0002001 / 12 NOV 24

Applicable to: ALL

APPROACH AND LANDING		
EVENT	PF	PM
Activation of approach Phase	ACTIVATE APPROACH PHASE	APPROACH PHASE ACTIVATED
RA alive	CHECKED	RADIO ALTIMETER ALIVE ^{(1)/(2)}

Continued on the following page

PROCEDURES

NORMAL PROCEDURES

STANDARD CALLOUTS

Continued from the previous page

APPROACH AND LANDING		
EVENT	PF	PM
At F-G/S*, G/S*, FINAL APP or below the go-around altitude for approach with FPA guidance	● If the PF requests the PM to set the go-around altitude: SET GA ALTITUDE_FT	GA ALTITUDE_SET
	● If the PF sets the go-around altitude: GA ALTITUDE_SET	CHECKED
FDP	CHECKED	PASSING__(Fix Name),__ FT,
1 000 ft RA	CHECKED	ONE THOUSAND ⁽²⁾
100 ft above MDA/DH	CHECKED	ONE HUNDRED ABOVE ⁽²⁾
MDA/DH visual reference ⁽⁶⁾	CONTINUE	MINIMUM ⁽²⁾
MDA/DH no visual reference ⁽⁶⁾	GO AROUND-FLAPS	MINIMUM ⁽²⁾
100 ft RA		ONE HUNDRED ⁽²⁾
50 ft RA		FIFTY ⁽²⁾
After touchdown		
Ground spoilers extended		SPOILERS ⁽³⁾
REV green on EWD		REVERSE GREEN ⁽⁴⁾
Deceleration		DECEL ⁽⁵⁾
Autobrake disengagement	MANUAL BRAKING ⁽⁷⁾	AUTOBRAKE OFF ⁽²⁾⁽⁸⁾

Continued on the following page

Continued from the previous page

APPROACH AND LANDING		
EVENT	PF	PM
At 70 kt	CHECKED	SEVENTY KNOTS

- (1) *Flight crew awareness, flight crew should now keep RA in scan to landing.*
- (2) *PM monitors pin-programmed auto callout, or announces if inoperative.*
- (3) *If the spoilers are not extended, call NO SPOILERS.*
- (4) *If the reverse deployment is not as expected, call NO REVERSE ENGINE__ or NO REVERSE, as appropriate.*
- (5) *DECEL callout means that the deceleration is felt by the flight crew, and confirmed by the speed trend on the PFD. If no positive deceleration, NO DECEL.*
- (6) *In the case of circling approach, this callout should be performed at the latest, at the MAP.*
- (7) *PF announces MANUAL BRAKING when using the brake pedals if:*
 - *Autobrake was selected for the landing, and*
 - *No AUTOBRAKE OFF callout.*
- (8) *PM announces AUTOBRAKE OFF if:*
 - *Autobrake does not engage as expected or autobrake disengages, and*
 - *No MANUAL BRAKING callout from the PF.*

Ident.: PRO-NOR-SCO-D-00015353.0001001 / 23 DEC 14

Applicable to: ALL

DISCONTINUED APPROACH		
EVENT	PF	PM
DISCONTINUED APPROACH decision	CANCEL APPROACH	

Ident.: PRO-NOR-SCO-D-00011926.0001001 / 09 NOV 21

Applicable to: ALL

GO AROUND		
EVENT	PF	PM
GO AROUND decision	GO AROUND - FLAPS	
Flaps retraction		FLAPS__
Gear retraction	GEAR UP	POSITIVE CLIMB
		GEAR UP

PROCEDURES

NORMAL PROCEDURES

STANDARD CALLOUTS

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES TASKSHARING
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GENERAL INFORMATION

Ident.: PRO-NOR-TSK-00028178.0001001 / 18 NOV 24

Applicable to: ALL

The Airbus policy about the crew resource management includes three cases : PF or PM, PF-PM or BOTH.

PF OR PM

PF or PM is used for individual actions. The actions should be completed by a single crew member, the PF or the PM. This rule also applies for CM1 or CM2.

PF		PM	
DESCENT	INITIATE	● At FL 380: PACK FLOW AS RQRD	
MCDU	PROG/PERF DESCENT	MCDU	F-PLN
DESCENT	MONITOR/ADJUST		

PF or PM items are displayed either in the PF or the PM column

Not for operational use

PF-PM

PF-PM means that the PF and the PM perform the same action, but not necessarily simultaneously. This rule also applies for CM1-CM2.

CM1		CM2	
AIRFIELD DATA	OBTAIN	AIRFIELD DATA	OBTAIN
MEL/CDL ITEMS	CHECK	MEL/CDL ITEMS	CHECK
PRELIM T.O PERF DATA	COMPUTE	PRELIM T.O PERF DATA	COMPUTE

PF-PM items are displayed in the PF and the PM columns

Not for operational use

BOTH

BOTH means both pilots are doing the same action at the same time, because there is a need to coordinate or share what is done.

PROCEDURES

NORMAL PROCEDURES

TASKSHARING

CM1	CM2
LOGBOOK AND MEL/CDL ITEMS	CHECK
AIRCRAFT CONFIGURATION SUMMARY	CHECK
OEB	CHECK

BOTH items are displayed in a single row

Not for operational use

SAFETY EXTERIOR INSPECTION

Ident.: PRO-NOR-TSK-00024892.0001001 / 03 NOV 22

Applicable to: **ALL**

CM1	CM2
	WHEEL CHOCKS.....CHECK
	L/G DOORS.....CHECK POSITION
	APU AREA.....CHECK

PRELIMINARY COCKPIT PREPARATION

Ident.: PRO-NOR-TSK-A-00024971.0001001 / 22 NOV 21

Applicable to: **ALL**

AIRCRAFT SETUP:	
CM1	CM2
	ENG 1, 2 MASTER LEVERS..... OFF
	ENG MODE selector..... NORM
	* WEATHER RADAR..... OFF
	* WINDSHEAR/PWS  sw..... OFF
	L/G lever..... DOWN
	Both WIPER selectors..... OFF

Ident.: PRO-NOR-TSK-A-00024972.0001001 / 22 NOV 21

Applicable to: **ALL**

BATTERIES/EXTERNAL POWER:	
CM1	CM2
	BAT..... CHECK/AUTO
	EXT PWR pb..... ON

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES TASKSHARING
--	--

Ident.: PRO-NOR-TSK-A-00024976.0001001 / 06 NOV 25

Applicable to: ALL

1

APU FIRE TEST/APU START:	
CM1	CM2
	RMP 1 and 2.....CHECK ON/SET
	ACP.....CHECK ON/SET
	APU FIRE TEST.....PERFORM
	APU.....START
	•When the APU is AVAIL: AIR COND panel.....SET
	* EXT PWR pb.....AS RQRD

Ident.: PRO-NOR-TSK-A-00024978.0001001 / 24 NOV 23

Applicable to: ALL

ADIRS:	
CM1	CM2
	* ALL IR MODE selector.....NAV

Ident.: PRO-NOR-TSK-A-00024973.0001001 / 22 NOV 21

Applicable to: ALL

COCKPIT LIGHTS:	
CM1	CM2
* COCKPIT LIGHTS.....AS RQRD	* COCKPIT LIGHTS.....AS RQRD

Ident.: PRO-NOR-TSK-A-00026701.0001001 / 07 NOV 25

Applicable to: ALL

2

3

EFB/ACARS < > /AOC < > INITIALIZATION:	
CM1	CM2
All EFB.....START	All EFB.....START
EFB Version and Database.....CHECK	EFB Version and Database.....CHECK
* ACARS/AOC.....INITIALIZE	
•For operations with the ACARS < > /AOC < > or the EFB (when a synchronization with the avionics is available):	
FMGS PRE-INITIALIZATION:	
* ENGINE & AIRCRAFT TYPE.....CHECK	
* DATABASE VALID.....CHECK	
* FLT NBR & FROM/TO.....INSERT/CHECK	
* EFB.....INITIALIZE	* EFB.....INITIALIZE

PROCEDURES

NORMAL PROCEDURES

TASKSHARING

Ident.: PRO-NOR-TSK-A-00024975.0001001 / 24 NOV 23

Applicable to: ALL

AIRCRAFT ACCEPTANCE:	
CM1	CM2
* RCL pb.....PRESS 3 s	
* LOGBOOK AND MEL/CDL ITEMS.....	CHECK
AIRCRAFT CONFIGURATION SUMMARY.....	CHECK
* OEB.....	CHECK
* AIRCRAFT ACCEPTANCE.....	PERFORM

Ident.: PRO-NOR-TSK-A-00024977.0001001 / 14 NOV 24

Applicable to: ALL

PRELIMINARY PERFORMANCE DETERMINATION:	
CM1	CM2
* AIRFIELD DATA .....OBTAIN	* AIRFIELD DATA .....OBTAIN
•If an EFB application for load and trim sheet is used:	
* PRELIMINARY LOADING..... COMPUTE/CROSSCHECK	* PRELIMINARY LOADING..... COMPUTE/CROSSCHECK
* MEL/CDL ITEMS.....CHECK	* MEL/CDL ITEMS.....CHECK
* NAVIGATION CHARTS.....	PREPARE
* PRELIM T.O PERF DATA.....COMPUTE	* PRELIM T.O PERF DATA.....COMPUTE
* PRELIM T.O PERF DATA.....	CROSSCHECK

PRELIMINARY COCKPIT PREPARATION - BEFORE WALKAROUND

Ident.: PRO-NOR-TSK-A-00024979.0002001 / 17 MAY 22

Applicable to: MSN 02719-07792

BEFORE WALKAROUND:	
PF	PM
	* ECAM OXY PRESS/HYD QTY/ENG OIL QTY..... CHECK
	FLAPS..... CHECK POSITION
	* SPEED BRAKE lever..... CHECK RET AND DISARMED
	* ACCU PRESS..... CHECK
	* PARK BRK handle..... ON
	* BRAKES PRESS indicator..... CHECK
	EMER EQPT CHECK
	RAIN REPELLENT  CHECK
	C/B PANELS..... CHECK
	* GEAR PINS.....CHECK ONBOARD/STOWED
	* EXTERIOR WALKAROUND.....PERFORM

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES TASKSHARING
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Ident.: PRO-NOR-TSK-A-00024979.0001001 / 17 MAY 22

Applicable to: MSN 02155-02212

BEFORE WALKAROUND:	
PF	PM
	* ECAM OXY PRESS/HYD QTY/ENG OIL QTY..... CHECK
	FLAPS..... CHECK POSITION
	* SPEED BRAKE lever..... CHECK RET AND DISARMED
	* ACCU PRESS.....CHECK
	* PARK BRK handle..... ON
	* BRAKES PRESS indicator.....CHECK
	ALTN BRAKING..... CHECK
	EMER EQPT.....CHECK
	RAIN REPELLENT  CHECK
	C/B PANELS.....CHECK
	* GEAR PINS .....CHECK ONBOARD/STOWED
	* EXTERIOR WALKAROUND.....PERFORM

COCKPIT PREPARATION

Ident.: PRO-NOR-TSK-B-00024980.0001001 / 17 MAY 24

Applicable to: ALL

OVERHEAD PANEL:	
PF	PM
As a general rule, during the scan sequence:	
* All white lights (except MAINTENANCE panel)..... OFF	
* RCDR GND CTL pb-sw..... ON	
CVR TEST pb..... PRESS and MAINTAIN	
CAPT & PURS/CAPT sw.....AS RQRD	
EXTERIOR LIGHTS..... SET	
* SIGNS panel.....SET	
PROBE/WINDOW HEAT pb-sw.....AUTO	
LDG ELEV.....AUTO	
* PACK FLOW.....AS RQRD	
ELEC panel.....CHECK	
BAT..... CHECK	
* FUEL CTR TK MODE SEL pb-sw.....CHECK AUTO	
ENG FIRE.....CHECK/TEST	
AUDIO SWITCHING.....NORM	
CARGO AIR COND panel.....AS RQRD	

Continued on the following page

Continued from the previous page
OVERHEAD PANEL:

PF	PM
PA (3rd occupant).....RECEPT	
MAINT panel.....CHECK	

Ident.: PRO-NOR-TSK-B-00024981.0001001 / 09 NOV 21

 Applicable to: **ALL**
CTR INSTRUMENT PANEL:

PF	PM
* ISIS/STBY INSTRUMENTS..... CHECK	
* CLOCK..... CHECK/SET	
* A/SKID & N/W STRG sw..... ON	

COCKPIT PREPARATION - PEDESTAL

Ident.: PRO-NOR-TSK-B-00024982.0001001 / 06 NOV 25

 Applicable to: **MSN 02155-02212, 02926-02944, 04392**
PEDESTAL:

PF	PM
RMP..... CHECK ON/SET	
ACP..... CHECK ON/SET	
* COCKPIT DOOR sw..... NORM	
SWITCHING PANEL..... NORM	
* THRUST levers.....IDLE	
* ENG MASTER levers.....OFF	
* ENG MODE selector..... NORM	
* ACCU PRESS.....CHECK	
* PARK BRK handle..... CHECK ON	
* BRAKES PRESS..... CHECK	
GRAVITY GEAR EXTN..... CHECK STOWED	
* ATC.....STBY	
* TCAS..... STBY	
ALT RPTG..... ON	
* ATC SYS 1/2..... SELECT	
* FMS..... PREPARE	
	* FMS PREPARATION..... CROSSCHECK
	* EFB/MCDU GREEN DOT..... COMPARE

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES TASKSHARING
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Ident.: PRO-NOR-TSK-B-00024982.0003001 / 06 NOV 25
Applicable to: MSN 02719-02789, 03031-03060, 05152-07792

5

PEDESTAL:	
PF	PM
RMP.....CHECK ON/SET	
ACP.....CHECK ON/SET	
* COCKPIT DOOR sw.....NORM	
SWITCHING PANEL..... NORM	
* THRUST levers.....IDLE	
* ENG MASTER levers..... OFF	
* ENG MODE selector.....NORM	
* ACCU PRESS.....CHECK	
* PARK BRK handle.....CHECK ON	
* BRAKES PRESS.....CHECK	
GRAVITY GEAR EXTN.....CHECK STOWED	
* ATC.....STBY	
* TCAS.....STBY	
ALT RPTG.....ON	
* ATC SYS 1/2.....SELECT	
* MSG RECORD (MCDU).....ERASE	
* FMS.....PREPARE	
	* FMS PREPARATION.....CROSSCHECK
	* EFB/MCDU GREEN DOT.....COMPARE

Ident.: PRO-NOR-TSK-B-00024992.0003001 / 14 NOV 23
Applicable to: ALL

GLARESHIELD:	
PF	PM
•When both flight crewmembers are seated: * BAROMETRIC REFERENCE.....SET/CROSSCHECK	
* FD.....CHECK ON	* FD.....CHECK ON
* LS pb.....AS RQRD	* LS pb.....AS RQRD
* ND mode and range.....AS RQRD	* ND mode and range.....AS RQRD
* ADF/VOR sw.....AS RQRD	* ADF/VOR sw.....AS RQRD
* FCU.....SET	

Ident.: PRO-NOR-TSK-B-00024993.0001001 / 06 NOV 25

Applicable to: ALL

LATERAL CONSOLE AND PF/PM INSTRUMENT PANELS:	
PF	PM
OXYGEN MASK.....TEST	OXYGEN MASK.....TEST
PFD-ND brightness.....AS RQRD	PFD-ND brightness.....AS RQRD
LOUDSPEAKER knob.....SET	LOUDSPEAKER knob.....SET
* PFD-ND.....CHECK	* PFD-ND.....CHECK
* LDG ELEV (ECAM).....CHECK AUTO	* IRS ALIGN.....CHECK
* ECAM STATUS.....CHECK	
* FOB.....CHECK	* FOB.....CHECK
* DEPARTURE BRIEFING.....PERFORM	
* PC DEDICATED TO MAINTENANCE 	
.....CHECK STOWED	
* COCKPIT PREPARATION C/L.....COMPLETE	

BEFORE PUSHBACK OR START

Applicable to: ALL

Ident.: PRO-NOR-TSK-C-00024898.0001001 / 06 NOV 25

BEFORE PUSHBACK/START CLEARANCE:	
PF	PM
FINAL LOADSHEET.....CHECK	FINAL LOADSHEET.....CHECK
ZFW/ZFWCG.....CHECK/REVISE	ZFW/ZFWCG.....CROSSCHECK
FUEL ON BOARD.....CHECK	FUEL ON BOARD.....CHECK
*If takeoff conditions changed:	
FINAL T.O PERF DATA.....RECOMPUTE	FINAL T.O PERF DATA.....RECOMPUTE
FMS T.O DATA.....REVISE	
	FMS REVISED TAKEOFF PERF DATA.....CROSSCHECK
	EFB/MCDU GREEN DOT.....COMPARE
SEATING POSITION.....ADJUST	SEATING POSITION.....ADJUST
HUD DEPLOY/ADJUST	HUD DEPLOY/ADJUST
FMS PERF TO page.....SELECT	FMS F-PLN page.....SELECT
	AIR CONDITIONING UNITS.....CHECK DISCONNECTED
	EXT PWR.....CHECK AVAIL
	EXT PWR DISCONNECTION.....REQUEST

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES TASKSHARING
--	--

Ident.: PRO-NOR-TSK-C-00024983.0001001 / 06 NOV 25

8

AT PUSHBACK/START CLEARANCE:	
PF	PM
	PUSHBACK/START CLEARANCE.....OBTAIN
BEACON sw..... ON	
	ATC..... SET FOR OPERATION
WINDOWS/DOORS.....CHECK CLOSED	WINDOWS/DOORS.....CHECK CLOSED
SLIDES.....CHECK ARMED	SLIDES.....CHECK ARMED
THRUST LEVERS.....IDLE	
ACCU PRESS.....CHECK	
•If pushback is not required: PARK BRK handle.....ON BRAKES PRESS indicator.....CHECK BEFORE START C/L.....COMPLETE	
•If pushback is required: NW STRG DISC MEMO.....CHECK DISPLAYED BEFORE START C/L.....COMPLETE PARK BRK handle.....OFF •When pushback is completed: PARK BRK handle.....ON BRAKES PRESS indicator.....CHECK	

ENGINE START	
Ident.: PRO-NOR-TSK-00024899.0001001 / 14 NOV 24	
Applicable to: ALL	
PF	PM
THRUST LEVERS.....IDLE	
ENG MODE selector.....IGN/START	
ENGINE 1 START.....ANNOUNCE	
ENG 1 MASTER LEVER.....ON	
ENG IDLE PARAMETERS.....CHECK	
•In the case of all engine taxi at departure: REPEAT THE START SEQUENCE FOR ENG 2	

PROCEDURES

NORMAL PROCEDURES

TASKSHARING

AFTER START (ALL ENGINE TAXI AT DEPARTURE)

Ident.: PRO-NOR-TSK-00024894.0001001 / 06 NOV 25

Applicable to: ALL

PF	PM
ENG MODE selector..... NORM	
APU BLEED pb-sw..... OFF	GND SPLRS..... ARM
ANTI ICE..... AS RQRD	RUD TRIM RESET pb..... PRESS
	RUD TRIM..... CHECK NEUTRAL
	FLAPS..... SET
•If the APU is not required:	PITCH TRIM wheel..... SET
APU MASTER SW pb-sw..... OFF	
ECAM STATUS.....	CHECK
NW STRG DISC MEMO..... CHECK NOT DISPLAYED	
THRUST SETTING..... CROSSCHECK	
CLEAR TO DISCONNECT..... ANNOUNCE	
AFTER START C/L.....	COMPLETE

AFTER START (ONE ENGINE TAXI AT DEPARTURE)

Ident.: PRO-NOR-TSK-00027743.0001001 / 06 NOV 25

Applicable to: ALL

PF	PM
ENG MODE selector..... NORM	
YELLOW ELEC PUMP pb-sw..... ON	GND SPLRS..... ARM
APU BLEED pb-sw..... OFF	RUD TRIM RESET pb..... PRESS
ENG 1 ANTI ICE pb-sw..... AS RQRD	RUD TRIM..... CHECK NEUTRAL
APU MASTER SW pb-sw..... KEEP ON	FLAPS..... SET
NW STRG DISC MEMO..... CHECK NOT DISPLAYED	PITCH TRIM wheel..... SET
THRUST SETTING..... CROSSCHECK	
CLEAR TO DISCONNECT..... ANNOUNCE	

ALL ENGINE TAXI AT DEPARTURE

Ident.: PRO-NOR-TSK-00024904.0002001 / 18 NOV 24

Applicable to: MSN 02719-03060, 07784-07792

PF	PM
	TAXI CLEARANCE..... OBTAIN
EXTERIOR LIGHTS..... SET	
PARK BRK handle..... OFF	

Continued on the following page

PROCEDURES

NORMAL PROCEDURES

TASKSHARING

Continued from the previous page

PF	PM
BRAKES PRESSURE.....CHECK AT ZERO	
BRAKES.....CHECK	BRK FAN pb-sw  AS RQRD
F/CTL.....CHECK	
	ATC CLEARANCE.....CONFIRM
	CLEARED ALTITUDE ON FCU.....CHECK
	HDG ON FCU.....IF REQUIRED, PRESET
	BOTH FD.....CHECK ON
PFD/ND.....CHECK	PFD/ND.....CHECK
	AUTO BRK MAX pb-sw.....ON
TERR ON ND.....AS RQRD	TERR ON ND.....AS RQRD
	ATC CODE/MODE.....CONFIRM/SET FOR TAKEOFF
	ENG MODE selector.....AS RQRD
	WEATHER RADAR .....ON
	PREDICTIVE WINDSHEAR SYSTEM AUTO
	T.O CONFIG pb.....TEST
	T.O MEMO.....CHECK NO BLUE
CABIN REPORT.....RECEIVE	CABIN REPORT.....RECEIVE
TAXI C/L.....	COMPLETE

ALL ENGINE TAXI AT DEPARTURE

Ident.: PRO-NOR-TSK-00024904.0023001 / 12 NOV 24

Applicable to: MSN 04392-05746

PF	PM
	TAXI CLEARANCE.....OBTAIN
EXTERIOR LIGHTS.....SET	
PARK BRK handle.....OFF	
BRAKES PRESSURE.....CHECK AT ZERO	
BRAKES.....CHECK	BRK FAN pb-sw  AS RQRD
F/CTL.....CHECK	
	ATC CLEARANCE.....CONFIRM
	CLEARED ALTITUDE ON FCU.....CHECK
	HDG ON FCU.....IF REQUIRED, PRESET
	BOTH FD.....CHECK ON
PFD/ND.....CHECK	PFD/ND.....CHECK
	AUTO BRK MAX pb-sw.....ON
TERR ON ND.....AS RQRD	TERR ON ND.....AS RQRD
	ATC CODE/MODE.....CONFIRM/SET FOR TAKEOFF
	ENG MODE selector.....AS RQRD

Continued on the following page

PROCEDURES

NORMAL PROCEDURES

TASKSHARING

Continued from the previous page

PF	PM
	WEATHER RADAR..... ON
	PREDICTIVE WINDSHEAR SYSTEM  ON
	T.O CONFIG pb..... TEST
	T.O MEMO..... CHECK NO BLUE
CABIN REPORT.....RECEIVE	CABIN REPORT.....RECEIVE
TAXI C/L.....	COMPLETE

ALL ENGINE TAXI AT DEPARTURE

Ident.: PRO-NOR-TSK-00024904.0001001 / 18 NOV 24

Applicable to: MSN 02155-02212

PF	PM
	TAXI CLEARANCE..... OBTAIN
EXTERIOR LIGHTS..... SET	
PARK BRK handle..... OFF	
BRAKES PRESSURE.....CHECK AT ZERO	
BRAKES.....CHECK	BRK FAN pb-sw  AS RQRD
	BRAKES PRESSURE.....CHECK AT ZERO
F/CTL.....	CHECK
	ATC CLEARANCE.....CONFIRM
	CLEARED ALTITUDE ON FCU.....CHECK
	HDG ON FCU.....IF REQUIRED, PRESET
	BOTH FD..... CHECK ON
PFD/ND.....CHECK	PFD/ND.....CHECK
	AUTO BRK MAX pb-sw..... ON
TERR ON ND..... AS RQRD	TERR ON ND..... AS RQRD
	ATC CODE/MODE..... CONFIRM/SET FOR TAKEOFF
	ENG MODE selector..... AS RQRD
	WEATHER RADAR ON
	PREDICTIVE WINDSHEAR SYSTEM  AUTO
	T.O CONFIG pb..... TEST
	T.O MEMO..... CHECK NO BLUE
CABIN REPORT.....RECEIVE	CABIN REPORT.....RECEIVE
TAXI C/L.....	COMPLETE

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES TASKSHARING
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ONE ENGINE TAXI AT DEPARTURE

Ident.: PRO-NOR-TSK-00028193.0005001 / 06 NOV 25

Applicable to: MSN 04392-05746

11

PF	PM
	•When the ground crew makes the hand signal: TAXI CLEARANCE..... OBTAIN
EXTERIOR LIGHTS.....SET	
PARK BRK handle..... OFF	
BRAKES PRESSURE.....CHECK AT ZERO	
BRAKES.....CHECK	BRK FAN pb-sw  AS RQRD
	ATC CLEARANCE.....CONFIRM
	CLEARED ALTITUDE ON FCU.....CHECK
	HDG ON FCU.....IF REQUIRED, PRESET
	BOTH FD..... CHECK ON
PFD/ND.....CHECK	PFD/ND.....CHECK
•When taxiing in a straight line: ENG 2 START.....ORDER	
	YELLOW ELEC PUMP pb-sw..... OFF
	APU BLEED pb-sw..... ON
	ENG 2 THRUST LEVER..... IDLE
	ENG MODE selector.....IGN/START
	•10 s after APU bleed ON: ENG 2 START..... ANNOUNCE ENG 2 MASTER lever..... ON
	ENG 2 IDLE PARAMETERS.....CHECK
	CHRONO..... START
	ENG MODE selector..... NORM
	APU BLEED pb-sw..... OFF
	ANTI ICE.....AS RQRD
	APU MASTER SW pb-sw..... AS RQRD
ECAM STATUS.....	CHECK
AFTER START C/L.....	COMPLETE
F/CTL.....	CHECK
	AUTO BRK MAX pb-sw..... ON
TERR ON ND..... AS RQRD	TERR ON ND..... AS RQRD
	SQWK CODE/ATC MODE.. CONFIRM/SET FOR TAKEOFF
	ENG MODE selector..... AS RQRD
	WXR/PWS sw.....SYS 1(2)
	T.O CONFIG pb..... TEST
	T.O MEMO..... CHECK NO BLUE

Continued on the following page

PROCEDURES

NORMAL PROCEDURES

TASKSHARING

Continued from the previous page

CABIN REPORT.....RECEIVE	CABIN REPORT.....RECEIVE
TAXI C/L.....COMPLETE	

ONE ENGINE TAXI AT DEPARTURE

Ident.: PRO-NOR-TSK-00028193.0002001 / 06 NOV 25

Applicable to: MSN 02719-03060, 07784-07792

12

PF	PM
	•When the ground crew makes the hand signal: TAXI CLEARANCE..... OBTAIN
EXTERIOR LIGHTS..... SET	
PARK BRK handle..... OFF	
BRAKES PRESSURE..... CHECK AT ZERO	
BRAKES..... CHECK	BRK FAN pb-sw  AS RQRD
	ATC CLEARANCE..... CONFIRM
	CLEARED ALTITUDE ON FCU..... CHECK
	HDG ON FCU..... IF REQUIRED, PRESET
	BOTH FD..... CHECK ON
PFD/ND..... CHECK	PFD/ND..... CHECK
•When taxiing in a straight line: ENG 2 START..... ORDER	
	YELLOW ELEC PUMP pb-sw..... OFF
	APU BLEED pb-sw..... ON
	ENG 2 THRUST LEVER..... IDLE
	ENG MODE selector..... IGN/START
	•10 s after APU bleed ON: ENG 2 START..... ANNOUNCE ENG 2 MASTER lever..... ON ENG 2 IDLE PARAMETERS..... CHECK CHRONO..... START ENG MODE selector..... NORM APU BLEED pb-sw..... OFF ANTI ICE..... AS RQRD APU MASTER SW pb-sw..... AS RQRD
ECAM STATUS..... CHECK	
AFTER START C/L..... COMPLETE	
F/CTL..... CHECK	
	AUTO BRK MAX pb-sw..... ON
TERR ON ND..... AS RQRD	TERR ON ND..... AS RQRD
	SQWK CODE/ATC MODE.. CONFIRM/SET FOR TAKEOFF

Continued on the following page

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES TASKSHARING
--	---

Continued from the previous page

	ENG MODE selector..... AS RQRD
	WEATHER RADAR ON
	PREDICTIVE WINDSHEAR SYSTEM  AUTO
	T.O CONFIG pb..... TEST
	T.O MEMO..... CHECK NO BLUE
CABIN REPORT.....RECEIVE	CABIN REPORT.....RECEIVE
TAXI C/L.....	COMPLETE

ONE ENGINE TAXI AT DEPARTURE

Ident.: PRO-NOR-TSK-00028193.0001001 / 06 NOV 25

Applicable to: MSN 02155-02212

13

PF	PM
	•When the ground crew makes the hand signal: TAXI CLEARANCE..... OBTAIN
EXTERIOR LIGHTS..... SET	
PARK BRK handle..... OFF	
BRAKES PRESSURE..... CHECK AT ZERO	
BRAKES..... CHECK	BRK FAN pb-sw  AS RQRD
	BRAKES PRESSURE..... CHECK AT ZERO
	ATC CLEARANCE..... CONFIRM
	CLEARED ALTITUDE ON FCU..... CHECK
	HDG ON FCU..... IF REQUIRED, PRESET
	BOTH FD..... CHECK ON
PFD/ND..... CHECK	PFD/ND..... CHECK
•When taxiing in a straight line:	
ENG 2 START..... ORDER	
	YELLOW ELEC PUMP pb-sw..... OFF
	APU BLEED pb-sw..... ON
	ENG 2 THRUST LEVER..... IDLE
	ENG MODE selector..... IGN/START
	•10 s after APU bleed ON:
	ENG 2 START..... ANNOUNCE
	ENG 2 MASTER lever..... ON
	ENG 2 IDLE PARAMETERS..... CHECK
	CHRONO..... START
	ENG MODE selector..... NORM
	APU BLEED pb-sw..... OFF
	ANTI ICE..... AS RQRD
	APU MASTER SW pb-sw..... AS RQRD

Continued on the following page

PROCEDURES

NORMAL PROCEDURES

TASKSHARING

Continued from the previous page

ECAM STATUS.....	CHECK
AFTER START C/L.....	COMPLETE
F/CTL.....	CHECK
	AUTO BRK MAX pb-sw..... ON
TERR ON ND..... AS RQRD	TERR ON ND..... AS RQRD
	SQWK CODE/ATC MODE.. CONFIRM/SET FOR TAKEOFF
	ENG MODE selector..... AS RQRD
	WEATHER RADAR ON
	PREDICTIVE WINDSHEAR SYSTEM  AUTO
	T.O CONFIG pb..... TEST
	T.O MEMO..... CHECK NO BLUE
CABIN REPORT..... RECEIVE	CABIN REPORT..... RECEIVE
TAXI C/L.....	COMPLETE

DEPARTURE CHANGE

Ident.: PRO-NOR-TSK-00024984.0001001 / 18 NOV 24
 Applicable to: ALL

PF	PM
FINAL T.O PERF DATA..... RECOMPUTE	FINAL T.O PERF DATA..... RECOMPUTE
	FMS..... REVISE
REVISED FMS..... CROSSCHECK	
EFB/MCDU GREEN DOT..... COMPARE	
	FLAPS lever..... SET
	FCU ALT..... SET
	T.O CONFIG pb..... TEST
RE-BRIEFING.....	PERFORM
DEPARTURE CHANGE C/L.....	COMPLETE

BEFORE TAKEOFF

Ident.: PRO-NOR-TSK-00024905.0001001 / 07 NOV 25
 Applicable to: ALL

PF	PM
	•If the Brake Fans  are set to ON and the temperature of all brakes is below 150 °C: BRAKE FAN pb..... OFF LINE-UP CLEARANCE..... OBTAIN TCAS..... TA ONLY or TA/RA TAKEOFF RUNWAY..... CONFIRM

Continued on the following page

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES TASKSHARING
--	--

Continued from the previous page

PF	PM
APPROACH PATH..... CLEAR OF TRAFFIC	APPROACH PATH.....CLEAR OF TRAFFIC
EXTERIOR LIGHTS.....SET	PACK 1 and 2.....AS RQRD
SLIDING TABLE.....STOW	SLIDING TABLE.....STOW
All EFB TRANSMITTING MODE.....AS RQRD	All EFB TRANSMITTING MODE..... AS RQRD
All EFB (with no mounted equipment).....STOW	All EFB (with no mounted equipment).....STOW
THRUST BUMP <⚡>AS RQRD	CABIN CREW.....ADVISE
LINE UP C/L.....COMPLETE	

TAKEOFF

Ident.: PRO-NOR-TSK-00024906.0001001 / 24 NOV 23

Applicable to: ALL

PF	PM
	TAKEOFF CLEARANCE..... OBTAIN
EXTERIOR LIGHTS.....SET	
TAKEOFF..... ANNOUNCE	
THRUST..... 50 % N1 (1.05 EPR)	
SIDESTICK.....AS RQRD	
BRAKES..... RELEASE	
THRUST levers..... FLX or TOGA	CHRONO..... START
The Captain places one hand on thrust levers until V1	
DIRECTIONAL CONTROL..... USE RUDDER	
	PFD/ND.....MONITOR
•Below 80 kt:	
	TAKEOFF THRUST..... CHECK
	THRUST SET..... ANNOUNCE
	PFD and ENG indications.....MONITOR
•At 80 kt:	
SIDESTICK.....RELEASE	
•At 100 kt:	
100 kt.....CROSSCHECK	ONE HUNDRED KNOTS..... ANNOUNCE
•At V1:	
	V1..... ANNOUNCE
•At VR:	
ROTATION.....PERFORM	ROTATION.....ORDER
•When positive climb:	
	POSITIVE CLIMB..... ANNOUNCE
L/G UP..... ORDER	L/G lever..... SELECT UP
AP.....AS RQRD	
•At the thrust reduction altitude:	
THRUST levers..... CL	PACK 1 and 2 (if applicable).....ON

Continued on the following page

Continued from the previous page

PF	PM
•At F speed: FLAPS 1.....ORDER	FLAPS 1.....SELECT
•At S speed: FLAPS 0.....ORDER	FLAPS 0.....SELECT GND SPLRS.....DISARM L/G.....CHECK UP EXTERIOR LIGHTS.....SET

AFTER TAKEOFF

Ident.: PRO-NOR-TSK-00024907.0001001 / 06 NOV 25
Applicable to: ALL

15

PF	PM
	•If the APU was used to supply the air conditioning during takeoff: APU BLEED pb-sw.....OFF APU MASTER SW pb-sw.....OFF
	ENG MODE selector.....AS RQRD
	•If the takeoff was performed with TA ONLY: TCAS.....TA/RA
	ENG 1 and 2 ANTI ICE pb-sw.....AS RQRD

CLIMB

Ident.: PRO-NOR-TSK-00024908.0001001 / 06 NOV 25
Applicable to: ALL

16

PF	PM
MCDU.....PERF CLB	MCDU.....F-PLN
•At transition altitude: BAROMETRIC REFERENCE.....	SET STD/CROSSCHECK
CRZ FL.....SET AS RQRD	
WEATHER RADAR.....ADJUST AS APPROPRIATE	ENG 1 and 2 ANTI ICE pb-sw.....AS RQRD
•At 10 000 ft AAL:	LAND sw.....RETRACT
	SEAT BELTS sw.....AS RQRD
EFIS OPTIONS.....AS RQRD	EFIS OPTIONS.....AS RQRD
	ECAM MEMO.....REVIEW
	NAVAIDS.....CLEAR

Continued on the following page

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES TASKSHARING
--	--

Continued from the previous page

PF	PM
	SEC F-PLN..... AS RQRD
	OPT FL/REC MAX FL..... CHECK

CRUISE

Ident.: PRO-NOR-TSK-00024909.0001001 / 12 NOV 24

Applicable to: ALL

PF	PM
ECAM MEMO/SD PAGES..... REVIEW	ECAM MEMO/SD PAGES..... REVIEW
FLIGHT PROGRESS.....CHECK	FLIGHT PROGRESS.....CHECK
STEP FLIGHT LEVEL.....AS APPROPRIATE	STEP FLIGHT LEVEL.....AS APPROPRIATE
•If GPS PRIMARY LOST:	
NAVIGATION ACCURACY..... MONITOR	NAVIGATION ACCURACY..... MONITOR
RADAR..... ADJUST AS APPROPRIATE	
•If the oxygen mask has been used:	
OXYGEN MASK..... CHECK	OXYGEN MASK..... CHECK

DESCENT PREPARATION

Ident.: PRO-NOR-TSK-00024910.0004001 / 06 NOV 25

Applicable to: ALL

17

PF	PM
	WEATHER AND LANDING INFORMATION..... OBTAIN
NAVIGATION CHARTS.....	PREPARE
	BAROMETRIC REFERENCE..... PRESET
	STATUS page.....CHECK
LANDING CONDITIONS..... CONFIRM	LANDING CONDITIONS CONFIRM
•If landing conditions changed:	
LANDING PERF DATA..... COMPUTE	LANDING PERF DATA..... COMPUTE
LANDING PERF DATA.....	CROSSCHECK
FMS..... PREPARE	FMS PREPARATION.....CROSSCHECK
GPWS LDG FLAP 3..... AS RQRD	
LDG ELEV .....CHECK	
AUTO BRK..... AS RQRD	
ARRIVAL BRIEFING.....PERFORM	
RADAR..... ADJUST AS APPROPRIATE	
	ENG 1 and 2 ANTI ICE pb-sw.....AS RQRD
	DESCENT CLEARANCE..... OBTAIN
CLEARED ALTITUDE ON FCU.....SET	

DESCENT

Ident.: PRO-NOR-TSK-00024911.0002001 / 18 NOV 24

Applicable to: ALL

PF	PM
DESCENT.....INITIATE	
MCDU..... PROG/PERF DESCENT	MCDU.....F-PLN
DESCENT.....MONITOR/ADJUST	
TERR ON ND..... AS RQRD	TERR ON ND..... AS RQRD
•When the aircraft approaches the transition level, and when cleared for an altitude: BAROMETRIC REFERENCE..... SET/CROSSCHECK	
•At 10 000 ft AAL:	
	LAND sw..... ON
	SEAT BELTS sw..... ON
EFIS option pb..... CSTR	EFIS option pb..... CSTR
LS pb..... AS RQRD	LS pb..... AS RQRD
NAVAIDS..... AS RQRD/CHECK	ENG MODE selector..... AS RQRD
•If GPS PRIMARY LOST: NAVIGATION ACCURACY..... MONITOR	
APPROACH C/L..... COMPLETE	

APPROACH

Ident.: PRO-NOR-TSK-D-00024913.0001001 / 18 NOV 24

Applicable to: ALL

AIRCRAFT CONFIGURATION FOR APPROACH

PF	PM
INITIAL APPROACH:	
F-PLN SEQUENCING..... ADJUST	
•Approx 15 NM from touchdown: APPROACH PHASE CHECK/ACTIVATE or set green dot ⁽¹⁾	
MANAGED SPEED..... CHECK	
FLIGHT PATH..... MONITOR	NAV ACCURACY..... MONITOR
SPEED BRAKES lever..... AS RQRD	
RADAR..... ADJUST AS APPROPRIATE	
INTERMEDIATE/FINAL APPROACH:	
•At green dot: FLAPS 1..... ORDER | FLAPS 1..... SELECT	
	TCAS..... TA or TA/RA
S SPEED..... CHECK or SET ⁽¹⁾	
•At 2 000 ft AGL minimum: FLAPS 2..... ORDER | FLAPS 2..... SELECT	

Continued on the following page

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES TASKSHARING
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Continued from the previous page

AIRCRAFT CONFIGURATION FOR APPROACH	
PF	PM
F SPEED..... CHECK or SET ⁽¹⁾	
•When FLAPS 2: L/G DOWN..... ORDER L/G lever..... SELECT DOWN AUTO BRAKE.....CONFIRM GND SPLRS.....ARM EXTERIOR LIGHTS..... SET	
•When L/G down: FLAPS 3..... ORDER FLAPS 3..... SELECT ECAM WHEEL PAGE.....CHECK	
•When FLAPS 3: FLAPS FULL..... ORDER FLAPS FULL..... SELECT SPEED TARGET..... CHECK or SET ⁽¹⁾ A/THR.....CHECK IN SPEED MODE or OFF WING A.ICE (if not required)..... OFF SLIDING TABLE..... STOW SLIDING TABLE..... STOW All EFB (with no mounted equipment)..... STOW All EFB (with no mounted equipment)..... STOW LDG MEMO..... CHECK NO BLUE CABIN REPORT.....RECEIVE CABIN REPORT.....RECEIVE LANDING C/L..... COMPLETE CABIN CREW..... ADVISE FLIGHT PARAMETERS..... MONITOR	

⁽¹⁾ PF if AP is ON, PM if AP is OFF. The PF may request that this action is performed by the PM depending on the situation.

Ident.: PRO-NOR-TSK-D-00024915.0001001 / 24 NOV 23

Applicable to: ALL

APPROACH USING LOC G/S GUIDANCE	
PF	PM
DESCENT PREPARATION:	
APPROACH MINIMUM..... DETERMINE	
ARRIVAL BRIEFING.....PERFORM	
INITIAL/INTERMEDIATE APPROACH:	
APPR pb on FCU.....PRESS	
BOTH AP..... ENGAGE	
LOC..... CHECK ARMED	
G/S.....CHECK ARMED	
LOC CAPTURE.....MONITOR	
G/S CAPTURE.....MONITOR	

Continued on the following page

Continued from the previous page

APPROACH USING LOC G/S GUIDANCE
PF
PM

 GO-AROUND ALTITUDE.....SET⁽¹⁾
FINAL APPROACH:

FLIGHT PARAMETERS..... MONITOR

•At 350 ft RA:

LAND mode.....CHECK ENGAGED/ANNOUNCE

For CATI, CATII and CATIII with DH approach:
•At minimum +100 ft:

ONE HUNDRED ABOVE.....MONITOR or ANNOUNCE

•At minimum:

CONTINUE or GO-AROUND..... ANNOUNCE MINIMUM..... MONITOR or ANNOUNCE

For CATIII with no DH approach:
•At 100 ft RA:

If no failure detected:

CONTINUE.....ANNOUNCE

⁽¹⁾ PF if AP is ON, PM if AP is OFF. The PF may request that this action is performed by the PM depending on the situation.

Ident.: PRO-NOR-TSK-D-00024917.0001001 / 18 NOV 24

Applicable to: ALL

APPROACH USING FINAL APP GUIDANCE
PF
PM
DESCENT PREPARATION:

WEATHER AND LANDING INFO.....OBTAIN

F-PLN A page.....CHECK

F-PLN A page.....CHECK

GO-AROUND STRATEGY.....REVIEW

DESCENT:
•At 10 000 ft AAL:

NAV ACCURACY..... CHECK

•For RNAV(GNSS):

GPS PRIMARY.....CHECK

BAROMETRIC REFERENCE.....SET/CROSSCHECK

INITIAL/INTERMEDIATED/FINAL APPROACH:

POSITION.....MONITOR

APPR pb on FCU.....PRESS

APP NAV.....CHECK ARMED or ENGAGED

FINAL.....CHECK ARMED

•At Final Descent Point:

FINAL APP..... CHECK ENGAGED

Continued on the following page

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES TASKSHARING
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Continued from the previous page

APPROACH USING FINAL APP GUIDANCE	
PF	PM
GO-AROUND ALTITUDE.....SET ⁽¹⁾	
FLIGHT PARAMETERS..... MONITOR	
•At minimum + 100 ft:	
ONE HUNDRED ABOVE.....MONITOR or ANNOUNCE	
•At minimum:	
CONTINUE or GO-AROUND.....ANNOUNCE MINIMUM..... MONITOR or ANNOUNCE	

(1) PF if AP is ON, PM if AP is OFF. The PF may request that this action is performed by the PM depending on the situation.

18 Ident.: PRO-NOR-TSK-D-00029187.0002001 / 06 NOV 25
Applicable to: ALL

APPROACH USING FINAL APP GUIDANCE FOR RNP(VPT)	
PF	PM
DESCENT PREPARATION:	
WEATHER AND LANDING INFORMATION..... OBTAIN	
F-PLN A page.....CHECK	F-PLN A page.....CHECK
PROG page..... COMPLETE	PROG page..... COMPLETE
PERF APPR page..... CHECK	PERF APPR page..... CHECK
GO-AROUND STRATEGY.....REVIEW	
DESCENT:	
•At 10 000 ft AAL:	
NAV ACCURACY..... CHECK	
•If GNSS is required by the chart:	
GPS PRIMARY..... CHECK	
BAROMETRIC REFERENCE..... SET/CROSSCHECK	
INITIAL/INTERMEDIATE/FINAL APPROACH:	
FD or AP/FD..... USE FOR APPROACH	
•At the Visual Fix	
•If visual references are sufficient:	
CONTINUE..... ANNOUNCE	
•If visual references are sufficient:	
GO-AROUND..... ANNOUNCE	
•Before the Final Descent Point:	
APPR pb on FCU.....PRESS	
APP NAV..... CHECK ARMED or ENGAGED	
FINAL.....CHECK ARMED	
•At Final Descent Point:	
FINAL APP..... CHECK ENGAGED	

Continued on the following page

Continued from the previous page

APPROACH USING FINAL APP GUIDANCE FOR RNP(VPT)
PF
PM

 GO-AROUND ALTITUDE.....SET ⁽¹⁾

FLIGHT PARAMETERS.....MONITOR

•At the latest at the Minimum Use Height of the AP:

AP.....OFF

⁽¹⁾ PF if AP is ON, PM if AP is OFF. The PF may request that this action is performed by the PM depending on the situation.

APPROACH USING FPA GUIDANCE

Ident.: PRO-NOR-TSK-D-00024920.0001001 / 18 NOV 24

Applicable to: MSN 02155-02212, 04392-07792

APPROACH USING FPA GUIDANCE
PF
PM
DESCENT PREPARATION:

F-PLN A Page.....CHECK F-PLN A Page.....CHECK

GO-AROUND STRATEGY.....REVIEW

DESCENT:
•At 10 000 ft AAL:

NAV ACCURACY.....CHECK

•For RNAV(GNSS):

GPS PRIMARY.....CHECK

BAROMETRIC REFERENCE.....SET/CROSSCHECK

INITIAL/INTERMEDIATE/FINAL APPROACH:

LATERAL GUIDANCE MODE.....SET FOR APPROACH

•For LOC ONLY and ILS G/S OUT:

LOC pb-sw.....PRESS

LOC.....CHECK ARMED

•For back course localizer approaches:

TRK FPA MODE.....USE FOR APPROACH

LATERAL path.....INTERCEPT

TRK FPA (Bird).....SELECT

FPA FOR FINAL APPROACH.....SET

•At 0.3 NM from the Final Descent Point:

FPA selector.....PULL

FPA.....CHECK ENGAGED

POSITION/FLT PATH.....MONITOR/ADJUST

 GO-AROUND ALTITUDE.....SET ⁽¹⁾

FLIGHT PARAMETERS.....MONITOR

Continued on the following page

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES TASKSHARING
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Continued from the previous page

APPROACH USING FPA GUIDANCE	
PF	PM
•At minimum +100 ft:	ONE HUNDRED ABOVE..... MONITOR or ANNOUNCE
•At minimum: CONTINUE or GO-AROUND.....ANNOUNCE	MINIMUM..... MONITOR or ANNOUNCE

- (1) PF if AP is ON, PM if AP is OFF. The PF may request that this action is performed by the PM depending on the situation.

Ident.: PRO-NOR-TSK-D-00024920.0002001 / 18 NOV 24

Applicable to: MSN 02719-03060

APPROACH USING FPA GUIDANCE	
PF	PM
DESCENT PREPARATION:	
F-PLN A Page..... CHECK	F-PLN A Page..... CHECK
GO-AROUND STRATEGY..... REVIEW	
DESCENT:	
•At 10 000 ft AAL:	
NAV ACCURACY..... CHECK	
•For RNAV(GNSS):	
GPS PRIMARY..... CHECK	
BAROMETRIC REFERENCE.....	SET/CROSSCHECK
INITIAL/INTERMEDIATE/FINAL APPROACH:	
LATERAL GUIDANCE MODE..... SET FOR APPROACH	
•For LOC ONLY, ILS G/S OUT and back course localizer approaches:	
LOC pb-sw..... PRESS	
LOC/LOC B/C..... CHECK ARMED	
LATERAL path..... INTERCEPT	
TRK FPA (Bird)..... SELECT	
FPA FOR FINAL APPROACH..... SET	
•At 0.3 NM from the Final Descent Point:	
FPA selector..... PULL	
FPA..... CHECK ENGAGED	
POSITION/FLT PATH..... MONITOR/ADJUST	
GO-AROUND ALTITUDE.....	SET ⁽¹⁾
	FLIGHT PARAMETERS..... MONITOR
•At minimum +100 ft:	ONE HUNDRED ABOVE.....MONITOR or ANNOUNCE

Continued on the following page

Continued from the previous page
APPROACH USING FPA GUIDANCE
PF
PM
•At minimum:

CONTINUE or GO-AROUND.....ANNOUNCE | MINIMUM..... MONITOR or ANNOUNCE

(1) PF if AP is ON, PM if AP is OFF. The PF may request that this action is performed by the PM depending on the situation.

MANUAL LANDING

Ident.: PRO-NOR-TSK-00024921.0008001 / 24 NOV 23

Applicable to: MSN 02155-03060, 05152-07792

PF
PM

AP.....OFF

•Around 30 ft RA:

 FLARE..... PERFORM | ATTITUDE..... MONITOR
 BOTH THRUST LEVERS..... IDLE

•At touchdown:

 DEROTATION..... INITIATE |
 BOTH REVERSER LEVERS..... REV MAX or REV IDLE | GND SPLRS..... CHECK/ANNOUNCE
 REVERSERS..... CHECK/ANNOUNCE
 DIRECTIONAL CONTROL..... ENSURE

•If autobrake is selected:

 AUTO BRK..... CHECK/ANNOUNCE
 AUTO BRK..... MONITOR

•If landing without autobrake:

 BRAKES..... AS RQRD |
 DECELERATION..... CHECK/ANNOUNCE

•At 70 kt:

BOTH REVERSER LEVERS..... IDLE | SEVENTY KNOTS..... ANNOUNCE

•At taxi speed:

BOTH REVERSER LEVERS..... STOW

•Before 20 kt:

AUTO BRK..... DISENGAGE

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES TASKSHARING
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MANUAL LANDING

Ident.: PRO-NOR-TSK-00024921.0001001 / 24 NOV 23

Applicable to: MSN 04392

PF	PM
AP.....OFF	
•Around 30 ft RA: FLARE..... PERFORM ATTITUDE..... MONITOR BOTH THRUST LEVERS.....IDLE	
•At touchdown: DEROTATION.....INITIATE BOTH REVERSER LEVERS.....REV MAX or REV IDLE DIRECTIONAL CONTROL.....ENSURE	
•If autobrake is selected: •If landing without autobrake: BRAKES.....AS RQRD	
	GND SPLRS..... CHECK/ANNOUNCE REVERSERS..... CHECK/ANNOUNCE AUTO BRK..... MONITOR DECELERATION.....CHECK/ANNOUNCE
•At 70 kt: BOTH REVERSER LEVERS..... IDLE	
	SEVENTY KNOTS.....ANNOUNCE
•At taxi speed: BOTH REVERSER LEVERS.....STOW	
•Before 20 kt: AUTO BRK.....DISENGAGE	

AUTOMATIC LANDING

Ident.: PRO-NOR-TSK-00024922.0008001 / 24 NOV 23

Applicable to: MSN 02155-03060, 05152-07792

PF	PM
•At 350 ft RA: LAND on FMA..... CHECK/ANNOUNCE ILS/GLS <⊗> /MLS <⊗> COURSE.....CHECK	
•At 40 ft RA: FLARE..... MONITOR	
	FLARE on FMA..... CHECK/ANNOUNCE
•At 30 ft RA: •At 10 ft RA: "Retard" BOTH THRUST LEVERS.....IDLE LATERAL GUIDANCE.....MONITOR	
	THR IDLE on FMA..... CHECK THR IDLE..... CHECK

Continued on the following page

PROCEDURES

NORMAL PROCEDURES

TASKSHARING

Continued from the previous page

PF	PM
•At touchdown:	
BOTH REVERSER LEVERS.....REV MAX or REV IDLE	ROLL OUT on FMA.....CHECK/ANNOUNCE
DIRECTIONAL CONTROL.....MONITOR/ENSURE	GND SPLRS.....CHECK/ANNOUNCE
•If autobrake is selected:	REVERSERS.....CHECK/ANNOUNCE
	AUTO BRK.....CHECK/ANNOUNCE
	AUTO BRK.....MONITOR
•If landing without autobrake:	
BRAKES.....AS RQRD	DECELERATION.....CHECK/ANNOUNCE
•At 70 kt:	
BOTH THRUST LEVERS.....REV IDLE	SEVENTY KNOTS.....ANNOUNCE
•Before 20 kt:	
AUTO BRK.....DISENGAGE	
•End of roll out:	
BOTH REVERSER LEVERS.....STOW	
AP.....OFF	

AUTOMATIC LANDING

Ident.: PRO-NOR-TSK-00024922.0001001 / 24 NOV 23

Applicable to: MSN 04392

PF	PM
•At 350 ft RA:	
LAND on FMA.....CHECK/ANNOUNCE	
ILS/GLS <⬅> /MLS <⬅> COURSE.....CHECK	
•At 40 ft RA:	
FLARE.....MONITOR	FLARE on FMA.....CHECK/ANNOUNCE
•At 30 ft RA:	
	THR IDLE on FMA.....CHECK
	THR IDLE.....CHECK
•At 10 ft RA: "Retard"	
BOTH THRUST LEVERS.....IDLE	
LATERAL GUIDANCE.....MONITOR	
•At touchdown:	
BOTH REVERSER LEVERS.....REV MAX or REV IDLE	ROLL OUT on FMA.....CHECK/ANNOUNCE
DIRECTIONAL CONTROL.....MONITOR/ENSURE	GND SPLRS.....CHECK/ANNOUNCE
	REVERSERS.....CHECK/ANNOUNCE

Continued on the following page

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES TASKSHARING
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Continued from the previous page

PF	PM
•If autobrake is selected:	AUTO BRK..... MONITOR
•If landing without autobrake: BRAKES..... AS RQRD	DECELERATION.....CHECK/ANNOUNCE
•At 70 kt: BOTH THRUST LEVERS..... REV IDLE	SEVENTY KNOTS.....ANNOUNCE
•Before 20 kt: AUTO BRK.....DISENGAGE	
•End of roll out: BOTH REVERSER LEVERS.....STOW	
AP..... OFF	

GO AROUND WITH FD ON

Ident.: PRO-NOR-TSK-00024925.0001001 / 06 NOV 25

Applicable to: ALL

19

PF	PM
•Simultaneously apply the following three actions: THRUST LEVERS.....TOGA ROTATION..... PERFORM GO-AROUND.....ANNOUNCE FMA..... CHECK/ANNOUNCE	
	POSITIVE CLIMB..... ANNOUNCE
L/G UP.....ORDER	L/G lever.....SELECT UP
NAV or HDG mode.....AS RQRD	GO-AROUND ALTITUDE..... CHECK
•At go-around thrust reduction altitude: THRUST LEVERS..... CL	
•At go-around acceleration altitude: SPEED TARGET.....MONITOR	
•AT F SPEED: FLAPS 1..... ORDER	FLAPS 1..... SELECT
•AT S SPEED: FLAPS 0..... ORDER	FLAPS 0..... SELECT GND SPLRS.....DISARM L/G..... CHECK UP EXTERIOR LIGHTS..... SET

PROCEDURES

NORMAL PROCEDURES

TASKSHARING

AFTER LANDING

Ident.: PRO-NOR-TSK-00024928.0001001 / 18 NOV 24

Applicable to: ALL

PF	PM
GND SPLRS..... DISARM	
EXTERIOR LIGHTS.....SET	
	RADAR..... OFF
	PREDICTIVE WINDSHEAR  OFF
	ENG MODE selector..... NORM
	FLAPS.....RETRACT
	TCAS..... STBY
	ATC..... AS RQRD
	APU..... AS RQRD
	ANTI ICE..... AS RQRD
	BRAKE TEMPERATURE.....MONITOR
	BRK FAN pb  AS RQRD
AFTER LANDING C/L..... COMPLETE	

ONE ENGINE TAXI AT ARRIVAL

Ident.: PRO-NOR-TSK-00026833.0001001 / 12 NOV 24

Applicable to: ALL

PF	PM
	•No less than 3 min after high thrust operations: COOLING TIME ELAPSED..... ANNOUNCE
•When taxiing in a straight line: ENG 2 SHUTDOWN..... ORDER	
	APU START pb-sw.....CHECK AVAILABLE
	ENG 2 ANTI ICE pb-sw.....OFF
	ENG 2 MASTER lever..... OFF
	ENG 2 PARAMETERS..... CHECK
	YELLOW ELEC PUMP pb-sw..... ON

PARKING

Ident.: PRO-NOR-TSK-00024929.0004001 / 18 NOV 24

Applicable to: ALL

PF	PM
ACCU PRESS..... CHECK	ANTI ICE.....OFF
PARK BRK handle.....ON	
BRAKES PRESS indicator..... CHECK	

Continued on the following page

Continued from the previous page

PF	PM
YELLOW ELEC PUMP pb-sw.....OFF	
•If the APU is not used:	APU BLEED pb-sw..... AS RQRD
EXT PWR pb.....CHECK AVAIL	
EXT PWR pb.....ON	
•If the APU is used:	
APU START pb-sw.....CHECK AVAIL	
ALL ENG MASTER levers.....OFF	
ENGINE PARAMETERS.....CHECK	
WING sw.....OFF	
BEACON sw.....OFF	
OTHER EXTERIOR LIGHTS.....AS RQRD	FUEL PUMPS/CTR XFR VALVES.....OFF
SLIDES.....CHECK DISARMED	ATC.....STBY
SEAT BELTS sw.....OFF	IRS PERFORMANCE.....CHECK
GROUND CONTACT.....ESTABLISH	FUEL QUANTITY.....CHECK
PARK BRK handle.....AS RQRD	BRAKE FAN pb AS RQRD
PARKING C/L.....	COMPLETE
HUD STOW	HUD STOW
STATUS page.....CHECK (CM1)	STATUS page.....CHECK (CM1)
LOGBOOK.....COMPLETE (CM1)	LOGBOOK.....COMPLETE (CM1)
All EFB TRANSMITTING MODE.....AS RQRD	All EFB TRANSMITTING MODE.....AS RQRD
EFB.....CLOSE FLIGHT	EFB.....CLOSE FLIGHT
DUs.....DIM	DUs.....DIM

SECURING THE AIRCRAFT

Ident.: PRO-NOR-TSK-00024930.0003001 / 06 NOV 25

Applicable to: MSN 07784-07792

20

CM1	CM2
PARK BRK handle.....CHECK ON	OXYGEN CREW SUPPLY pb.....OFF
All IR MODE selectors.....OFF	EXTERIOR LIGHTS.....OFF
	MAINT BUS sw.....AS RQRD
	APU BLEED pb-sw.....OFF
	EXT PWR pb.....AS RQRD
	APU MASTER SW pb-sw.....OFF
	EMER EXIT LT sw.....OFF
	NO PORTABLE ELEC DEVICE sw.....OFF
	BAT 1 pb-sw + BAT 2 pb-sw.....OFF
WINDOWS.....CHECK CLOSED	WINDOWS.....CHECK CLOSED
	SECURING THE AIRCRAFT C/L.....COMPLETE

Continued on the following page

PROCEDURES

NORMAL PROCEDURES

TASKSHARING

Continued from the previous page

CM1	CM2
EFB applications..... CLOSE	EFB applications..... CLOSE
All EFB..... SWITCH OFF	All EFB..... SWITCH OFF

SECURING THE AIRCRAFT

Ident.: PRO-NOR-TSK-00024930.0002001 / 06 NOV 25

Applicable to: MSN 02155-05746

21

CM1	CM2
PARK BRK handle..... CHECK ON	OXYGEN CREW SUPPLY pb..... OFF
All IR MODE selectors..... OFF	EXTERIOR LIGHTS..... OFF
	MAINT BUS sw..... AS RQRD
	APU BLEED pb-sw..... OFF
	EXT PWR pb..... AS RQRD
	APU MASTER SW pb-sw..... OFF
	EMER EXIT LT sw..... OFF
	SIGNS sw..... OFF
	BAT 1 pb-sw + BAT 2 pb-sw..... OFF
WINDOWS..... CHECK CLOSED	WINDOWS..... CHECK CLOSED
	SECURING THE AIRCRAFT C/L..... COMPLETE
EFB applications..... CLOSE	EFB applications..... CLOSE
All EFB..... SWITCH OFF	All EFB..... SWITCH OFF

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES SUPPLEMENTARY PROCEDURES - SUPPLEMENTARY PROCEDURES MENU
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SUPPLEMENTARY PROCEDURES

Ident.: PRO-NOR-SUP-SUP-SUP-00-00020244.0001001 / 04 MAY 23

Applicable to: ALL

ADVERSE WEATHER

- [SUP] AIRFRAME DEICING/ANTI-ICING PROCEDURE ON GROUND (*Refer to procedure*)
- [SUP] GROUND OPERATIONS IN COLD WEATHER CONDITIONS (*Refer to procedure*)
- [SUP] GROUND OPERATION IN HEAVY RAIN (*Refer to procedure*)
- [SUP] ENGINE OPERATIONS ON GROUND IN ICING CONDITIONS (*Refer to procedure*)
- [SUP] MINIMUM SPEED WITH ICE ACCRETION (*Refer to procedure*)
- [SUP] OPERATIONS ON CONTAMINATED AIRPORTS (*Refer to procedure*)
- [SUP] OPERATIONS WITH VOLCANIC ASH, SAND OR DUST (*Refer to procedure*)
- [SUP] SECURING THE AIRCRAFT FOR COLD SOAK (*Refer to procedure*)
- [SUP] FOR DRAINING WATER PROCEDURE (*Refer to procedure*)
- [SUP] WATER SYSTEM DRAINING (*Refer to procedure*)

Ident.: PRO-NOR-SUP-SUP-SUP-00-00020248.0001001 / 14 NOV 24

Applicable to: ALL

ENGINE

- [SUP] MANUAL ENGINE START (*Refer to procedure*)
- [SUP] ENGINE START WITH AN AIR START UNIT (*Refer to procedure*)
- [SUP] CROSSBLEED ENGINE START (*Refer to procedure*)
- [SUP] ENGINE START VALVE MANUAL OPERATION (*Refer to procedure*)
- [SUP] ENGINE VENTILATION (DRY CRANKING) (*Refer to procedure*)

Ident.: PRO-NOR-SUP-SUP-SUP-00-00020249.0001001 / 17 MAR 17

Applicable to: ALL

FUEL

- [SUP] REFUELING (*Refer to procedure*)
- [SUP] REFUELING WITH ONE ENGINE RUNNING (*Refer to procedure*)
- [SUP] GROUND FUEL TRANSFER (*Refer to procedure*)
- [SUP] DEFUELING (*Refer to procedure*)

Ident.: PRO-NOR-SUP-SUP-SUP-00-00025164.0001001 / 26 JAN 22

Applicable to: ALL

GPS INTERFERENCES

- [SUP] GPS INTERFERENCES (*Refer to procedure*)



A318/A319/A320/A321
FLIGHT CREW
OPERATING MANUAL

PROCEDURES

NORMAL PROCEDURES

SUPPLEMENTARY PROCEDURES -
SUPPLEMENTARY PROCEDURES MENU

Ident.: PRO-NOR-SUP-SUP-SUP-00-00020251.0001001 / 17 NOV 20

Applicable to: **ALL**

LANDING GEAR

[SUP] OPERATION WITH NOSEWHEEL STEERING OFFSET (*Refer to procedure*)

[SUP] FLIGHT WITH GEAR DOWN (*Refer to procedure*)

MISCELLANEOUS

1 Ident.: PRO-NOR-SUP-SUP-SUP-00-00029131.0015001 / 06 NOV 25

Applicable to: **MSN 02719-02789, 03031-03060, 07784-07792**

MISCELLANEOUS

- [SUP] FLIGHT WITHOUT CABIN PRESSURIZATION (*Refer to procedure*)
- [SUP] HIGH ALTITUDE AIRPORT OPERATIONS (*Refer to procedure*)
- [SUP] OPERATIONS AT QNH ABOVE 1050 HPA (31.00 INHG) (*Refer to procedure*)
- [SUP] PUSHBACK WITH POWER PUSH UNIT (*Refer to procedure*)

2 Ident.: PRO-NOR-SUP-SUP-SUP-00-00029131.0004001 / 06 NOV 25

Applicable to: **MSN 02155-02212**

MISCELLANEOUS

- [SUP] FLIGHT WITHOUT CABIN PRESSURIZATION (*Refer to procedure*)
- [SUP] OPERATIONS AT QNH ABOVE 1050 HPA (31.00 INHG) (*Refer to procedure*)
- [SUP] OPERATIONS WITH QFE BAROMETRIC REFERENCE (*Refer to procedure*)
- [SUP] PUSHBACK WITH POWER PUSH UNIT (*Refer to procedure*)

3 Ident.: PRO-NOR-SUP-SUP-SUP-00-00029131.0003001 / 06 NOV 25

Applicable to: **MSN 02926-02944, 04392-05746**

MISCELLANEOUS

- [SUP] FLIGHT WITHOUT CABIN PRESSURIZATION (*Refer to procedure*)
- [SUP] OPERATIONS AT QNH ABOVE 1050 HPA (31.00 INHG) (*Refer to procedure*)
- [SUP] PUSHBACK WITH POWER PUSH UNIT (*Refer to procedure*)

SURVEILLANCE

Ident.: PRO-NOR-SUP-SUP-SUP-00-00020253.0011001 / 17 MAR 17

Applicable to: **MSN 02155-02212, 02926-07792**

SURVEILLANCE

[SUP] AUTOMATIC DEPENDENT SURVEILLANCE - BROADCAST (ADS-B) (*Refer to procedure*)

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES SUPPLEMENTARY PROCEDURES - SUPPLEMENTARY PROCEDURES MENU
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Ident.: PRO-NOR-SUP-SUP-SUP-00-00020253.0010001 / 17 MAR 17
Applicable to: MSN 02719-02789

SURVEILLANCE
[SUP] AUTOMATIC DEPENDENT SURVEILLANCE - BROADCAST (ADS-B) (*Refer to procedure*)
[SUP] (ENHANCED) GROUND PROXIMITY WARNING SYSTEM (EGPWS/GPWS) (*Refer to procedure*)

PROCEDURES

NORMAL PROCEDURES

SUPPLEMENTARY PROCEDURES -
SUPPLEMENTARY PROCEDURES MENU

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AIRFRAME DEICING/ANTI-ICING PROCEDURE ON GROUND

Applicable to: ALL

Ident.: PRO-NOR-SUP-ADVWXR-A-00020694.0001001 / 06 NOV 25

1
2

BEFORE FLUID SPRAYING

In all situations, it is the captain's responsibility to decide if the ground crew must deice/anti-ice the aircraft, and/or if additional deicing/anti-icing treatment are required.

CAUTION	- Make sure that the low or high-pressure ground connectors do not supply any external air to the aircraft. - If it is necessary for the ground crew to repeatedly anti-ice the aircraft, they must deice the surfaces with a hot fluid mixture before applying a new layer of anti-icing fluid.
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COMMUNICATION WITH GROUND CREW.....ESTABLISH

L2

Establish communication with the crew that will apply the procedure.

L1

DEICING/ANTI-ICING FLUIDS TYPE..... CHECK APPROPRIATE

L2

Check that the ground crew uses the correct deicing/anti-icing fluids, in accordance with the applicable operator requirements and AMM.

L1

DO NOT START THE ENGINES DURING FLUID SPRAYING

L2

Engines and APU can be either stopped or running during deicing/anti-icing.

L1

CAUTION	- The ground crew should take care when spraying deicing fluid, and make sure that the engines and APU do not ingest any fluid. - Do not move flaps, slats, ailerons, spoilers or elevators if they are not free of ice. - Always ensure that both left and right side of the aircraft receive the same complete and symmetrical deicing/anti-icing treatment.
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Note: In case of frost formation on one or several areas of the wing, the Captain can request a local deicing application only on the affected areas. The Captain shall take care that both wings receive the same symmetrical treatment, even if frost formation does not affect both wing symmetrically. For more information, refer to AMM.

CABIN PRESS MODE SEL.....CHECK AUTO
 ENG 1 BLEED..... OFF
 ENG 2 BLEED..... OFF
 APU BLEED..... OFF
 DITCHING pb-sw.....ON

L2

On the CABIN PRESS panel, check that the ON light on the DITCHING pb-sw comes on. Outflow valve, pack valves, and avionic ventilation inlet and extract valves close.

PROCEDURES

NORMAL PROCEDURES

SUPPLEMENTARY PROCEDURES - ADVERSE WEATHER

This prevents deicing/anti-icing fluid from entering the aircraft. Avionic ventilation is in a closed circuit with both fans running. In view of the low OAT, there is no time limit for this configuration.

- L1** Note:
1. If the **DITCHING pb-sw** is left on after the completion of the fluid spraying, it will lead to lack of pressurization in flight, and ultimately trigger the **CAB PR EXCESS CAB ALT** alert.
 2. If the **VENT AVNCS SYS FAULT** alert appears, reset the AEVC circuit breaker at the end of the aircraft deicing/anti-icing procedure (Refer to QRH/ABN-02 VENT AVNCS SYS FAULT).
 3. For passenger comfort reason, it is not recommended to operate on ground with both PACKS set to OFF for more than 20 min.

THRUST LEVERS.....CHECK IDLE
 “AIRCRAFT PREPARED FOR SPRAYING”..... INFORM GROUND CREW

Ident.: PRO-NOR-SUP-ADVWXR-A-00002311.0001001 / 06 NOV 25

3
4

UPON COMPLETION OF THE SPRAYING OPERATION

PITOTS and STATICS (ground crew).....CHECK

CAUTION

When the OAT is low (below -5 °C) during snow/freezing rain precipitations, melted snow or raindrops may drip from the cockpit windshields and freeze on the fuselage below. This could create ice build up on the forward fuselage that could possibly disturb the airflow around the static/pitot/angle-of-attack probes, and result in unreliable air data measurements during takeoff. Therefore, during taxi out before takeoff, beware of this possible build up of ice. The area around static/pitot/angle-of-attack probes must be free of ice/snow before starting takeoff.

GROUND EQUIPMENT..... REMOVE
 DEICING/ANTI-ICING REPORT.....RECEIVED

- L2** The information from ground personnel, who performed the deicing/anti-icing and post-application check, must include (ANTI-ICING CODE):
- The type of fluid used
 - The ratio of fluid to water (e.g. 75/25)
 - The time of the holdover beginning
 - The result of the post application check: "Aircraft critical parts are clean".

L1 DITCHING pb-sw..... OFF

- L2** On the CABIN PRESS panel, check that the **ON** light on the DITCHING pb-sw goes off.

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L1 Note: If the DITCHING pb-sw is left on after the completion of the fluid spraying, it will lead to lack of pressurization in flight, and ultimately trigger the **CAB PR EXCESS CAB ALT** alert.

OUTFLOW VALVE.....CHECK OPEN

L2 On the ECAM PRESS page, confirm that the outflow valve indication reaches the open green position to avoid any unexpected aircraft pressurization.

L1 ● **At least 1 minute after completion of spraying operations:**
ENG 1 BLEED..... ON
ENG 2 BLEED..... ON

● **At least 5 minutes after completion of spraying operation:**
APU BLEED.....AS RQRD

Note: There is a risk of de-icing fluid ingestion by the APU air intake, resulting in specific odors, or smoke warnings. Therefore:

- Keep the APU running with the APU BLEED OFF for 5 min after spraying completion before setting the APU BLEED to ON (if required),
- Consider APU BLEED OFF for takeoff.

NORMAL PROCEDURE..... RESUME

L2 Apply appropriate normal procedures. Pay special attention to the flight control check. In freezing precipitation, perform the appropriate checks to evaluate aircraft icing. Base the decision on whether to takeoff, or to re-protect the aircraft, on the amount of ice that has built up on the critical surfaces since the last deicing/anti-icing, as revealed by a personal inspection from the inside and outside of the aircraft. Make this inspection before the holdover time expires, or just before takeoff.

GROUND OPERATIONS IN COLD WEATHER CONDITIONS

Applicable to: ALL

Ident.: PRO-NOR-SUP-ADVWXR-B-00020703.0001001 / 17 NOV 20

GENERAL

For ground operations on contaminated runways, Refer to EFB-TOF-30-30 Descriptions and Refer to PRO-NOR-SUP-ADVWXR General.

The following procedures supplement the normal operating procedures.

Ident.: PRO-NOR-SUP-ADVWXR-B-00020698.0001001 / 13 DEC 17

SAFETY EXTERIOR INSPECTION

PROTECTIVE COVERS..... REMOVED

PROCEDURES

NORMAL PROCEDURES

SUPPLEMENTARY PROCEDURES - ADVERSE WEATHER

APU INTAKE.....CHECK FREE OF SNOW AND ICE
 PACKS INLET/OUTLET DOORS.....CHECK FREE OF SNOW AND ICE
 OUTFLOW VALVES..... CHECK FREE OF SNOW AND ICE
 ABOVE ITEMS.....DEICE IF NECESSARY

Ident.: PRO-NOR-SUP-ADVWXR-B-00020699.0001001 / 21 MAR 17

PRELIMINARY COCKPIT PREPARATION

PRELIMINARY COCKPIT PREPARATION - SOP.....COMPLETED

L2

APU is started and the air conditioning is on.

Note: - Ground power should be used to start the APU if the OAT is -15 °C (5 °F) or below.
 - With cockpit temperatures below -15 °C (5 °F), the display units may not be available.

L1

● If the avionics bay is cold soaked:

L2

The aircraft was parked without electrical ground supply or without air conditioning.

L1

IRS.....INITIATE ALIGNMENT

L2

For temperatures at or below -15 °C (5 °F) in the avionics bay, the IRS alignment requires 15 min.

L1

WINDSHIELD AND UPPER COCKPIT FUSELAGE.....ICE/SNOW REMOVED

CAUTION

With ice or snow accumulated on the windshield and/or the upper cockpit fuselage, and if the PROBE/WINDOW HEAT is on, melted ice or snow running down from these areas could re-freeze on the fuselage area below, if the temperature is very low. This could create ice build-up on the forward fuselage that could possibly disturb the airflow around the static/pitot/angle-of-attack probes.

PROBE COVERS..... CHECK REMOVED

L2

Ensure that the probe covers are removed in order to prevent the covers from melting.

L1

PROBE/WINDOW HEAT..... ON

Ident.: PRO-NOR-SUP-ADVWXR-B-00020700.0001001 / 05 JUN 18

EXTERIOR WALKAROUND

SURFACES CHECK FREE OF FROST, ICE AND SNOW

L2

Check critical surfaces: leading edges, upper wing surfaces, vertical and horizontal stabilizers, all control surfaces, slats and flaps.

PROCEDURES

NORMAL PROCEDURES

SUPPLEMENTARY PROCEDURES - ADVERSE WEATHER

- L1** FLIGHT CONTROL SURFACES: DO NOT MOVE UNTIL ACFT IS DEICED
- L2** *The flight crew must not perform the flight controls check until the aircraft is fully deiced.*
- L1** AFTER START C/L: DELAY UNTIL ACFT IS DEICED
- L2** *Delay the AFTER START checklist until the aircraft is fully deiced.*
- L1** ● **At the deicing bay:**
 AIRFRAME DEICING/ANTI-ICING PROCEDURE ON GROUND..... APPLY
- L2** *Refer to procedure.*
- L1** NORMAL PROCEDURE..... RESUME

GROUND OPERATIONS IN HEAVY RAIN

Ident.: PRO-NOR-SUP-ADVWXR-00020720.0001001 / 21 MAR 17

Applicable to: ALL

On ground (Aircraft taxiing or parked) in case of heavy rain, water may enter the avionics ventilation system via the skin air inlet valve.

- **When on ground:**
 EXTRACT.....OVRD

L2 This closes the skin air inlets, preventing rainwater from entering the avionics bay.

- L1** PACK 1 ON..... CHECK
- PACK 2 ON..... CHECK

L2 Air conditioning compensates the avionics cooling reduction when the skin air inlet is closed.

- L1** ● **If air conditioning not available:**

L2 When the aircraft avionics are powered, closing the skin air inlet valve reduces avionics cooling capability. With air conditioning not available, the reduced cooling is efficient for a limited period of time, depending on the outside temperature.

- L1** Aircraft should not remain powered more than:
- OAT ≤ 39 °C (102 °F): no limit
 - 39 °C (102 °F) < OAT ≤ 45 °C (113 °F): 3 h
 - 45 °C (113 °F) < OAT: 30 min

- **After takeoff:**
 EXTRACT..... AUTO

ENGINE OPERATIONS ON GROUND IN ICING CONDITIONS
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Ident.: PRO-NOR-SUP-ADVWXR-00026014.0001001 / 13 MAY 25

Applicable to: ALL

INTRODUCTION

CAUTION	During engine operations on ground in icing conditions, and with OAT at +3 °C (37 °F) or below, ice accretion may affect the engine fan blades, spinner, or stators of the low pressure compressor. Apply the following engine ice shedding procedure to prevent possible engine degradation or damage.
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The quantity of ice accretion depends on the time during which the engine is running on ground in the above mentioned icing conditions.

This procedure involves the performance of engine accelerations before the end of specific time intervals, or if the engine vibrations increase during taxi.

The taxi-out time starts when the first engine is running, and finishes when the aircraft is aligned on the departure runway for takeoff. The taxi-in time starts at touchdown, and finishes when both engines are set to off.

PRELIMINARY COCKPIT PREPARATION

- **If the engines are operated on ground in icing conditions with OAT at +3 °C (37 °F) or below:**
 LOGBOOK..... CHECK
Note: Check the taxi-in time of the previous flight in icing conditions with OAT at +3 °C (37 °F) or below recorded in the logbook.
 MAXIMUM TIME TO NEXT ENGINE ACCELERATION..... DETERMINE
 - The maximum time to next engine acceleration is the difference between 30 min and the taxi-in time of the previous flight recorded in the logbook
 - If there is freezing rain, freezing drizzle, freezing fog, or heavy snow, the maximum time to next engine acceleration is the difference between 10 min and the taxi-in time of the previous flight recorded in the logbook
 - Disregard the taxi-in time of the previous flight, if a maintenance task to deice the engines is performed before engine start.
 SOP PRELIMINARY COCKPIT PREPARATION..... RESUME

TAXI-OUT

TAXI TIME.....MONITOR

PROCEDURES

NORMAL PROCEDURES

SUPPLEMENTARY PROCEDURES - ADVERSE WEATHER

Perform the following procedure before the taxi time reaches the maximum time to next engine acceleration, or if the engine vibrations increase.

WARNING Before and during the application of the procedure, ensure that the jet blast due to the increased thrust does not result in any hazard to people or installations behind the aircraft.

GND SURFACE COND & AREA.....CHECK
 ATC.....NOTIFY
 PARKING BRAKE.....ON

CAUTION Pay special attention to the aircraft movement during this procedure. If during thrust increase the aircraft starts to move, immediately retard the thrust levers to IDLE.

CAUTION If the ground surface conditions or the area behind the aircraft do not permit to accelerate up to 70 % N1, then the thrust setting and the hold time should be as high as possible.

- **If in icing conditions with OAT at +3 °C (37 °F) or below:**
 THR LEVERS.....70 % N1 for 30 s
 THR LEVERS.....RETARD TO IDLE

Repeat this procedure at intervals not longer than 30 min, or if the engine vibrations increase.

- **In addition, if there is freezing rain, freezing drizzle, freezing fog, or heavy snow:**
 THR LEVERS.....70 % N1 (NO HOLD TIME)
 THR LEVERS.....RETARD TO IDLE

Repeat this procedure at intervals not longer than 10 min, or if the engine vibrations increase.

SOP TAXI.....RESUME

BEFORE TAKEOFF

LINE-UP CLEARANCE

A final engine acceleration must be performed before takeoff to clean the engine from ice accretion (regardless of any engine acceleration performed during the taxi-out).

If the ice shedding procedure cannot be performed on the runway (due to airport/operation constraint), the ice shedding procedure can be performed before line-up, in areas that provide both:

- Sufficient clearance to avoid any risk of jet blast for:
 - People
 - Other aircraft in the line up
 - The airport facilities behind the aircraft.
- Better friction coefficient.

ATC..... NOTIFY

DO NOT PERFORM ROLLING TAKEOFF

L2 *The following procedure must be performed with the aircraft stopped.*

L1 SOP BEFORE TAKEOFF..... RESUME

TAKEOFF

AFTER LINE-UP

PARKING BRAKE (OR BRAKE WITH PEDALS)..... APPLY

L2 *Apply braking with the pedals or the parking brake, as required.*

L1

CAUTION	Pay special attention to the aircraft movement during this procedure. If during thrust increase the aircraft starts to move, immediately retard the thrust levers to IDLE.
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CAUTION	If the ground surface conditions or the area behind the aircraft do not permit to accelerate up to 70 % N1, then the thrust setting and the hold time should be as high as possible.
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● **If in icing conditions with OAT at +3 °C (37 °F) or below:**

THR LEVERS..... 70 % N1 for 30 s

THR LEVERS..... RETARD TO IDLE

Note: The final engine acceleration can be performed in combination with the takeoff procedure.

SOP TAKEOFF..... RESUME

AFTER LANDING

TAXI-IN TIME..... MONITOR

Perform the following procedure when in icing conditions with OAT at +3 °C (37 °F) or below:

PROCEDURES

NORMAL PROCEDURES

SUPPLEMENTARY PROCEDURES - ADVERSE WEATHER

- If the engine vibrations increase, or
- At the latest when the taxi-in time reaches:
 - 30 minutes, or
 - 10 minutes, if there is freezing rain, freezing drizzle, freezing fog, or heavy snow.

WARNING Before and during the application of the procedure, ensure that the jet blast due to the increased thrust does not result in any hazard to people or installations behind the aircraft.

GND SURFACE COND & AREA.....CHECK
 ATC.....NOTIFY
 PARKING BRAKE.....ON

CAUTION Pay special attention to the aircraft movement during this procedure. If during thrust increase the aircraft starts to move, immediately retard the thrust levers to IDLE.

CAUTION If the ground surface conditions or the area behind the aircraft do not permit to accelerate up to 70 % N1, then the thrust setting and the hold time should be as high as possible.

- **If in icing conditions with OAT at +3 °C (37 °F) or below:**
 THR LEVERS.....70 % N1 for 30 s
 THR LEVERS.....RETARD TO IDLE
 Repeat this procedure at intervals not longer than 30 min, or if the engine vibrations increase.
- **In addition, if there is freezing rain, freezing drizzle, freezing fog, or heavy snow:**
 THR LEVERS.....70 % N1 (NO HOLD TIME)
 THR LEVERS.....RETARD TO IDLE
 Repeat this procedure at intervals not longer than 10 min, or if the engine vibrations increase.

SOP AFTER LANDING.....RESUME

PARKING

TAXI-IN TIME.....RECORD IN THE LOGBOOK

L2 Record the taxi-in time in icing conditions with OAT at +3 °C (37 °F) or below, or the taxi-in time after last engine acceleration if performed. This time is used to determine the maximum time to next engine acceleration for the next flight.

L1 SOP PARKING.....RESUME

MINIMUM SPEED WITH ICE ACCRETION

Ident.: PRO-NOR-SUP-ADVWXR-00020722.0002001 / 21 MAR 17

Applicable to: ALL

Evidence of ice accretion can be ice on the visual indicator (between the two cockpit windshields) or on the windshield wipers.

CAUTION Extended flight in icing conditions with the slats extended should be avoided.

■ **If wing anti ice is operative:**

■ **In CONF clean, 1, 2 or 3:**

MIN SPEED: VLS + 10 kt

■ **In CONF FULL:**

MIN SPEED: VLS + 5 kt

The minimum speed takes into account ice accretion on non-heated structure.

■ **If wing anti ice is not operative:**

MIN SPEED: VLS + 10 kt/GREEN DOT

The minimum speed takes into account ice accretion on the entire airframe when anti-ice is inoperative.

OPERATIONS ON CONTAMINATED AIRPORTS
Applicable to: ALL

Ident.: PRO-NOR-SUP-ADVWXR-C-00020729.0001001 / 21 MAR 17

GENERAL

If the ground surfaces are not contaminated but the weather corresponds to icing conditions with falling rain, slush or snow, anticipate a probable resulting runway/surfaces contamination.

There is a low probability of fluid ingestion by the engines which should anyway not degrade the safety. The risk of ingestion is independent of the depth of the contaminant.

Ident.: PRO-NOR-SUP-ADVWXR-C-00020726.0003001 / 06 NOV 25

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UNDUE ALERTS

On the ground with contaminated surfaces or deicing fluid on radio altimeter antennas, the radio altimeters may indicate some erroneous values or no values.

If the PFD displays erroneous radio altimeter values, the flight crew can disregard the triggered auto callouts and/or the GPWS/EGPWS alerts.

PROCEDURES

NORMAL PROCEDURES

SUPPLEMENTARY PROCEDURES - ADVERSE WEATHER

Note: *Undue GPWS/EGPWS alerts may trigger at the apron, during taxi, takeoff and landing runs.*

If the PFD does not display any radio altimeter values on both sides, the flight crew can disregard the following alerts:

- **ENG ALL ENGINES FAILURE**
- **ANTI ICE CAPT TAT** or **ANTI ICE F/O TAT**
- **L/G SHOCK ABSORBER FAULT**
- **STALL WARNING**
- **ENG 1(2) REVERSE UNLOCKED**
- **ENG REV SET**
- **NAV TCAS STBY**
- **BRAKES PARK BRK ON**
- **WING A.ICE SYS FAULT.**

The PFD recovers the radio altimeter indication in the following cases:

- The aircraft is on a non-contaminated surface, or
- The radio altimeter antennas are no longer covered by any fluids (deicing fluid or water).

The flight crew must check that the radio altimeter values are indicated on the PFD before entering the runway.

Ident.: PRO-NOR-SUP-ADVWXR-C-00020725.0001001 / 03 MAY 23

PARKING

● After engine shutdown and before shutting down electrical supply:

FLAPS/SLATS..... CONFIRM FREE OF CONTAMINATION

L2

Perform a visual inspection to determine if the flaps/slats mechanism is free of contamination. If necessary, perform decontamination.

When ADIRSS are OFF with the slats/flaps extended, the **AUTO FLT REAC W/S DET FAULT** alert may trigger and may be disregarded.

L1

YELLOW ELEC PUMP pb..... ON
 BLUE ELEC PUMP pb..... AUTO
 BLUE PUMP OVRD pb..... ON
 SLATS/FLAPS..... RETRACT

L2

Monitor slats/flaps retraction on ECAM upper display.

L1

● When slats and flaps are retracted:

YELLOW ELEC PUMP pb..... OFF
 BLUE PUMP OVRD pb..... OFF
 NORMAL PROCEDURE..... RESUME

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OPERATIONS WITH VOLCANIC ASH, SAND OR DUST

Applicable to: ALL

Ident.: PRO-NOR-SUP-ADVWXR-G-00020733.0001001 / 14 NOV 24

PRELIMINARY COCKPIT PREPARATION

- APU..... AVOID USE
- L2** *Request ground power for air conditioning and electricity. If ground power is not available, the APU should be used only to start the engines.*
- L1** WINDSHIELD WIPERS..... DO NOT USE
- L2** *Do not use the windshield wipers to remove ash, sand or dust.*
- L1** ● **For takeoff performance:**
- BRAKING PERFORMANCE MAY BE DEGRADED**
- L2** A layer of volcanic ash, sand or dust on the runway may degrade the braking efficiency.
- L1** EXTRACT pb-sw..... OVRD
- L2** This closes the skin air inlets, preventing volcanic ash, sand or dust from entering the avionics bay.
- L1** PACK 1 ON..... CHECK
- PACK 2 ON..... CHECK
- L2** Air conditioning compensates the avionics cooling reduction when the skin air inlet is closed.
- L1** ● **If air conditioning not available:**
- L2** When the aircraft avionics are powered, closing the skin air inlet valve reduces avionics cooling capability. With air conditioning not available, the reduced cooling is efficient for a limited period of time, depending on the outside temperature.
- L1** Aircraft should not remain powered more than:
- OAT ≤ 39 °C (102 °F): no limit
 - 39 °C (102 °F) < OAT ≤ 45 °C (113 °F): 3 h
 - 45 °C (113 °F) < OAT: 30 min

Ident.: PRO-NOR-SUP-ADVWXR-G-00020734.0001001 / 21 MAR 17

EXTERIOR WALKAROUND

- SURFACES AND EQUIPMENT.....CHECK FREE OF DEPOSITS
- L2** *Ground maintenance should remove ash, sand or dust that has settled on exposed lubricated surfaces and could penetrate seals or enter the engine gas path, air conditioning system, air data probes, access doors and panels and other orifices on the aircraft.*

PROCEDURES

NORMAL PROCEDURES

SUPPLEMENTARY PROCEDURES - ADVERSE WEATHER

L1 ENGINE/APU INLETS..... CHECK FREE OF DEPOSITS

L2 Inspect the inlets and order them cleaned of deposit. Have the area within 8 m (25 ft) of the engine inlet cleaned of volcanic ash, as much as practical.

Ident.: PRO-NOR-SUP-ADVWXR-G-00020735.0004001 / 06 NOV 23

ENGINE START

ALL ENGINES..... CRANK

L2 Before engine start, to ventilate all engines, dry crank for two minutes at the maximum motoring speed to remove any deposit from the booster area. Start the two minutes **CHRONO** when the engines reach the maximum motoring speed. Refer to PRO-NOR-SUP-ENG Engine Ventilation (Dry Cranking).

L1 Note: The **ENG 1(2) START FAULT - STARTER TIME EXCEEDED** alert may be triggered during the dry cranking of the engines. If this occurs, the flight crew can disregard the alert and continue to dry crank the engines.

■ **If air start unit is available:**

ENGINE START WITH AN AIR START UNIT..... Refer
to PRO-NOR-SUP-ENG Engine Start with an Air Start Unit

■ **If air start unit is not available:**

SOP - ENGINE START.....PERFORM

Ident.: PRO-NOR-SUP-ADVWXR-G-00022532.0002001 / 16 OCT 18

AFTER START

ENG ANTI-ICE pb-sw.....ON for 10 s

L2 Engine anti-ice should be operated on both engines for about 10 s after the first engine start of the day in order to flush any sand and/or dust which could affect later operation of Engine Anti-Ice system.

Ident.: PRO-NOR-SUP-ADVWXR-G-00020736.0001001 / 14 NOV 24

TAXI

ONE ENGINE TAXI..... DO NOT PERFORM

L2 Minimize the thrust during taxi.

L1 ENG 1 BLEED..... OFF

ENG 2 BLEED..... OFF

L2 Keep engine bleed valves closed for taxiing, especially in volcanic ash.

L1 FOR 180 ° TURN ON RUNWAY: INITIATE THE TURN DOWNWIND

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L2 In order to prevent ash, sand or dust ingestion.

L1 ***Note:** For passenger comfort reason, it is not recommended to operate on ground without air conditioning supply for more than 20 min.Refer to LIM-AIR General*

Ident.: PRO-NOR-SUP-ADVWXR-G-00020737.0001001 / 21 MAR 17

TAKEOFF

- ASH, SAND OR DUST..... ALLOW TO SETTLE
- L2** *Allow ash, sand or dust to settle on runway before starting the takeoff roll.*
- L1** PACK OFF TAKEOFF..... CONSIDER
- L2** *This will prevent air conditioning system contamination.*
- L1** ROLLING TAKEOFF.....CONSIDER

9 Ident.: PRO-NOR-SUP-ADVWXR-G-00020738.0004001 / 14 NOV 24

AFTER TAKEOFF

- MINIMIZE TIME IN SAND OR DUST CLOUD
- L2** *Climb to quickly exit the sand/dust cloud. If possible, altitude constraints may be disregarded in coordination with ATC.*
- L1** ENG 1 BLEED.....ON
- ENG 2 BLEED.....ON
- Note:** The **AIR ENG 1+2 BLEED FAULT** alert triggers if both ENG BLEED pb-sw are still OFF above 1 500 ft. If this occurs, disregard this alert.*
- EXTRACT pb-sw.....AUTO

Ident.: PRO-NOR-SUP-ADVWXR-G-00020739.0001001 / 21 MAR 17

IN FLIGHT

- AVOID ASH, SAND OR DUST CLOUD
- **If sand or dust cloud encounter:**
- MINIMIZE TIME IN SAND OR DUST CLOUD
- L2** *If possible and in coordination with ATC, adapt flight path (route and altitude) to exit the cloud.*
- L1** ● **If ash cloud encounter:**
- VOLCANIC ASH ENCOUNTER PROCEDURE..... APPLY
- Refer to PRO-ABN-MISC [QRH] VOLCANIC ASH ENCOUNTER .*

Ident.: PRO-NOR-SUP-ADVWXR-G-00020740.0001001 / 21 MAR 17

DESCENT PREPARATION

AUTOLAND RECOMMENDED

L2 *Deposits on the windshield and landing lights may significantly reduce visibility during approach and landing. Consider a diversion to an airport where autoland is possible.*

L1 ● **For landing performance:**

CONSIDER IDLE REVERSE

BRAKING PERFORMANCE MAY BE DEGRADED

L2 *A layer of volcanic ash, sand or dust on the runway may degrade the braking efficiency.*

Ident.: PRO-NOR-SUP-ADVWXR-G-00020741.0001001 / 21 MAR 17

DESCENT

AVOID LEVEL FLIGHT IN ASH, SAND OR DUST CLOUD

If possible and in coordination with ATC, perform holding patterns and last level off before final descent outside of the cloud.

Ident.: PRO-NOR-SUP-ADVWXR-G-00020742.0001001 / 21 MAR 17

LANDING

● **Before Landing:**

ENG 1 BLEED..... OFF

ENG 2 BLEED..... OFF

PACK 1 and 2..... AS REQUIRED

L2 *Consider to set the packs OFF in order to avoid contamination of the air conditioning system.*

L1 ● **During Landing:**

REVERSERS..... AS REQUIRED

L2 *If it appears that maximum reverse thrust is needed, apply reverse thrust when the main landing gear touches down. Limit the use of reverse thrust as much as possible, because reverse flow may throw up ash, sand or dust and impair visibility.*

Ident.: PRO-NOR-SUP-ADVWXR-G-00020744.0001001 / 14 NOV 24

AFTER LANDING

ONE ENGINE TAXI..... DO NOT PERFORM

L2 *Minimize thrust during taxi.*

L1 APU..... AVOID USE

FOR 180 ° TURN ON RUNWAY: INITIATE THE TURN DOWNWIND

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES SUPPLEMENTARY PROCEDURES - ADVERSE WEATHER
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EXTRACT pb-sw..... OVRD

L2 This closes the skin air inlets, preventing volcanic ash, sand or dust from entering the avionics bay.

When the aircraft avionics are powered, closing the skin air inlet valve reduces avionics cooling capability. With air conditioning not available, the reduced cooling is efficient for a limited period of time, depending on the outside temperature.

L1 Aircraft should not remain powered more than:

- OAT ≤ 39 °C (102 °F): no limit
- 39 °C (102 °F) < OAT ≤ 45 °C (113 °F): 3 h
- 45 °C (113 °F) < OAT: 30 min

Note: For passenger comfort reason, it is not recommended to operate on ground without air conditioning supply for more than 20 min. Refer to LIM-AIR General

Ident.: PRO-NOR-SUP-ADVWXR-G-00020745.0001001 / 21 MAR 17

SECURING THE AIRCRAFT

If the aircraft is parked at an airport covered with volcanic ash, sand or dust, install engine inlet covers and other protective covers and plugs.
In addition:

● **After switching off all bleeds and before switching off the electrical AC power:**
DITCHING pb..... ON

L2 This closes the outflow valve, pack valves and avionics ventilation inlet and extract valves.

L1 ● **After switching off the electrical AC power and the batteries:**
DITCHING pb..... OFF

L2 All the applicable valves will open at the next power-up.

L1 PROTECTIVE COVERS..... INSTALL

L2 Request ground crew to install protective covers and plugs, in order to protect the aircraft and engines from volcanic ash, sand or dust.

L1 LOGBOOK..... REPORT ASH, SAND OR DUST CLOUD ENCOUNTER

PROCEDURES

NORMAL PROCEDURES

SUPPLEMENTARY PROCEDURES - ADVERSE WEATHER

SECURING THE AIRCRAFT FOR COLD SOAK

Ident.: PRO-NOR-SUP-ADVWXR-00020772.0002001 / 13 MAY 25

Applicable to: MSN 02719-07792

Cold soak should be considered in the following conditions:

- The OAT is less than 0 °C (32 °F), and
- No electrical supply and no air conditioning are provided to the aircraft, and
- The temperatures of aircraft components decrease below 0 °C (32 °F).

WHEN SECURING THE AIRCRAFT

● After switching off all bleeds and before switching off the electrical AC power:

DITCHING pb.....ON

L2

This closes the outflow valve, pack valves and avionics ventilation inlet and extract valves.

L1

On 122VU:

C/B X23 (RPCU)..... PULL

L2

This prevents the RPCU from re-opening the outflow valve.

L1

● When the chocks are in place:

PARKING BRAKE handle..... OFF

L2

Releasing the parking brake prevents the brakes from freezing.

L1

● After switching off the electrical AC power and the batteries:

DITCHING pb..... OFF

L2

All the applicable valves will open at the next power-up.

L1

On 122VU:

C/B X23 (RPCU)..... PUSH

PROTECTIVE COVERS.....INSTALL

L2

Request ground crew to install protective covers and plugs, in order to protect the wheels, the engines and the probes from snow and ice.

L1

WATER SYSTEM DRAINING.....REQUEST

L2

*Request maintenance actions to drain the water system for cold soak prevention purposes.
 Refer to PRO-NOR-SUP-ADVWXR Water System Draining.*

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES SUPPLEMENTARY PROCEDURES - ADVERSE WEATHER
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SECURING THE AIRCRAFT FOR COLD SOAK

Ident.: PRO-NOR-SUP-ADVWXR-00020772.0001001 / 28 MAY 20

Applicable to: MSN 02155-02212

Cold soak should be considered in the following conditions:

- The OAT is less than 0 °C (32 °F), and
- No electrical supply and no air conditioning are provided to the aircraft, and
- The temperatures of aircraft components decrease below 0 °C (32 °F).

WHEN SECURING THE AIRCRAFT

- **After switching off all bleeds and before switching off the electrical AC power:**
DITCHING pb.....ON

L2

This closes the outflow valve, pack valves and avionics ventilation inlet and extract valves.
- **When the chocks are in place:**
PARKING BRAKE handle..... OFF

L2

Releasing the parking brake prevents the brakes from freezing.
- **After switching off the electrical AC power and the batteries:**
DITCHING pb..... OFF

L2

All the applicable valves will open at the next power-up.

L1

PROTECTIVE COVERS.....INSTALL

L2

Request ground crew to install protective covers and plugs, in order to protect the wheels, the engines and the probes from snow and ice.

L1

WATER SYSTEM DRAINING.....REQUEST

L2

*Request maintenance actions to drain the water system for cold soak prevention purposes.
Refer to PRO-NOR-SUP-ADVWXR Water System Draining.*

FOR DRAINING WATER PROCEDURE

Applicable to: ALL

Ident.: PRO-NOR-SUP-ADVWXR-D-00002313.0001001 / 21 MAR 17

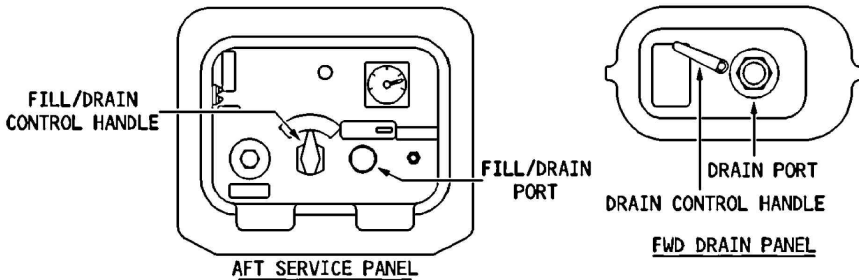
INTRODUCTION

This procedure uses electrical power.

PROCEDURES

NORMAL PROCEDURES

SUPPLEMENTARY PROCEDURES - ADVERSE WEATHER



ACCESS PLATFORM(S).....PUT IN POSITION
SHUTOFF VALVE IN GALLEYS/TOILETS..... CHECK OPEN
FWD/AFT ACCESS PANEL DOORS..... OPEN
DRAIN PORT CAPS..... REMOVE

Remove drain port caps on forward drain and aft service panels.

DRAIN HOSES.....CONNECT

Connect drain hoses to :

- the drain port on the forward drain panel.
- the full/drain port on the aft service panel.

Ident.: PRO-NOR-SUP-ADVWXR-D-00002314.0001001 / 24 JUN 24

ON THE FWD DRAIN PANEL

DRAIN CONTROL HANDLE..... TURN TO "OPEN" POSITION

Ident.: PRO-NOR-SUP-ADVWXR-D-00002315.0001001 / 21 MAR 17

ON THE AFT SERVICE PANEL

FILL/DRAIN CONTROL HANDLE.....TURN TO "DRAIN" AND PULL

Turn the handle to the "DRAIN" position and pull it out to its mechanical stop to drain.

The indicator light comes on.

Ident.: PRO-NOR-SUP-ADVWXR-D-00002316.0001001 / 21 MAR 17

WHEN THE WATER SYSTEM IS DRAINED

In freezing conditions, the drain valves must stay open to prevent damage to the system. Do not put on the caps and leave the access door open.

DRAIN HOSES.....DISCONNECT

PANELS..... CLEAN AND DRY

ACCESS PLATFORM(S)..... REMOVE

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES SUPPLEMENTARY PROCEDURES - ADVERSE WEATHER
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WATER SYSTEM DRAINING

Ident.: PRO-NOR-SUP-ADVWXR-00002205.0001001 / 21 MAR 17

Applicable to: ALL

Drain the water system, if the OAT requires it, as shown below :

Configuration			Exposure time	Water tank drain
Air Conditioning	Cabin temperature	Outside Air Temperature		
ON	Above 10 °C (50 °F)	Between 0 °C and -15 °C (32 °F and 5 °F)	None	Not required
		Below -15 °C (5 °F)	1 h 15 min	
OFF		Between 0 °C and -7 °C (32 °F and 19.4 °F)	1 h 30 min	Required
		Between -7 °C and -15 °C (19.4 °F and 5 °F)	0 h 30 min	
		Below -15 °C (5 °F)	Any	

PROCEDURES

NORMAL PROCEDURES

SUPPLEMENTARY PROCEDURES - ADVERSE WEATHER

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES SUPPLEMENTARY PROCEDURES - ENGINES
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MANUAL ENGINE START

Applicable to: ALL

Ident.: PRO-NOR-SUP-ENG-A-00009443.0004001 / 25 FEB 14

Pilots normally use automatic starting to start an engine.

However, manual starting is recommended in the following cases:

- **After aborting a start, because of:**
 - Engine stall
 - Engine EGT overlimit
 - Low start air pressure
- **When expecting a start abort, because of:**
 - Degraded bleed performance, due to hot conditions, or at a high-altitude airfields.
 - An engine with a reduced EGT margin, in hot conditions, or at a high-altitude airfields.
 - Marginal performance of the external pneumatic power group.
 - Intermittent ECAM **ENG 1(2) IGN A(B) FAULT** alert, during the first start of the day.

Ident.: PRO-NOR-SUP-ENG-A-00020858.0003001 / 19 DEC 17

MANUAL ENGINE START PROCEDURE

***Note:** During a manual engine start, if the flight crew suspects an engine start malfunction, or if an engine-related ECAM alert is triggered, the PF must abort the start sequence as follows:*

- *Before the ENG MASTER lever is set to ON, the PF must set the ENG MAN START pb-sw to OFF*
- *After the ENG MASTER lever is set to ON, the PF must set the ENG MASTER lever to OFF, and then the ENG MAN START pb-sw to OFF.*

In that case, the flight crew should consider a dry crank cycle of the affected engine before they perform another start attempt (Refer to PRO-NOR-SUP-ENG Engine Ventilation (Dry Cranking)).

Then, in the case of an ECAM alert, the PF must announce "ECAM actions", in accordance with the ECAM management philosophy.

THR LEVERS.....IDLE

CAUTION

The engines start regardless of the thrust lever position. If the thrust levers are not set to IDLE, the thrust rapidly increases to the corresponding thrust lever position, causing a hazardous situation.

ENG MODE sel..... NORM THEN IGN/START

L2

The lower ECAM displays the engine page.

PROCEDURES

NORMAL PROCEDURES

SUPPLEMENTARY PROCEDURES - ENGINES

L1

Note: If both engines are started manually, the following procedure applies one engine at a time.

- When all engines parameters are available on the upper ECAM display (no amber crosses displayed):

ENG MAN START pb-sw..... ON
 START VALVE.....CHECK IN-LINE
 N2 INCREASE..... CHECK
 OIL PRESS INCREASE..... CHECK

- If the N2 does not reach 20 %:

PACK VALVES.....CHECK CLOSED

- If the APU bleed is used for engine start and the pack valves are closed, shed the APU electrical loads as follows:

Shedding APU electrical loads enables to increase bleed air pressure.

L2
L1

GALY & CAB.....OFF

- If needed, shed also:

BLUE ELEC PUMP (on ground only).....OFF
 FUEL X FEED..... ON
 FUEL PUMPS (except R TK PUMP 2)..... OFF
 BLOWER..... OVRD
 CAB FANS..... OFF

- When N2 reaches 22 % or the maximum motoring speed (20 % minimum):

Note: The maximum motoring speed is defined as the speed at which N2 acceleration is less than 1 % in approximately 5 s.

ENG MASTER..... ON
 CHRONO..... START

L2

The PM starts the timing in order to monitor the light-up duration.

L1

IGNITERS A AND B..... CHECK ON
 FUEL FLOW INCREASE.....CHECK

- 15 s maximum after fuel flow increase:

EGT INCREASE..... CHECK
 N1 INCREASE..... CHECK

If the electrical power supply is interrupted during the start sequence (indicated by loss of ECAM displays), abort the start by setting the ENG MASTER lever to OFF. Then perform a 30 s dry crank (*Refer to PRO-NOR-SUP-ENG Engine Ventilation (Dry Cranking)*).

- L2

L1

● **When N2 reaches 50 %:**

START VALVE (between 50 and 56 % N2)..... CHECK CROSS LINE

IGNITERS A AND B..... CHECK OFF

MAIN ENG PARAMETERS..... CHECK NORMAL

SECONDARY ENG PARAMETERS..... CHECK NORMAL

The gray background on the N2 indication disappears.

Note: CFM 56-5B1/B2 engines, N2 accelerates slowly from 50 % to idle. Start abort is not required as long as N2 increases.

ENG MAN START pb-sw..... OFF

ENG MODE sel..... NORM
- **When no other engine requires to be started manually:**

SHEDDED SYSTEMS..... RESTORE

SOP - ENGINE START..... RESUME

ENGINE START WITH AN AIR START UNIT

Ident.: PRO-NOR-SUP-ENG-00020859.0002001 / 04 NOV 20
 Applicable to: ALL

- L2

L1

● **Before connecting the air start unit:**

PACK 1..... OFF

PACK 2..... OFF

Packs are selected off to prevent any possible contamination of the packs by the air start unit.

APU BLEED..... OFF

ENG 1 BLEED..... OFF

ENG 2 BLEED..... OFF

X BLEED..... OPEN

AIR START UNIT CONNECTION..... REQUEST
- **When cleared to start:**

ENG 2..... START

Note: - For any operational reason, engine 1 can be started first.
 In this case, check the brake ACCU pressure prior to engine start.
 - The minimum recommended starter air supply pressure is 30 PSI when the start valve is open.

PROCEDURES

NORMAL PROCEDURES

SUPPLEMENTARY PROCEDURES - ENGINES

● After Engine 2 is started:

WARNING Disconnection of the external power with the EXT PWR pb-sw set to ON may cause injury to the ground engineer. Request disconnection of the external power only with the EXT PWR pb-sw set to AVAIL.

EXT PWR..... CHECK AVAIL
 EXT PWR DISCONNECTION..... REQUEST

Note: The external electrical power can be removed after the second engine start.

■ If the air start unit is used to start engine 1:

ENG 1..... START

● When engine 1 is started:

AIR START UNIT DISCONNECTION..... REQUEST
 X BLEED..... AUTO
 ENG 1 BLEED..... ON
 ENG 2 BLEED..... ON
 PACK 1..... ON
 PACK 2..... ON

■ If the crossbleed engine start procedure is used to start engine 1:

AIR START UNIT DISCONNECTION..... REQUEST
 PACK 1..... ON
 PACK 2..... ON
 ENG 2 BLEED..... ON
 CROSSBLEED ENGINE START PROC..... APPLY

Refer to PRO-NOR-SUP-ENG Crossbleed Engine Start

SOP - AFTER START..... RESUME

CROSSBLEED ENGINE START

Ident.: PRO-NOR-SUP-ENG-00020860.0001001 / 17 MAR 17

Applicable to: ALL

CAUTION Do not perform the crossbleed engine start procedure during pushback. Simultaneous use of engine bleed supply and external pneumatic power supply is prohibited.

One engine must be running in order to supply air for other engine start.

● Before second engine start :

APU BLEED..... OFF

L2 The BLEED valve of the supplying engine reopens and the cross bleed valve closes.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES SUPPLEMENTARY PROCEDURES - ENGINES
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- L1

ENG BLEED (supplying engine).....ON
- ENG BLEED (receiving engine).....OFF
- L2

The bleed valve of receiving engine is closed to avoid reverse flow leakage.
- L1

X BLEED..... OPEN
- When cleared to start :
- AREA CLEAR OF OBSTACLES..... CONFIRM
- L2

Ensure increased power jet wake does not constitute any hazard to people or installation behind the aircraft.
- L1

THR LEVER (supplying engine)..... ADJUST FOR BLEED PRESSURE
- Adjust thrust of supplying engine to obtain an engine bleed pressure of 30 PSI before start initiation, and at least 25 PSI during the start sequence.
- If the thrust required to obtain the appropriate engine bleed pressure exceeds 40 % N1, pay particular attention to the surrounding area.
- Note: If the supplying engine is a DAC engine, preset a 30 % N1 before launching the start sequence.
- RECEIVING ENGINE..... START
- Apply the normal engine start procedure.
- After start :
- THR LEVER (supplying engine)..... IDLE
- X BLEED..... AUTO
- ENG BLEED (receiving engine)..... ON
- PACK 1..... ON
- PACK 2..... ON

ENGINE START VALVE MANUAL OPERATION
Ident.: PRO-NOR-SUP-ENG-00020861.0001001 / 02 MAY 24 Applicable to: ALL

- BEFORE ENGINE START

Advise ground crew to prepare for manual engine start valve operation.

WARNING

To ensure safety of the ground crew when starting an engine with manual operation of the start valve, the flight crew should start the affected engine first.

- ENGINE START

COMMUNICATION WITH GROUND CREW..... ESTABLISH

L2

Establish communication with the ground crew before the start of the procedure.

PROCEDURES

NORMAL PROCEDURES

SUPPLEMENTARY PROCEDURES - ENGINES

L1 GROUND CREW CLEARANCE.....OBTAIN

● **When the ground crew is ready:**

“ENGINE 1(2) START”..... ANNOUNCE
 ENG MODE selector..... IGN/START
 ENG MASTER lever..... ON
 “OPEN START VALVE AND KEEP OPEN”.....ORDER

If not maintained in the OPEN position by the ground crew, the start valve closes.

● **When N2 at 50 %:**

“CLOSE START VALVE”..... ORDER
 SOP – ENGINE START..... RESUME

ENGINE VENTILATION (DRY CRANKING)

Ident.: PRO-NOR-SUP-ENG-00020943.0001001 / 17 MAR 17

Applicable to: ALL

On ground, after:

- An unsuccessful manual engine start, or
- An unsuccessful automatic start not followed by an automatic dry crank,

the flight crew can perform a dry crank cycle on the affected engine to remove the fuel vapors.

● **Before dry crank:**

ENG MASTER (affected engine)..... CHECK OFF
 ENG MODE sel..... CHECK NORM
 ENG MAN START pb-sw (affected engine).....CHECK OFF

● **Dry crank:**

ENG MODE sel..... CRANK
 ENG MAN START pb-sw (affected engine)..... ON

Note: To clear fuel vapors, a 30 seconds dry crank cycle is the minimum required.

L2 Note: A manual start sequence can be initiated following a dry crank cycle (Refer to PRO-NOR-SUP-ENG Manual Engine Start - Procedure). The flight crew should consider the starter limitations (Refer to LIM-ENG Starter).

L1 ● **When the dry crank is completed:**

ENG MAN START pb-sw (affected engine)..... OFF
 ENG MODE sel..... NORM

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES SUPPLEMENTARY PROCEDURES - FUEL
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REFUELING

Ident.: PRO-NOR-SUP-FUEL-A-00021256.0002001 / 17 MAY 24

Applicable to: ALL

WARNING

1. Prior initiation of any ground fuel operations, obey the below fuel safety precautions. This will prevent injury to people and/or damage to the aircraft.
2. Do not request or perform any ground fuel operations if a fire or engine overheat warning is displayed.
3. If the APU fails during any ground fuel operations, do not restart the APU. For APU use during refueling/defueling *Refer to LIM-APU APU Start/Shutdown during Refueling/Defueling.*
4. Do not refuel in bad weather conditions and electrical storms.

PREPARATION

SAFETY PRECAUTIONS.....APPLY

- During refueling operations, ensure that:*

 - HF transmission (including HF transmission via the HF DATA LINK ☒ pb) is not performed
 - The aircraft is properly bonded to the tanker
 - The tanker and the aircraft grounding requirement is based on local regulations. Always connect the ground cable to the parking ground point (or to the tanker) before connecting it to the aircraft.
 - The external lighting is not operated (except for NAV & LOGO).

In the cockpit, check that the PARK BRK is ON and that the ACCU PRESS has sufficient pressure. If the PARK BRK cannot be set to ON, check that the chocks are in place.

ACCESS PLATFORM.....IN POSITION

MAX REFUELING PRESSURE: 50 PSI (3.5 bar)

- **On the External Refuel Control Panel:**

TEST sw..... LTS
Lights on the panel come on. FUEL QTY and the PRESELECTED and ACTUAL displays show 8's.
TEST sw..... HI.LVL
HI LVL lights change state if the high level sensors and their circuits are serviceable.

REFUELING - AUTOMATIC REFUELING

Ident.: PRO-NOR-SUP-FUEL-A-00021257.0001001 / 17 MAY 24

Applicable to: MSN 02155-02212, 02926-02944, 04392, 07784-07792

AUTOMATIC REFUELING

● **On the External Refuel Control Panel:**

REFUEL VALVES sel.....CHECK NORM and GUARDED
[PRESELECTOR sw] REQUESTED BLOCK FUEL..... SET
MODE SELECT sw..... REFUEL
START REFUELING

When the refueling is finished, the END light comes on.

ACTUAL QUANTITY.....CHECK

The actual quantity must be within 100 kg (220 lb) of the preselected quantity.

MODE SELECT sw.....OFF and GUARDED

Ident.: PRO-NOR-SUP-FUEL-A-00021257.0002001 / 17 MAY 24

Applicable to: MSN 02719-02789, 03031-03060, 05152-05746

AUTOMATIC REFUELING

● **On the Cockpit Overhead Refuel Panel:**

REFUEL PWR pb-sw.....ON

*Cockpit panel takes priority. The CKPT light comes on. The ECAM MEMO displays
REFUELG.*

[PRESELECTOR sw] REQUESTED BLOCK FUEL..... SET

REFUEL CTL pb-sw..... ON

Refueling starts. When refueling is finished, the END light comes on.

REFUEL CTL pb-sw.....OFF

REFUEL PWR pb-sw..... OFF

● **On the External Refuel Control Panel:**

REFUEL VALVES sel.....CHECK NORM and GUARDED

[PRESELECTOR sw] REQUESTED BLOCK FUEL..... SET

MODE SELECT sw..... REFUEL

START REFUELING

When the refueling is finished, the END light comes on.

ACTUAL QUANTITY.....CHECK

The actual quantity must be within 100 kg (220 lb) of the preselected quantity.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES SUPPLEMENTARY PROCEDURES - FUEL
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MODE SELECT sw.....OFF and GUARDED

Ident.: PRO-NOR-SUP-FUEL-A-00021260.0001001 / 17 MAY 24
Applicable to: ALL

MANUAL REFUELING

● **On the External Refuel Control Panel:**

REFUEL VALVES sel.....SHUT
MODE SELECT sw.....REFUEL
REFUEL VALVES sel (tanks to be filled)..... OPEN
START REFUELING
FUEL QTY..... MONITOR

● **When the contents of the tanks reach the required level:**

Corresponding REFUEL VALVES sel..... SHUT
MODE SELECT sw.....OFF and GUARDED
REFUEL VALVES sel..... NORM and GUARDED

REFUELING WITH ONE ENGINE RUNNING
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Ident.: PRO-NOR-SUP-FUEL-00001677.0003001 / 21 MAR 17
Applicable to: ALL

- Refuel with one engine running only at airports where no external ground pneumatic power is available and only when APU is unserviceable.
- Only the RH fuel couplings can be used.
- Overwing gravity filling is not permitted.
- Disembark all passengers.
- Obtain airport authorization.
The Airport Fire Department should standby at the aircraft during the entire refueling procedure.
- Point the aircraft into the wind at a location where the slope is negligible.
Set the parking brake and check its pressure.
Run engine n° 1 at ground idle with its generator connected.
- Do not start engine n° 2, do not shut down engine n° 1 or do not attempt to start the APU before all fueling operations have been completed.
- Position the fuel truck under the extremity of the right wing. Its pressure should not exceed 30 PSI.
- Follow manual refueling procedure.

PROCEDURES

NORMAL PROCEDURES

SUPPLEMENTARY PROCEDURES - FUEL

OPERATION MONITORING

DURING THE ENTIRE REFUELING PROCEDURE :

- Monitor the fuel truck shut off valve.
- Be sure that the fueling company is keeping permanent control of the emergency fuel shut off device.
- Have a flight crew member in the cockpit monitoring all systems and the running engine.
- Have a qualified ground crew member at the fueling station to operate the refuel valve switches.
- Monitor the refueling closely and be prepared to close the refuel valves in order not to exceed the following fuel quantities :

DENSITY (kg/l)	0.77	0.78	0.79	0.8	0.81	0.82	0.83
L(R) WING (kg)	5 710	5 780	5 860	5 930	6 005	6 080	6 160
CENTER (kg)	6 030	6 110	6 190	6 270	6 350	6 430	6 500

AFTER SECOND ENGINE START :

● Reset the 3DMCs in order to reinitialize the fuel used values :

DMC 1 SPLY C/B (E11 on 49VU).....PULL
 DMC 2 SPLY C/B (Q8 on 121 VU).....PULL
 DMC 3 SPLY C/B (Q9 on 121 VU).....PULL
 DMC 3 SPLY STBY (E10 on 49 VU).....PULL

● After 5 s :

All C/B's.....PUSH

Note: The T.O MEMO does not appear automatically since one engine is kept running.

GROUND FUEL TRANSFER

Ident.: PRO-NOR-SUP-FUEL-00021258.0001001 / 17 MAY 24

Applicable to: MSN 02155-05746

WARNING

1. Prior initiation of any ground fuel operations, obey the below fuel safety precautions. This will prevent injury to people and/or damage to the aircraft.
2. Do not request or perform any ground fuel operations if a fire or engine overheat warning is displayed.
3. If the APU fails during any ground fuel operations, do not restart the APU. For APU use during refueling/defueling *Refer to LIM-APU APU Start/Shutdown during Refueling/Defueling.*

SAFETY PRECAUTIONS.....APPLY

During ground operations, ensure that:

- HF transmission is not performed (including HF transmission via the HF DATA LINK ☞ pb)
- If connected:
 - The aircraft is properly bonded to the tanker
 - The tanker and the aircraft grounding requirement is based on local regulations. Always connect the ground cable to the parking ground point (or to the tanker) before connecting it to the aircraft
 - The external lighting is not operated (except for NAV & LOGO).

In the cockpit, check that the PARK BRK is ON and that the ACCU PRESS has sufficient pressure. If the PARK BRK cannot be set to ON, check that the chocks are in place.

ACCESS PLATFORM.....IN POSITION

● **On the Cockpit Overhead Fuel Panel:**

FUEL PUMPS (of the tanks not to be defueled)..... OFF
 CTR TK MODE SEL pb-sw..... MAN
 FUEL PUMPS (of the tank to be defueled)..... ON

● **if left wing and/or center tanks is (are) to be defueled:**

X FEED..... ON
OPEN light comes on.

● **On the External Refuel Control Panel:**

REFUEL VALVES sel (of tanks not to be filled)..... SHUT
 REFUEL VALVES sel (of tanks to be filled)..... OPEN
 MODE SELECT sw..... DEFUEL XFR
OPEN light comes on.

FUEL QTY..... MONITOR

● **When the tank contents reach the required level:**

Corresponding REFUEL VALVES sel..... SHUT
 MODE SELECT sw..... OFF and GUARDED
OPEN light comes off.

REFUEL VALVES sel..... NORM and GUARDED

Set the Cockpit Overhead Fuel Panel to normal configuration.

PROCEDURES

NORMAL PROCEDURES

SUPPLEMENTARY PROCEDURES - FUEL

GROUND FUEL TRANSFER

Ident.: PRO-NOR-SUP-FUEL-00021258.0004001 / 06 NOV 25

Applicable to: MSN 07784-07792

WARNING

1. Prior initiation of any ground fuel operations, obey the below fuel safety precautions. This will prevent injury to people and/or damage to the aircraft.
2. Do not request or perform any ground fuel operations if a fire or engine overheat warning is displayed.
3. If the APU fails during any ground fuel operations, do not restart the APU. For APU use during refueling/defueling *Refer to LIM-APU APU Start/Shutdown during Refueling/Defueling.*

SAFETY PRECAUTIONS.....APPLY

During ground operations, ensure that:

- HF transmission is not performed (including HF transmission via the HF DATA LINK  pb)
- If connected:
 - The aircraft is properly bonded to the tanker
 - The tanker and the aircraft grounding requirement is based on local regulations. Always connect the ground cable to the parking ground point (or to the tanker) before connecting it to the aircraft
 - The external lighting is not operated (except for NAV & LOGO).

In the cockpit, check that the PARK BRK is ON and that the ACCU PRESS has sufficient pressure. If the PARK BRK cannot be set to ON, check that the chocks are in place.

ACCESS PLATFORM.....IN POSITION

● From one wing to the other wing or to the center tank:

● On the Cockpit Overhead Fuel Panel:

FUEL PUMPS (of the tank not to be defueled)..... OFF
 FUEL PUMPS (of the tank to be defueled)..... ON
 X FEED.....ON
OPEN light comes on.

● On the External Refuel Control Panel:

REFUEL VALVES sel (of tanks not to be filled).....SHUT
 REFUEL VALVES sel (of tanks to be filled)..... OPEN
 MODE SELECT sw.....DEFUEL XFR
OPEN light comes on.
 FUEL QTY..... MONITOR

● When the tank contents reach the required level:

Corresponding REFUEL VALVES sel..... SHUT

MODE SELECT sw..... OFF and GUARDED
OPEN light comes off.
 REFUEL VALVES sel..... NORM and GUARDED
 Set the Cockpit Overhead Fuel Panel to normal configuration.

● **From center tank to the L (R) inner tank:**

● **On the Cockpit Overhead Fuel Panel:**

CTR TK MODE SEL pb-sw..... AUTO
 L(R) TK PUMPS..... ON
 CTR TK L(R) XFR..... ON

When the inner tank is full or if the center tank is empty the center tank transfer valve will automatically close.

Note: If the fuel pumps are ON and the CTR TK MODE SEL pb-sw is not in AUTO position, the automatic cutoff will not occur, and there is a risk of fuel spillage.

DEFUELING

Ident.: PRO-NOR-SUP-FUEL-00021259.0004001 / 17 MAY 24

Applicable to: MSN 07784-07792

WARNING	1. Prior initiation of any ground fuel operations, obey the below fuel safety precautions. This will prevent injury to people and/or damage to the aircraft. 2. Do not request or perform any ground fuel operations if a fire or engine overheat warning is displayed. 3. If the APU fails during any ground fuel operations, do not restart the APU. For APU use during refueling/defueling <i>Refer to LIM-APU APU Start/Shutdown during Refueling/Defueling.</i> 4. Do not defuel in bad weather conditions and electrical storms. 5. Defueling by suction is not possible. Fuel can be removed from inner tank only. To defuel center tank, first transfer fuel to the inner tanks.
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SAFETY PRECAUTIONS.....APPLY

During defueling operations, ensure that:

- HF transmission (including HF transmission via the HF DATA LINK  pb) is not performed
- The aircraft is properly bonded to the tanker
- The tanker and the aircraft grounding requirement is based on local regulations. Always connect the ground cable to the parking ground point (or to the tanker) before connecting it to the aircraft
- The external lighting is not operated (except for NAV & LOGO).

In the cockpit, check that the PARK BRK is ON and that the ACCU PRESS has sufficient pressure. If the PARK BRK cannot be set to ON, check that the chocks are in place.

PROCEDURES

NORMAL PROCEDURES

SUPPLEMENTARY PROCEDURES - FUEL

ACCESS PLATFORM.....IN POSITION

● **On the Cockpit Overhead Fuel Panel:**

FUEL PUMPS..... OFF

● **On the External Refuel Control Panel:**

REFUEL VALVES sel..... NORM

MODE SELECT sw..... DEFUEL XFR

OPEN light comes on.

● **On the Cockpit Overhead Fuel Panel:**

FUEL PUMPS (of the tank(s) to be defueled)..... ON

X FEED..... ON

OPEN light comes on.

FUEL QTY..... MONITOR

● **When tank contents reach required level**

Corresponding FUEL PUMPS..... OFF

● **On the External Refuel Control Panel:**

MODE SELECT sw..... OFF and GUARDED

OPEN light comes off.

REFUEL VALVES sel..... NORM and GUARDED

Set the Cockpit Overhead Fuel Panel to normal configuration.

DEFUELING

Ident.: PRO-NOR-SUP-FUEL-00021259.0001001 / 17 MAY 24

Applicable to: MSN 02155-05746

WARNING

1. Prior initiation of any ground fuel operations, obey the below fuel safety precautions. This will prevent injury to people and/or damage to the aircraft.
2. Do not request or perform any ground fuel operations if a fire or engine overheat warning is displayed.
3. If the APU fails during any ground fuel operations, do not restart the APU. For APU use during refueling/defueling *Refer to LIM-APU APU Start/Shutdown during Refueling/Defueling.*
4. Do not defuel in bad weather conditions and electrical storms.
5. Defueling by suction is not possible

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES SUPPLEMENTARY PROCEDURES - FUEL
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SAFETY PRECAUTIONS.....APPLY

During defueling operations, ensure that:

- HF transmission (including HF transmission via the HF DATA LINK  pb) is not performed
- The aircraft is properly bonded to the tanker
- The tanker and the aircraft grounding requirement is based on local regulations. Always connect the ground cable to the parking ground point (or to the tanker) before connecting it to the aircraft
- The external lighting is not operated (except for NAV & LOGO).

In the cockpit, check that the PARK BRK is ON and that the ACCU PRESS has sufficient pressure. If the PARK BRK cannot be set to ON, check that the chocks are in place.

ACCESS PLATFORM.....IN POSITION

- **On the Cockpit Overhead Fuel Panel:**
FUEL PUMPS..... OFF
- **On the External Refuel Control Panel:**
REFUEL VALVES sel..... NORM
MODE SELECT sw..... DEFUEL XFR
OPEN light comes on.
- **On the Cockpit Overhead Fuel Panel:**
CTR TK MODE SEL pb-sw..... MAN
FUEL PUMPS (of the tank(s) to be defueled).....ON
X FEED..... ON
OPEN light comes on.
FUEL QTY.....MONITOR
- **When tank contents reach required level**
Corresponding FUEL PUMPS..... OFF
- **On the External Refuel Control Panel:**
MODE SELECT sw..... OFF and GUARDED
OPEN light comes off.
REFUEL VALVES sel..... NORM and GUARDED
Set the Cockpit Overhead Fuel Panel to normal configuration.

PROCEDURES

NORMAL PROCEDURES

SUPPLEMENTARY PROCEDURES - FUEL

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES SUPPLEMENTARY PROCEDURES - GPS INTERFERENCE
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GPS INTERFERENCE

Ident.: PRO-NOR-SUP-GPSINT-A-00025101.0001001 / 15 NOV 24

Applicable to: ALL

Radio frequency interference can affect the GPS data and the aircraft functions that use GPS data. The aircraft can be exposed to different types of interference:

- GPS Jamming: Type of radio frequency interference that degrades the GPS reception capability. The GPS data used by the aircraft systems can be degraded or lost.
- GPS Spoofing: Type of radio frequency interference that makes the GPS signals erroneous, and that can result in erroneous GPS data used by the aircraft systems.

The following table provides a list of cockpit effects that may occur during the GPS interference (the associated sequence of cockpit effects cannot be predicted):

Ident.: PRO-NOR-SUP-GPSINT-A-00025102.0001001 / 26 JAN 22

Applicable to: ALL

Function	PFD/ND	ECAM Alert	ECAM Status	Other Effects
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Ident.: PRO-NOR-SUP-GPSINT-A-00025152.0001001 / 17 MAY 24

Applicable to: MSN 02155-03060, 05152-07792

ADS-B OUT		NAV ADS-B RPTG 1(2) FAULT	ADS-B RPTG	
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Ident.: PRO-NOR-SUP-GPSINT-A-00025153.0001001 / 17 NOV 25

Applicable to: ALL

Aircraft position	NAV ACCUR DOWNGRAD GPS PRIMARY LOST Erroneous aircraft position.	NAV FM/GPS POS DISAGREE		Erroneous GPIRS data. The synthetic runway on HUD  may be lost or at an erroneous position.
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¹ Ident.: PRO-NOR-SUP-GPSINT-A-00029231.0001001 / 17 NOV 25

Applicable to: ALL

FPV	The FPV symbol position may be erroneous.			The FPV may revert to IRS source only. The FPV IRS message may appear on HUD 
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PROCEDURES

NORMAL PROCEDURES

SUPPLEMENTARY PROCEDURES - GPS INTERFERENCE

Ident.: PRO-NOR-SUP-GPSINT-A-00025157.0001001 / 17 NOV 25

 Applicable to: **ALL**

GPS		NAV GPS 1(2) FAULT	GPS 1(2)	Dashed or erroneous GPS data on GPS MONITOR page.
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Ident.: PRO-NOR-SUP-GPSINT-A-00027513.0001001 / 16 MAY 25

 Applicable to: **ALL**

ILS / GLS  / SLS 				Non availability of Pre-Capture Zone of the LOC Beam
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Ident.: PRO-NOR-SUP-GPSINT-A-00028060.0001001 / 17 MAY 24

 Applicable to: **MSN 02719-07792**

LS		NAV LS 1(2)(1+2) FAULT	LS 1(2)(1+2)	
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Ident.: PRO-NOR-SUP-GPSINT-A-00029148.0001001 / 17 NOV 25

 Applicable to: **MSN 05152-05746**

RAAS				Spurious RAAS alerts.
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Ident.: PRO-NOR-SUP-GPSINT-A-00025162.0002001 / 19 MAY 25

 Applicable to: **MSN 04392**

SATCOM				Voice/datalink communications degraded or lost.
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Ident.: PRO-NOR-SUP-GPSINT-A-00025160.0001001 / 17 MAY 24

 Applicable to: **ALL**

TAWS (for aircraft equipped with T2CAS  , T3CAS  or EGPWS )		NAV GPWS TERR DET FAULT NAV GPWS FAULT	GPWS TERR GPWS	Erroneous terrain alerts. Terrain map shift displayed on ND.
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Ident.: PRO-NOR-SUP-GPSINT-A-00025161.0001001 / 26 JAN 22

 Applicable to: **ALL**

Time predictions				Erroneous time and FMS predictions (time drifts or jumps).
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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES SUPPLEMENTARY PROCEDURES - GPS INTERFERENCE
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Ident.: PRO-NOR-SUP-GPSINT-A-00025163.0001001 / 26 JAN 25

Applicable to: ALL

Wind information	Erroneous wind speed and direction.			
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Ident.: PRO-NOR-SUP-GPSINT-A-00028698.0001001 / 19 MAY 25

Applicable to: MSN 04392-05746

Weather Radar	Erroneous weather radar information displayed on the ND. Weather Hazard Prediction Function  : - Spurious hazard prediction icons on the ND. - Spurious WEATHER AHEAD alerts on the ND.			
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Ident.: PRO-NOR-SUP-GPSINT-A-00028011.0001001 / 17 NOV 25

Applicable to: ALL

The flight crew can anticipate the risk of GPS interference via the presence of NOTAMs (from Authority or Company).

When the flight crew suspects GPS interference due to the cockpit effects, the flight crew can check the GPS data. The FMS page GPS MONITOR may display dashes or erroneous data on GPS positions, and/or the number of tracked satellites ("MODE/SAT") may be lower than 5 or null, in the case of GPS interference.

Note: *In the absence of data available (dashed) in the GPS MONITOR page, the flight crew should consider the GPS capability of the affected equipment inoperative. Depending on the number of GPS impacted, the aircraft condition may no longer be compliant with the minimum navigation equipment required for RNP operations.*

Ident.: PRO-NOR-SUP-GPSINT-A-00028012.0001001 / 17 NOV 25

Applicable to: ALL

LIST OF EFFECTS DUE TO ERRONEOUS GPS DATA (SPOOFING):

The following cockpit effects can be the result of erroneous GPS data (lateral position, altitude and/or time):

PROCEDURES

NORMAL PROCEDURES

SUPPLEMENTARY PROCEDURES - GPS INTERFERENCE

Effects	Additional Information
The GPS / GNSS ALT information is not consistent with the aircraft altitude	One or both GPS receivers may compute incorrect GPS data as valid.
The GPS / GNSS position latitude/longitude information are not consistent with the aircraft position	
Erroneous time and/or date, and FMS predictions	
Erroneous position transmitted over ADS-B OUT	
Erroneous FLS  , GLS  , SLS  deviations	The deviations may be incorrect due to erroneous GPS data (not rejected). <i>Refer to PRO-NOR-SUP-GPSINT GPS Interference - Within the Interference Area - Approach to access the required actions.</i>
Loss of ADS-C, CPDLC applications	The ADS-C and CPDLC should be considered inoperative due to erroneous time stamp on position report that may affect the controlled aircraft separations.
NAV FM / GPS POS DISAGREE	A discrepancy is detected between the GPS position and the computed aircraft position.
Erroneous wind speed and direction	It may indicate an incorrect computation of the GPIRS data.
The GPIRS information in the POSITION MONITOR page is not consistent with the real aircraft position	
Unexpected roll with the AP engaged in NAV mode and the FMS navigation mode GPIRS	
Abnormal IRS drift increase in the POSITION MONITOR page with the FMS navigation mode GPIRS	
Aircraft position map shifted on ND (with the FMS navigation mode GPIRS on one or both sides):	The aircraft position computation may be degraded due to erroneous GPS data (not rejected). <i>Refer to PRO-NOR-SUP-GPSINT GPS Interference - Within the Interference Area - General to access the required actions.</i>
- The aircraft is not on ND track, and - The cross track error increases	
MCDU scratchpad messages:	TAWS warnings may be considered cautionary during daylight VMC conditions provided that the cause of the warning can be identified immediately. <i>Refer to PRO-NOR-SUP-GPSINT GPS Interference - Within the Interference Area - General to access the related actions.</i>
- CHECK IRS 1(2)(3) / FIM POSITION - FMS1 / FMS2 POS DIF	
Terrain map shifted on ND	
Undue predictive TAWS alerts (e.g. PULL UP, OBSTACLE AHEAD)	

Continued on the following page

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES SUPPLEMENTARY PROCEDURES - GPS INTERFERENCE
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Continued from the previous page

Effects	Additional Information
Spurious ALTSM  alerts (ALTIMETER SETTING)	Spurious aural alert may trigger due to erroneous GPS altitude. <i>Refer to PRO-NOR-SUP-GPSINT GPS Interference - Within the Interference Area - ALTSM to access the related actions.</i>
Spurious ROW/ROPS  alerts (e.g. RWY TOO SHORT)	Spurious ROW/ROP messages may trigger due to erroneous GPS data. <i>Refer to PRO-NOR-SUP-GPSINT GPS Interference - Within the Interference Area - Approach to access the related actions.</i>

GPS INTERFERENCE - ERRONEOUS GNSS DATA - GPWS

Ident.: PRO-NOR-SUP-GPSINT-A-00028023.0001001 / 17 MAY 24

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

NAV GPWS FAULT above 5 000 ft AGL	TAWS basic modes are lost and may result in persistent misbehavior of the TAWS predictive modes. A reset of the GPWS is required after the interference area. <i>Refer to PRO-NOR-SUP-GPSINT GPS Interference - After the Interference Area - EGPWS Reset to access the required actions.</i>
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Ident.: PRO-NOR-SUP-GPSINT-A-00028023.0002001 / 15 NOV 24

Applicable to: MSN 02926-02944, 04392, 07784-07792

NAV GPWS FAULT above 5 000 ft AGL	TAWS basic modes are temporarily lost.
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4 Ident.: PRO-NOR-SUP-GPSINT-A-00029359.0001001 / 17 NOV 25

Applicable to: MSN 04392-05746

Erroneous weather radar information on ND.	It may indicate an incorrect computation of the GPIRS data.
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GPS INTERFERENCE - PERSISTENT EFFECTS

Ident.: PRO-NOR-SUP-GPSINT-A-00028952.0020001 / 19 MAY 25

Applicable to: MSN 07784-07792

LIST OF EFFECTS THAT MAY REMAIN AFTER LEAVING THE INTERFERENCE AREA:

Depending on the signature of the GPS interference and the equipment installed, some of the following effects could remain after leaving the interference area.

PROCEDURES

NORMAL PROCEDURES

SUPPLEMENTARY PROCEDURES - GPS INTERFERENCE

Effects	Additional Information
GPS PRIMARY LOST	The conditions for GPS PRIMARY are not recovered after the interference area.
Dashed GPS data on GPS MONITOR page	The GPS data is not recovered after the interference area. A reset of the MMR may clear this condition. <i>Refer to PRO-NOR-SUP-GPSINT GPS Interference - After the Interference Area - GPS reset for associated actions.</i>
NAV GPS 1(2) FAULT	The GPS part of one or both MMRs is faulty following the GPS interference. A reset of the MMR can clear the fault. <i>Refer to PRO-NOR-SUP-GPSINT GPS Interference - After the Interference Area - GPS reset for associated actions.</i>
NAV LS 1(2)(1+2) FAULT	One or both MMRs may be locked partially faulty, and the FLS  , GLS  , SLS  capabilities are lost. A reset of the MMR can clear the fault. <i>Refer to PRO-NOR-SUP-GPSINT GPS Interference - After the Interference Area - GPS reset for associated actions.</i>
For approach using FLS  , GLS  , SLS  guidance, deviations might not be available without any ECAM alert	The GPS part of one or both MMRs is faulty. A reset of the MMR can clear the condition. <i>Refer to PRO-NOR-SUP-GPSINT GPS Interference - After the Interference Area - GPS reset for associated actions.</i>
NAV ADS-B RPTG 1(2) FAULT	The ADS-B out function is not recovered after the interference area. A reset of the MMR may clear this condition. <i>Refer to PRO-NOR-SUP-GPSINT GPS Interference - After the Interference Area - GPS reset for associated actions.</i>

Ident.: PRO-NOR-SUP-GPSINT-A-00028952.0008001 / 19 MAY 25

Applicable to: MSN 02155-03060, 05152-05746

LIST OF EFFECTS THAT MAY REMAIN AFTER LEAVING THE INTERFERENCE AREA:

Depending on the signature of the GPS interference and the equipment installed, some of the following effects could remain after leaving the interference area.

Effects	Additional Information
GPS PRIMARY LOST	The conditions for GPS PRIMARY are not recovered after the interference area.
Dashed GPS data on GPS MONITOR page	The GPS data is not recovered after the interference area. A reset of the MMR may clear this condition. <i>Refer to PRO-NOR-SUP-GPSINT GPS Interference - After the Interference Area - GPS reset for associated actions.</i>

Continued on the following page

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES SUPPLEMENTARY PROCEDURES - GPS INTERFERENCE
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Continued from the previous page

Effects	Additional Information
<u>NAV GPS 1(2) FAULT</u>	The GPS part of one or both MMRs is faulty following the GPS interference. A reset of the MMR can clear the fault. <i>Refer to PRO-NOR-SUP-GPSINT GPS Interference - After the Interference Area - GPS reset</i> for associated actions.
<u>NAV ADS-B RPTG 1(2) FAULT</u>	The ADS-B out function is not recovered after the interference area. A reset of the MMR may clear this condition. <i>Refer to PRO-NOR-SUP-GPSINT GPS Interference - After the Interference Area - GPS reset</i> for associated actions.

Ident.: PRO-NOR-SUP-GPSINT-A-00028952.0001001 / 19 MAY 25
Applicable to: MSN 04392

LIST OF EFFECTS THAT MAY REMAIN AFTER LEAVING THE INTERFERENCE AREA:

Depending on the signature of the GPS interference and the equipment installed, some of the following effects could remain after leaving the interference area.

Effects	Additional Information
<u>GPS PRIMARY LOST</u>	The conditions for GPS PRIMARY are not recovered after the interference area.
Dashed GPS data on GPS MONITOR page	The GPS data is not recovered after the interference area. A reset of the MMR may clear this condition. <i>Refer to PRO-NOR-SUP-GPSINT GPS Interference - After the Interference Area - GPS reset</i> for associated actions.
<u>NAV GPS 1(2) FAULT</u>	The GPS part of one or both MMRs is faulty following the GPS interference. A reset of the MMR can clear the fault. <i>Refer to PRO-NOR-SUP-GPSINT GPS Interference - After the Interference Area - GPS reset</i> for associated actions.

5 Ident.: PRO-NOR-SUP-GPSINT-A-00029317.0001001 / 17 NOV 25
Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

<u>NAV GPWS FAULT</u> above 5000ft AGL Undue predictive TAWS alerts.	After exposure to erroneous GPS altitude, TAWS predictive modes may remain unreliable. A reset of the GPWS is required after the interference area to clear this condition. <i>Refer to PRO-NOR-SUP-GPSINT GPS Interference - After the Interference Area - EGPWS Reset</i> to access the required actions.
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FLIGHT PREPARATION

The flight crew should consider the following:

- The possibility to identify the entry and exit points of the interference area
- The possible effects of GPS interferences on flight operations
- The availability of alternate routes
- The availability of routes, procedures and approaches that do not require GPS (e.g. ILS, VOR/DME) for the affected area (*Refer to PRO-SPO-51 General - General*).

PRELIMINARY COCKPIT PREPARATION

Perform a complete IRS alignment if the flight crew expects long segments in airspaces with low radio NAVAIDS coverage.

● If erroneous GPS data are observed or expected on ground:

Note: For the list of effects due to erroneous GPS data, Refer to PRO-NOR-SUP-GPSINT GPS Interference - Erroneous GNSS Data - All.

GPS..... DESELECT

Deselect GPS on the SELECTED NAVAIDS page.

Keep GPS deselected on ground and during takeoff to enable takeoff position update (Refer to DSC-22_20-10-20-10 Takeoff Update). This ensures a precise aircraft position during departure.

Reselect GPS after Takeoff when aircraft is no longer affected by GPS interference.

For IRS alignment: (IRS Alignment Based on GPS Position )

Erroneous GPS data may result in an incorrect alignment of the IRS.

MMR1 C/B..... PULL

NAV/MMR/1 - G12 - on 49 VU (overhead panel)

MMR2 C/B..... PULL

COM NAV/MMR/2 - L07 (or K09) - on 121VU (rear maintenance panel)

On some aircraft, the MMR2 C/B may be located in K09 instead of L07.

Apply IRS alignment procedure with manual position initialization (ALIGN ON REF prompt in IRS INIT page).

Refer to FCTM/PR-NP-SOP-60 FMGS Preparation.

Wait until the IRS alignment phase is completed before pushing the MMR C/Bs. Make sure that the IRS are initialized to an appropriate position.

MMR1 C/B..... PUSH

MMR2 C/B..... PUSH

Ident.: PRO-NOR-SUP-GPSINT-A-00028875.0001001 / 19 MAY 25
 Applicable to: ALL

BEFORE THE INTERFERENCE AREA

In order to maintain most ATC datalink applications and the FMS predictions, the flight crew should apply the following:

CLOCK..... INT

L12

Note: *When the clock is in INT mode:*

- *The ADS-C application is considered as not available.*
 The Figure of Merit of the ADS-C reports will indicate a loss of the navigation accuracy, that impacts the PBCS capability of the aircraft.
- *If the clock was previously synchronized with the GNSS, the INT mode of the clock maintains all other ATC datalink applications for 24 h.*
- *Setting the clock to INT mode might not prevent erroneous FMS time predictions in all cases.*

6 Ident.: PRO-NOR-SUP-GPSINT-A-00029335.0001001 / 17 NOV 25
 Applicable to: ALL

WITHIN THE INTERFERENCE AREA

A/C POS.....MONITOR

The flight crew must regularly monitor the aircraft position using non-GPS references.

GPS DESELECTION..... CONSIDER

At any time, in the case of expected spoofing or detected FMS position shift (Refer to PRO-NOR-SUP-GPSINT GPS Interference - Erroneous GNSS Data - All to access the list of effects), the flight crew should consider GPS deselection on the FMS page SELECTED NAVAIDS.

Note: - *FMS navigation modes revert to IRS/DME/DME, IRS/VOR/DME or IRS only*

 - *The GPS deselection only affect the FMS position computation. Other aircraft systems will continue to use the GPS data if available (aircraft clock, TAWS, ADS-B out, etc.)*

 - *The GPS deselection on one MCDU side applies to both FMS.*

● **If FMS position shift detected:**

 Use AP/FD on reliable FMS side

● **If both FMS position erroneous:**

 HDG/TRK MODE..... SELECT

● **If expected undue predictive TAWS alerts:**

GPWS TERR pb-sw OFF.....CONSIDER

The basic GPWS modes remain operative. For more information about the consequences of the predictive modes inhibition, Refer to DSC-34-SURV-40-40 Overhead Panel.

Note: In cruise above MSA, the flight crew can set GPWS TERR pb-sw to OFF.
 In other flight phases, the Operator must perform a safety assessment based on their knowledge of operations to adapt the procedures and pilot briefings to specific routes.

ATC..... NOTIFY

L2 The flight crew should notify the ATC of any suspected interference during the flight (with the observed effects on the aircraft systems).

Ident.: PRO-NOR-SUP-GPSINT-A-00028876.0001001 / 19 MAY 25

Applicable to: ALL

● **If the flight crew encounters unexpected GPS interference:**

During the flight, the flight crew may suspect not anticipated GPS interference. In order to maintain the FMS predictions, the flight crew should crosscheck the aircraft time with an external reference.

ATC..... TIME CHECK

L2 The flight crew crosschecks the external time reference with the aircraft clock.

L1 ● **If the external time is different from the time displayed on the clock:**

CLOCK..... SET

Note: Manually enter the time data on the clock, based on the external time reference.

CLOCK..... INT

L12

Note: When the clock is switched to INT mode after manual entry in SET mode, the flight crew should consider that the ATC datalink CPDLC and ADS-C applications are unavailable (Refer to DSC-31-55-20 Operation in Internal Mode).
 The Figure of Merit of the ADS-C reports will indicate a loss of navigation accuracy, that impacts the PBCS capability of the aircraft.

⁷ Ident.: PRO-NOR-SUP-GPSINT-A-00028017.0001001 / 17 NOV 25

Applicable to: ALL

● **In the case of expected spoofing during approach:**

GLS, RNAV(GNSS) or RNAV(RNP) approaches should not be considered.

● **For approaches using F-LOC , FINAL APP or NAV guidance:**

The FMS uses the GPS-based position as primary source, also for approaches such as VOR or NDB.

GPS..... DESELECT

On airports affected by spoofing, the flight crew should deselect the GPS on the FMS page SELECTED NAVAIDS.

- Note:
- FMS navigation modes revert to IRS/DME/DME, IRS/VOR/DME or IRS only
 - The GPS deselection only affects the FMS position computation. Other aircraft systems will continue to use the GPS data if available (aircraft clock, TAWS, ADS-B out, etc.)
 - The GPS deselection on one MCDU side applies to both FMS.

● **Below 5 000 ft AGL:**

● **If the GPWS was set to OFF during the interference area:**

GPWS SYS pb-sw ON

Push the GPWS SYS pb-sw to activate the GPWS basic modes. The OFF light goes off.

*If the flight crew turned OFF the GPWS basic modes in accordance with the **NAV GPWS FAULT** procedure during the interference area, the GPWS can be turned back ON below 5000 ft AGL in order to recover the basic modes.*

L2

Ident.: PRO-NOR-SUP-GPSINT-A-00028018.0001001 / 19 MAY 25

Applicable to: ALL

AFTER THE INTERFERENCE AREA

GPS MODE..... CHECK

Check that the FMS GPS MONITOR page displays the following for the available GPS (1, 2 or both):

- **NAV** mode with at least 5 satellites tracked (or at least 4 satellites tracked in SBAS  mode)
- Altitude information consistent with the aircraft altitude.
- Latitude/longitude information consistent with the aircraft position.

GPS SELECTION.....CHECK/SELECT

The flight crew checks that the GPS is selected on the SELECTED NAVAIDS page. This ensures that the GPS source is correctly used by the FMS to compute aircraft position.

● **If previously set to OFF during the Interference Area:**

GPWS TERR pb-sw..... ON

Push the GPWS TERR pb-sw to activate the GPWS predictive modes. The OFF light goes off.

GPWS SYS pb-sw..... ON

Push the GPWS SYS pb-sw to activate the GPWS basic modes. The OFF light goes off.

L2

If the flight crew turned OFF the GPWS during the interference area in accordance with the ECAM procedure **NAV GPWS FAULT**, it can be turned back ON in order to recover the basic modes.

Ident.: PRO-NOR-SUP-GPSINT-A-00028877.0001001 / 19 MAY 25

Applicable to: ALL

- If GPS 1 data are confirmed reliable:

CLOCK.....GPS

L2

The clock should remain on INT mode until the GPS1 NAV mode is recovered.

Ident.: PRO-NOR-SUP-GPSINT-A-00028038.0001001 / 15 NOV 24

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

- If **NAV GPWS FAULT** or other indications of erroneous GPS data were detected during the interference area:

Note: Refer to PRO-NOR-SUP-GPSINT GPS Interference - Erroneous GNSS Data - All to access the list of effects due to erroneous GPS data.

The flight crew should attempt a reset of the GPWS (even if the ECAM alert is no longer displayed) to recover potentially affected TAWS functions:

GPWS C/B.....PULL

EIS/GPWS/115VAC - P07 on 121VU (rear maintenance panel)

Make sure GPWS SYS pb-sw and GPWS TERR pb-sw are set to ON

Wait 5 seconds.

GPWS C/B.....PUSH

GPS INTERFERENCE - AFTER THE INTERFERENCE AREA - GPS RESET

Ident.: PRO-NOR-SUP-GPSINT-A-00028953.0005001 / 19 MAY 25

Applicable to: MSN 07784-07792

- If **NAV GPS 1(2) FAULT** or **NAV LS 1(2)(1+2) FAULT** or **NAV ADS-B RPTG 1(2) FAULT** or dashed GPS data on GPS MONITOR page remain after leaving the interference area:
MMR RESET.....CONSIDER

Refer to QRH/ABN-02 NAV - MMR RESET

- For approach using FLS , SLS , GLS  guidance:

- If deviations are not available on PFD before the approach:

MMR RESET.....CONSIDER

Refer to QRH/ABN-02 NAV - MMR RESET

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES SUPPLEMENTARY PROCEDURES - GPS INTERFERENCE
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If deviations are not available at the Intermediate Fix (at the latest), the flight crew should consider changing the approach type, using FINAL APP or reverting to NAV-FPA or TRK-FPA guidance.

Ident.: PRO-NOR-SUP-GPSINT-A-00028953.0003001 / 19 MAY 25
Applicable to: MSN 02155-03060, 05152-05746

- If **NAV GPS 1(2) FAULT** or **NAV ADS-B RPTG 1(2) FAULT** or dashed GPS data on GPS **MONITOR** page remain after leaving the interference area:
MMR RESET.....CONSIDER
Refer to QRH/ABN-02 NAV - MMR RESET

Ident.: PRO-NOR-SUP-GPSINT-A-00028953.0001001 / 19 MAY 25
Applicable to: MSN 04392

- If **NAV GPS 1(2) FAULT** or dashed GPS data on GPS **MONITOR** page remain after leaving the interference area:
MMR RESET.....CONSIDER
Refer to QRH/ABN-02 NAV - MMR RESET

Ident.: PRO-NOR-SUP-GPSINT-A-00028419.0001001 / 17 NOV 25
Applicable to: ALL

PARKING - IRS PERFORMANCE

In the case of GPS spoofing, if FMS position is affected, the POSITION MONITOR page may provide erroneous IRS drift resulting in undue ADIRU removals.
The IRS MONITOR page provides data independent from GPS.

- Note:
- The data provided by the IRS MONITOR page are based on flight plan data (destination airport and runway).
 - GPS deselection on the FMS before spoofing exposure would prevent abnormal IRS drift display on the POSITION/MONITOR page.

- In the case of abnormal IRS drift observed on the POSITION MONITOR page, the following procedure is recommended:
IRS PERFORMANCE.....CHECK
1. On the IRS MONITOR page, record the drift rate of IRS 1, IRS 2 and IRS 3
 2. Calculate the block time of the IRS

Note: The block time of the IRS is equal to the accumulated block times, for each flight performed, since last IRS alignment.

PROCEDURES**NORMAL PROCEDURES****SUPPLEMENTARY PROCEDURES - GPS INTERFERENCE**

3. Multiply the block time by the recorded drift rate
4. Compare the result with table provided in *Refer to PRO-NOR-SOP-22 Parking - IRS Performance.*

PARKING - LOGBOOK

The flight crew must report any kind of interference encountered in flight as maintenance actions may be required before the next flight.

If the maintenance actions are not performed, persistent effects may remain on the aircraft. *Refer to PRO-NOR-SUP-GPSINT GPS Interference - Persistent effects* for more information about the list of persistent effects.

Flight With Landing Gear Down

FLIGHT WITH LANDING GEAR DOWN

Ident.: PRO-NOR-SUP-LG-LG_DN-SUP-LG-00023362.0001001 / 17 NOV 20

Applicable to: ALL

This chapter applies to dispatch with L/G down. A revenue flight is permitted with the L/G down, and the L/G gear doors closed in the conditions stated below.

Ident.: PRO-NOR-SUP-LG-LG_DN-SUP-LG-00023363.0003001 / 17 NOV 20

Applicable to: ALL

FLIGHT PREPARATION - LIMITATIONS

MAX SPEED : 235/.60

L2 VMO/MMO for a flight with the L/G in the extended position and L/G doors closed is 235 kt/M 0.60.

L1 RECOMMENDED SPEED : 230/.50

L2 230 kt/M 0.50 is the recommended speed for climb, cruise, and descent.

L1 LANDING GEAR DOORS..... CHECK CLOSED
 TCAS..... TA ONLY

ALTITUDE ALERT: NOT AVAIL

FLT IN EXPECTED ICING CONDITIONS : NOT PERMITTED

L2 Due to the possible ice accretion on the L/G, flight is not permitted in expected icing conditions.

L1 RVSM : NOT PERMITTED

ETOPS : NOT PERMITTED

DITCHING NOT DEMONSTRATED

MANAGED VERTICAL MODES (CLB & DES) : DO NOT USE

L2 Due to the L/G in the extended position in flight, the FMS vertical guidance is not accurate.

L1 MANAGED SPEED (EXCEPT IN APPR) : DO NOT USE

FMS PRED (ALT, SPD, TIME & PSEUDO-WPT) : DO NOT USE

Note: However, in level flight, time predictions at cruise waypoints are correct.

FUEL CONSUMPT INCRSD

FMS FUEL PRED UNRELIABLE

 SIGNS AUTO MODE  : DO NOT USE

L2 Because the L/G is in the extended position, the signs remain on during the whole flight if the AUTO mode  is used.

L1 CRUISE SD PAGE NOT AVAIL

- L2** Because the L/G is in the extended position, the default SD page is the WHEEL SD page. The flight crew should check the other SD pages more frequently.

Ident.: PRO-NOR-SUP-LG-LG_DN-SUP-LG-00023364.0002001 / 14 NOV 24

Applicable to: ALL

DURING PRELIMINARY COCKPIT PREPARATION

VMO/MMO SETTING

VMO-MM0 sw..... CHECK L/G DOWN

- L2** The ground crew should set the VMO/MMO switch on the "L/G DOWN" position.

L1 TAKEOFF PERF

RECOMMENDED FLAPS : CONF 1+F

- L2** CONF 1+F configuration gives a lower drag.

L1 AVOID TAILWIND

T.O PERF WITH L/G DOWN.....COMPUTE

- L2** Takeoff performance is affected, compute takeoff performance with the L/G in the extended position.

L1 LANDING PERF (DISPATCH)

LDG PERF WITH L/G DOWN..... CHECK

- L2** Landing performance (go-around gradient) is affected, check landing performance with the L/G in the extended position.

Ident.: PRO-NOR-SUP-LG-LG_DN-SUP-LG-00023365.0001001 / 17 NOV 20

Applicable to: ALL

DURING COCKPIT PREPARATION

OVERHEAD PANEL

 SIGNS AUTO MODE  : DO NOT USE

- L2** Because the L/G is in the extended position, the signs remain on during the whole flight if the AUTO mode  is used.

L1 FMGS PREPARATION

FMS FUEL PRED UNRELIABLE

Note: A conservative value for the fuel penalty is provided in the Fuel Penalty INOP SYS TABLE for L/G - L/G RETRACTION - All L/G extended (Refer to QRH/OPS Fuel Penalty Factors/Inop Sys Table).

RECOMMENDED SPEED : 230/.50

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES SUPPLEMENTARY PROCEDURES - L/G
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- L2** 230 kt/M 0.50 is the recommended speed for climb, cruise, and descent.
- L1** [FMS-ACTIVE/PERF PAGES] PRESEL SPDs.....INSERT

Ident.: PRO-NOR-SUP-LG-LG_DN-SUP-LG-00023366.0001001 / 17 NOV 20
Applicable to: ALL

TAKEOFF

WHEN POSITIVE CLIMB

L/G : KEEP DOWN

AT S SPEED

A/BRK MAX.....CHECK DISARMED

- L2** After standard actions, check that **BRK MAX** does not appear on the FMA.

Ident.: PRO-NOR-SUP-LG-LG_DN-SUP-LG-00023367.0001001 / 17 NOV 20
Applicable to: ALL

DURING CLIMB AND CRUISE

RVSM : NOT PERMITTED

AVOID ICING CONDITIONS

RECOMMENDED SPEED : 230/.50

- L2** 230 kt/M 0.50 is the recommended speed for climb and cruise.

- L1** CRUISE SD PAGE NOT AVAIL

- L2** Because the L/G is in the extended position, the default SD page is the WHEEL SD page. The flight crew should check the other SD pages more frequently.

Ident.: PRO-NOR-SUP-LG-LG_DN-SUP-LG-00023369.0001001 / 14 NOV 24
Applicable to: ALL

LANDING PERFORMANCE

LDG PERF WITH L/G DOWN..... CONFIRM

- L2** Go-around performance is affected.

- L1** **FOR DESCENT AND APPROACH**

RECOMMENDED SPEED : 230/.50

- L2** 230 kt/M 0.50 is the recommended speed for descent.

- L1** DESCENT SELECTED V/S MODE..... CONSIDER

- L2** To avoid a high rate of descent due to the L/G in the extended position, consider using selected vertical speed.

- L1** AVOID ICING CONDITIONS

FOR HOLDING : CONF 1 RECOMMENDED

L2 Slats extended is the least penalizing configuration.

Ident.: PRO-NOR-SUP-LG-LG_DN-SUP-LG-00023370.0001001 / 17 NOV 20

Applicable to: ALL

GO-AROUND

GO-AROUND INITIATION

ALL THR LEVERS.....TOGA

WHEN POSITIVE CLIMB

L/G : KEEP DOWN

FLIGHT WITH GEAR DOWN - ABNORMAL PROCEDURES

Ident.: PRO-NOR-SUP-LG-LG_DN-SUP-LG-00025310.0091001 / 14 NOV 24

Applicable to: MSN 05746-07792

ABNORMAL PROCEDURES

FLIGHT CONTROLS

Failure cases, which would normally lead to ALTN law, will degrade F/CTL laws down to DIRECT law, if the landing gear is extended (except for the yaw damper loss where the controls remain in alternate law).

FAILURE OF ONE ENGINE

GREEN DOT SPD (FINAL TAKEOFF, GO-AROUND, DRIFT DOWN) : DO NOT USE

 L2 *The Green Dot speed displayed by the PFD does not take into account the extended position of the L/G. The flight crew should use the speed mentioned in the TAKEOFF / GO-AROUND and EN-ROUTE sections below instead of Green Dot when required.*

 L1 TAKEOFF / GO-AROUND

- After acceleration, and when flaps/slats are retracted:
 SPEED.....SELECT GDOT - 5KT

 L2 *The flight crew should select GDOT - 5 kt instead of Green Dot.*

- When GDOT - 5 kt is reached:
 ALT KNOB.....PULL
 THR LEVER (REMAINING ENG).....MCT

EN-ROUTE

DRIFT-DOWN SPEED : GDOT – 5KT

 L2 *The flight crew should use GDOT - 5 kt instead of Green Dot as drift-down speed.*

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES SUPPLEMENTARY PROCEDURES - L/G
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L1 **EO MAX ALT..... COMPUTE**

L2 *The EO MAX ALT displayed by the FMS does not take into account the extended position of the L/G. The flight crew should use an alternate source to determine the EO maximum altitude.*

L1 **FAILURE OF BOTH ENGINES**

When both engines are failed, to ease the handling of all the different ECAM procedures resulting from this all engine flame out situation, it is recommended to use the **ALL ENG FAIL** QRH procedure, and if time permits, to clear the ECAM.
Follow all the steps of the QRH procedure, except those that are modified by the procedure below:

■ **If APU is available:**

Perform an assisted relight, when below FL 200.

■ **If APU is not available:**

- Attempt an APU start
- If APU start is unsuccessful, a windmilling relight can be performed, as long as the speed is above 300 kt (corresponding N2 above 12 %). In this case, increase the aircraft speed and disregard VMO warning.

Flight controls are in direct laws. Use manual pitch trim as necessary (not indicated on PFD if APU GEN is not available).

Ident.: PRO-NOR-SUP-LG-LG_DN-SUP-LG-00025310.0044001 / 14 NOV 24

1 **Applicable to: MSN 02155-05253**

ABNORMAL PROCEDURES

FLIGHT CONTROLS

Failure cases, which would normally lead to ALTN law, will degrade F/CTL laws down to DIRECT law, if the landing gear is extended.

FAILURE OF ONE ENGINE

GREEN DOT SPD (FINAL TAKEOFF, GO-AROUND, DRIFT DOWN) : DO NOT USE

L2 *The Green Dot speed displayed by the PFD does not take into account the extended position of the L/G. The flight crew should use the speed mentioned in the TAKEOFF / GO-AROUND and EN-ROUTE sections below instead of Green Dot when required.*

L1 TAKEOFF / GO-AROUND

- **After acceleration, and when flaps/slats are retracted:**

SPEED.....**SELECT GDOT - 5KT**

L2 *The flight crew should select GDOT - 5 kt instead of Green Dot.*

- **When GDOT - 5 kt is reached:**

ALT KNOB.....**PULL**

THR LEVER (REMAINING ENG).....**MCT**

EN-ROUTE

DRIFT-DOWN SPEED : GDOT – 5KT

L2 *The flight crew should use GDOT - 5 kt instead of Green Dot as drift-down speed.*

L1 **EO MAX ALT**.....**COMPUTE**

L2 *The EO MAX ALT displayed by the FMS does not take into account the extended position of the L/G. The flight crew should use an alternate source to determine the EO maximum altitude.*

L1 FAILURE OF BOTH ENGINES

When both engines are failed, to ease the handling of all the different ECAM procedures resulting from this all engine flame out situation, it is recommended to use the **ALL ENG FAIL** QRH procedure, and if time permits, to clear the ECAM.

Follow all the steps of the QRH procedure, except those that are modified by the procedure below:

■ **If APU is available:**

Perform an assisted relight, when below FL 200.

■ **If APU is not available:**

- Attempt an APU start
- If APU start is unsuccessful, a windmilling relight can be performed, as long as the speed is above 300 kt (corresponding N2 above 12 %). In this case, increase the aircraft speed and disregard VMO warning.

Flight controls are in direct laws. Use manual pitch trim as necessary (not indicated on PFD if APU GEN is not available).

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES SUPPLEMENTARY PROCEDURES - L/G
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Operation with Nosewheel Steering Offset

OPERATION WITH NOSEWHEEL STEERING OFFSET

Applicable to: ALL

Ident.: PRO-NOR-SUP-LG-LG-A-00020945.0001001 / 17 MAR 17

During taxi in a straight line, the crew may notice aircraft veering tendency. This can be due to external conditions (crosswind, slope....), or to a nosewheel steering offset.

A nosewheel steering offset is usually notified through consecutive crew reports. The NWS offset value is determined regarding the necessary rudder trim input used to cancel the veering tendency.

Ident.: PRO-NOR-SUP-LG-LG-A-00020946.0001001 / 17 MAR 17

When the NWS offset is within admissible limits, the flight crew can operate the aircraft as follows:

CAUTION	A rudder trim reset must be performed before takeoff. When the rudder trim adjustment is above the maintenance tolerance ($\pm 0.5^\circ$ NWS offset corresponding to $\pm 3^\circ$ rudder trim necessary to taxi straight), the flight crew must systematically and accurately report the rudder trim value in the logbook.
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NWS Offset	Necessary Rudder Trim Input	Procedure
Offset $\leq 0.5^\circ$	Trim $\leq 3^\circ$	● Taxi: RUDDER TRIM.....ADJUST Adjust trim until the aircraft taxies in a straight line. Check input value. ● Before takeoff: RUDDER TRIM.....RESET
$0.5^\circ < \text{Offset} \leq 1.5^\circ$	$3^\circ < \text{Trim} \leq 8.8^\circ$	● Taxi: RUDDER TRIM.....ADJUST Adjust trim until the aircraft taxies in a straight line. Check input value. ● Before takeoff: RUDDER TRIM.....RESET ● Landing: ● For autoland: MAX CROSSWIND.....10 kt
Offset $> 1.5^\circ$	Trim $> 8.8^\circ$	MAINTENANCE ACTION.....REQUEST Do not attempt takeoff. Request for troubleshooting.

PROCEDURES

NORMAL PROCEDURES

SUPPLEMENTARY PROCEDURES - L/G

Intentionally left blank

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Flight Without Cabin Pressurization

FLIGHT WITHOUT CABIN PRESSURIZATION

Ident.: PRO-NOR-SUP-MISC-E-A-00024334.0001001 / 17 NOV 20

Applicable to: ALL

This chapter applies to dispatch under MMEL/MCDL or following a structural damage.

Ident.: PRO-NOR-SUP-MISC-E-A-00024335.0001001 / 17 NOV 20

Applicable to: ALL

DURING PRELIMINARY COCKPIT PREPARATION

- **If both packs are inoperative:**

FLIGHT WITH NO PASSENGERS..... CHECK

L2

Dispatch for a flight with both packs inoperative is not allowed with passengers.

L1

OXYGEN FOR FLIGHT CREW MEMBERS

CKPT OXYGEN PRESSURE.....CHECK

L2

To obtain the requirements in oxygen for flight crew members, refer to FAR 121.329 or AIR-OPS CAT.IDE.A.235, or any other applicable operational regulation.

For more information on oxygen limitations for flight crew members, Refer to LIM-OXY Minimum Flight Crew Oxygen Pressure.

L1

OXYGEN FOR CABIN OCCUPANTS

OXYGEN FOR CABIN OCCUPANTS.....CHECK

L2

To obtain the requirements in oxygen for cabin occupants, refer to FAR 121.329 or AIR-OPS CAT.IDE.A.235, or any other applicable operational regulation.

DURING COCKPIT PREPARATION

Ident.: PRO-NOR-SUP-MISC-E-A-00024424.0002001 / 05 MAY 22

Applicable to: MSN 02719-07792

DURING COCKPIT PREPARATION

FLIGHT PLAN INITIALIZATION

MAX SPEED: 250 kt

MAX CRZ FL: 100/MSA

If the altitude of the aircraft cabin reaches 14 000 ft, the cabin oxygen masks will automatically drop.

The flight crew must decide the minimum aircraft altitude, depending on:

- The MSA
- Oxygen requirements
- Turbulence, that can be uncomfortable for passengers
- Possible low OAT, that can be uncomfortable for passengers when the aircraft is ventilated by emergency ram air only.

● **If aircraft cruise FL is above FL 95:**

EXPECT **CAB PR EXCESS CAB ALT** ALERT

● **If both packs are inoperative:**

PACK 1.....OFF
 PACK 2.....OFF
 RAM AIR.....ON

Note: If the "AVIONICS SMOKE" procedure has to be applied, the following flight time limitations have to be considered to protect the avionic equipment:

At ISA +40: 0.5 h

At ISA +30 : 1.5 h

At ISA +20: 4 h

At ISA +10 and below: No limitation.

● **If both automatic cabin pressure control systems are inoperative, or if there is structural damage:**

TEST OF THE MANUAL OPERATION OF THE OUTFLOW VALVE ON GROUND:

PACK 1.....OFF
 PACK 2.....OFF
 OUTFLOW VALVE FULLY OPEN.....CHECK

L2

Check that the outflow valve is fully open on the CAB PRESS SD page.

L1

RPCU C/B (X23 ON 122VU).....PULL
 CABIN PRESS MODE SEL.....MAN
 MAN V/S CTL.....DN

L2

Check that the outflow valve is fully closed on the CAB PRESS SD page.

L1

MAN V/S CTL.....UP

L2

Check that the outflow valve is fully open on the CAB PRESS SD page.

L1

CABIN PRESS MODE SEL.....AUTO
 RPCU C/B (X23 ON 122VU).....PUSH
 PACK 1.....ON
 PACK 2.....ON

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Ident.: PRO-NOR-SUP-MISC-E-A-00024424.0001001 / 05 MAY 22

Applicable to: MSN 02155-02212

DURING COCKPIT PREPARATION

FLIGHT PLAN INITIALIZATION

MAX SPEED: 250 kt

MAX CRZ FL: 100/MSA

If the altitude of the aircraft cabin reaches 14 000 ft, the cabin oxygen masks will automatically drop.

The flight crew must decide the minimum aircraft altitude, depending on:

- The MSA
- Oxygen requirements
- Turbulence, that can be uncomfortable for passengers
- Possible low OAT, that can be uncomfortable for passengers when the aircraft is ventilated by emergency ram air only.

● **If aircraft cruise FL is above FL 95:**

EXPECT **CAB PR EXCESS CAB ALT** ALERT

● **If both packs are inoperative:**

PACK 1.....OFF
PACK 2.....OFF
RAM AIR.....ON

Note: If the "AVIONICS SMOKE" procedure has to be applied, the following flight time limitations have to be considered to protect the avionic equipment:

At ISA +40: 0.5 h

At ISA +30 : 1.5 h

At ISA +20: 4 h

At ISA +10 and below: No limitation.

● **If both automatic cabin pressure control systems are inoperative, or if there is structural damage:**

PACK 1.....ON
PACK 2.....ON
CABIN PRESS MODE SEL.....MAN
MAN V/S CTL.....AS RQRD

L2

Use MAN V/S CTL sw to set the outflow valve opening to 50 %.

PROCEDURES

NORMAL PROCEDURES

SUPPLEMENTARY PROCEDURES - MISCELLANEOUS

- L1** OUTFLOW VALVE HALF OPEN.....CHECK
- L2** *The outflow valve opening is limited to 50 %, to prevent the cabin air suction effect.*

AFTER TAKEOFF

Ident.: PRO-NOR-SUP-MISC-E-A-00024425.0002001 / 10 MAY 21

Applicable to: MSN 02719-07792

AFTER TAKEOFF

FOR PAX AND CREW COMFORT:

AVOID EXCESSIVE RATE OF CLIMB (MAX: +1 000 ft/min)

AVOID EXCESSIVE RATE OF DESCENT (MAX: -500 ft/min)

- L2** *In the case of a door failure or a structural damage, the flight crew must ensure that the differential pressure remains equal to 0 PSI during the whole flight.*

- L1** ● If both automatic cabin pressure control systems are inoperative, or if there is structural damage:
- When in clean configuration:
 - MODE SEL..... MAN
 - MAN V/S CTL..... AS RQRD
- L2** *Use MAN V/S CTL sw to set the outflow valve opening to 50 %.*
- L1** OUTFLOW VALVE HALF OPEN.....CHECK
- L2** *The outflow valve opening is limited to 50 %, to prevent the cabin air suction effect.*

ECAM ALERT

- If aircraft/cabin altitude is above 9 550 ft:
 - EXPECT **CAB PR EXCESS CAB ALT** ALERT
 - ECAM CLR..... CONSIDER

Ident.: PRO-NOR-SUP-MISC-E-A-00024425.0001001 / 10 MAY 21

Applicable to: MSN 02155-02212

AFTER TAKEOFF

FOR PAX AND CREW COMFORT:

AVOID EXCESSIVE RATE OF CLIMB (MAX: +1 000 ft/min)

AVOID EXCESSIVE RATE OF DESCENT (MAX: -500 ft/min)

- L2** *In the case of a door failure or a structural damage, the flight crew must ensure that the differential pressure remains equal to 0 PSI during the whole flight.*

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L1 ECAM ALERT

- If aircraft/cabin altitude is above 9 550 ft:
EXPECT **CAB PR EXCESS CAB ALT** ALERT
ECAM CLR.....CONSIDER

PROCEDURES

NORMAL PROCEDURES

SUPPLEMENTARY PROCEDURES - MISCELLANEOUS

Intentionally left blank

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High Altitude Airport Operations

HIGH ALTITUDE AIRPORT OPERATIONS

Applicable to: ALL

Ident.: PRO-NOR-SUP-MISC-A-A-00020648.0002001 / 18 NOV 25

1
2
CAB PRESS SYSTEM

TAKEOFF

TAKEOFF WITH BOTH PACKS OFF : DO NOT PERFORM

L2
Takeoff with both packs off may trigger the **CAB PR EXCESS CAB ALT** alert.

L1
APU BLEED..... AS RQRD

If required for takeoff performance, takeoff must be performed with:

- Both packs running supplied by APU bleed, *Refer to LIM-APU APU Bleed*, or
 - One pack running supplied by APU bleed (if permitted), *Refer to LIM-APU APU Bleed*.

HYD SYSTEM

- If the **HYD Y(B)(G) RSVR LO AIR PR** alert triggers on ground:
Before engine start: SWITCH OFF AFFECTED HYD PUMP.

PROCEDURES

NORMAL PROCEDURES

SUPPLEMENTARY PROCEDURES - MISCELLANEOUS

Intentionally left blank

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES SUPPLEMENTARY PROCEDURES - MISCELLANEOUS
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Operations at QNH above 1050 hPa (31.00 inHg)

GENERAL

Ident.: PRO-NOR-SUP-MISC-C-00024567.0002001 / 03 NOV 22

Applicable to: MSN 02155-02212

Operators may occasionally experience high barometric settings above 1 050 hPa (31.00 inHg), due to polar anticyclonic air mass conditions. These conditions mainly occur during winter in the upper northern region.

For departure and arrival, the flight crew must ensure that the aircraft remains within its flight envelope.

CAUTION	When the QNH exceeds 1 050 hPa (31.00 inHg), the aircraft pressure altitude might be outside of its flight envelope (below -1 000 ft STD), depending on the airfield elevation. Operations at QNH above 1 050 hPa (31.00 inHg) are only authorized within the flight envelope of the aircraft.
----------------	---

In addition, the flight crew should apply the following procedures when the QNH is more than 1 050 hPa (31.00 inHg).

Note: Refer to FCOM PRO-NOR-SOP Standard Operating Procedures if no procedure is present in this section (depending on the aircraft configuration).

GENERAL

Ident.: PRO-NOR-SUP-MISC-C-00024567.0003001 / 10 MAY 21

Applicable to: MSN 02719-07792

Operators may occasionally experience high barometric settings above 1 050 hPa (31.00 inHg), due to polar anticyclonic air mass conditions. These conditions mainly occur during winter in the upper northern region.

High QNH values may result in pressure altitudes below -1 000 ft during takeoff and landing at low altitude airports. Therefore, the flight crew should apply the following procedures when the QNH is more than 1 050 hPa (31.00 inHg).

PROCEDURES

Ident.: PRO-NOR-SUP-MISC-C-P-00024599.0002001 / 10 MAY 21

Applicable to: MSN 02719-07792

BEFORE TAKEOFF

ALT RPTG..... OFF

L2 Due to the transponder limitation, the flight crew must disconnect the altitude reporting. After the flight crew turn off the altitude reporting, a **TCAS STBY** memo appears on the E/WD.

L1 ATC..... NOTIFY

L2 Notify the ATC that altitude reporting is not available.

Ident.: PRO-NOR-SUP-MISC-C-P-00024600.0001001 / 10 MAY 21

Applicable to: MSN 02719-07792

TAKEOFF

- Above 1 000 ft, when time permits:

ALT RPTG.....ON

L2 As a result, the TCAS automatically reverts to its previous setting.

Ident.: PRO-NOR-SUP-MISC-C-P-00024607.0001001 / 06 NOV 25

Applicable to: MSN 02155-02212

DESCENT PREPARATION

DO NOT INSERT a DEST QNH value on the MCDU PERF APPR page.

Note: As no DEST QNH is entered, the FMS initially assumes that standard barometric reference will be kept down to destination for descent flight path calculations. When QNH is set on the FCU, the aircraft and cabin altitude will be higher than expected (the aircraft altitude can be up to 2 000 ft higher than expected). This will lead to a higher descent rate, with a possible **CAB PR LO DIFF PR** alert, and possible opening of the cabin pressure safety valve.

- For QFE  use:

LDG ELEVSET TO 0

L2 When Approach phase is activated, a **TERR STBY** memo appears on the E/WD.

Ident.: PRO-NOR-SUP-MISC-C-P-00024602.0001001 / 10 MAY 21

Applicable to: MSN 02719-07792

APPROACH

- Before final approach:

ATC.....NOTIFY

L2 Notify the ATC that the altitude reporting will be turned off.

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES SUPPLEMENTARY PROCEDURES - MISCELLANEOUS
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- L1

ALT RPTG.....OFF
- L2

*Due to the transponder limitation, the flight crew must disconnect the altitude reporting. After the flight crew turn off the altitude reporting, a **TCAS STBY** memo appears on the E/WD.*
- L1

Note: *Perform approaches based on a barometric vertical profile using selected lateral and vertical guidance, and raw data reference.*

PROCEDURES

NORMAL PROCEDURES

SUPPLEMENTARY PROCEDURES - MISCELLANEOUS

Intentionally left blank

Operations with QFE Barometric Reference**INTRODUCTION**

¹ Ident.: PRO-NOR-SUP-MISC-F-00029052.0002001 / 06 NOV 25

Applicable to: MSN 02155-02212

The flight crew should apply the following procedures when the QFE is used as the barometric reference at the departure and/or destination airport. It must be used as an additional or amended part of the SOPs for QFE operations.

DESIGN SPECIFICITIES

² Ident.: PRO-NOR-SUP-MISC-F-00029053.0002001 / 06 NOV 25

Applicable to: MSN 02155-02212

This section highlights design specificities related to the use of the QFE during operations on the following aircraft systems:

- PFD
- ND
- MCDU.

EFIS CONTROL PANEL

At the EFIS CP power-up, the barometric reference is QFE, and the QFE value is set to 1 013 hPa or 29.92 inHg by default, depending on the selected barometric unit.

For more information on the setting of the barometric reference through the EFIS CP:

- *Refer to DSC-31-50 Barometer Reference Windows*
- *Refer to DSC-31-50 Barometer Reference Selector .*

PROCEDURES

NORMAL PROCEDURES

SUPPLEMENTARY PROCEDURES - MISCELLANEOUS

EFIS AND MCDU DISPLAYS

When the QFE reference is selected on the EFIS CP, altitudes displayed on the PFD, ND and MCDU do not have the same barometric reference:

- The PFD displays target altitudes that use the QFE barometric reference (AGL)
- When below the Transition Altitude:
 - The MCDU displays altitude predictions and altitude constraints that use the QNH barometric reference (AMSL).
 - The ND displays altitude constraints that use the QNH barometric reference (AMSL).
- When above the Transition Altitude, and independently of the FCU setting:
 - The MCDU displays altitude predictions and altitude constraints that use the “STD” barometric reference (FL).
 - The ND displays altitude constraints that use the “STD” barometric reference (FL).

For more information:

- On the PFD and MCDU altitudes, *Refer to DSC-22_20-30-30 Target Altitude on PFD*
- For MCDU basic rules, *Refer to DSC-22_20-30-30 MCDU Altitude Predictions - In Flight*.

PROCEDURES

Applicable to: MSN 02155-02212

Ident.: PRO-NOR-SUP-MISC-F-P-00029054.0002001 / 06 NOV 25

COCKPIT PREPARATION

FMGS PREPARATION - TAKEOFF DATA INSERTION (PERF TAKEOFF PAGE)

THR RED/ACC altitude..... SET or CHECK

CAUTION

THR RED ALT and ACC ALT are QNH altitudes. For any modification, the flight crew must ensure that the values used in the THR RED ALT and ACC ALT fields are QNH referenced, in order to avoid incorrect guidance on the vertical plan.

Note: **LVR CLB** flashes on the PFD at the appropriate QFE height. THR RED ALT and ACC ALT are converted to the QFE heights to provide correct flight guidance to the flight crew through the PFD.

FMGS PREPARATION - QNH AT DESTINATION PRE-ENTRY (PERF/APPR PAGE)

PERF APPR QNH field..... INSERT

The QNH at destination can be obtained from the meteorological information available before departure. If meteorological information provides the QFE, the flight crew must convert the QFE value to the QNH value.

CAUTION

During QFE Operations, the flight crew must enter a QNH (not a QFE) in the PERF APPR page. The CPC uses the QNH to compute the cabin pressurization profile. Therefore, the entry of QFE in QNH field of the PERF APPR page leads to an erroneous cabin pressurization profile.

GLARESHIELD - EFIS CONTROL PANEL

BAROMETRIC REFERENCE.....SET/CROSSCHECK

- Set the QFE on the EFIS control panel and on the standby altimeter.
- Check the barometric reference and altitude indications on the PFDs and on the standby altimeter.

The maximum difference is:

± 20 ft between both PFDs

And depending on the aircraft configuration:

± 100 ft between ISIS  and PFDs, or

± 300 ft between mechanical standby altimeter and PFDs.

⁴ Ident.: PRO-NOR-SUP-MISC-F-P-00029058.0006001 / 06 NOV 25

CLIMB
ALTITUDE CONSTRAINTS BELOW TRANSITION ALTITUDE

The flight crew can manually enter vertical constraints, if needed. The flight crew must convert the QFE height constraints into QNH altitude constraints for insertion into the FMS F-PLN page.

CAUTION

The FMS uses values entered in the MCDU as altitude (QNH). The flight crew must only enter altitude constraints using the QNH in the MCDU to avoid incorrect guidance and altitude constraint violations.

AT TRANSITION ALTITUDE

BAROMETRIC REFERENCE..... SET STD/CROSSCHECK

- At the transition altitude, the barometric setting flashes on the PFD. The flight crew should set STD on the EFIS CP and on the standby altimeter.
- Crosscheck the barometric settings and the altitude indications.

PROCEDURES

NORMAL PROCEDURES

SUPPLEMENTARY PROCEDURES - MISCELLANEOUS

Note: The barometric setting flashes on the PFD based on the QFE barometric reference in use.

The Transition Altitude that is referenced in the FMS is automatically converted to a QFE height, to provide correct guidance to the flight crew.

Note: When STD is set on the EFIS control panel, the transponder does not transmit to the ATC the standard barometric reference but the last QFE previously selected. The transmitted aircraft altitude is not affected. Only the FCU selected altitude, if used by the ATC, may be misinterpreted.

Upon ATC notification of an incorrect barometric reference value, the flight crew can manually select a barometric reference of 1 013 hPa and set again STD on the EFIS control panel.

5 Ident.: PRO-NOR-SUP-MISC-F-P-00029059.0010001 / 06 NOV 25

DESCENT PREPARATION

DESCENT PREPARATION - BAROMETRIC REFERENCE

BAROMETRIC REFERENCE.....PRESET

Preset the QFE on the ISIS .

DESCENT PREPARATION - FMGS - PERF APPR - PERF GO AROUND

PERF APPR page..... COMPLETE/CHECK

- Enter the QNH, temperature, and wind at destination.

CAUTION

During QFE operations, the flight crew must convert QFE into QNH. The CPC uses the QNH to compute the cabin pressurization profile. Therefore, the entry of QFE in QNH field of the PERF APPR page leads to an erroneous cabin pressurization profile.

Note: Insert the average wind given by the ATC or ATIS. Do not insert the gust value. During approach, the Ground Speed Mini function (managed speed mode) takes into account the instantaneous gust.

For more information, Refer to Ground Speed Mini Function.

For example, if the wind is 15020G35KT, insert 150/20.

- Insert the minimum. Refer to DSC-22_20-30-20 QFE Use for Aircraft Equipped with QFE Option.

Note: To avoid the aircraft to descend below the published minimum during go-around, due to aircraft inertia during pull-up, some Authorities may require Operators to add a specific number of feet to the published minimum.

Note: Changing the RWY or the type of approach automatically erases the previous minimum.

Note: After the activation of the SEC F-PLN, check the VAPP, and modify if necessary.

- Check or modify the landing configuration. Always select the landing configuration on the PERF APPR page: CONF FULL or CONF 3 is the normal landing configuration. CONF 3 should be considered, depending on the available runway length and go-around performance, or if windshear/severe turbulence is considered possible during approach.
- Check or modify the transition altitude/flight level.

PERF GO AROUND page..... CHECK/MODIFY

Check THR RED ALT and ACC ALT, and modify if necessary.

CAUTION

THR RED ALT and ACC ALT are QNH altitudes. For any modification, the flight crew must ensure that the values used in the THR RED ALT and ACC ALT fields are QNH referenced, in order to avoid incorrect guidance after a go-around on the vertical plan.

Note: **LVR CLB** flashes on the PFD at the appropriate QFE height. THR RED ALT and ACC ALT are converted to the QFE heights to provide correct flight guidance to the flight crew through the PFD.

DESCENT

DESCENT ADJUSTMENT - BAROMETRIC REFERENCE

- **When the aircraft approaches the transition level, and when cleared for an altitude:**
 BAROMETRIC REFERENCE..... SET/CROSSCHECK

- Set QFE on the EFIS control panel and on the standby altimeter.
- Crosscheck the barometric reference settings and the altitude indications.

Note:

- The flight crew must take into account any QFE change on the EFIS control panels, standby altimeter and on the FMS PERF APPR page. If required, the QFE value must be converted to the QNH for the entry on the FMS PERF APPR page.
- The flight crew should pay attention to a barometric reference that significantly differs from the one used for approach preparation. That could be the symptom of a barometric reference error. In this case, the flight crew should consider the confirmation of the barometric reference from all available sources.

CAUTION

During QFE operations, the flight crew must convert QFE into QNH. The CPC uses the QNH to compute the cabin pressurization profile. Therefore, the entry of QFE in QNH field of the PERF APPR page leads to an erroneous cabin pressurization profile.

Pushback with Power Push Unit
PUSHBACK WITH POWER PUSH UNIT VIA THE MAIN LANDING GEAR

Ident.: PRO-NOR-SUP-MISC-D-A-00020472.0002001 / 09 NOV 21

Applicable to: ALL

When pushback is performed with a Power Push Unit (PPU) via the main landing gear, this procedure replaces the BEFORE PUSHBACK OR START SOP.

● Before start clearance

SOP - BEFORE START CLEARANCE.....PERFORM

L2 Refer to PRO-NOR-SOP-07 Before Start Clearance.

L1 NW STRG DISC MEMO.....CHECK NOT DISPLAYED

L2 The ground crew should check that the towing lever is in the normal position.

 L1 **● At start clearance**

PUSHBACK/START CLEARANCE.....OBTAIN

L2 Obtain ATC pushback/start clearance.

Obtain ground crew clearance.

L1 ATC.....SET FOR OPERATION

L2 ATC is set in accordance with airport requirements.

L1 WINDOWS AND DOORS.....CHECK CLOSED

L2 - To ensure that the sliding window is correctly closed, push the handle of the sliding window fully forward to the closed position, and check that the red indicator is visible.

- Check, on the ECAM lower display, that all the aircraft doors are closed.

- When required by local airworthiness authorities, check that the cockpit door is closed and locked (no cockpit door open/fault indication).

If entry is requested, identify the person requesting entry before unlocking the door. With the cockpit door sw on NORM, the cockpit door is closed and locked. If entry is requested from the cabin, and if no further action is performed by the pilot, the cabin crew will be able to unlock the door by using the emergency access procedure. Except for crew entry/exit, the cockpit door should remain closed until engine shutdown.

L1 SLIDES.....CHECK ARMED

L2 - Check, on the ECAM lower display, that all slides are armed.

L1 BEACON sw.....ON

PROCEDURES

NORMAL PROCEDURES

SUPPLEMENTARY PROCEDURES - MISCELLANEOUS

THRUST LEVERS.....IDLE

CAUTION Engines will start, regardless of the thrust lever position; thrust will rapidly increase to the corresponding thrust lever position, causing a hazardous situation, if thrust levers are not at IDLE.

ACCU PRESS indicator.....CHECK

L2 The ACCU PRESS indication must be in the green band. If required, use the electric pump on yellow hydraulic system to recharge the brake accumulator.

L1 PARK BRK handle.....CHECK ON
 BRAKES PRESS indicator.....CHECK

L2 Check for normal indication.

L1 BEFORE START CHECKLISTCOMPLETE

PUSHBACK WITH POWER PUSH UNIT VIA THE MAIN LANDING GEAR - PROCEDURE 2/2

Ident.: PRO-NOR-SUP-MISC-D-A-00020473.0002001 / 17 MAR 17

Applicable to: MSN 02719-07792

ENG 2.....START

L2 Engine 2 is usually started first to pressurize the yellow hydraulic system, making the nosewheel steering and parking brake available.

Ident.: PRO-NOR-SUP-MISC-D-A-00020473.0001001 / 17 MAR 17

Applicable to: MSN 02155-02212

ENG 2.....START

L2 Engine 2 is usually started first to pressurize the yellow hydraulic system, making the parking brake available.

L1 PTU.....CHECK AUTO

L2 The green hydraulic system is pressurized via PTU, making the nosewheel steering available.

Ident.: PRO-NOR-SUP-MISC-D-A-00020474.0001001 / 17 MAR 17

Applicable to: ALL

PUSHBACK

Due to a face-to-face situation between the ground personnel and the flight crew, a clear understanding of directional phraseology is essential.

PARK BRK handle.....OFF

BRAKES PRESS indicator.....CHECK ZERO

L2 A slight residual pressure may remain for a short period of time on the triple indicator. Advise the ground crew that the parking brake is off and that the pushback can be started.

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES SUPPLEMENTARY PROCEDURES - MISCELLANEOUS
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CAUTION

Do not use the brakes during pushback, except in case of emergency.

Do not move flight controls or flap lever.

L2 *In case of emergency, order the ground crew to separate the PPU and move it away from the evacuation areas. Nevertheless, evacuation is possible with the PPU in place.*

L1 STEERING HANDWHEEL.....AS REQUIRED

L2 *Steer the aircraft using guidance from the ground crew.*

- L1** ● **When pushback is completed:**
- PARK BRK handle.....ON
BRAKES PRESS indicator..... CHECK
GROUND CREW..... ADVISED TO REMOVE PPU
- **When PPU is removed and ground crew clearance obtained:**
- ENG 1..... START
SOP - AFTER START..... RESUME
Refer to PRO-NOR-SOP-09 After Start

PROCEDURES

NORMAL PROCEDURES

SUPPLEMENTARY PROCEDURES - MISCELLANEOUS

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 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES SUPPLEMENTARY PROCEDURES - SURVEILLANCE
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AUTOMATIC DEPENDENT SURVEILLANCE - BROADCAST (ADS-B)

Ident.: PRO-NOR-SUP-SURV-00020957.0001001 / 17 MAR 17

Applicable to: ALL

ADS-B OUT:

In some cases, the ATC ground stations can receive non valid data from the ADS-B function. Therefore, the air traffic controller may ask the flight crew to stop the transmission of the ADS-B data (e.g. the air traffic controller requests "STOP ADS-B TRANSMISSION" or "STOP ADS-B ALTITUDE TRANSMISSION").

The flight crew cannot switch off the ADS-B automatic data transmission independently of the XPDR.

Therefore, do not switch off the ATC transponder or the altitude reporting, in order to maintain TCAS operations or Air Traffic Controller radar surveillance.

In such cases, the flight crew must refer to local Aeronautical Information Publication (AIP) to apply alternate procedure when the air traffic controller requests to stop ADS-B transmission.

ADS-B IN:

The ATSAW  enables the reception of ADS-B information from other aircraft in the vicinity. Refer to the ATSAW section.

ENHANCED GROUND PROXIMITY WARNING SYSTEM (EGPWS)

Ident.: PRO-NOR-SUP-SURV-00020960.0004001 / 17 MAR 17

Applicable to: MSN 02719-02789

During climb, descent, approach and go-around phases:

- If GPS PRIMARY  is not available and FMS navigation accuracy check prevents the flight crew from using NAV mode in a phase of flight:
TERR pb-sw..... OFF

Note: When the TERR pb-sw is switched OFF, the ECAM message "**NAV GPWS TERR DET FAULT**" is displayed.
Only the basic GPWS modes 1 to 5 remain operative.

PROCEDURES

NORMAL PROCEDURES

SUPPLEMENTARY PROCEDURES - SURVEILLANCE

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 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES SYSTEMS RELATED PROCEDURES - FMS
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Introduction

INTRODUCTION

Ident.: PRO-NOR-SRP-01-05-00003959.0001001 / 09 OCT 12

Applicable to: ALL

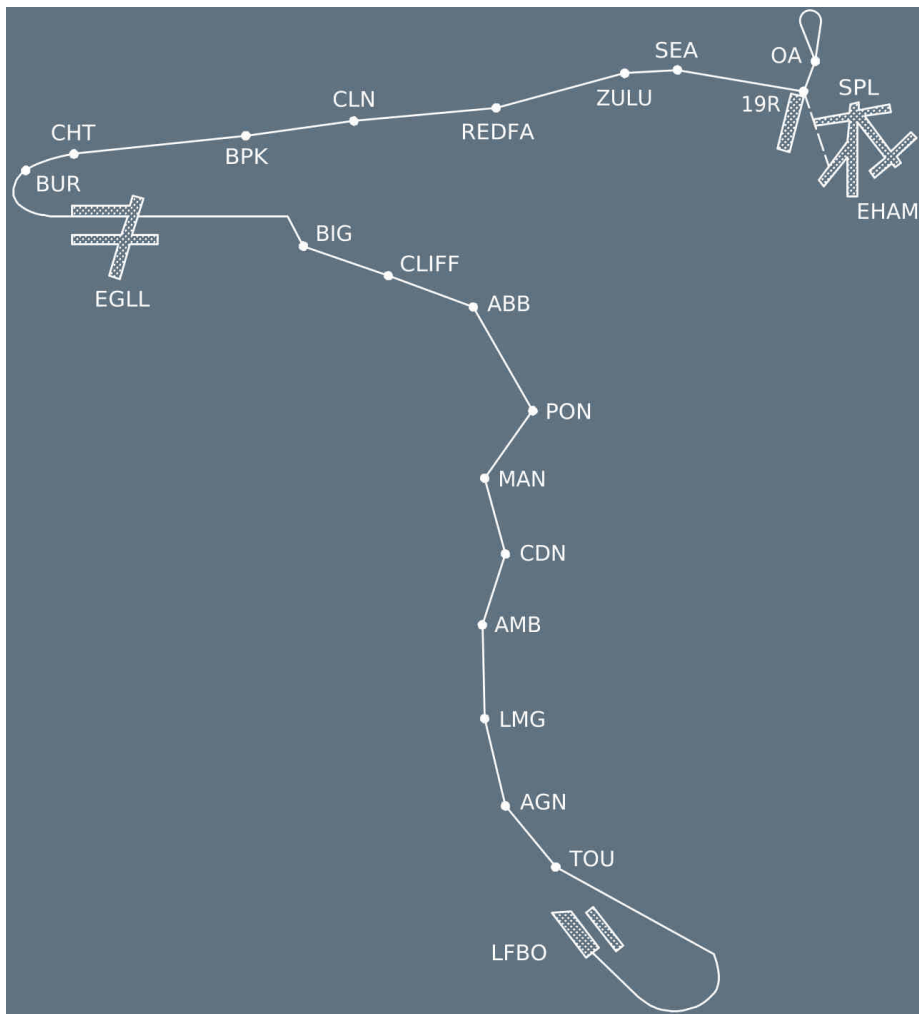
Note: *This chapter is an amplification of the SOP. Anytime it was feasible, the same chapters and the same titles of paragraph were retained.*

The following discussion of the FMGS uses this flight plan as an example.

PROCEDURES

NORMAL PROCEDURES

SYSTEMS RELATED PROCEDURES - FMS



Cockpit Preparation

FMGS INITIALIZATION

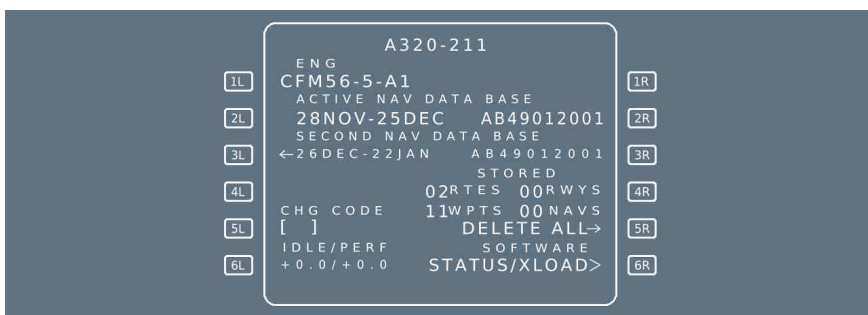
Ident.: PRO-NOR-SRP-01-10-00003960.0002001 / 22 MAY 12

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

CHECKING THE CLOCK DATE

CHECK the CLOCK DATE and ADJUST, if necessary.

If the date in the active database does not match the clock date, the MCDU displays “CHECK DATA BASE CYCLE”. If this message appears, check the period of validity in the second database and select it, if required.



CAUTION

Cycling the navigation database deletes the active and secondary flight plans. Do not cycle it while airborne because doing so will delete the flight plan, eliminate all speed predictions, and blank the ND. If the aircraft is in managed speed, Green Dot becomes the speed target.

CHECKING STORED WAYPOINTS, NAVAIDS, RUNWAYS, OR ROUTES

PRESS the DATA key.

PRESS the next page key.

SELECT, successively, as required:

- STORED WAYPOINT
- STORED NAVAIDS
- STORED RUNWAYS
- STORED ROUTES

CHECK the contents of each of these data storages and DELETE items, as appropriate.

PROCEDURES

NORMAL PROCEDURES

SYSTEMS RELATED PROCEDURES - FMS

NAVAIDS DESELECTION

- If NOTAMS indicate that selected NAVAIDs are unreliable or unserviceable, deselect them as follows:

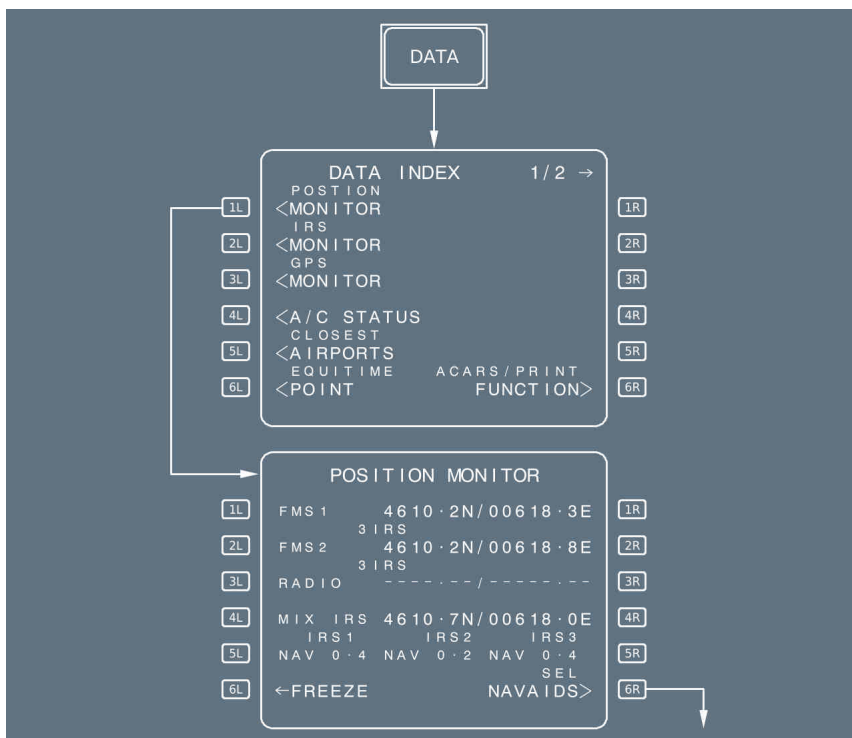
PRESS the DATA key.

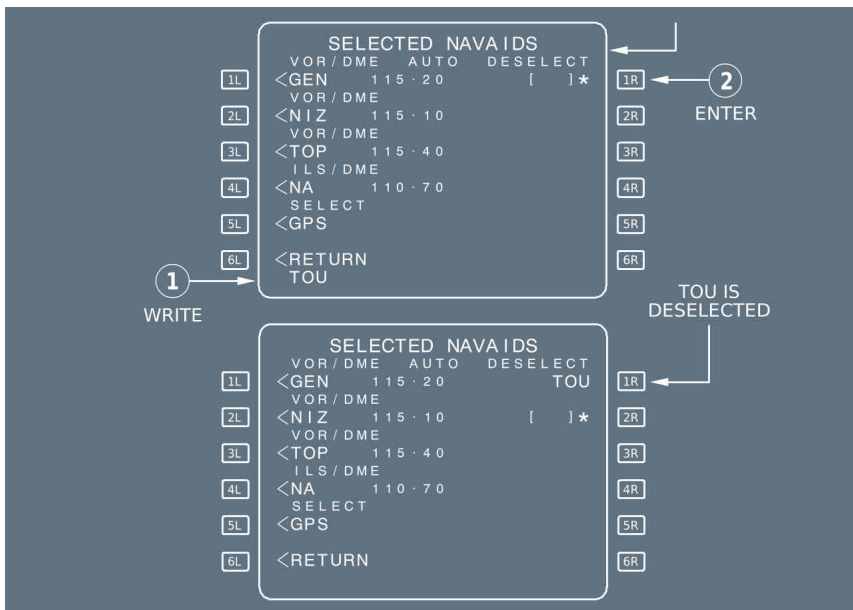
SELECT the POSITION MONITOR page.

SELECT the SELECTED NAVAIDS page.

Under “DESELECT”, INSERT the NAVAID identifier in the brackets.

The pilot can only make six deselections.





FMGS INITIALIZATION

Ident.: PRO-NOR-SRP-01-10-00003960.0008001 / 22 MAY 12

Applicable to: MSN 02926-02944, 04392, 07784-07792

CHECKING THE DATABASE CYCLE

CHECK the CLOCK DATE and ADJUST, if necessary.

If the date in the active database does not match the clock date, the MCDU displays “CHECK DATA BASE CYCLE”. If this message appears, check the period of validity in the second database and select it, if required.

PROCEDURES

NORMAL PROCEDURES

SYSTEMS RELATED PROCEDURES - FMS

A320-211		
1L	ENG	1R
2L	CFM56-5-A1	2R
3L	ACTIVE NAV DATA BASE	3R
4L	28NOV-25DEC AB49012001	4R
5L	SECOND NAV DATA BASE	5R
6L	←26DEC-22JAN AB49012001	6R
	PILOTS STORED	
	02RTES 00RWYS	
	CHG CODE 11WPTS 00NAVS	
	[] DELETE ALL→	
	IDLE/PERF SOFTWARE	
	+0.0/+0.0 STATUS/XLOAD>	

CAUTION Cycling the navigation database deletes the active and secondary flight plans. Do not cycle it while airborne because doing so will delete the flight plan, eliminate all speed predictions, and blank the ND. If the aircraft is in managed speed, Green Dot becomes the speed target.

CHECKING PILOT'S WAYPOINTS, NAVAIDS, RUNWAYS, OR ROUTES

PRESS the DATA key.

PRESS the next page key.

SELECT, successively, as required:

- PILOTS WAYPOINTS
- PILOTS NAVAIDS
- PILOTS RUNWAYS
- PILOTS ROUTES

CHECK the contents of each of these data storages and DELETE items, as appropriate.

NAVAIDS DESELECTION

- The flight crew can manually deselect all the RADIO NAVAIDS as follows:

PRESS the DATA key.

SELECT the POSITION MONITOR page.

SELECT the SELECTED NAVAIDS page.

Press [5L] to DESELECT all the Radio NAVAIDS.

- If NOTAMS indicate that selected NAVAIDS are unreliable or unserviceable, deselect them as follows:

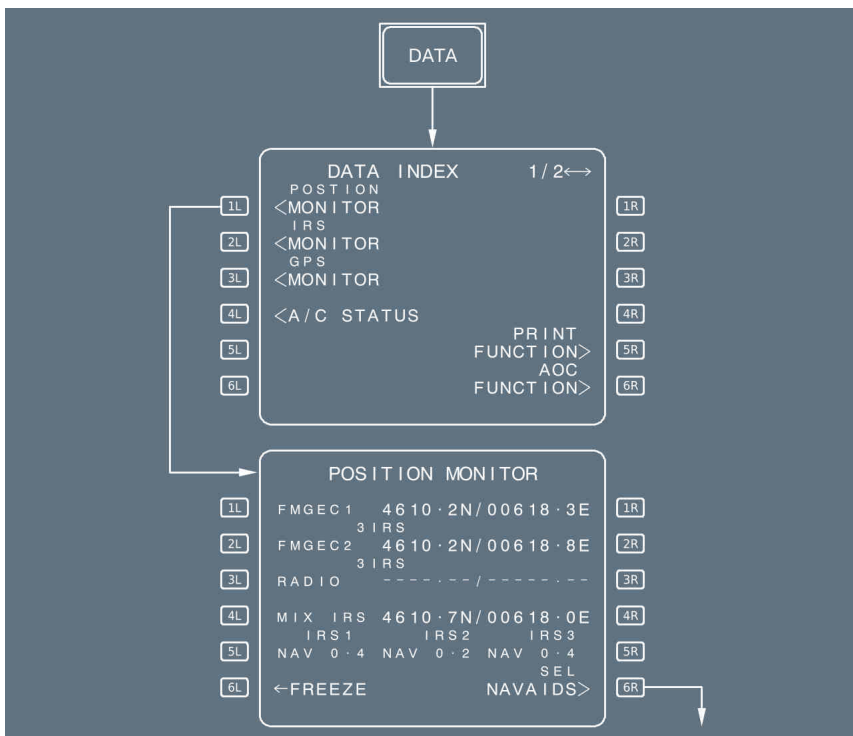
PRESS the DATA key.

SELECT the POSITION MONITOR page.

SELECT the SELECTED NAVAIDS page.

Under “DESELECT”, INSERT the NAVAID identifier in the brackets.

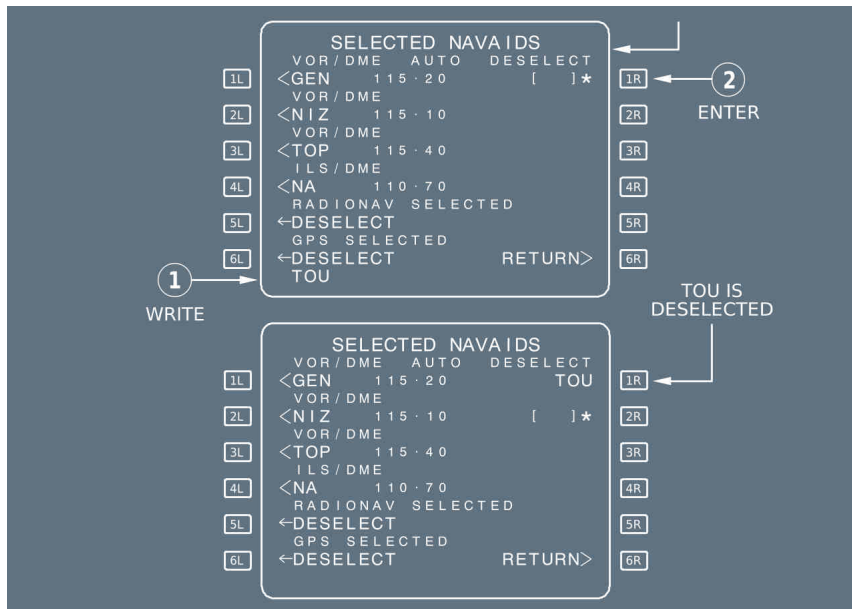
The flight crew can only make four deselections.



PROCEDURES

NORMAL PROCEDURES

SYSTEMS RELATED PROCEDURES - FMS



Note: When a NAVAID is deselected, it is no more used for navigation by the FMGC during the rest of the flight. However a deselected NAVAID can still be manually tuned on the RAD NAV page and displayed on ND.

FLIGHT PLAN INITIALIZATION

FLIGHT PLAN INITIALIZATION - GENERAL

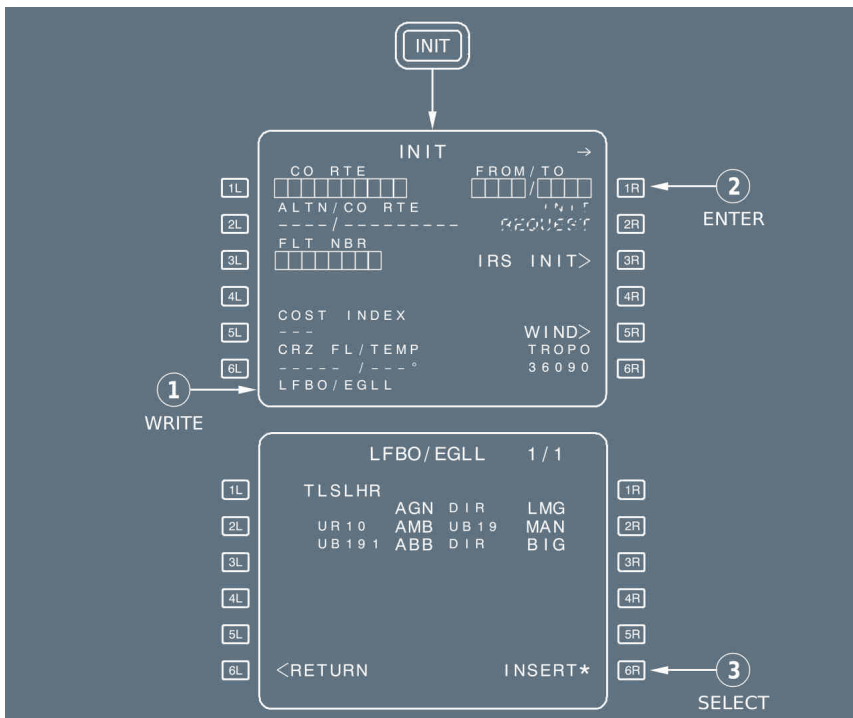
Ident.: PRO-NOR-SRP-01-10-A-00003961.0025001 / 22 MAY 12

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

GENERAL

Follow SOP instructions, when the route is a company route stored in the database.

- If the company route is unknown, proceed as follows:



WRITE a "FROM/TO" city pair, then ENTER it:

If one or more company routes run between the cities, the ROUTE SELECTION page appears and defines them.

INSERT the preferred company route.

- If the database does not contain a company route:

The flight plan must be constructed manually:

PRESS the INIT key

ENTER a city pair in the FROM/TO field.

The ROUTE SELECTION page comes up with "NONE"

SELECT RETURN [6L] key then construct the flight plan manually.

1L

2L

3L

4L

5L

6L

CO RTE

ALTN/CO RTE

FLT NBR

COST INDEX

CRZ FL/TEMP

----- / - - -

INIT

FROM/TO

LFBO/EGLL

INIT

REQUEST

IRS INIT>

WIND>

TROPO

3 6 0 9 0

1R

2R

3R

4R

5R

6R

1L

2L

3L

4L

5L

6L

LFBO/EGLL

NONE

<RETURN

1R

2R

3R

4R

5R

6R

DEPRESS →

ROUTE SELECTION

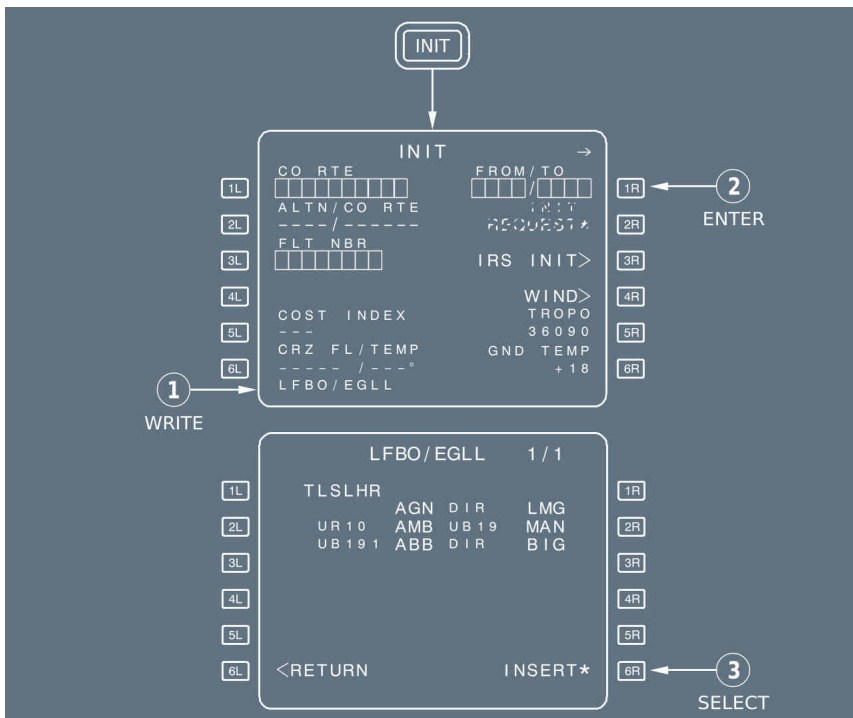
If waypoints, NAVAIDs or airports are not in the NAV database, the crew must define and store them manually, using the “data stored” function.

Ident.: PRO-NOR-SRP-01-10-A-00003961.0062001 / 22 MAY 12
 Applicable to: MSN 02926-02944, 04392, 07784-07792

GENERAL

Follow SOP instructions, when the route is a company route stored in the database.

- If the company route is unknown, proceed as follows:



WRITE a "FROM/TO" city pair, then ENTER it:

If one or more company routes run between the cities, the ROUTE SELECTION page appears and defines them.

INSERT the preferred company route.

Check COST INDEX.

Check/modify GND TEMP.

- If the database does not contain a company route:

The flight plan must be constructed manually:

PRESS the INIT key

ENTER a city pair in the FROM/TO field.

The ROUTE SELECTION page comes up with "NONE"

SELECT RETURN [6L] key then construct the flight plan manually.

PROCEDURES

NORMAL PROCEDURES

SYSTEMS RELATED PROCEDURES - FMS

INIT		→	
1L	CO RTE	FROM / TO	1R
2L	ALTN / CO RTE	INIT	2R
3L	FLT NBR	REQUEST *	3R
4L		IRS INIT >	4R
5L	COST INDEX	WIND >	5R
6L	CRZ FL / TEMP	TROPO	6R
		36090	
		GND TEMP	
		+18°	

LFBO/EGLL		
1L	NONE	1R
2L		2R
3L		3R
4L		4R
5L		5R
6L	<RETURN	6R

PRESS →

ROUTE SELECTION

If waypoints, NAVAIDs or airports are not in the NAV database, the crew must define and store them manually, using the “data stored” function.

FLIGHT PLAN INITIALIZATION - ALIGNING IRS

Ident.: PRO-NOR-SRP-01-10-A-00003962.0037001 / 23 JUN 15

Applicable to: MSN 02926-02944

ALIGNING IRS

PRESS the INIT key, and then the IRS INIT prompt.

IRS INIT page is displayed with the airport reference point as default coordinates.

If necessary, PRESS [1L] and/or [1R] and use scroll keys to adjust the latitude and/or longitude values.

For example, this can be used to enter the gate precise coordinates when the aircraft is intended to fly without GPS on long segments without radio coverage.

PRESS the ALIGN ON REF prompt and CONFIRM ALIGN* prompt.

The displayed coordinates are sent to ADIRS for initialization.

The alignment status changes to ALIGNING ON REF.

- If the “CHECK IRS/AIRPORT POS” or “REF/GPS POS DIF” or “REF/LAST IRS POS DIF” message is displayed:
CHECK the departure airport on INIT A page and CORRECT it if necessary.
REALIGN the IRS per the procedure described previously.
- If a new FROM or a new CO RTE is entered after IRS alignment is already completed, the ALIGN ON REF prompt is displayed in [6R]:
REALIGN the IRS per the procedure described previously.

Ident.: PRO-NOR-SRP-01-10-A-00003962.0046001 / 23 JUN 15

Applicable to: MSN 02155-02789, 03031-07792

ALIGNING IRS

The alignment phase is completed, when the ADIRS is initialized to an appropriate position. If the GPS is available, initialization is automatic, using the GPS position. Flight crew intervention is not necessary.

However, automatic initialization may be manually overridden by flight crew entry, at any moment during the alignment phase. In this case, perform the following procedure as soon as possible, to prevent delays if an alignment error occurs:

PRESS the INIT key, and then the IRS INIT prompt.

IRS INIT page is displayed with the airport reference point as default coordinates.

If necessary, PRESS [1L] and/or [1R] and use scroll keys to adjust the latitude and/or longitude values.

For example, this can be used to enter the gate precise coordinates when the aircraft is intended to fly without GPS on long segments without radio coverage.

PRESS the ALIGN ON REF prompt and CONFIRM ALIGN* prompt.

The displayed coordinates are sent to ADIRS for initialization.

The alignment status changes to ALIGNING ON REF.

- If the “CHECK IRS/AIRPORT POS” or “REF/GPS POS DIF” or “REF/LAST IRS POS DIF” message is displayed:
CHECK the departure airport on INIT A page and CORRECT it if necessary.
REALIGN the IRS per the procedure described previously.
- If a new FROM or a new CO RTE is entered after IRS alignment is already completed, the ALIGN ON REF prompt is displayed in [6R]:
REALIGN the IRS per the procedure described previously.

PROCEDURES

NORMAL PROCEDURES

SYSTEMS RELATED PROCEDURES - FMS

FLIGHT PLAN INITIALIZATION - LATERAL FLIGHT PLAN

Ident.: PRO-NOR-SRP-01-10-A-00003963.0010001 / 22 MAY 12

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

LATERAL FLIGHT PLAN

SELECTING A DEPARTURE

1

SELECT

1L

2L

3L

4L

5L

6L

FROM

TIME

SPD/ALT

A I 1 0 1 ↔

LFBO32L

H 3 2 6

9 0 0

1R

2R

3R

4R

5R

6R

2

SELECT

1L

2L

3L

4L

5L

6L

LAT REV FROM LFBO

43°37.4N/001°22.8E

<DEPARTURE FIX INFO>

LL XING/INCR/NO

[]°/[]°/[]

NEXT WPT

[]

1R

2R

3R

4R

5R

6R

3

SELECT

1L

2L

3L

4L

5L

6L

DEPARTURES FROM LFBO ↔

RWY SID TRANS

33L AFR I 1 D NONE

AVAILABLE RUNWAYS

← 15L 3000M

146 ILS TG / 108 . 9 0

← 15R 3500M

146 ILS TBS / 110 . 7 0

33L 3500M

326 ILS TBN / 109 . 3 0

← 33R 3000M

326

<RETURN

1R

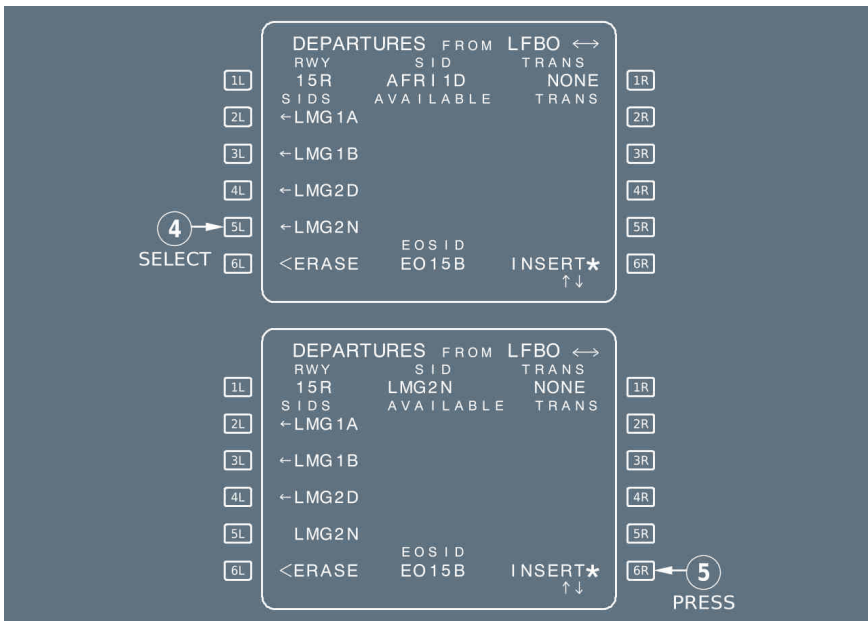
2R

3R

4R

5R

6R



The diagram illustrates the FMS DEPARTURES FROM LFBO screen in two states. The screen is divided into two main sections, each with a central display area and two columns of function keys (1L-6L on the left, 1R-6R on the right).

Initial State (Top):

- Central Display:**

DEPARTURES	FROM	LFBO	←→
RWY	SID	TRANS	
15R	AFR11D	NONE	
SIDS	AVAILABLE	TRANS	
← LMG1A			
← LMG1B			
← LMG2D			
← LMG2N			
<ERASE	EOSID EO15B	INSERT★	↑↓
- Function Keys:** 1L, 2L, 3L, 4L, 5L, 6L on the left; 1R, 2R, 3R, 4R, 5R, 6R on the right.
- Annotation:** A circled '4' with an arrow points to the 5L key, labeled 'SELECT'.

After Pressing 5 Key (Bottom):

- Central Display:**

DEPARTURES	FROM	LFBO	←→
RWY	SID	TRANS	
15R	LMG2N	NONE	
SIDS	AVAILABLE	TRANS	
← LMG1A			
← LMG1B			
← LMG2D			
LMG2N			
<ERASE	EOSID EO15B	INSERT★	↑↓
- Function Keys:** 1L, 2L, 3L, 4L, 5L, 6L on the left; 1R, 2R, 3R, 4R, 5R, 6R on the right.
- Annotation:** A circled '5' with an arrow points to the 6R key, labeled 'PRESS'.

You may use the "NEXT PAGE"  , or the "←" or "→" keys to gain access to the listings of runways, SIDs, and transitions.

Procedure

- PRESS the F-PLN key on MCDU
- SELECT the DEPARTURE prompt [1L] key
- SELECT the RWY in USE, SID and TRANS
- CHECK the resulting temporary F-PLN
- If it is correct, INSERT it using [6R] key.
- If it is not correct, ERASE it using [6L] key.

Ident.: PRO-NOR-SRP-01-10-A-00003963.0026001 / 22 MAY 12

Applicable to: MSN 02926-02944, 04392, 07784-07792

LATERAL FLIGHT PLAN

SELECTING A DEPARTURE

1 →

SELECT

1L

2L

3L

4L

5L

6L

FROM

TIME

SPD / ALT

AI101→

LFBO32L

H326

900

1R

2R

3R

4R

5R

6R

2 →

SELECT

1L

2L

3L

4L

5L

6L

LAT REV FROM LFBO

43°37.4N / 001°22.8E

<DEPARTURE FIX INFO>

LL XING / INCR / NO

<OFFSET []°/[]°/[]

NEXT WPT

[]

1R

2R

3R

4R

5R

6R

3 →

SELECT

1L

2L

3L

4L

5L

6L

DEPARTURES FROM LFBO ↔

RWY SID TRANS

32L AFR11D NONE

RUNWAYS AVAILABLE

←14L-ILS3000M CRS 144

ILS TG / 108.90

←14R-ILS3500M CRS 144

ILS TBS / 110.70

32L-ILS3500M CRS 324

ILS TBN / 109.30

←32R-MLS3000M CRS 324

326

<RETURN

1R

2R

3R

4R

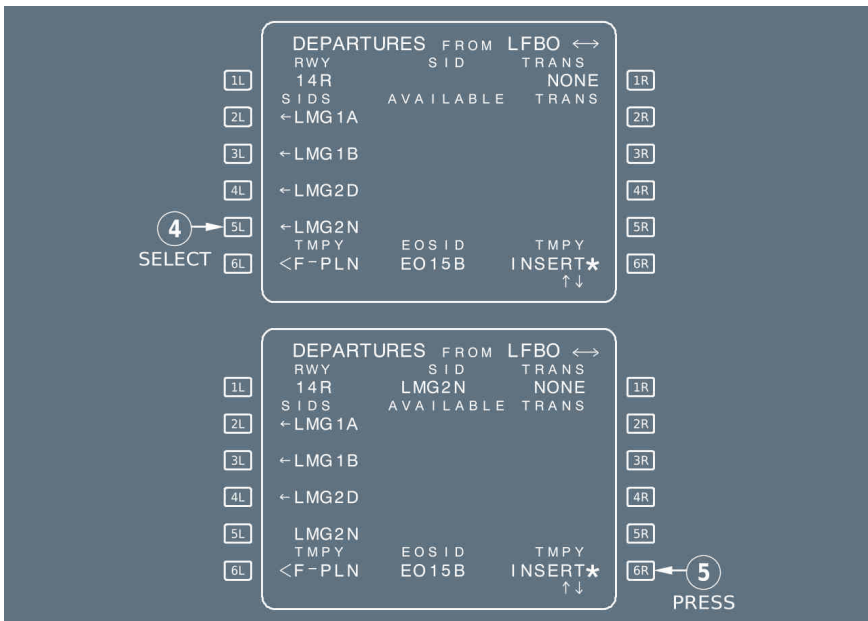
5R

6R

PROCEDURES

NORMAL PROCEDURES

SYSTEMS RELATED PROCEDURES - FMS



The diagram illustrates the FMS DEPARTURES FROM LFBO screen in two states, separated by a horizontal line. The screen features a central display area with a table of flight data and two columns of physical keys (1L-6L on the left, 1R-6R on the right).

Top State (Before F-PLN Press):

DEPARTURES FROM LFBO ↔		
RWY	SID	TRANS
14R		NONE
SIDS	AVAILABLE	TRANS
← LMG 1A		
← LMG 1B		
← LMG 2D		
← LMG 2N		
TMPLY	EOSID	TMPLY
<F-PLN	EO15B	INSERT★

Key 4 is highlighted with a circle and an arrow pointing to the 5L key.

Bottom State (After F-PLN Press):

DEPARTURES FROM LFBO ↔		
RWY	SID	TRANS
14R	LMG2N	NONE
SIDS	AVAILABLE	TRANS
← LMG 1A		
← LMG 1B		
← LMG 2D		
LMG2N		
TMPLY	EOSID	TMPLY
<F-PLN	EO15B	INSERT★

Key 5 is highlighted with a circle and an arrow pointing to the 6R key, with the word "PRESS" written below it.

You may use the “←” or “→” keys to gain access to the listings of runways, or the one of SIDs, and transitions.

Procedure

PRESS the F-PLN key on MCDU

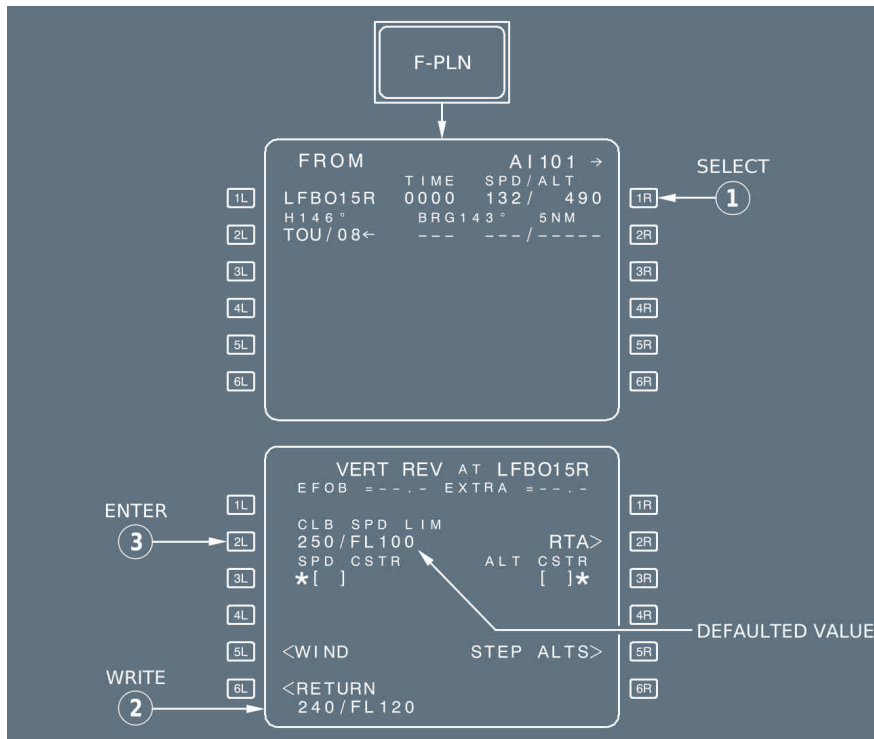
SELECT the DEPARTURE prompt [1L] key

SELECT the RWY in USE, SID and TRANS

CHECK and INSERT the TMPLY F-PLN or continue with next revision.

VERTICAL FLIGHT PLAN

ENTERING/MODIFYING A SPEED LIMIT



PRESS the F-PLN key on the MCDU.

SELECT VERTICAL REVISION at the FROM waypoint.

WRITE a new speed limit/altitude and ENTER.

The crew can insert one climb speed limit and one descent speed limit into the vertical flight plan, or modify or clear the limits that are already in it.

The speed limit is defined by a speed and an altitude (for example, 230/9 000), which means that the managed speed target will be limited by the speed limit when the aircraft flies below the specified altitude.

*In both climb and descent, 250 kt at 10 000 ft is the default speed limit in the vertical flight plan.
The vertical revision page presents the climb speed (CLB SPD) limit if the revised waypoint is
between departure and top of descent.*

*The vertical revision page shows the descent speed (DES SPD) limit, if the revised waypoint is
between top of descent and destination.*

*It can be deleted by a clear action, the field reverts to brackets. It can also be cleared directly on
the F-PLN A page by clearing the SPD LIM pseudo-waypoint.*

ENTERING A SPEED CONSTRAINT

F-PLN

F-PLN A PAGE

1L
2L
3L
4L
5L
6L

FROM	TIME	SPD/ALT	AI101→
LFBO15L	----	---/ 490	
H146°	BRG143°	6MN	
TOU/08	←----	---/ +900	
(SPD)	TRK306°		
(LIM)	----	---/-----	
C300°			
TOU	----	---/-----	
LMG2D			
AGN	----	---/-----	
DEST	TIME	DIST EFOB	
EGLL27R	----	541	↑↓

F-PLN A PAGE WITHOUT PREDICTIONS

VERT REV AT AGN

EFOB = --- EXTRA = ---

CLB SPD LIM RTA>

250/10000 SPD CSTR ALT CSTR

[] MACH/START WPT []

*[]/AGN

<WIND STEP ALTS>

CLB DES

190

ENTER
3
SELECT
4
WRITE
2

FROM	TIME	SPD/ALT	AI101→
LFBO15L	----	---/ 490	
H146°	BRG143°	6MN	
TOU/08	←----	---/ +900	
(SPD)	TRK306°		
(LIM)	----	---/-----	
C300°			
TOU	----	---/-----	
LMG2D			
AGN	----	190/-----	
DEST	TIME	DIST EFOB	
EGLL27R	----	541	↑↓

MAGENTA

PROCEDURES

NORMAL PROCEDURES

SYSTEMS RELATED PROCEDURES - FMS

Procedure

PRESS the F-PLN key on the MCDU.

SELECT the VERT REV page at the revised waypoint.

WRITE the speed constraint value into the scratchpad and ENTER it in 3L.

INSERT the constraint using the appropriate *CLB or DES* prompt when displayed. If CLB and DES are not displayed, insertion occurs when the value is entered in 3L.

The system displays the climb (CLB) or the descent (DES) prompt at [6L] or [6R] when the predictions are not yet available or when the waypoint is part of the cruise phase as originally defined.

When predictions are not yet available, the constraints are displayed on the F-PLN A page in magenta.

When predictions are available, the speed constraint is highlighted by a star ().*

** If the predicted speed matches the constraint, the star is magenta.*

** If the prediction is that the aircraft will miss the speed constraint, the star is amber.*

If a speed constraint cannot be met (by more than 10 kt), the FMGS generates the message "SPD ERROR AT WPT XX".

A speed constraint may be assigned to any waypoint in the climb or the descent phase except the FROM, origin, or destination waypoints, and any pseudo waypoint.

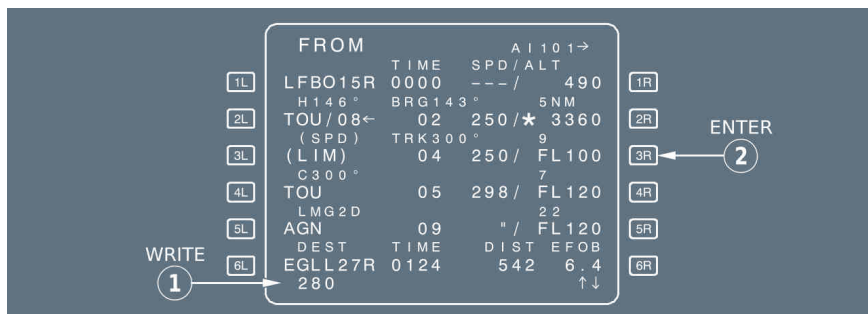
When a speed constraint is assigned to a waypoint, the constraint will limit the managed speed target as follows:

- In takeoff or climb phase until you pass the constrained waypoint.
- In descent an approach phase, after passing the constrained waypoint.

Speed constraints are observed by the FMGS when NAV mode and speed managed are active.

ENTERING A SPEED CONSTRAINT THROUGH F-PLN A PAGE

You may also enter a speed constraint through the F-PLN A page.



The diagram illustrates the F-PLN A page MCDU interface. It shows a central display area with flight data and a surrounding keypad with 12 buttons (1L-6L, 1R-6R). The display shows the following data:

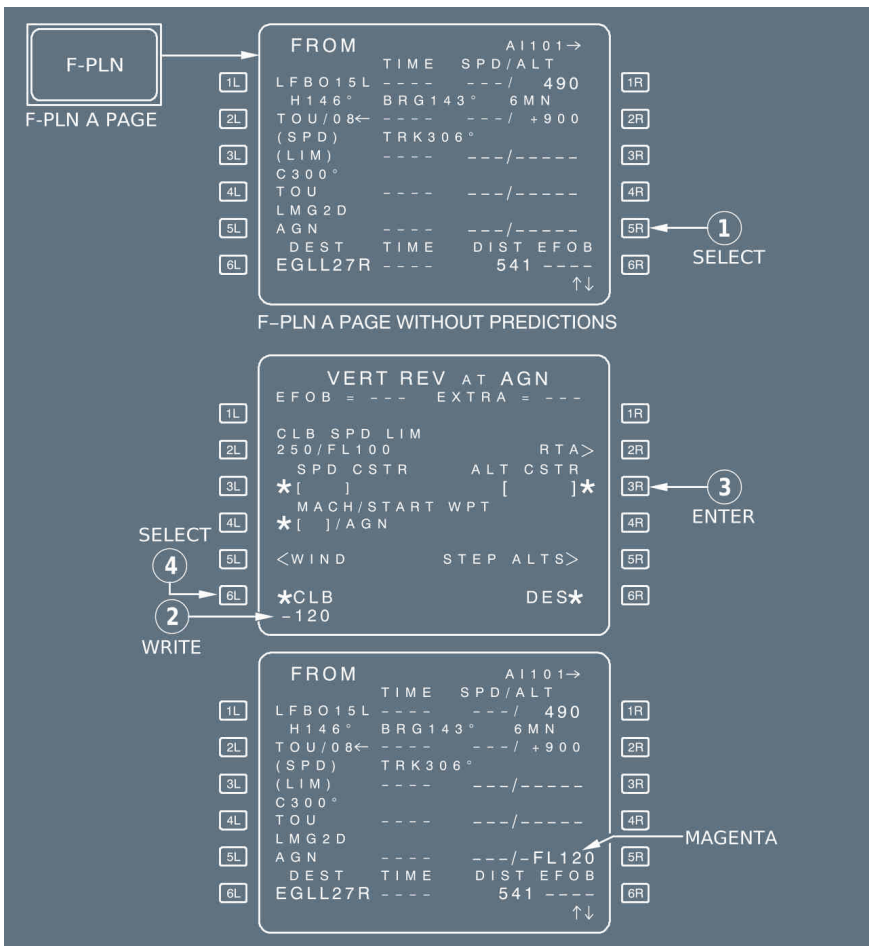
FROM	TIME	SPD / ALT	AI 101 →
LFBO15R	0000	--- /	490
H146°	BRG143°	5 NM	
TOU/08←	02	250 / ★	3360
(SPD)	TRK300°	9	
(LIM)	04	250 /	FL100
C300°		7	
TOU	05	298 /	FL120
LMG2D		22	
AGN	09	" /	FL120
DEST	TIME	DIST	EFOB
EGLL27R	0124	542	6.4
280			↑↓

Annotations on the diagram:

- A circle with the number '1' is next to the 6L button, with an arrow pointing to the '280' value in the DEST row.
- A circle with the number '2' is next to the 3R button, with an arrow pointing to the '250 / ★' value in the (LIM) row.
- The word 'WRITE' is next to the 6L button.
- The word 'ENTER' is next to the 3R button.

Note: You may delete the constraint using the clear key on the relevant right hand key. However if there is an altitude constraint assigned at that point, the clear action deletes it too.

ENTERING AN ALTITUDE CONSTRAINT



F-PLN A PAGE

FROM	TIME	SPD/ALT	AI101→
LFBO15L	----	---/---	490
H146°	BRG143°	6MN	
TOU/08←	----	---/---	+900
(SPD)	TRK306°		
(LIM)	----	---/---	
C300°			
TOU	----	---/---	
LMG2D			
AGN	----	---/---	
DEST	TIME	DIST	EFOB
EGLL27R	----	541	----

F-PLN A PAGE WITHOUT PREDICTIONS

VERT REV AT AGN	
EFOB = --	EXTRA = --
CLB SPD LIM	
250/FL100	RTA>
SPD CSTR	ALT CSTR
[]	[]
MACH/START WPT	
*[]/AGN	
<WIND	STEP ALTS>
CLB	DES
-120	

FROM

FROM	TIME	SPD/ALT	AI101→
LFBO15L	----	---/---	490
H146°	BRG143°	6MN	
TOU/08←	----	---/---	+900
(SPD)	TRK306°		
(LIM)	----	---/---	
C300°			
TOU	----	---/---	
LMG2D			
AGN	----	---/---	FL120
DEST	TIME	DIST	EFOB
EGLL27R	----	541	----

Procedure

PRESS the F-PLN key on the MCDU.

PROCEDURES**NORMAL PROCEDURES**

SYSTEMS RELATED PROCEDURES - FMS

SELECT the “VERT REV” page at the revised waypoint.

WRITE an altitude constraint in the scratchpad and ENTER it in 3R.

INSERT the constraint using *CLB or DES* prompt when it is displayed. Otherwise the value is inserted when it is entered in 3R field.

*The system displays the *CLB or DES* prompt, when the predictions are not yet available, or when the waypoint is part of the cruise phase as originally defined.*

Note: *In case of QFE operations, the altitude constraints must be converted and entered as an altitude in feet.*

You or the database may assign an altitude constraint to any waypoint in the climb or descent phases except the FROM, origin, or destination waypoints, or any pseudo waypoint.

An altitude constraint may be defined as an “at”, an “at or above”, or an “at or below”

constraint. In certain procedures, the database may define an altitude constraint as a window in which the aircraft should fly.

Enter “AT” constraints with no sign.

Enter “AT or ABOVE” constraints preceded by a + sign (+FL 130, for example).

Enter “AT or BELOW” constraints preceded by a – sign (-15 000, for example).

enter four or five-digit number when entering altitude. Include the lead zero (0 500 ft , for example).

For flight level, enter a two- or three-digit number, with or without the letters “FL”. The lead zero is optional. (Examples : +FL 120 or +120 ; -FL 090 or -90 or -090)

Enter the altitude value as either altitude or flight level ; the MCDU displays the selected value as an “ALT” or “FL,” as appropriate for the transition altitude.

The constraint must be higher than the thrust reduction altitude and lower than the cruise flight level.

Once inserted in the flight plan, the altitude constraint (ALT CSTR) is displayed in magenta as long as predictions are not available.

When predictions are available, the altitude constraints are replaced by the predicted altitude at relevant waypoints highlighted by a star.

** If the predicted altitude matches the constraint the star is magenta. If the predicted altitude is missed (by more than 250 ft), the star is amber.*

MAGENTA

		FROM		AI 101→			
	TIME	SPD / ALT					
1L	LFBO15L	----	----	490			1R
	H 146 °	BRG 143 °	5 NM				
2L	TOU/08←	----	----	+900			2R
	(SPD)	TRK 306 °					
3L	(LIM)	----	----				3R
	C 300 °						
4L	TOU	----	----				4R
	LMG2D						
5L	AGN		----	FL 120			5R
	DEST	TIME	DIST	EFOB			
6L	EGLL27R	----	541	----			6R
				↑↓			

F-PLN A PAGE WITHOUT PREDICTIONS

		FROM		AI 101→			
	TIME	SPD / ALT					
1L	LFBO15R	0000	----	490			1R
	H 146 °	BRG 143 °	5 NM				
2L	TOU/08←	02	250 / ★3360				2R
	(SPD)	TRK 300 °	9				
3L	(LIM)	04	250 / FL 100				3R
	C 300 °		7				
4L	TOU	05	298 / FL 120				4R
	LMG2D		22				
5L	AGN	09	" / ★FL 120				5R
	DEST	TIME	DIST	EFOB			
6L	EGLL27R	0124	542 6.4				6R
				↑↓			

F-PLN A PAGE WITH PREDICTIONS AND STARS

The vertical revision page displays "ALT ERROR", along with the difference between the constraint and the predicted altitude at the revised waypoint.

		VERT REV		AT LACOU			
	SPD	LIM					
1L			EFOB=14.5	EXTRA=0.8		1R	
	CLB	SPD	LIM				
2L	210	/	7000		RTA>		2R
	SPD	CSTR		ALT	CSTR		
3L	★[]			5000			3R
				ALT ERROR			
4L				-500			4R
5L	<WIND			STEP	ALTS>		5R
6L	<RETURN						6R

ND Display

An altitude-constrained waypoint is marked by a circle (●) on the navigation display.

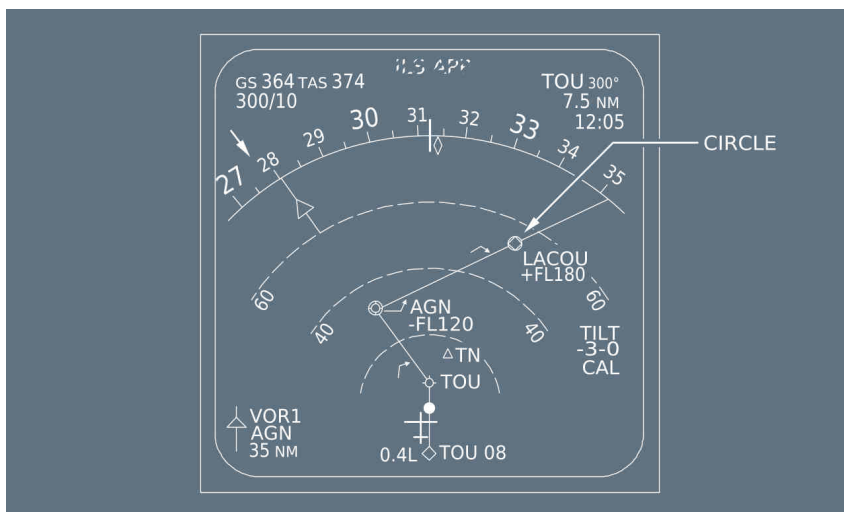
PROCEDURES

NORMAL PROCEDURES

SYSTEMS RELATED PROCEDURES - FMS

This circle is white when the guidance does not take the altitude constraint into account. It is magenta if the guidance system takes the altitude constraint into account and predicts that it will be matched.

It is amber if the guidance system takes the altitude constraint into account and predicts that it will not be matched.



The aircraft should be at or below FL 120 at AGN and above FL 180 at LACOU.

Entering an Altitude Constraint Through F-PLN A Page

The pilot may also enter an altitude constraint directly through the F-PLN A page.

When entering the value into the scratchpad do not forget the slash e.g. /-120 or /-FL 120.

If the slash is omitted the value will be considered as a speed constraint if it is within the range value.

	FROM	TIME	SPD / ALT	AI 101→	
1L	LFBO15R	0000	-- /	490	1R
2L	H146°	BRG143°	5NM		2R
3L	TOU/08←	02	250/*	3360	ENTER
4L	(SPD)	TRK300°	9		3R
5L	(LIM)	04	250 /	FL100	2
6L	C300°		7		4R
WRITE	TOU	05	298 /	FL120	5R
1	LMG2D		22		6R
	AGN	09	" /	FL120	
	DEST	TIME	DIST	EFOB	
	EGLL27R	0124	542	6.4	
	/ - FL120			↑↓	

Use CLR to delete them directly from the flight plan page, as well. However, if there is also a speed constraint assigned at that waypoint, the clear action deletes it too.

ENTERING AN ESTIMATED TIME OF TAKEOFF (ETT)

In Preflight Phase:

SELECT the SEC F-PLN key on the MCDU.

SELECT a VERT REV at any waypoint.

SELECT the Required Time of Arrival (RTA) prompt (2R).

The MCDU displays the RTA page.

ENTER the Estimated Takeoff Time in the [6R] field.

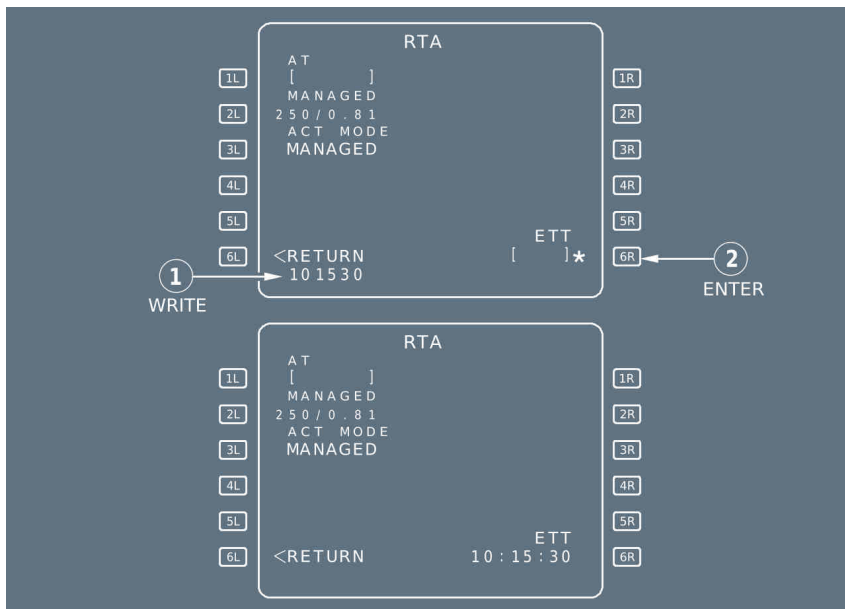
The format is HHMMSS (entry of seconds is not mandatory).

ENTER it in the 6R field

PROCEDURES

NORMAL PROCEDURES

SYSTEMS RELATED PROCEDURES - FMS



If the aircraft has not taken off by the time entered as estimated takeoff time, the MCDU displays the “CLK IS TAKE OFF TIME” message, meaning that the system will replace your estimated takeoff time with the actual time.

When beginning the takeoff roll, the system automatically adopts that clock time as the takeoff time.

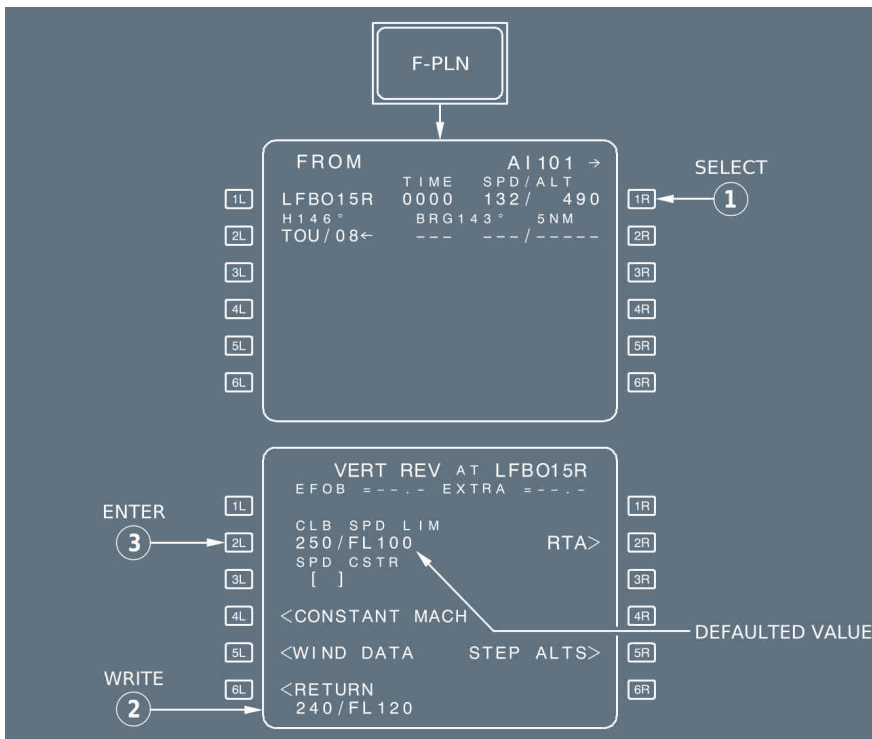
If the origin airport is changed, or the clock time is invalid, the system automatically deletes the estimated takeoff time.

Ident.: PRO-NOR-SRP-01-10-A-00003964.0039001 / 22 MAY 12

Applicable to: MSN 02926-02944, 04392, 07784-07792

VERTICAL FLIGHT PLAN

ENTERING/MODIFYING A SPEED LIMIT



PRESS the F-PLN key on the MCDU.

SELECT VERTICAL REVISION at the FROM waypoint.

WRITE a new speed limit/altitude and ENTER.

The crew can insert one climb speed limit and one descent speed limit into the vertical flight plan, or modify or clear the limits that are already in it.

The speed limit is defined by a speed and an altitude (for example, 230/9 000), which means that the managed speed target will be limited by the speed limit when the aircraft flies below the specified altitude.

PROCEDURES**NORMAL PROCEDURES**

SYSTEMS RELATED PROCEDURES - FMS

In both climb and descent, 250 kt at 10 000 ft is the default speed limit in the vertical flight plan. The vertical revision page presents the climb speed (CLB SPD) limit if the revised waypoint is between departure and top of descent.

The vertical revision page shows the descent speed (DES SPD) limit, if the revised waypoint is between top of descent and destination.

It can be deleted by a clear action, the field reverts to brackets. It can also be cleared directly on the F-PLN A page by clearing the SPD LIM pseudo-waypoint.

CHECK and INSERT the TMPY F-PLN or continue with next revision.

Note: *The speed limit cannot be cleared in the temporary flight plan. If the crew inadvertently tries to clear the SPD LIM in the TMPY F-PLN, the message "NOT ALLOWED" is displayed in the scratchpad.*

ENTERING A SPEED CONSTRAINT

F-PLN

F-PLN A PAGE

1L
2L
3L
4L
5L
6L

FROM AI 101→

TIME	SPD / ALT	
LFBO 15L	--- / ---	490
H 146 °	BRG 143 °	6 MN
TOU / 08 ←	--- / ---	+ 900
(SPD)	TRK 306 °	
(LIM)	--- / ---	
C 300 °		
TOU	--- / ---	
LMG 2D		
AGN	--- / ---	
DEST	TIME	DIST EFOB
EGLL 27R	---	541 ---

↑↓

F-PLN A PAGE WITHOUT PREDICTIONS

VERT REV AT AGN

EFOB= --- EXTRA = ---

CLB	SPD	LIM	
250 / 10000			RTA>
SPD CSTR		ALT	CSTR
*[]		[]	*★
<CONSTANT MACH			
<WIND DATA STEP ALTS>			
230			

VERT REV AT AGN

EFOB= --- EXTRA = ---

CLB	SPD	LIM	
250 / 10000			RTA>
SPD CSTR		ALT	CSTR
230		[]	*★
<CONSTANT MACH			
<WIND DATA STEP ALTS>			
TMPY TMPY			
<FPLN INSERT★			

1R
2R
3R
4R
5R
6R

1
2
3
4
5
6

1
2
3
4
5
6

1R
2R
3R
4R
5R
6R

1
2
3
4
5
6

1R
2R
3R
4R
5R
6R

SELECT

SELECT

Procedure

PRESS the F-PLN key on the MCDU.

SELECT the VERT REV page at the revised waypoint.

WRITE the speed constraint value into the scratchpad and ENTER it in 3L.

CHECK and INSERT the TMPY F-PLN or continue with next revision.

Note: A speed constraint can also be entered directly on F-PLN page, without using VERT REV page.

When predictions are not yet available, the constraints are displayed on the F-PLN A page in magenta.

When predictions are available, the speed constraint is highlighted by a star (*).

* If the predicted speed matches the constraint, the star is magenta.

* If the prediction is that the aircraft will miss the speed constraint, the star is amber.

If a speed constraint cannot be met (by more than 10 kt), the FMGS generates the message "SPD ERROR AT WPT XX".

A speed constraint may be assigned to any waypoint in the climb or the descent phase except the FROM, origin, or destination waypoints, and any pseudo waypoint.

When a speed constraint is assigned to a waypoint, the constraint will limit the managed speed target as follows:

- In takeoff or climb phase until you pass the constrained waypoint.
- In descent an approach phase, after passing the constrained waypoint.

Speed constraints are observed by the FMGS when NAV mode and speed managed are active.

ENTERING A SPEED CONSTRAINT THROUGH F-PLN A PAGE

You may also enter a speed constraint through the F-PLN A page.



FROM	TIME	SPD	ALT
LFBO15R	0000	---	490
H146°	BRG143°	5NM	
TOU/08←	02	250/★	3360
(SPD)	TRK300°	9	
(LIM)	04	250/	FL100
C300°		7	
TOU	05	298/	FL120
LMG2D		22	
AGN	09	"	FL120
DEST	TIME	DIST	EFOB
EGLL27R	0124	542	6.4
280		↑↓	

Note: You may delete the constraint using the clear key on the relevant right hand key. However if there is an altitude constraint assigned at that point, the clear action deletes it too.

ENTERING AN ALTITUDE CONSTRAINT

F-PLN

F-PLN A PAGE

1L

2L

3L

4L

5L

6L

FROM	TIME	SPD / ALT	A I 1 0 1 →
LFBO15L	----	---/ 490	
H 146 °	BRG 143 °	6 MN	
TOU / 08 ←	----	---/ +900	
(SPD)	TRK 306 °		
(LIM)	----	---/ ----	
C 300 °			
TOU	----	---/ ----	
LMG 2 D			
AGN	----	---/ ----	
DEST	TIME	DIST	EFOB
EGLL 27R	----	541	----

↑ ↓

1R

2R

3R

4R

5R

6R

F-PLN A PAGE WITHOUT PREDICTIONS

1L

2L

3L

4L

5L

6L

VERT REV AT AGN

EFOB= --- EXTRA = ---

CLB	SPD	LIM	RTA >
250 / FL100			
SPD CSTR		ALT CSTR	
[]		[]	

<CONSTANT MACH

<WIND DATA STEP ALTS>

<RETURN

- 120

1R

2R

3R

4R

5R

6R

WRITE

2

3

ENTER

PROCEDURES

NORMAL PROCEDURES

SYSTEMS RELATED PROCEDURES - FMS

1L	VERT REV AT AGN	1R
2L	EFOB = --- EXTRA = ---	2R
3L	CLB SPD LIM	3R
4L	250 / 10000 RTA>	4R
5L	SPD CSTR ALT CSTR	5R
6L	[] -FL120	6R
	<CONSTANT MACH	
	<WIND DATA STEP ALTS>	
	TMPY OR INSERT*	
		4 SELECT
1L	FROM TMPY UTC SPD / ALT	1R
2L	LFBO15L --- / 490	2R
3L	H146° BRG143° 6MN	3R
4L	TOU / 08< --- / +900	4R
5L	(SPD) TRK306°	5R
6L	(LIM) --- / ---	6R
	C300°	
	TOU --- / ---	
	LMG2D	
	AGN --- / -FL120	
	TMPY TMPY	
	<ERASE INSERT*	
		MAGENTA

Procedure

PRESS the F-PLN key on the MCDU.

SELECT the "VERT REV" page at the revised waypoint.

WRITE an altitude constraint in the scratchpad and ENTER it in 3R.

If ← CLB and DES → prompt are displayed, SELECT the type of constraint.

The system displays the ← CLB or DES → prompt, when the predictions are not yet available, or when the waypoint is part of the cruise phase as originally defined.

CHECK and INSERT the TMPY F-PLN or continue with next revision

- Note:
1. In case of QFE operations, the altitude constraints defined in heights (QFE) must be converted and entered in the FMS as altitudes (QNH).
 2. An altitude constraint can also be entered directly on F-PLN page, without using VERT REV page.

You or the database may assign an altitude constraint to any waypoint in the climb or descent phases except the FROM, origin, or destination waypoints, or any pseudo waypoint.

An altitude constraint may be defined as an "at", an "at or above", or an "at or below"

constraint. In certain procedures, the database may define an altitude constraint as a window in which the aircraft should fly.

PROCEDURES**NORMAL PROCEDURES**

SYSTEMS RELATED PROCEDURES - FMS

Enter "AT" constraints with no sign.

Enter "AT or ABOVE" constraints preceded by a + sign (+FL 130, for example).

Enter "AT or BELOW" constraints preceded by a – sign (-15 000, for example).

enter four or five-digit number when entering altitude. Include the lead zero (0 500 ft , for example).

For flight level, enter a two- or three-digit number, with or without the letters "FL". The lead zero is optional. (Examples : +FL 120 or +120 ; -FL 090 or -90 or -090)

Enter the altitude value as either altitude or flight level ; the MCDU displays the selected value as an "ALT" or "FL," as appropriate for the transition altitude.

The constraint must be higher than the thrust reduction altitude and lower than the cruise flight level.

Once inserted in the flight plan, the altitude constraint (ALT CSTR) is displayed in magenta as long as predictions are not available.

When predictions are available, the altitude constraints are replaced by the predicted altitude at relevant waypoints highlighted by a star.

** If the predicted altitude matches the constraint the star is magenta. If the predicted altitude is missed (by more than 250 ft), the star is amber.*

PROCEDURES

NORMAL PROCEDURES

SYSTEMS RELATED PROCEDURES - FMS

MAGENTA

		FROM		TIME		SPD / ALT		AI 101→	
1L	LFBO15L	----	----	----	----	----	490	1R	
	H 146 °			BRG 143 °			5 NM		
2L	TOU / 08←	----	----	----	----	----	+900	2R	
	(SPD)			TRK 306 °					
3L	(LIM)	----	----	----	----	----		3R	
	C300 °								
4L	TOU	----	----	----	----	----		4R	
	LMG2D								
5L	AGN	----	----	----	----	----	FL120	5R	
	DEST	TIME		DIST		EFOB			
6L	EGLL27R	----	----	541	----	----		6R	
							↑↓		

F-PLN A PAGE WITHOUT PREDICTIONS

		FROM		TIME		SPD / ALT		AI 101→	
1L	LFBO15R	0000	----	----	----	----	490	1R	
	H 146 °			BRG 143 °			5 NM		
2L	TOU / 08←	02		250 / ★	3360			2R	
	(SPD)			TRK 300 °			9		
3L	(LIM)	04		250 / FL100				3R	
	C300 °						7		
4L	TOU	05		298 / FL120				4R	
	LMG2D						22		
5L	AGN	09		" / ★	FL120			5R	
	DEST	TIME		DIST		EFOB			
6L	EGLL27R	0124		542		6.4		6R	
							↑↓		

F-PLN A PAGE WITH PREDICTIONS AND STARS

The vertical revision page displays “ALT ERROR”, along with the difference between the constraint and the predicted altitude at the revised waypoint.

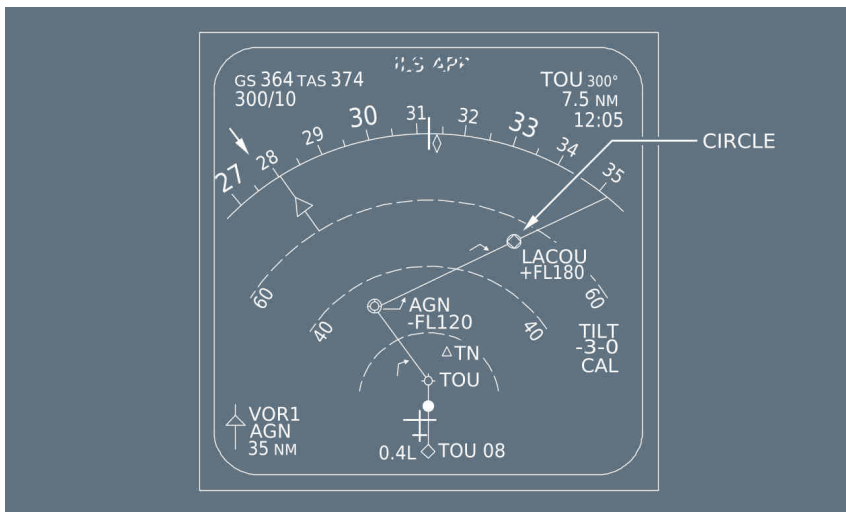
		VERT REV AT LACOU			
1L	EFOB=13.6		EXTRA=6.2		1R
2L	CLB SPD LIM				2R
	250 / FL100		RTA>		
3L	SPD CSTR		ALT CSTR		3R
	★[]		+FL180		
4L	<CONSTANT MACH		ALT ERROR		4R
			-500		
5L	<WIND DATA		STEP ALTS>		5R
6L	<RETURN				6R

ND Display

An altitude-constrained waypoint is marked by a circle (○) on the navigation display.

This circle is white when the guidance does not take the altitude constraint into account. It is magenta if the guidance system takes the altitude constraint into account and predicts that it will be matched.

It is amber if the guidance system takes the altitude constraint into account and predicts that it will not be matched.



The aircraft should be at or below FL 120 at AGN and above FL 180 at LACOU.

Entering an Altitude Constraint Through F-PLN A Page

The pilot may also enter an altitude constraint directly through the F-PLN A page. When entering the value into the scratchpad do not forget the slash e.g. /-120 or /-FL 120. If the slash is omitted the value will be considered as a speed constraint if it is within the range value.

PROCEDURES

NORMAL PROCEDURES

SYSTEMS RELATED PROCEDURES - FMS

	FROM	TIME	SPD / ALT	AI 1101→	
1L	LFBO15R	0000	-- / 490		1R
2L	H146°	BRG143°	5NM		2R
3L	TOU/08←	02	250/* 3360		3R
4L	(SPD)	TRK300°	9		4R
5L	(LIM)	04	250 / FL100		5R
6L	C300°		7		6R
	TOU	05	298 / FL120		
	LMG2D		22		
	AGN	09	" / FL120		
	DEST	TIME	DIST EFOB		
	EGLL27R	0124	542 6.4		
	/ -FL120		↑↓		

WRITE (1) →

ENTER (2) →

Use CLR to delete them directly from the flight plan page, as well. However, if there is also a speed constraint assigned at that waypoint, the clear action deletes it too.

ENTERING AN ESTIMATED TAKEOFF TIME (ETT)

In Preflight Phase:

SELECT the SEC F-PLN key on the MCDU.

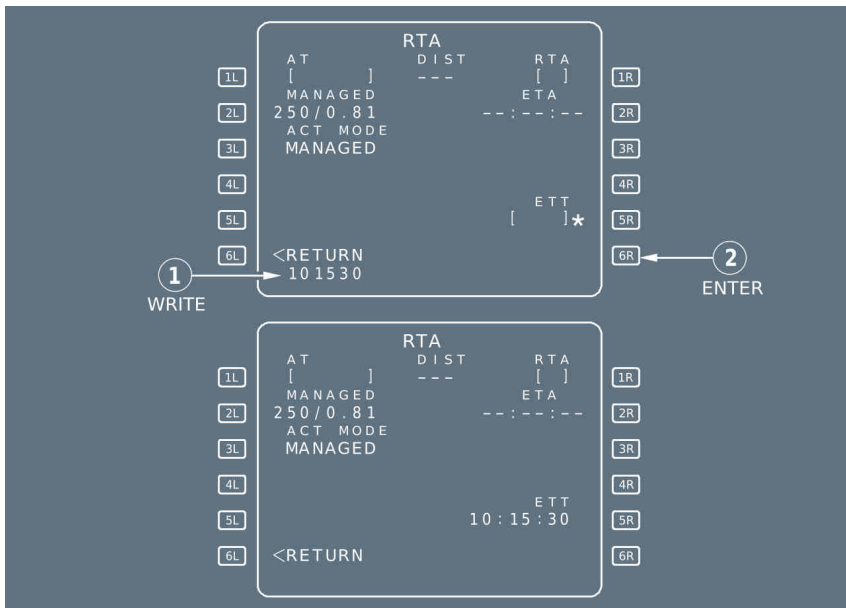
SELECT a VERT REV at any waypoint.

SELECT the Required Time of Arrival (RTA) prompt (2R).

The MCDU displays the RTA page.

ENTER the Estimated Takeoff Time in the [5R] field.

The format is HHMMSS (entry of seconds is not mandatory).



If the aircraft has not taken off by the time entered as estimated takeoff time, the MCDU displays the "CLK IS TAKE OFF TIME" message, meaning that the system will replace your estimated takeoff time with the actual time.

When beginning the takeoff roll, the system automatically adopts that clock time as the takeoff time.

If the origin airport is changed, or the clock time is invalid, the system automatically deletes the estimated takeoff time.

Ident.: PRO-NOR-SRP-01-10-A-00003965.0001001 / 15 FEB 11

Applicable to: ALL

FLIGHT PLAN CHECK

CHECK the EOSID on the ND plan mode (yellow line).

Note: If the details of the EOSID require review, select the EOSID as a TMPY F-PLN and review it as TMPY. Then ERASE it.

Ident.: PRO-NOR-SRP-01-10-A-00003966.0001001 / 09 DEC 09

 Applicable to: **ALL**

SECONDARY F-PLN

 For details : *Refer to DSC-22_20-10-30-40 Secondary Flight Plan.*

Ident.: PRO-NOR-SRP-01-10-A-00003967.0001001 / 14 NOV 24

 Applicable to: **ALL**

RADIO NAV

Whenever a NAVAID ident is correctly decoded, in agreement with that published, no audio check is necessary.

Morse decoding is displayed on the ND for VOR/DME, VOR/TAC, DME, ADF , and on the PFD for ILS.

Preferably use the identifier for NAVAID entry.

If the ADF  ident is not in the database, be sure to include a decimal point when tuning the frequency (e.g 315. or 325.7).



Note: Whenever, the runway ILS is intended to be retained for guidance after the takeoff phase, it is recommended to manually tune the ILS by its identifier.

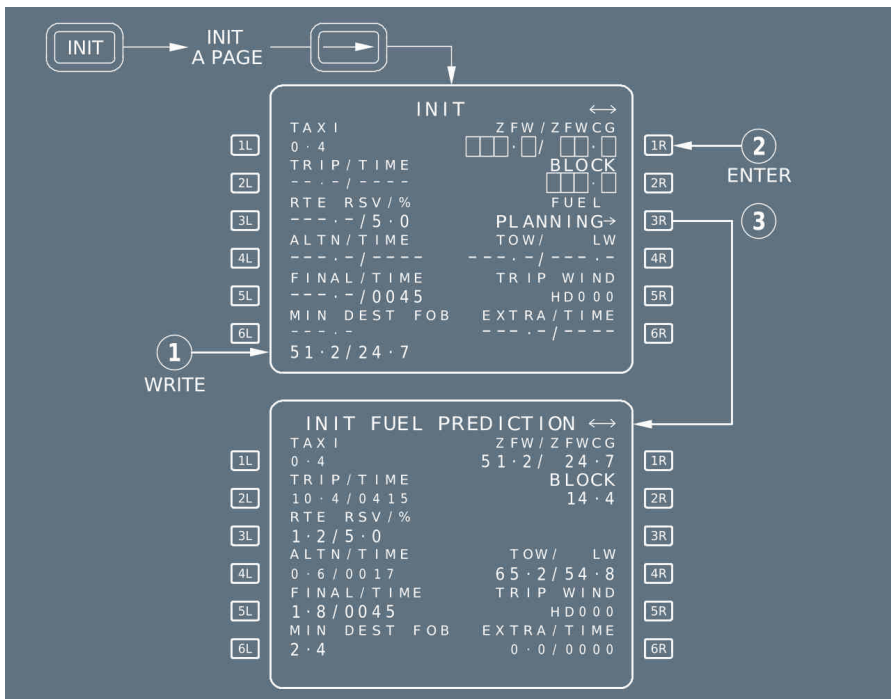
FMGS DATA INSERTION

Ident.: PRO-NOR-SRP-01-10-B-00003968.0024001 / 28 MAY 20

 Applicable to: **ALL**

WEIGHT/CG INSERTION AND FUEL PLANNING

The flight crew must enter the Zero Fuel Weight (ZFW) and Zero Fuel Weight Center of Gravity (ZFWCG) values on the INIT B page, to allow the FMS to perform the fuel planning computations.



PROCEDURE

PRESS the INIT key, and the Next (“→”) key to access the INIT B page.

ENTER the ZFW and ZFWCG value in the [1R] field.

The “FUEL PLANNING →” prompt appears in the [3R] field.

Note: As long as the final Load and Trim Sheet is not available, the crew should insert the estimated ZFW/ZFWCG in order to get fuel estimates. The ZFW and ZFWCG values must be updated with the final Load and Trim Sheet values.

CHECK/MODIFY the TAXI [1L], RTE RSV [3L] and FINAL TIME [5L] values.

The TAXI, RTE RSV and FINAL TIME fields display the default values specified in the AMI file (for example, “0.4 t” for TAXI, “5.0 %” for RTE RSV and “0045” for FINAL TIME). The flight crew may modify these values.

PROCEDURES**NORMAL PROCEDURES**

SYSTEMS RELATED PROCEDURES - FMS

Note: At takeoff, the RTE RSV field will automatically be reset to 0. The RTE RSV fuel is then added to the EXTRA fuel, which ensures that the EXTRA fuel and MIN DEST FOB values are consistent in flight.

ENTER an ALTN fuel value in the [4L] field, as necessary.

The flight crew may enter the ALTN fuel value planned on the Computerized Flight Plan (CFP), as necessary.

ENTER a MIN DEST FOB value in the [6L] field, as necessary.

Note: MIN DEST FOB (equal to ALTN + FINAL) can be increased at flight crew discretion (e.g. when HOLD is expected at destination).

ENTER the TRIP WIND value in the [5R] field, as necessary.

If no wind profile has been entered in the F-PLN, the crew may enter an average TRIP WIND in this field, to obtain more realistic fuel/time predictions before departure.

- Note:
1. The flight crew should only enter a TRIP WIND to obtain realistic fuel/time predictions, on ground. Then, the flight crew should enter a wind profile using the WIND pages, for fuel/time predictions in flight. As soon as flight crew has entered a wind profile on the WIND pages, the TRIP WIND will be erased.
 2. If the crew has already defined a wind profile, even partially (such as climb wind), it is not possible to enter a TRIP WIND.

ENTER the planned BLOCK fuel, as indicated in the computerized flight plan (CFP)

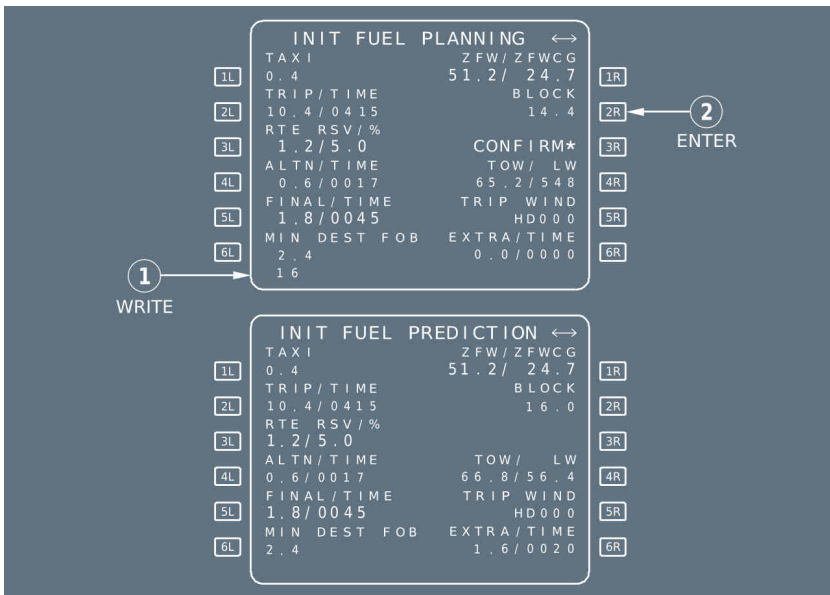
If the planned BLOCK fuel is not available, the crew may obtain a prediction of the minimum BLOCK fuel required for the flight by pressing the FUEL PLANNING prompt [3R].

Pressing this prompt makes the FMS compute the minimum required BLOCK fuel, which is the BLOCK fuel required to have EXTRA fuel = 0, based on the parameters entered on the INIT and F-PLN pages.

The computed BLOCK fuel value is displayed in the [2R] field, and a BLOCK CONFIRM prompt appears in the [3R] field.

Note: In order to obtain a realistic fuel computation, the flight crew should ensure that the F-PLN initialization has been completed (including insertion of the ALTN F-PLN and/or ALTN fuel and/or MIN DEST FOB if necessary), and that flight parameters, such as CRZ FL, steps climbs (if any), and winds, have been inserted.

- When the final Load and Trim Sheet (LTS) data are available:



INIT FUEL PLANNING ↔

TAXI	ZFW/ZFWCG
0.4	51.2 / 24.7
TRIP/TIME	BLOCK
10.4 / 0415	14.4
RTE RSV/%	CONFIRM*
1.2 / 5.0	
ALTN/TIME	TOW/LW
0.6 / 0017	65.2 / 548
FINAL/TIME	TRIP WIND
1.8 / 0045	HD000
MIN DEST FOB	EXTRA/TIME
2.4	0.0 / 0000
1.6	

INIT FUEL PREDICTION ↔

TAXI	ZFW/ZFWCG
0.4	51.2 / 24.7
TRIP/TIME	BLOCK
10.4 / 0415	16.0
RTE RSV/%	
1.2 / 5.0	
ALTN/TIME	TOW/LW
0.6 / 0017	66.8 / 56.4
FINAL/TIME	TRIP WIND
1.8 / 0045	HD000
MIN DEST FOB	EXTRA/TIME
2.4	1.6 / 0020

ENTER the final ZFW/ZFWCG [1R], and the required BLOCK fuel [2R].

The FMS computes the predictions, based on the entered BLOCK fuel, and estimates the EXTRA fuel value.

CHECK the resulting computed data, against the data planned on the CFP: TRIP fuel, RTE RSV fuel, ALTN fuel, FINAL and EXTRA fuel values.

If necessary, the flight crew may modify the ALTN or FINAL fuel values.

PRINT the PREFLIGHT REPORT, if necessary.

When the final Load and Trim Sheet values (ZFW/ZFWCG/BLOCK) have been entered, the crew may print the pre-flight report, which provides a copy of the F-PLN with the associated FMS predictions.

Ident.: PRO-NOR-SRP-01-10-B-00003969.0010001 / 15 FEB 11

Applicable to: ALL

TAKEOFF WITH NO WEIGHT/CG DATA

If the crew does not enter ZFW/ZFWCG data prior takeoff, or if the FMGC loses these values due to a power interruption, the following will occur:

- At takeoff, the Speed Reference System (SRS) mode is available (provided a V2 has been inserted)
- When the aircraft leaves the SRS mode, the target speed becomes the current speed and reverts to selected.

Note: If the AP/FD has reverted to ALT or V/S (FPA) mode, the associated A/THR mode is SPEED. In this case, the system will probably reduce thrust, because the speed will be equal to, or greater than, the target speed.

● When appropriate, to regain FMS predictions and associated managed modes:

INSERT the ZFW/ZFWCG values on the FUEL PRED page.

Ident.: PRO-NOR-SRP-01-10-B-00003970.0007001 / 15 FEB 11

Applicable to: ALL

INSERTING WEIGHT/CG DATA AFTER ENGINE START

The flight crew must enter the ZFW/ZFWCG values on INIT B page prior to engine start. If these data have not been entered at engine start, the MCDU displays the "INITIALIZE WEIGHTS" amber message in the scratchpad. After engine start, the crew should enter the ZFW/ZFWCG values on the FUEL PRED page.

PRESS to the FUEL PRED key.

INSERT the ZFW/ZFWCG values in the [4R] field.

This allows predictions and performance computation.

CHECK the resulting computed data, against the data planned on the CFP: TRIP fuel, RTE RSV fuel, ALTN fuel, FINAL and EXTRA fuel values.

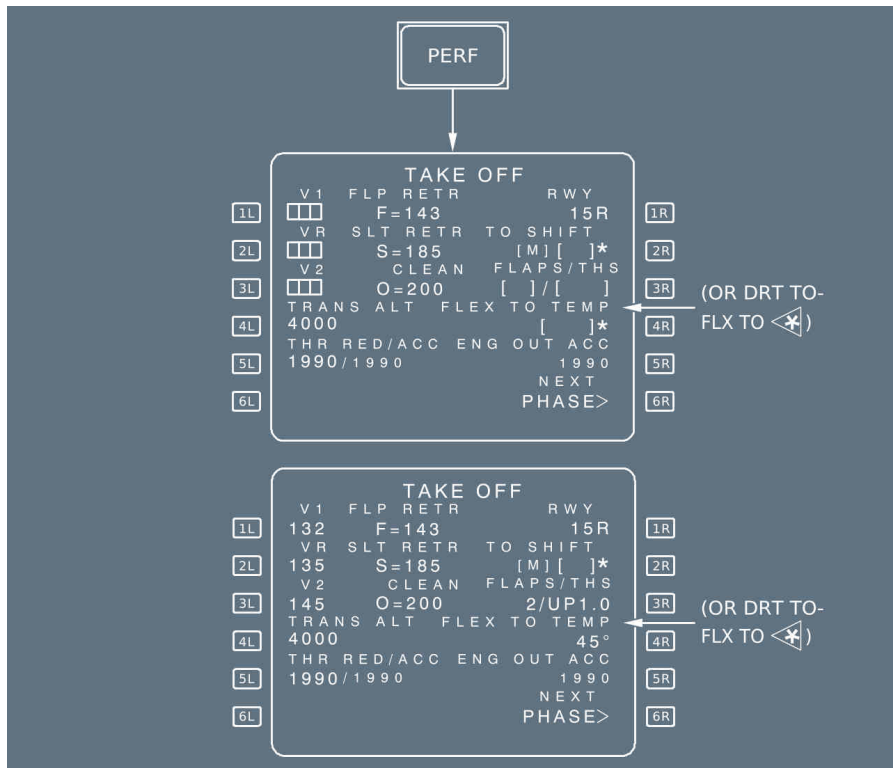
If necessary, the flight crew may modify the ALTN or FINAL fuel values.

PRINT the PREFLIGHT REPORT, if necessary.

When the final load sheet values (ZFW/ZFWCG/BLOCK) have been entered, the crew may print the pre-flight report, which provides a copy of the F-PLN with the associated FMS predictions.

Ident.: PRO-NOR-SRP-01-10-B-00003971.0001001 / 22 MAR 16

Applicable to: ALL

TAKEOFF DATA INSERTION

PROCEDURE

PRESS the PERF key on the MCDU.

WRITE successively and ENTER : V1, VR, V2.

WRITE and ENTER FLX TEMP or DRT TO <*.

CHECK/MODIFY the THR RED ALT (Thrust reduction altitude) See *.

CHECK/MODIFY the ACC ALT (acceleration altitude) See *.

CHECK/MODIFY the ENG OUT ACC (engine out acceleration altitude) See *.

CHECK/MODIFY the TRANS ALT (transition altitude) See *.

WRITE and ENTER T.O. SHIFT.

PROCEDURES

NORMAL PROCEDURES

SYSTEMS RELATED PROCEDURES - FMS

CHECK V1, V2 on PFD See **

- * *Altitudes less than 400 ft above airfield elevation cannot be selected.*
- ** *If the PFD does not display V2 at the top of its speed scale, check that at least one FD is ON.*

ENTERING A FLEX TEMPERATURE

WRITE the desired flex temperature in the scratchpad and ENTER using the [4R] key.

		TAKE OFF			
	V1	FLP	RETR		RWY
1L	132	F=143			23
2L	VR	SLT	RETR	TO	SHIFT
3L	135	S=185		[M]	900
4L	V2	CLEAN FLAPS/THS			
5L	145	O=200		2/UP	3.4
6L	TRANS	ALT	FLEX	TO	TEMP
	4000				45
	THR	RED/ACC	ENG	OUT	ACC
	1990/1990				
				NEXT	
				PHASE>	
WRITE	1	45			
				2	ENTER
				4R	
				5R	
				6R	

FMGS DATA INSERTION - CLIMB SPEED PRESELECTION

Ident.: PRO-NOR-SRP-01-10-B-00003972.0003001 / 22 MAY 12

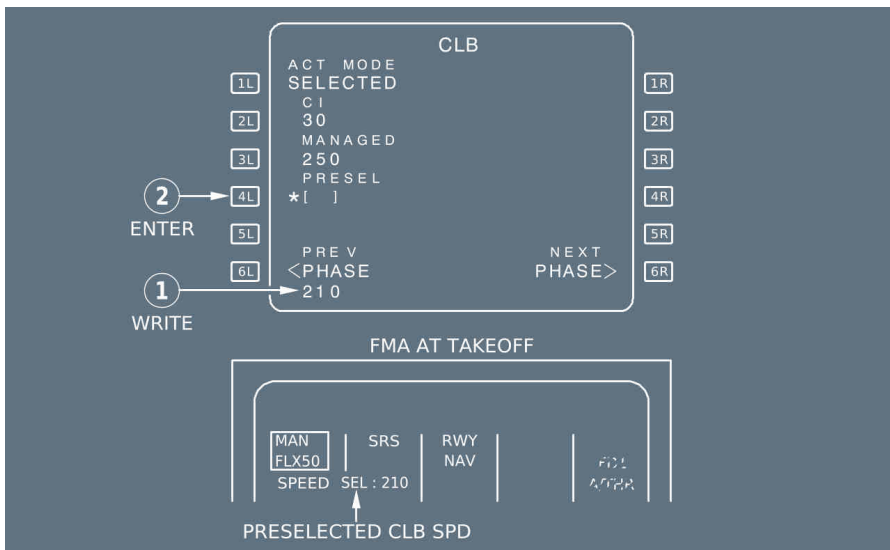
Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

CLIMB SPEED PRESELECTION

If the managed speeds for the initial climb are not suitable, the pilot can preselect an appropriate climb speed on the “PERF CLB” page, as long as the climb phase is not active.

The CLB SPD preselection applies, when the:

- ATC specifies an initial climb speed.
- Initial climb speed must be lower than normal because:
 - There are to be turns greater than 120 ° in the initial climb out.
 - Obstacle clearance, or some other situation, requires a high climb angle.
 - The airfield has a risk area to be quickly cleared (birds reported, for example).



PROCEDURE

PRESS the PERF key on the MCDU.

The PERF TAKE OFF page is displayed.

SELECT the "NEXT PHASE" [6R] key to display the CLB page.

WRITE a climb speed and ENTER it.

To revert to managed speed, select MANAGED by pressing [3L].

When the aircraft is transitioning into the climb phase, the preselected value becomes the target speed:

- The selected speed target is active.
- The primary flight display shows the target speed in blue.
- The FCU's speed window displays the new speed or Mach number.

Ident.: PRO-NOR-SRP-01-10-B-00003972.0011001 / 22 MAY 12

Applicable to: MSN 02926-02944, 04392, 07784-07792

CLIMB SPEED PRESELECTION

If the managed speeds for the initial climb are not suitable, the pilot can preselect an appropriate climb speed on the "PERF CLB" page, as long as the climb phase is not active.

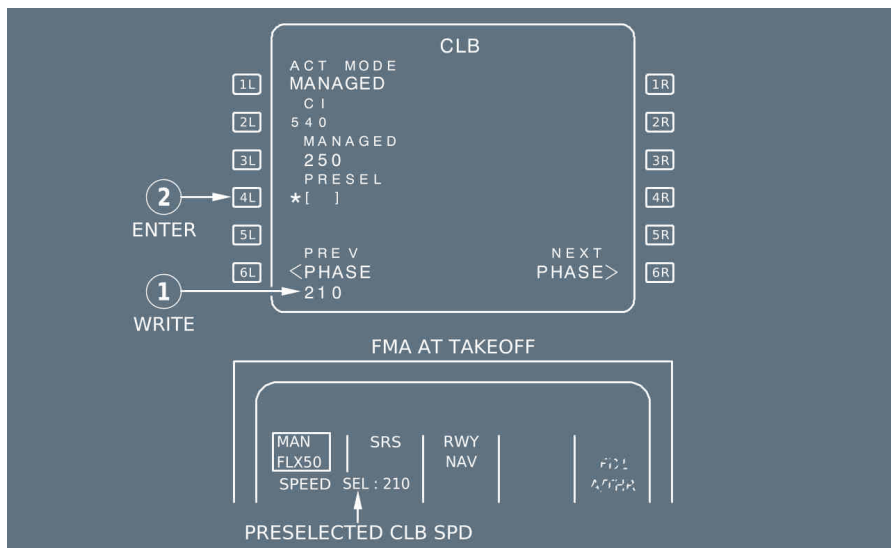
PROCEDURES

NORMAL PROCEDURES

SYSTEMS RELATED PROCEDURES - FMS

The CLB SPD preselection applies, when the:

- ATC specifies an initial climb speed.
- Initial climb speed must be lower than normal because:
 - There are to be turns greater than 120 ° in the initial climb out.
 - Obstacle clearance, or some other situation, requires a high climb angle.
 - The airfield has a risk area to be quickly cleared (birds reported, for example).



PROCEDURE

PRESS the PERF key on the MCDU.

The PERF TAKE OFF page is displayed.

SELECT the PERF CLB page by pressing [6 R] ("NEXT PHASE" prompt).

WRITE a climb speed and ENTER it.

To revert to managed speed, select MANAGED by pressing [3L].

When the aircraft is transitioning into the climb phase, the preselected value becomes the target speed:

- The selected speed target is active.
- The primary flight display shows the target speed in blue.
- The FCU's speed window displays the new speed or Mach number.

FMGS DATA INSERTION - CRUISE MACH (SPEED) PRESELECTION

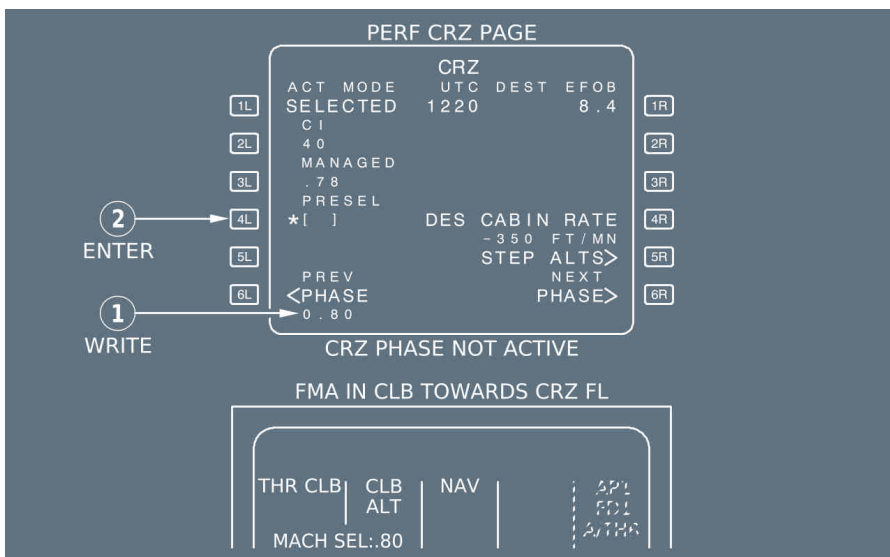
Ident.: PRO-NOR-SRP-01-10-B-00003973.0003001 / 09 OCT 12

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

CRUISE MACH (SPEED) PRESELECTION

The pilot preselects a cruise Mach, when a Mach number other than the ECON cruise Mach number is required.

When the aircraft transitions to the cruise phase, the speed target symbol goes to the preselected value and "SELECTED" becomes the active speed mode (blue target on PFD, target MACH shown in the speed/Mach window of the FCU).


PROCEDURE

PRESS the PERF key on the MCDU.

PRESS the "NEXT PHASE" [6R] key on the MCDU, until the CRZ page is accessed.

WRITE a cruise Mach (or speed) in the scratchpad and ENTER it in [4L].

To revert to managed speed, PRESS [3L].

When the cruise phase is active, you cannot preselect a cruise Mach or speed.

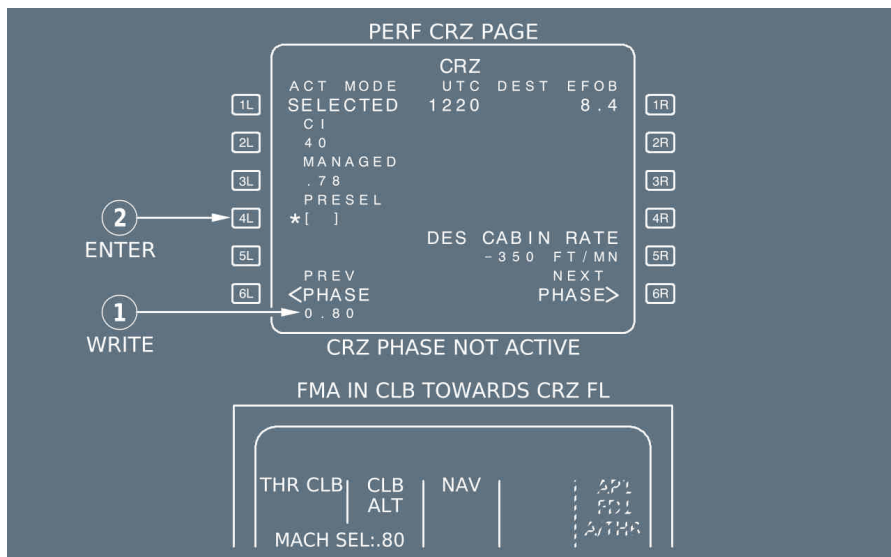
Ident.: PRO-NOR-SRP-01-10-B-00003973.0004001 / 09 OCT 12

Applicable to: MSN 02926-02944, 04392, 07784-07792

CRUISE MACH (SPEED) PRESELECTION

The pilot preselects a cruise Mach, when a Mach number other than the ECON cruise Mach number is required.

When the aircraft transitions to the cruise phase, the speed target symbol goes to the preselected value and “SELECTED” becomes the active speed mode (blue target on PFD, target MACH shown in the speed/Mach window of the FCU).



PROCEDURE

PRESS the PERF key on the MCDU.

PRESS the “NEXT PHASE” [6R] key on the MCDU, until the CRZ page is accessed.

WRITE a cruise Mach (or speed) in the scratchpad and ENTER it in [4L].

To revert to managed speed, PRESS [3L].

When the cruise phase is active, you cannot preselect a cruise Mach or speed.

Ident.: PRO-NOR-SRP-01-10-B-00004095.0001001 / 09 OCT 12

Applicable to: ALL

ENTERING A HEADING/TRACK PRESET FUNCTION

The heading/track preset allows the pilot to preset a takeoff or go-around heading or track before commanding the aircraft to take up that heading or track (manual activation).

The flight crew can enter a heading or a track preset while the aircraft is on the ground and until takeoff.

PROCEDURE

● Before takeoff:

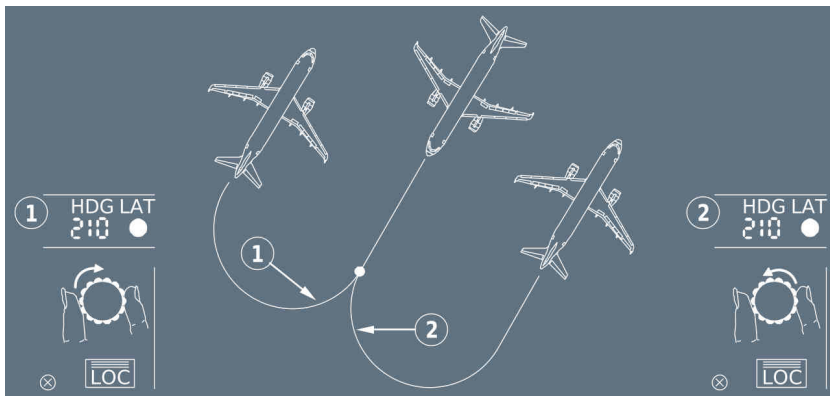
SET the appropriate HDG or TRK in the FCU window.

This disarms the navigation mode and allows the runway mode to remain engaged after takeoff.

● After takeoff:

PULL HDG/TRK knob.

The heading or track mode engages on the preset value.



The direction in which the pilot rotates the HDG/TRK selection knob usually determines the direction of the turn. A left rotation (decreasing heading) produces a left turn; a right rotation produces a right turn.

However, when a heading has been preset before takeoff or go-around, the direction of the turn will be such as to cause the shortest turn at the moment of engagement.

PROCEDURES**NORMAL PROCEDURES**

SYSTEMS RELATED PROCEDURES - FMS

CANCELLING THE HEADING/TRACK PRESET FUNCTION

The pilot can cancel the heading preset by pushing the HDG/TRK knob back in again. This engages or arms the NAV mode.

FMGS RE-INITIALIZATION AFTER A CANCELED FLIGHT

Ident.: PRO-NOR-SRP-01-10-00013064.0001001 / 16 NOV 11

Applicable to: **ALL**

If the flight crew initially prepared a flight with all the data associated with this flight (takeoff speeds, winds, etc.), and if this flight is later canceled and replaced by another flight, the flight crew may use the following procedure to initialize the FMGS again:

PREPARE the new flight data in the secondary flight plan, using SEC INIT A, SEC INIT B, and SEC PERF pages

ACTIVATE the secondary flight plan.

Note: When the flight crew activates the secondary flight plan, the following data of the primary flight plan is lost if the secondary flight plan does not include any replacement data:

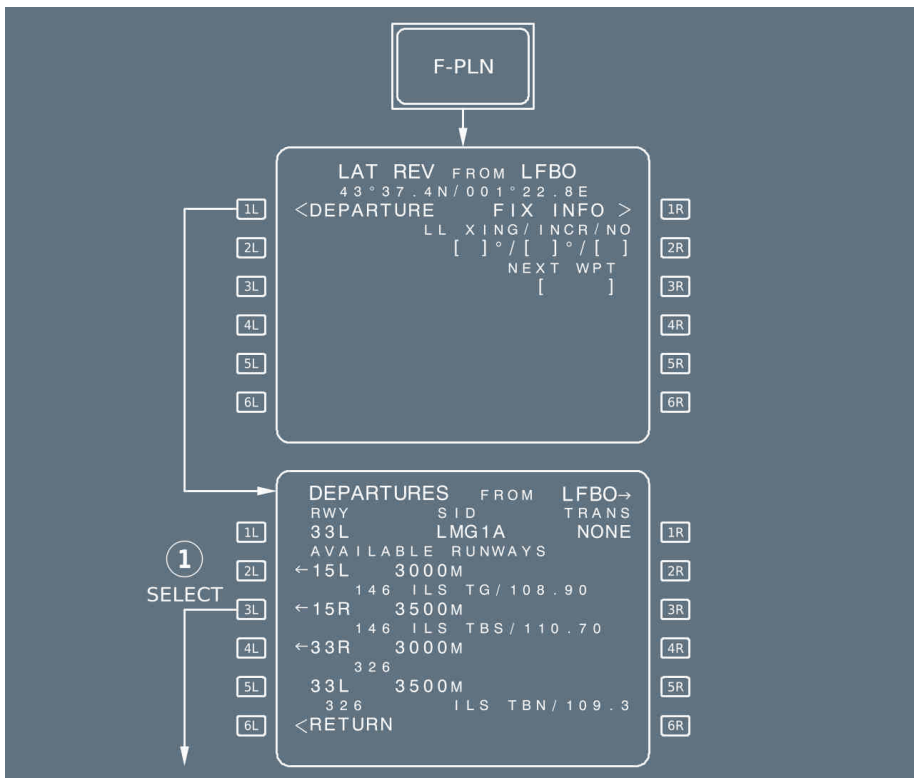
- Alternate data
- Winds and cruise TEMP at waypoints as inserted on CRZ WIND pages
- Departure and arrival selection (STAR, APP, RWY) and approach parameters (QNH, TEMP, WIND, TRANS ALT, VAPP, MDA/MDH, DH, LDG CONF)
- Altitude, speed, and time constraints
- Steps
- CMS
- Offsets
- Flaps/THS
- Preselected cruise and descent speeds.

Before Pushback or Start

CHANGE OF RUNWAY

Ident.: PRO-NOR-SRP-01-15-00003975.0003001 / 03 NOV 21

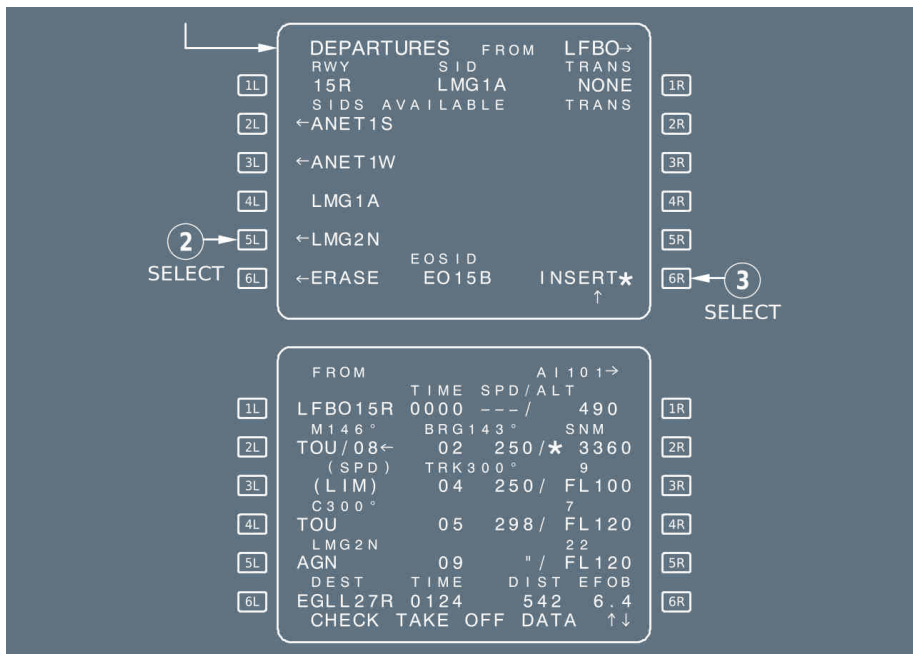
Applicable to: MSN 02155-02789, 03031-03060, 05152-05746



PROCEDURES

NORMAL PROCEDURES

SYSTEMS RELATED PROCEDURES - FMS



DEPARTURES FROM LFBO→

1L	RWY	SID	TRANS	1R
2L	15R	LMG1A	NONE	2R
3L	SIDS	AVAILABLE	TRANS	3R
4L	←ANET1S			4R
5L	←ANET1W			5R
6L	LMG1A			6R
	←LMG2N			
	←ERASE	EO SID	INSERT*	
		EO15B	↑	

FROM AI101→

1L	LFBO15R	0000	-- /	490	1R
2L	M146°	BRG143°	SNM		2R
3L	TOU/08←	02	250 / *	3360	3R
4L	(SPD)	TRK300°	9		4R
5L	(LIM)	04	250 /	FL100	5R
6L	C300°		7		6R
	TOU	05	298 /	FL120	
	LMG2N		22		
	AGN	09	" /	FL120	
	DEST	TIME	DIST	EF0B	
	EGLL27R	0124	542	6.4	
	CHECK	TAKE OFF	DATA	↑↓	

PRESS the F-PLN key on the MCDU.

SELECT the LAT REV at origin.

SELECT the DEPARTURE prompt [1L].

SELECT the new RWY in use.

SELECT the appropriate SID and TRANS.

CHECK the resulting temporary F-PLN and INSERT it.

CHECK TAKE OFF DATA comes up in the scratchpad if the PERF TO page had been filled in.

ENTER the new V1, VR, V2, FLEX TEMP or CONF, as appropriate.

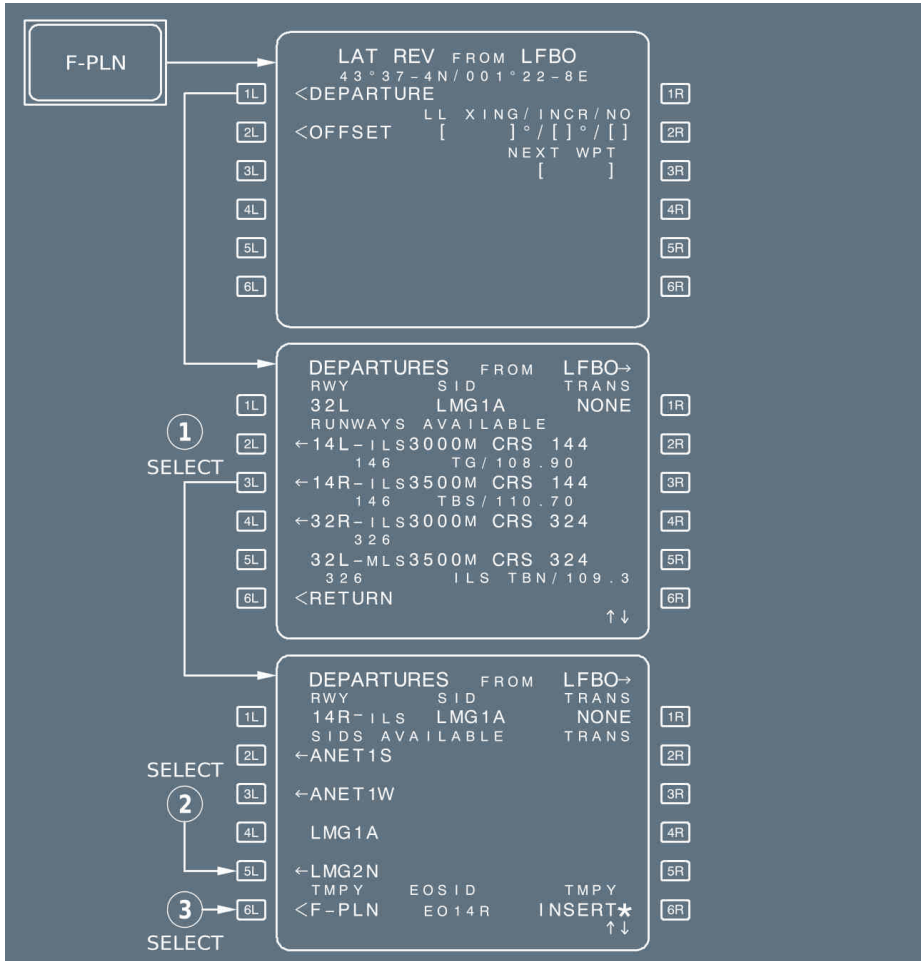
Note: If the previously selected SID is compatible with the new runway, it automatically appears in the temporary flight plan. Any revision the flight crew may have made to the previous SID will not be transferred.

If the flight crew still wants it, the flight crew has to reenter it.

CHANGE OF RUNWAY

Ident.: PRO-NOR-SRP-01-15-00003975.0015001 / 28 NOV 17

Applicable to: MSN 02926-02944, 04392, 07784-07792



PROCEDURES

NORMAL PROCEDURES

SYSTEMS RELATED PROCEDURES - FMS

TAKE OFF	
[1L] [2L] [3L] [4L] [5L] [6L]	[1R] [2R] [3R] [4R] [5R] [6R]
V1 VR V2 TRANS ALT THR RED/ACC 2000/3000 UPLINK <TO DATA CHECK TO DATA	FLP RETR SLT RETR CLEAN O=224 F=157 S=203 FLEX TO TEMP F42 ENG OUT ACC 2265 CONFIRM TO DATA*
140 143 145 4800 2265	14R []* []/[] []°

PERT TO PAGE AFTER
TMPY F-PLN INSERTION

FROM		AI 101→
[1L] [2L] [3L] [4L] [5L] [6L]	[1R] [2R] [3R] [4R] [5R] [6R]	TIME SPD/ALT LFBO15R 0000 -- / 490 M146° BRG143° SNM TOU/08← 02 250/* 3360 (SPD) TRK300° 9 (LIM) 04 250/ FL100 C300° 7 TOU 05 298/ FL120 LMG2N 22 AGN 09 " / FL120 DEST TIME DIST EFOB EGLL27R 0124 542 6·4 CHECK TAKE OFF DATA ↑↓

F-PLN A PAGE AFTER
TMPY F-PLN INSERTION

PRESS the F-PLN key on the MCDU.

SELECT the LAT REV at origin.

SELECT the DEPARTURE prompt [1L].

SELECT the new RWY in use.

The "CHECK TAKE-OFF DATA" message is displayed.

CHECK/SELECT the appropriate SID and TRANS.

CHECK and INSERT the TMPY F-PLN, or continue with next revision.

PRESS the PERF key to access PERF TAKEOFF page.

CHECK the V1, VR, V2 and FLEX values displayed after the amber boxes. If these values are correct, PRESS [6R] to confirm and insert them. Else, ENTER new values.

ENTER the new V1, VR, V2, FLEX TEMP or CONF, as appropriate.

The previously-entered values, adjacent to the boxes, may be re-selected by pressing the CONFIRM TO DATA on [6R].*

Note: In case of a runway change, any previous lateral modification performed on the active DEPARTURE procedure may lead to additional waypoint stacking in the temporary F-PLN. The crew has to check and revise it, as necessary.

TAKEOFF FROM INTERSECTION

Ident.: PRO-NOR-SRP-01-15-00003976.0001001 / 09 DEC 09

Applicable to: ALL

Use RTOW or FCOM to revise takeoff parameters :
PRESS the [PERF] key on MCDU
ENTER the takeoff shift
ENTER the new V1, VR, V2, FLX TEMP, or CONF, as appropriate

Note: The insertion of the shift in takeoff position permits the system to make an accurate revision to its navigation data at takeoff.

PROCEDURES

NORMAL PROCEDURES

SYSTEMS RELATED PROCEDURES - FMS

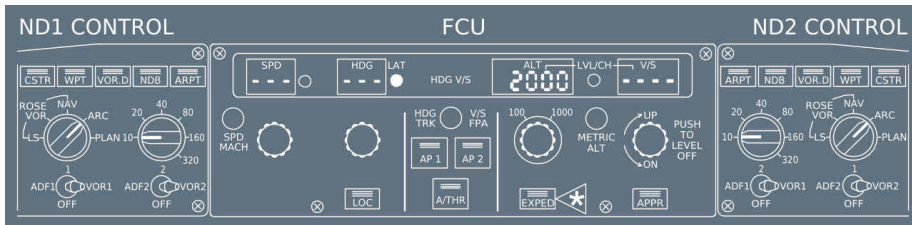
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Taxi

FCU SELECTION FOR TAKEOFF

Ident.: PRO-NOR-SRP-01-20-00003978.0004001 / 09 OCT 12

Applicable to: ALL



PROCEDURE

ENSURE that HDG – V/S modes are selected (change over pb).

CONFIRM or SELECT the first cleared altitude

CROSS CHECK on PFD the target altitude

CONFIRM both FDs ON

FMA MODE CHECK

Ident.: PRO-NOR-SRP-01-20-00003979.0002001 / 22 MAY 12

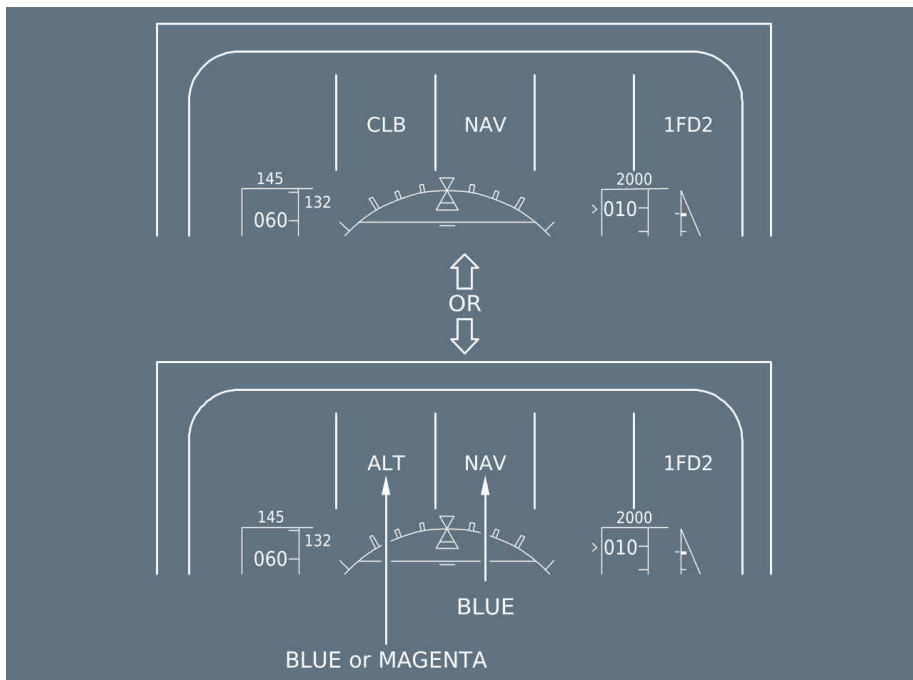
Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

CHECK that the FMA CLB (or ALT) mode is armed

PROCEDURES

NORMAL PROCEDURES

SYSTEMS RELATED PROCEDURES - FMS



Note: ALT (in blue or magenta) may be displayed instead of CLB if the FCU altitude or a constraint is set at or below the acceleration altitude.

If a HDG/TRK was preset, NAV is disarmed.

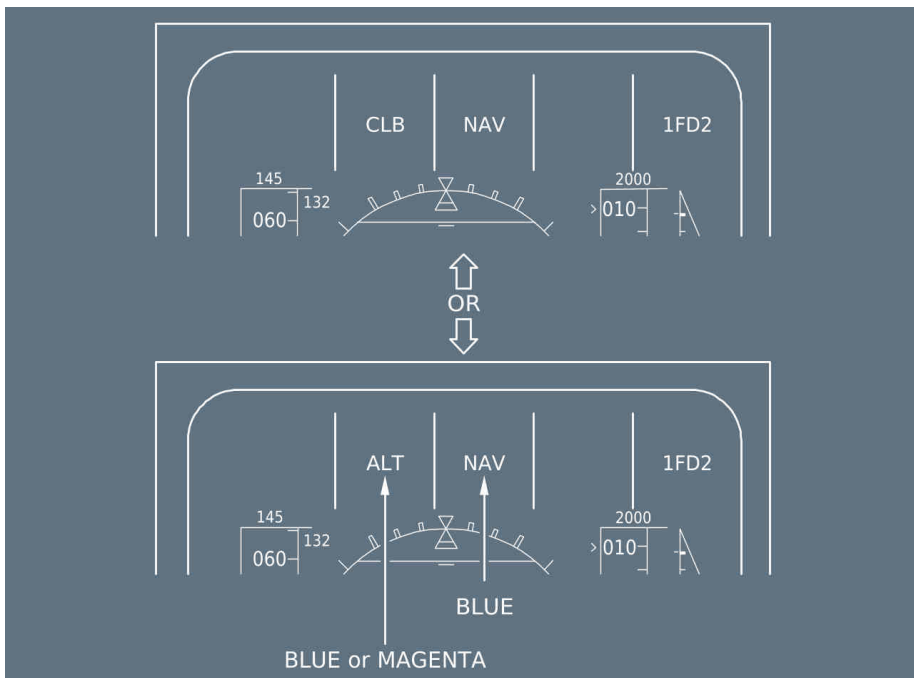


FMA MODE CHECK

Ident.: PRO-NOR-SRP-01-20-00003979.0003001 / 22 MAY 12

Applicable to: MSN 02926-02944, 04392, 07784-07792

CHECK that the FMA CLB (or ALT) mode is armed



Note: ALT (in blue or magenta) may be displayed instead of CLB if the FCU altitude or a constraint is set at or below the acceleration altitude.

Note: If a radar-vector standard instrument departure (SID) has been selected, a F-PLN discontinuity immediately follows the departure runway, and NAV mode is not armed. After takeoff, RWY TRK mode engages until the crew selects a HDG or performs a DIR TO.

If a HDG/TRK was preset, NAV is disarmed.



PROCEDURES

NORMAL PROCEDURES

SYSTEMS RELATED PROCEDURES - FMS

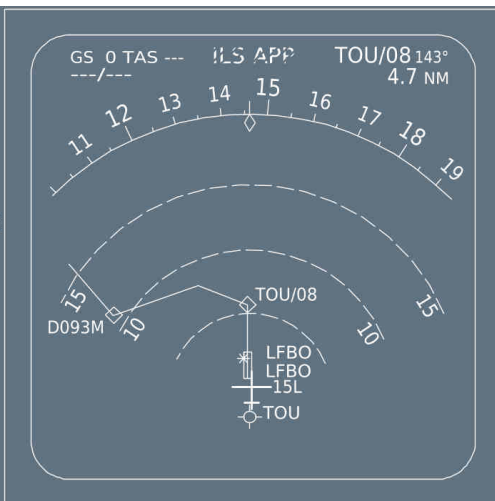
SELECTING A NAVIGATION DISPLAY

Ident.: PRO-NOR-SRP-01-20-00003980.0001001 / 22 MAY 12

Applicable to: ALL

SET the minimum range to display the first waypoint after departure or as required for weather radar.

ARC mode
FOR DEPARTURE
IN GENERAL
DIRECTION
OF RUNWAY
HEADING



Rose NAV mode
FOR DEPARTURE
IN DIRECTION
OPPOSITE TO
THAT OF RUNWAY
HEADING



SELECTING TAKEOFF DISPLAYS FOR PILOT'S AND COPILOT'S MCDU

Ident.: PRO-NOR-SRP-01-20-00003981.0001001 / 23 DEC 14

Applicable to: ALL

TAKE OFF					
1L	V1	FLP	RETR	RWY	1R
	132	F=	143	15R	
2L	VR	SLT	RETR	TO SHIFT	2R
	134	S=	185	[M][]*	
3L	V2	CLEAN	FLAPS / THS		3R
	145	O-200	2 / UP1.0		
4L	TRANS	ALT	FLEX	TO TEMP	4R
	4000			45°	
5L	THR	RED / ACC	ENG	OUT ACC	5R
	1990 / 1990			1990	
6L				NEXT	6R
				PHASE>	

PF SELECTS PERF T.O. PAGE

FROM					
1L	TIME	SPD / ALT			1R
	LFBO15R	0000	132 /	490	
2L	H146°	BRG143°	5NM		2R
	TOU / 08←	02	250 / *	3360	
3L	(SPD)	TRK300°	9		3R
	(LIM)	04	250 /	FL100	
4L	C300°		7		4R
	TOU	05	298 /	FL120	
5L	LMG2D		22		5R
	AGN	09	" / *	FL120	
6L	DEST	TIME	DIST	EFOB	6R
	EGLL27R	0124	542	6.4	
				↑↓	

PM SELECTS F-PLN A PAGE

PROCEDURES

NORMAL PROCEDURES

SYSTEMS RELATED PROCEDURES - FMS

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Takeoff
MONITORING THE TAKEOFF

Ident.: PRO-NOR-SRP-01-30-00003983.0007001 / 09 MAY 22

Applicable to: ALL

- **At power set (thrust levers in FLX or TOGA position):**

CHECK that the navigation is updated to the runway threshold by verifying that the aircraft symbol is centered on the runway threshold of the ND.

CHECK the FMA for appropriate mode selection.

Note: - **RWY** mode appears if an ILS is tuned to a station corresponding to the departure runway. Otherwise no lateral mode comes up until the aircraft has lifted off.
 - Until the aircraft is airborne, do not rely on the wind displayed on the NDs.

- **At 30 ft:**

- If **NAV** is armed, it engages automatically.

- If **NAV** is not armed, **RWY TRK** mode engages and remains displayed until the crew selects another lateral mode.

- **At 100 ft:**

Engage AP1 or AP2.

L2 The FMGS has an internal delay that prevents the AP from engaging 5 s after lift-off and if the aircraft is below 100 ft.

L1 ● **At thrust reduction altitude:**

LVR CLB flashes in the first column of the FMA.

Procedure

SET the thrust levers to the CL detent.

L2 **A/THR** activates automatically.

L1 CHECK that the FMA displays **A/THR** in the fifth column.

CHECK that the FMA displays **THR CLB** in the first column.

- **At acceleration altitude:**

The vertical phase automatically switches to climb.

CLB mode engages. The target speed jumps to initial climb speed on the PFD.

Procedure

PROCEDURES**NORMAL PROCEDURES**

SYSTEMS RELATED PROCEDURES - FMS

CHECK that the FMA displays **CLB** in the second column.

L2

- **SRS** mode remains engaged until **CLB** mode is engaged, which occurs at ACCEL ALT or at any other vertical mode engagement, whichever comes first
- If during takeoff the FCU altitude is set below the current aircraft altitude, the system ignores the FCU altitude and the aircraft remains in **SRS** mode until the flight crew selects an altitude above the aircraft altitude or engages any other mode.

PRESELECTING A HDG OR A TRK

Ident.: PRO-NOR-SRP-01-30-00003984.0001001 / 16 NOV 11

Applicable to: ALL

PROCEDURE**● If a HDG or a TRK was preselected on the ground :**

PULL OUT the HDG/TRK selector knob when required

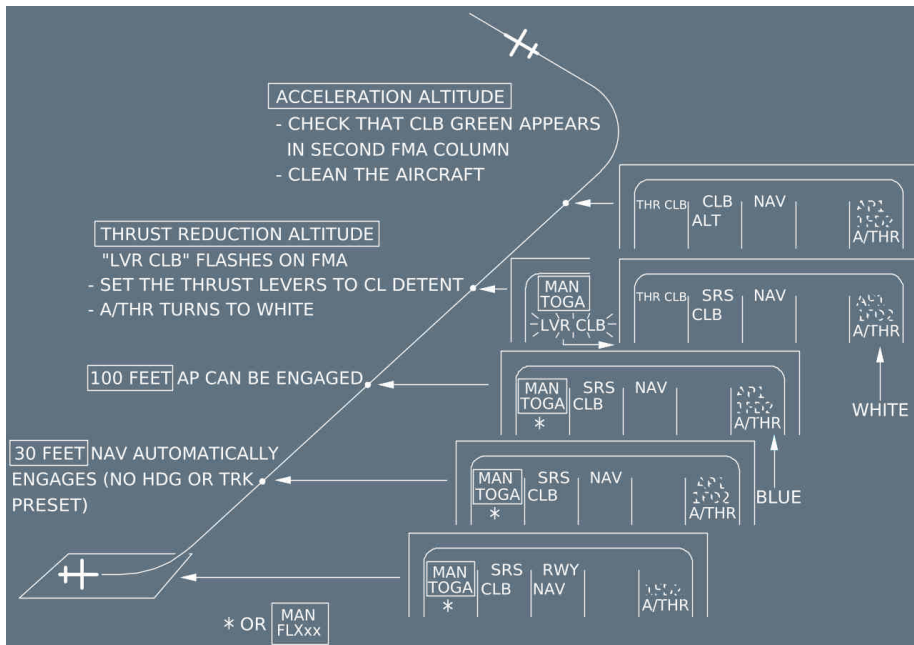
CHECK that the HDG/TRK mode is active and displayed on the FMA

When a HDG or TRK is preset, OP CLB mode will engage at the acceleration altitude. (CLB mode is not available in HDG/TRK mode).

NORMAL TAKEOFF PROFILE

Ident.: PRO-NOR-SRP-01-30-00003985.0002001 / 22 MAY 12

Applicable to: ALL



NO FLIGHT DIRECTOR TAKEOFF

Ident.: PRO-NOR-SRP-01-30-00003986.0004001 / 09 OCT 12

Applicable to: ALL

If a takeoff is initiated without FDs, the system responds as follow:

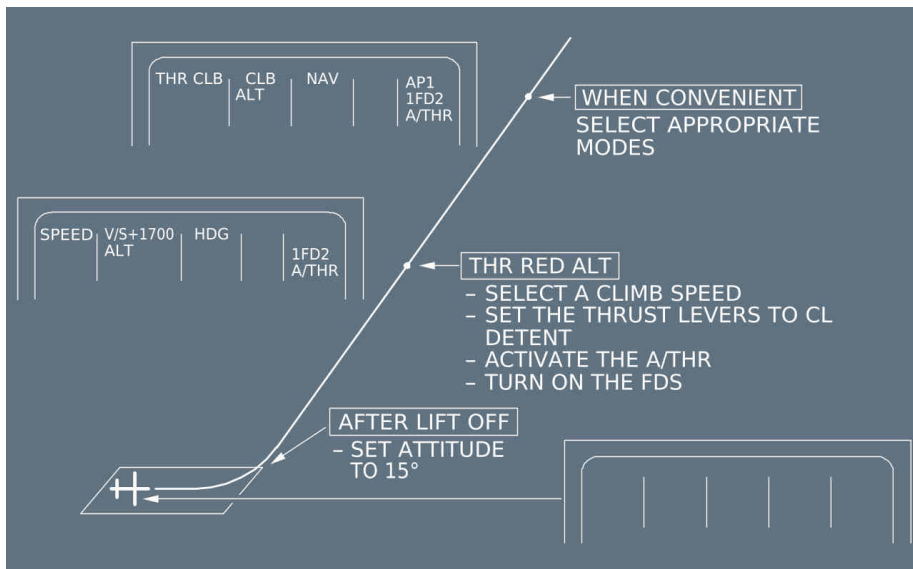
- There are no FD bars.
- There is no A/THR arming.
- There is no guidance available.
- The target speed on the PFD is that selected on the FCU or is defaulted to 100 kt.
- Setting the thrust levers to the CL detent does not activate A/THR.

Note: Do not engage the autothrust prior to selecting a target speed on the FCU.

PROCEDURES

NORMAL PROCEDURES

SYSTEMS RELATED PROCEDURES - FMS



PROCEDURE

Establish initial climb of 15 °

● **When reaching the thrust reduction altitude (THR RED ALT):**

SELECT a climb speed.

SET the thrust levers to CL detent.

ACTIVATE the autothrust.

TURN ON the FDs (basic modes engage).

SELECT appropriate mode.

Failure of both FDs after the start of takeoff:

- The FD bars disappear.
- The FCU window displays the target speed, which synchronizes on V2, or the current speed (if it is higher).
- The autothrust remains armed.
- At thrust reduction altitude, LVR CLB flashes. If the pilot set the thrust levers to the CLB detent, the autothrust becomes active in selected SPD mode (no FDs selected). If the current speed is greater than the target speed, the thrust decreases.
- At acceleration altitude the target speed does not change, since it is selected.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES SYSTEMS RELATED PROCEDURES - FMS
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TAKEOFF WITH NO V2 ENTRY

Ident.: PRO-NOR-SRP-01-30-00003987.0001001 / 16 NOV 11

Applicable to: ALL

If V2 is not inserted, the speed reference system (SRS) will not engage for takeoff.
5 s after lift off, V/S mode will engage. When V/S engages the current airspeed becomes the FCU target speed.

To regain a normal speed target, the pilot must :

SELECT the appropriate climb speed on the FCU and PULL out the knob.

● **At ACC ALT :**

PUSH the A/THR pb on the FCU.

SET the thrust levers to CL detent.

PUSH in the SPD selector knob to get a managed speed target.

TAKEOFF USING THE LOCALIZER OF THE OPPOSITE RUNWAY

Ident.: PRO-NOR-SRP-01-30-00003988.0005001 / 09 OCT 12

Applicable to: MSN 02155-02212, 04392-07792

● **If the localizer, of the ILS associated with the opposite runway, must be used for takeoff:**

SELECT the RAD NAV PAGE.

ENTER the ILS IDENT.

If the ILS is in the database, the system tunes the proper frequency.

Check that the ILS front course is displayed in the CRS field.

Note: *This may trigger the "RWY/ILS MISMATCH" message. Disregard it.*

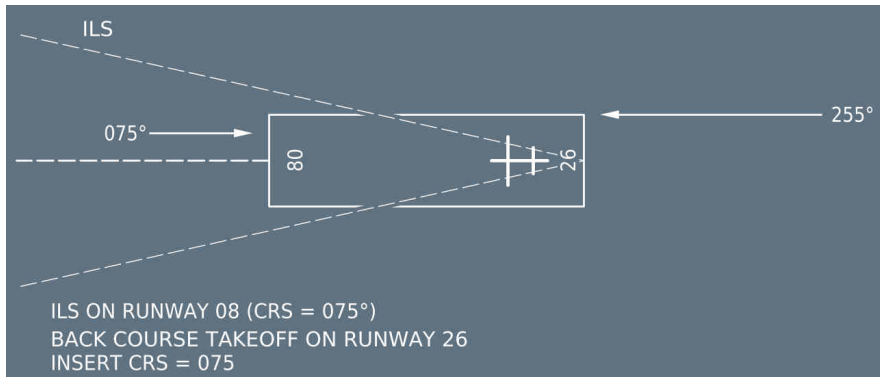
PROCEDURES

NORMAL PROCEDURES

SYSTEMS RELATED PROCEDURES - FMS

- **If the ILS is not in the database:**

SET the appropriate frequency, and SET the ILS front course in the CRS field.



DESELECT the LS pb on the FCU.

Since the PFD displays reverse deviation.

DESELECT the LS pb on ISIS.

Since ISIS displays LOC reverse deviation.

SELECT ROSE-ILS on one ND.

TAKEOFF USING THE LOCALIZER OF THE OPPOSITE RUNWAY

Ident.: PRO-NOR-SRP-01-30-00003988.0006001 / 09 OCT 12

Applicable to: MSN 02719-03060

- **If the localizer, of the ILS associated with the opposite runway, must be used for takeoff:**

SELECT the RAD NAV PAGE.

ENTER the ILS IDENT.

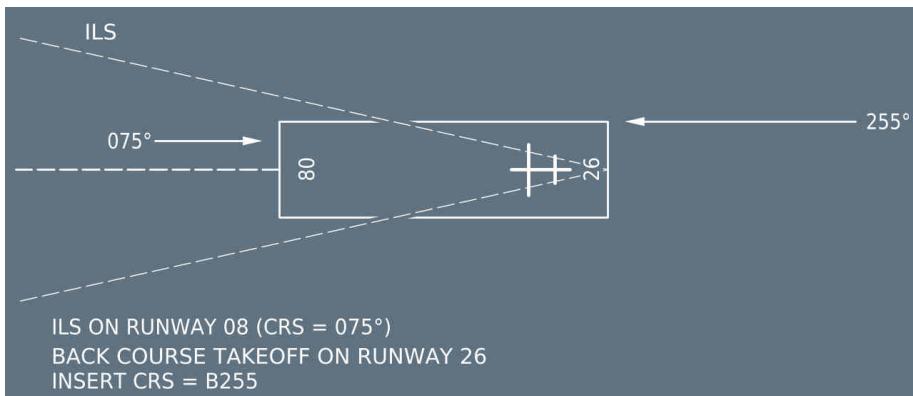
If the ILS is in the database, the system tunes the proper frequency.

Note: This may trigger the "RWY/ILS MISMATCH" message. Disregard it.

- **If the ILS is not in the database:**

ENTER the appropriate frequency.

INSERT the takeoff runway course with a "B".



DESELECT the LS pb on ISIS.

Since ISIS displays LOC reverse deviation.

SELECT ROSE-ILS on one ND.

PROCEDURES

NORMAL PROCEDURES

SYSTEMS RELATED PROCEDURES - FMS

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---	--

Climb

MONITORING THE CLIMB PHASE

Ident.: PRO-NOR-SRP-01-40-00003989.0031001 / 12 NOV 24

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

The PF MCDU should display the PERF CLB page allowing him to monitor the climb.
The PM MCDU should display the F-PLN page to allow the pilot to monitor time, speed and altitude predictions. This page also displays matched or missed information for constraints.

1L

2L

3L

4L

5L

6L

CLB

ACT MODE
SELECTED

CI
40

MANAGED	UTC	PRED TO	FL 330
290/.79	1201		77
SELECTED			
280/.78	1159		73
EXPEDITE		1145	61
ACTIVATE		NEXT	
<APPR PHASE		PHASE>	

1R

2R

3R

4R

5R

6R

PF

1L

2L

3L

4L

5L

6L

FROM

UTC SPD/ALT

AGN **1149** **275/*FL120**

BRG006° 24NM

LACOU **1152** **280/*FL205**

TRK005° 49

(T/C) **1159** **.78/FL330**

LMG **1205** **"/"**

URIO **96**

AMB **1217** **"/"**

DEST	UTC	DIST	EFOB
EGLL27R	1300	352	6.3

↕

1R

2R

3R

4R

5R

6R

PM

CHECK vertical mode CLB if NAV is engaged.
CHECK vertical mode OP CLB if HDG/TRK is engaged.

MONITORING THE ND (ROSE NAV OR ARC)

Displays the lateral and vertical paths, in the current AP/FD active modes.

PROCEDURES

NORMAL PROCEDURES

SYSTEMS RELATED PROCEDURES - FMS



THE  BLUE SYMBOL INDICATES WHERE THE FCU ALTITUDE WILL BE REACHED.

THE  MAGENTA SYMBOL INDICATES WHERE THE NEXT F-PLN ALT CSTR WILL BE REACHED.

IF THE FCU ALTITUDE IS SET AT NEXT ALT CSTR, THE  SYMBOL IS BLUE.

○ SYMBOL AROUND WAYPOINT INDICATES AN ALTITUDE CONSTRAINT :

WHITE : DISREGARDED IN THE CURRENT AP/FD MODES.

MAGENTA : PREDICTED AS MATCHED IN THE CURRENT MODES.

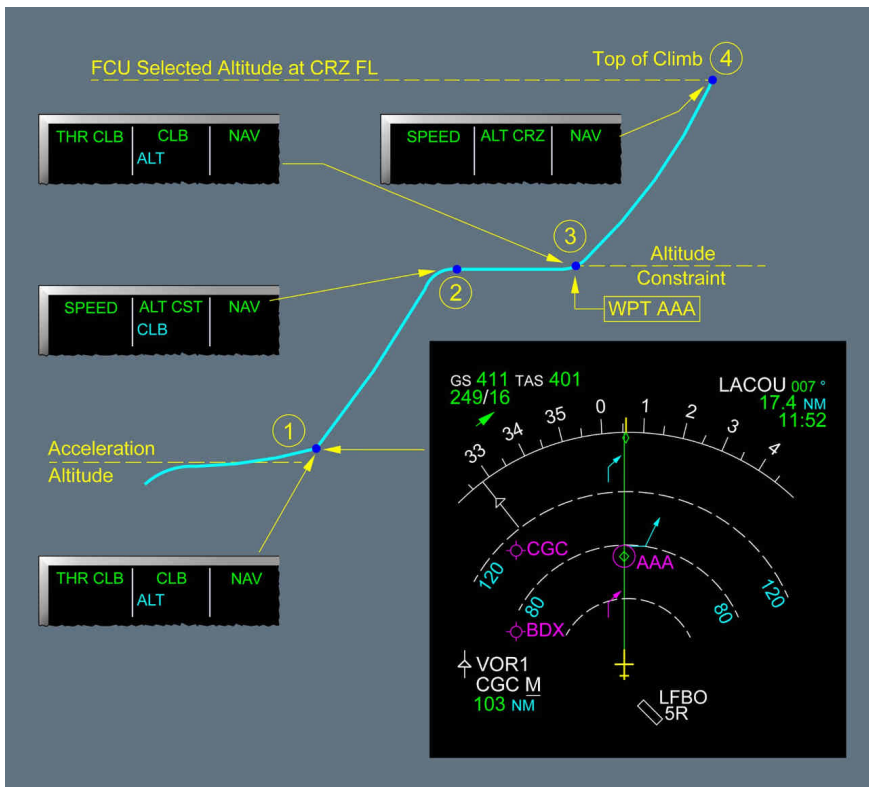
AMBER : PREDICTED AS MISSED IN THE CURRENT MODES.

MONITORING THE AP/FD MODES AND FMA

If CLB mode is engaged, the flight mode annunciator (FMA) and the navigation display (ND) show the tactical situation as follows:

CASE 1

The FCU selected altitude is set above the next altitude constraint.



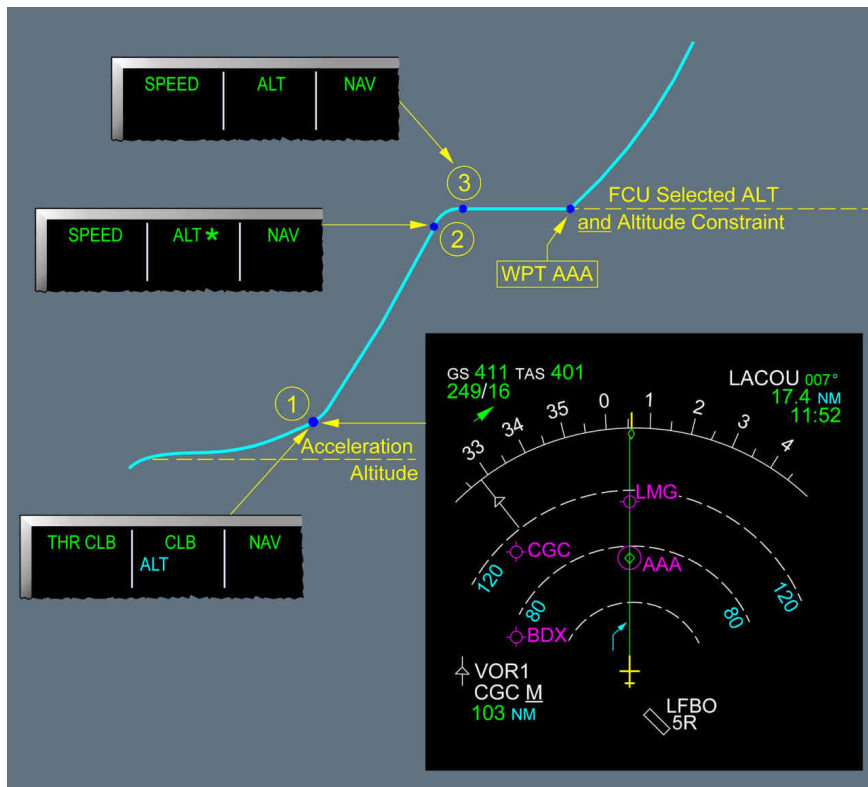
CASE 2

The FCU selected altitude is set at the next altitude constraint.
The aircraft will automatically levels off at this altitude.

PROCEDURES

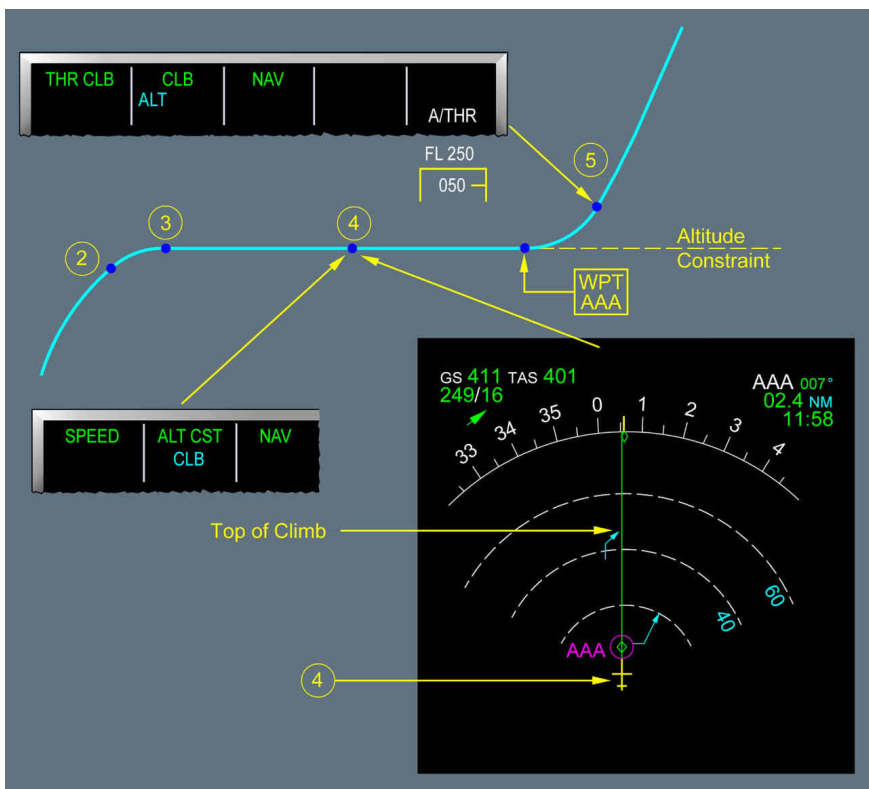
NORMAL PROCEDURES

SYSTEMS RELATED PROCEDURES - FMS



To resume the climb automatically when the waypoint AAA is reached, apply the following procedure during the level off (Position 4):

- SELECT the FCU altitude to the next constraint (if any) or the cruise FL.
- PUSH the FCU ALT selector knob to arm CLB mode.



RECOMMENDATION:

To ensure that you will not miss the next constraint, it is recommended to select the FCU altitude to the next constraint as described above.

MONITORING THE CONSTRAINTS

SPEED, ALTITUDE and TIME constraint can be checked using MCDUs. Each constraint is preceded by a star that indicates if the constraint is matched (magenta star) or missed (amber star).

ALTITUDE CONSTRAINT

If an altitude constraint is predicted as missed, use the following procedure:

- SET the FCU ALT to the next ALT CSTR.
- CHECK the position of the level off symbol on the ND (blue arrow) with respect to the waypoint with the constraint.
- DECREASE the target speed until the constraint is met.



SPEED CONSTRAINT

CHECK the SPD CSTR predictions on the MCDU.

A magenta or amber star (*) indicates that the aircraft will match or miss the constraint.

If the aircraft is to miss the constraint by more than 10 kt, the MCDU scratchpad displays "SPD ERROR AT WPT ----".

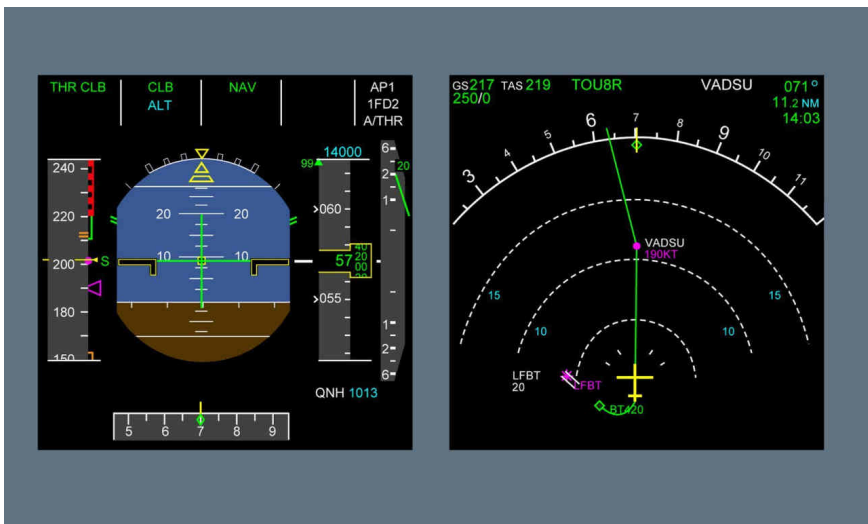
Note: The AFS will not guide the aircraft below the maneuvering speed, even if the managed speed displayed on PFD (magenta triangle) is lower.

For example:

- The aircraft is in climb
- There is a speed constraint in the flight plan
- The maneuvering speed of the current flaps configuration is above the speed constraint.

In this case, the AFS will target the maneuvering speed (i.e. S or green dot) and not the managed speed displayed on PFD (i.e. the speed constraint).

In the illustration below, in CONF 1, the managed speed is equal to the speed constraint (190 kt) but the speed target used for guidance is S speed (200 kt).



“CHECK WEIGHT” MESSAGE.

Refer to DSC-22_20-40-20 "CHECK WEIGHT" Message

HDG/TRK MODE ENGAGEMENT

If HDG/TRK is engaged, the guidance does not consider any F-PLN constraint. Therefore, if the flight crew disengages NAV, CLB mode reverts to OP CLB.



SPEED SELECTION

If a specific speed is required TURN and PULL the SPD selector knob. (This changes the target speed to blue on the PFD speed scale).

PROCEDURES

NORMAL PROCEDURES

SYSTEMS RELATED PROCEDURES - FMS

Predictions on the F-PLN page assume that the speed remains selected until the next SPD LIM or SPD CSTR, or the next phase, whichever comes first.

MONITORING THE CLIMB PHASE

Ident.: PRO-NOR-SRP-01-40-00003989.0025001 / 12 NOV 24

Applicable to: MSN 02926-02944, 04392, 07784-07792

The PF MCDU should display the PERF CLB page allowing him to monitor the climb.

The PM MCDU should display the F-PLN page to allow the pilot to monitor time, speed and altitude predictions. This page also displays matched or missed information for constraints.

PF					
1L	CLB ACT MODE SELECTED CI 40				1R
2L	PRED TO FL 330 MANAGED UTC DIST 290/.79 1201 77				2R
3L	SELECTED 280/.78 1159 73				3R
4L	EXPEDITE 1130 61				4R
5L	<T/O PHASE ACTIVATE →APPR PHASE				5R
6L	NEXT PHASE>				6R
PM					
1L	FROM UTC SPD/ALT AGN 1149 275/*FL120				1R
2L	BRG 006° 24 NM LACOU 1152 280/*FL205				2R
3L	(T/C) 1159 .78 / FL 330 43				3R
4L	LMG 1205 "/ "				4R
5L	URIO 96 AMB 1217 "/ "				5R
6L	DEST UTC DIST EFOB EGLL27R 1300 352 6.3				6R

CHECK vertical mode CLB if NAV is engaged.

CHECK vertical mode OP CLB if HDG/TRK is engaged.

MONITORING THE ND (ROSE NAV OR ARC)

Displays the lateral and vertical paths, in the current AP/FD active modes.



THE ↗ BLUE SYMBOL INDICATES WHERE THE FCU ALTITUDE WILL BE REACHED.

THE ↗ MAGENTA SYMBOL INDICATES WHERE THE NEXT F-PLN ALT CSTR WILL BE REACHED.

IF THE FCU ALTITUDE IS SET AT NEXT ALT CSTR, THE ↗ SYMBOL IS BLUE.

○ SYMBOL AROUND WAYPOINT INDICATES AN ALTITUDE CONSTRAINT :

WHITE : DISREGARDED IN THE CURRENT AP/FD MODES.

MAGENTA : PREDICTED AS MATCHED IN THE CURRENT MODES.

AMBER : PREDICTED AS MISSED IN THE CURRENT MODES.

MONITORING THE AP/FD MODES AND FMA

If CLB mode is engaged, the flight mode annunciator (FMA) and the navigation display (ND) show the tactical situation as follows:

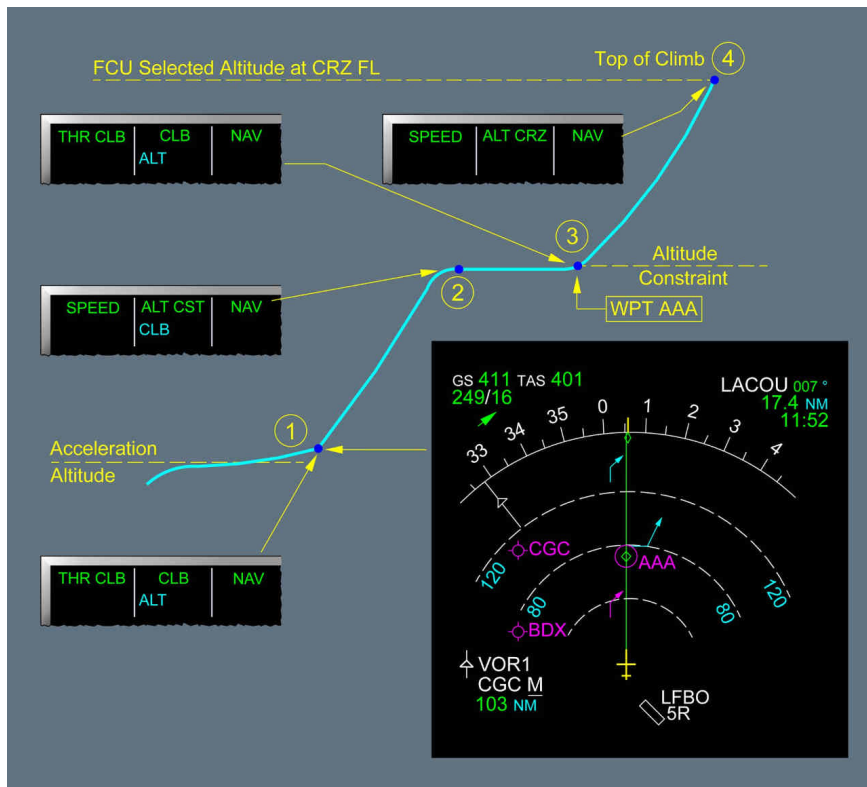
CASE 1

The FCU selected altitude is set above the next altitude constraint.

PROCEDURES

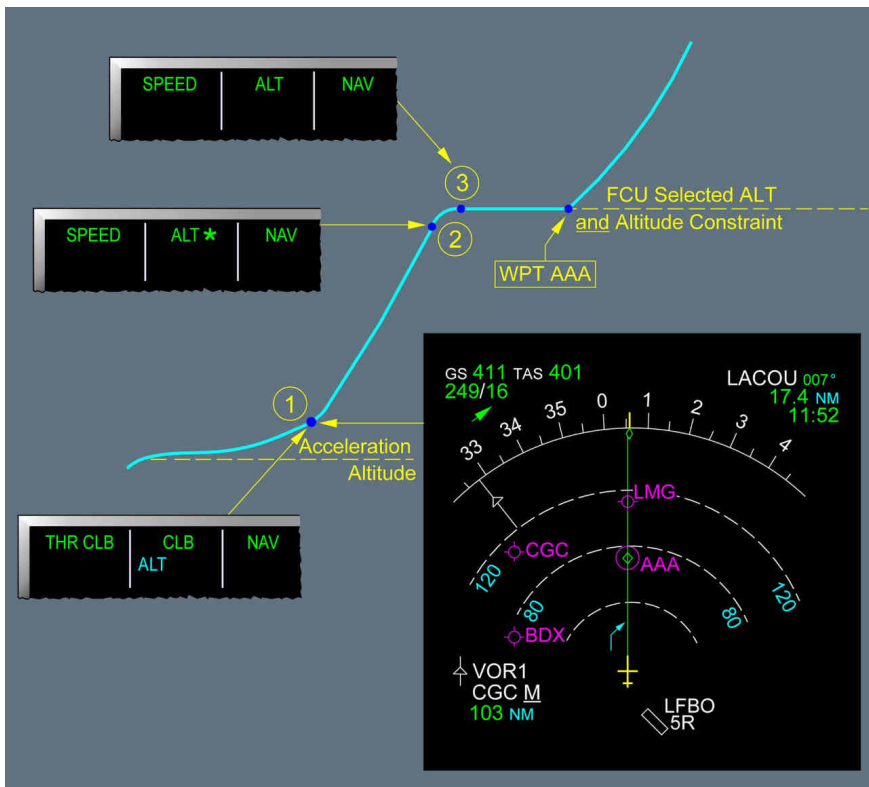
NORMAL PROCEDURES

SYSTEMS RELATED PROCEDURES - FMS



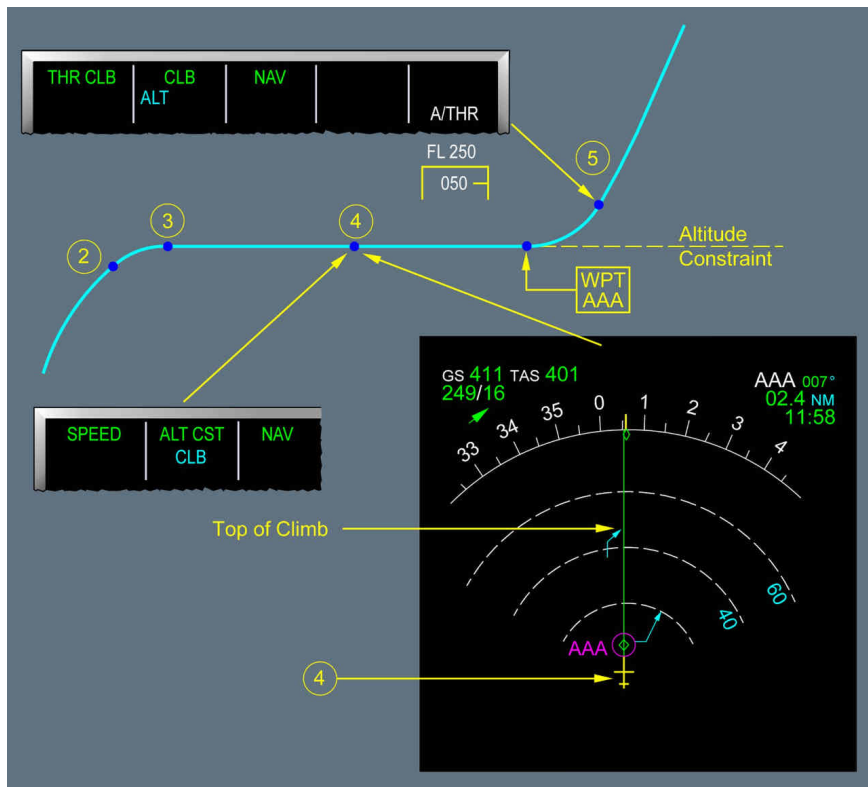
CASE 2

The FCU selected altitude is set at the next altitude constraint.
The aircraft will automatically level off at this altitude.



To resume the climb automatically when the waypoint AAA is reached, apply the following procedure during the level off (Position 4):

- SELECT the FCU altitude to the next constraint (if any) or the cruise FL.
- PUSH the FCU ALT selector knob to arm CLB mode.



RECOMMENDATION:

To ensure that you will not miss the next constraint, it is recommended to select the FCU altitude to the next constraint as described above.

MONITORING THE CONSTRAINTS

SPEED, ALTITUDE and TIME constraint can be checked using MCDUs. Each constraint is preceded by a star that indicates if the constraint is matched (magenta star) or missed (amber star).

ALTITUDE CONSTRAINT

If an altitude constraint is predicted as missed, use the following procedure:

- SET the FCU ALT to the next ALT CSTR
- CHECK the position of the level off symbol on the ND (blue arrow) with respect to the waypoint with the constraint.
- DECREASE the target speed until the constraint is met.



SPEED CONSTRAINT

CHECK the SPD CSTR predictions on the MCDU.

A magenta or amber star () indicates that the aircraft will match or miss the constraint.*

If the aircraft is to miss the constraint by more than 10 kt, the MCDU scratchpad displays "SPD ERROR AT WPT ----".

Note: The AFS will not guide the aircraft below the maneuvering speed, even if the managed speed displayed on PFD (magenta triangle) is lower.

For example:

- The aircraft is in climb
- There is a speed constraint in the flight plan
- The maneuvering speed of the current flaps configuration is above the speed constraint.

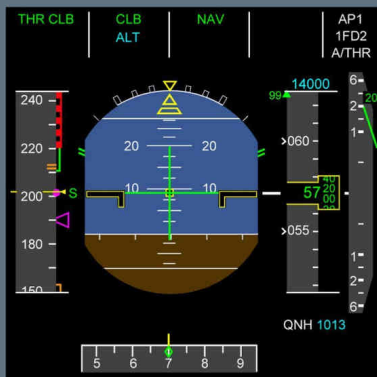
In this case, the AFS will target the maneuvering speed (i.e. S or green dot) and not the managed speed displayed on PFD (i.e. the speed constraint).

In the illustration below, in CONF 1, the managed speed is equal to the speed constraint (190 kt) but the speed target used for guidance is S speed (200 kt).

PROCEDURES

NORMAL PROCEDURES

SYSTEMS RELATED PROCEDURES - FMS

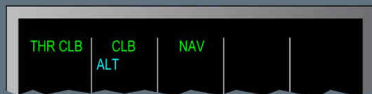


“CHECK WEIGHT” MESSAGE.

Refer to DSC-22_20-40-20 "CHECK WEIGHT" Message

HDG/TRKMODE ENGAGEMENT

If HDG/TRK is engaged, the guidance does not consider any F-PLN constraint. Therefore, if the flight crew disengages NAV, CLB mode reverts to OP CLB.



NAV is engaged



HDG or TRK is engaged
CLB reverts to OP CLB

SPEED SELECTION

If a specific speed is required TURN and PULL the SPD selector knob. (This changes the target speed to blue on the PFD speed scale).

Predictions on the F-PLN page assume that the speed remains selected until the next SPD LIM or SPD CSTR, or the next phase, whichever comes first.

EXPEDITE CLIMB

Ident.: PRO-NOR-SRP-01-40-00003990.0002001 / 06 NOV 23

Applicable to: MSN 02155-04392, 07784-07792

The flight crew may use the expedite climb mode temporarily to clear a specified altitude or to match a constraint.

PRESS EXPED pb on the FCU.

The AP receives and maintains Green Dot speed. There is no benefit to use the Expedite Climb mode above FL 250 because the Mach corresponding to green dot is too low to maintain an increased vertical speed.

[L2] When selecting *EXPED pb* with slats/flaps extended, the targeted speed is *S* or *F* depending on the configuration.



[L1] To revert to normal climb:

PUSH ALT knob, **CLB** mode will engage.

Note: Pulling ALT knob, V/S knob or SPD/MACH knob also disengages the expedite climb mode. Pressing EXPED pb does not disengage the mode.

PROCEDURES

NORMAL PROCEDURES

SYSTEMS RELATED PROCEDURES - FMS

IMMEDIATE RETURN TO ORIGIN AIRPORT

Ident.: PRO-NOR-SRP-01-40-00003991.0003001 / 23 JUN 15

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

- If the SEC F-PLN has been prepared for an immediate return to the airport of origin:
 ACTIVATE the SEC F-PLN.
 PERFORM a DIR TO the appropriate waypoint.
- If the SEC F-PLN has not been prepared for an immediate return to the airport of origin:

1 →

SELECT

FROM	IT 5612	
	UTC SPD / ALT	
AGN	10 13	FL 220
LMG 1	BRG 004	93 NM
LMG	10 25	.78 / FL 290
UR 10	TRK 006	97
AMB	10 38	. / .
UR 10		16

1R

2R

3R

4R

5R

6R

→ **2**

WRITE

LAT REV FROM LMG	
45° 49.0N / 001° 01.6E	
LL XING / INCR / NO	[] ° / [] ° / []
	NEXT WPT []
<HOLD	NEW DEST []
ENABLE	
←ALTN	AIRWAYS>
<RETURN LFBO	

1R

2R

3R

4R ← **3**

5R

6R

PERFORM a lateral revision at TO waypoint
 ENTER the departure airport ident in the NEW DEST field and INSERT the temporary flight plan.
 PERFORM a lateral revision at the new destination
 SELECT: APPR – STAR – VIA – TRANS and INSERT

● When cleared to divert:

PERFORM a DIR TO the suitable waypoint.
 ENTER QNH, WIND, MDA/MDH, LDG CONF.

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CHECK RAD NAV page.

IMMEDIATE RETURN TO ORIGIN AIRPORT

Ident.: PRO-NOR-SRP-01-40-00003991.0007001 / 23 JUN 15

Applicable to: MSN 02926-02944, 04392, 07784-07792

- If the SEC F-PLN has been prepared for an immediate return to the airport of origin:
REVERT to HDG mode, then ACTIVATE the SEC F-PLN.
PERFORM a DIR TO the appropriate waypoint.
- If the SEC F-PLN has not been prepared for an immediate return to the airport of origin:

1
SELECT

FROM
AGN
LMG 1
LMG
UR 10
AMB
UR 10

IT 5 6 1 2
UTC SPD / ALT
10 13 FL 220
BRG 0 0 4 9 3 NM
10 25 . 7 8 / FL 2 9 0
TRK 0 0 6 9 7
10 3 8 . / .
 1 6

1R

2R

3R

4R

5R

6R

2
WRITE

LAT REV FROM LMG
4 5 ° 4 9 . 0 N / 0 0 1 ° 0 1 . 6 E

NEXT WPT
[]
NEW DEST
[]
A I R W A Y S >

<HOLD
ENABLE
←ALTN

<RETURN
LFBO

1R

2R

3R

4R

5R

6R

3
ENTER

PERFORM a lateral revision at TO waypoint
ENTER the departure airport ident in the NEW DEST field.
PERFORM a lateral revision at the new destination
SELECT: APPR – STAR – VIA – TRANS and INSERT
CHECK and INSERT the TMPY F-PLN or continue with next revision.

PROCEDURES**NORMAL PROCEDURES**

SYSTEMS RELATED PROCEDURES - FMS

■ **When cleared to divert:**

PERFORM a DIR TO the suitable waypoint.

ENTER QNH, WIND, MDA/MDH, LDG CONF.

CHECK RAD NAV page.

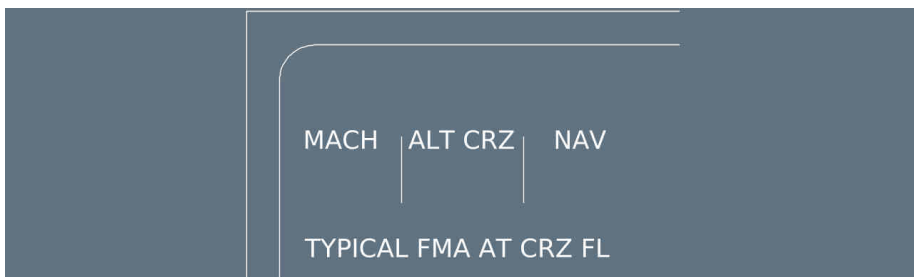
Cruise

REACHING CRUISE FLIGHT LEVEL

Ident.: PRO-NOR-SRP-01-50-00003992.0002001 / 03 NOV 14

Applicable to: ALL

On reaching the cruise flight level, the flight crew should be sure that the FMA displays “ALT CRZ” in its second column, which ensures that the aircraft is at cruise flight level and at Economy Cruise Mach (ECON CRZ MACH).



The FMGS engages the “soft altitude” (SOFT ALT) mode 2 min after the cruise flight level is captured and Mach stabilized. (SOFT ALT) mode allows the aircraft to deviate ± 50 ft from the target altitude to minimize the thrust variation and reduce the fuel consumption.

- If the FMA does not display ALT CRZ at the assigned flight level, soft altitude mode will not engage and the predictions will be computed at the preplanned flight level. This will occur when the ATC assigned flight level is lower than the preplanned flight level entered on the PROG page.
- If the FMA does not display ALT CRZ at the assigned FL (as may occur when the ATC-assigned FL is lower than the preplanned FL selected initially):
 PRESS the [PROG].
 ENTER the current cruise flight level.

Note: If the current cruise flight level is above the preplanned FL, selecting the FCU updates it automatically.

“SET SPD AUTO” OR “SET MANAGED SPD” OR “CHECK SPEED MODE”

- If the climb phase was flown in selected speed and if the cruise phase is planned to be flown in managed speed (ECON MACH/SPEED), “SET SPD AUTO” or “SET MANAGED SPEED” or “CHECK SPEED MODE” appears on the PFD and MCDU as a reminder.

PROCEDURES**NORMAL PROCEDURES**

SYSTEMS RELATED PROCEDURES - FMS

PRESS the FCU speed selector knob to activate the managed Mach.

MONITORING THE NAVIGATION ACCURACY

Ident.: PRO-NOR-SRP-01-50-A-00003993.0001001 / 22 MAY 12

Applicable to: ALL

GENERAL

On aircraft equipped with GPS PRIMARY, the navigation accuracy check is not required as long as GPS PRIMARY  is available.

Otherwise, navigation accuracy shall be checked periodically in cruise.

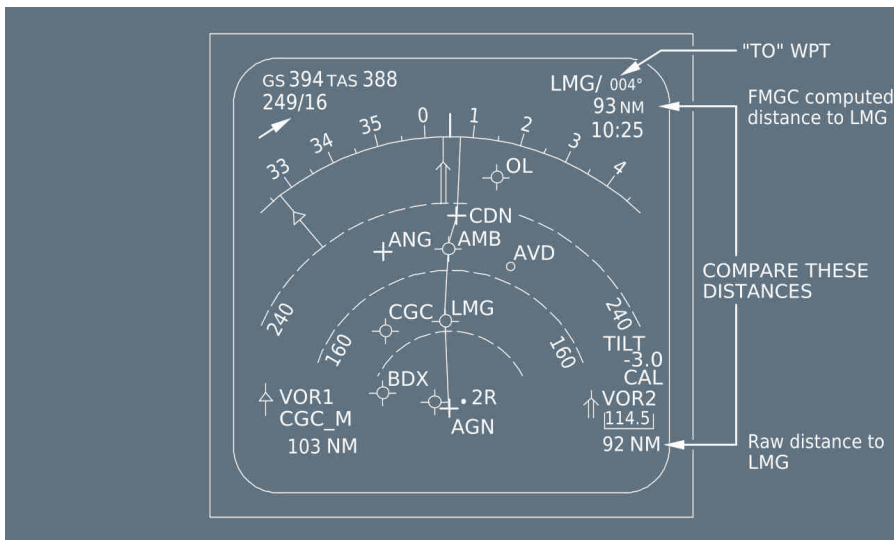
The PROG page displays an estimated accuracy as being high or low (center of sixth line):

- “HIGH” means that the FMGS estimates the FM position accurate enough to meet the EN ROUTE criteria,
- “LOW” means that the pilot must compare raw data from tuned nav aids with corresponding data computed by FM and shown on the ND or MCDU PROG page. The appearance of the message “NAV ACCUR DOWNGRAD” on the MCDU calls for a similar crosscheck.

Note: *The pilot should make such a comparison periodically, even if the PROG page is displaying “HIGH” and nav aids are available: this allows him to quantify the FM position error.*

The method for checking the accuracy is explained in the SOP and in Evaluation of position accuracy chapter (*Refer to DSC-22_20-10-20-20 General*).

A quick check is explained here below when the TO waypoint is a DME type. (VOR/DME or VOR/TAC or DME or TAC)



MONITORING THE NAVIGATION ACCURACY - POSITION DISCREPANCY

Ident.: PRO-NOR-SRP-01-50-A-00003994.0013001 / 22 NOV 11

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

POSITION DISCREPANCY

- If there is a discrepancy between the raw data position and the FM position:

PRESS the DATA key on the MCDU.

SELECT the POSITION MONITOR page.

SELECT "FREEZE".

On the other MCDU : Select the GPS MONITOR page.

POSITION FROZEN AT 1035				GPS MONITOR			
1L	FMS 1	4610.2N/00618.3E	1R	1L	GPS1 POSITION	46°10.2N/006°13.3E	1R
2L	FMS 2	4610.2N/00618.8E	2R	2L	TTRK UTC	GS	2R
3L	GPS	4610.1N/00618.2E	3R	3L	359.9 10:37:42	450	3R
4L	MIX IRS	4609.7N/00618.0E	4R	4L	MERIT GPS ALT MODE/SAT	NAV/6	4R
5L	IRS1	IRS2	IRS3	5R	5L	GPS2 POSITION	5R
6L	NAV 0.4	NAV 0.2	NAV 0.4	6R	6L	46°10.2N/006°13.3E	6R
			SEL			TTRK UTC	
			← UNFREEZE			359.9 10:37:42	
			NAVAIDS>			450	
						MERIT GPS ALT MODE/SAT	
						100M 32000 NAV/6	

Ident.: PRO-NOR-SRP-01-50-A-00003994.0014001 / 14 FEB 11

Applicable to: MSN 02926-02944, 04392, 07784-07792

POSITION DISCREPANCY

- If there is a discrepancy between the raw data position and the FM position:

PRESS the DATA key on the MCDU.

SELECT the POSITION MONITOR page.

SELECT "FREEZE".

On the other MCDU: Select the GPS MONITOR page.

POSITION FROZEN AT 1035				GPS MONITOR			
1L	FMGC1	4610.2N/00618.3E	1R	1L	GPS1 POSITION	1R	
		IRS/DME/DME			46°10.2N/006°13.3E		
2L	FMGC2	4610.2N/00618.8E	2R	2L	TTRK UTC GS	2R	
		IRS/GPS			359.9 10:37:42 450		
3L	GPS	4610.1N/00618.2E	3R	3L	MERIT GPS ALTMODE/SAT	3R	
					100M 32000 NAV/6		
4L	MIX IRS	4609.7N/00618.0E	4R	4L	GPS2 POSITION	4R	
		IRS1 IRS2 IRS3			46°10.2N/006°13.3E		
5L	NAV 0.4	NAV 0.2 NAV 0.4	5R	5L	TTRK UTC GS	5R	
		SEL			359.9 10:37:42 450		
6L	← UNFREEZE	NAVAIDS>	6R	6L	MERIT GPS ALT MODE/SAT	6R	
					100M 32000 NAV/6		

MONITORING THE FUEL PREDICTIONS

Ident.: PRO-NOR-SRP-01-50-00003995.0013001 / 14 FEB 11

Applicable to: ALL

The F-PLN and FUEL PRED pages display fuel and time predictions throughout the flight. These predictions are meaningful if the lateral and vertical flight plan, and the entered winds are kept accurate enough as the flight progresses.

PROCEDURE

In addition to the Fuel Management procedure described in the SOPs (*Refer to PRO-NOR-SOP-15 Cruise - Flight Progress*), periodically apply the following actions:

KEEP ACCURATE FMS PREDICTIONS

Periodically **UPDATE** the F-PLN elements (F-PLN waypoints, step altitudes, predicted winds).

CHECK the MIN DEST FOB value on the FUEL PRED page

The MIN DEST FOB value is computed by the FMS and by default it is equals to ALTN + FINAL.
 ALTN, FINAL and MIN DEST FOB can be modified by the flight crew.

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At the beginning of the CRZ phase, and/or after any change of destination or alternate airport, check that the MIN DEST FOB value is meaningful. Otherwise, update the MIN DEST FOB value, as appropriate.

CHECK the DEST EFOB value on the F-PLN or FUEL PRED page

MONITOR the EFOB at destination on the F-PLN or FUEL PRED page. If necessary, ADAPT the flight strategy.

"DEST EFOB BELOW MIN" MESSAGE

If the predicted EFOB at destination becomes less than the MIN DEST FOB value displayed on the FUEL PRED page:

- The destination EFOB turns to amber on the F-PLN, FUEL PRED and PERF (CLB, CRZ, DES) pages, and REPORT page.
- The "DEST EFOB BELOW MIN" amber message is displayed on the MCDU scratchpad, after 2 min (if the FMS is in CRZ or DES phase).

Note: *If the flight crew has cleared the "DEST EFOB BELOW MIN" message, and if the predicted EFOB at destination is still less than the MIN DEST FOB value, the "DEST EFOB BELOW MIN" message will appear again at the beginning of the descent phase.*

PROCEDURE

● **If the "DEST EFOB BELOW MIN" message is triggered on the MCDU:**

CHECK the DEST EFOB value on the F-PLN or FUEL PRED page,

CHECK the hypothesis used by the FMS to compute the fuel predictions,

Check that the F-PLN elements (F-PLN waypoints, step altitudes, predicted winds) are up-to-date, to ensure that the FMS predictions are accurate.

Check that the MIN DEST FOB fuel value is meaningful and corresponds to the planned fuel strategy.

ADAPT the flight strategy as required.

ENTERING A STEP CLIMB OR A STEP DESCENT

Ident.: PRO-NOR-SRP-01-50-00003996.0002001 / 22 MAY 12

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

The crew may use the STEP ALTS page to enter up to four geographic step points or one optimal step (computed by the FMGS) at any waypoint of the cruise.

PROCEDURE

PRESS the PERF key.

PROCEDURES**NORMAL PROCEDURES**

SYSTEMS RELATED PROCEDURES - FMS

SELECT "STEP ALTS" prompt.

The PERF PAGE displays this prompt in cruise phase. The crew may also call up the STEP ALTS page using a vertical revision at any cruise waypoint.

ENTERING AN OPTIMAL STEP (ONLY STEP CLIMB)

WRITE a step altitude or FL into the scratchpad.

ENTER the step altitude or FL in the [1R] field.

CHECK the FUEL and TIME SAVINGS predictions on the 5L and 5R fields.

PUSH the INSERT prompt [6R] if adequate.

After insertion, the optimum step climb is updated only when the flight crew presses the UPDATE prompt [6R].

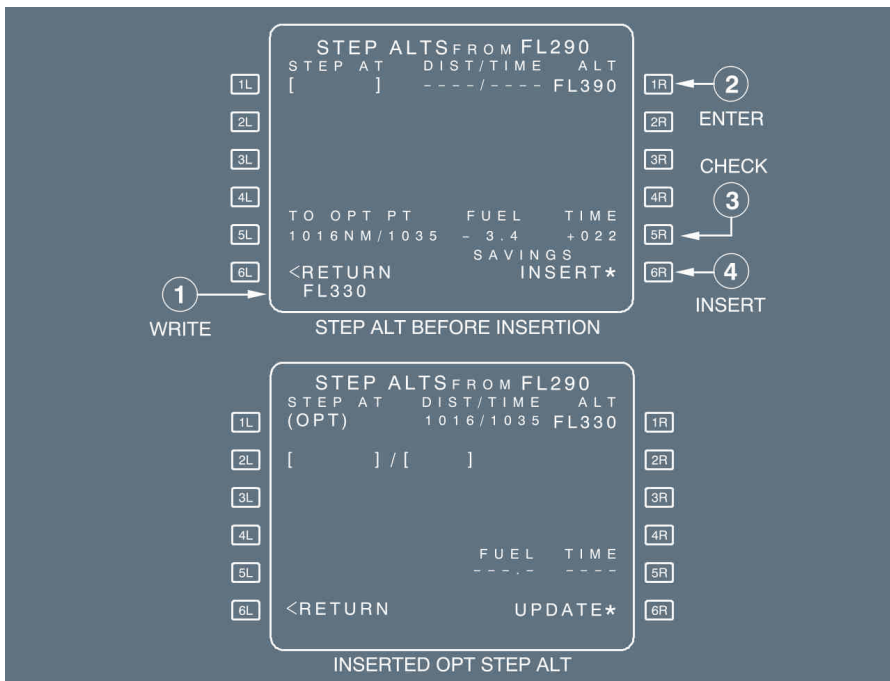
The ND shows symbols for the start of climb (S/C) and the top of climb (T/C). The MCDU shows the associated pseudo-waypoints.

It is possible to convert an optimum step to a geographic step by overwriting the [1L] field (see geographic step).

● **When reaching the step climb pseudo-waypoint:**

REQUEST climb clearance.

ADJUST the FCU altitude to the STEP ALT, and PUSH.



ENTERING A GEOGRAPHIC STEP

WRITE a step altitude into the scratchpad.

The format is position/altitude (or FL). The position can be a waypoint or waypoint/distance to waypoint. The waypoint/distance is an along track offset waypoint.

ENTER it in [1L] to [4L] field.

The entry of the initial geographic step point requires both a valid waypoint and altitude entries. When a step has been entered, the flight crew may change the position and the altitude independently. The flight crew cannot modify the position and the altitude in a single entry: To modify both, they should modify the position first, and then the altitude.

CHECK the predictions

- **When reaching the step climb or descent pseudo-waypoint (S/C or S/D):**

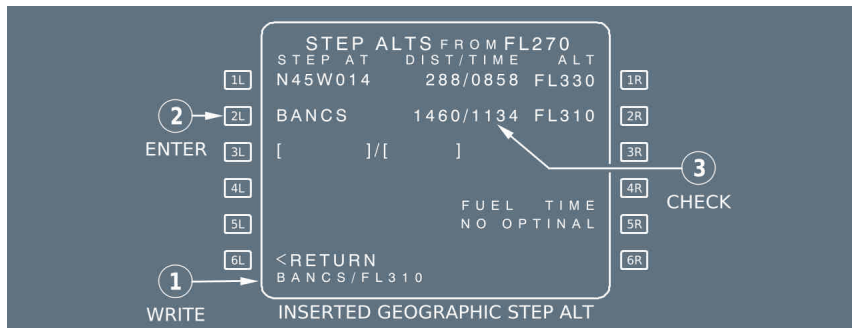
REQUEST climb or descent clearance.

ADJUST the FCU altitude to the STEP ALT, and PUSH.

PROCEDURES

NORMAL PROCEDURES

SYSTEMS RELATED PROCEDURES - FMS



The DIST/TIME field may display the following messages:

- ABOVE MAX if the step altitude exceeds the MAX ALT.
- IGNORED if the start step point is less than 50 NM from the top of descent.
- STEP NOW when the aircraft is within 20 NM of the step point.

If the aircraft overflies the step waypoint without commencing a climb or a descent, the system deletes the step from the vertical F-PLN automatically (a "STEP DELETED" message is displayed on the MCDU scratchpad), and recomputes the predictions.

A step is not deleted if the FCU altitude is moved only partially towards the step altitude.

The flight phase remains "cruise" whenever a step is initiated.

Note: For an altitude restriction defined at a waypoint less than 50 NM before the top of descent and lower than the CRZ FL, it is recommended to enter an altitude constraint rather than a step.

ENTERING A STEP CLIMB OR A STEP DESCENT

Ident.: PRO-NOR-SRP-01-50-00003996.0012001 / 22 MAY 12

Applicable to: MSN 02926-02944, 04392, 07784-07792

The crew may use the STEP ALTS page to enter up to four geographic step points or one optimal step (computed by the FMGS) at any waypoint of the cruise.

PROCEDURE

PRESS the F-PLN key on the MCDU.

SELECT the VERT REV page at any waypoint.

SELECT "STEP ALTS" prompt.

The PERF PAGE displays this prompt in cruise phase. The crew may also call up the STEP ALTS page using a vertical revision at any cruise waypoint.

ENTERING AN OPTIMAL STEP (ONLY STEP CLIMB)

WRITE the desired step altitude into the scratchpad.

ENTER it in the [1L] field

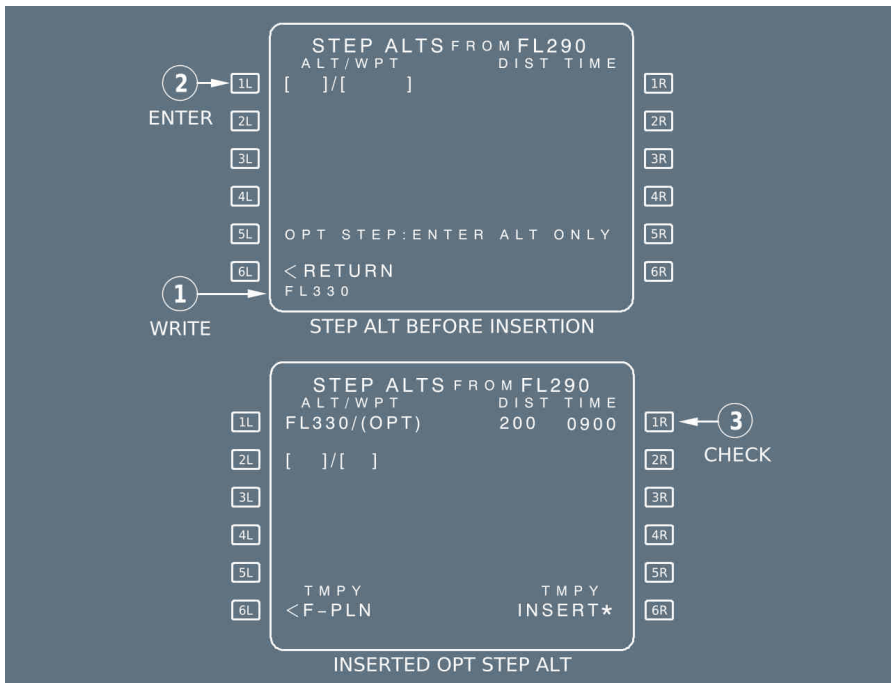
The FMGS automatically computes the optimal location of the step and inserts it in the TMPY F-PLN.

CHECK the FUEL and TIME SAVINGS predictions on the [5R].

After insertion, the optimum step location is regularly updated, until the aircraft is within 20 NM of the step point.

The ND shows symbols for the start of climb (S/C) and the top of climb (T/C). The MCDU shows the associated pseudo-waypoints.

It is possible to convert an optimum step to a geographic step by overwriting the [1L] field (see geographic step).



● **When reaching the step climb pseudo-waypoint (S/C):**

REQUEST climb clearance to ATC.

ADJUST the FCU altitude to the STEP ALT, and PUSH the FCU knob.

PROCEDURES

NORMAL PROCEDURES

SYSTEMS RELATED PROCEDURES - FMS

Note: The step will be deleted from the F-PLN after having sequenced the start of climb for the step.

ENTERING A GEOGRAPHIC STEP (STEP CLIMB OR STEP DESCENT)

WRITE a step altitude and waypoint into the scratchpad.

The format is:

- Altitude (or FL)/waypoint (Ex: FL 350/BERAD)
- Altitude (or FL)/waypoint/distance (Ex: FL 350/BERAD/-20)

The waypoint must be in the flight plan.

ENTER it in [1L] to [4L] field.

It is possible to independently modify either the location or the altitude of an existing step altitude. It is not possible to modify with a single entry both the location and the altitude : An entry "waypoint/xxx" will be taken by the system as an along track offset of xxx nautical miles.

CHECK the predictions (distance, time).

● When reaching the step climb or descent pseudo-waypoint (S/C or S/D):

REQUEST climb or descent clearance

ADJUST the FCU altitude to the STEP ALT, and PUSH the FCU knob.



STEP ALTS FROM FL270		
ALT/WPT	DIST	TIME
FL330/PD07	300	0900
FL390/N45W014	455	0921
FL350/BANCS	1210	1131

INSERTED GEOGRAPHIC STEP ALT			
ALT/WPT	DIST	TIME	FUEL
[]/[]			
←OPT TO FL330	-0003		-1.2
<RETURN			

Diagram labels: 1. WRITE, 2. ENTER, 3. CHECK, 4. R, 5. R, 6. R

The DIST/TIME field may display the following messages:

- ABOVE MAX if the step altitude exceeds the MAX ALT.
- IGNORED if the step end point is less than 50 NM from the top of descent or if the step climb is located prior to the top of climb or after the top of descent.
- STEP AHEAD when the aircraft is within 20 NM of the step point.

If the aircraft overflies the step pseudo-waypoint without commencing a climb or a descent, the system deletes the step from the vertical F-PLN automatically (a "STEP DELETED" message is displayed on the MCDU scratchpad), and recomputes the predictions.

The step is not deleted if the FCU altitude is moved only partially towards the step altitude.

The flight phase remains "cruise" whenever a step is initiated.

Note: For an altitude restriction defined at a waypoint less than 50 NM before the top of descent and lower than the CRZ FL, it is recommended to enter an altitude constraint rather than a step.

IMMEDIATE CHANGE OF LEVEL IN CRUISE

Ident.: PRO-NOR-SRP-01-50-00003997.0001001 / 14 FEB 11

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

When the pilot changes his flight level without inserting a step:

- If the FCU-selected altitude is above the previous CRZ FL, the CRZ FL on the PROG page changes to the new flight level.
- If the FCU-selected altitude is lower than the previous CRZ FL and if the distance to DEST is more than 200 NM, the CRZ FL on the PROG page changes.

In that case Mach target is managed as follows:

- At the start of the descent, the Mach target is the managed Mach number at the initial cruise flight level.
- When the aircraft reaches the new flight level, the Mach target switches either to the Mach number for the lower CRZ FL, or to the speed for the lower CRZ FL if the aircraft reaches the crossover altitude. This logic prevents the aircraft from exceeding VMO during descent.
- If the FCU-selected altitude is lower than the previous CRZ FL and the aircraft is within 200 NM of its destination, the system activates the descent phase.

The pilot may reactivate the cruise phase by entering a new cruise flight level in the PROG page.

PROCEDURES**NORMAL PROCEDURES**

SYSTEMS RELATED PROCEDURES - FMS

IMMEDIATE CHANGE OF LEVEL IN CRUISE

Ident.: PRO-NOR-SRP-01-50-00003997.0002001 / 14 FEB 11

Applicable to: MSN 02926-02944, 04392, 07784-07792

When the flight crew changes the flight level through a FCU altitude selection:

- If the FCU-selected altitude is above the previous CRZ FL, the CRZ FL on the PROG page changes to the new flight level.
- If the FCU-selected altitude is lower than the previous CRZ FL and if the distance to DEST is more than 200 NM, the CRZ FL on the PROG page changes.

In that case Mach target is managed as follows:

- At the start of the descent, the Mach target is the managed Mach number at the initial cruise flight level.
- When the aircraft reaches the new flight level, the Mach target switches either to the Mach number for the lower CRZ FL, or to the speed for the lower CRZ FL if the aircraft reaches the crossover altitude. This logic prevents the aircraft from exceeding VMO during descent.
- If the FCU-selected altitude is lower than the previous CRZ FL and the aircraft is within 200 NM of its destination, the system activates the descent phase.

The pilot may reactivate the cruise phase by entering a new cruise flight level in the PROG page.

CAUTION

If the pilot modifies the CRZ FL on the PROG page without setting the FCU altitude, the FMS may target a Speed/Mach above VMO/MMO.
Changing the FCU altitude makes the FMS behavior become correct again.

PREPARATION FOR DESCENT AND APPROACH

Ident.: PRO-NOR-SRP-01-50-B-00003998.0001001 / 09 DEC 09

Applicable to: ALL

GENERAL

The preparation for descent and approach consists of :

- Entering PERF and WIND data
- Defining the lateral and vertical F-PLN
- Checking the tuning (auto or manual) of the appropriate nav aids

After receiving the arrival information, the flight crew should use the following procedure.

REVISION OF LATERAL F-PLN

1 ← SELECTION

2 → SELECTION

3 → SELECTION

LAT REV FROM EGLL
 51°28.6N/000°25.9W
 ARRIVAL>

NEXT WPT
 []

ARRIVAL TO EGLL →

APPL	VIA	STAR
-----	-----	-----
TRANS		

APPR AVAILABLE		
←ILS27L	3658M	
275	ILL/109.50	
←ILS27R	3902M	
275	IRR/110.30	
←05	2357M	
047		
<RETURN		

↑↓

ARRIVAL TO EGLL

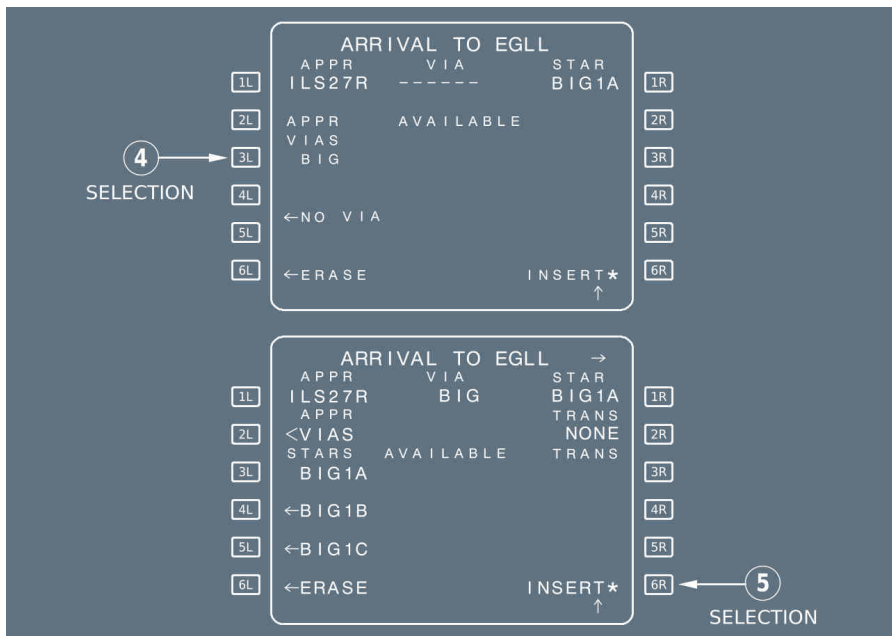
APPR	VIA	STAR
ILS27R	-----	-----
APPR	-----	TRANS
<VIAS	-----	-----
STARS	AVAILABLE	TRANS
←BIG1A		
←BIG1B		
←BIG1C		
←ERASE		INSERT*

↑

PROCEDURES

NORMAL PROCEDURES

SYSTEMS RELATED PROCEDURES - FMS



PERFORM a lateral revision at destination

SELECT an ARRIVAL

SELECT an APPROACH, a STAR, a TRANSITION, a VIA.

When the pilot selects successive items, the page are automatically sequenced. But pressing "NEXT PAGE" key brings up the APPR and STAR page successively.

CHECK the temporary revision including the missed approach.

INSERT the temporary revision, [6R] key.

Ident.: PRO-NOR-SRP-01-50-B-00003999.0015001 / 22 MAY 12

Applicable to: MSN 02926-02944, 04392, 07784-07792

REVISION OF LATERAL F-PLN

1 ← SELECTION

2 → SELECTION

3 → SELECTION

LAT REV FROM EGLL
 51° 28' 6N / 000° 25' 9W
 ARRIVAL>
 NEXT WPT
 []

ARRIVAL TO EGLL →

APPL	VIA	STAR
-----	-----	-----
TRANS		

APPR	AVAILABLE	
← ILS27L	3658M	CRS275
	ILL / 109.50	
← ILS27R	3902M	CRS275
	IRR / 110.30	
← 05	2357M	
	047	
← RETURN		

↑↓

ARRIVAL TO EGLL

APPR	VIA	STAR
-----	-----	-----
ILS27R		
APPR		TRANS

<VIAS		
STARS	AVAILABLE	TRANS
← BIG1A		
← BIG1B		
← BIG1C		
← TMPY		
← F-PLN		

↑↓

PROCEDURES

NORMAL PROCEDURES

SYSTEMS RELATED PROCEDURES - FMS

④ →

SELECTION

ARRIVAL TO EGLL

APPR	VIA	STAR
ILS27R	-----	TOENB
APPR	VIA	
←BIG		
←BIG-L		
←BIG-R		
←NO VIA		
←RETURN		

↑ ↓

1R

2R

3R

4R

5R

6R

1L

2L

3L

4L

5L

6L

ARRIVAL TO EGLL →

APPR	VIA	STAR
ILS27R	BIG-L	BIG1A
APPR		TRANS
<VIAS		NONE
STARS	AVAILABLE	TRANS
BIG1A		
←BIG1B		
←BIG1C		
TMPY		TMPY
←ERASE		INSERT *

↑

1R

2R

3R

4R

5R

6R

⑤ ←

SELECTION

PERFORM a lateral revision at destination

SELECT an ARRIVAL prompt.

SELECT an APPROACH.

SELECT A STAR.

If a desired, call up VIA subpage by pressing [2L] prompt on STAR page and SELECT a VIA.

Note: When the pilot selects successive items, the page are automatically sequenced. But pressing "→" key brings up the APPR and STAR page successively.

CHECK and INSERT the TMPY F-PLN or continue with next revision.

PREPARATION FOR DESCENT AND APPROACH - REVISION OF VERTICAL FLIGHT PLAN

Ident.: PRO-NOR-SRP-01-50-B-00004000.0001001 / 22 MAY 12

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

REVISION OF VERTICAL FLIGHT PLAN

CHECK that the speed and altitude constraints as displayed on the ND. (Use the CSTR pushbutton).

PROCEDURES

NORMAL PROCEDURES

SYSTEMS RELATED PROCEDURES - FMS

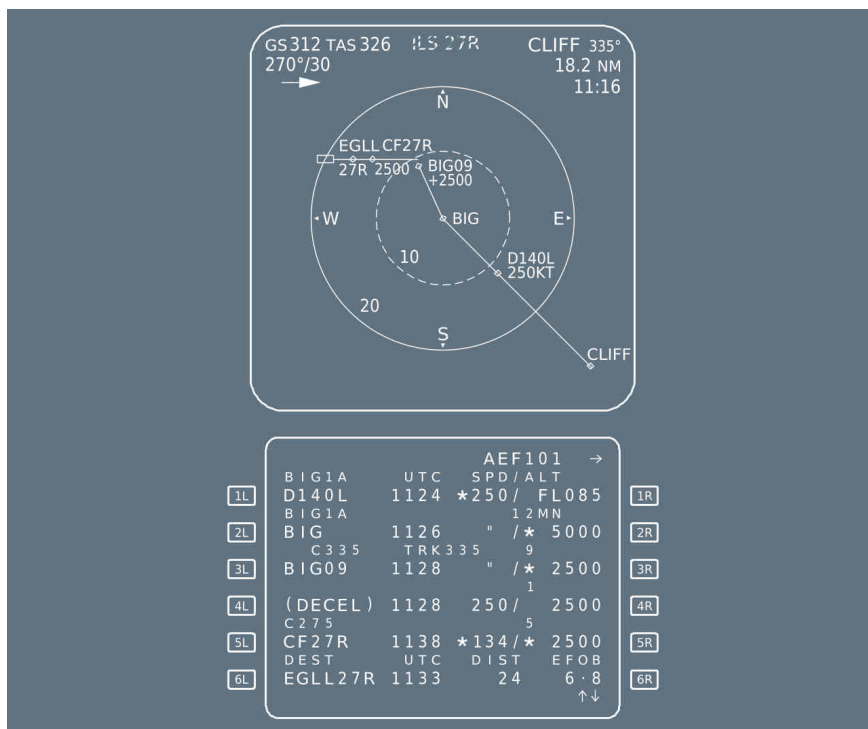
ENTER any additional speed or altitude constraints using the vertical revision page.

In order not to be too fast when commencing the approach, you may insert a speed constraint at the FAF (Final Approach Fix).

When all computations are completed.

REVIEW the flight plan, using the approach chart.

Note: : When the crew changes the approach or the destination runway, and if the previously selected approach procedure is compatible with the new one, the system automatically inserts it in the temporary F-PLN.



PREPARATION FOR DESCENT AND APPROACH - ENTERING THE WINDS FOR DESCENT

Ident.: PRO-NOR-SRP-01-50-B-00004001.0002001 / 05 JUN 18

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

ENTERING THE WINDS FOR DESCENT

Refer to DSC-22_20-30-20-25 Wind - Temperature - QNH - General.

Ident.: PRO-NOR-SRP-01-50-B-00004001.0003001 / 05 JUN 18

Applicable to: MSN 02926-02944, 04392, 07784-07792

ENTERING THE WINDS FOR DESCENT

Refer to DSC-22_20-30-20-28 Wind - Temperature - QNH - General.

PREPARATION FOR DESCENT AND APPROACH - ENTERING AN AUTO SPEED

Ident.: PRO-NOR-SRP-01-50-B-00004002.0002001 / 22 MAY 12

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

PRESELECTING A MANAGED SPEED/MACH

As long as the descent phase is not active, the PERF DES page may either be used to select a speed, or a Mach number, or both, to replace the optimum descent speed.

The Flight Guidance Computer then uses the entered speed, instead of the optimum speed for computing the descent profile.

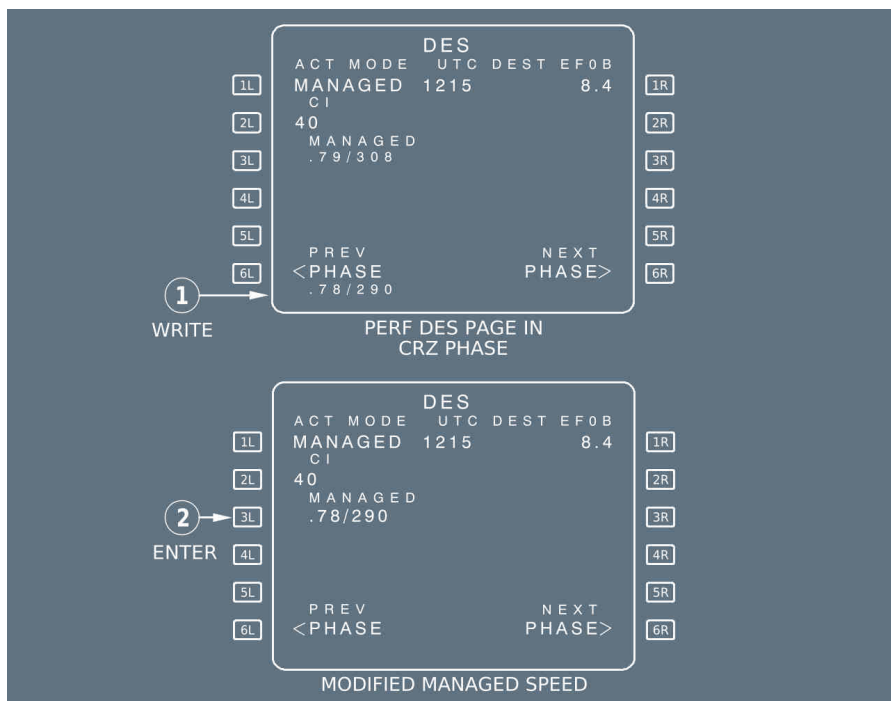
When the system switches to the descent phase, it sets the MANAGED target speed to the entered speed. From there, the speed may only be modified by using the FCU selector knob.

Once in descent phase, the pilot cannot modify the MANAGED speed again.

PROCEDURES

NORMAL PROCEDURES

SYSTEMS RELATED PROCEDURES - FMS



PROCEDURE

PRESS the PERF on MCDU.

SELECT the “NEXT PHASE” prompt.

WRITE the descent speed into the scratchpad and ENTER it.

The 3L field displays the imposed managed speed value.

Ident.: PRO-NOR-SRP-01-50-B-00004002.0009001 / 22 MAY 12

Applicable to: MSN 02926-02944, 04392, 07784-07792

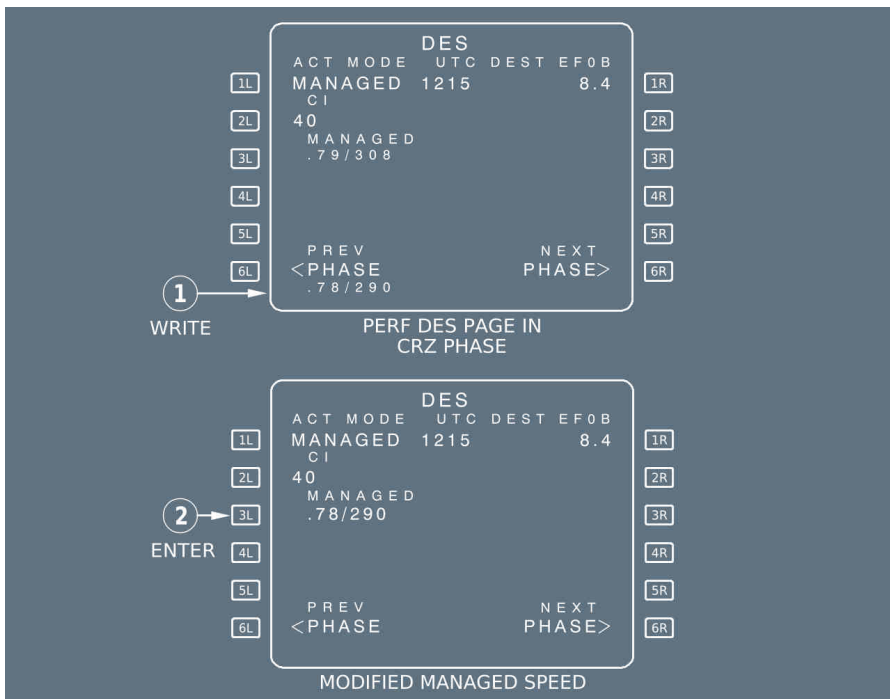
PRESELECTING A MANAGED SPEED/MACH

The PERF DES page may either be used to select a speed, or a Mach number, or both, to replace the optimum descent speed.

The Flight Guidance Computer then uses the entered speed, instead of the optimum speed for computing the descent profile.

When the system switches to the descent phase, it sets the MANAGED target speed to the entered speed. From there, the speed may only be modified by using the FCU selector knob.

Once in descent phase, the pilot cannot modify the MANAGED speed again.



PROCEDURE

PRESS the PERF on MCDU.

SELECT the “NEXT PHASE” prompt.

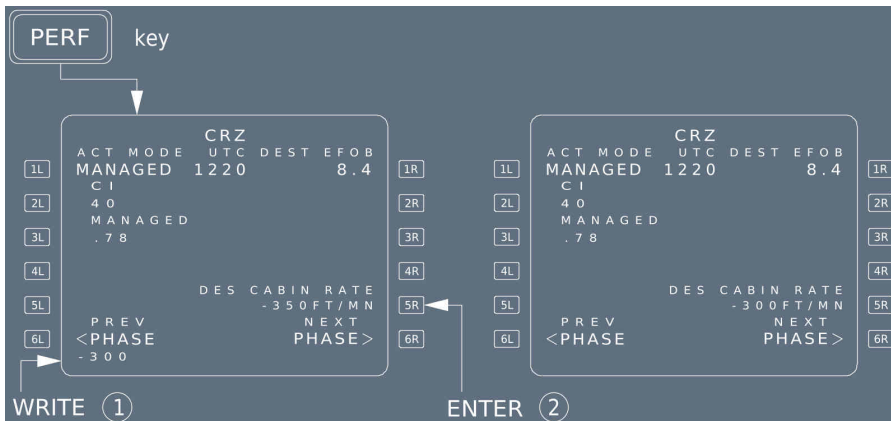
WRITE the descent speed into the scratchpad and ENTER it.

The 3L field displays the imposed managed speed value.

Ident.: PRO-NOR-SRP-01-50-B-00004003.0004001 / 16 NOV 11

Applicable to: MSN 02926-02944, 04392, 07784-07792

MODIFICATION OF THE CABIN RATE



PROCEDURE

PRESS the MCDU's PERF.

WRITE the new cabin rate in the scratchpad.

ENTER it in the [5R] field.

PREPARATION FOR DESCENT AND APPROACH - ENTERING THE APPROACH DATA

Ident.: PRO-NOR-SRP-01-50-B-00004004.0010001 / 22 MAY 12

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

ENTERING THE APPROACH DATA

From PERF DES page, SELECT "NEXT PHASE" [6R] key to display the APPR page.

ENTER QNH, TEMP, WIND at destination (magnetic north reference), minimum in the RADIO or BARO fields.

(The PFD displays the entered BARO or RADIO minimum value, only when the distance to destination is less than 250 NM).

PROCEDURES

NORMAL PROCEDURES

SYSTEMS RELATED PROCEDURES - FMS

CHECK and, if necessary, MODIFY

- LDG CONF (landing configuration),
- VAPP (the FM-computed value may be modified),
- TRANS ALT (transition altitude).

1L	DEST ONH	APPR FLP RETR	FINAL F=135 ILS 27R	1R
2L	TEMP	SLT RETR	BARO	2R
3L	MAG WIND	CLEAN	RADIO	3R
4L	TRANS ALT	LDG CONF	CONF 3*	4R
5L	VAPP	VLS	FULL	5R
6L	PREV	NEXT	PHASE	6R

The scratchpad displays “ENTER DEST DATA” if the approach page is not completed when the aircraft is 180 NM from destination.

SELECT “NEXT PHASE” in order to display the GO AROUND page.

CHECK and, if necessary, MODIFY the THR RED ALT and the ACC ALT.

1L	GO AROUND			1R
2L	FLP RETR	F=134		2R
3L	SLT RETR	S=176		3R
4L	CLEAN	O=190		4R
5L	THR RED/ACC	ENG OUT	ACC	5R
6L	1580/1580	1580		6R
	PREV			
	<PHASE			

Ident.: PRO-NOR-SRP-01-50-B-00004004.0027001 / 19 APR 17

Applicable to: MSN 02926-02944, 04392, 07784-07792

ENTERING THE APPROACH DATA

From PERF DES page, SELECT “NEXT PHASE” [6R] key to display the APPR page.

ENTER QNH, TEMP, WIND at destination (magnetic north reference), minimum in the RADIO or BARO fields.

(The PFD displays the entered BARO or RADIO minimum value, only when the distance to destination is less than 250 NM).

CHECK and, if necessary, MODIFY the LDG CONF (landing configuration)

CHECK, and if necessary MODIFY the VAPP

The FMS-computed value may be modified

CHECK the TRANS FL value

(see note 1 below)

1L	DEST	APPR	1R
2L	QNH	FLP RETR	2R
3L	1014	F=135	3R
4L	TEMP	SLT RETR	4R
5L	12°	S=175	5R
6L	MAG WIND	CLEAN	6R
	270°/ 15	O=190	
	TRANS FL	LDG CONF	
	FL45	CONF3*	
	VAPP	VLS	
	129	124	
	PREV	FULL	
	<PHASE	NEXT	
		PHASE >	

Note: 1. The default TRANS FL value is computed by the FMS based on:

- The Transition Altitude of the destination airport (extracted from the NAV Database),
- The QNH value entered on PERF APPR page. Due to the internal FMS computation of altitude constraints, it is rounded to the upper multiple of 5.

If this computed TRANS FL value differs by more than 500 ft from the Transition Level specified on the approach chart or reported by ATC, the flight crew may modify the TRANS FL value.

2. The scratchpad displays "ENTER DEST DATA" if the PERF APPR page has not been completed when the aircraft is less than 180 NM from destination.

SELECT "NEXT PHASE" in order to display the GO AROUND page.

PROCEDURES

NORMAL PROCEDURES

SYSTEMS RELATED PROCEDURES - FMS

CHECK and, if necessary, MODIFY the THR RED ALT and the ACC ALT.

1L	GO AROUND FLP RETR F=134 SLT RETR S=176 CLEAN O=190 THR RED/ACC ENG OUT ACC 1580 / 1580 1580 PREV <PHASE		1R
2L			2R
3L			3R
4L			4R
5L			5R
6L			6R

Ident.: PRO-NOR-SRP-01-50-B-00004005.0001001 / 22 MAY 12

Applicable to: **ALL**

SELECTING THE RADIO NAVAIDS

CHECK or SELECT the NAVAIDS appropriate for the approach.

For an ILS procedure, the ILS will be autotuned.

NDBs must be manually entered.

Note: When the destination has a VOR/DME, ENTER it manually in the VOR field. ENTER its identifier in the BRG/DIST field of the PROG page. This allows you to perform a permanent NAV accuracy check.

1L	RADIO NAV VOR1/FREQ FREQ/VOR2 BIG / 115.1 115.1 / BIG CRS CRS 075 [] ILS / FREQ IRR / 110.30 CRS 275 ADF1/FREQ FREQ/ADF2 TOE / 389.5 [] / [] ←ADF1 BFO		1R
2L			2R
3L			3R
4L			4R
5L			5R
6L			6R

Ident.: PRO-NOR-SRP-01-50-B-00004006.0003001 / 08 DEC 16

Applicable to: ALL

COST INDEX FOR LONG-RANGE CRUISE

The flight crew can use the table below to find an approximate Cost Index value that is calculated for cruise at long-range cruise speed. This value is valid for CRZ FL = OPT ALT $\pm$ 1 000 ft.

AIRCRAFT	ENGINE	CILRC	
		kg/min	100 lb/h
A318/A319/A320/A321	CFM 56-5-A1/A3	45	60
	CFM 56-5-A4/A5	40	55
	CFM 56-5-B1/B2/B3	65	85
	CFM 56-5-B4 (A321)	65	85
	CFM 56-5-B4 (A320)	55	75
	CFM 56-5-B4/P	25	35
	CFM 56-5-B5/B6/B7	25	35
	CFM 56-5-B5/2P CFM 56-5-B6/2P CFM 56-5-B7/2P	30	40
	CFM 56-5-B8/B9	15	20
	CFM LEAP-1A	40	55
	PW6122/PW6124	20	30
	PW1100G-JM	40	55
	V2500-A1	45	60
	V2522-A5/V2524-A5/ V2527M-A5	50	70
	V2530-A5/V2533-A5	50	70
	V2527-A5/V2527E-A5	40	55

PROCEDURES

NORMAL PROCEDURES

SYSTEMS RELATED PROCEDURES - FMS

Intentionally left blank

Descent

DESCENT INITIATION

Ident.: PRO-NOR-SRP-01-60-00004007.0001001 / 17 MAY 21

Applicable to: ALL

The top of descent, displayed on the F-PLN page (T/D) and on the ND (ND), is a position that the system calculates, assuming that the aircraft will begin its descent in DES mode with managed speed, and that the system will guide the aircraft along the descent profile computed with all the vertical F-PLN data (ALT CSTR, ECON or AUTO MACH/SPD, SPD CSTR, SPD LIMIT) to reach VAPP at 1 000 ft AGL.

Note: The ND does not display the top of descent when HDG (or TRACK) mode is engaged.

PROCEDURES

- **When the aircraft reaches the top of descent (T/D) :**

SELECT the altitude target.

PUSH the ALT selector knob. DES mode engages.

CHECK the FMA annunciators.

DESCENT MONITORING

DESCENT MONITORING - DES MODE ENGAGED

Ident.: PRO-NOR-SRP-01-60-A-00004008.0007001 / 06 JUN 16

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

DES MODE ENGAGED

When DES mode is engaged, NAV mode is engaged, and the system takes into account all altitude and speed constraints of the F-PLN.

The key parameter for monitoring the descent is the vertical deviation (VDEV) displayed on the PFD and on the PROG page, which indicates whether the aircraft is on, above, or below the descent profile.

PROCEDURE

SET the ATC-cleared altitude on the FCU (considering also what is the safe altitude).

If the lowest safe altitude is higher than the ATC-cleared altitude, check with ATC that this constraint applies.

If it is confirmed, SET the FCU altitude to the safe altitude until it is safe to go to the ATC-cleared altitude.

MONITOR vertical deviation (VDEV) on the PFD and the PROG page.

PROCEDURES

NORMAL PROCEDURES

SYSTEMS RELATED PROCEDURES - FMS

MONITOR the speed change that occurs, when the aircraft reaches a speed change symbol (magenta ball) under managed speed.

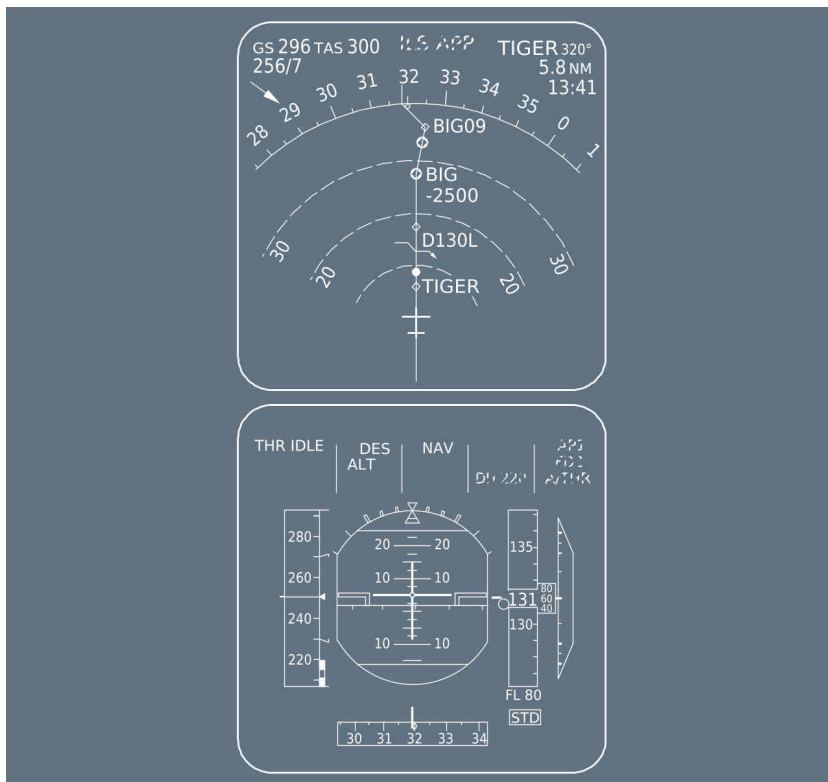
MONITOR the FMA (ALT*, ALT CST*, ALT, ALT CST), when the aircraft reaches level symbols.

■ If the aircraft is on the descent profile:

The aircraft is considered to be on the vertical profile, when it is within 50 ft of it. VDEV is close to zero, and the system predicts that it will match constraints until the aircraft levels off at the next FCU altitude.

MONITOR the predicted descent point after the next level-off.

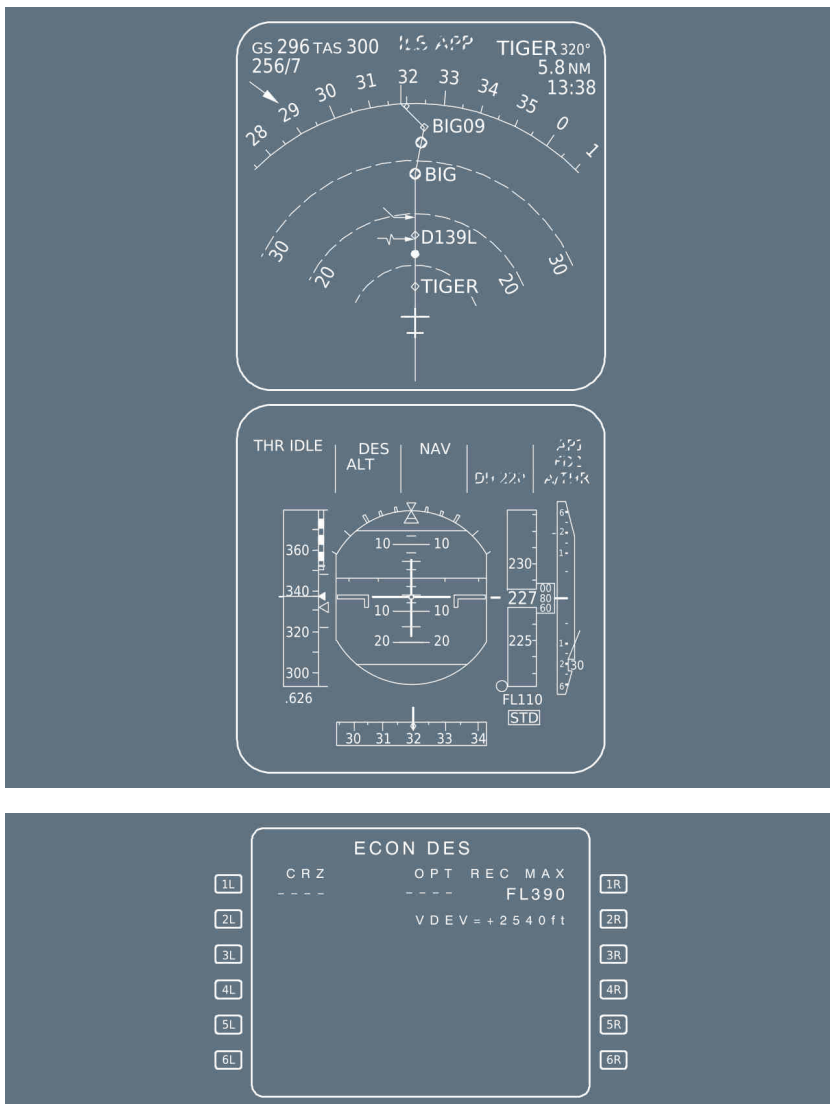
A/THR adjusts thrust for the particular segment. The first FMA column may display "THR IDLE" or "SPEED".



■ If the aircraft is above the descent profile:

VDEV is down on the PFD and positive on the PROG page.

A/THR sets IDLE thrust and the AP increases speed by calling for down elevator. If the aircraft reaches the upper limit of the managed speed range, the aircraft diverges and maintains the upper limit speed.



PROCEDURES

NORMAL PROCEDURES

SYSTEMS RELATED PROCEDURES - FMS

Procedure

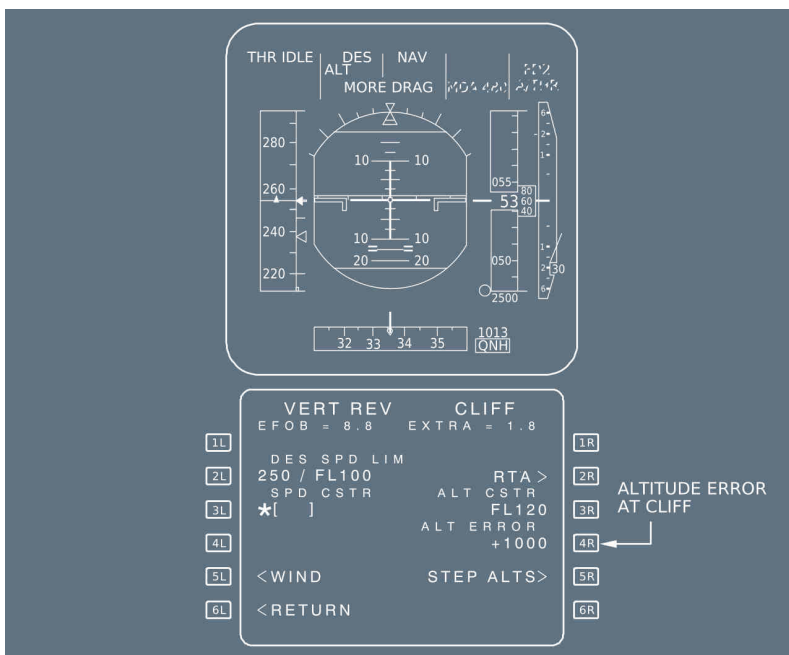
SELECT a descent speed higher than the upper limit when possible.

MONITOR the intercept symbol 

When this symbol reaches the next ALT CSTR waypoint, "MORE DRAG" appears on the PFD, indicating that speedbrakes must be extended in order to match the next altitude constraint. This is an advisory message.

Note: With DPO , when above the descent profile, the flight crew may have to extend the speed brakes in order to go back on the descent profile.

- If an **altitude constraint** is predicted to be missed by more than 250 ft, the vertical revision page shows ALT ERROR at the waypoint.



- If a **speed constraint** is predicted to be missed by more than 10 kt:
 SELECT an appropriate speed.
 RESUME managed speed when the aircraft is back on the descent path.

■ **If the aircraft is below the descent profile:**

VDEV is up on the PFD and negative on the PROG page. The system maintains the target speed (managed or selected speed).

MONITOR the intercept symbol ([V-I]) on the ND and any leveling off at the next ALT CSTR.

● **If the aircraft is flying at an altitude that is higher than both the descent speed limit altitude and the destination elevation +5 000 ft:**

The FMGS maintains the V/S at -1 000 ft/min and the target speed, until the aircraft reaches the altitude constraint or intercepts the descent profile.

● **If the aircraft is flying at an altitude that is lower than either the descent speed limit altitude, or the destination elevation +5 000 ft:**

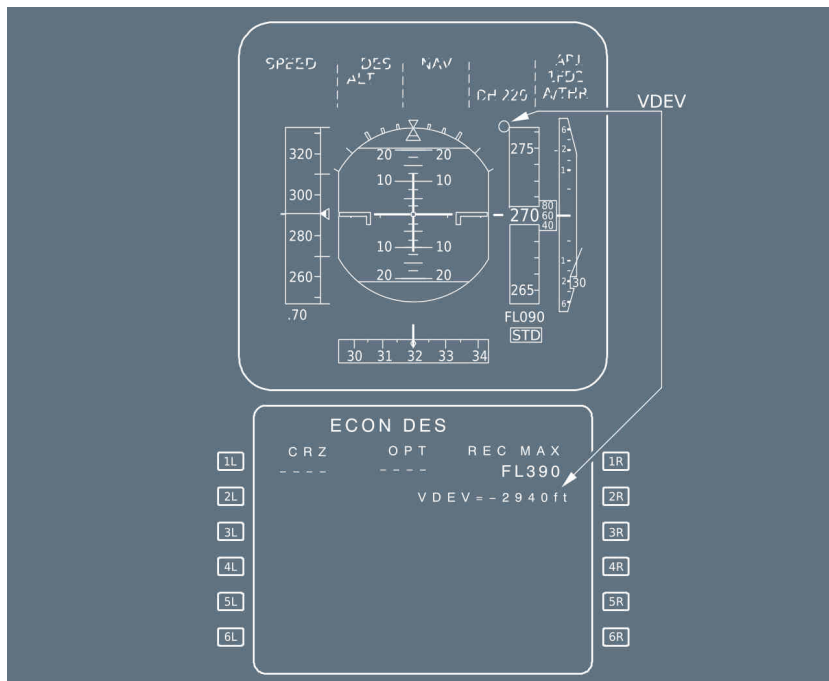
The FMGS maintains the V/S at -500 ft/min and the target speed, until the aircraft reaches the altitude constraint or intercepts the descent profile.



PROCEDURES

NORMAL PROCEDURES

SYSTEMS RELATED PROCEDURES - FMS



● **If the rate of descent has to be increased (ATC requirement):**

SELECT OP DES mode

Increase the target speed or extend the speedbrakes.

Ident.: PRO-NOR-SRP-01-60-A-00004008.0032001 / 13 MAY 25

Applicable to: MSN 02926-02944, 04392, 07784-07792

DES MODE ENGAGED

When DES mode is engaged, NAV mode is engaged, and the system takes into account all altitude and speed constraints of the F-PLN.

The key parameter for monitoring the descent is the vertical deviation (VDEV) displayed on the PFD and on the PROG page, which indicates whether the aircraft is on, above, or below the descent profile.

PROCEDURE

SET the ATC-cleared altitude on the FCU (considering also what is the safe altitude).

If the lowest safe altitude is higher than the ATC-cleared altitude, check with ATC that this constraint applies.

If it is confirmed, SET the FCU altitude to the safe altitude until it is safe to go to the ATC-cleared altitude.

MONITOR vertical deviation (VDEV) on the PFD and the PROG page.

MONITOR the speed change that occurs, when the aircraft reaches a speed change symbol (magenta ball) under managed speed.

MONITOR the FMA (ALT*, ALT CST*, ALT, ALT CST), when the aircraft reaches level symbols.

■ **If the aircraft is on the descent profile:**

The aircraft is considered to be on the vertical profile, when it is within 50 ft of it. VDEV is close to zero, and the system predicts that it will match constraints until the aircraft levels off at the next FCU altitude.

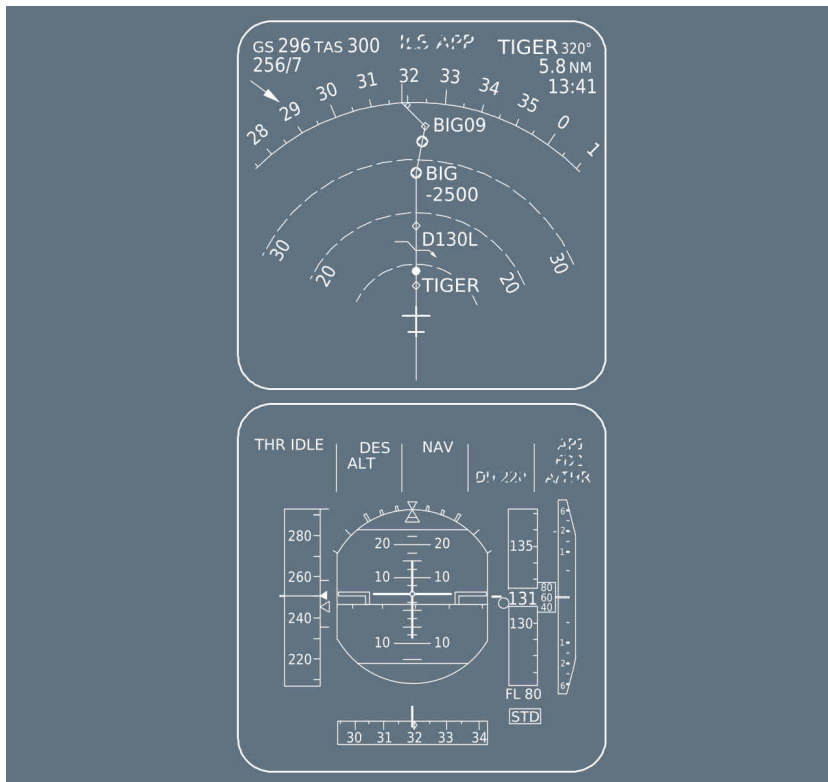
MONITOR the predicted descent point after the next level-off.

A/THR adjusts thrust for the particular segment. The first FMA column may display "THR IDLE" or "SPEED".

PROCEDURES

NORMAL PROCEDURES

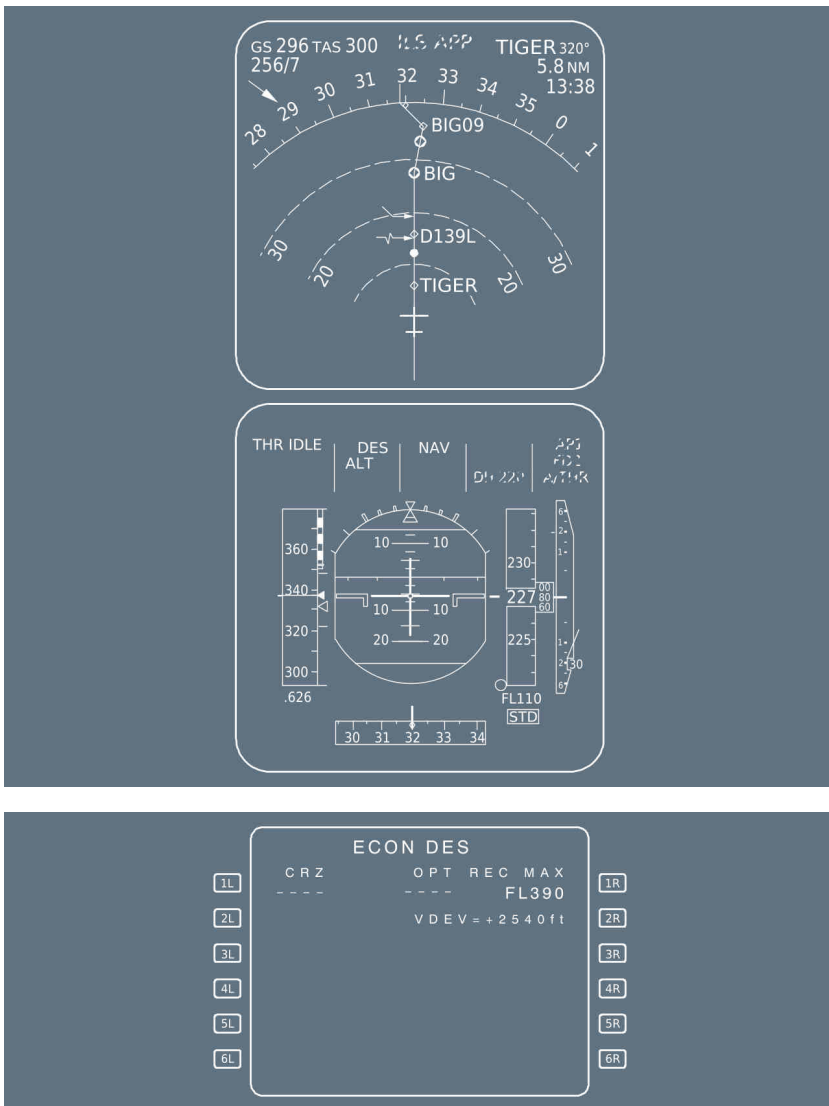
SYSTEMS RELATED PROCEDURES - FMS



■ If the aircraft is above the descent profile:

VDEV is down on the PFD and positive on the PROG page.

A/THR sets IDLE thrust and the AP increases speed by calling for down elevator. If the aircraft reaches the upper limit of the managed speed range, the aircraft diverges and maintains the upper limit speed.



Procedure

SELECT a descent speed higher than the upper limit when possible.

PROCEDURES

NORMAL PROCEDURES

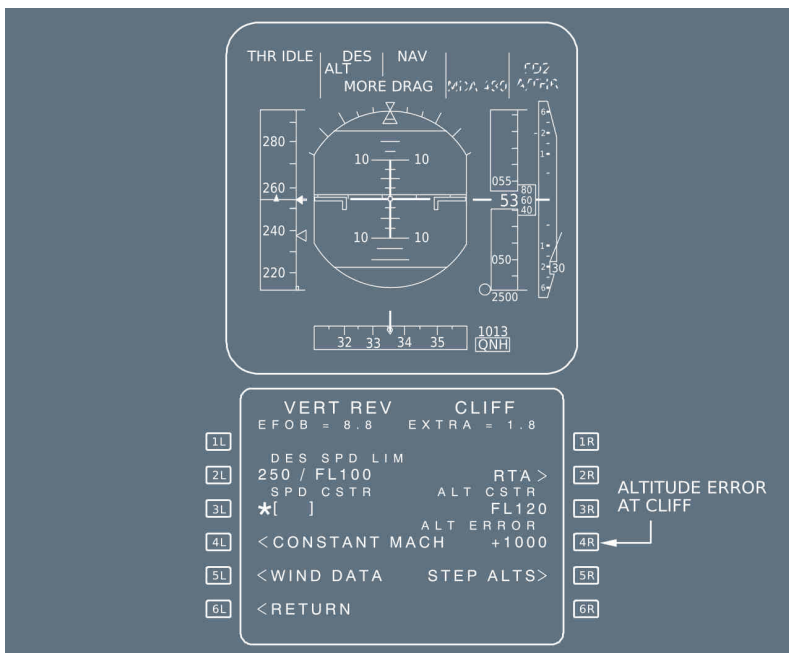
SYSTEMS RELATED PROCEDURES - FMS

MONITOR the intercept symbol .

When this symbol reaches the next ALT CSTR waypoint, “MORE DRAG” appears on the PFD, indicating that speed brakes must be extended in order to match the next altitude constraint. This is an advisory message.

Note: With DPO , when above the descent profile, the flight crew may have to extend the speed brakes in order to go back on the descent profile.

- If an **altitude constraint** is predicted to be missed by more than 250 ft the vertical revision page shows ALT ERROR at the waypoint.



- If a **speed constraint** is predicted to be missed by more than 10 kt:
 SELECT an appropriate speed.
 RESUME managed speed when the aircraft is back on the descent profile.

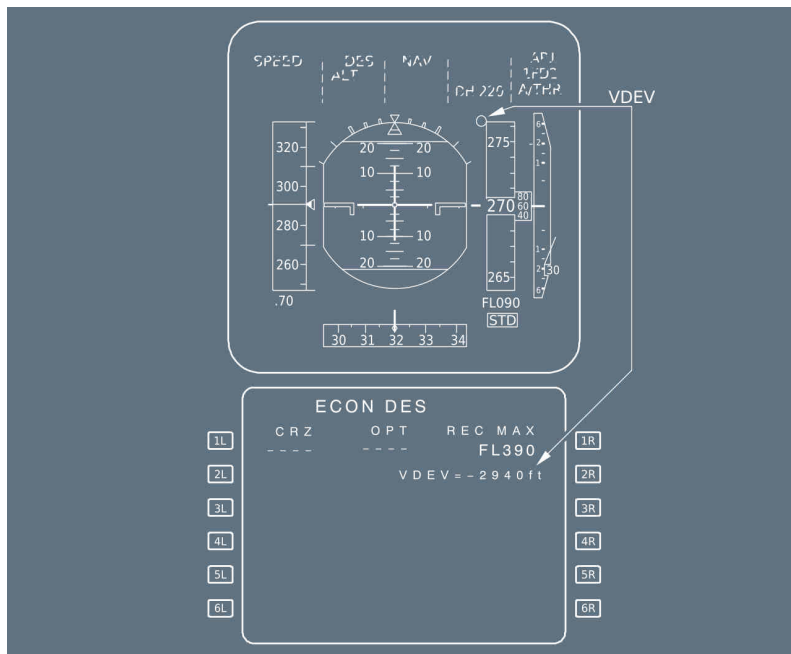
- If the aircraft is below the descent profile
 VDEV is up on the PFD and negative on the PROG page. The system maintains the target speed (managed or selected speed).

MONITOR the intercept symbol () on the ND and any leveling off at the next ALT CSTR.

PROCEDURES

NORMAL PROCEDURES

SYSTEMS RELATED PROCEDURES - FMS



● **If the rate of descent has to be increased (ATC requirement):**

SELECT OP DES mode

Increase the target speed or extend the speed brakes.

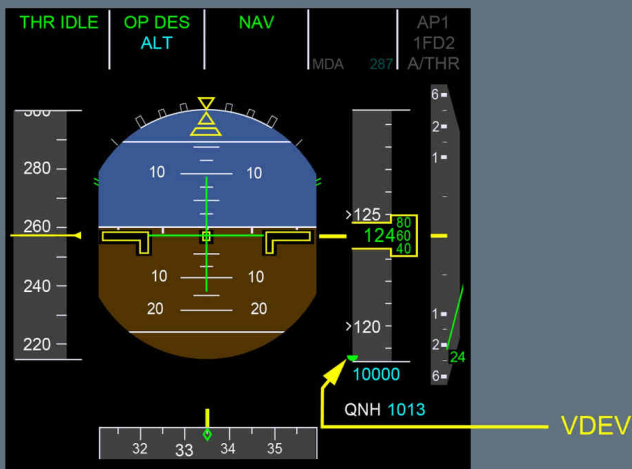
DESCENT MONITORING - OP DES, V/S OR FPA MODE ENGAGED

Ident.: PRO-NOR-SRP-01-60-A-00004009.0007001 / 03 NOV 21

Applicable to: MSN 02926-02944, 04392, 07784-07792

OP DES, V/S OR FPA MODE ENGAGED

- In either case, the aircraft is no longer guided on the descent profile and altitude constraints are disregarded. If **NAV** mode is engaged, the ND displays a white circle on waypoint with an altitude constraint. If **NAV** mode is disengaged, the circle is removed.
- The PFD still shows VDEV for reference purposes
- The target altitude is always the FCU selected altitude (shown in blue).
On the ND, level-off symbol is blue (no constraint). If **NAV** mode is engaged and the speed target managed, speed constraints are considered.



When **HDG** or **TRK** mode is engaged, vertical position may also be assessed on the ND using the energy circle. It is displayed as a green arc oriented on the current track and centered on the aircraft current position.

Note: Altitude and speed predictions displayed on the F-PLN page assume an immediate return to **DES** mode.

PROCEDURES

NORMAL PROCEDURES

SYSTEMS RELATED PROCEDURES - FMS

PROCEDURE

SET the FCU altitude as cleared by ATC, while considering the applicable safe altitude.

L2 *If the next safe altitude is above the ATC-cleared altitude, check with the ATC to verify that this constraint applies.*

If confirmed, set the FCU altitude to the safe altitude, until it is safe to fly at the cleared altitude.

L1 MONITOR the speed target, when the aircraft reaches the speed change symbol.

MONITOR the **ALT*** or **ALT** mode, upon reaching the level symbol.

When in **HDG/TRK** mode, MONITOR the energy circle on the ND.

The predictions presented on the F-PLN page take into account the SPD/ALT constraints.

Those predictions assume that **DES** mode is immediately re-engaged.

CHECK the predictions before re-engaging **DES** mode (in order to resume the descent profile).

L2 Note: *VDEV is available on the PFD even in **HDG** mode, it is a valuable tool for monitoring the descent, as long as XTK is less than 4 NM.*

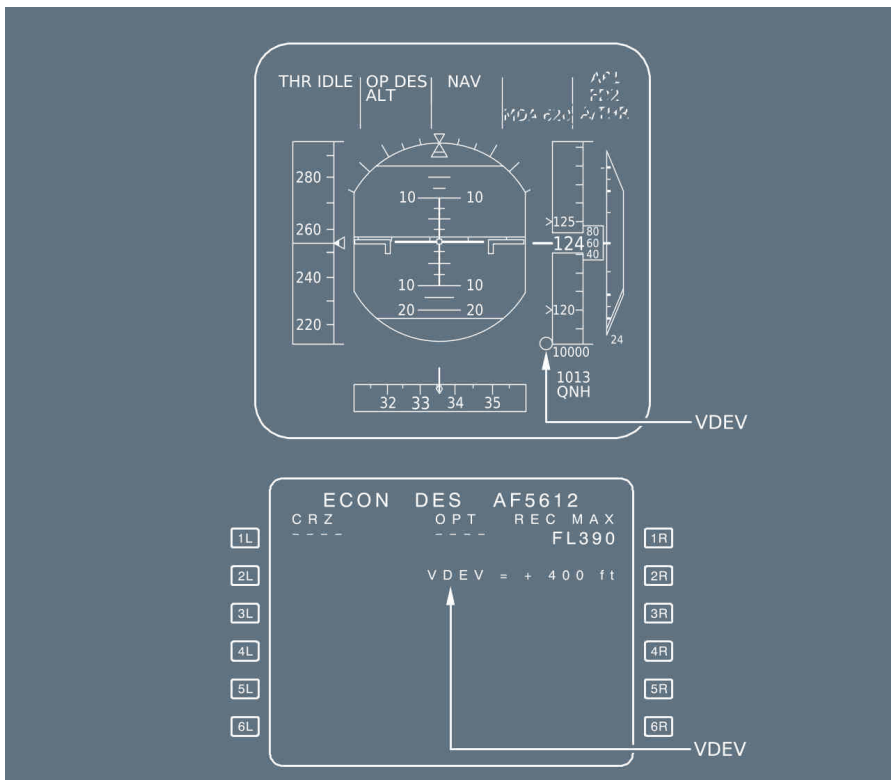
*The aircraft automatically decelerates for approach, only if it flies over the **DECEL** pseudo waypoint with **NAV** mode engaged (or **LOC***, **LOC**, **F-LOC*** , **F-LOC** ).*

Ident.: PRO-NOR-SRP-01-60-A-00004009.0002001 / 22 MAY 12

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

OP DES, V/S OR FPA MODE ENGAGED

- In either case, the aircraft is no longer guided on the descent profile and altitude constraints are disregarded. If NAV mode is engaged the ND displays a white circle on waypoint with an altitude constraint. If NAV mode is disengaged, the circle is removed.
- The PFD still shows VDEV for reference purposes.
- The target altitude is always the FCU selected altitude (shown in blue).
On the ND, level-off symbol is blue (no constraint). If NAV mode is engaged and the speed target managed, speed constraints are considered.



When HDG or TRK mode is engaged, vertical position may also be assessed on the ND using the energy circle. It is displayed as a green arc oriented on the current track and centered on the aircraft current position.

Note: Altitude and speed predictions displayed on the F-PLN page assume an immediate return to DES mode.

PROCEDURE

SET the FCU altitude as cleared by ATC, while considering the applicable safe altitude.

If the next safe altitude is higher than the ATC-cleared altitude, check with the ATC to verify that this constraint applies.

If confirmed, set the FCU altitude to the safe altitude, until it is safe to fly at the cleared altitude.

MONITOR the speed target, when the aircraft reaches the speed change symbol.

MONITOR the FMA ALT*, ALT, upon reaching the level symbol.

PROCEDURES

NORMAL PROCEDURES

SYSTEMS RELATED PROCEDURES - FMS

When in HDG/TRK mode, MONITOR the energy circle  on the ND.

The MCDU F-PLN page presents SPD/ALT constraint-matching predictions, which assume that DES mode is immediately re-engaged.

CHECK the predictions before re-engaging DES mode (in order to resume the descent profile).

Note: VDEV is available on the PFD even in HDG mode; it is a valuable tool for monitoring the descent, as long as crosstrack error (XTK) is less than 5 NM.

The aircraft automatically decelerates for approach, only if it flies over the DECEL pseudo waypoint with NAV mode engaged (or LOC*, LOC).

EXPEDITE DESCENT (IF INSTALLED)

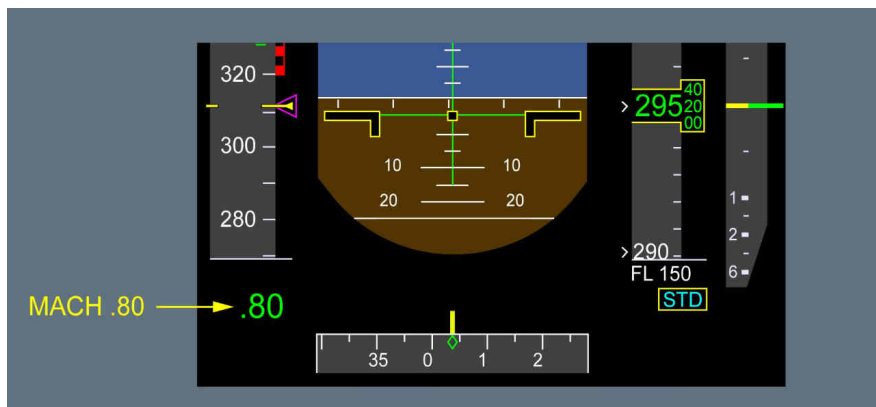
Ident.: PRO-NOR-SRP-01-60-00004010.0001001 / 10 MAY 21

Applicable to: ALL

● When ATC requires a rapid descent:

PUSH the EXPED pb .

FG pitches the aircraft to acquire and maintain M 0.80/340 kt. FG orders a pitch rate that produces no more than 0.15 g. To resume normal descent, PUSH the ALT knob or engage any other vertical mode.



PROCEDURES**NORMAL PROCEDURES**

SYSTEMS RELATED PROCEDURES - FMS

MONITORING THE NAVIGATION IN THE TERMINAL CONTROL AREA

Ident.: PRO-NOR-SRP-01-60-00004012.0002001 / 14 FEB 11

Applicable to: ALL

If the MCDU “AREA RNP IS XX.X” message or “PROCEDURE RNP IS XX.X” message is displayed, the pilot will manually-entered RNP value in the REQUIRED field of the PROG page and clear or modify it, if it is not in accordance with the RNP value specified in the area (NAV or approach chart).

TOO STEEP PATH

Ident.: PRO-NOR-SRP-01-60-00004013.0007001 / 22 MAY 12

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

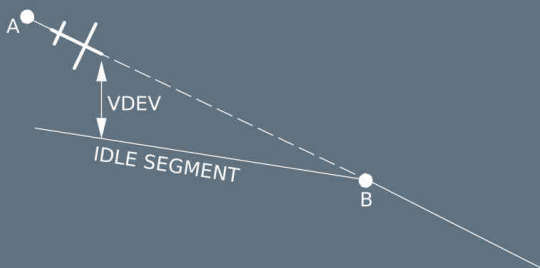
“TOO STEEP PATH AHEAD” appears on the MCDU scratchpad, when the system predicts this situation, and TOO STEEP PATH is displayed on the F-PLN page.

When the aircraft is crossing the first waypoint of a TOO STEEP PATH, the system computes a flyable descent profile (with an idle segment). The VDEV makes a jump because it is related to a new profile.

PROCEDURES

NORMAL PROCEDURES

SYSTEMS RELATED PROCEDURES - FMS



1L	VERT REV AT FIR96		1R
2L	EFOB=6.4 EXTRA=3.0		2R
3L	TOO STEEP PATH BEYOND		3R
4L	DES SPD LIM		4R
5L	250/FL100	RTA>	5R
6L	SPD CSTR	ALT CSTR	6R
	*[]	+FL260	
	<WIND	STEP ALTS>	
	<RETURN		

1L	UB191	UTC	SPD/ALT	1R
2L	ABB	1238	.78/FL330	2R
3L	(T/D)	1239	.79/FL330	3R
4L	BIG1A	TRK320° 21		4R
5L	FIR96	1242 310/ *	FL260	5R
6L	-----TOO STEEP PATH-----			6R
	BIG1A			
	CLIFF	1246 293/ *	FL120	
	DEST	UTC	DIST EFOB	
	EGLL27R	1301 149	6.1	
	TOO STEEP PATH AHEAD↑↓			

F.PLN A PAGE WITH A TOO STEEP PATH

PROCEDURE

- **When passing the first waypoint of the TOO STEEP PATH:**
 MONITOR VDEV and predictions at the next CSTR waypoint.
 If required, EXTEND the speedbrakes before seeing the "MORE DRAG" message.
 CONSIDER using a holding pattern, if necessary.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES NORMAL PROCEDURES SYSTEMS RELATED PROCEDURES - FMS
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TOO STEEP PATH

Ident.: PRO-NOR-SRP-01-60-00004013.0008001 / 22 MAY 12

Applicable to: MSN 02926-02944, 04392, 07784-07792

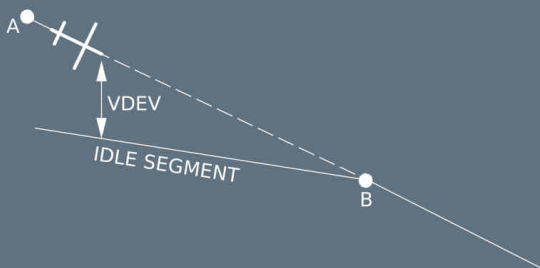
“TOO STEEP PATH AHEAD” appears on the MCDU scratchpad, when the system predicts this situation, and TOO STEEP PATH is displayed on the F-PLN page.

When the aircraft is crossing the first waypoint of a TOO STEEP PATH, the system computes a flyable descent profile (with an idle segment). The VDEV makes a jump because it is related to a new profile.

PROCEDURES

NORMAL PROCEDURES

SYSTEMS RELATED PROCEDURES - FMS



1L	VERT REV AT FIR96	1R
2L	EFOB=6.4 EXTRA=3.0	2R
3L	TOO STEEP PATH BEYOND	3R
4L	DES SPD LIM UTC	4R
5L	250/FL100 RTA>	5R
6L	SPD CSTR ALT CSTR	6R
	*[] +FL260	
	<CONSTANT MACH	
	ACCESS	
	<WIND DATA STEP ALTS>	
	<RETURN	

1L	UB191	UTC	SPD/ALT	1R
2L	ABB	1238	.78/FL330	2R
3L	(T/D)	1239	.79/FL330	3R
4L	BIG1A	TRK320° 21		4R
5L	FIR96	1242 310/ * FL260		5R
6L	-----TOO STEEP PATH-----			6R
	BIG1A			
	CLIFF	1246 293/ * FL120		
	DEST UTC DIST EFOB			
	EGLL27R 1301 149	6.1		
	TOO STEEP PATH AHEAD↑↓			

F.PLN A PAGE WITH A TOO STEEP PATH

PROCEDURE

- **When passing the first waypoint of the TOO STEEP PATH:**
 MONITOR VDEV and predictions at the next CSTR waypoint.
 If required, EXTEND the speedbrakes before seeing the "MORE DRAG" message.
 CONSIDER using a holding pattern, if necessary.

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HOLDING PATTERN

Ident.: PRO-NOR-SRP-01-60-00004014.0001001 / 09 OCT 12

Applicable to: ALL

A hold may be required during the descent, and may be manually inserted.

PROCEDURE

PRESS the F-PLN key.

SELECT the lateral revision page.

SELECT the HOLD prompt.

CHECK the HOLDING data, and MODIFY it if necessary.

CHECK the temporary flight plan and INSERT the holding pattern in it.

Note: If the holding fix is close to the DECEL pseudo waypoint and the speed is managed, manually activate the approach phase to change the managed target speed to approach speed (VAPP). This will avoid having an increase of speed not appropriate.

PROCEDURES

NORMAL PROCEDURES

SYSTEMS RELATED PROCEDURES - FMS



	FROM		A1101→	
1L	CLIFF	1248	UTC SPD/ALT	1R
	BIG1A	BRG321°	/ FL123	
2L	D140L	1252	★250/ FL069	2R
		HOLD		
3L	HOLD R	SPD 213		3R
	C321°		O	
4L	D140L	1252	/ FL069	4R
	BIG1A		1 2	
5L	BIG	1255	250/ 4480	5R
	DEST	UTC	DIST EFOB	
6L	EGLL27R	1302	51 6.1	6R
			↑ ↓	

MANUAL TERMINATION

Ident.: PRO-NOR-SRP-01-60-00004016.0001001 / 09 DEC 09

Applicable to: ALL

You should not use DES mode when entering a leg with manual termination. Manual termination, which is defined as a track or a heading with no termination, is always part of a database procedure. The computed descent flight profile may not be adequate when flying this type of leg.

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Approach

INITIAL APPROACH

Ident.: PRO-NOR-SRP-01-70-00004017.0002001 / 26 NOV 19

Applicable to: ALL

UPON REACHING THE INITIAL APPROACH AREA

- Approach phase activates automatically when flying over the DECEL pseudo waypoint with NAV, APP NAV or LOC* or LOC mode engaged.
- Approach phase needs a manual activation on the PERF page in case of one of the following:
 - HDG / TRK mode is engaged, or
 - After a go around, or
 - An early deceleration is required.

PROCEDURES

NORMAL PROCEDURES

SYSTEMS RELATED PROCEDURES - FMS

F-PLN PAGE

	FROM	UTC	SPD/ALT	
1L	D1 40L	110	/FL086	1R
2L	BIG 1A	BRG 333	12 NM	2R
3L	BIG 05A	112	" / 5220	3R
4L	(DECEL)	TRK 335	9	4R
5L	C 275	114	" / 2760	5R
6L	CF27R	118	250 / 2500	6R
	DEST	UTC	DIST	
	EFL27R	0119	541	
			6.4	
			↑↓	



DES PERF PAGE

	ACT MODE	DES	UTC	DEST	EFOB	
1L	SELECTED	0119	6.4			1R
2L	CI	PRED TO	FL025			2R
3L	MANAGED	UTC	DIST			3R
4L	SELECTED	.77/300	0105	12		4R
5L	EXPEDITE	.70/240	0109	22		5R
6L	ACTIVATE	0106	10			6R
	<APPR PHASE		NEXT	PHASE>		

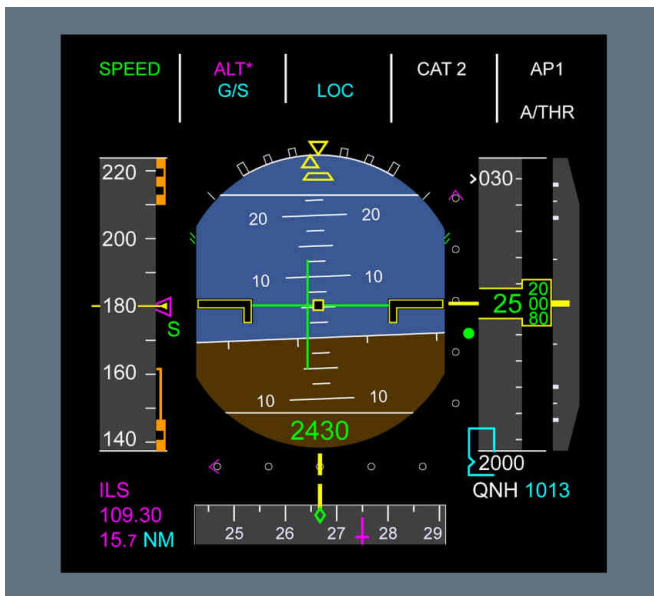
PRESS ①

PRESS ②

MANAGED SPEED

CHECK that managed speed is active: MONITOR the target speed.

During the approach, the autothrust limits the speed of the current configuration. (GD, S, F, VAPP).



- **If ATC requires a specific speed:**
SWITCH to selected speed (turn and pull the speed selector knob on the FCU).
ADJUST the aircraft configuration accordingly.
- **If ATC orders successive step descents down to the final approach flight path:**
Use the V/S or FPA mode.
MONITOR VDEV.

NAV ACCURACY

As required by the SOP.

Without installed GPS and when no DME is available for the accuracy check, use HIGH/LOW on the PROG page.

In this case, consider a “HIGH” to be equivalent to a positive crosscheck.

ATC CLEARANCE

MODIFY the F-PLN, RAD NAV, and PERF APPR data to agree with the latest clearance and landing information.

PROCEDURES

NORMAL PROCEDURES

SYSTEMS RELATED PROCEDURES - FMS

ILS/MLS/GLS/FLS/SLS APPROACH

Ident.: PRO-NOR-SRP-01-70-A-00004018.0001001 / 17 MAR 11

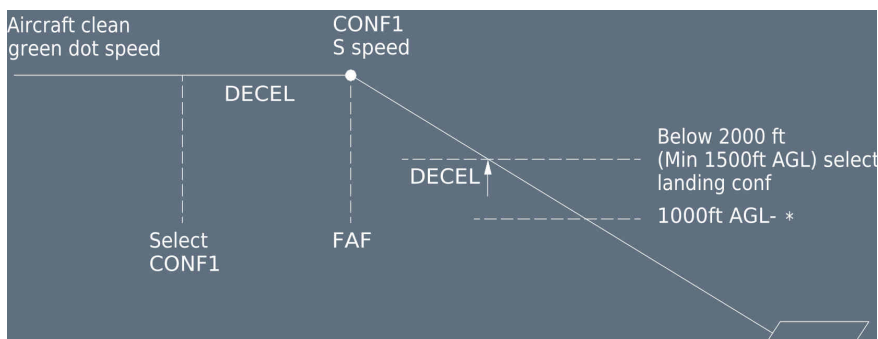
Applicable to: ALL

INTERMEDIATE/FINAL APPROACH (ILS APPROACH ENTERED IN THE F-PLN)

The preferred technique for flying an ILS approach is to fly a decelerated approach using the AP/FDs, the LOC and G/S modes, A/THR in the SPEED mode, managed speed target is recommended.

DECELERATED APPROACH

The decelerated approach technique brings the aircraft down to 1 000 ft, at VAPP. In most cases, the interception of the final descent path is achieved with CONF 1 at S speed.



- (*) The approach must be stabilized at approach speed (minimum ground speed) in the landing configuration before reaching 1 000 ft AGL.

APPROACH MODE ACTIVATION (LOC - G/S)● **When cleared by ATC and when appropriate:**

PRESS the APPR pb on the FCU to arm the APPR mode for the approach entered in the flight plan.

Note: If a non precision approach is selected in the active flight plan and if the flight crew manually tunes an ILS / GLS  on the RAD NAV page:

- the MCDU and PFD display **CHECK APPR SELECTION**. This message is a reminder to the flight crew that this manually-tuned landing system does not correspond to the approach that is selected in the flight plan.
- When the APPR pb is pressed on the FCU, the available approach guidance modes are **LOC** and **G/S**.

The FCU APPR pb arms or engages **LOC** and **G/S** modes, if :

- An ILS / GLS  / LPV (with SLS ) approach is entered in the flight plan, or
- An ILS / GLS  is manually-tuned on the RADIO NAV page, or
- Both RMPs are set to NAV, and an ILS / GLS  is selected.

APPROACH MODE ACTIVATION (LOC-G/S)● **When cleared by ATC and when appropriate:**

DEPRESS the APPR pushbutton to arm the APPR mode for the approach entered in the flight plan.

Note: If a **NON PRECISION** approach is selected in the active flight plan and if the flight crew manually tunes an ILS on the RAD NAV page, the MCDU and the PFD display "CHECK APPR SELECTION". This message is a reminder to the flight crew that, although an ILS is tuned on RAD NAV page, the available approach guidance modes are APP NAV-FINAL when the APPR pushbutton is pressed in on the FCU.

PROCEDURES

NORMAL PROCEDURES

SYSTEMS RELATED PROCEDURES - FMS

The FCU APPR pushbutton arms or engages LOC and G/S modes, if:

- An ILS approach is entered in the flight plan, or
- No approach, or only a runway, is entered in the flight plan, and an ILS is manually-tuned on the RAD NAV page, or
- Both RMPs are set to NAV, and an ILS is selected.

Ident.: PRO-NOR-SRP-01-70-A-00004020.0002001 / 05 MAY 22

Applicable to: ALL

AUTOLAND

CHECK that the FMA displays the aircraft capability (**CAT 2** or **CAT 3**) for the intended ILS approach.

MONITOR the radio automatic callout.

● At 350 ft RA:

CHECK that **LAND** is displayed on the FMA.

CHECK ILS course.

Note: If **LAND** is not displayed or if the ILS course is not correct, do not perform an autoland. The flight crew should perform a go-around, if visual references are not sufficient.

● At 40 ft RA:

CHECK that **FLARE** is displayed on the FMA.

● At approximately 30 ft RA:

CHECK that **IDLE** is displayed on the FMA, and that autothrust starts to reduce thrust toward IDLE.

● At 10 ft, “RETARD” callout comes up:

MOVE the thrust levers to IDLE.

Autothrust disconnects.

L2

● At touchdown:

CHECK that **ROLL OUT** appears on the FMA.

Note: In the case of tailwind during an automatic rollout, it is recommended to use manual braking without delay or automatic braking for an optimised runway centerline tracking.

L1

● At the end of the Rollout:

Disconnect the autopilot.

L2

If the flight crew does not disconnect the AP at the end of the rollout, and uses the nosewheel steering handwheel to taxi the aircraft off the runway, the following will occur:

- *The AP will try to steer the aircraft back to the runway centerline, if the nosewheel steering handwheel is released and the aircraft heading is less than 20 ° off the runway centerline*
- *The AP will automatically disconnect, if the aircraft heading is 20 ° or more off the runway centerline.*

Ident.: PRO-NOR-SRP-01-70-A-00004021.0001001 / 17 MAR 11

Applicable to: **ALL**

MANUAL LANDING**● At DH:**

DISCONNECT the APs. SPEED mode remains engaged.

● At 20 ft “RETARD” automatic call out comes up:

MOVE the thrust levers to IDLE if they are not there already. (The A/THR disconnects).

● At touch down:

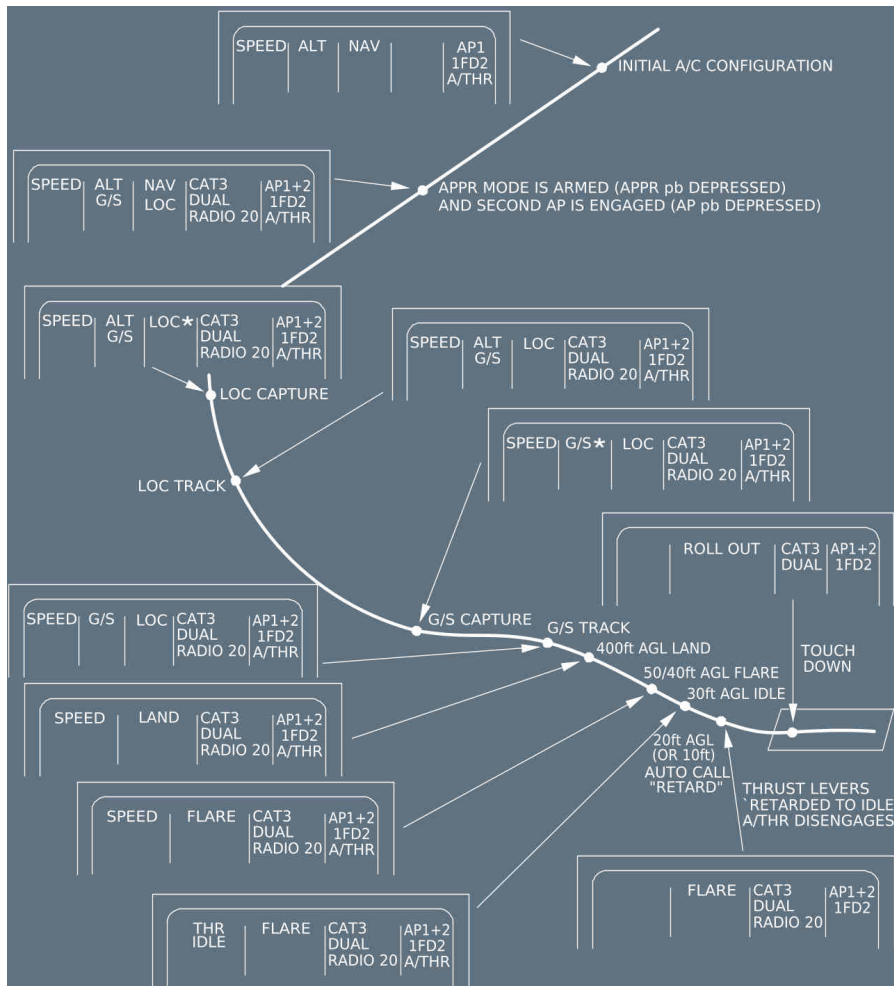
“ROLL OUT” appears on the FMA and the yaw bar comes up on the PFD.

Note: *The retard call out is only a reminder when a manual landing is performed.*

Ident.: PRO-NOR-SRP-01-70-A-00004022.0011001 / 22 MAY 12

Applicable to: ALL

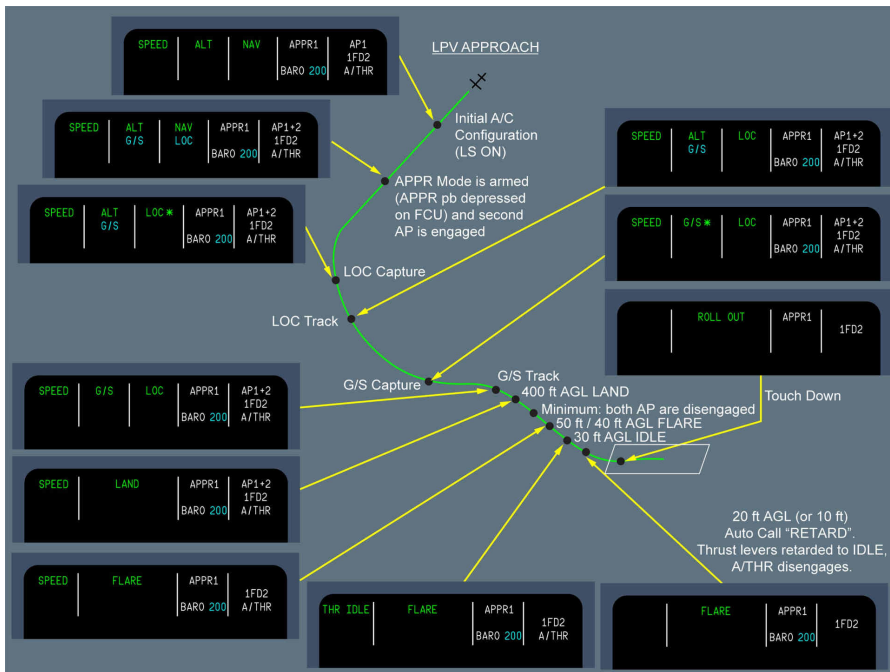
STANDARD ILS AUTOMATIC APPROACH



Ident.: PRO-NOR-SRP-01-70-A-00024846.0001001 / 06 NOV 23

Applicable to: ALL

STANDARD LPV APPROACH (SLS)



Ident.: PRO-NOR-SRP-01-70-A-00004023.0001001 / 26 NOV 13

Applicable to: ALL

EARLY SELECTION OF APPROACH MODE LOC-G/S

Pressing the APPR pushbutton arms LOC and G/S.

When the aircraft is above 5 000 ft AGL, the Radio altimeter signals may not be valid. As long as the Radio altimeter signals are invalid, the FMA displays CAT 1.

- **When the aircraft is cleared for an ILS/MLS  /GLS  approach:**
PRESS the APPR pb on the FCU.
- **When the aircraft is below 5 000 ft AGL:**
Check that the FMA displays the correct capability for the intended approach.

Ident.: PRO-NOR-SRP-01-70-A-00004024.0002001 / 10 MAY 21

 Applicable to: **ALL**

G/S (F-G/S) () INTERCEPTION FROM ABOVE

If the aircraft is above the glideslope, the system will not capture the G/S (F-G/S ()) automatically.

The pilot must bring the aircraft onto the glideslope beam, and select an appropriate V/S to intercept it:

- For approach using ILS, *Refer to PRO-NOR-SOP-18-C Approach using LOC G/S Guidance - Glide Interception from Above*
- For approach using FLS (), *Refer to PRO-NOR-SOP-18-C Approach using F-LOC F-G/S Guidance - F-G/S Beam Interception From Above*

Ident.: PRO-NOR-SRP-01-70-A-00004025.0001001 / 17 MAR 11

 Applicable to: **ALL**

DATA LOCK

When the aircraft reaches 700 ft RA with APPR mode (LOC and G/S) armed or engaged, the ILS FREQ and course are frozen in the receiver.

This function (ILS tune inhibit) is available, when at least one AP/FD is engaged. Any attempt to change the ILS frequency or CRS, via the MCDU or RMP, does not affect the receiver.

If the speed is managed, the system does not accept any modifications the pilot may enter on the PERF APPR page (surface wind, selected landing configuration, or VAPP) for speed guidance purposes below this altitude.

When the aircraft reaches 400 ft RA, LAND mode engages. The flight crew can only disengage this mode by engaging the GO AROUND mode.

Ident.: PRO-NOR-SRP-01-70-A-00004026.0001001 / 17 MAR 11

 Applicable to: **ALL**

USE OF RMPS FOR ILS/DME

If both FMGCs fail, the flight crew can use the RMPS (Radio Management Panels 1 and 2) for back up tuning. Either RMP controls ILS. Prior to select an ILS frequency on one of the RMPS, the flight crew has to select "NAV" button from RMP 1 and RMP 2.

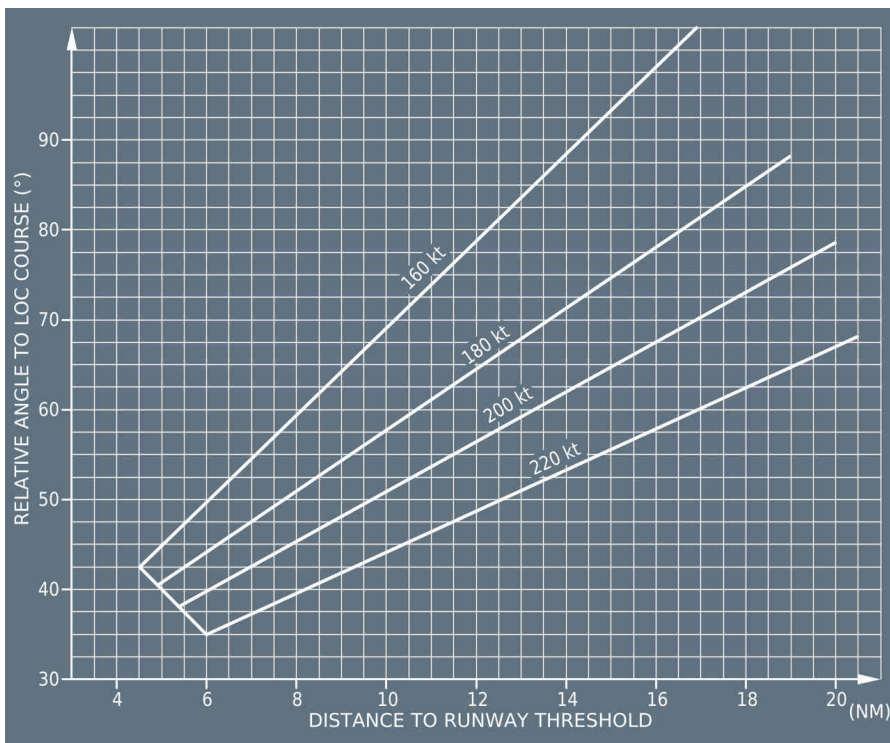
If the ILS has a DME, the PFD will not display the DME distance. In this situation, the flight crew will fly without DME information. If necessary, increase the Decision height (DH) accordingly.

Ident.: PRO-NOR-SRP-01-70-A-00004027.0001001 / 22 MAY 12

Applicable to: ALL

LOCALIZER (LOC) BEAM CAPTURE

The flight crew must always monitor the capture of a LOC beam. During this evolution, the PFD and ND must indicate that associated deviation indications move toward the centre of the scale. To avoid performing a false capture, the flight crew must be careful not to arm the LOC too early. The following graph shows the angle of interception versus distance to the runway threshold that ensures that the aircraft will not overshoot the axis by more than one and a half dot.



The capture begins when the deviation is two dots or less. It is programmed to line the aircraft up on the beam with a single overshoot, even if the intercept angle is large.

Note: ICAO requires LOC beam to ensure a normal capture within 10 NM and plus or minus 35° from the course centerline. Some ILS systems just meet the requirement and are subject to false capture outside these limits.

PROCEDURES**NORMAL PROCEDURES**

SYSTEMS RELATED PROCEDURES - FMS

SWITCHING FROM NON ILS TO ILS APPROACH

Ident.: PRO-NOR-SRP-01-70-00004028.0002001 / 03 NOV 21

Applicable to: ALL

If an ILS approach is possible when a non ILS was previously scheduled, use one of the following procedures:

USE OF SECOND FLIGHT PLAN

Use a secondary flight plan to prepare the alternate ILS approach, time permitting.

COPY the ACTIVE flight plan.

REVISE the ARRIVAL: insert the ILS approach and the applicable STAR/VIA.

On the RAD NAV page, TUNE in the ILS manually.

REVISE the PERF APPR page.

CHANGE OF THE CLEARANCE

ATC changes the clearance from the non-ILS to the ILS approach.

● If a secondary flight plan has been prepared:

ACTIVATE the SEC F-PLN and adjust.

Follow subsequent standard procedures.

● If a secondary flight plan has not been prepared:

REVISE the ARRIVAL on the primary F-PLN, inserting the ILS approach.

REVISE the PERF APPR page.

Follow subsequent standard procedures.

CAUTION

If the flight crew decides to fly the ILS approach without revising the arrival of the primary flight plan (a non ILS approach is in the F-PLN), LOC and G/S modes will not be available when the flight crew presses the APPR pushbutton.

Consequently, the flight crew should:

- Manually TUNE in the ILS on the RAD NAV page: CHECK that the "CHECK APPR SELECTION" message comes up.
- Press the ILS pushbutton and select ROSE ILS on the EIS CONTROL panel.
- Use HDG, V/S or TRK, FPA modes to fly the ILS.

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LANDING CATEGORIES

Ident.: PRO-NOR-SRP-01-70-00004038.0001001 / 16 NOV 11

Applicable to: ALL

Each FMGC computes its own landing category : CAT1, CAT2, CAT3 single, and CAT3 dual and displays the corresponding landing category on the FMAs.

Each category depends upon the availability of aircraft systems and functions.

When the landing capability downgrades, a triple click aural warning is activated.

FAIL-OPERATIONAL AUTOMATIC LANDING SYSTEM

An automatic landing system is fail-operational if, in the event of a failure below alert height, the remaining part of the automatic system allows the aircraft to complete the approach, flare, and landing. A CAT 3 DUAL system is a fail-operational automatic landing system.

Note: In the event of a failure, the automatic landing system operates as a fail-passive system.

FAIL-PASSIVE AUTOMATIC LANDING SYSTEM

An automatic landing system is fail-passive if, in the event of a failure, there is no significant out-of-trim condition or deviation of flight path or attitude, but the landing is not completed automatically. A CAT3 single system is a fail-passive automatic landing system.

Note: With a fail-passive automatic landing system the pilot assumes control of the aircraft after a failure.

Below 100 ft (radio altimeter), the FMGS freezes the landing capability until LAND mode is disengaged or both APs are off.

Therefore a failure occurring below 100 ft does not change the category of the system.

ALERT HEIGHT

The alert height is the height above touch down, above which a CAT3 autoland would be discontinued and a missed approach executed, if a failure occurred in either the airplane systems or the relevant ground equipments.

Below the alert height, if such a failure occurs, the flare, touchdown and roll out may be accomplished using the remaining automatic system.

WARNINGS FOR ILS APPROACH

Ident.: PRO-NOR-SRP-01-70-00004039.0010001 / 18 MAY 22

Applicable to: MSN 02155-03060, 05152-07792

AUTOLAND WARNING

For more information on conditions triggering AUTOLAND warning, *Refer to DSC-22_30-80-10 Autoland Warning Light.*

PROCEDURES**NORMAL PROCEDURES**

SYSTEMS RELATED PROCEDURES - FMS

WARNING OF EXCESSIVE BEAM DEVIATION

The LOC and G/S scales flash on the PFD and ND (ROSE ILS mode). It occurs whenever:

- G/S deviation is more than 1 dot (above 100 ft RA)
- LOC deviation is more than 1/4 dot (above 15 ft RA).

WARNING ASSOCIATED WITH ILS "LANDING CAPABILITY"

Any downgrading in the aircraft's capability for automatic approach and landing sounds a triple-click aural warning.

FAILURE OF BOTH LOCALIZER AND GLIDESLOPE RECEIVERS

The PFD and ND (ROSE ILS mode) display **LOC** and **G/S** flags (if the ILS pb has been pressed green). LOC and G/S scales disappear from the PFD.

If **LOC** or **G/S** modes are engaged and at least one AP/FD is engaged:

- The AP disengages
- The FD reverts to its HDG-V/S or TRK-FPA modes.

FAILURE OF LOCALIZER OR GLIDESLOPE TRANSMITTER (WHEN CAPTURED)

- The corresponding index is lost
- The LOC and G/S scales flash
- The corresponding FD bar flashes.

Above 200 ft RA, if the transmitter failure lasts less than 7 s, the FMA retains the **LOC** and **G/S** modes (or the **LAND** mode) and the APs are able to regain these modes. If the failure lasts longer than 7 s, the AP disengages and the FD reverts to its basic modes. Below 200 ft RA, if the transmitter failure occurs, the AUTOLAND warning appears, indicating that the crew must perform a go-around (if insufficient visual references) with one or two APs engaged.

WARNINGS FOR ILS APPROACH

Ident.: PRO-NOR-SRP-01-70-00004039.0002001 / 18 MAY 22

Applicable to: MSN 04392

AUTOLAND WARNING

For more information on conditions triggering AUTOLAND warning, *Refer to DSC-22_30-80-10 Autoland Warning Light.*

WARNING OF EXCESSIVE BEAM DEVIATION

The LOC and G/S scales flash on the PFD and ND (ROSE ILS mode). It occurs whenever:

- G/S deviation is more than 1 dot (above 100 ft RA)
- LOC deviation is more than 1/4 dot (above 15 ft RA).

WARNING ASSOCIATED WITH ILS "LANDING CAPABILITY"

Any downgrading in the aircraft's capability for automatic approach and landing sounds a triple-click aural warning.

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PROCEDURES

NORMAL PROCEDURES

SYSTEMS RELATED PROCEDURES - FMS

Intentionally left blank

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Go-Around

MONITORING THE GO-AROUND

Ident.: PRO-NOR-SRP-01-80-00004054.0005001 / 09 JUL 13
Applicable to: MSN 02155-03060, 05152-07792

Engage the GO-AROUND phase and GO-AROUND modes by setting the thrust levers to the TOGA position, if at least CONF1 is selected.

When the GO-AROUND phase is engaged, the previously-flown approach is automatically strung back into the flight plan at the end of the missed approach procedure.

In the GO-AROUND phase, the system makes no predictions. Consequently, CLB and DES modes are not available, and the flight crew must monitor constraints.

When the aircraft leaves the GO-AROUND phase, all predictions and modes become available again. During a GO-AROUND phase, the managed speed is Green Dot.

ACTIVATE THE APPROACH PHASE MANUALLY
THIS WILL SWITCH THE MANAGED
SPEED TO APPROPRIATE
SPEED (S,F,VAPP,VAPP TARGET)

4L
4R

5L
5R

6L
6R

THR RED/ACC 1500/2000 ENG OUT ACC 2000

ACTIVATE NEXT

← APPR PHASE → PHASE>

PERF PAGE, GO-AROUND PHASE ACTIVE

HEADING/TRACK PRESET FUNCTION IN GO-AROUND PHASE

The flight crew can use the heading/track preset, when LOC*, LOC, LAND or GA is engaged.

SET the appropriate heading, or track value, in the window of the FCU.

When necessary, PULL the HDG/TRK selection knob to engage the mode on the preset value.

Note: The heading/track preset is not available in non precision approach in AP/FD FINAL mode.

MONITORING THE GO-AROUND

Ident.: PRO-NOR-SRP-01-80-00004054.0002001 / 09 DEC 09
Applicable to: MSN 04392

Engage the GO-AROUND phase and GO-AROUND modes by setting the thrust levers to the TOGA position, if at least CONF1 is selected.

When the GO-AROUND phase is engaged, the previously-flown approach is automatically strung back into the flight plan at the end of the missed approach procedure.

In the GO-AROUND phase, the system makes no predictions. Consequently, CLB and DES modes are not available, and the flight crew must monitor constraints.

When the aircraft leaves the GO-AROUND phase, all predictions and modes become available again. During a GO-AROUND phase, the managed speed is Green Dot.

PROCEDURES

NORMAL PROCEDURES

SYSTEMS RELATED PROCEDURES - FMS

ACTIVATE THE APPROACH PHASE MANUALLY
 THIS WILL SWITCH THE MANAGED
 SPEED TO APPROPRIATE
 SPEED (S,F,VAPP,VAPP TARGET)

4L

5L

6L

THR RED/ACC	ENG OUT ACC
1500/2000	2000
ACTIVATE	NEXT
← APPR PHASE	PHASE >

4R

5R

6R

PERF PAGE, GO-AROUND PHASE ACTIVE

HEADING/TRACK PRESET FUNCTION IN GO-AROUND PHASE

The flight crew can use the heading/track preset, when LOC*, LOC, LAND, FINAL or GA is engaged.

SET the appropriate heading, or track value, in the window of the FCU.

When necessary, PULL the HDG/TRK selection knob to engage the mode on the preset value.

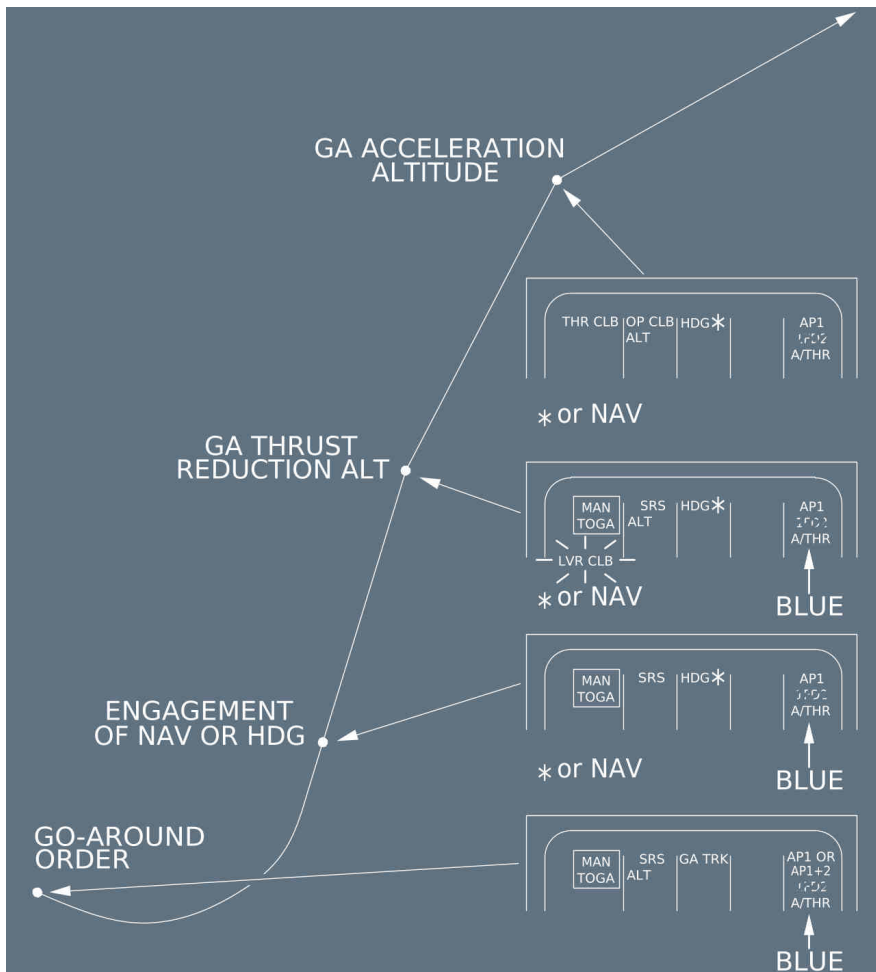
GO-AROUND PROFILE

Ident.: PRO-NOR-SRP-01-80-00004055.0014001 / 22 MAY 12

Applicable to: MSN 02926-02944

● WITH FD ON:

Apply SOP procedures



GO-AROUND PROFILE

Ident.: PRO-NOR-SRP-01-80-00004055.0043001 / 22 MAY 12

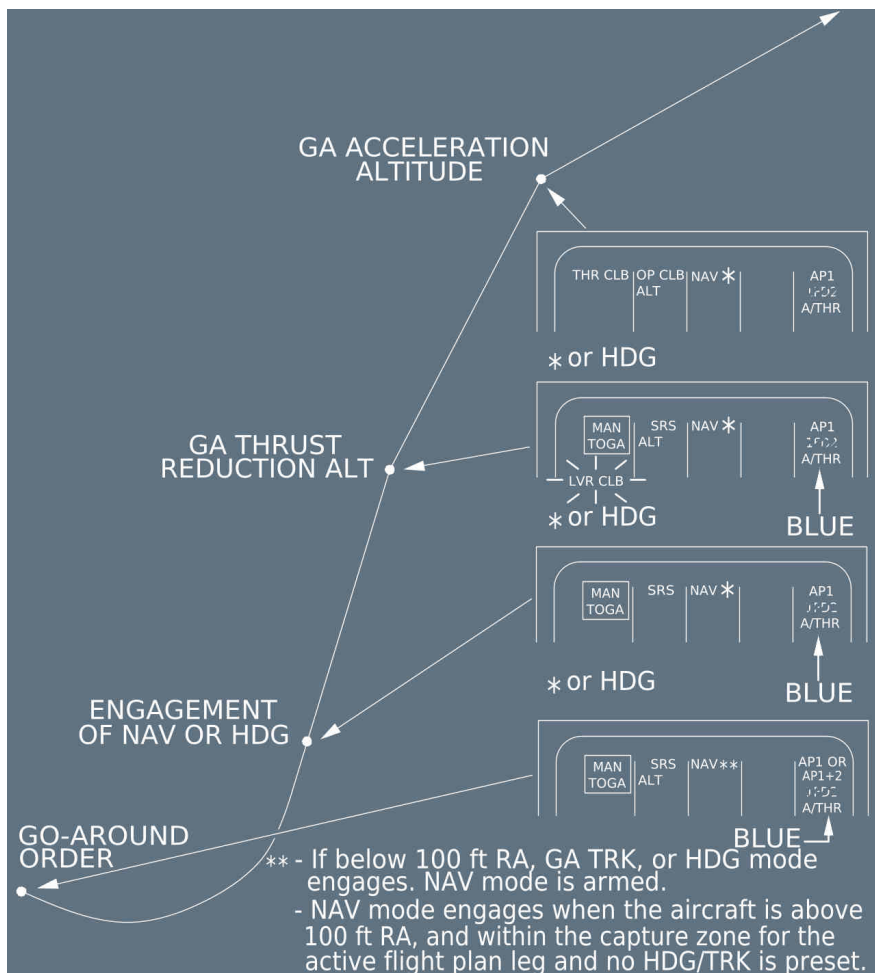
Applicable to: MSN 02155-02789, 03031-07792

- **WITH FD ON:**
Apply SOP procedures

PROCEDURES

NORMAL PROCEDURES

SYSTEMS RELATED PROCEDURES - FMS



MISSED APPROACH: TRY AGAIN

Ident.: PRO-NOR-SRP-01-80-00004057.0008001 / 14 FEB 11

Applicable to: ALL

If the pilot intends to fly another approach to the destination:

- The flight plan has all the necessary data for the missed approach
- Green Dot is the target speed.

- **When cleared by the ATC to follow the missed approach procedure:**
 ENGAGE NAV mode, or
 TURN and PULL the HDG selector knob to set a heading
HDG, or TRK, or NAV modes can only be engaged above 100 ft.
- **When entering the initial approach area:**
 Activate the approach phase on the MCDU's PERF GO AROUND page
 - **If the APPR phase is not activated:**
 - Managed approach speed will not be available
 - The system will not furnish predictions
 - BARO/RADIO minima displays will not appear on the PFD.

MISSED APPROACH: DIVERT

Ident.: PRO-NOR-SRP-01-80-00004058.0005001 / 10 MAY 21

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

- **If the flight crew decides to divert to the alternate:**
 ENABLE ALTN, preferably at the TO waypoint.
- **When cleared to a waypoint:**
 Perform a DIRECT TO.

The system reverts automatically to CLB phase and modifies the target speed from Green Dot to initial speed.

The system automatically sets the CRZ FL to the defaulted alternate CRZ and retains the previous cost index.

The flight crew may adjust these as necessary.

Note: Diversion may also be initiated by entering a NEW DEST in the LAT REV page at the TO waypoint or using the secondary F-PLN if prepared (Refer to DSC-22_20-10-30-30 General).

MISSED APPROACH: DIVERT

Ident.: PRO-NOR-SRP-01-80-00004058.0004001 / 10 MAY 21

Applicable to: MSN 02926-02944, 04392, 07784-07792

- **If the flight crew decides to divert to the alternate:**
 ENABLE ALTN, preferably at the TO waypoint.
- **When cleared to a waypoint:**
 Perform a DIRECT TO.

PROCEDURES**NORMAL PROCEDURES**

SYSTEMS RELATED PROCEDURES - FMS

The system reverts automatically to CLB phase and modifies the target speed from Green Dot to initial speed.

The system automatically sets the CRZ FL to the defaulted alternate CRZ.

The cost index is set to 0.0 and the message **USING COST INDEX 0** is triggered.

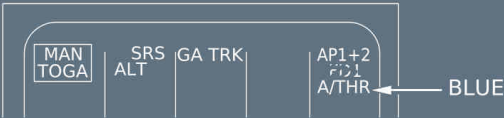
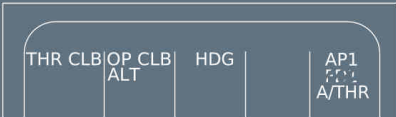
The flight crew may adjust these as necessary.

Note: Diversion may also be initiated by entering a NEW DEST in the LAT REV page at the TO waypoint or using the secondary F-PLN if prepared (Refer to DSC-22_20-10-30-30 General).

TASK SHARING DURING A GO-AROUND

Ident.: PRO-NOR-SRP-01-80-00004059.0002001 / 20 JUL 15

Applicable to: ALL

PF	PM
-Announce "GO AROUND, FLAPS". Simultaneously set thrust levers to TO GA. -Monitor the flight path.	-Announce "FLAPS _". Retract flaps one step, and monitor engine parameters.
	
When rate of climb is positive:	
-Announce "GEAR UP"	-Announce "POSITIVE CLIMB". -Retract the gear and confirm "GEAR UP ".
When LVR CLB flashes on FMA:	
-Set thrust levers to CL detent. -Push or Turn/pull HDG/TRK sel knob on FCU, according to ATC clearance.	
	
At go-around acceleration altitude:	
-Monitor that the target speed increases to Green Dot.	
	
● If the speed target does not increase to Green Dot: -CHECK and PULL the altitude selector knob to engage OP CLB The speed target increases to Green Dot -Retract flaps on schedule.	

PROCEDURES

NORMAL PROCEDURES

SYSTEMS RELATED PROCEDURES - FMS

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PROCEDURES

SPECIAL OPERATIONS

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PRO-SPO-40 Extended Range Operations
PRO-SPO-40-30 Dispatch Consideration

ETOPS Critical Fuel Reserves.....	A
Check of CAS for L/G Safety Valve Closure	B

PRO-SPO-40-40 Diversion During Extended Range Operations

Diversion Decision Making.....	A
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PRO-SPO-40-50 Procedures

General.....	A
Normal Procedures.....	B
Abnormal and Emergency Procedures.....	C

PRO-SPO-40-60 Performance

Maximum Diversion Distance.....	A
---------------------------------	---

PRO-SPO-45 Engine Intermix Operations

Engine Intermix Type 1.....	A
Engine Intermix Type 2.....	B

PRO-SPO-50 Reduced Vertical Separation Minimum - RVSM

General.....	A
Required Equipments/Functions for RVSM.....	B
RVSM Normal Procedure.....	C
RVSM Abnormal and Emergency Procedure.....	D

PRO-SPO-51 Performance-Based Navigation (PBN)

General.....	A
RNAV 10 / RNP 10.....	B
RNAV 5 / BRNAV.....	C
RNAV 1 RNAV 2 / P-RNAV - Terminal RNAV.....	D
RNP 4.....	E
RNP 2 in Oceanic and Remote Continental Area.....	F
RNP 2 in Domestic Area.....	G
RNP 1 / Terminal RNP 1- Basic RNP 1.....	H
RNP APCH / RNAV(GNSS).....	I

Continued on the following page

Continued from the previous page

PRO-SPO-60 Operations on Narrow Runways

General.....	A
Limitations.....	B
Procedures.....	C

PRO-SPO-85 Simultaneous Parallel Approach Operations

Overview.....	A
Break out Turn and Climb Procedure.....	B
Break out Turn and Descent Procedure.....	C

Localization Title	Toc Index	ID	Reason
PRO-SPO-40-30 Check of CAS for L/G Safety Valve Closure	B	1	Wording enhancement. No technical change.
PRO-SPO-51 RNAV 5 / BRNAV - Procedure	C	1	Layout modification. No technical change.
PRO-SPO-51 RNAV 1 RNAV 2 / P-RNAV - Terminal RNAV - Procedure	D	2	Layout modification. No technical change.
PRO-SPO-51 RNP 2 in Domestic Area - Procedure	G	3	Layout modification. No technical change.
PRO-SPO-51 RNP 1 / Terminal RNP 1 - Basic RNP 1 - Procedure	H	4	Layout modification. No technical change.

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ETOPS CRITICAL FUEL RESERVES

Ident.: PRO-SPO-40-30-00023321.0001001 / 03 NOV 21

Applicable to: ALL

ICING

The most critical scenario must be compensated for the greater of:

- A. The effect of airframe icing during 10 % of the time during icing is forecast, including ice accumulation on unprotected surfaces, and the fuel used by engine and wing anti-ice during this period.
- B. Fuel for engine and wing anti-ice for the entire time during which icing is forecast.

Note: The ETOPS icing fuel reserve is always limited by (B).

Unless a reliable icing forecast is available, icing may be presumed to occur when the Total Air Temperature is less than +10 °C (50 °F), or if the outside air temperature is between 0 °C (32 °F) and -20 °C (-4 °F) with a relative humidity of 55 % or more.

APU

Fuel consumption of 80 kg/h or 176 lb/h (APU GEN ON, APU BLEED OFF).

In view of our experience, Airbus recommends that the operator includes a contingency fuel provision from departure to the Critical Point, when computing the ETOPS critical fuel planning.

CHECK OF CAS FOR L/G SAFETY VALVE CLOSURE

Ident.: PRO-SPO-40-30-00027928.0002001 / 06 NOV 25

Applicable to: ALL

1 CHECK OF CAS

Check that the flights are planned with a climb speed profile exceeding 264 kt CAS before reaching the top of climb. When the aircraft speed is above 264 kt, the L/G Safety Valve automatically closes.

For more information Refer to DSC-32-10-10 Landing Gears and Doors Operation - Normal Operation.

PROCEDURES

SPECIAL OPERATIONS

EXTENDED RANGE OPERATIONS - DISPATCH CONSIDERATION

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES SPECIAL OPERATIONS EXTENDED RANGE OPERATIONS - DIVERSION DURING EXTENDED RANGE OPERATIONS
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DIVERSION DECISION MAKING

Ident.: PRO-SPO-40-40-00023322.0001001 / 03 NOV 22

Applicable to: ALL

The technical criteria governing a re-routing or diversion decision can be classified into four categories, as follows:

- Loss of NAT-HLA capability, before entering the NAT-HLA area (as applicable)
- Weather minima at diversion airport(s) going below the company/crew en-route minima, before reaching the ETOPS Entry Point, or diversion airport(s) becoming unsuitable for any reason
- Failure cases requiring a diversion to the nearest airport (cases leading to a LAND ASAP message on the ECAM and/or in the QRH)
- Failure cases resulting in increased fuel consumption, exceeding the available fuel reserves.

Comments and Recommendations

- Electrical generation

If one IDG fails, a diversion is required in the case of:

- Blue hydraulic circuit low level, low pressure or overheat, or
- APU no start, or
- APU or APU generator inoperative, or
- Second IDG failure.

- Fuel system

Some failure cases may lead to fuel gravity feeding which implies flight at lower altitude or to some fuel being unusable. The flight crew's evaluation of the actual situation and the fuel remaining may lead to the decision that a diversion is required.

- Hydraulic system:

If there is low level, low pressure or overheat on blue hydraulic circuit, a diversion is required in the case of:

- One IDG failure, or
- APU no start, or
- APU/APU GEN failure.

- APU :

If APU/APU GEN fails, a diversion is required in the case of:

- Blue hydraulic circuit low level, low pressure or overheat, or
- One IDG failure.

PROCEDURES

SPECIAL OPERATIONS

EXTENDED RANGE OPERATIONS - DIVERSION
DURING EXTENDED RANGE OPERATIONS

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES SPECIAL OPERATIONS EXTENDED RANGE OPERATIONS - PROCEDURES
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GENERAL

Ident.: PRO-SPO-40-50-00002051.0001001 / 26 JUN 17

Applicable to: ALL

For ETOPS flights, the flight crew must apply the below procedures, in addition to the SOP (refer to chapter PRO-NOR-SOP) and the ABNORMAL and EMERGENCY procedures (refer to chapter PRO-ABN).

NORMAL PROCEDURES

Applicable to: ALL

Ident.: PRO-SPO-40-50-A-00021794.0002001 / 26 JUN 17

COCKPIT PREPARATION

FUEL

Before each ETOPS flight, the flight crew must check that the fuel crossfeed valve is operating correctly :

FUEL X FEEDON

On the ECAM FUEL page, check that the fuel crossfeed valve is open (indication is inline green).

FUEL X FEED..... OFF

Check that the fuel crossfeed valve is closed.

ABNORMAL AND EMERGENCY PROCEDURES
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Ident.: PRO-SPO-40-50-00002053.0004001 / 05 JUN 18

Applicable to: MSN 02155-04392, 07784-07792

ELECTRICAL EMERGENCY CONFIGURATION

The flight crew must complete the ECAM procedure using the following:

AIR CONDITIONING

As cockpit and cabin temperature control is lost, it is recommended to open the cockpit door.

FUEL

As all fuel pumps are lost, the engines are fed by gravity. *Refer to GRVTY FUEL FEEDING Procedure.*

PROCEDURES**SPECIAL OPERATIONS****EXTENDED RANGE OPERATIONS - PROCEDURES****ENGINE ANTI-ICE**

Engine anti-ice valves are permanently open, although the ECAM memo ENG A. ICE is not displayed on the ECAM (except if the ENG A. ICE pb is at ON).

WING ANTI-ICE

If only one ENG BLEED is available, PACK 1 must be switched OFF, to avoid having both packs and wing anti-ice supplied by a single bleed source.

BLUE HYDRAULIC CIRCUIT LOW LEVEL OR LOW PRESSURE OR OVERHEAT

Start the APU to ensure availability of the APU generator.

ENGINE OR IDG FAILURE

Start the APU and use the APU electrical channel.

LOSS OF AIR CONDITIONING

In the case of loss of the air conditioning capability (loss of both packs, loss of both bleeds without APU bleed etc.), when at FL 100 with the RAM AIR opened, the CAB FANS must be switched off.

ABNORMAL AND EMERGENCY PROCEDURES

Ident.: PRO-SPO-40-50-00002053.0007001 / 05 JUN 18

Applicable to: MSN 05152-05746

ELECTRICAL EMERGENCY CONFIGURATION

The flight crew must complete the ECAM procedure using the following:

AIR CONDITIONING

As cockpit and cabin temperature control is lost, it is recommended to open the cockpit door.

PRESSURIZATION

If one engine (or one bleed system) is failed, forward cargo ventilation must be closed to avoid CAB PR EXCESS CAB ALT from being triggered on the ECAM during descent or cruise.

FUEL

As all fuel pumps are lost, the engines are fed by gravity. *Refer to GRVTY FUEL FEEDING Procedure.*

ENGINE ANTI-ICE

Engine anti-ice valves are permanently open, although the ECAM memo ENG A. ICE is not displayed on the ECAM (except if the ENG A. ICE pushbutton is at ON).

WING ANTI-ICE

If only one ENG BLEED is available, PACK 1 must be switched OFF, to avoid having both packs and wing anti-ice supplied by a single bleed source.

BLUE HYDRAULIC CIRCUIT LOW LEVEL OR LOW PRESSURE OR OVERHEAT

Start the APU to ensure availability of the APU generator.

ENGINE OR IDG FAILURE

Start the APU and use the APU electrical channel.

LOSS OF AIR CONDITIONING

In the case of loss of the air conditioning capability (loss of both packs, loss of both bleeds without APU bleed etc.), when at FL 100 with the RAM AIR opened, the CAB FANS must be switched off.

PROCEDURES

SPECIAL OPERATIONS

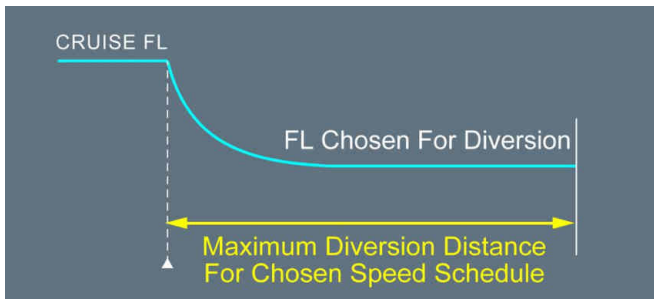
EXTENDED RANGE OPERATIONS - PROCEDURES

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MAXIMUM DIVERSION DISTANCE

Ident.: PRO-SPO-40-60-00023324.0049001 / 17 NOV 20

Applicable to: MSN 05746-07792



The following computation takes into account the below conditions:

- ISA conditions
- No wind
- Optimum diversion level after engine failure
- Single engine diversion speed schedule.

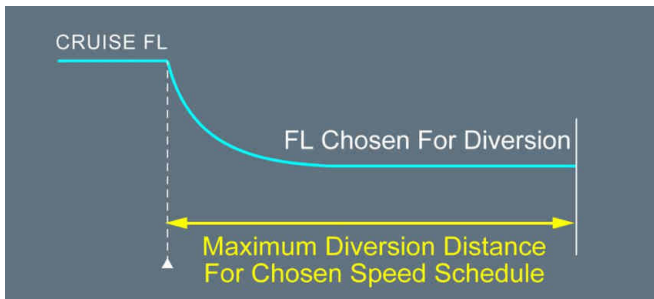
Note: Obstacles have not to be considered to determine if a route is or is not an ETOPS route.

MAXIMUM DIVERSION DISTANCE							
SPEED SCHEDULE	A/C WEIGHT AT CRITICAL POINT (KG)	FL FOR DIVERSION	DIVERSION TIME (MIN)				
			60	90	120	150	180
MCT/VMO	50 000	160	415	617	819	1 022	1 224
	55 000	160	414	615	817	1 018	1 220
	60 000	160	413	613	813	1 014	1 215
	65 000	160	412	610	809	1 009	1 209
	70 000	160	410	607	804	1 003	1 202
	75 000	160	407	603	799	996	1 193
MCT/320 kt	50 000	170	413	614	815	1 017	1 219
	55 000	160	413	614	815	1 015	1 216
	60 000	160	412	612	813	1 013	1 214
	65 000	160	411	610	809	1 008	1 208
	70 000	160	409	607	804	1 003	1 201
	75 000	160	407	603	799	996	1 193

MAXIMUM DIVERSION DISTANCE

Ident.: PRO-SPO-40-60-00023324.0045001 / 17 NOV 20

Applicable to: MSN 02926-02944



The following computation takes into account the below conditions:

- ISA conditions
- No wind
- Optimum diversion level after engine failure
- Single engine diversion speed schedule.

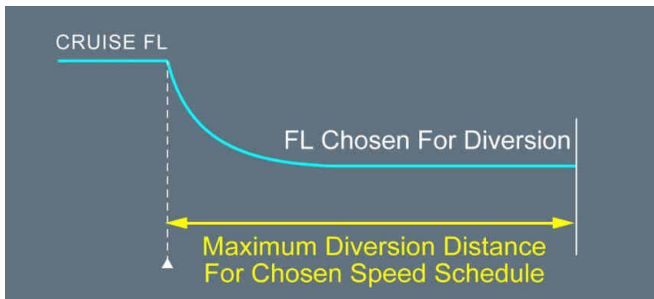
Note: Obstacles have not to be considered to determine if a route is or is not an ETOPS route.

MAXIMUM DIVERSION DISTANCE							
SPEED SCHEDULE	A/C WEIGHT AT CRITICAL POINT (KG)	FL FOR DIVERSION	DIVERSION TIME (MIN)				
			60	90	120	150	180
MCT/VMO	50 000	160	407	603	800	-	-
	55 000	160	405	600	796	992	1 189
	60 000	130	406	600	794	988	1 183
	65 000	110	406	598	791	984	1 177
	70 000	110	405	595	786	978	1 170
	75 000	100	403	592	781	972	1 162
MCT/320 kt	50 000	160	407	604	801	-	-
	55 000	160	406	601	797	993	1 189
	60 000	150	404	598	792	986	1 181
	65 000	130	403	595	787	979	1 171
	70 000	130	400	591	781	973	1 165
	75 000	120	398	587	776	965	1 154

MAXIMUM DIVERSION DISTANCE

Ident.: PRO-SPO-40-60-00023324.0005001 / 17 NOV 20

Applicable to: MSN 02155-02789, 03031-05253



The following computation takes into account the below conditions:

- ISA conditions
- No wind
- Optimum diversion level after engine failure
- Single engine diversion speed schedule.

Note: Obstacles have not to be considered to determine if a route is or is not an ETOPS route.

MAXIMUM DIVERSION DISTANCE							
SPEED SCHEDULE	A/C WEIGHT AT CRITICAL POINT (KG)	FL FOR DIVERSION	DIVERSION TIME (MIN)				
			60	90	120	150	180
MCT/VMO	50 000	160	414	616	818	-	-
	55 000	160	413	614	815	1 017	1 219
	60 000	160	412	612	812	1 012	1 213
	65 000	160	410	608	807	1 007	1 206
	70 000	160	408	605	802	1 000	1 198
	75 000	160	405	600	795	992	1 188
MCT/320 kt	50 000	160	412	613	814	-	-
	55 000	160	412	613	814	1 015	1 215
	60 000	160	412	612	812	1 012	1 213
	65 000	160	410	608	807	1 007	1 206
	70 000	160	408	605	802	1 000	1 198
	75 000	160	405	600	795	992	1 188

PROCEDURES

SPECIAL OPERATIONS

EXTENDED RANGE OPERATIONS - PERFORMANCE

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ENGINE INTERMIX TYPE 1Applicable to: **ALL**

Ident.: PRO-SPO-45-A-00002059.0001001 / 30 JUN 14

The following information provides the conditions and procedures necessary in order to temporarily operate an A318/A319/A320/A321 aircraft when a CFM56–5B Single Annular Combustor (SAC) engine is intermixed with a CFM56–5B Double Annular Combustor (DAC) engine.

This engine intermix configuration is indicated in the cockpit with the following placard: "CAUTION: ENGINE INTERMIX TYPE 1" or "CAUTION: ENGINE INTERMIX".

Ident.: PRO-SPO-45-A-00002060.0001001 / 07 DEC 10

ENGINE PARAMETERS

Engine parameters differ significantly, when the engines are at idle:

- EGT : Up to 250 °C higher on the DAC engine.
- FUEL FLOW : Up to 25 % higher on the DAC engine.
- N1 : Higher on the DAC engine.
- N2 : Lower on ground on the DAC engine; higher in flight on the DAC engine.

Ident.: PRO-SPO-45-A-00002061.0001001 / 07 DEC 10

CROSSBLEED ENG START

The DAC engine has insufficient acceleration capability to sustain idle speed with a large bleed offtake, when it operates with only 20 injectors. Therefore, it is necessary to preset a 30 % N1 on the supplying engine before launching the start sequence.

Ident.: PRO-SPO-45-A-00004068.0001001 / 07 DEC 10

TAKEOFF PROCEDURE

- The PF must progressively adjust engine thrust in two steps:
 - Step 1 : Idle to 50 % N1.
Brakes released, when the 50 % N1 is stabilized on both engines.

- Step 2 : Both engines N1 to takeoff thrust.

This procedure enables a significantly slower acceleration from ground idle to N1 = 50 % for the double annular combustor.

- Other standard operating procedures apply for takeoff.

Ident.: PRO-SPO-45-A-00002062.0001001 / 07 DEC 10

ENGINE RESPONSE

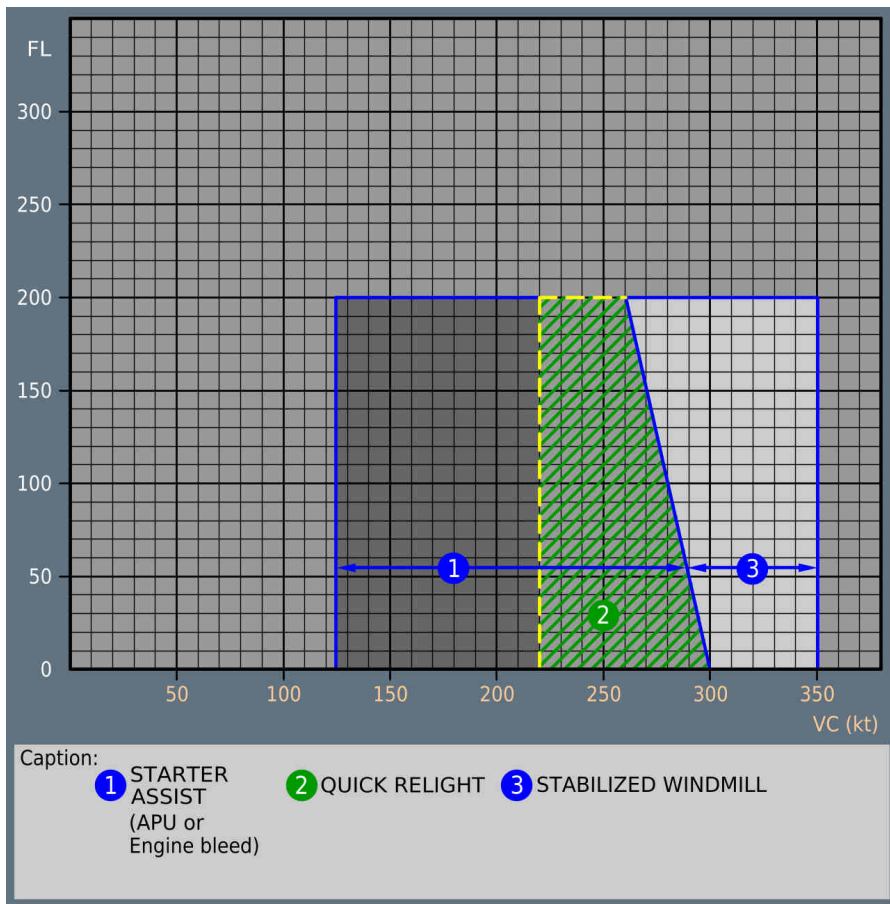
In flight, when the aircraft is in clean configuration, the DAC engine may accelerate from idle more slowly than the SAC engine. This is particularly evident, if the acceleration follows a deceleration.

There is no significant effect on aircraft handling. This difference in engine response disappears when the slats are extended.

Ident.: PRO-SPO-45-A-00004067.0001001 / 09 OCT 12

ENGINE RELIGHT

The DAC engine relight envelope is more restrictive than the SAC engine relight envelope. Therefore, in case of engine intermix, the flight crew must use the DAC engine relight procedure with the corresponding chart (See chart below).



ENGINE INTERMIX TYPE 2Applicable to: **ALL**

Ident.: PRO-SPO-45-B-00012731.0007001 / 06 MAR 17

The following information provides the necessary conditions and procedures in order to temporarily operate an A318/A319/A320/A321 with engine intermix configuration between two different SAC engines among CFM56–5Bx classic, the CFM56–5Bx/P, the CFM56-5Bx/3 and the CFM56-5Bx/P “TI HPC kit”.

FADEC intermix configuration 5BM software (installed on CFM56-5B classic) with FADEC 5BR software is indicated in the cockpit with the following placard: “CAUTION: ENGINE INTERMIX TYPE 2”.

Note: When FADEC Standard “5BR” or subsequent is installed on both engines, engine thrust behavior is harmonized (transient thrust dissymmetry no longer exist). Therefore, a placard is not necessary and is not displayed.

Ident.: PRO-SPO-45-B-00012732.0001001 / 07 DEC 10

ENGINE PARAMETERS

In the case of only one operative pack configuration (only one pack OFF):

- N1 : At idle up to 9 % higher on the CFM56-5B/3 TI engine, on ground or in flight in clean configuration.
- N2 : At idle up to 11 % higher on the CFM56-5B/3 TI engine, on ground or in flight in clean configuration.

Ident.: PRO-SPO-45-B-00012733.0001001 / 07 DEC 10

TAKEOFF PROCEDURE

In the case of only one operative pack configuration, due to the difference in N2 at idle between engines, the following takeoff procedure is recommended:

- The PF progressively adjusts engine thrust in two steps:
 - Step 1 : From idle to about 50 % N1 on brakes.
 - Step 2 : From both engines at similar N1 to takeoff thrust after brakes release.
- Other standard operative procedures apply for takeoff.

Ident.: PRO-SPO-45-B-00012734.0007001 / 14 MAY 12

ENGINE RESPONSE

In the case of only one operative pack configuration, due to the difference in N2 at idle between engines, the CFM56–5B/3 TI engine may accelerate from idle to high thrust faster than the CFM56–5B/P SAC engine when the aircraft is on ground or in flight in clean configuration. There is no significant effect on aircraft handling.

PROCEDURES

SPECIAL OPERATIONS

ENGINE INTERMIX OPERATIONS

The difference in engine response disappears in flight when the slats are extended.

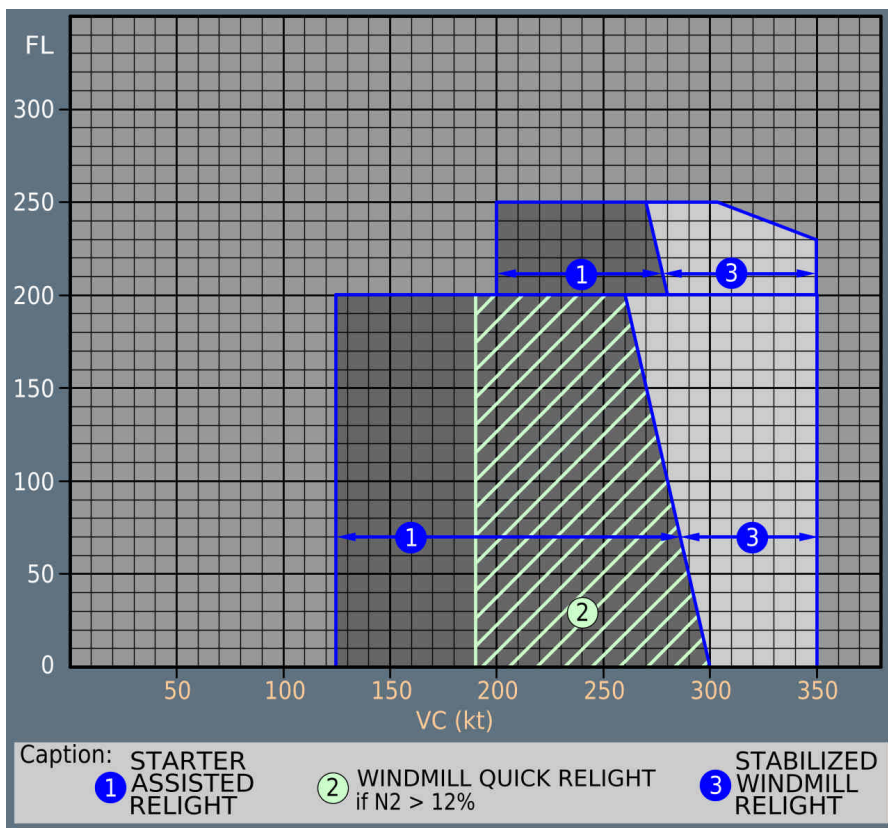
Note: Depending on the FADEC standard, the flight crew may observe a different deceleration between the two engines (CFM56-5B/P engine is faster to decelerate) when the aircraft is above FL 100 and in unsymmetrical bleed configuration or with the APU BLEED ON.

Ident.: PRO-SPO-45-B-00016162.0010001 / 02 MAY 17

ENGINE RELIGHT

For SAC-TI engine the maximum altitude for the engine relight envelope is reduced, compared with the SAC engine relight envelope. Therefore, in case of engine intermix, the flight crew must use the SAC-TI engine relight envelope below.

Engine Relight Envelope



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GENERAL

Ident.: PRO-SPO-50-00020828.0001001 / 17 MAR 17

Applicable to: ALL

The A318/A319/A320/A321 aircraft systems are designed to comply with the design criteria of the EASA and FAA regulations (documents references provided in the AFM) for the RVSM capability. In addition, operators must obtain an operational approval from their national airworthiness authorities, in order to operate within the RVSM airspace. The EASA and FAA regulations (documents references provided in the AFM) also indicate the requirements for obtaining operational approval.

REQUIRED EQUIPMENTS/FUNCTIONS FOR RVSM

Ident.: PRO-SPO-50-00020955.0002001 / 17 MAR 17

Applicable to: ALL

RVSM regulations require the following equipment/functions in order to be operative:

- 2 ADRs + 2 DMCs
- 1 transponder
- 1 Autopilot function
- 1 FCU channel (for altitude target selection and OP CLB/OP DES mode engagement)
- 2 PFD functions (for altitude indication)
- 1 FWC (for altitude alert function).

RVSM NORMAL PROCEDURE

Ident.: PRO-SPO-50-00020830.0002001 / 17 MAR 17

Applicable to: ALL

For flights in RVSM airspace, the flight crew must apply the standard procedures, in addition to the following RVSM procedures.

FLIGHT PREPARATION

The flight crew must take into account the conditions that may affect operations in RVSM airspace, including:

RVSM APPROVAL..... CHECK

L2 *Verify that the aircraft is approved for RVSM operations.*

L1 WEATHER..... CHECK

L2 *Review the weather forecasted for the flight route. If severe turbulence is expected, this may affect the ability to maintain aircraft altitude.*

L1 REQUIRED EQUIPMENT FOR RVSM..... CHECK

L2 *Check that the required equipment is operative (MEL).*

The flight crew should review the maintenance logs and forms, in order to ensure that the equipment required for RVSM is satisfactory.

L1 ALTITUDES..... CHECK

L2 Check that the difference between each altitude indication (in the QNH reference) displayed on PFDs and the airport elevation is less than 75 ft.

Check that the difference between the two primary altitude indications on the PFDs is less than the tolerance specified in SOP. Refer to PRO-NOR-SOP-06 Glareshield - EFIS Control Panel.

L1 **IN FLIGHT**

BEFORE ENTERING RVSM AIRSPACE

REQUIRED EQUIPMENT FOR RVSM..... OPERATIVE

L2 If any of the required equipment fails before the aircraft enters RVSM airspace, the flight crew must request new clearance, to avoid this airspace.

L1 ALTITUDES..... CHECK

L2 Check on the PFDs that the difference between altitude indications (in the standard baro setting) is less than the specified tolerance in the table below.

If only two ADRs are operative, the altimeter indications on PFD and standby altimeter should be recorded. This information may be useful in case of subsequent PFD altitude discrepancy, or loss of both remaining ADRs.

L1

		Comparison of Altitude Indication (ft)		
Flight Level	Speed or Mach Number	Difference between ADR1 and ADR2 (on PFDs)	Difference between ADR3 and ADR1/2 (on PFDs)	Difference between STBY ALTI and ADRs
FL 50	250 kt	50 (15 m)	65 (20 m)	130 (40 m)
FL 100	250 kt	55 (17 m)	80 (24 m)	185 (56 m)
FL 200	300 kt	90 (27 m)	135 (41 m)	295 (90 m)
FL 300	M 0.78	130 (40 m)	195 (59 m)	390 (119 m)
FL 390	M 0.78	130 (40 m)	195 (59 m)	445 (136 m)

IN RVSM AIRSPACE

AP..... KEEP ENGAGED

L2 Ensure that autopilot is engaged for cruise, and for flight level changes.

L1 AP GUIDANCE..... MONITOR

L2 During flight level transitions, do not exceed or go below the assigned flight level by more than 150 ft.

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L1

- **Approximately every hour:**
ALTIMETRES.....CHECK

L2

*Check that the difference between the altitude indications on PFDs is less than the specified tolerance. For more information, See table in "Before Entering RVSM airspace".
Regular check of the flight deck instruments should be sufficient.*

L1 AT THE END OF THE FLIGHT

ANY MALFUNCTIONS or DEVIATIONS..... REPORT

L2

- Report any malfunction of the systems that enable the aircraft to maintain altitude, including:*
- Any malfunction or loss of required equipment
 - Any deviation involving the functions that enable the aircraft to maintain altitude.

RVSM ABNORMAL AND EMERGENCY PROCEDURE

Ident.: PRO-SPO-50-00020831.0002001 / 17 MAR 17

Applicable to: ALL

ATC..... NOTIFY

When the aircraft is in RVSM airspace, the flight crew must notify the ATC of the following situations, because they may affect the aircraft's ability to maintain the flight level:

- The failure of both autopilots
- The loss of altimeter system redundancy (only one PFD indication remaining)
- An excessive discrepancy in altitude indications, and no way to identify the valid indication
- The failure of any other equipment, that affects the aircraft's ability to maintain flight level
- The encounter of greater than moderate turbulence.

If the flight crew cannot notify the ATC or obtain the ATC clearance before deviating from the assigned flight level, they should follow the established contingency procedure and obtain the ATC clearance as soon as possible.

PROCEDURES

SPECIAL OPERATIONS

REDUCED VERTICAL SEPARATION MINIMUM - RVSM

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GENERAL

Applicable to: ALL

Ident.: PRO-SPO-51-A-00015857.0001001 / 20 MAR 17

GENERAL

The Performance Based Navigation (PBN) concept implies that the aircraft follows the defined track with a requested navigation performance. The PBN includes RNAV and RNP operations. For RNAV and RNP operations, an operational approval from the airline's national authorities may be required.

The AFM provides regulatory compliances associated with PBN operations.

Ident.: PRO-SPO-51-A-00015859.0001001 / 09 SEP 14

RNAV/RNP CAPABILITY

Before the aircraft enters an RNAV/RNP airspace, RNAV/RNP capability is based on:

- The required RNAV/RNP equipment that is described in each RNAV/RNP section of the FCOM
- Navigation Accuracy HIGH displayed on the MCDU PROG page
- Any specific local requirements published in the Aeronautical Information Publication (AIP).

When the aircraft flies in RNAV/RNP airspace, RNAV/RNP capability is based on:

- Navigation Accuracy HIGH displayed on the MCDU PROG page
- Any specific local requirements published in the Aeronautical Information Publication (AIP).

RNAV 10 / RNP 10

Applicable to: ALL

Ident.: PRO-SPO-51-B-00015854.0001001 / 09 SEP 14

GENERAL

RNAV 10 operations correspond to RNP 10 operations.

In RNAV 10 airspace, the aircraft is expected to fly for a long period of time outside radio navaid coverage.

Ident.: PRO-SPO-51-B-00015855.0001001 / 28 MAY 20

REQUIRED RNAV 10 EQUIPMENT

The minimum navigation equipment required to enter RNAV 10 airspace is:

- Two FMGCs (or one FMGC and one BACK UP NAV )
- Two MCDUs
- Two IRS

- Two NDs (the temporary display of ND information via the PFD/ND sw is permitted on PM side)
- One GPS if the flight time outside radio navaid coverage is longer than:
 - 6.2 hr from the time of IRS ground alignment, or
 - 5.7 hr from the time of the last FM position update.

Ident.: PRO-SPO-51-B-00015863.0001001 / 11 APR 17

PROCEDURE

MANAGEMENT OF DEGRADED NAVIGATION

- **If one of the following messages is displayed, the flight crew should resume navigation with the FMGC that provides the correct position:**
 - GPS PRIMARY LOST  on one ND/MCDU
 - NAV ACCUR DOWNGRAD on one ND/MCDU.
- **If the GPS PRIMARY LOST  message is displayed on both NDs/MCDUs, RNAV 10 operations can be continued:**
 - With no time restriction if radio navaids update is available
 - For 5.7 hr from the time of the last position update if radio navaids update is not available. After 5.7 hr, the navigation accuracy must be considered LOW regardless of the navigation accuracy that is displayed on the MCDU PROG page.
- **If one of the following MCDU or ECAM messages is displayed, the flight crew should crosscheck the position data using the POSITION MONITOR page, the IRS 1(2)(3) pages, and the GPS MONITOR page  in order to identify which FMGC position is correct:**
 - FMS1/FMS2 POS DIFF
 - CHECK IRS 1(2)(3)/FM POSITION 
 - CHECK A/C POSITION 
 - NAV FM/GPS POS DISAGREE 

The flight crew should resume navigation with the FMGC that provides the correct position.

- **If NAV ACCUR DOWNGRAD is displayed on both sides:**
 - As per design FMS REQ ACCUR is set by default; this default value (e.g. 2 NM in cruise, 1 NM in terminal area) is more restrictive than overflown airspace required navigation performance.
 - Any change on FMS REQ ACCUR to be in accordance with airspace requirement is at flight crew's discretion; and should be set back to default value when leaving intended airspace.

If NAV ACCUR DOWNGRAD remains displayed, the flight crew should inform ATC that the RNAV 10 capability is lost.

RNAV 5 / BRNAV

Applicable to: ALL

Ident.: PRO-SPO-51-C-00015851.0001001 / 20 MAR 17

GENERAL

RNAV 5 operations correspond to European BRNAV operations.

Ident.: PRO-SPO-51-C-00015852.0001001 / 28 MAY 20

REQUIRED RNAV 5 EQUIPMENT

The minimum navigation equipment required to enter RNAV 5 airspace is:

- One FMGC
- One MCDU
- One GPS or one DME receiver to update FM position
- Two NDs (the temporary display of ND information via the PFD/ND sw is permitted on PM side)
- One IRS.

Ident.: PRO-SPO-51-C-00015864.0001001 / 07 NOV 25

¹ PROCEDURE

MANAGEMENT OF DEGRADED NAVIGATION

- If one of the following messages is displayed, the flight crew should resume navigation with the FMGC that provides the correct position:
 - **GPS PRIMARY LOST**  on one ND/MCDU
 - **NAV ACCUR DOWNGRAD** on one ND/MCDU.
- If one of the following MCDU or ECAM messages is displayed, the flight crew should check the position data via the MCDU PROG page in order to identify which FMGC position is correct:
 - **GPS PRIMARY LOST**  on both NDs/MCDUs
 - **FMS1/FMS2 POS DIFF**
 - **CHECK IRS 1(2)(3)/FM POSITION** 
 - **CHECK A/C POSITION** 
 - **NAV FM/GPS POS DISAGREE**  .

The flight crew should resume navigation with the FMGC that provides the correct position.

PROCEDURES

SPECIAL OPERATIONS

PERFORMANCE-BASED NAVIGATION (PBN)

● If **NAV ACCUR DOWNGRAD** is displayed on both sides:

- As per design FMS REQ ACCUR is set by default; this default value (e.g. 2 NM in cruise, 1 NM in terminal area) is more restrictive than overflow airspace required navigation performance.
- Any change on FMS REQ ACCUR to be in accordance with airspace requirement is at flight crew's discretion; and should be set back to default value when leaving intended airspace.

If **NAV ACCUR DOWNGRAD** remains displayed, the flight crew should inform ATC that the RNAV 5 capability is lost.

RNAV 1 RNAV 2 / P-RNAV - TERMINAL RNAV

Applicable to: **ALL**

Ident.: PRO-SPO-51-D-00015848.0001001 / 20 MAR 17

GENERAL

RNAV 1(2) operations correspond to P-RNAV TERMINAL RNAV operations.
 The AIP may specify that GPS equipment is required.

Ident.: PRO-SPO-51-D-00015849.0001001 / 28 MAY 20

REQUIRED RNAV 1(2) EQUIPMENT

The minimum navigation equipment required to enter RNAV1/RNAV2 airspace is:

- One FMGC
- One MCDU
- One GPS or one DME receiver to update the FM position
- Two IRS
- One FD in NAV mode
- Two NDs (the temporary display of ND information via the PFD/ND sw is permitted on PM side).

Ident.: PRO-SPO-51-D-00015865.0001001 / 07 NOV 25

2 PROCEDURE

BEFORE ENTERING RNAV 1(2) AIRSPACE

The FMS navigation database provides the terminal procedure (RNAV SID, RNAV STAR, RNAV TRANSITION, etc.) of the flight plan. The flight crew must crosscheck the terminal procedure from the published charts with the FMS navigation database on the F-PLN page (waypoint sequences, tracks, distances, and altitude or speed constraints). The flight crew must

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES SPECIAL OPERATIONS PERFORMANCE-BASED NAVIGATION (PBN)
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not modify the procedure that is provided by the navigation database, unless required by the ATC (DIR TO, radar vectoring, insertion of waypoints from the navigation database).

MANAGEMENT OF DEGRADED NAVIGATION

- If one of the following messages is displayed, the flight crew should resume navigation with the FMGC that provides the correct position:
 - **GPS PRIMARY LOST**  on one ND/MCDU
 - **NAV ACCUR DOWNGRAD** on one ND/MCDU.
- If one of the following MCDU or ECAM messages is displayed, the flight crew should check the position data via the MCDU PROG page in order to identify which FMGC position is correct:
 - **GPS PRIMARY LOST**  on both NDs/MCDUs
 - **FMS1/FMS2 POS DIFF**
 - **CHECK IRS 1(2)(3)/FM POSITION** 
 - **CHECK A/C POSITION** 
 - **NAV FM/GPS POS DISAGREE**  .

The flight crew should resume navigation with the FMGC that provides the correct position.

- If **NAV ACCUR DOWNGRAD** is displayed on both sides:

The flight crew should inform the ATC that the RNAV 1(2) capability is lost.

RNP 4

Applicable to: ALL

Ident.: PRO-SPO-51-E-00015845.0001001 / 09 SEP 14

GENERAL

In this airspace, the aircraft is expected to fly for a long period of time outside radio navaid coverage.

Ident.: PRO-SPO-51-E-00015846.0001001 / 28 MAY 20

REQUIRED RNP 4 EQUIPMENT

The minimum navigation equipment required to enter RNP 4 airspace is:

- Two FMGCs (or one FMGC and one BACK UP NAV )
- Two MCDUs
- Two IRS
- One GPS
- Two NDs (the temporary display of ND information via the PFD/ND sw is permitted on PM side).

PROCEDURE

MANAGEMENT OF DEGRADED NAVIGATION

- If one of the following messages is displayed, the flight crew should resume navigation with the FMGC that provides the correct position:
 - GPS PRIMARY LOST on one ND/MCDU
 - NAV ACCUR DOWNGRAD on one ND/MCDU.
- If one of the following MCDU or ECAM messages is displayed, the flight crew should crosscheck the position data using the POSITION MONITOR page, the IRS 1(2)(3) pages, and the GPS MONITOR page in order to identify which FMGC position is correct:
 - GPS PRIMARY LOST on both NDs/MCDUs
 - FMS1/FMS2 POS DIFF
 - CHECK IRS 1(2)(3)/FM POSITION 
 - CHECK A/C POSITION 
 - NAV FM/GPS POS DISAGREE

The flight crew should resume navigation with the FMGC that provides the correct position.

- If NAV ACCUR DOWNGRAD is displayed on both sides:
 - As per design FMS REQ ACCUR is set by default; this default value (e.g. 2 NM in cruise, 1 NM in terminal area) is more restrictive than overflown airspace required navigation performance.
 - Any change on FMS REQ ACCUR to be in accordance with airspace requirement is at flight crew's discretion; and should be set back to default value when leaving intended airspace.

If NAV ACCUR DOWNGRAD remains displayed, the flight crew should inform ATC that the RNP 4 capability is lost.

RNP 2 IN OCEANIC AND REMOTE CONTINENTAL AREA

Applicable to: ALL

Ident.: PRO-SPO-51-I-00021541.0001001 / 20 MAR 17

GENERAL

In this airspace, the aircraft is expected to fly for a long period of time outside radio navaid coverage.

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Ident.: PRO-SPO-51-I-00021542.0001001 / 28 MAY 20

REQUIRED RNP 2 IN OCEANIC AND REMOTE CONTINENTAL AREA EQUIPMENT

The minimum navigation equipment required to enter RNP 2 oceanic and remote continental airspace is:

- Two FMGCs (or one FMGC and one BACK UP NAV )
- Two MCDUs
- Two IRS
- One GPS
- Two NDs (the temporary display of ND information via the PFD/ND sw is permitted on PM side).

Ident.: PRO-SPO-51-I-00021544.0001001 / 20 MAR 17

PROCEDURE

FLIGHT PREPARATION

RAIM/AIME availability should be confirmed for RNP 2 in oceanic and remote continental area operations.

Refer to PRO-NOR-SOP-02 GPS PRIMARY Availability (If Installed)

MANAGEMENT OF DEGRADED NAVIGATION

- **If one of the following messages is displayed, the flight crew should resume navigation with the FMGC that provides the correct position:**
 - GPS PRIMARY LOST on one ND/MCDU
 - NAV ACCUR DOWNGRAD on one ND/MCDU.
- **If one of the following MCDU or ECAM messages is displayed, the flight crew should crosscheck the position data using the POSITION MONITOR page, the IRS 1(2)(3) pages, and the GPS MONITOR page in order to identify which FMGC position is correct:**
 - GPS PRIMARY LOST on both NDs/MCDUs
 - FMS1/FMS2 POS DIFF
 - CHECK IRS 1(2)(3)/FM POSITION 
 - CHECK A/C POSITION 
 - NAV FM/GPS POS DISAGREE

The flight crew should resume navigation with the FMGC that provides the correct position.

- **If NAV ACCUR DOWNGRAD is displayed on both sides:**

The flight crew should inform the ATC that the RNP 2 capability is lost.

RNP 2 IN DOMESTIC AREA

Applicable to: ALL

Ident.: PRO-SPO-51-J-00021545.0001001 / 28 MAY 20

REQUIRED RNP 2 IN DOMESTIC AREA EQUIPMENT

The minimum navigation equipment required to enter RNP 2 domestic airspace is:

- One FMGC
- One MCDU
- One GPS
- Two IRS
- Two NDs (the temporary display of ND information via the PFD/ND sw is permitted on PM side).

Ident.: PRO-SPO-51-J-00021546.0001001 / 07 NOV 25

3 PROCEDURE
FLIGHT PREPARATION

RAIM/AIME availability should be confirmed for RNP 2 in domestic area operations.

Refer to PRO-NOR-SOP-02 GPS PRIMARY Availability (If Installed)
MANAGEMENT OF DEGRADED NAVIGATION

- If one of the following messages is displayed, the flight crew should resume navigation with the FMGC that provides the correct position:
 - **GPS PRIMARY LOST**  on one ND/MCDU
 - **NAV ACCUR DOWNGRAD** on one ND/MCDU.
- If one of the following MCDU or ECAM messages is displayed, the flight crew should check the position data via the MCDU PROG page in order to identify which FMGC position is correct:
 - **GPS PRIMARY LOST**  on both NDs/MCDUs
 - **FMS1/FMS2 POS DIFF**
 - **CHECK IRS 1(2)(3)/FM POSITION** 
 - **CHECK A/C POSITION** 
 - **NAV FM/GPS POS DISAGREE**  .

The flight crew should resume navigation with the FMGC that provides the correct position.

- If **NAV ACCUR DOWNGRAD** is displayed on both sides:

The flight crew should inform the ATC that the RNP 2 capability is lost.

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RNP 1 / TERMINAL RNP 1- BASIC RNP 1

Applicable to: ALL

Ident.: PRO-SPO-51-F-00015842.0001001 / 20 MAR 17

GENERAL

RNP 1 operations correspond to RNP 1 Terminal operations.

Ident.: PRO-SPO-51-F-00015843.0001001 / 28 MAY 20

REQUIRED RNP 1 EQUIPMENT

The minimum navigation equipment required to enter RNP 1 airspace is:

- One FMGC
- One MCDU
- One GPS
- Two IRS
- One FD in NAV mode
- Two NDs (the temporary display of ND information via the PFD/ND sw is permitted on PM side).

Ident.: PRO-SPO-51-F-00015867.0001001 / 07 NOV 25

4 PROCEDURE

FLIGHT PREPARATION

RAIM/AIME availability should be confirmed for RNP 1 operations.

Refer to PRO-NOR-SOP-02 GPS PRIMARY Availability (If Installed)

BEFORE ENTERING RNP 1 AIRSPACE

The FMS navigation database provides the terminal procedure (RNAV SID, RNAV STAR, RNAV TRANSITION, etc.) of the flight plan. The flight crew must check the terminal procedure from the published charts with the FMS navigation database on the F-PLN page (waypoint sequences, tracks, distances, and altitude or speed constraints). The flight crew must not modify the procedure that is provided by the navigation database, unless required by the ATC (DIR TO, radar vectoring, insertion of waypoints from the navigation database).

MANAGEMENT OF DEGRADED NAVIGATION

- **If one of the following messages is displayed, the flight crew should resume navigation with the FMGC that provides the correct position:**
 - **GPS PRIMARY LOST**  on one ND/MCDU
 - **NAV ACCUR DOWNGRAD** on one ND/MCDU.

PROCEDURES

SPECIAL OPERATIONS

PERFORMANCE-BASED NAVIGATION (PBN)

- If one of the following MCDU or ECAM messages is displayed, the flight crew should check the position data via the MCDU PROG page in order to identify which FMGC position is correct:

- GPS PRIMARY LOST  on both NDs/MCDUs
- FMS1/FMS2 POS DIFF
- CHECK IRS 1(2)(3)/FM POSITION 
- CHECK A/C POSITION 
- NAV FM/GPS POS DISAGREE .

The flight crew should resume navigation with the FMGC that provides the correct position.

- If **NAV ACCUR DOWNGRAD** is displayed on both sides:

The flight crew should inform the ATC that the RNP 1 capability is lost.

RNP APCH / RNAV(GNSS)

Applicable to: ALL

Ident.: PRO-SPO-51-G-00015839.0001001 / 20 MAR 17

GENERAL

RNP APCH operations correspond to RNAV(GNSS) or RNAV(GPS) operations.

Ident.: PRO-SPO-51-G-00015840.0001001 / 11 JUL 17

REQUIRED RNP APCH EQUIPMENT

The minimum equipment required to start RNP APCH operations is:

- One FMGC
- One GPS
- Two IRS
- One MCDU
- One FD
- One PFD on the PF side
- Two NDs (the temporary display of ND information via the PFD/ND switch is permitted on PM side)
- Two FCU channels.

Ident.: PRO-SPO-51-G-00015868.0001001 / 10 MAY 21

PROCEDURE

Refer to PRO-NOR-SOP-18-C Approach using FINAL APP Guidance - General.

Refer to PRO-NOR-SOP-18-C Approach using FPA Guidance - General.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES SPECIAL OPERATIONS OPERATIONS ON NARROW RUNWAYS
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GENERAL

Ident.: PRO-SPO-60-00023439.0001001 / 17 NOV 20

Applicable to: MSN 02155-02212, 05152-07792

A standard runway is 45 m wide. Operations on runways less than 45 m wide require authorization from the Airworthiness Authorities.

GENERAL

Ident.: PRO-SPO-60-00023439.0002001 / 17 NOV 20

Applicable to: MSN 02719-04392

This chapter gives the limitations, procedures and performance for operations from/to runways with a width below 45 m .

This chapter does not constitute an operational approval to operate on narrow runways. Such authorization must be obtained by the operator from the appropriate authorities.

LIMITATIONS

Ident.: PRO-SPO-60-00023440.0002001 / 15 NOV 21

Applicable to: MSN 02719-04392

Minimum runway width.....30 m

The dispatch from/to narrow runways is not allowed in the case of:

- Nose wheel steering inoperative
- One brake or more inoperative.

Autoland is not allowed.

MAXIMUM DEMONSTRATED CROSSWIND FOR TAKEOFF AND LANDING

Runway Surface Conditions		Maximum Crosswind for Takeoff (Gust included)	Related Landing Performance		Maximum Crosswind for Landing (Gust included)
Runway State or / and Runway Contaminant	AIREP ⁽¹⁾		RWYCC ⁽²⁾	Level	
Dry	Dry	38 kt	6	DRY	38 kt
Damp	Good	33 kt	5	GOOD	33 kt
Wet					
Up to 3 mm (1/8") of water					
Slush					
Up to 3 mm (1/8")					
Dry snow	Good	33 kt	5	GOOD	33 kt
Up to 3 mm (1/8")					
Wet snow					
Up to 3 mm (1/8")	Good	33 kt	5	GOOD	33 kt
Frost					

Continued on the following page

PROCEDURES

SPECIAL OPERATIONS

OPERATIONS ON NARROW RUNWAYS

Continued from the previous page

Runway Surface Conditions		Maximum Crosswind for Takeoff (Gust included)	Related Landing Performance		Maximum Crosswind for Landing (Gust included)
Runway State or / and Runway Contaminant	AIREP ⁽¹⁾		RWYCC ⁽²⁾	Level	
Compacted snow OAT at or below -15 °C	Good to Medium	10 kt	4	GOOD TO MEDIUM	10 kt
Dry snow More than 3 mm (1/8"), up to 100 mm (4") Wet snow More than 3 mm (1/8"), up to 30 mm (6/5") Compacted snow OAT above -15 °C Dry snow over compacted snow Wet snow over compacted snow Slippery wet	Medium	10 kt	3	MEDIUM	10 kt
Standing Water More than 3 mm (1/8"), up to 13 mm (1/2") Slush More than 3 mm (1/8"), up to 13 mm (1/2")	Medium to Poor	10 kt	2	MEDIUM TO POOR	10 kt
Ice (cold & dry)	Poor	10 kt	1	POOR	10 kt

⁽¹⁾ *AIREP: Special Air Report of Braking Action*

⁽²⁾ *RWYCC: Runway Condition Code*

Note: *These maximum demonstrated crosswind values are based on the assumption that the flight crew have been trained accordingly.*

PROCEDURES

Ident.: PRO-SPO-60-00023441.0003001 / 17 NOV 20

Applicable to: MSN 02719-04392

Diversion to a 45 m wide runway is recommended in case of :

- Rudder jam
- Rudder pedal jam
- Yaw damper system fault

- Rudder Travel Limit system fault
- All failures leading to the loss of the nose wheel steering (HYD Yellow system loss, double hydraulic failure, double BSCU fault, double LGCIU fault)

PROCEDURES

SPECIAL OPERATIONS

OPERATIONS ON NARROW RUNWAYS

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PROCEDURES SPECIAL OPERATIONS SIMULTANEOUS PARALLEL APPROACH OPERATIONS
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OVERVIEW

Ident.: PRO-SPO-85-00020844.0001001 / 28 NOV 19

Applicable to: ALL

Simultaneous Parallel Approach operations permit ILS/RNAV(GNSS)/RNAV(RNP)/GLS instrument approaches to be performed to dual or triple parallel runway configurations.

Two types of simultaneous approaches to parallel or near-parallel instrument runways exist:

- Independent Approaches, where radar separation minima between aircraft on adjacent extended runway center lines are not prescribed and approaches are monitored to ensure aircraft do not enter a No Transgression Zone (NTZ). A Precision Runway Monitor (PRM) system which enables simultaneous close parallel approaches may also be employed. The air traffic controllers use the PRM system to monitor the aircraft position.
- Dependent Approaches, where radar separation minima between aircraft on adjacent extended runway center lines are prescribed and aircraft are staggered to provide separation from the adjacent final course.

To perform Simultaneous Parallel Approach operations:

- The ATC and flight crew must satisfy specific training requirements.
- The ATC and the aircraft equipment must also comply with specific requirements.

BREAK OUT TURN AND CLIMB PROCEDURE

Ident.: PRO-SPO-85-00020845.0001001 / 17 MAR 17

Applicable to: ALL

Simultaneously:

AP..... OFF
BREAK OUT LEFT(RIGHT), HDG __, ALT ____ ANNOUNCE
THRUST LEVERS..... TOGA, and back to CL

[L2] *The SRS GA and the GA TRK modes engage. The THR CLB mode engages.*

The speed is managed. The speed target is the aircraft speed at SRS GA engagement.

The FMS GO-AROUND phase becomes active. Therefore, the FMS reinserts the approach.

[L1] TURN LEFT(RIGHT) AND CLIMB

[L2] *As the situation is urgent, the flight crew should temporarily disregard the FD orders.*

PROCEDURES

SPECIAL OPERATIONS

SIMULTANEOUS PARALLEL APPROACH OPERATIONS

Then

L1 HDG..... TURN AND PULL

L2 *The GA TRK mode disengages, and the HDG mode engages.*

L1 ALT.....TURN AND PULL

L2 *The SRS GA mode disengages, and the OP CLB mode engages. The speed target becomes the FMS speed target of the CLIMB phase.*

L1 SPEED.....PULL AND ADJUST

L2 *For the initial break out procedure, adjust the speed (e.g. 160 kt), in order to avoid a significant acceleration, and an increase in workload.*

L1 ● **When established on the break out path:**

AP.....ON

L2 *Before engaging the AP, ensure that the FD bar orders correspond to the aircraft current path.*

L1 SPEED.....SELECT AS RQRD

FLAPS.....AS RQRD

GEAR.....AS RQRD

TCAS MODE SEL.....TA/RA AS RQRD

BREAK OUT TURN AND DESCENT PROCEDURE

Ident.: PRO-SPO-85-00020846.0001001 / 17 MAR 17

Applicable to: ALL

Simultaneously:

AP..... OFF

TURN LEFT(RIGHT) AND MAINTAIN RATE OF DESCENT

BREAK OUT LEFT(RIGHT), HDG____, ALT..... ANNOUNCE

L2 *As the situation is urgent, the flight crew should temporarily disregard the FD orders.*

Then

L1 HDG TURN AND PULL

L2 *The HDG mode engages. The vertical mode reverts to the V/S mode. The vertical speed target is the aircraft vertical speed at V/S engagement.*

L1 ALT TURN AND PULL

L2 *This action defines an altitude target. The OP DES mode and the THR IDLE mode engage. The speed target does not change.*

L1 V/S MONITOR

CAUTION Depending on the speed target, the vertical speed may become excessive. If the rate of descent exceeds 1 000 ft/min, engage the V/S mode and limit the rate of descent to 1 000 ft/min.

● **When established on the break out path:**

AP ON

L2 *Before engaging the AP, ensure that the FD bar orders correspond to the aircraft current path.*

L1 ● **When cleared by ATC:**

ALT TURN

L2 *Select an altitude target for go-around, in accordance with the ATC clearance.*

L1 THRUST LEVERS TOGA, and back to CL

L2 *The SRS GA and the GA TRK modes engage. The THR CLB mode engages.
 The speed is managed. The speed target is the aircraft speed at SRS GA engagement.
 The FMS GO-AROUND phase becomes active.*

L1 HDG PULL

L2 *The GA TRK mode disengages, and the HDG mode engages. The SRS GA mode remains engaged, until ALT* engagement.*

L1 SPEED SELECT AS RQRD

FLAPS AS RQRD

GEAR AS RQRD

TCAS MODE SEL TA/RA AS RQRD

PROCEDURES

SPECIAL OPERATIONS

SIMULTANEOUS PARALLEL APPROACH OPERATIONS

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LIMITATIONS

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LIM-INT Introduction

LIM-AG Aircraft General

LIM-AIR Air Bleed/Cond/Press/Vent

LIM-AFS Auto Flight System

LIM-APU Auxiliary Power Unit

LIM-CAB Cabin Systems

LIM-COM Communication

LIM-ENG Engines

LIM-F_CTL Flight Controls

LIM-FUEL Fuel

LIM-ICE_RAIN Ice and Rain Protection

LIM-LG Landing Gear

| LIM-NAV Navigation

LIM-OXY Oxygen

LIM-SURV Surveillance

LIMITATIONS

PRELIMINARY PAGES

TABLE OF CONTENTS

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 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	LIMITATIONS PRELIMINARY PAGES LIST OF EFFECTIVE TEMPORARY DOCUMENTARY UNITS
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M ⁽¹⁾	Localization	DU Title	DU identification	DU date
	LIM-AFS-20 Criteria: A320 Applicable to: ALL <i>Impacted DU: NONE</i>	Automatic Landing in Johannesburg	00013685.0001001	25 APR 13

(1) Evolution code : N=New, R=Revised, E=Effectivity

LIMITATIONS

PRELIMINARY PAGES

LIST OF EFFECTIVE TEMPORARY DOCUMENTARY UNITS

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LIMITATIONS

INTRODUCTION

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	LIMITATIONS INTRODUCTION PRELIMINARY PAGES - TABLE OF CONTENTS
--	--

Introduction.....	A
-------------------	---

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	LIMITATIONS INTRODUCTION
--	---

INTRODUCTION

Ident.: LIM-INT-00019839.0001001 / 04 SEP 17

Applicable to: ALL

This FCOM chapter contains operational limitations, related to the aircraft and associated systems. All references to airspeed, Mach and altitude relate to indicated airspeed, indicated Mach, and pressure altitude, unless otherwise noted.

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LIMITATIONS

AIRCRAFT GENERAL

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	LIMITATIONS AIRCRAFT GENERAL PRELIMINARY PAGES - TABLE OF CONTENTS
--	--

LIM-AG-F_CTL Flight Maneuvering Load Acceleration Limits	
Flight Maneuvering Load Acceleration Limits.....	A

LIM-AG-OPS Operational Parameters	
Environmental Envelope.....	A
1 Airport Operations and Wind Limitations.....	B

LIM-AG-SPD Speeds	
Cockpit Window Open Maximum Speed.....	A
Maximum Flaps/Slats Speeds.....	B
Maximum Operating Speed VMO/MMO.....	C
Maximum Speeds with the Landing Gear Extended.....	D
Maximum Tire Speed.....	E
Minimum Control Speeds.....	F
Minimum Control Speeds on Narrow Runways.....	G
Taxi Speed.....	H
Wipers Maximum Operating Speed.....	I

LIM-AG-WGHT Weights	
Weight Limitations.....	A

LIMITATIONS

AIRCRAFT GENERAL

PRELIMINARY PAGES - TABLE OF CONTENTS

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	LIMITATIONS AIRCRAFT GENERAL PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS
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Localization Title	Toc Index	ID	Reason
LIM-AG-PLP-TOC Airport Operations and Wind Limitations		1	Documentation update: Deletion of "Runway Altitude (00020135)".
			Documentation update: Deletion of "Runway Altitude (00020135.0001001)".

LIMITATIONS

AIRCRAFT GENERAL

PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	LIMITATIONS AIRCRAFT GENERAL FLIGHT MANEUVERING LOAD ACCELERATION LIMITS
--	--

FLIGHT MANEUVERING LOAD ACCELERATION LIMITS
--

Ident.: LIM-AG-F_CTL-00020793.0001001 / 17 MAR 17 Applicable to: ALL
--

Clean configuration.....	-1 g to +2.5 g
Other configurations.....	0 g to +2 g

LIMITATIONS

AIRCRAFT GENERAL

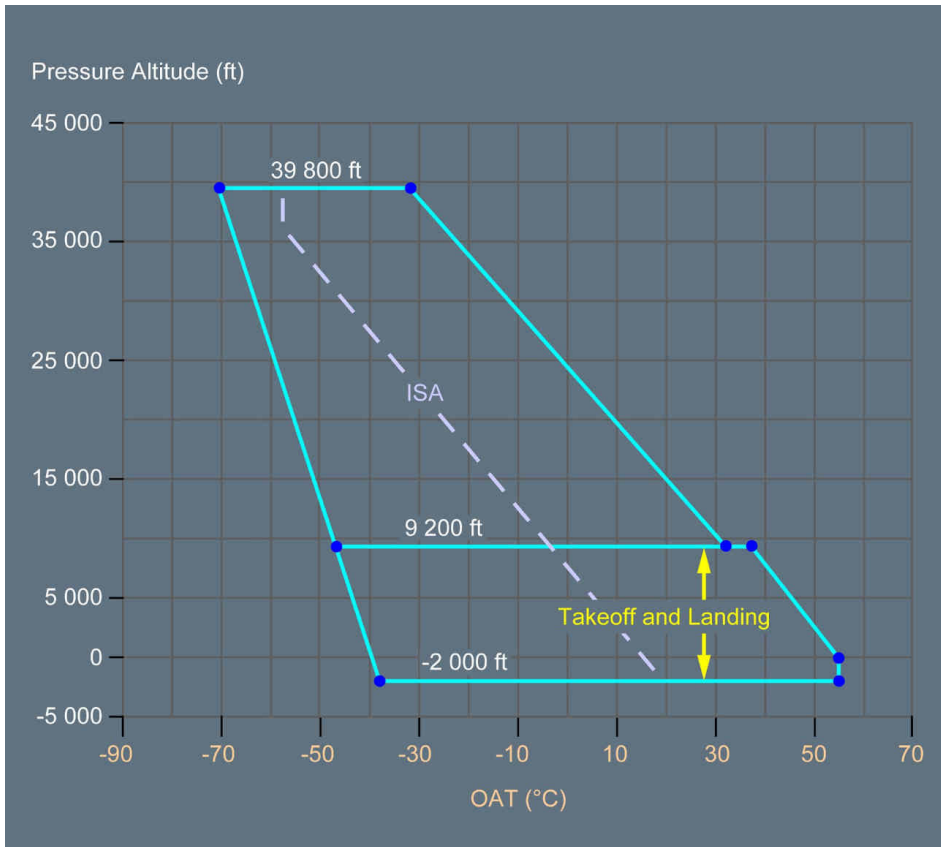
FLIGHT MANEUVERING LOAD ACCELERATION LIMITS

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ENVIRONMENTAL ENVELOPE

Ident.: LIM-AG-OPS-00021818.0027001 / 27 JUL 17

Applicable to: MSN 02719-07792



LIMITATIONS

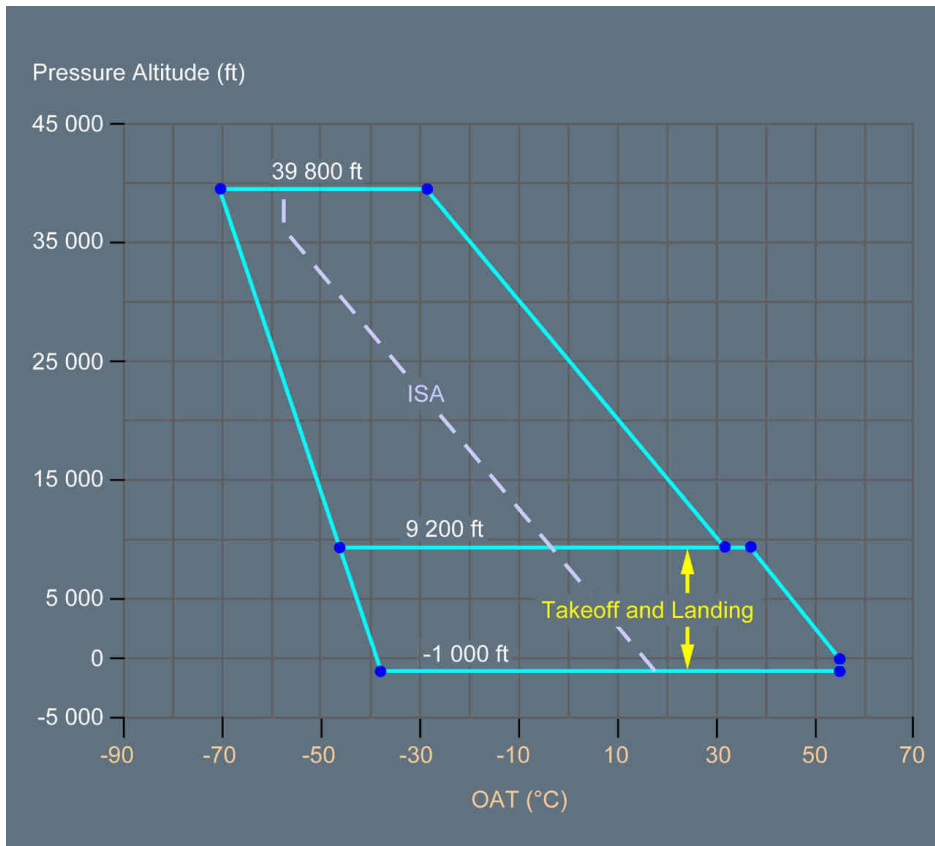
AIRCRAFT GENERAL

OPERATIONAL PARAMETERS

ENVIRONMENTAL ENVELOPE

Ident.: LIM-AG-OPS-00021818.0014001 / 19 JUL 17

Applicable to: MSN 02155-02212



AIRPORT OPERATIONS AND WIND LIMITATIONS

Ident.: LIM-AG-OPS-ARPT_WIND-00020145.0001001 / 17 MAR 17

Applicable to: ALL

RUNWAY SLOPE

Runway slope (mean)..... ±2 %

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	LIMITATIONS AIRCRAFT GENERAL OPERATIONAL PARAMETERS
--	--

NOMINAL RUNWAY WIDTH

Ident.: LIM-AG-OPS-ARPT_WIND-00020146.0001001 / 17 MAR 17
Applicable to: MSN 02155-02212, 05152-07792

NOMINAL RUNWAY WIDTH

Nominal runway width..... 45 m

Ident.: LIM-AG-OPS-ARPT_WIND-00020146.0002001 / 17 MAR 17
Applicable to: MSN 02719-04392

NOMINAL RUNWAY WIDTH

Nominal runway width..... 45 m
Minimal runway width..... 30 m

Ident.: LIM-AG-OPS-ARPT_WIND-00020148.0001001 / 17 MAR 17
Applicable to: ALL

WIND FOR TAKEOFF AND LANDING

Maximum demonstrated crosswind (takeoff and landing)..... 38 kt (gust included)

- Note:
- *The maximum demonstrated crosswind value is not an Airplane Flight Manual (AFM) limitation : It is the maximum crosswind condition experienced during the aircraft certification campaign.*
 - *Airbus recommends that operators should not intentionally operate in crosswinds that exceed this value.*

TAILWIND TAKEOFF

Ident.: LIM-AG-OPS-ARPT_WIND-00020157.0003001 / 17 MAR 17
Applicable to: MSN 02926-02944

TAILWIND TAKEOFF

Maximum tailwind for takeoff..... 15 kt

Ident.: LIM-AG-OPS-ARPT_WIND-00020157.0001001 / 17 MAR 17
Applicable to: MSN 02155-02789, 03031-07792

TAILWIND TAKEOFF

Maximum tailwind for takeoff 10 kt

LIMITATIONS

AIRCRAFT GENERAL

OPERATIONAL PARAMETERS

TAILWIND LANDING

Ident.: LIM-AG-OPS-ARPT_WIND-00020159.0001001 / 21 MAR 17

Applicable to: MSN 02155-02789, 03031-07792

TAILWIND LANDING

Maximum tailwind for landing 10 kt

Note: For maximum tailwind for automatic landing and rollout, Refer to LIM-AFS-20 Maximum Wind Conditions for ILS/MLS (If Installed) CAT II or CAT III and for GLS (If Installed) CAT I or CAT II.

Ident.: LIM-AG-OPS-ARPT_WIND-00020159.0003001 / 21 MAR 17

Applicable to: MSN 02926-02944

TAILWIND LANDING

Maximum tailwind for landing 15 kt

Note: For maximum tailwind for automatic landing and rollout, Refer to LIM-AFS-20 Maximum Wind Conditions for ILS/MLS (If Installed) CAT II or CAT III and for GLS (If Installed) CAT I or CAT II.

Ident.: LIM-AG-OPS-ARPT_WIND-00020168.0002001 / 22 MAR 17

Applicable to: MSN 02926-02944

Note: For landing with a tailwind greater than 10 kt, use FLAPS FULL only.

Ident.: LIM-AG-OPS-ARPT_WIND-00020166.0001001 / 04 JUL 17

Applicable to: ALL

PASSENGER AND CARGO DOORS OPERATION

The following are the wind limitations for passenger and cargo doors operation:

- The maximum wind for passenger door operation is 65 kt
- The maximum wind for FWD and AFT cargo door operation is 40 kt (or 50 kt, if the aircraft nose is into the wind, or if the FWD and AFT cargo doors are on the leeward side)
- The FWD and AFT cargo doors must be closed before the wind speed exceeds 65 kt.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	LIMITATIONS AIRCRAFT GENERAL OPERATIONAL PARAMETERS
--	--

Ident.: LIM-AG-OPS-ARPT_WIND-00020046.0003001 / 10 MAY 21

Applicable to: ALL

MAXIMUM RECOMMENDED CROSSWIND ON WET AND CONTAMINATED RUNWAYS

Runway Surface Conditions		Maximum Crosswind for Takeoff (Gust included)	Related Landing Performance		Maximum Crosswind for Landing (Gust included)
Runway State or / and Runway Contaminant	AIREP ⁽¹⁾		RWYCC ⁽²⁾	Level	
Damp Wet Up to 3 mm (1/8") of water Slush Up to 3 mm (1/8") Dry snow Up to 3 mm (1/8") Wet snow Up to 3 mm (1/8") Frost	Good	38 kt	5	GOOD	38 kt
Compacted snow OAT at or below -15 °C	Good to Medium	29 kt	4	GOOD TO MEDIUM	29 kt
Dry snow More than 3 mm (1/8"), up to 100 mm (4") Wet snow More than 3 mm (1/8"), up to 30 mm (6/5") Compacted snow OAT above -15 °C Dry snow over compacted snow Wet snow over compacted snow Slippery wet	Medium	25 kt	3	MEDIUM	25 kt
Standing Water More than 3 mm (1/8"), up to 13 mm (1/2") Slush More than 3 mm (1/8"), up to 13 mm (1/2")	Medium to Poor	20 kt	2	MEDIUM TO POOR	20 kt
Ice (cold & dry)	Poor	15 kt	1	POOR	15 kt

⁽¹⁾ *AIREP: Special Air Report of Braking Action*

⁽²⁾ *RWYCC: Runway Condition Code*

Note: *The maximum crosswind values given in the above table are recommended values based on computations.*

LIMITATIONS

AIRCRAFT GENERAL

OPERATIONAL PARAMETERS

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	LIMITATIONS AIRCRAFT GENERAL SPEEDS
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COCKPIT WINDOW OPEN MAXIMUM SPEED
--

Ident.: LIM-AG-SPD-00001904.0001001 / 17 MAR 17

Applicable to: ALL

Maximum speed.....200 kt

MAXIMUM FLAPS/SLATS SPEEDS

Ident.: LIM-AG-SPD-00020087.0001001 / 17 MAR 17

Applicable to: ALL

Flaps Lever Position	Configuration on Slat/Flap Display	Max Speed	Flight Phase
0		VMO/MMO	CRUISE
1	1	230 kt	HOLDING
	1 + F	215 kt	TAKEOFF
2	2	200 kt	TAKEOFF/APPROACH
3	3	185 kt	TAKEOFF/APPROACH/LANDING
FULL	FULL	177 kt	LANDING

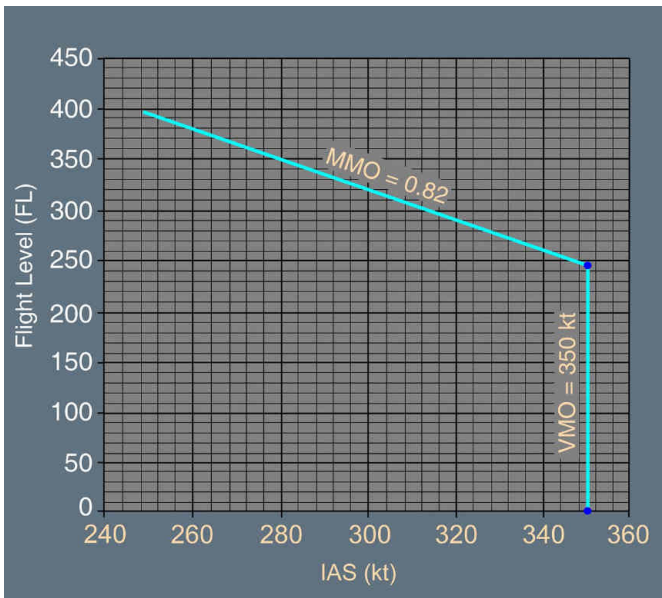
MAXIMUM OPERATING SPEED VMO/MMO
--

Ident.: LIM-AG-SPD-00019991.0002001 / 17 MAR 17

Applicable to: ALL

VMO.....350 kt

MMO..... M 0.82



MAXIMUM SPEEDS WITH THE LANDING GEAR EXTENDED

Ident.: LIM-AG-SPD-00001901.0001001 / 17 MAR 17

Applicable to: ALL

Maximum speed with the landing gear extended (VLE).....	280 kt / M 0.67
Maximum speed at which the landing gear may be extended (VLO extension)	250 kt / M 0.60
Maximum speed at which the landing gear may be retracted (VLO retraction)	220 kt / M 0.54

MAXIMUM TIRE SPEED

Ident.: LIM-AG-SPD-00001902.0001001 / 17 MAR 17

Applicable to: ALL

Maximum ground speed.....	195 kt
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MINIMUM CONTROL SPEEDS

Ident.: LIM-AG-SPD-00023443.0015001 / 17 NOV 20

Applicable to: MSN 02155-02789, 03031-07792

MINIMUM CONTROL SPEED FOR LANDING (VMCL)

VMCL.....	113 kt
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LIMITATIONS AIRCRAFT GENERAL SPEEDS

MINIMUM CONTROL SPEEDS IN THE AIR (VMCA) AND ON THE GROUND (VMCG)

Altitude (ft)	VMCA (kt IAS)	VMCG (kt IAS)		
		CONF 1 + F	CONF 2	CONF 3
-2 000	112	112	110	109
0	110	111	109	109
2 000	108	109	107	107
4 000	108	109	107	107
6 000	107	108	106	105
8 000	104	105	103	103
10 000	100	101	99	99
12 000	97	99	97	96
14 100	94	95	93	93

When the Thrust Bump  is used, consider the following VMCA / VMCG:

Altitude (ft)	VMCA (kt IAS)	VMCG (kt IAS)		
		CONF 1 + F	CONF 2	CONF 3
-2 000	111	112	110	109
0	110	111	109	109
2 000	108	109	107	107
4 000	108	109	107	107
6 000	108	109	107	106
8 000	105	106	104	104
10 000	102	103	101	101
12 000	99	100	98	97
14 100	95	97	95	95

MINIMUM CONTROL SPEEDS

Ident.: LIM-AG-SPD-00023443.0016001 / 17 NOV 20

Applicable to: MSN 02926-02944

MINIMUM CONTROL SPEED FOR LANDING (VMCL)

VMCL..... 108 kt

MINIMUM CONTROL SPEEDS IN THE AIR (VMCA) AND ON THE GROUND (VMCG)

Altitude (ft)	VMCA (kt IAS)	VMCG (kt IAS)		
		CONF 1 + F	CONF 2	CONF 3
-2 000	105	107	105	104
0	105	106	104	104
2 000	103	104	102	102
4 000	102	103	101	101
6 000	100	101	99	99
8 000	98	100	98	97
10 000	96	98	96	95

Continued on the following page

LIMITATIONS

AIRCRAFT GENERAL

SPEEDS

Continued from the previous page

Altitude (ft)	VMCA (kt IAS)	VMCG (kt IAS)		
		CONF 1 + F	CONF 2	CONF 3
12 000	94	96	94	93
14 100	91	94	92	92

MINIMUM CONTROL SPEEDS ON NARROW RUNWAYS

Ident.: LIM-AG-SPD-00023493.0001001 / 17 NOV 20

Applicable to: MSN 02719-04392

For runways with a width below 40 m , the VMCG must be increased by the values indicated in the following table :

Runway Width	30 m	35 m	40 m
Δ VMCG(kt)	+ 2.5	+ 1.5	+ 0

TAXI SPEED

Ident.: LIM-AG-SPD-00019838.0001001 / 28 MAY 20

Applicable to: ALL

- When the takeoff weight is higher than 76 000 kg (167 550 lb):

CAUTION Do not exceed a taxi speed of 20 kt during a turn.

WIPERS MAXIMUM OPERATING SPEED

Ident.: LIM-AG-SPD-00001903.0001001 / 17 MAR 17

Applicable to: ALL

Maximum speed.....230 kt

 **Note:** This limitation is applicable when the wipers are sweeping. It is not applicable if the wipers are not sweeping for any reasons.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	LIMITATIONS AIRCRAFT GENERAL WEIGHTS
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WEIGHT LIMITATIONS

Ident.: LIM-AG-WGHT-00001893.0295001 / 18 MAR 11
Applicable to: MSN 07784-07792

Maximum taxi weight.....	77 400 kg (170 637 lb)
Maximum takeoff weight (brake release).....	77 000 kg (169 755 lb)
Maximum landing weight.....	64 500 kg (142 198 lb)
Maximum zero fuel weight.....	61 000 kg (134 481 lb)
Minimum weight.....	37 230 kg (82 079 lb)
In exceptional cases (in flight turn back or diversion), an immediate landing at weight above maximum landing weight is permitted, provided the pilot follows the overweight landing procedure.	

WEIGHT LIMITATIONS

Ident.: LIM-AG-WGHT-00001893.0268001 / 18 MAR 11
Applicable to: MSN 02155-02212, 04392-05746

Maximum taxi weight.....	77 400 kg (170 637 lb)
Maximum takeoff weight (brake release).....	77 000 kg (169 755 lb)
Maximum landing weight.....	66 000 kg (145 505 lb)
Maximum zero fuel weight.....	62 500 kg (137 788 lb)
Minimum weight.....	37 230 kg (82 079 lb)
In exceptional cases (in flight turn back or diversion), an immediate landing at weight above maximum landing weight is permitted, provided the pilot follows the overweight landing procedure.	

WEIGHT LIMITATIONS

Ident.: LIM-AG-WGHT-00001893.0270001 / 16 NOV 11
Applicable to: MSN 02926-02944

Maximum taxi weight 1.....	75 900 kg (167 330 lb)
Maximum takeoff weight 1 (brake release)*.....	75 500 kg (166 448 lb)
Maximum taxi weight 2.....	73 900 kg (162 921 lb)
Maximum takeoff weight 2 (brake release)*.....	73 500 kg (162 039 lb)
Maximum landing weight.....	66 000 kg (145 505 lb)
Maximum zero fuel weight.....	62 500 kg (137 788 lb)
Minimum weight.....	37 230 kg (82 079 lb)

* Dual MTOW are certified. A placard fitted on the aircraft must reflect the current MTOW.
In exceptional cases (in flight turn back or diversion), an immediate landing at weight above maximum landing weight is permitted, provided the pilot follows the overweight landing procedure.

WEIGHT LIMITATIONS

Ident.: LIM-AG-WGHT-00001893.0011001 / 16 NOV 11

Applicable to: MSN 02719-02789, 03031-03060

Maximum taxi weight 1.....	77 400 kg (170 637 lb)
Maximum takeoff weight 1 (brake release)*.....	77 000 kg (169 755 lb)
Maximum taxi weight 2.....	75 900 kg (167 330 lb)
Maximum takeoff weight 2 (brake release)*.....	75 500 kg (166 448 lb)
Maximum taxi weight 3.....	73 900 kg (162 921 lb)
Maximum takeoff weight 3 (brake release)*.....	73 500 kg (162 039 lb)
Maximum landing weight.....	66 000 kg (145 505 lb)
Maximum zero fuel weight.....	62 500 kg (137 788 lb)
Minimum weight.....	37 230 kg (82 079 lb)

* Multiple MTOW are certified. A placard fitted on the aircraft must reflect the current MTOW.

In exceptional cases (in flight turn back or diversion), an immediate landing at weight above maximum landing weight is permitted, provided the pilot follows the overweight landing procedure.

LIMITATIONS

AIR BLEED/COND/PRESS/VENT

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	LIMITATIONS AIR BLEED/COND/PRESS/VENT PRELIMINARY PAGES - TABLE OF CONTENTS
--	---

General.....	A
APU Bleed Use with HP Air Start Unit.....	B
Avionics Ventilation.....	C
Cabin Pressure.....	D
Packs Use with LP Air Conditioning Unit.....	E

LIMITATIONS

AIR BLEED/COND/PRESS/VENT

PRELIMINARY PAGES - TABLE OF CONTENTS

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	LIMITATIONS AIR BLEED/COND/PRESS/VENT
--	--

GENERAL

Ident.: LIM-AIR-00020807.0001001 / 17 MAR 17

Applicable to: ALL

With passengers on board, it is not recommended to exceed 20 min without air conditioning supply.
The lack of fresh air supply will significantly reduce the cabin's air quality.

APU BLEED USE WITH HP AIR START UNIT

Ident.: LIM-AIR-00020084.0001001 / 17 MAR 17

Applicable to: ALL

The flight crew must not use bleed air from the APU BLEED and from the HP Air Start Unit at the same time, to prevent any adverse effect on the Bleed Air System.

AVIONICS VENTILATION

Ident.: LIM-AIR-00020086.0001001 / 17 MAR 17

Applicable to: ALL

During ground operations and depending on the Outside Air Temperature (OAT), the flight crew must limit the time that the aircraft electric power supply is used, in normal avionics ventilation system configuration, as follows:

OAT ≤ 49 °C	No limitation
49 °C < OAT ≤ 55 °C	2 h
55 °C < OAT ≤ 60 °C	1 h
60 °C < OAT ≤ 64 °C	0.5 h

CABIN PRESSURE

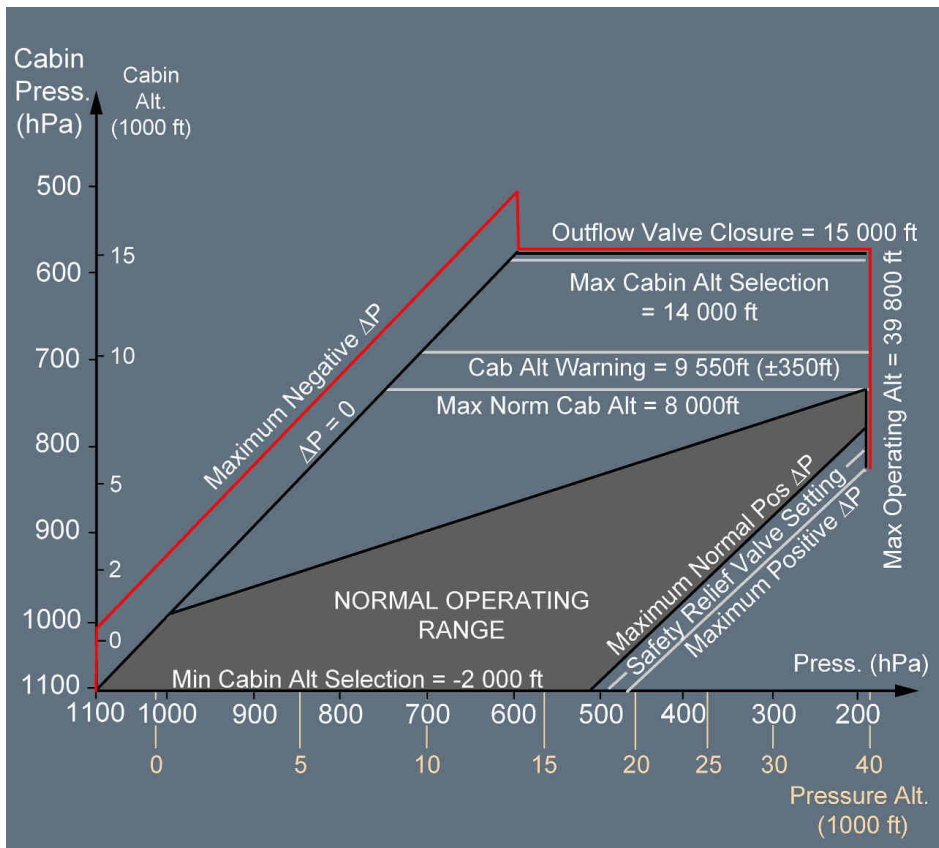
Ident.: LIM-AIR-00020085.0003001 / 17 MAR 17

Applicable to: ALL

Maximum positive differential pressure..... 9.0 PSI
Maximum negative differential pressure.....-1.0 PSI
Safety relief valve setting..... 8.6 PSI

LIMITATIONS

AIR BLEED/COND/PRESS/VENT



Note: Maximum differential pressure (Δp) and safety valve setting tolerance = ± 7 hPa (0.1 PSI).

PACKS USE WITH LP AIR CONDITIONING UNIT

Ident.: LIM-AIR-00020083.0001001 / 17 MAR 17

Applicable to: **ALL**

The flight crew must not use conditioned air from the packs and from the LP Air Conditioning Unit at the same time, to prevent any adverse effect on the Air Conditioning system.

LIMITATIONS

AUTO FLIGHT SYSTEM

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LIM-AFS-10 General

Autopilot Function.....	A
Flight Management Function.....	B
Use of NAV Mode.....	C
Use of FLS 	D
Non-Precision Approaches with Engine-Out.....	E
Navigation Database Validation.....	F

LIM-AFS-20 Automatic Approach, Landing and Rollout

ILS Category II.....	A
Special Authorization CAT II (SA CAT II).....	B
Other than Standard CAT II (OTS CAT II).....	C
ILS Category III Fail Passive (Single).....	D
ILS Category III Fail Operational (Dual).....	E
Engine-Out.....	F
Maximum Wind Conditions for ILS/MLS  CAT II or CAT III and for GLS  CAT I.....	G
Automatic Landing.....	H
Automatic Landing in Johannesburg.....	I

LIMITATIONS

AUTO FLIGHT SYSTEM

PRELIMINARY PAGES - TABLE OF CONTENTS

Intentionally left blank

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	LIMITATIONS AUTO FLIGHT SYSTEM GENERAL
--	--

AUTOPILOT FUNCTION

Applicable to: MSN 02155-03060, 05152-05746

Ident.: LIM-AFS-10-10-00019567.0001001 / 17 MAR 17

The autopilot can be used with the following minimum values:

Ident.: LIM-AFS-10-10-00019753.0001001 / 23 JUL 18

At takeoff	100 ft AGL and at least 5 s after liftoff
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Ident.: LIM-AFS-10-10-00019568.0001001 / 23 JUL 18

In approach with F-G/S  mode	200 ft AGL
In approach with FINAL APP, V/S or FPA mode	250 ft AGL

Ident.: LIM-AFS-10-10-00019746.0005001 / 09 JUN 17

In circling approach	500 ft AGL for aircraft category C (600 ft AGL for aircraft category D).
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Ident.: LIM-AFS-10-10-00019747.0001001 / 06 SEP 22

ILS/MLS  approach when CAT1 is displayed on the FMA	160 ft AGL
ILS/MLS  approach when CAT2 or CAT3 SINGLE or CAT3 DUAL is displayed on the FMA	0 ft AGL if autoland
GLS  approach when CAT1 is displayed on the FMA	160 ft AGL
GLS  approach when AUTO LAND is displayed on the FMA	0 ft AGL if autoland
LPV approach (with SLS ) when APPR1 is displayed on the FMA	160 ft AGL

Ident.: LIM-AFS-10-10-00019748.0001001 / 17 MAR 17

PAR approach (Precision Approach Radar) <u>Note:</u> - The use of the AP and/or FD is authorized in PAR approach, with HDG V/S or TRK FPA. - PAR approaches may be subject to operational approval.	250 ft AGL
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Ident.: LIM-AFS-10-10-00019750.0001001 / 17 MAR 17

After a manual go-around	100 ft AGL
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Ident.: LIM-AFS-10-10-00019751.0001001 / 06 JUL 17

In all other phases	500 ft AGL
The AP or FD in OP DES or DES mode can be used in approach. However, its use is only permitted if the FCU selected altitude is set to, or above, the higher of the two: MDA/MDH or 500 ft AGL.	

LIMITATIONS

AUTO FLIGHT SYSTEM

GENERAL

AUTOPILOT FUNCTION

Applicable to: MSN 04392, 07784-07792

Ident.: LIM-AFS-10-10-00019567.0001001 / 17 MAR 17

The autopilot can be used with the following minimum values:

Ident.: LIM-AFS-10-10-00019753.0001001 / 23 JUL 18

At takeoff	100 ft AGL and at least 5 s after liftoff
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Ident.: LIM-AFS-10-10-00019568.0001001 / 23 JUL 18

In approach with F-G/S  mode	200 ft AGL
In approach with FINAL APP, V/S or FPA mode	250 ft AGL

Ident.: LIM-AFS-10-10-00019746.0005001 / 09 JUN 17

In circling approach	500 ft AGL for aircraft category C (600 ft AGL for aircraft category D).
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Ident.: LIM-AFS-10-10-00019747.0001001 / 06 SEP 22

ILS/MLS  approach when CAT1 is displayed on the FMA	160 ft AGL
ILS/MLS  approach when CAT2 or CAT3 SINGLE or CAT3 DUAL is displayed on the FMA	0 ft AGL if autoland
GLS  approach when CAT1 is displayed on the FMA	160 ft AGL
GLS  approach when AUTO LAND is displayed on the FMA	0 ft AGL if autoland
LPV approach (with SLS ) when APPR1 is displayed on the FMA	160 ft AGL

Ident.: LIM-AFS-10-10-00019750.0001001 / 17 MAR 17

After a manual go-around	100 ft AGL
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Ident.: LIM-AFS-10-10-00019751.0001001 / 06 JUL 17

In all other phases	500 ft AGL
The AP or FD in OP DES or DES mode can be used in approach. However, its use is only permitted if the FCU selected altitude is set to, or above, the higher of the two: MDA/MDH or 500 ft AGL.	

FLIGHT MANAGEMENT FUNCTION

Applicable to: ALL

Ident.: LIM-AFS-10-20-00020069.0001001 / 12 MAY 22

FMGS lateral and vertical navigation is certified for:

- After takeoff, en route, and terminal area operations
- Navigation within RNAV/RNP airspace

- Instrument approach procedures (except ILS, LOC, LOC B/C, LDA, SDF, GLS  , MLS  and FLS  final approaches)
- Missed approach procedures.

The FLS  function is certified for:

- RNAV, RNAV (GNSS) approach with LNAV/VNAV or LNAV minima, GPS, VOR, VOR/DME, NDB, NDB/DME instrument approach procedures, using FMS navigation for lateral and vertical navigation
- LOC, ILS (GS out), or LOC B/C instrument approaches, using FMS navigation for vertical navigation, associated with LOC or LOC B/C for lateral navigation.

The SLS  function is certified for RNAV (GNSS) approach with LPV or LP minima.

Approval of the FMGS is based on the assumption that the navigation database is validated for intended use.

Obstacle clearance and adherence to airspace constraints remains a flight crew responsibility.

Fuel, time predictions/performance information is provided for advisory purposes only.

Ident.: LIM-AFS-10-20-00020070.0002001 / 17 MAR 17

NAVIGATION PERFORMANCE

The navigation accuracy depends on:

- IRS drift, or
- One of the following:
 - Radio navaid availability, or
 - Elapsed time since last computation of radio navaid position.

RNP accuracy with GPS PRIMARY  is:

	With AP ON ⁽¹⁾	With AP OFF and FD ON ⁽¹⁾	With AP OFF and FD OFF
En route	1 NM	1 NM	1.1 NM
In terminal area	0.5 NM	0.51 NM	0.51 NM
In approach	0.3 NM	0.3 NM	0.3 NM with F-LOC  deviation Not authorized without F-LOC  deviation

- ⁽¹⁾ - In NAV (all phases), or
- In F-LOC  (approach phase)

Ident.: LIM-AFS-10-20-00020389.0001001 / 04 MAY 18

DEGRADED SITUATION

If GPS PRIMARY LOST  is displayed on the ND and MCDU, the navigation accuracy remains sufficient for RNP operations provided that, the RNP value is checked or entered on the MCDU and HIGH ACCURACY is displayed.

USE OF NAV MODE

Applicable to: ALL

Ident.: LIM-AFS-10-30-00020334.0001001 / 17 MAR 17

AFTER TAKEOFF

NAV mode may be used after takeoff provided that:

- GPS PRIMARY  is available, or
- The flight crew checked the FMGS takeoff updating.

Ident.: LIM-AFS-10-30-00020335.0001001 / 17 MAR 17

IN TERMINAL AREA

NAV mode may be used in terminal area provided that:

- GPS PRIMARY  is available, or
- the appropriate RNP is checked or entered on the MCDU, and HIGH accuracy is displayed, or
- FMS navigation is crosschecked with navaid raw data.

Ident.: LIM-AFS-10-30-00020336.0001001 / 17 MAR 17

APPROACH BASED ON RADIO NAVAIDS

A nav aids approach may be performed in NAV, APP NAV or FINAL APP, with AP or FD engaged, provided that:

- If GPS PRIMARY  is available, the reference nav aid may be unserviceable, or the airborne radio equipment may be inoperative, or not installed, provided that an operational approval is obtained
- If GPS PRIMARY is not available, the reference nav aid and the corresponding airborne radio equipment must be serviceable, tuned and monitored during the approach.

Note: *FLS  is the recommended managed lateral and vertical guidance mode for radio nav aids approach.*

Ident.: LIM-AFS-10-30-00020337.0001001 / 17 MAR 17

RNAV APPROACH

An RNAV(RNP) approach may be performed, with GPS PRIMARY not available, only if the radio navaid coverage supports the RNP value and HIGH accuracy is displayed on the MCDU with the specified RNP, and an operational approval is obtained.

An RNAV(GNSS) approach may be performed provided that GPS PRIMARY  is available.

Refer to Guidance Modes per Approach Types

Note: FLS  is the recommended managed lateral and vertical guidance mode for RNAV approach.

**USE OF FLS **

Ident.: LIM-AFS-10-00020808.0001001 / 13 MAY 25

Applicable to: ALL**APPROACH BASED ON RADIO NAVAIDS**

A navaids approach (e.g. VOR/DME) may be flown with the FLS provided that:

- F-APP capability is displayed on FMA.

In this case, the reference navaids may be unserviceable, or the airborne radio equipment may be inoperative, or not installed, provided an operational approval is obtained.

- F-APP + RAW capability is displayed on FMA.

In this case, the reference navaids and the corresponding airborne radio equipment must be serviceable, tuned and monitored during the approach.

An ILS (G/S out), ILS-B/C (G/S out), LOC, LOC-B/C approach may be flown with the lateral LOC (LOC B/C) mode and with the F-G/S mode of FLS function provided that:

- F-APP capability is displayed on FMA.

In this case, the reference navaids used for the vertical path validation must be tuned and checked at final descent point.

- F-APP + RAW capability is displayed on FMA.

In this case, the reference navaids used for the vertical path validation must be tuned and checked at final descent point and monitored during the approach.

RNAV(GNSS) APPROACH

An RNAV(GNSS) approach with LNAV minimum may be flown with the FLS provided that the F-APP capability is displayed on FMA.

An RNAV(GNSS) approach with LNAV/VNAV minimum may be flown with the FLS provided that the F-APP capability is displayed on FMA.

LIMITATIONS**AUTO FLIGHT SYSTEM**

GENERAL

Note: The RNAV(GNSS) approach limitations and procedures must be used to perform an RNAV approach for which the GNSS is not required.

NON-PRECISION APPROACHES WITH ENGINE-OUT

Ident.: LIM-AFS-10-00006519.0001001 / 09 FEB 11

Applicable to: MSN 02926-02944

If one engine is inoperative, it is not permitted to use the autopilot to perform NPAs in the following modes: FINAL APP, NAV V/S, NAV/FPA.
Only FD use is permitted.

NAVIGATION DATABASE VALIDATION

Applicable to: ALL

Ident.: LIM-AFS-10-40-00021656.0002001 / 05 MAY 22

RNAV(GNSS) APPROACHES AND APPROACHES BASED ON VOR/NDB

To fly an approach in lateral managed mode or lateral and vertical managed mode, the approach stored in the Navigation database must be either:

- Produced by an approved supplier compliant with ED76/DO200A or DAT Type 2 requirements, or
- Validated and approved by the Operator.

Note: RNAV(GNSS) approaches lateral trajectories are geometrically based on waypoints coordinates. Thus, validating waypoints coordinate ensure no coding error on the approach and correct lateral trajectory. Observed lateral track degree of difference between MCDU F-PLN page display and charts may come from inconsistency between FMS MagVar and charted MagVar, which has no effect on lateral trajectory.

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ILS CATEGORY II

Ident.: LIM-AFS-20-00020136.0001001 / 18 SEP 18
Applicable to: ALL

Minimum decision height..... 100 ft
At least one autopilot must be engaged in APPR mode, and CAT 2 or CAT 3 SINGLE or CAT 3 DUAL must be displayed on the FMA.
For manual landing, AP should be disconnected no later than 80 ft AGL.

SPECIAL AUTHORIZATION CAT II (SA CAT II)

Ident.: LIM-AFS-20-00020138.0001001 / 18 SEP 18
Applicable to: ALL

Minimum decision height..... 100 ft
At least one autopilot must be engaged in APPR mode, and CAT 2 or CAT 3 SINGLE or CAT 3 DUAL must be displayed on the FMA.
With HUD , the flight crew must use the HUD to monitor the approach and perform an automatic landing or a manual landing. If the flight crew performs an automatic approach without automatic landing, the autopilot must be disengaged no later than at 80 ft AGL.
Without HUD, the flight crew must perform an automatic landing.

OTHER THAN STANDARD CAT II (OTS CAT II)
--

Ident.: LIM-AFS-20-00020139.0001001 / 18 SEP 18
Applicable to: ALL

Minimum decision height..... 100 ft
At least one autopilot must be engaged in APPR mode, and CAT 2 or CAT 3 SINGLE or CAT 3 DUAL must be displayed on the FMA.
With HUD , the flight crew must use the HUD to monitor the approach and perform an automatic landing or a manual landing. If the flight crew performs an automatic approach without automatic landing, the autopilot must be disengaged no later than at 80 ft AGL.
Without HUD, the flight crew must perform an automatic landing.

ILS CATEGORY III FAIL PASSIVE (SINGLE)

Ident.: LIM-AFS-20-00020140.0001001 / 18 SEP 18
Applicable to: ALL

Minimum decision height..... 50 ft
A/THR must be used in selected or managed speed.
At least one autopilot must be engaged in APPR mode, and CAT 3 SINGLE or CAT 3 DUAL must be displayed on the FMA.

LIMITATIONS

AUTO FLIGHT SYSTEM

AUTOMATIC APPROACH, LANDING AND ROLLOUT

ILS CATEGORY III FAIL OPERATIONAL (DUAL)

Ident.: LIM-AFS-20-00020141.0008001 / 18 SEP 18

Applicable to: MSN 02155-05253

Alert height..... 100 ft

A/THR must be used in selected or managed speed.

Both autopilots must be engaged in APPR mode, and CAT 3 DUAL must be displayed on the FMA.

■ **CAT III with DH:**

Minimum Decision Height..... 20 ft

■ **CAT III without DH:**

Minimum Runway Visual Range..... 75 m

ILS CATEGORY III FAIL OPERATIONAL (DUAL)

Ident.: LIM-AFS-20-00020141.0002001 / 18 SEP 18

Applicable to: MSN 05746-07792

Alert height..... 100 ft

A/THR must be used in selected or managed speed.

Both autopilots must be engaged in APPR mode, and CAT 3 DUAL must be displayed on the FMA.

■ **CAT III with DH:**

Minimum Decision Height..... 22 ft

■ **CAT III without DH:**

Minimum Runway Visual Range..... 75 m

ENGINE-OUT

Ident.: LIM-AFS-20-00020142.0001001 / 17 MAR 17

Applicable to: ALL

CAT II and CAT III fail passive autoland are only approved in configuration FULL, and if engine-out procedures are completed before reaching 1 000 ft in approach.

MAXIMUM WIND CONDITIONS FOR ILS/MLS CAT II OR CAT III AND FOR GLS CAT I

Ident.: LIM-AFS-20-00020144.0001001 / 17 MAR 17

Applicable to: MSN 02155-05253

Headwind : 30 kt

Tailwind : 10 kt

Crosswind : 20 kt

LIMITATIONS**AUTO FLIGHT SYSTEM****AUTOMATIC APPROACH, LANDING AND ROLLOUT**

Note: Wind limitation is based on the surface wind reported by ATC. If the wind displayed on the ND exceeds the above-noted autoland limitations, but the tower reports a surface wind within the limitations, then the autopilot can remain engaged. If the tower reports a surface wind beyond limitations, only CAT I automatic approach without autoland can be performed.

MAXIMUM WIND CONDITIONS FOR ILS/MLS CAT II OR CAT III AND FOR GLS CAT I

Ident.: LIM-AFS-20-00020144.0005001 / 17 MAR 17

Applicable to: MSN 05746-07792

Headwind : 30 kt

Tailwind : 10 kt

Crosswind : 20 kt without Automatic Rollout / 15 kt with Automatic Rollout

Note: Wind limitation is based on the surface wind reported by ATC. If the wind displayed on the ND exceeds the above-noted autoland limitations, but the tower reports a surface wind within the limitations, then the autopilot can remain engaged. If the tower reports a surface wind beyond limitations, only CAT I automatic approach without autoland can be performed.

LIMITATIONS

AUTO FLIGHT SYSTEM

AUTOMATIC APPROACH, LANDING AND ROLLOUT

AUTOMATIC LANDING

Applicable to: MSN 02155-02212, 02926-02944, 04392-05253

Ident.: LIM-AFS-20-10-00020149.0001001 / 17 MAR 17

ILS/MLS  CAT II and CAT III autoland and GLS  CAT I autoland are approved in CONF 3 and CONF FULL.

Ident.: LIM-AFS-20-10-00020150.0001001 / 17 MAR 17

Automatic landing is demonstrated:

- With CAT II and CAT III ILS/MLS  beam and CAT I GLS  beam.

Ident.: LIM-AFS-20-10-00020151.0001001 / 17 MAR 17

- With a glide slope angle between -2.5 ° and -3.15 °

Ident.: LIM-AFS-20-10-00020152.0001001 / 17 MAR 17

- With an airport elevation at or below 2 500 ft

Ident.: LIM-AFS-20-10-00021180.0003001 / 25 JAN 18

- With aircraft weight below the maximum landing weight

Ident.: LIM-AFS-20-10-00020155.0001001 / 17 MAR 17

Automatic landing is not allowed below -1 000 ft pressure altitude.

Ident.: LIM-AFS-20-10-00020156.0001001 / 05 MAR 19

Automatic rollout performance is approved on dry and wet runways, but performance on contaminated runways was not demonstrated.

During automatic rollout with one engine inoperative or one thrust reverser inoperative, the flight crew can use the remaining thrust reverser, provided that the wind does not exceed the maximum wind conditions for automatic rollout.

Ident.: LIM-AFS-20-10-00020158.0001001 / 17 MAR 17

Automatic landing system performance is demonstrated with CAT II or CAT III ILS/MLS  airport installation. However, automatic landing in CAT I or better weather conditions is possible on CAT I ground installations or on CAT II/III ground installations when ILS/MLS  sensitive areas are not protected, if the following precautions are taken:

- The airline checked that the ILS/MLS  beam quality, and the effect of the terrain profile before the runway have no adverse effect on AP/FD guidance. Particularly, the effect of terrain profile within 300 m before the runway threshold must be evaluated
- The flight crew is aware that LOC or G/S beam fluctuations, independent of the aircraft system, may occur. The PF is prepared to immediately disconnect the autopilot, and to take the appropriate action, should not satisfactory guidance occur
- At least CAT2 capability is displayed on the FMA and the flight crew uses CAT II/III procedures
- Visual references are obtained at an altitude appropriate for the CAT I approach. If not, a go-around must be performed.

LIMITATIONS

AUTO FLIGHT SYSTEM

AUTOMATIC APPROACH, LANDING AND ROLLOUT

AUTOMATIC LANDING

Applicable to: MSN 02719-02789, 03031-03060

Ident.: LIM-AFS-20-10-00020149.0001001 / 17 MAR 17

ILS/MLS  CAT II and CAT III autoland and GLS  CAT I autoland are approved in CONF 3 and CONF FULL.

Ident.: LIM-AFS-20-10-00020150.0001001 / 17 MAR 17

Automatic landing is demonstrated:

- With CAT II and CAT III ILS/MLS  beam and CAT I GLS  beam.

Ident.: LIM-AFS-20-10-00020151.0001001 / 17 MAR 17

- With a glide slope angle between -2.5 ° and -3.15 °

Ident.: LIM-AFS-20-10-00020152.0003001 / 17 MAR 17

- With an airport elevation at or below 9 200 ft

Ident.: LIM-AFS-20-10-00021180.0003001 / 25 JAN 18

- With aircraft weight below the maximum landing weight

Ident.: LIM-AFS-20-10-00020155.0001001 / 17 MAR 17

Automatic landing is not allowed below -1 000 ft pressure altitude.

Ident.: LIM-AFS-20-10-00020156.0001001 / 05 MAR 19

Automatic rollout performance is approved on dry and wet runways, but performance on contaminated runways was not demonstrated.

During automatic rollout with one engine inoperative or one thrust reverser inoperative, the flight crew can use the remaining thrust reverser, provided that the wind does not exceed the maximum wind conditions for automatic rollout.

Ident.: LIM-AFS-20-10-00020158.0001001 / 17 MAR 17

Automatic landing system performance is demonstrated with CAT II or CAT III ILS/MLS  airport installation. However, automatic landing in CAT I or better weather conditions is possible on CAT I ground installations or on CAT II/III ground installations when ILS/MLS  sensitive areas are not protected, if the following precautions are taken:

- The airline checked that the ILS/MLS  beam quality, and the effect of the terrain profile before the runway have no adverse effect on AP/FD guidance. Particularly, the effect of terrain profile within 300 m before the runway threshold must be evaluated
- The flight crew is aware that LOC or G/S beam fluctuations, independent of the aircraft system, may occur. The PF is prepared to immediately disconnect the autopilot, and to take the appropriate action, should not satisfactory guidance occur
- At least CAT2 capability is displayed on the FMA and the flight crew uses CAT II/III procedures
- Visual references are obtained at an altitude appropriate for the CAT I approach. If not, a go-around must be performed.

LIMITATIONS

AUTO FLIGHT SYSTEM

AUTOMATIC APPROACH, LANDING AND ROLLOUT

AUTOMATIC LANDING

Applicable to: MSN 05746-07792

Ident.: LIM-AFS-20-10-00020149.0001001 / 17 MAR 17

ILS/MLS  CAT II and CAT III autoland and GLS  CAT I autoland are approved in CONF 3 and CONF FULL.

Ident.: LIM-AFS-20-10-00020150.0001001 / 17 MAR 17

Automatic landing is demonstrated:

- With CAT II and CAT III ILS/MLS  beam and CAT I GLS  beam.

Ident.: LIM-AFS-20-10-00020151.0001001 / 17 MAR 17

- With a glide slope angle between -2.5 ° and -3.15 °

Ident.: LIM-AFS-20-10-00020152.0001001 / 17 MAR 17

- With an airport elevation at or below 2 500 ft

Ident.: LIM-AFS-20-10-00021180.0003001 / 25 JAN 18

- With aircraft weight below the maximum landing weight

Ident.: LIM-AFS-20-10-00020155.0001001 / 17 MAR 17

Automatic landing is not allowed below -1 000 ft pressure altitude.

Ident.: LIM-AFS-20-10-00020156.0005001 / 05 MAR 19

Automatic rollout performance is approved on dry and wet runways, but performance on contaminated runways was not demonstrated.

During automatic rollout with one engine inoperative or one thrust reverser inoperative, the flight crew can use the remaining thrust reverser, provided that:

- No more than idle thrust is used
- The wind does not exceed the maximum wind conditions for automatic rollout.

Ident.: LIM-AFS-20-10-00020158.0001001 / 17 MAR 17

Automatic landing system performance is demonstrated with CAT II or CAT III ILS/MLS  airport installation. However, automatic landing in CAT I or better weather conditions is possible on CAT I ground installations or on CAT II/III ground installations when ILS/MLS  sensitive areas are not protected, if the following precautions are taken:

- The airline checked that the ILS/MLS  beam quality, and the effect of the terrain profile before the runway have no adverse effect on AP/FD guidance. Particularly, the effect of terrain profile within 300 m before the runway threshold must be evaluated
- The flight crew is aware that LOC or G/S beam fluctuations, independent of the aircraft system, may occur. The PF is prepared to immediately disconnect the autopilot, and to take the appropriate action, should not satisfactory guidance occur
- At least CAT2 capability is displayed on the FMA and the flight crew uses CAT II/III procedures
- Visual references are obtained at an altitude appropriate for the CAT I approach. If not, a go-around must be performed.

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	LIMITATIONS AUTO FLIGHT SYSTEM AUTOMATIC APPROACH, LANDING AND ROLLOUT
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AUTOMATIC LANDING IN JOHANNESBURG

Ident.: TDU / LIM-AFS-20-00013685.0001001 / 25 APR 13
Applicable to: ALL
Impacted DU: NONE

Automatic landing is not permitted on Johannesburg 03R/21L runways.

LIMITATIONS

AUTO FLIGHT SYSTEM

AUTOMATIC APPROACH, LANDING AND ROLLOUT

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LIMITATIONS

AUXILIARY POWER UNIT

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	LIMITATIONS AUXILIARY POWER UNIT PRELIMINARY PAGES - TABLE OF CONTENTS
--	--

General.....	A
APU Start/Shutdown during Refueling/Defueling.....	B
Operational Envelope.....	C

LIMITATIONS

AUXILIARY POWER UNIT

PRELIMINARY PAGES - TABLE OF CONTENTS

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	LIMITATIONS AUXILIARY POWER UNIT
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GENERAL

Ident.: LIM-APU-10-00020088.0001001 / 17 MAR 17
Applicable to: ALL

APU START

After three consecutive APU start attempts, the flight crew must wait 60 min before a new start attempt.

Ident.: LIM-APU-10-00020089.0001001 / 17 MAR 17
Applicable to: ALL

ROTOR SPEED

Maximum N speed..... 107 %

EGT

Ident.: LIM-APU-10-00020090.0003001 / 17 MAR 17
Applicable to: MSN 02719-03060, 07784-07792

EGT

Maximum EGT for APU start (below 35 000 ft)..... 1 090 °C
Maximum EGT for APU start (above 35 000 ft).....1 120 °C
Maximum EGT for APU running.....675 °C

Ident.: LIM-APU-10-00020090.0002001 / 17 MAR 17
Applicable to: MSN 02155-02212, 04392-05746

EGT

Maximum EGT for APU start (below 25 000 ft)..... 900 °C
Maximum EGT for APU start (above 25 000 ft).....982 °C
Maximum EGT for APU running (with 5 s confirmation for shutdown).....682 °C
Maximum EGT for APU running (for immediate shutdown)..... 700 °C to 742 °C

APU START/SHUTDOWN DURING REFUELING/DEFUELING

Ident.: LIM-APU-00020091.0001001 / 17 MAR 17
Applicable to: ALL

During refuel/defuel procedures, APU starts or shutdown are permitted with the following restrictions:

- If the APU failed to start or following an automatic APU shutdown, do not start the APU
- If a fuel spill occurs, perform a normal APU shutdown.

LIMITATIONS

AUXILIARY POWER UNIT

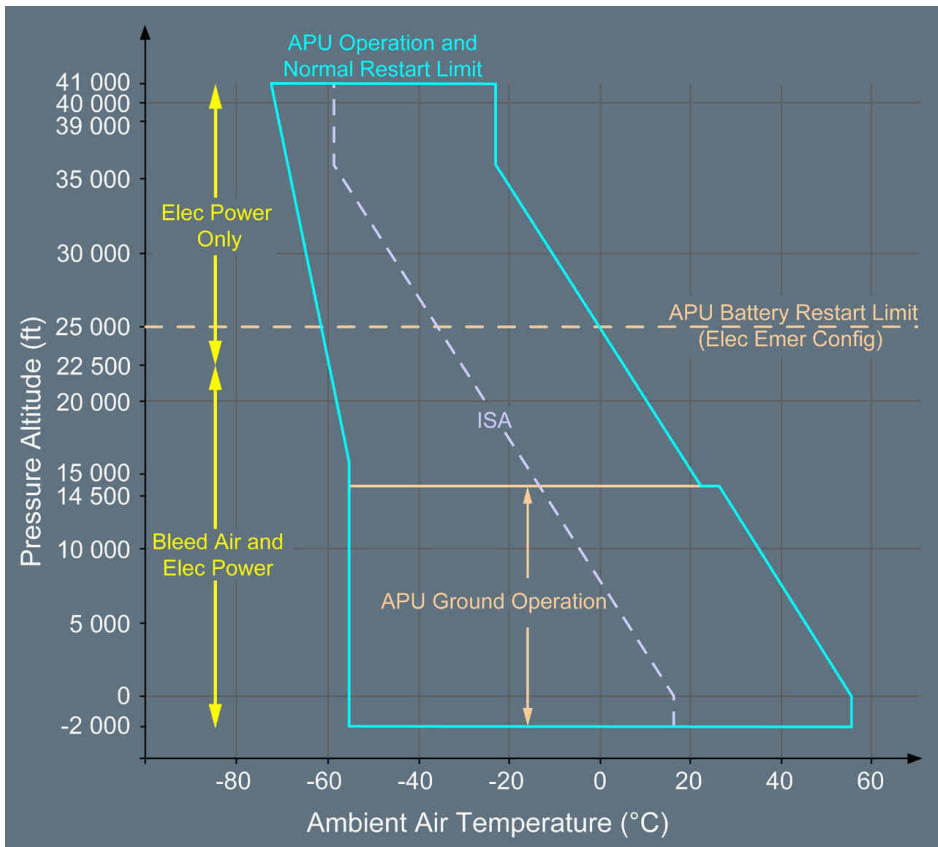
OPERATIONAL ENVELOPE

OPERATIONAL ENVELOPE

Ident.: LIM-APU-20-00019832.0003001 / 26 NOV 19

Applicable to: MSN 02719-03060, 07784-07792

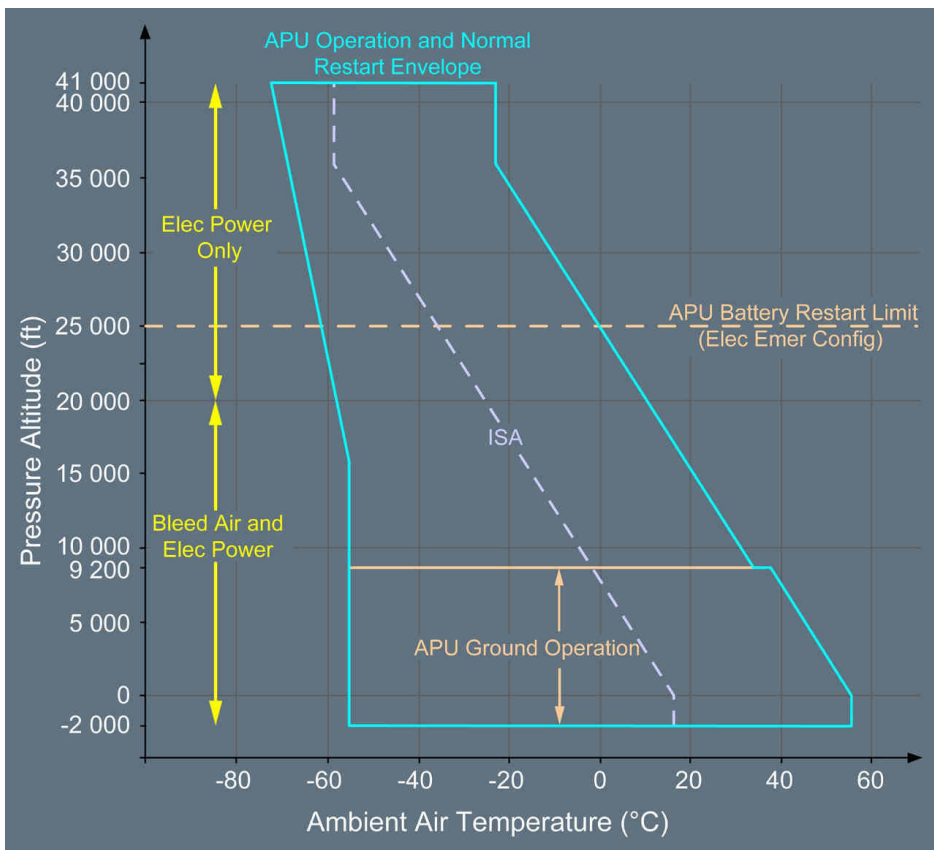
Note: When a value of the environmental envelope of the aircraft is more limited than the operational envelope of the APU, the value of the environmental envelope of the aircraft must not be exceeded. Refer to LIM-AG-OPS Environmental Envelope.



Ident.: LIM-APU-20-00019832.0008001 / 26 NOV 19

Applicable to: MSN 02155-02212, 04392-05746

Note: When a value of the environmental envelope of the aircraft is more limited than the operational envelope of the APU, the value of the environmental envelope of the aircraft must not be exceeded. Refer to LIM-AG-OPS Environmental Envelope.



APU BLEED

Ident.: LIM-APU-20-00021771.0002001 / 04 JUL 17

Applicable to: MSN 02719-03060, 07784-07792

APU BLEED

- Max altitude to assist engine start..... 20 000 ft
- Max altitude for air conditioning and pressurization (single pack operation)..... 22 500 ft
- Max altitude for air conditioning and pressurization (dual pack operation)..... 15 000 ft
- Use of APU bleed air for wing anti-ice is not permitted.

Ident.: LIM-APU-20-00021771.0001001 / 04 JUL 17

Applicable to: MSN 02155-02212, 04392-05746

APU BLEED

- Max altitude to assist engine start..... 20 000 ft
- Max altitude for air conditioning and pressurization (single pack operation)..... 20 000 ft
- Max altitude for air conditioning and pressurization (dual pack operation)..... 15 000 ft
- Use of APU bleed air for wing anti-ice is not permitted.

LIMITATIONS

CABIN SYSTEMS

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	LIMITATIONS CABIN SYSTEMS PRELIMINARY PAGES - TABLE OF CONTENTS
--	---

Power Supply for Portable Electronic Device (PED).....	A
--	---

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	LIMITATIONS CABIN SYSTEMS
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POWER SUPPLY FOR PORTABLE ELECTRONIC DEVICE (PED)
--

Ident.: LIM-CAB-00020226.0001001 / 22 MAR 17

Applicable to: MSN 04392-05746

The In-Seat Power Supply System (ISPSS) for the Portable Electronic Device (PED) carried by the passengers must be turned off during takeoff and landing.

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LIMITATIONS

COMMUNICATION

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	LIMITATIONS COMMUNICATION PRELIMINARY PAGES - TABLE OF CONTENTS
--	---

GSM Onboard	 A
-------------	---------

LIMITATIONS

COMMUNICATION

PRELIMINARY PAGES - TABLE OF CONTENTS

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 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	LIMITATIONS COMMUNICATION
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GSM ONBOARD
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Ident.: LIM-COM-00020293.0001001 / 17 MAR 17

Applicable to: ALL

The use of mobile phones is prohibited in the toilets and the cockpit.

It is prohibited to use the GSM Onboard System:

- Below 3 000 m AGL (approximately 10 000 ft)
- In some geographical areas (refer to the “Regional Operation Data for the Onboard Mobile Telephony System” document for the identification of these geographical areas).

Note: *The GSM Onboard System is able to identify the above-mentioned flight conditions. If the system identifies any of these conditions, it automatically turns off.*

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LIMITATIONS

ENGINES

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Thrust Setting/EGT Limits.....	A
Shaft Speeds.....	B
Oil.....	C
Starter.....	D
Reverse Thrust.....	E
Reduced Thrust Takeoff.....	F

LIMITATIONS

ENGINES

PRELIMINARY PAGES - TABLE OF CONTENTS

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	LIMITATIONS ENGINES
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THRUST SETTING/EGT LIMITS

Ident.: LIM-ENG-00019960.0004001 / 20 MAR 17

Applicable to: ALL

Operating Conditions		Time Limit	EGT Limit
Takeoff ⁽¹⁾ and Go-around	All engines operative	5 min	950 °C
	One engine inoperative	10 min	
Maximum Continuous Thrust (MCT)		Not limited	915 °C
Starting	On ground		725 °C
	In flight		

(1) Includes TOGA, FLEX, and DERATE  thrust modes.

SHAFT SPEEDS

Ident.: LIM-ENG-00020355.0002001 / 17 NOV 20

Applicable to: ALL

Maximum N1..... 104 %

Note: The N1 limit depends on the ambient conditions and on the configuration of the engine air bleed. These parameters may limit N1 to a value that is less than the above-mentioned N1 value.

Maximum N2..... 105 %

OIL

Ident.: LIM-ENG-00020354.0001001 / 10 MAY 21

Applicable to: ALL

OIL TEMPERATURE

Maximum continuous temperature..... 140 °C

Maximum transient temperature (15 min)..... 155 °C

Minimum starting temperature..... -40 °C

Minimum temperature before takeoff..... -10 °C

OIL QUANTITY

Minimum oil quantity..... 9.5 qt + estimated consumption

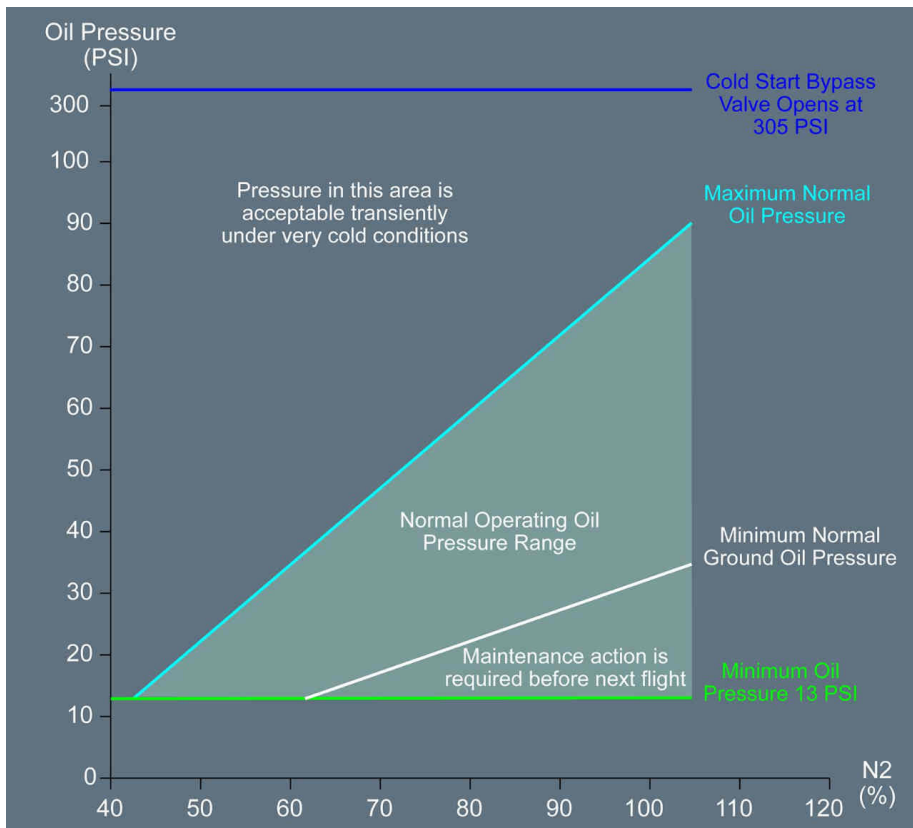
Average estimated consumption = 0.5 qt/h.

LIMITATIONS

ENGINES

OIL PRESSURE

MIN/MAX Oil Pressure (ECAM Indication)



STARTER

Ident.: LIM-ENG-00020356.0001001 / 20 MAR 17

Applicable to: ALL

- A standard automatic start that includes up to three start attempts, is considered one cycle
- For ground starts (automatic or manual), a 20 s pause is required between successive cycles
- A 15 min cooling period is required, subsequent to four failed cycles
- The starter must not be run when N2 is above 20 %.

REVERSE THRUST

Ident.: LIM-ENG-00020357.0001001 / 20 MAR 17

Applicable to: ALL

Selection of the reverse thrust is prohibited in flight.

Backing the aircraft with reverse thrust is not permitted.

Maximum reverse should not be used below 70 kt. Idle reverse is permitted down to aircraft stop.

REDUCED THRUST TAKEOFF

FLEX TAKEOFF

Ident.: LIM-ENG-10-00020358.0008001 / 26 NOV 19

Applicable to: MSN 02155-02789, 03031-07792

FLEX TAKEOFF

Takeoff at reduced thrust, so-called as FLEX takeoff, is permitted only if the airplane meets all performance requirements at the takeoff weight, with the operating engines at the thrust available for the flexible temperature (TFLEX).

Takeoff at reduced thrust is permitted with any inoperative item affecting the performance only if the associated performance shortfall has been applied to meet the above requirements.

FLEX takeoff is not permitted on contaminated runways.

TFLEX cannot be:

- Higher than TMAXFLEX, equal to ISA + 53 °C.
- Lower than the flat temperature (TREF).
- Lower than the actual OAT.

Ident.: LIM-ENG-10-00020358.0020001 / 20 MAR 17

Applicable to: MSN 02926-02944

FLEX TAKEOFF

Takeoff at reduced thrust, so-called as FLEX takeoff, is permitted only if the airplane meets all performance requirements at the takeoff weight, with the operating engines at the thrust available for the flexible temperature (TFLEX).

Takeoff at reduced thrust is permitted with any inoperative item affecting the performance only if the associated performance shortfall has been applied to meet the above requirements.

FLEX takeoff is not permitted on contaminated runways.

LIMITATIONS**ENGINES**

TFLEX cannot be:

- Higher than TMAXFLEX, equal to ISA + 70 °C.
- Lower than the flat temperature (TREF).
- Lower than the actual OAT.

Ident.: LIM-ENG-10-00020359.0001001 / 20 MAR 17

Applicable to: **ALL**

DERATED TAKEOFF

Selection of TOGA thrust is not permitted when a derated takeoff is performed, except when requested in any abnormal or emergency procedures.

The use of reduced thrust takeoff (FLEX takeoff) is not permitted in association with derated takeoff.

The use of derated takeoff is permitted regardless of the runway condition (dry, wet, or contaminated).

LIMITATIONS

FLIGHT CONTROLS

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	LIMITATIONS FLIGHT CONTROLS PRELIMINARY PAGES - TABLE OF CONTENTS
--	---

Flight Maneuvering Load Acceleration Limits.....	A
Maximum Altitude Flaps/Slats Extended.....	B
Maximum Flaps/Slats Speeds.....	C
Use of Flight Controls.....	D

LIMITATIONS

FLIGHT CONTROLS

PRELIMINARY PAGES - TABLE OF CONTENTS

Intentionally left blank

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	LIMITATIONS FLIGHT CONTROLS
--	--

FLIGHT MANEUVERING LOAD ACCELERATION LIMITS
--

Ident.: LIM-F_CTL-00020162.0001001 / 17 MAR 17 Applicable to: ALL
<i>Refer to LIM-AG-F_CTL Flight Maneuvering Load Acceleration Limits.</i>

MAXIMUM ALTITUDE FLAPS/SLATS EXTENDED
--

Ident.: LIM-F_CTL-00020160.0001001 / 17 MAR 17 Applicable to: ALL
Maximum operating altitude with slats and/or flaps extended.....20 000 ft

MAXIMUM FLAPS/SLATS SPEEDS

Ident.: LIM-F_CTL-00020163.0001001 / 17 MAR 17 Applicable to: ALL
<i>Refer to LIM-AG-SPD Maximum Flaps/Slats Speeds.</i>

USE OF FLIGHT CONTROLS

Ident.: LIM-F_CTL-00020000.0001001 / 17 MAR 17 Applicable to: ALL		
<table border="1" style="width: 100%;"> <tr> <td style="width: 15%; vertical-align: top; color: orange; font-weight: bold;">CAUTION</td> <td> Rapid and large alternating control inputs, especially in combination with large changes in pitch, roll or yaw (e.g. large sideslip angles) may result in structural failures at any speed. </td> </tr> </table>	CAUTION	Rapid and large alternating control inputs, especially in combination with large changes in pitch, roll or yaw (e.g. large sideslip angles) may result in structural failures at any speed.
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LIMITATIONS

FUEL

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Certified Fuel.....	A
Fuel Temperature.....	B
Fuel Temperature Limits when JP4 and JET B Fuels are Used.....	C
Maximum Allowed Fuel Imbalance.....	D
Minimum Fuel Quantity for Takeoff.....	E

LIMITATIONS

FUEL

PRELIMINARY PAGES - TABLE OF CONTENTS

Intentionally left blank

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	LIMITATIONS FUEL
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CERTIFIED FUEL

Ident.: LIM-FUEL-00019707.0001001 / 17 MAR 17

Applicable to: ALL

The fuel system is certified with: JET A, JET A1, JET B, JP4, JP5, JP8, N° 3 JET, RT, and TS-1, in accordance with engine manufacturers and fuel specifications.

FUEL TEMPERATURE

Ident.: LIM-FUEL-00019708.0001001 / 28 NOV 17

Applicable to: ALL

	JET A1/JP8/ N°3 JET	JET A	JP5	RT	TS-1	JET B	JP4
MINI	-43 °C	-36 °C ⁽¹⁾	-42 °C	-45 °C	-45 °C	-46 °C	-54 °C
MAXI	54 °C					49 °C	

⁽¹⁾ For JET A only, if TAT reaches -34 °C, monitor the fuel temperature on the FUEL SD page, to ensure that it remains above -36 °C.

Note: The various types of fuel can be mixed in all proportions. However, in the case of fuel mixture, the minimum fuel specification values provided in the table above are no longer applicable.

FUEL TEMPERATURE LIMITS WHEN JP4 AND JET B FUELS ARE USED
--

Ident.: LIM-FUEL-00019709.0001001 / 17 MAR 17

Applicable to: MSN 02155-05746

If the wing fuel temperature exceeds 30 °C at engine start, the altitude must be limited to 35 000 ft until the center tank is empty.

If the wing fuel temperature exceeds 40 °C at engine start, the altitude must be limited to 30 000 ft until the center tank is empty.

If the wing fuel temperature exceeds 49 °C at engine start, the altitude must be limited to 25 000 ft until the center tank is empty.

Reason : At high altitude with high fuel temperature, the pressure supplied by the center tank pumps becomes lower than the pressure supplied by the wing tank pumps.

MAXIMUM ALLOWED FUEL IMBALANCE

Ident.: LIM-FUEL-00020435.0001001 / 17 MAR 17

Applicable to: ALL

The following tables indicate the maximum allowed wing imbalance at takeoff, in flight, and at landing.

LIMITATIONS

FUEL

FUEL IMBALANCE AT TAKEOFF

INNER TANKS (OUTER TANKS BALANCED)

Tank Fuel Quantity (Heavier Tank)	Maximum Asymmetry
Full	500 kg (1 102 lb)
3 000 kg (6 613 lb)	1 050 kg (2 314 lb)
1 450 kg (3 196 lb)	1 450 kg (3 196 lb)

The variation is linear between these values.

OUTER TANKS (INNER TANKS BALANCED)

Maximum Asymmetry	370 kg (815 lb)
-------------------	-----------------

FUEL IMBALANCE IN FLIGHT AND AT LANDING

INNER TANKS (OUTER TANKS BALANCED)

Tank Fuel Quantity (Heavier Tank)	Maximum Asymmetry
Full	1 500 kg (3 306 lb)
4 300 kg (9 479 lb)	1 600 kg (3 527 lb)
2 250 kg (4 960 lb)	2 250 kg (4 960 lb)

The variation is linear between these values, and there is no limitation below 2 250 kg (4 960 lb).

OUTER TANKS

Maximum Asymmetry	690 kg (1 521 lb) ⁽¹⁾
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⁽¹⁾ The maximum fuel imbalance in the outer wing fuel tanks (one full/one empty) is allowed provided that:

- The fuel quantity of the outer and inner wing fuel tanks of one side is equal to the fuel quantity of the outer and inner wing fuel tanks on the other side, or
- On the side of the lighter outer tank, the fuel quantity of the inner tank is more than the fuel quantity of the opposite inner tank. The difference between the fuel quantity in the inner tanks should not be more than 3 000 kg (6 613 lb).

Note: In exceptional conditions (i.e. fuel system failure), the above-mentioned values for maximum fuel imbalance may be exceeded without significant effect to the aircraft handling qualities. The aircraft remains fully controllable in all flight phases.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	LIMITATIONS FUEL
--	--

MINIMUM FUEL QUANTITY FOR TAKEOFF
--

Ident.: LIM-FUEL-00019771.0001001 / 17 MAR 17 Applicable to: ALL
--

Minimum fuel quantity for takeoff.....1 500 kg (3 307 lb)
The ECAM alerts that are related to fuel low level in the wing tanks (**FUEL WING TK LO LVL**, etc.)
must not appear for takeoff.

LIMITATIONS

FUEL

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LIMITATIONS

ICE AND RAIN PROTECTION

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Definition of Icing Conditions.....	A
Definition of Severe Ice Accretion.....	B
Definition of Thin Hoarfrost.....	C
Rain Repellent 	D
Wipers Maximum Operating Speed.....	E

LIMITATIONS

ICE AND RAIN PROTECTION

PRELIMINARY PAGES - TABLE OF CONTENTS

Intentionally left blank

LIMITATIONS
ICE AND RAIN PROTECTION**DEFINITION OF ICING CONDITIONS**

Ident.: LIM-ICE_RAIN-00020608.0001001 / 05 JUN 18

Applicable to: ALL

- Icing conditions exist when the OAT (on ground or after takeoff) or the TAT (in flight) is at or below 10 °C and visible moisture in any form is present (such as clouds, fog with visibility of 1 sm (1 600 m) or less, rain, snow, sleet or ice crystals).
- Icing conditions also exist when the OAT on the ground and for takeoff is at or below 10 °C and operating on ramps, taxiways or runways where surface snow, standing water or slush may be ingested by the engines, or freeze on engines, nacelles or engine sensor probes.

DEFINITION OF SEVERE ICE ACCRETION

Ident.: LIM-ICE_RAIN-00020609.0001001 / 17 MAR 17

Applicable to: ALL

Ice accretion is considered severe when the ice accumulation on the airframe reaches approximately 5 mm (0.2 in) thick or more.

DEFINITION OF THIN HOARFROST

Ident.: LIM-ICE_RAIN-00020610.0001001 / 17 MAR 17

Applicable to: ALL

Thin hoarfrost is typically a white crystalline deposit which usually develops uniformly on exposed surfaces on cold and cloudless nights.

It is so thin that surface features (lines or markings) can be distinguished beneath it.

RAIN REPELLENT

Ident.: LIM-ICE_RAIN-00020224.0001001 / 17 MAR 17

Applicable to: ALL

The flight crew should only use the rain repellent in the case of moderate to heavy rain.

WIPERS MAXIMUM OPERATING SPEED

Ident.: LIM-ICE_RAIN-00020225.0001001 / 17 MAR 17

Applicable to: ALL

Refer to LIM-AG-SPD Wipers Maximum Operating Speed.

LIMITATIONS
ICE AND RAIN PROTECTION

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LIMITATIONS

LANDING GEAR

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Braking System.....	A
Brake Temperature.....	B
Maximum Speeds with the Landing Gear Extended.....	C
Maximum Tire Speed.....	D
Nosewheel Steering (NWS).....	E
Taxi with Deflated or Damaged Tires.....	F

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	LIMITATIONS LANDING GEAR
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BRAKING SYSTEM

Ident.: LIM-LG-00020233.0001001 / 17 MAR 17

Applicable to: ALL

The braking system is not designed to hold the aircraft in a stationary position when a high thrust level is applied on at least one engine.

During ground procedures that require a thrust increase with braking, the flight crew must ensure that the aircraft remains stationary, and must be ready to immediately retard the thrust levers to IDLE.

BRAKE TEMPERATURE

Ident.: LIM-LG-00020255.0001001 / 17 MAR 17

Applicable to: ALL

Maximum brake temperature for takeoff (brake fans  off).....300 °C

MAXIMUM SPEEDS WITH THE LANDING GEAR EXTENDED
--

Ident.: LIM-LG-00020237.0001001 / 17 MAR 17

Applicable to: ALL

Refer to LIM-AG-SPD Maximum Speeds with the Landing Gear Extended.

MAXIMUM TIRE SPEED

Ident.: LIM-LG-00020238.0001001 / 17 MAR 17

Applicable to: ALL

Refer to LIM-AG-SPD Maximum Tire Speed.

NOSEWHEEL STEERING (NWS)

Ident.: LIM-LG-00020236.0001001 / 12 SEP 17

Applicable to: ALL

For NWS angle limit, *Refer to DSC-20-30 Taxiing.*

Towbarless operation on the nose landing gear (towing and pushback) is approved when using the accepted towbarless towing vehicles listed in the Airbus WISE ISI 09.11.00001, with the following information:

Maximum NWS angle.....±85 °

LIMITATIONS
LANDING GEAR
TAXI WITH DEFLATED OR DAMAGED TIRES

Ident.: LIM-LG-00020235.0001001 / 01 JUN 17

Applicable to: ALL

To vacate the runway or taxi at low speed with tire(s) deflated (not damaged), all of the following limitations apply:

- If maximum one tire per gear is deflated (consider three gears)
 Maximum taxi speed during turn..... 7 kt
- If two tires are deflated on the same main gear (maximum one main gear)
 Maximum taxi speed..... 3 kt
- For the nosewheel steering (NWS) angle
 Maximum NWS angle..... 30 °

In addition, if tire damage is suspected, the flight crew must ask for an aircraft inspection prior to vacate the runway or taxi. If the ground crew suspects that a tire burst may damage the landing gear, maintenance action is due.

For more information, *Refer to FCTM/PR-AEP-LG Taxi with Deflated or Damaged Tires.*

LIMITATIONS

NAVIGATION

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	LIMITATIONS NAVIGATION PRELIMINARY PAGES - TABLE OF CONTENTS
--	--

I	Inertial Reference System (IRS).....A
	Operations with QFE Barometric Reference.....B

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	LIMITATIONS NAVIGATION PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS
--	---

Localization Title	Toc Index	ID	Reason
LIM-NAV Operations with QFE Barometric Reference	B	1	Documentation update: Addition of "Operations with QFE Barometric Reference" documentary unit

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	LIMITATIONS NAVIGATION
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INERTIAL REFERENCE SYSTEM (IRS)
--

Ident.: LIM-NAV-00020081.0001001 / 17 MAR 17

Applicable to: MSN 02155-02789, 03031-07792

IR GROUND ALIGNMENT

Ground alignment of the IRS is possible in latitudes between 73 ° North and 73 ° South.

MAGNETIC (MAG) REFERENCE

■ If all ADIRUs have the same magnetic variation table:

In NAV mode, the IR will not provide valid magnetic heading and magnetic track angle:

- North of 73 ° North, and
- South of 60 ° South.

Flying at latitudes beyond these limits is prohibited.

■ If one ADIRU has a different magnetic variation table:

In NAV mode, the IR will not provide valid magnetic heading and magnetic track angle:

- North of 60 ° North, between 30 ° West and 160 ° West, and
- North of 73 ° North, and
- South of 55 ° South.

Flying at latitudes beyond these limits is prohibited.

INERTIAL REFERENCE SYSTEM (IRS)
--

Ident.: LIM-NAV-00020081.0002001 / 17 MAR 17

Applicable to: MSN 02926-02944

IR GROUND ALIGNMENT

Ground alignment of the IRS is possible in latitudes between 82 ° North and 82 ° South.

MAGNETIC (MAG) REFERENCE

■ If all ADIRUs have the same magnetic variation table:

In NAV mode, the IR will not provide valid magnetic heading and magnetic track angle:

- North of 73 ° North, between 90 ° West and 120 ° West (magnetic polar region), and
- North of 82 ° North, and
- South of 60 ° South.

Flying at latitudes beyond these limits is prohibited.

■ If one ADIRU has a different magnetic variation table:

In NAV mode, the IR will not provide valid magnetic heading and magnetic track angle:

- North of 60 ° North, between 30 ° West and 160 ° West, and
- North of 75 ° North, and
- South of 55 ° South.

Flying at latitudes beyond these limits is prohibited.

OPERATIONS WITH QFE BAROMETRIC REFERENCE

Ident.: LIM-NAV-00029017.0001001 / 06 NOV 25

Applicable to: MSN 02719-07792

The QFE barometric reference must not be used for operations on aircraft that are not equipped with the QFE option.

LIMITATIONS

OXYGEN

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 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	LIMITATIONS OXYGEN PRELIMINARY PAGES - TABLE OF CONTENTS
--	--

Minimum Flight Crew Oxygen Pressure.....A

LIMITATIONS

OXYGEN

PRELIMINARY PAGES - TABLE OF CONTENTS

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	LIMITATIONS OXYGEN PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS
--	--

Localization Title	Toc Index	ID	Reason
LIM-OXY Minimum Flight Crew Oxygen Pressure	A	4	Documentation update: Addition of "Minimum Flight Crew Oxygen Pressure" documentary unit
LIM-OXY Minimum Flight Crew Oxygen Pressure	A	1	Effectivity update: The information now also applies to MSN 03060.
LIM-OXY Minimum Flight Crew Oxygen Pressure	A	2	Effectivity update: The information no longer applies to MSN 07792.
LIM-OXY Minimum Flight Crew Oxygen Pressure	A	3	Effectivity update: The information no longer applies to MSN 03060.

LIMITATIONS

OXYGEN

PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	LIMITATIONS OXYGEN
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MINIMUM FLIGHT CREW OXYGEN PRESSURE

Ident.: LIM-OXY-00020232.0007001 / 17 MAR 17

1 Applicable to: MSN 02719, 02789, 03060-04392

REF Temperature ⁽¹⁾		°C	-10	0	10	20	30	40	50
		°F	14	32	50	68	86	104	122
MIN Bottle Pressure (PSI)⁽²⁾	2 Crewmembers		509	529	548	567	587	606	626
	2 Crewmembers + 1 OBS		615	638	661	685	708	732	755
	2 Crewmembers + 2 OBS		768	798	827	856	885	915	944

(1) REF Temperature :

- On ground : REF Temperature = (OAT + Cockpit TEMP) / 2
- In flight : REF Temperature = CAB TEMP (°C) - 10 °C, or
REF Temperature = CAB TEMP (°F) - 18 °F

(2) Minimum Bottle Pressure to Cover:

- Preflight checks
- The use of oxygen, when only one flight crewmember is in the cockpit
- Unusable quantity (to ensure regulator operation with minimum pressure)
- Normal system leakage
- The most demanding case among the following:
 - Protection after loss of cabin pressure, with mask regulator on NORMAL (diluted oxygen):
 - During emergency descent for all flight crewmembers and observers for 22 min
 - During cruise at FL 100 for two flight crewmembers for 98 min.
 - Protection against smoke with 100 % oxygen for all flight crewmembers and observers during 15 min at 8 000 ft cabin altitude.

Note: The above times that are based on the use of a sealed mask may be shorter for bearded crew (in terms of performance, pressure, or duration).

LIMITATIONS
OXYGEN
MINIMUM FLIGHT CREW OXYGEN PRESSURE

Ident.: LIM-OXY-00020232.0002001 / 17 MAR 17

2 Applicable to: MSN 02155-02212, 05152-07784

REF Temperature ⁽¹⁾		°C	-10	0	10	20	30	40	50
		°F	14	32	50	68	86	104	122
MIN Bottle Pressure (PSI)⁽²⁾	2 Crewmembers		656	681	706	731	756	781	806
	2 Crewmembers + 1 OBS		861	893	926	959	992	1 024	1 057
	2 Crewmembers + 2 OBS		1 090	1 132	1 173	1 215	1 256	1 298	1 339

⁽¹⁾ REF Temperature :

- On ground : REF Temperature = (OAT + Cockpit TEMP) / 2
- In flight : REF Temperature = CAB TEMP (°C) - 10 °C, or
REF Temperature = CAB TEMP (°F) - 18 °F

⁽²⁾ Minimum Bottle Pressure to Cover:

- Preflight checks
- The use of oxygen, when only one flight crewmember is in the cockpit
- Unusable quantity (to ensure regulator operation with minimum pressure)
- Normal system leakage
- The most demanding case among the following:
 - Protection after loss of cabin pressure, with mask regulator on NORMAL (diluted oxygen):
 - During emergency descent for all flight crewmembers and observers for 13 min
 - During cruise at FL 100 for two flight crewmembers for 107 min.
 - Protection against smoke with 100 % oxygen for all flight crewmembers and observers during 15 min at 8 000 ft cabin altitude.

Note: The above times that are based on the use of a sealed mask may be shorter for bearded crew (in terms of performance, pressure, or duration).

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	LIMITATIONS OXYGEN
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MINIMUM FLIGHT CREW OXYGEN PRESSURE

Ident.: LIM-OXY-00020232.0003001 / 17 MAR 17

3 Applicable to: MSN 02758, 02926-03031

REF Temperature ⁽¹⁾		°C	-10	0	10	20	30	40	50
		°F	14	32	50	68	86	104	122
MIN Bottle Pressure (PSI) ⁽²⁾	2 Crewmembers		468	486	504	522	540	558	576
	2 Crewmembers + 1 OBS		606	629	652	675	698	721	744
	2 Crewmembers + 2 OBS		759	788	817	846	875	904	933

(1) REF Temperature :

- On ground : REF Temperature = (OAT + Cockpit TEMP) / 2
- In flight : REF Temperature = CAB TEMP (°C) - 10 °C, or
REF Temperature = CAB TEMP (°F) - 18 °F

(2) Minimum Bottle Pressure to Cover:

- Preflight checks
- The use of oxygen, when only one flight crewmember is in the cockpit
- Unusable quantity (to ensure regulator operation with minimum pressure)
- Normal system leakage
- The most demanding case among the following:
 - Protection after loss of cabin pressure, with mask regulator on NORMAL (diluted oxygen):
 - During emergency descent for all flight crewmembers and observers for 13 min
 - During cruise at FL 100 for two flight crewmembers for 107 min.
 - Protection against smoke with 100 % oxygen for all flight crewmembers and observers during 15 min at 8 000 ft cabin altitude.

Note: The above times that are based on the use of a sealed mask may be shorter for bearded crew (in terms of performance, pressure, or duration).

MINIMUM FLIGHT CREW OXYGEN PRESSURE

4 Ident.: LIM-OXY-00020232.0004001 / 17 MAR 17

Applicable to: MSN 07792

LIMITATIONS
OXYGEN

REF Temperature ⁽¹⁾		°C	-10	0	10	20	30	40	50
		°F	14	32	50	68	86	104	122
MIN Bottle Pressure (PSI)⁽²⁾	2 Crewmembers		716	744	771	798	826	853	880
	2 Crewmembers + 1 OBS		874	907	940	974	1 007	1 040	1 073
	2 Crewmembers + 2 OBS		1 103	1 145	1 187	1 229	1 270	1 312	1 354

⁽¹⁾ REF Temperature :

- On ground : REF Temperature = (OAT + Cockpit TEMP) / 2
- In flight : REF Temperature = CAB TEMP (°C) - 10 °C, or
REF Temperature = CAB TEMP (°F) - 18 °F

⁽²⁾ Minimum Bottle Pressure to Cover:

- Preflight checks
- The use of oxygen, when only one flight crewmember is in the cockpit
- Unusable quantity (to ensure regulator operation with minimum pressure)
- Normal system leakage
- The most demanding case among the following:
 - Protection after loss of cabin pressure, with mask regulator on NORMAL (diluted oxygen):
 - During emergency descent for all flight crewmembers and observers for 22 min
 - During cruise at FL 100 for two flight crewmembers for 98 min.
 - Protection against smoke with 100 % oxygen for all flight crewmembers and observers during 15 min at 8 000 ft cabin altitude.

Note: The above times that are based on the use of a sealed mask may be shorter for bearded crew (in terms of performance, pressure, or duration).

LIMITATIONS

SURVEILLANCE

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	LIMITATIONS SURVEILLANCE PRELIMINARY PAGES - TABLE OF CONTENTS
--	--

GPWS / Predictive GPWS A

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 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	LIMITATIONS SURVEILLANCE
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GPWS / PREDICTIVE GPWS

Ident.: LIM-SURV-00019775.0001001 / 28 MAY 20

Applicable to: ALL

Aircraft navigation must not be based on the use of the terrain display .

The terrain display is intended to serve as a situation awareness tool only, and may not provide the accuracy on which to solely base terrain avoidance maneuvering.

The predictive GPWS  functions should be inhibited (TERR pushbutton to OFF, on the GPWS panel) when the aircraft position is less than 15 NM from the airfield:

- For operations from/to runways not incorporated in the predictive GPWS database.
- For specific approach or departure procedures, which have previously been identified by the operator as potentially causing expected or spurious terrain alerts.

Note: *The decision to inhibit the predictive GPWS functions must not be based on flight crew judgement only.*

Only aircraft with Man-made Obstacle Function  can display obstacles on ND and trigger alerts, based on a dedicated database which includes artificial obstacles worldwide.

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TEMPORARY ABNORMAL BEHAVIORS

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	TEMPORARY ABNORMAL BEHAVIORS PRELIMINARY PAGES TABLE OF CONTENTS
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1	Temporary Abnormal Behaviors Table.....	A
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TEMPORARY ABNORMAL BEHAVIORS

PRELIMINARY PAGES

TABLE OF CONTENTS

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	TEMPORARY ABNORMAL BEHAVIORS PRELIMINARY PAGES SUMMARY OF HIGHLIGHTS
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Localization Title	Toc Index	ID	Reason
TAB-PLP-TOC Temporary Abnormal Behaviors Table		1	Documentation update: Deletion of "TCAS - Undue NAV TCAS FAULT (00024638)".
			Documentation update: Deletion of "Undue NAV TCAS FAULT Alert (00024638.0003001)".
			Documentation update: Deletion of "Undue NAV TCAS FAULT Alert (00024638.0002001)".

TEMPORARY ABNORMAL BEHAVIORS

PRELIMINARY PAGES

SUMMARY OF HIGHLIGHTS

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	TEMPORARY ABNORMAL BEHAVIORS PRELIMINARY PAGES LIST OF EFFECTIVE TEMPORARY DOCUMENTARY UNITS
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M	Localization	DU Title	DU identification	DU date
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No Temporary Documentary Unit

TEMPORARY ABNORMAL BEHAVIORS

PRELIMINARY PAGES

LIST OF EFFECTIVE TEMPORARY DOCUMENTARY UNITS

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	TEMPORARY ABNORMAL BEHAVIORS
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TEMPORARY ABNORMAL BEHAVIORS TABLE

Ident.: TAB-TABT-00024331.0001001 / 17 MAY 21

Applicable to: ALL

The table below provides a list of all Temporary Abnormal Behaviors.

Ident.: TAB-TABT-00024332.0001001 / 17 MAY 21

Applicable to: ALL

System	Temporary Abnormal Behavior	Link
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Ident.: TAB-TABT-00024333.0002001 / 17 MAY 21

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

AUTO FLT	Incorrect Management of Speed Constraint for Arrival Procedure	Refer to link
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Ident.: TAB-TABT-00024356.0002001 / 17 MAY 21

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

AUTO FLT	Erroneous Fuel Predictions in the case of Descent with Two Altitude Constraints	Refer to link
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Ident.: TAB-TABT-00024360.0003001 / 17 MAY 21

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

AUTO FLT	Erroneous Lateral Guidance in NAV Mode with LOC Mode Armed during Approach	Refer to link
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Ident.: TAB-TABT-00024361.0003001 / 17 MAY 21

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

AUTO FLT	Erroneous Trajectory during Procedures with a Turn Direction on a Leg with an Altitude Termination	Refer to link
----------	--	-------------------------------

Ident.: TAB-TABT-00024362.0002001 / 17 MAY 21

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

AUTO FLT	No Engagement of the PRESEL SPD TARGET in Climb	Refer to link
----------	---	-------------------------------

Ident.: TAB-TABT-00024363.0002001 / 17 MAY 21

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

AUTO FLT	Erroneous Managed Approach Speed after Descent Wind Uplink	Refer to link
----------	--	-------------------------------

Ident.: TAB-TABT-00024365.0001001 / 17 MAY 21

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

AUTO FLT	Misalignment of FMS F-PLN Legs for ILS Approaches	Refer to link
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Ident.: TAB-TABT-00024366.0001001 / 17 MAY 21

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

AUTO FLT	Incorrect Management of ETA Entry on Predictive GPS Page	Refer to link
----------	--	-------------------------------

Ident.: TAB-TABT-00024367.0001001 / 17 MAY 21

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

AUTO FLT	Flight Number Erased upon AOC Flight Plan Uplink	Refer to link
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A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL

Ident.: TAB-TABT-00024370.0001001 / 17 MAY 21

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

AUTO FLT	Unexpected Switch of Speed Target when RTA is used	Refer to link
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Ident.: TAB-TABT-00024372.0001001 / 17 MAY 21

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

AUTO FLT	VOR/DME and VOR/TACAN not Automatically Tuned	Refer to link
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Ident.: TAB-TABT-00024374.0001001 / 17 MAY 21

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

AUTO FLT	Optimum Target Speeds not Updated following the Automatic Deletion of a Step Climb	Refer to link
----------	--	-------------------------------

Ident.: TAB-TABT-00024376.0002001 / 17 MAY 21

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

AUTO FLT	Undue Reduction of the Speed Target in case of DIR TO/ABEAM while Flying a Constant Mach Segment	Refer to link
----------	--	-------------------------------

Ident.: TAB-TABT-00024377.0001001 / 17 MAY 21

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

AUTO FLT	Loss of Fuel and Time Predictions during Takeoff Data Insertion	Refer to link
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Ident.: TAB-TABT-00024388.0001001 / 17 MAY 21

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

AUTO FLT	Erroneous Vertical Profile during LOC B/C Approaches with a MAP Located Before the Runway Threshold	Refer to link
----------	---	-------------------------------

Ident.: TAB-TABT-00024389.0001001 / 17 MAY 21

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

AUTO FLT	Erroneous Vertical Guidance in Approach Subsequent to a DIR TO Performed when Near the Top of Descent	Refer to link
----------	---	-------------------------------

Ident.: TAB-TABT-00024390.0001001 / 17 MAY 21

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

AUTO FLT	Erroneous CF Leg Computation following FMS NEW RUNWAY with LS IDENT creation	Refer to link
----------	--	-------------------------------

Ident.: TAB-TABT-00024391.0001001 / 17 MAY 21

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

AUTO FLT	Unexpected ILS Auto-tuning	Refer to link
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Ident.: TAB-TABT-00027763.0001001 / 03 MAY 24

Applicable to: MSN 02155-02789, 03031-03060, 05152-05746

AUTO FLT	Inadvertent T.O. Data Reversion Upon Runway Change	Refer to link
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Ident.: TAB-TABT-00024395.0001001 / 17 MAY 21

Applicable to: MSN 02926-02944, 04392, 07784-07792

AUTO FLT	MCDU Frozen after the Flight Crew Accesses the "DIR TO", "HOLD" or "OFFSET" Function	Refer to link
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Ident.: TAB-TABT-00024399.0001001 / 17 MAY 21

Applicable to: MSN 02926-02944, 04392, 07784-07792

AUTO FLT	Erroneous Cross Track Error/FD Display Orders after a DIR TO on Aligned Waypoint	Refer to link
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Ident.: TAB-TABT-00024400.0001001 / 17 MAY 21

Applicable to: MSN 04392

AUTO FLT	Erroneous Offset	Refer to link
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Ident.: TAB-TABT-00024404.0001001 / 17 MAY 21

Applicable to: MSN 02926-02944, 04392, 07784-07792

AUTO FLT	Erroneous Fuel Predictions in the case of Descent with Two Altitude Constraints	Refer to link
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Ident.: TAB-TABT-00024405.0001001 / 17 MAY 21

Applicable to: MSN 04392

AUTO FLT	FM PREDICTIONS LOST Message when using the FUEL PLANNING Function	Refer to link
----------	--	-------------------------------

Ident.: TAB-TABT-00024406.0001001 / 17 MAY 21

Applicable to: MSN 04392

AUTO FLT	Erroneous Lateral Guidance in NAV Mode during Procedures that use not Collocated NAVAIDS	Refer to link
----------	---	-------------------------------

Ident.: TAB-TABT-00024407.0001001 / 17 MAY 21

Applicable to: MSN 04392

AUTO FLT	Erroneous Trajectory during Departure Procedures with a Course-to-Fix Leg and an Arc Leg	Refer to link
----------	--	-------------------------------

Ident.: TAB-TABT-00024409.0001001 / 17 MAY 21

Applicable to: MSN 02926-02944, 04392, 07784-07792

AUTO FLT	Erroneous Lateral Guidance in NAV Mode with LOC Mode Armed during Approach	Refer to link
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Ident.: TAB-TABT-00024410.0001001 / 17 MAY 21

Applicable to: MSN 02926-02944, 04392, 07784-07792

AUTO FLT	Erroneous Trajectory Computation while in HDG/TRK Mode during Procedures with a Turn Direction on a Leg With an Altitude Termination	Refer to link
----------	---	-------------------------------

Ident.: TAB-TABT-00024411.0001001 / 17 MAY 21

Applicable to: MSN 02926-02944, 07784-07792

AUTO FLT	Erroneous Vertical Profile in Final Approach	Refer to link
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A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL

Ident.: TAB-TABT-00024412.0001001 / 17 MAY 21

Applicable to: MSN 02926-02944, 04392, 07784-07792

AUTO FLT	Uncommanded Climb near the Top of Descent (T/D)	Refer to link
----------	---	-------------------------------

Ident.: TAB-TABT-00024413.0001001 / 17 MAY 21

Applicable to: MSN 02926-02944, 04392, 07784-07792

AUTO FLT	Erroneous Altitude Constraint after SID or STAR Selection Change	Refer to link
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Ident.: TAB-TABT-00024414.0001001 / 17 MAY 21

Applicable to: MSN 02926-02944, 04392, 07784-07792

AUTO FLT	Waypoint not Sequenced after DIR TO RADIAL IN	Refer to link
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Ident.: TAB-TABT-00024415.0001001 / 17 MAY 21

Applicable to: MSN 02926-02944, 07784-07792

AUTO FLT	Unusable MIN DEST FOB Value in the Secondary Flight Plan	Refer to link
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Ident.: TAB-TABT-00024416.0001001 / 17 MAY 21

Applicable to: MSN 02926-02944, 04392, 07784-07792

AUTO FLT	Unexpected DECELERATE displayed on MCDU (and T/D REACHED on PFD) during Climb	Refer to link
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Ident.: TAB-TABT-00024417.0001001 / 17 MAY 21

Applicable to: MSN 02926-02944, 04392, 07784-07792

AUTO FLT	Missing or Incorrect Insert UPLINK Prompt on UPLINK T.O DATA Page	Refer to link
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Ident.: TAB-TABT-00024418.0001001 / 17 MAY 21

Applicable to: MSN 02926-02944, 04392, 07784-07792

AUTO FLT	FMS Reset upon crossing the 180th Meridian	Refer to link
----------	--	-------------------------------

Ident.: TAB-TABT-00024419.0001001 / 17 MAY 21

Applicable to: MSN 02926-02944, 04392, 07784-07792

AUTO FLT	Dual FMS Reset with Loss of Data upon DIR TO/ABEAM Insertion with 3 STEP ALTS	Refer to link
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Ident.: TAB-TABT-00024455.0001001 / 17 MAY 21

Applicable to: ALL

AUTO FLT	Misbehaviour of the Enhanced LOC Capture Function	Refer to link
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Ident.: TAB-TABT-00024456.0001001 / 17 MAY 21

Applicable to: ALL

AUTO FLT	Unexpected G/S Mode Armed	Refer to link
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Ident.: TAB-TABT-00024457.0001001 / 17 MAY 21

Applicable to: MSN 04392

AUTO FLT	Left Turn Not Expected while in HDG or TRK Mode	Refer to link
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 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	TEMPORARY ABNORMAL BEHAVIORS
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Ident.: TAB-TABT-00024458.0001001 / 17 MAY 21

Applicable to: MSN 02155-03060, 05152-07792

AUTO FLT	Spurious CAT 2 INOP	Refer to link
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Ident.: TAB-TABT-00024462.0001001 / 17 MAY 21

Applicable to: MSN 02719-02789, 03031-07792

DATALINK	ATC MSG RECORD NOT RELIABLE - Displayed at ATSU Power-Up	Refer to link
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Ident.: TAB-TABT-00024726.0001001 / 17 MAY 21

Applicable to: ALL

DOORS	Erroneous Activation of the Cabin Pressure Warning Lights without Residual Differential Pressure	Refer to link
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Ident.: TAB-TABT-00027100.0001001 / 06 JUL 23

Applicable to: MSN 04392-05746

SURV	Weather Radar Performance Above 80 NM	Refer to link
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PERFORMANCE

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EFB-LOD Loading

EFB-TOF Takeoff

EFB-IFT In-Flight

EFB-LDG Landing

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PERFORMANCE PRELIMINARY PAGES LIST OF EFFECTIVE TEMPORARY DOCUMENTARY UNITS
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M	Localization	DU Title	DU identification	DU date
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No Temporary Documentary Unit

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PERFORMANCE

LOADING

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 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PERFORMANCE LOADING PRELIMINARY PAGES - TABLE OF CONTENTS
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EFB-LOD-FUL FUEL

USE OF MANUAL MAGNETIC INDICATORS (MMI)..... A

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USE OF MANUAL MAGNETIC INDICATORS (MMI)

USE OF MANUAL MAGNETIC INDICATORS (MMI) - GENERAL

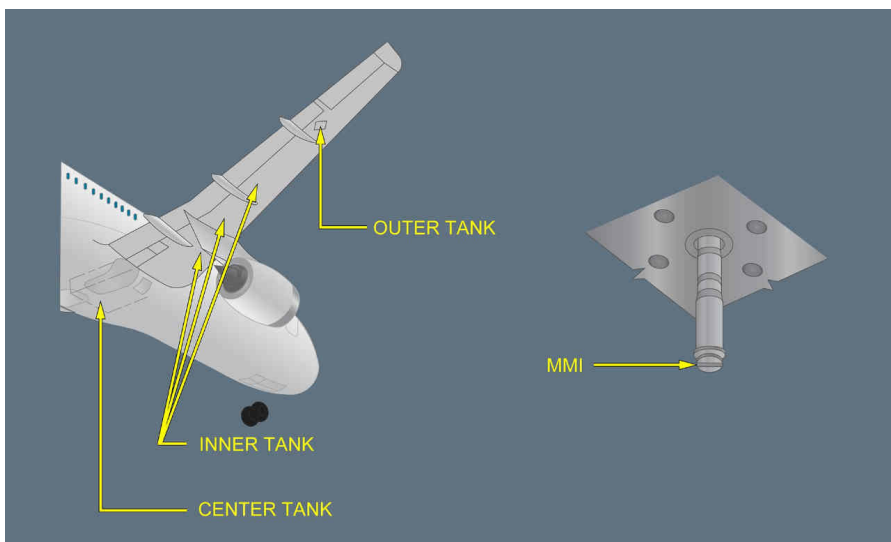
Ident.: EFB-LOD-FUL-C-00001679.0009001 / 02 MAY 24

Applicable to: MSN 07784-07792

GENERAL

Indicators are installed as follows:

- Four in each wing tank (three in the inner tank and one in the outer tank)
- One in the center tank.


TO DETERMINE AIRCRAFT ATTITUDE

Set ADIRS 1, 2, 3 to the NAV position.

On the LH or RH MCDU, press MCDU MENU key.

Select CFDS by pressing [4L].

Select SYSTEM REPORT/TEST by pressing [5L].

Select FUEL by pressing [2R].

Select INPUT PARAMETERS by pressing [3L].

Use the table given on the next page to determine the equivalent number and letter from PITCH and ROLL data.

Select RETURN by pressing [6L] until CFDS main menu appears.

Press MCDU MENU key.

PITCH	REF	ROLL	REF
-1.5	1	-1.5	A
-1.0	2	-1.0	B
-0.5	3	-0.5	C
0.0	4	0.0	D
+0.5	5	+0.5	E
+1.0	6	+1.0	F
+1.5	7	+1.5	G

- Note:
- The **PITCH** and **ROLL** data is taken from the **ADIRS** (make sure that the **FQIS** status page does not show **NO DATA FROM ADIRU 1** and **NO DATA FROM ADIRU 2**)
 - The **FQIS** input parameter pages are automatically updated every 5.5 s.

ACCESS PLATFORM.....IN POSITION

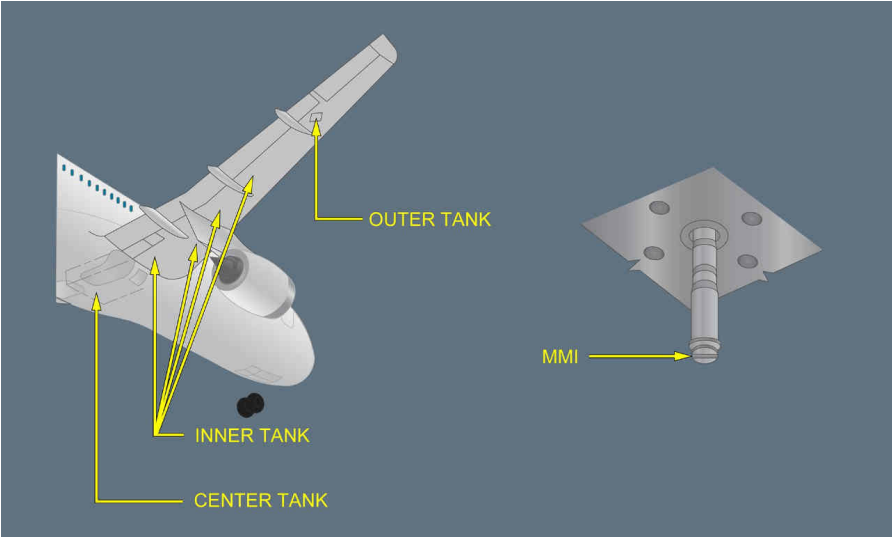
Ident.: EFB-LOD-FUL-C-00001679.0005001 / 02 MAY 24

Applicable to: MSN 02155-03060

GENERAL

Indicators are disposed as follows:

- Five in each wing tank (four in inner tank and one in outer tank)
- one in the center tank.



 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PERFORMANCE LOADING FUEL
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TO DETERMINE AIRCRAFT ATTITUDE

Set ADIRS 1, 2, 3 to the NAV position.
On the LH or RH MCDU, press MCDU MENU key.
Select CFDS by pressing [4L].
Select SYSTEM REPORT/TEST by pressing [5L].
Select FUEL by pressing [2R].
On the MCDU control panel, press the NEXT PAGE key to display the FUEL main menu second page.
Select INPUT PARAMETERS VALUES by pressing [3L].
Use the table given on the next page to determine the equivalent number and letter from PITCH and ROLL data.
Select RETURN by pressing [6L] until CFDS main menu appears.
Press MCDU MENU key.

PITCH	REF	ROLL	REF
-1.5	1	-1.5	A
-1.0	2	-1.0	B
-0.5	3	-0.5	C
0.0	4	0.0	D
+0.5	5	+0.5	E
+1.0	6	+1.0	F
+1.5	7	+1.5	G

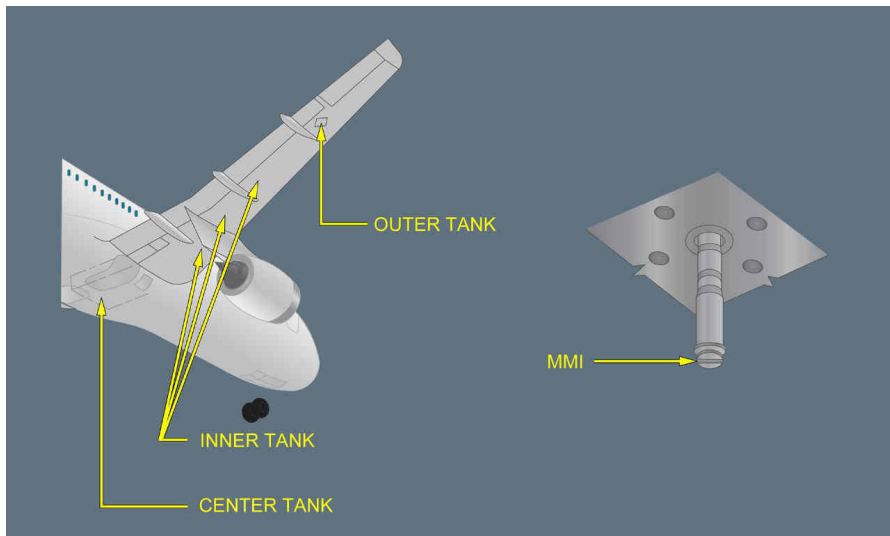
- Note: 1. This procedure can only be used if:
- The PITCH and ROLL data is taken from the ADIRS (identified by an “A” after the PITCH and ROLL title).
 - The PITCH data displayed for the LEFT, CTR, and RIGHT is no more or less than 0.1 of each other.
 - The ROLL data displayed for the LEFT, CTR, and RIGHT is no more or less than 0.1 of each other.
2. The FQIS input parameters are not automatically updated. Use the NEXT PAGE key on the MCDU to cycle the pages to update the screen.

ACCESS PLATFORM.....IN POSITION

GENERAL

Indicators are installed as follows:

- Four in each wing tank (three in the inner tank and one in the outer tank)
- One in the center tank.



TO DETERMINE AIRCRAFT ATTITUDE

Set ADIRS 1, 2, 3 to the NAV position.

On the LH or RH MCDU, press MCDU MENU key.

Select CFDS by pressing [4L].

Select SYSTEM REPORT/TEST by pressing [5L].

Select FUEL by pressing [2R].

On the MCDU control panel, press the NEXT PAGE key to display the FUEL main menu second page.

Select INPUT PARAMETERS VALUES by pressing [3L].

Use the table given on the next page to determine the equivalent number and letter from PITCH and ROLL data.

Select RETURN by pressing [6L] until CFDS main menu appears.

Press MCDU MENU key.

PITCH	REF	ROLL	REF
-1.5	1	-1.5	A
-1.0	2	-1.0	B
-0.5	3	-0.5	C
0.0	4	0.0	D
+0.5	5	+0.5	E
+1.0	6	+1.0	F
+1.5	7	+1.5	G

Note: 1. This procedure can only be used if:

- The PITCH and ROLL data is taken from the ADIRS (identified by an “A” after the PITCH and ROLL title).
- The PITCH data displayed for the LEFT, CTR, and RIGHT is no more or less than 0.1 of each other.
- The ROLL data displayed for the LEFT, CTR, and RIGHT is no more or less than 0.1 of each other.

2. The FQIS input parameters are not automatically updated. Use the NEXT PAGE key on the MCDU to cycle the pages to update the screen.

ACCESS PLATFORM.....IN POSITION

Ident.: EFB-LOD-FUL-C-00001692.0001001 / 03 NOV 21
Applicable to: ALL

TO DETERMINE FUEL QUANTITY IN THE OUTER TANK

MMI number 5.....UNLOCK and WITHDRAW

The flight crew must withdraw the MMI slowly until the flight crew feels the magnetic attraction between the rod and float magnets.

Do not use force when withdrawing the MMI as this will disengage the float magnet from the rod magnet and bring the rod down onto the mechanical stop.

ROD GRADUATION (which aligns with bottom wing surface).....READ
MMI..... IN PLACE and LOCKED

Use the table for the applicable aircraft wing side, aircraft attitude (grid square letter and number), and the MMI stick number 5, to find the volume of fuel in the outer tank (See below).

Multiply the result by the specific gravity to find the fuel weight.

Note: The manual magnetic indication accuracy is around 5 %.

TO DETERMINE FUEL QUANTITY IN THE INNER TANK

MMI (from number 4 to number 1)..... UNLOCK and WITHDRAW

The flight crew must withdraw the MMI slowly until the flight crew feels the magnetic attraction between the rod and float magnets.

Do not use force when withdrawing the MMI as this will disengage the float magnet from the rod magnet and bring the rod down onto the mechanical stop.

ROD GRADUATION (which aligns with bottom wing surface)..... READ

MMI..... IN PLACE and LOCKED

MMIs shall be withdrawn from number 4 to number 1 until one MMI measures fuel.

Use the table for the applicable aircraft wing side, aircraft attitude (grid square letter and number), and the applicable MMI stick number to find the volume of fuel in the inner tank (Refer to FCOM - PER.LOD.FUL FUEL. C.USE OF MANUAL MAGNETIC INDICATORS (MMI) - WING TANKS).

Multiply the result by the specific gravity to find the fuel weight.

Note: The manual magnetic indication accuracy is around 5 %.

TO DETERMINE FUEL QUANTITY IN THE INNER TANK

MMI (from number 4 to number 2)..... UNLOCK and WITHDRAW

The flight crew must withdraw the MMI slowly until the flight crew feels the magnetic attraction between the rod and float magnets.

Do not use force when withdrawing the MMI as this will disengage the float magnet from the rod magnet and bring the rod down onto the mechanical stop.

ROD GRADUATION (which aligns with bottom wing surface)..... READ

MMI..... IN PLACE and LOCKED

MMIs shall be withdrawn from number 4 to number 2 until one MMI measures fuel.

Use the table for the applicable aircraft wing side, aircraft attitude (grid square letter and number), and the applicable MMI stick number to find the volume of fuel in the inner tank (Refer to FCOM - PER.LOD.FUL FUEL. C.USE OF MANUAL MAGNETIC INDICATORS (MMI) - WING TANKS).

Multiply the result by the specific gravity to find the fuel weight.

Note: The manual magnetic indication accuracy is around 5 %.

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PERFORMANCE LOADING FUEL
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Ident.: EFB-LOD-FUL-C-00009658.0001001 / 03 NOV 21
Applicable to: ALL

TO DETERMINE FUEL QUANTITY IN THE CENTER TANK

CENTER TANK MMI..... UNLOCK and WITHDRAW

The flight crew member must withdraw the MMI slowly until the flight crew feels the magnetic attraction between the rod and float magnets.

Do not use force when withdrawing the MMI as this will disengage the float magnet from the rod magnet and bring the rod down onto the mechanical stop.

ROD GRADUATION (which aligns with bottom wing surface)..... READ

MMI..... IN PLACE and LOCKED

Use the table for the center tank, and for the applicable aircraft attitude (grid square letter and number) to find the volume of fuel in the center tank (See below).

Multiply the result by the specific gravity to find the fuel weight.

Note: *The manual magnetic indication accuracy is around 5 %.*

PERFORMANCE
LOADING
FUEL

USE OF MANUAL MAGNETIC INDICATORS (MMI) - WING TANKS (LITERS)

Ident.: EFB-LOD-FUL-C-00001681.0001001 / 17 MAR 11

Applicable to: MSN 02155-03060

WING TANKS (LITERS)

M M I N°	R E A D I N G	LITERS								M M I N°	R E A D I N G	LITERS							
		ATTITUDE MONITOR READING										ATTITUDE MONITOR READING							
		A*	LEFT WING			G	RIGHT WING					A	RIGHT WING			G	LEFT WING		
		1	2	3	4	5	6	7	1			2	3	4	5	6	7**		
1	2	50	50	50	50	50	50	50	2	50	50	50	50	50	50	50	50		
	4	100	100	100	100	100	100	100	4	50	50	50	50	50	50	50	50		
	6	100	100	100	100	100	100	100	6	100	100	100	100	100	100	100	100		
	8	150	150	150	150	150	150	150	8	150	150	150	150	150	150	150	150		
	10	200	200	200	200	200	200	200	10	200	200	200	200	200	200	200	150		
	12	250	250	250	250	250	250	250	12	250	250	250	250	250	250	250	200		
	14	300	300	300	300	300	300	300	14	300	300	300	300	300	300	300	250		
	16	350	350	350	350	350	350	350	16	350	350	350	350	350	350	350	300		
	18	450	450	450	450	450	450	400	18	400	400	400	400	400	400	400	350		
	20	500	500	500	500	500	500	500	20	450	450	450	450	450	450	450	400		
	22	550	550	550	550	550	550	550	22	500	500	500	500	500	500	500	450		
	24	650	650	650	650	650	650	600	24	550	550	550	550	550	550	550	550		
	26	750	750	750	750	750	700	700	26	650	650	650	650	650	650	650	600		
	28	800	800	800	800	800	800	800	28	700	700	700	700	700	700	700	700		
	30	900	900	900	900	900	900	900	30	800	800	800	800	800	800	800	750		
	32	1050	1050	1050	1050	1050	1000	1000	32	900	900	900	900	900	850	850	850		
	34	1150	1150	1150	1150	1150	1150	1100	34	950	950	950	950	950	950	950	950		
	36	1250	1250	1250	1250	1250	1250	1250	36	1050	1050	1050	1050	1050	1050	1050	1050		
	38	1350	1350	1350	1350	1350	1350	1350	38	1150	1150	1150	1150	1150	1150	1150	1150		
	40	1500	1500	1500	1500	1500	1500	1500	40	1250	1250	1250	1250	1250	1250	1250	1250		
	42	1600	1600	1600	1600	1600	1600	1600	42	1350	1350	1350	1350	1350	1350	1350	1350		
	44	1750	1750	1750	1750	1750	1750	1750	44	1450	1450	1450	1450	1450	1450	1450	1450		
	46	1900	1900	1900	1900	1900	1900	1900	46	1550	1550	1550	1550	1550	1550	1550	1550		
	48	2000	2000	2000	2000	2000	2000	2050	48	1700	1700	1700	1700	1700	1700	1700	1700		
	50	2200	2200	2200	2200	2200	2200	2200	50	1800	1800	1800	1800	1800	1800	1800	1800		
	52	2350	2350	2350	2350	2350	2350	2400	52	1950	1950	1950	1950	1950	1950	1950	1950		
	54	2500	2500	2500	2500	2500	2550	2550	54	2000	2000	2050	2050	2050	2050	2050	2050		
	56	2650	2650	2700	2700	2700	2650	2700	56	2200	2200	2200	2200	2200	2200	2200	2200		
	58	2800	2800	2800	2800	2850	2850	2850	58	2300	2300	2300	2300	2300	2300	2350	2350		
	60	2950	2950	2950	3000	3000	3050	3050	60	2450	2500	2500	2500	2500	2500	2500	2500		
	62	3100	3100	3150	3150	3150	3200	3250	62	2600	2600	2650	2650	2650	2650	2650	2650		
	63	3150	3150	3200	3200	3250	3300	3350	63	2650	2650	2700	2700	2700	2700	2700	2700		
	MAX	3450	3450	3450	3500	3500	3600	3600	MAX	2950	2950	2950	2950	2950	3000	3000	3000		

* GRID SQUARE LETTER

** GRID SQUARE NUMBER

A318/A319/A320/A321
**FLIGHT CREW
OPERATING MANUAL**
PERFORMANCE
LOADING
FUEL

M M I N G	R E A D I N G	LITERS ATTITUDE READING							
		A LEFT WING				G RIGHT WING			
		1	2	3	4	5	6	7	
2	2	2300	2250	2200	2200	2200	2200	2200	
	4	2500	2450	2400	2400	2350	2350	2350	
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	10	2900	2900	2900	2900	2850	2850	2850	
	12	3100	3100	3100	3100	3100	3050	3000	
	14	3250	3250	3250	3250	3250	3250	3200	
	16	3450	3450	3450	3450	3450	3400	3400	
	18	3700	3650	3650	3650	3650	3600	3600	
	20	3900	3900	3900	3900	3850	3850	3850	
	22	4100	4100	4050	4050	4050	4050	4050	
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	28	4700	4700	4750	4750	4750	4750	4750	
	30	4950	4950	4950	4950	5000	5000	5000	
	32	5100	5100	5150	5150	5150	5200	5200	
	MAX								
3	2	4400	4350	4300	4250	4200	4150	4050	
	4	4700	4700	4650	4600	4500	4400	4300	
	6	4950	4950	4900	4850	4800	4700	4550	
	8	5150	5100	5100	5050	5000	4950	4800	
	10	5250	5250	5250	5250	5200	5150	5050	
	12	5400	5400	5400	5400	5350	5300	5250	
	14	5600	5600	5550	5550	5500	5500	5450	
	16	5750	5750	5700	5700	5700	5650	5600	
	18	5900	5900	5850	5850	5850	5850	5800	
	20	6000	6000	6000	6000	6000	6000	6000	
4	2	5700	5600	5550	5500	5450	5400	5300	
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	6	6000	5900	5850	5800	5750	5700	5650	
	8	6150	6100	6050	6000	5950	5900	5850	
	10	6300	6300	6250	6200	6150	6150	6100	
	12	6450	6400	6400	6400	6350	6300	6250	
	14	6550	6500	6500	6500	6500	6450	6450	
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	MAX								
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	6	750	700	700	650	650	600	600	
	8	750	750	750	750	700	700	700	
	10	800	800	800	750	750	750	750	
	12	800	800	800	800	800	800	800	
	14	850	850	850	850	850	850	850	
	MAX	850	850	850	850	850	850	850	
5	2	700	700	700	700	700	700	700	
	4	750	750	750	750	750	750	750	
	6	800	800	800	800	800	800	800	
6	8	800	800	800	800	800	800	800	
	10	850	850	850	850	850	850	850	
	12	850	850	850	850	850	850	850	
	14	850	850	850	850	850	850	850	
	MAX	850	850	850	850	850	850	850	
6	2	2850	2850	2850	2850	2850	2850	2800	
	4	3050	3050	3050	3050	3050	3000	3000	
	6	3200	3200	3200	3200	3200	3200	3150	
7	8	3300	3300	3300	3300	3300	3300	3250	
	10	3500	3500	3500	3500	3500	3450	3400	
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	14	3800	3800	3750	3750	3750	3750	3750	
	16	3950	3900	3900	3900	3900	3900	3900	
	18	4050	4050	4050	4050	4050	4050	4050	
	20	4200	4200	4200	4200	4200	4200	4200	
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8	28	4600	4650	4650	4700	4700	4750	4800	
	30	4750	4750	4800	4800	4850	4850	4900	
	32	4850	4850	4900	4900	4950	5000	5000	
	MAX								
9	2	5050	5050	5100	5100	5100	5100	5100	
	4	5150	5150	5200	5200	5200	5200	5200	
	6	5250	5250	5300	5300	5300	5300	5300	
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	16	5650	5700	5700	5750	5750	5800	5800	
	18	5800	5800	5850	5850	5900	5900	5950	
	20	5900	5900	5950	5950	6000	6000	6050	
10	2	6000	6050	6100	6100	6100	6100	6100	
	4	6100	6100	6150	6150	6150	6200	6200	
	6	6200	6200	6200	6250	6250	6250	6300	
	8	6250	6300	6300	6350	6350	6350	6400	
	10	6350	6400	6400	6400	6450	6450	6450	
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	14	6500	6550	6550	6600	6600	6650	6650	
	16	6600	6600	6600	6650	6650	6700	6750	
	18	6650	6700	6700	6750	6750	6750	6800	
	MAX								
11	2	700	700	700	700	700	700	700	
	4	750	750	750	750	750	750	750	
	6	800	800	800	800	800	800	800	
	8	800	800	800	800	800	800	800	
	10	850	850	850	850	850	850	850	
	12	850	850	850	850	850	850	850	
	14	850	850	850	850	850	850	850	
	MAX	850	850	850	850	850	850	850	
12	2	2850	2850	2850	2850	2850	2850	2800	
	4	3050	3050	3050	3050	3050	3000	3000	
	6	3200	3200	3200	3200	3200	3200	3150	
13	8	3300	3300	3300	3300	3300	3300	3250	
	10	3500	3500	3500	3500	3500	3450	3400	
	12	3650	3650	3600	3600	3600	3600	3600	
	14	3800	3800	3750	3750	3750	3750	3750	
	16	3950	3900	3900	3900	3900	3900	3900	
	18	4050	4050	4050	4050	4050	4050	4050	
	20	4200	4200	4200	4200	4200	4200	4200	
	22	4250	4250	4250	4300	4300	4300	4300	
	24	4400	4400	4400	4400	4450	4450	4450	
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14	28	4600	4650	4650	4700	4700	4750	4800	
	30	4750	4750	4800	4800	4850	4850	4900	
	32	4850	4850	4900	4900	4950	5000	5000	
	MAX								

PERFORMANCE
LOADING
FUEL

M M I N°	R E A D I N G	LITERS ATTITUDE MONITOR READING								M M I N°	R E A D I N G	LITERS ATTITUDE MONITOR READING									
		B*	LEFT WING				F	RIGHT WING				B	RIGHT WING				F	LEFT WING			
			1	2	3	4		5	6				7	1	2	3		4	5	6	7**
1	2	50	50	50	50	50	50	50	50	2	50	50	50	50	50	50	50	50			
	4	50	50	50	50	50	50	50	50	4	50	50	50	50	50	50	50	50			
	6	100	100	100	100	100	100	100	100	6	100	100	100	100	100	100	100	100			
	8	150	150	150	150	150	150	150	150	8	150	150	150	150	150	150	150	150			
	10	200	200	200	200	200	200	200	200	10	200	200	200	200	200	200	200	150			
	12	250	250	250	250	250	250	250	250	12	250	250	250	250	250	250	250	200			
	14	300	300	300	300	300	300	300	300	14	300	300	300	300	300	300	300	250			
	16	350	350	350	350	360	350	350	350	16	350	350	350	350	350	350	350	300			
	18	400	400	400	400	400	400	400	400	18	400	400	400	400	400	400	400	350			
	20	450	450	450	450	450	450	450	450	20	450	450	450	450	450	450	450	450			
	22	550	550	550	550	550	550	550	550	22	500	500	500	500	500	500	500	500			
	24	600	600	600	600	600	600	600	600	24	550	550	550	550	550	550	550	550			
	26	700	700	700	700	700	700	700	700	26	650	650	650	650	650	650	650	650			
	28	800	800	800	800	800	800	800	800	28	700	700	700	700	700	700	700	700			
	30	900	900	900	900	900	900	900	850	30	800	800	800	800	800	800	800	800			
	32	1000	1000	1000	1000	1000	1000	1000	950	32	900	900	900	900	900	900	900	850			
	34	1100	1100	1100	1100	1100	1100	1100	1100	34	1000	1000	1000	1000	950	950	950	950			
	36	1200	1200	1200	1200	1200	1200	1200	1200	36	1100	1100	1100	1100	1050	1050	1050	1050			
	38	1300	1300	1300	1300	1300	1300	1300	1300	38	1200	1200	1200	1200	1200	1200	1150	1150			
	40	1450	1450	1450	1450	1450	1450	1450	1450	40	1300	1300	1300	1300	1300	1300	1300	1300			
	42	1550	1550	1550	1550	1550	1550	1550	1550	42	1400	1400	1400	1400	1400	1400	1400	1400			
	44	1700	1700	1700	1700	1700	1700	1700	1700	44	1500	1500	1500	1500	1500	1500	1500	1500			
	46	1800	1800	1800	1800	1800	1800	1800	1800	46	1600	1600	1600	1600	1600	1600	1600	1600			
	48	1950	1950	1950	1950	1950	1950	1950	1950	48	1700	1700	1700	1700	1700	1700	1700	1700			
	50	2100	2100	2100	2100	2100	2100	2100	2100	50	1850	1850	1850	1850	1850	1850	1850	1850			
	52	2250	2250	2250	2250	2250	2250	2250	2250	52	1950	1950	1950	1950	1950	1950	1950	1950			
	54	2400	2400	2400	2400	2400	2400	2400	2450	54	2100	2100	2100	2100	2100	2100	2100	2100			
	56	2550	2550	2600	2600	2600	2600	2600	2600	56	2250	2250	2250	2250	2250	2250	2250	2250			
	58	2750	2750	2750	2750	2750	2750	2750	2750	58	2400	2400	2400	2400	2400	2400	2400	2400			
	60	2850	2850	2850	2850	2900	2900	2950		60	2550	2550	2550	2550	2550	2550	2550	2550			
	62	3000	3000	3000	3050	3050	3050	3100		62	2700	2700	2700	2700	2700	2700	2700	2700			
	63	3050	3050	3050	3100	3150	3150	3200		63	2750	2750	2750	2750	2750	2750	2750	2750			
	MAX	3350	3350	3350	3350	3400	3450	3500		MAX	3000	3000	3000	3000	3000	3000	3000	3000			

* GRID SQUARE LETTER

** GRID SQUARE NUMBER

A318/A319/A320/A321
**FLIGHT CREW
OPERATING MANUAL**
PERFORMANCE
LOADING
FUEL

M M I N°	R E A D I N G	LITERS ATTITUDE MONITOR READING							M M I N G	R E A D I N G	LITERS ATTITUDE MONITOR READING							
		B	LEFT WING			F	RIGHT WING				B	RIGHT WING			F	LEFT WING		
		1	2	3	4	5	6	7			1	2	3	4	5	6	7	
2	2	2350	2350	2300	2300	2250	2200	2200	2	2800	2750	2750	2750	2700	2700	2650		
	4	2550	2500	2500	2450	2450	2400	2400	4	2950	2950	2900	2900	2900	2900	2850		
	6	2750	2700	2700	2650	2650	2600	2600	6	3100	3100	3100	3100	3100	3050	3050		
	8	2850	2850	2800	2800	2800	2750	2750	8	3200	3200	3200	3200	3200	3200	3150		
	10	3000	3000	3000	3000	3000	2950	2900	10	3400	3400	3350	3350	3350	3350	3300		
	12	3150	3150	3200	3150	3150	3150	3100	12	3550	3550	3550	3550	3500	3500	3450		
	14	3350	3350	3350	3350	3350	3300	3300	14	3750	3700	3700	3700	3650	3650	3650		
	16	3550	3550	3550	3550	3500	3500	3450	16	3900	3850	3850	3850	3850	3800	3800		
	18	3750	3750	3750	3750	3700	3700	3650	18	4050	4000	4000	4000	4000	4000	3950		
	20	4000	3950	3950	3950	3950	3900	3900	20	4200	4150	4150	4150	4150	4150	4150		
	22	4150	4100	4100	4100	4100	4100	4100	22	4250	4250	4250	4250	4250	4250	4250		
	24	4300	4300	4300	4300	4300	4300	4300	24	4400	4400	4400	4400	4400	4400	4400		
	26	4500	4500	4500	4500	4500	4500	4500	26	4500	4500	4500	4550	4550	4550	4550		
	28	4700	4700	4700	4700	4700	4750	4750	28	4650	4650	4650	4650	4700	4700	4750		
	30	4850	4900	4900	4900	4950	4950	4950	30	4750	4750	4800	4800	4850	4850	4900		
	32	5050	5100	5100	5100	5100	5150	5150	32	4850	4900	4900	4950	4950	5000	5050		
		MAX								MAX								
3	2	4550	4500	4500	4450	4400	4350	4300	2	5000	5000	5000	5000	5000	5000	4950		
	4	4800	4800	4800	4750	4650	4600	4500	4	5100	5100	5100	5100	5100	5100	5100		
	6	5050	5000	5000	5000	4900	4850	4750	6	5200	5200	5200	5250	5250	5200	5200		
	8	5150	5150	5150	5150	5100	5000	5000	8	5300	5300	5350	5350	5350	5350	5350		
	10	5300	5300	5300	5300	5250	5200	5150	10	5400	5400	5450	5450	5450	5450	5450		
	12	5450	5450	5450	5450	5400	5400	5350	12	5500	5500	5550	5550	5550	5550	5550		
	14	5600	5600	5600	5550	5550	5550	5500	14	5600	5600	5650	5650	5650	5650	5700		
	16	5700	5700	5700	5700	5700	5700	5700	16	5700	5700	5700	5750	5750	5750	5800		
	18	5850	5850	5850	5850	5850	5850	5850	18	5800	5800	5800	5850	5850	5850	5900		
	20	6000	6000	6050	6050	6050	6000	6000	20	5900	5900	5950	5950	6000	6000	6000		
		MAX								MAX								
4	2								2	5950	5950	6100	6000	6050	6050	6050		
	4	5850	5750	5700	5650	5600	5600	5600	4	6050	6050	6100	6100	6100	6100	6150		
	6	6000	6000	5950	5900	5850	5800	5800	6	6150	6150	6200	6200	6200	6200	6250		
	8	6150	6150	6100	6100	6050	6000	6000	8	6250	6250	6250	6300	6300	6300	6300		
	10	6300	6300	6250	6250	6250	6200	6150	10	6350	6350	6350	6400	6400	6400	6400		
	12	6400	6400	6400	6400	6350	6350	6300	12	6400	6450	6450	6450	6500	6500	6500		
	14	6500	6500	6500	6500	6500	6450	6450	14	6500	6500	6550	6550	6600	6600	6600		
	16	6600	6600	6600	6600	6550	6550	6550	16	6600	6600	6600	6650	6650	6700	6700		
	18	6760	6770	6770	6770	6770	6770	6760	18	6750	6770	6800	6830	6850	6870	6880		
		MAX								MAX								
5	2	650	650	600	600	600	550	550	2	750	700	700	700	700	700	700		
	4	750	700	700	700	650	600	600	4	750	750	750	750	750	750	750		
	6	750	750	750	700	700	650	650	6	800	800	800	800	750	750	750		
	8	800	800	750	750	750	750	700	8	800	800	800	800	800	800	800		
	10	800	800	800	800	800	750	750	10	850	850	850	850	800	800	800		
	12	850	850	800	800	800	800	800	12	850	850	850	850	850	850	850		
	14	850	850	850	850	850	850	850	14	850	850	850	850	850	850	850		
		MAX	850	850	850	850	850	850	850	MAX	850	850	850	850	850	850	850	

PERFORMANCE
LOADING
FUEL

M M I N°	R E A D I N G	LITERS ATTITUDE MONITOR READING							M M I N°	R E A D I N G	LITERS ATTITUDE MONITOR READING										
		C*	LEFT WING			E	RIGHT WING				C	RIGHT WING			E	LEFT WING					
			1	2	3		4	5				6	7	1		2	3	4	5	6	7**
1	2	50	50	50	50	50	50	50	2	50	50	50	50	50	50	50	50				
	4	50	50	50	50	50	50	50	4	50	50	50	50	50	50	50					
	6	100	100	100	100	100	100	100	6	100	100	100	100	100	100	100					
	8	150	150	150	150	150	150	150	8	150	150	150	150	150	150	150					
	10	200	200	200	200	200	200	200	10	200	200	200	200	200	200	150					
	12	250	250	250	250	250	250	250	12	250	250	250	250	250	250	200					
	14	300	300	300	300	300	300	300	14	300	300	300	300	300	300	250					
	16	350	350	350	350	350	350	350	16	350	350	350	350	350	350	350					
	18	400	400	400	400	400	400	400	18	400	400	400	400	400	400	400					
	20	450	450	450	450	450	450	450	20	450	450	450	450	450	450	450					
	22	550	550	550	550	500	500	500	22	500	500	500	500	500	500	500					
	24	600	600	600	600	600	600	600	24	600	600	600	600	600	550	550					
	26	700	700	700	700	650	650	650	26	650	650	650	650	650	650	650					
	28	750	750	750	750	750	750	750	28	750	750	750	750	750	700	700					
	30	850	850	850	850	850	850	850	30	800	800	800	800	800	800	800					
	32	950	950	950	950	950	950	950	32	900	900	900	900	900	900	900					
	34	1050	1050	1050	1050	1050	1050	1050	34	1000	1000	1000	1000	1000	1000	1000					
	36	1200	1150	1150	1150	1150	1150	1150	36	1100	1100	1100	1100	1100	1100	1100					
	38	1300	1300	1300	1250	1250	1250	1250	38	1200	1200	1200	1200	1200	1200	1200					
	40	1400	1400	1400	1400	1400	1400	1400	40	1300	1300	1300	1300	1300	1300	1300					
	42	1500	1500	1500	1500	1500	1500	1500	42	1400	1400	1400	1400	1400	1400	1400					
	44	1600	1600	1600	1600	1600	1600	1600	44	1550	1550	1500	1500	1500	1500	1500					
	46	1750	1750	1750	1750	1750	1750	1750	46	1650	1650	1650	1650	1650	1650	1650					
	48	1850	1850	1850	1850	1900	1900	1900	48	1800	1750	1750	1750	1750	1750	1800					
	50	2000	2000	2000	2000	2000	2000	2050	50	1900	1900	1900	1900	1900	1900	1900					
	52	2150	2150	2150	2150	2150	2150	2200	52	2000	2000	2000	2000	2000	2000	2050					
	54	2300	2300	2300	2300	2300	2300	2350	54	2150	2150	2150	2150	2150	2150	2200					
	56	2450	2500	2500	2500	2500	2500	2500	56	2300	2300	2300	2300	2300	2300	2350					
	58	2600	2650	2650	2650	2650	2650	2700	58	2450	2450	2450	2450	2450	2500	2500					
	60	2800	2800	2800	2800	2850	2850	2850	60	2600	2600	2600	2600	2600	2650	2650					
	62	2900	2950	2950	2950	2950	2950	3000	62	2750	2750	2750	2750	2800	2800	2800					
	63	2950	3000	3000	3000	3050	3050	3100	63	2800	2800	2800	2800	2850	2850	2850					
	MAX	3250	3250	3300	3350	3350	3350	3400	MAX	3100	3100	3100	3100	3100	3100	3100					

* GRID SQUARE LETTER

** GRID SQUARE NUMBER

A318/A319/A320/A321

FLIGHT CREW OPERATING MANUAL

PERFORMANCE

LOADING

FUEL

M M I N	R E A D I N G	LITERS ATTITUDE READING							M M I N	R E A D I N G	LITERS ATTITUDE MONITOR READING								
		C	LEFT WING			E	RIGHT WING				C	RIGHT WING			E	LEFT WING			
		1	2	3	4	5	6	7			1	2	3	4	5	6	7		
2	2	2450	2400	2400	2400	2350	2350	2350	2	2700	2650	2650	2600	2600	2550	2550			
	4	2650	2600	2600	2600	2550	2550	2500	4	2850	2800	2800	2800	2800	2750	2750			
	6	2800	2800	2800	2800	2750	2750	2700	6	3000	3000	3000	3000	3000	2950	2950			
	8	2900	2900	2900	2900	2900	2850	2850	8	3100	3100	3100	3100	3100	3100	3050			
	10	3100	3100	3100	3100	3100	3050	3000	10	3300	3300	3300	3250	3250	3250	3200			
	12	3250	3250	3250	3250	3250	3250	3200	12	3450	3450	3450	3450	3450	3400	3350			
	14	3450	3450	3450	3450	3400	3400	3350	14	3650	3650	3600	3600	3600	3550	3550			
	16	3650	3650	3650	3600	3600	3550	3550	16	3800	3800	3800	3750	3750	3750	3700			
	18	3850	3850	3800	3800	3800	3750	3750	18	4000	3950	3950	3950	3900	3900	3900			
	20	4050	4050	4000	4000	4000	3950	3950	20	4150	4100	4100	4100	4100	4100	4100			
	22	4200	4200	4150	4150	4150	4100	4100	22	4250	4250	4200	4200	4200	4200	4200			
	24	4350	4350	4300	4300	4300	4300	4300	24	4350	4350	4350	4350	4350	4350	4350			
	26	4500	4500	4500	4500	4500	4500	4500	26	4500	4500	4500	4500	4500	4500	4550			
	28	4650	4650	4650	4700	4700	4700	4700	28	4650	4650	4650	4650	4700	4700	4700			
	30	4850	4850	4850	4850	4900	4900	4900	30	4750	4800	4800	4800	4850	4850	4850			
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		MAX								MAX									
3	2	4650	4650	4650	4600	4600	4500	4500	2	4900	4900	4900	4900	4900	4850	4800			
	4	4900	4900	4900	4900	4800	4750	4650	4	5050	5100	5100	5100	5100	5100	5050	5000		
	6	5100	5100	5100	5050	5050	5000	4900	6	5150	5200	5200	5200	5200	5150	5150			
	8	5200	5200	5200	5200	5200	5150	5100	8	5250	5300	5300	5300	5300	5300	5300			
	10	5300	5350	5350	5350	5300	5300	5250	10	5350	5400	5400	5400	5400	5400	5400			
	12	5450	5450	5450	5450	5450	5450	5400	12	5500	5500	5500	5500	5550	5550	5550			
	14	5600	5600	5600	5600	5600	5600	5550	14	5600	5600	5600	5650	5650	5650	5650			
	16	5700	5700	5700	5700	5700	5700	5700	16	5700	5700	5750	5750	5750	5750	5800			
	18	5800	5850	5850	5850	5850	5850	5850	18	5800	5800	5850	5850	5900	5900	5900			
	20	5950	5950	6000	6000	6000	6000	6000	20	5900	5950	5950	6000	6000	6000	6000			
4	2	5800	5750	5750	5700	5700	5700	5700	2	5900	5900	5900	5900	5950	5950	5950			
	4	5950	5900	5900	5850	5850	5800	5800	4	6000	6000	6000	6050	6050	6050	6050			
	6	6050	6050	6000	6000	6000	5950	5950	6	6100	6100	6150	6150	6150	6150	6150			
	8	6200	6150	6150	6150	6150	6100	6100	8	6200	6250	6250	6250	6250	6250	6250			
	10	6300	6300	6300	6300	6300	6250	6250	10	6300	6350	6350	6350	6350	6350	6350			
	12	6400	6400	6400	6400	6400	6400	6400	12	6400	6400	6450	6450	6450	6450	6450			
	14	6500	6500	6500	6500	6500	6500	6500	14	6500	6500	6500	6550	6550	6550	6550			
	16	6600	6600	6600	6600	6600	6600	6600	16	6550	6600	6600	6600	6600	6600	6600			
	18	6730	6740	6750	6750	6760	6760	6770	18	6750	6750	6770	6790	6800	6810	6820			
		MAX								MAX									
5	2	700	700	650	650	600	600	600	2	750	700	700	700	700	650	650			
	4	750	750	700	700	650	650	650	4	750	750	750	750	750	700	700			
	6	750	750	750	750	700	700	700	6	800	800	750	750	750	750	750			
	8	800	800	800	800	750	750	750	8	800	800	800	800	800	800	800			
	10	800	800	800	800	800	800	800	10	850	850	850	850	800	800	800			
	12	850	850	850	850	800	800	800	12	850	850	850	850	850	850	850			
	14	850	850	850	850	850	850	850	14	900	900	850	850	850	850	850			

PERFORMANCE
LOADING
FUEL

M M I N°	M M I N°	R E A D I N G	LITERS ATTITUDE MONITOR READING							M M I N°	R E A D I N G	LITERS ATTITUDE MONITOR READING							M M I N°	
			D*	BOTH WINGS								D	BOTH WINGS							7**
				1	2	3	4	5	6				7	1	2	3	4	5			6
1	2	50	50	50	50	50	50	50	18	3950	3900	3900	3850	3850	3850	3800	2			
	4	100	100	100	100	100	100	100	20	4100	4100	4050	4050	4050	4000	4000				
	6	100	100	100	100	100	100	100	22	4200	4200	4150	4150	4150	4150	4150				
	8	150	150	150	150	150	150	150	24	4350	4350	4350	4300	4300	4300	4300				
	10	200	200	200	200	200	200	200	26	4500	4500	4500	4500	4500	4500	4500				
	12	250	250	250	250	250	250	250	28	4650	4650	4650	4650	4650	4700	4700				
	14	300	300	300	300	300	300	300	30	4800	4800	4800	4850	4850	4850	4900				
	16	350	350	350	350	350	350	350	32	4950	4950	5000	5000	5000	5050	5100				
	18	400	400	400	400	400	400	400	MAX											
	20	450	450	450	450	450	450	450												
	22	500	500	500	500	500	500	500	2	4800	4800	4800	4800	4750	4750	4600		3		
	24	600	600	600	600	600	600	600	4	5000	5000	5000	5000	4950	4900	4850				
	26	650	650	650	650	650	650	650	6	5100	5150	5150	5100	5100	5100	5050				
	28	750	750	750	750	750	750	750	8	5250	5250	5250	5250	5250	5200	5200				
	30	850	850	850	850	850	850	850	10	5350	5350	5350	5400	5400	5350	5350				
	32	950	950	950	950	950	950	950	12	5450	5500	5500	5500	5500	5500	5500				
	34	1050	1050	1050	1050	1050	1000	1000	14	5600	5600	5600	5600	5600	5600	5600				
	36	1150	1150	1150	1150	1150	1100	1100	16	5700	5700	5700	5750	5750	5750	5750				
	38	1250	1250	1250	1250	1250	1250	1250	18	5800	5800	5850	5850	5850	5900	5900				
	40	1350	1350	1350	1350	1350	1350	1350	20	5900	5900	5950	5950	5950	6000	6000				
	42	1450	1450	1450	1450	1450	1450	1450	MAX											
	44	1550	1550	1550	1550	1550	1550	1550												
	46	1700	1700	1700	1700	1700	1700	1700	2	5900	5850	5800	5800	5800	5800	5800	4			
	48	1800	1800	1800	1800	1800	1800	1800	4	6000	5950	5950	5950	5950	5950	5950				
	50	1950	1950	1950	1950	1950	1950	1950	6	6100	6100	6050	6050	6050	6050	6050				
	52	2100	2100	2100	2100	2100	2100	2100	8	6200	6200	6200	6200	6200	6200	6200				
	54	2250	2250	2250	2250	2250	2250	2250	10	6300	6300	6300	6300	6300	6300	6300				
	56	2400	2400	2400	2400	2400	2400	2400	12	6400	6400	6400	6400	6400	6400	6400				
	58	2550	2550	2550	2550	2550	2600	2600	14	6500	6500	6500	6500	6500	6500	6500				
	60	2700	2700	2700	2700	2700	2750	2750	16	6600	6600	6600	6600	6600	6600	6600				
	62	2850	2850	2850	2850	2850	2900	2900	18	6750	6750	6770	6800	6800	6810	6820				
	63	2900	2900	2900	2900	2900	2950	2950	MAX											
	MAX	3050	3050	3100	3100	3100	3150	3150												
2	2	2550	2550	2500	2500	2450	2450	2450	2	700	700	700	650	650	650	600	5			
	4	2750	2700	2700	2700	2650	2650	2600	4	750	750	750	700	700	700	650				
	6	2900	2900	2850	2850	2850	2800	2800	6	800	800	750	750	750	750	700				
	8	3000	3000	2950	2950	2950	2950	2900	8	800	800	800	800	800	750	750				
	10	3200	3150	3150	3150	3150	3100	3050	10	850	800	800	800	800	800	800				
	12	3350	3350	3350	3350	3300	3300	3250	12	850	850	850	850	850	850	850				
	14	3550	3550	3550	3500	3500	3450	3450	14	850	850	850	850	850	850	850				
	16	3750	3750	3700	3700	3650	3650	3600	MAX	850	850	850	850	850	850	850				

* GRID SQUARE LETTER

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PERFORMANCE LOADING FUEL
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** GRID SQUARE NUMBER

A318/A319/A320/A321
FLIGHT CREW
OPERATING MANUAL
PERFORMANCE
LOADING
FUEL

Ident.: EFB-LOD-FUL-C-00001681.0004001 / 17 MAR 11

Applicable to: MSN 04392-07792

WING TANKS (LITERS)

M M I N	M M I N	R E A D I N G	LITERS ATTITUDE READING							R E A D I N G	LITERS ATTITUDE READING								
			A*	LEFT WING			G	RIGHT WING			A	RIGHT WING			G	LEFT WING			
			1	2	3	4	5	6	7		1	2	3	4	5	6	7**		
2	2	2300	2250	2200	2200	2200	2200	2200	2	2850	2850	2850	2850	2850	2850	2800			
	4	2500	2450	2400	2400	2350	2350	2350	4	3050	3050	3050	3050	3050	3000	3000			
	6	2650	2600	2600	2600	2550	2500	2500	6	3200	3200	3200	3200	3200	3200	3150			
	8	2750	2750	2750	2700	2700	2650	2650	8	3300	3300	3300	3300	3300	3300	3250			
	10	2900	2900	2900	2900	2850	2850	2850	10	3500	3500	3500	3500	3450	3450	3400			
	12	3100	3100	3100	3100	3100	3050	3000	12	3650	3650	3600	3600	3600	3600	3600			
	14	3250	3250	3250	3250	3250	3250	3200	14	3800	3800	3750	3750	3750	3750	3750			
	16	3450	3450	3450	3450	3450	3400	3400	16	3950	3900	3900	3900	3900	3900	3900			
	18	3700	3650	3650	3650	3650	3600	3600	18	4050	4050	4050	4050	4050	4050	4050			
	20	3900	3900	3900	3900	3850	3850	3850	20	4200	4200	4200	4200	4200	4200	4200			
	22	4100	4100	4050	4050	4050	4050	4050	22	4250	4250	4250	4300	4300	4300	4300			
	24	4300	4300	4300	4300	4300	4300	4300	24	4400	4400	4400	4400	4450	4450	4450			
	26	4500	4500	4500	4500	4500	4500	4550	26	4500	4500	4550	4550	4550	4600	4600			
	28	4700	4700	4750	4750	4750	4750	4750	28	4600	4650	4650	4700	4700	4750	4800			
	30	4950	4950	4950	4950	5000	5000	5000	30	4750	4750	4800	4800	4850	4850	4900			
	32	5100	5100	5150	5150	5150	5200	5200	32	4850	4850	4900	4900	4950	5000	5000			
		MAX								MAX									
3	2	4400	4350	4300	4250	4200	4150	4050	2	5050	5050	5100	5100	5100	5100	5100			
	4	4700	4700	4650	4600	4500	4400	4300	4	5150	5150	5200	5200	5200	5200	5200			
	6	4950	4950	4900	4850	4800	4700	4550	6	5250	5250	5300	5300	5300	5300	5300			
	8	5150	5100	5100	5050	5000	4950	4800	8	5350	5350	5400	5400	5400	5400	5400			
	10	5250	5250	5250	5250	5200	5150	5050	10	5450	5450	5500	5500	5500	5500	5500			
	12	5400	5400	5400	5400	5350	5300	5250	12	5500	5500	5550	5600	5600	5600	5650			
	14	5600	5600	5550	5550	5500	5500	5450	14	5600	5650	5650	5700	5700	5700	5750			
	16	5750	5750	5700	5700	5700	5650	5600	16	5650	5700	5700	5750	5750	5800	5800			
	18	5900	5900	5850	5850	5850	5850	5800	18	5800	5800	5850	5850	5900	5900	5950			
	20	6000	6000	6000	6000	6000	6000	6000	20	5900	5900	5950	5950	6000	6000	6050			

* GRID SQUARE LETTER

** GRID SQUARE NUMBER

A318/A319/A320/A321
 FLIGHT CREW
 OPERATING MANUAL

PERFORMANCE
LOADING
FUEL

M M I N°	M M I N G	LITERS ATTITUDE READING							M M I N G	LITERS ATTITUDE READING						
		A LEFT WING			G RIGHT WING					A RIGHT WING			G LEFT WING			
		1	2	3	4	5	6	7		1	2	3	4	5	6	7
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	4	5850	5750	5700	5650	5600	5550	5500	4	6100	6100	6150	6150	6150	6200	6200
	6	6000	5900	5850	5800	5750	5700	5650	6	6200	6200	6200	6250	6250	6250	6300
	8	6150	6100	6050	6000	5950	5900	5850	8	6250	6300	6300	6350	6350	6350	6400
	10	6300	6300	6250	6200	6150	6150	6100	10	6350	6400	6400	6400	6450	6450	6450
	12	6450	6400	6400	6400	6350	6300	6250	12	6450	6450	6450	6500	6500	6550	6550
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	18	6650	6650	6650	6650	6650	6650	6650	18	6650	6700	6700	6750	6750	6750	6800
	MAX								MAX							
5	2	650	600	550	550	550	500	500	2	700	700	700	700	700	700	700
	4	700	650	650	600	600	550	550	4	750	750	750	750	750	750	750
	6	750	700	700	650	650	650	600	6	800	800	800	800	750	750	750
	8	750	750	750	750	700	700	700	8	800	800	800	800	800	800	800
	10	800	800	800	800	750	750	750	10	850	850	850	850	850	850	850
	12	800	800	800	800	800	800	800	12	850	850	850	850	850	850	850
	14	850	850	850	850	850	850	850	14	850	850	850	850	850	850	850
	MAX	850	850	850	850	850	850	850	MAX	850	850	850	850	850	850	850

M M I N°	M M I N G	LITERS ATTITUDE READING							M M I N G	LITERS ATTITUDE READING								
		B*	LEFT WING			F	RIGHT WING			B	RIGHT WING			F	LEFT WING			
			1	2	3		4	5			6	7	1		2	3	4	5	6	7**
2		2	2350	2350	2300	2300	2250	2200	2200	2	2800	2750	2750	2750	2700	2700	2650	
	4	2550	2500	2500	2450	2450	2400	2400	4	2950	2950	2900	2900	2900	2900	2850		
	6	2750	2700	2700	2650	2650	2600	2600	6	3100	3100	3100	3100	3100	3050	3050		
	8	2850	2850	2800	2800	2800	2750	2750	8	3200	3200	3200	3200	3200	3200	3150		
	10	3000	3000	3000	3000	3000	2950	2900	10	3400	3400	3350	3350	3350	3350	3300		
	12	3150	3150	3200	3150	3150	3150	3100	12	3550	3550	3550	3550	3500	3500	3450		
	14	3350	3350	3350	3350	3350	3300	3300	14	3750	3700	3700	3700	3650	3650	3650		
	16	3550	3550	3550	3550	3500	3500	3450	16	3900	3850	3850	3850	3850	3800	3800		
	18	3750	3750	3750	3750	3700	3700	3650	18	4050	4000	4000	4000	4000	4000	3950		
	20	4000	3950	3950	3950	3950	3900	3900	20	4200	4150	4150	4150	4150	4150	4150		
	22	4150	4100	4100	4100	4100	4100	4100	22	4250	4250	4250	4250	4250	4250	4250		
	24	4300	4300	4300	4300	4300	4300	4300	24	4400	4400	4400	4400	4400	4400	4400		
	26	4500	4500	4500	4500	4500	4500	4500	26	4500	4500	4500	4550	4550	4550	4550		
	28	4700	4700	4700	4700	4700	4750	4750	28	4650	4650	4650	4650	4700	4700	4750		
	30	4850	4900	4900	4900	4950	4950	4950	30	4750	4750	4800	4800	4850	4850	4900		
	32	5050	5100	5100	5100	5100	5150	5150	32	4850	4900	4900	4950	4950	5000	5050		
		MAX								MAX								
3		2	4550	4500	4500	4450	4400	4350	4300	2	5000	5000	5000	5000	5000	5000	4950	
	4	4800	4800	4800	4750	4650	4600	4500	4	5100	5100	5100	5100	5100	5100	5100		
	6	5050	5000	5000	5000	4900	4850	4750	6	5200	5200	5200	5250	5200	5200	5200		
	8	5150	5150	5150	5150	5100	5000	5000	8	5300	5300	5350	5350	5350	5350	5350		
	10	5300	5300	5300	5300	5250	5200	5150	10	5400	5400	5450	5450	5450	5450	5450		
	12	5450	5450	5450	5450	5400	5400	5350	12	5500	5500	5550	5550	5550	5550	5550		
	14	5600	5600	5600	5550	5550	5550	5500	14	5600	5600	5650	5650	5650	5650	5700		
	16	5700	5700	5700	5700	5700	5700	5700	16	5700	5700	5700	5750	5750	5750	5800		
	18	5850	5850	5850	5850	5850	5850	5850	18	5800	5800	5800	5850	5850	5850	5900		
	20	6000	6000	6050	6050	6050	6000	6000	20	5900	5900	5950	5950	6000	6000	6000		
		MAX								MAX								

* GRID SQUARE LETTER

A318/A319/A320/A321
 FLIGHT CREW
 OPERATING MANUAL

PERFORMANCE
LOADING
FUEL

** GRID SQUARE NUMBER

M M I N	R E A D I N G	LITERS ATTITUDE READING							R E A D I N G	LITERS ATTITUDE READING						
		B LEFT WING			F RIGHT WING					B RIGHT WING			F LEFT WING			
		1	2	3	4	5	6	7		1	2	3	4	5	6	7
4	2								2	5950	5950	6100	6000	6050	6050	6050
	4	5850	5750	5700	5650	5600	5600	5600	4	6050	6050	6100	6100	6100	6100	6150
	6	6000	6000	5950	5900	5850	5800	5800	6	6150	6150	6200	6200	6200	6200	6200
	8	6150	6150	6100	6100	6050	6000	6000	8	6250	6250	6250	6300	6300	6300	6300
	10	6300	6300	6250	6250	6200	6200	6150	10	6350	6350	6350	6400	6400	6400	6400
	12	6400	6400	6400	6400	6350	6350	6300	12	6400	6450	6450	6450	6500	6500	6500
	14	6500	6500	6500	6500	6500	6450	6450	14	6500	6500	6550	6550	6600	6600	6600
	16	6600	6600	6600	6600	6550	6550	6550	16	6600	6600	6600	6650	6650	6700	6700
	18	6760	6770	6770	6770	6770	6770	6760	18	6750	6770	6800	6830	6850	6870	6880
	MAX								MAX							
5	2	650	650	600	600	600	550	550	2	750	700	700	700	700	700	700
	4	750	700	700	650	650	600	600	4	750	750	750	750	750	750	750
	6	750	750	750	700	700	650	650	6	800	800	800	800	750	750	750
	8	800	800	750	750	750	750	700	8	800	800	800	800	800	800	800
	10	800	800	800	800	800	750	750	10	850	850	850	850	800	800	800
	12	850	850	800	800	800	800	800	12	850	850	850	850	850	850	850
	14	850	850	850	850	850	850	850	14	850	850	850	850	850	850	850
	MAX	850	850	850	850	850	850	850	MAX	850	850	850	850	850	850	850

M M I N	R E A D I N G	LITERS ATTITUDE READING							M M I N	R E A D I N G	LITERS ATTITUDE READING								
		C*	LEFT WING			E RIGHT WING					C	RIGHT WING			E LEFT WING				
		1	2	3	4	5	6	7			1	2	3	4	5	6	7**		
2	2	2450	2400	2400	2400	2350	2350	2350	2	2700	2650	2650	2600	2600	2550	2550			
	4	2650	2600	2600	2600	2550	2550	2500	4	2850	2800	2800	2800	2800	2750	2750			
	6	2800	2800	2800	2800	2750	2750	2700	6	3000	3000	3000	3000	3000	2950	2900			
	8	2900	2900	2900	2900	2900	2850	2850	8	3100	3100	3100	3100	3100	3100	3050			
	10	3100	3100	3100	3100	3100	3050	3000	10	3300	3300	3300	3250	3250	3250	3200			
	12	3250	3250	3250	3250	3250	3250	3200	12	3450	3450	3450	3450	3450	3400	3350			
	14	3450	3450	3450	3450	3400	3400	3350	14	3650	3650	3600	3600	3600	3550	3550			
	16	3650	3650	3650	3600	3600	3550	3550	16	3800	3800	3800	3750	3750	3750	3700			
	18	3850	3850	3800	3800	3800	3750	3750	18	4000	3950	3950	3950	3900	3900	3900			
	20	4050	4050	4000	4000	4000	3950	3950	20	4150	4100	4100	4100	4100	4100	4100			
	22	4200	4200	4150	4150	4150	4100	4100	22	4250	4250	4200	4200	4200	4200	4200			
	24	4350	4350	4300	4300	4300	4300	4300	24	4350	4350	4350	4350	4350	4350	4350			
	26	4500	4500	4500	4500	4500	4500	4500	26	4500	4500	4500	4500	4500	4500	4550			
	28	4650	4650	4650	4700	4700	4700	4700	28	4650	4650	4650	4650	4700	4700	4700			
	30	4850	4850	4850	4850	4900	4900	4900	30	4750	4800	4800	4800	4850	4850	4850			
	32	5000	5000	5000	5050	5050	5050	5100	32	4900	4900	4950	4950	5000	5000	5050			
		MAX								MAX									
3	2	4650	4650	4650	4600	4600	4500	4500	2	4900	4900	4900	4900	4900	4850	4800			
	4	4900	4900	4900	4900	4800	4750	4650	4	5050	5100	5100	5100	5100	5050	5000			
	6	5100	5100	5100	5050	5050	5000	4900	6	5150	5200	5200	5200	5200	5150	5150			
	8	5200	5200	5200	5200	5200	5150	5100	8	5250	5300	5300	5300	5300	5300	5300			
	10	5300	5350	5350	5350	5300	5300	5250	10	5350	5400	5400	5400	5400	5400	5400			
	12	5450	5450	5450	5450	5450	5450	5400	12	5500	5500	5500	5500	5550	5550	5550			
	14	5600	5600	5600	5600	5600	5600	5550	14	5600	5600	5600	5650	5650	5650	5650			
	16	5700	5700	5700	5700	5700	5700	5700	16	5700	5700	5750	5750	5750	5750	5800			
	18	5800	5850	5850	5850	5850	5850	5850	18	5800	5800	5850	5850	5900	5900	5900			
	20	5950	5950	6000	6000	6000	6000	6000	20	5900	5950	5950	6000	6000	6000	6000			

A318/A319/A320/A321

**FLIGHT CREW
OPERATING MANUAL**

PERFORMANCE

LOADING

FUEL

- * GRID SQUARE LETTER
** GRID SQUARE NUMBER

M M I N°	M M I N°	R E A D I N G	LITERS ATTITUDE READING								M M I N°	M M I N°	R E A D I N G	LITERS ATTITUDE READING							
			C LEFT WING				E RIGHT WING							C RIGHT WING				E LEFT WING			
			1	2	3	4	5	6	7					1	2	3	4	5	6	7	
4	2	5800	5750	5750	5700	5700	5700	5700	5700		2	5900	5900	5900	5900	5950	5950	5950	5950		
	4	5950	5900	5900	5850	5850	5800	5800	5800		4	6000	6000	6000	6050	6050	6050	6050	6050		
	6	6050	6050	6000	6000	6000	6000	5950	5950		6	6100	6100	6150	6150	6150	6150	6150	6150		
	8	6200	6150	6150	6150	6150	6100	6100	6100		8	6200	6250	6250	6250	6250	6250	6250	6250		
	10	6300	6300	6300	6300	6300	6250	6250	6250		10	6300	6350	6350	6350	6350	6350	6350	6350		
	12	6400	6400	6400	6400	6400	6400	6400	6400		12	6400	6400	6450	6450	6450	6450	6450	6450		
	14	6500	6500	6500	6500	6500	6500	6500	6500		14	6500	6500	6500	6550	6550	6550	6550	6550		
	16	6600	6600	6600	6600	6600	6600	6600	6600		16	6550	6600	6600	6600	6600	6600	6600	6600		
	18	6730	6740	6750	6750	6760	6760	6770	6770		18	6750	6750	6770	6790	6800	6810	6820	6820		
		MAX										MAX									
5	2	700	700	650	650	600	600	600	600		2	750	700	700	700	700	650	650	650		
	4	750	750	700	700	650	650	650	650		4	750	750	750	750	700	700	700	700		
	6	750	750	750	750	700	700	700	700		6	800	800	750	750	750	750	750	750		
	8	800	800	800	750	750	750	750	750		8	800	800	800	800	800	800	800	800		
	10	800	800	800	800	800	800	800	800		10	850	850	850	800	800	800	800	800		
	12	850	850	850	800	800	800	800	800		12	850	850	850	850	850	850	850	850		
	14	850	850	850	850	850	850	850	850		14	900	900	850	850	850	850	850	850		
		MAX										MAX									

M M I N°	M M I N°	R E A D I N G	LITERS ATTITUDE READING								M M I N°	M M I N°	R E A D I N G	LITERS ATTITUDE READING								M M I N°
			D*	BOTH WINGS										D	BOTH WINGS							
				1	2	3	4	5	6	7					1	2	3	4	5	6	7**	
2		2	2550	2550	2500	2500	2450	2450	2450		2	5900	5850	5800	5800	5800	5800	5800		4		
		4	2750	2700	2700	2700	2650	2650	2600		4	6000	5950	5950	5950	5950	5950	5950				
		6	2900	2900	2850	2850	2850	2800	2800		6	6100	6100	6050	6050	6050	6050	6050				
		8	3000	3000	2950	2950	2950	2950	2900		8	6200	6200	6200	6200	6200	6200	6200				
		10	3200	3150	3150	3150	3150	3100	3050		10	6300	6300	6300	6300	6300	6300	6300				
		12	3350	3350	3350	3350	3300	3300	3250		12	6400	6400	6400	6400	6400	6400	6400				
		14	3550	3550	3550	3500	3500	3500	3450		14	6500	6500	6500	6500	6500	6500	6500				
		16	3750	3750	3700	3700	3650	3650	3600		16	6600	6600	6600	6600	6600	6600	6600				
		18	3950	3900	3900	3850	3850	3850	3800		18	6750	6750	6770	6800	6800	6810	6820				
		MAX									MAX											
3		2	4800	4800	4800	4800	4750	4750	4600		2	700	700	700	650	650	650	600		5		
		4	5000	5000	5000	5000	4950	4900	4850		4	750	750	750	700	700	700	650				
		6	5100	5150	5150	5100	5100	5100	5050		6	800	800	750	750	750	750	700				
		8	5250	5250	5250	5250	5250	5200	5200		8	800	800	800	800	800	800	750				
		10	5350	5350	5350	5400	5400	5350	5350		10	850	850	850	850	850	850	850				
		12	5450	5500	5500	5500	5500	5500	5500		12	850	850	850	850	850	850	850				
		14	5600	5600	5600	5600	5600	5600	5600		14	850	850	850	850	850	850	850				
		16	5700	5700	5700	5750	5750	5750	5750		16	850	850	850	850	850	850	850				
		18	5800	5800	5850	5850	5850	5900	5900		18	850	850	850	850	850	850	850				
		MAX									MAX											



A318/A319/A320/A321
FLIGHT CREW
OPERATING MANUAL

PERFORMANCE

LOADING

FUEL

* GRID SQUARE LETTER

** GRID SQUARE NUMBER

Ident.: EFB-LOD-FUL-C-00001682.0001001 / 16 NOV 11

Applicable to: ALL

CENTER TANK (LITERS)

READING MM	LITERS ATTITUDE MONITOR READING LINES A AND G*							READING MM	LITERS ATTITUDE MONITOR READING LINES B AND F						
	1	2	3	4	5	6	7		1	2	3	4	5	6	7**
2	300	300	350	350	350	350	350	2	300	300	300	300	300	300	350
4	400	450	450	500	500	500	500	4	400	450	450	450	500	500	500
6	600	600	650	650	650	650	650	6	600	600	650	650	650	650	600
8	750	750	750	750	750	750	750	8	750	750	750	750	750	750	750
10	900	850	850	850	850	850	900	10	900	850	850	850	850	850	900
12	1050	1000	1000	1000	1000	1000	1050	12	1050	1000	1000	1000	1000	1000	1050
14	1250	1250	1200	1200	1200	1200	1200	14	1250	1200	1200	1200	1200	1200	1200
16	1450	1450	1400	1400	1400	1400	1400	16	1450	1450	1450	1450	1400	1400	1400
18	1650	1650	1600	1600	1600	1600	1600	18	1700	1700	1650	1650	1600	1600	1600
20	1900	1850	1850	1850	1850	1800	1800	20	1900	1900	1900	1850	1850	1850	1800
22	2100	2050	2050	2050	2050	2000	2000	22	2100	2100	2100	2050	2050	2000	2000
24	2300	2250	2250	2250	2200	2200	2150	24	2300	2300	2250	2250	2200	2200	2150
26	2450	2450	2450	2450	2450	2400	2350	26	2500	2500	2450	2450	2400	2350	2350
28	2700	2650	2650	2650	2600	2550	2550	28	2700	2700	2650	2650	2600	2550	2500
30	2900	2850	2850	2850	2800	2800	2750	30	2900	2900	2800	2850	2800	2800	2750
32	3050	3050	3050	3050	3000	3000	2950	32	3100	3100	3100	3050	3050	3000	2950
34	3250	3250	3250	3250	3200	3200	3150	34	3300	3300	3300	3250	3250	3200	3150
36	3500	3500	3450	3450	3450	3400	3400	36	3500	3500	3500	3450	3450	3400	3400
38	3700	3700	3700	3700	3650	3650	3600	38	3700	3700	3700	3700	3650	3650	3600
40	3900	3900	3900	3900	3900	3850	3800	40	3950	3950	3950	3900	3900	3850	3800
42	4100	4100	4100	4100	4100	4050	4050	42	4150	4150	4150	4100	4100	4050	4000
44	4350	4350	4350	4300	4300	4250	4250	44	4350	4350	4350	4300	4300	4250	4200
46	4550	4550	4550	4550	4500	4500	4450	46	4550	4550	4550	4550	4500	4500	4450
48	4750	4750	4750	4700	4700	4650	4650	48	4750	4750	4750	4750	4700	4700	4650
50	4950	4950	4950	4950	4900	4900	4850	50	4950	4950	4950	4950	4900	4900	4850
52	5150	5150	5150	5150	5100	5100	5050	52	5150	5150	5150	5150	5150	5100	5050
54	5400	5400	5400	5400	5350	5300	5250	54	5400	5400	5400	5400	5350	5300	5250
56	5600	5600	5600	5600	5550	5500	5450	56	5600	5600	5600	5600	5550	5500	5450
58	5800	5800	5800	5750	5750	5700	5650	58	5800	5800	5800	5800	5750	5750	5700
60	6000	6000	6000	5950	5950	5900	5900	60	6000	6000	6000	6000	5950	5950	5900
62	6200	6200	6200	6150	6150	6100	6100	62	6200	6200	6200	6200	6150	6150	6100
64	6400	6400	6400	6400	6350	6300	6300	64	6400	6400	6400	6400	6350	6350	6300
66	6600	6600	6600	6600	6550	6550	6500	66	6600	6600	6600	6600	6550	6550	6500
68	6800	6800	6750	6750	6750	6700	6700	68	6800	6800	6800	6800	6750	6750	6700
70	7000	6950	6950	6950	6900	6900	6900	70	7000	7000	7000	6950	6950	6950	6900
72	7200	7200	7150	7150	7100	7100	7050	72	7200	7200	7150	7150	7150	7100	7100
74	7400	7400	7350	7350	7300	7300	7300	74	7400	7400	7350	7350	7350	7300	7300
76	7600	7600	7600	7550	7550	7500	7500	76	7600	7600	7600	7550	7550	7500	7500
78	7850	7800	7800	7800	7750	7700	7700	78	7800	7800	7800	7750	7750	7700	7700
MAX	7950	7900	7900	7900	7850	7800	7800	MAX	7900	7900	7850	7850	7850	7800	7800

A318/A319/A320/A321
 FLIGHT CREW
 OPERATING MANUAL

PERFORMANCE
LOADING
FUEL

R E A D I N G	LITERS ATTITUDE MONITOR READING LINES C AND E						
	1	2	3	4	5	6	7
2	250	300	300	300	300	300	300
4	400	450	450	500	500	500	450
6	600	600	650	650	650	600	600
8	750	750	750	750	750	750	750
10	850	850	850	850	850	850	850
12	1050	1000	1000	1000	1000	1000	1000
14	1250	1200	1200	1200	1200	1200	1200
16	1450	1450	1450	1400	1400	1400	1400
18	1650	1650	1650	1650	1600	1600	1600
20	1900	1900	1900	1900	1900	1850	1800
22	2100	2100	2100	2100	2050	2050	2000
24	2300	2300	2250	2250	2250	2200	2200
26	2500	2500	2450	2450	2400	2400	2350
28	2700	2650	2650	2650	2600	2600	2550
30	2900	2900	2850	2850	2800	2800	2750
32	3100	3100	3100	3100	3050	3050	3000
34	3300	3300	3300	3250	3250	3200	3200
36	3500	3500	3500	3500	3450	3450	3400
38	3700	3700	3700	3700	3700	3650	3600
40	3950	3950	3950	3950	3900	3900	3850
42	4150	4150	4150	4150	4100	4100	4050
44	4350	4350	4350	4350	4300	4300	4250
46	4550	4550	4550	4550	4500	4500	4450
48	4750	4750	4750	4750	4750	4700	4650
50	4950	4950	4950	4950	4900	4900	4850
52	5150	5150	5150	5150	5100	5100	5050
54	5400	5400	5400	5400	5350	5300	5250
56	5600	5600	5600	5600	5550	5500	5450
58	5800	5800	5800	5800	5750	5700	5650
60	6000	6000	6000	6000	5950	5950	5900
62	6200	6200	6200	6200	6150	6100	6100
64	6400	6400	6400	6400	6350	6300	6300
66	6600	6600	6600	6600	6550	6550	6500
68	6800	6800	6800	6750	6750	6700	6700
70	7000	7000	7000	6950	6950	6900	6900
72	7200	7200	7150	7150	7150	7150	7100
74	7400	7400	7400	7350	7350	7300	7300
76	7600	7600	7600	7550	7550	7500	7500
78	7800	7800	7800	7750	7750	7700	7700
MAX	7900	7900	7850	7850	7850	7800	7800

R E A D I N G	LITERS ATTITUDE MONITOR READING LINES D						
	1	2	3	4	5	6	7
2	300	300	300	300	300	300	300
4	450	450	500	500	500	500	500
6	600	600	650	650	650	650	600
8	750	750	750	750	750	750	750
10	900	900	900	900	900	900	900
12	1050	1000	1000	1000	1000	1000	1050
14	1250	1250	1200	1200	1200	1200	1200
16	1500	1450	1450	1450	1400	1400	1400
18	1700	1700	1700	1650	1650	1650	1600
20	1900	1900	1900	1900	1900	1850	1850
22	2100	2100	2100	2100	2050	2050	2000
24	2300	2300	2300	2250	2250	2200	2200
26	2500	2500	2450	2450	2400	2400	2350
28	2700	2700	2700	2650	2600	2600	2550
30	2900	2900	2900	2900	2850	2800	2750
32	3100	3100	3100	3100	3050	3050	3000
34	3300	3300	3300	3300	3250	3250	3200
36	3500	3500	3500	3500	3450	3450	3400
38	3700	3750	3750	3700	3700	3650	3650
40	3950	3950	3950	3950	3900	3900	3850
42	4150	4150	4150	4150	4100	4100	4050
44	4350	4350	4350	4350	4300	4300	4250
46	4550	4550	4550	4550	4500	4500	4450
48	4750	4750	4750	4750	4700	4700	4650
50	4950	4950	4950	4950	4900	4900	4850
52	5200	5200	5200	5150	5100	5100	5050
54	5400	5400	5400	5400	5350	5300	5250
56	5600	5600	5600	5600	5550	5500	5450
58	5800	5800	5800	5800	5750	5700	5650
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62	6200	6200	6200	6200	6150	6150	6100
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68	6800	6800	6800	6800	6750	6750	6700
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74	7400	7400	7400	7350	7350	7350	7300
76	7600	7600	7600	7550	7550	7550	7500
78	7800	7800	7800	7750	7750	7700	7700
MAX	7900	7900	7900	7900	7850	7850	7800

* GRID SQUARE LETTER

** GRID SQUARE NUMBER

PERFORMANCE

TAKEOFF

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PERFORMANCE TAKEOFF PRELIMINARY PAGES - TABLE OF CONTENTS
--	---

EFB-TOF-10 Takeoff Performance Optimization

General.....	A
Takeoff Parameters.....	B

EFB-TOF-20 Thrust Options

EFB-TOF-20-10 Takeoff at Maximum Thrust

TOGA Thrust.....	A
------------------	---

EFB-TOF-20-20 Flexible and Derated Takeoff

EFB-TOF-20-20-10 General

General.....	A
--------------	---

EFB-TOF-20-20-20 Flexible Takeoff

Flexible Takeoff Definition.....	A
Flexible Takeoff Principle.....	B
Flexible Takeoff Limitations.....	C

EFB-TOF-20-20-30 Derated Takeoff (If Installed)

Derated Takeoff Principle.....	A
Derated Takeoff Limitation.....	B

EFB-TOF-20-20-40 Flexible Takeoff vs Derated Takeoff

Flexible Takeoff vs Derated Takeoff.....	A
--	---

EFB-TOF-30 Runway Conditions

EFB-TOF-30-10 Takeoff on Dry Runway

Description.....	A
Performance Calculation.....	B

EFB-TOF-30-20 Takeoff on Wet Runways

Descriptions.....	A
Performance Calculation.....	B

EFB-TOF-30-30 Takeoff on Contaminated Runway

Descriptions.....	A
Performance Calculation.....	B
Restrictions.....	C

EFB-TOF-40 Takeoff with MEL or CDL Item

Takeoff with MEL or CDL Item.....	A
-----------------------------------	---

EFB-TOF-50 Takeoff Recommendations

Takeoff Recommendations.....	A
------------------------------	---

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PERFORMANCE TAKEOFF TAKEOFF PERFORMANCE OPTIMIZATION
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GENERAL

Ident.: EFB-TOF-10-00022478.0001001 / 18 NOV 24

Applicable to: ALL

The takeoff performance optimization is the process which aims at obtaining:

- The maximum performance limited takeoff weight (MTOW (perf))
- The optimum takeoff thrust for a given weight.

The takeoff performance is optimized for a given runway, the associated obstacles, the flaps setting, the prevailing outside conditions (temperature, wind, and QNH) and the aircraft status.

The takeoff performance optimization process:

- Takes into account the parameters that affect takeoff performance
- Optimizes the parameters for which there is a possible range of values or settings

 The takeoff performance optimization process is made with the EFB takeoff performance application.

TAKEOFF PARAMETERS

Ident.: EFB-TOF-10-00022479.0001001 / 06 NOV 23

Applicable to: ALL

The takeoff performance parameters are:

- The characteristics of the runway:

- L2**
 - Declared lengths (TORA, TODA, ASDA)
 - Elevation
 - Slope
 - Obstacles.

- L1** - The regulatory requirements
 - The line up distances as applicable
 - The outside conditions:

- L2**
 - OAT
 - Wind

Maximum tailwind is limited to a certified value. There is no maximum certified value for headwind, however a headwind higher than 40 kt results in no additional performance credit.

In accordance with regulation, the computation is based on 150 % of the entered tailwind, and 50 % of the entered headwind.

A maximum crosswind component is associated with each runway condition.

For more information on crosswind limitations, *Refer to LIM-AG-OPS Crosswind for Takeoff and Landing.*

In addition, the flight crew applies a different thrust setting technique during the takeoff procedure:

- In the case of tailwind, or
- When the crosswind component exceeds a threshold value that may affects the calculation of the takeoff distance depending on the engine model installed on the aircraft.

For more information on the takeoff procedure, *Refer to PRO-NOR-SOP-12 Takeoff - Takeoff Clearance.*

- QNH
- Runway condition.

- L1** - The aircraft configuration:

- L2**
 - Aerodynamic configuration
 - Air conditioning setting
 - Anti-ice selection
 - Thrust setting.

- L1** - The aircraft status:

- L2**
- MEL items
 - CDL items.

L1 - The takeoff speeds:

- L2**
- V1
 - VR
 - V2.

L1 The following parameters can be optimized:

- Aerodynamic configuration
- Air conditioning
- Thrust setting:

- L2**
- TOGA
 - FLEX
 - Derate levels.

L1 - Takeoff speeds.

L2 From the takeoff performance parameters that can be optimized, the takeoff speeds optimization has the largest effect on the gain of takeoff weight. The range for optimization varies from 0.84 to 1.0 for V1/VR ratio and from 1.13 to 1.4 for V2/VS1G ratio.

PERFORMANCE

TAKEOFF

TAKEOFF PERFORMANCE OPTIMIZATION

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PERFORMANCE TAKEOFF THRUST OPTIONS - TAKEOFF AT MAXIMUM THRUST
--	--

TOGA THRUST

Ident.: EFB-TOF-20-10-00022493.0001001 / 28 NOV 19

Applicable to: ALL

TOGA is the maximum thrust certified for takeoff.

When all engines are operative, the TOGA thrust rating must not be used more than 5 min.

In the case of one engine out, the TOGA thrust rating may be used for a maximum of 10 min.

The flight crew must use TOGA thrust for takeoff if at least one of the following conditions applies:

- Maximum power is required
- Performance reasons
- Flexible takeoff and derated takeoff are not permitted.

PERFORMANCE

TAKEOFF

THRUST OPTIONS - TAKEOFF AT MAXIMUM THRUST

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PERFORMANCE TAKEOFF THRUST OPTIONS - FLEXIBLE AND DERATED TAKEOFF
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General

GENERAL

Ident.: EFB-TOF-20-20-10-00022494.0001001 / 28 NOV 19

Applicable to: ALL

The actual takeoff weight of the aircraft is often lower than the maximum regulatory takeoff weight. In this case, it may be possible to takeoff at a thrust less than the maximum takeoff thrust. This allows to increase the engine life, improve the engine reliability and reduce the maintenance costs.

Two categories of takeoff at reduced thrust exist:

- The use of flexible temperature concept referred to as flexible takeoff
- The use of a fixed derated thrust level referred to as derated takeoff.

PERFORMANCE

TAKEOFF

THRUST OPTIONS - FLEXIBLE AND DERATED TAKEOFF

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PERFORMANCE

TAKEOFF

THRUST OPTIONS - FLEXIBLE AND DERATED TAKEOFF

Flexible Takeoff

FLEXIBLE TAKEOFF DEFINITION

Ident.: EFB-TOF-20-20-00022495.0001001 / 28 NOV 19

Applicable to: ALL

When the actual takeoff weight is lower than the maximum performance limited takeoff weight, the aircraft may comply with the regulatory requirements with a reduced thrust, called flexible takeoff thrust.

This takeoff operation is the FLEX takeoff.

PERFORMANCE

TAKEOFF

THRUST OPTIONS - FLEXIBLE AND DERATED TAKEOFF

FLEXIBLE TAKEOFF PRINCIPLE

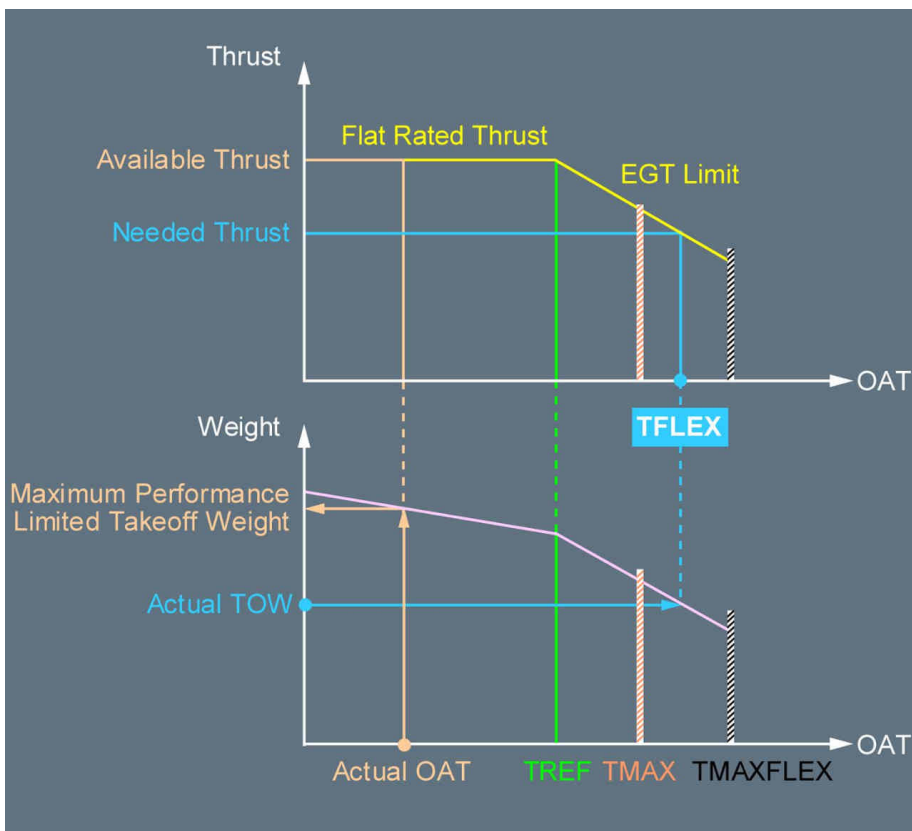
Ident.: EFB-TOF-20-20-00022497.0001001 / 28 NOV 19

Applicable to: ALL

The FLEX takeoff principle is based on the change in maximum available thrust with OAT. The maximum performance limited takeoff weight depends on the maximum available takeoff thrust, therefore it is possible to determine a temperature at which the actual takeoff weight would be limited by performance.

This temperature is referred to as TFLEX (Flex Temperature).

Flexible Takeoff Principle



FLEXIBLE TAKEOFF LIMITATIONS

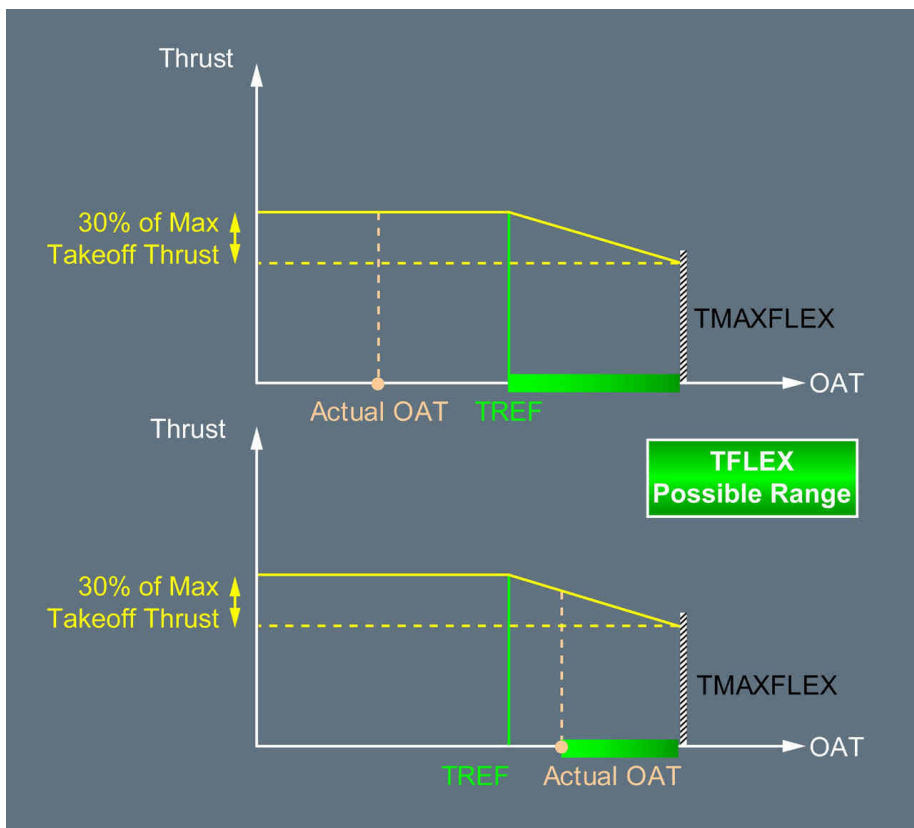
Ident.: EFB-TOF-20-20-20-00022498.0008001 / 28 NOV 19

Applicable to: MSN 02926-02944

Takeoff at reduced thrust, so-called as FLEX takeoff, is allowed only if the airplane meets all performance requirements at the takeoff weight, with the operating engines at the thrust available for the flexible temperature (TFLEX).

TFLEX cannot be:

- Higher than TMAXFLEX.
-  For more information on TMAXFLEX, Refer to LIM-ENG Flex Takeoff.
-  - Lower than the flat rating temperature (TREF).
- Lower than the actual OAT.



PERFORMANCE**TAKEOFF**

THRUST OPTIONS - FLEXIBLE AND DERATED TAKEOFF

FLEX takeoff is not permitted on contaminated runways.

Some items listed in the MEL and CDL do not permit a flexible takeoff.

12 The operator should check the maximum thrust (TOGA) by:

- Performing full-rated takeoffs at regular intervals, in order to detect a reduced EGT margin, or
- Maintaining an adequate engine monitoring program, in order to follow-up on the engine parameters.

FLEXIBLE TAKEOFF LIMITATIONS

Ident.: EFB-TOF-20-20-20-00022498.0002001 / 28 NOV 19

Applicable to: MSN 02155-02789, 03031-07792

Takeoff at reduced thrust, so-called as FLEX takeoff, is allowed only if the airplane meets all performance requirements at the takeoff weight, with the operating engines at the thrust available for the flexible temperature (TFLEX).

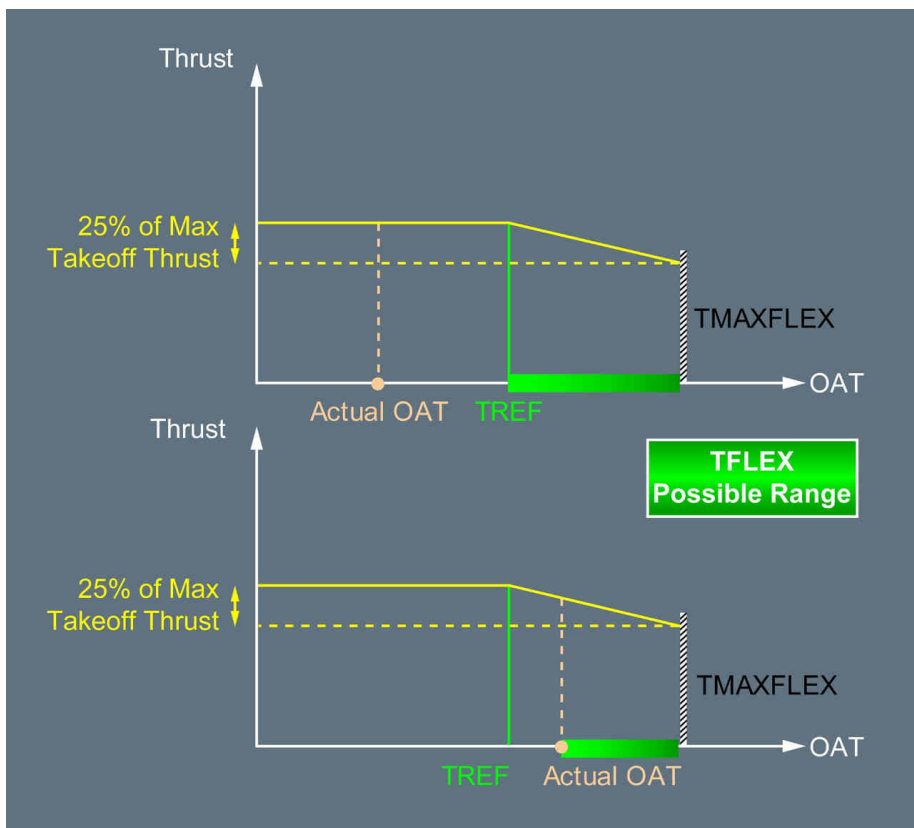
TFLEX cannot be:

- Higher than TMAXFLEX.

L2 For more information on TMAXFLEX, Refer to LIM-ENG Flex Takeoff.

L1 - Lower than the flat rating temperature (TREF).

- Lower than the actual OAT.



PERFORMANCE**TAKEOFF**

THRUST OPTIONS - FLEXIBLE AND DERATED TAKEOFF

FLEX takeoff is not permitted on contaminated runways.

Some items listed in the MEL and CDL do not permit a flexible takeoff.

📌 The operator should check the maximum thrust (TOGA) by:

- Performing full-rated takeoffs at regular intervals, in order to detect a reduced EGT margin, or
- Maintaining an adequate engine monitoring program, in order to follow-up on the engine parameters.



A318/A319/A320/A321
FLIGHT CREW
OPERATING MANUAL

PERFORMANCE

TAKEOFF

THRUST OPTIONS - FLEXIBLE AND DERATED TAKEOFF

Derated Takeoff (If Installed)

DERATED TAKEOFF PRINCIPLE

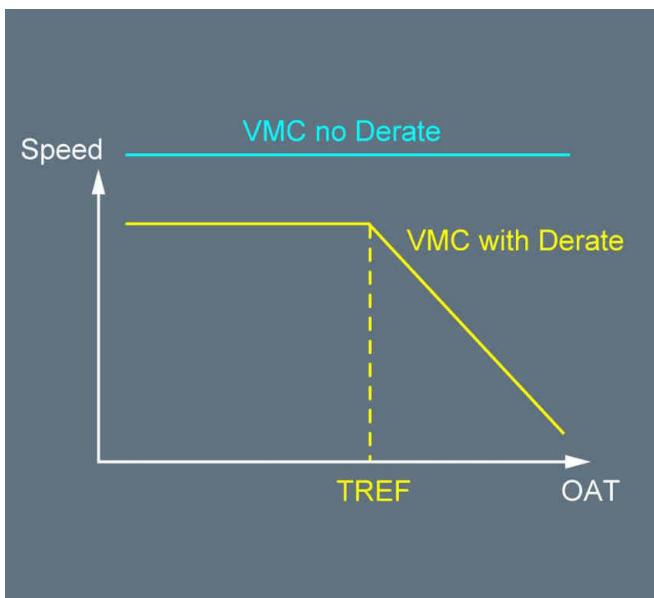
Ident.: EFB-TOF-20-20-30-00022500.0001001 / 28 NOV 19

Applicable to: ALL

The derated takeoff enables to improve the takeoff performance if the TOW is limited by VMCG. VMCG limitation usually occurs on short and/or contaminated runways. The principle is to impose a lower engine rating to benefit from lower minimum control speeds.

☐ In the case of derated takeoff, the minimum control speeds (VMCG and VMCA) are decreased because:

- The derated thrust is lower than the maximum takeoff thrust
- The effect of temperature on maximum available thrust is taken into account.

Derated Takeoff Principle

VMCG LIMITING

VMCG only has an impact on the ASD that includes an acceleration and a deceleration phase. The decrease in VMCG allows to use lower V1 values in the speed optimization, which shortens both the acceleration and the deceleration distances.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PERFORMANCE TAKEOFF THRUST OPTIONS - FLEXIBLE AND DERATED TAKEOFF
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The weight decrement linked to the derated thrust is largely compensated by the benefit of shorter ASD. As a consequence, if takeoff performance is limited by the VMCG limited weight, an overall improvement can be achieved by derating.

VMCA LIMITING

The penalizing effect on climb gradient of the decrease in thrust outweighs the advantage of a lower VMCA.

Therefore derated takeoff would not improve the takeoff weight if VMCA limited.

DERATED TAKEOFF LIMITATION

Ident.: EFB-TOF-20-20-30-00022501.0001001 / 28 NOV 19

Applicable to: ALL

It is not permitted to combine a derated takeoff and a FLEX takeoff.

When a derated takeoff is performed, the selection of full takeoff thrust, by setting thrust levers to TOGA, is not permitted below the speeds specified in the "Engine Failure After V1 - Continued Takeoff Operating Technique". The only exception is the Recovery Technique at takeoff after the penetration of unforecast windshear.

 For more information on the specified speeds, *Refer to FCTM/PR-AEP-ENG Engine Failure after V1.*

PERFORMANCE

TAKEOFF

THRUST OPTIONS - FLEXIBLE AND DERATED TAKEOFF

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PERFORMANCE
TAKEOFF
THRUST OPTIONS - FLEXIBLE AND DERATED TAKEOFF
Flexible Takeoff vs Derated Takeoff
FLEXIBLE TAKEOFF VS DERATED TAKEOFF

Ident.: EFB-TOF-20-20-40-00022502.0001001 / 28 NOV 19

Applicable to: ALL

	Flexible Takeoff	Derated Takeoff
Takeoff parameters calculation	TOGA with OAT = TFLEX	Derate level
Thrust level limitations for VMC	TOGA	Derate level
Runway state	Dry and wet only	All
TOGA Selection	Possible at any moment	Possible above F speed
Performance improvement	None	For short and contaminated runways (VMCG limited)
Benefits	Engine life saving	Engine life saving

PERFORMANCE

TAKEOFF

THRUST OPTIONS - FLEXIBLE AND DERATED TAKEOFF

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PERFORMANCE TAKEOFF RUNWAY CONDITIONS - TAKEOFF ON DRY RUNWAY
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DESCRIPTION

Ident.: EFB-TOF-30-10-00022480.0001001 / 28 MAY 20

Applicable to: ALL

A runway is dry when its surface is:

- Free of visible moisture
- Not contaminated.

PERFORMANCE CALCULATION

Ident.: EFB-TOF-30-10-00022481.0001001 / 28 NOV 19

Applicable to: ALL

Takeoff performance is calculated without the benefit of thrust reversers, as per regulation.
Flexible takeoff and derated takeoff are allowed for a takeoff from a dry runway.

PERFORMANCE

TAKEOFF

RUNWAY CONDITIONS - TAKEOFF ON DRY RUNWAY

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 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PERFORMANCE TAKEOFF RUNWAY CONDITIONS - TAKEOFF ON WET RUNWAYS
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DESCRIPTIONS

Ident.: EFB-TOF-30-20-00022482.0001001 / 15 NOV 21

Applicable to: ALL

WET RUNWAY

A runway is considered as wet, when the surface is covered by any visible moisture or water up to and including 3 mm (1/8 in) depth. When the water film does not exceed 3 mm (1/8 in), there is no significant danger of hydroplaning.

- Note:
1. A damp runway is considered wet, regardless of whether or not the surface has a shiny appearance.
 2. A runway is considered slippery wet when a significant portion of its surface does not comply with the applicable minimum friction criteria.

PERFORMANCE CALCULATION

Ident.: EFB-TOF-30-20-00022483.0001001 / 15 NOV 21

Applicable to: ALL

Takeoff performance on a wet runway can be calculated with the benefit of thrust reversers.

However, it is not allowed to take off at a weight higher than the weight on dry runway.

Flexible takeoff and derated takeoff are allowed for a takeoff from a wet runway.

-  For information on contaminants equivalent to wet runway, *Refer to EFB-TOF-30-30 Performance Calculation.*
-  For runways that have portions declared as slippery wet, performance should be calculated with the Slippery wet runway condition option, or, if not available, Dry snow 10 mm (2/5").

Note: Flexible takeoff computation is not available for Dry snow 10 mm (2/5").

PERFORMANCE

TAKEOFF

RUNWAY CONDITIONS - TAKEOFF ON WET RUNWAYS

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PERFORMANCE TAKEOFF RUNWAY CONDITIONS - TAKEOFF ON CONTAMINATED RUNWAY
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DESCRIPTIONS

Ident.: EFB-TOF-30-30-00022484.0001001 / 15 NOV 21

Applicable to: ALL

A runway is contaminated when a significant portion (depending on the applicable regulation) of its surface is covered with:

- A layer of fluid contaminant not considered as thin
- A hard contaminant.

FLUID CONTAMINANT

In terms of performance, a contaminated runway is a runway covered by a fluid contaminant with a depth of more than 3 mm (1/8 in). The fluid contaminant can be either:

- Dry snow
- Wet snow
- Standing water
- Slush.

Fluid Contaminants reduce friction forces, and cause:

- Precipitation drag
- Hydroplaning.

L2 Fluid contaminants descriptions:

- Dry snow is snow that, if compacted by hand, does not stay compressed when released. The wind can blow dry snow. The density of dry snow is approximately 0.2 kg/l (1.7 lb/US Gal).
- Wet snow is snow that, if compacted by hand, stays compressed when released, and with which snowballs can be created. The density of wet snow is approximately 0.4 kg/l (3.35 lb/US Gal).
- Standing water occurs due to heavy rain and/or not sufficient runway drainage. Standing water has a depth of more than 3 mm (1/8 in).
- Slush is snow soaked with water, which spatters when stepped on firmly. Slush occurs at temperatures of approximately 5 °C, and has a density of approximately 0.85 kg/l (7.1 lb/US Gal).

L1 **HARD CONTAMINANT**

In terms of performance, a contaminated runway is a runway covered by a hard contaminant that can be either:

- Compacted snow
- Ice (Cold and Dry)
- Wet ice.

Hard contaminants only reduce friction forces.

PERFORMANCE**TAKEOFF**

RUNWAY CONDITIONS - TAKEOFF ON CONTAMINATED RUNWAY



Hard contaminants descriptions:

- Compacted snow: the maintenance personnel use a snow groomer to compress the snow on a runway in order to obtain a hard surface
- Ice (Cold and Dry): situation in which ice occurs on the runway in cold and dry conditions
- Wet ice: when the ice on a runway melts, or there are loose/fluid contaminants on top of the ice, the ice is referred to as "wet ice". When there is wet ice on a runway, braking and directional control are difficult or not possible, because the runway surface is very slippery.

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PERFORMANCE TAKEOFF RUNWAY CONDITIONS - TAKEOFF ON CONTAMINATED RUNWAY
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PERFORMANCE CALCULATION

Ident.: EFB-TOF-30-30-00022485.0001001 / 18 NOV 24

Applicable to: ALL

Takeoff performance on contaminated runways can be calculated with the benefit of thrust reversers. However, it is not allowed to take off at a weight higher than the weight on a dry runway.

For fluid contaminants, takeoff performance data are provided up to the following depths:

- Dry snow: 100 mm (4 in)
- Wet snow: 30 mm (6/5 in)
- Standing water: 13 mm (1/2 in)
- Slush: 13 mm (1/2 in).

Performance computations for depths above the real depth of contamination on the runway may provide results that are better than the real aircraft performance, because of the excess drag that improves the stopping distance. Airbus recommends to retain the takeoff speeds and thrust setting of the lower MTOW (perf) resulting from two computations: one with the depth above the reported depth and one with the depth below.

Note: *The Airbus EFB takeoff performance application automatically makes this double computation.*

L2 The following assumptions are considered for the calculation:

- The contaminant covers the entire length of the runway in a layer that has a uniform depth and density
- The friction coefficient is based on studies, and verified by tests
- The screen height at the end of the takeoff segment is 15 ft, instead of 35 ft.

L1 Derated takeoff is allowed on contaminated runways.

EQUIVALENCES

In terms of performance:

- A fluid contamination is equivalent to wet, up to a maximum depth of 3 mm (1/8 in) of:
 - Dry snow
 - Wet snow
 - Standing water
 - Slush.
- Frost is equivalent to wet, unless a lower runway performance code is reported
- Compacted snow with OAT above -15 °C is equivalent to Dry snow 10 mm (2/5 in)

Note: *Compacted snow is appropriate for OAT at or below -15 °C.*

- Dry snow over compacted snow is equivalent to dry snow of appropriate depth
- Wet snow over compacted snow is equivalent to wet snow of appropriate depth.

PERFORMANCE

TAKEOFF

RUNWAY CONDITIONS - TAKEOFF ON CONTAMINATED RUNWAY

DOWNGRADE

■ **If both the runway condition and the RWYCC inputs are available in the EFB takeoff performance application:**

The flight crew enters both the downgraded RWYCC and the runway condition to perform the takeoff computation.

■ **If only the runway condition is available in the EFB takeoff performance application:**

■ **For a runway covered by a hard contaminant, or a fluid contaminant with a depth of 3 mm (1/8 in) or less:**

In the case of a downgrade to:

- RWYCC 4, the flight crew computes the takeoff performance with Compacted snow
- RWYCC 3, the flight crew computes the takeoff performance with Dry snow 10 mm (2/5 in)
- RWYCC 2, the computation with any depth of Slush or Standing water may not be conservative. The flight crew should delay the takeoff, or compute the takeoff performance with Ice cold & dry
- RWYCC 1, the flight crew computes the takeoff performance with Ice cold & dry.

■ **For a runway covered by a fluid contaminant with a depth of more than 3 mm (1/8 in):**

In the case of any downgrade, the flight crew should delay the takeoff.

RESTRICTIONS

Ident.: EFB-TOF-30-30-00022486.0001001 / 28 NOV 19

Applicable to: ALL

FLEX takeoff is not permitted on contaminated runways.

Dispatch from a runway covered with wet ice is not permitted, unless a specific method for performance assessment has been established by the operator.

Refer to the AFM for further guidance.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PERFORMANCE TAKEOFF TAKEOFF WITH MEL OR CDL ITEM
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TAKEOFF WITH MEL OR CDL ITEM

Ident.: EFB-TOF-40-00022487.0001001 / 28 NOV 19

Applicable to: ALL

The aircraft can be dispatched with deferred MEL or CDL items.

MEL or CDL items that affect takeoff performance are:

- MEL items that reduce braking capabilities (brakes, spoilers, thrust reversers)
- MEL items that have an effect on thrust available (engine anti-ice valve stuck open)
- MEL items that may lead to a reduced systems efficiency (rudder actuator, DFS, EDP)
- CDL items that increase aircraft drag (seals, fairings).

 CDL items are divided in two categories: negligible and non-negligible items.

If the number of negligible CDL items is less or equal to three, no penalty applies.

If the number of negligible CDL items is more than three, a drag increase for each item is applied.

PERFORMANCE

TAKEOFF

TAKEOFF WITH MEL OR CDL ITEM

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PERFORMANCE TAKEOFF TAKEOFF RECOMMENDATIONS
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TAKEOFF RECOMMENDATIONS

Ident.: EFB-TOF-50-00022489.0001001 / 18 NOV 24

Applicable to: ALL

TAKEOFF CONFIGURATION

As a general rule, CONF 1+F gives better performance on long runways (better climb gradient), whereas CONF 3 gives better performance on short runways (shorter takeoff distances). Sometimes, other parameters, such as obstacles can interfere. In this case, a compromise between climb and runway performance is requested, making CONF 2 the optimum configuration for takeoff.

Environmental takeoff conditions may also impact the choice of the takeoff configuration.

The following takeoff configuration is then recommended:

OUTSIDE CONDITIONS	FLAPS SETTINGS	OBJECTIVE
Dry or wet, well-paved runway	Use the flaps setting that provides the optimum performance. If takeoff weight is not limited by performance, consider using the higher flaps setting.	To extend engine life and save maintenance costs
High altitude takeoff	Use CONF 2 or CONF 3	To improve comfort
Badly-paved runway, or accelerate stop distance limited runway	Use CONF 2 or CONF 3	To improve comfort and stopping distance

FLEXIBLE TAKEOFF

Flexible takeoff is the recommended method for takeoff at reduced thrust on dry and wet runways. The highest flexible temperature (TFLEX) extends engine life and saves maintenance costs. However, if a high TFLEX is reduced by a few degrees only, the engines are not significantly affected.

The highest TFLEX will usually be obtained at the lowest flap setting. However, a higher flaps setting provides a lower decision speed (V1) and more comfort.

To extend engine life and to save maintenance costs, the use of flaps setting that provides the highest TFLEX is recommended. However, when the difference (in terms of TFLEX) between two configurations is low, the highest of both takeoff configurations is preferable.

PERFORMANCE

TAKEOFF

TAKEOFF RECOMMENDATIONS

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PERFORMANCE

IN-FLIGHT

Intentionally left blank

EFB-IFT-10 In-Flight Performance Calculation

In-Flight Performance Calculation.....	A
--	---

EFB-IFT-20 All Engines Operative Operations

EFB-IFT-20-10 Climb

EFB-IFT-20-10-10 General

General.....	A
--------------	---

EFB-IFT-20-10-20 Climb Thrusts

Maximum Climb Thrust.....	A
---------------------------	---

EFB-IFT-20-20 Cruise

EFB-IFT-20-20-10 Speeds

Economic Mach Number (ECON Mach).....	A
---------------------------------------	---

Long Range Cruise Speed (LRC).....	B
------------------------------------	---

Fixed Speed.....	C
------------------	---

Turbulence Speed.....	D
-----------------------	---

Maximum Speed.....	E
--------------------	---

EFB-IFT-20-20-20 Altitude/Ceilings

Definitions.....	A
------------------	---

Altitude Optimization.....	B
----------------------------	---

EFB-IFT-20-30 Descent

General.....	A
--------------	---

EFB-IFT-20-40 Holding

General.....	A
--------------	---

EFB-IFT-30 One Engine Inoperative Operations

One Engine Inoperative Strategies.....	A
--	---

Long Range Cruise Speed.....	B
------------------------------	---

EO MAX Altitude.....	C
----------------------	---

Holding.....	D
--------------	---

PERFORMANCE

IN-FLIGHT

PRELIMINARY PAGES - TABLE OF CONTENTS

Intentionally left blank

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PERFORMANCE IN-FLIGHT IN-FLIGHT PERFORMANCE CALCULATION
--	---

IN-FLIGHT PERFORMANCE CALCULATION
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Ident.: EFB-IFT-10-00022556.0001001 / 18 NOV 24

Applicable to: ALL

Performance data are split by flight phases: climb, cruise, descent, and holding.
In-flight performance calculation is made with an in-flight performance application.

PERFORMANCE

IN-FLIGHT

IN-FLIGHT PERFORMANCE CALCULATION

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PERFORMANCE IN-FLIGHT ALL ENGINES OPERATIVE OPERATIONS - CLIMB
--	--

General

GENERAL

Ident.: EFB-IFT-20-10-10-00022557.0001001 / 28 NOV 19

Applicable to: **ALL**

The climb phase starts at the end of takeoff and ends at the initial cruise level.

The only available thrust option is:

- CLB: maximum climb thrust.

PERFORMANCE

IN-FLIGHT

ALL ENGINES OPERATIVE OPERATIONS - CLIMB

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PERFORMANCE IN-FLIGHT ALL ENGINES OPERATIVE OPERATIONS - CLIMB
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Climb Thrusts

MAXIMUM CLIMB THRUST

Ident.: EFB-IFT-20-10-20-00022560.0001001 / 28 NOV 19

Applicable to: ALL

The “Maximum Climb” thrust rating is the maximum thrust approved for normal climb.
The FADEC commands this rating when the thrust lever is on the CL detent and the flight crew has selected CLB in the CLB THR list of the FMS ACTIVE/PERF page.

PERFORMANCE

IN-FLIGHT

ALL ENGINES OPERATIVE OPERATIONS - CLIMB

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Speeds**ECONOMIC MACH NUMBER (ECON MACH)**

Ident.: EFB-IFT-20-20-10-00022561.0001001 / 28 NOV 19

Applicable to: ALL**COST INDEX**

The Cost index (CI) is defined as the ratio between Cost of Time per time unit (CT) and Cost of Fuel per mass unit (CF).

The CI value is expressed in kilograms per minute (kg/min), or hundreds of pounds per hour (100 lbs/hr).

The purpose of the CI concept is to reduce Direct Operating Costs (DOC).

ECON MACH

For a given CI, ECON Mach is defined as the Mach for which DOC are minimum.

LONG RANGE CRUISE SPEED (LRC)

Ident.: EFB-IFT-20-20-10-00022562.0001001 / 28 NOV 19

Applicable to: ALL

The Long Range Cruise speed (LRC) is defined as the Mach number for which the specific range is equal to 99 % of the maximum specific range.

 For more information, *Refer to DSC-22_20-10-40-20 Cost Index (CI).*

FIXED SPEED

Ident.: EFB-IFT-20-20-10-00022563.0001001 / 28 NOV 19

Applicable to: ALL

The fixed speed is either a Mach or a CAS.

TURBULENCE SPEED

Ident.: EFB-IFT-20-20-10-00022564.0001001 / 28 NOV 19

Applicable to: ALL

Turbulence speeds are recommended when the aircraft flies in a turbulent atmosphere.

For recommended turbulence speed, *Refer to PRO-ABN-MISC [QRH] General.*

PERFORMANCE**IN-FLIGHT**

ALL ENGINES OPERATIVE OPERATIONS - CRUISE

MAXIMUM SPEED

Ident.: EFB-IFT-20-20-10-00022565.0001001 / 28 NOV 19

Applicable to: ALL

Maximum speed is either:

- The Maximum Operating Mach (MMO), or
- The Maximum Operating speed (VMO), or
- The speed limited by the available thrust.

 For more information on Maximum Speed, *Refer to LIM-AG-SPD Maximum Operating Speed VMO/MMO.*

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PERFORMANCE IN-FLIGHT ALL ENGINES OPERATIVE OPERATIONS - CRUISE
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Altitude/Ceilings

DEFINITIONS

Ident.: EFB-IFT-20-20-20-00022566.0001001 / 28 NOV 19

Applicable to: ALL

OPTIMUM ALTITUDE

The optimum altitude (OPT ALT) is the altitude at which the SR is maximum.

REC MAX

Maximum altitude is defined as the lower of:

- Maximum altitude at maximum cruise thrust in level flight
- Maximum altitude at maximum climb thrust with 300 ft/min vertical speed
- Maximum certified altitude
- 1.3 g buffet limited altitude.

ALTITUDE OPTIMIZATION

Ident.: EFB-IFT-20-20-20-00022567.0001001 / 18 NOV 24

Applicable to: ALL

The optimum altitude definition depends on the cruise type.

The OPT altitude displayed on the FMS PERF page and the optimum altitude determined by the EFB in-flight performance application for a given Cost Index (CI) are the result of a minimum cost analysis. To determine these optimum altitudes, both the FMS and the EFB calculate the value of the Cost Function (CF) based on the CI. The altitude that provides the lowest value for the CF is displayed as OPT on the FMS PERF page and as the optimum altitude on the EFB.

These optimum altitude computations take into account a large number of parameters. The FMS and the EFB consider some of these parameters in a different manner. Therefore, OPT on the FMS and the optimum altitude on the EFB may differ.

- [2]** The main contributor to any difference between OPT on the FMS and the optimum altitude in the EFB is the wind.

PERFORMANCE

IN-FLIGHT

ALL ENGINES OPERATIVE OPERATIONS - CRUISE

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PERFORMANCE IN-FLIGHT ALL ENGINES OPERATIVE OPERATIONS - DESCENT
--	--

GENERAL

Ident.: EFB-IFT-20-30-00022568.0001001 / 28 NOV 19

Applicable to: ALL

The descent phase starts at the top of descent and ends at landing or level off.
In the case of an emergency descent, MMO/VMO is the best speed profile as it gives high rate of descent, which can be increased by extending the speed brakes, if needed.

PERFORMANCE

IN-FLIGHT

ALL ENGINES OPERATIVE OPERATIONS - DESCENT

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PERFORMANCE IN-FLIGHT ALL ENGINES OPERATIVE OPERATIONS - HOLDING
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GENERAL

Ident.: EFB-IFT-20-40-00022569.0001001 / 28 NOV 19

Applicable to: ALL

The holding phase, when required, starts before the landing phase above the destination or alternate airport.

In CONF CLEAN, the standard holding speed is the Green dot, as it is a good approximation of the maximum endurance speed.

PERFORMANCE

IN-FLIGHT

ALL ENGINES OPERATIVE OPERATIONS - HOLDING

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PERFORMANCE IN-FLIGHT ONE ENGINE INOPERATIVE OPERATIONS
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ONE ENGINE INOPERATIVE STRATEGIES
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Ident.: EFB-IFT-30-00022570.0001001 / 28 NOV 19

Applicable to: ALL

For more information about One Engine Inoperative Strategies, *Refer to FCTM/PR-AEP-ENG Engine Failure During Cruise.*

LONG RANGE CRUISE SPEED

Ident.: EFB-IFT-30-00022571.0001001 / 28 NOV 19

Applicable to: ALL

If the EO mode of the FMS is active, the FMS takes the engine failure into account to compute the EO-LRC speed/ Mach.

EO MAX ALTITUDE

Ident.: EFB-IFT-30-00022572.0001001 / 28 NOV 19

Applicable to: ALL

The FMS Engine Out Maximum (EO MAX) altitude is a precomputed value, function of the aircraft gross weight and DISA, displayed on all the PERF pages if one engine is inoperative.

EO MAX altitude respects the following criteria:

- It can be flown with LRC speed
- It can be held in level flight with:
 - The operating engine at "Maximum Continuous Thrust" rating
 - The failed engine in windmilling
 - Anti-ice OFF
- It can be reached before buffeting with a margin of 0.3 g
- It is less than the maximum certified altitude.

HOLDING

Ident.: EFB-IFT-30-00022573.0001001 / 28 NOV 19

Applicable to: ALL

In CONF CLEAN, the standard EO holding speed is the Green dot.

PERFORMANCE

IN-FLIGHT

ONE ENGINE INOPERATIVE OPERATIONS

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PERFORMANCE

LANDING

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PERFORMANCE LANDING PRELIMINARY PAGES - TABLE OF CONTENTS
--	---

EFB-LDG-10 Landing Performance Calculation	
General.....	A
Landing Parameters.....	B
EFB-LDG-20 Landing Speeds and Distances Definitions	
Landing Speeds.....	A
Landing Distances Definitions.....	B
EFB-LDG-30 Runway Conditions	
Dry Runway.....	A
Wet Runway.....	B
Contaminated Runway.....	C
Runway Condition Assessment Matrix for Landing.....	D
EFB-LDG-40 Dispatch Requirements	
General.....	A
Dispatch on Dry Runway.....	B
Dispatch on Wet Runway.....	C
Dispatch on Contaminated Runway.....	D
Dispatch with MEL or CDL Item.....	E
In-Flight Landing Distance Crosscheck.....	F
ROW  Landing Distance Crosscheck.....	G
EFB-LDG-50 In-Flight Performance Assessment	
General.....	A
Landing Performance without In-Flight Failure.....	B
Landing Performance following In-Flight Failure.....	C
ROW  Landing Distance Crosscheck.....	D

PERFORMANCE

LANDING

PRELIMINARY PAGES - TABLE OF CONTENTS

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PERFORMANCE LANDING LANDING PERFORMANCE CALCULATION
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GENERAL

Ident.: EFB-LDG-10-00022590.0001001 / 18 NOV 24

Applicable to: ALL

The landing performance calculation enables:

- At dispatch, to check that the aircraft can land at destination for the predicted conditions, in compliance with the regulatory requirements
- During flight, to check that the aircraft can land at destination for the actual conditions.

 The landing performance calculation is made with the EFB landing performance application.

LANDING PARAMETERS

Ident.: EFB-LDG-10-00022591.0001001 / 28 NOV 19

Applicable to: ALL

The landing performance parameters are:

- The characteristics of the runway

- L2** • Landing Distance Available (LDA)
- Elevation
- Slope
- Missed approach gradient.

- L1** - The regulatory requirements
- The outside conditions

- L2** • Wind

- L3** As per regulation, the computation is based on 150 % of the entered tailwind, and 50 % of the entered headwind.

The crosswind component does not affect the calculation of the landing distance. However, a maximum crosswind component is associated with each runway condition.

For more information about crosswind limitation, *Refer to LIM-AG-OPS Crosswind for Takeoff and Landing.*

- L2** • Outside Air Temperature (OAT)
- Sea level atmospheric pressure (QNH)
- Icing conditions (anti-ice selection)
- Runway condition, or landing performance level.

- L1** - The aircraft configuration

- L2** • Landing Weight (LW)
- Aerodynamic configuration
- Air conditioning setting
- Aircraft CG position
- Approach speed and go-around speed.

- L1** - The aircraft status.

- L2** • MEL items
- CDL items
- Abnormal and emergency configuration (ABN EMER) for in-flight computation only.

- L1** The following parameters can be optimized:

- Aerodynamics configuration
- Go-around speed.

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PERFORMANCE LANDING LANDING PERFORMANCE CALCULATION
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 For more information about the go-around speed, *Refer to EFB-LDG-20 Landing Speeds.*

PERFORMANCE

LANDING

LANDING PERFORMANCE CALCULATION

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 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PERFORMANCE LANDING LANDING SPEEDS AND DISTANCES DEFINITIONS
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LANDING SPEEDS

Ident.: EFB-LDG-20-00022592.0001001 / 28 NOV 19

Applicable to: ALL

LOWEST SELECTABLE SPEED (VLS)

VLS is the lowest selectable speed. VLS is used to determine the Final Approach Speed (VAPP) in normal conditions.

For more information about VLS, *Refer to DSC-22_10-50-20 Characteristic Speeds.*

REFERENCE SPEED (VREF)

VREF is equal to the VLS of CONF FULL. VREF is used to determine the Final Approach Speed (VAPP) when a system failure affects the landing performance.

For more information about VREF, *Refer to DSC-22_10-50-50 Other Speeds.*

FINAL APPROACH SPEED (VAPP)

VAPP is the speed of the aircraft when crossing the runway threshold. The flaps/slats are in the landing configuration, and the landing gears are extended.

For more information about VAPP, *Refer to DSC-22_10-50-50 Other Speeds.*

GO-AROUND SPEED

In the case of a missed approach, the go-around climb gradient is calculated at the go-around speed.

The standard go-around speed is 1.23 VS1G of the go-around configuration. For approaches with a decision height at or above 200 ft, where approach climb performance is found restrictive, the go-around speed can be increased up to a maximum limit. For more information about maximum go-around acceleration speed, *Refer to AFM/PERF-LDG Approach Climb and Landing Climb.*

LANDING DISTANCES DEFINITIONS

Ident.: EFB-LDG-20-00022593.0001001 / 15 NOV 21

Applicable to: ALL

REQUIRED LANDING DISTANCE

The RLD is the regulatory reference to be used for dispatch landing performance computation.

The RLD is the factored certified landing distance based on:

- Maximum manual braking initiated immediately after main gear touchdown
- Prompt selection of max reverse thrust, maintained to 70 kt, and idle thrust to full stop (when reverse thrust is taken into account)
- Antiskid system and all ground spoilers operative
- The regulatory dispatch factor.

Note: The RLD calculation considers the effect of the MEL/CDL items that affect the landing performance.

IN-FLIGHT LANDING DISTANCE

The In-Flight Landing Distance reflects the performance achievable in a typical operational landing without margin.

The In-Flight Landing Distance calculation assumes:

- An airborne phase of 7 s from threshold to touchdown
- In the case of manual braking: maximum manual braking initiated immediately after main gear touchdown
- In the case of autobrake: normal system delays in braking activation
- Antiskid system and all ground spoilers operative
- Prompt selection of max reverse thrust, maintained to 70 kt, and idle thrust to full stop (when reverse thrust is taken into account).

Note: The In-Flight Landing Distance calculation considers the effect of the inoperative system(s) following:

- An MEL/CDL dispatch that affects the landing performance
- An in-flight failure (ECAM alert) that affects the landing performance.

Note: The In-Flight Landing Distance fulfills the requirements of the Landing Distance at Time of Arrival (LDTA) described in Air Ops AMC1 CAT.OP.MPA.303(e).

FACTORED IN-FLIGHT LANDING DISTANCE

The definition of the In-Flight Landing Distance does not include any margin. The In-Flight Landing Distance is a realistic distance achievable in nominal conditions, i.e. the actual conditions during the landing are those used for the computation.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PERFORMANCE LANDING LANDING SPEEDS AND DISTANCES DEFINITIONS
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It is recommended to apply an appropriate margin to the In-Flight Landing Distance (either determined with or without failure) in order to cover:

- The variability in flying techniques (e.g. flare execution, delay in application of the deceleration means)
- Unexpected conditions at landing (e.g. real runway friction vs. reporting, turbulence, crosswind).

L2 The FLD is defined as:

- The In-Flight Landing Distance multiplied by a Factor, or
- The In-Flight Landing Distance plus an Increment.

L1 It is the airlines responsibility to define the margins (and their applicability) to apply on top of the In-Flight Landing Distance.

The recommended margin is a Factor of 1.15 on the In-Flight Landing Distance. In an emergency situation, the flight crew may decide to disregard this margin.

ROW LANDING DISTANCE

The ROW  landing distance is calculated below 400 ft based on:

- The detected runway
- The current outside condition (e.g QNH, Temperature...)
- Dry and wet runway conditions
- A realistic manual or automatic landing, normal flare, and de-rotation technique
- Maximum braking
- IDLE REV, when runway condition/braking action is assumed to be DRY-6
- MAX REV, when runway condition/braking action is assumed to be WET-5.

PERFORMANCE

LANDING

LANDING SPEEDS AND DISTANCES DEFINITIONS

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 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PERFORMANCE LANDING RUNWAY CONDITIONS
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DRY RUNWAY

Ident.: EFB-LDG-30-00022594.0001001 / 28 MAY 20

Applicable to: ALL

A runway is dry when its surface is:

- Free of visible moisture
- Not contaminated.

WET RUNWAY

Ident.: EFB-LDG-30-00022595.0001001 / 15 NOV 21

Applicable to: ALL

A runway is considered as wet, when the surface is covered by any visible moisture or water up to and including 3 mm (1/8 in) depth. When the water film does not exceed 3 mm (1/8 in), there is no significant danger of hydroplaning.

- Note:
1. A damp runway is considered wet, regardless of whether or not the surface has a shiny appearance.
 2. A runway is considered slippery wet when a significant portion of its surface does not comply with the applicable minimum friction criteria.

PERFORMANCE**LANDING**

RUNWAY CONDITIONS

CONTAMINATED RUNWAY

Ident.: EFB-LDG-30-00022596.0001001 / 03 NOV 22

Applicable to: ALL

A runway is contaminated when a significant portion (depending on the applicable regulation) of its surface is covered with:

- A layer of fluid contaminant not considered as thin
- A hard contaminant.

DESCRIPTION OF FLUID CONTAMINANTS

In terms of performance, a contaminated runway is a runway covered by a fluid contaminant with a depth of more than 3 mm (1/8 in). The fluid contaminant can be either:

- Dry snow
- Wet snow
- Standing water
- Slush.

Fluid Contaminants reduce friction forces, and cause:

- Precipitation drag
- Hydroplaning.

L2 Fluid contaminants descriptions:

- Dry snow is snow that, if compacted by hand, does not stay compressed when released. The wind can blow dry snow. The density of dry snow is approximately 0.2 kg/l (1.7 lb/US Gal).
- Wet snow is snow that, if compacted by hand, stays compressed when released, and with which snowballs can be created. The density of wet snow is approximately 0.4 kg/l (3.35 lb/US Gal).
- Standing water occurs due to heavy rain and/or not sufficient runway drainage. Standing water has a depth of more than 3 mm (1/8 in).
- Slush is snow soaked with water, which spatters when stepped on firmly. Slush occurs at temperatures of approximately 5 °C, and has a density of approximately 0.85 kg/l (7.1 lb/US Gal).

L1 **DESCRIPTION OF HARD CONTAMINANTS**

In terms of performance, a contaminated runway is a runway covered by a hard contaminant that can be either:

- Compacted snow
- Ice (Cold and Dry)
- Wet ice.

Hard contaminants only reduce friction forces.

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PERFORMANCE LANDING RUNWAY CONDITIONS
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L2 Hard contaminants descriptions:

- Compacted snow: the maintenance personnel use a snow groomer to compress the snow on a runway in order to obtain a hard surface
- Ice (Cold and Dry): situation in which ice occurs on the runway in cold and dry conditions
- Wet ice: when the ice on a runway melts, or there are loose/fluid contaminants on top of the ice, the ice is referred to as "wet ice". When there is wet ice on a runway, braking and directional control are difficult or not possible, because the runway surface is very slippery.

L1 **LANDING PERFORMANCE CALCULATION**

L2 **COMPUTATION ASSUMPTIONS**

The following assumptions are considered for the calculation:

- The contaminant covers the entire length of the runway
- For fluid contaminants, the landing distance calculation does not take credit of the precipitation drag.

L1 **EQUIVALENCES**

In terms of performance:

- A fluid contamination is equivalent to wet, up to a maximum depth of 3 mm (1/8 in) of:
 - Dry snow
 - Wet snow
 - Standing water
 - Slush.
- Frost is equivalent to wet, unless a lower runway performance code is reported
- Slippery wet is equivalent to Dry snow
- Compacted snow with OAT above -15 °C is equivalent to Dry snow

Note: *Compacted snow is appropriate for OAT at or below -15 °C.*

- Dry snow over compacted snow is equivalent to Dry snow
- Wet snow over compacted snow is equivalent to Wet snow.

Note: - *In the case of a downgraded RWYCC for dispatch computation, Airbus recommends to perform the landing computation with a contaminant included in this RWYCC's category in the RCAM.*

- *In the case of a downgraded or upgraded RWYCC, the flight crew should use the recommendations applicable to in-flight performance calculation. For more information, Refer to FCTM/LANDING PERFORMANCE / DOWNGRADED OR UPGRADED RWYCC.*

PERFORMANCE**LANDING**

RUNWAY CONDITIONS

RESTRICTIONS

For maximum depth of fluid contaminants, *Refer to EFB-LDG-30 Runway Condition Assessment Matrix for Landing.*

Dispatch to a runway covered with wet ice is not permitted, unless a specific method for performance assessment has been established by the operator.

Refer to the AFM for further guidance.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PERFORMANCE LANDING RUNWAY CONDITIONS
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RUNWAY CONDITION ASSESSMENT MATRIX FOR LANDING

Ident.: EFB-LDG-30-00022597.0001001 / 15 NOV 21

Applicable to: ALL

Runway Surface Conditions		Observations on Deceleration and Directional Control	Related Landing Performance		Maximum Crosswind for Landing (Gust included)
Runway State or / and Runway Contaminant	AIREP ⁽¹⁾		RWYCC	Level	
Dry	-	-	6	DRY	38 kt
Damp Wet Up to 3 mm (1/8 in) of water Slush Up to 3 mm (1/8 in) Dry snow Up to 3 mm (1/8 in) Wet snow Up to 3 mm (1/8 in) Frost	Good	Braking deceleration is normal for the wheel braking effort applied. Directional control is normal.	5	GOOD	38 kt
Compacted snow OAT at or below -15 °C	Good to Medium	Braking deceleration and controllability is between Good and Medium.	4	GOOD TO MEDIUM	29 kt
Dry snow More than 3 mm (1/8 in), up to 100 mm (4 in) Wet snow More than 3 mm (1/8 in), up to 30 mm (6/5 in) Compacted snow OAT above -15 °C Dry snow over compacted snow Wet snow over compacted snow Slippery wet	Medium	Braking deceleration is noticeably reduced for the wheel braking effort applied. Directional control may be reduced.	3	MEDIUM	25 kt
Standing Water More than 3 mm (1/8 in), up to 13 mm (1/2 in) Slush More than 3 mm (1/8 in), up to 13 mm (1/2 in)	Medium to Poor	Braking deceleration and controllability is between Medium and Poor. Potential for hydroplaning exists.	2	MEDIUM TO POOR	20 kt
Ice (cold & dry)	Poor	Braking deceleration is significantly reduced for the wheel braking effort applied. Directional	1	POOR	15 kt

Continued on the following page

PERFORMANCE

LANDING

RUNWAY CONDITIONS

Continued from the previous page

Runway Surface Conditions		Observations on Deceleration and Directional Control	Related Landing Performance		Maximum Crosswind for Landing (Gust included)
Runway State or / and Runway Contaminant	AIREP ⁽¹⁾		RWYCC	Level	
		control may be significantly reduced.			
Wet ice Water on top of Compacted Snow Dry Snow or Wet Snow over ice	Less than Poor	Braking deceleration is minimal to non-existent for the wheel braking effort applied. Directional control may be uncertain.	0	-	-

⁽¹⁾ *AIREP: Special Air Report of Braking Action*

Note: Refer for FCOM LIM-AFS chapter for Automatic Approach, Landing and Rollout limitations.

 PAKISTAN International Airlines <i>Great People to Fly With</i> A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PERFORMANCE LANDING DISPATCH REQUIREMENTS
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GENERAL

Ident.: EFB-LDG-40-00022598.0001001 / 18 NOV 24

Applicable to: ALL

LANDING PERFORMANCE CALCULATION

The landing performance calculation is made with the EFB landing performance application for dispatch computation.

REQUIREMENT ON THE LANDING DISTANCE

The Landing Distance Available (LDA) at destination must be at least equal to the Required Landing Distance (RLD) for the planned landing weight.

REQUIREMENT ON THE GO-AROUND PERFORMANCE

The go-around climb gradient must be at least equal to:

- 2.1 %
- The gradient published in the airport approach chart.

Note: EU-OPS requires a minimum go-around climb gradient of 2.5 % for instrument approaches with decision heights below 200 ft.

DISPATCH ON DRY RUNWAY

Ident.: EFB-LDG-40-00022599.0001001 / 28 NOV 19

Applicable to: ALL

Landing performance is calculated without the benefit of thrust reversers, as per regulation.

 For information, the AFM publishes the autoland landing distance increments on dry runways.

DISPATCH ON WET RUNWAY

Ident.: EFB-LDG-40-00022600.0001001 / 28 NOV 19

Applicable to: ALL

Landing performance is calculated without the benefit of thrust reversers, as per regulation.

The RLD for a wet runway is the RLD for the dry runway multiplied by 1.15.

DISPATCH ON CONTAMINATED RUNWAY
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Ident.: EFB-LDG-40-00022601.0001001 / 28 NOV 19

Applicable to: ALL

Landing performance can be calculated with the benefit of the thrust reversers.

For operators complying with EU-OPS regulation, the landing weight on a contaminated runway cannot exceed the landing weight on a wet runway.

PERFORMANCE

LANDING

DISPATCH REQUIREMENTS

DISPATCH WITH MEL OR CDL ITEM

Ident.: EFB-LDG-40-00022602.0001001 / 28 NOV 19

 Applicable to: **ALL**

The aircraft can be dispatched with deferred MEL or CDL items. In this case, the LDA must be at least equal to the RLD calculated with the applicable MEL or CDL item selected.

MEL or CDL items that affect landing performance are:

- MEL items that reduce braking capabilities (brakes, spoilers, thrust reversers if applicable)
- MEL items that have an impact on thrust available for go-around (engine anti-ice valve stuck open)
- CDL items that increase aircraft drag (seals, fairings).

 CDL items are divided in two categories: negligible and non-negligible items.

If the number of negligible CDL items is less or equal to three, no penalty applies.

If the number of negligible CDL items is more than three, a drag increase for each item is applied.

IN-FLIGHT LANDING DISTANCE CROSSCHECK

Ident.: EFB-LDG-40-00022603.0001001 / 15 NOV 21

 Applicable to: **ALL**

The FLD may, in some cases, and particularly on contaminated runway, exceed the RLD considered at dispatch.

The requirements at dispatch remain unchanged and are based on the RLD. It is however recommended to make a preliminary calculation of the FLD at dispatch.

Based on this crosscheck, the crew only need to perform a computation during Descent Preparation in case of changes since dispatch.

If the FLD exceeds the LDA at destination, the Operator may limit the planned weight at destination by the maximum between the RLD and the FLD. The Operator may also consider suitable destination alternates.

ROW LANDING DISTANCE CROSSCHECK

Ident.: EFB-LDG-40-00022715.0001001 / 28 MAY 20

 Applicable to: **ALL**

The ROW  landing distance may, in some cases, exceed the RLD considered at dispatch.

If the conditions remain unchanged, the flight crew will not be authorized to initiate an approach (unless a specific authorization is obtained from the appropriate authority to deactivate the ROW/ROP ).

As a consequence, the dispatch conditions should be adapted in order to prevent a ROW  alert being triggered.

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PERFORMANCE LANDING IN-FLIGHT PERFORMANCE ASSESSMENT
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GENERAL

Ident.: EFB-LDG-50-00022605.0001001 / 18 NOV 24

Applicable to: ALL

During flight, the flight crew performs a landing performance computation if the landing conditions changed compared with the landing performance computation at dispatch, or with a previous computation (e.g. runway, weather conditions, in-flight failure affecting performance, diversion). The landing performance calculation is made with the EFB landing performance application for in-flight computation.

The landing distance used for this computation is the FLD. The flight crew uses the RCAM to determine the landing performance level.

If the aircraft has been dispatched with deferred MEL or CDL items, the In-Flight Landing Distance and FLD must be calculated with the applicable MEL or CDL items selected.

In an emergency situation, the flight crew may decide to disregard the FLD. In this case the flight crew must check that the In-Flight Landing Distance is shorter than the LDA at the destination or diversion airport.

 For more information on In-Flight Landing Distances, *Refer to EFB-LDG-20 Landing Distances Definitions.*

PERFORMANCE**LANDING****IN-FLIGHT PERFORMANCE ASSESSMENT****LANDING PERFORMANCE WITHOUT IN-FLIGHT FAILURE**

Ident.: EFB-LDG-50-00022606.0001001 / 13 MAY 25

Applicable to: ALL

LANDING PERFORMANCE CALCULATION

The flight crew enters the expected landing conditions and calculates the landing performance.

FLAPS LEVER POSITION

The FLAPS lever position for landing is at discretion of the flight crew.

VAPP DETERMINATION**VAPP FORMULA**

$VAPP = VLS + APPR COR + \Delta V \text{ Pilot.}$

APPR COR: approach correction, that is the highest of:

- 5 kt in the case of A/THR ON
- 5 kt in the case of ice accretion in CONF FULL
- 10 kt in the case of ice accretion in CONF 3
- 1/3 headwind component excluding gust (maximum 15 kt).

ΔV Pilot: speed increment that the flight crew can enter in order to increase the approach speed.

Note: The landing performance application takes into account this formula for the computation of the VAPP.

OPERATIONAL RECOMMENDATIONS

In the case of strong wind or gusty crosswind above 20 kt:

- The VAPP should be at least $VLS + 5 \text{ kt}$
- The 5 kt increment above VLS may be increased up to 15 kt at discretion of the flight crew, with the ΔV Pilot.

This ΔV Pilot must be taken into account in the landing performance calculation.

FMS VAPP DEFAULT VALUE

The FMS computes a default VAPP value. For more information, *Refer to DSC-22_10-50-50 Other Speeds.*

The flight crew modifies this FMS default value when required (e.g. in the case of ice accretion or landing below $VLS + 5 \text{ kt}$).

 PAKISTAN International Airlines Great People to Fly With A318/A319/A320/A321 FLIGHT CREW OPERATING MANUAL	PERFORMANCE LANDING IN-FLIGHT PERFORMANCE ASSESSMENT
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LANDING PERFORMANCE FOLLOWING IN-FLIGHT FAILURE
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Ident.: EFB-LDG-50-00022607.0001001 / 13 MAY 25

Applicable to: ALL

LANDING PERFORMANCE ECAM/QRH INDICATIONS

If an ECAM alert/QRH procedure affects landing performance, the ECAM/QRH procedure requests LDG DIST PROC... APPLY.

In this case the flight crew must verify the landing performance.

LANDING PERFORMANCE CALCULATION

The flight crew enters the expected landing conditions and the ECAM alert/QRH procedure items that affect performance in the landing performance application.

FLAPS LEVER POSITION

The flight crew selects the FLAPS lever position requested by the ECAM/QRH procedure.

Note: If there are no instructions in the ECAM/QRH procedure, the FLAPS lever position for landing is at flight crew's discretion.

VAPP DETERMINATION

The landing performance application takes into account the following formula for the calculation of the VAPP:

$VAPP = VREF + \Delta VREF + APPR COR + \Delta V Pilot.$

APPR COR: approach correction that depends on:

- A/THR
- Ice accretion
- Headwind Component
- $\Delta VREF$.

$\Delta V Pilot$: speed increment that the flight crew can enter in order to increase the approach speed.

Note: In the case of $\Delta VREF + APPR COR$ above 20 kt, an additional $\Delta V Pilot$ is not recommended.

The flight crew enters into the FMS-PERF-APPR page the VAPP value computed by the landing performance application.

PERFORMANCE**LANDING****IN-FLIGHT PERFORMANCE ASSESSMENT****ROW LANDING DISTANCE CROSSCHECK**

Ident.: EFB-LDG-50-00022608.0001001 / 28 MAY 20

Applicable to: ALL

The ROW  landing distance may, in some cases, exceed the factored in-flight landing distance. The flight crew will not be authorized to initiate an approach if a ROW  alert is expected (unless a specific authorization is obtained from the appropriate authority to deactivate the ROW/ROP ). If a ROW  alert is expected, and the flight crew is not authorized to deactivate the ROW/ROP  , the flight crew should request to change the runway, or initiate a diversion.