

**CHAPTER 1**

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**ABBREVIATIONS**

The following abbreviations may be used by cockpit displays, radio tuning units and flight management system or be found throughout the manual. Some abbreviations may also appear in lower case letters. Abbreviations having very limited usage are explained in the systems chapters where they are used.

**A**

A/C	Air Conditioning	ALT	Altitude Hold (PFD/FD)
A/G	Air/Ground	ALT CAP	Altitude Capture (PFD/FD)
A/ICE	Anti-ice	ALT HOLD	Altitude Hold
A/P	Autopilot	ALTN	Alternate
A/S	Airspeed	ALTS	Selected Altitude Arm/Abort (PFD/FD)
A/SKID	Anti-skid	AM	Amplitude Modulation
ABS	Absolute	AMB	Ambient
AC	Alternating Current	AMP	Amperes
ACARS	ARINC Communications Addressing and Reporting System	ANNUN	Annunciator
ACSC	Air Conditioning System Controller	ANT	Antenna
ACCEL	Acceleration, accelerate(d), accelerometers	AOA	Angle of Attack
ACM	Air Cycle Machine	AP	Autopilot
ACMP	Alternating Current Motor Pump/Electric Hydraulic Pump	APC	Auxiliary Power Control
ACPC	Alternating Current Power Center	APP, APR	Approach
ACT	Active	APPROX	Approximately
ACU	Air Conditioning Unit	APU	Auxiliary Power Unit
ACV	Air Control Valve	ARINC	Aeronautical Radio Incorporated
ADC	Air Data Computer	ARP	Air Data Reference Panel
ADDR	Address	ASCB	Avionic Standard Communication Bus
ADF	Automatic Direction Finder	ASYM	Asymmetrical
ADI	Attitude Director Indicator	AT	Auto Throttle
ADS	Air Data System	ATA	Air Transport Association
AFCS	Automatic Flight Control System	ATC	Air Traffic Control
AFT	Aftward	ATS	Air Turbine Starter
AGL	Above Ground Level	ATT	Attitude
AHC	Attitude Heading Computer	ATTD	Attitude
AIL	Aileron	ATTND	Attendant
ALIGN	Aligning, alignment	AUTO	Automatic
ALPHA	alpha	AUTO BAL	Automatic Balance
ALT	Altitude, Altimeter	AUTO XFER	Automatic Transfer
		AUX	Auxiliary
		AV	Avionics
		AVAIL	Available
		AZ	Azimuth

**ABBREVIATIONS (CONT'D)**

**B**

B/AIR	Bleed Air	BLD	Bleed
B/C, BC	Back Course	BMC	Bleed Management Controller
B/CRS	Back Course		
BCU	Brake Control Unit	BOOM	Headset microphone
B/LEAK	Bleed Leak	BRG	Bearing
BARO	Barometric	BRKR(s)	Breaker(s)
BAT	Battery	BRT	Bright
BATT	Battery	BTL	Bottle
BDI	Bearing Distance Indicator	BTMS	Brake Temperature Monitoring System
BIT	Built-In-Test		
BITE	Built-In-Test Equipment	BTMU	Brake Temperature Monitoring Unit
BRK	Brake	BYPS	Bypass

**C**

C	Center, Caution, Cabin	CHAN	Channel
CAI	Cowl Anti-Ice	CHGR	Charger
CAA	Civil Aviation Authority (UK)	CHRT	Chart
CAIMS	Central Aircraft Information Maintenance System	CK	Check
		CKPT	Cockpit
CAL	Calibrate	CKT	Circuit
CAP	Capture	CL	Closed
CAPT	Captain	CLB	Climb
CAS	Calibrated Air Speed	CLK	Clock
CAS	Crew Alerting System	cm	Centimeters
CAT	Category	CMD	Command
CAT II	Category II	CMPS	Compass
CB, C/B	Circuit Breaker	CMPTR	Computer
CBP	Circuit Breaker Panel	CO2	Carbon Dioxide
CCBP	Cockpit Circuit Breaker Panel	COM	Communication
CCW	Counter Clockwise	COMM	Communication
CDL	Configuration Deviation List	COMP	Compressor, Comparator
CDP	Compressor Discharge Pressure	COMPT	Compartment
CDU	Control Display Unit	COND	Condition, Continued
CFM	Cubic Feet Per Minute	CONFIG	Configuration
CG	Center of Gravity	CONN	Connection
CH	Chapter, Channel	CONT	Control, Continuous, Contactor, Controller
CL	Centreline		
CHG	Change	CORR	Correction

**ABBREVIATIONS (CONT'D)**

CPAM	Cabin Pressure Acquisition Module	CRT	Cathode Ray Tube
CPCP	Cabin Pressure Control Panel	CRZ	Cruise
CPC	Cabin Pressure Controller	CTR	Center
CPCS	Cabin Pressure Control System	CPCS	Cabin Pressure Control System
CPL	Couple	CTRL	Control
CPLT	Copilot	CVR	Cockpit Voice Recorder
CRS	Course	CW	Clockwise
		CYL	Cylinder

**D**

DA	Drift Angle	DFDR	Digital Flight Data Recorder
DCT	Direct	DG	Directional Gyro
DAU	Data Acquisition Unit	DH	Decision Height
DBU	Data Base Unit	DIFF	Differential
DC	Direct Current	DIM	Dimming
DCP	Display Control Panel	DIR	Direct
DCPC	Direct Current Power Center	DIS	Distance (to way point), Disconnect
DECEL	Decelerate(d)	DISC	Disconnect
DECR	Decrease	DISCH	Discharge
DEFL	Defuel	DISP	Dispatch, Display
DEG	Degree	DIST	Distance
DEGRAD	Degraded	DME	Distance Measuring Equipment
DEPR	Depressurize	DN	Down
DEPT	Departure	DOT	Department of Transport (Canada)
DEST	Destination	DR	Door
DET	Detector	DSPY	Display
DEV	Deviation		
DFDAU	Digital Flight Data Acquisition Unit		

**E**

EAS	Equivalent Airspeed	EDP	Engine Driven Pump/Engine Primary Hydraulic Pump
ECP	EICAS Control Panel	EFIS	Electronic Flight Instrument System
ECS	Environmental Control System	EGPWS	Enhanced Ground Proximity Warning System ( including windshear)
ECU	Electronic Control Unit	EGT	Exhaust Gas Temperature
ED	EICAS Display		
EEC	Engine Electronic Controller		

**ABBREVIATIONS (CONT'D)**

EICAS	Engine Indication and Crew Alerting System	EPR	Engine Pressure Ratio
EL	Elevation	EQUIP	Equipment
ELEC	Electrical	ERP	Eye Reference Position (datum)
ELEV	Elevator, Elevation	ESS	Essential
ELT	Emergency Locator Transmitter	ET	Elapsed Time
EMER(G)	Emergency	ETA	Estimated Time of Arrival
EMS	Electrical Management System	ETTC	Essential TRU Tie Contactor
EMS CDU	Electrical Management System Control Display Unit	ETOPS	Extended Range Twin Engine Operation
ENG	Engine	EVAC	Evacuation
EPC	External Power Contactor	EXH	Exhaust
EPLC	External Power Line Contactor	EXT PWR	External Power
EPCU	External Power Control Unit	EXTIN	Extinguish(ed)
EPGDS	External Power Generation and Distribution System	EVMU	Engine Vibration Monitor Unit
		EVMS	Engine Vibration Monitor System

**F**

F/CTL	Flight Controls	FL	Flight Level
FAA	Federal Aviation Administration (USA)	FL CH, FLC	Flight Level Change
FADEC	Full Authority Digital Electronic Control	FLD	Field
FAIL	Failure	FLT	Flight
FCC	Flight Control Computer	FLT DIR	Flight Director
FCU	Flight Control Unit	FLUOR	Fluorescent
FD, F/D	Flight Director	FM	Fan Marker
FDAU	Flight Data Acquisition Unit	FMS	Flight Management System
FDR	Flight Data Recorder	FPM	Feet Per Minute
FEED	Feeder	FQMC	Fuel Quantity Management Computer
FF, F/F	Fuel Flow	FMQGS	Fuel Management Quantity Gauging System
FIDEEX	Fire Detection and Extinguishing System	FREQ	Frequency
FIRE BTL	Fire Bottle	FT	Feet, Foot
FIREX	Fire Extinguisher	FW	Fire Wall
FECU	Flap Electronic Control Unit	FWD	Forward
		FWC	Fault Warning Computer



ABBREVIATIONS (CONT'D)

G

G (+/-)	Receiver Gain	GND	Ground
G/S	Glideslope	GPM	Gallons Per Minute
GA	Go-around	GPWS	Ground Proximity Warning System
GAL	Gallon	GR	Gear
GALY	Galley	G	Gravity
GCS	Ground Clutter Suppression	GS,G/S	Glideslope
GCU	Generator Control Unit	GS	Ground Speed
GE	General Electric	GTC	Generator Transfer Contactor
GEN	Generator	GP	Guidance Panel
GLC	Generator Line Contactor	GUIDE	Guidance
GLD	Ground Lift Dumper (ing)	GW	Gross Weight
GMT	Greenwich Mean Time		

H

HBMU	Heater Current/Brake Temp Monitor Unit	HP	High Pressure
HDG	Heading	HPSOV	High Pressure Shut-off Valve
HDG HOLD	Heading Hold	HPA	Hecto Pascals
HDG SEL	Heading Select	HSI	Horizontal Situation Indicator
HEAT	Heater	HSTA	Horizontal Stabilizer Trim Actuator
HF	High Frequency (3 – 30 MHz)	HSTCU	Horizontal Stabilizer Trim Control Unit
Hg	Mercury	HTR	Heater
HI	High	HUD	Heads-up Display
HLDR	Holder	HYD	Hydraulic
HOR, HORIZ	Horizontal	Hz	Hertz
HOT	Hot Oil Temperature		

I

I/B	Inboard	ICS	Idle Corrected Speed, Inter-Communication System
I/C	Intercom, Inspection Check	ID	Identification
IAC	Integrated Avionics Computer	IDENT	Identification
IAPS	Integrated Avionics Processor System	IFR	Instrument Flight Rules
IAS	Indicated Air Speed	IGN	Ignition
ICAO	International Civil Aviation Organization	IGV	Inlet Guide Vanes
		ILS	Instrument Landing System
		IM	ILS Inner Marker

**ABBREVIATIONS (CONT'D)**

IMBAL	Imbalance	INST(S)	Instrument(s)
IMC	Instrument Meteorological Conditions	INST, INSTR	Instrument
IMP	Imperial	INT	Internal, Integral, Intersection
IN	Inch, Inches	INTEG	Integral
IN Hg	Inches of Mercury	I/O	Input/Output
INBD	Inboard	IRS	Inertial Reference System
INCR	Increase	IRU	Inertial Reference Unit
IND	Indication, Indicator	ISA	International Standard Atmosphere
INFLT	In Flight	ISO	International Standard Organization
INHIB, INHB	Inhibit	ISOL	Isolation, Isolated
INOP	Inoperative	ITT	Inter Turbine Temperature
INPH	Interphone	IOP	Input/Output Processor
INSP	Inspection		

**J**

JAA Joint Airworthiness Authority

**K**

K, KT, KTS	Knots	KIAS	Knots Indicated Airspeed
kg(s)	Kilogram(s)	kW(s)	KiloWatt(s)
kHz	KiloHertz		

**L**

L	Left, Landing	LGECU	Landing Gear Electronic Control Unit
L/T	Landing/Taxi	LGW	Landing Gross Weight
LAV	Lavatory	LH	Left Hand
LB(s)	Pound(s)	LIM	Limit
LCN	Load Classification Number	LK	Leak
LCV	Load Control Valve	LN	Left Nose
LDG	Landing	LNAV	Lateral Navigation
LGDCIS	Landing Gear and Door Control Indicating System	LOC	Localizer
LDG GR	Landing Gear	LOGO	Logo Graphic
LDU	Lamp Driver Unit	LOM, MM	Compass Locator at Outer Marker
LE	Leading Edge	LOP	Low Oil Pressure
LFE	Landing Field Elevation	LP	Low Pressure
LG	Landing Gear	LPM	Liter Per Minute

**ABBREVIATIONS (CONT'D)**

LPT	Lo Pressure Turbine	LTG(s)	Light(s)
LR	Left Rear	LW	Left Wing
LRC	Long Range Cruise	LWD	Left Wing Down
LRN	Long Range Navigation	LWR	Lower
LSB	Lower Side Band		

**M**

M	Mach Number	MI	Miles
m	Meter	MIC	Microphone
MAA	Maximum Authorized IFR Altitude	MID AFT	Middle Aftward
		MID FWD	Middle Forward
MAC	Mean Aerodynamic Chord	MILS	.001 of an inch
MADC	Micro Air Data Computer	MIN	Minimum
MAG	Magnetic	MISC	Miscellaneous
MAINT	Maintenance	MKR	Marker
MALF	Malfunction	MLG	Main Landing Gear
MAN	Manual	MLS	Microwave Landing System
MAP	Ground Map (WXR)	MLW	Maximum Landing Weight
MAX	Maximum	MM	Middle Marker
MAZ	MLS Azimuth	MMEL	Master Minimum Equipment List
MB	Millibars		
MCA	Minimum Crossing Altitude	MMO	Maximum Operating Speed in Mach Number
MCL	Maximum Climb		
MCR	Maximum Cruise	MOCA	Minimum Obstruction Clearance Altitude
MCT	Maximum Continuous Thrust		
MDA	Minimum Descent Altitude	MOD	Module
MEA	Minimum Enroute IFR Altitude	MON	Monitor
		MPH	Miles Per Hour
MECH	Mechanic	MRA	Minimum Reception Altitude
MED	Medium	MSG	Message
MEL	Minimum Equipment List	MSL	Mean Sea Level
MFD	Multi-function Display	MTG	Miles to Go
MGP	MLS Glideslope	MTO/MTOW	Maximum Take-off Weight
MHz	MegaHertz	MTW	Maximum Taxi Weight
		MZFW	Maximum Zero Fuel Weight

**Misc**

%	Percent	° C	Degrees Centigrade
&	and	° F	Degrees Fahrenheit

**ABBREVIATIONS (CONT'D)**

**N**

N/A	Not Applicable	NL	Nose Left
N2	High Pressure Rotor RPM	NLG	Nose Landing Gear
NAV	Navigation	NM	Nautical Mile(s)
ND	Nose Down, Navigation Display	No.	Number
NDB (ADF)	Nondirectional Beacon (Automatic Direction Finder)	NOPT	No Procedure Turn Required
NEG	Negative	NORM	Normal
NEUT	Neutral	NOSE, N/W	Nose Wheel
		NR	Nose Right
		NU	Nose Up

**O**

OAT	Outside Air Temperature	OVBD	Overboard
OB/OUTBD	Outboard	OVHT, OH	Overheat
OBS	Observer	OVLDT	Overload
OEI	One Engine Inoperative	OVSP	Overspeed
OEW	Operating Empty Weight	OVSPD	Overspeed
OH, OVHD	Overhead	OVTEMP	Over Temperature
OK	Okay	OXY, O2	Oxygen
OM	Outer Marker		

**P**

P#6	Panel 6	PRI/PRIM	Primary
P/S	Pitot/Static	PROC	Procedure
PA	Passenger Address	PROT	Protection
PASS	Passenger	PROX	Proximity
PBE	Portable Breathing Equipment (Smoke Hood)	PRV	Bleed Pressure Regulating and Shut-off Valve
PCU	Power Control Unit	PSI	Pounds Per Square Inch
PFD	Primary Flight Display	PSID	Pounds Per Square Inch Differential
PLA	Power Lever Angle	PSIG	Pounds Per Square Inch Gauge
PLT(s)	Pilot(s)	PSU	Passenger Service Unit
PNLS(s)	Panel(s)	PTCT	Protect
PO	Outside Air Pressure	PTT	Push To Talk
POS	Position	PWR	Power
PPH	Pounds Per Hour		
PRESS	Pressure, Pressurization		

**ABBREVIATIONS (CONT'D)**

**Q**

QAR	Quick Access Recorder	QNH	Altimeter Setting
QEC	Quick Engine Change	QTY	Quantity
QFE	Local Station Pressure		

**R**

R	Right	REFL	Refuel
RA	Radio Altitude	REV	Reverse
RA	Resolution Advisory (TCAS)	RH	Right Hand
RAT	Ram Air Turbine	RMI	Radio Magnetic Indicator
RAT GEN	Ram Air Turbine Generator	RMU	Radio Management Unit
RATLC	Ram Air Turbine Line Contactor	ROT	Rotation
RADALT	Radio Altimeter	RPM	Revolutions Per Minute
RCCB	Remote Controlled Circuit Breaker	RSB	Radio System Bus
RCDR	Recorder	RT, R/T	Receiver-Transmitter
RCVR	Receiver	RTE	Route
R/D	Refuel/Defuel	RTE DATA	Route Data
RDCP	Refuel/Defuel Control Panel	RTO	Rejected Take-off
RDR	Radar	RTU	Radio Tuning Unit
REC	Receiver, Recorder	RUD	Rudder
RECIRC	Recirculation	RVR	Runway Visual Range
RECOG	Recognition	RVSR	Reverser
REF(s)	Reference(s)	RW	Right Wing
		RWD	Right Wing Down
		RWY	Runway

**S**

S	Status	SID	Standard Instrument Departure
SAT	Static Air Temperature	SMKG	Smoking
SBY, STBY	Standby	SOV	Shut-off Valve
SCAV	Scavenge	SP, SPD	Speed
SCV	Surge Control Valve	SPC	Stall Protection Computer
SCR	Selector (Nav source)	SPS	Stall Protection System
SEC	Second, Secondary	SPKR	Speaker
SEL	Select, Selector	SPLR(s)	Spoiler(s)
SELCAL	Selected Call	SQ	Squelch
SENS	Sensitivity, Sensor	SSB	Single Side Band
SERV, SVCE	Service	STA	Station
SFCU	Slats and Flaps Control Unit		

**ABBREVIATIONS (CONT'D)**

STAB	Stabilizer	SYN	Synchronize
STAT	Status	SYNC	Synchronous
STEER	Steering	SYS, SYST	System
SUPPL	Supply	STD	Standard
SW(s)	Switches		

**T**

TA	Traffic Advisory (TCAS)	TLC	TRU Line Contactor
TACAN	UHF Tactical Air Navigation Aid	TMS	Thermal Management System
TAS	True Airspeed	TO, T/O	Take-off
TAT	Total Air Temperature	TOL	Tolerance
TCAS	Traffic Alert and Collision Avoidance System	T/R	Thrust Reverser
TCS	Touch Control Steering	TRB, TURB	Turbulence
T/C	Top of Climb	TRK	Track
T/D	Top of Descent	TRM	Trim
TE	Trailing Edge	TRU	Transformer Rectifier Unit
TEMP	Temperature	TST	Test
TGT	Turbine Gas Temperature or Target	TTC	TRU Transfer Contactor

**U**

UNSCHD	Unscheduled	USG	United States Gallons
USB	Upper Side Band	UTIL	Utility

**V**

V	Volt	V <sub>FE</sub>	Maximum Flap Extended Speed
V <sub>A</sub>	Design Maneuvering Speed	V <sub>LE</sub>	Maximum Landing Gear Extended Speed
V <sub>B</sub>	Design Speed for Maximum Gust Intensity	V <sub>LO</sub>	Maximum Landing Gear Operating Speed
V <sub>C</sub>	Design Cruising Speed	V <sub>LOF</sub>	Lift-off Speed
V <sub>D</sub>	Design Diving Speed	V <sub>MC</sub>	Minimum Control Speed with the Critical Engine Inoperative
V <sub>DF/MDF</sub>	Demonstrated flight diving speed	V <sub>MO/M<sub>MO</sub></sub>	Maximum Operating Limit Speed
V <sub>EF</sub>	Engine Failure Speed	V <sub>MU</sub>	Minimum Unstick Speed
V <sub>F</sub>	Design Flap Speed	V <sub>R</sub>	Rotation Speed
V <sub>FC/MFC</sub>	Maximum Speed for Stability Characteristics		

**ABBREVIATIONS (CONT'D)**

V <sub>S</sub>	Stalling Speed or the Minimum Steady Flight Speed at which the Airplane is Controllable	VFG	Variable Frequency Generator
V <sub>S0</sub>	Stalling Speed or the Minimum Steady Flight Speed in the Landing Configuration	VFR	Visual Flight Rules
V <sub>S1</sub>	Stalling Speed or the Minimum Steady Flight Speed Obtained in a Specific Configuration	VG	Vertical Gyro
V <sub>1</sub>	Take-off Decision Speed (formerly Denoted as Critical Engine Failure Speed)	VHF	Very High Frequency (30 – 300 MHz)
V <sub>2</sub>	Take-off Safety Speed	VIB	Vibration
V <sub>2 MIN</sub>	Minimum Take-off Safety Speed	VIGB	Variable Inlet Guide Vanes
V/S, VS	Vertical Speed	VMC	Visual Meteorological Conditions
VERT	Vertical	VNAV	Vertical Navigation
VF	Variable Frequency	VOL	Volume
		VOLT	Voltage
		VOR	VHF Omnidirectional Range Station
		VORTAC	VOR and TACAN Co-located
		V/L	VOR/Localizer
		VSI	Vertical Speed Indicator

**W**

WAIV	Wing Anti-Ice modulating and Shut-off Valve	WHLS	Wheels
WAI	Wing Anti-Ice	WIND	Window
W	Warning	WOW	Weight-On-Wheel
W/C	Wind Component	WPT(s)	Waypoint(s)
W/S	Wind Shear	WRN	Warning
W/W	Wheel Well	WS	Second Segment Limited Weight
WARN	Warning	WTC	Windshield Temperature Control
WF	Runway Length Limited Weight	WSHLD	Windshield
Wf	Fuel Flow In Pounds Per Hour	WX	Weather
WGT	Weight	WXR	Weather Radar

**X**

X	Cross Transfer	XMIT	Transmit
XFEED	Crossfeed	XPNDR	Transponder
XFER, XFR	Transfer	XTK	Cross Track
XFLOW	Cross Flow	XWC	Cross Wind Component

**ABBREVIATIONS (CONT'D)**

**Y**

YD, Y/D      Yaw Damper

**Z**

ZFW      Zero Fuel Weight



**CONVERSION FACTORS**

<b>Multiply</b>	<b>By</b>	<b>To Obtain</b>			
			Km/hr	0.54	knots
				0.6214	mph
Centimeters	0.3937	in	Knots	1.151	mph
				1.852	km/hr
Centimeters <sup>2</sup>	0.155	in <sup>2</sup>	kPa	0.145	psi
Centimeters <sup>3</sup>	0.061	in <sup>3</sup>	Liters	0.2642	USG
Cu ft <sup>3</sup>	0.0283	meters <sup>3</sup>		0.22	Imperial gal
Ft	0.3048	meters	Meters	3.281	ft
Ft <sup>2</sup>	0.0929	m <sup>2</sup>	Meters <sup>2</sup>	10.76	ft <sup>2</sup>
Gal, Imperial	1.2009	USG	Meters <sup>3</sup>	35.3115	ft <sup>3</sup>
	4.546	liters	Miles	5280	ft
Gal, US	3.7854	liters		1.609	km
	0.8327	Imperial gal		0.869	nautical miles
In	2.54	cm	Mph	1.609	km/hr
				0.869	knots
In <sup>2</sup>	6.452	cm <sup>2</sup>	Nautical Miles	1.151	miles
				1.852	m
In <sup>3</sup>	16.387	cm <sup>3</sup>	Pounds (lb)	0.4536	kilograms
Kilograms	2.205	lb	PSI	6.895	kPa
Kilometers	0.6214	miles			
	0.54	nautical miles			

**TEMPERATURE CONVERSION TABLE**

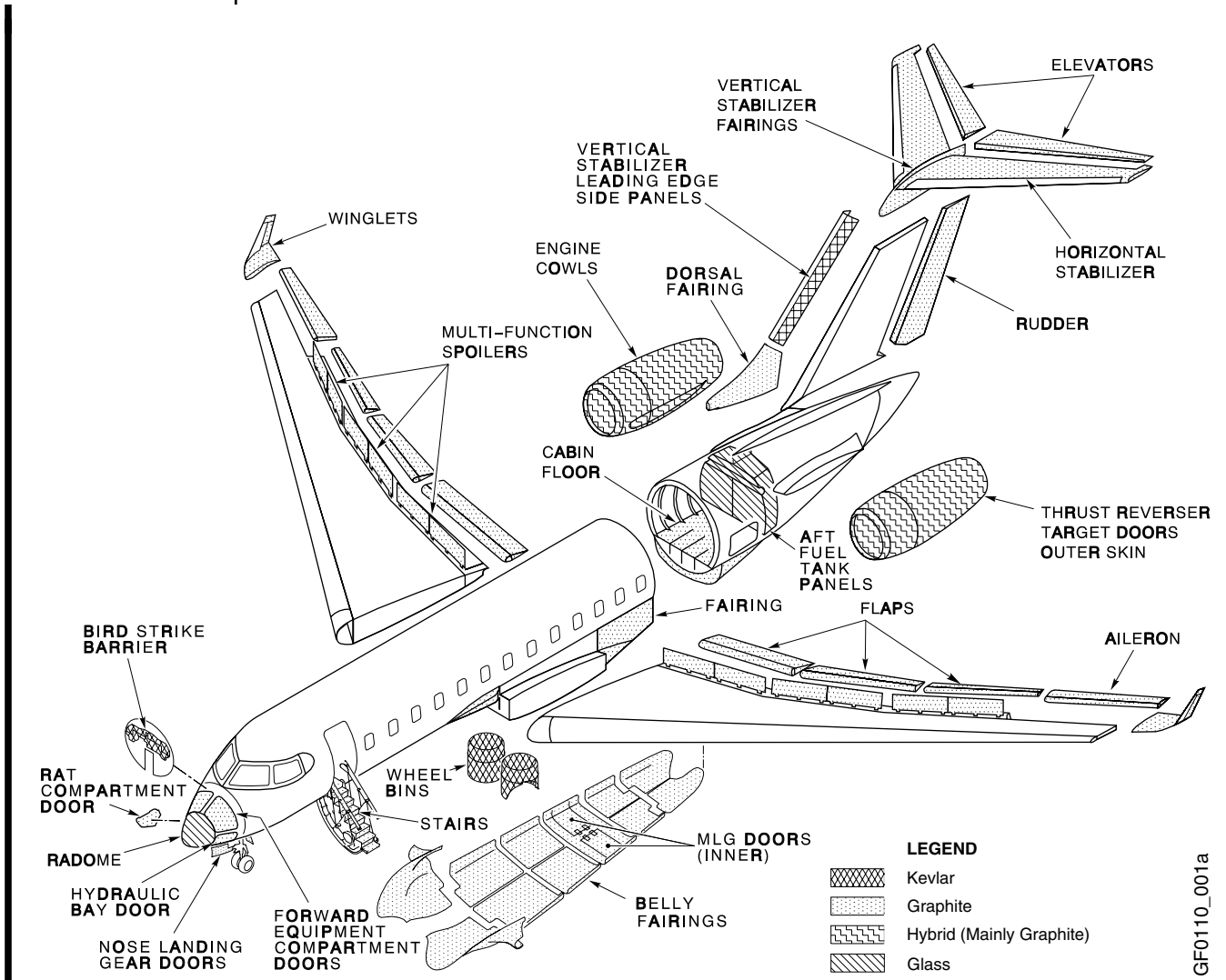
°C	°F	°C	°F	°C	°F	°C	°F	°C	°F	°C	°F	°C	°F	°C	°F		
-73.3	-100	-148.0	-45.6	-50	-58.0	-17.8	0	32.0	10.0	50	122.0	37.8	100	212.0	65.6	150	302.0
-72.8	-99	-146.2	-45.0	-49	-56.2	-17.2	1	33.8	10.6	51	123.8	38.3	101	213.8	66.1	151	303.8
-72.2	-98	-144.4	-44.4	-48	-54.4	-16.7	2	35.6	11.1	52	125.6	38.9	102	215.6	66.7	152	305.6
-71.7	-97	-142.6	-43.9	-47	-52.6	-16.1	3	37.4	11.7	53	127.4	39.4	103	217.4	67.2	153	307.4
-71.1	-96	-140.8	-43.3	-46	-50.8	-15.6	4	39.2	12.2	54	129.2	40.0	104	219.2	67.8	154	309.2
-70.6	-95	-139.0	-42.8	-45	-49.0	-15.0	5	41.0	12.8	55	131.0	40.6	105	221.0	68.3	155	311.0
-70.0	-94	-137.2	-42.2	-44	-47.2	-14.4	6	42.8	13.3	56	132.8	41.1	106	222.8	68.9	156	312.8
-69.4	-93	-135.4	-41.7	-43	-45.4	-13.9	7	44.6	13.9	57	134.6	41.7	107	224.6	69.4	157	314.6
-68.9	-92	-133.6	-41.1	-42	-43.6	-13.3	8	46.4	14.4	58	136.4	42.2	108	226.4	70.0	158	316.4
-68.3	-91	-131.8	-40.6	-41	-41.8	-12.8	9	48.2	15.0	59	138.2	42.8	109	228.2	70.6	159	318.2
-67.8	-90	-130.0	-40.0	-40	-40.0	-12.2	10	50.0	15.6	60	140.0	43.3	110	230.0	71.1	160	320.0
-67.2	-89	-128.2	-39.4	-39	-38.2	-11.7	11	51.8	16.1	61	141.8	43.9	111	231.8	71.7	161	321.8
-66.7	-88	-126.4	-38.9	-38	-36.4	-11.1	12	53.6	16.7	62	143.6	44.4	112	233.6	72.2	162	323.6
-66.1	-87	-124.6	-38.3	-38	-34.6	-10.6	13	55.4	17.2	63	145.4	45.0	113	235.4	72.8	163	325.4
-65.6	-86	-122.8	-37.8	-36	-32.8	-10.0	14	57.2	17.8	64	147.2	45.6	114	237.2	73.3	164	327.2
-65.0	-85	-121.0	-37.2	-35	-31.0	-9.4	15	59.0	18.3	65	149.0	46.1	115	239.0	73.9	165	329.0
-64.4	-84	-119.2	-36.7	-34	-29.0	-8.9	16	60.8	18.9	66	150.8	46.7	116	240.8	74.4	166	330.8
-63.9	-83	-117.4	-36.1	-33	-27.4	-8.3	17	62.6	19.4	67	152.6	47.2	117	242.6	75.0	167	332.6
-63.3	-82	-115.6	-35.6	-32	-25.6	-7.8	18	64.4	20.0	68	154.4	47.8	118	244.4	75.6	168	334.4
-62.8	-81	-113.8	-35.0	-31	-23.8	-7.2	19	66.2	20.6	69	156.2	48.3	119	246.2	76.1	169	336.2
-62.2	-80	-112.0	-34.4	-30	-22.0	-6.7	20	68.0	21.1	70	158.0	48.9	120	248.0	76.1	170	338.0
-61.7	-79	-110.2	-33.9	-29	-20.2	-6.1	21	69.8	21.7	71	159.8	49.4	121	249.8	77.2	171	339.8
-61.1	-78	-108.4	-33.3	-28	-18.4	-5.6	22	71.6	22.2	72	161.6	50.0	122	251.6	77.8	172	341.6
-60.6	-77	-106.6	-32.8	-27	-16.6	-5.0	23	73.4	22.8	73	163.4	50.6	123	253.4	78.3	173	343.4
-60.0	-76	-104.8	-32.2	-26	-14.8	-4.4	24	75.2	23.3	74	165.2	51.1	124	255.2	78.9	174	345.2
-59.4	-75	-103.0	-31.7	-25	-13.0	-3.9	25	77.0	23.9	75	167.0	51.7	125	257.0	79.4	175	347.0
-58.9	-74	-101.2	-31.1	-24	-11.2	-3.3	26	78.8	24.4	76	168.8	52.2	126	258.8	80.0	176	348.8
-58.3	-73	-99.4	-30.6	-23	-9.4	-2.8	27	80.6	25.0	77	170.6	52.8	127	260.6	80.6	177	350.6
-57.8	-72	-97.6	-30.0	-22	-7.6	-2.2	28	82.4	25.6	78	172.4	53.3	128	262.4	81.1	178	352.4
-57.2	-71	-95.8	-29.4	-21	-5.8	-1.7	29	84.2	26.1	79	174.2	53.9	129	264.2	81.7	179	354.2
-56.7	-70	-90.0	-28.9	-20	-4.0	-1.1	30	86.0	26.7	80	176.0	54.4	130	266.0	82.2	180	356.0
-56.1	-69	-92.2	-28.3	-19	-2.2	-0.6	31	87.8	27.2	81	177.8	55.0	131	267.8	82.8	181	357.8
-55.6	-68	-90.4	-27.8	-18	-0.4	0.0	32	89.6	27.8	82	179.6	55.6	132	269.6	83.3	182	359.6
-55.0	-67	-88.6	-27.2	-17	1.4	0.6	33	91.4	28.3	83	181.4	56.1	133	271.4	83.9	183	361.4
-54.4	-66	-86.8	-26.7	-16	3.2	1.1	34	93.2	28.9	84	183.2	56.7	134	273.2	84.4	184	363.2
-53.9	-65	-85.0	-26.1	-15	5.0	1.7	35	95.0	29.4	85	185.0	57.2	135	275.0	85.0	185	365.0
-53.3	-64	-83.2	-25.6	-14	6.8	2.2	36	96.8	30.0	86	186.8	57.8	136	276.8	85.6	186	366.8
-52.8	-63	-81.4	-25.0	-13	8.6	2.8	37	98.6	30.6	87	188.6	58.3	137	278.6	86.1	187	368.6
-52.2	-62	-79.6	-24.4	-12	10.4	3.3	38	100.4	31.1	88	190.4	58.9	138	280.4	86.7	188	370.4
-51.7	-61	-77.8	-23.9	-11	12.2	3.9	39	102.2	31.7	89	192.2	59.4	139	282.2	87.2	189	372.2
-51.1	-60	-76.0	-23.3	-10	14.0	4.4	40	104.0	32.2	90	194.0	60.0	140	284.0	87.8	190	374.0
-50.6	-59	-74.2	-22.8	-9	15.8	5.0	41	105.8	32.8	91	195.8	60.6	141	285.8	88.3	191	375.8
-50.0	-58	-72.4	-22.2	-8	17.6	5.6	42	107.6	33.3	92	197.6	61.1	142	287.6	88.9	192	377.6
-49.4	-57	-70.6	-21.7	-7	19.4	6.1	43	109.4	33.9	93	199.4	61.7	143	289.4	89.4	193	379.4
-48.9	-56	-68.8	-21.1	-6	21.2	6.7	44	111.2	34.4	94	201.2	62.2	144	291.2	90.0	194	381.2
-48.3	-55	-67.0	-20.6	-5	23.0	7.2	45	113.0	35.0	95	203.0	62.8	145	293.0	90.6	195	383.0
-47.8	-54	-65.2	-20.0	-4	24.8	7.8	46	114.8	35.6	96	204.8	63.3	146	294.8	91.1	196	384.8
-47.2	-53	-63.4	-19.4	-3	26.6	8.3	47	116.6	36.1	97	206.6	63.9	147	296.6	91.7	197	386.6
-46.7	-52	-61.6	-18.9	-2	28.4	8.9	48	118.4	36.7	98	208.4	64.4	148	298.4	92.2	198	388.4
-46.1	-51	-59.8	-18.3	-1	30.2	9.4	49	120.2	37.2	99	210.2	65.0	149	300.2	92.8	199	390.2

GF0110\_047

**GENERAL AIRPLANE DESCRIPTION**

The airplane is a swept-wing monoplane with a pressurized cabin. It is capable of accommodating a pilot, a copilot, a third crew member and up to 19 passengers. The airplane has two BMW/Rolls Royce BR 710 turbo fan engines.

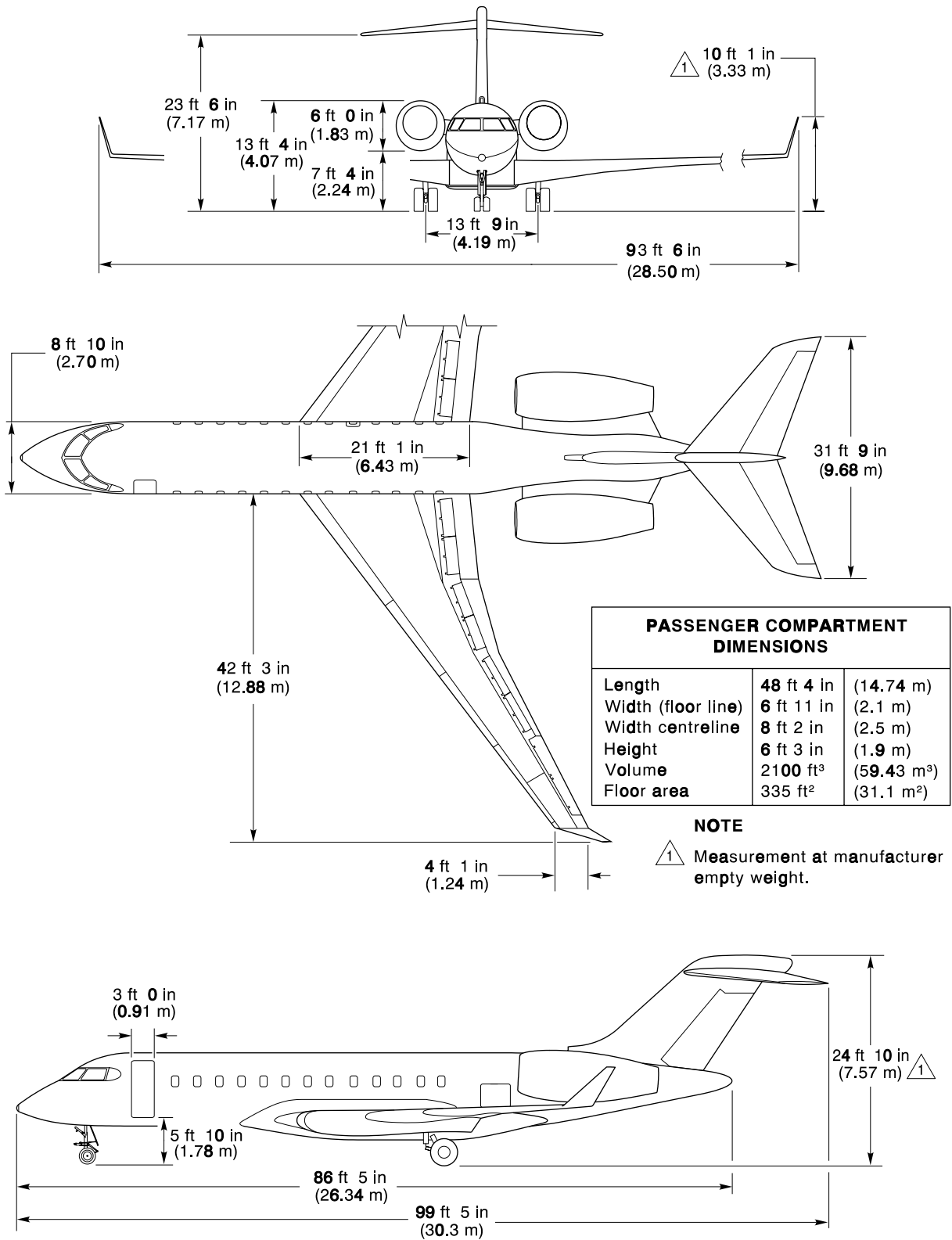
The airplane structure, in general, is fabricated from aluminum alloys. Alloy steels, stainless steels, titanium and composites are also used.



Attention and strict processes are given to surface finishes, protection against corrosion and to external surface smoothness throughout airplane. Sealing requirements include environmental sealing, protection of faying surfaces (similar and dissimilar) against corrosion, pressure sealing and integral fuel tank sealing.

At sea level, the airplane and its installed equipment is certificated for operation in ambient temperatures ranging between  $-30^{\circ}\text{C}$  ( $-22^{\circ}\text{F}$ ) and  $+50^{\circ}\text{C}$  ( $122^{\circ}\text{F}$ ). The airplane pressurization system is certificated for operations up to a maximum pressure altitude of 51,000 feet.

AIRPLANE DIMENSION SCHEMATIC



GF0110\_002

**DIMENSIONS AND GENERAL DATA**

The data that follows is for general information only and is not to be used for inspection or rejection purposes. When specific data is required, the applicable illustration should be used.

**Overall dimension**

Length	99 ft. 5 in.	(30.30 m)
Height	24 ft. 10 in.	(7.57 m)

**Wing**

Span	93 ft. 6 in.	(28.5 m)
Root chord (BL 47.61)	21 ft. 1 in.	(6.43 m)
Tip chord (W/STA 544)	4 ft. 1 in.	(1.24 m)
Dihedral of Wing Ref. Plane	2.5°	

**Spar locations**

Front	14.0%	
Rear	67.0%	
Flaps	3 per side	Single Slotted Fowler Flaps
Slats	4 L.E. segments per side	
Ground spoilers	2 per side	
Multi-function spoilers	4 per side	

**Horizontal tail surface**

Span	31 ft. 9 in.	(9.68 m)
Root chord	10 ft. 5 in.	(3.18 m)
Tip chord	5 ft.	(1.52 m)
Anhedral	5.0°	

**Vertical tail surface**

Span	13 ft. 9 in.	(4.19 m)
Root chord	16 ft. 7 in.	(5.05 m)
Tip chord	10 ft. 7 in.	(3.22 m)

**Fuselage**

Diameter	8 ft. 10 in.	(2.69 m)
Length	86 ft. 5 in.	(26.34 m)

**Landing gear**

	Main gear	Nose gear
Wheel size	19 in.	10 in.

**DIMENSIONS AND GENERAL DATA (CONT'D)**

**Landing gear (Cont'd)**

Tire size	38 in.	21 in.
Max loaded tire pressure	172 psi.	154 psi
Main gear track	13 ft. 4 in. (4.06 m)	
Nose gear track	13.14 in. (33.4 cm)	
Wheel base (max.)	42 ft. 10 in. (13.06 m)	

**Areas**

Equivalent wing area (including ailerons, flaps spoilers and area within the fuselage)	1022 sq. ft.	(94.95 sq. m)
Horizontal tail area (Gross)	245 sq. ft.	(22.76 sq. m)
Vertical tail area (Gross)	186 sq. ft.	(17.28 sq. m)

**Doors**

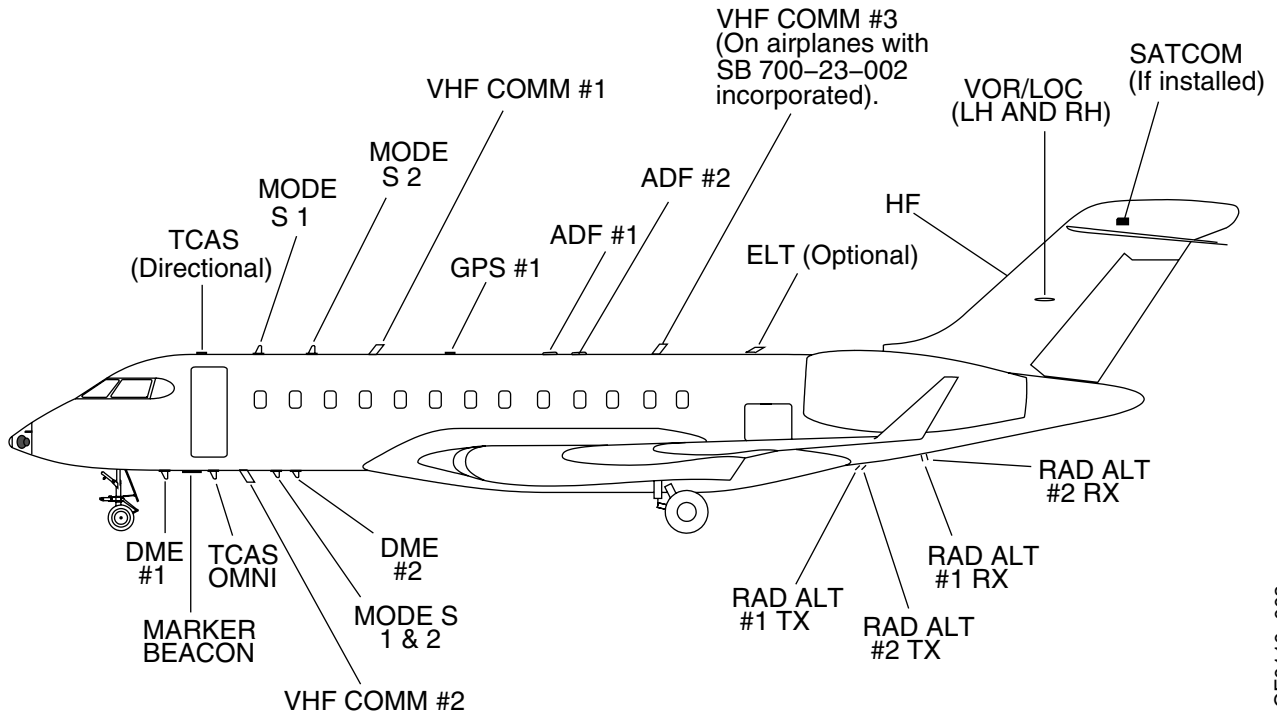
Passenger door (LH. fwd)

Height to sill (one step below the floor line)	6 ft. 2 in.	(188 m)
Width	3 ft.	(0.91 m)
Height to sill (at floor line)	5 ft. 4 in.	(163 m)

**Baggage compartment door (LH, aft)**

Height	2 ft. 9 in.	(0.84 m)
Width	3 ft. 7 in.	(1.09 m)
Height to sill (floor line)	6 ft. 7 in.	(2.01 m)

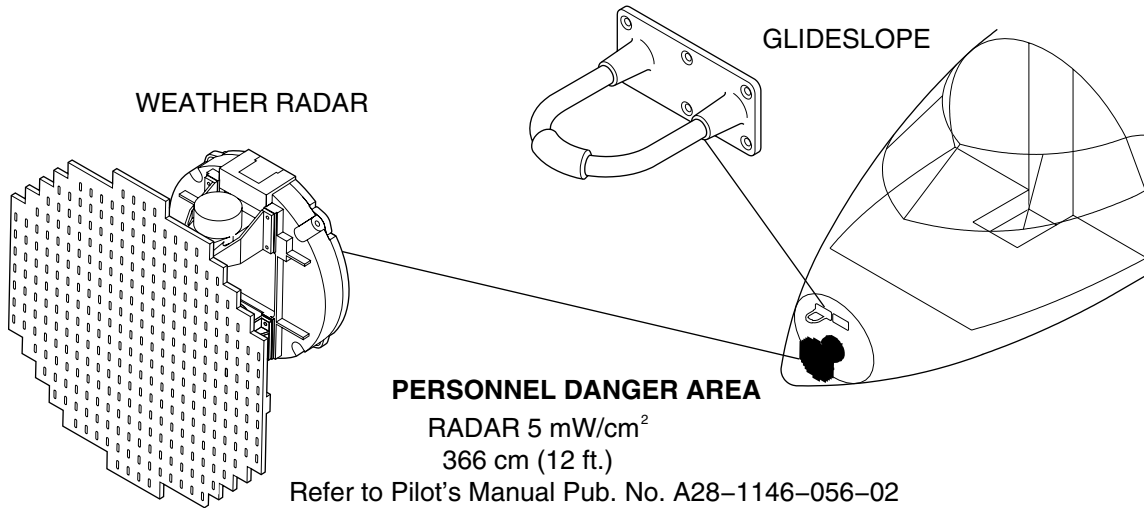
ANTENNA LOCATION SCHEMATIC



**WARNING**



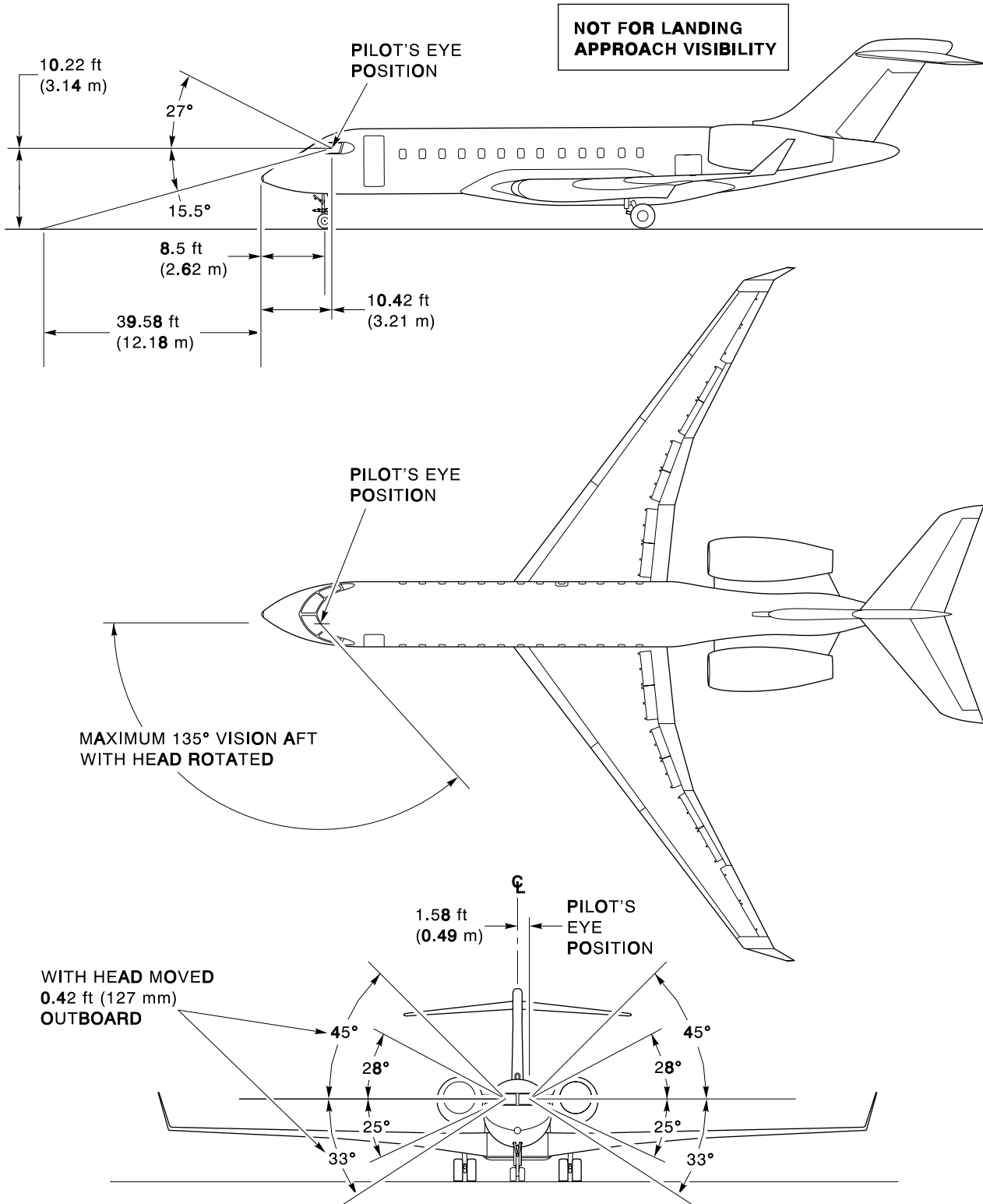
Personnel should not stand nearby or in front of the radar antenna when it is transmitting.



GF0110\_003

GF0110\_004

VISUAL EYE REFERENCES FOR GROUND OPERATION



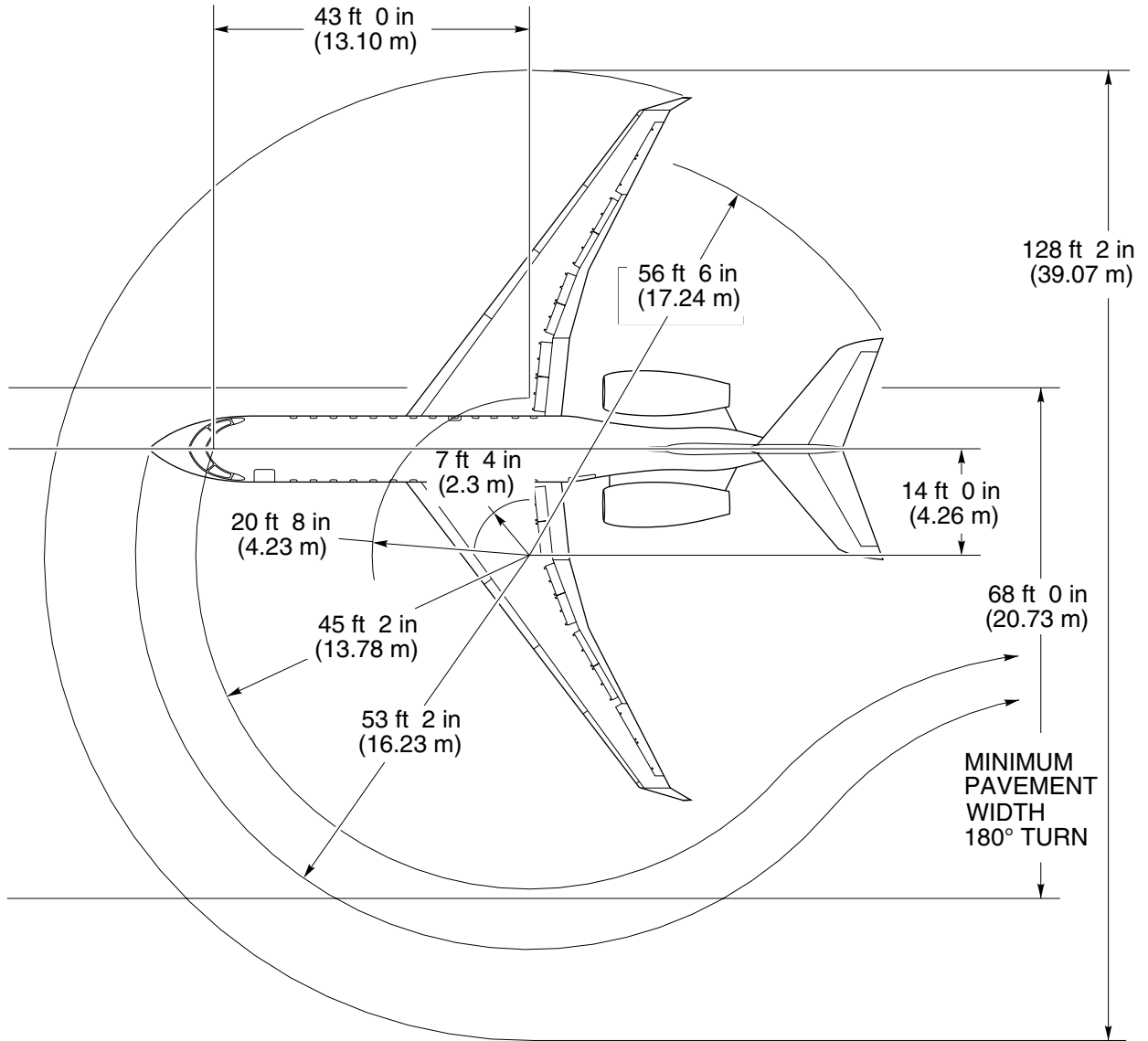
GF0110\_005



**STEERING RADII**

Steering radii are shown below.

**STEERING RADII SCHEMATIC**



**NOTE**

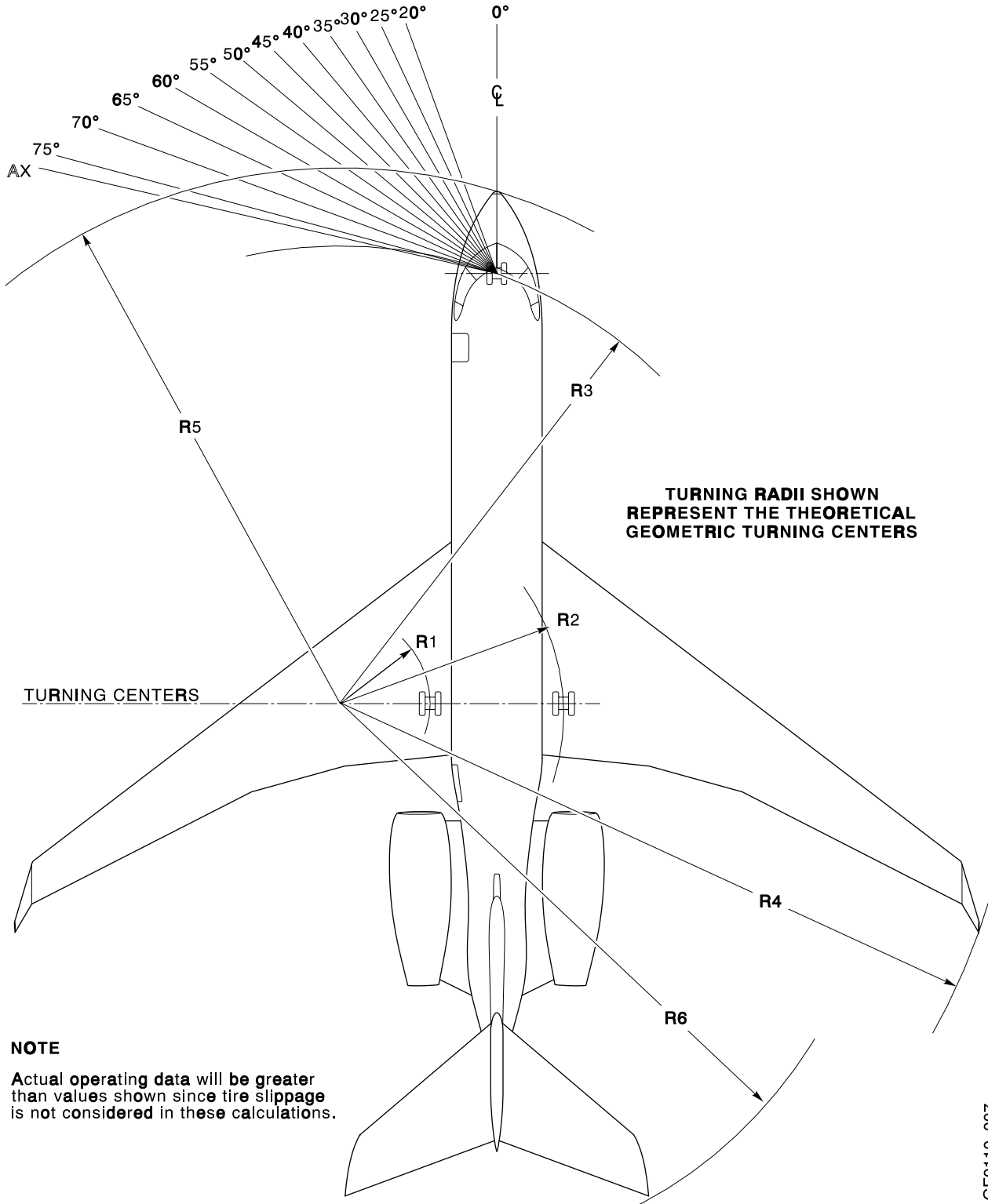
- Maximum steering
- Symmetrical and idle thrust
- No differential braking
- 75° steering angle
- 3° slip
- Dry runway
- Slow continuous turn
- Max A/C weight
- AFT CG.

GF0110\_006a

**TURNING RADII**

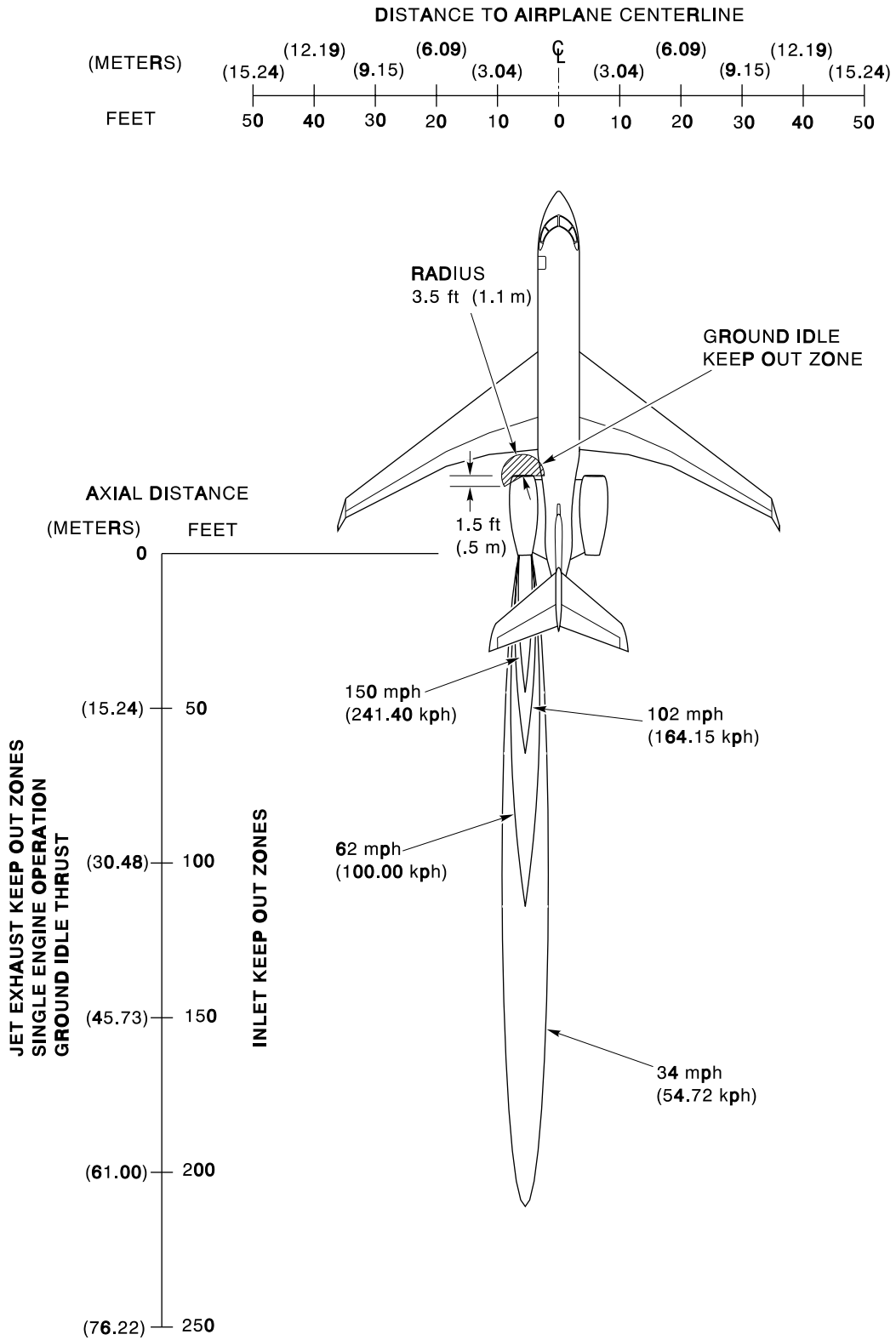
Minimum paving width for 180° turn – 68 ft. (20.76 m)

**TURNING RADII SCHEMATIC**



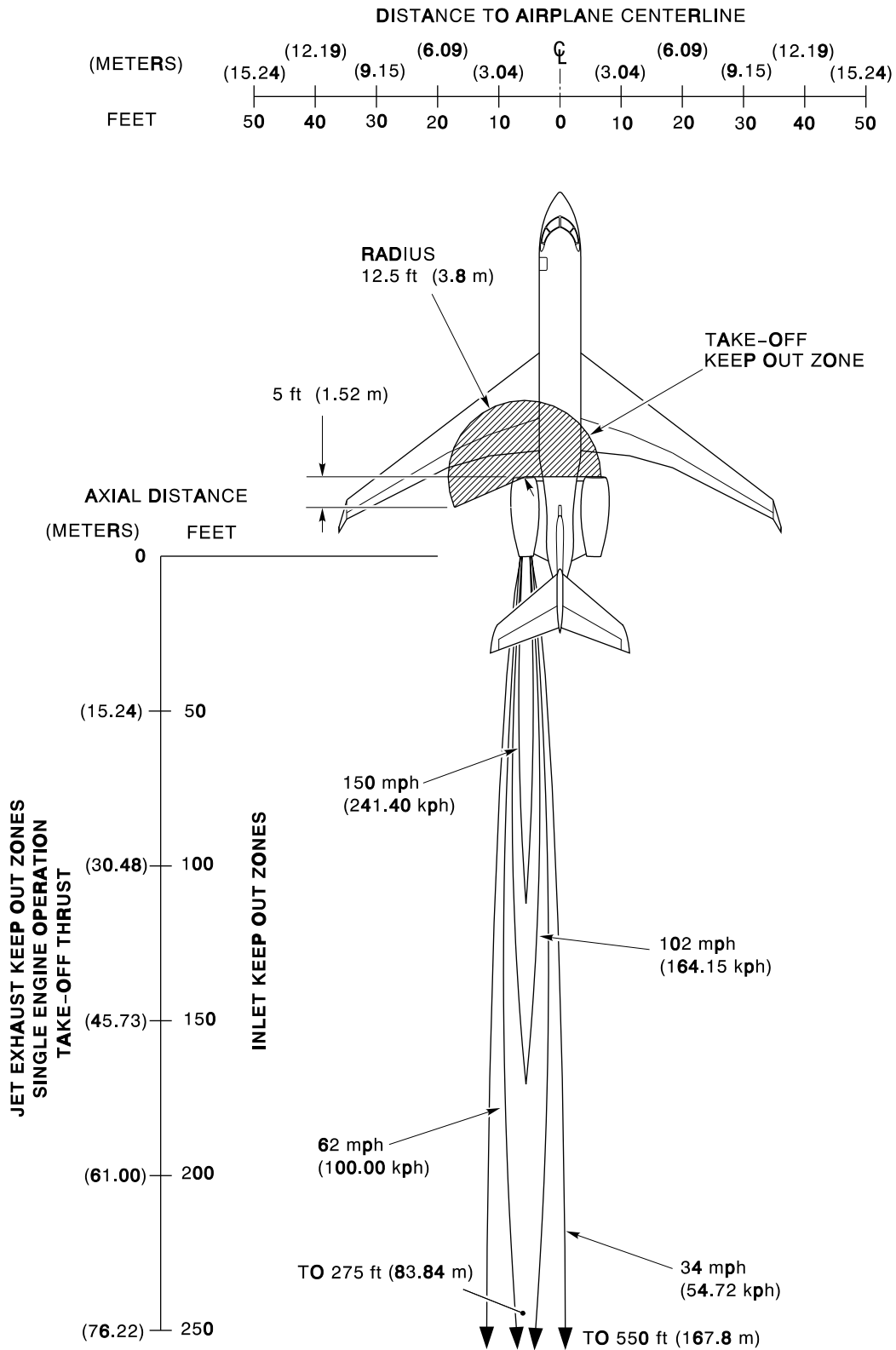
GF0110\_007

JET EXHAUST SINGLE ENGINE GROUND IDLE THRUST



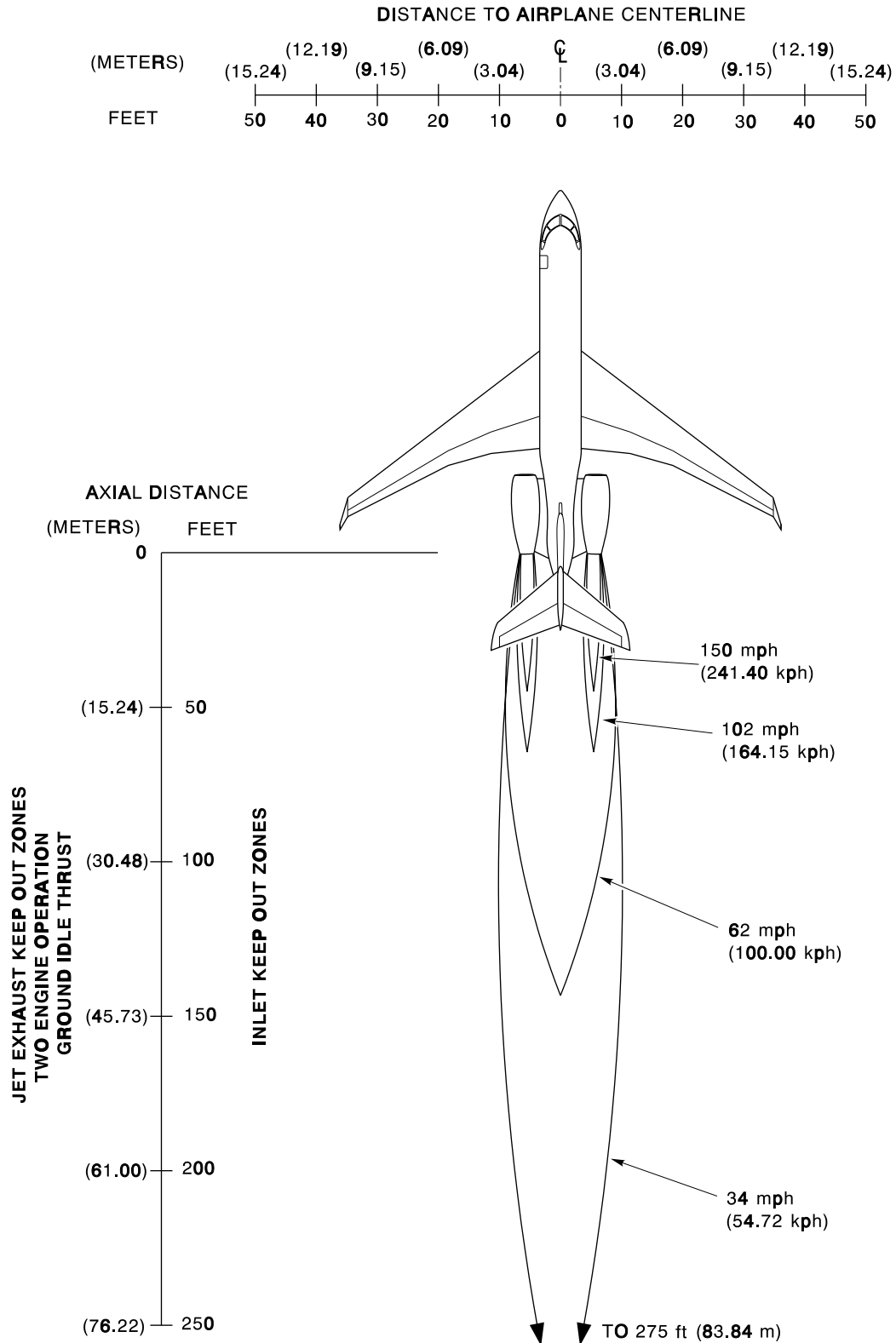
GF0110\_008

**JET EXHAUST SINGLE ENGINE TAKE-OFF THRUST**



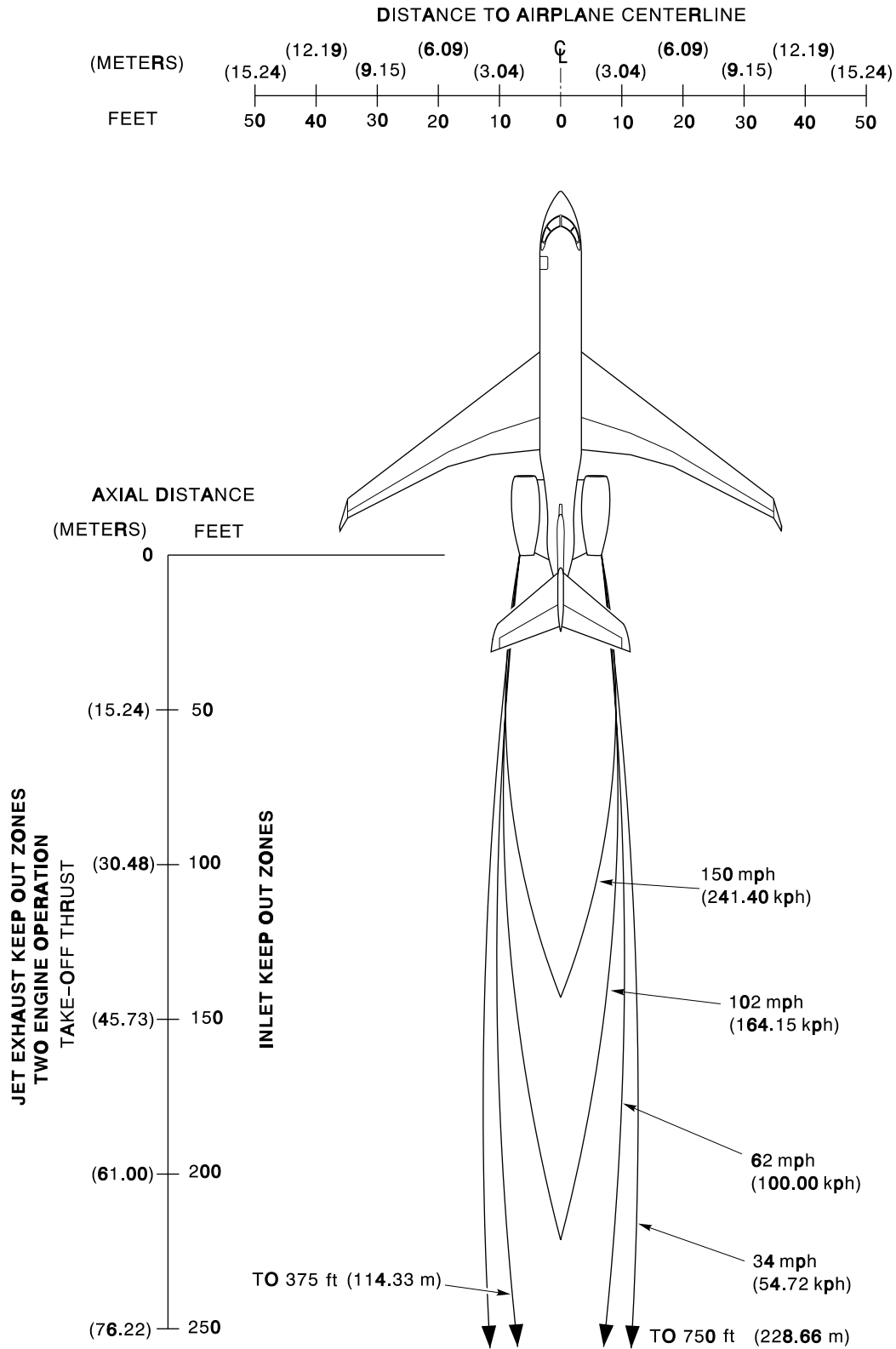
GF0110\_009

**JET EXHAUST TWO ENGINE GROUND IDLE THRUST**



GF0110\_010

**JET EXHAUST TWO ENGINE TAKE-OFF THRUST**

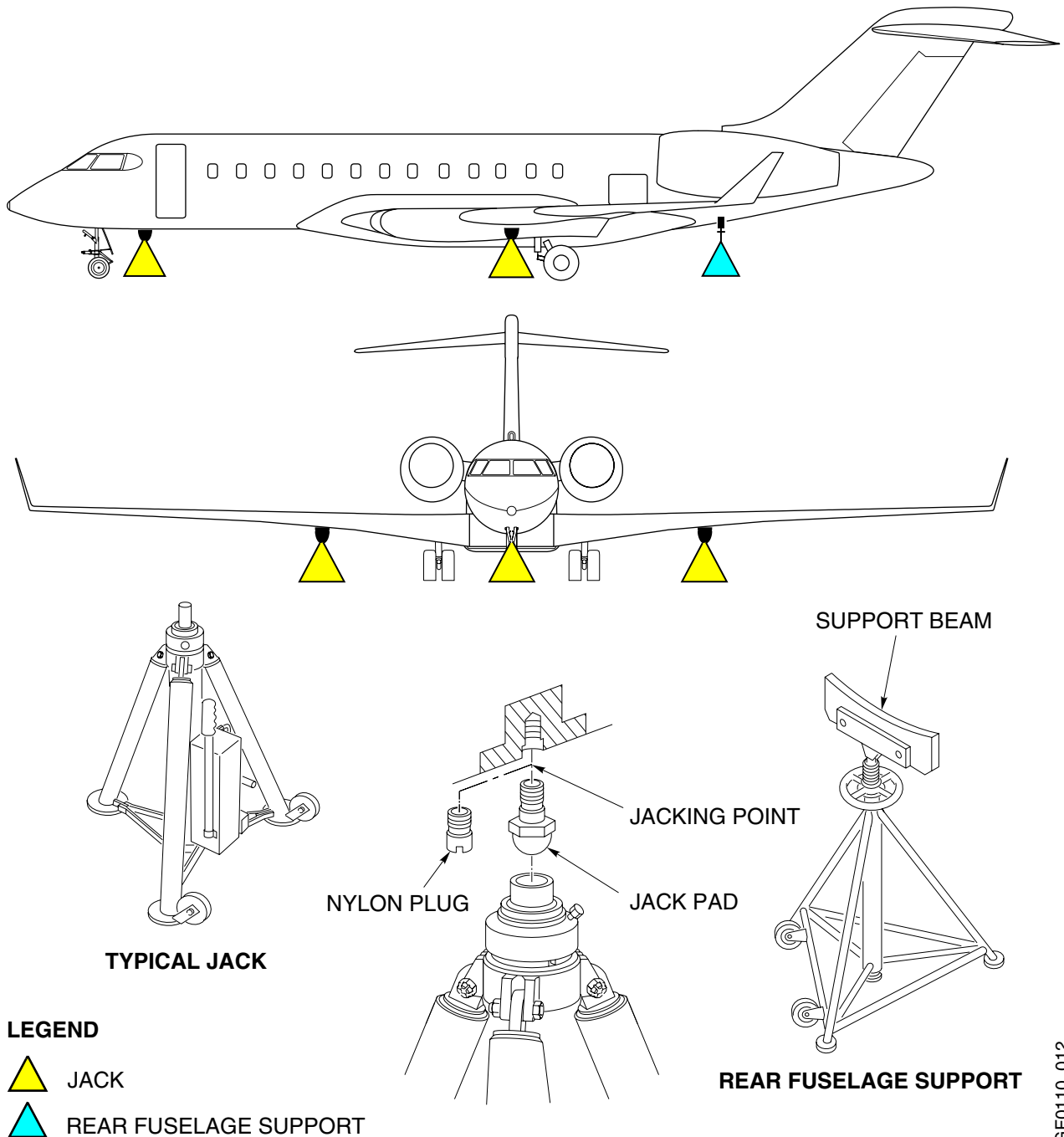


GF0110\_011

**AIRPLANE JACKING**

Three jacking points are provided, one on the forward fuselage and one on each wing rear spar for jacking the complete airplane.

**JACKING POINTS SCHEMATIC**



GF0110\_012

The nose jacking point is located on the fuselage centerline. Gear jacking points are also provided for tire/wheel/brake changes. Jacking procedures are located in the Aircraft Maintenance Manual (Chapter 07).

**TOWING**

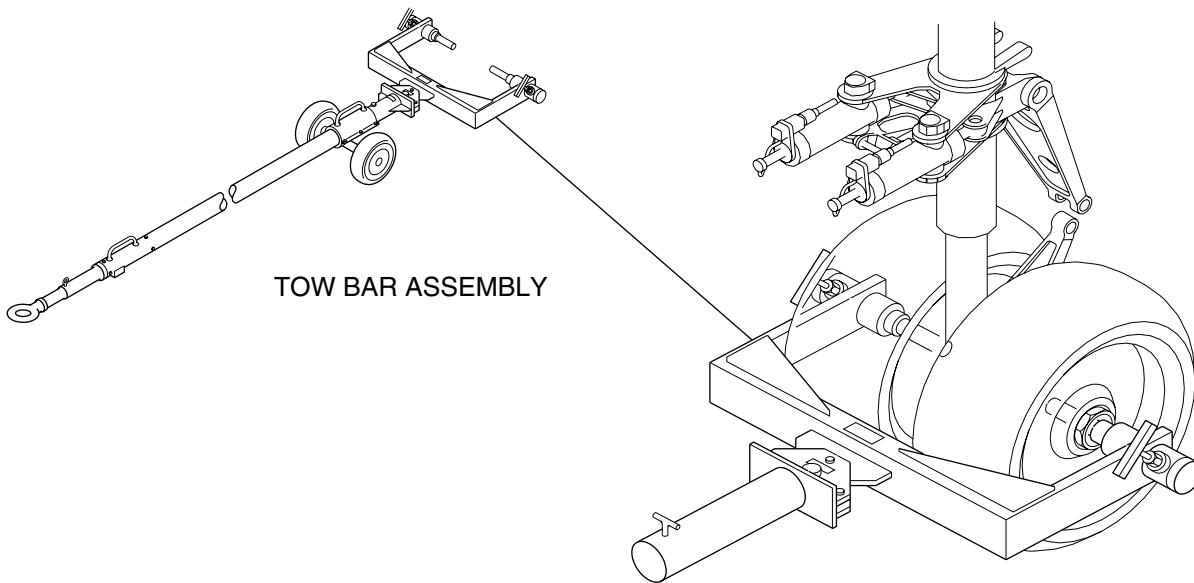
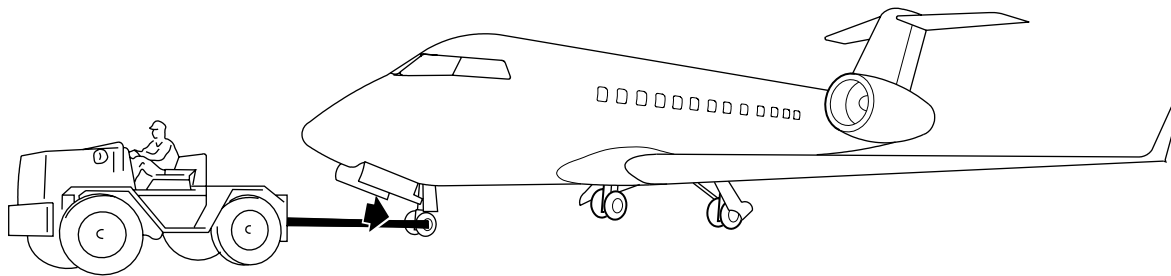
A fitting for towing or pushing the airplane is located on the nose landing gear.

During towing, nose wheel swivel through the range of  $\pm 75^\circ$  each side of center is possible, without disconnecting the nose wheel steering torque links. The Aircraft Maintenance Manual (Chapter 09) has a detailed description of towing operations.

**NOTE**

Disconnecting the nose wheel steering torque links is recommended for all towing operations.

**TOW BAR ATTACHMENT SCHEMATIC**



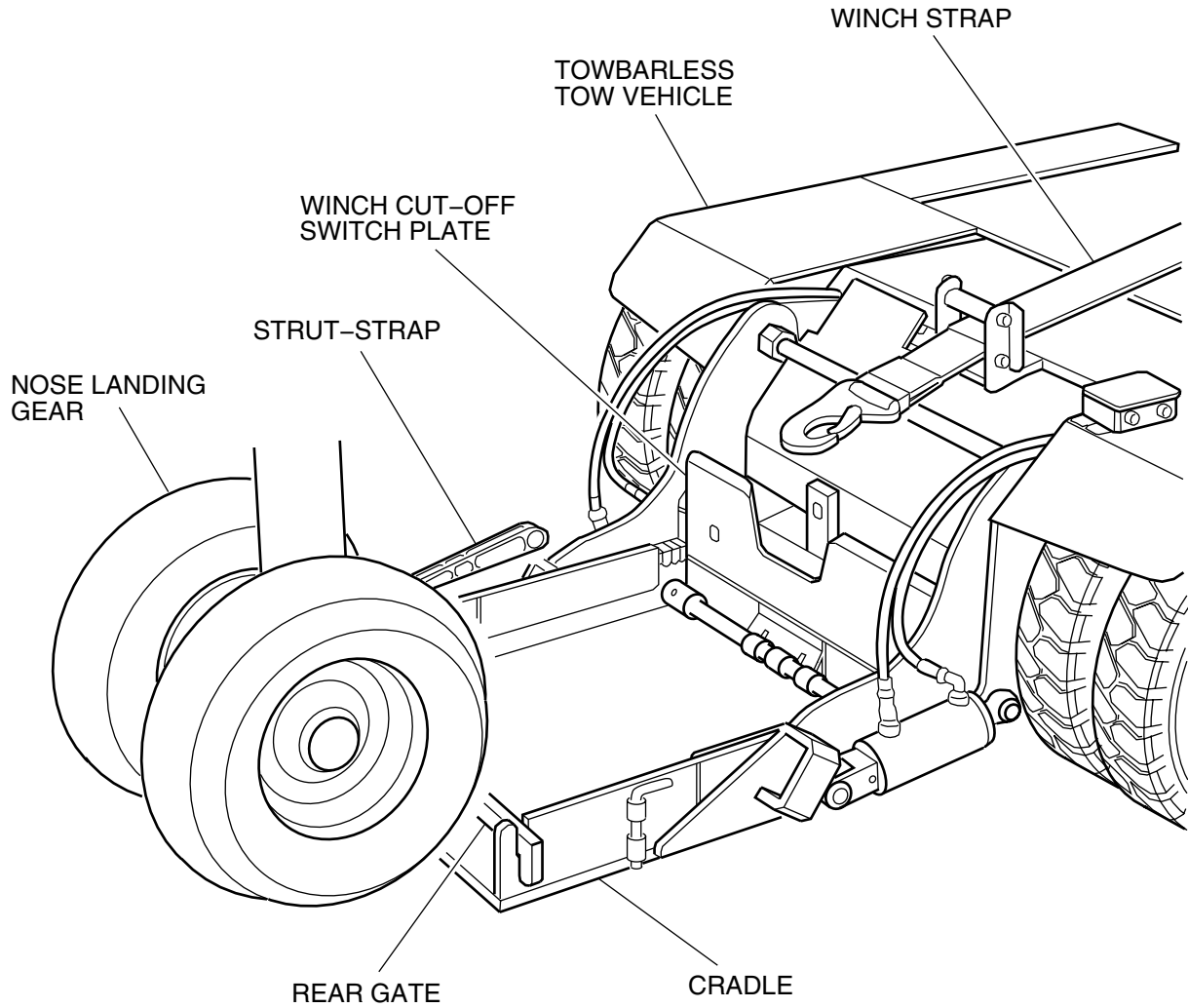
**Ground Locking Safety Pins**

Ground safety locks are provided for the nose and each main gear, gear doors and for the Ram Air Turbine (RAT). Refer to the applicable chapter for the safety pin installations.



TOW BAR ATTACHMENT SCHEMATIC (CONT'D)

I Towbarless Vehicle

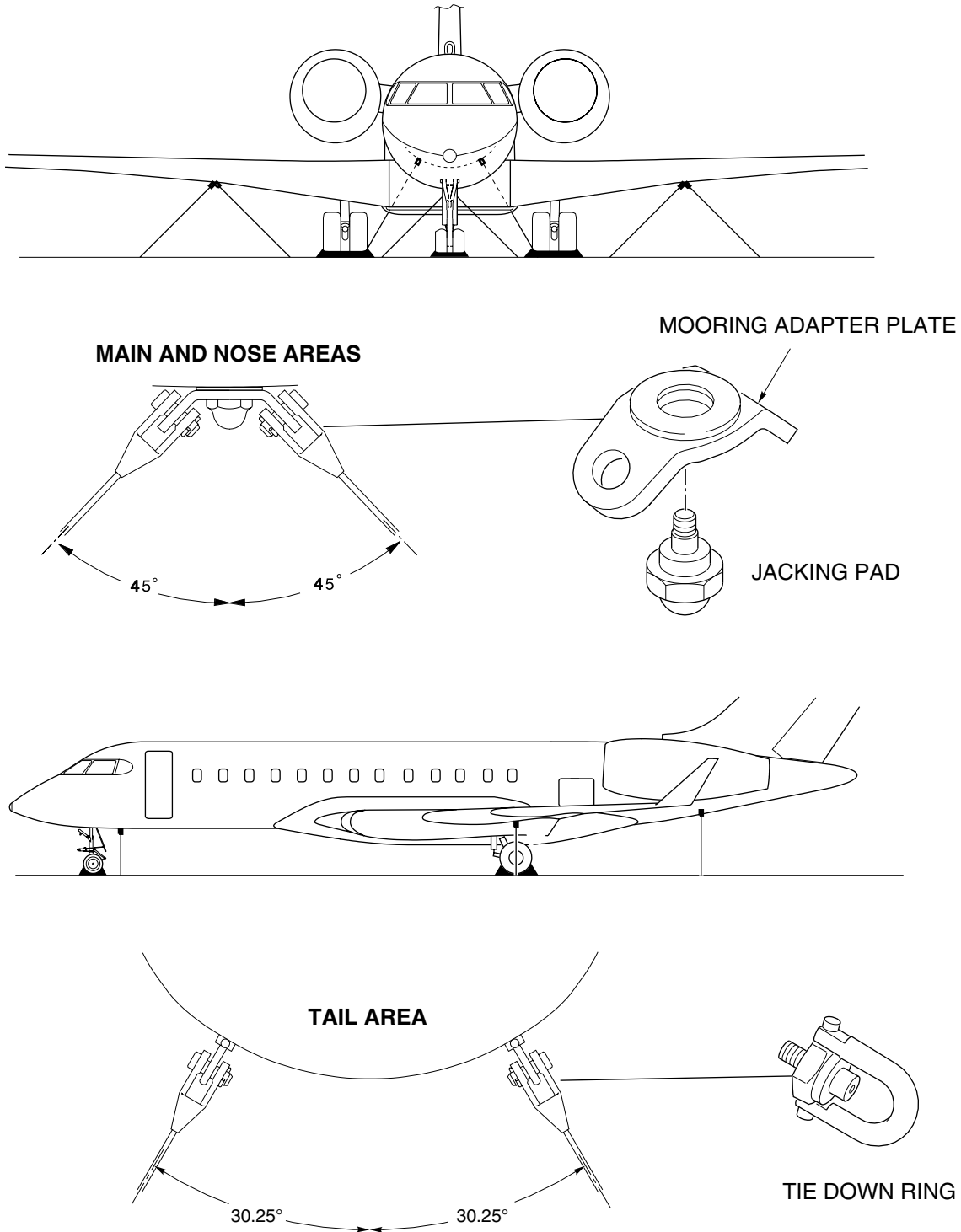


FGF0110\_013

## MOORING

Fittings are provided on the fuselage and on the wing jacking points for mooring the airplane. Mooring procedures are located in the Aircraft Maintenance Manual (Chapter 10).

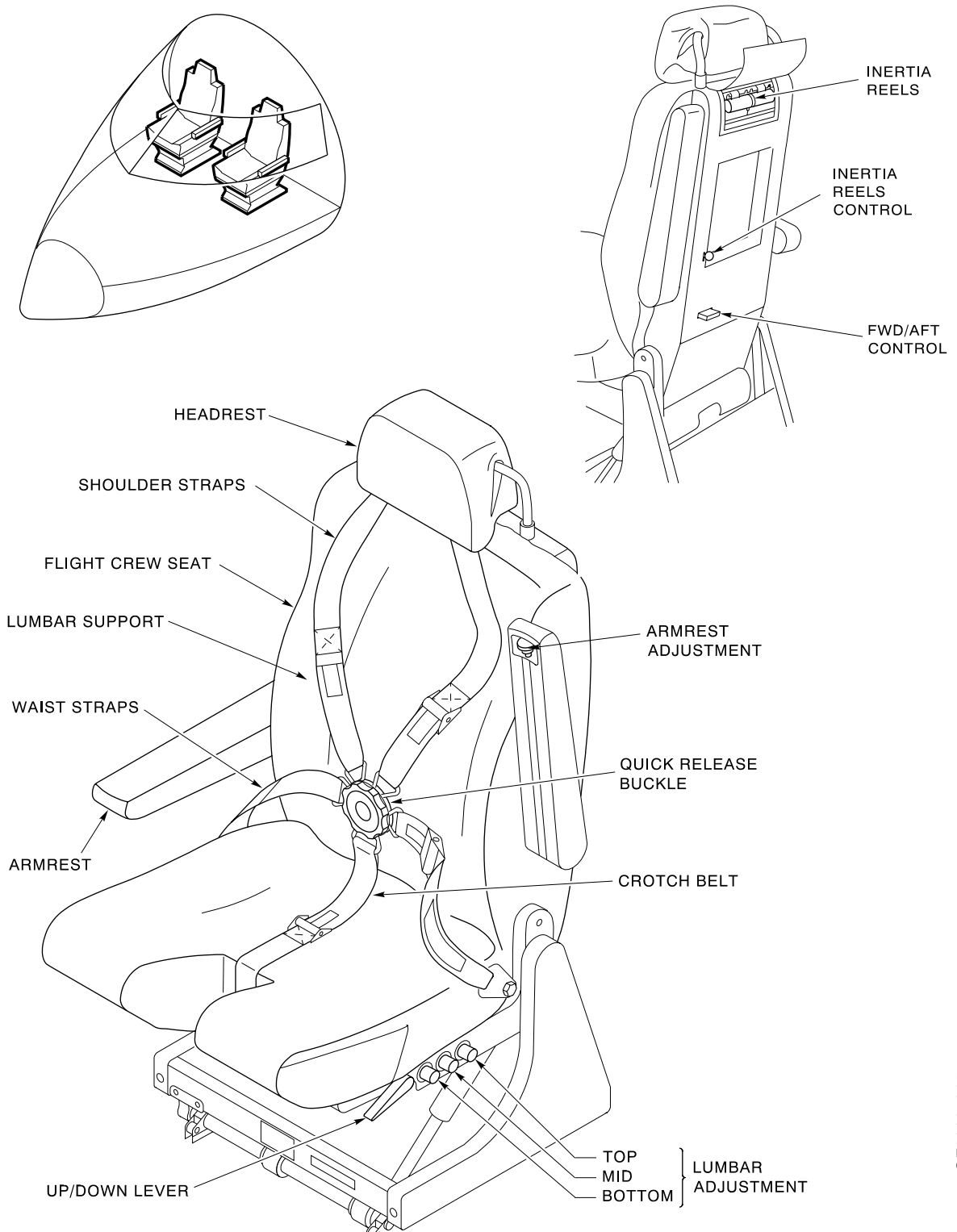
### MOORING ATTACHMENT POINTS SCHEMATIC



GF0110\_014

**SEAT ASSEMBLY**

The crew seats provide adjustments fore and aft, inboard/outboard lateral adjustment ("J" track), height and armrest position.



GF0110\_015a

## SEAT ASSEMBLY (CONT'D)

### Seat Egression

Make sure the seat is in the fully upright position, then pull on the fore/aft lever and move the seat to its fully aft position.

#### NOTE

The lateral tracking is now automatically enabled.



Do not try to move the seat laterally with the fore/aft lever in the up position. This could cause damage to the mechanism.

Release the fore/aft lever.

Move the seat to its fully outboard position to facilitate egress from the seat.

### Moving the Seat Forward



If the seat is moved forward when it is not in its fully inboard position, it can jam.

After getting back onto the seat, before touching the fore/aft lever, move the seat laterally to its fully inboard position.

#### NOTE

There is no mechanical lock to keep the seat in its position until you move it forward.

Keeping the seat in its fully inboard position, raise the fore/aft lever to move the seat forward. The seat must be moved forward at least one inch (2.54 cm) before the lateral tracking latch is automatically locked. Release the lever when the desired forward position is reached.

#### NOTE

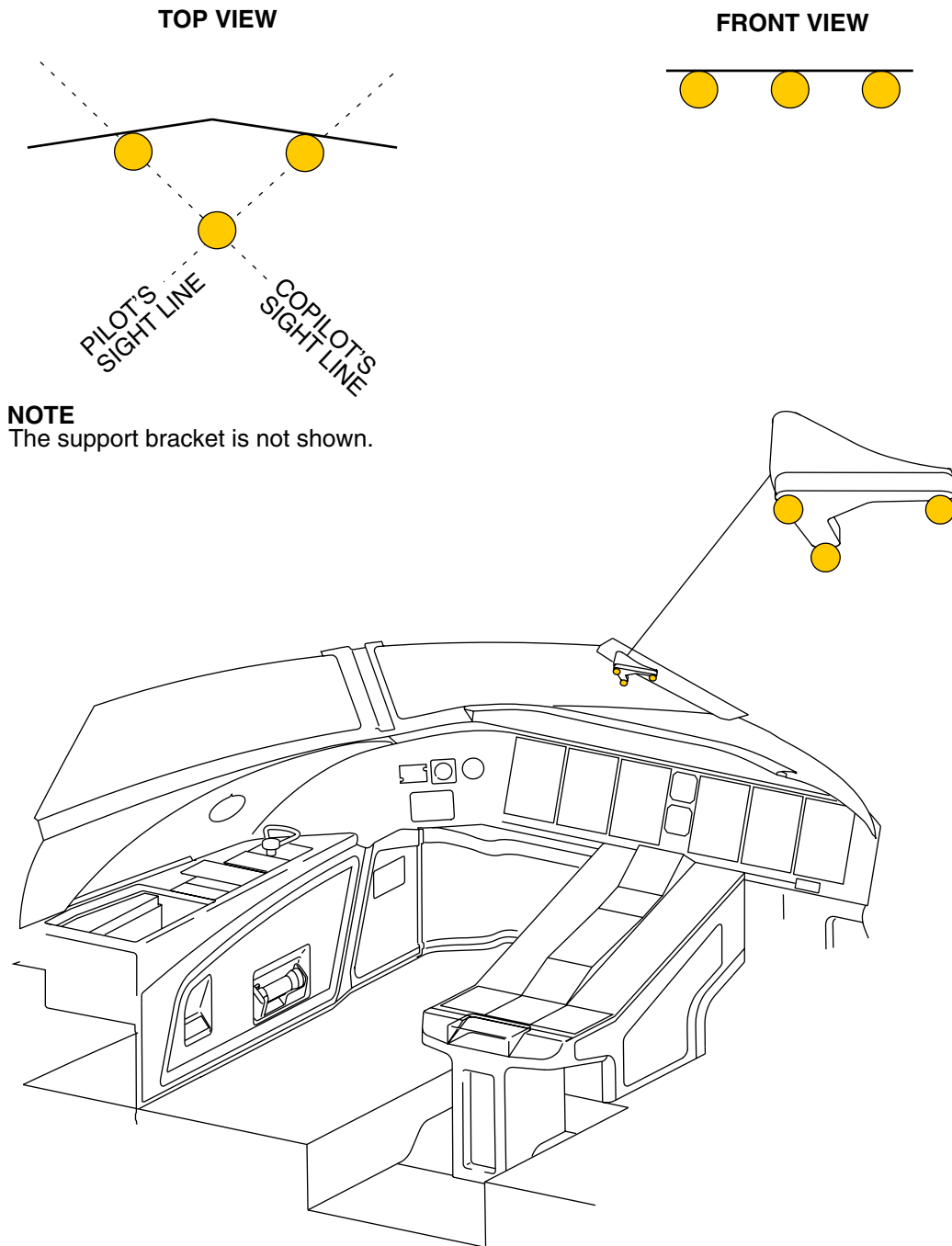
When the seat moves forward, the lateral tracking mechanism is disabled, and the seat should not move laterally.



If the seat jams or moves laterally when it is not in its fully aft position, do not attempt to reset it using force, as damage to the mechanism may occur. Call a maintenance technician for troubleshooting and repair.

### EYE LOCATOR-SEAT ADJUSTMENT

An eye locator is mounted on the centre windshield post to enable seat adjustment for correct eye-to-wheel height.



**NOTE**  
The support bracket is not shown.

GF0110\_016

## CONTROL WHEEL

The pilot and copilot control wheels contain the following switches:

- Master disconnect.
- Pitch Trim Switch.
- Autopilot/Flight Director Touch Control.
- Radio Key.

### Master Disconnect

The Master Disconnect switch disengages the autopilot, deactivates the stick pusher and the pitch trim. When released, the stick pusher and the pitch trim system are immediately reactivated but the autopilot remains disengaged.

### Pitch Trim Switch

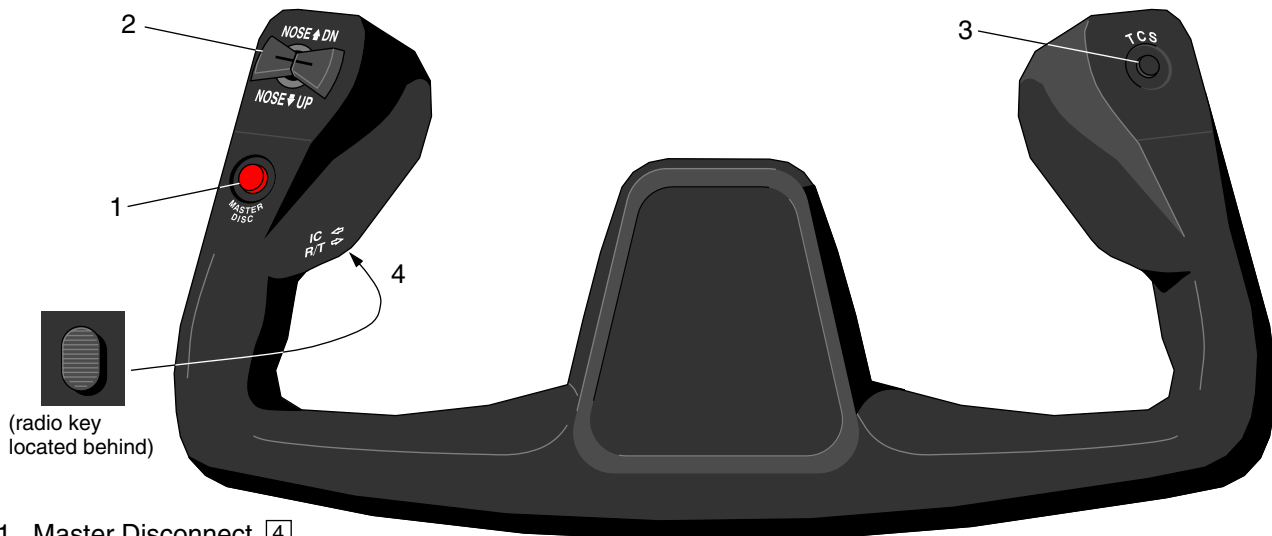
The Pitch Trim Switch enables the pilot/copilot to control the trim from each control wheel.

### Autopilot/Flight Director (Touch Control)

The Touch Control Switch (TCS) is located on the control wheel. It enables the pilot to maneuver the airplane without disconnecting the autopilot control.

### Radio Key

The Radio Key activates the selected radio transmitter.

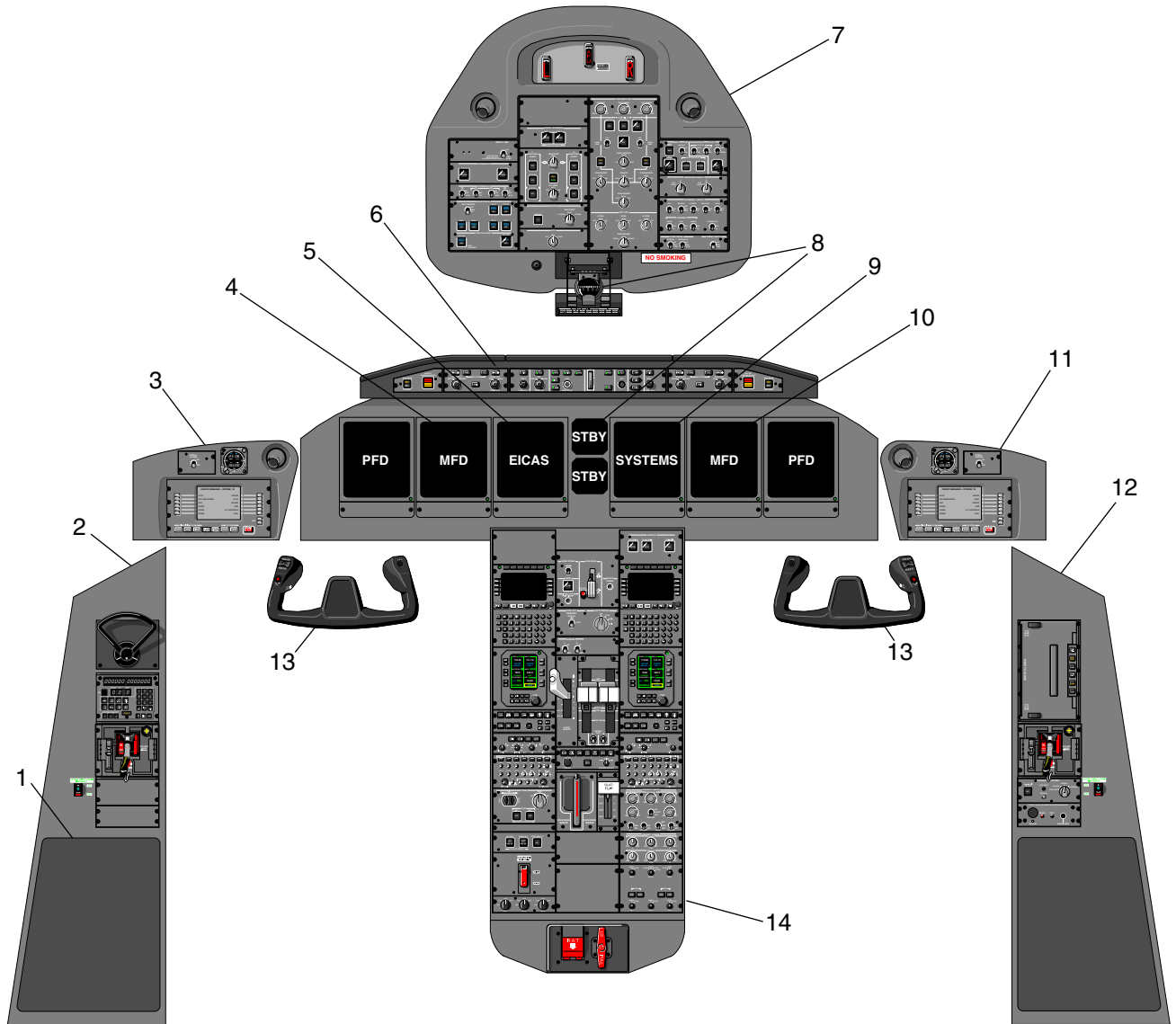


1. Master Disconnect  4
2. Pitch Trim Switch  10
3. Autopilot/Flight Director Touch Control  4
4. Radio Key  6

Indicates Chapter in which information on item may be found.

GF0110\_017

FLIGHT COMPARTMENT GENERAL ARRANGEMENT

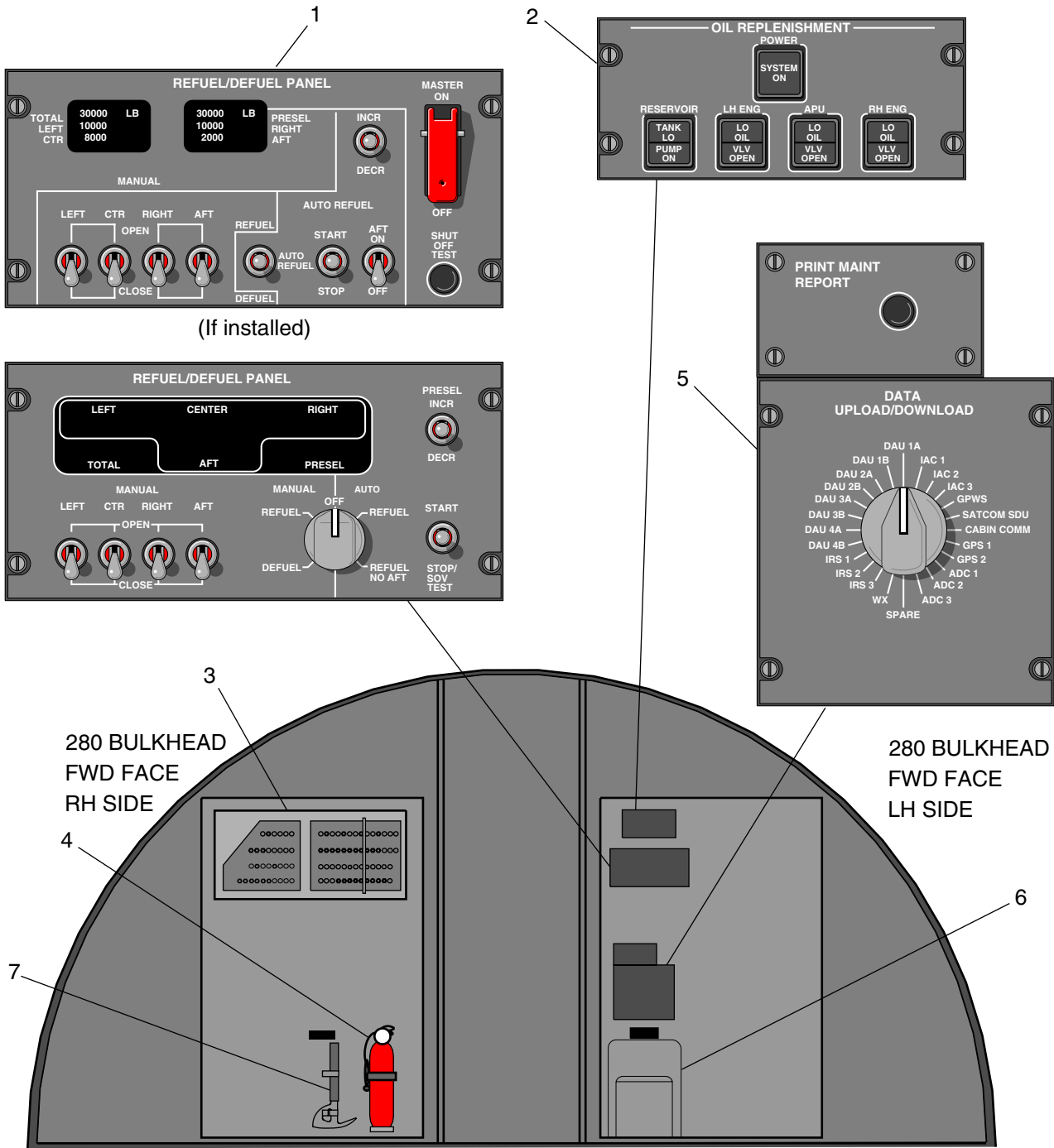


- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>1. Flight Bag Storage</li> <li>2. Pilot's Side Console [ 8 ] [ 15 ] [ 17 ]</li> <li>3. Pilot's Side Panel [ 7 ] [ 10 ] [ 11 ]</li> <li>4. Pilot's Instrument Panel [ 11 ] [ 17 ]</li> <li>5. EICAS Display [ 3 ]</li> <li>6. Glareshield [ 3 ] [ 4 ] [ 10 ]</li> <li>7. Overhead Panel [ 2 ] [ 3 ] [ 5 ] [ 7 ] [ 9 ]<br/>[ 12 ] [ 13 ] [ 14 ] [ 16 ] [ 18 ]</li> </ul> | <ul style="list-style-type: none"> <li>8. Standby Instruments [ 11 ]</li> <li>9. Systems Display [ 2 ] [ 3 ] [ 7 ] [ 10 ] [ 12 ] [ 13 ] [ 18 ]</li> <li>10. Copilot's Instrument Panel [ 11 ] [ 17 ]</li> <li>11. Copilot's Side Panel [ 7 ] [ 10 ] [ 11 ]</li> <li>12. Copilot's Side Console [ 6 ] [ 8 ] [ 15 ] [ 17 ]</li> <li>13. Control Wheel [ 4 ] [ 6 ] [ 10 ]</li> <li>14. Pedestal [ 3 ] [ 6 ] [ 7 ] [ 10 ] [ 11 ]<br/>[ 15 ] [ 16 ] [ 17 ] [ 18 ]</li> </ul> |
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Indicates Chapter in which information on item may be found.

GF0110\_018

FLIGHT COMPARTMENT (AFT VIEW)



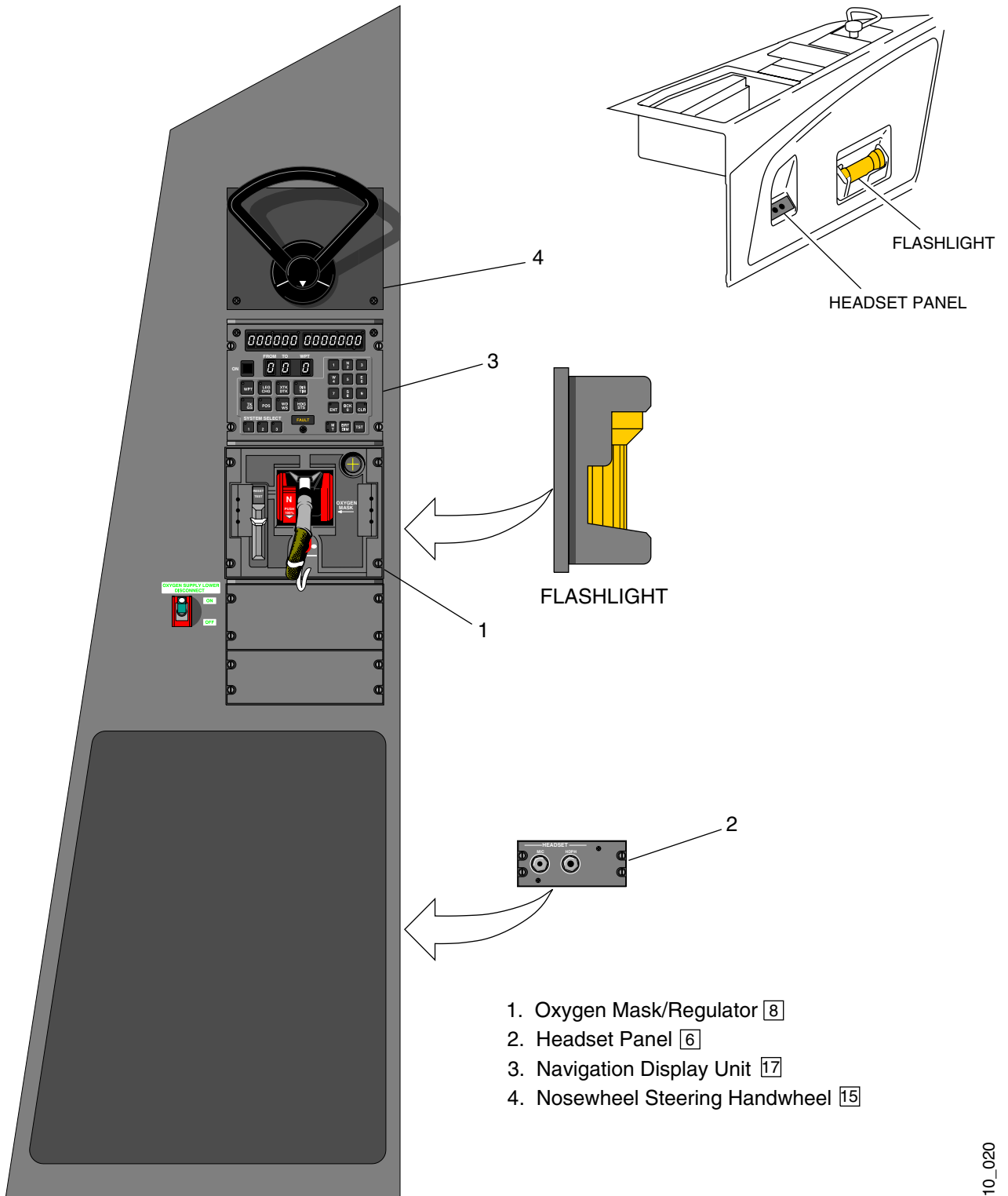
- 1. Refuel/Defuel Panel 12
- 2. Oil Replenishment Panel 18
- 3. Circuit Breaker Panel 7
- 4. Halon Fire Extinguisher 8
- 5. Data Upload/Download Panel 6
- 6. Portable Breathing Equipment 8
- 7. Crash Axe 8

Indicates Chapter in which information on item may be found.

GF0110\_019



PILOT'S SIDE CONSOLE

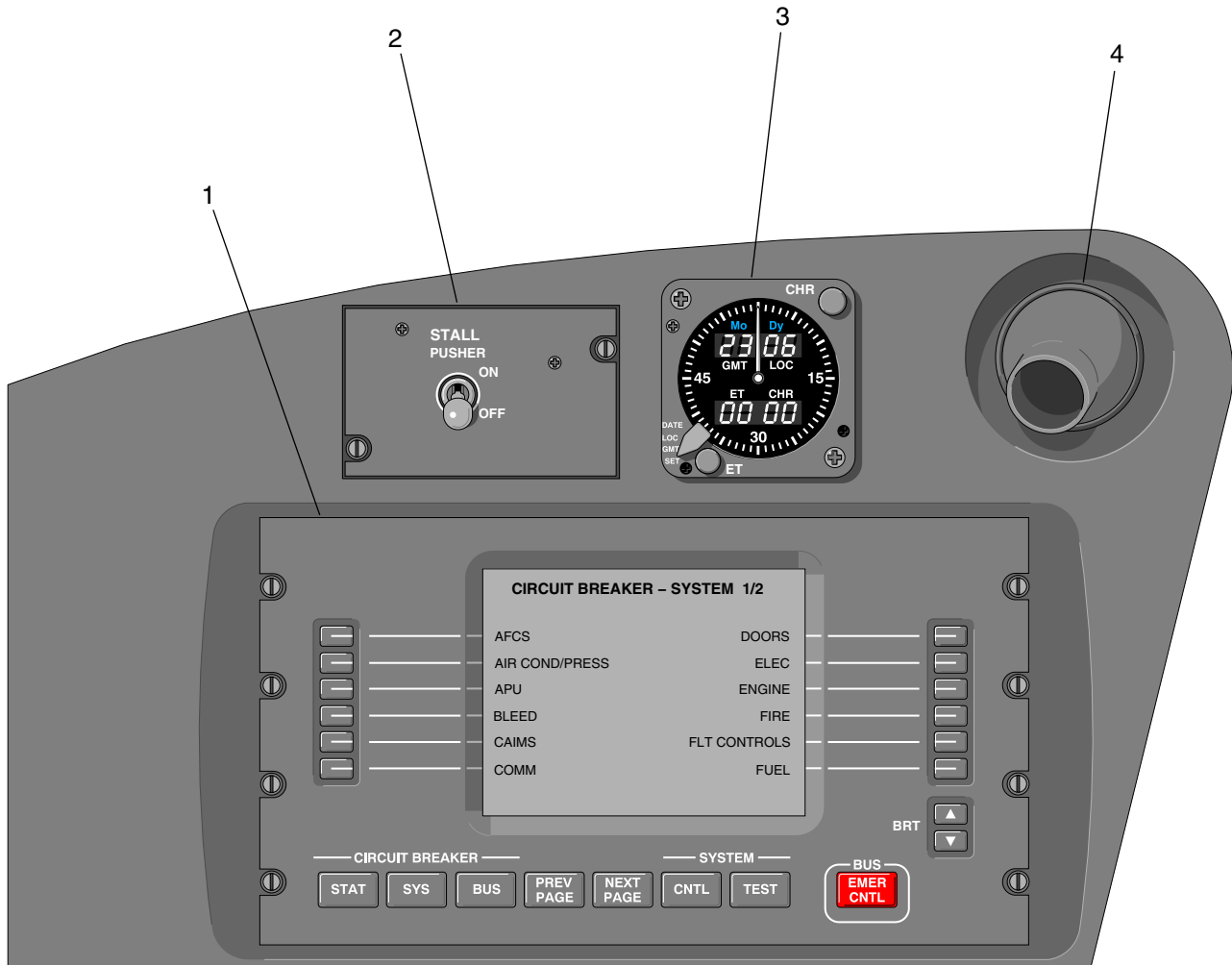


- 1. Oxygen Mask/Regulator [8]
- 2. Headset Panel [6]
- 3. Navigation Display Unit [17]
- 4. Nosewheel Steering Handwheel [15]

Indicates Chapter in which information on item may be found.

GF0110\_020

PILOT'S SIDE PANEL

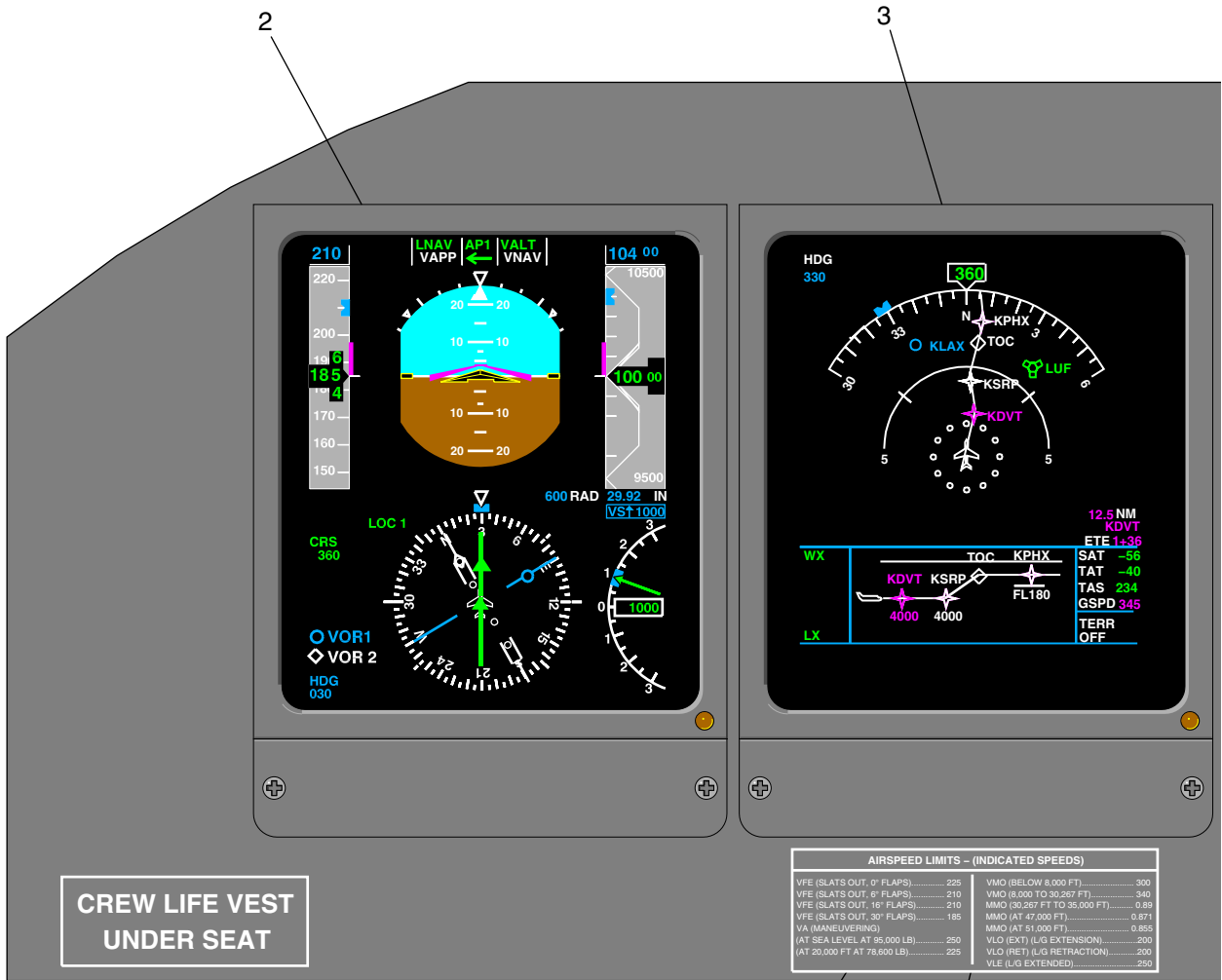


1. Electrical Management System 7
2. Stall Pusher Switch 10
3. Clock 11
4. Air Conditioning Gasper 2

Indicates Chapter in which information on item may be found.

GF0110\_021

PILOT'S INSTRUMENT PANEL



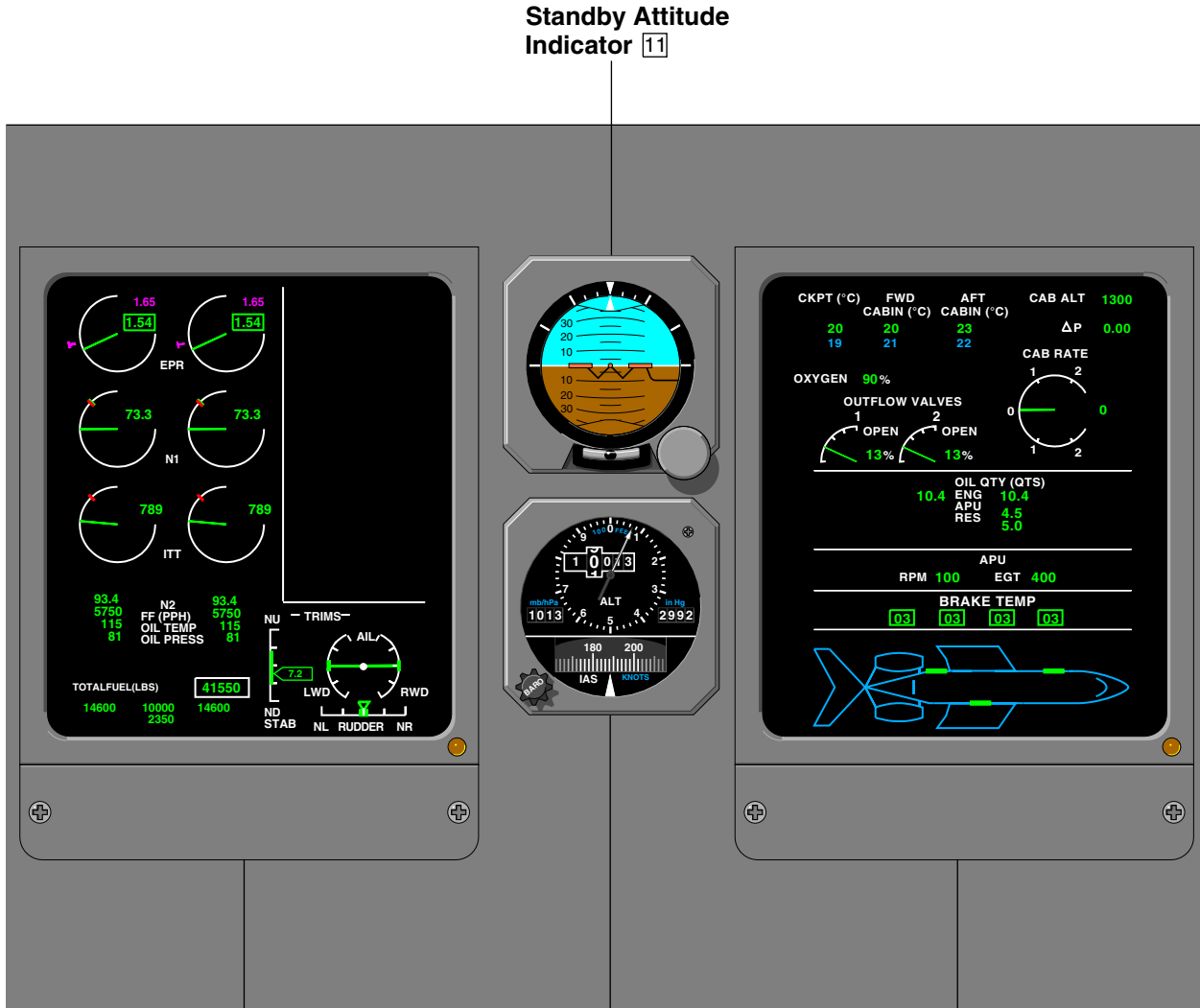
1. Airspeed Placard
2. Primary Flight Display 11 17
3. Multi-Functional Display 11 17
  - MAP Mode
  - PLAN Format
  - WX Radar
  - TCAS Traffic

AIRSPEED LIMITS - (INDICATED SPEEDS)	
VFE (SLATS OUT, 0° FLAPS).....	225
VFE (SLATS OUT, 6° FLAPS).....	210
VFE (SLATS OUT, 16° FLAPS).....	210
VFE (SLATS OUT, 30° FLAPS).....	185
VA (MANEUVERING)	
(AT SEA LEVEL AT 95,000 LB).....	250
(AT 20,000 FT AT 78,600 LB).....	225
VMO (BELOW 8,000 FT).....	300
VMO (8,000 TO 30,267 FT).....	340
MMO (30,267 FT TO 35,000 FT).....	0.89
MMO (AT 47,000 FT).....	0.871
MMO (AT 51,000 FT).....	0.855
VLO (EXT) (L/G EXTENSION).....	200
VLO (RET) (L/G RETRACTION).....	200
VLE (L/G EXTENDED).....	250

Indicates Chapter in which information on item may be found.

GF0110\_022

CENTRE INSTRUMENT PANELS



Standby Attitude Indicator 11

Engine Indication and Crew Alerting System (EICAS) Primary Display

Standby Altimeter/  
Airspeed Indicator 11

EICAS System Display

- Engine Instruments 18
- Caution and Warning Annunciator 3
- Fuel Quantity 12
- Flap/Slat and Spoiler Status 10
- Landing Gear Status 15
- Flight Control Trims 10

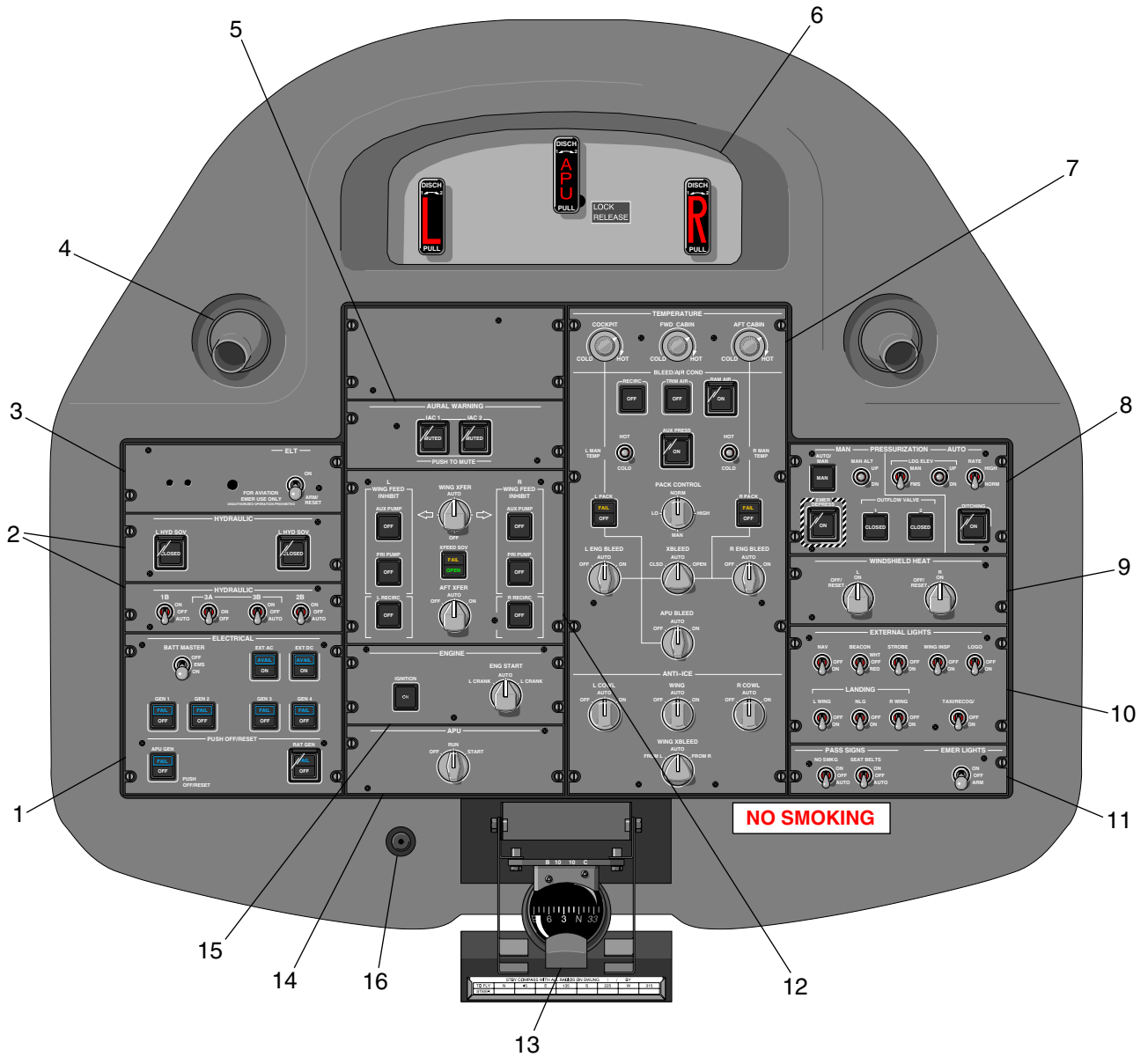
- Airplane Status Information and the following synoptic pages:

- Bleed System 2
- Anti-Ice System 2
- Electrical System (AC and DC) 7
- Fuel System 12
- Flight Controls 10
- Hydraulics 13

  Indicates Chapter in which information on item may be found.

GF0110\_023

OVERHEAD PANEL



- |  |   |
|--|---|
| 1. Electrical Panel [7]                              | 9. Windshield Heat Panel [14]                   |
| 2. Hydraulic Panels [13]                             | 10. External Lights Panel [16]                  |
| 3. ELT Panel [6]                                     | 11. Passenger Signs/Emergency Lights Panel [16] |
| 4. Gasper [2]  | 12. Engine Panel [18]                           |
| 5. Aural Warning Panel [3]                           | 13. Standby Compass [17]                        |
| 6. Fire Discharge Handles [9]                        | 14. APU Panel [5]                               |
| 7. Bleed/Air Conditioning/Anti-Ice Panel [2][14][18] | 15. Fuel Panel [12]                             |
| 8. Pressurization Panel [2]                          | 16. CVR Area Microphone [6]                     |

☐ Indicates Chapter in which information on item may be found.

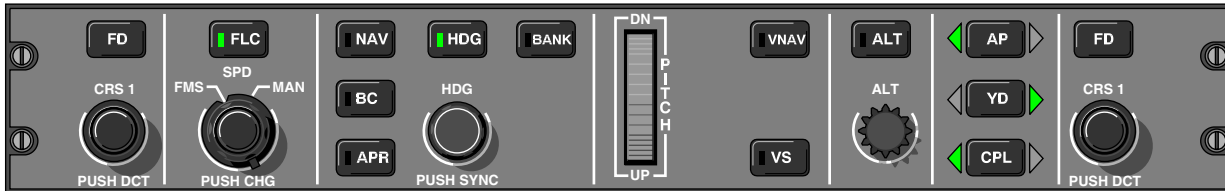
GF0110\_024

GLARESHIELD



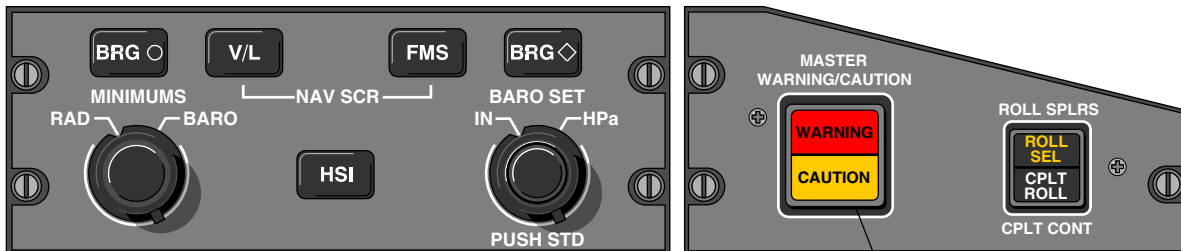
Left Glareshield

2



Centre Glareshield

3



Right Glareshield

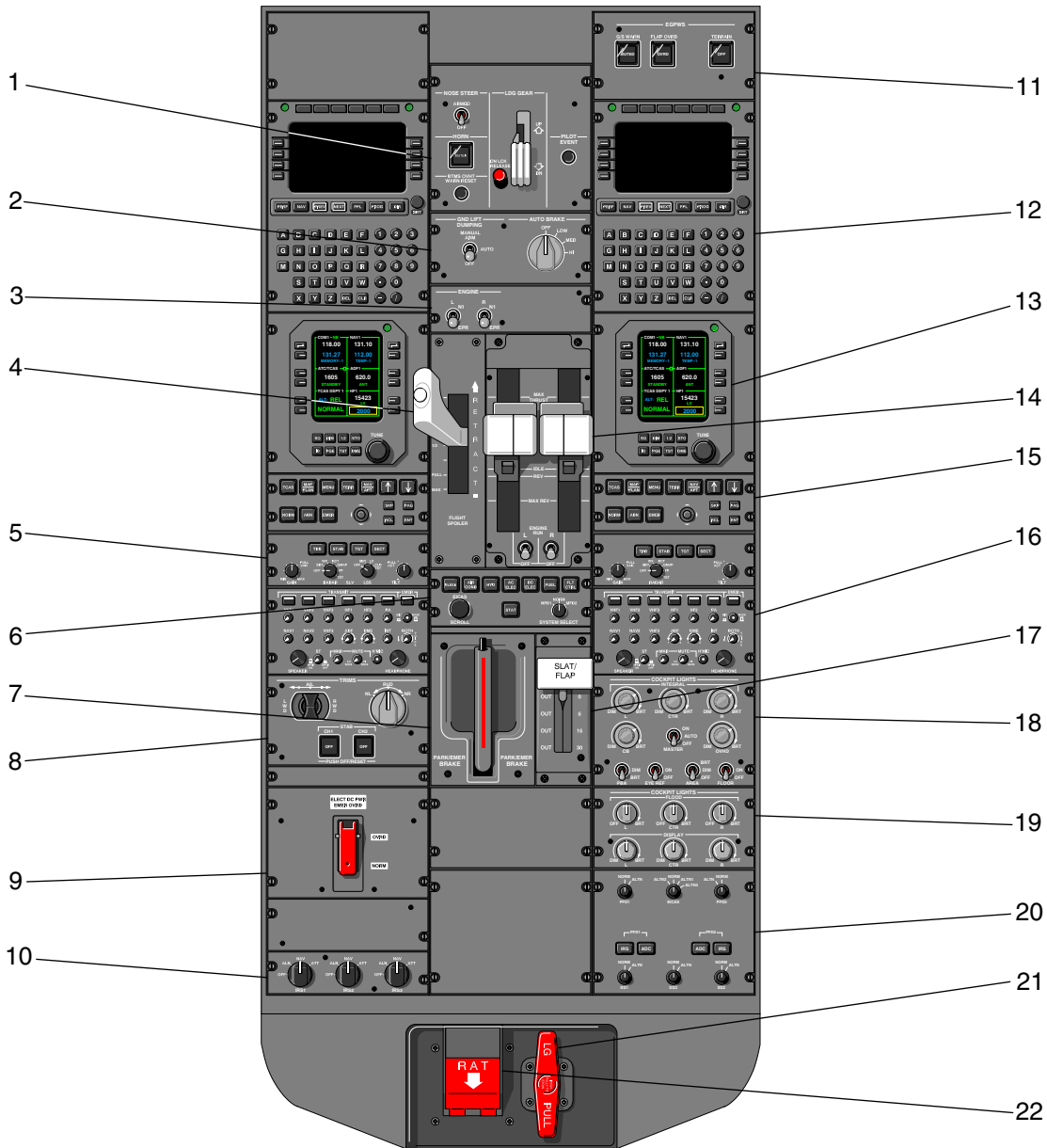
4

1. Roll Select Switch 10
2. Primary Flight Display Controller 11
3. Guidance Panel 4
4. Master Warning/ Caution Switch 3

Indicates Chapter in which information on item may be found.

GF0110\_025

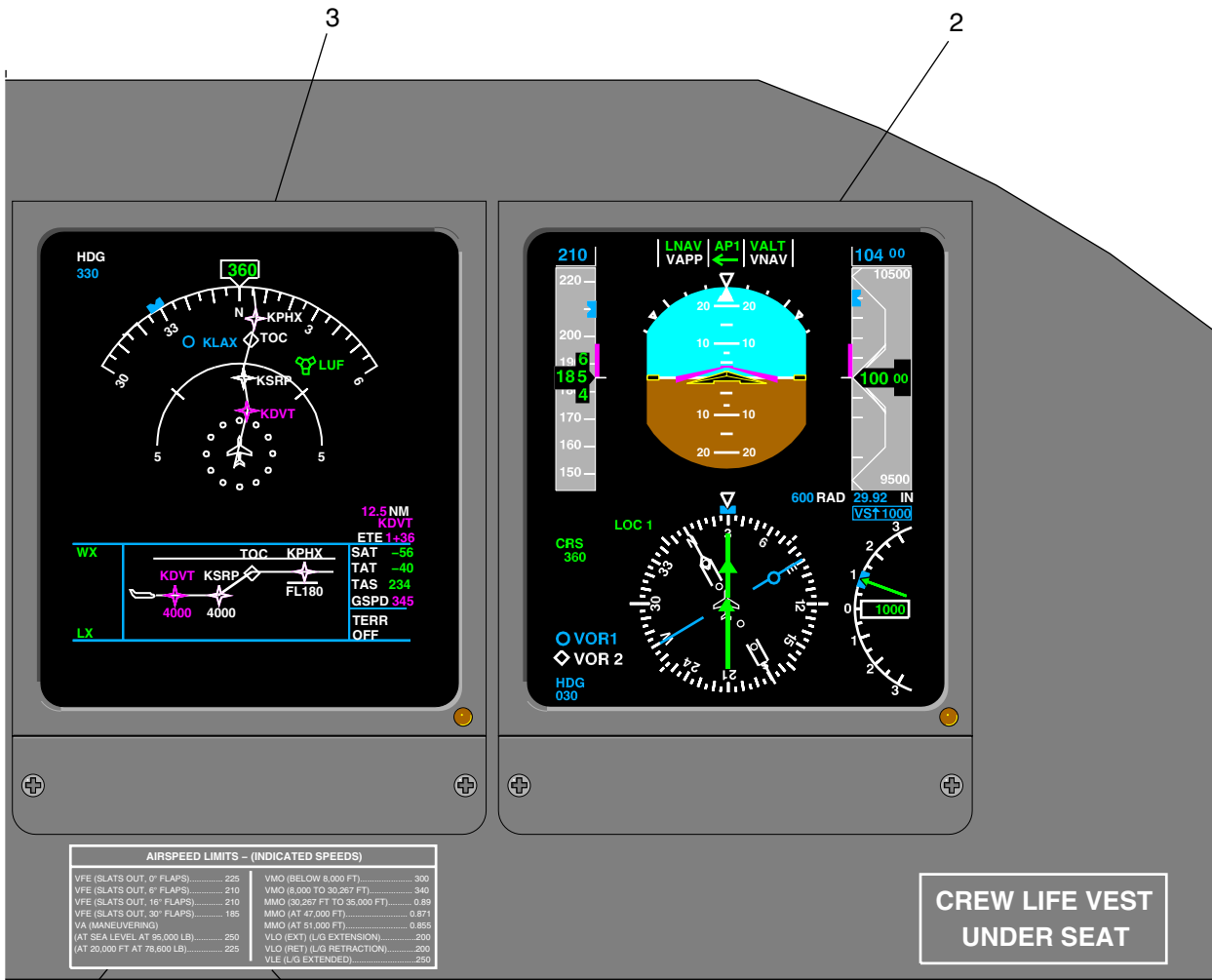
CENTRE PEDESTAL



- |  |  |   |
|--|--|---|
| 1. Landing Gear Panel <span style="border: 1px solid black; padding: 0 2px;">15</span>   | 9. DC Power Emergency Ovrdr <span style="border: 1px solid black; padding: 0 2px;">7</span>  | 17. Flap Selector Panel <span style="border: 1px solid black; padding: 0 2px;">10</span>                |
| 2. Gnd Lift Dump/Autobrake Panel <span style="border: 1px solid black; padding: 0 2px;">15</span> <span style="border: 1px solid black; padding: 0 2px;">10</span> | 10. IRS Mode Selector Panel <span style="border: 1px solid black; padding: 0 2px;">17</span>   | 18. Cockpit Lights – Integral/Misc <span style="border: 1px solid black; padding: 0 2px;">16</span>     |
| 3. Engine Control Panel <span style="border: 1px solid black; padding: 0 2px;">18</span>   | 11. EGPWS Panel <span style="border: 1px solid black; padding: 0 2px;">17</span>   | 19. Cockpit Lights – Flood/Display <span style="border: 1px solid black; padding: 0 2px;">16</span>     |
| 4. Flight Spoiler Lever <span style="border: 1px solid black; padding: 0 2px;">10</span>   | 12. FMS Control Display Panel. <span style="border: 1px solid black; padding: 0 2px;">17</span>  | 20. Reversion Control Panel <span style="border: 1px solid black; padding: 0 2px;">3</span>             |
| 5. Weather Radar Control Panel <span style="border: 1px solid black; padding: 0 2px;">17</span>  | 13. Radio Management Unit <span style="border: 1px solid black; padding: 0 2px;">6</span> <span style="border: 1px solid black; padding: 0 2px;">17</span> | 21. Landing Gear Manual Release Handle <span style="border: 1px solid black; padding: 0 2px;">15</span> |
| 6. EICAS Control Panel <span style="border: 1px solid black; padding: 0 2px;">3</span>   | 14. Thrust Lever Quadrant <span style="border: 1px solid black; padding: 0 2px;">18</span>   | 22. RAT Manual Release Handle <span style="border: 1px solid black; padding: 0 2px;">3</span>           |
| 7. Parking Brake Handle <span style="border: 1px solid black; padding: 0 2px;">15</span>   | 15. MFD Control Panel <span style="border: 1px solid black; padding: 0 2px;">13</span>   |   |
| 8. Fit Control Trim Panel <span style="border: 1px solid black; padding: 0 2px;">10</span>   | 16. Audio Panel <span style="border: 1px solid black; padding: 0 2px;">6</span>  |   |

Indicates Chapter in which information on item may be found.

COPILOT'S INSTRUMENT PANEL



AIRSPEED LIMITS – (INDICATED SPEEDS)	
VFE (SLATS OUT, 0° FLAPS).....	225
VFE (SLATS OUT, 6° FLAPS).....	210
VFE (SLATS OUT, 16° FLAPS).....	210
VFE (SLATS OUT, 30° FLAPS).....	185
VA (MANEUVERING)	
(AT SEA LEVEL AT 95,000 LB).....	250
(AT 20,000 FT AT 78,600 LB).....	225
VMO (BELOW 8,000 FT).....	300
VMO (8,000 TO 30,267 FT).....	340
MMO (30,267 FT TO 35,000 FT).....	0.89
MMO (AT 47,000 FT).....	0.871
MMO (AT 51,000 FT).....	0.855
VLO (EXT) (L/G EXTENSION).....	200
VLO (RET) (L/G RETRACTION).....	200
VLE (L/G EXTENDED).....	250

AIRSPEED LIMITS – (INDICATED SPEEDS)

VFE (SLATS OUT, 0° FLAPS).....	225	VMO (BELOW 8,000 FT).....	300
VFE (SLATS OUT, 6° FLAPS).....	210	VMO (8,000 TO 30,267 FT).....	340
VFE (SLATS OUT, 16° FLAPS).....	210	MMO (30,267 FT TO 35,000 FT).....	0.89
VFE (SLATS OUT, 30° FLAPS).....	185	MMO (AT 47,000 FT).....	0.871
VA (MANEUVERING)		MMO (AT 51,000 FT).....	0.855
(AT SEA LEVEL AT 95,000 LB).....	250	VLO (EXT) (L/G EXTENSION).....	200
(AT 20,000 FT AT 78,600 LB).....	225	VLO (RET) (L/G RETRACTION).....	200
		VLE (L/G EXTENDED).....	250

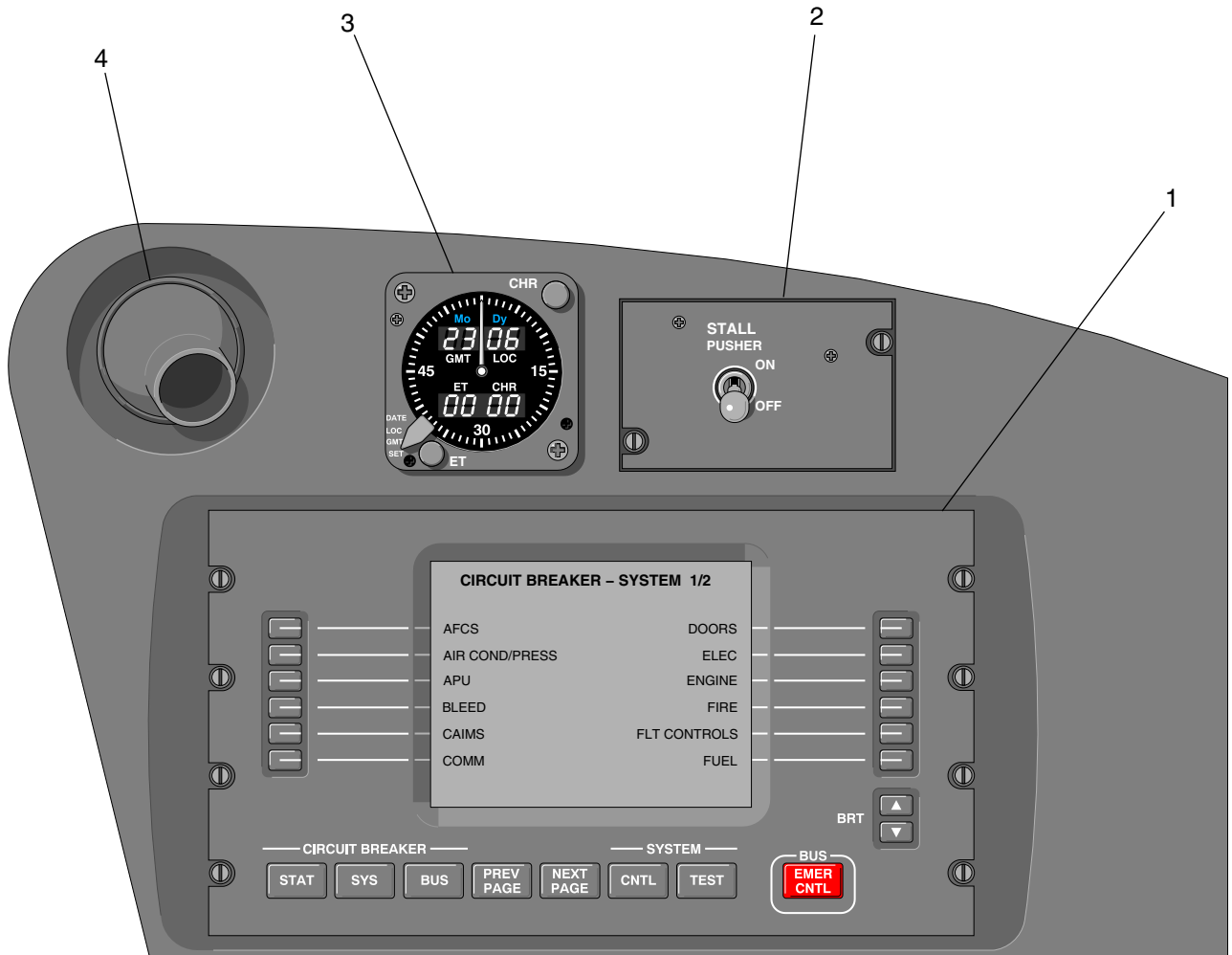
1. Airspeed Placard
2. Primary Flight Display 11 17
3. Multi-Function Display 11 17
  - MAP Mode
  - PLAN Format
  - WX Radar
  - TCAS Traffic

  Indicates Chapter in which information on item may be found.

GF0110\_027



COPILLOT'S SIDE PANEL

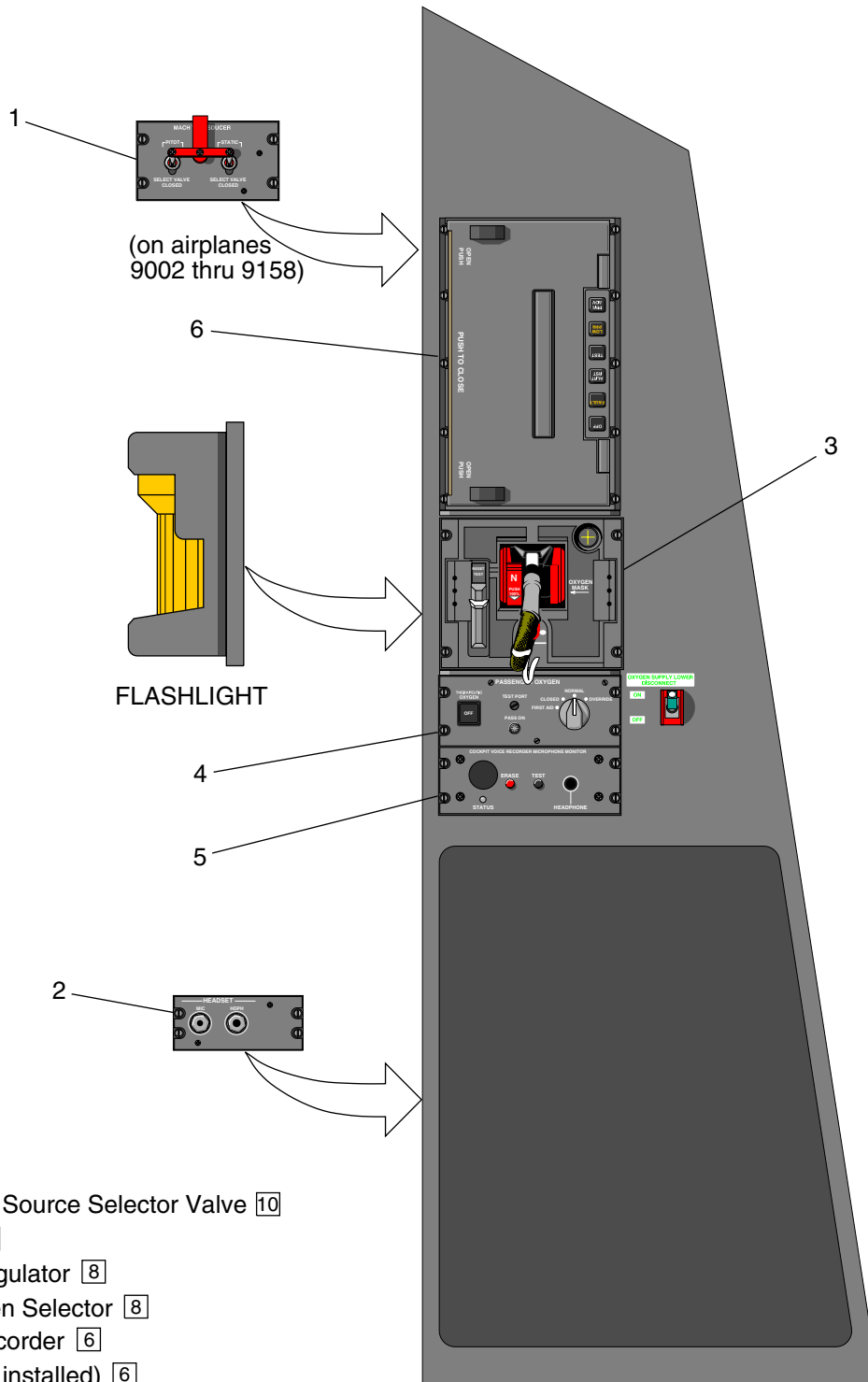


- 1. Electrical Management System  7
- 2. Stall Pusher Switch  10
- 3. Clock  11
- 4. Air Conditioning Gasper  2

Indicates Chapter in which information on item may be found.

GF0110\_028

COPILLOT'S SIDE CONSOLE



- 1. Mach Transducer Source Selector Valve [10]
- 2. Headset Panel [6]
- 3. Oxygen Mask/Regulator [8]
- 4. Passenger Oxygen Selector [8]
- 5. Cockpit Voice Recorder [6]
- 6. Cockpit Printer (If installed) [6]

□ Indicates Chapter in which information on item may be found.

GF0110\_029a

## **AIRPLANE DOORS**

The airplane is equipped with the one passenger door (which serves as an emergency exit), one overwing emergency exit, one baggage compartment door, one rear fuselage equipment bay door and several service doors and panels.

The door warning system provides the flight crew with a visual indication (EICAS), when any of the following exterior doors/exits are opened or incorrectly latched:

- Passenger door.
- Cargo door.
- Aft equipment bay door.
- Left or right emergency exit.

Description and operation of the emergency features of the wing emergency exits are in this manual Chapter 8, EMERGENCY EQUIPMENT.

The door warning system also provides the flight crew with a visual indication (EICAS), when any of the landing gear doors are not in their commanded position. Description and operation of the landing gear doors are in this manual Chapter 15, LANDING GEAR.

### **PASSENGER DOOR**

The passenger door is the main entrance /exit for passengers as well as the flight crew and is located on the left side of the airplane, aft of the flight compartment. The door is a mechanically balanced airstair with an attached door. The door assembly which opens outwards and downwards, turns on two brackets attached to each side of the airstairs and hinge points in the fuselage. Handrails are attached to each side of the airstairs and the fuselage. They extend and retract as the door opens and closes.

The door operation is power assisted with a cable system and a DC electric motor. The door locking mechanism is capable of operations from inside and outside the airplane. A single operation from either handle will unlock the door and lift it clear of its latching mechanism.

The door opens under a controlled descent through a tension spring arrangement and mechanical damping using a pulley and cable mechanism.

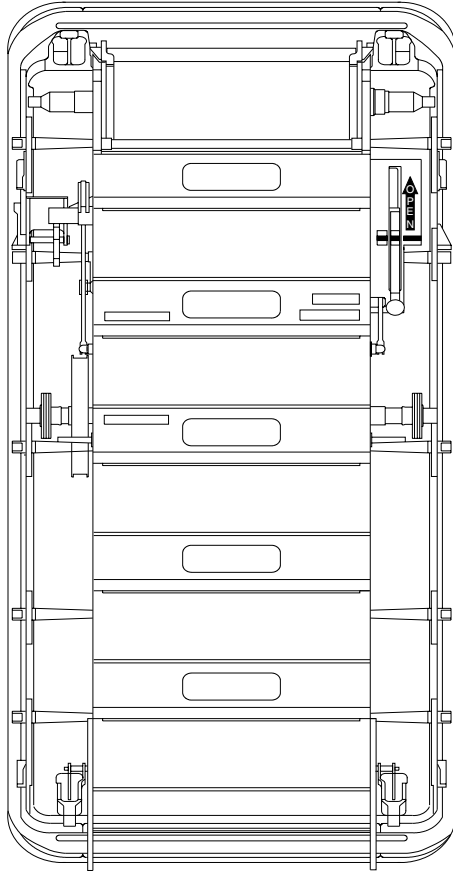
The door is normally closed from inside or outside of the airplane through an electrical actuator. The door can also be manually closed without electrical power.

A hinged flap (vent flap) opens in the exterior surface of the door to protect against pressurization of the fuselage, to an unsafe level, until the door is closed and locked.

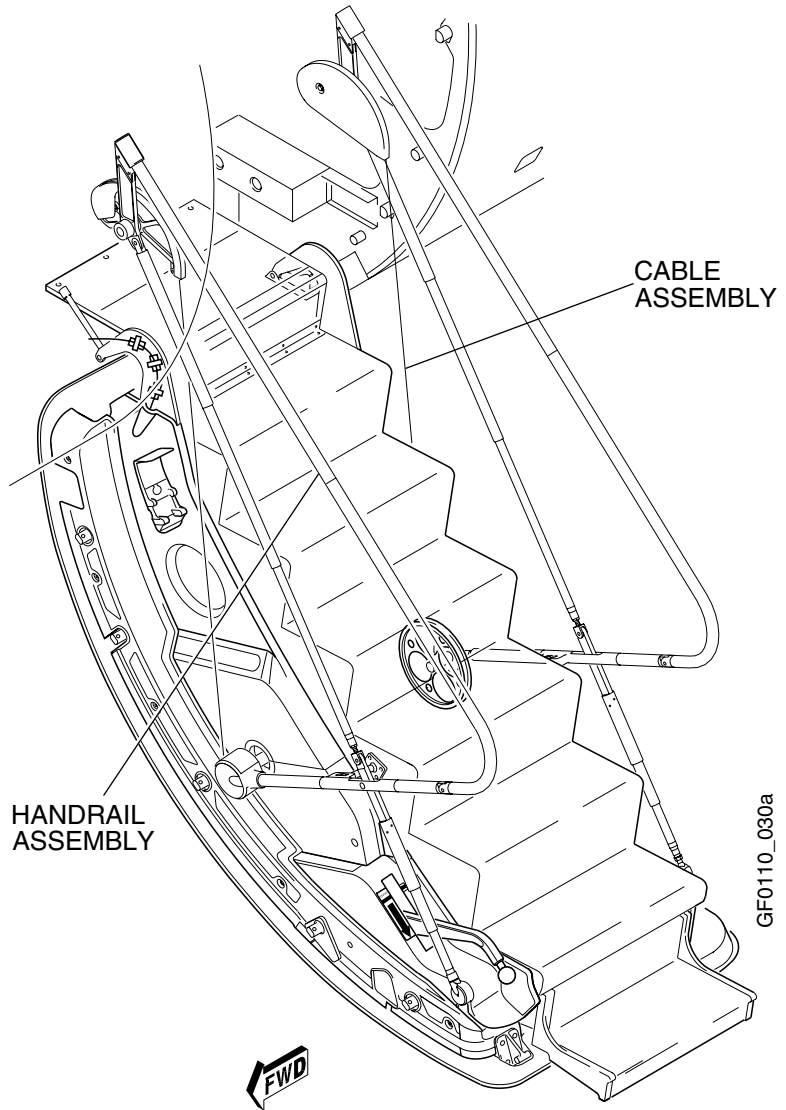
The door locks have proximity switches to display an EICAS indication of closed and locked.

Lights are provided in each step riser to illuminate the steps. Door lighting automatically shuts-off when the passenger door closes.

**PASSENGER DOOR SCHEMATIC**



**CLOSED POSITION**



GF0110\_030a

**PASSENGER DOOR COMPONENTS**

The following components are described to provide an understanding of the passenger door operating system.

**Airstair and Handrails Assembly**

The airstairs act as the steps for embarking/disembarking the airplane. They also act as support for the door structure, which hangs below the airstairs when open. The airstairs are hinged to the airplane via two hinges and two pins.

The handrails are attached to the fuselage and the airstairs. They support the weight of the door and airstair assembly and passenger loading. Handrails are capable of supporting the weight of the door and passenger loading.

The design of the door is such that there is no contact with the ground when the door is in the open position.

**PASSENGER DOOR COMPONENTS (CONT'D)**

**Lift arms**

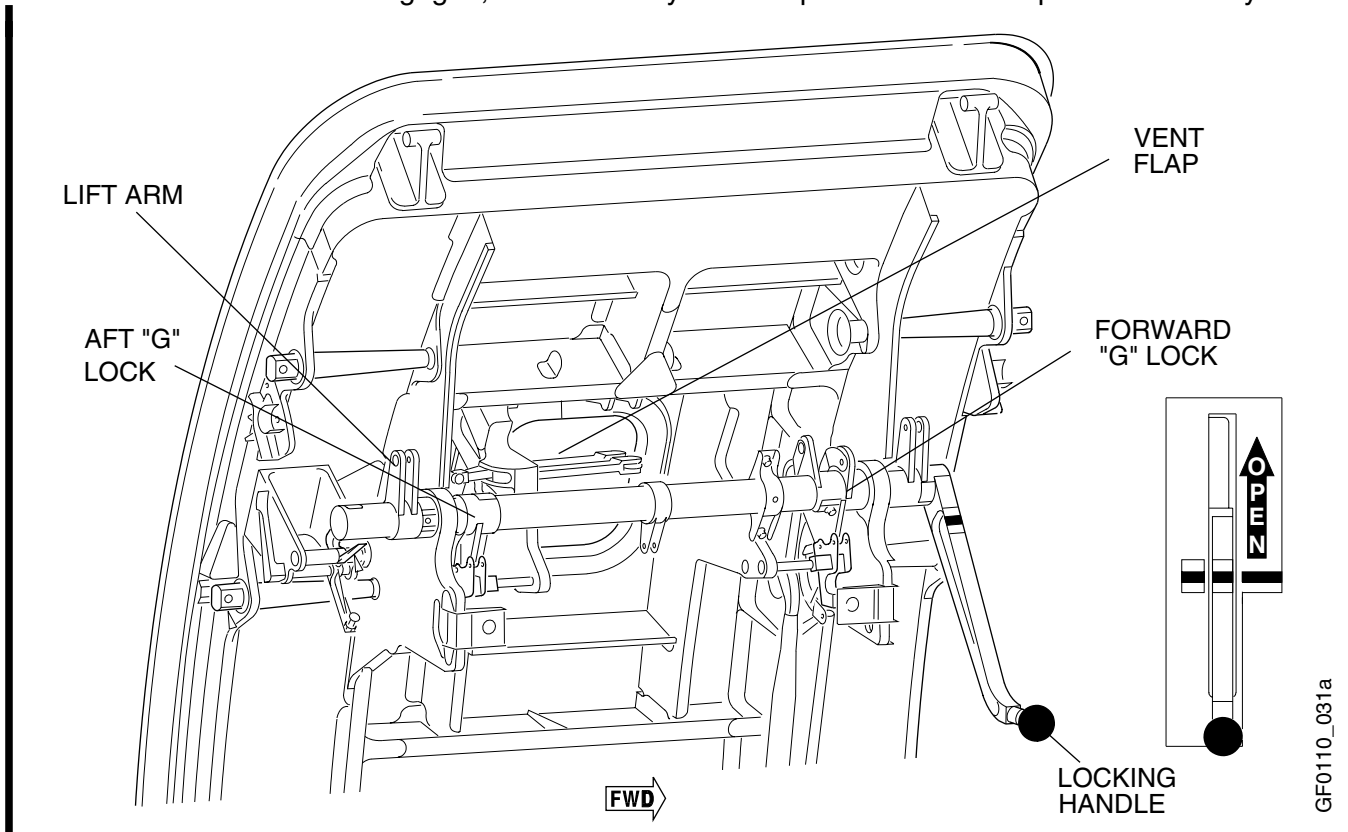
Two levers are connected from either end of the lockshaft to the fixed linked arms on the airstair structure. They are driven by the handles, assisted by the tension spring. Their purpose is to lift the door out of its frame and hold it up and out in relation to the airstair, while the door is opening.

**“G” Locks**

In the locked position, the “G” lock hooks hold the door relative to the airstairs and prevent any upward movement in the door frame during turbulence or negative “G” flight.

**Vent Flap**

A pressurization vent flap is centrally located at the top of the door under the lockshaft. The flap prevents pressure building up until the “G” locks engage. Once the locks are in and the flap is shut, the pressure holds the flap firmly shut. The vent flap is opened by the lockshaft mechanism as the “G” locks are disengaged, to release any residual pressure from the pressurization system.



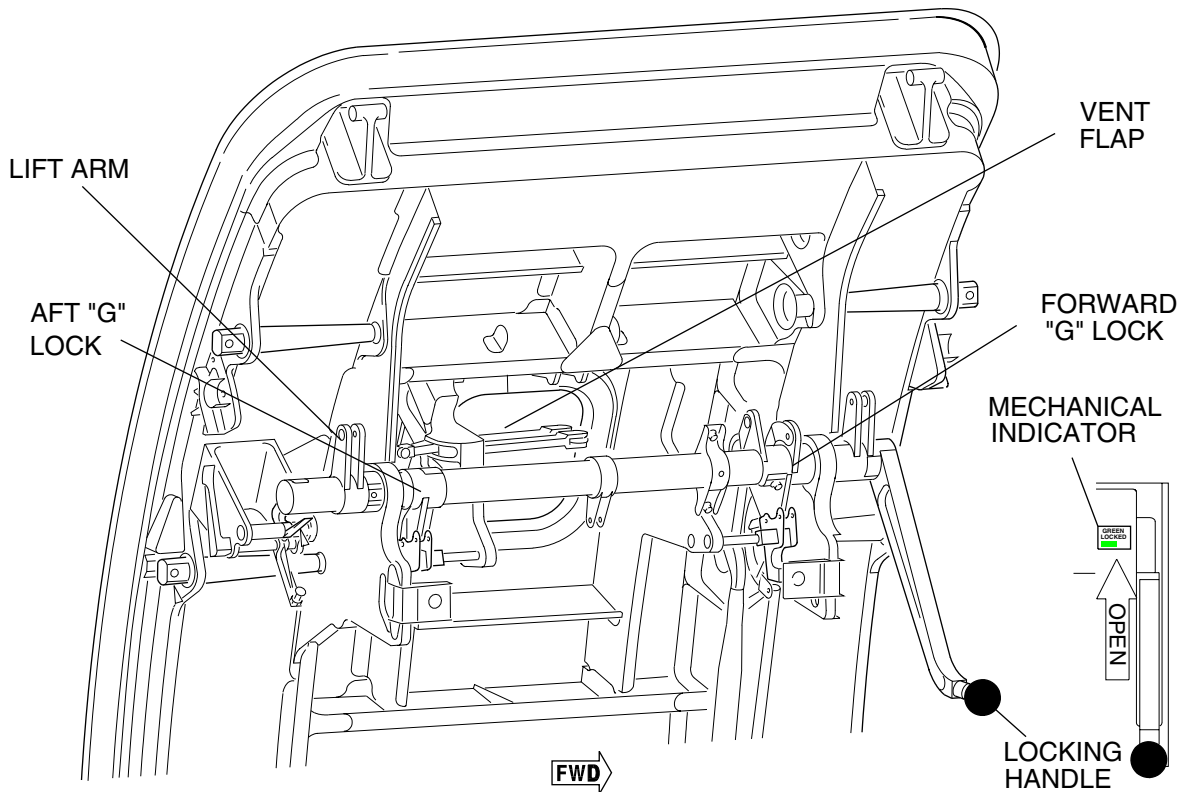
**PASSENGER DOOR COMPONENTS (CONT'D)**

**Locked Indication**

- █ Visual indication of latching and locking is given to the cabin crew by the red band indicators on the internal handle cover and the handle. The red band across the handle and cover clearly shows the handle in the locked position. A safe indication is indicated by the alignment of the two red lines.

**Effectivity:**

- Airplanes 9002 to 9095 **not incorporating** Service Bulletin:
  - SB 700-52-22, Passenger Door – Internal Handle Indication Improvement.



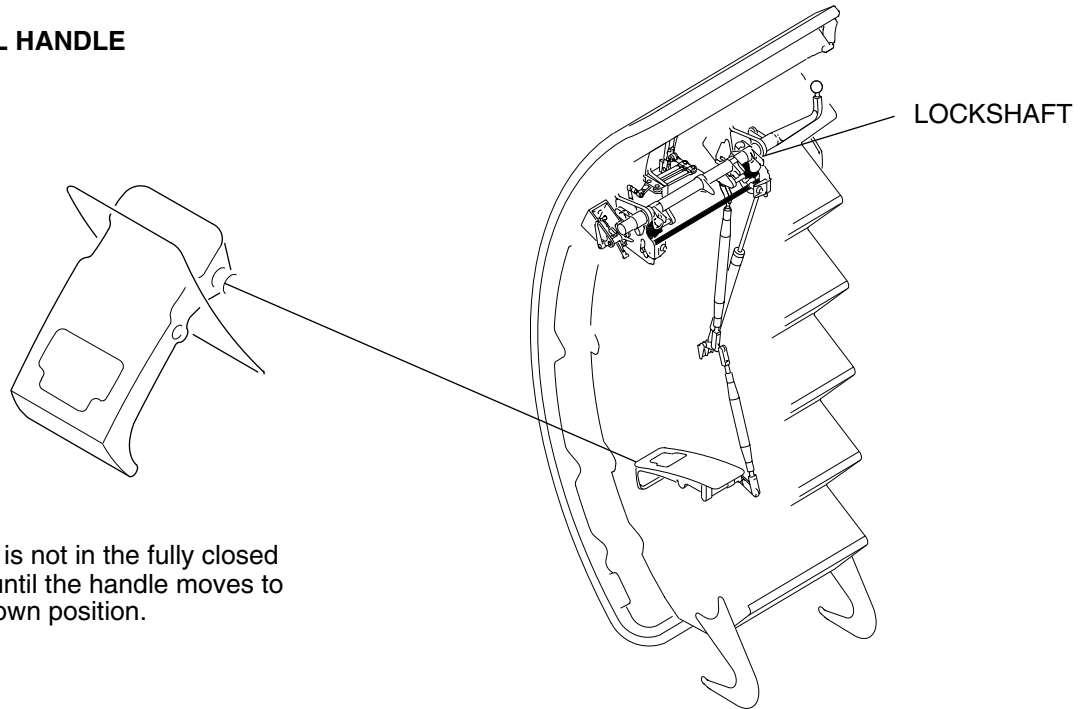
GF0110\_031

Visual indication of latching and locking is given by an indicator arm that is driven directly by the last motion of the internal handle. The indicator, in the form of a green line, lines up with a green line on the airstairs only after the door latches and detents are engaged. The indication is viewed through a window cutout in the internal handle cover. A safe indication is indicated by the alignment of the two green lines. A window in the handle exposes a red fixed plate when the handle is out of the safe locked position.

**PASSENGER DOOR OPERATING HANDLES**

The external handle is set into a box in the lower door structure. It is connected by push/pull rods inside the door to the lockshaft, at the forward end.

**EXTERNAL HANDLE**



**NOTE**

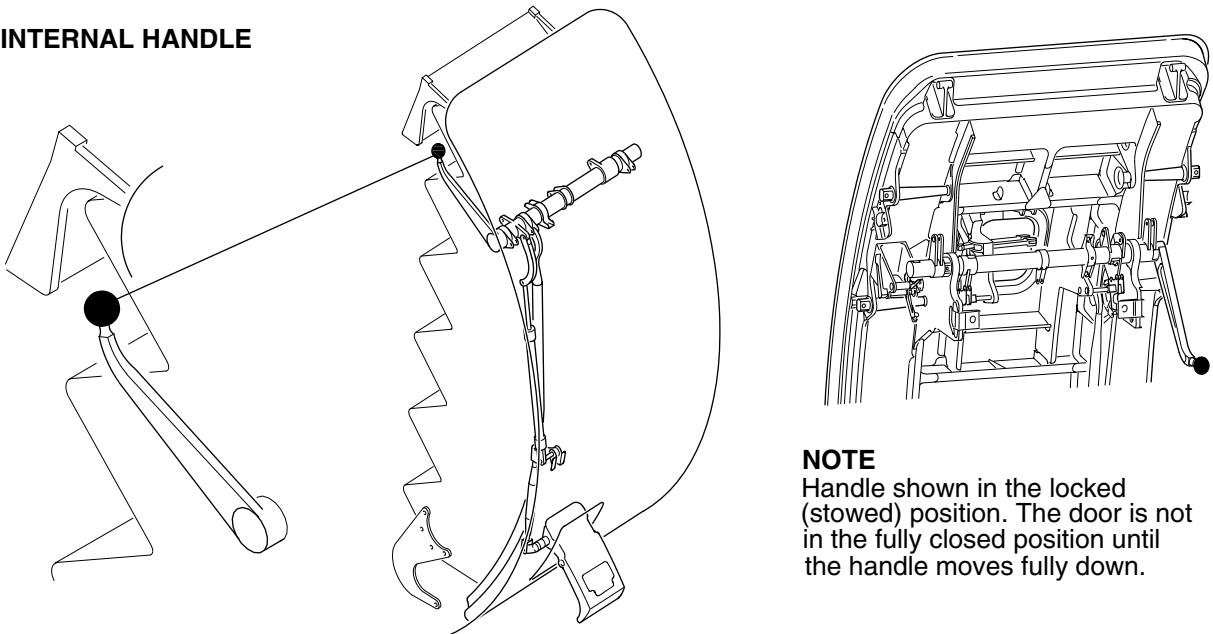
The door is not in the fully closed position until the handle moves to the full down position.

GF0110\_032

As the lockshaft reaches its fully locked position, the handles are held in position with spring tension. When the handles are moved out of the locked position, the spring assists in lifting the door and reduces the load on the handles.

The internal handle is a lever on the forward side of the door directly attached to a lockshaft and to the forward door lift arm.

**INTERNAL HANDLE**



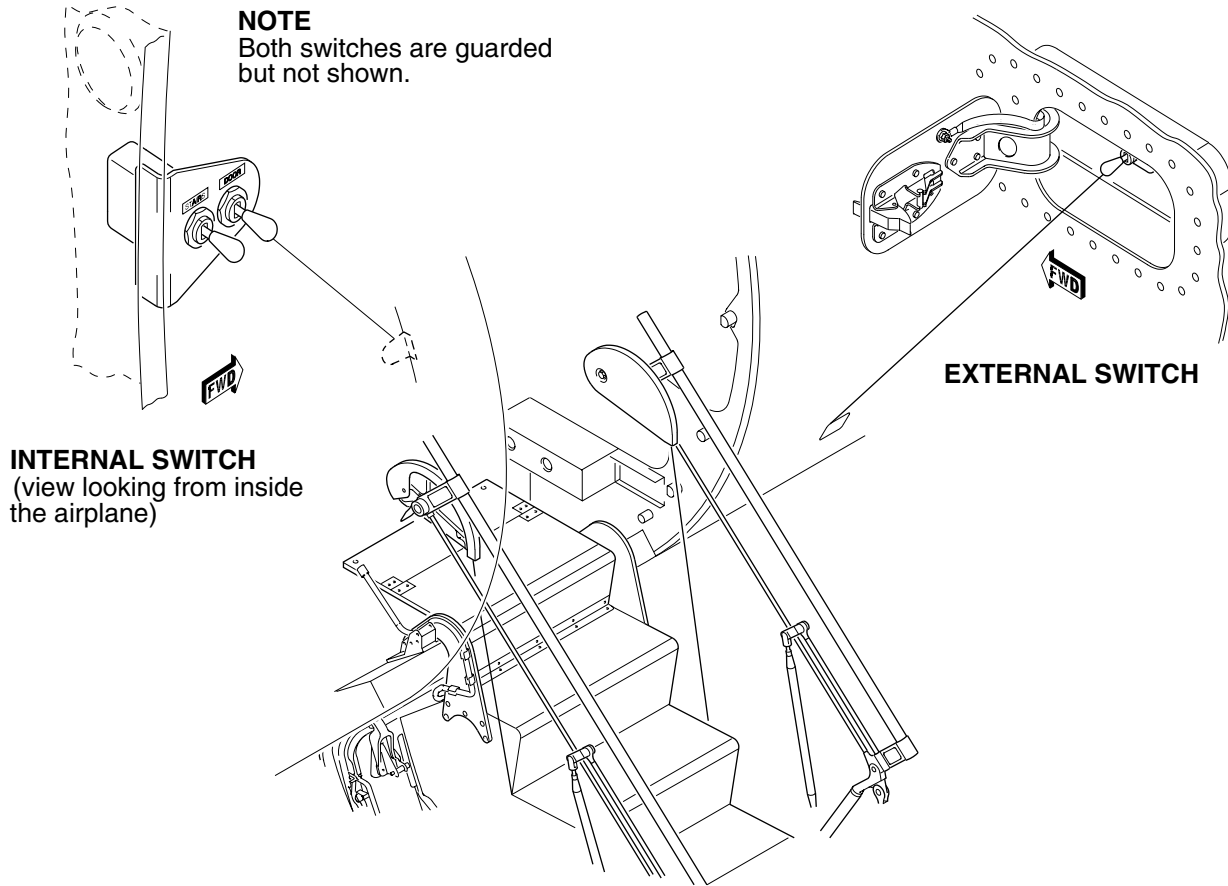
**NOTE**

Handle shown in the locked (stowed) position. The door is not in the fully closed position until the handle moves fully down.

GF0110\_033

**PASSENGER DOOR SWITCHES**

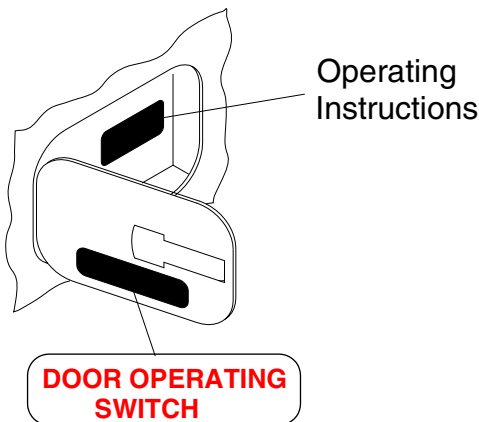
The internal door operating switch is controlled on and off by the “DOOR” switch installed internally in the door frame, next to the main passenger door.



GF0110\_034

The external door operating switch is controlled on and off by the “DOOR” switch installed next to the main passenger door.

**EXTERNAL DOOR SWITCH ACCESS PANEL**



DOOR OPERATION	
TO OPEN	TO CLOSE
PUSH IN FLAP TO GRASP HANDLE LIFT HANDLE FULL UP PULL DOOR OUT	1. OPERATE SWITCH TO ROTATE DOOR FULLY INTO DOOR APERTURE 2. PULL HANDLE DOWNWARDS TO STOW
NOTE: DO NOT RE-CYCLE HANDLE DURING CLOSING OPERATION WITHOUT RE-OPENING DOOR SUFFICIENTLY TO RE-ARM DOOR UPLOCK LEVER	

GF0110\_035



## PASSENGER DOOR OPERATION

The following examples are intended to familiarize the operator with events which occur when moving the passenger door from either the open or closed positions. The door operations are described in detail and should be followed as per Aircraft Maintenance Manual Chapter 52.

### External Door Operation

To open the passenger door externally:

- PUSH IN FLAP TO GRASP HANDLE
- LIFT HANDLE FULL UP
- PULL DOOR OUT

To close the passenger door externally:

### NOTE

Do not re-cycle the handle during closing operation without re-opening door sufficiently to re-arm door uplock lever.

- DISENGAGE HANDRAIL LOCK
- PRESS AND HOLD DOOR CLOSE SWITCH
- PULL HANDLE DOWNWARDS TO STOW

### Internal Door Operation

To open the passenger door internally:

- OPERATE DOOR HANDLE FROM THE LOCKED POSITION
- DOOR MOVES INWARD AND UPWARD
- PUSH DOOR OUT TO OPEN

To close the passenger door internally:

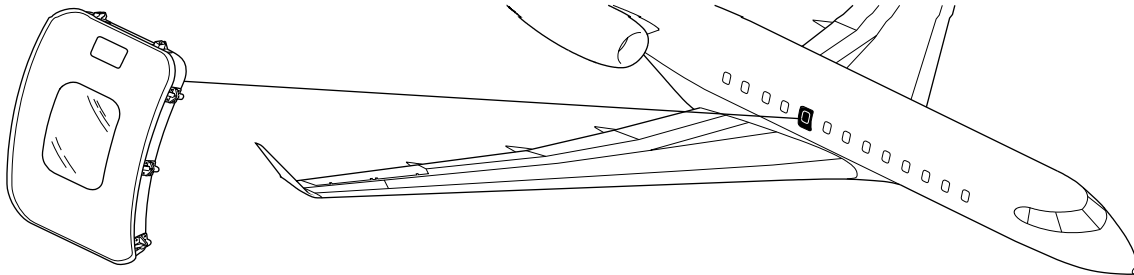
- PUSH FOOT PEDAL (to disengage handrail lock)
- PRESS AND HOLD DOOR CLOSE SWITCH
- MOVE DOOR HANDLE FULLY DOWN
- CHECK GREEN VISUAL INDICATION IN THE HANDLE

### Manual Closing

A rope wound around a pulley on the aft end of the torque shaft must be unwound sufficiently to be brought into the cabin. The handrail latch must be released and then the rope can be pulled, rotating the torque shaft and raising the door via the normal cables. Once the door is raised it may be lowered into the frame and locked by the normal method with the lock handle.

**EMERGENCY EXIT**

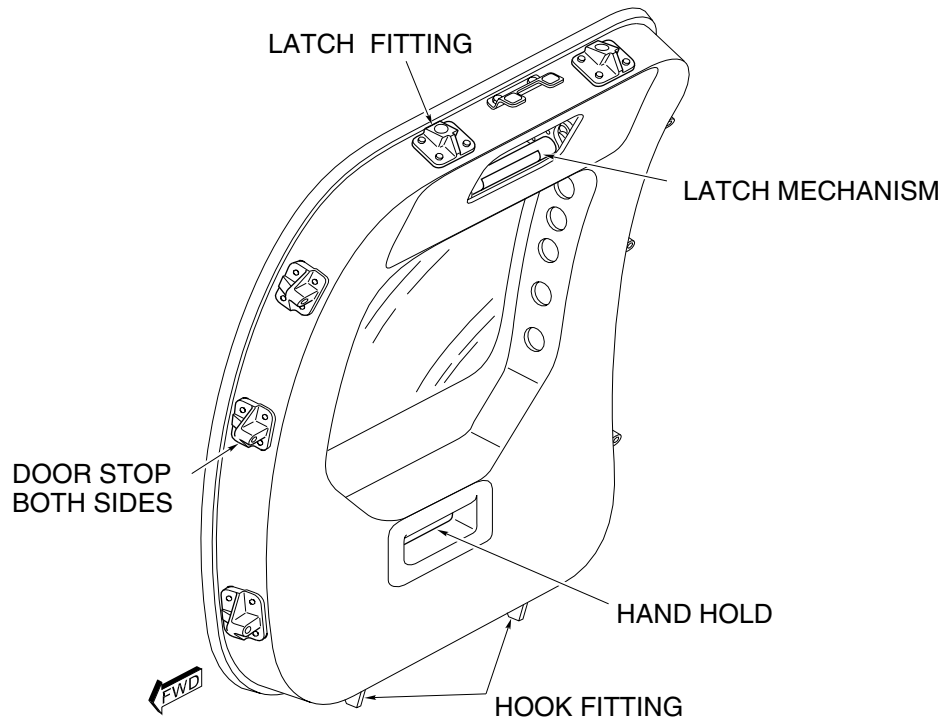
An overwing emergency plug type emergency exit is installed on the right side of the airplane. The exit is an inward opening plug type and can be unlatched from the interior or exterior of the airplane. Emergency door operation from inside the cabin is achieved by single action of the emergency exit operating handle.



GF0110\_036

EMERGENCY EXIT DOOR

Two lower hook fittings and two upper latch fittings position the door in the door opening. Three stop fittings on each side of the door and surround structure react to the pressurization forces of the plug door type.

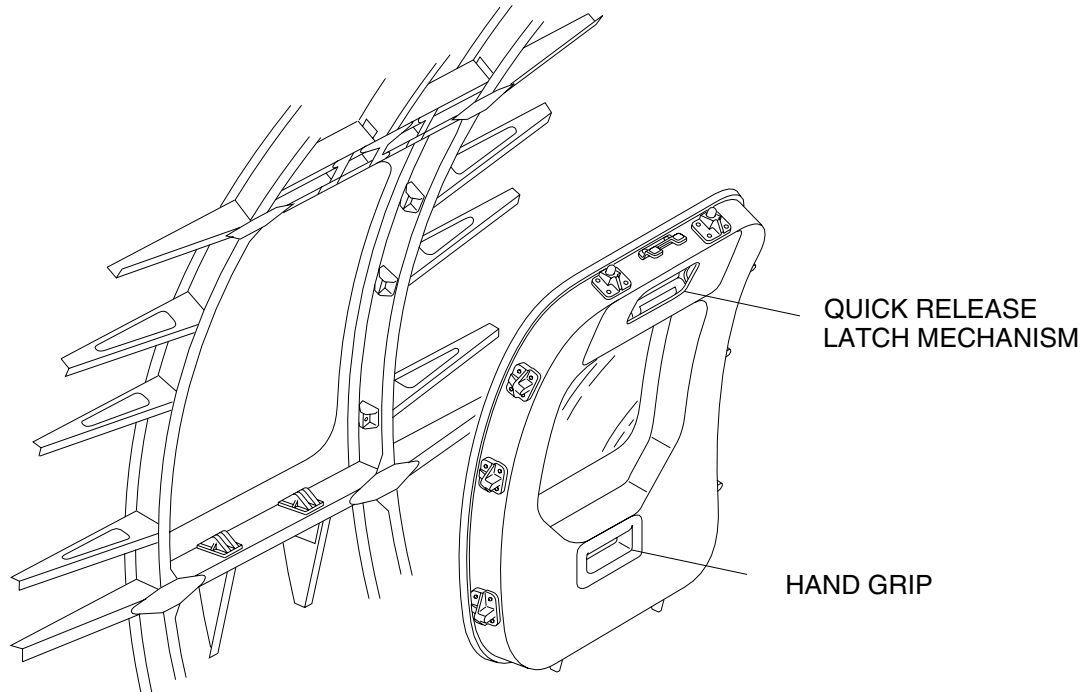


GF0110\_037

When the door is removed, handling is facilitated by an interior hand grip, flush-mounted within the door box structure.

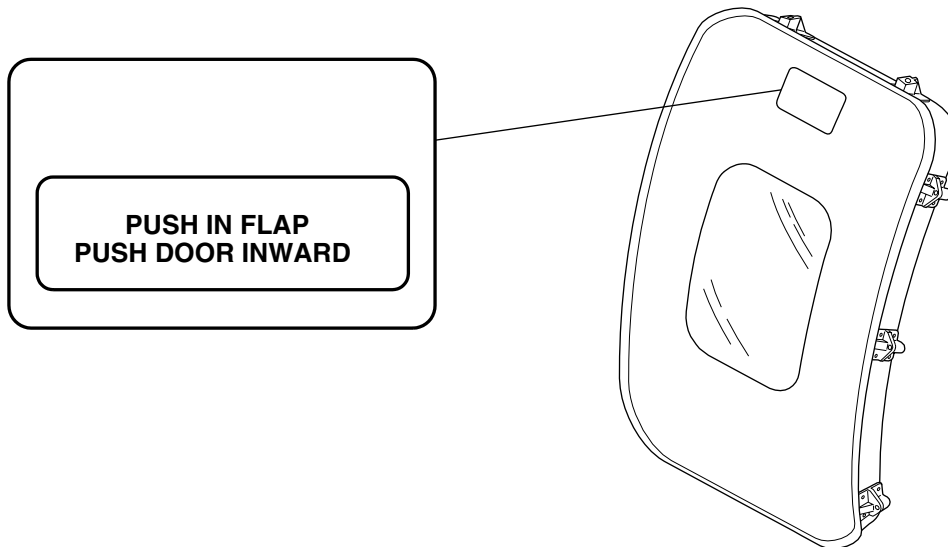
**EMERGENCY EXIT (CONT'D)**

To unlatch the emergency exit door from the interior, the upper door handle is pulled inward. This motion opens the exterior push plate/vent flap to bleed any residual pressure and disengages the two latch pins. The door moves inward and pivots on the lower hook fittings. A grip of the upper handle is maintained while grasping the lower hand grip and the door is lifted inwards away from the door opening.



GF0110\_038

To unlatch the emergency exit door from the exterior, the upper push plate/vent flap is depressed to disengage the latch pins and the door is pushed inwards away from the opening.



GF0110\_039

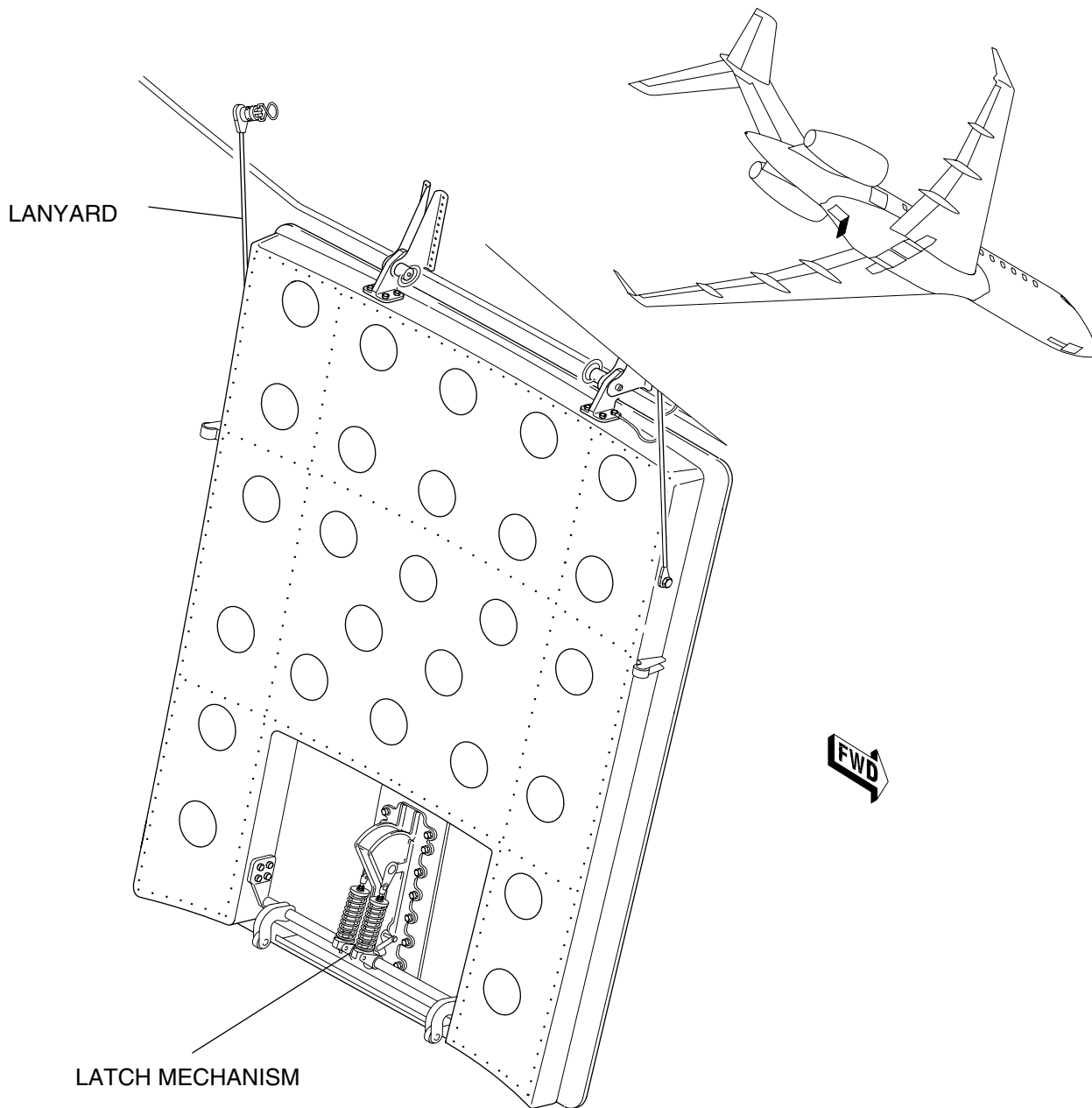
Visual indication of a locked condition of the overwing emergency is the exit door secured in position, with the interior handle recessed in the surround structure.

**AFT EQUIPMENT BAY DOOR**

The unpressurized aft equipment bay is accessed by a maintenance door in the fuselage fairing. The door is horizontally hinged at its forward edge with initial and subsequent opening movements being downward and outward. When the door is opened, it is restrained from over travel and striking the belly fairing using two, door-to-fairing mounted lanyards.

The door locking mechanism is capable of operation only from outside of the airplane.

**AFT EQUIPMENT BAY DOOR SCHEMATIC**



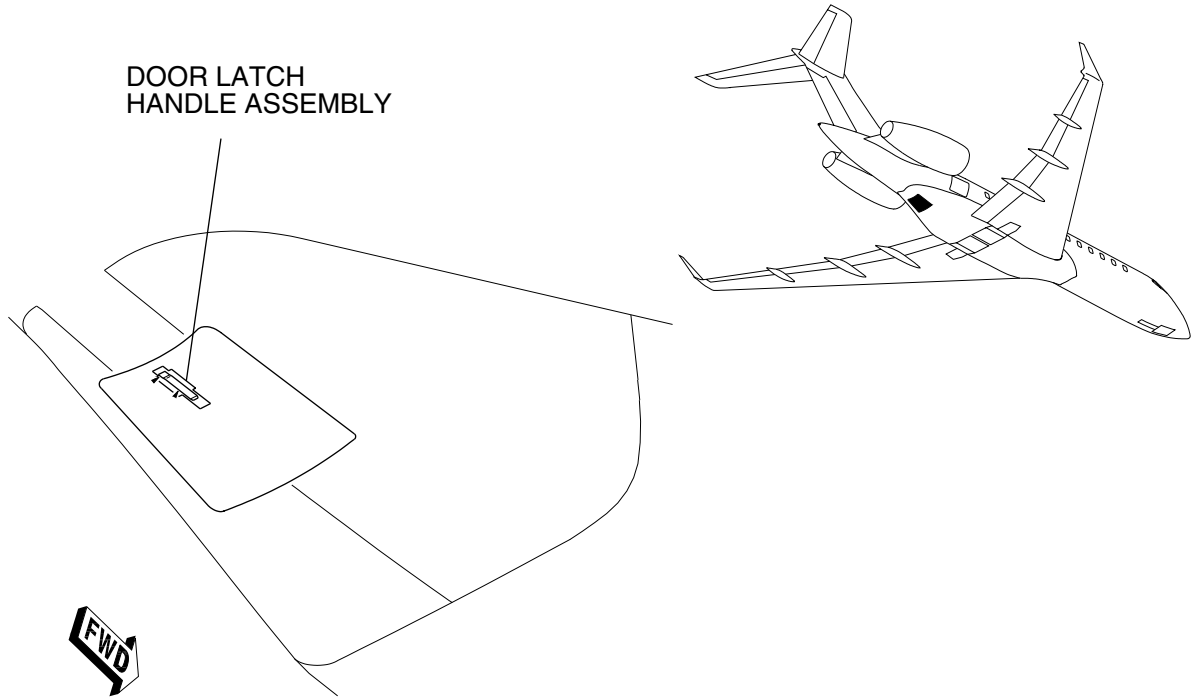
GF0110\_040

During the closing cycle, two rollers, one on either side of the door, act as guides to locate and centre the door within its belly fairing aperture.

## AFT EQUIPMENT BAY DOOR SCHEMATIC (CONT'D)

### Aft Equipment Bay Door Operation

**DOOR OPENING** – Door opening is accomplished by depressing the trigger and pulling the handle to the full open position.



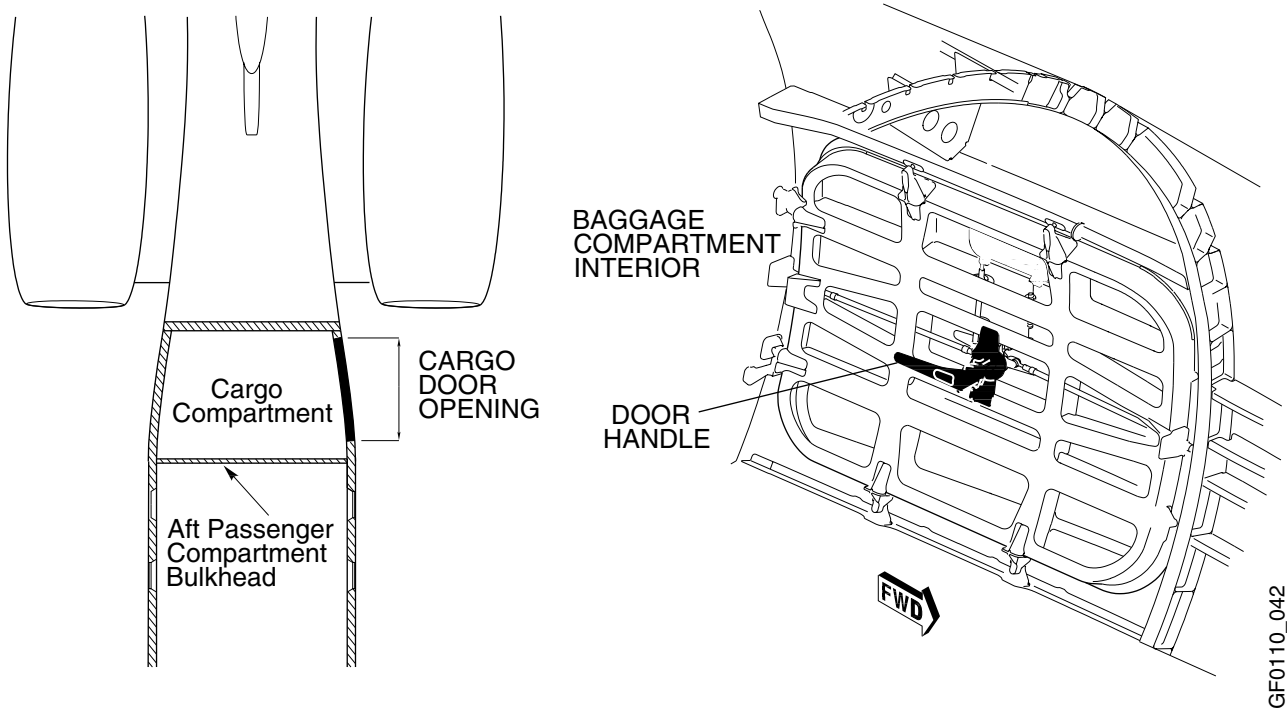
**DOOR CLOSING** – The door latch handle is flush fitting and is secured by an integral push trigger, which when depressed, releases the handle to the free open position. The door is secured by returning the handle flush with the door.

Visual indication of secure latching and locking is given by the door, the push trigger and the external handle all being flush with the fuselage's surface.

GF0110\_041

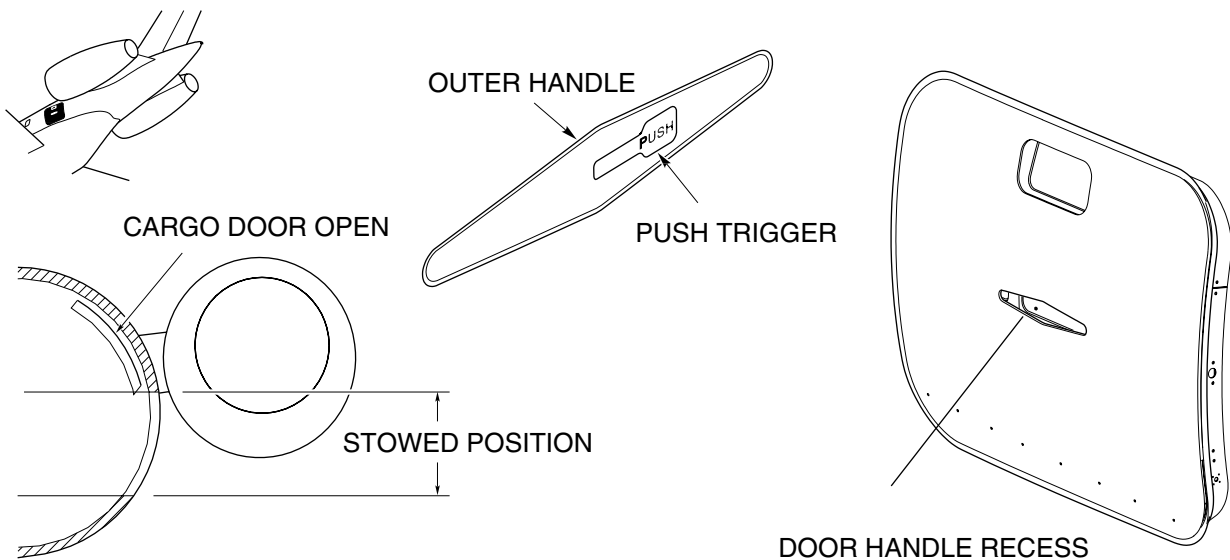
**BAGGAGE COMPARTMENT DOOR**

A baggage compartment plug type access door is installed in the fuselage aft section on the left side forward of the rear pressure bulkhead.



GF0110\_042

The door is an inward opening plug type and can be unlatched from outside or inside the airplane. The door is accessible, but not visible, from the passenger compartment and is not an emergency exit. The door moves inward and upward to a stowed position above and clear of the door aperture.

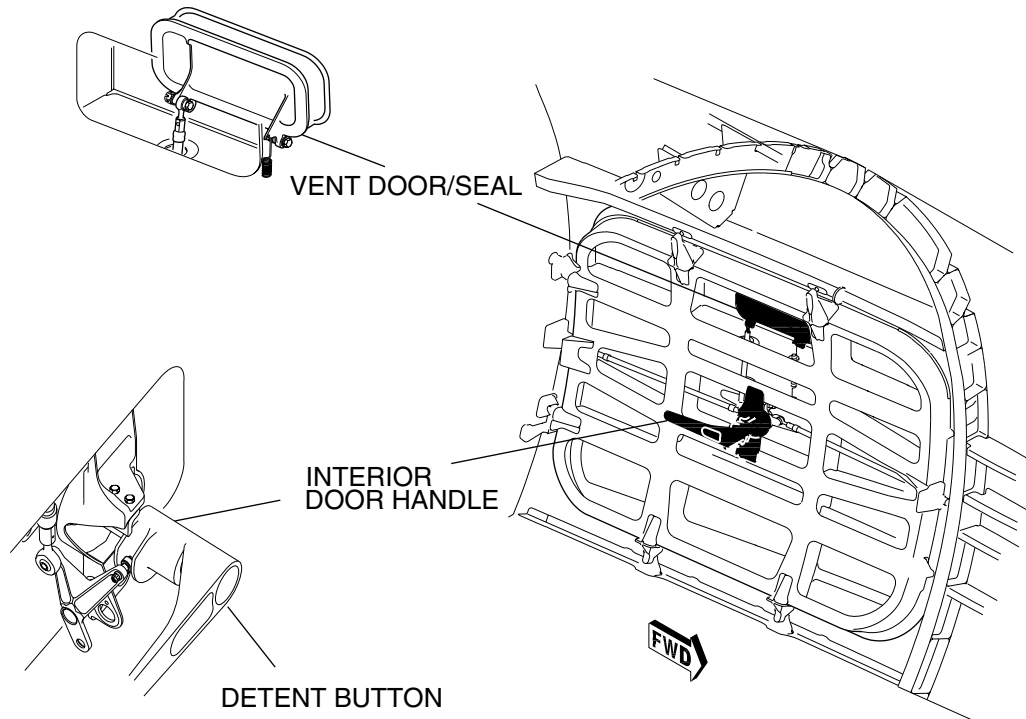


GF0110\_043

The latch mechanism consists of inner and outer handles directly coupled together and mounted on the forward and aft sides of the door. The handle assembly contains a trigger lock which holds the handle in the stowed position. The door is latched when the exterior handle is rotated to engage latch pins and locked when the handle is stowed and latched in its housing recess.

**BAGGAGE COMPARTMENT DOOR (CONT'D)**

A vent door is located in the upper portion of the door and will not close until the door is fully closed and the handle stowed in the locked position.



GF0110\_044

**Baggage Door Operation**

**CLOSING THE BAGGAGE DOOR EXTERNALLY** – Rotate the outer handle 90 degrees to latch the door. Push the handle into the recessed housing until the trigger button is latched into the trigger mechanism.

**CLOSING THE BAGGAGE DOOR INTERNALLY** – Rotate the inner handle 90 degrees counter clockwise to latch the door. Pull the handle until the outer handle trigger latches into the trigger mechanism and the handle is stowed into the recessed housing.

**OPENING THE BAGGAGE DOOR EXTERNALLY** – Press the trigger button to release and eject the outer handle from the recessed housing. Rotate the handle 90 degrees counter clockwise to unlatch and open the door.

**OPENING THE BAGGAGE DOOR INTERNALLY** – Press the release button on the inside handle to unlock the handle from the trigger. Rotate the handle 90 degrees clockwise to open the door.

**Baggage Door Indication**

Visual indication of a locked condition is the baggage door secured in position and the exterior handle stowed and locked in the handle recess.

**DOOR INDICATION AND CONTROL**

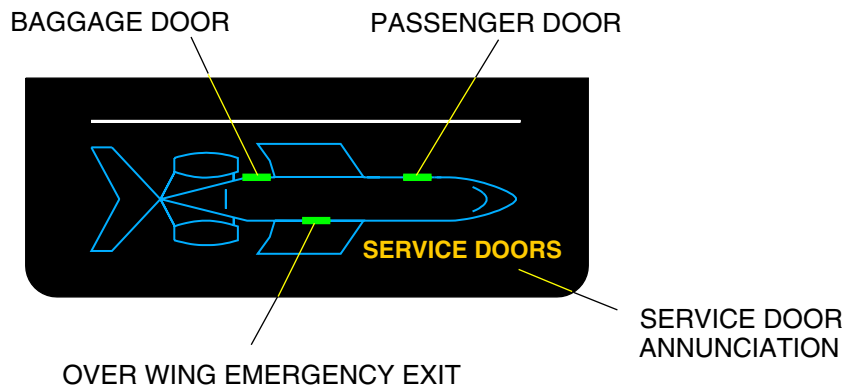
The airplane door position and locked indication is provided to the EICAS by the LGECU. The LGECU provides data that is used to generate alerts and synoptic displays for the fuselage doors.

Door position information is displayed on the STAT page and message information is displayed on the PRIMARY page.

The STAT page presents the following doors:

- PASSENGER
- EMERGENCY OVERWING EXIT
- BAGGAGE
- SERVICE DOORS

**STAT Page**



Airplane Door Position	Airplane Door Graphic
CLOSED	
OPEN	
INVALID	

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**Passenger Door**

The passenger door is monitored by three proximity sensors to determine the locked and handle stowed position. Proximity sensors (one at each location) are located on the passenger door forward and aft latch to monitor the “G” latch position. A proximity sensor is mounted in the passenger door to monitor the outer handle stowed condition.

The sensor information is used by the Landing Gear Electronic Control Unit (LGECU) for door position and locked indication and sends the results to EICAS for position and locked displays.

**Emergency Exit**

One proximity sensor is installed at the top of the door position and senses the door in the closed position.



## **DOOR INDICATION AND CONTROL (CONT'D)**

### **Baggage Door**

Two proximity sensors monitor the door position and provide signals to the LGECU which in turn provides the EICAS display.

### **Large Maintenance Doors**

Two (optional third) separate large hinged and latched maintenance hatches, are monitored by the LGECU. Each door is monitored by one proximity sensor to determine the door closed condition. In each case, the proximity sensor is mounted on the airplane structure and monitors a sensor on the hatch. The information is used by the LGECU for door position indication.

The LGECU combines the status of the aft equipment bay door with the status of the maintenance hatches to produce a single EICAS indication.

The maintenance hatches that are monitored are:

- Rear hydraulic system access door.
- Refuel/defuel station door.
- Optional belly fairing stowage access door.

### **Aft Equipment Bay Door**

An electrical proximity sensor provides indication to the EICAS system when the door is properly closed. The LGECU monitors the signals and provides the input to EICAS.

### **Small Service Doors**

The LGECU monitors the signals and provides input to EICAS when any one of the access/small service doors is not properly closed.

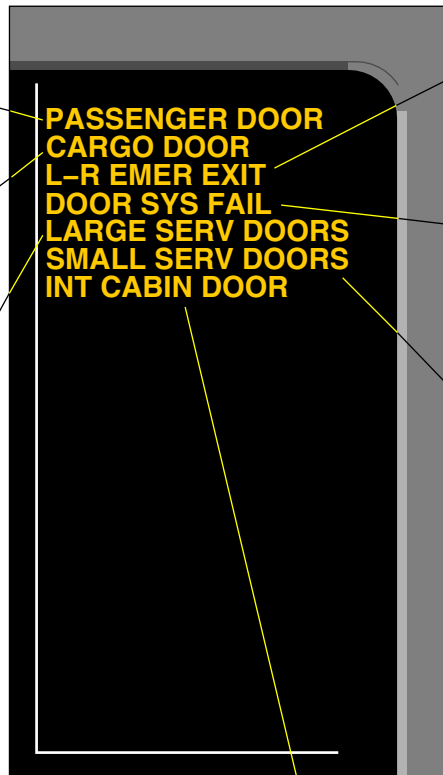
**EICAS MESSAGES**

**PASSENGER DOOR**  
Comes on to indicate that the passenger door is not closed and locked.

**CARGO DOOR**  
Comes on to indicate that the cargo door is not closed and latched.

**LARGE SERV DOORS**  
Comes on to indicate that one or more of the following doors are not closed:

- Equipment bay.
- Rear hydraulic system access.
- Refuel/defuel station.
- Optional belly fairing stowage access.



**L-R EMER EXIT**  
Comes on to indicate that the applicable emergency exit door is not in position.

**DOOR SYS FAIL**  
Comes on to indicate the loss of fuselage and gear door indication.

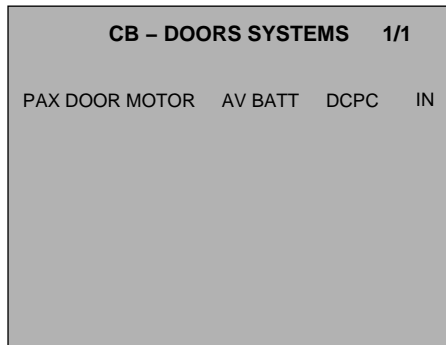
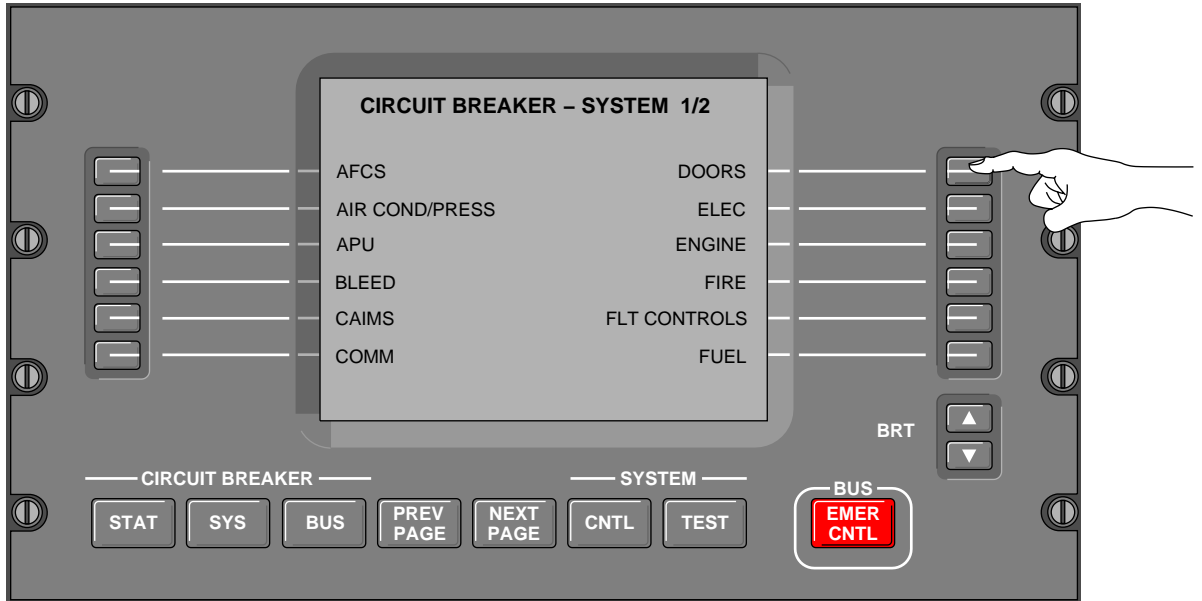
**SMALL SERV DOORS**  
Comes on to indicate that any one or more of the small service doors are not closed.

**INT CABIN DOOR**  
Comes on to indicate that the interior cabin door is closed for takeoff and landing.

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# AIRPLANE GENERAL EMS CIRCUIT PROTECTION

## CB - DOORS SYSTEMS



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**AIRPLANE GENERAL  
EMS CIRCUIT PROTECTION**

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