AURAL AND VISUAL WARNINGS

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CHAPTER 3

AURAL AND VISUAL WARNINGS

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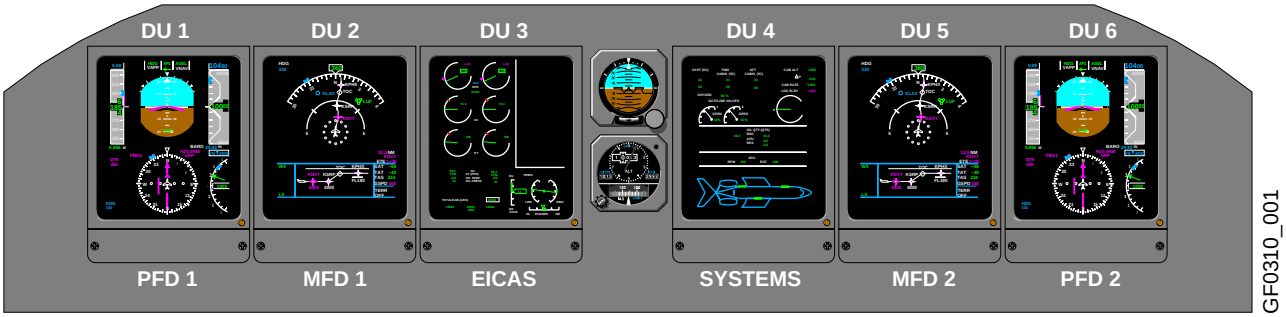
GENERAL

The aural and visual warning system provides indications to warn of potentially unsafe operating conditions or airplane configurations, system malfunctions, and non-normal situations. Indications can be generated by the following:

- Crew alerting sub-system within the Engine Indication and Crew Alerting System (EICAS).
- Enhanced Ground Proximity Warning System (EGPWS).
- Weather Radar (WX) system.
- Traffic alert and Collision Avoidance System (TCAS).
- Altitude alert portion of the Air Data Computer (ADC).
- Stick shaker portion of the Stall Protection System (SPS).

EICAS provides crew with the necessary displays for airplane engine control and monitoring, control surface monitoring and all major sub-system synoptic displays. During normal operation, the engine and control surface information is displayed on the EICAS display unit (DU3) and the system synoptic information is displayed on the SYSTEMS display (DU4).



EICAS provides display of:

- Primary engine parameters
- Fuel quantities
- Flaps/slats/spoilers positions
- Crew Alerting System (CAS) messages
- Secondary engine parameters
- Landing gear position
- Surface trim indication

SYSTEMS provides synoptics display of:

- Bleed/Anti-Ice Air
- Hydraulics
- DC Electrical
- Flight Controls
- Air Conditioning
- AC Electrical
- Fuel
- Status

CENTRAL DISPLAY SYSTEM

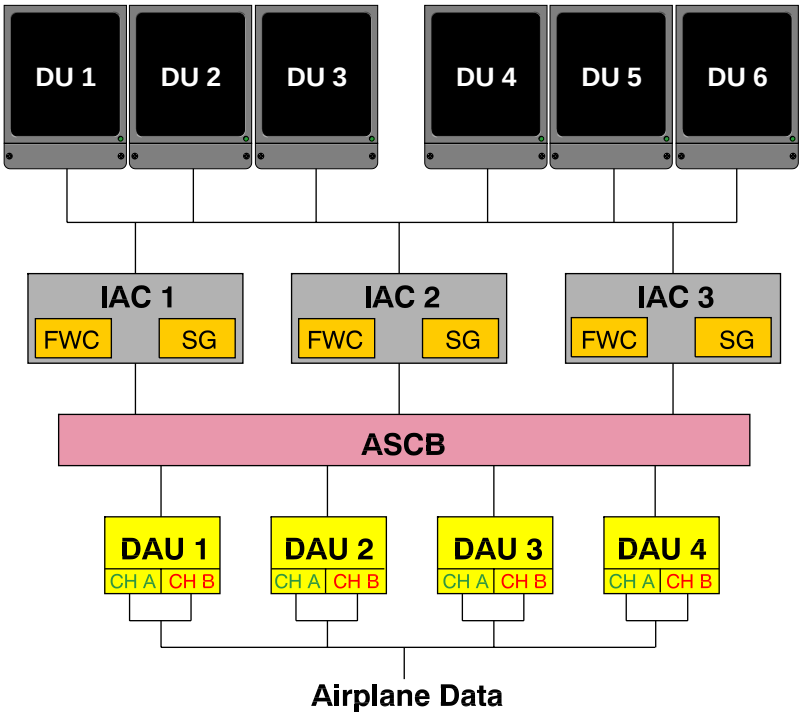
The central display system provides crew with displays for aircraft control, navigation, engine control and monitoring and systems synoptic. Other systems information provided for display are WX display, TCAS, EGPWS and Lightning Sensor System (LSS) display.

Airplane data is transmitted from airplane systems to 4 dual channel, Data Acquisition Units (DAU), through the Avionics Standard Communication Bus (ASCB), to 3 Integrated Avionics Computers (IAC), to the Display Units (DU).

The 4 dual channel DAUs operate with one channel active and the other channel on standby, with both channels updating data at the same time.

The ASCB is the principal communications network interconnecting the system components. Data traffic flow on the ASCB is managed by 3 bus controllers (one bus controller in each IAC). Only one bus controller is in control at a time, with the other 2 in standby status.

The three IACs, each contain a Symbol Generator (SG) and a Fault Warning Computer (FWC). The SGs process data from various sources and output the data to the 6 DUs. The FWC compares sensor input data, verifies all critical display data and displays warning, caution, advisory and status messages as applicable.



The IACs perform the following functions:

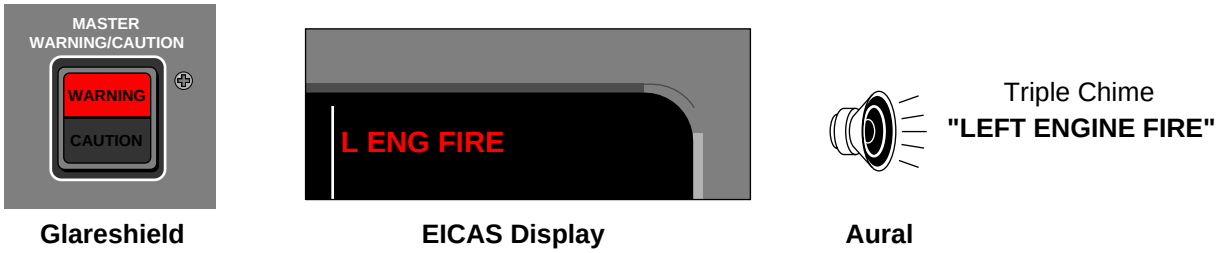
IAC 1	IAC 2	IAC 3
EFIS, EICAS, FWC, CAIMS	EFIS, EICAS, FWC, CAIMS	EFIS, EICAS, FWC, CAIMS
Tone/Aural generator	Tone/Aural generator	LASERTRACK (if installed)
Flight Management System	Flight Management System	FMS 3 (if installed)
Autothrottle	Autothrottle	
AFCS	AFCS	

CREW ALERTING MESSAGES

The crew alerting system portion of EICAS continually monitors all airplane systems. If an operationally significant fault occurs on a system, EICAS displays a crew alerting message on the EICAS display unit. In addition to the display messages, some crew alerts are also indicated by aural tones, voice advisories, MASTER WARNING and MASTER CAUTION lights.

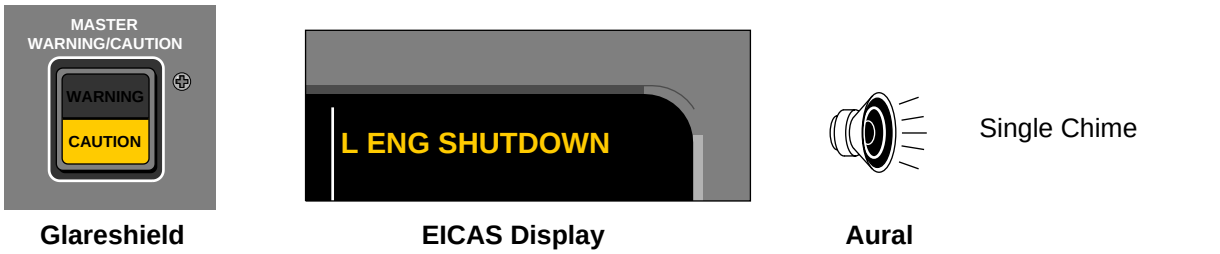
All crew alerting system messages are divided into one of four categories and in the following priority:

Warning messages are generated when immediate recognition and corrective or compensatory action is required. They are the most urgent type of crew alerts. They always appear at the top of the message stack on the EICAS primary display. All warnings cause the MASTER WARNING lights on the glareshield to flash and have an aural alert consisting of a unique tone or a triple chime plus a voice advisory. Once acknowledged flashing stops.

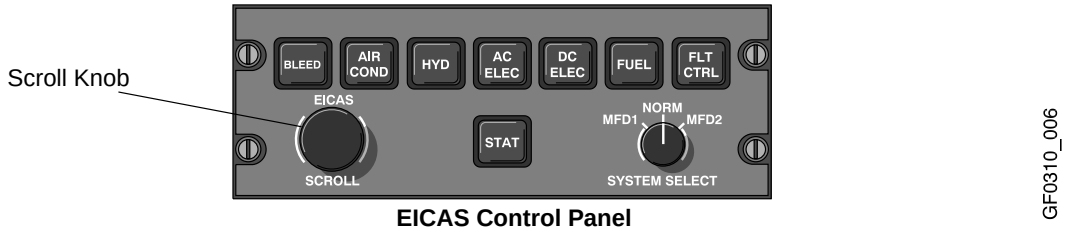


Warning messages cannot be removed from view, unless the applicable failure has been rectified. If a failure is rectified, messages which appeared below the deleted message, will move up one line. When a new fault occurs, the new message will move to the top of the stack.

Caution messages are generated when immediate crew awareness is required and subsequent crew action will be required. Caution messages appear immediately below the warnings in the message stack on the EICAS display. All cautions cause the MASTER CAUTION lights on the glareshield to flash and have an aural alert consisting of a single chime. Once acknowledged flashing stops .



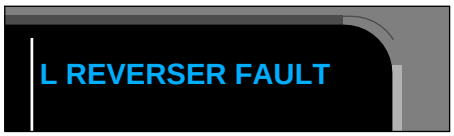
Caution messages can be paged and scrolled from view, using SCROLL knob on EICAS control panel. If a new abnormal situation occurs, the corresponding caution message will flash and the remaining messages will remain steady. To view all of the non-displayed messages, turn SCROLL knob on the EICAS control panel. If a new message is posted, it will be displayed at the top of the stack.



EICAS Control Panel

CREW ALERTING MESSAGES (CONT'D)

Advisory messages are generated when crew awareness is required and subsequent crew action may be required. Advisory messages appear immediately below the cautions in the message stack on the EICAS display. When a new advisory message appears, it will flash for 5 seconds, then steady. There is no aural alert for advisory messages.



EICAS Display

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Advisory messages can be paged and scrolled from view, using SCROLL knob on EICAS control panel. To view all of the non-displayed messages, turn SCROLL knob on the EICAS control panel.

Status messages are generated to indicate non-normal pilot selections and are reminders to the crew. They are set in the message stack below the advisories. There is no aural alert for status messages.

EICAS Display

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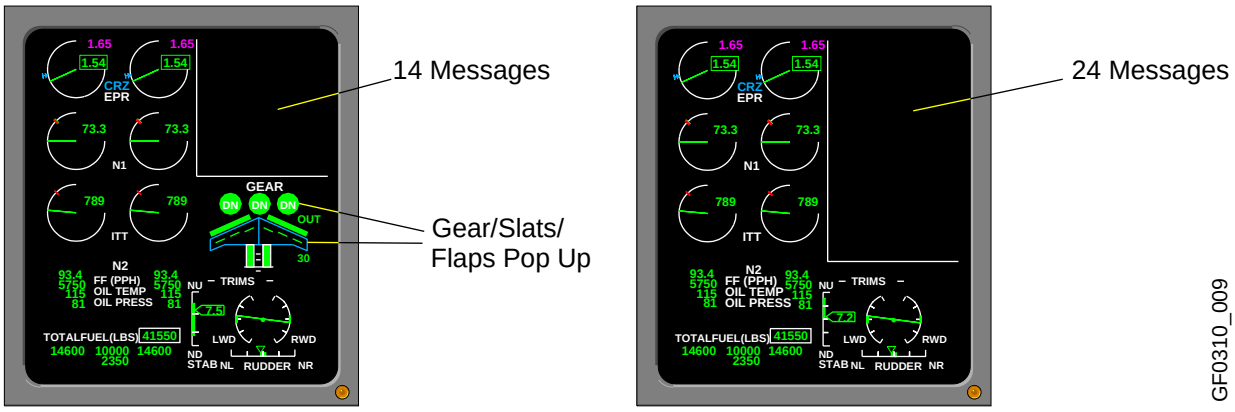
Status messages can be scrolled from view, using SCROLL knob on EICAS control panel. To view all of the non-displayed messages, turn SCROLL knob on the EICAS control panel.

The EICAS message window displays up to 14 messages with the Gear/Slats/Flaps pop up displayed. With the Gear/Slats/Flaps pop up not displayed, the window can display up to 24 messages.



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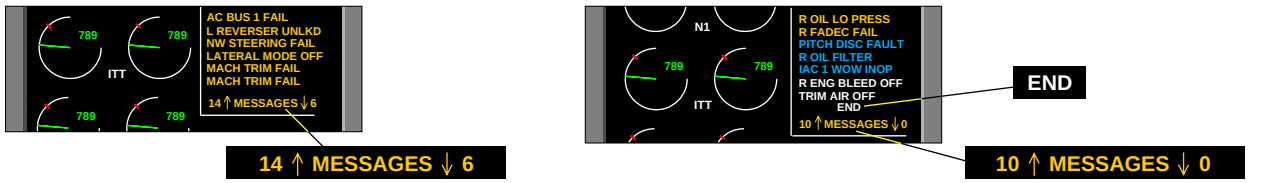
CREW ALERTING MESSAGES (CONT'D)

If there are non-displayed messages above the top of the display XXX↑ messages ↓XXX symbols will appear at the bottom of message window. The number of non-displayed messages will be indicated beside the ↑ or ↓ x arrows. If there are no more messages, END symbol will appear below last message. The colour of the status line corresponds to the highest level of messages not displayed. Warning messages are not part of the colour logic.



CREW ALERTING MESSAGES (CONT'D)

EICAS WARNING MESSAGES

	Chapt. Ref.
APU FIRE	9
APU OVERSPEED	5
APU OVERTEMP	5
BRAKE OVHT	9
CABIN ALT	2
CABIN DELTA P	2
CHECK PFD	11
CONFIG AIL TRIM	10
CONFIG RUD TRIM	10
CONFIG SLAT/FLAP	10
CONFIG SPOILERS	10
CONFIG STAB TRIM	10
DUAL ENGINE OUT	18
EMER PWR ONLY	7
GEAR	15
L ENG FIRE	9
L OIL LO PRESS	18
L REVERSER UNLKD	18
MLG BAY OVHT	9
NORM BRAKE FAIL	15
PARK/EMER BRAKE ON	15
R ENG FIRE	9
R OIL LO PRESS	18
R REVERSER UNLKD	18
SMOKE AFT LAV	9
SMOKE AVIONICS BAY	9
SMOKE BAGGAGE	9
SMOKE FWD LAV	9
SMOKE CABIN	9
SMOKE CLOSET	9
SMOKE CLOSET FWD	9
SMOKE CLOSET AFT	9
WING A/ICE OVHT	9

NOTE

A single message or a combined message can be displayed on a message line, up to a maximum of 18 characters.

Example: L REVERSER UNLKD or R REVERSER UNLKD or L−R REVERSER UNLKD

GF0310_011

CREW ALERTING MESSAGES (CONT'D)

EICAS CAUTION MESSAGES	Chapt. Ref.
AC BUS 1 FAIL	7
AC BUS 2 FAIL	7
AC BUS 3 FAIL	7
AC BUS 4 FAIL	7
AC ESS BUS FAIL	7
ADC 1 MISCMP	11
ADC 2 MISCMP	11
ADC 3 MISCMP	11
AFCS ENGAGE INVAL	4
AFT XFER FAIL	12
AFT XFER OFF SCHED	12
ALL ADC MISCMP	11
ALL IRS MISCMP	11
AP TRIM IS LWD	4
AP TRIM IS RWD	4
AP TRIM IS ND	4
AP TRIM IS NU	4
AP PITCH TRIM FAIL	4
APU BATT FAIL	7
APU BLEED SYS FAIL	2
APU DOOR FAIL	5
APU EGT SENSORS	5
APU FIRE FAIL	9
APU FUEL SOV	5
APU GEN OVERHEAT	7
APU GEN OVLD	7
APU OIL HI TEMP	5
APU OIL LO PRESS	5
APU REVERSE FLOW	2
ASCB FAIL	11
AIT NOT IN HOLD	18
AUTOBRAKE FAIL	15
AUTO PRESS FAIL	2
AV BATT FAIL	7
BATT BUS FAIL	7
BATT MASTER OFF	7
BRAKE 50% DGRADED	15
CABIN ALT	2
CARGO DOOR	1
CAT 2 INVALID	17
CB TRIP AC FEED	7
CB TRIP DC FEED	7
CHECK DU 1	3
CHECK DU 2	3
CHECK DU 3	3
CHECK DU 4	3
CHECK DU 5	3
CHECK DU 6	3
CPLT BRAKE FAULT	15
CTR FUEL XFER FAIL	12
DC BUS 1 FAIL	7
DC BUS 2 FAIL	7
DC EMER BUS FAIL	7
DC ESS BUS FAIL	7
DISP CTRLS FAIL	3
DOOR SYS FAIL	1
ELT TRANSMITTIG	6
EMER DEPRESS	2
EMER LIGHTS OFF	16
ELEVATOR SPLIT	10
FIRE BTL1 LO PRESS	9
FIRE BTL2 LO PRESS	9
FLAP FAIL	10
FLT SPOILERS FAIL	10
FLT SPLR DEPLOYED	10
FUEL COMPUTR FAIL	12
FUEL IMBALANCE	12
FUEL LO QTY	12
FUEL TEMP SENSOR	12
FUEL UNIT MISMATCH	12
⟶ FUEL XFER FAIL	12
⟵ FUEL XFER FAIL	12
⟶ FUEL XFER ON	12
⟵ FUEL XFER ON	12
GEAR DISAGREE	15
GEAR SYS FAIL	15
GEN 1 OVLD	7
GEN 2 OVLD	7
GEN 3 OVLD	7
GEN 4 OVLD	7
GND LIFT DUMP	10
HUD FAIL	11
HUD MISCOMPARE	11
HYD 1 HI TEMP	13
HYD 2 HI TEMP	13
HYD 3 HI TEMP	13
HYD 1 LO PRESS	13
HYD 2 LO PRESS	13
HYD 3 LO PRESS	13
HYD 1 LO QTY	13
HYD 2 LO QTY	13
HYD 3 LO QTY	13
HYD 3 OVERFILLED	13
HYD RAT PUMP FAIL	13
IAC 1 OVHT	3
IAC 2 OVHT	3
IAC 3 OVHT	3
ICE	14
ICE DETECTOR FAIL	14
INBD BRK LO PRESS	15
IRS 1 MSCMP	11
IRS 2 MSCMP	11
IRS 3 MSCMP	11
IRS 1 OVHT	11
IRS 2 OVHT	11
IRS 3 OVHT	11
IRS 1 SET HDG	11
IRS 2 SET HDG	11
IRS 3 SET HDG	11

NOTE

A single message or a combined message can be displayed on a message line, up to a maximum of 18 characters.

Example: DU 1 FAN or DU 2 FAN or DU 3 FAN or DU 1−2−3 FAN

GF0310_012

CREW ALERTING MESSAGES (CONT'D)

EICAS CAUTION MESSAGES

	Chapt. Ref.		Chapt. Ref.		Chapt. Ref.
LARGE SERV DOORS	1	PARK/EMER BRAKE ON	15	SG 1 FAIL	3
L AOA HEAT FAIL	15	PASSENGER DOOR	1	SG 2 FAIL	3
L BLEED LEAK	2	PITOT 1 HT FAIL	14	SG 3 FAIL	3
L BLEED SYS FAIL	2	PITOT 2 HT FAIL	14	SLAT – FLAP FAIL	10
L COWL A/ICE FAIL	2	PITOT 3 HT FAIL	14	SLAT–FLAP FAULT	10
L EMER EXIT	1	PLT BRAKE FAULT	15	SMALL SERV DOORS	1
L ENG FIRE FAIL	9			SMOKE AFT LAV FAIL	9
L ENG FLAMEOUT	18	RAT GEN FAIL	7	SMOKE AV BAY FAIL	9
L ENG FUEL LO TEMP	18	R AOA HEAT FAIL	15	SMOKE BAGGAGE FAIL	9
L ENG FUEL SOV	18	R BLEED LEAK	2	SMOKE CABIN FAIL	9
L ENGINE OVHT	18	R BLEED SYS FAIL	2	SMOKE CLOSET FAIL	9
L ENG OVERSPED	18	R COWL A/ICE FAIL	2	SMOKE CLO FWD FAIL	9
L ENG SAV FAIL	18	R EMER EXIT	1	SMOKE CLO AFT FAIL	9
L FADEC FAIL	18	R ENG FIRE FAIL	9	SMOKE FWD LAV FAIL	9
L FADEC N1 CTL	18	R ENG FLAMEOUT	18	SPLR LEVER FAIL	10
L FADEC OVHT	18	R ENG FUEL LO TEMP	18	STAB TRIM	10
L FUEL FILTER	18	R ENG FUEL SOV	18	STALL PROTECT FAIL	10
L FUEL LO PRESS	18	R ENGINE OVHT	18	STBY PITOT HT FAIL	14
L FUEL RECIRC FAIL	12	R ENG OVERSPED	18		
L HYD SOV FAIL	13	R ENG SAV FAIL	18	TRIM AIR FAIL	2
L INBD BRAKE FAIL	15	R FADEC FAIL	18	TRIM AIR LEAK	2
L MAIN GEAR DOOR	15	R FADEC N1 CTL	18		
L OIL LO QTY	18	R FADEC OVHT	18		
L OUTBD BRAKE FAIL	15	R FUEL FILTER	18	UNCOMMANDED BRAKE	15
L PACK AUTO FAIL	2	R FUEL LO PRESS	18	WING A/ICE LO HEAT	14
L PACK FAIL	2	R FUEL RECIRC FAIL	12	WING A/ICE LEAK	14
L PACK TEMP	2	R HYD SOV FAIL	13	WING FUEL HI TEMP	12
L PRI FUEL PUMPS	12	R INBD BRAKE FAIL	15	WING FUEL LO TEMP	12
L REVERSER FAIL	18	R MAIN GEAR DOOR	15	WING TO CTR LEAK	12
L REV LOCK FAIL	18	R OIL LO QTY	18	WOW FAIL	15
L START ABORTED	18	R OUTBD BRAKE FAIL	15		
L THROTTLE FAIL	18	R PACK AUTO FAIL	2	XBLEED FAIL	2
L WINDOW HEAT FAIL	14	R PACK FAIL	2		
L WING A/ICE FAIL	14	R PACK TEMP	2	YD 1 FAIL	4
L WING FULL	12	R PRI FUEL PUMPS	12	YD 2 FAIL	4
L WSHLD HEAT FAIL	14	R REVERSER FAIL	18	YD OFF	4
		R REV LOCK FAIL	18		
MACH TRIM FAIL	10	R START ABORTED	18		
MLG BAY OVHT FAIL	9	R THROTTLE FAIL	18		
		R WINDOW HEAT FAIL	14		
NOSE DOOR	15	R WING A/ICE FAIL	14		
NOSE STEER FAIL	15	R WING FULL	12		
		R WSHLD HEAT FAIL	14		
OUTBD BRK LO PRESS	15	ROLL SELECT	10		
OXYGEN LO QTY	8	ROLL SPOILERS FAIL	10		
		RUD AUTHORITY HIGH	10		
		RUD AUTHORITY LOW	10		
		RUD LIMITER FAIL	10		

Note:
A single message or a combined message can be displayed on a message line, up to a maximum of 18 characters.
Example: L HYD SOV FAIL or R HYD SOV FAIL or L–R HYD SOV FAIL

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CREW ALERTING MESSAGES (CONT'D)

EICAS ADVISORY MESSAGES

	Chapt. Ref.
AC BUS 1 XFER FAULT	7
AC BUS 2 XFER FAULT	7
AC BUS 3 XFER FAULT	7
AC BUS 4 XFER FAULT	7
ADC 1 FAIL	11
ADC 2 FAIL	11
ADC 3 FAIL	11
ADC 1 DEGRADED	11
ADC 2 DEGRADED	11
ADC 3 DEGRADED	11
AFCS 1 FAIL	4
AFCS 2 FAIL	4
AFT R/D VALVE OPEN	12
AFT XFER FAULT	12
AFT XFER OFF SCHED	12
AP 1 FAIL	4
AP 2 FAIL	4
APU BATT CHGR FAIL	7
APU BLEED DISABLED	2
APU FADEC FAIL	5
APU FAULT	5
APU FIRE FAULT	9
APU GEN FAIL	7
APU IN BITE	7
APU NOT AVAILABLE	5
APU OIL LO QTY	5
APU SHUTDOWN	5
APU SQUIB 1 FAIL	9
APU SQUIB 2 FAIL	9
ASCB FAULT	11
ASCB CTLR 1 FAIL	11
ASCB CTLR 2 FAIL	11
ASCB CTLR 3 FAIL	11
AT 1 FAIL	18
AT 2 FAIL	18
AT ADC MISCMP	18
AT IRS MISCMP	18
ATS ENVELOPE	18
AUTO PRESS FAULT	2
AV BATT CHGR FAIL	7
AVIONIC FAN FAIL	2
BATT BUS XFER FAULT	7
BATT EMER PWR ON	7
BLEED MISCONFIG	2
BRAKE FAULT	15
BRAKE TEMP	15
CAB ALT LEVEL HI	2
CB TRIP	7
CHECKLIST MISMATCH	3
CTR XFER FAULT	12
DAU 1A FAIL	3
DAU 1B FAIL	3
DAU 2A FAIL	3
DAU 2B FAIL	3
DAU 3A FAIL	3
DAU 3B FAIL	3
DAU 4A FAIL	3
DAU 4B FAIL	3
DC BUS 1 XFER FAULT	7
DC BUS 2 XFER FAULT	7
DC ESS XFER FAULT	7
DU 1−2−3−4−5−6 FAN	3
ELEC SYS FAULT	7
ENG SYNC FAIL	18
ENG SYNC LIMIT	18
ESS TRU 1 FAIL	7
ESS TRU 2 FAIL	7
EXT AC PWR AVAIL	7
EXT DC PWR AVAIL	7
FCU FAULT	10
FDR ACCEL FAIL	11
FDR FAIL	11
FIRE SYS FAULT	9
FLAP DRIVE OVHT	10
FLAP HALFSPD	10
FLT SPOILERS FAULT	10
FMS 1 FAIL	17
FMS 2 FAIL	17
FMS 3 FAIL	17
FUEL COMPUTR FAULT	12
FUEL QTY DEGRADED	12
FUEL RECIRC ON	12
⟶ FUEL XFER ON	12
⟵ FUEL XFER ON	12
⟶ XFER VALVE OPEN	12
⟵ XFER VALVE OPEN	12
GEAR SYS FAULT	15
GEN 1 FAIL	7
GEN 2 FAIL	7
GEN 3 FAIL	7
GEN 4 FAIL	7
GND LIFT DUMP	10
GND PROX FAIL	17
GPWS SYSTEM FAIL	17
HUD FAN FAIL	11
HUD MISALIGN	11
HUMIDIFIER FAIL	2
HYD EDP 1A FAIL	13
HYD EDP 2A FAIL	13
HYD PUMP 3A FAIL	13
HYD PUMP 1B FAIL	13
HYD PUMP 2B FAIL	13
HYD PUMP 3B FAIL	13

NOTE

A single message or a combined message can be displayed on a message line, up to a maximum of 18 characters.

Example: AFCS 1 FAIL or AFCS 2 FAIL or AFCS 1−2 FAIL

GF0310_014

CREW ALERTING MESSAGES (CONT'D)

EICAS ADVISORY MESSAGES

	Chapt. Ref.
IAC 1 AURAL FAIL	3
IAC 2 AURAL FAIL	3
IAC 1 INVALID	11
IAC 2 INVALID	11
IAC 3 INVALID	11
IAC 1 MEM FULL	11
IAC 2 MEM FULL	11
IAC 3 MEM FULL	11
IAC 1 WOW INOP	15
IAC 2 WOW INOP	15
IAC 3 WOW INOP	15
IAC CONFIG MISMTCH	11
ICE	14
ICE DETECTOR FAULT	14
IRS 1 AUX FAIL	11
IRS 2 AUX FAIL	11
IRS 3 AUX FAIL	11
IRS 1 FAIL	11
IRS 2 FAIL	11
IRS 3 FAIL	11
IRS 1 NO ALIGN	11
IRS 2 NO ALIGN	11
IRS 3 NO ALIGN	11
IRS 1 AUX PWR	11
IRS 2 AUX PWR	11
IRS 3 AUX PWR	11
L AUX FUEL PUMP	12
L BLEED FAULT	2
L COWL A/ICE FAULT	14
L ENG FIRE FAULT	9
L ENG SQUIB 1 FAIL	9
L ENG SQUIB 2 FAIL	9
L FADEC FAULT	18
L FUEL FILTER	18
L OIL FILTER	18
L PACK FAULT	2
L PRI FUELPUMP	12
L PROBE MON FAIL	14
L R/D VALVE OPEN	12
L REVERSER FAULT	18
L REV LOCK FAULT	18
LTRK FAIL	17
MACH XDUCER FAULT	10
MAN PRESS FAULT	2
MFD CTLR 1 FAIL	11
MFD CTLR 2 FAIL	11
MLG BAY OVHT FAULT	15
NAV LIGHTS FAIL	16
NO TAKEOFF	3
OIL RES LO QTY	18
OUTFLOW VLV 1 FAIL	2
OUTFLOW VLV 2 FAIL	2
PASSENGER OXY ON	8
PITCH DISC FAULT	10
PITCH FEEL FAULT	10
RAM AIR FAIL	2
RAT GEN ON	7
RECIRC FAN FAIL	2
REVRSION CTLR FAIL	3
R AUX FUEL PUMP	12
R BLEED FAULT	2
R COWL A/ICE FAULT	14
R ENG FIRE FAULT	9
R ENG SQUIB 1 FAIL	9
R ENG SQUIB 2 FAIL	9
R FADEC FAULT	18
R FUEL FILTER	18
R OIL FILTER	18
R PACK FAULT	2
R PRI FUELPUMP	12
R POBE MON FAIL	14
R R/D VALVE OPEN	12
R REVERSER FAULT	18
R REV LOCK FAULT	18
RUD AUTHORITY SAFE	10
RUD LIMITER FAULT	10
SAFETY VALVE OPEN	2
SELCAL HF 1	6
SELCAL HF 2	6
SELCAL VHF 1	6
SELCAL VHF 2	6
SELCAL VHF 3	6
SET LDG ELEV	2
SHAKER 1 FAIL	10
SHAKER 2 FAIL	10
SLAT DRIVE OVHT	10
SLAT HALFSPD	10
SLAT/FLAP BIT	10
SLAT/FLAP HALFSPD	10
SPLRS/STAB IN TEST	10
STAB CH 1 FAIL	10
STAB CH 2 FAIL	10
STALL WARN ADVANCE	10
STALL WARN BASIC	10
TAT 1 FAIL	14
TAT 2 FAIL	14
TAT 3 FAIL	14
TAT HT 1 FAIL	14
TAT HT 2 FAIL	14
TAT HT 3 FAIL	14
TERR FAIL	17
TRIM AIR FAULT	2
TRU 1 FAIL	7
TRU 2 FAIL	7
WINDSHEAR FAIL	18
WINDMILL ENVELOPE	18
WING A/ICE FAULT	14
WING A/ICE SENSOR	14
WOW FAULT	15
XFEED VALVE FAIL	12
YD HEAT 1 FAIL	4
YD HEAT 2 FAIL	4
YD NOT CENTERED	4

NOTE
A single message or a combined message can be displayed on a message line, up to a maximum of 18 characters.
Example: MFD CTLR 1 FAIL or MFD CTLR 2 FAIL or MFD 1−2 CTLR FAIL

GF0310_015

CREW ALERTING MESSAGES (CONT'D)

EICAS STATUS MESSAGES

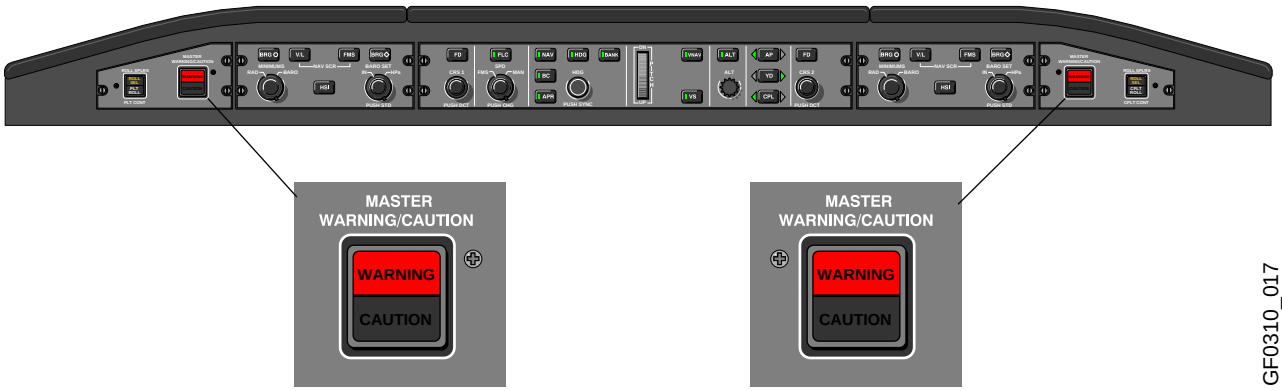
	Chapt. Ref.
AC BUS1 MAN OFF	7
AC BUS 2 MAN OFF	7
AC BUS 3 MAN OFF	7
AC BUS 4 MAN OFF	7
AFT FUEL XFER OFF	12
AFT FUEL XFER ON	12
APU BLEED OFF	5
APU BLEED ON	5
APU FUEL SOV CLSD	12
APU GEN OFF	7
APU SOVS CLSD	9
AUTOBRAKE HI	15
AUTOBRAKE LOW	15
AUTOBRAKE MED	15
AUX PRESS ON	2
BATT BUS MAN OFF	7
	10
CPLT ROLL SPLRS	
DC BUS 1 MAN OFF	7
DC BUS 2 MAN OFF	7
DC ESS BUS MAN OFF	7
DITCHING ON	2
EGPWS TERR OFF	17
EMER LIGHTS ON	16
EXT AC PWR ON	7
EXT DC PWR ON	7
→ FUEL XFER ON	12
← FUEL XFER ON	12
GEAR HORN MUTED	15
GEN 1 OFF	7
GEN 2 OFF	7
GEN 3 OFF	7
GEN 4 OFF	7
GLD MANUAL ARM	10
GND LIFT DUMP OFF	10
GPWS FLAP OVRD	17
GPWS G/S MUTED	17
HUD ON	11
HYD PUMP 1B OFF	13
HYD PUMP 1B ON	13
HYD PUMP 2B OFF	13
HYD PUMP 2B ON	13
HYD PUMP 3A OFF	13
HYD PUMP 3B OFF	13
HYD 3B ON	13
HIGH PRESS RATE	2
IAC 1 AURAL MUTE	3
IAIC 2 AURAL MUTE	31
IRS 1 IN ATT	17
IRS 2 IN ATT	17
IRS 3 IN ATT	17
LDG ELEV MAN	2
L AUX PUMP OFF	12
L COWL A/ICE AUTO	14
L COWL A/ICE ON	14
L ENG BLEED ON	18
L ENG BLEED OFF	18
L ENG SOVS CLSD	9
L ENG SHUTDOWN	18
L FADEC NI CTL	18
L FUEL SOV CLSD	12
L FUEL RECIRC ON	12
L HYD SOV CLSD	9
L IGNITION ON	18
L PACK HIGH FLOW	2
L PACK LOW FLOW	2
L PACK MAN TEMP	2
L PACK OFF	2
L PRI PUMPS OFF	12
L WSHLD HEAT OFF	14
MAN PRESS CONTROL	2
NO SMKG SIGN ON	16
NOSE STEER OFF	15
OUTFLOW VLV 1 CLSD	2
OUTFLOW VLV 2 CLSD	2
PARK/EMER BRAKE ON	15
PLT ROLL SPLRS	10
RAT GEN OFF	7
RAM AIR ON	2
RECIRC FAN OFF	2
R AUX PUMPS OFF	12
R COWL A/ICE AUTO	14
R COWL A/ICE ON	14
R ENG BLEED ON	18
R ENG BLEED OFF	18
R ENG SOVS CLSD	9
R ENG SHUTDOWN	18
R FADEC NI CTL	18
R FUEL SOV CLSD	12
R FUEL RECIRC ON	12
R HYD SOV CLSD	9
R IGNITION ON	18
R PACK HIGH FLOW	2
R PACK LOW FLOW	2
R PACK MAN TEMP	2
R PACK OFF	2
R PRI PUMPS OFF	12
R WSHLD HEAT OFF	14
SEAT BELTS SIGN ON	16
STAB CH 1 OFF	10
STAB CH 2 OFF	10
TRIM AIR OFF	2
WING A/ICE AUTO	14
WING A/ICE ON	14
WING FUEL XFER OFF	12
WING XBLEED FROM L	12
WING XBLEED FROM R	12
XBLEED CLOSED	2
XBLEED OPEN	2
XFEED VALVE OPEN	12

NOTE
A single message or a combined message can be displayed on a message line, up to a maximum of 18 characters.
Example: L IGNITION ON or R IGNITION ON or L−R IGNITION ON

GF0310_016

MASTER WARNING/MASTER CAUTION LIGHTS

- Two MASTER WARNING switch/lights come on flashing when any warning occurs. Pushing either MASTER WARNING switch/light extinguishes both MASTER WARNING lights for the duration of that warning and resets the lights for future warnings.

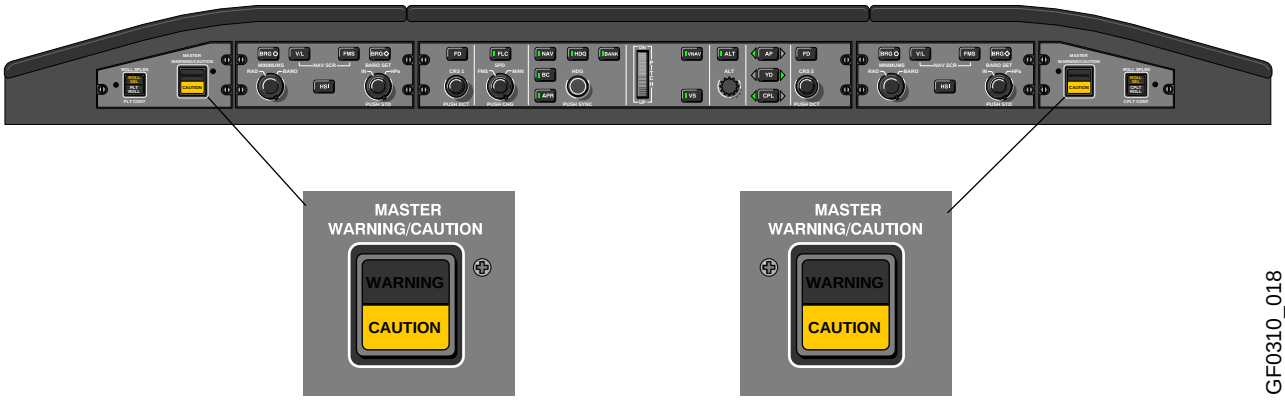


GF0310_017

Pushing the MASTER WARNING also silences the aural warnings except for the following cases:

- Stall warnings
- EGPWS/TCAS (voices and aurals)
- Overspeed Continuous Horn (A-chord)
- Trim clacker
- Autopilot disconnect cavalry charge
- Configuration warnings
- Gear Horn
- Autothrottle disconnect
- Windshear warning

Two MASTER CAUTION switch/lights come on flashing when any caution occurs. Pushing either MASTER CAUTION switch/light extinguishes both MASTER CAUTION lights for the duration of that caution and resets the lights for future cautions.



GF0310_018

Pushing the MASTER CAUTION will not silence the following:

- EGPWS and TCAS voice alerts
- Altitude alert (C-chord) aural

AURALS

Aurals and tones that call attention to warnings and cautions.

Aural/Tone	Indication	Chapter Reference
C-chord (1 second)	Altitude alert	Chapter 11, Flight Instruments
Cavalry Charge	Autopilot disconnect	Chapter 4, Automatic Flight Control System
Caution (Single chime)	Tone that precedes an aircraft system caution message	Chapters 2 through 18
Clacker	Excessive stabilizer movement	Chapter 10, Flight Controls
Double C-chord	VNAV vertical track alert	Chapter 4, Automatic Flight Control System
Horn Continuous (A-chord)	Overspeed warning	Chapter 4, Automatic Flight Control System Chapter 10, Flight Controls
Stick Shaker	Stall	Chapter 10, Flight Controls
Voice	Voice aural warnings	Chapters 2 through 18
Warning (Triple chime)	Tone that precedes an aircraft system warning message and/or voice advisory	Chapters 2 through 18
Whoop − Whoop	EGPWS mode 1 or 2 (excessive descent rate or excessive closure rate) (if installed)	EGPWS, Chapter 17, Navigation

Voice Messages

(Airplanes 9002, 9005 to 9066 **not incorporating** SB 700-34-013, Traffic Alert and Collision Avoidance System − Change 7 Software Upgrade)

The following is an alphabetical list of Voice messages:

VOICE MESSAGE − ALPHABETICAL W = Warning SYS = System			
Voice Message	**Type**	**Chapter Ref.**	**EICAS/ PFD INDICATION**
Approaching Decision Height (DH)	SYS	17	Approaching DH selected on PFD
Approaching Minimums	SYS	17	Approaching minimum altitude selected on PFD
APU FIRE	W	5	APU FIRE
Bank Angle	SYS	17	EGPWS − Excessive bank angle on final approach
CABIN ALTITUDE	W	2	CABIN ALT / Cabin altitude >9000 feet

AURALS (CONT'D)

VOICE MESSAGE − ALPHABETICAL W = Warning SYS = System			
Voice Message	**Type**	**Chapter Ref.**	**EICAS/ PFD INDICATION**
Caution Obstacle	SYS	17	EGPWS − An obstacle threat has been detected.
Caution Terrain	SYS	17	EGPWS − A terrain threat has been detected.
Cavalry Charge	SYS	4	Autopilot disconnect
Clear of Conflict	SYS	17	TCAS − Encounter has ended and separation increasing
Climb, Climb, Climb	SYS	17	TCAS − Indicates a climb command. Displays a green fly-to Pitch Target Zone (PTZ) and a red Pitch Avoidance Zone (PAZ) on both PFD ADIs
Climb, Climb, Now	SYS	17	TCAS − Following a descent command, a climb is necessary to provide adequate separation
Climb, Crossing Climb	SYS	17	TCAS − Indicates a climb command. Displays a green fly-to PTZ and a red PAZ on both PFD ADIs. Aircraft flight path will cross intruder's altitude
Decision Height	SYS	11	At DH selected on PFD
Descend, Crossing, Descend	SYS	17	TCAS − Indicates a descend command. Displays a green fly-to PTZ and a red PAZ on both PFD ADIs. Aircraft flight path will cross intruder's altitude
Descend, Descend, Descend	SYS	17	TCAS − Indicates a descend command. Displays a green fly-to PTZ and a red PAZ on both PFD ADIs
Descend, Descend, Now	SYS	17	TCAS − Following a climb command, a descent is necessary to provide adequate separation
Don't Sink	SYS	17	EGPWS − Sink after take-off
Gear, Gear	SYS	15	Gear not all fully down and locked during an attempted landing
GEAR BAY OVERHEAT	W	9	MLG BAY OVHT / Main wheel well overheat
Glideslope	SYS	17	EGPWS − Excessive deviation below glideslope
Increase Climb	SYS	17	TCAS − PTZ command increases to increase climb rate

AURALS (CONT'D)

VOICE MESSAGE − ALPHABETICAL W = Warning SYS = System			
Voice Message	**Type**	**Chapter Ref.**	**EICAS/ PFD INDICATION**
Increase Descent	SYS	17	TCAS − PTZ command decreases to increase descent rate
LEFT ENGINE FIRE	W	9	L ENG FIRE
Minimums	SYS	17	At minimum altitude selected on PFD
Monitor Vertical Speed	SYS	17	TCAS − Monitor pitch attitude to keep pitch attitude inside PTZ and away from PAZ
NO TAKEOFF	W	10 & 15	CONFIG AIL TRIM CONFIG RUD TRIM CONFIG SLATS/FLAPS CONFIG SPOILERS CONFIG STAB TRIM PARK BRAKE ON
Obstacle, Obstacle	SYS	17	EGPWS − Excessive obstacle closure
Pull Up	SYS	17	EGPWS − Corrective action after excessive descent rate during approach
Reduce Climb	SYS	17	TCAS − PTZ command decreases to decrease climb rate
Reduce Descent	SYS	17	TCAS − PTZ command increases to decrease descent rate
RIGHT ENGINE FIRE	W	9	R ENG FIRE
Selcal	SYS	6	SELCAL HF, SELCAL VHF 1, SELCAL VHF 2, SELCAL VHF 3 (On airplanes with SB 700-23-002 incorprated)
Sink Rate	SYS	17	EGPWS − Excessive descent rate during approach
SMOKE	W	9	SMOKE BAGGAGE SMOKE FWD LAV SMOKE AFT LAV SMOKE CLOSET SMOKE AVIONICS BAY
Terrain, Terrain	SYS	17	EGPWS − Excessive terrain closure
Too Low Flap	SYS	17	EGPWS − Insufficient flap, low altitude
Too Low Gear	SYS	17	EGPWS − Gear up, low altitude
Too Low Obstacle	SYS	17	EGPWS − Obstacle closure low altitude
Too Low Terrain	SYS	17	EGPWS − Terrain closure low altitude

AURALS (CONT'D)

VOICE MESSAGE − ALPHABETICAL W = Warning SYS = System			
Voice Message	**Type**	**Chapter Ref.**	**EICAS/ PFD INDICATION**
Traffic, Traffic	SYS	17	TCAS − Conduct visual search for intruder
Windshear,Windshear	SYS	17	EGPWS − **WINDSHR** (decreasing performance)
500, 100, 50, 30	SYS	17	EGPWS − Descending altitude callouts

Voice Messages

(Airplanes 9067 and subsequent and airplanes 9002, 9005 to 9066 **incorporating** SB 700-34-013, Traffic Alert and Collision Avoidance System − Change 7 Software Upgrade)

The following is an alphabetical list of Voice messages:

VOICE MESSAGE − ALPHABETICAL W = Warning SYS = System			
Voice Message	**Type**	**Chapter Ref.**	**EICAS/ PFD INDICATION**
Adjust Vertical Speed, Adjust	SYS	17	TCAS − Monitor vertical speed to keep aircraft inside PTZ and away from PAZ.
Approaching Decision Height (DH)	SYS	17	Approaching DH selected on PFD
Approaching Minimums	SYS	17	Approaching minimum altitude selected on PFD
APU FIRE	W	5	APU FIRE
Bank Angle	SYS	17	EGPWS − Excessive bank angle on final approach
CABIN ALTITUDE	W	2	CABIN ALT / Cabin altitude >9000 feet
Caution Obstacle	SYS	17	EGPWS − An obstacle threat has been detected.
Caution Terrain	SYS	17	EGPWS − A terrain threat has been detected.
Cavalry Charge	SYS	4	Autopilot disconnect
Clear of Conflict	SYS	17	TCAS − Encounter has ended and separation increasing
Climb − Climb	SYS	17	TCAS − Indicates a climb command. Displays a green fly-to PTZ and a red PAZ on both PFD ADIs

AURALS (CONT'D)

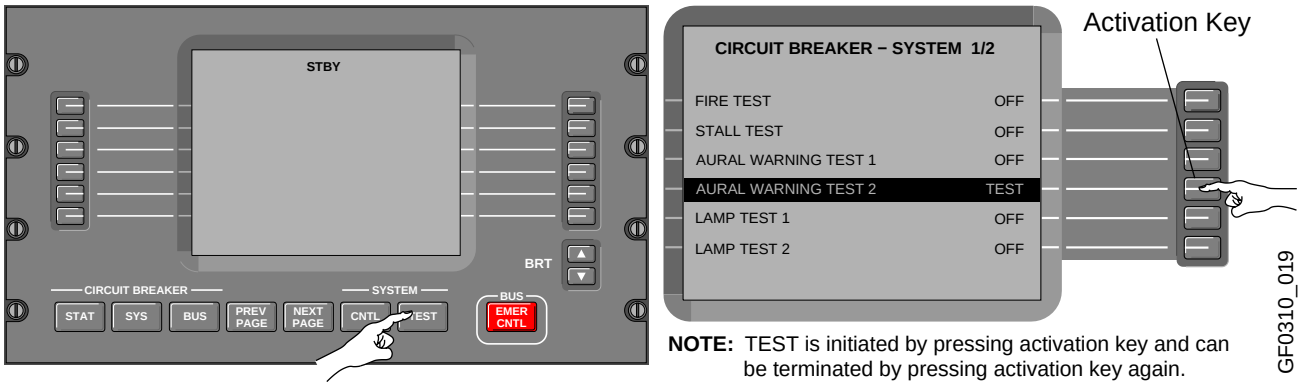
VOICE MESSAGE − ALPHABETICAL W = Warning SYS = System			
Voice Message	**Type**	**Chapter Ref.**	**EICAS/ PFD INDICATION**
Climb, Climb Now! − Climb, Climb Now!	SYS	17	TCAS − Following a descent command, a climb is necessary to provide adequate separation
Climb, Crossing Climb − Climb, Crossing Climb	SYS	17	TCAS − Indicates a climb command. Displays a green fly-to PTZ and a red PAZ on both PFD ADIs. Aircraft flight path will cross intruder's altitude
Decision Height	SYS	11	At DH selected on PFD
Descend, Crossing Descend − Descend, Crossing Descend	SYS	17	TCAS − Indicates a descend command. Displays a green fly-to PTZ and a red PAZ on both PFD ADIs. Aircraft flight path will cross intruder's altitude
Descend − Descend	SYS	17	TCAS − Indicates a descend command. Displays a green fly-to PTZ and a red PAZ on both PFD ADIs
Descend, Descend Now! − Descend, Descend Now!	SYS	17	TCAS − Following a climb command, a descent is necessary to provide adequate separation
Don't Sink	SYS	17	EGPWS − Sink after take-off
Gear Bay Overheat	W	9	MLG BAY OVHT / Main wheel well overheat
Gear, Gear	SYS	15	Gear not all fully down and locked during an attempted landing
Glideslope	SYS	17	EGPWS − Excessive deviation below glideslope
Increase Climb − Increase Climb	SYS	17	TCAS − PTZ command increases to increase climb rate
Increase Descent − Increase Descent	SYS	17	TCAS − PTZ command decreases to increase descent rate
LEFT ENGINE FIRE	W	9	L ENG FIRE
Maintain Vertical Speed, Crossing Maintain	SYS	17	TCAS − Monitor pitch attitude to keep pitch attitude inside PTZ and away from PAZ. Aircraft flight path will cross intruder's altitude
Maintain Vertical Speed Maintain	SYS	17	TCAS − Monitor pitch attitude to keep pitch attitude inside PTZ and away from PAZ
Minimums	SYS	17	At minimum altitude selected on PFD
Monitor Vertical Speed − Monitor Vertical Speed	SYS	17	TCAS − Monitor pitch attitude to keep pitch attitude inside PTZ and away from PAZ

AURALS (CONT'D)

VOICE MESSAGE − ALPHABETICAL W = Warning SYS = System			
Voice Message	**Type**	**Chapter Ref.**	**EICAS/ PFD INDICATION**
NO TAKEOFF	W	10 & 15	CONFIG AIL TRIM CONFIG RUD TRIM CONFIG SLATS/FLAPS CONFIG SPOILERS CONFIG STAB TRIM PARK BRAKE ON
Obstacle, Obstacle	SYS	17	EGPWS − Excessive obstacle closure
Pull Up	SYS	17	EGPWS − Corrective action after excessive descent rate during approach
RIGHT ENGINE FIRE	W	9	R ENG FIRE
Selcal	SYS	6	SELCAL HF, SELCAL VHF 1, SELCAL VHF 2, SELCAL VHF 3
Sink Rate	SYS	17	EGPWS − Excessive descent rate during approach
SMOKE	W	9	SMOKE BAGGAGE SMOKE FWD LAV SMOKE AFT LAV SMOKE CLOSET SMOKE AVIONICS BAY
Terrain, Terrain	SYS	17	EGPWS − Excessive terrain closure
Too Low Flap	SYS	17	EGPWS − Insufficient flap, low altitude
Too Low Gear	SYS	17	EGPWS − Gear up, low altitude
Too Low Obstacle	SYS	17	Obstacle closure low altitude
Too Low Terrain	SYS	17	EGPWS − Terrain closure low altitude
Traffic, Traffic	SYS	17	TCAS − Conduct visual search for intruder
Windshear, Windshear	SYS	17	EGPWS − WINDSHR (decreasing performance)
500, 100, 50, 30	SYS	17	EGPWS − Descending altitude callouts

AURAL WARNING TEST

Most aural alerts are exercised as part of their own system test. For all other aural alerts, an AURAL WARN TEST can be initiated via the Electrical Management System (EMS) Display Unit (DU) located on the pilot's and copilot's side panel. There are two warning test selections provided to test Integrated Avionics Computer (IAC 1 and IAC 2).



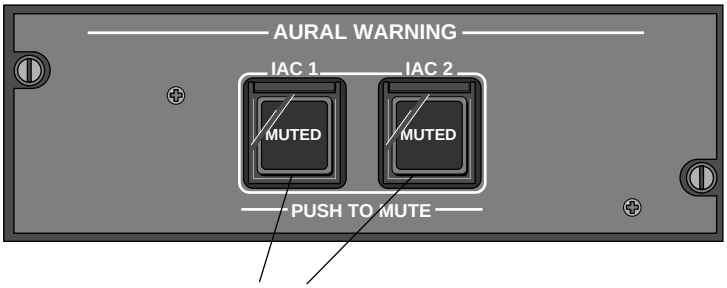
NOTE: TEST is initiated by pressing activation key and can be terminated by pressing activation key again.

The test sequences through each tone and/or voice message in the following priority order:

- "AURAL WARNING TEST 1"or "AURAL WARNING TEST 2".
- "STALL" (stall shaker active).
- Continuous Tone (overspeed).
- Triple Chime tone (any warning).
- "NO TAKE-OFF".
- "LEFT ENGINE FIRE".
- "RIGHT ENGINE FIRE".
- "APU FIRE".
- "SMOKE".
- "CABIN ALTITUDE".
- "GEAR BAY OVERHEAT".
- "LEFT REVERSER UNLOCKED".
- "RIGHT REVERSER UNLOCKED".
- "NORMAL BRAKE FAIL"l.
- Single Chime (any caution).
- "GEAR".
- Single Cavalry Charge tone (autopilot disengage).
- "AUTOTHROTTLE".
- "ALTITUDE" (altitude alert − departure).
- C-chord tone (altitude alert − capture).
- Double C-chord tone (vertical track alert).
- Single Chime.
- Trim clacker (trim in motion).
- "MINIMUMS, MINIMUMS" (DH and MDA).
- "SELCAL, SELCAL".

AURAL WARNING PANEL

The aural warning panel, located on the overhead panel, is used to disable the tone/aural generators, located in IAC 1 and IAC 2.



IAC1 and IAC2 PUSH TO MUTE Switches
Used to disable respective tone/aural generator located in the respective IACs.

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INHIBITS

During take-off and landing, the IAC fault warning computer, will process inhibit logic to minimize spurious or distracting messages. Warnings and status messages are not inhibited except for **CABIN ALT** and **APU OVERTEMP** (TO only).

During take-off, the caution and advisory messages are inhibited when:

- Weight On Wheels.
- Indicated airspeed transitions from less than 80 knots to greater than or equal to 80 knots.

The caution and advisory messages' inhibit is removed 25 seconds after:

- Weight Off Wheels.
- Pressure Altitude is greater than or equal to take-off altitude +400 feet.
- Indicated airspeed is less than 50 knots.
- Take-off inhibit has been active for 60 consecutive seconds.

During landing, the caution and advisory messages are inhibited when:

- Landing gear down.
- Radio altitude transitions from 200 feet to less than or equal to 200 feet.

The caution and advisory messages' inhibit is removed:

- 25 seconds after air to ground transition.
- Radio altitude greater than 200 feet.
- Indicated airspeed less than 50 knots.

INHIBITS (CONT'D)

The following caution and advisory messages are **NOT** inhibited during take-off and/or landing.

Airplane System	Caution Messages	Advisory Messages
AFCS	AP MISTRIM NOSE UP-DN (Ldg only) AP MISTRIM LWD-RWD (Ldg only) YD OFF	YD NOT CENTERED (TO only)
Air Conditioning Pressurization	EMER DEPRESS	
Aural and Visual Warnings	CHECK DU 1−2−3−4−5−6 SG 1−2−3 FAIL	
Electrical Power	BATT MASTER OFF	BATT EMER PWR ON RAT GEN ON (Ldg only)
Doors and Exits	CARGO DOOR LARGE SERV DOORS L−R EMER EXIT PASSENGER DOOR SMALL SERV DOORS	
Flight Controls	ELEVATOR SPLIT FLT SPLR DEPLOYED FLT SPOILERS FAIL GND LIFT DUMP ROLL SELECT ROLL SPOILERS FAIL RUD AUTHORITY LOW SLAT−FLAP FAIL STAB TRIM STALL PROTECT FAIL	FLT SPOILERS FAULT GND LIFT DUMP NO TAKEOFF (TO only) SHAKER 1−2 FAIL SLAT−FLAP HALFSPD STALL WRN ADVANCE
Hydraulic Power	HYD 1−2−3 LO PRESS HYD RAT PUMP FAIL (Ldg only)	
Ice and Rain Protection	ICE	
Instruments	ALL ADC MISCMP	ADC 1−2−3 FAIL

INHIBITS (CONT'D)

The following caution and advisory messages are **NOT** inhibited during take-off and/or landing.

Airplane System	Caution Messages	Advisory Messages
Landing Gear	**BRAKE 50% DEGRADED** **CPLT BRAKE FAULT** **GEAR DISAGREE** **INBD BRAKE LO PRESS** **L−R ANTI-SKID FAIL** **L−R INBD BRAKE FAIL** **L−R OUTBD BRAKE FAIL** **NOSE STEER FAIL** **OUTBD BRAKE LO PRESS** **PARK/EMER BRAKE ON** (Ldg only) **PLT BRAKE FAULT** **UNCOMMANDED BRAKE**	**BRAKE TEMP** (TO only) **GEAR SYS FAULT** **NO TAKEOFF** (TO only)
Lighting	**EMER LIGHTS OFF**	
Navigation	**ALL IRS MISCMP**	
Power Plant	**A/T NOT IN HOLD** (TO only) **L−R FADEC N1 CTL** **L−R FUEL FILTER** **L−R REV LOCK FAIL** **L−R REVERSER FAIL** (Ldg only) **L−R FUEL FILTER**	**A/T 1−2 FAIL**

CENTRAL AIRCRAFT INFORMATION AND MAINTENANCE SYSTEM (CAIMS)

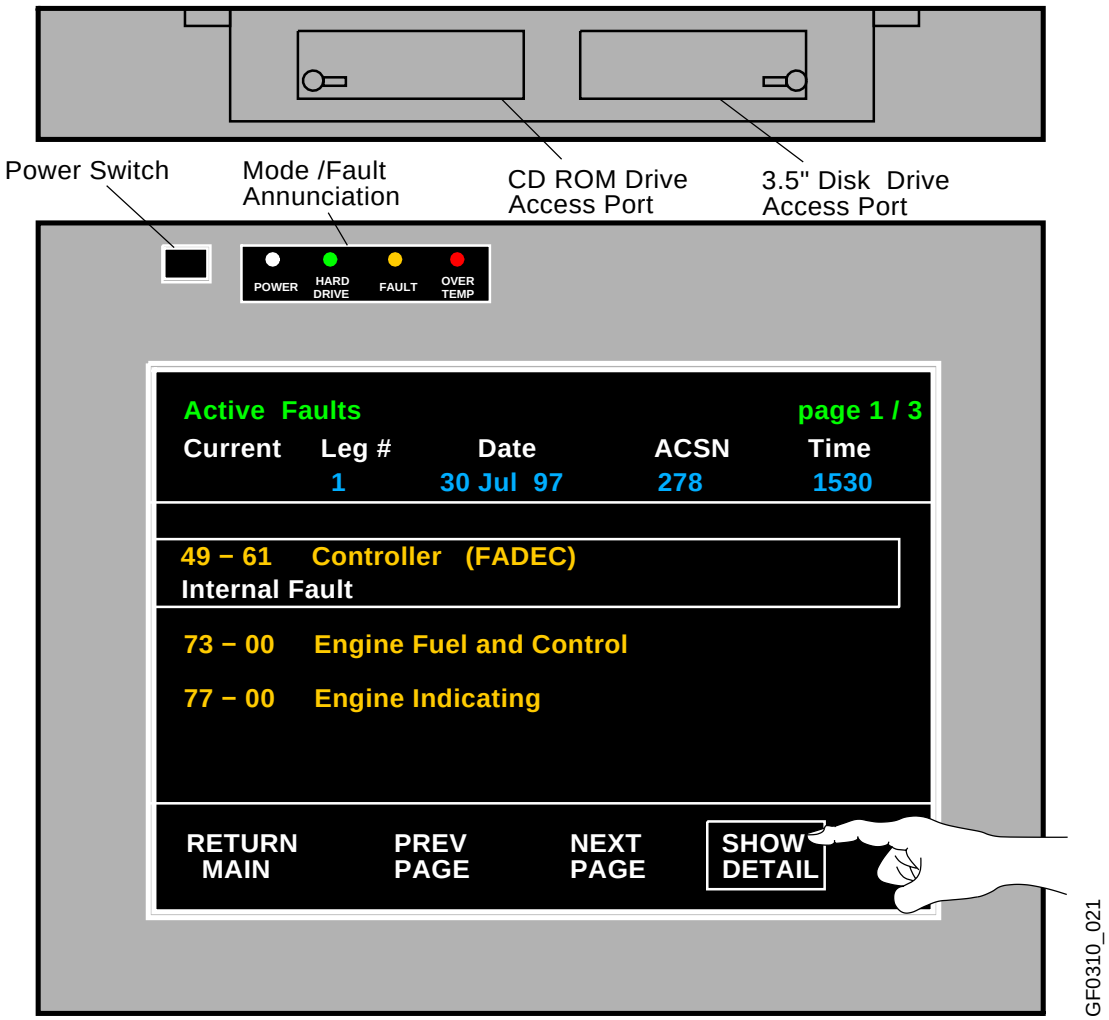
The CAIMS collects diagnostic and fault data from other airplane systems. From this data, the CAIMS assembles a fault record that can be used to monitor system performance during the flight. The maintenance personnel uses CAIMS to accomplish system tests and to isolate defective components.

The CAIMS supplies fault data during all phases of airplane operation through the Portable Maintenance Access Terminal (PMAT), touch screen, located in the passenger cabin . The PMAT hard-disk contains approximately 8MB of operational software files and 25MB of loadable diagnostic files. A CD-ROM is installed in the PMAT CD-ROM drive and contains an electronic copy of the Aircraft Maintenance Manual (AMM).

The crew has the option of monitoring the PMAT display for active faults and/or may print the report on the cockpit printer. For more information on the printer, refer to chapter 6 COMMUNICATIONS.

The CAIMS is comprised of the following components:

- PMAT (located in the cabin)

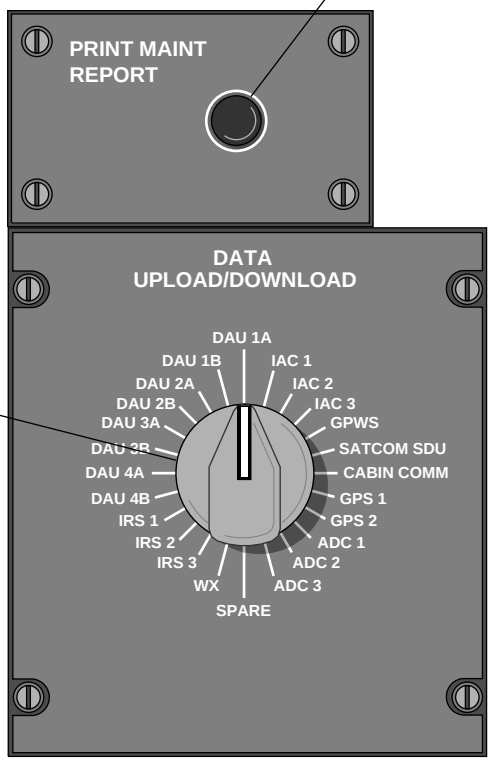


- DATA UPLOAD/DOWNLOAD switch and PRINT MAINT REPORT switch (on airplanes with SB 700-45-001 incorporated) (located on bulkhead behind pilot).

CENTRAL AIRCRAFT INFORMATION AND MAINTENANCE SYSTEM (CAIMS) (CONT'D)

CAIMS PRINT MAINT REPORT SWITCH
(On airplanes with SB 700−45−001 incorporated)
Used to get a report of active faults from the cockpit printer.

Data Selector Switch
Used to select system to upload/download a copy of non-volatile data on to a 3.5 inch disk.



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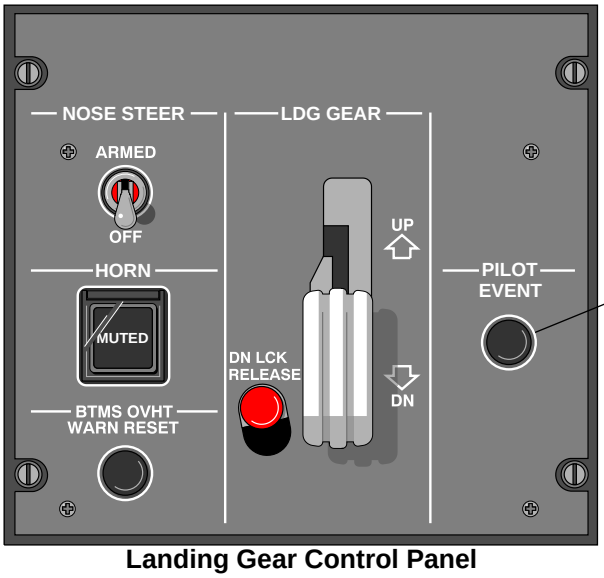
- Pilot Event Marker (located on the landing gear control panel).



FDR/CAIMS Event Button
Used to store information in Line Replaceable Units (LRUs), which report to CAIMS.

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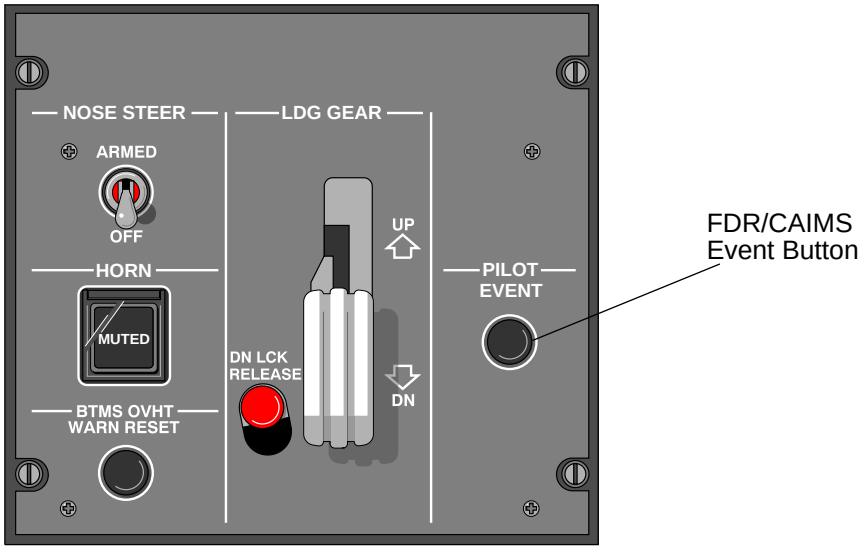
Landing Gear Control Panel

FLIGHT DATA RECORDER

EICAS channels aircraft systems data (including altitude, airspeed, heading, acceleration and radio communications events) to the Flight Data Recorder (FDR). DAU 4B gathers sensor data for transmission to the FDR.

DAU 4 is fully self-monitoring and provides CAS messages in the event of a failure. If DAU 4B channel fails, FDR information is not available.

To record an additional event, in the FDR push the PILOT EVENT button on landing gear control panel, located on the pedestal. Pushing the PILOT EVENT will also encode the Central Aircraft Information Maintenance System (CAIMS).



Landing Gear Control Panel

STALL WARNING

Warning of an impending stall is provided by independent stall protection systems. Both systems are energized in flight and deactivated on the ground through air/ground logic. The flight displays indicate airplane approach to stall speed by low speed cues (red band) and a TBD V_S indicator on the primary flight displays (PFDs) airspeed tape.

Stall warnings are provided by an aural “STALL”, a **STALL** icon appears on the PFD and vibration of both control columns. If the airplane angle-of-attack continues to increase, a stick pusher then pushes the control column forward to prevent further development of a stall. For more information refer to Chapter 10, FLIGHT CONTROLS.

TAKE-OFF CONFIGURATION WARNINGS

Take-off configuration warnings are armed when the airplane is on the ground and both engines are accelerated towards take-off thrust (throttle position ≥ 30°). A voice warning, EICAS warning message, and both MASTER WARNING lights come on for any of the following:

Condition	Voice Message	EICAS Message
Aileron trim outside of take-off range	“NO TAKEOFF”	**CONFIG AIL TRIM**
Parking brake on during take-off	“NO TAKEOFF”	**PARK BRAKE ON**
Rudder trim outside of take-off range	“NO TAKEOFF”	**CONFIG RUD TRIM**
Flaps not in take-off position	“NO TAKEOFF”	**SLATS/FLAPSLERS**
Spoilers not in take-off position	“NO TAKEOFF”	**CONFIG SPOICONFIG**
Horizontal stabilizer outside of take-off range (“green band”)	“NO TAKEOFF”	**CONFIG STAB TRIM**

All configuration warning indications are cancelled when the configuration error is corrected, or the airplane is airborne or either thrust lever is retarded.

Note: **NO TAKEOFF** advisory message will appear during taxi, prior to advancing throttles.

LANDING CONFIGURATION WARNING

The “GEAR” aural will sound if any gear is not down and locked and the airplane is below 16,500 feet and:

- The radio altitude is less than 1,000 feet AGL and the descent rate is more than 400 feet per minute

OR

- The radio altitude is less than 500 feet AGL and at least 2 minutes after ground to air transition and both throttles are below 25° throttle lever angle (approximately CRZ thrust)

OR

- The radio altitude is less than 500 feet AGL and the flaps position is 30° at any throttle position

NOTE

The “GEAR” aural can not be muted during any of these conditions.

The “Too low gear” (EGPWS) aural warning is heard if any landing gear is not down and locked with the radio altitude less than 500 feet AGL and the indicated airspeed at less than 190 knots.

If neither radio altimeter is valid, the “GEAR” aural will sound if any gear is not down and locked and the airplane is below 16,500 feet and landing flaps selected or either thrust lever at idle and:

- 2 minutes after ground to air transition and airspeed less than 191 knots with flaps at 0°.

OR

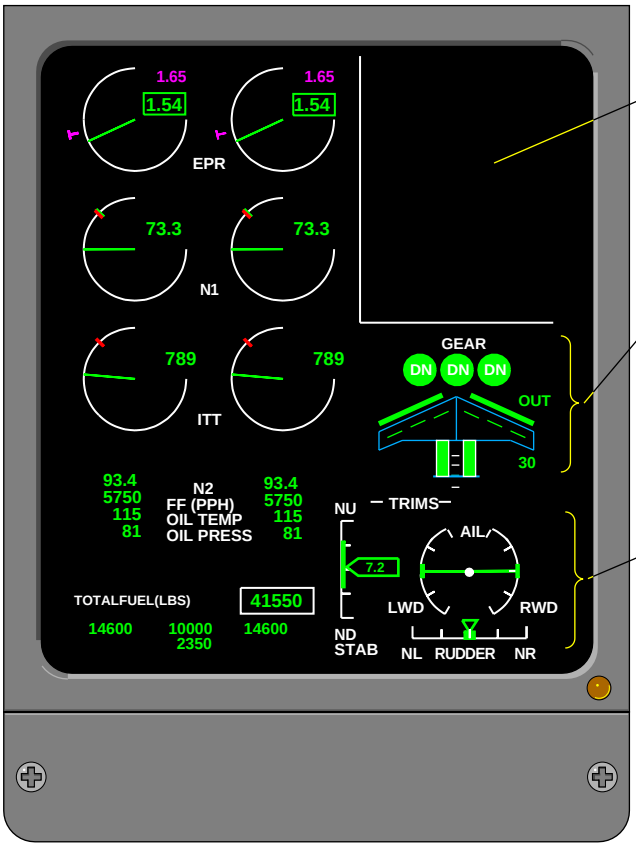
- 2 minutes after ground to air transition and the airspeed is less than 165 knots.

OR

NOTE

The landing gear horn may be muted (press muted horn switch/light on landing gear control panel) with one thrust lever at IDLE and airplane below 16,500 feet and any landing gear not in the down and locked position and conditions A or B not satisfied.

EICAS DISPLAY



Crew Alerting System Window
14 message lines with Gear/Slats/Flaps pop up displayed.

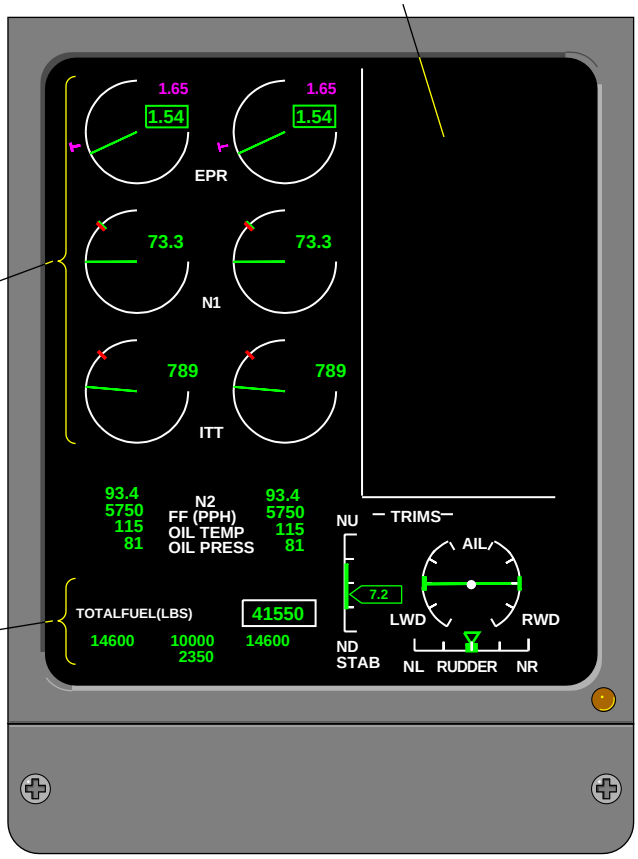
Slats/Flaps, Spoilers and Gear Position Pop Up
The pop up display will be removed from the primary page (in flight only) 30 seconds after the gear and flaps indicate up, ans no predetermined malfunctions exist, or flight spoilers out.

The pop up display will appear with flap selection greater than zero degrees, gear selected down and/or if any predetermined malfunctions exist.

Trims
Indications for Aileron, Rudder and Stabilizer Trim. For more information see Chapter 10, FLIGHT CONTROLS.

NOTE
EICAS will automatically be displayed when airplane is powered up (BATT MASTER ON)

Crew Alerting System Window
24 message lines with Gear/Slats/Flaps pop up not displayed.



Engine Indicating
Indications of EPR, N1, ITT, N2, FF, OIL TEMP and OIL PRESSURE. For more information see Chapter 18, POWER PLANT.

Fuel
Indications of total fuel quantity and individual tank quantity. For more information see Chapter 12, FUEL.

GF0310_025

SYSTEMS DISPLAY (STAT PAGE)

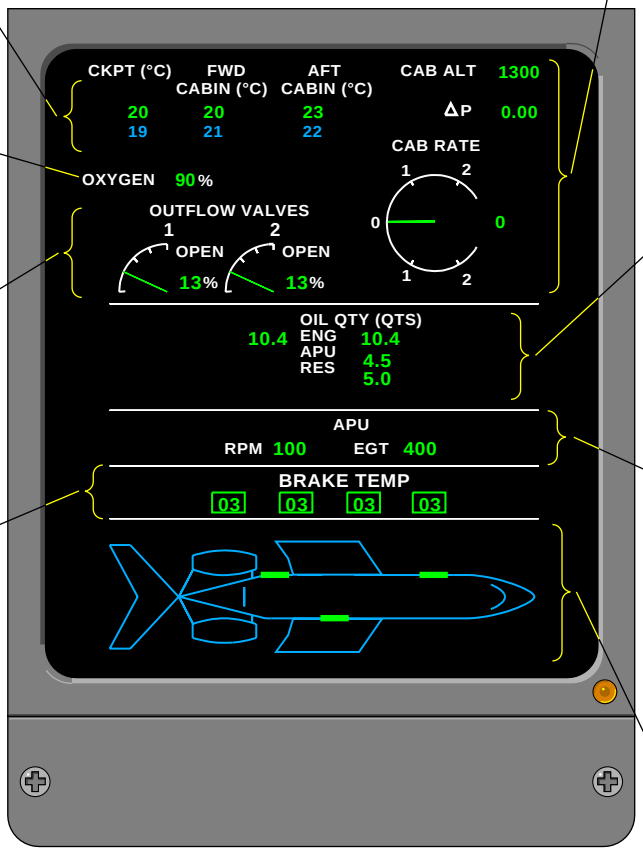
CKPT/CABIN Temperature
Indications of cockpit, cabin forward and cabin aft temperature. For more information see Chapter 2, AIR CONDITIONING AND PRESSURIZATION.

CAB ALT, ΔP and CAB RATE
Indications of cabin altitude, cabin differential and cabin rate of climb. For more information see Chapter 2, AIR CONDITIONING AND PRESSURIZATION.

OXYGEN
Indications of oxygen quantity. For more information see Chapter 8, EMERGENCY EQUIPMENT.

OUTFLOW VALVES
Indications of outflow valves position (manual mode only). For more information see Chapter 2, AIR CONDITIONING AND PRESSURIZATION.

BRAKE TEMP
Indications of brake temperatures. For more information see Chapter 15, LANDING GEAR.



OIL QTY
Indications of engine, APU and reservoir oil quantity. For more information see Chapter 5, APU, and Chapter 18, POWER PLANT.

APU
Indications of APU door position (failure mode only), APU RPM and EGT. For more information see Chapter 5, AUXILIARY POWER UNIT.

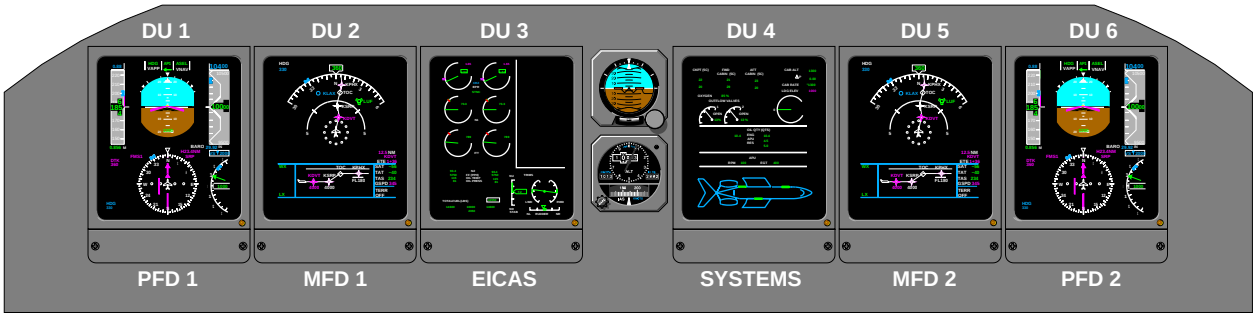
DOORS
Indications of passenger entry door, overwing emergency exit baggage door and aft equipment bay door. For more information see Chapter 1, AIRPLANE GENERAL.

GF0310_026

NOTE
SYSTEM display will automatically be displayed when airplane is powered up (BATT MASTER ON).

REVERSION CONTROL PANEL

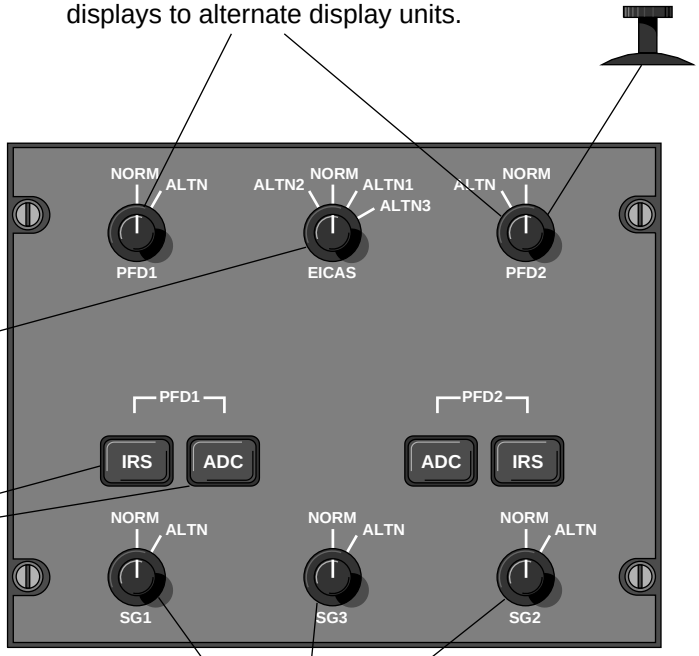
The reversion panel, located on the pedestal, can be used to revert the EICAS display to alternate display units, to revert IRS and ADCs and to revert SGs.



PFD1 and PFD2 Knobs
Used to revert PFD 1 and PFD 2 displays to alternate display units.

EICAS Knob
Used to revert EICAS display to alternate display units.

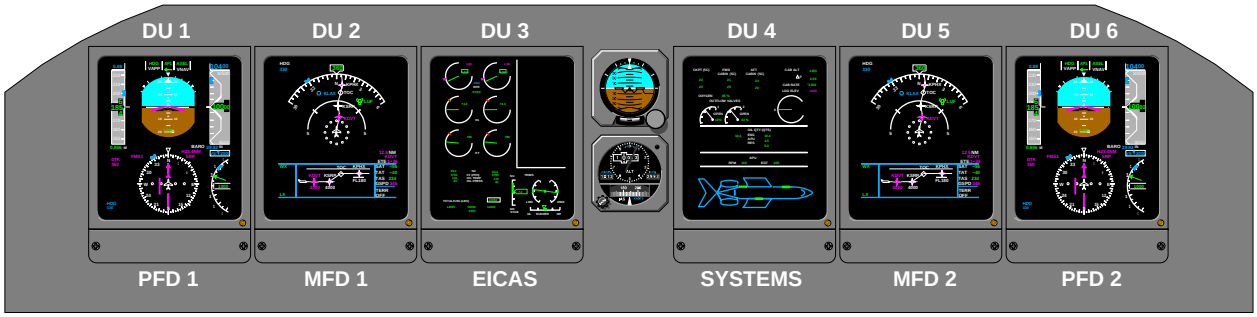
IRS and ADC Knobs
Used to revert IRS and ADCs. For more information see Chapter 11, FLIGHT INSTRUMENTS.



SG1, SG2, SG3, Knobs
Used to revert applicable symbol generators to specific displays.

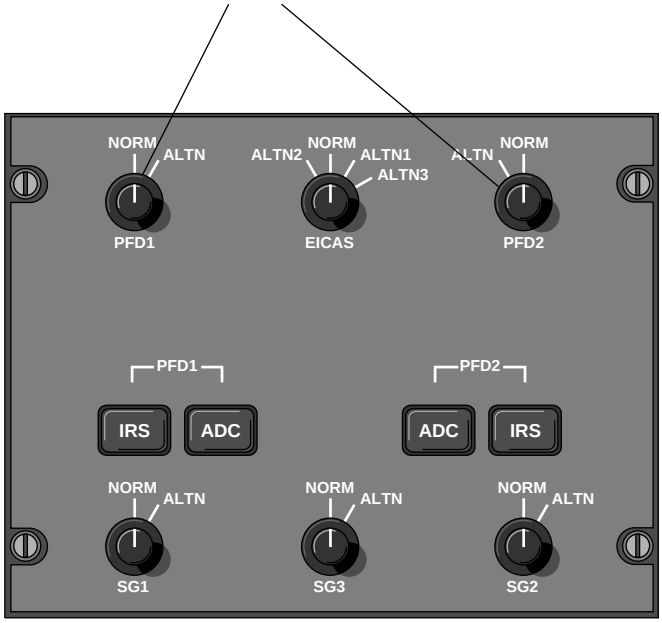
GF0310_027

PFD REVERSION CONTROL



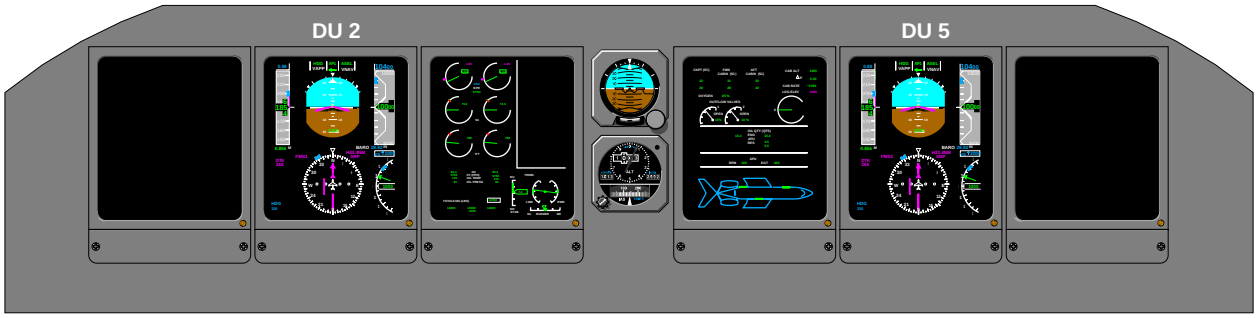
PFD1 and PFD2 Reversion Knobs

- **NORM** − PFD 1 displayed on DU1, PFD 2 displayed on DU6.
- **ALTN** − PFD 1 displayed on DU2, PFD 2 displayed on DU5.

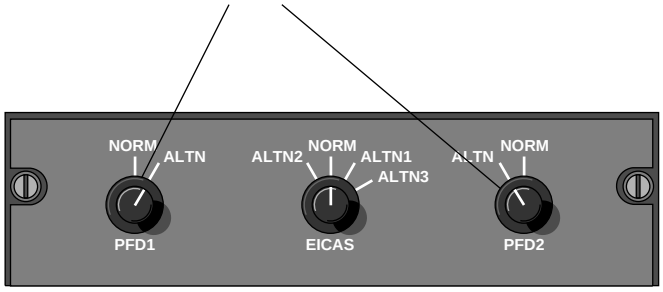


GF0310_028

PFD REVERSION

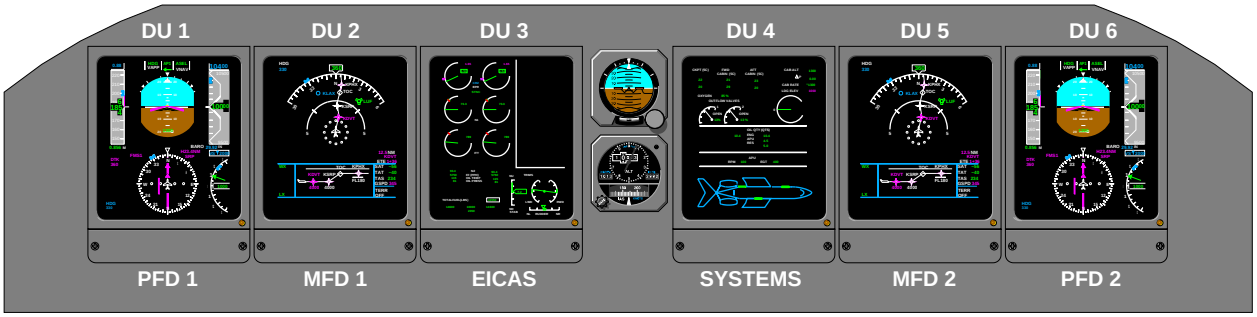


- **ALTN** − PFD 1 displayed on DU2, PFD 2 displayed on DU5.



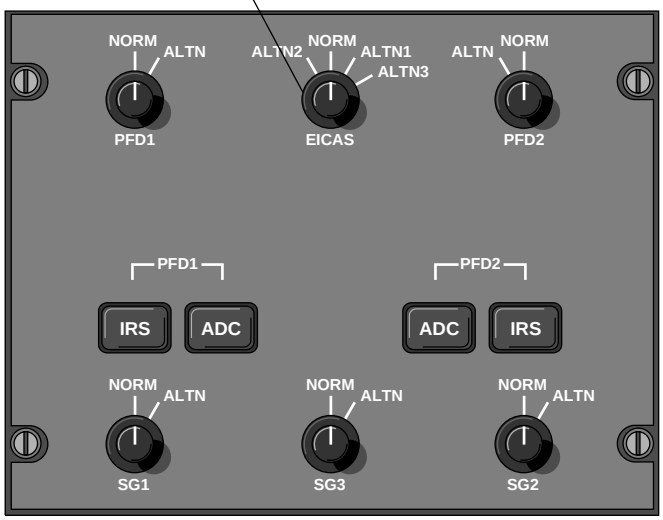
GF0310_029

EICAS REVERSION CONTROL



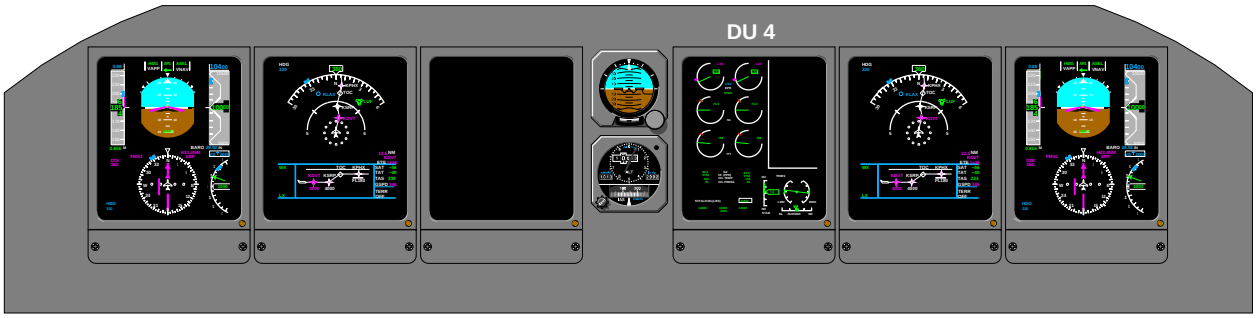
EICAS Reversion Knob

- **NORM** − EICAS displayed on DU3.
- **ALTN 1** − EICAS displayed on DU4.
- **ALTN 2** − EICAS displayed on DU2.
- **ALTN 3** − EICAS displayed on DU5.

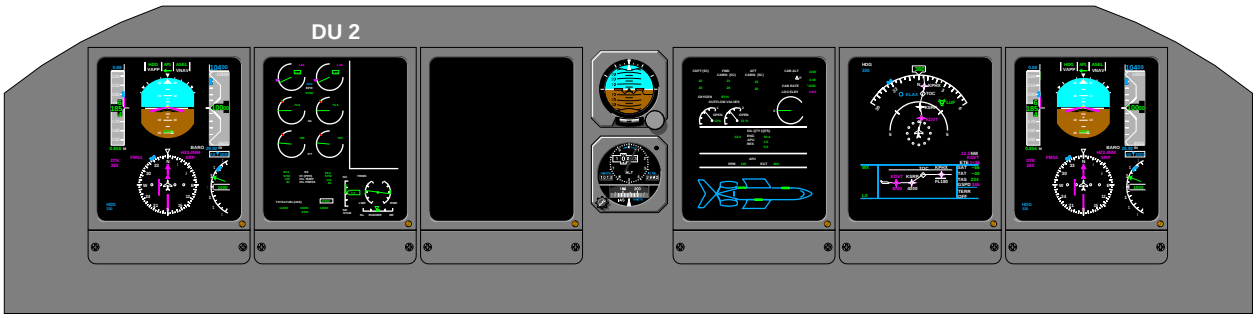


GF0310_030

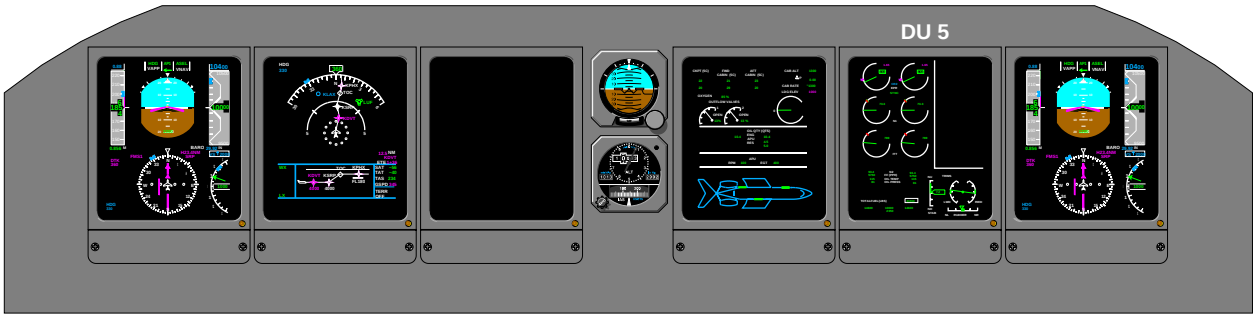
EICAS REVERSION



• **ALTN 1** − EICAS displayed on DU4.



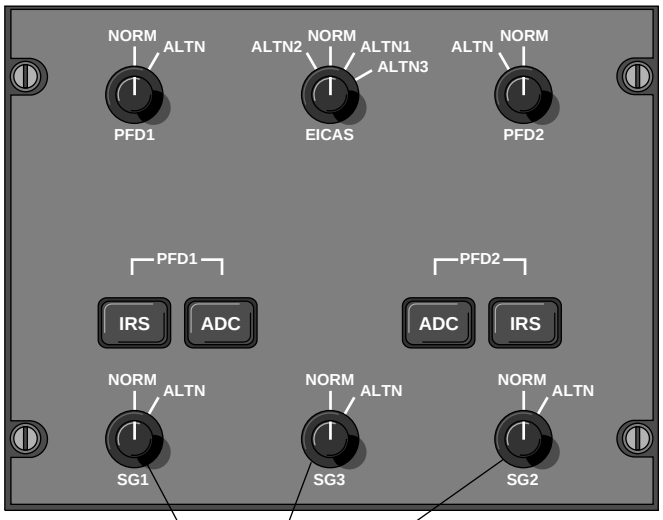
• **ALTN 2** − EICAS displayed on DU2.



ALTN 3 − EICAS displayed on DU5.

GF0310_031

SG REVERSION CONTROL



SG1, SG2, SG3 Reversion Knobs

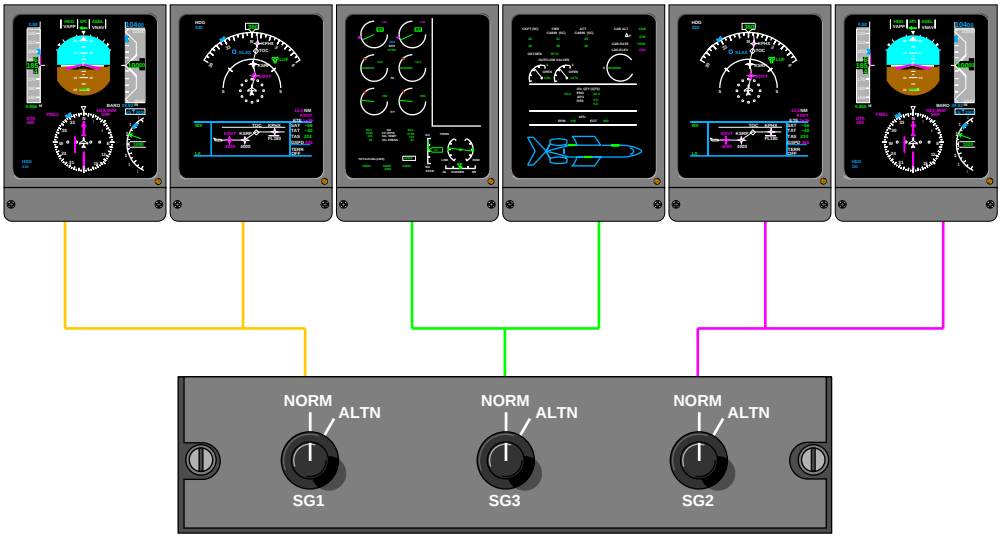
- **SG1 NORM** − SG1 drives DU1 and DU2.
- **SG2 NORM** − SG2 drives DU5 and DU6.
- **SG3 NORM** − SG3 drives DU3 and DU4.

- **SG1 ALTN** − SG2 drives DU5 and DU6 as well as DU3.
  SG3 drives DU1 and DU2 as well as DU4.
- **SG2 ALTN** − SG1 drives DU1 and DU2 as well as DU4.
  SG3 drives DU5 and DU6 as well as DU3.
- **SG3 ALTN** − SG1 drives DU1, DU2 as well as DU4.
  SG2 drives DU3, DU5 and DU6.

GF0310_032

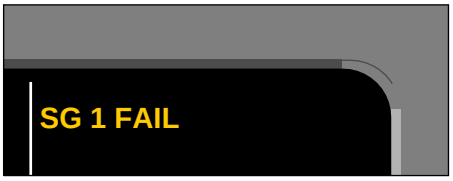
SG REVERSION

- **SG1 NORM** − SG1 drives DU1 and DU2.
- **SG2 NORM** − SG2 drives DU5 and DU6.
- **SG3 NORM** − SG3 drives DU3 and DU4.

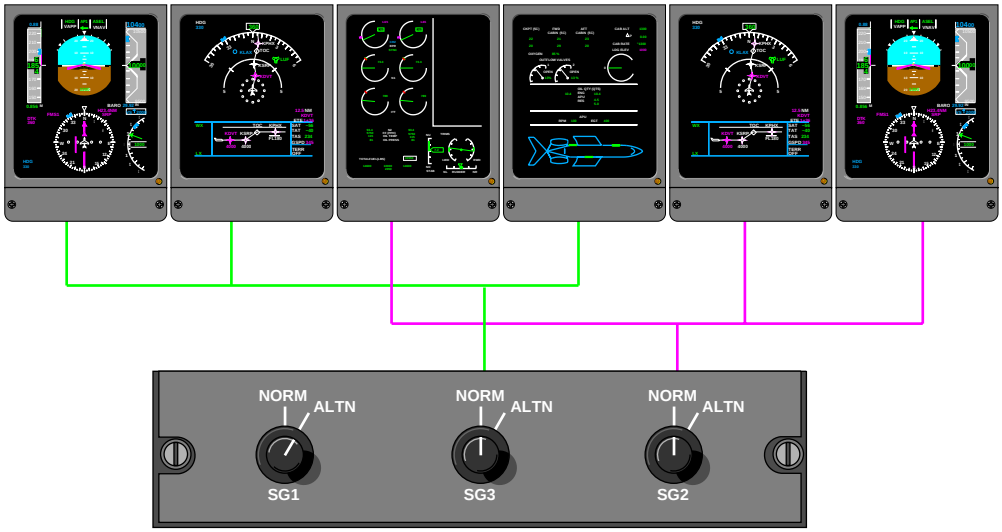


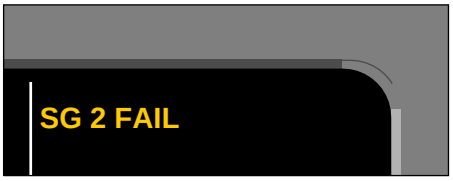
GF0310_033

SG REVERSION (CONT'D)

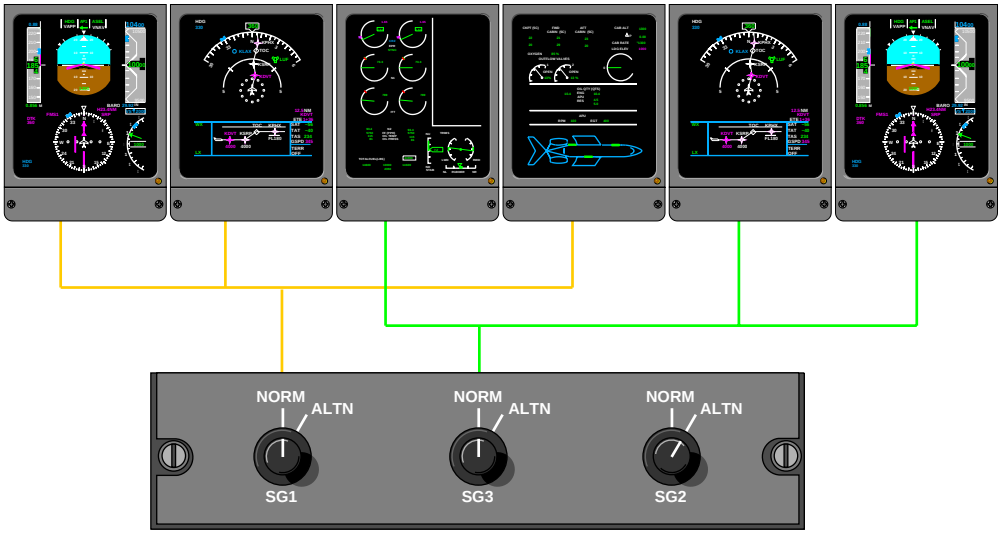


If SG 1 FAIL select **SG1 ALTN**
− SG2 drives DU3, DU5 and DU6.
− SG3 drives DU1, DU2 and DU4.



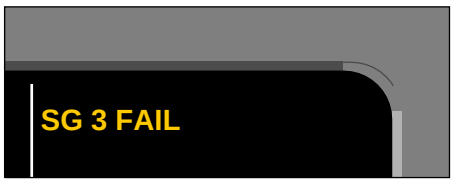


If SG 2 FAIL select **SG2 ALTN**
− SG1 drives DU1, DU2 and DU4.
− SG3 drives DU3, DU5 and DU6.

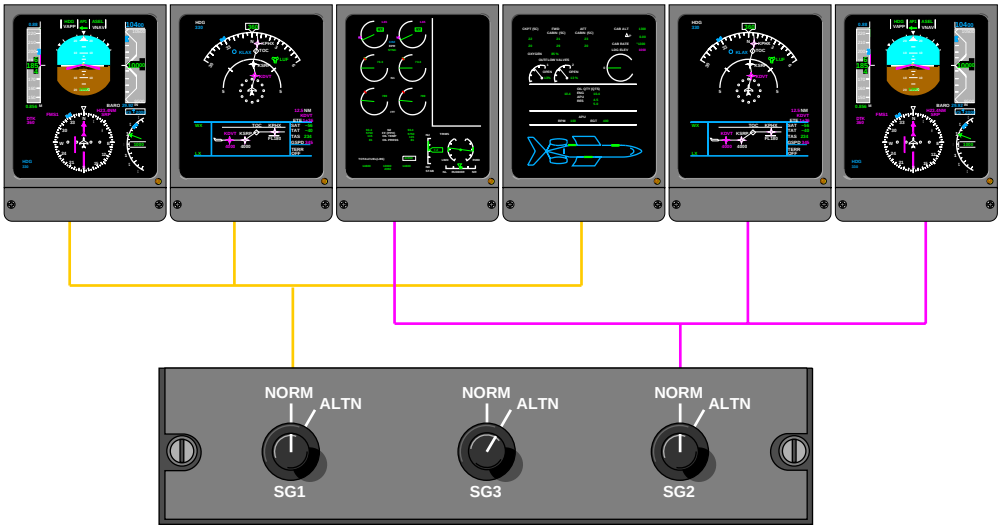


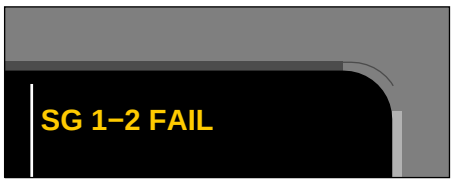
GF0310_034

SG REVERSION (CONT'D)

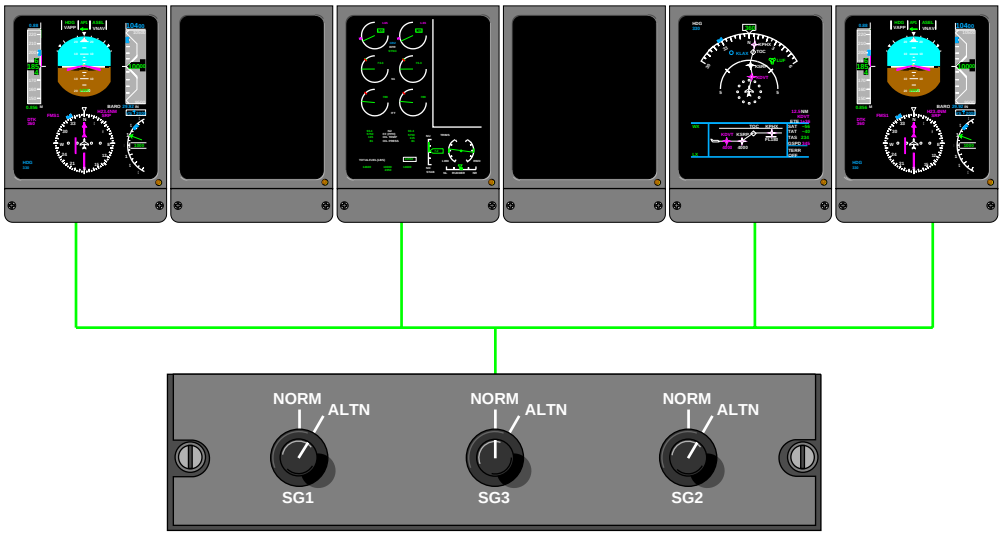


If SG 3 FAIL select **SG3 ALTN** − SG1 drives DU1, DU2 and DU4.
− SG2 drives DU3, DU5 and DU6.





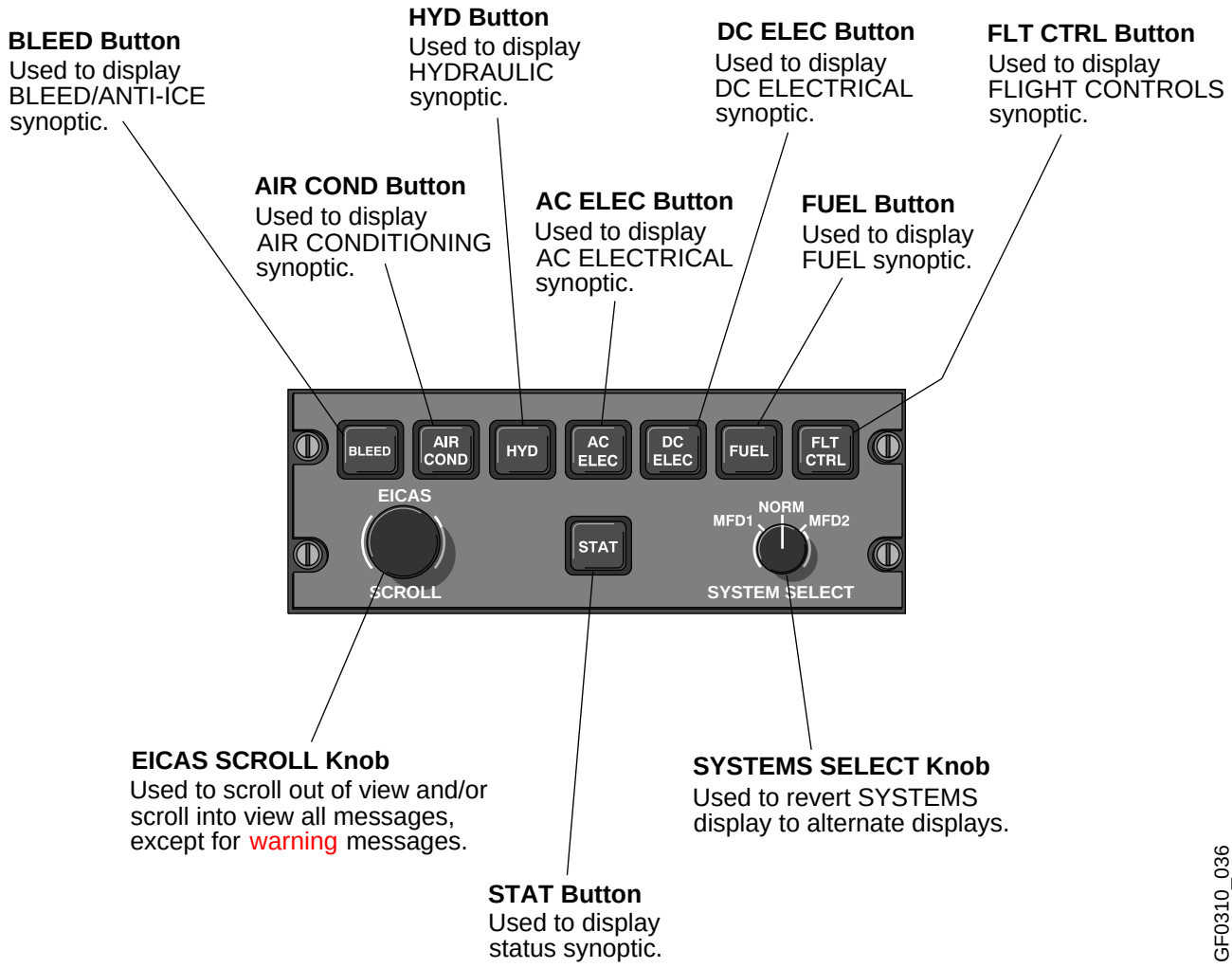
If SG 1−3 FAIL − **SG2** drives DU1, DU3, DU5 and DU6.
If SG 2−3 FAIL − **SG1** drives DU1, DU3, DU5 and DU6.
If SG 1−2 FAIL − **SG3** drives DU1, DU3, DU5 and DU6.



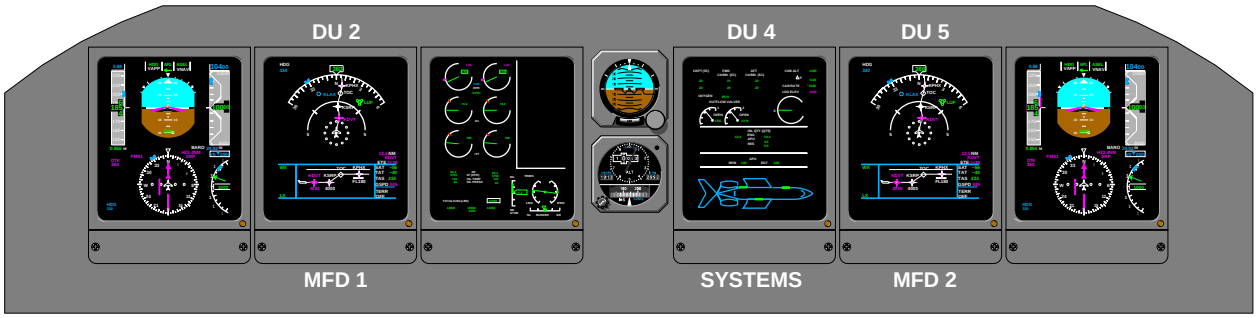
GF0310_035

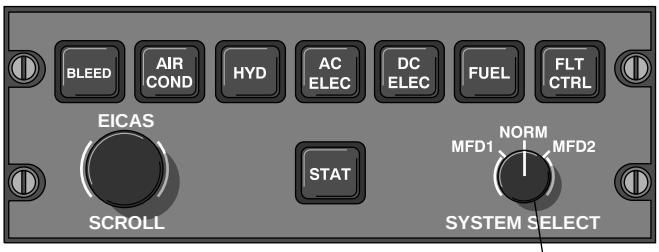
EICAS CONTROL PANEL

The EICAS control panel, located on the pedestal, can be used to revert SYSTEMS display, scroll non-displayed messages and to display SYSTEMS synoptic pages.



SYSTEMS REVERSION CONTROL



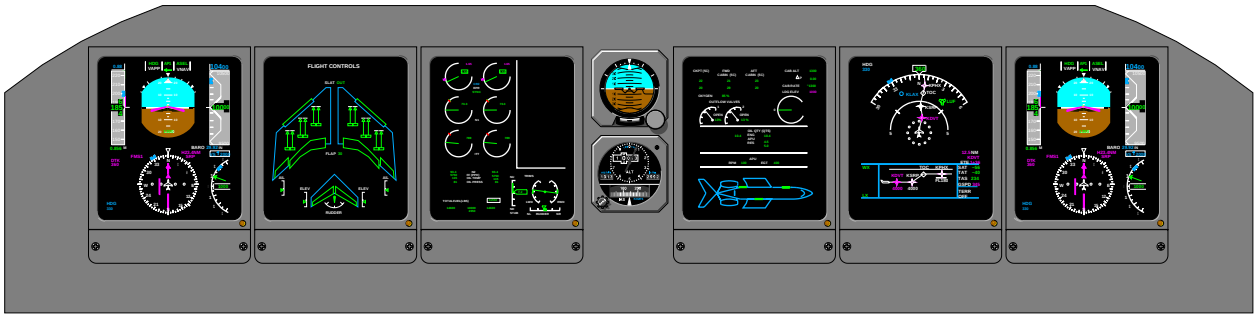


SYSTEM SELECT Knob

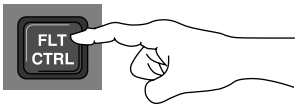
- **CENTER** − SYSTEM displayed on DU4.
- **MFD1** − SYSTEM displayed on DU2.
- **MFD2** − SYSTEM displayed on DU5.

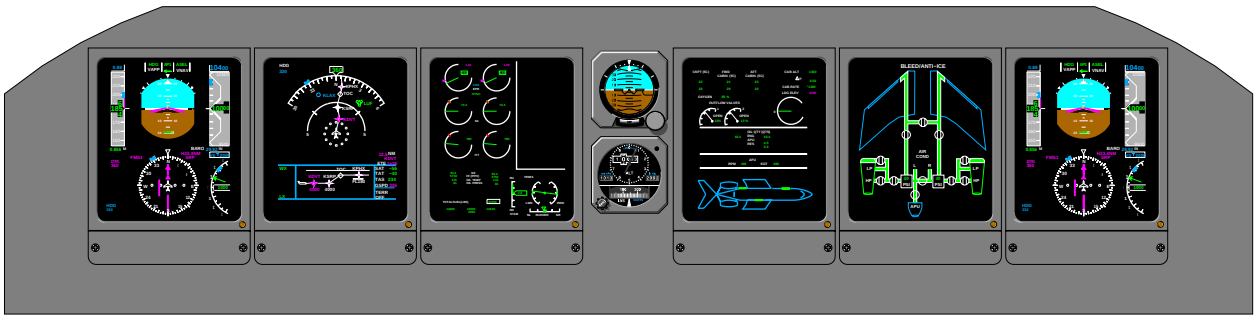
GF0310_037

SYSTEMS REVERSION CONTROL (CONT'D)

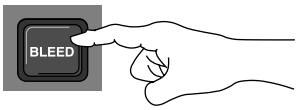


• **MFD1** − SYSTEM displayed on DU2 and DU4.





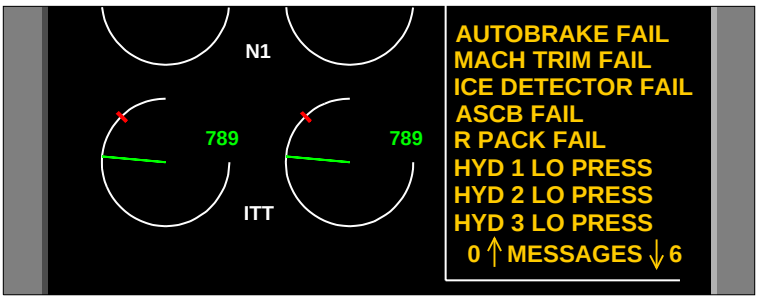
• **MFD2** − SYSTEM displayed on DU5 and DU4.

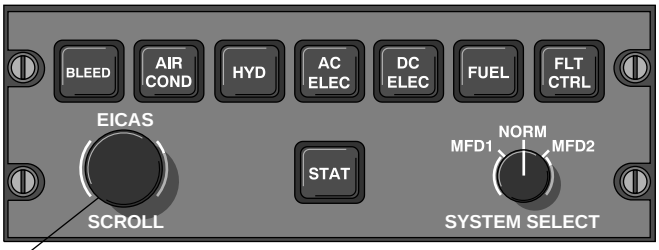


NOTE
All SYSTEMS synoptics can be displayed, when SYSTEM SELECT reverted, on MFD1 or MFD2, by selecting applicable button on EICAS Control Panel

GF0310_038

MESSAGE SCROLLING





EICAS SCROLL Knob

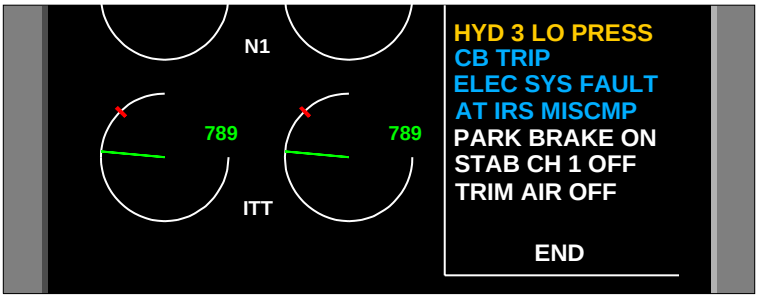
Used to scroll messages out of view and/or display non−displayed messages. Warning messages cannot be scrolled out of view.

− Turning SCROLL knob clockwise will scroll messages up.

− Turning SCROLL knob counter−clockwise will scroll messages down.

NOTE

Each "click" of the SCROLL knob will move the message stack, one line up or down.

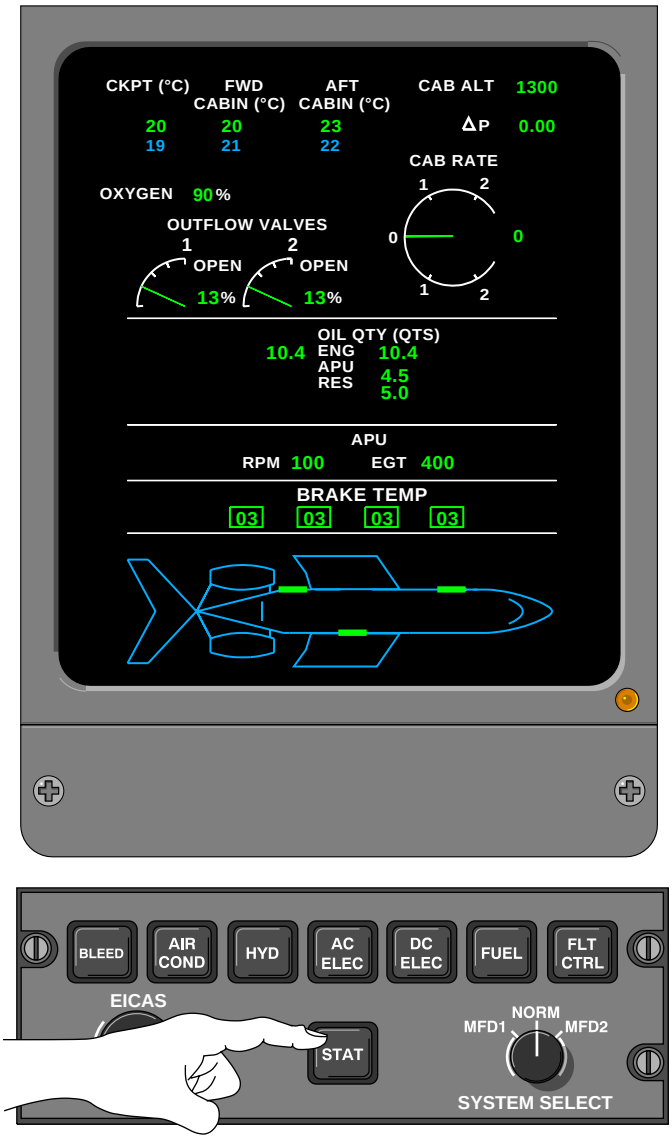


GF0310_039

SYSTEMS SYNOPTICS

To view SYSTEMS synoptic displays, select the appropriate button on the EICAS control panel.

STAT Page

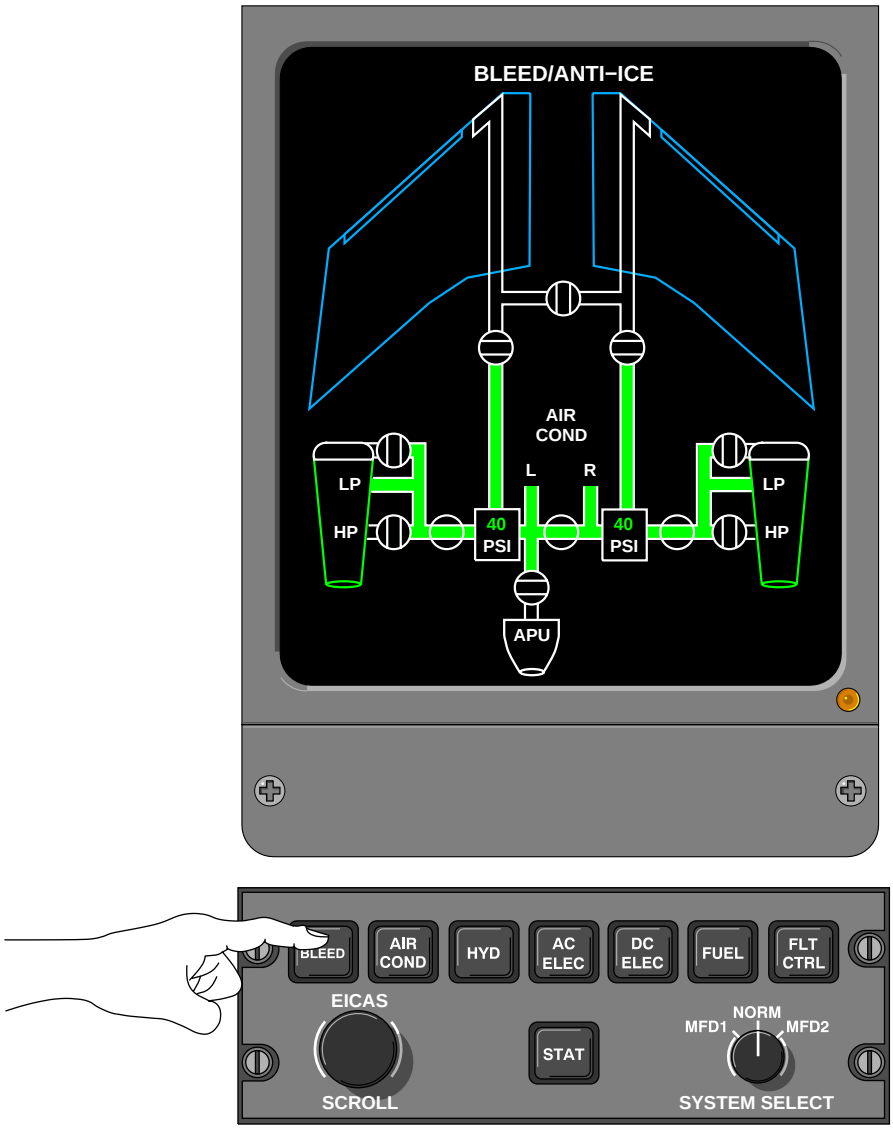


GF0310_040

NOTE
STAT page will automatically be displayed when airplane is powered up (BATT MASTER ON).

SYSTEMS SYNOPTICS (CONT'D)

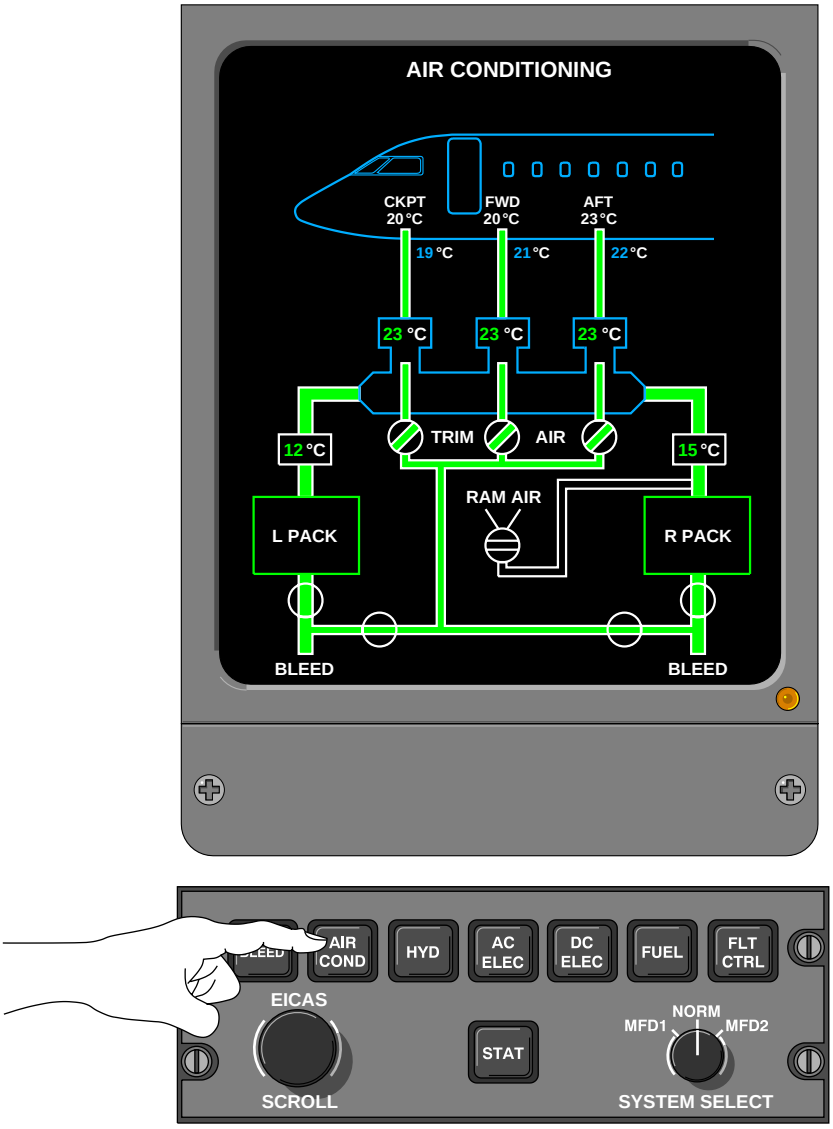
Bleed/Anti-Ice Synoptic Page



GF0310_041

SYSTEMS SYNOPTICS (CONT'D)

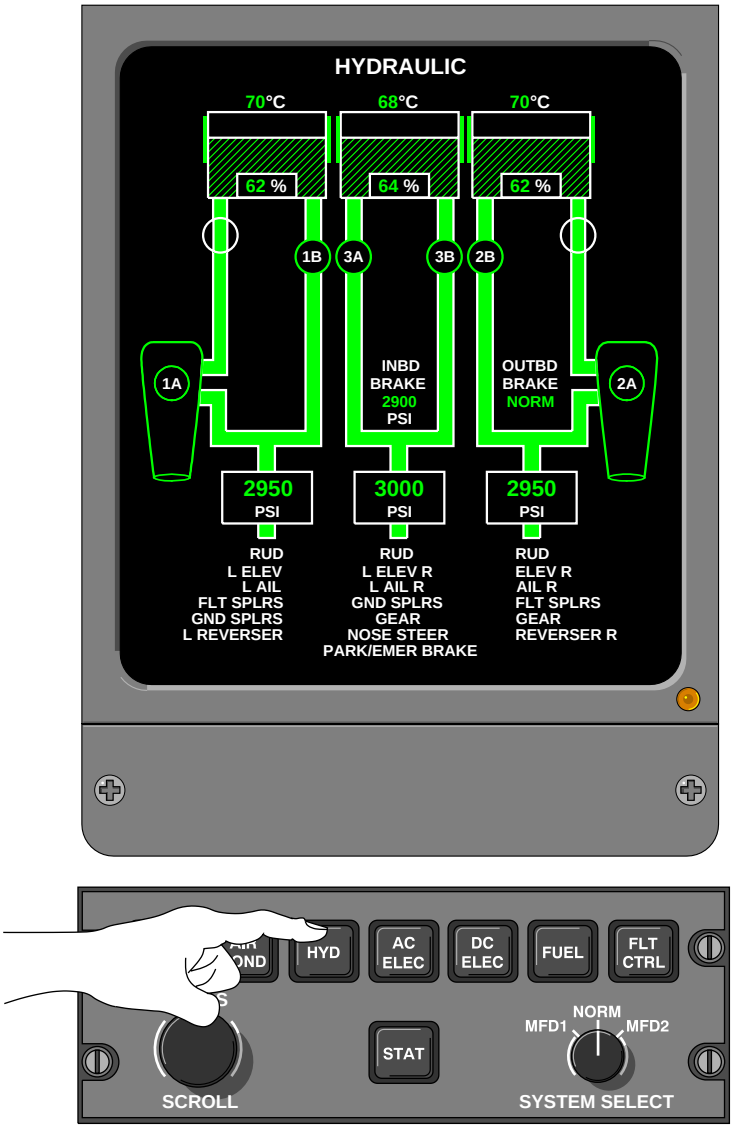
Air Conditioning Synoptic Page



GF0310_042

SYSTEMS SYNOPTICS (CONT'D)

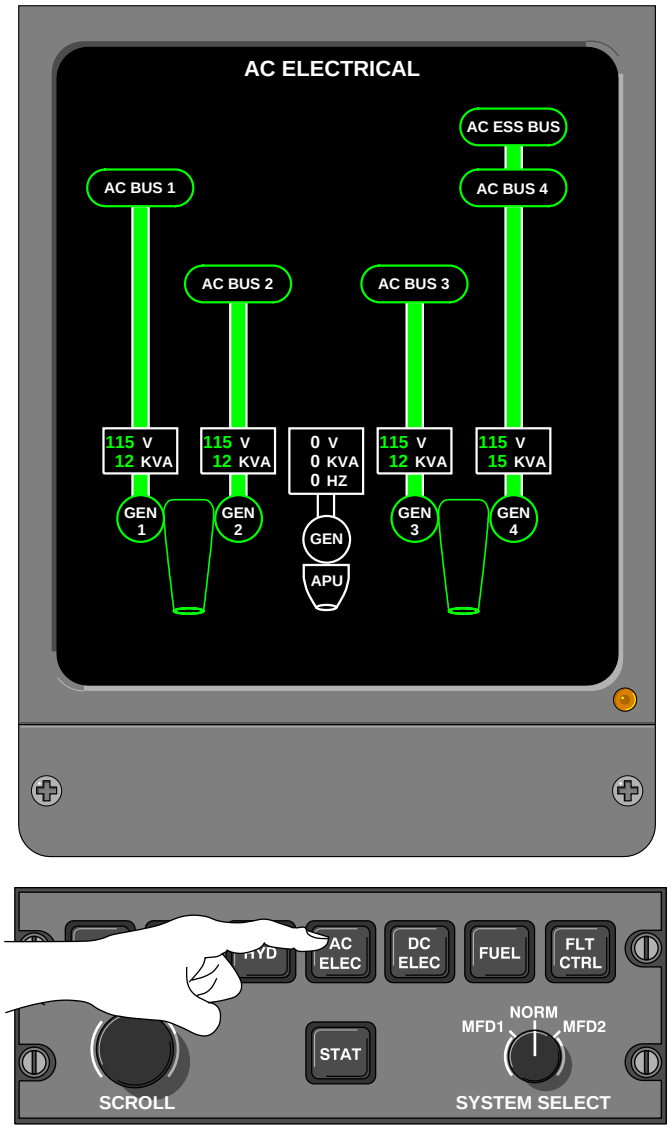
Hydraulic Synoptic Page



GF0310_043

SYSTEMS SYNOPTICS (CONT'D)

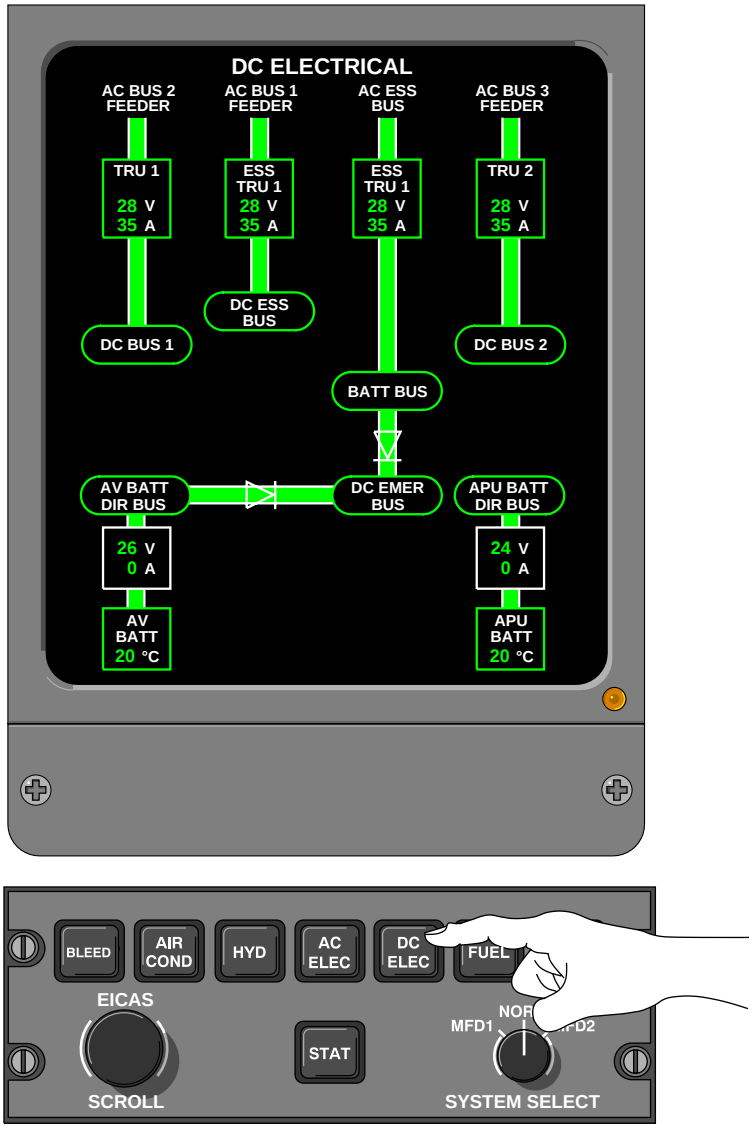
AC Electrical Synoptic Page



GF0310_044

SYSTEMS SYNOPTICS (CONT'D)

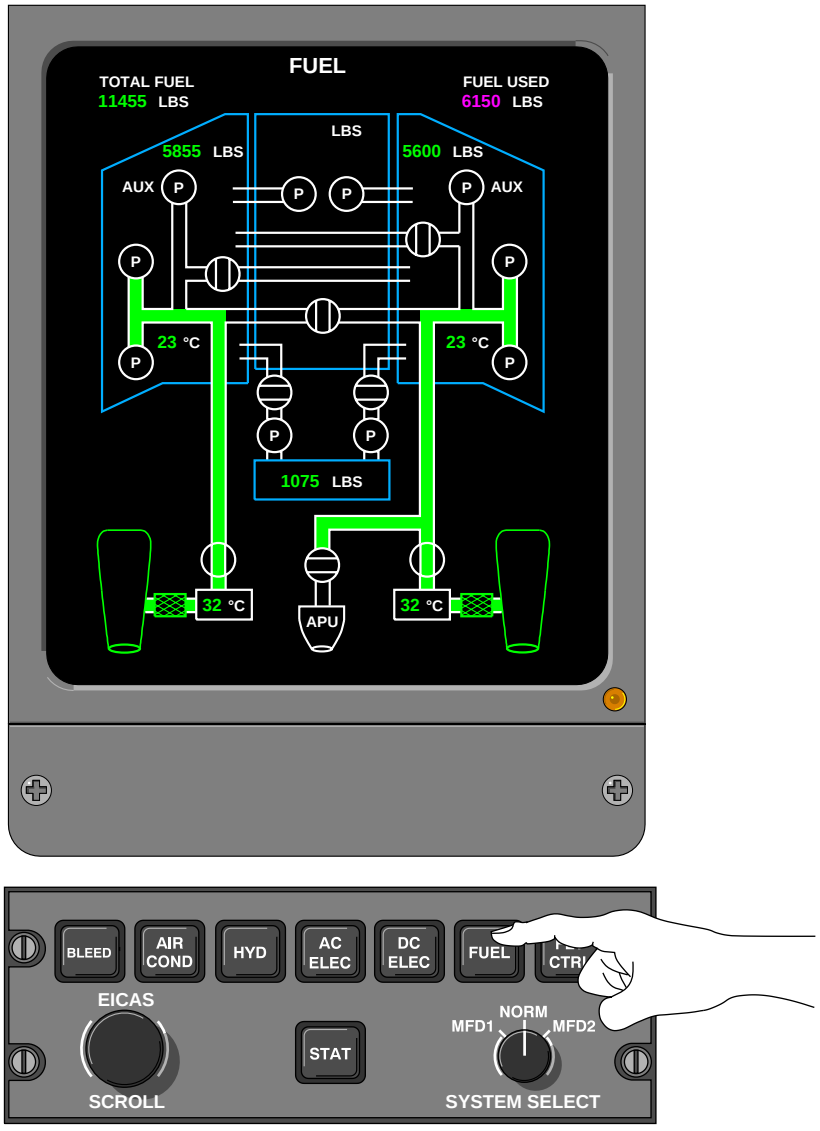
DC Electrical Synoptic Page



GF0310_045

SYSTEMS SYNOPTICS (CONT'D)

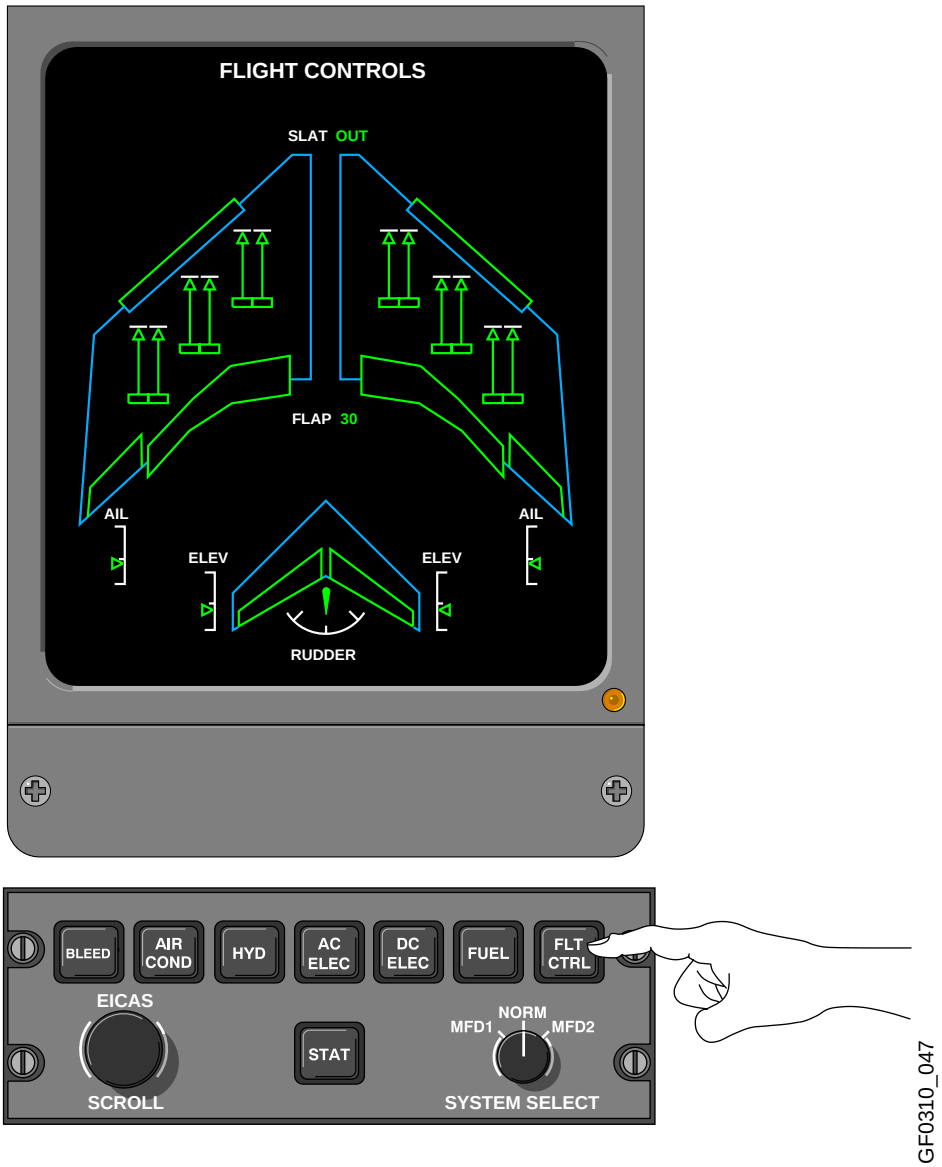
Fuel Synoptic Page



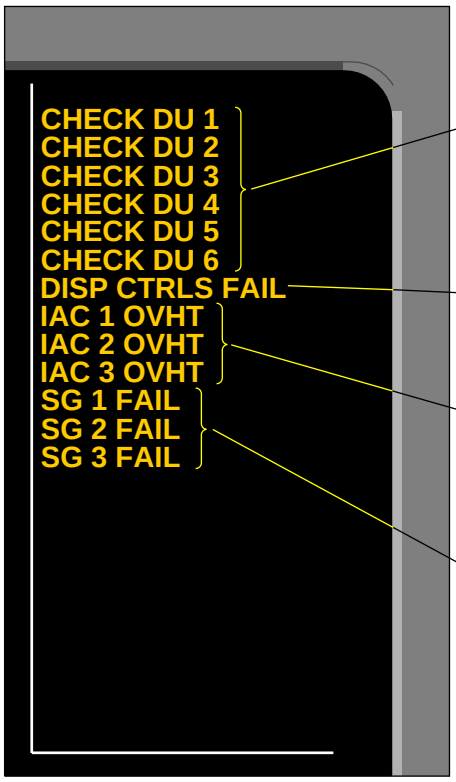
GF0310_046

SYSTEMS SYNOPTICS (CONT'D)

Flight Controls Synoptic Page



AURAL AND VISUAL WARNING EICAS MESSAGES



CHECK DU 1−2−3−4−5−6
Indicates that data from affected DU does not match data from sensor.
Note: If all 6 DUs fail, the messages posted are **CHECK PFD** and **CHECK DU 1−2−3−4−5−6.**

DISP CTLRS FAIL
Indicates that both display controllers have failed.

IAC 1 (2, 3) OVHT
Indicates that IAC has overheated, resulting in possible loss of functions.

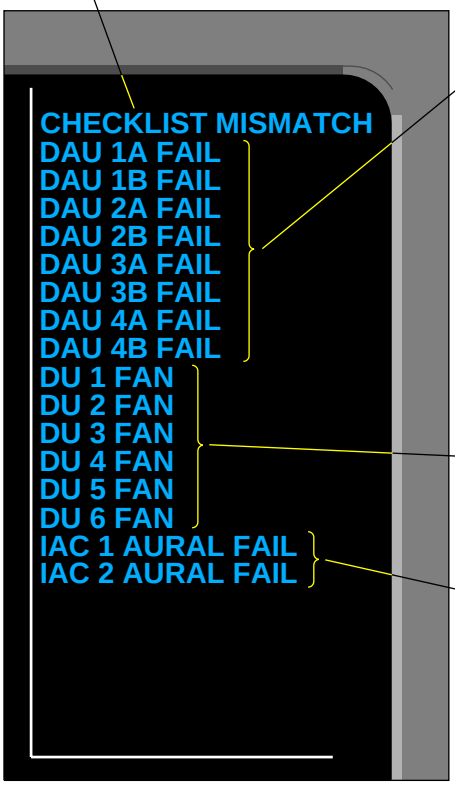
SG 1 (2, 3) FAIL
Indicates that there is a loss of communication with affected SG, or SG is indicating a power up failure.

GF0310_048

AURAL AND VISUAL WARNING EICAS MESSAGES (CONT'D)

CHECKLIST MISMATCH
Indicates that checklists are not identical in all IACs (on ground only).

DAU 1A−1B−2A−2B−3A−3B−4A−4B FAIL
Indicates that there is a loss of communication with the affected DAU, or DAU has failed.



DU 1−2−3−4−5−6 FAN
Indicates that DU has overheated, resulting in possible loss of functions.

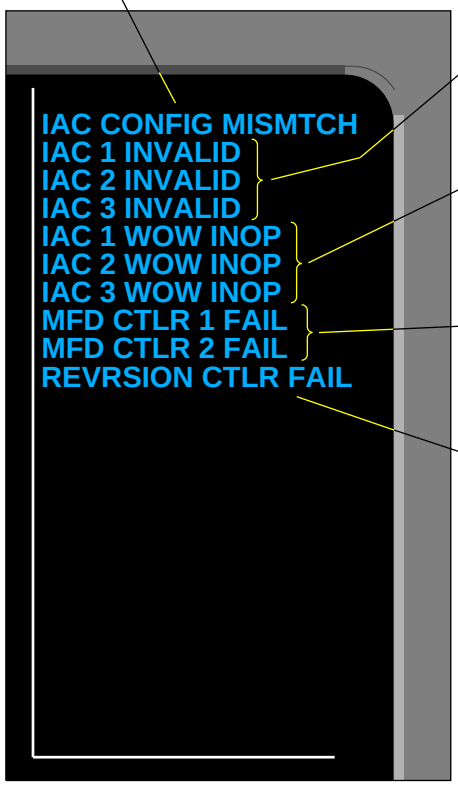
IAC 1−2 AURAL FAIL
Indicates that there is no DC power to aural warning system, or a BIT failure is being indicated and not muted.

GF0310_049

AURAL AND VISUAL WARNING EICAS MESSAGES (CONT'D)

IAC CONFIG MISMTCH
Indicates that the IACs are not configured with the same options or aircraft configuration.

IAC 1−2−3 INVALID
Indicates that there is invalid software configuration in IAC, or incorrect airplane ID.



IAC 1−2−3 WOW INOP
Indicates that there is a loss of power up testing and function loss. IAC WOW input is inconsistent with other airplane parameters.

MFD CTLR 1−2 FAIL
Indicates that the affected MFD controller has failed.

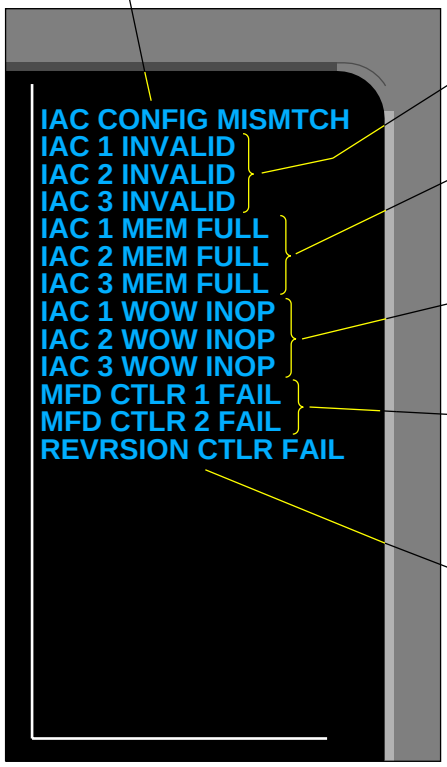
REVRSION CTRL FAIL
Indicates that there is a loss of reversionary control functions. May not be able to revert SGs or DUs.

GF0310_050

AURAL AND VISUAL WARNING EICAS MESSAGES (CONT'D)

Effectivity:

- *Airplanes 9002 thru 9119* ***not incorporating*** *Service Bulletin:*
  - *SB 700−31−018, Integrated Avionics Computers (IAC) − Avionics 2001 Batch 1 IAC Upgrade.*



IAC CONFIG MISMTCH
Indicates that the IACs are not configured with the same options or aircraft configuration.

IAC 1−2−3 INVALID
Indicates that there is invalid software configuration in IAC, or incorrect airplane ID.

IAC 1−2−3 MEM FULL
Indicates that affected IAC has reached its memory limit.

IAC 1−2−3 WOW INOP
Indicates that there is a loss of power up testing and function loss. IAC WOW input is inconsistent with other airplane parameters.

MFD CTLR 1−2 FAIL
Indicates that the affected MFD controller has failed.

REVRSION CTRL FAIL
Indicates that there is a loss of reversionary control functions. May not be able to revert SGs or DUs.

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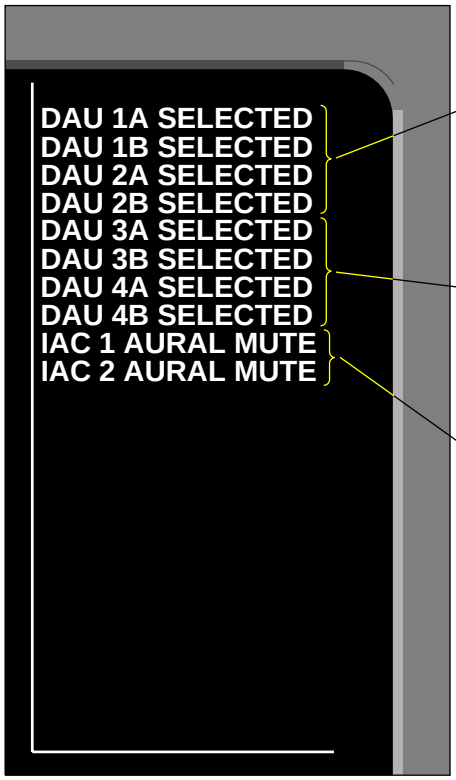
AURAL AND VISUAL WARNING EICAS MESSAGES (CONT'D)



DAU 1A−1B−2A−2B SELECTED
Indicates that the DAU has been reverted.

DAU 3A−3B−4A−4B SELECTED
Indicates that the DAU has been reverted.

IAC 1−2 AURAL MUTE
Indicates that the AURAL WARNING IAC1 (2) switch has been pushed. The aural warnings for the applicable IAC (s) are disabled.

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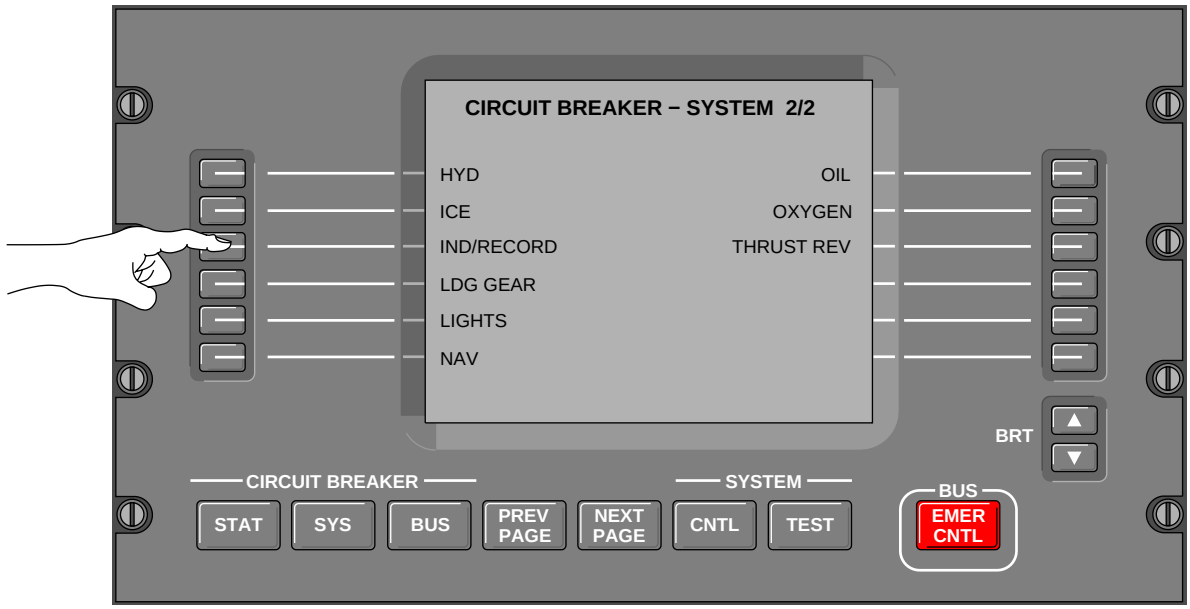
CB - IND/RECORD SYSTEM



CB – IND/RECORD SYSTEM 1/5

ADC 1	BATT	IN
ADC 2	DC 1	IN
ADC 3	DC ESS	IN
AURAL WARNING 1	BATT	IN
AURAL WARNING 2	DC ESS	IN
CLOCK 1	BATT	IN

CB – IND/RECORD SYSTEM 2/5

CLOCK 2	DC 1	IN
CLOCK BACK UP	AV BATT DCPC	IN
CVR	DC ESS	IN
CVR ERASE	DC 2	IN
DATA LOADER	DC 2	IN
DAU 1 CH A	BATT	IN

CB – IND/RECORD SYSTEM 3/5

DAU 1 CH B	DC 1	IN
DAU 2 CH A	BATT	IN
DAU 2 CH B	DC 2	IN
DAU 3 CH A	BATT	IN
DAU 3 CH B	DC 2	IN
DAU 4 CH A	BATT	IN

CB – IND/RECORD SYSTEM 4/5

DAU 4 CH B	DC 1	IN
DU 1	DC ESS	IN
DU 2	DC ESS	IN
DU 3 PWR A	BATT	IN
DU 3 PWR B	DC 1	IN
DU 4 PWR A	BATT	IN

CB – IND/RECORD SYSTEM 5/5

DU 4 PWR B	DC 2	IN
DU 5	DC 2	IN
DU 6	DC 2	IN
FDR	DC 2	IN
FDR ACCELEROMETER	DC 2	IN

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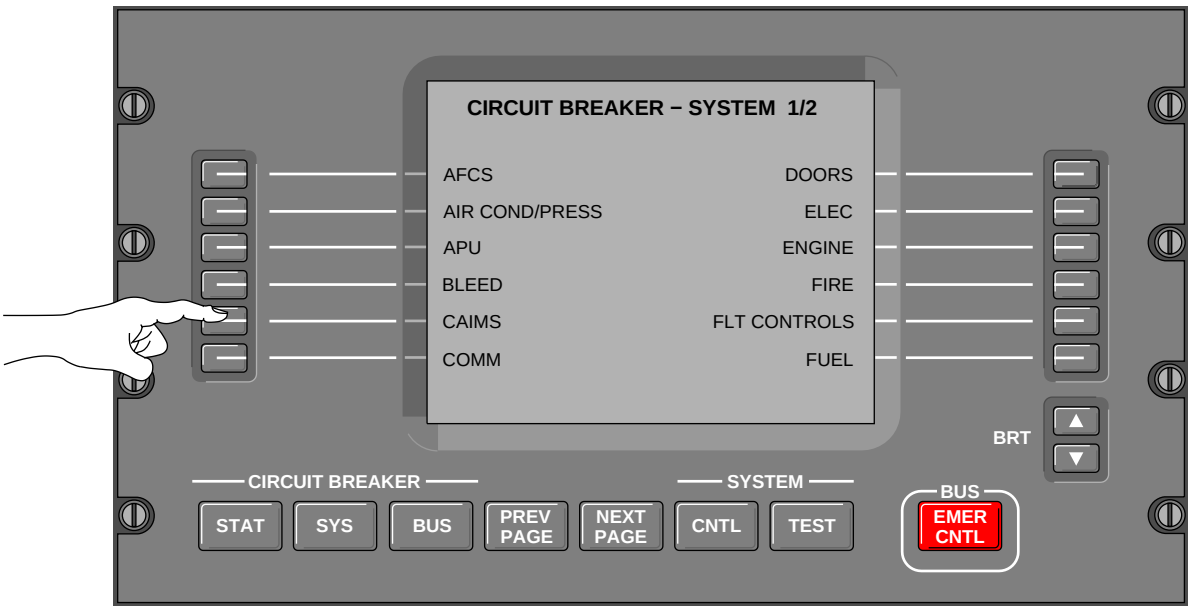
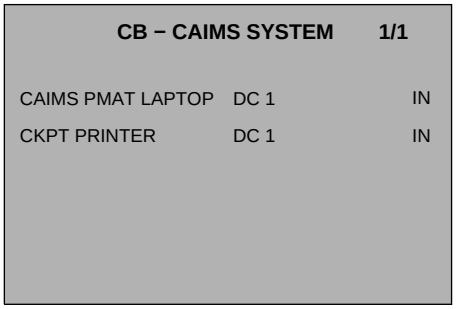
CB - CAIMS SYSTEM





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