FLIGHT DATA RECORDER - ADJUSTMENT/TEST

EFFECTIVITY: ALL

1. General

   A. This section gives the procedures to do the test ofthe Flight Data Recorder.

   B. The test of the TCAS parameters has the potential tocause interference with the local air traffic. Notify the local ATC(Air Traffic Controller) that the TCAS test is in progress, if applicable.

   C. The procedures in this section are given in the sequence below. The tasks identified with (♦) are part of the Scheduled Maintenance Requirements Document (SMRD).

TASK NUMBER	*DESCRIPTION*	*EFFECTIVITY*
31-31-00-700-801-A ♦	FLIGHT DATA RECORDER - FUNCTIONAL TEST	AIRCRAFT WITHOUT AFDAU/AFDAMU
31-31-00-700-802-A	FLIGHT DATA RECORDER - OPERATIONAL TEST	ALL
31-31-00-700-803-A ♦	FDR DATA - PERSONAL COMPUTER DOWNLOADING	ALL
31-31-00-700-804-A ♦	FLIGHT DATA RECORDER - FUNCTIONAL TEST	AIRCRAFT WITH AFDAU/AFDAMU
31-31-00-700-805-A ♦	FLIGHT DATA RECORDER - FUNCTIONAL TEST BY ANALYSIS OF DOWNLOADED DATA	ALL

TASK 31-31-00-700-801-A
EFFECTIVITY: AIRCRAFT WITHOUT AFDAU/AFDAMU

2. FLIGHT DATA RECORDER - FUNCTIONAL TEST

A. General

(1) This task gives the procedures to do the functional test of the Flight Data Recorder. In this test, the parameters are measured with the engines off and with the engines in operation.

(2) This functional test gives the procedures for the check of all the inputs to the Flight Data Recorder system.

WARNING: BEFORE PERFORMING A SPECIFIC STEP MAKE SURE THE REQUIRED PREPARATION ACTION(S) FOR THIS STEP IS (ARE) DONE.

(3) As necessary it is possible to do the tests out of sequence and each test independently.

(4) GSEs 058, 059, 070, and 196 will be used only on aircraft with the RVDTs/RVITs installed. The RVDTs/RVITs are used to monitor the control surface positions.

(5) The combination of DAU and ICs P/Ns that make up each EICAS version is shown in a table referred to in IPC 31-41-01.

(6) The GSE 092 - Hand-Held Download Unit (HHDLU), GSE 582 - Extended Hand-Held Download Unit (EHHDLU) for handheld and GSE 583 - Extended Handheld Download Unit (EHHDLU) for personal computer are applicable only to aircraft with FDR Honeywell installed.

(7) GSE 091, GSE 490 or GSE 607 can be used to extract, convert, and display digital flight data stored on the Honeywell Solid-State Flight Data Recorder.

(8) (Aircraft with FDR Honeywell installed) ADRAS and ADRAS-related support must be ordered directly from Honeywell. ADRAS is the software solution suggested by EMBRAER, but you can use other software to analyze downloaded FDR data. EMBRAER has no responsibility for the parameter conversion settings if other software is used.

(9) The GSE 464 - Portable Interface Unit (PIU) is applicable only to aircraft with FDR L3 installed.

(10) (Aircraft with FDR L3 installed) When using the L3 PIU (Portable Interface Unit) GSE 464, it is not possible to read binary values. To check discrete parameters, it is necessary to convert the binary value into its respective octal values. All possible combinations can be checked at Figure 510, Binary-to-Octal Conversion Table.

NOTE: The Figure 510, Binary-to-Octal Conversion Table shows the conversion from binary to octal representation. The 12-bit word size can be divided into four octal representations (Octal 1, Octal 2, Octal 3, and Octal 4).
To get the octal value do the steps that follow:

1. Set the indicated bit position to "1" or "0", in the 12-bit word. Refer to parameter indication specification. The other bits can be "1" or "0". Ignore them because they have no relation with the referred test,

2. In the corresponding line of the octal value column, get the octal digits of that binary representation,

3. Remember that from a 12-bit word size, you will get four octal digits.

E.g.
Suppose that 11th, 10th, 9th, 7th, 6th, 5th, 4th, and 2nd bits are set to "1". Refer to Figure 511, Example of Conversion.
The octal number will be:
Octal 4 : 3 (if 12th bit = "0") or 7 (if 12th bit = "1"),
Octal 3 : 5 (if 8th bit = "0") or 7 (if 8th bit = "1"),
Octal 2 : 7,
Octal 1 : 2 (if 3rd bit and 1st bit = "0") or 3 (if 3rd bit = "0" and 1st bit = "1") or 6 (if 3rd bit = "1" and 1st bit = "0"), or 7 (if 3rd bit and 1st bit = "1").
If 11th, 10th, 9th, 7th, 6th, 5th, 4th, and 2nd bits are set to "1" and the other bits are set to "0" the octal value will be 3572.

(11) (Aircraft with FDR L3 installed) Process the aircraft flight data with the ROSE for Windows (GSE 473) or other similar FDR raw data analyzer software.

NOTE: ROSE for Windows is the software solution suggested by EMBRAER, but you can use other software to analyze downloaded FDR data. EMBRAER has no responsibility for the parameter conversion settings if other software is used.

B. References

REFERENCE	*DESIGNATION*
AMM MPP 06-41-01/100	-
AMM MPP 06-41-03/100	- COMPONENT LOCATION
AMM MPP 06-44-00/100	- COMPONENT LOCATION
AMM MPP 28-00-00/200	- MAINTENANCE PRACTICES
AMM MPP 71-00-00/200	- MAINTENANCE PRACTICES
AMM SDS 22-10-00/1	
AMM SDS 23-11-00/1	
AMM SDS 23-12-00/1	
AMM SDS 23-31-00/1	
AMM SDS 23-51-00/1	
AMM SDS 23-81-00/1	
AMM SDS 27-10-00/1	
AMM SDS 27-14-00/1	
AMM SDS 27-20-00/1	
AMM SDS 27-24-00/1	
AMM SDS 27-30-00/1	
AMM SDS 27-31-00/1	
AMM SDS 27-36-00/1	
AMM SDS 27-40-00/1	
AMM SDS 27-43-00/1	
AMM SDS 27-50-00/1	
AMM SDS 27-53-00/1	

(Continued)

REFERENCE	*DESIGNATION*
AMM SDS 27-60-00/1	
AMM SDS 27-63-00/1	
AMM SDS 31-21-00/1	
AMM SDS 31-31-00/1	
AMM SDS 31-41-00/1	
AMM SDS 31-42-00/1	
AMM SDS 31-51-00/1	
AMM SDS 32-30-00/1	
AMM SDS 32-44-00/1	
AMM SDS 34-15-00/1	
AMM SDS 34-21-00/1	
AMM SDS 34-22-00/1	
AMM SDS 34-27-00/1	
AMM SDS 34-31-00/1	
AMM SDS 34-32-00/1	
AMM SDS 34-41-00/1	
AMM SDS 34-42-00/1	
AMM SDS 34-43-00/1	
AMM SDS 34-51-00/1	
AMM SDS 34-61-00/1	
AMM SDS 73-22-00/1	
AMM TASK 10-10-01-500-801-A/200	AIRCRAFT NORMAL PARKING
AMM TASK 20-40-01-860-801-A/200	ENERGIZATION OF THE AIRCRAFT WITH AN EXTERNAL POWER SOURCE
AMM TASK 23-51-00-700-801-A/500	AUDIO SYSTEM EMERGENCY MODE - OPERATIONAL CHECK
AMM TASK 27-63-01-700-801-A/500	SPOILER SYSTEM - OPERATIONAL CHECK
AMM TASK 28-45-00-700-801-A/500	FUEL LOW-PRESSURE WARNING SYSTEM - OPERATIONAL CHECK
AMM TASK 29-10-00-860-801-A/200	HYDRAULIC SYSTEM - PRESSURIZATION WITH HTS
AMM TASK 29-10-00-860-802-A/200	HYDRAULIC SYSTEM - PRESSURIZATION WITH EMDP
AMM TASK 31-21-00-700-802-A/500	DIGITAL CLOCK - OPERATIONAL TEST
AMM TASK 31-31-00-700-803-A/500	FDR DATA - PERSONAL COMPUTER DOWNLOADING
AMM TASK 31-31-03-000-801-A/400	FDR TRIAXIAL ACCELEROMETER - REMOVAL
AMM TASK 31-31-03-400-801-A/400	FDR TRIAXIAL ACCELEROMETER - INSTALLATION
AMM TASK 32-00-01-910-801-A/200	LG SAFETY PIN - INSTALLATION AND REMOVAL
AMM TASK 32-00-02-910-801-A/200	SAFETY PIN OF THE NLG DOORS SOLENOID VALVE - INSTALLATION AND REMOVAL

(Continued)

REFERENCE	*DESIGNATION*
AMM TASK 32-44-02-910-801-A/200	HYDRAULIC ACCUMULATOR EMERGENCY/PARKING BRAKE - RELEASE
AMM TASK 32-63-00-860-801-A/200	"FLIGHT"/"GROUND" CONDITION SIMULATION IN AIR/GROUND SYSTEM
AMM TASK 34-13-00-000-801-A/400	PITOT/STATIC-SYSTEM TEST SET - DISCONNECTION
AMM TASK 34-13-00-400-801-A/400	PITOT/STATIC-SYSTEM TEST SET - CONNECTION
AMM TASK 34-15-00-700-801-A/500	ADC SYSTEM - FUNCTIONAL CHECK
AMM TASK 34-31-00-800-801-A/200	RADIO ALTIMETER - RIGGING
AMM TASK 34-32-00-700-801-A/500	VOR/ILS SYSTEM OPERATIONAL TEST
AMM TASK 34-41-00-700-801-A/500	GPWS/WINDSHEAR - OPERATIONAL CHECK
AMM TASK 34-51-00-700-801-A/500	DME SYSTEM OPERATIONAL TEST
AMM TASK 71-00-01-910-801-A/200	ENGINE START PROCEDURE (NORMAL)
AMM TASK 71-00-01-910-804-A/200	ENGINE STOP PROCEDURE
AMM TASK 71-12-01-000-801-A/400	ENGINE LOWER COWLING - OPENING
AMM TASK 71-12-01-400-801-A/400	ENGINE LOWER COWLING - CLOSING
AMM TASK 78-31-01-940-801-A/200	THRUST REVERSER - OPENING PROCEDURE
AMM TASK 78-31-01-940-802-A/200	THRUST REVERSER - CLOSURE PROCEDURE
Extended Handheld Download Unit - User's Manual	-
Extended Handheld Download Unit - User's Manual	-
Hand-Held Download Unit - User's Manual	-
IPC 31-41-01	DATA ACQUISITION UNIT
Portable Interface Unit - User's Manual	-
SB145-27-0050	-
SB145-32-0036	-

C. Zones and Accesses

ZONE	*PANEL/DOOR*	*LOCATION*
272	272DR	Fuselage rear section I - Right side
223	223LZ	Cockpit - LH side

D. Tools and Equipment

ITEM	*DESCRIPTION*	*PURPOSE*	*QTY*
GSE 036	Platform, Hydraulic	To get access to the work area on the aileron, on the elevator, on the rudder, and in the rear electronic compartment	
GSE 044	Headset - Ramp handling	For communication	
GSE 058	Kit, rigging pins, flight controls	To keep the aileron control surface in the neutral position	
GSE 059	Protractor - Control Surface Deflection	To measure the rudder deflection angle	

(Continued)

ITEM	DESCRIPTION	PURPOSE	QTY
GSE 070	Protractor - digital	To measure the aileron, the elevator and the control column deflection angle	
GSE 091	Automated Test Unit (ATU) or IBM - compatible personal computer with Microsoft Windows 3.1 and PCMCIA driver	To process aircraft flight data retrieved from the FDR to the PCMCIA by the HHDLU, with the ADRAS for Windows (Aircraft Data Recovery/Analysis System)	
GSE 092	Hand-Held Download Unit (HHDLU)	To retrieve the stored data from the FDR and make possible the ability to monitor the aircraft data in real time	
GSE 126	Test Set - COMM/VOR/ILS, Ramp and Bench	To simulate VOR, LOC and GS frequencies and deviations	
GSE 127	Test Set - Transponder and DME, Ramp	To simulate DME distances	
GSE 128	Kit - Air Data	To connect the Pitot/Static System Test Set to the pitot/static tubes of the aircraft	
GSE 129	Test Set - Pitot-Static	To simulate altitude and airspeed	
GSE 190	Test Set - TCAS	To simulate an intruder	
GSE 196	Clamp-Lock, elevator	To lock the elevator in the neutral position	
GSE 301	Test Set - COMM/VOR/ILS, Ramp and Bench	To simulate VOR, LOC and GS frequencies and deviations	
GSE 302	Test Set - Transponder and DME, Ramp	To simulate DME distances	
GSE 304	Test Set - TCAS	To simulate an intruder	
GSE 361	Radio Altimeter Test Harness	To simulate radio altitude	
GSE 464	Portable Interface Unit (PIU)	To retrieve the stored data from the FDR and make possible the ability to monitor the aircraft data in real time, for aircraft with FDR L3 installed	
GSE 473	Read-Out Support Equipment/Recorder Interface	To read FDR Data for aircraft with FDR L3 installed.	
GSE 474	Test Set - COMM/VOR/ILS, Ramp and Bench	To simulate VOR, LOC and GS frequencies and deviations	
GSE 475	Test Set - Transponder / DME / TCAS Ramp Test Set IFR 6000	To simulate DME distances and an intruder	
GSE 490	Automated Test Unit (ATU) or IBM - compatible personal computer with Microsoft Windows 2000, PCMCIA driver and USB port	To process aircraft flight data retrieved from the Honeywell Solid-State Flight Data Recorder (SSFDR) to the PCMCIA by the HHDLU, with the ADRAS for Windows (Aircraft Data Recovery/Analysis System)	
GSE 582	Extended Handheld Download Unit (EHHDLU), for Handheld	Used to download flight recorder memory, and view data stream during recording	
GSE 583	Extended Handheld Download Unit (EHHDLU) Set, for PC	Used to download flight recorder memory, and view data stream during recording	
GSE 607	Playback Test-VDR System (PATS II)	Used to extract, convert, and display (in engineering units) digital flight data stored on the Honeywell solid-state flight recorder.	

E. Auxiliary Items

ITEM	*DESCRIPTION*	*PURPOSE*	*QTY*
Commercially available	Workstand	To get access to the engines	1
Commercially available	Screw, NASM(MS)24694-6 (or similar with #8-32UNC thread, 19/32 in. length)	To attach the base of GSE-059 to the aircraft	1

F. Consumable Materials

SPECIFICATION (BRAND)	*DESCRIPTION*	*QTY*
Commercially available	Double-face adhesive-tape	AR

G. Expandable Parts

Not Applicable

H. Persons Recommended

QTY	*FUNCTION*	*PLACE*
1	Does the task	Cockpit
1	Does the task	Outside the aircraft

I. Preparation (Figure 501)

SUBTASK 841-002-A

(1) Make sure that the aircraft is safe for maintenance.

(2) Make sure that the sensors (PITOT 1/TAT 1/AOA 1, PITOT 3 and PITOT 2/TAT 2/AOA 2) pushbuttons, on the Overhead Panel (Ice Protection Panel), are set to OFF. Attach DO-NOT-TURN-AUTO tags to them.

WARNING: DO NOT TOUCH THE PITOT, PITOT/STATIC SENSORS, AND ANEMOMETRIC STATIC PORTS IMMEDIATELY AFTER THE HEATER WAS SET TO OFF TO PREVENT INJURY TO PERSONS.

CAUTION: DO NOT APPLY PRESSURE TO THE PITOT TUBES WHEN THE STATIC PORTS ARE WITHOUT PRESSURE. THIS COULD CAUSE DAMAGE TO THE MADC.

(3) Remove the protection cover from the pitot and pitot/static sensors.

(4) Connect the Pitot/Static System Test Set (GSE 129) to the aircraft (AMM TASK 34-13-00-400-801-A/400).

(5) Energize the aircraft with the External DC Power Supply (AMM TASK 20-40-01-860-801-A/200).

(6) Connect the headsets (GSE 044).

(7) Make sure that the systems below are operational and on:

– Autopilot (AMM SDS 22-10-00/1).

- Passenger Address & Cabin Interphone System (AMM SDS 23-31-00/1).
- Airborne Audio System (AMM SDS 23-51-00/1).
- Radio Management System (AMM SDS 23-81-00/1).
- Aileron System (AMM SDS 27-10-00/1).
- Rudder Control System (AMM SDS 27-20-00/1).
- Elevator & TAB Systems (AMM SDS 27-30-00/1).
- Stall Protection System (AMM SDS 27-36-00/1).
- Horizontal Stabilizer (AMM SDS 27-40-00/1).
- Flap System (AMM SDS 27-50-00/1).
- Spoiler (AMM SDS 27-60-00/1).
- EICAS (AMM SDS 31-41-00/1).
- Integrated Computer System (AMM SDS 31-42-00/1).
- Aural Warning System (AMM SDS 31-51-00/1).
- ADC System (AMM SDS 34-15-00/1).
- AHRS (AMM SDS 34-21-00/1) or IRS (AMM SDS 34-27-00/1), as applicable.
- EFIS (AMM SDS 34-22-00/1).
- Radio Altimeter System (AMM SDS 34-31-00/1).
- VOR/ILS/GS/MB System (AMM SDS 34-32-00/1).
- EGPWS/Windshear System or GPWS/Windshear System, as applicable (AMM SDS 34-41-00/1).
- TCAS (AMM SDS 34-43-00/1).
- DME System (AMM SDS 34-51-00/1).
- (Aircraft with dual IRS) FMS (Honeywell) (AMM SDS 34-61-00/1).
- FADEC System (AMM SDS 73-22-00/1).

(8) Install the landing gear safety pins on all main landing gear and nose landing gear (AMM TASK 32-00-01-910-801-A/200).

(9) Put the hydraulic platform (GSE 036) to the necessary height to get access to the rear electronic compartment.

(10) Open access door 272DR (AMM MPP 06-41-01/100).

(11) On the circuit breaker panel, open the FDR circuit breaker (Location Tip: ESSENTIAL DC BUS 1/MISCELLANEOUS/FDR) and attach a DO-NOT-CLOSE tag to it.

(12) Open maintenance panel door 223LZ (AMM MPP 06-41-03/100).

(13) Make sure that the DFDR switch, on the maintenance panel, is at the NORM position.

(14) (Aircraft with FDR Honeywell installed) To connect the GSE to the FDR, do one of these procedures:

1. If you use GSE 092, in the rear electronic compartment, connect the Hand-Held Download Unit (HHDLU) with the PCMCIA card inserted in it to the FDR (Refer to Hand-Held Download Unit - User's Manual).

2. If you use GSE 582, in the rear electronic compartment, connect the Extended Handheld Download Unit (EHHDLU) to the FDR (Refer to Extended Handheld Download Unit - User's Manual).

3. If you use GSE 583, in the rear electronic compartment, connect the personal computer (GSE 130) with EHHDLU software installed to the FDR using the SSFDR download cable (Refer to Extended Handheld Download Unit - User's Manual).

(15) (Aircraft with FDR L3 installed) In the rear electronic compartment, connect to the FDR the Portable Interface Unit (PIU) (GSE 464) with the PCMCIA card inserted in it (Refer to Portable Interface Unit - User's Manual).

(16) On the circuit breaker panel, remove the DO-NOT-CLOSE tag from the FDR circuit breaker (Location Tip: ESSENTIAL DC BUS 1/MISCELLANEOUS/FDR) and close it.

J. Functionally Check Flight Data Recorder System (Figure 501) (Figure 502) (Figure 503) (Figure 504) (Figure 505) (Figure 506)

SUBTASK 720-002-A

(1) On the maintenance panel, set the DFDR switch to the TEST position.

NOTE: These steps start the recording function of the FDR which will overwrite the data stored in the FDR.

(2) If it is necessary to keep the data stored in the FDR, do an FDR downloading according to AMM TASK 31-31-00-700-803-A/500.

(3) (Aircraft with FDR L3 installed) On the PIU, select the word monitor function.

(4) (Aircraft with FDR Honeywell installed) If you use GSE 092, on the HHDLU select the DSDU (Data Signal Display Unit) function.

(5) (Aircraft with FDR Honeywell installed) If you use either GSE 582 or GSE 583, select the Monitor function.

NOTE:
- (Aircraft with FDR Honeywell installed) If you use GSE 092 to set the parameters (SUBFRAME, WORD and BASE) on the HHDLU, obey the instructions in the Hand-Held Download Unit - User's Manual.
- (Aircraft with FDR Honeywell installed) If you use either GSE 582 or GSE 583 to set the Recorder Type and parameters (SUBFRAME, WORD and FORMAT) on the EHHDLU, obey the instructions in the Extended Handheld Download Unit - User's Manual.

- (Aircraft with FDR L3 installed) To set the parameters (SUBFRAME, WORD and BASE) on the PIU, obey the instructions in the of the , Portable Interface Unit - User's Manual.
- To measure the parameters from step (3) to step (37), the engines must be off.

(6) Do the test of the Anemometric Parameters as follows (OCTAL BASE):

(a) On the HHDLU/EHHDLU/PIU, select the PRESSURE ALTITUDE. Select WORDS 114 (bits 12-1) and 115 (bits 6-1), and SUBFRAME ALL.

(b) Refer to the table below and, on the pitot/static system test set (GSE 129), adjust the air data parameters. Make sure that the values shown on the HHDLU/ EHHDLU/PIU agree with the tolerances:

Table 501 - PRESSURE ALTITUDE

VALUES (ft)	HHDLU/EHHDLU/PIU (OCTAL)
4,000	017454 - 017524
10,000	047014 - 047064
30,000	165114 - 165164

NOTE:
- The 18-bit long pressure altitude data from the air data computer was split into two words to be recorded on the SSFDR. The most significant 12 bits (which include a sign bit) are stored as Word 114 and the least significant 6 bits are stored as Word 115.
- The octal number is made of the four digits of Word 114 followed by the two last digits of Word 115.

(c) On the HHDLU/EHHDLU/PIU, select the AIRSPEED parameter. Select WORD 19 and SUBFRAME ALL.

(d) On the pitot/static system test set (GSE 129), adjust the air data parameters. Refer to the table below and make sure that the values shown on the HHDLU/PIU are in the tolerances:

Table 502 - AIRSPEED

VALUES (kt)	HHDLU/EHHDLU/PIU (OCTAL)
60	0162 - 0176
180	0533 - 0563
300	1105 - 1151

(7) Do the test of the STATIC AIR TEMPERATURE (SAT) parameter as follows (OCTAL BASE):

(a) On the HHDLU/EHHDLU/PIU, select the STATIC AIR TEMPERATURE (SAT) parameter. Select WORD 100 and SUBFRAMES 2 and 4.

(b) On the MFD, on the Static Air Temperature (SAT) indicator, read the temperature.

(c) Refer to the table below and compare the value on the SAT indicator with the value shown on the HHDLU/EHHDLU/PIU. Make sure that the difference is in the tolerances.

Table 503 - STATIC AIR TEMPERATURE (SAT)

VALUES (°C)	HHDLU/EHHDLU/PIU (OCTAL)
15	317 - 417
20	437 - 537
21	457 - 557
22	477 - 577
23	517 - 617
24	537 - 637
25	557 - 657
26	577 - 677
27	617 - 717
28	637 - 737
29	657 - 757
30	677 - 777
31	717 - 1017
32	737 - 1037
33	757 - 1057
34	777 - 1077
35	1017 - 1117
36	1037 - 1137
37	1057 - 1157

(8) Do the test of the Triaxial Accelerometer Parameters as follows (OCTAL BASE):

(a) Release the Triaxial Accelerometer from its attaching support (AMM TASK 31-31-03-000-801-A/400).

(b) On the HHDLU/EHHDLU/PIU, select the NORMAL ACCELERATION parameter. Select WORDS 5, 21, 37, 53, 69, 85, 101, and 117, and SUBFRAME ALL.

(c) Refer to the table below and put the accelerometer at those positions. Make sure that the values on the HHDLU/EHHDLU/PIU are in the tolerances:

NOTE: The arrows in the tables show the axis under test, after the triaxial accelerometer rotation. Refer to the "FDR Triaxial Accelerometer - Removal/Installation" figure in AMM TASK 31-31-03-000-801-A/400.

Table 504 - NORMAL ACCELERATION

ACCELEROMETER POSITION	VALUES (g)	HHDLU/ EHHDLU/PIU (OCTAL)
Turned 90° (→)	0	1326 - 1356
Turned downwards (↓)	-1	773 - 1023

Table 504 - NORMAL ACCELERATION (Continued)

ACCELEROMETER POSITION	VALUES (g)	HHDLU/ EHHDLU/PIU (OCTAL)
Normal (↑)	1	1660 - 1710

(d) On the HHDLU/EHHDLU/PIU, select the LATERAL ACCELERATION parameter. Select WORDS 7, 39, 71, and 103, and SUBFRAME ALL.

(e) Refer to the table below, put the accelerometer at those positions, and make sure that the values shown on the HHDLU/PIU are in the tolerances:

Table 505 - LATERAL ACCELERATION

ACCELEROMETER POSITION	VALUES (g)	HHDLU/ EHHDLU/PIU (OCTAL)
Neutral (→)	0	1766 - 2131
Left Side Turned Upwards (↓)	-1	037 - 202
Right Side Turned Upwards (↑)	1	3715 - 4060

NOTE: Left and right references are related to the flight line.

(f) On the HHDLU/EHHDLU/PIU, select the LONGITUDINAL ACCELERATION parameter. Select WORDS 6, 38, 70, and 102, and SUBFRAME ALL.

(g) Refer to the table below, put the accelerometer at those positions, and make sure that the values shown on the HHDLU/EHHDLU/PIU are in the tolerances:

Table 506 - LONGITUDINAL ACCELERATION

ACCELEROMETER POSITION	VALUES (g)	HHDLU/ EHHDLU/PIU (OCTAL)
Neutral (←)	0	1766 - 2131
Forward Turned Downwards (↓)	-1	037 - 202
Forward Turned Upwards (↑)	1	3715 - 4060

(h) Tighten the Triaxial Accelerometer on its attaching support (AMM TASK 31-31-03-400-801-A/400).

(9) (Aircraft with AHRS) Do the test of the Attitude and Heading Parameters as follows (OCTAL BASE):

(a) Make sure that the AHRS 1 (Location Tip: ESSENTIAL DC BUS 1/NAV/AHRS 1) and AHRS 2 (Location Tip: DC BUS 2/NAV/AHRS 2) circuit breakers are closed.

(b) On the Maintenance Panel, adjust the AHRS TEST 1 switch to TEST to get the indications listed in the tables that follow (PITCH ATTITUDE, ROLL ATTITUDE, MAGNETIC HEADING), and as shown on the PFDs.

(c) On the HHDLU/EHHDLU/PIU, select the PITCH ATTITUDE parameter. Select WORDS 22, 54, 86, and 118, and SUBFRAME ALL. Make sure that the value shown on the HHDLU/EHHDLU/PIU is in the tolerance given in the table below:

Table 507 - PITCH ATTITUDE

VALUE (°)	HHDLU/EHHDLU/PIU (OCTAL)
0	7751 - 0026
15	0223 - 0301

(d) On the HHDLU/EHHDLU/PIU, select the ROLL ATTITUDE parameter. Select WORDS 23 and 87, and SUBFRAME ALL. Make sure that the value shown on the HHDLU/EHHDLU/PIU is in the tolerance given in the table below:

Table 508 - ROLL ATTITUDE

VALUE (°)	HHDLU/EHHDLU/PIU (OCTAL)
5	0042 - 0117

(e) On the HHDLU/EHHDLU/PIU, select the MAGNETIC HEADING parameter. Select WORD 18 and SUBFRAME ALL. Make sure that the value shown on the HHDLU/EHHDLU/PIU is in the tolerance given in the table below:

Table 509 - MAGNETIC HEADING

VALUE (°)	HHDLU/EHHDLU/PIU (OCTAL)
30	0476 - 0553

(10) Do the test of the Flight Control Parameters as follows (OCTAL BASE):

WARNING: MAKE SURE THAT THERE ARE NO PERSONS AND EQUIPMENT IN THE AILERON, FLAP, RUDDER, HORIZONTAL STABILIZER, AND ELEVATOR TRAVEL AREA.

CAUTION:
- DO NOT DO OTHER TASKS ON THE AILERON, FLAP, RUDDER, ELEVATOR, AND HORIZONTAL STABILIZER SYSTEMS.
- MAKE SURE THAT THE AILERON SYSTEM IS NOT RIG-PINNED AT THE CONTROL WHEEL, TORQUE TUBE QUADRANTS, INTERMEDIARY SECTOR, AND WING SECTOR.
- MAKE SURE THAT THE RUDDER SYSTEM IS NOT RIG-PINNED AT THE RUDDER PEDALS AND FORWARD AND REAR TORQUE TUBES.
- MAKE SURE THAT THE ELEVATOR SYSTEM IS NOT RIG-PINNED AT THE CONTROL COLUMN, TORQUE TUBE, REAR SECTOR, AND SURFACES.

(a) Pressurize the hydraulic system (AMM TASK 29-10-00-860-801-A/200).

(b) On the HHDLU/EHHDLU/PIU, select the PITCH TRIM POSITION parameter. Select WORD 82, and SUBFRAME ALL.

(c) Set the TRIM switch, on the Pilot Control Wheel (AMM SDS 27-43-00/1), to the neutral/DOWN/UP position until the PITCH indication on the EICAS shows the positions given in the table below, and make sure that the values shown on the HHDLU/EHHDLU/PIU obey the tolerances.

Table 510 - PITCH TRIM POSITION

VALUE (°)	HHDLU/EHHDLU/PIU (OCTAL)
0	7760 - 0020
2 (Nose Down)	0060 - 0121
5 (Nose Up)	7516 - 7556
10 (Nose Up)	7253 - 7313

(d) Set the horizontal stabilizer to the neutral position with the TRIM switch, and make sure that the PITCH indication, on the EICAS, shows this position.

(e) On the HHDLU/EHHDLU/PIU, select the AILERON (ROLL) TRIM POSITION parameter. Select WORD 68 and SUBFRAME ALL.

(f) Push the ROLL TRIM switch, on the Control Pedestal (AMM SDS 27-14-00/1), to the RWD/neutral/LWD position for approximately 3 seconds, several times, until the ROLL indication on the EICAS shows the positions given in the table below, and make sure that the values shown on the HHDLU/EHHDLU/PIU obey the tolerances.

To make sure that the bug is accurately at the last mark of the scale on the EICAS (AMM SDS 27-24-00/1) full at the right side or full at the left side, push the ROLL TRIM switch more than it is necessary to make the bug be at the end of the scale. Then, carefully push the ROLL TRIM switch to the opposite side until you see the bug to move in the direction of the center of the scale. At this moment, stop to push the switch. This is the accurate position of the bug at the end of the scale.

Table 511 - AILERON (ROLL) TRIM POSITION

POSITION	HHDLU/EHHDLU/PIU (OCTAL)
Full Right Side (Indicated on EICAS)	1372 - 1512
Centered (Indicated on EICAS)	7727 - 0050
Full Left Side (Indicated on EICAS)	6265 - 6405

(g) Move the aileron to the neutral position with the ROLL TRIM switch, and make sure that the ROLL indication on the EICAS shows this position.

(h) On the HHDLU/EHHDLU/PIU, select the RUDDER (YAW) TRIM POSITION parameter. Select WORD 36 and SUBFRAME ALL.

(i) Turn the YAW TRIM switch, on the Control Pedestal (AMM SDS 27-24-00/1), to the RIGHT/neutral/LEFT position until the YAW indication on the EICAS shows the positions given in the table below, and make sure that the values shown on the HHDLU/EHHDLU/PIU obey the tolerances.

To make sure that the bug is accurately at the last mark of the scale on the EICAS (AMM SDS 27-24-00/1) full at the right side or full at the left side, turn the YAW TRIM switch more than it is necessary to make the bug be at the end of the scale. Then, carefully turn the YAW TRIM switch to the opposite side until you see the bug to move in the direction of the center of the scale. At this moment, stop the switch movement. This is the accurate position of the bug at the end of the scale.

Table 512 - RUDDER (YAW) TRIM POSITION

POSITION	HHDLU/EHHDLU/PIU (OCTAL)
Full Right Side (Indicated on EICAS)	1372 - 1512
Centered (Indicated on EICAS)	7727 - 0050
Full Left Side (Indicated on EICAS)	6265 - 6405

(j) Move the YAW TRIM switch to the neutral position, and make sure that the YAW indication on the EICAS shows this position.

(k) On the HHDLU/EHHDLU/PIU, select the CONTROL COLUMN POSITION # 1 parameter. Select WORDS 8, 40, 72, and 104, and SUBFRAME ALL.

(l) Install the digital protractor (GSE 070) on the control column #1 with adhesive tape (see Figure 503). Make sure that the instrument is aligned with the column.

(m) With the control column in the neutral position and locked (use GSE 058), set the digital protractor to zero.

(n) Refer to the table below and move the pilot control column (AMM SDS 27-31-00/1) to make sure that the values shown on the HHDLU/EHHDLU/PIU are in the tolerances.

Table 513 - CONTROL COLUMN POSITION # 1

EFFECTIVITY	POSITION	HHDLU/EHHDLU/PIU (OCTAL)
Pre-Mod SB145-27-0050	Neutral and Locked	1751 - 2025
	5 Degrees - Forward	1163 - 1535
	10 Degrees - Rearward	2651 - 3156
Post-Mod SB145-27-0050	Neutral and Locked	1751 - 2025
	5 Degrees - Forward	1070 - 1516
	15 Degrees - Rearward	3320 - 3617

(o) On the HHDLU/EHHDLU/PIU, select the CONTROL COLUMN POSITION # 2 parameter. Select WORDS 24, 56, 88, and 120, and SUBFRAME ALL.

(p) Install the digital protractor (GSE 070) on the control column #2 with adhesive tape (see Figure 503). Make sure that the instrument is aligned with the column.

(q) With the control column in the neutral position and locked (use GSE 058), set the digital protractor to zero.

(r) Refer to the table below and move the pilot control column (AMM SDS 27-31-00/1) to make sure that the values shown on the HHDLU/EHHDLU/PIU are in the tolerances.

Table 514 - CONTROL COLUMN POSITION # 2

EFFECTIVITY	POSITION	HHDLU/EHHDLU/PIU (OCTAL)
Pre-Mod SB145-27-0050	Neutral and Locked	1751 - 2025
	5 Degrees - Forward	1163 - 1535
	10 Degrees - Rearward	2651 - 3156

Table 514 - CONTROL COLUMN POSITION # 2 (Continued)

EFFECTIVITY	POSITION	HHDLU/EHHDLU/PIU (OCTAL)
Post-Mod SB145-27-0050	Neutral and Locked	1751 - 2025
	5 Degrees - Forward	1070 - 1516
	15 Degrees - Rearward	3320 - 3617

(s) On the HHDLU/EHHDLU/PIU, select the CONTROL WHEEL POSITION # 1 parameter. Select WORDS 9, 41, 73, and 105, and SUBFRAME ALL.

(t) Refer to the table below and move the control yoke (AMM SDS 27-10-00/1) to make sure that the values shown on the HHDLU/EHHDLU/PIU are in the tolerances.

Table 515 - CONTROL WHEEL POSITION # 1

POSITION	HHDLU/EHHDLU/PIU (OCTAL)
Neutral and Locked	1771 - 2007
Fully Left	0640 - 1020
Fully Right	3010 - 3170

(u) On the HHDLU/EHHDLU/PIU, select the CONTROL WHEEL POSITION # 2 parameter. Select WORDS 25, 57, 89, and 121, and SUBFRAME ALL.

(v) Refer to the table below and move the control yoke (AMM SDS 27-10-00/1) to make sure that the values shown on the HHDLU/EHHDLU/PIU are in the tolerances.

Table 516 - CONTROL WHEEL POSITION # 2

POSITION	HHDLU/EHHDLU/PIU (OCTAL)
Neutral and Locked	1771 - 2007
Fully Left	0640 - 1020
Fully Right	3010 - 3170

(w) On the HHDLU/EHHDLU/PIU, select the RUDDER PEDAL POSITION parameter. Select WORDS 55, and 119, and SUBFRAME ALL.

NOTE: Make sure that the aircraft is on the ground configuration.

(x) Refer to the table below and, with the pedals, control the rudder (AMM SDS 27-20-00/1) to make sure that the values shown on the HHDLU/EHHDLU/PIU are in the tolerances.

Table 517 - RUDDER PEDAL POSITION

POSITION	HHDLU/EHHDLU/PIU (OCTAL)		
	CTA/FAA/IAC-AR - CERTIFIED AIRCRAFT	JAA - CERTIFIED AIRCRAFT	
		WITH RUDDER MOVABLE PRIMARY STOP	WITHOUT RUDDER MOVABLE PRIMARY STOP
NEUTRAL AND LOCKED	1740 - 2040	1740 - 2040	1740 - 2040

Table 517 - RUDDER PEDAL POSITION (Continued)

POSITION	HHDLU/EHHDLU/PIU (OCTAL)		
	CTA/FAA/IAC-AR - CERTIFIED AIRCRAFT	JAA - CERTIFIED AIRCRAFT	
		WITH RUDDER MOVABLE PRIMARY STOP	WITHOUT RUDDER MOVABLE PRIMARY STOP
RIGHT PEDAL FULLY FORWARD	3103 - 4303	3103 - 4303	2400 - 3037
LEFT PEDAL FULLY FORWARD	0000 - 0767	0000 - 0767	0726 - 1365

(y) Release the pressure from the hydraulic system (AMM TASK 29-10-00-860-801-A/200).

(11) Do the test of the Flap Control as follows (OCTAL BASE):

(a) On the HHDLU/EHHDLU/PIU, select the FLAP POSITION parameter. Select WORD 100, and SUBFRAMES 1 and 3.

(b) Set the Flap Selector Lever, on the Control Pedestal (AMM SDS 27-53-00/1), to the positions listed in the table below, and make sure that the FLAPS position indication on the EICAS shows the same positions. Make sure that the values shown on the HHDLU/EHHDLU/PIU obey the tolerances.

Table 518 - FLAP POSITION

VALUES (°)	HHDLU/EHHDLU/PIU (OCTAL)
0	0000 - 0137
9	0277 - 0577
22	1137 - 1437
45	2477 - 2777

(12) Do the test of the Stall Protection System Parameters as follows (OCTAL BASE):

(a) On the HHDLU/EHHDLU/PIU, select the ANGLE OF ATTACK # 1 (AOA - Left Side) Sensor parameter. Select WORDS 20, and 84, and SUBFRAME ALL.

(b) Refer to the table below, adjust the Angle of Attack (AOA) # 1 Sensor to those positions, and make sure that the values shown on the HHDLU/EHHDLU/PIU are in the tolerances:

Table 519 - ANGLE OF ATTACK # 1

POSITION	HHDLU/EHHDLU/PIU (OCTAL)
LOWER STOP	3752 - 4030
UPPER STOP	3747 - 4025

(c) On the HHDLU/EHHDLU/PIU, select the ANGLE OF ATTACK # 2 (AOA - Right Side) Sensor parameter. Select WORDS 52, and 116, and SUBFRAME ALL.

(d) Refer to the table below, adjust the Angle of Attack (AOA) # 2 Sensor to those positions, and make sure that the values shown on the HHDLU/EHHDLU/PIU are in the tolerances:

Table 520 - ANGLE OF ATTACK # 2

POSITION	HHDLU/EHHDLU/PIU (OCTAL)
LOWER STOP	3752 - 4030
UPPER STOP	3747 - 4025

(e) The items (f) thru (k) are applicable to aircraft with EICAS versions 17 and on.

WARNING: FOR THIS TEST, THE PUSHER WILL BE OPERATED. MAKE SURE THAT THERE ARE NO PERSONS OR EQUIPMENT NEAR THE ELEVATOR SURFACES.

(f) On the Overhead Panel, make sure that the BATT1 and BATT2 switches are set at OFF and, on the Circuit Breaker Panel, open the AIR/GND A (Location Tip: DC BUS 1/LDG GEAR/AIR/GND A), AIR/GND B (Location Tip: ESSENTIAL DC BUS 1/LDG GEAR/AIR/GND B), AIR/GND C (Location Tip: DC BUS 2/LDG GEAR/AIR/GND C), and AIR/GND D (Location Tip: ESSENTIAL DC BUS 2/LDG GEAR/AIR/GND D) circuit breakers and attach DO-NOT-CLOSE tags to them.

(g) On the Pitot/Static System Test Set (GSE 129), adjust the air data parameters as follows:

- Climb to 0 feet per minute.

- Airspeed to 200 Knots.

- Altitude to 1,500 feet.

This procedure puts the aircraft in the flight configuration.

(h) (Aircraft with FDR Honeywell installed) On the HHDLU/EHHDLU, select the STICK PUSHER and STICK SHAKER parameters. Select WORD 10 (BINARY BASE) and SUBFRAME ALL.

(i) (Aircraft with FDR L3 installed) On the PIU, select the STICK PUSHER and STICK SHAKER parameters. Select WORD 10 (OCTAL BASE) and SUBFRAME ALL. Cross check all the binary variations described below with its respective octal according to Figure 510.

(j) Pull the control column rearward. Change the position of the Angle-of-Attack (AOA) sensors (outside the aircraft) in order to simulate a nose-up condition.

Result:

1 Shakers 1 and 2 start.

2 The pusher starts and controls the elevator nose down, and the clacker operates.

3 The HHDLU/EHHDLU 3rd and 4th bits go to "1".

(k) Change the position of the angle-of-attack (AOA) sensors (outside the aircraft) in order to simulate the return of the aircraft to the horizontal position.

Result:

1 Shakers 1 and 2 stop.

2 The pusher and clacker sound stop.

3 The HHDLU/EHHDLU 3rd and 4th bits come back to "0".

(l) The items (m) thru (r) are applicable to aircraft with EICAS versions 20.5 and on.

(m) (Aircraft with FDR Honeywell installed) On the HHDLU/EHHDLU, select the SPC # (1,2) FAIL parameter. Select WORD 3 (BINARY BASE) and SUBFRAME 1.

(n) (Aircraft with FDR L3 installed) On the PIU, select the SPC # (1,2) FAIL parameter . Select WORD 3 (OCTAL BASE) and SUBFRAME ALL. Cross check all the binary variations described below with its respective octal according to Figure 510.

(o) On the circuit breaker panel, open the CHANNEL 1 (Location Tip: ESSENTIAL DC BUS 1/STALL PROT/CHANNEL 1) circuit breaker.

Result:

1 On the EICAS display, the message SPS 1 INOP comes into view.

2 On the HHDLU/EHHDLU, the 2nd bit changes from "0" to "1".

(p) On the circuit breaker panel, close the CHANNEL 1 (Location Tip: ESSENTIAL DC BUS 1/STALL PROT/CHANNEL 1) circuit breaker.

Result:

1 On the EICAS display, the message SPS 1 INOP goes out of view.

2 On the HHDLU/EHHDLU, the 2nd bit changes from "1" to "0".

(q) On the circuit breaker panel, open the CHANNEL 2 (Location Tip: DC BUS 2/ STALL PROT/CHANNEL 2) circuit breaker.

Result:

1 On the EICAS display, the message SPS 2 INOP comes into view.

2 On the HHDLU/EHHDLU, the 3rd bit changes from "0" to "1".

(r) On the circuit breaker panel, close the CHANNEL 2 (Location Tip: DC BUS 2/ STALL PROT/CHANNEL 2) circuit breaker.

Result:

1 On the EICAS display, the message SPS 2 INOP goes out of view.

2 On the HHDLU/EHHDLU, the 3rd bit changes from "1" to "0".

(13) Do the test of the Radio Altitude (Radio Altimeter # 1) Parameter as follows (OCTAL BASE):

(a) On the HHDLU/EHHDLU/PIU, select the RADIO ALTITUDE parameter. Select WORD 50 and SUBFRAME ALL.

(b) Simulate the radio altitude values given in the table below (RADIO ALTITUDE). To do this, refer to AMM TASK 34-31-00-800-801-A/200. See the indications on PFD 1 and make sure that the values shown on the HHDLU/EHHDLU/PIU are in the tolerance.

Table 521 - RADIO ALTITUDE

RADIO ALTITUDE (ft)	POWER SUPPLY (V DC)	HHDLU/EHHDLU/PIU (OCTAL)
250 ± 3%	1.35	0171 - 0200
500 ± 3%	2.74	0362 - 0401
1500 ± 5%	8.20	1310 - 1423
2500 ± 5%	13.65	2243 - 2440

(c) Restore the Radio Altimeter System back to normal. Refer to AMM TASK 34-31-00-800-801-A/200.

(14) (Aircraft with 2nd radio altimeter and EICAS versions 20.5 and on) Do the test of the Radio Altitude (Radio Altimeter # 2) Parameter as follows (OCTAL BASE):

(a) On the HHDLU/EHHDLU/PIU, select the RADIO ALTITUDE parameter. Select WORD 122 and SUBFRAME ALL.

(b) Simulate the radio altitude values given in the table below (RADIO ALTITUDE). To do this, refer to AMM TASK 34-31-00-800-801-A/200. See the indications on PFD 2 and make sure that the values shown on the HHDLU/EHHDLU/PIU are in the tolerance.

Table 522 - RADIO ALTITUDE

RADIO ALTITUDE (ft)	POWER SUPPLY (V DC)	HHDLU/EHHDLU/PIU (OCTAL)
250 ± 3%	1.35	0171 - 0200
500 ± 3%	2.74	0362 - 0401
1500 ± 5%	8.20	1310 - 1423
2500 ± 5%	13.65	2243 - 2440

(c) Restore the Radio Altimeter System back to normal. Refer to AMM TASK 34-31-00-800-801-A/200.

(15) Do the test of the Navigation Analog Parameters as follows:

(a) On the HHDLU/EHHDLU/PIU, select the GLIDE SLOPE DEVIATION # 1 parameter. Select WORD 34, SUBFRAME ALL, and OCTAL BASE.

(b) Set RMU1 to the NAV1 window and tune in to VOR/ILS stations (AMM TASK 34-32-00-700-801-A/500).

(c) On the COMM/VOR/ILS Ramp and Bench Test Set (GSE 126 or GSE 301 or GSE 474), set the MODE switch to G/S XTL, and make sure that the frequency of 334.70 MHz is shown.

(d) On RMU1, select the frequency of 108.10 MHz.

(e) On the Test Set (GSE 126 or GSE 301 or GSE 474), set the G/S DDM switch to the values shown in the table below. See the indications shown on PFD 1 and make sure that the values shown on the HHDLU/EHHDLU/PIU are in the tolerances:

Table 523 - GLIDE SLOPE DEVIATION # 1

VALUES (DDM)	HHDLU/EHHDLU/PIU (OCTAL)	PFD 1 INDICATIONS
0	7702 - 0075	G/S DEVIATION BAR CENTERED
+ 0.175	0662 - 0715	2-DOT DEVIATION UP
- 0.175	7062 - 7115	2-DOT DEVIATION DOWN

(f) On the HHDLU/EHHDLU/PIU, select the GLIDE SLOPE DEVIATION # 2 parameter. Select WORD 98, SUBFRAME ALL, and OCTAL BASE.

(g) Set RMU2 to the NAV2 window and tune in to VOR/ILS stations (AMM TASK 34-32-00-700-801-A/500).

(h) On the COMM/VOR/ILS Ramp and Bench Test Set (GSE 126 or GSE 301 or GSE 474), set the MODE switch to G/S XTL and make sure that the frequency of 334.70 MHz is shown.

(i) On RMU2, select the frequency of 108.10 MHz.

(j) On the Test Set (GSE 126 or GSE 301 or GSE 474), set the G/S DDM switch to the values given in the table below. See the indications shown on PFD 2 and make sure that the values shown on the HHDLU/EHHDLU/PIU are in the tolerances:

Table 524 - GLIDE SLOPE DEVIATION # 2

VALUES (DDM)	HHDLU/EHHDLU/PIU (OCTAL)	PFD 2 INDICATIONS
0	7702 - 0075	G/S DEVIATION BAR CENTERED
+ 0.175	0662 - 0715	2-DOT DEVIATION UP
- 0.175	7062 - 7115	2-DOT DEVIATION DOWN

(k) On the HHDLU/EHHDLU/PIU, select the LOCALIZER DEVIATION # 1 parameter. Select WORD 35, SUBFRAME ALL, and OCTAL BASE.

(l) Set RMU1 to the NAV1 window, and tune in to VOR/ILS stations (AMM TASK 34-32-00-700-801-A/500).

(m) On the COMM/VOR/ILS Ramp and Bench Test Set (GSE 126 or GSE 301 or GSE 474), set the MODE switch to LOC XTL, and make sure that the frequency of 108.10 MHz is shown.

(n) On RMU1, select the frequency of 108.10 MHz.

(o) Refer to the table below and, on the Test Set (GSE 126 or GSE 301 or GSE 474), set the LOC DDM switch to those values. See the indications on PFD 1 and make sure that the values shown on the HHDLU/EHHDLU/PIU are in the tolerances:

Table 525 - LOCALIZER DEVIATION # 1

VALUES (DDM)	HHDLU/EHHDLU/PIU (OCTAL)	PFD 1 INDICATIONS
0	7741 - 0036	LOC DEVIATION BAR CENTERED
+ 0.155	1401 - 1461	2-DOT DEVIATION RIGHT
- 0.155	6316 - 6376	2-DOT DEVIATION LEFT

(p) On the HHDLU/EHHDLU/PIU, select the LOCALIZER DEVIATION # 2 parameter. Select WORD 99, SUBFRAME ALL, and OCTAL BASE.

(q) Set the RMU2 to the NAV2 window, and tune in to VOR/ILS stations (AMM TASK 34-32-00-700-801-A/500).

(r) On the COMM/VOR/ILS Ramp and Bench Test Set (GSE 126 or GSE 301 or GSE 474), set the MODE switch to LOC XTL, and make sure that the frequency of 108.10 MHz is shown.

(s) On RMU2, select the frequency of 108.10 MHz.

(t) Refer to the table below and, on the Test Set (GSE 126 or GSE 301 or GSE 474), set the LOC DDM switch to those values. See the indications on PFD 2 and make sure that the values shown on the HHDLU/EHHDLU/PIU are in the tolerances:

Table 526 - LOCALIZER DEVIATION # 2

VALUES (DDM)	HHDLU/EHHDLU/PIU (OCTAL)	PFD 2 INDICATIONS
0	7741 - 0036	LOC DEVIATION BAR CENTERED
+ 0.155	1401 - 1461	2-DOT DEVIATION RIGHT
- 0.155	6316 - 6376	2-DOT DEVIATION LEFT

(u) On the HHDLU/EHHDLU/PIU, select the NAVIGATION FREQUENCY # 1 parameter. Select WORD 97, SUBFRAME 2, and HEXADECIMAL BASE.

(v) Set RMU1 to the NAV1 window, and tune in to VOR/ILS stations (AMM TASK 34-32-00-700-801-A/500).

(w) Refer to the table below and tune in RMU1 to those frequencies. Make sure that the values shown on the HHDLU/EHHDLU/PIU are correct:

Table 527 - NAVIGATION FREQUENCY # 1

VALUES (MHz)	HHDLU/EHHDLU/PIU (HEXADECIMAL)
108.00	800
110.00	000
114.00	400
116.85	685

(x) On the HHDLU/EHHDLU/PIU, select the NAVIGATION FREQUENCY # 2 parameter. Select WORD 97, SUBFRAME 4, and HEXADECIMAL BASE.

(y) Set RMU2 to the NAV2 window and tune in to VOR/ILS stations (AMM TASK 34-32-00-700-801-A/500).

(z) Refer to the table below and tune in RMU2 to those frequencies. Make sure that the values shown on the HHDLU/EHHDLU/PIU are correct:

Table 528 - NAVIGATION FREQUENCY # 2

VALUES (MHz)	HHDLU/EHHDLU/PIU (HEXADECIMAL)
108.00	800
110.00	000
114.00	400
116.85	685

(aa) On the HHDLU/EHHDLU/PIU, select the DME DISTANCE # 1 parameter. Select WORD 97, SUBFRAME 1, and OCTAL BASE.

(ab) On RMU1, push the DME function key and move the cursor of RMU1 to the DME1 window.

(ac) On the TRANSPONDER and DME Ramp Test Set (GSE 127 or GSE 302 or GSE 475), set the XFR DME switch to DME and the VELOCITY switch to RANGE.

(ad) Put the test antenna (GSE 127 or GSE 302 or GSE 475) near DME1 (one meter, approximately).

(ae) Tune in RMU1 to the frequency of 108.00 MHz (DME station) (AMM TASK 34-51-00-700-801-A/500).

(af) Refer to the table below and tune in the Test Set (GSE 127 or GSE 302 or GSE 475) to those values. Make sure that the values shown on the HHDLU/ EHHDLU/PIU are in the tolerances:

Table 529 - DME DISTANCE # 1

VALUES (Nm)	HHDLU/EHHDLU/PIU (OCTAL)
50	610 - 630
100	1430 - 1450
150	2250 - 2270

(ag) On the HHDLU/EHHDLU/PIU, select the DME DISTANCE # 2 parameter. Select WORD 97, SUBFRAME 3, and OCTAL BASE.

(ah) On RMU2, push the DME function key and move the cursor of RMU2 to the DME2 window.

(ai) On the TRANSPONDER and DME Ramp Test Set (GSE 127 or GSE 302 or GSE 475), set the XFR DME switch to DME and the VELOCITY switch to RANGE.

(aj) Put the test antenna (GSE 127 or GSE 302 or GSE 475) near DME 2 (one meter, approximately).

(ak) On RMU2, select the frequency of 108.00 MHz (DME station) (AMM TASK 34-51-00-700-801-A/500).

(al) Refer to the table below and tune in the Test Set (GSE 127 or GSE 302 or GSE 475) to those values. Make sure that the values shown on the HHDLU/ EHHDLU/PIU are in the tolerances:

Table 530 - DME DISTANCE # 2

VALUES (Nm)	HHDLU/EHHDLU/PIU (OCTAL)
50	610 - 630
100	1430 - 1450
150	2250 - 2270

(16) Do the test of the Navigation Discrete Parameters as follows (BINARY BASE):

NOTE: For the PIU use the OCTAL BASE. Cross check all the binary variations described below with its respective octal according to Figure 510.

(a) On the HHDLU/EHHDLU, select WORD 26 and SUBFRAME ALL.

(b) On the COMM/VOR/ILS Ramp and Bench Test Set (GSE 126 or GSE 301 or GSE 474), set the MODE switch to MKR XTL.

(c) Do the test of INNER MARKER # 1 (Marker Beacon # 1) as follows: on the Test Set (GSE 126 or GSE 301 or GSE 474), set the TUNE selector to the frequency of 3000 Hz (WHITE).

Result:

1 On the HHDLU/EHHDLU display, make sure that the 1st bit changes from "0" to "1".

(d) Do the test of INNER MARKER # 2 (Marker Beacon # 2) as follows: on the Test Set (GSE 126 or GSE 301 or GSE 474), make sure that the TUNE selector is set to the frequency of 3000 Hz (WHITE).

Result:

1 On the HHDLU/EHHDLU/PIU display, make sure that the 4th bit changes from "0" to "1".

(e) Do the test of MIDDLE MARKER # 1 (Marker Beacon # 1) as follows: on the Test Set (GSE 126 or GSE 301 or GSE 474), set the TUNE selector to the frequency of 1300 Hz (YELLOW).

Result:

1 On the HHDLU/EHHDLU display, make sure that the 2nd bit changes from "0" to "1".

(f) Do the test of MIDDLE MARKER # 2 (Marker Beacon # 2) as follows: on the Test Set (GSE 126 or GSE 301 or GSE 474), make sure that the TUNE selector is set to the frequency of 1300 Hz (YELLOW).

Result:

1 On the HHDLU/EHHDLU display, make sure that the 5th bit changes from "0" to "1".

(g) Do the test of OUTER MARKER # 1 (Marker Beacon # 1) as follows: on the Test Set (GSE 126 or GSE 301 or GSE 474), set the TUNE selector to the frequency of 400 Hz (BLUE).

Result:

1 On the HHDLU/EHHDLU display, make sure that the 3rd bit changes from "0" to "1".

(h) Do the test of OUTER MARKER # 2 (Marker Beacon # 2) as follows: on the Test Set (GSE 126 or GSE 301 or GSE 474), make sure that the TUNE selector is set to the frequency of 400 Hz (BLUE).

Result:

1 On the HHDLU/EHHDLU display, make sure that the 6th bit changes from "0" to "1".

(17) Do the test of the PTT (Communication) Parameter as follows (BINARY BASE):

NOTE: For the PIU use the OCTAL BASE. Cross check all the binary variations described below with its respective octal according to Figure 510.

(a) On the HHDLU/EHHDLU, select WORD 10 and SUBFRAME ALL.

(b) Make sure that the pilot and copilot headsets are connected.

(c) On the pilot and copilot DAPs (digital audio panel), push to set the BOOM/MASK pushbutton to the BOOM position.

NOTE: Steps (d) through (g) are applicable only to aircraft with the HF system installed.

(d) On the pilot and copilot DAPs (digital audio panel), push the HF pushbutton.

(e) On the HF control panel (CTL-230), on the control pedestal, tune in an HF frequency (AMM SDS 23-11-00/1).

(f) Momentarily set the PTT/HOT mic switches, on the pilot or copilot control yoke, to the PTT position.

Result:

1 On the HHDLU/EHHDLU display, make sure that the 1st bit changes from "0" to "1".

(g) Momentarily push the PTT mic switch, on the pilot or copilot glareshield panel.

Result:

1 On the HHDLU/EHHDLU display, make sure that the 1st bit changes from "0" to "1".

(h) On the pilot DAP (digital audio panel), push the COM1 pushbutton.

(i) Set RMU1 to the COM1 window (AMM SDS 23-81-00/1).

(j) Tune in the COMM 1 system, on RMU1, to a VHF-1 frequency (AMM SDS 23-12-00/1).

(k) Momentarily set the PTT/HOT mic switches, on the pilot control yoke, to the PTT position.

Result:

1 RMU1 shows the TX indication, on the COM1 window.

2 On the HHDLU/EHHDLU display, make sure that the 1st bit changes from "0" to "1".

(l) Momentarily push the PTT mic switch, on the pilot glareshield panel.

Result:

1 RMU1 shows the TX indication, on the COM1 window.

2 On the HHDLU/EHHDLU display, make sure that the 1st bit changes from "0" to "1".

(m) On the copilot DAP (digital audio panel), push the COM2 pushbutton.

(n) Set RMU2 to the COM2 window (AMM SDS 23-81-00/1).

(o) Tune in the COMM 2 system, on RMU2, to a VHF-2 frequency (AMM SDS 23-12-00/1).

(p) Momentarily set the PTT/HOT mic switches, on the copilot control yoke, to the PTT position.

Result:

1 RMU2 shows the TX indication, on the COM2 window.

2 On the HHDLU/EHHDLU display, make sure that the 1st bit changes from "0" to "1".

(q) Momentarily push the PTT mic switch, on the copilot glareshield panel.

Result:

1 RMU2 shows the TX indication, on the COM2 window.

2 On the HHDLU/EHHDLU display, make sure that the 1st bit changes from "0" to "1".

NOTE: Steps (r) through (u) are applicable only to aircraft with the VHF-3 enabled for voice communication.

(r) On the DAPs (digital audio panel), push the COM3 pushbutton.

(s) Tune in, on the VHF-3 control panel, a VHF-3 frequency (AMM SDS 23-12-00/1).

(t) Momentarily set the PTT/HOT mic switches, on the pilot or copilot control yoke, to the PTT position.

Result:

1 On the HHDLU/EHHDLU display, make sure that the 1st bit changes from "0" to "1".

(u) Momentarily push the PTT mic switch, on the pilot or copilot glareshield panel.

Result:

1 On the HHDLU/EHHDLU display, make sure that the 1st bit changes from "0" to "1".

(18) Do the test of the Landing Gear Parameters as follows (BINARY BASE):

NOTE: For the PIU use the OCTAL BASE. Cross check all the binary variations described below with its respective octal according to Figure 510.

(a) On the Electrical Control Panel, set the BATT 1 and BATT 2 switches to OFF.

(b) To do the test of the AIR/GND SWITCH parameter, select the WORD 10 and SUBFRAME ALL, on the HHDLU/EHHDLU.

(c) On the Circuit Breaker Panel, open the AIR/GND B (Location Tip: ESSENTIAL DC BUS 1/LDG GEAR/AIR/GND B) circuit breaker. This is to put the aircraft in the flight configuration with NLG and MLG shock absorbers extended (AMM SDS 32-30-00/1).

Result:

1 On the HHDLU/EHHDLU display, make sure that the 7th bit changes from "1" to "0".

(d) On the Circuit Breaker Panel, close the AIR/GND B (Location Tip: ESSENTIAL DC BUS 1/LDG GEAR/AIR/GND B) circuit breaker.

Result:

1 On the HHDLU/EHHDLU display, make sure that the 7th bit changes from "0" to "1".

(e) The items (f) thru (h) are applicable to aircraft with EICAS versions 17 and on.

(f) To do the test of the AIR/GND SWITCH parameter, select the WORDS 42, 74 and 106, and SUBFRAME ALL, on the HHDLU/EHHDLU.

(g) On the Circuit Breaker Panel, open the AIR/GND B (Location Tip: ESSENTIAL DC BUS 1/LDG GEAR/AIR/GND B) circuit breaker. This is to put the aircraft in the flight configuration with NLG and MLG shock absorbers extended (AMM SDS 32-30-00/1).

Result:

1 On the HHDLU/EHHDLU display, make sure that the 12th bit (WORDS 42, 74 and 106) changes from "1" to "0".

(h) On the Circuit Breaker Panel, close the AIR/GND B (Location Tip: ESSENTIAL DC BUS 1/LDG GEAR/AIR/GND B) circuit breaker.

Result:

1 On the HHDLU/EHHDLU display, make sure that the 12th bit changes from "0" to "1".

(i) To do the test of the LANDING GEAR DOWN LOCKED parameter, select WORD 3 and SUBFRAME 4, on the HHDLU/EHHDLU.

(j) On the Circuit Breaker Panel, open the IND 1 (Location Tip: ESSENTIAL DC BUS 1/LDG GEAR/IND 1) and IND 2 (Location Tip: ESSENTIAL DC BUS 2/LDG GEAR/IND 2) circuit breakers and attach DO-NOT-CLOSE tags to them.

Result:

1 On the HHDLU/EHHDLU display, make sure that the 1st bit changes from "1" to "0".

(k) Remove the DO-NOT-CLOSE tags from the circuit breakers opened in (j), and close the circuit breakers.

(l) The items (m) thru (v) are applicable to aircraft with EICAS versions 20.5 and on.

(m) For aircraft PRE-MOD SB145-32-0036, make sure that the pressure in hydraulic system No. 1 is fully released (AMM TASK 29-10-00-860-802-A/200).

(n) For aircraft POST-MOD SB145-32-0036, install safety pin of the NLG doors solenoid valve (AMM TASK 32-00-02-910-801-A/200).

WARNING: MAKE SURE THAT THE LANDING GEAR SAFETY PINS ARE INSTALLED ON ALL MAIN LANDING GEAR AND NOSE LANDING GEAR TO PREVENT INJURIES TO PERSONS AND DAMAGE TO MATERIAL (AMM TASK 32-00-01-910-801-A/200).

(o) Make sure that the hydraulic system is not energized.

(p) On the circuit breaker panel, open the LG CMD (Location Tip: ESSENTIAL DC BUS 2/LDG GEAR/CMD), and the DOOR CMD (Location Tip: DC BUS 2/LDG GEAR/DOOR CMD) circuit breakers and attach a DO-NOT-CLOSE tag to them.

(q) Disconnect the LG solenoid valve connector P0037 and the door solenoid valve connector P0036.

(r) On the HHDLU/EHHDLU, select the LANDING GEAR LEVER DOWN parameter. Select WORD 03 (BINARY BASE) and SUBFRAME 3.

(s) On the main panel, on the landing gear lever control panel, push the down lock override button, while you move the lever to the up position.

Result:

1 On the HHDLU/EHHDLU the1st bit changes from "0" to "1".

(t) Move the landing gear lever to the down position.

Result:

1 On the HHDLU/EHHDLU the1st bit changes from "1" to "0".

(u) Reconnect the LG solenoid valve connector P0037 and the door solenoid valve connector P0036.

(v) On the circuit breaker panel, remove the DO-NOT-CLOSE tag from the LG CMD (Location Tip: ESSENTIAL DC BUS 2/LDG GEAR/CMD), and the DOOR CMD (Location Tip: DC BUS 2/LDG GEAR/DOOR CMD) circuit breakers and close them.

(19) (Aircraft with EICAS versions 20.5 and on) Do the test of the Speed Brake Lever Command Parameter :

(a) (Aircraft with FDR Honeywell installed) On the HHDLU/EHHDLU, select the SPEED BRAKE LEVER COMMAND parameter. Select WORD 42 and WORD 106 (BINARY BASE), SUBFRAME ALL.

(b) (Aircraft with FDR L3 installed) On the PIU, select the SPEED BRAKE LEVER COMMAND parameter. Select WORD 42 and WORD 106 (OCTAL BASE) and SUBFRAME ALL. Cross check all the binary variations described below with its respective octal according to Figure 510.

(c) Make sure that on the Circuit Breaker Panel, the AIR/GND A (Location Tip: DC BUS 1/LDG GEAR/AIR/GND A), AIR/GND B (Location Tip: ESSENTIAL DC BUS 1/LDG GEAR/AIR/GND B), AIR/GND C (Location Tip: DC BUS 2/LDG GEAR/AIR/GND C), and AIR/GND D (Location Tip: ESSENTIAL DC BUS 2/LDG GEAR/AIR/GND D) circuit breakers are closed.

(d) On the control pedestal, set the speed-brake control lever to the OPEN position.

Result:

1 On the HHDLU/EHHDLU display, make sure that on the WORD 42 and on the WORD 106, the 5th bit shows "0".

(e) On the control pedestal, set the speed-brake control lever to the CLOSE position.

Result:

1 On the HHDLU/EHHDLU display, make sure that on the WORD 42 and on the WORD 106, the 5th bit shows "1".

(20) Do the test of the Warning/Caution Parameters as follows :

(a) (Aircraft with FDR Honeywell installed) On the HHDLU/EHHDLU, select the MASTER WARNING parameter. Select WORD 10 (BINARY BASE) and SUBFRAME ALL.

(b) (Aircraft with FDR L3 installed) On the PIU, select the MASTER WARNING parameter. Select WORD 10 (OCTAL BASE) and SUBFRAME ALL. Cross check all the binary variations described below with its respective octal according to Figure 510.

(c) Simulate a cancelating warning (EMERGENCY) condition (AMM SDS 31-51-00/1). Make sure that the master warning lights, on the Glareshield Panel, are on.

Result:

1 On the HHDLU/EHHDLU display, make sure that the 5th bit shows "1".

(d) On the Glareshield Panel, push a master warning light.

Result:

1 The master warning lights go off.

(e) On the HHDLU/EHHDLU, select the MASTER CAUTION parameter. Select WORD 10 and SUBFRAME ALL.

(f) Simulate a caution (ABNORMAL) condition (AMM SDS 31-51-00/1). Make sure that the master caution lights, on the Glareshield Panel, are on.

Result:

1 On the HHDLU/EHHDLU display, make sure that the 6th bit shows "1".

(g) On the Glareshield Panel, push a master caution light.

Result:

1 The master caution lights go off.

(21) (Aircraft with EICAS versions 20.5 and on) Do the test of the WARNING CAS MESSAGES Parameters as follows (BINARY BASE):

NOTE: For the PIU use the OCTAL BASE. Cross check all the binary variations described below with its respective octal according to Figure 510.

(a) Make sure that the emergency/parking brake accumulator is fully released (AMM TASK 32-44-02-910-801-A/200).

(b) Put chocks at the landing gear wheels (AMM TASK 10-10-01-500-801-A/200).

(c) On the HHDLU/EHHDLU, select WORD 4 and 13 and SUBFRAME ALL.

(d) On the overhead panel, on the FIRE control panel, push the FIRE TEST switch and hold it for a few seconds.

Result:

1 Some CAS messages come into view on the EICAS display.

2 The warning/caution lights flash.

3 The aural warning operates (bell).

4 On the HHDLU/EHHDLU display, make sure that on the WORD 4, the 12th bit shows "1" and on the WORD 13, the 4th and the 5th bits show "1".

(e) Release the FIRE TEST switch.

Result:

1 The CAS messages caused by the fire test go out of view on the EICAS display.

2 On the HHDLU/EHHDLU display, make sure that on the WORD 4, the 12th bit shows "0" and on the WORD 13, the 4th and the 5th bits show "0".

(f) On the glareshield panel, push a master warning/caution lighted pushbutton.

NOTE: If it is necessary to do this test again, wait 6 seconds for the system to reset.

(g) On the HHDLU/EHHDLU, select WORD 33 and SUBFRAME ALL.

(h) On the maintenance panel, move the "FUEL QTY" toggle switch.

Result:

1 Some CAS messages come into view on the EICAS display.

2 The MFD shows some indications.

3 The warning lights flash.

4 The aural warning operates (bell).

5 On the HHDLU/EHHDLU display, make sure that on the WORD 33, the 11th and the 10th bits shows "1".

(i) Wait 10 seconds and the indications above go back to the normal condition.

Result:

1 On the HHDLU/EHHDLU display, make sure that on the WORD 33, the 11th and the 10th bits shows "0".

(j) On the glareshield panel, push a master warning lighted pushbutton.

WARNING: MAKE SURE THAT THERE ARE NO PERSONS OR EQUIPMENT IN THE FLAP, HORIZONTAL STABILIZER, AND SPOILER TRAVEL AREA.

NOTE: Do not do other tasks on the flap system.

(k) On the HHDLU/EHHDLU, select WORD 65 and SUBFRAME ALL.

(l) Set the flaps to the 9-degree position (AMM SDS 27-53-00/1).

(m) Make sure that the thrust control levers are at the IDLE position.

(n) On the control yoke, operate the pilot trim switch to make the pitch trim indication show 1 DN (indication out of green band) on the EICAS display (AMM SDS 27-43-00/1).

(o) Advance the left (engine 1) thrust control lever to the THRUST SET position.

Result:

1 The TAKEOFF TRIM aural warning will be in operation.

2 On the glareshield panel, the master warning lighted pushbuttons flash.

3 The master warning tone sounds.

4 The EICAS display shows the NO TAKEOFF CONFIG message.

5 On the HHDLU/EHHDLU display, make sure that on the WORD 65, the 12th bit shows "1".

(p) Move the left (engine 1) thrust control lever back to the IDLE position.

Result:

1 The TAKEOFF TRIM aural warning is canceled.

2 On the EICAS display, the NO TAKEOFF CONFIG warning message goes out of view.

3 On the HHDLU/EHHDLU display, make sure that on the WORD 65, the 12th bit shows "0".

(q) On the glareshield panel, push a master warning lighted pushbutton.

Result:

1 The master warning lighted pushbuttons go off.

2 The master warning tone stops.

(r) Set the flaps to the 0-degree position.

(22) (Aircraft with EICAS versions 20.5 and on) Do the test of the Ground Speed Source Parameters as follows (BINARY BASE):

NOTE:
- For the PIU use the OCTAL BASE. Cross check all the binary variations described below with its respective octal according to Figure 510.
- Make sure that the DME system is operational and on, and tuned in an active DME frequency.
- Make sure that all FMS units have the present position updated.

(a) Push the NAV pushbutton on DC-550 panel.

(b) On the HHDLU/EHHDLU, select WORD 51 and SUBFRAME ALL.

(c) On the circuit breaker panel, open the FMC 1 (Location Tip: DC BUS 1/NAV/FMS/FMC 1 or CMPTR or FMS1 or 1) circuit breaker.

Result:

1 (Aircraft with Dual FMS) On the HHDLU/EHHDLU display, the related status of the 12th, 11th and 10th bits are "1", "1" and "0".

2 (Aircraft with Single FMS and IRS) On the HHDLU/EHHDLU display, the related status of the 12th, 11th and 10th bits are "0", "1" and "1".

3 (Aircraft with Single FMS and AHRS) On the HHDLU/EHHDLU display, the related status of the 12th, 11th and 10th bits are "0", "0" and "1".

(d) (Aircraft with Dual FMS) On the circuit breaker panel, open the FMC 2 (Location Tip: DC BUS 2/NAV/FMS/FMC 2) circuit breaker.

Result:

1 (Aircraft with IRS) On the HHDLU/EHHDLU display, the related status of the 12th, 11th and 10th bits are "0", "1" and "1".

2 (Aircraft with AHRS) On the HHDLU/EHHDLU display, the related status of the 12th, 11th and 10th bits are "0", "0" and "1".

(e) (Aircraft with IRS) On the circuit breaker panel, open the IRS 1 (Location Tip: DC BUS 1/NAV/FMS/IRS 1) circuit breaker.

Result:

1 On the HHDLU/EHHDLU display, the 12th, 11th and 10th bits status are "0", "1" and "0".

(f) (Aircraft with IRS) On the circuit breaker panel, open the IRS 2 (Location Tip: DC BUS 2/NAV/FMS/IRS 2) circuit breaker.

Result:

1 On the HHDLU/EHHDLU display, the 12th, 11th and 10th bits status are "0", "0" and "1".

(g) On the circuit breaker panel, open the DME 1 (Location Tip: DC BUS 1/NAV/FMS/DME 1) circuit breaker.

Result:

1 On the HHDLU/EHHDLU display, the 12th, 11th and 10th bits status are "0", "0" and "0".

(h) Close all the circuit breakers open since step (a).

(i) The items (i) thru (z) are applicable to aircraft with IRS.

(j) Do the alignment procedure for IRS 1, as follows:

(k) Make sure that PFD1 shows red flags ATT FAIL and HDG FAIL.

(l) Make sure that MFD1 shows a red flag HDG FAIL.

(m) Turn the MSU1 rotary switch to the ALIGN position.

Result:

1 The ALIGN annunciator (amber) lights.

2 The ON BATT and the NO AIR annunciators (amber) come on momentarily.

NOTE: The IRS must receive the present position for the alignment to be completed. The FMS position must be updated to permit this data to be read by the IRS.
If the aircraft is moved during the alignment, the IRU stops the alignment and starts a full alignment again 30 seconds after the motion stops.

(n) On FMS1 or FMS2, push the NAV mode key and the NEXT function key.

Result:

1 The NAV INDEX 2/2 page is shown.

(o) Push the POS INIT (3L) left line select key.

Result:

1 The POS INIT 1/1 page is shown.

(p) Push the LOAD (2R) right line select key to update the FMS position with the last saved position.

Result:

1 The CDU shows the LOADED POSITION coordinates.

(q) Wait until the alignment is completed. The alignment time depends on the local latitude. The time of alignment is less than 10 minutes for latitudes of less than 70.25 degrees.

Result:

1 After the alignment of the IRS is completed, the NAV RDY annunciator (green) comes on.

(r) Turn the MSU1 rotary switch to the NAV position.

Result:

1 The ALIGN and NAV RDY annunciators go out of the MSU.

2 The flags ATT FAIL and HDG FAIL go out of PFD1 and MFD1, and a valid attitude and heading data are shown.

(s) Do the alignment procedure for IRS 2, as follows:

(t) Make sure that PFD2 shows red flags ATT FAIL and HDG FAIL.

(u) Make sure that MFD2 shows a red flag HDG FAIL.

(v) Turn the MSU2 rotary switch to the ALIGN position.

Result:

1 The ALIGN annunciator (amber) lights.

2 The ON BATT and the NO AIR annunciators (amber) come on momentarily.

NOTE: The IRS must receive the present position for the alignment to be completed. The FMS position must be updated to permit this data to be read by the IRS.
If the aircraft is moved during the alignment, the IRU stops the alignment and starts a full alignment again 30 seconds after the motion stops.

(w) On FMS1 or FMS2, push the NAV mode key and the NEXT function key.

Result:

1 The NAV INDEX 2/2 page is shown.

(x) Push the POS INIT (3L) left line select key.

Result:

1 The POS INIT 1/1 page is shown.

(y) Push the LOAD (2R) right line select key to update the FMS position with the last saved position.

Result:

1 The CDU shows the LOADED POSITION coordinates.

(z) Wait until the alignment is completed. The alignment time depends on the local latitude. The time of alignment is less than 10 minutes for latitudes of less than 70.25 degrees.

Result:

1 After the alignment of the IRS is completed, the NAV RDY annunciator (green) comes on.

(aa) Turn the MSU2 rotary switch to the NAV position.

Result:

1 The ALIGN and NAV RDY annunciators go out of the MSU.

2 The flags ATT FAIL and HDG FAIL go out of PFD2 and MFD2, and a valid attitude and heading data are shown.

(ab) After all the systems are operational again, make sure that on the HHDLU/EHHDLU display, the 12th, 11th and 10th bits status are "1", "1" and "1".

(23) Do the test of the GPWS/Windshear Parameters as follows (BINARY BASE):

NOTE: For the PIU use the OCTAL BASE. Cross check all the binary variations described below with its respective octal according to Figure 510.

(a) On the HHDLU/EHHDLU, select WORD 10 and SUBFRAME ALL.

(b) To do the test of the GPWS # 2 (INOP) alarm condition parameter, set the GPWS/WDSH TEST switch, on the Maintenance Panel, to the up position (AMM TASK 34-41-00-700-801-A/500) and hold it in that position.

Result:

1 Make sure that the HHDLU/EHHDLU 9th bit changes from "0" to "1", before the Aural Warning gives the GLIDE SLOPE voice warning.

(c) To do the test of the GPWS # 3 (Below GS) alarm condition parameter, set the GPWS/WDSH TEST switch, on the Maintenance Panel, to the up position (AMM TASK 34-41-00-700-801-A/500) and hold it in that position.

Result:

1 Make sure that the HHDLU/EHHDLU 10th bit changes from "0" to "1", after the Aural Warning gives the GLIDE SLOPE voice warning

(d) To do the test of the GPWS # 1 (Modes 1...4) alarm condition parameter, set the GPWS/WDSH TEST switch, on the Maintenance Panel, to the up position (AMM TASK 34-41-00-700-801-A/500) and hold it in that position.

Result:

1 Make sure that the HHDLU/EHHDLU 8th bit changes from "0" to "1", after the Aural Warning gives the PULL UP voice warning.

(e) To do the test of the WINDSHEAR WARNING parameter, set the GPWS/WDSH TEST switch, on the Maintenance Panel, to the up position (AMM TASK 34-41-00-700-801-A/500) and hold it in that position.

Result:

1 Make sure that the HHDLU/EHHDLU 12th bit changes from "0" to "1", when the PFD shows the WDSHEAR (red) annunciator.

(f) To do the test of the WINDSHEAR CAUTION parameter, set the GPWS/WDSH TEST switch, on the Maintenance Panel, to the up position (AMM TASK 34-41-00-700-801-A/500) and hold it in that position.

Result:

1 Make sure that the HHDLU/EHHDLU 11th bit changes from "0" to "1", when the PFD shows the WDSHEAR (amber) annunciator.

(g) The items (h) thru (k) are applicable to aircraft with EGPWS and EICAS versions 17 and on.

(h) To do the test of the TERRAIN, WINDSHEAR and TERRAIN INHIBIT parameters, on the HHDLU/EHHDLU/PIU select word 76, subframe ALL and OCTAL BASE.

(i) Make sure that the ground spoiler is closed. Refer to AMM SDS 27-63-00/1.

(j) On the maintenance panel, set the EGPWS switch to the TEST position. On the circuit breaker panel, make sure that the EGPWS, AWS 1 and AWS 2 circuit breakers are closed.

Result:

1 A sequence of aural messages are heard. Make sure that on the HHDLU/ EHHDLU/PIU the values in OCTAL change synchronized with the aural messages, as shown in this table:

Table 531 - AURAL MESSAGES

AURAL MESSAGE / SITUATION	HHDLU/EHHDLU/PIU (OCTAL)[1]
(START OF MESSAGES)	X
CHIME	110X
GLIDE SLOPE	004X
PULL UP	X
SIREN WINDSHEAR WINDSHEAR WINDSHEAR	(NO CHANGE)
TERRAIN TERRAIN	040X
PULL UP	043X
SINK RATE	023X
PULL UP	117X
(SUBSEQUENT MESSAGES)	(NO CHANGE)
(END OF MESSAGES)	X

[1] The character "X" means that this digit can be ignored during the test, because it has no relation with the EGPWS.

NOTE: 1 - The values on the HHDLU/EHHDLU/PIU change very quickly and they can change during or immediately after the aural message.
2 - If different values are shown, make sure that all the systems given in Preparation are operational and on, and do this step again.

(k) On the HHDLU/EHHDLU, select BINARY BASE. Push the GPWS TERRAIN SYS OVRD button.

Result:

1 Make sure that the message TERRAIN INHIBIT comes into view on the two MFD displays.

2 Make sure that the HHDLU/EHHDLU 11th bit changes from "0" to "1".

(24) Do the test of the Identification/Date/Time Parameters as follows (BINARY BASE):

NOTE: For the PIU use the OCTAL BASE. Cross check all the binary variations described below with its respective octal according to Figure 510.

(a) On the HHDLU/EHHDLU, select the FLIGHT NUMBER parameter. Select WORD 83 and SUBFRAMES 1 and 2.

(b) On the pilot digital clock, adjust the Flight Number (AMM TASK 31-21-00-700-802-A/500).

(c) Refer to the tables below, and compare the pilot digital clock indication with the values shown on the HHDLU/EHHDLU (The example data represents the Flight Number = 6543):

Table 532 - FLIGHT NUMBER (MOST SIGNIFICANT DIGIT - WORD 83 AND SUBFRAME 1)

BIT POSITION	12	11	10	9	8	7	6	5	4	3	2	1
									8	4	2	1
DATA (EXAMPLE)	X	X	X	X	X	X	X	X	0	1	1	0
	NOT USED				NOT USED				THOU-SANDS			

Table 533 - FLIGHT NUMBER (THREE LEAST SIGNIFICANT DIGITS - WORD 83 AND SUBFRAME 2)

BIT POSITION	12	11	10	9	8	7	6	5	4	3	2	1
	8	4	2	1	8	4	2	1	8	4	2	1
DATA (EXAMPLE)	0	1	0	1	0	1	0	0	0	0	1	1
	HUN-DREDS				TENS				UNITS			

(d) On the HHDLU/EHHDLU, select the HOURS parameter. Select WORD 3 and SUBFRAME 1.

(e) Refer to the table below and compare the pilot digital clock hour indication (AMM TASK 31-21-00-700-802-A/500) with the values shown on the HHDLU/EHHDLU (The example data represents Hours = 23):

Table 534 - HOURS

BIT POSITION	12	11	10	9	8	7	6	5	4	3	2	1
	16	8	4	2	1							
DATA (EXAMPLE)	1	0	1	1	1	X	X	X	X	X	X	X
	HOURS					NOT USED						

(f) On the HHDLU/EHHDLU, select the MINUTES/SECONDS parameters. Select WORD 2 and SUBFRAME ALL.

(g) Refer to the table below and compare the pilot digital clock minutes/seconds indication (AMM TASK 31-21-00-700-802-A/500) with the values shown on the HHDLU/EHHDLU (The example data represents Minutes = 59 and Seconds = 59):

Table 535 - MINUTES/SECONDS

BIT POSITION	12	11	10	9	8	7	6	5	4	3	2	1
	32	16	8	4	2	1	32	16	8	4	2	1
DATA (EXAMPLE)	1	1	1	0	1	1	1	1	1	0	1	1
	MINUTES						SECONDS					

(h) On the HHDLU/EHHDLU, select the YEAR parameter. Select WORD 3 and SUBFRAME 3.

(i) Refer to the table below and compare the pilot digital clock year indication (AMM TASK 31-21-00-700-802-A/500) with the values shown on the HHDLU/EHHDLU (The example data represents the Year = 93):

Table 536 - YEAR

BIT POSITION	12	11	10	9	8	7	6	5	4	3	2	1
	8	4	2	1	8	4	2	1				
DATA (EXAMPLE)	1	0	0	1	0	0	1	1	X	X	X	X
	TENS				UNITS							
	YEAR								NOT USED			

(j) On the HHDLU/EHHDLU, select the DAY/MONTH parameters. Select WORD 3 and SUBFRAME 2.

(k) Refer to the table below and compare the pilot digital clock day/month indications (AMM TASK 31-21-00-700-802-A/500) with the values shown on the HHDLU/ EHHDLU (The example data represents Day = 25 and Month = 12):

Table 537 - DAY/MONTH

BIT POSITION	12	11	10	9	8	7	6	5	4	3	2	1
	2	1	8	4	2	1	1	8	4	2	1	
DATA (EXAMPLE)	1	0	0	1	0	1	1	0	0	1	0	X
	TENS		UNITS				TENS	UNITS				
	DAY						MONTH					

(25) Do the test of the Flight Director Mode Parameters as follows (BINARY BASE):

NOTE: For the PIU use the OCTAL BASE. Cross check all the binary variations described below with its respective octal according to Figure 510.

NOTE: The following table shows the parameters that are tested in this step. Some of them are automatically validated when other ones are tested using the HHDLU/EHHDLU.

Table 538 - FDR PARAMETERS

FDR PARAMETERS TO BE TESTED WITH THE HHDLU/EHHDLU	FDR PARAMETERS AUTOMATICALLY VALIDATED WHEN PARAMETER IN THE LEFT IS TESTED
GO AROUND	ALTITUDE HOLD
	ALTITUDE PRESELECT
	SPEED HOLD
	GLIDE SLOPE
	WINDSHEAR
	TAKEOFF

Table 538 - FDR PARAMETERS (Continued)

FDR PARAMETERS TO BE TESTED WITH THE HHDLU/EHHDLU	FDR PARAMETERS AUTOMATICALLY VALIDATED WHEN PARAMETER IN THE LEFT IS TESTED
HEADING SELECT	VOR NAV
	VOR APPROACH
	LOCALIZER
	BACK COURSE

(a) On the HHDLU/EHHDLU, select WORD 58 and SUBFRAME ALL.

(b) On the Flight Guidance Controller (GC-550), push the AP engage button (AMM SDS 22-10-00/1) to test the AUTOPILOT ENGAGED parameter.

Result:

1 Make sure that the HHDLU/EHHDLU 1st bit changes from "0" to "1".

(c) On the Flight Guidance Controller (GC-550), push again the AP engage button to disengage the AutoPilot.

(d) Make sure that no flight director mode is selected and do the test of the FD Mode Lateral parameter.

Result:

1 Make sure that the HHDLU/EHHDLU 9th, 8th, 7th, and 6th bits show "0", "0", "0", and "0", respectively.

(e) On the GC-550, push the HDG pushbutton (AMM SDS 22-10-00/1).

Result:

1 On the GC-550, the HDG pushbutton comes on.

2 Make sure that the HHDLU/EHHDLU 9th, 8th, 7th, and 6th bits show "0", "0", "1", and "0", respectively.

(f) Reset all flight director modes and do the test of FD Mode Vertical parameter.

Result:

1 Make sure that the AutoPilot is disengaged.

2 Make sure that the HHDLU/EHHDLU 5th, 4th, 3th, and 2th bits show "0", "0", "0", and "0", respectively.

(g) On the Circuit Breaker Panel, open the AIR/GND A (Location Tip: DC BUS 1/LDG GEAR/AIR/GND A), AIR/GND B (Location Tip: ESSENTIAL DC BUS 1/LDG GEAR/AIR/GND B), AIR/GND C (Location Tip: DC BUS 2/LDG GEAR/AIR/GND C), and AIR/GND D (Location Tip: ESSENTIAL DC BUS 2/LDG GEAR/AIR/GND D) circuit breakers and attach DO-NOT-CLOSE tags to them.

(h) On the Flight Guidance Controller (GC-550), push the AP engage button (AMM 22-10-00/1).

(i) On the pilot's power control lever, push the GA (GO-AROUND) pushbutton.

NOTE: Make sure that the PLI (Pitch Limit Indicator) is not shown on the ADI. If it is shown, turn the AOA (Angle of Attack) vane until the PLI goes out of view on the ADI top.

Result:

1 Make sure that the HHDLU/EHHDLU 5th, 4th, 3th, and 2th bits show "1", "0", "0", and "1", respectively.

(j) On the Circuit Breaker Panel, remove the DO-NOT-CLOSE tags and close the AIR/GND A (Location Tip: DC BUS 1/LDG GEAR/AIR/GND A), AIR/GND B (Location Tip: ESSENTIAL DC BUS 1/LDG GEAR/AIR/GND B), AIR/GND C (Location Tip: DC BUS 2/LDG GEAR/AIR/GND C), and AIR/GND D (Location Tip: ESSENTIAL DC BUS 2/LDG GEAR/AIR/GND D) circuit breakers.

(26) Do the test of the Selection parameters as follows:

(a) On the HHDLU/EHHDLU/PIU, select the SELECTED DH parameter. Select WORD 78, SUBFRAME ALL, and OCTAL BASE.

(b) Refer to the table below and, with the RA - TEST knob, on the Display Controller (DC-550), adjust the decision height (DH). Compare the values shown on the PFDs (RA) with those shown on the HHDLU/EHHDLU/PIU, and make sure that the values on the HHDLU/EHHDLU/PIU are in the tolerances:

Table 539 - SELECTED DH

VALUES (ft)	HHDLU/EHHDLU/PIU (OCTAL)
10	0000 - 0047
500	1723 - 1773
900	3363 - 3433

(c) (Aircraft with EICAS up to version 20) On the HHDLU/EHHDLU/PIU, select the SELECTED ALTITUDE parameter. Select WORD 94, SUBFRAME ALL, and OCTAL BASE.

(d) (Aircraft with EICAS versions 20.5 and on) On the HHDLU/EHHDLU/PIU, select the SELECTED ALTITUDE parameter. Select WORD 90, SUBFRAME ALL, and OCTAL BASE.

(e) Refer to the table below and, with the ASEL knob, on the Flight Guidance Controller (GC-550), adjust the altitude. Make sure that the values on the HHDLU/EHHDLU/PIU are in the tolerances:

Table 540 - SELECTED ALTITUDE

VALUES (ft)	HHDLU/EHHDLU/PIU (OCTAL)
1,000	0030 - 0045
10,000	0461 - 0476
30,000	1642 - 1656

(f) (Aircraft with EICAS up to version 20) On the HHDLU/EHHDLU/PIU, select the SELECTED AIRSPEED parameter. Select WORD 110, SUB FRAME ALL, and OCTAL BASE.

(g) (Aircraft with EICAS versions 20.5 and on) On the HHDLU/EHHDLU/PIU, select the SELECTED AIRSPEED parameter. Select WORD 111, SUBFRAME ALL, and OCTAL BASE.

(h) Refer to the table below and, on the Flight Guidance Controller (GC-550), press the SPD pushbutton and adjust the airspeed with the PUSH IAS/M knob. Make sure that the values on the HHDLU/EHHDLU/PIU are in the tolerances:

Table 541 - SELECTED AIRSPEED

VALUES (kt)	HHDLU/EHHDLU/PIU (OCTAL)
120	0333 - 0403
180	0523 - 0573
240	0713 - 0763

(i) On the HHDLU/EHHDLU/PIU, select the SELECTED VERTICAL SPEED parameter. Select WORD 126, SUBFRAME ALL, and OCTAL BASE.

(j) Refer to the table below and, on the Flight Guidance Controller (GC-550), push the VS pushbutton and adjust the vertical speed with the PUSH IAS/M knob. Make sure that the values on the HHDLU/EHHDLU/PIU are in the tolerances:

Table 542 - SELECTED VERTICAL SPEED

VALUES (ft/min)	HHDLU/EHHDLU/PIU (OCTAL)
-3,000	7175 - 7226
000	7764 - 0014
+3,000	0552 - 0603

(k) On the HHDLU/EHHDLU/PIU, select the BARO SETTING # 1 parameter. Select WORD 15, and SUBFRAMES 1 and 2 (HEXADECIMAL BASE).

(l) Refer to the tables below (BARO SETTING #1) and, on the PFD 1 bezel controller, with the BARO knob and the IN/HPA pushbutton, select values (1013 HPA, 1000 HPA, and 1083 HPA) for the Baro Correction Display (AMM TASK 34-15-00-700-801-A/500) and compare with the values on the HHDLU/EHHDLU/PIU:

NOTE: The values in the TENTHS column must not be considered.

Table 543 - BARO SETTING # 1 (TWO MOST SIGNIFICANT DIGITS - WORD 15 AND SUBFRAME 1)

BARO SETTING # 1	NOT USED	THOUSANDS	HUNDREDS
1013	X	1	0
1000	X	1	0
1083	X	1	0

Table 544 - BARO SETTING # 1 (TWO LEAST SIGNIFICANT DIGITS - WORD 15 AND SUBFRAME 2)

BARO SETTING # 1	TENS	UNITS	TENTHS
1013	1	3	X
1000	0	0	X
1083	8	3	X

(m) On the HHDLU/EHHDLU/PIU, select the BARO SETTING # 2 parameter. Select WORD 79 and SUBFRAMES 1 and 2 (HEXADECIMAL BASE).

(n) Refer to the tables below (BARO SETTING #2) and, on the PFD 2 bezel controller, with the BARO knob and the IN/HPA pushbutton, select values (1013 HPA, 1000 HPA, and 1083 HPA) for the Baro Correction Display (AMM TASK 34-15-00-700-801-A/500) and compare with the values on the HHDLU/EHHDLU/PIU:

NOTE: The values in the TENTHS column must not be considered.

Table 545 - BARO SETTING # 2 (TWO MOST SIGNIFICANT DIGITS - WORD 79 AND SUBFRAME 1)

BARO SETTING # 2	NOT USED	THOUSANDS	HUNDREDS
1013	X	1	0
1000	X	1	0
1083	X	1	0

Table 546 - BARO SETTING # 2 (TWO LEAST SIGNIFICANT DIGITS - WORD 79 AND SUBFRAME 2)

BARO SETTING # 2	TENS	UNITS	TENTHS
1013	1	3	X
1000	0	0	X
1083	8	3	X

(27) Do the test of the Thrust Lever parameters as follows (OCTAL BASE):

(a) On the HHDLU/EHHDLU/PIU, select the THRUST LEVER ANGLE # 1 (TLA) parameter. Select WORD 27 and SUBFRAME ALL.

(b) Set thrust lever # 1 as shown in the table below, and make sure that the values on the HHDLU/EHHDLU/PIU are in the tolerances:

Table 547 - THRUST LEVER ANGLE # 1

POSITIONS	HHDLU/EHHDLU/PIU (OCTAL)
FULLY FORWARD	2420 - 2456
FULLY BACKWARD (Idle Position)	0600 - 0636

(c) On the HHDLU/EHHDLU/PIU, select the THRUST LEVER ANGLE # 2 (TLA) parameter. Select WORD 91 and SUBFRAME ALL.

(d) Set thrust lever # 2 as shown in the table below, and make sure that the values on the HHDLU/EHHDLU/PIU are in the tolerances:

Table 548 - THRUST LEVER ANGLE # 2

POSITIONS	HHDLU/EHHDLU/PIU (OCTAL)
FULLY FORWARD	2420 - 2456
FULLY BACKWARD (Idle Position)	0600 - 0636

(28) Do the test of the Brake Pressure parameters as follows (OCTAL BASE):

(a) Pressurize the hydraulic system (AMM TASK 29-10-00-860-801-A/200).

(b) Make sure that, on the Circuit Breaker Panel, the ELEC PUMP 1 (Location Tip: DC BUS 2/HYD/ELEC PUMP 1) and/or ELEC PUMP 2 (Location Tip: DC BUS 1/HYD/ELEC PUMP 2) circuit breaker(s) is (are) closed.

(c) Make sure that the safety pins are installed on the landing gears.

(d) On the HHDLU/EHHDLU/PIU, select the BRAKE PRESSURE # 1 parameter. Select WORD 31 and SUBFRAME ALL.

(e) On the Hydraulic Panel, on the Overhead Panel, set the ELEC PUMP switch of system 1 to ON.

(f) Refer to the table below and push the pilot's brake pedals. Make sure that the values on the HHDLU/EHHDLU/PIU are in the tolerances:

Table 549 - BRAKE PRESSURE # 1

BRAKE CONDITION	HHDLU/EHHDLU/PIU (OCTAL)
NOT APPLIED	0000 - 0200
APPLIED	2340 - 2734

(g) On the Hydraulic Panel, on the Overhead Panel, set the ELEC PUMP switch of system 1 to OFF.

(h) On the HHDLU/EHHDLU/PIU, select the BRAKE PRESSURE # 3 parameter. Select WORD 95 and SUBFRAME ALL.

(i) On the Hydraulic Panel, on the Overhead Panel, set the ELEC PUMP switch of system 2 to ON.

(j) Refer to the table below and push the copilot's brake pedals. Make sure that the values on the HHDLU/EHHDLU/PIU are in the tolerances:

Table 550 - BRAKE PRESSURE # 3

BRAKE CONDITION	HHDLU/EHHDLU/PIU (OCTAL)
NOT APPLIED	0000 - 0200
APPLIED	2340 - 2734

(k) Set the ELEC PUMP switch of system 2 to OFF.

(l) Release the pressure from the hydraulic system (AMM TASK 29-10-00-860-801-A/200).

(29) Do the test of the Spoiler parameters (BINARY BASE):

NOTE: For the PIU use the OCTAL BASE. Cross check all the binary variations described below with its respective octal according to Figure 510.

(a) Pressurize the hydraulic system (AMM TASK 29-10-00-860-801-A/200).

(b) Make sure that the flaps are in the 0-degree position.

WARNING: MAKE SURE THAT THERE ARE NO PERSONS OR EQUIPMENT IN THE FLAP AND SPOILER TRAVEL AREA.

(c) Make sure that, on the Circuit Breaker Panel, the AIR/GND A (DC BUS 1/LDG GEAR/AIR/GND A), AIR/GND B (Location Tip: ESSENTIAL DC BUS 1/LDG GEAR/AIR/GND B), AIR/GND C (Location Tip: DC BUS 2/LDG GEAR/AIR/GND C), and AIR/GND D (Location Tip: ESSENTIAL DC BUS 2/LDG GEAR/AIR/GND D) circuit breakers are closed.

(d) On the HHDLU/EHHDLU/PIU, select the LEFT INBOARD SPOILER (BIT 1), RIGHT INBOARD SPOILER (BIT 2), LEFT OUTBOARD SPOILER (BIT 3), and RIGHT OUTBOARD SPOILER (BIT 4) parameters. Select WORDS 42, and 106, and SUBFRAME ALL.

(e) Set the engine thrust control levers to the IDLE position.

(f) On the Maintenance Panel, set the SPOILER switch to the TEST position and hold it in this position (AMM TASK 27-63-01-700-801-A/500).

Result:

1 Make sure that the HHDLU/EHHDLU/PIU 4th, 3rd, 2nd, and 1st bits change from "1" to "0".

(g) On the Maintenance Panel, release the SPOILER switch to the NORM position (AMM TASK 27-63-01-700-801-A/500).

Result:

1 Make sure that the HHDLU/EHHDLU 4th, 3rd, 2nd, and 1st bits change from "0" to "1".

(h) On the HHDLU/EHHDLU, select the GROUND SPOILER COMMAND parameter. Select WORD 76 and SUBFRAME ALL.

(i) Make sure that the engine thrust control levers are in the IDLE position.

(j) On the Maintenance Panel, set the SPOILER switch to the TEST position and hold it in this position (AMM TASK 27-63-01-700-801-A/500).

Result:

1 Make sure that the HHDLU/EHHDLU 1st bit changes from "1" to "0".

(k) On the Maintenance Panel, release the SPOILER switch to the NORM position (AMM TASK 27-63-01-700-801-A/500).

Result:

1 Make sure that the HHDLU/EHHDLU 1st bit changes from "0" to "1".

(l) Release the pressure from the hydraulic system (AMM TASK 29-10-00-860-801-A/200).

(30) *EFFECTIVITY: Applicable to procedure using TCAS Test Set (GSE 190 or GSE 304)*

Do the test of the TCAS parameters (BINARY BASE):

NOTE: For the PIU use the OCTAL BASE. Cross check all the binary variations described below with its respective octal according to Figure 510.

(a) On the RMU, set the ATC/TCAS window to the TA/RA mode.

NOTE: The best condition to do this test is when there is a line-of-sight path from the two TCAS antennas on the aircraft to the antenna of the TCAS Test Set, without obstacles. The layout conditions around the aircraft also can change the test results, such as buildings, vehicles and other aircraft. If the aircraft is in a hangar, it is recommended that hangar door not to be closed. Read the TCAS Test Set operational manual to get more information.

(b) On the Overhead Panel, make sure that the BATT1 and BATT2 switches are set at OFF and, on the Circuit Breaker Panel, open the AIR/GND A (Location Tip: DC BUS 1/LDG GEAR/AIR/GND A), AIR/GND B (Location Tip: ESSENTIAL DC BUS 1/LDG GEAR/AIR/GND B), AIR/GND C (Location Tip: DC BUS 2/LDG GEAR/AIR/GND C), and AIR/GND D (Location Tip: ESSENTIAL DC BUS 2/LDG GEAR/AIR/GND D) circuit breakers and attach DO-NOT-CLOSE tags to them. This is to put the aircraft in the flight configuration.

(c) Make sure that the flaps are in the 0-degree position.

(d) Simulate a radio altitude of more than 1,500 ft AGL on Radio Altimeter 1. Refer to AMM TASK 34-31-00-800-801-A/200.

(e) On the Pitot/Static System Bench Test Set (GSE 129), simulate an altitude of 2,000 feet.

(f) Prepare the TCAS Test Set (GSE 190 or GSE 304) for operation as follows:

1. Put the antenna of the TCAS Test Set (GSE 190 or GSE 304) at a distance between 20 and 30 feet from the TCAS antennas on the aircraft.

2. Adjust the height of the antenna of the TCAS Test Set (GSE 190 or GSE 304) between 6 and 8 feet.

3. Make sure that the antenna of the TCAS Test Set (GSE 190 or GSE 304) is in a position where there is a line-of-sight path from it to the two TCAS antennas on the aircraft, without obstacles.

(g) When the TCAS Test Set (GSE 190 or GSE 304) is ready for use, push the SET/CONT key until the SETUP#1 screen comes into view. Set the parameters on this screen as follows (the values in parentheses are the recommended range for that parameter):

- INTRUDER TYPE: MODE-S
- SQUITTERS: ON
- UUT DIST: HORIZ = (20 to 30) ft
- VERT = (6 to 8) ft
- ALT REPORTING = ON
- STORE = 0
- RECALL = 0
- GAIN_1030 = 9,3 dB
- LOSS = 1.0 dB

(h) Push the SET/CONT key. The SETUP#2 screen comes into view. Set the parameters on this screen as follows:

- RANGE MAX: 3 nm
- MIN: 0 nm
- ALT MAX: 3000 ft
- MIN: 1000 ft

- MODE: TCAS II

(i) Push the SCEN key. SCENARIO TEST screen comes into view. Set the parameters on this screen as follows (the indications in parentheses are the recommended values for that parameter):

- RANGE: 3.00 nm
- RATE: + 450 kt
- ALT: (1950 or 1975) ft
- RATE: 0 fpm

(j) Push the RUN/STOP key to run the test.

(k) (Applicable to aircraft with EICAS versions 20.5 and on) On the HHDLU/EHHDLU, select the TCAS TA parameter. Select WORD 10 and SUBFRAME ALL.

Result:

1 Make sure that on the HHDLU/EHHDLU, on the WORD 10, the 2nd bit changes from "0" to "1" when the aural message "TRAFFIC - TRAFFIC" is heard.

(l) On the HHDLU/EHHDLU, select the TCAS RA parameter. Select WORD 67 and SUBFRAME ALL.

Result:

1 Make sure that on the HHDLU/EHHDLU, on the WORD 67, the 7th and 3rd bits change from "0" to "1" when one of these aural messages is heard:

- (aircraft with TCAS P/N 4066010-904 or 7517900-55001, -71002 or -10002) CLIMB - CLIMB - CLIMB.
- (aircraft with TCAS P/N 4066010-910 or 7517900-55003, -71003 or -10003) CLIMB - CLIMB.

2 After that, when the INCREASE CLIMB - INCREASE CLIMB aural message is heard, on the WORD 67, the 5th and 4th bits change from "0" to "1".

NOTE: If the messages are not heard, run the test in a same scenario 3 times minimum to get the correct results. If this does not occur, try to change the values in the TCAS Test Set parameters that are recommended in parentheses (SETUP#1 and SCENARIO TEST screens). Also try new adjustments on the antenna of TCAS Test Set, as described before.

(m) On the TCAS Test Set (GSE 190 or GSE 304), push the RUN/STOP key to stop the test.

(n) Set the parameters on the SCENARIO TEST screen as follows (the values in parentheses are the recommended values for that parameter):

- RANGE: 3.00 nm
- RATE: + 450 kt
- ALT: (2025 or 2050) ft
- RATE: 0 fpm

Push the RUN/STOP key to run the test.

Result:

1 Make sure that the HHDLU/EHHDLU, on the WORD 67, the 10th, 3rd, and 1st bits change from "0" to "1" when one of these aural messages is heard:

- (aircraft with TCAS P/N 4066010-904 or 7517900-55001, -71002 or -10002) DESCEND - DESCEND - DESCEND.
- (aircraft with TCAS P/N 4066010-910 or 7517900-55003, -71003 or -10003) DESCEND - DESCEND.

NOTE: If the messages is not heard, run the test in a same scenario 3 times minimum to get the correct results. If this does not occur, try to change the values in the TCAS Test Set parameters that are recommended in parentheses (SCENARIO TEST screen).

(o) On the TCAS Test Set (GSE 190 or GSE 304), push the RUN/STOP key to stop the test.

(p) On the Pitot/Static System Bench Test Set (GSE 129), simulate an altitude of 3,000 feet.

(q) On the TCAS Test Set (GSE 190 or GSE 304), push the SCEN key. The SCENARIO TEST screen comes into view. Set the parameters in this screen as follows (the indications in parentheses are the recommended values for that parameter):

- RANGE: 0 nm
- RATE: (- 350 or - 400) kt
- ALT: 2900 ft
- RATE: 1500 fpm

(r) Push the SET/CONT key until SETUP#2 screen comes into view. Set the parameters in this screen, as follows:

- RANGE MAX: 5 nm
- MIN: 0 nm
- ALT MAX: 5000 ft
- MIN: 2900 ft
- MODE: TCAS II

Push the RUN/STOP key to run the test.

Result:

1 Make sure that the HHDLU/EHHDLU, on the WORD 67, the 4th and 3rd bits change from "0" to "1", when the CLIMB - CROSSING - CLIMB, CLIMB - CROSSING - CLIMB aural messages are heard.

2 If the conditions of the area (hangar doors closed, buildings, vehicles and other aircraft around) permits, it is possible that after the previous message, the INCREASE CLIMB - INCREASE CLIMB aural message is heard. If this occurs, make sure that, on the WORD 67, the 5th and 4th bits are "1". It is not mandatory to generate this message, because it was tested before.

NOTE: If the message is not heard, run the test in a same scenario 3 times minimum to get the correct results. If this does not occur, try to change the values in the TCAS Test Set parameters that are recommended in parentheses (SCENARIO TEST screen).

(s) On the TCAS Test Set (GSE 190 or GSE 304), push the RUN/STOP key to stop the test.

(31) *EFFECTIVITY: Applicable to procedure using TCAS Test Set (GSE 475)*

Do the test of the TCAS parameters (BINARY BASE):

NOTE: For the PIU use the OCTAL BASE. Cross check all the binary variations described below with its respective octal according to Figure 510.

(a) On the RMU, set the ATC/TCAS window to the TA/RA mode.

NOTE: The best condition to do this test is when there is a line-of-sight path from the two TCAS antennas on the aircraft to the antenna of the TCAS Test Set, without obstacles. The layout conditions around the aircraft also can change the test results, such as buildings, vehicles and other aircraft. If the aircraft is in a hangar, it is recommended that hangar door not to be closed. Read the TCAS Test Set operational manual to get more information.

(b) On the Overhead Panel, make sure that the BATT1 and BATT2 switches are set at OFF and, on the Circuit Breaker Panel, open the AIR/GND A (Location Tip: DC BUS 1/LDG GEAR/AIR/GND A), AIR/GND B (Location Tip: ESSENTIAL DC BUS 1/LDG GEAR/AIR/GND B), AIR/GND C (Location Tip: DC BUS 2/LDG GEAR/AIR/GND C), and AIR/GND D (Location Tip: ESSENTIAL DC BUS 2/LDG GEAR/AIR/GND D) circuit breakers and attach DO-NOT-CLOSE tags to them. This is to put the aircraft in the flight configuration.

(c) Make sure that the flaps are in the 0-degree position.

(d) Simulate a radio altitude of more than 1,500 ft AGL on Radio Altimeter 1. Refer to AMM TASK 34-31-00-800-801-A/200.

(e) On the Pitot/Static System Bench Test Set (GSE 129), simulate an altitude of 2,000 feet.

(f) Prepare the TCAS Test Set (GSE 475) for operation as follows:

1. Put the antenna of the TCAS Test Set (GSE 475) at a distance between 20 and 30 feet from the TCAS antennas on the aircraft.

2. Adjust the height of the antenna of the TCAS Test Set (GSE 475) between 6 and 8 feet.

3. Make sure that the antenna of the TCAS Test Set (GSE 475) is in a position where there is a line-of-sight path from it to the two TCAS antennas on the aircraft, without obstacles.

(g) When the TCAS Test Set (GSE 475) is ready for use, push the SETUP key until the SETUP TCAS screen comes into view. Set the parameters on this screen as follows (the values in parentheses are the recommended range for that parameter):

- RF REPORT: ANTENNA
- ANT RANGE: (20 to 30) ft
- ANT HEIGHT: (6 to 8) ft
- UUT ADDRESS: AUTO
- ANT CABLE LOSS: As required
- ANT AGAIN: As required
- SQUITTERS: ON
- ALT REPORTING: ON
- DISPLAYED ALT: RELATIVE
- TEST SET AA: A92493

NOTE:
- The antenna cable loss value is written on a tag bonded to the antenna cable.
- The TCAS TEST SET antenna gain values are written on the back of antenna.

(h) Push the TCAS key. The TCAS TEST screen comes into view. Set the parameters on this screen as follows:

- SCENARIO: CUSTOM
- TCAS TYPE: TCAS II
- % REPLY: 100
- INTRUDER TYPE: MODE S
- RANGE START: 3 nm
- RANGE RATE: + 450 kts
- ALT START: (1950 or 1975) ft
- CONVERGE: ON
- ALT DETECT: ON

(i) Push the RUN TEST key to run the test.

(j) (Applicable to aircraft with EICAS versions 20.5 and on) On the HHDLU/ EHHDLU, select the TCAS TA parameter. Select WORD 10 and SUBFRAME ALL.

Result:

1 Make sure that on the HHDLU/EHHDLU, on the WORD 10, the 2nd bit changes from "0" to "1" when the aural message "TRAFFIC - TRAFFIC" is heard.

(k) On the HHDLU/EHHDLU, select the TCAS RA parameter. Select WORD 67 and SUBFRAME ALL.

Result:

1 Make sure that on the HHDLU/EHHDLU, on the WORD 67, the 7th and 3rd bits change from "0" to "1" when one of these aural messages is heard:

- (aircraft with TCAS P/N 4066010-904 or 7517900-55001, -71002 or -10002) CLIMB - CLIMB - CLIMB.
- (aircraft with TCAS P/N 4066010-910 or 7517900-55003, -71003 or -10003) CLIMB - CLIMB.

2 After that, when the INCREASE CLIMB - INCREASE CLIMB aural message is heard, on the WORD 67, the 5th and 4th bits change from "0" to "1".

NOTE: If the messages are not heard, run the test in a same scenario 3 times minimum to get the correct results. If this does not occur, try to change the values in the TCAS Test Set parameters that are recommended in parentheses (TCAS TEST screens). Also try new adjustments on the antenna of TCAS Test Set, as described before.

(l) On the TCAS Test Set (GSE 475), push the STOP TEST key to stop the test.

(m) Set the parameters on the TCAS TEST screen as follows (the values in parentheses are the recommended values for that parameter):

- SCENARIO: CUSTOM
- TCAS TYPE: TCAS II
- % REPLY: 100
- INTRUDER TYPE: MODE S
- RANGE START: 3 nm
- RANGE RATE: + 450 kts
- ALT START: (2025 or 2050) ft
- CONVERGE: ON
- ALT DETECT: ON

Push the RUN TEST key to run the test.

Result:

1 Make sure that the HHDLU/EHHDLU, on the WORD 67, the 10th, 3rd, and 1st bits change from "0" to "1" when one of these aural messages is heard:

- (aircraft with TCAS P/N 4066010-904 or 7517900-55001, -71002 or -10002) DESCEND - DESCEND - DESCEND.
- (aircraft with TCAS P/N 4066010-910 or 7517900-55003, -71003 or -10003) DESCEND - DESCEND.

NOTE: If the messages is not heard, run the test in a same scenario 3 times minimum to get the correct results. If this does not occur, try to change the values in the TCAS Test Set parameters that are recommended in parentheses (TCAS TEST screen).

(n) On the TCAS Test Set (GSE 475), push the STOP TEST key to stop the test.

(o) On the Pitot/Static System Bench Test Set (GSE 129), simulate an altitude of 3,000 feet.

(p) On the TCAS Test Set (GSE 475), push the TCAS key. The TCAS TEST screen comes into view. Set the parameters in this screen as follows (the indications in parentheses are the recommended values for that parameter):

- SCENARIO: CUSTOM
- TCAS TYPE: TCAS II
- % REPLY: 100
- INTRUDER TYPE: MODE S
- RANGE START: 0 nm
- RANGE STOP: 5 nm
- RANGE RATE: (- 350 or - 400) kts
- ALT START: 2900 ft
- ALT STOP: 5000 ft
- CONVERGE: OFF
- ALT DETECT: ON

(q) Push the RUN TEST key to run the test.

Result:

1 Make sure that the HHDLU/EHHDLU, on the WORD 67, the 4th and 3rd bits change from "0" to "1", when the CLIMB - CROSSING - CLIMB, CLIMB - CROSSING - CLIMB aural messages are heard.

2 If the conditions of the area (hangar doors closed, buildings, vehicles and other aircraft around) permits, it is possible that after the previous message, the INCREASE CLIMB - INCREASE CLIMB aural message is heard. If this occurs, make sure that, on the WORD 67, the 5th and 4th bits are "1". It is not mandatory to generate this message, because it was tested before.

NOTE: If the message is not heard, run the test in a same scenario 3 times minimum to get the correct results. If this does not occur, try to change the values in the TCAS Test Set parameters that are recommended in parentheses (TCAS TEST screen).

(r) On the TCAS Test Set (GSE 475), push the STOP TEST key to stop the test.

(32) *EFFECTIVITY: Applicable to procedure using TCAS Test Set (GSE 190 or GSE 304)*

Do the test of the TCAS parameters (OCTAL BASE):

(a) Make sure that the ATC/TCAS window, on the RMU, is at the TA/RA mode.

(b) Make sure that the AIR/GND A (Location Tip: DC BUS 1/LDG GEAR/AIR/GND A), AIR/GND B (Location Tip: ESSENTIAL DC BUS 1/LDG GEAR/AIR/GND B), AIR/GND C (Location Tip: DC BUS 2/LDG GEAR/AIR/GND C), and AIR/GND D (Location Tip: ESSENTIAL DC BUS 2/LDG GEAR/AIR/GND D) circuit breakers, on the Circuit Breaker Panel, are open.

(c) Make sure that the flaps are in the 0-degree position.

(d) Make sure that PFD 1 shows a radio altitude value higher than 1,500 ft (radio altitude simulated as written in step d of item 24).

(e) On the Pitot/Static System Bench Test Set (GSE 129), simulate an altitude of 2,000 feet.

(f) On the HHDLU/EHHDLU, select the TCAS RESOLUTION ADV (Vertical Speed) parameter. Select WORD 66 and SUBFRAME ALL.

(g) Before you run the TCAS Test Set (GSE 190 or GSE 304) program, make sure that the conditions and the parameters are the same as written in steps f and g of item 24 (antenna adjustments and SETUP#1 screen parameters).

(h) On the TCAS Test Set (GSE 190 or GSE 304), push the SET/CONT until the SETUP#2 screen comes into view. Set the parameters on this screen as follows:

- RANGE MAX: 3 nm
- MIN: 0 nm
- ALT MAX: 3000 ft
- MIN: 1000 ft
- MODE: TCAS II

(i) Push the SCEN key. The SCENARIO TEST screen comes into view. Set the parameters on this screen as follows (the indications in parentheses are the recommended values for that parameter):

- RANGE: 3.00 nm
- RATE: + 450 kt

- ALT: (1950 or 1975) ft
- RATE: 0 fpm

Push the RUN/STOP key to run the test.

Result:

1 Make sure that the HHDLU/EHHDLU shows 0017 when one of these aural messages is heard:

- (aircraft with TCAS P/N 4066010-904 or 7517900-55001, -71002 or -10002) CLIMB - CLIMB - CLIMB.
- (aircraft with TCAS P/N 4066010-910 or 7517900-55003, -71003 or -10003) CLIMB - CLIMB.

2 After that, when the INCREASE CLIMB - INCREASE CLIMB aural message is heard, the HHDLU/EHHDLU shows 0031.

NOTE: If the messages are not heard, run the test in a same scenario 3 times minimum to get the correct results. If this does not occur, try to change the values in the TCAS Test Set parameters that are recommended in parentheses (SCENARIO TEST screen).

(j) On the TCAS Test Set (GSE 190 or GSE 304), push the RUN/STOP key to stop the test.

(k) Set the parameters on the SCENARIO TEST screen as follows (the indications in parentheses are the recommended values for that parameter):

- RANGE: 3.00 nm
- RATE: + 450 kt
- ALT: (2025 or 2050) ft
- RATE: 0 fpm

Push the RUN/STOP key to run the test.

Result:

1 Make sure that the HHDLU/EHHDLU shows 0161 when one of these aural messages is heard:

- (aircraft with TCAS P/N 4066010-904 or 7517900-55001, -71002 or -10002) DESCEND - DESCEND - DESCEND.
- (aircraft with TCAS P/N 4066010-910 or 7517900-55003, -71003 or -10003) DESCEND - DESCEND.

NOTE: If the message is not heard, run the test in a same scenario 3 times minimum to get the correct results. If this does not occur, try to change the values in the TCAS Test Set parameters that are recommended in parentheses (SCENARIO TEST screen).

(l) On the TCAS Test Set (GSE 190 or GSE 304), push the RUN/STOP key to stop the test.

(m) Restore the Radio Altimeter System back to normal. Refer to AMM TASK 34-31-00-800-801-A/200.

(n) On the Circuit Breaker Panel, remove the DO-NOT-CLOSE tags from the AIR/GND A (Location Tip: DC BUS 1/LDG GEAR/AIR/GND A), AIR/GND B (Location Tip: ESSENTIAL DC BUS 1/LDG GEAR/AIR/GND B), AIR/GND C (Location Tip: DC BUS 2/LDG GEAR/AIR/GND C), and AIR/GND D (Location Tip: ESSENTIAL DC BUS 2/LDG GEAR/AIR/GND D) circuit breakers and close them in ten seconds maximum.

(33) *EFFECTIVITY: Applicable to procedure using TCAS Test Set (GSE 475)*

Do the test of the TCAS parameters (OCTAL BASE):

(a) Make sure that the ATC/TCAS window, on the RMU, is at the TA/RA mode.

(b) Make sure that the AIR/GND A (Location Tip: DC BUS 1/LDG GEAR/AIR/GND A), AIR/GND B (Location Tip: ESSENTIAL DC BUS 1/LDG GEAR/AIR/GND B), AIR/GND C (Location Tip: DC BUS 2/LDG GEAR/AIR/GND C), and AIR/GND D (Location Tip: ESSENTIAL DC BUS 2/LDG GEAR/AIR/GND D) circuit breakers, on the Circuit Breaker Panel, are open.

(c) Make sure that the flaps are in the 0-degree position.

(d) Simulate a radio altitude of more than 1,500 ft AGL on Radio Altimeter 1. Refer to AMM TASK 34-31-00-800-801-A/200.

(e) On the Pitot/Static System Bench Test Set (GSE 129), simulate an altitude of 2,000 feet.

(f) On the HHDLU/EHHDLU, select the TCAS RESOLUTION ADV (Vertical Speed) parameter. Select WORD 66 and SUBFRAME ALL.

(g) Prepare the TCAS Test Set (GSE 475) for operation as follows:

1. Put the antenna of the TCAS Test Set (GSE 475) at a distance between 20 and 30 feet from the TCAS antennas on the aircraft.

2. Adjust the height of the antenna of the TCAS Test Set (GSE 475) between 6 and 8 feet.

3. Make sure that the antenna of the TCAS Test Set (GSE 475) is in a position where there is a line-of-sight path from it to the two TCAS antennas on the aircraft, without obstacles.

(h) When the TCAS Test Set (GSE 475) is ready for use, push the SETUP key until the SETUP TCAS screen comes into view. Set the parameters on this screen as follows (the values in parentheses are the recommended range for that parameter):

- RF REPORT: ANTENNA
- ANT RANGE: (20 to 30) ft
- ANT HEIGHT: (6 to 8) ft
- UUT ADDRESS: AUTO
- ANT CABLE LOSS: As required
- ANT AGAIN: As required
- SQUITTERS: ON

- ALT REPORTING: ON
- DISPLAYED ALT: RELATIVE
- TEST SET AA: A92493

NOTE:
- The antenna cable loss value is written on a tag bonded to the antenna cable.
- The TCAS TEST SET antenna gain values are written on the back of antenna.

(i) Push the TCAS key. The TCAS TEST screen comes into view. Set the parameters on this screen as follows:

- SCENARIO: CUSTOM
- TCAS TYPE: TCAS II
- % REPLY: 100
- INTRUDER TYPE: MODE S
- RANGE START: 3 nm
- RANGE RATE: + 450 kts
- ALT START: (1950 or 1975) ft
- CONVERGE: ON
- ALT DETECT: ON

(j) Push the RUN TEST key to run the test.

Result:

1 Make sure that the HHDLU/EHHDLU shows 0017 when one of these aural messages is heard:

- (aircraft with TCAS P/N 4066010-904 or 7517900-55001, -71002 or -10002) CLIMB - CLIMB - CLIMB.
- (aircraft with TCAS P/N 4066010-910 or 7517900-55003, -71003 or -10003) CLIMB - CLIMB.

2 After that, when the INCREASE CLIMB - INCREASE CLIMB aural message is heard, the HHDLU/EHHDLU shows 0031.

NOTE: If the messages are not heard, run the test in a same scenario 3 times minimum to get the correct results. If this does not occur, try to change the values in the TCAS Test Set parameters that are recommended in parentheses (TCAS TEST screens). Also try new adjustments on the antenna of TCAS Test Set, as described before.

(k) On the TCAS Test Set (GSE 475), push the STOP TEST key to stop the test.

(l) Set the parameters on the TCAS TEST screen as follows (the values in parentheses are the recommended values for that parameter):

- SCENARIO: CUSTOM

- TCAS TYPE: TCAS II
- % REPLY: 100
- INTRUDER TYPE: MODE S
- RANGE START: 3 nm
- RANGE RATE: + 450 kts
- ALT START: (2025 or 2050) ft
- CONVERGE: ON
- ALT DETECT: ON

Push the RUN TEST key to run the test.

Result:

1 Make sure that the HHDLU/EHHDLU shows 0161 when one of these aural messages is heard:

- (aircraft with TCAS P/N 4066010-904 or 7517900-55001, -71002 or -10002) DESCEND - DESCEND - DESCEND.
- (aircraft with TCAS P/N 4066010-910 or 7517900-55003, -71003 or -10003) DESCEND - DESCEND.

NOTE: If the messages are not heard, run the test in a same scenario 3 times minimum to get the correct results. If this does not occur, try to change the values in the TCAS Test Set parameters that are recommended in parentheses (TCAS TEST screens). Also try new adjustments on the antenna of TCAS Test Set, as described before.

(m) On the TCAS Test Set (GSE 475), push the STOP TEST key to stop the test.

(n) Restore the Radio Altimeter System back to normal. Refer to AMM TASK 34-31-00-800-801-A/200.

(o) On the Circuit Breaker Panel, remove the DO-NOT-CLOSE tags from the AIR/GND A (Location Tip: DC BUS 1/LDG GEAR/AIR/GND A), AIR/GND B (Location Tip: ESSENTIAL DC BUS 1/LDG GEAR/AIR/GND B), AIR/GND C (Location Tip: DC BUS 2/LDG GEAR/AIR/GND C), and AIR/GND D (Location Tip: ESSENTIAL DC BUS 2/LDG GEAR/AIR/GND D) circuit breakers and close them in ten seconds maximum.

(34) (Aircraft under CAT III configuration with HGS) Do the test of the Headup Guidance System (HGS) as follows (BINARY BASE):

NOTE: For the PIU use the OCTAL BASE. Cross check all the binary variations described below with its respective octal according to Figure 510.

(a) On the HHDLU/EHHDLU, select the HGS parameters. Select word 74, SUBFRAME ALL.

(b) On the circuit breaker panel, open the OHU circuit breaker (Location tip: DC BUS 1/CAT III/HEAD UP DISPLAY/OHU).

Result:

1 On the EICAS display, the HGS FAIL message comes into view.

2 On the HGS module, the FAULT message comes into view.

3 On the HHDLU/EHHDLU, the 4th bit changes from "0" to "1".

(c) On the circuit breaker panel, close the OHU circuit breaker (Location tip: DC BUS 1/CAT III/HEAD UP DISPLAY/OHU).

(d) On the HHDLU/EHHDLU, select the COMBINER STOWED (HGS DATA) parameter. Select word 74, SUBFRAME ALL.

(e) Set the combiner to the "stowed" position.

Result:

1 On the HHDLU/EHHDLU, after a few seconds, the 5th bit goes to "1".

(f) Set the combiner to the "not stowed" position.

Result:

1 On the HHDLU/EHHDLU, after a few seconds, the 5th bit goes to "0".

(g) On the Circuit Breaker Panel, open the AIR/GND A (Location Tip: DC BUS 1/LDG GEAR/AIR/GND A), AIR/GND B (Location Tip: ESSENTIAL DC BUS 1/LDG GEAR/AIR/GND B), AIR/GND C (Location Tip: DC BUS 2/LDG GEAR/AIR/GND C), and AIR/GND D (Location Tip: ESSENTIAL DC BUS 2/LDG GEAR/AIR/GND D) circuit breakers and attach DO-NOT-CLOSE tags to them.

(h) Attach metallic targets with adhesive in front of the Air/Ground proximity switches (Weight-On-Wheel - WOW 1, 2, 3, and 4) installed on the main landing gear. Refer to (AMM TASK 32-63-00-860-801-A/200).

(i) Attach metallic targets with adhesive in front of the Air/Ground proximity switch (Weight-On-Wheel - WOW) installed on the nose landing gear. Refer to (AMM TASK 32-63-00-860-801-A/200).

(j) On the Circuit Breaker Panel, open the RA 1 (Location Tip: DC BUS 1/NAV/RA 1) circuit breaker and close it after a few seconds.

(k) On the Circuit Breaker Panel, open the RA 2 (Location Tip: DC BUS 2/NAV/RA 2) circuit breaker and close it after a few seconds.

(l) Simulate 20 ft (or above) radio altitude, by using the GSE 361. Refer to (AMM TASK 34-31-00-800-801-A/200).

Result:

1 See the indications on the PFD 1.

(m) On the HGS module, push the MODE button to change the HGS operational mode and make sure the bits on the HHDLU/EHHDLU change as shown in the table below. Make sure that you test all HGS modes listed in the table.

Table 551 - HGS OPERATIONAL MODE PARAMETER

HGS OPERATIONAL MODE	HHDLU/EHHDLU BITS (WORD 74, SUBFRAME ALL)		
	BIT 3	BIT 2	BIT 1
PRI	0	0	0
IMC	0	0	1
VMC	0	1	0

(n) On the Circuit Breaker Panel, remove the DO-NOT-CLOSE tags from the AIR/GND A (Location Tip: DC BUS 1/LDG GEAR/AIR/GND A), AIR/GND B (Location Tip: ESSENTIAL DC BUS 1/LDG GEAR/AIR/GND B), AIR/GND C (Location Tip: DC BUS 2/LDG GEAR/AIR/GND C), and AIR/GND D (Location Tip: ESSENTIAL DC BUS 2/LDG GEAR/AIR/GND D) circuit breakers and close them in ten seconds maximum.

WARNING: MAKE SURE THAT THE METALLIC TARGETS ARE REMOVED FROM THE PROXIMITY SWITCHES.

(o) Remove the metallic targets with adhesive from the Air/Ground proximity switches (Weight-On-Wheel - WOW 1, 2, 3, and 4) of the main landing gear.

(p) Remove the metallic targets with adhesive from the Air/Ground proximity switch (Weight-On-Wheel - WOW) of the nose landing gear.

(35) (Aircraft with thrust reversers) Do the test of the Thrust Reversers parameters (BINARY BASE):

NOTE: For the PIU use the OCTAL BASE. Cross check all the binary variations described below with its respective octal according to Figure 510.

(a) On the HHDLU/EHHDLU, select the Thrust Reversers (LO T/R DEPLOYED # 1, LO T/R DEPLOYED # 2, UP T/R STOWED # 1, UP T/R STOWED # 2, LO T/R STOWED # 1, LO T/R STOWED # 2, UP T/R DEPLOYED # 1, and UP T/R DEPLOYED # 2) parameters. Select WORD 47 and SUBFRAME ALL.

Result:

1 Make sure that the 5th, 6th, 7th, and 8th bits show "1".

(b) Open the thrust reversers (AMM TASK 78-31-01-940-801-A/200).

Result:

1 Make sure that the 5th, 6th, 7th, and 8th bits change from "1" to "0", and the 3rd, 4th, 9th, and 10th bits change from "0" to "1".

(c) Close the thrust reversers (AMM TASK 78-31-01-940-802-A/200).

(d) The items (e) thru (g) are applicable to aircraft with EICAS versions 17 and on.

(e) On the HHDLU/EHHDLU, select the T/R IN TRANSIT # 1 and T/R IN TRANSIT # 2 parameters. Select WORD 47 and SUBFRAME ALL.

Result:

1 The HDDLU/EHHDLU 1st and 2nd bits remain in "0"

(f) Open the thrust reversers (AMM TASK 78-31-01-940-801-A/200).

Result:

1 The 1st and 2nd bits change from "0" to "1", while the thrust reversers open.

2 The 3rd and 4th bits change from "0" to "1" when the thrust reversers are open.

(g) Close the thrust reversers (AMM TASK 78-31-01-940-802-A/200).

Result:

1 The 3rd and 4th bits change from "1" to "0" , while the thrust reversers close.

2 The 1st and 2nd bits come back to "0" when the thrust reversers are closed.

(36) Do the test of the fuel parameters (BINARY BASE):

WARNING: BEFORE YOU DO THIS ITEM, OBEY THE SAFETY PRECAUTIONS GIVEN IN AMM MPP 28-00-00/200 AND AMM MPP 71-00-00/200 TO PREVENT INJURY TO PERSONS AND DAMAGE TO THE MATERIAL.

NOTE: For the PIU use the OCTAL BASE. Cross check all the binary variations described below with its respective octal according to Figure 510.

(a) On the HHDLU/EHHDLU, select WORD 76 and SUBFRAME ALL.

(b) Do the test of the FUEL LOW PRESSURE # 1 parameter. Refer to step (c) thru step (j) and step (t).

(c) Put the workstand in the work area, under the LH engine.

(d) Open the lower cowling (AMM TASK 71-12-01-000-801-A/400) to get access to the LH engine.

(e) Disconnect electrical connector P0259 from the LH engine-low pressure switch.

(f) Put a jumper between pins A and B of connector P0259.

Result:

1 On the HHDLU/EHHDLU, make sure that the 2nd bit changes from "1" to "0".

(g) Remove the jumper installed in step (f).

(h) Connect the electrical connector disconnected in step (e).

(i) Close the lower cowling (AMM TASK 71-12-01-400-801-A/400).

(j) Remove the workstand.

(k) Do the test of the FUEL LOW PRESSURE # 2 parameter. Refer to step (l) thru step (t).

(l) Put the workstand in the work area, under the RH engine.

(m) Open the lower cowling (AMM TASK 71-12-01-000-801-A/400) to get access to the RH engine.

(n) Disconnect electrical connector P0259 from the RH engine-low pressure switch.

(o) Place a jumper between pins A and B of connector P0259.

Result:

1 On the HHDLU/EHHDLU, make sure that the 3rd bit changes from "1" to "0".

(p) Remove the jumper installed in step (o).

(q) Connect the electrical connector disconnected in step (n).

(r) Close the lower cowling (AMM TASK 71-12-01-400-801-A/400).

(s) Remove the workstand.

NOTE: To do step (t), it is necessary to operate the APU and the engines. You can do this step together with the checks of the parameters with engines in operation.

(t) Do an operational check of the Fuel Low-Pressure Warning System. Refer to AMM TASK 28-45-00-700-801-A/500.

(37) Do the test of the Engine/FADEC parameters (BINARY BASE):

NOTE: For the PIU use the OCTAL BASE. Cross check all the binary variations described below with its respective octal according to Figure 510.

(a) On the HHDLU/EHHDLU, select the FADEC # 1A IN CONTROL parameter. Select WORD 16 and SUBFRAME ALL.

(b) On the Power Plant Panel, on the Overhead Panel, set the FADEC switch to the ALTN position. Make sure that the FADEC 1A indication comes into view on the EICAS display:

Result:

1 On the HHDLU/EHHDLU, make sure that the 1st bit changes from "0" to "1".

(c) On the HHDLU/EHHDLU, select the FADEC # 1B IN CONTROL parameter. Select WORD 16 and SUBFRAME ALL.

(d) On the Power Plant Panel, on the Overhead Panel, set the FADEC switch to the ALTN position. Make sure that the FADEC 1B indication comes into view on the EICAS display:

Result:

1 On the HHDLU/EHHDLU, make sure that the 2nd bit changes from "0" to "1".

(e) On the HHDLU/EHHDLU, select the FADEC # 2A IN CONTROL parameter. Select WORD 80 and SUBFRAME ALL.

(f) On the Power Plant Panel, on the Overhead Panel, set the FADEC switch to the ALTN position. Make sure that the FADEC 2A indication comes into view on the EICAS display:

Result:

1 On the HHDLU/EHHDLU, make sure that the 1st bit changes from "0" to "1".

(g) On the HHDLU/EHHDLU, select the FADEC # 2B IN CONTROL parameter. Select WORD 80 and SUBFRAME ALL.

(h) On the Power Plant Panel, on the Overhead Panel, set the FADEC switch to the ALTN position. Make sure that the FADEC 2B indication comes into view on the EICAS display:

Result:

1 On the HHDLU/EHHDLU, make sure that the 2nd bit changes from "0" to "1".

(i) On the Pitot/Static System Bench Test Set (GSE 129), simulate an altitude of 2,500 feet.

(j) On the HHDLU/EHHDLU, select the ENGINE # 1 MODES parameter. Select WORD 45 and SUBFRAME ALL.

(k) On the Circuit Breaker Panel, open the FADEC 1A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/1A), FADEC 2A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/2A), FADEC 1B (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/1B), and FADEC 2B (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/2B) circuit breakers, and attach DO-NOT-CLOSE tags to them.

(l) On the Overhead Panel, make sure that the BATT1 and BATT2 switches are positioned at OFF and, on the Circuit Breaker Panel, open the AIR/GND A (Location Tip: DC BUS 1/LDG GEAR/AIR/GND A), AIR/GND B (Location Tip: ESSENTIAL DC BUS 1/LDG GEAR/AIR/GND B), AIR/GND C (Location Tip: DC BUS 2/LDG GEAR/AIR/GND C), and AIR/GND D (Location Tip: ESSENTIAL DC BUS 2/LDG GEAR/AIR/GND D) circuit breakers to simulate aircraft in flight, and attach DO-NOT-CLOSE tags to them.

(m) Remove the DO-NOT-CLOSE tags from the circuit breakers opened in (k), and close them simultaneously and wait 15 seconds.

(n) On the Power Plant Panel, on the Overhead Panel, set the FADEC switch to the ALTN position.

(o) Push the pushbutton CON on the THRUST RATING MODULE, on the Control Pedestal.

Result:

1 On aircraft with A1P or A1/3 engine models, on the HHDLU/EHHDLU, make sure that the 4th, 3rd, 2nd and 1st bits change from "1011" to "0110".

2 On aircraft with A, A1, A1/1 or A3 engine models, on the HHDLU/EHHDLU, make sure that the 4th, 3rd, 2nd and 1st bits change from "0000" to "0110".

NOTE: The engine model is shown on a placard installed on the engine; access to it is got through the engine lower cowling opening (refer to AMM TASK 71-12-01-000-801-A/400).

(p) Remove the DO-NOT-CLOSE tags from the circuit breakers opened in (l) and close them in ten seconds maximum.

(q) On the HHDLU/EHHDLU, select the ENGINE # 2 MODES parameter. Select WORD 109 and SUBFRAME ALL.

(r) On the Circuit Breaker Panel, open the FADEC 1A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/1A), FADEC 2A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/2A), FADEC 1B (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/1B), and FADEC 2B (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/2B) circuit breakers, and attach DO-NOT-CLOSE tags to them.

(s) On the Overhead Panel, make sure that the BATT1 and BATT2 switches are at OFF and, on the Circuit Breaker Panel, open the AIR/GND A (Location Tip: DC BUS 1/LDG GEAR/AIR/GND A), AIR/GND B (Location Tip: ESSENTIAL DC BUS 1/LDG GEAR/AIR/GND B), AIR/GND C (Location Tip: DC BUS 2/LDG GEAR/AIR/GND C), and AIR/GND D (Location Tip: ESSENTIAL DC BUS 2/LDG GEAR/AIR/GND D) circuit breakers to simulate aircraft in flight, and attach DO-NOT-CLOSE tags to them.

(t) Remove the DO-NOT-CLOSE tags from the circuit breakers opened in (r), and close them simultaneously and wait 15 seconds.

(u) On the Power Plant Panel, on the Overhead Panel, set the FADEC switch to the ALTN position.

(v) Push the pushbutton CON on the THRUST RATING MODULE, on the Control Pedestal.

Result:

1 On aircraft with A1P or A1/3 engine models, on the HHDLU/EHHDLU, make sure that the 4th, 3rd, 2nd and 1st bits change from "1011" to "0110".

2 On aircraft with A, A1, A1/1 or A3 engine models, on the HHDLU/EHHDLU, make sure that the 4th, 3rd, 2nd and 1st bits change from "0000" to "0110".

NOTE: The engine model is shown on a placard installed on the engine; access to it is got through the engine lower cowling opening (refer to AMM TASK 71-12-01-000-801-A/400).

(w) Remove the DO-NOT-CLOSE tags from the circuit breakers opened in (s) and close them in ten seconds maximum.

(x) Disconnect the Pitot/Static System Bench Test Set (GSE 129) from the aircraft.

(y) On the Circuit Breaker Panel, open the FADEC 1A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/1A), FADEC 2A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/2A) and FADEC 2B (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/2B) circuit breakers.

(z) On the Circuit Breaker Panel, close the FADEC 1A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/1A), FADEC 1B (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/1B), FADEC 2A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/2A) and FADEC 2B (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/2B) circuit breakers simultaneously.

Result:

1 The EICAS message goes out of view.

(aa) On the Circuit Breaker Panel, open the FIRE EXTG BTL A 1 (Location Tip: HOT BUS 1/FIRE EXTG/BTL A/1), FIRE EXTG BTL A 2 (Location Tip: HOT BUS 1/ FIRE EXTG/BTL A/2), FIRE EXTG BTL B 1 (Location Tip: HOT BUS 2/FIRE EXTG/BTL B/1), FIRE EXTG BTL B 2 (Location Tip: HOT BUS 2/FIRE EXTG/BTL B/2), and APU FIRE EXTG (Location Tip: ESSENTIAL DC BUS 2/APU/FIRE/EXTG) circuit breakers, and attach DO-NOT-CLOSE tags to them.

(ab) On the HHDLU/EHHDLU, select the ENG # 1 EMERG STOP ACTUATED parameter. Select WORD 16 and SUBFRAME ALL.

(ac) On the Overhead Panel, pull Fire Extinguishing Handle 1 (Do not turn it).

Result:

1 (Aircraft with EICAS up to version 15B) On the HHDLU/EHHDLU, make sure that the 9th bit changes from "0" to "1":

2 (Aircraft with EICAS versions 16 and on) On the HHDLU/EHHDLU, make sure that the 9th bit changes from "1" to "0":

(ad) Set Fire Extinguishing Handle 1 to its original position.

(ae) On the HHDLU/EHHDLU, select the ENG # 2 EMERG STOP ACTUATED parameter. Select WORD 80 and SUBFRAME ALL.

(af) On the Overhead Panel, pull Fire Extinguishing Handle 2 (Do not turn it).

Result:

1 (Aircraft with EICAS up to version 15B) On the HHDLU/EHHDLU, make sure that the 9th bit changes from "0" to "1":

2 (Aircraft with EICAS versions 16 and on) On the HHDLU/EHHDLU, make sure that the 9th bit changes from "1" to "0":

(ag) Set Fire Extinguishing Handle 2 to its original position.

(ah) Remove the DO-NOT-CLOSE tags from the circuit breakers opened in (aa), and close them.

(ai) The items (aj) thru (bx) are applicable to aircraft with EICAS versions 17 and on.

(aj) On the HHDLU/EHHDLU, select the FADEC ENGINE NO DISPATCH parameters. Select WORDs 45 and 109 and SUBFRAME ALL.

(ak) On the circuit breaker panel, open the FADEC 1B circuit breaker (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/1B).

Result:

1 The EICAS caution message E1 NO DISP is shown.

2 The master caution tone sounds.

3 On the glareshield panel, the master caution lighted pushbuttons flash.

4 On the HHDLU/EHHDLU, make sure that the 7th bit of WORD 45 (FADEC #1A ENGINE NO DISP) changes from "0" to "1".

5 After 30 seconds, the EICAS message changes to E1-2 NO DISP caution message, and the 8th bit of WORD 109 (FADEC #2B ENGINE NO DISP) changes from "0" to "1".

(al) On the glareshield panel, push a master caution lighted pushbutton.

Result:

1 The master caution tone ceases.

2 The master caution lighted pushbuttons goes off.

(am) On the Circuit Breaker Panel, open the FADEC 1A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/1A), FADEC 2A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/2A) and FADEC 2B (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/2B) circuit breakers.

(an) On the Circuit Breaker Panel, close the FADEC 1A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/1A), FADEC 1B (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/1B), FADEC 2A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/2A) and FADEC 2B (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/2B) circuit breakers simultaneously.

Result:

1 The EICAS message goes out of view.

2 On the HHDLU/EHHDLU, make sure that the 7th bit of WORD 45 (FADEC #1A ENGINE NO DISP) is "0".

3 On the HHDLU/EHHDLU, make sure that the 8th bit of WORD 109 (FADEC #2B ENGINE NO DISP) is "0".

(ao) On the circuit breaker panel, open the FADEC 1A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/1A) circuit breaker.

Result:

1 The EICAS caution message E1 NO DISP is shown.

2 The master caution tone sounds.

3 On the glareshield panel, the master caution lighted pushbuttons flash.

4 On the HHDLU/EHHDLU, make sure that the 8th bit of WORD 45 (FADEC #1B ENGINE NO DISP) changes from "0" to "1".

5 After 30 seconds, the EICAS message changes to E1-2 NO DISP caution message, and the 7th bit of WORD 109 (FADEC #2A ENGINE NO DISP) changes from "0" to "1".

(ap) On the glareshield panel, push a master caution lighted pushbutton.

Result:

1 The master caution tone ceases.

2 The master caution lighted pushbuttons goes off.

(aq) On the Circuit Breaker Panel, open the FADEC 1B (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/1B), FADEC 2A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/2A) and FADEC 2B (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/2B) circuit breakers.

(ar) On the Circuit Breaker Panel, close the FADEC 1A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/1A), FADEC 1B (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/1B), FADEC 2A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/2A) and FADEC 2B (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/2B) circuit breakers simultaneously.

Result:

1 The EICAS message goes out of view.

2 On the HHDLU/EHHDLU, make sure that the 8th bit of WORD 45 (FADEC #1B ENGINE NO DISP) is "0".

3 On the HHDLU/EHHDLU, make sure that the 7th bit of WORD 109 (FADEC #2A ENGINE NO DISP) is "0".

(as) On the HHDLU/EHHDLU, select the FADEC ENGINE SHORT TERM DISPATCH and the FADEC ENGINE LONG TERM DISPATCH. Select WORDs 45 and 109, SUBFRAME ALL.

(at) On the Circuit Breaker Panel, open the ADC1 (Location Tip: ESSENTIAL DC BUS 1/NAV/ADC1) circuit breaker and attach a DO-NOT-CLOSE tag to it.

Result:

1 Some EICAS messages will appear.

2 Make sure that 9th (FADEC 1A ENGINE SHORT TERM DISPATCH) and the 11th (FADEC 1A ENGINE LONG TERM DISPATCH) bits of WORD 45 change from "0" to "1".

3 Make sure that 9th (FADEC 2A ENGINE SHORT TERM DISPATCH) and the 11th (FADEC 2A ENGINE LONG TERM DISPATCH) bits of WORD 109 change from "0" to "1".

4 After 60 seconds, the EICAS Advisory message E1-2 SHORT DISP is shown.

(au) On the Circuit Breaker Panel, open the ADC2 (Location Tip: DC BUS 2/NAV/ADC2) circuit breaker and attach a DO-NOT-CLOSE tag to it.

Result:

1 Some new EICAS messages will appear.

2 Make sure that 10th (FADEC 1B ENGINE SHORT TERM DISPATCH) and the 12th (FADEC 1B ENGINE LONG TERM DISPATCH) bits of WORD 45 change from "0" to "1".

3 Make sure that 10th (FADEC 2B ENGINE SHORT TERM DISPATCH) and the 12th (FADEC 2B ENGINE LONG TERM DISPATCH) bits of WORD 109 change from "0" to "1".

(av) On the Circuit Breaker Panel, remove the DO-NOT-CLOSE tags and close the ADC1 (Location Tip: ESSENTIAL DC BUS 1/NAV/ADC1) and ADC2 (Location Tip: DC BUS 2/NAV/ADC2) circuit breakers.

(aw) On the Circuit Breaker Panel, open the FADEC 1A (Location Tip: ESSENTIAL DC BUS 1/POWRPLANT/FADEC/1A), FADEC 1B (Location Tip: ESSENTIAL DC BUS 2/POWRPLANT/FADEC/1B), FADEC 2A (Location Tip: ESSENTIAL DC BUS 1/POWRPLANT/FADEC/2A) and FADEC 2B (Location Tip: ESSENTIAL DC BUS 2/POWRPLANT/FADEC/2B) circuit breakers and close them simultaneously.

Result:

1 The EICAS Advisory message goes out of view.

2 Make sure that the 9th, 10th, 11th, and 12th bits of WORDS 45 and 109 are "0".

(ax) On the HHDLU/EHHDLU, select the FADEC INCAPABLE parameters. Select WORDs 16 and 80, SUBFRAME ALL.

(ay) In the cockpit, on the Circuit Breaker Panel, open the FADEC 1A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/1A) and FADEC 1B (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/1B) circuit breakers.

Result:

1 Some EICAS messages will appear.

(az) Put the workstand in the work area, under the LH engine.

(ba) Open the lower cowling (AMM TASK 71-12-01-000-801-A/400) to get access to the LH engine.

(bb) On the LH engine, disconnect electrical connector FPMU A (blue harness).

(bc) In the cockpit, on the Circuit Breaker Panel, close the FADEC 1A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/1A) and FADEC 1B (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/1B) circuit breakers.

Result:

1 During the initialization of the FADECs, some bits will change their states.

2 After the initialization, make sure that the 3rd bit of WORD 16 (FADEC 1A INCAPABLE) is "1".

(bd) In the cockpit, on the Circuit Breaker Panel, open the FADEC 1A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/1A) and FADEC 1B (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/1B) circuit breakers.

Result:

1 Some EICAS messages will come into view.

(be) On the LH engine, connect electrical connector FPMU A (blue harness) and disconnect the electrical connector FPMU B (yellow harness).

(bf) In the cockpit, on the Circuit Breaker Panel, close the FADEC 1A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/1A) and FADEC 1B (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/1B) circuit breakers.

Result:

1 During the initialization of the FADECs, some bits will change their state.

2 After the initialization, make sure that the 4th bit of WORD 16 (FADEC 1B INCAPABLE) is "1".

(bg) In the cockpit, on the Circuit Breaker Panel, open the FADEC 1A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/1A) and FADEC 1B (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/1B) circuit breakers.

Result:

1 Some EICAS messages will come into view.

(bh) On the LH engine, connect the electrical connector FPMU B (yellow harness).

(bi) Close the LH engine lower cowling (AMM TASK 71-12-01-400-801-A/400).

(bj) Remove the workstand.

(bk) In the cockpit, on the Circuit Breaker Panel, close the FADEC 1A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/1A) and FADEC 1B (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/1B) circuit breakers.

(bl) In the cockpit, on the Circuit Breaker Panel, open the FADEC 2A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/2A) and FADEC 2B (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/2B) circuit breakers.

Result:

1 Some EICAS messages will come into view.

(bm) Open the lower cowling (AMM TASK 71-12-01-000-801-A/400) to get access to the RH engine.

(bn) On the RH engine, disconnect electrical connector FPMU A (blue harness).

(bo) In the cockpit, on the Circuit Breaker Panel, close the FADEC 2A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/2A) and FADEC 2B (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/2B) circuit breakers.

Result:

1 During the initialization of the FADECs, some bits will change their state.

2 After the initialization, make sure that the 3rd bit of WORD 80 (FADEC 2A INCAPABLE) is "1".

(bp) In the cockpit, on the Circuit Breaker Panel, open the FADEC 2A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/2A) and FADEC 2B (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/2B) circuit breakers.

Result:

1 Some EICAS messages will come into view.

(bq) On the RH engine, connect electrical connector FPMU A (blue harness) and disconnect the electrical connector FPMU B (yellow harness).

(br) In the cockpit, on the Circuit Breaker Panel, close the FADEC 2A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/2A) and FADEC 2B (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/2B) circuit breakers.

Result:

1 During the initialization of the FADECs, some bits will change their states.

2 After the initialization, make sure that the 4th bit of WORD 80 (FADEC 2B INCAPABLE) is "1".

(bs) In the cockpit, on the Circuit Breaker Panel, open the FADEC 2A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/2A) and FADEC 2B (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/2B) circuit breakers.

Result:

1 Some EICAS messages will come into view.

(bt) On the RH engine, connect the electrical connector FPMU B (yellow harness).

(bu) Close the RH engine lower cowling (AMM TASK 71-12-01-400-801-A/400).

(bv) In the cockpit, on the Circuit Breaker Panel, close the FADEC 2A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/2A) and FADEC 2B (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/2B) circuit breakers.

(bw) In the cockpit, on the Circuit Breaker Panel, open the FADEC 1A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/1A), FADEC 1B (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/1B), FADEC 2A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/2A) and FADEC 2B (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/2B) circuit breakers.

(bx) In the cockpit, on the Circuit Breaker Panel, close the FADEC 1A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/1A), FADEC 1B (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/1B), FADEC 2A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/2A) and FADEC 2B (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/2B) circuit breakers simultaneously.

Result:

1 No EICAS messages related to the engines can be shown. If new message is shown after this test, examine the FPMU connections.

2 After the initialization, make sure that the 3rd and the 4th bits of WORDS 16 and 80 are "0".

(38) Do the test of the Ice Detection parameters (BINARY BASE):

NOTE: For the PIU use the OCTAL BASE. Cross check all the binary variations described below with its respective octal according to Figure 510.

(a) On the HHDLU/EHHDLU, select WORD 12 and SUBFRAME ALL.

(b) On the HHDLU/EHHDLU, select the ICE CONDITION and ICE DETECTION FAIL parameters.

(c) On the Ice Detection Panel, on the Overhead Panel, set the TEST knob to 1 and hold it in this position.

Result:

1 On the HHDLU/EHHDLU, make sure that the 1st bit changes from "1" (No Ice) to "0" (Ice), and that the 2nd bit changes from "0" (Normal) to "1" (Fail).

(d) Set the TEST knob back to its original position.

(e) On the HHDLU/EHHDLU, select the ENG # 1 A/ICE COMMAND parameter.

(f) On the Circuit Breaker Panel, open the ENG AIR INLET 1 (Location Tip: DC BUS 1/ICE AND RAIN PROTECTION/ENG AIR INLET 1) circuit breaker and attach a DO-NOT-CLOSE tag to it.

Result:

1 On the HHDLU/EHHDLU, make sure that the 3rd bit changes from "0" (OFF) to "1" (ON).

(g) Remove the DO-NOT-CLOSE tag from the circuit breaker opened in (f) and close it.

(h) On the HHDLU/EHHDLU, select the ENG # 2 A/ICE COMMAND parameter.

(i) On the Circuit Breaker Panel, open the ENG AIR INLET 2 (Location Tip: DC BUS 2/ICE AND RAIN PROTECTION/ENG AIR INLET 2) circuit breaker and attach a DO-NOT-CLOSE tag to it.

Result:

1 On the HHDLU/EHHDLU, make sure that the 4th bit changes from "0" (OFF) to "1" (ON).

(j) Remove the DO-NOT-CLOSE tag from the circuit breaker opened in (i) and close it.

(k) On the HHDLU/EHHDLU, select the WING A/ICE COMMAND parameter.

(l) On the Ice Protection Panel, on the Overhead Panel, push the WING button.

(m) On the Ice Detection Panel, on the Overhead Panel, set the TEST knob to 1 and hold it in this position.

Result:

1 On the HHDLU/EHHDLU, make sure that the 5th bit changes from "0" (OFF) to "1" (ON).

(n) Set the TEST knob and the WING button back to their original positions.

(o) On the HHDLU/EHHDLU, select the STAB A/I COMMAND parameter.

(p) On the Ice Protection Panel, on the Overhead Panel, push the STAB button.

(q) On the Ice Detection Panel, on the Overhead Panel, set the TEST knob to 1 and hold it in this position.

Result:

1 On the HHDLU/EHHDLU, make sure that the 6th bit changes from "0" (OFF) to "1" (ON).

(r) Set the TEST knob and the STAB button back to their original positions.

(s) On the HHDLU/EHHDLU, select the T/O REF A-ICE # 1 and T/O REF A-ICE # 2 parameters. Select WORDS 48 and 112, and SUBFRAME ALL.

(t) On the MFD's, on the Main Panel, select the T/O (TAKE-OFF) page.

(u) On the Powerplant Panel, on the Overhead Panel, push (three times) the STORE button until the MFD shows REF A-ICE. Then turn the SET control to the INC (increase) position.

Result:

1 On the HHDLU/EHHDLU, make sure that the 1st bit of WORDS 48 and 112 changes from "0" (OFF) to "1" (ON).

(v) Set the SET control back to its original position.

(39) Do the test of the Surface Position (RVDTs/RVITs) Parameters as follows (OCTAL BASE):

NOTE: This step is applicable only to aircraft with the RVDTs/RVITs installed.

WARNING: MAKE SURE THAT THERE ARE NO PERSONS AND EQUIPMENT IN THE AILERON, ELEVATOR, AND RUDDER TRAVEL AREA.

CAUTION:
- DO NOT DO OTHER TASKS ON THE AILERON, ELEVATOR, AND RUDDER SYSTEMS.
- MAKE SURE THAT THE AILERON SYSTEM IS NOT RIG-PINNED AT THE CONTROL WHEEL, TORQUE TUBE QUADRANTS, INTERMEDIARY SECTOR, AND WING SECTOR.
- MAKE SURE THAT THE ELEVATOR SYSTEM IS NOT RIG-PINNED AT THE CONTROL COLUMN, TORQUE TUBE, REAR SECTOR, AND SURFACES.
- MAKE SURE THAT THE RUDDER SYSTEM IS NOT RIG-PINNED AT THE RUDDER PEDALS AND FORWARD AND REAR TORQUE TUBES.

(a) On the HHDLU/EHHDLU, select the AILERON SURFACE POSITION # 1. Select WORD 17 and SUBFRAME ALL.

(b) Put the left aileron surface at the neutral position as follows:

1. Remove access panel 551CB (AMM MPP 06-44-00/100).
2. Install the rig pin (GSE 058) in the LH wing sector (Figure 504).
3. Make sure that the aileron and aileron/flap torsion box are aligned.
4. Install the digital protractor (GSE 070) to the LH aileron surface. Use double-face adhesive tape for it.
5. Set the digital protractor (GSE 070) to zero (reference), and remove the rig pin (GSE 058) from the aileron wing sector.
6. Install access panel 551CB (AMM MPP 06-44-00/100).

(c) On the HHDLU/EHHDLU, the displayed value is between 1764 and 2012.

(d) Refer to the table below and manually change the LH aileron deflection angle and make sure that the displayed values on the HHDLU/EHHDLU/PIU obey the tolerances.

Table 552 - AILERON SURFACE POSITION # 1

DEFLECTION ANGLE (DIGITAL PROTRACTOR)	HHDLU/EHHDLU/PIU (OCTAL)
25 degrees - up	0711 - 1033

Table 552 - AILERON SURFACE POSITION # 1 (Continued)

DEFLECTION ANGLE (DIGITAL PROTRACTOR)	HHDLU/EHHDLU/PIU (OCTAL)
15 degrees - down	2437 - 2567

(e) Remove the protractor (GSE 070) from the LH aileron surface.

(f) On the HHDLU/EHHDLU/PIU, select the AILERON SURFACE POSITION # 2 parameter. Select WORD 49 and SUBFRAME ALL.

(g) Put the right aileron surface at the neutral position as follows:

1. Remove access panel 651CB (AMM MPP 06-44-00/100).
2. Install the rig pin (GSE 058) in the RH wing sector (Figure 504).
3. Make sure that the aileron and aileron/flap torsion box are aligned.
4. Install the digital protractor (GSE 070) to the RH aileron surface. Use double-face adhesive tape for it.
5. Set the digital protractor (GSE 070) to zero (reference), and remove the rig pin (GSE 058) from the aileron wing sector.
6. Install access panel 651CB (AMM MPP 06-44-00/100).

(h) On the HHDLU/EHHDLU/PIU, the displayed value is between 1764 and 2012.

(i) Refer to the table below and manually change the RH aileron deflection angle and make sure that the displayed values on the HHDLU/EHHDLU/PIU obey the tolerances.

Table 553 - AILERON SURFACE POSITION # 2

DEFLECTION ANGLE (DIGITAL PROTRACTOR)	HHDLU/EHHDLU/PIU (OCTAL)
25 degrees - up	2741 - 3061
15 degrees - down	1220 - 1344

(j) Remove the protractor (GSE 070) from the RH aileron surface.

(k) (Aircraft with EICAS up to version 20) On the HHDLU/EHHDLU/PIU, select the ELEVATOR SURFACE POSITION # 1 parameter. Select WORD 33 and SUBFRAME ALL.

(l) (Aircraft with EICAS versions 20.5 and on) On the HHDLU/EHHDLU/PIU, select the ELEVATOR SURFACE POSITION # 1 parameter. Select WORD 30 and SUBFRAME ALL.

(m) Put the left elevator surface at the neutral position as follows:

1. Install the elevator lock clamp (GSE 196) to the LH elevator surface (Figure 505).
2. Install the digital protractor (GSE 070) to the LH elevator surface. Use double-face adhesive tape for it.
3. Set the digital protractor (GSE 070) to zero (reference), and remove the lock clamp from the elevator surface.

(n) On the HHDLU/EHHDLU/PIU, the displayed value is between 1760 and 2016.

(o) Refer to the table below and manually change the LH elevator deflection angle and make sure that the displayed values on the HHDLU/EHHDLU/PIU obey the tolerances.

Table 554 - ELEVATOR SURFACE POSITION # 1

DEFLECTION ANGLE (DIGITAL PROTRACTOR)	HHDLU/EHHDLU/PIU (OCTAL)	
	AIRCRAFT WITH MECHANICAL GUST LOCK AND WITHOUT PROVISIONS FOR ELECTROMECHANICAL GUST LOCK	AIRCRAFT WITH ELECTROMECHANI-CAL GUST LOCK OR PROVISIONS FOR IT
25 degrees - up	3045 - 3205	3147 - 3322
10 degrees - down	1177 - 1367	1276 - 1451

(p) Remove the protractor (GSE 070) from the LH elevator surface.

(q) On the HHDLU/EHHDLU/PIU, select the ELEVATOR SURFACE POSITION # 2 parameter. Select WORD 46 and SUBFRAME ALL.

(r) Put the right elevator surface at the neutral position as follows:

1. Install the elevator lock clamp (GSE 196) to the RH elevator surface (Figure 505).
2. Install the digital protractor (GSE 070) to the RH elevator surface. Use double-face adhesive tape for it.
3. Set the digital protractor (GSE 070) to zero (reference), and remove the lock clamp from the elevator surface.

(s) On the HHDLU/EHHDLU/PIU, the displayed value is between 1760 and 2016.

(t) Refer to the table below and manually change the RH elevator deflection angle and make sure that the displayed values on the HHDLU/EHHDLU/PIU obey the tolerances.

Table 555 - ELEVATOR SURFACE POSITION # 2

DEFLECTION ANGLE (DIGITAL PROTRACTOR)	HHDLU/EHHDLU/PIU (OCTAL)	
	AIRCRAFT WITH MECHANICAL GUST LOCK AND WITHOUT PROVISIONS FOR ELECTROMECHANICAL GUST LOCK	AIRCRAFT WITH ELECTROMECHANI-CAL GUST LOCK OR PROVISIONS FOR IT
25 degrees - up	0602 - 0706	0454 - 0627
10 degrees - down	2402 - 2572	2325 - 2500

(u) Remove the protractor (GSE 070) from the RH elevator surface.

(v) On the HHDLU/EHHDLU/PIU, select the RUDDER SURFACE POSITION parameter. Select WORD 28 and SUBFRAME ALL.

(w) Put the rudder surface at the neutral position as follows:

1. Pressurize the hydraulic system (AMM TASK 29-10-00-860-801-A/200).
2. On the overhead panel, turn on rudder systems 1 and 2. Make sure that the RUDDER SHUTOFF SYS 1 and 2 pushbutton lights are off.
3. Make sure that the yaw trim indicator on the EICAS shows zero.
4. Install the protractor (GSE 059) to the fin/rudder I, with screw NASM(MS)24694-6 or with a double face adhesive tape, and set it to the zero position (reference) (Figure 506).
5. On the overhead panel, turn off rudder systems 1 and 2. Make sure that the RUDDER SHUTOFF SYS 1 and 2 pushbutton lights are on.
6. Release the pressure from the hydraulic system (AMM TASK 29-10-00-860-801-A/200).

(x) On the HHDLU/EHHDLU/PIU, the value shown is between 1756 and 2020.

(y) Refer to the table below and manually change the rudder deflection angle and make sure that the values shown on the HHDLU/EHHDLU/PIU obey the tolerances.

Table 556 - RUDDER SURFACE POSITION

DEFLECTION ANGLE (DIGITAL PROTRACTOR)	HHDLU/EHHDLU/PIU (OCTAL)
10 degrees - left	1205 - 1400
10 degrees - right	2332 - 2562

(z) Remove the protractor (GSE 059) from fin/rudder I.

(40) (Aircraft with dual IRS) Do the test of the Attitude and Heading Parameters as follows (OCTAL BASE):

(a) Make sure that the IRS 1 (Location Tip: ESSENTIAL DC BUS 1/NAV/IRS 1) and IRS 2 (Location Tip: DC BUS 2/NAV/IRS 2) circuit breakers are closed.

(b) If PFD1 shows the red flags ATT FAIL and HDG FAIL and MFD1 shows the red flag HDG FAIL, align the IRS as follows:

1 Make sure that the aircraft is in the on-ground configuration and the indicated airspeed on the PFD is lower than 20 knots.

2 Make sure that the rotary switch on MSU1 is in the OFF position.

3 Turn the MSU1 rotary switch to the ALIGN position.

- The ALIGN annunciator (amber) on the MSU comes on.
- The ON BATT and the NO AIR annunciators (amber) on the MSU come on briefly.

NOTE: • The IRS must receive the present position for the alignment to be completed. The FMS position must be updated to let this data be read by the IRS.

• If the aircraft is moved during the alignment, the IRU stops the current alignment and starts a full alignment again 30 seconds after the movement stops.

4 Do the FMS position update as follows:

a On FMS1 or FMS2, push the NAV mode key and the NEXT function key.

• The NAV INDEX 2/2 page is shown.

b Push the POS INIT (3L) left line select key.

• The POS INIT 1/1 page is shown.

c Push the LOAD (2R) right line select key to update the FMS position with the last saved position.

• The CDU shows the LOADED POSITION coordinates.

5 Wait until the alignment is completed. The alignment time depends on the local latitude. The time of alignment is less than 10 minutes for latitudes shorter than 70.25 degrees.

• After the alignment of the IRS is completed, the NAV RDY annunciator (green) on the MSU comes on.

6 Turn the MSU1 rotary switch to the NAV position.

• The ALIGN and NAV RD annunciators go off on the MSU.

• The flags ATT FAIL and HDG FAIL go out of view on PFD1 and MFD1 and a valid attitude and heading data are shown.

(c) On the MSU1 panel, push the test switch.

• All MSU1 annunciators come on for eight seconds.

• PFD1 shows ATT TEST and HDG TEST (red) and MFD1 shows HDG TEST (red).

• PFD1 shows these indications: 30 degrees for Magnetic Heading, 15 degrees for Pitch Angle, and 5 degrees for Roll Angle.

NOTE: When the test switch is pushed, the above test data is available for three cycles of eight seconds each. If this time is not sufficient for the reading, keep the switch pushed or push it as many times as necessary.

(d) On the HHDLU/EHHDLU/PIU, select the PITCH ATTITUDE parameter. Select WORDS 22, 54, 86, and 118, and SUBFRAME ALL. Make sure that the value shown on the HHDLU/EHHDLU/PIU is in the tolerance given in the table below:

Table 557 - PITCH ATTITUDE

VALUE (°)	HHDLU/EHHDLU/PIU (OCTAL)
0	7751 - 0026
15	0223 - 0301

(e) On the HHDLU/EHHDLU/PIU, select the ROLL ATTITUDE parameter. Select WORDS 23 and 87, and SUBFRAME ALL. Make sure that the value shown on the HHDLU/EHHDLU/PIU is in the tolerance given in the table below:

Table 558 - ROLL ATTITUDE

VALUE (°)	HHDLU/EHHDLU/PIU (OCTAL)
5	0042 - 0117

(f) On the HHDLU/EHHDLU/PIU, select the MAGNETIC HEADING parameter. Select WORD 18 and SUBFRAME ALL. Make sure that the value shown on the HHDLU/EHHDLU/PIU is in the tolerance given in the table below:

Table 559 - MAGNETIC HEADING

VALUE (°)	HHDLU/EHHDLU/PIU (OCTAL)
30	0476 - 0553

(g) Set the MSU1 rotary switch to the OFF position.

- The ALIGN annunciator on the MSU comes on.
- After three seconds, the flags ATT FAIL and HDG FAIL come on, on PFD1 and the flag HDG FAIL comes into view on MFD1.

(41) (Aircraft with EICAS versions 17 and on) Do the test of the Displays parameters as follows (BINARY BASE).

NOTE: For the PIU use the OCTAL BASE. Cross check all the binary variations described below with its respective octal according to Figure 510.

(a) Make sure that PFD 1 and PFD 2 are in the full compass format (AMM SDS 34-21-00/1).

(b) On the HHDLU/EHHDLU, select the PFD FORMAT (FULL/WX) #1 parameter. Select WORD 48 and SUBFRAMES 1 and 3.

(c) Make sure that the HHDLU/EHHDLU 11th bit is "0".

(d) Press the FULL/WX key on DC-550 1.

Result:

1 PFD 1 changes to the arc format.

2 The HHDLU/EHHDLU 11th bit changes from "0" to "1".

(e) Press the FULL/WX key on DC-550 1 again.

Result:

1 PFD 1 comes back to the full format.

2 The HHDLU/EHHDLU 11th bit changes from "1" to "0".

(f) Make sure that MFD 1 and MFD 2 are in the MAP format (AMM SDS 34-21-00/1).

(g) On the HHDLU/EHHDLU, select the MFD FORMAT (PLAN/MAP) #1 parameter. Select WORD 48 and SUBFRAMES 1 and 3.

(h) Make sure that the HHDLU/EHHDLU 12th bit is "0".

(i) Through the MFD 1 primary menu, select the PLAN format.

Result:

1 MFD 1 changes to the PLAN format.

2 The HHDLU/EHHDLU 12th bit changes from "0" to "1".

(j) On the HHDLU/EHHDLU, select the PILOT PFD WX DISPLAYED HALF RANGES parameter. Select WORD 48 and SUBFRAMES 1 and 3.

(k) On DC 550 1, on the glareshield panel, push the FULL/WX pushbutton, to start the WX mode on PFD 1 (AMM SDS 34-42-00/1).

Result:

1 PFD 1 shows the WX inscription in amber, on the left corner.

2 The compass card of PFD 1 goes to the ARC mode.

(l) (Aircraft with dual weather radar controller panel) Set the RADAR rotary switch, on the pilot weather radar controller panel, on the glareshield panel, to the SBY position.

(m) (Aircraft with single weather radar controller panel) Set the RADAR rotary switch, on the weather radar controller panel, on the control pedestal, to the SBY position.

(n) Wait until the FSBY indication is shown in green on the PFD 1 display.

(o) Push the "UP ARROW" pushbutton to increase the range, or the "DOWN ARROW" pushbutton to decrease the range, on the weather radar controller panel, and make sure that the 2nd, 3rd, 4th and 5th bits in the HHDLU/EHHDLU agree with the table below.

Table 560 - PILOT PFD WX DISPLAYED HALF RANGES

SELECTED RANGE	HHDLU/EHHDLU (5th, 4th, 3rd, and 2nd bits)
2.5	0011
5	0100
12.5	0101
25	0110
50	0111
100	1001
150	1010

(p) (Aircraft with dual weather radar controller panel) Set the RADAR rotary switch, on the pilot weather radar controller panel, on the glareshield panel, to the OFF position.

(q) (Aircraft with single weather radar controller panel) Set the RADAR rotary switch, on the weather radar controller panel, on the control pedestal, to the OFF position.

(r) Press the FULL/WX key on DC-550 1 again.

Result:

1 PFD 1 comes back to the full format.

(s) On the HHDLU/EHHDLU, select the PRIMARY NAVIGATION SYSTEM REFERENCE (PILOT) parameter. Select the WORD 48 and SUBFRAMES 1 and 3.

(t) Push the NAV or FMS pushbutton on DC 550 1.

Result:

1 The primary navigation system is displayed on PFD 1.

2 The parameter is displayed on the HHDLU/EHHDLU according to the table below.

Table 561 - PRIMARY NAVIGATION SYSTEM REFERENCE (PILOT)

PRIMARY NAVIGATION SYSTEM DISPLAYED ON PFD 1	HHDLU/EHHDLU (9th, 8th, 7th, and 6th bits)
VOR 1	0000
VOR 2	0001
ILS 1	0010
ILS 2	0011
FMS 1	0100
FMS 2	0101

(u) On the HHDLU/EHHDLU, select the PFD FORMAT (FULL/WX) #2 parameter from. Select WORD 48 and SUBFRAMES 2 and 4.

(v) Make sure that the HHDLU/EHHDLU 11th bit is "0".

(w) Press the FULL/WX key on DC-550 2.

Result:

1 PFD 2 changes to the arc format.

2 The HHDLU/EHHDLU 11th bit changes from "0" to "1".

(x) Press the FULL/WX key on DC-550 2 again.

Result:

1 PFD 2 comes back to the full format.

2 The HHDLU/EHHDLU 11th bit changes from "1" to "0".

(y) On the HHDLU/EHHDLU, select the MFD FORMAT (PLAN/MAP) #2 parameter. Select WORD 48 and SUBFRAMES 2 and 4.

(z) Make sure that the HHDLU/EHHDLU 12th bit is "0".

(aa) Through the MFD 2 primary menu, select the PLAN format.

Result:

1 MFD 2 changes to the PLAN format.

2 The HHDLU/EHHDLU 12th bit changes from "0" to "1".

(ab) On the HHDLU/EHHDLU, select the COPILOT PFD WX DISPLAYED HALF RANGES parameter. Select WORD 48 and SUBFRAMES 2 and 4.

(ac) On DC 550 2, on the glareshield panel, push the FULL/WX pushbutton, to start the WX mode on PFD 2.

Result:

1 PFD 2 shows the WX inscription in amber, on the left corner.

2 The compass card of PFD 2 goes to the ARC mode.

(ad) (Aircraft with dual weather radar controller panel) Set the RADAR rotary switch, on the copilot weather radar controller panel, on the glareshield panel, to the SBY position.

(ae) (Aircraft with single weather radar controller panel) Set the RADAR rotary switch, on the weather radar controller panel, on the control pedestal, to the SBY position.

(af) Wait until the FSBY indication is shown in green on the PFD 2 display.

(ag) Push the "UP ARROW" pushbutton to increase the range, or the "DOWN ARROW" pushbutton to decrease the range, on the weather radar controller panel, and make sure that the 2nd, 3rd, 4th, and 5th bits on the HHDLU/EHHDLU agree with the table below.

Table 562 - COPILOT PFD WX DISPLAYED HALF RANGES

SELECTED RANGE	HHDLU/EHHDLU (5th, 4th, 3rd and 2nd bits)
2.5	0011
5	0100
12.5	0101
25	0110
50	0111
100	1001
150	1010

(ah) (Aircraft with dual weather radar controller panel) Set the RADAR rotary switch, on the copilot weather radar controller panel, on the glareshield panel, to the OFF position.

(ai) (Aircraft with single weather radar controller panel) Set the RADAR rotary switch, on the weather radar controller panel, on the control pedestal, to the OFF position.

(aj) Press the FULL/WX key on DC-550 2 again.

Result:

1 PFD 2 comes back to the full format.

(ak) On the HHDLU/EHHDLU, select the PRIMARY NAVIGATION SYSTEM REFERENCE (COPILOT) parameter. Select WORD 48 and SUBFRAMES 2 and 4.

(al) Push the NAV or FMS pushbutton on DC 550 2.

Result:

1 The primary navigation system is displayed on PFD 2.

2 The parameter is displayed on the HHDLU/EHHDLU according to the table below.

Table 563 - PRIMARY NAVIGATION SYSTEM REFERENCE (COPILOT)

PRIMARY NAVIGATION SYSTEM DISPLAYED ON PFD 2	HHDLU/EHHDLU (9th, 8th, 7th, and 6th bits)
VOR 1	0000
VOR 2	0001
ILS 1	0010
ILS 2	0011
FMS 1	0100
FMS 2	0101

(am) On the HHDLU/EHHDLU, select the PILOT PFD (DU #1) STATUS parameter. Select WORD 51 and SUBFRAMES 1 and 3.

(an) On the circuit breaker panel, open the PFD 1 circuit breaker.

Result:

1 PFD 1 goes off.

2 The HHDLU/EHHDLU 1st bit goes to "1".

(ao) On the circuit breaker panel, close the PFD 1 circuit breaker.

Result:

1 PFD 1 comes on.

2 The HHDLU/EHHDLU 1st bit comes back to "0".

(ap) On the HHDLU/EHHDLU, select the EICAS (DU #3) STATUS parameter. Select WORD 51 and SUBFRAMES 1 and 3.

(aq) On the circuit breaker panel, open the EICAS DISPLAY circuit breaker.

Result:

1 The EICAS display goes off.

2 The HHDLU/EHHDLU 3rd bit goes to "1".

(ar) On the circuit breaker panel, close the EICAS DISPLAY circuit breaker.

Result:

1 The EICAS display comes on.

2 The HHDLU/EHHDLU 3rd bit goes to "0".

(as) On the HHDLU/EHHDLU, select the PILOT DU REVERSION parameter. Select WORD 51 and SUBFRAMES 1 and 3.

(at) On the pilot reversionary panel, make sure that the MFD rotate switch is on the NORM position.

Result:

1 MFD remains in the normal operation mode.

2 The HHDLU/EHHDLU 4th and 5th bits remain in "0".

(au) On the pilot reversionary panel, turn the MFD rotate switch to the PFD position.

Result:

1 MFD 1 is configured to operate as a PFD 1.

2 The image of PFD 1 is shown on the MFD 1 display.

3 The HHDLU/EHHDLU 5th bit remains in "0" and the 4th bit goes to "1".

(av) On the pilot reversionary panel, turn the MFD rotate switch to the EICAS position.

Result:

1 MFD 1 is configured to work as an EICAS display.

2 The image of the EICAS is shown on the MFD 1 display.

3 The HHDLU/EHHDLU 4th bit goes to "0" and the 5th bits goes to "1".

(aw) Restore the MFD rotate switch to the NORM position.

(ax) On the HHDLU/EHHDLU, select the PILOT SG REVERSION parameter. Select WORD 51 and SUBFRAMES 1 and 3.

(ay) On the pilot reversionary panel, push the SG pushbutton.

Result:

1 The SG pushbutton striped bar light comes on.

2 PFD 1 shows SG 2 (amber).

3 The HHDLU/EHHDLU 6th bit goes to "1".

(az) On the pilot reversionary panel, push the SG pushbutton again.

Result:

1 The SG pushbutton striped bar light goes off.

2 The HHDLU/EHHDLU 6th bit changes to "0".

3 The SG 2 indication on PFD 1 (amber) disappears.

(ba) On the HHDLU/EHHDLU, select the PILOT ADC REVERSION parameter. Select WORD 51 and SUBFRAMES 1 and 3.

(bb) Push the ADC pushbutton, on the pilot reversionary panel.

Result:

1 PFD 1 shows ADC 2 (amber).

2 The ADC pushbutton striped bar light comes on.

3 The HHDLU/EHHDLU 7th bit changes to "1".

(bc) Push the ADC pushbutton again, on the pilot reversionary panel.

Result:

1 The PFD 1 goes back to the normal configuration.

2 The HHDLU/EHHDLU 7th bit comes back to "0".

3 The ADC 2 indication on PFD 1 (amber) disappears.

(bd) On the HHDLU/EHHDLU, select the PILOT AHRS/IRS REVERSION parameter. Select WORD 51 and SUBFRAMES 1 and 3.

(be) Push the AHRS (or IRS) pushbutton, on the pilot reversionary panel.

Result:

1 (Aircraft with AHRS) PFD 1 shows MAG 2 or DG2 (amber) and ATT 2 (amber).

2 (Aircraft with Dual IRS) PFD 1 shows MAG 2 (amber) and ATT 2 (amber).

3 The HHDLU/EHHDLU 8th bit changes to "1".

(bf) Push the AHRS (or IRS) pushbutton again, on the pilot reversionary panel.

Result:

1 The PFDs go back to the normal configuration.

2 The HHDLU/EHHDLU 8th bit changes to "0".

3 (Aircraft with AHRS) The MAG 2 or DG2 (amber) and ATT 2 (amber) indications, disappear, on the PFD 1.

4 (Aircraft with Dual IRS) The MAG 2 (amber) and ATT 2 (amber) indications disappear, on the PFD 1.

(bg) On the HHDLU/EHHDLU, select the COPILOT PFD (DU #5) STATUS parameter. Select WORD 51 and SUBFRAMES 2 and 4.

(bh) On the circuit breaker panel, open the PFD 2 circuit breaker.

Result:

1 PFD 2 goes off.

2 The HHDLU/EHHDLU 1st bit goes to "1".

(bi) On the circuit breaker panel, close the PFD 2 circuit breaker.

Result:

1 PFD 2 comes on.

2 The HHDLU/EHHDLU 1st bit comes back to "0".

(bj) On the HHDLU/EHHDLU, select the COPILOT MFD (DU #4) STATUS parameter. Select WORD 51 and SUBFRAMES 2 and 4.

(bk) On the circuit breaker panel, open the MFD 2 circuit breaker.

Result:

1 MFD 2 goes off.

2 The HHDLU/EHHDLU 2nd bit goes to "1".

(bl) On the circuit breaker panel, close the MFD 2 circuit breaker.

Result:

1 MFD 2 comes on.

2 The HHDLU/EHHDLU 2nd bit comes back to "0".

(bm) On the HHDLU/EHHDLU, select the COPILOT DU REVERSION parameter. Select WORD 51 and SUBFRAMES 2 and 4.

(bn) On the copilot reversionary panel, make sure that the MFD rotate switch is on the NORM position.

Result:

1 MFD remains in the normal operation mode.

2 The HHDLU/EHHDLU 4th and 5th bits remain in "0".

(bo) On the copilot reversionary panel, turn the MFD rotate switch to the PFD position.

Result:

1 MFD 2 is configured to operate as a PFD 2.

2 The image of PFD 2 is shown on the MFD 2 display.

3 The HHDLU/EHHDLU 5th bit remains in "0" and the 4th bit goes to "1".

(bp) On the copilot reversionary panel, turn the MFD rotate switch to the EICAS position.

Result:

1 MFD 2 is configured to work as an EICAS display.

2 The image of EICAS is shown on the MFD 2 display.

3 The HHDLU/EHHDLU 4th bit goes to "0" and the 5th bits goes to "1".

(bq) Restore the MFD rotate switch to the NORM position.

(br) On the HHDLU/EHHDLU, select the COPILOT SG REVERSION parameter. Select WORD 51 and SUBFRAMES 2 and 4.

(bs) On the copilot reversionary panel, push the SG.

Result:

1 The SG pushbutton striped bar light comes on.

2 PFD 2 shows SG 1 (amber).

3 The HHDLU/EHHDLU 6th bit goes to "1".

(bt) On the copilot reversionary panel, push the SG again.

Result:

1 The SG pushbutton striped bar light goes off.

2 The HHDLU/EHHDLU 6th bit changes to "0".

3 On the PFD 2, the SG 1 (amber) indication disappears.

(bu) On the HHDLU/EHHDLU, select the COPILOT ADC REVERSION parameter. Select WORD 51 and SUBFRAMES 2 and 4.

(bv) Push the ADC pushbutton, on the copilot reversionary panel.

Result:

1 PFD 2 shows ADC 1 (amber).

2 The ADC pushbutton striped bar light comes on.

3 The HHDLU/EHHDLU 7th bit changes to "1".

(bw) Push the ADC pushbutton again, on the copilot reversionary panel.

Result:

1 The PFD goes back to the normal configuration.

2 The HHDLU/EHHDLU 7th bit comes back to "0".

3 On the PFD 2, the ADC 1 (amber) indication disappears.

(bx) On the HHDLU/EHHDLU, select COPILOT AHRS/IRS REVERSION parameter. Select WORD 51 and SUBFRAMES 2 and 4.

(by) Push the AHRS (or IRS) pushbutton, on the copilot reversionary panel.

Result:

1 (Aircraft with AHRS) PFD 2 shows MAG 1 or DG1 (amber) and ATT 1 (amber).

2 (Aircraft with Dual IRS) PFD 2 shows MAG 1 (amber) and ATT 1 (amber).

3 The HHDLU/EHHDLU 8th bit changes to "1".

(bz) Push the AHRS (or IRS) pushbutton again, on the copilot reversionary panel.

Result:

1 The PFDs go back to the normal configuration.

2 The HHDLU/EHHDLU 8th bit changes to "0" in all subframes.

3 (Aircraft with AHRS) On the PFD 2, the MAG 1 or DG1 (amber) and ATT 1 (amber) indications disappear.

4 (Aircraft with Dual IRS) On the PFD 2, the MAG 1 (amber) and ATT 1 (amber) indications disappear.

(ca) On the HHDLU/EHHDLU, select the PILOT MFD MAP DISPLAYED RANGES parameter. Select WORD 112 and SUBFRAMES 1 and 3.

(cb) On MFD 1, push the WX mode pushbutton (AMM SDS 34-42-00/1).

Result:

1 MFD 1 shows the WX inscription in amber, on the left corner.

2 MFD 1 is shown in MAP format.

(cc) (Aircraft with dual weather radar controller panel) Set the RADAR rotary switch, on the pilot weather radar controller panel, on the glareshield panel, to the SBY position.

(cd) (Aircraft with single weather radar controller panel) Set the RADAR rotary switch, on the weather radar controller panel, on the control pedestal, to the SBY position.

(ce) Wait until the FSBY indication is shown in green on the MFD 1 display.

(cf) Push the "UP ARROW" pushbutton to increase the range, or the "DOWN ARROW" pushbutton to decrease the range, on the weather radar controller panel, and make sure that the 2nd, 3rd, 4th, and 5th bits on the HHDLU/EHHDLU agree with the table below.

Table 564 - PILOT MFD MAP DISPLAYED RANGES

SELECTED RANGE	HHDLU/EHHDLU (5th, 4th, 3rd and 2nd bits)
2.5	0011
5	0100
12.5	0101
25	0110
50	0111
100	1001
150	1010

NOTE: If the Map format is selected on MFD 1, the ranges are half ranges. But, if the Plan format is selected, the ranges are full ranges and the values are 5, 10, 25, 50, 100, 200, 300, 500, and 1000.

(cg) (Aircraft with dual weather radar controller panel) Set the RADAR rotary switch, on the pilot weather radar controller panel, on the glareshield panel, to the OFF position.

(ch) (Aircraft with single weather radar controller panel) Set the RADAR rotary switch, on the weather radar controller panel, on the control pedestal, to the OFF position.

(ci) On the HHDLU/EHHDLU, select the PILOT MFD TCAS FORMAT (BIT) parameter. Select WORD 112 and SUBFRAMES 1 and 3.

(cj) Push the TCAS menu button on the MFD 1 bezel controller (AMM SDS 34-43-00/1).

Result:

1 The TCAS display is shown on the MFD 1 map mode.

2 The HHDLU/EHHDLU 11th bit goes to "1".

(ck) (Aircraft with EGPWS) On the HHDLU/EHHDLU, select the PILOT MFD WX/EGPWS FORMAT (2 bits) parameter. Select WORD 112 and SUBFRAMES 1 and 3.

(cl) Make sure that MFD 1 is in the MAP format (AMM SDS 34-22-00/1).

(cm) Push many times the TERR/WX menu button on the MFD 1 bezel controller.

(cn) Compare the information shown on MFD 1 with the values in the table below.

Table 565 - PILOT MFD WX/EGPWS FORMAT

INFORMATION ON MFD	HHDLU/EHHDLU (10th and 9th bits)
none	00
WX	01
TERRAIN	10

(co) On the HHDLU/EHHDLU, select the PILOT MFD CHECKLIST FORMAT (BIT) parameter. Select WORD 112 and SUBFRAMES 1 and 3.

(cp) Make sure that CKLIST is not selected on MFD 2.

(cq) Push the CKLST menu button on MFD 1 bezel controller.

Result:

1 The MASTER INDEX display is shown on MFD 1.

2 The HHDLU/EHHDLU 12th bit goes to "1".

(cr) Push the RTN menu button on MFD 1 bezel controller.

Result:

1 The HHDLU/EHHDLU 12th bit comes back to "0".

(cs) On the HHDLU/EHHDLU, select the COPILOT MFD MAP DISPLAYED RANGES parameter. Select WORD 112 and SUBFRAMES 2 and 4.

(ct) On MFD 2, push the WX mode pushbutton (AMM SDS 34-42-00/1).

Result:

1 MFD 2 shows the WX inscription in amber, on the left corner.

2 MFD 2 is shown in MAP format.

(cu) (Aircraft with dual weather radar controller panel) Set the RADAR rotary switch, on the pilot weather radar controller panel, on the glareshield panel, to the SBY position.

(cv) (Aircraft with single weather radar controller panel) Set the RADAR rotary switch, on the weather radar controller panel, on the control pedestal, to the SBY position.

(cw) Wait until the FSBY indication is shown in green on the MFD 2 display.

(cx) Push the "UP ARROW" pushbutton to increase the range, or the "DOWN ARROW" pushbutton to decrease the range, on the weather radar controller panel, and make sure that the 2nd, 3rd, 4th, and 5th bits on the HHDLU/EHHDLU agree with the table below.

Table 566 - COPILOT MFD MAP DISPLAYED RANGES

SELECTED RANGE	HHDLU/EHHDLU (5th, 4th, 3rd, and 2nd bits)
2.5	0011
5	0100
12.5	0101
25	0110
50	0111
100	1001
150	1010

NOTE: If the Map format is selected on MFD 2, the ranges are half ranges. But, if the Plan format is selected, the ranges are full ranges and the values are 5, 10, 25, 50, 100, 200, 300, 500, and 1000.

(cy) (Aircraft with dual weather radar controller panel) Set the RADAR rotary switch, on the pilot weather radar controller panel, on the glareshield panel, to the OFF position.

(cz) (Aircraft with single weather radar controller panel) Set the RADAR rotary switch, on the weather radar controller panel, on the control pedestal, to the OFF position.

(da) On the HHDLU/EHHDLU, select the COPILOT MFD TCAS FORMAT (BIT) parameter. Select WORD 112 and SUBFRAMES 2 and 4.

(db) Push the TCAS menu button on the MFD 2 bezel controller (AMM SDS 34-43-00/1).

Result:

1 The TCAS display is shown on the MFD 2 map mode.

2 The HHDLU/EHHDLU 11th bit goes to "1".

(dc) (Aircraft with EGPWS) On the HHDLU/EHHDLU, select the COPILOT MFD WX/EGPWS FORMAT (2 bits) parameter. Select WORD 112 and SUBFRAMES 2 and 4.

(dd) Make sure that MFD 2 is in MAP format (AMM SDS 34-22-00/1).

(de) Push many times the TERR/WX menu button on the MFD 2 bezel controller.

(df) Compare the information shown on MFD 2 with the values in the table below.

Table 567 - COPILOT MFD WX/EGPWS FORMAT

INFORMATION ON MFD	HHDLU/EHHDLU (10th and 9th bits)
none	00
WX	01
TERRAIN	10

(dg) On the HHDLU/EHHDLU, select the COPILOT MFD CHECKLIST FORMAT (BIT) parameter. Select WORD 112 and SUBFRAMES 2 and 4.

(dh) Make sure that CKLIST is not selected on MFD 1.

(di) Push the CKLST menu button on the MFD 2 bezel controller.

Result:

1 The MASTER INDEX display is shown on MFD 2.

2 The HHDLU/EHHDLU 12th bit goes to "1".

(dj) Push the RTN menu button on MFD 1 bezel controller.

Result:

1 The HHDLU/EHHDLU 12th bit comes back to "0".

(42) Do the test of the Hydraulic Low Pressure parameters (BINARY BASE)

WARNING: BEFORE YOU TURN ON THE EMDP, MAKE SURE THAT THE CONTROL SURFACES OPERATED BY THE HYDRAULIC POWER (RUDDER, AILERON, SPOILERS, ETC) ARE CLEAR OF OBSTACLES.

NOTE: For the PIU use the OCTAL BASE. Cross check all the binary variations described below with its respective octal according to Figure 510.

(a) On the HHDLU/EHHDLU, select the HYDRAULIC LOW PRESSURE # 1 parameter. Select WORD 26, SUBFRAME ALL.

(b) On the overhead panel, set the SYS 1 ELEC PUMP switch to AUTO.

(c) On the HHDLU/EHHDLU, the 9th bit changes from 1 to 0.

(d) On the overhead panel, set SYS 1 ELEC PUMP to OFF.

(e) On the HHDLU/EHHDLU, the 9th bit changes from 0 to 1.

(f) On the HHDLU/EHHDLU, select the HYDRAULIC LOW PRESSURE # 2 parameter. Select WORD 26, SUBFRAME ALL.

(g) On the overhead panel, set the SYS 2 ELEC PUMP switch to AUTO.

(h) On the HHDLU/EHHDLU, the 10th bit changes from 1 to 0.

(i) On the overhead panel, set SYS 2 ELEC PUMP to OFF.

(j) On the HHDLU/EHHDLU, the 10th bit changes from 0 to 1.

(43) (Aircraft with EICAS versions 17 and on) Do the test of the AC/DC Distribution parameters (BINARY BASE).

NOTE: For the PIU use the OCTAL BASE. Cross check all the binary variations described below with its respective octal according to Figure 510.

(a) On the HHDLU/EHHDLU, select the AC/DC DISTRIBUTION STATUS parameters. Select WORD 3 and SUBFRAME 4.

(b) Make sure that the DC BUS 1 and 2, ESSENTIAL DC BUS 1 and 2, CENTRAL DC BUS, SHED DC BUS 1 and 2, and the 115 V AC BUS are operational. Observe that there are no EICAS messages indicating that any of the buses is off.

Result:

1 Make sure that the 2nd, 3rd, 4th, 5th, 6th, 7th, 8th, and 9th bits show "1".

(c) On the Left Power Control and Distribution Box (behind the pilot seat), open the ESSENTIAL DC BUS 1 VOLTAGE (Location Tip: RB ESSENTIAL DC BUS 1/ VOLTAGE) circuit breaker.

Result:

1 The 4th bit changes from "1" to "0".

2 The ESS BUS 1 OFF Caution message is shown on the EICAS display.

3 The master caution tone sounds.

4 On the glareshield panel, the master caution lighted pushbuttons flash.

(d) On the glareshield panel, push a master caution lighted pushbutton.

Result:

1 The master caution tone ceases.

2 The master caution lighted pushbuttons goes off.

(e) On the Left Power Control and Distribution Box (behind the pilot seat), close the ESSENTIAL DC BUS 1 VOLTAGE (Location Tip: RB ESSENTIAL DC BUS 1/ VOLTAGE) circuit breaker.

Result:

1 The 4th bit changes from "0" to "1".

2 The ESS BUS 1 OFF Caution message goes out of view on the EICAS display.

(f) On the Left Power Control and Distribution Box (behind the pilot seat), open the SHED DC BUS 1 VOLTAGE (Location Tip: RB SHED DC BUS 1/VOLTAGE) circuit breaker.

Result:

1 The 7th bit changes from "1" to "0".

2 The SHED BUS 1 OFF Caution message is shown on the EICAS display.

3 The master caution tone sounds.

4 On the glareshield panel, the master caution lighted pushbuttons flash.

(g) On the glareshield panel, push a master caution lighted pushbutton.

Result:

1 The master caution tone ceases.

2 The master caution lighted pushbuttons goes off.

(h) On the Left Power Control and Distribution Box (behind the pilot seat), close the SHED DC BUS 1 VOLTAGE (Location Tip: RB SHED DC BUS 1/VOLTAGE) circuit breaker.

Result:

1 The 7th bit changes from "0" to "1".

2 The SHED BUS 1 OFF Caution message goes out of view on the EICAS display.

(i) On the Left Power Control and Distribution Box (behind the pilot seat), open the DC BUS 1 VOLTAGE (Location Tip: RB DC BUS 1/VOLTAGE) circuit breaker.

Result:

1 The 2nd bit changes from "1" to "0".

2 The DC BUS 1 OFF Caution message is shown on the EICAS display.

3 The master caution tone sounds.

4 On the glareshield panel, the master caution lighted pushbuttons flash.

(j) On the glareshield panel, push a master caution lighted pushbutton.

Result:

1 The master caution tone ceases.

2 The master caution lighted pushbuttons goes off.

(k) On the Left Power Control and Distribution Box (behind the pilot seat), close the DC BUS 1 VOLTAGE (Location Tip: RB DC BUS 1/VOLTAGE) circuit breaker.

Result:

1 The 2nd bit changes from "0" to "1".

2 The DC BUS 1 OFF Caution message goes out of view on the EICAS display.

(l) On the Left Power Control and Distribution Box (behind the pilot seat), open the INVERTER (Location Tip: RB DC BUS 1/INVERTER) circuit breaker.

Result:

1 The 9th bit changes from "1" to "0".

2 The 115 V AC BUS OFF Caution message is shown on the EICAS display.

3 The master caution tone sounds.

4 On the glareshield panel, the master caution lighted pushbuttons flash.

(m) On the glareshield panel, push a master caution lighted pushbutton.

Result:

1 The master caution tone ceases.

2 The master caution lighted pushbuttons goes off.

(n) On the Left Power Control and Distribution Box (behind the pilot seat), close the INVERTER (Location Tip: RB DC BUS 1/INVERTER) circuit breaker.

Result:

1 The 9th bit changes from "0" to "1".

2 The 115 V AC BUS OFF Caution message goes out of view on the EICAS display.

(o) On the Right Power Control and Distribution Box (behind the copilot seat), open the ESS DC BUS 2 VOLTAGE (Location Tip: RB ESSENTIAL DC BUS 2/ VOLTAGE) circuit breaker.

Result:

1 The 5th bit changes from "1" to "0".

2 The ESS BUS 2 OFF Caution message is shown on the EICAS display.

3 The master caution tone sounds.

4 On the glareshield panel, the master caution lighted pushbuttons flash.

(p) On the glareshield panel, push a master caution lighted pushbutton.

Result:

1 The master caution tone ceases.

2 The master caution lighted pushbuttons goes off.

(q) On the Right Power Control and Distribution Box (behind the copilot seat), close the ESS DC BUS 2 VOLTAGE (Location Tip: RB ESSENTIAL DC BUS 2// VOLTAGE) circuit breaker.

Result:

1 The 5th bit changes from "0" to "1".

2 The ESS BUS 2 OFF Caution message goes out of view on the EICAS display.

(r) On the Right Power Control and Distribution Box (behind the copilot seat), open the SHED DC BUS 2 VOLTAGE (Location Tip: RB SHED DC BUS 2/VOLTAGE) circuit breaker

Result:

1 The 8th bit changes from "1" to "0".

2 The SHED BUS 2 OFF Caution message is shown on the EICAS display.

3 The master caution tone sounds.

4 On the glareshield panel, the master caution lighted pushbuttons flash.

(s) On the glareshield panel, push a master caution lighted pushbutton

Result:

1 The master caution tone ceases.

2 The master caution lighted pushbuttons goes off.

(t) On the Right Power Control and Distribution Box (behind the copilot seat), close the SHED DC BUS 2 VOLTAGE (Location Tip: RB SHED DC BUS 2/VOLTAGE) circuit breaker.

Result:

1 The 8th bit changes from "0" to "1".

2 The SHED BUS 2 OFF Caution message goes out of view on the EICAS display.

(u) On the Right Power Control and Distribution Box (behind the copilot seat), open the DC BUS 2 VOLTAGE (Location Tip: RB DC BUS 2/VOLTAGE) circuit breaker.

Result:

1 The 3th bit changes from "1" to "0".

2 The DC BUS 2 OFF Caution message is shown on the EICAS display.

3 The master caution tone sounds.

4 On the glareshield panel, the master caution lighted pushbuttons flash.

(v) On the glareshield panel, push a master caution lighted pushbutton.

Result:

1 The master caution tone ceases.

2 The master caution lighted pushbuttons goes off.

(w) On the Right Power Control and Distribution Box (behind the copilot seat), close the DC BUS 2 VOLTAGE (Location Tip: RB DC BUS 2/VOLTAGE) circuit breaker.

Result:

1 The 3th bit changes from "0" to "1".

2 The DC BUS 2 OFF Caution message goes out of view on the EICAS display.

(x) On the Right Power Control and Distribution Box (behind the copilot seat), open the CENTRAL DC BUS VOLTAGE (Location Tip: RB CENTRAL DC BUS/ VOLTAG) circuit breaker.

Result:

1 The 6th bit changes from "1" to "0".

(y) On the Right Power Control and Distribution Box (behind the copilot seat), close the CENTRAL DC BUS VOLTAGE (Location Tip: RB CENTRAL DC BUS/ VOLTAG) circuit breaker.

Result:

1 The 6th bit changes from "0" to "1".

(44) On the Maintenance Panel, set the DFDR switch to the NORM position.

(45) Deenergize the aircraft (AMM TASK 20-40-01-860-801-A/200).

(46) Disconnect the Pitot/Static System Test Set (GSE 129) from the aircraft (AMM TASK 34-13-00-000-801-A/400).

NOTE: To measure the parameters of steps on-aircraft check and downloading check, the engines must be in operation.

(47) Put the aircraft in the engine test area.

NOTE: To do the check of the parameters with the engines in operation, refer to one of the alternative procedures, on-aircraft check or downloading check:

- The procedure called on-aircraft check, permits the check of the parameters in aircraft at the same time as they are recorded in the FDR.
- (Aircraft with FDR Honeywell installed) The procedure called downloading check, permits the check of the parameters in a laboratory, after a downloading is done. For this procedure, it is necessary to have an Automated Test Unit (ATU) or an IBM-compatible personal computer with Microsoft Windows 3.1 and on, and PCMCIA driver, and ADRAS for Windows to process the aircraft flight data. Get the EMB-145 Parameter Conversion Database, necessary for the ADRAS, from EMBRAER - Customer Support Division.
- (Aircraft with FDR L3 installed) The procedure called downloading check, permits the check of the parameters in a laboratory, after a downloading

is done. For this procedure, it is necessary to have an Automated Test Unit (ATU) or an IBM-compatible personal computer with ROSE for Windows (GSE 473) to process the aircraft flight data. Get the EMB-145 Parameter Conversion Database, necessary for the ROSE, from EMBRAER - Customer Support Division.

- If you need the data stored in the FDR for a different purpose, do a downloading of the stored data before you do the next steps. That is because you can overwrite the data stored in the FDR.
- During the downloading process, the FDR do not record data.

(48) (On-Aircraft Check) Do the on-aircraft test of the parameters with the engines in operation, at the same time as they are recorded in the FDR.

(a) Start the engines (AMM TASK 71-00-01-910-801-A/200).

NOTE: When you do the engine start up procedure, make sure to set the takeoff temperature, as given in the task. This step is important for the correct reading of the TAKEOFF TEMPERATURE parameter.

(b) On the Maintenance Panel, set the DFDR switch to the TEST position.

NOTE: Setting the DFDR switch to the test position, all data recorded in FDR will be overwritten.

(c) Make sure that the systems below are operational and on:

- FDR System (AMM SDS 31-31-00/1).
- EICAS (AMM SDS 31-41-00/1).

(d) The items (e) thru (j) are applicable to aircraft with EICAS versions 17 and on.

(e) On the HHDLU/EHHDLU, select the FADEC #1A and FADEC #1B IGNITION ON parameters. Select WORD 16, SUBFRAME ALL, BINARY BASE.

NOTE: For the PIU use the OCTAL BASE. Cross check all the binary variations described below with its respective octal according to Figure 510.

(f) On the POWERPLANT control panel, on the Overhead Panel, set the Engine #1 Ignition switch to "ON" position.

Result:

1 On the HHDLU/EHHDLU, make sure that the 6th (FADEC #1A) and the 8th (FADEC #1B) bits change from "0" to "1".

(g) Return the Engine #1 Ignition switch to the "AUTO" position.

Result:

1 On the HHDLU/EHHDLU, make sure that the 6th and the 8th bits change from "1" to "0".

(h) On the HHDLU/EHHDLU, select the FADEC #2A and FADEC #2B IGNITION ON parameters. Select WORD 80, SUBFRAME ALL, BINARY BASE.

(i) On the POWERPLANT control panel, on the Overhead Panel, set the Engine #2 Ignition switch to the "ON" position.

Result:

1 On the HHDLU/EHHDLU, make sure that the 6th (FADEC #2A) and the 8th (FADEC #2B) bits change from "0" to "1".

(j) Return the Engine #2 Ignition switch to the "AUTO" position.

Result:

1 On the HHDLU/EHHDLU, make sure that the 6th and the 8th bits change from "1" to "0".

(k) On the HHDLU/EHHDLU/PIU, select the ENGINE N1 # 1 parameter. Select WORD 11, SUBFRAME ALL, and DECIMAL BASE.

(l) With the engine # 2 thrust control lever at the IDLE position, set the engine # 1 thrust control lever to 30% N1. Stop until the engine indications on the EICAS become stable:

Result:

1 Write the engine N1 # 1 values shown on the HHDLU/EHHDLU/PIU and on the EICAS.

2 Multiply the value shown on the HHDLU/EHHDLU/PIU by the conversion coefficient 0.125061.

3 Make sure that the value found is the same as the engine N1 # 1 indication on the EICAS, with a tolerance of ± 2% RPM.

(m) Repeat the last step again with 40% and 50% N1.

(n) On the HHDLU/EHHDLU/PIU, select the ENGINE N1 # 2 parameter. Select WORD 75, SUBFRAME ALL, and DECIMAL BASE.

(o) With the engine # 1 thrust control lever at the IDLE position, set the engine # 2 thrust control lever to 30% N1. Stop until the engine indications on the EICAS become stable:

Result:

1 Write the engine N1 # 2 values shown on the HHDLU/EHHDLU/PIU and on the EICAS.

2 Multiply the value shown on the HHDLU/EHHDLU/PIU by the conversion coefficient 0.125061.

3 Make sure that the value found is the same as the engine N1 # 2 indication on the EICAS, with a tolerance of ± 2% RPM.

(p) Repeat the last step again with 40% and 50% N1.

(q) On the HHDLU/EHHDLU/PIU, select the ENGINE N2 # 1 parameter. Select WORD 43, SUBFRAME ALL, and DECIMAL BASE.

(r) With the engine # 2 thrust control lever at the IDLE position, set the engine # 1 thrust control lever to 30% N1. Stop until the engine indications on the EICAS become stable:

Result:

1 Write the engine N2 # 1 values shown on the HHDLU/EHHDLU/PIU and on the EICAS.

2 Multiply the value shown on the HHDLU/EHHDLU/PIU by the conversion coefficient 0.125061.

3 Make sure that the value found is the same as the engine N2 # 1 indication on the EICAS, with a tolerance of ± 2% RPM.

(s) Repeat the last step again with 40% and 50% N1.

(t) On the HHDLU/EHHDLU/PIU, select the ENGINE N2 # 2 parameter. Select WORD 107, SUBFRAME ALL, and DECIMAL BASE.

(u) With the engine # 1 thrust control lever at the IDLE position, set the engine # 2 thrust control lever to 30% N1. Stop until the engine indications on the EICAS become stable:

Result:

1 Write the engine N2 # 2 values shown on the HHDLU/EHHDLU/PIU and on the EICAS.

2 Multiply the value shown on the HHDLU/EHHDLU/PIU by the conversion coefficient 0.125061.

3 Make sure that the value found is the same as the engine N2 # 2 indication on the EICAS, with a tolerance of ± 2% RPM.

(v) Repeat the last step again with 40% and 50% N1.

(w) On the HHDLU/EHHDLU/PIU, select the TAKEOFF TEMPERATURE # 1 parameter. Select WORD 60, SUBFRAME ALL, and DECIMAL BASE.

(x) With the engine # 2 thrust control lever at the IDLE position, set the engine # 1 thrust control lever to 30% N1. Stop until the engine indications on the EICAS become stable:

Result:

1 Write the TAKEOFF TEMPERATURE # 1 values shown on the HHDLU/EHHDLU/PIU and on the EICAS.

2 If the value is greater than 2047, subtract 4096 from the value read on the HHDLU/EHHDLU/PIU.

3 Multiply the value shown on the HHDLU/EHHDLU/PIU by the conversion coefficient 0.031265.

4 Make sure that the value found is the same as the TAKEOFF TEMPERATURE # 1 indication on the EICAS, with a tolerance of ± 1°C.

(y) Repeat the last step again with 40% and 50% N1.

(z) On the HHDLU/EHHDLU/PIU, select the FUEL FLOW # 1 parameter. Select WORD 61, SUBFRAME ALL, and DECIMAL BASE.

(aa) With the engine # 2 thrust control lever at the IDLE position, set the engine # 1 thrust control lever to 30% N1. Stop until the engine indications on the EICAS become stable:

Result:

1 Write the FUEL FLOW # 1 values shown on the HHDLU/EHHDLU/PIU and on the EICAS.

2 Multiply the value shown on the HHDLU/EHHDLU/PIU by the conversion coefficient 4.

3 Make sure that the value found is the same as the FUEL FLOW # 1 indication on the EICAS, with a tolerance of ± 20 PPH.

NOTE: If the EICAS indications are in metric units, convert the value shown on the EICAS display. Use this factor: 1 kg = 2.2046 pounds.

(ab) Repeat the last step again with 40% and 50% N1.

(ac) On the HHDLU/EHHDLU/PIU, select the FUEL FLOW # 2 parameter. Select WORD 125, SUBFRAME ALL, and DECIMAL BASE.

(ad) With the engine # 1 thrust control lever at the IDLE position, set the engine # 2 thrust control lever to 30% N1. Stop until the engine indications on the EICAS become stable:

Result:

1 Write the FUEL FLOW # 2 values shown on the HHDLU/EHHDLU/PIU and on the EICAS.

2 Multiply the value shown on the HHDLU/EHHDLU/PIU by the conversion coefficient 4.

3 Make sure that the value found is the same as the FUEL FLOW # 2 indication on the EICAS, with a tolerance of ± 20 PPH.

NOTE: If the EICAS indications are in metric units, convert the value shown on the EICAS display. Use this factor: 1 kg = 2.2046 pounds.

(ae) Repeat the last step again with 40% and 50% N1.

(af) On the HHDLU/EHHDLU/PIU, select the N1 TARGET # 1 parameter. Select WORD 44, SUBFRAME ALL, and DECIMAL BASE.

(ag) With the engine # 2 thrust control lever at the IDLE position, set the engine # 1 thrust control lever to 30% N1. Stop until the engine indications on the EICAS become stable:

Result:

1 Write the N1 TARGET # 1 values shown on the HHDLU/EHHDLU/PIU and on the EICAS.

2 Multiply the value shown on the HHDLU/EHHDLU/PIU by the conversion coefficient 0.125061.

3 Make sure that the value found is the same as the N1 TARGET # 1 indication on the EICAS, with a tolerance of ± 2% RPM.

(ah) Repeat the last step again with 40% and 50% N1.

(ai) On the HHDLU/EHHDLU/PIU, select the N1 TARGET # 2 parameter. Select WORD 108, SUBFRAME ALL, and DECIMAL BASE.

(aj) With the engine # 1 thrust control lever at the IDLE position, set the engine # 2 thrust control lever to 30% N1. Stop until the engine indications on the EICAS become stable:

Result:

1 Write the N1 TARGET # 2 values shown on the HHDLU/EHHDLU/PIU and on the EICAS.

2 Multiply the value shown on the HHDLU/EHHDLU/PIU by the conversion coefficient 0.125061.

3 Make sure that the value found is the same as the N1 TARGET # 2 indication on the EICAS, with a tolerance of ± 2% RPM.

(ak) Repeat the last step again with 40% and 50% N1.

(al) On the HHDLU/EHHDLU/PIU, select the ENGINE LP VIBRATION # 1 parameter. Select WORD 63, SUBFRAME ALL, and DECIMAL BASE.

(am) With the engine # 2 thrust control lever at the IDLE position, set the engine # 1 thrust control lever to 30% N1. Stop until the engine indications on the EICAS become stable:

Result:

1 Write the ENGINE LP VIBRATION # 1 values shown on the HHDLU/EHHDLU/PIU and on the EICAS.

2 Multiply the value shown on the HHDLU/EHHDLU/PIU by the conversion coefficient 0,00390815828.

3 Make sure that the value found is the same as the ENGINE LP VIBRATION # 1 indication on the EICAS, with a tolerance of ± 0.1 IPS (RMS).

NOTE: The analog indication on the EICAS display is limited to 0 (lower limit) and 2.5 IPS (upper limit). The converted value from the HHDLU/EHHDLU/PIU must be compared visually with the EICAS indication.

(an) Repeat the last step again with 40% and 50% N1.

(ao) On the HHDLU/EHHDLU/PIU, select the ENGINE LP VIBRATION # 2 parameter. Select WORD 64, SUBFRAME ALL, and DECIMAL BASE.

(ap) With the engine # 1 thrust control lever at the IDLE position, set the engine # 2 thrust control lever to 30% N1. Stop until the engine indications on the EICAS become stable:

Result:

1 Write the ENGINE LP VIBRATION # 2 values shown on the HHDLU/EHHDLU/PIU and on the EICAS.

2 Multiply the value shown on the HHDLU/EHHDLU/PIU by the conversion coefficient 0,00390815828.

3 Make sure that the value found is the same as the ENGINE LP VIBRATION # 2 indication on the EICAS, with a tolerance of ± 0.1 IPS (RMS).

NOTE: The analog indication on the EICAS display is limited to 0 (lower limit) and 2.5 IPS (upper limit). The converted value from the HHDLU/EHHDLU/PIU must be compared visually with the EICAS indication.

(aq) Repeat the last step again with 40% and 50% N1.

(ar) On the HHDLU/EHHDLU/PIU, select the ENGINE ITT # 1 parameter. Select WORD 59, SUBFRAME ALL, and DECIMAL BASE.

(as) With the engine # 2 thrust control lever at the IDLE position, set the engine # 1 thrust control lever to 30% N1. Stop until the engine indications on the EICAS become stable:

Result:

1 Make sure that the HHDLU/EHHDLU/PIU shows the same ENGINE ITT # 1 indication as the EICAS, with a tolerance of ± 10°C.

(at) Repeat the last step again with 40% and 50% N1.

(au) On the HHDLU/EHHDLU/PIU, select the ENGINE ITT # 2 parameter. Select WORD 123, SUBFRAME ALL, and DECIMAL BASE.

(av) With the engine # 1 thrust control lever at the IDLE position, set the engine # 2 thrust control lever to 30% N1. Stop until the engine indications on the EICAS become stable:

Result:

1 Make sure that the HHDLU/EHHDLU/PIU shows the same ENGINE ITT # 2 indication as the EICAS, with a tolerance of ± 10°C.

(aw) Repeat the last step again with 40% and 50% N1.

(ax) On the HHDLU/EHHDLU/PIU, select the N1 REQUEST # 1 parameter. Select WORD 29, SUBFRAME ALL, and DECIMAL BASE.

(ay) With the engine # 2 thrust control lever at the IDLE position, set the engine # 1 thrust control lever to 30% N1. Stop until the engine indications on the EICAS become stable:

Result:

1 Write the N1 REQUEST # 1 values shown on the HHDLU/EHHDLU/PIU and on the EICAS.

2 Multiply the value shown on the HHDLU/EHHDLU/PIU by the conversion coefficient 0.125061.

3 Make sure that the value found is the same as the N1 REQUEST # 1 indication on the EICAS, with a tolerance of ± 2% RPM.

(az) Repeat the last step again with 40% and 50% N1.

(ba) On the HHDLU/EHHDLU/PIU, select the N1 REQUEST # 2 parameter. Select WORD 93, SUBFRAME ALL, and DECIMAL BASE.

(bb) With the engine # 1 thrust control lever at the IDLE position, set the engine # 2 thrust control lever to 30% N1. Stop until the engine indications on the EICAS become stable:

Result:

1 Write the N1 REQUEST # 2 values shown on the HHDLU/EHHDLU/PIU and on the EICAS.

2 Multiply the value shown on the HHDLU/EHHDLU/PIU by the conversion coefficient 0.125061.

3 Make sure that the value found is the same as the N1 REQUEST # 2 indication on the EICAS, with a tolerance of ± 2% RPM.

(bc) Repeat the last step again with 40% and 50% N1.

(bd) On the HHDLU/EHHDLU/PIU, select the ENGINE # 1 FUEL SHUTOFF ON and ENG # 1 SHUTDOWN REQTD. Select WORD 16, SUBFRAME ALL, and BINARY BASE.

(be) Stop engine # 1 (AMM TASK 71-00-01-910-804-A/200).

Result:

1 On the HHDLU/EHHDLU, make sure that the 5th and 7th bits change from "0" to "1".

(bf) On the HHDLU/EHHDLU, select the ENGINE # 2 FUEL SHUTOFF ON and ENG # 2 SHUTDOWN REQTD. Select WORD 80, SUBFRAME ALL, and BINARY BASE.

(bg) Stop engine # 2 (AMM TASK 71-00-01-910-804-A/200).

Result:

1 On the HHDLU/EHHDLU, make sure that the 5th and 7th bits change from "0" to "1".

(49) (Downloading Check) Do the test of the parameters with the engines in operation and do an FDR downloading.

(a) Make sure that these systems are operational and on:

- FDR System (AMM SDS 31-31-00/1).
- EICAS (AMM SDS 31-41-00/1).

(b) Start the engines (AMM TASK 71-00-01-910-801-A/200).

NOTE:
- When you do the engine start up procedure, make sure to set the takeoff temperature, as given in the task. This step is important for the correct reading of the TAKEOFF TEMPERATURE parameter.
- When you set the engine thrust control levers to a new value of N1, write down the hours and minutes shown on the pilot digital clock and the related N1 value.

(c) Set the engine thrust control levers to 30% N1. Stop until the engines indications, on the EICAS, become stable.

(d) On the Pilot Glareshield Panel, push and release the PTT mic switch (AMM TASK 23-51-00-700-801-A/500), and write these values: ENGINE N1 # 1, ENGINE N1 # 2, ENGINE N2 # 1, ENGINE N2 # 2, TAKEOFF TEMPERATURE # 1, FUEL FLOW # 1, FUEL FLOW # 2, N1 TARGET #1, N1 TARGET # 2, ENGINE LP VIBRATION # 1, ENGINE LP VIBRATION # 2, ENGINE ITT # 1, ENGINE ITT # 2, N1 REQUEST # 1, and N1 REQUEST # 2 shown on the EICAS; DATE, HOURS, and MINUTES shown on the pilot digital clock (AMM SDS 31-21-00/1). In the end, push and release the PTT mic switch.

(e) Do the two last steps again with 40% and 50% N1.

(f) Items (g) thru (l) are applicable to aircraft with EICAS versions 17 and on.

(g) On the Pilot Glareshield Panel, push and release the PTT mic switch (AMM TASK 23-51-00-700-801-A/500).

(h) On the POWERPLANT control panel, on the Overhead Panel, set the Engine #1 Ignition switch to the "ON" position.

(i) After 10 seconds, move the Engine #1 Ignition switch back to the "AUTO" position.

(j) On the Pilot Glareshield Panel, push and release the PTT mic switch (AMM TASK 23-51-00-700-801-A/500).

(k) On the POWERPLANT control panel, on the Overhead Panel, set the Engine #2 Ignition switch to the "ON" position.

(l) After 10 seconds, move the Engine #2 Ignition switch back to the "AUTO" position.

(m) On the Pilot Glareshield Panel, push and release the PTT mic switch (AMM TASK 23-51-00-700-801-A/500).

(n) Stop engine # 1 (AMM TASK 71-00-01-910-804-A/200).

(o) Stop engine # 2 (AMM TASK 71-00-01-910-804-A/200).

(p) On the Pilot Glareshield Panel, push and release the PTT mic switch (AMM TASK 23-51-00-700-801-A/500).

(q) Do a download of the Flight Data Recorder (AMM TASK 31-31-00-700-803-A/500).

NOTE:
- During the downloading process, the FDR do not record data.
- On the HHDLU/EHHDLU, set a time longer than that used to do steps (b) thru (p).
- Make sure that you write down the file name.

(r) In a laboratory, make sure that the values recorded by the FDR for engines 1 and 2 are in the tolerance range. Refer to the table below:

NOTE:
- Use the recorded PTT indications to find the parameters in the downloaded data.
- Refer to steps (f) thru (m) and make sure that the ignition indications for the four FADECS stay ON for 10 seconds (first for FADECs #1A and #1B, and then for FADECs #2A and #2B) after the test for 30%, 40% and 50% N1.
- After the ignition indications, see a transition on the ENGINE #1 FUEL SHUTOFF ON parameter from "0" (NOT ACTIVE) to "1" (ACTIVE) and ENG #1 SHUTDOWN REQTD parameter from "0" (NOT REQTD) to "1" (SHUTDOWN), followed by a transition on the ENGINE #2 FUEL SHUTOFF ON parameter from "0" (NOT ACTIVE) to "1" (ACTIVE) and ENG #2 SHUTDOWN REQTD parameter from "0" (NOT REQTD) to "1" (SHUTDOWN).

Table 568 - PARAMETERS WITH ENGINES IN OPERATION

ENGINE PARAMETER	TOLERANCE RANGE
ENGINE N1 # 1	± 2% RPM
ENGINE N1 # 2	± 2% RPM
ENGINE N2 # 1	± 2% RPM
ENGINE N2 # 2	± 2% RPM
TAKEOFF TEMPERATURE # 1	± 1°C
FUEL FLOW # 1	± 20 PPH
FUEL FLOW # 2	± 20 PPH

Table 568 - PARAMETERS WITH ENGINES IN OPERATION (Continued)

ENGINE PARAMETER	TOLERANCE RANGE
N1 TARGET # 1	± 2% RPM
N1 TARGET # 2	± 2% RPM
ENGINE LP VIBRATION # 1	± 0.1 IPS (RMS)
ENGINE LP VIBRATION # 2	± 0.1 IPS (RMS)
ENGINE ITT # 1	± 10°C
ENGINE ITT # 2	± 10°C
N1 REQUEST # 1	± 2% RPM
N1 REQUEST # 2	± 2% RPM

(50) On the Maintenance Panel, set the DFDR switch to the NORM position.

K. Follow-on (Figure 501)

SUBTASK 842-002-A

(1) Close maintenance panel door 223LZ (AMM MPP 06-41-03/100).

(2) Make sure that the emergency/parking brake is set (AMM SDS 32-44-00/1) and remove the chocks from the landing gear wheels (AMM TASK 10-10-01-500-801-A/200).

(3) If you use either GSE 092 or GSE 464, disconnect the HHDLU/PIU from the FDR, and remove the PCMCIA card from it.

(4) If you use either GSE 582 or GSE 583, disconnect the EHHDLU/personal computer (GSE130) from the FDR.

(5) Close access door 272DR (AMM MPP 06-41-01/100).

(6) Remove the hydraulic platform (GSE 036).

(7) Put the protection cover again on the pitot and pitot/static sensors.

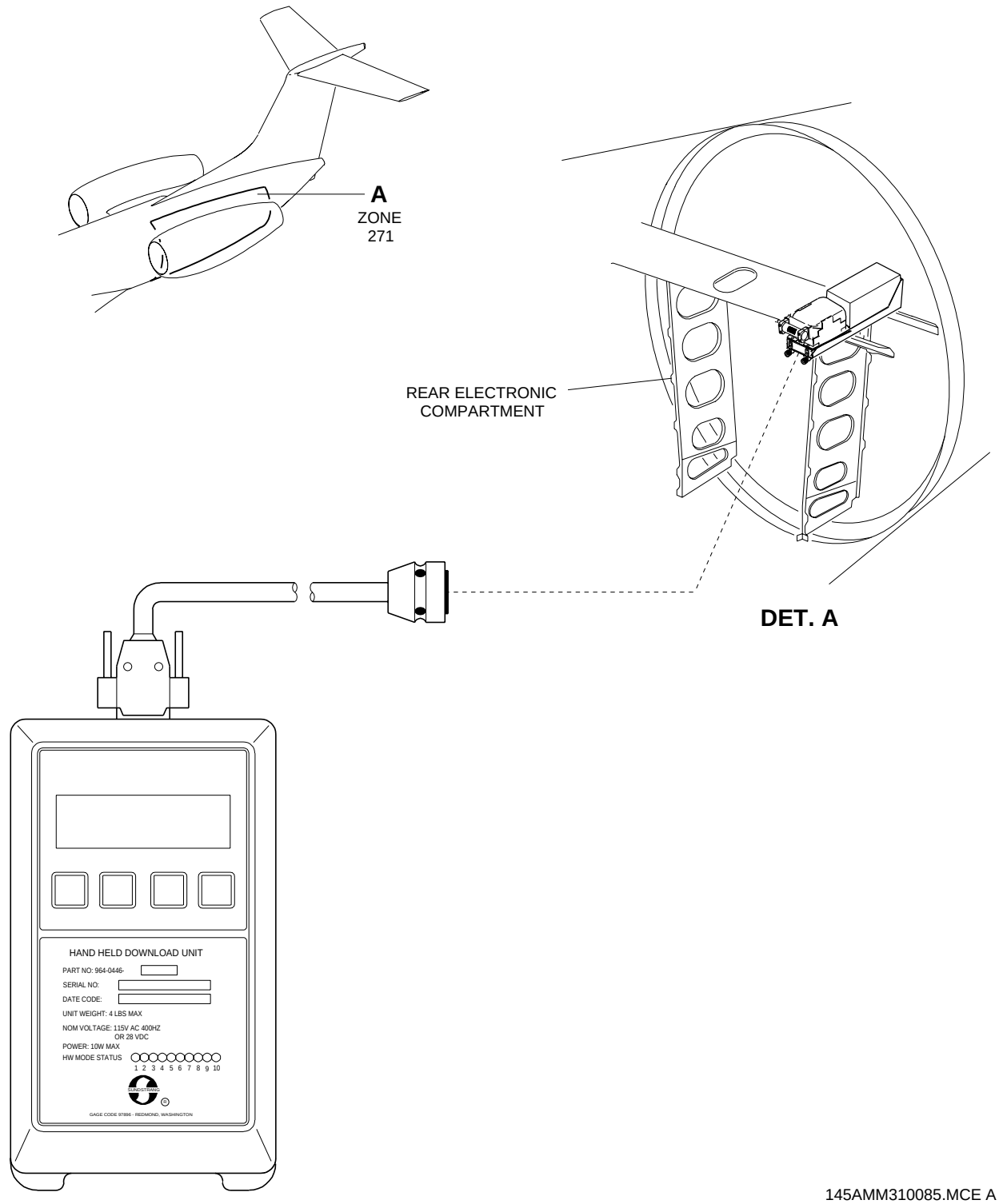
(8) On the Ice Protection Panel, on the Overhead Panel, remove the DO-NOT-TURN-AUTO tags from the PITOT 1/TAT 1/AOA 1, PITOT 3, and PITOT 2/TAT 2/AOA 2 pushbuttons.

(9) Disconnect the headsets (GSE 044).

EFFECTIVITY: AIRCRAFT WITHOUT AFDAU/AFDAMU

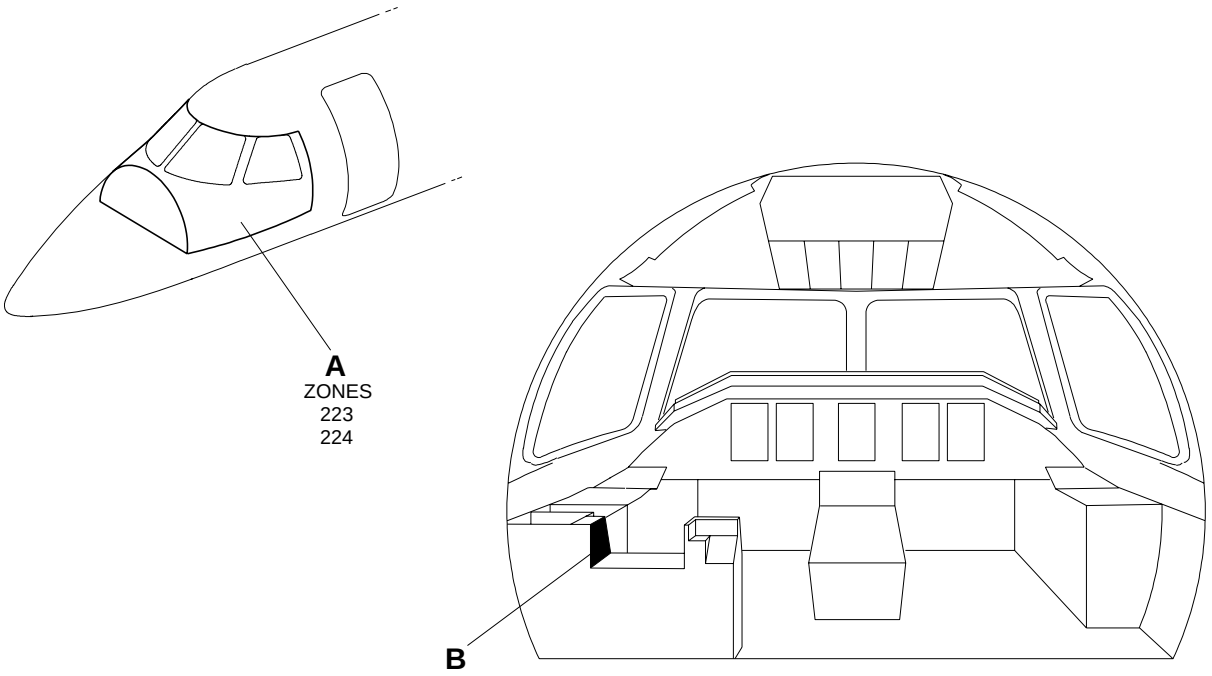
FDR Functional Test - HHDLU/FDR Interface

Figure 501

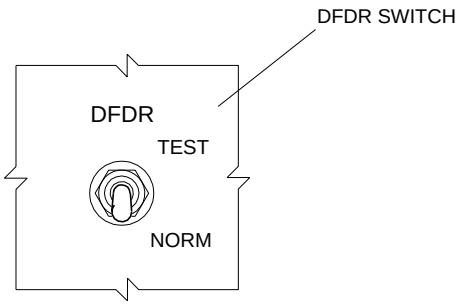


145AMM310085.MCE A

EFFECTIVITY: AIRCRAFT WITHOUT AFDAU/AFDAMU
Maintenance Panel - DFDR Switch
Figure 502



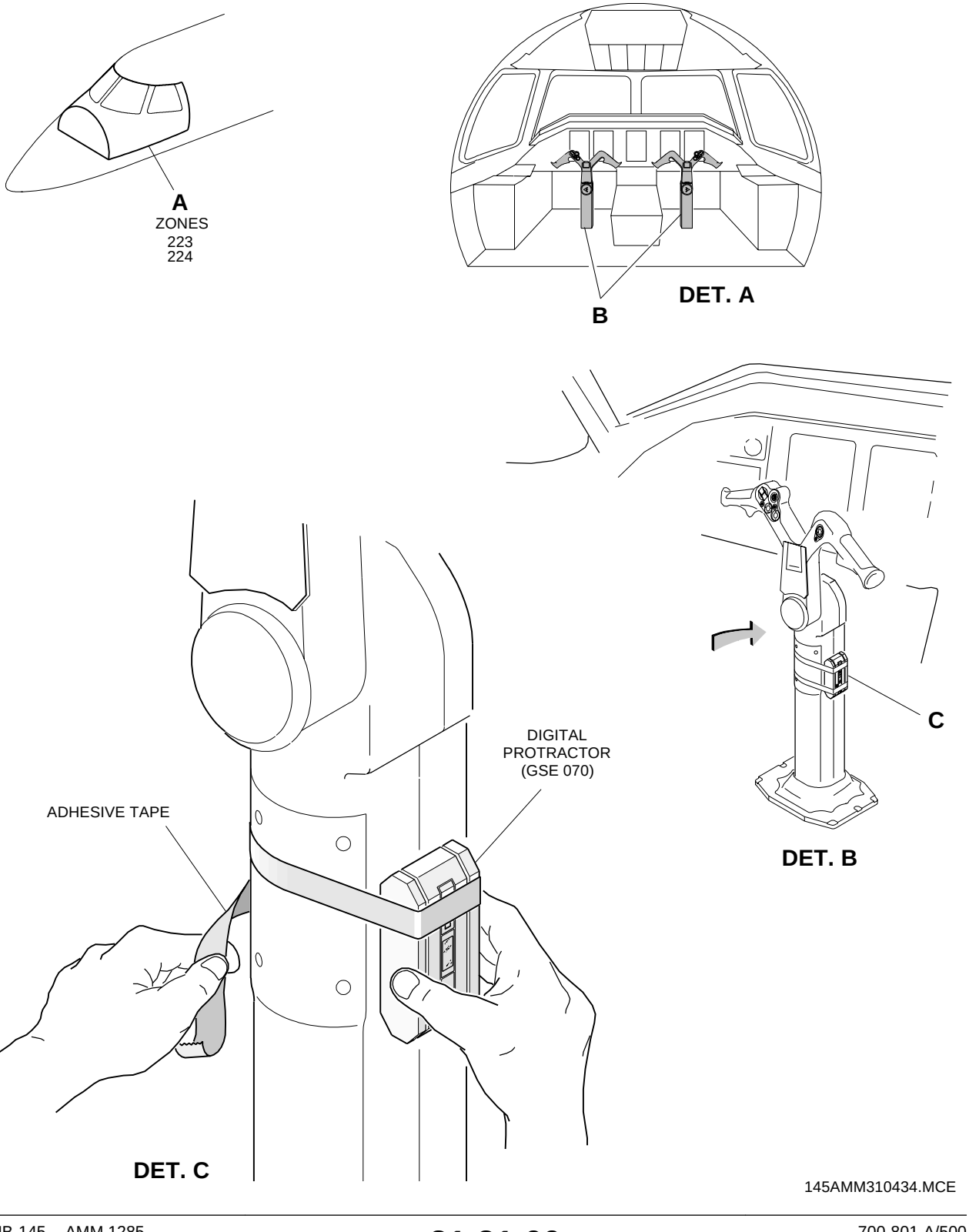
DET. A



DET. B
MAINTENANCE PANEL

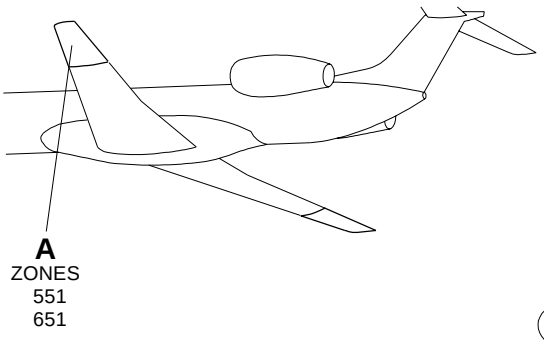
145AMM310147.MCE

EFFECTIVITY: AIRCRAFT WITHOUT AFDAU/AFDAMU
Digital Protractor Installation
Figure 503

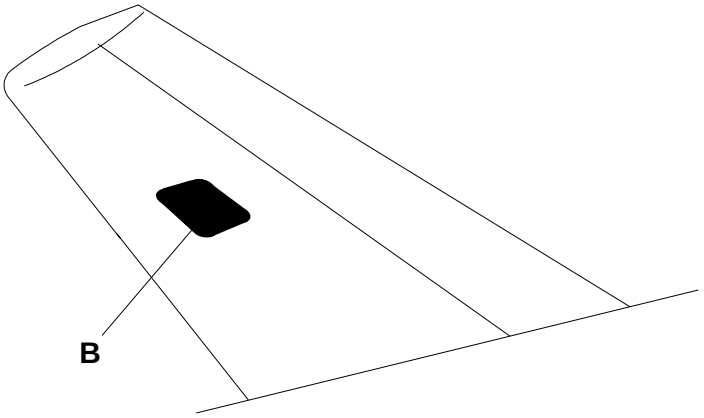


145AMM310434.MCE

EFFECTIVITY: AIRCRAFT WITH RVDTs
Aileron Rig Pin - Installation
Figure 504

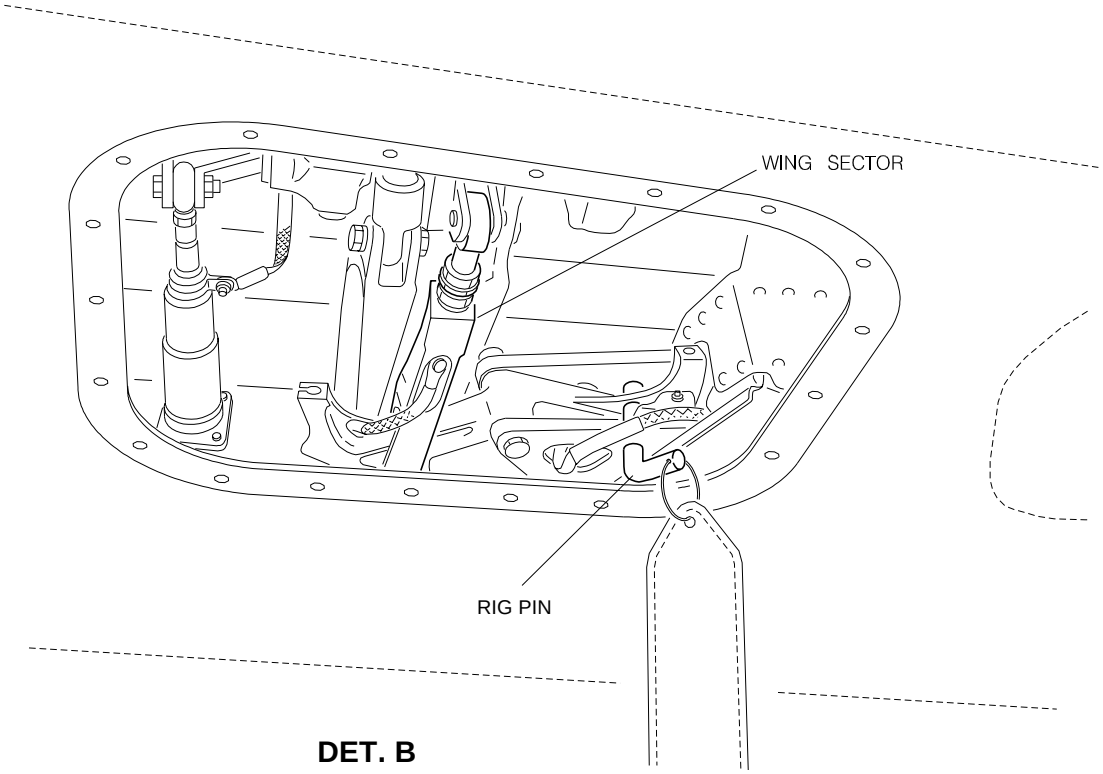


A
ZONES
551
651



B

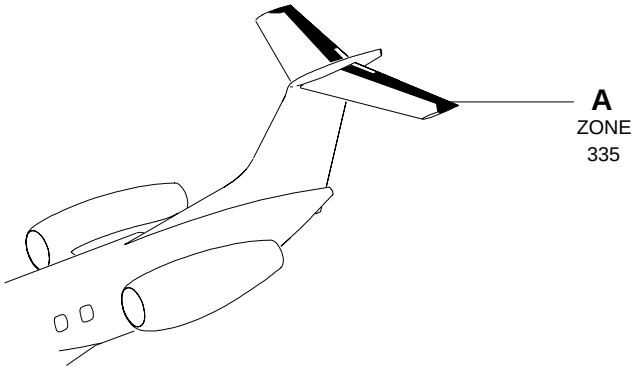
DET. A

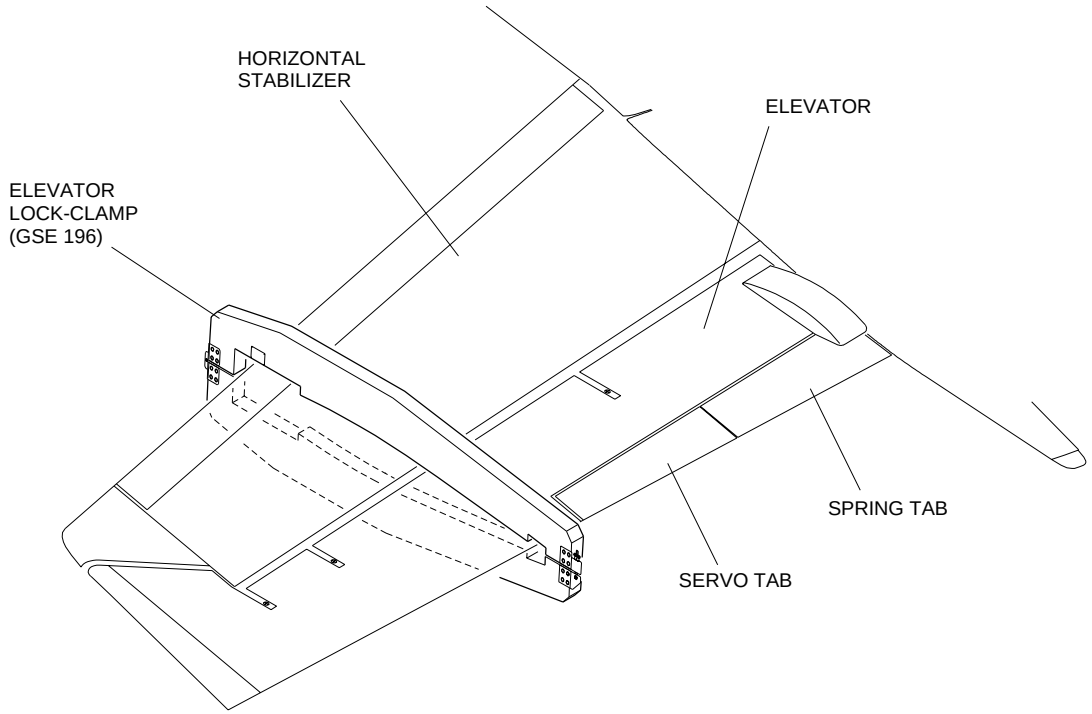


DET. B

EM145AMM270928A.DGN

EFFECTIVITY: AIRCRAFT WITH RVDTs
Elevator Lock Clamp - Installation
Figure 505

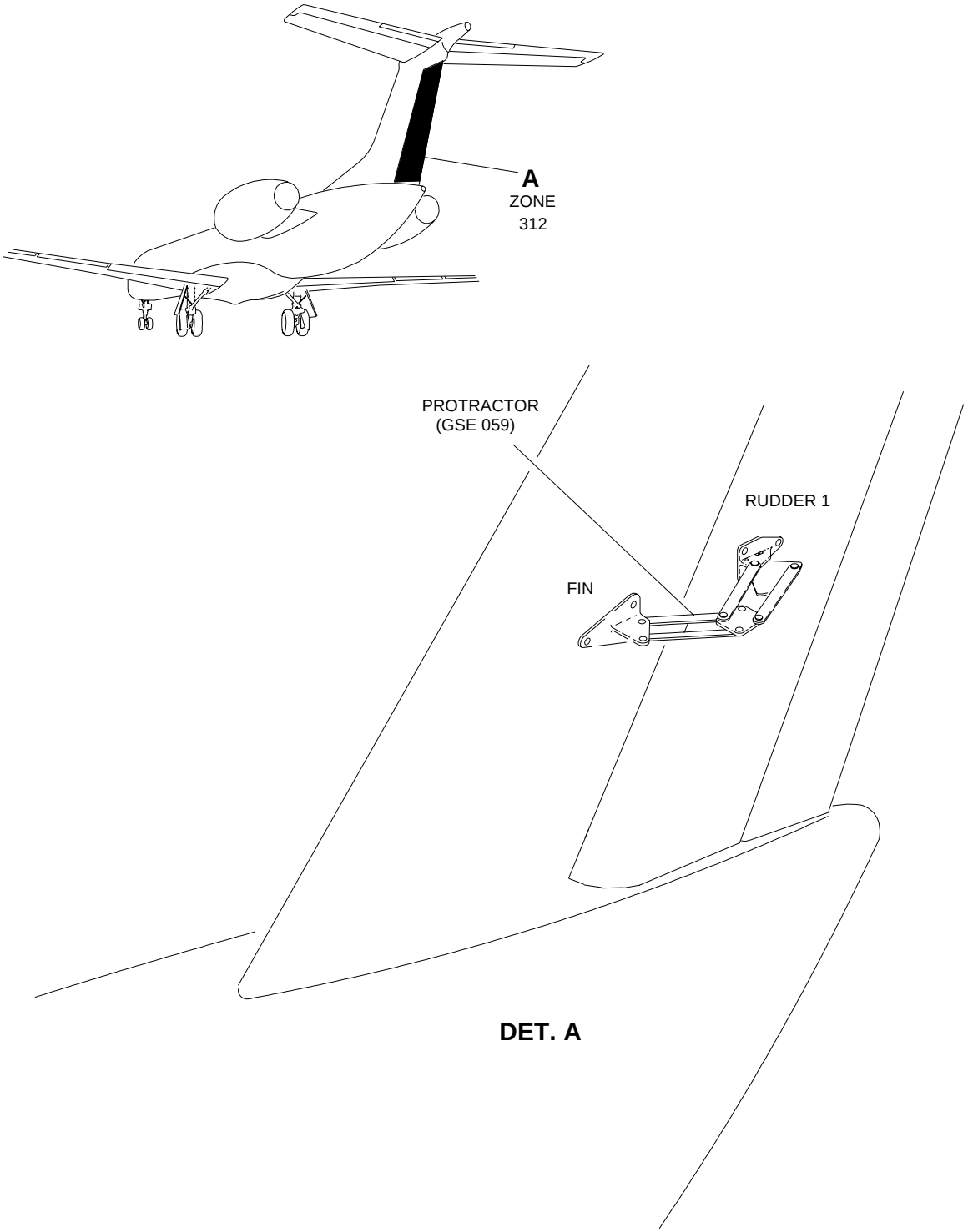




DET. A

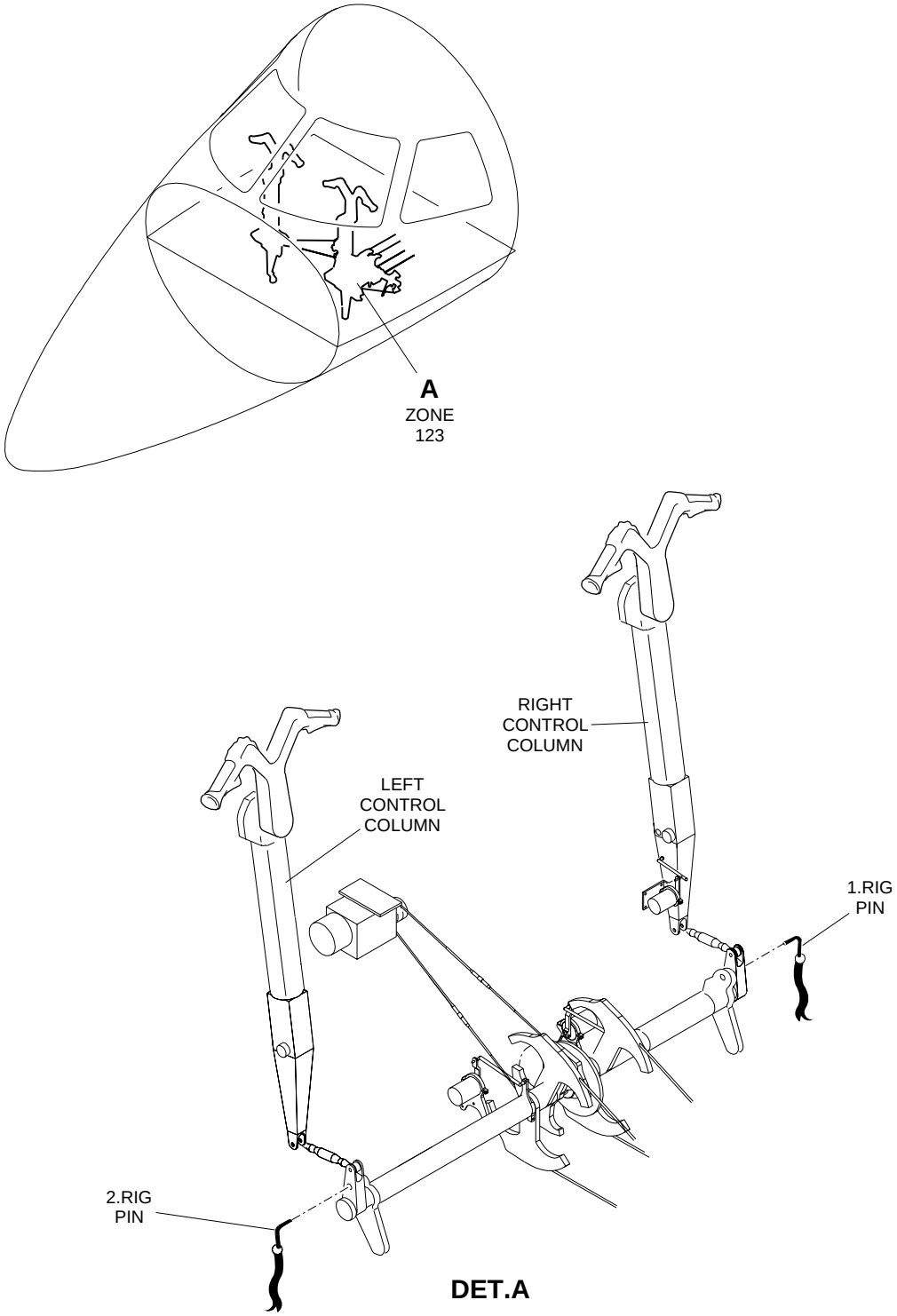
145AMM270468.MCE

EFFECTIVITY: AIRCRAFT WITH RVDTs
Rudder Protractor - Installation
Figure 506



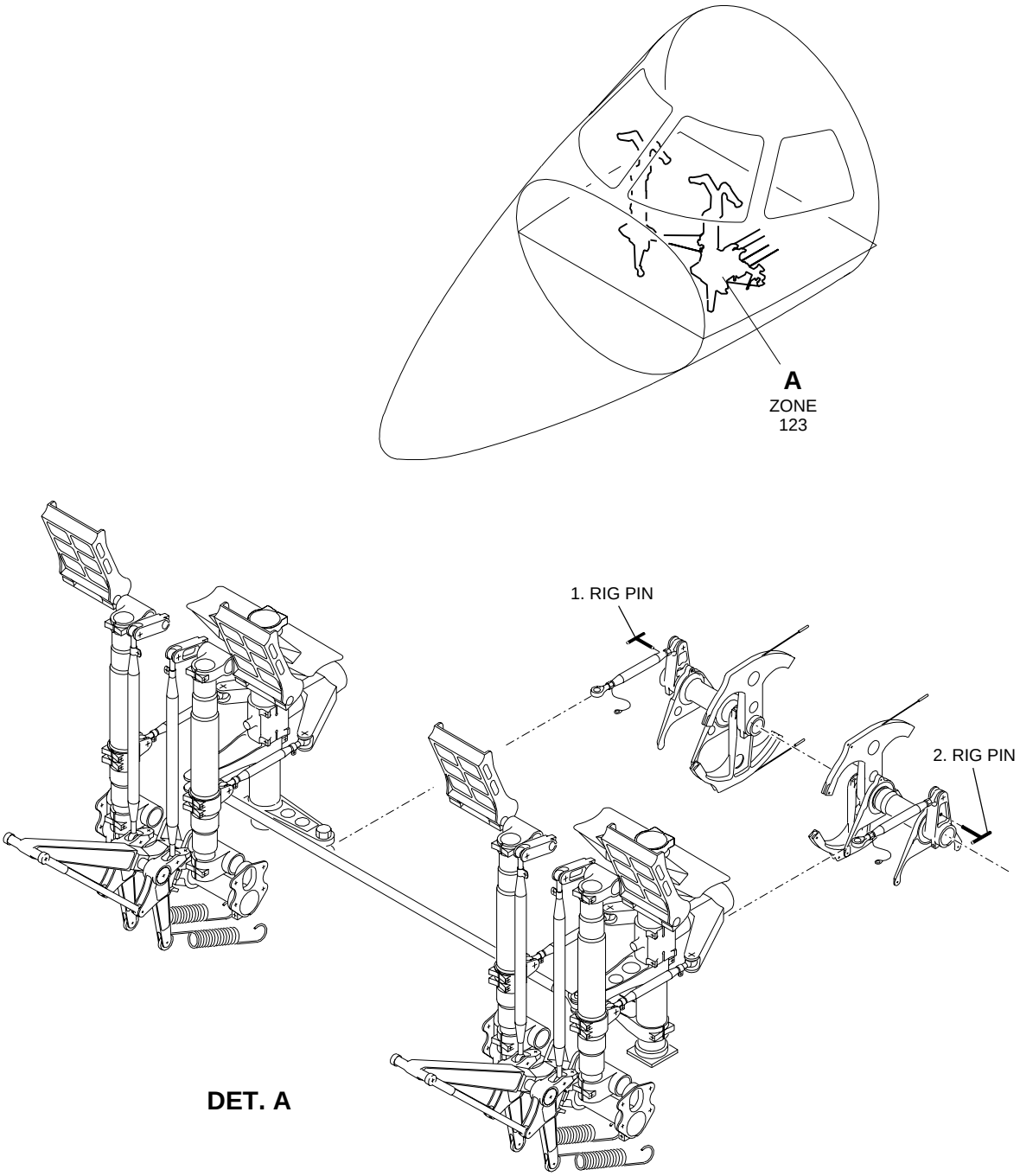
EM145AMM270266C.DGN

EFFECTIVITY: AIRCRAFT WITH LOAD CELLS
Control Column Rig Pins
Figure 507



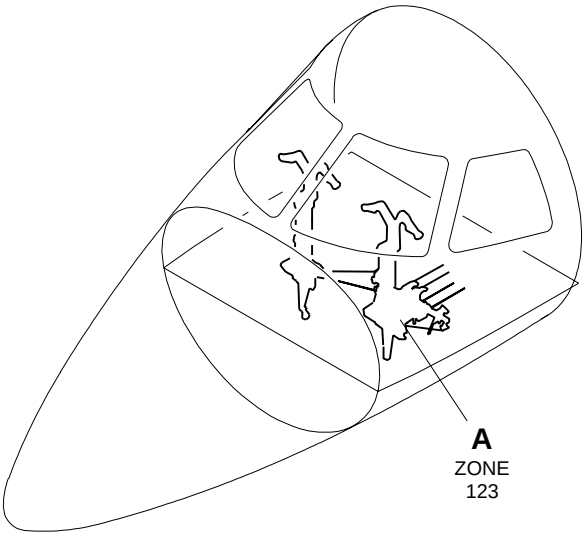
145AMM310358.MCE A

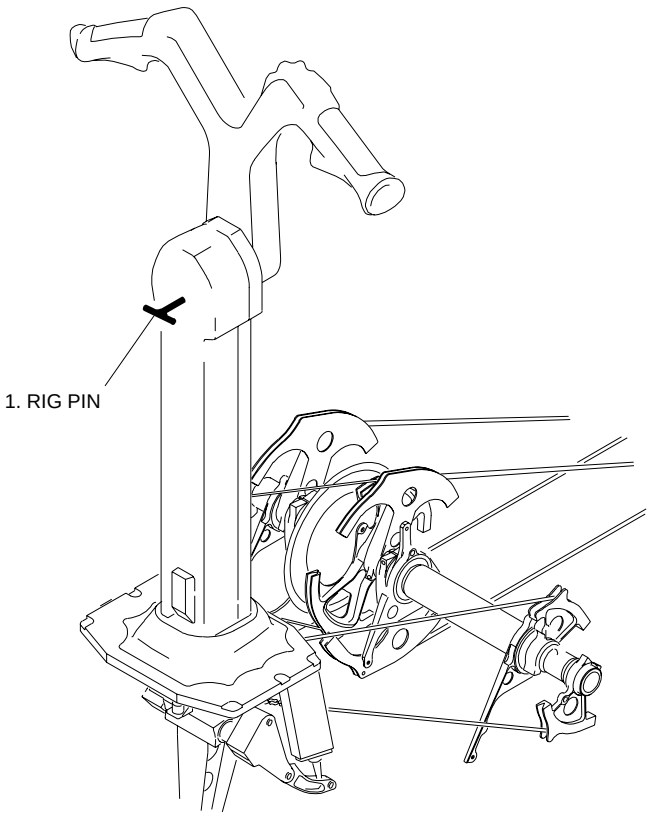
EFFECTIVITY: AIRCRAFT WITH LOAD CELLS
Rudder Pedal Rig Pins
Figure 508



145AMM310359.MCE A

EFFECTIVITY: AIRCRAFT WITH LOAD CELLS
Control Wheel Rig Pins
Figure 509





DET. A

145AMM310384.MCE

EFFECTIVITY: Aircraft with FDR L3 installed
Binary-to-Octal Conversion Table
Figure 510

	OCTAL 4				OCTAL 3				OCTAL 2				OCTAL 1		
OCTAL VALUE	12 th bit	11 th bit	10 th bit	OCTAL VALUE	9 th bit	8 th bit	7 th bit	OCTAL VALUE	6 th bit	5 th bit	4 th bit	OCTAL VALUE	3 rd bit	2 nd bit	1 st bit
0	"0"	"0"	"0"	0	"0"	"0"	"0"	0	"0"	"0"	"0"	0	"0"	"0"	"0"
1	"0"	"0"	"1"	1	"0"	"0"	"1"	1	"0"	"0"	"1"	1	"0"	"0"	"1"
2	"0"	"1"	"0"	2	"0"	"1"	"0"	2	"0"	"1"	"0"	2	"0"	"1"	"0"
3	"0"	"1"	"1"	3	"0"	"1"	"1"	3	"0"	"1"	"1"	3	"0"	"1"	"1"
4	"1"	"0"	"0"	4	"1"	"0"	"0"	4	"1"	"0"	"0"	4	"1"	"0"	"0"
5	"1"	"0"	"1"	5	"1"	"0"	"1"	5	"1"	"0"	"1"	5	"1"	"0"	"1"
6	"1"	"1"	"0"	6	"1"	"1"	"0"	6	"1"	"1"	"0"	6	"1"	"1"	"0"
7	"1"	"1"	"1"	7	"1"	"1"	"1"	7	"1"	"1"	"1"	7	"1"	"1"	"1"

EM145AMM310533A.DGN

EFFECTIVITY: Aircraft with FDR L3 installed
Example of Conversion
Figure 511

	OCTAL 4				OCTAL 3				OCTAL 2				OCTAL 1			
OCTAL VALUE	12 th bit	11 th bit	10 th bit	OCTAL VALUE	9 th bit	8 th bit	7 th bit	OCTAL VALUE	6 th bit	5 th bit	4 th bit	OCTAL VALUE	3 rd bit	2 nd bit	1 st bit
0	"0"	"0"	"0"	0	"0"	"0"	"0"	0	"0"	"0"	"0"	0	"0"	"0"	"0"
1	"0"	"0"	"1"	1	"0"	"0"	"1"	1	"0"	"0"	"1"	1	"0"	"0"	"1"
2	"0"	"1"	"0"	2	"0"	"1"	"0"	2	"0"	"1"	"0"	2	"0"	"1"	"0"
3	"0"	"1"	"1"	3	"0"	"1"	"1"	3	"0"	"1"	"1"	3	"0"	"1"	"1"
4	"1"	"0"	"0"	4	"1"	"0"	"0"	4	"1"	"0"	"0"	4	"1"	"0"	"0"
5	"1"	"0"	"1"	5	"1"	"0"	"1"	5	"1"	"0"	"1"	5	"1"	"0"	"1"
6	"1"	"1"	"0"	6	"1"	"1"	"0"	6	"1"	"1"	"0"	6	"1"	"1"	"0"
7	"1"	"1"	"1"	7	"1"	"1"	"1"	7	"1"	"1"	"1"	7	"1"	"1"	"1"

EM145AMM310534A.DGN

TASK 31-31-00-700-802-A
EFFECTIVITY: ALL

3. FLIGHT DATA RECORDER - OPERATIONAL TEST

A. General

(1) This task gives the procedures to do the operational test of the Flight Data Recorder.

B. References

REFERENCE	*DESIGNATION*
AMM MPP 06-41-03/100	- COMPONENT LOCATION
AMM SDS 31-41-00/1	
AMM SDS 31-42-00/1	
AMM SDS 31-51-00/1	
AMM TASK 20-40-01-860-801-A/200	ENERGIZATION OF THE AIRCRAFT WITH AN EXTERNAL POWER SOURCE

C. Zones and Accesses

ZONE	*PANEL/DOOR*	*LOCATION*
223	223LZ	Cockpit - LH side

D. Tools and Equipment

Not Applicable

E. Auxiliary Items

Not Applicable

F. Consumable Materials

Not Applicable

G. Expandable Parts

Not Applicable

H. Persons Recommended

QTY	*FUNCTION*	*PLACE*
1	Does the task	Cockpit

I. Preparation

SUBTASK 841-015-A

(1) Make sure that the aircraft is safe for maintenance.

(2) Energize the aircraft with the External DC Power Supply (AMM TASK 20-40-01-860-801-A/200).

(3) Make sure that the systems below are operational and on:

– EICAS (AMM SDS 31-41-00/1).

– Integrated Computer System (AMM SDS 31-42-00/1).

– Aural Warning System (AMM SDS 31-51-00/1).

(4) Make sure that the DFDR FAIL caution message is shown on the EICAS.

(5) Open maintenance panel door 223LZ (AMM MPP 06-41-03/100).

J. FDR System - Test Procedures (Figure 512) (Figure 502)

SUBTASK 710-005-A

(1) Do the test of the FDR System as follows:

(a) Set the DFDR switch, on the maintenance panel, to the TEST position.

Result:

1 The FDR system does a self-test (BITE).

2 On the EICAS, the DFDR FAIL caution message goes out of view.

NOTE: If the FDR system is defective, the EICAS shows the DFDR FAIL caution message.

(b) Set the DFDR switch, on the maintenance panel, to the NORM position.

Result:

1 The DFDR FAIL caution message is shown on the EICAS again.

2 The master caution tone sounds every five seconds.

3 On the glareshield panel, the master caution lighted pushbuttons stay on and flash.

(c) On the glareshield panel, push a master caution lighted pushbutton.

Result:

1 The master caution tone ceases.

2 The master caution lighted pushbuttons go off.

K. Follow-on

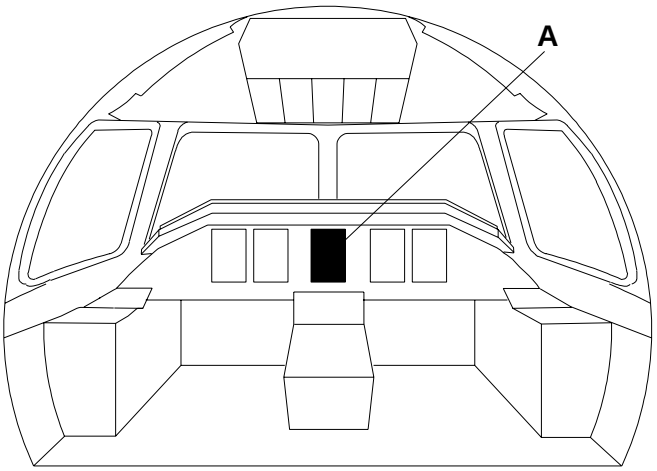
SUBTASK 842-015-A

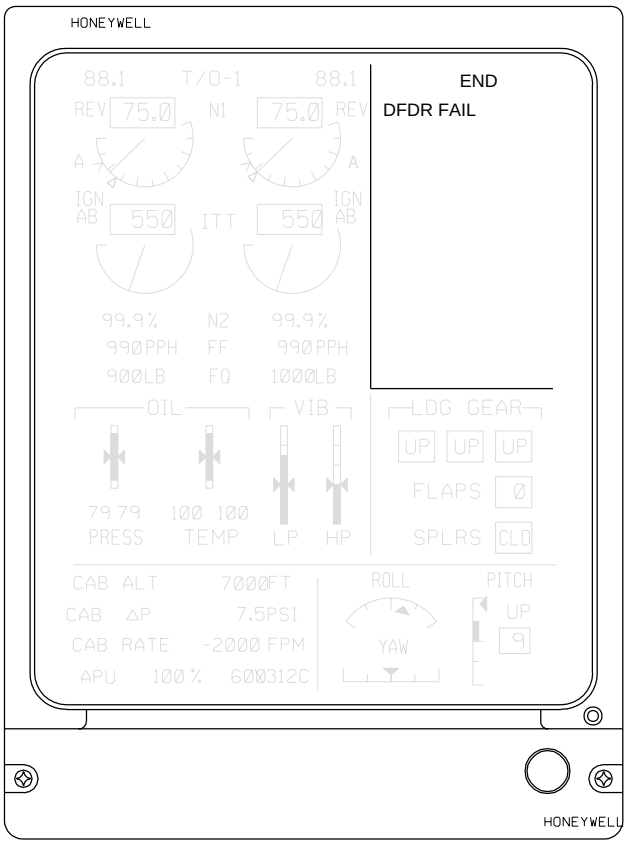
(1) Deenergize the aircraft (AMM TASK 20-40-01-860-801-A/200).

(2) Close maintenance panel door 223LZ (AMM MPP 06-41-03/100).

EFFECTIVITY: ALL

EICAS - DFDR FAIL Message
Figure 512





DET. A

145AMM310082.MCE B

TASK 31-31-00-700-803-A
EFFECTIVITY: ALL

4. FDR DATA - PERSONAL COMPUTER DOWNLOADING

A. General

(1) This task gives the procedures to do the download of all data or part of it from the Flight Data Recorder.

(2) GSE 091, GSE 490 or GSE 607 can be used to extract, convert, and display digital flight data stored on the Honeywell Solid-State Flight Data Recorder.

(3) (Aircraft with FDR Honeywell installed) ADRAS and ADRAS-related support must be ordered directly from Honeywell. ADRAS is the software solution suggested by EMBRAER, but you can use other software to analyze downloaded FDR data. EMBRAER has no responsibility for the parameter conversion settings if other software is used.

(4) (Aircraft with FDR FDR installed) The GSE 092 or GSE 582 or GSE 583 can be used to perform the task.

(5) (Aircraft with FDR L3 installed) Process the aircraft flight data with the ROSE for Windows (GSE 473) or other similar FDR raw data analyzer software.

NOTE: ROSE for Windows is the software solution suggested by EMBRAER, but you can use other software to analyze downloaded FDR data. EMBRAER has no responsibility for the parameter conversion settings if other software is used.

(6) The GSE 464 - Portable Interface Unit (PIU) is applicable only to aircraft with FDR L3 installed.

(7) When you do this task to comply with the SMRD requisite FDR DATA - Downloading, it is necessary only the storage of the FDR file. It is not necessary to analyze the data.

B. References

REFERENCE	*DESIGNATION*
AMM MPP 06-41-01/100	-
AMM MPP 06-41-03/100	- COMPONENT LOCATION
AMM TASK 20-40-01-860-801-A/200	ENERGIZATION OF THE AIRCRAFT WITH AN EXTERNAL POWER SOURCE
Extended Handheld Download Unit - User's Manual	-
Hand-Held Download Unit - User's Manual	-
Portable Interface Unit - User's Manual	-

C. Zones and Accesses

ZONE	*PANEL/DOOR*	*LOCATION*
223	223LZ	Cockpit - LH side
272	272DR	Fuselage rear section I - Right side

D. Tools and Equipment

ITEM	DESCRIPTION	PURPOSE	QTY
GSE 036	Platform - Hydraulic	To get access to the rear electronic compartment	
GSE 044	Headset - Ramp handling	For communication	
GSE 091	Automated Test Unit (ATU) or IBM-compatible personal computer with Microsoft Windows 3.1 and PCMCIA driver	To process aircraft flight data retrieved from the FDR to the PCMCIA by the HHDLU, with the ADRAS for Windows (Aircraft Data Recovery/Analysis System)	
GSE 092	Hand-Held Download Unit (HHDLU)	To do the download from the FDR and save the retrieved data in the PCMCIA card	
GSE 118	AFW Software	To perform the read out of the FDR data	
GSE 464	Portable Interface Unit (PIU)	To retrieve the stored data from the FDR L3 and make possible the ability to monitor the aircraft data in real time	
GSE 473	Read-Out Support Equipment/Recorder Interface	To read FDR Data for aircraft with FDR L3 installed.	
GSE 490	Automated Test Unit (ATU) or IBM - compatible personal computer with Microsoft Windows 2000, PCMCIA driver and USB port	To process aircraft flight data retrieved from the Honeywell Solid-State Flight Data Recorder (SSFDR) to the PCMCIA by the HHDLU, with the ADRAS for Windows (Aircraft Data Recovery/Analysis System)	
GSE 582	Extended Handheld Download Unit (EHHDLU), for Handheld	Used to download flight recorder memory, and view data stream during recording	
GSE 583	Extended Handheld Download Unit (EHHDLU) Set, for PC	Used to download flight recorder memory, and view data stream during recording	
GSE 607	Playback Test-VDR System (PATS II)	Used to extract, convert, and display (in engineering units) digital flight data stored on the Honeywell solid-state flight recorder.	

E. Auxiliary Items

Not Applicable

F. Consumable Materials

Not Applicable

G. Expandable Parts

Not Applicable

H. Persons Recommended

QTY	FUNCTION	PLACE
1	Does the task	Rear electronic compartment
1	Does the task	Cockpit

I. Preparation

SUBTASK 841-004-A

(1) Make sure that the aircraft is safe for maintenance.

(2) Energize the aircraft with the External DC Power Supply (AMM TASK 20-40-01-860-801-A/200).

(3) Connect the headsets (GSE 044).

(4) Put the hydraulic platform (GSE 036) at the necessary height to get access to the rear electronic compartment.

(5) Open access door 272DR (AMM MPP 06-41-01/100).

(6) On the circuit breaker panel, open the FDR circuit breaker (Location Tip: ESSENTIAL DC BUS 1/MISCELLANEOUS/FDR) and attach a DO-NOT-CLOSE tag to it.

(7) Open maintenance panel door 223LZ (AMM MPP 06-41-03/100).

(8) Make sure that the DFDR switch, on the maintenance panel, is at the NORM position.

(9) (Aircraft with FDR Honeywell Installed) To connect the GSE to the FDR, do one of these procedures:

1. If you use GSE 092, in the rear electronic compartment, connect the Hand-Held Download Unit (HHDLU) with the PCMCIA card inserted in it to the FDR (Refer to Hand-Held Download Unit - User's Manual).

2. If you use GSE 582, in the rear electronic compartment, connect the Extended Handheld Download Unit (EHHDLU) to the FDR (Refer to Extended Handheld Download Unit - User's Manual).

3. If you use GSE 583, in the rear electronic compartment, connect the personal computer (GSE 130) with EHHDLU software installed to the FDR using the SSFDR download cable (Refer to Extended Handheld Download Unit - User's Manual).

(10) (Aircraft with FDR L3 installed) In the rear electronic compartment, connect the portable unit with the PCMCIA card inserted in it, to the FDR (Refer to Portable Interface Unit - User's Manual).

(11) On the circuit breaker panel, remove the DO-NOT-CLOSE tag from the FDR circuit breaker (Location Tip: ESSENTIAL DC BUS 1/MISCELLANEOUS/FDR) and close it.

J. FDR System - Download Procedures (Figure 502)

SUBTASK 710-003-A

(1) (Aircraft with FDR Honeywell installed) If you use GSE 092, do the download procedure of FDR System as follows:

(a) Set the DFDR switch, on the maintenance panel, to the TEST position.

(b) Momentarily push the power pushbutton on the top of the HHDLU to turn it on.

(c) On the HHDLU, select the DNLD (download) function.

Result:

1 The HHDLU shows the following options:

- GO
- TIME
- FILE
- EXIT

(d) Select the option TIME and adjust the download time (duration):

- If it is necessary to increase the time, push key →.
- If it is necessary to decrease the time, push key ←.

NOTE: The time can be set from 0 to 27.2 hours.

(e) After the adjustment of the wanted download time, select the option SEL.

(f) Select the option FILE to set the name of the file to be recorded:

- Push key → or ← to select the position (character) to be changed.
- Select the option SEL to change the letter or number at the selected position.
- Push key → or ← to increase or decrease.
- After the wanted change, select the CHNG option.
- Do the steps above again for all positions you want to change.
- After all wanted changes are done, select the DONE option.

Result:

1 The HHDLU shows the name of the file, the set time and the options: GO, TIME, FILE, EXIT.

NOTE: An example of name file is DOWNLD06.DLU.

(g) Select the GO option to start the download.

Result:

1 On the HHDLU, the DOWNLOADING message is shown.

2 After a few minutes, on the HHDLU, the messages below are shown:

- DOWNLOAD COMPLETE
- PRESS ANY KEY

(h) Press a key:

Result:

1 The HHDLU shows the initial screen.

(i) Set the DFDR switch, on the maintenance panel, to the NORM position.

(2) (Aircraft with FDR Honeywell installed) If you use GSE 582, do the download procedure of FDR System as follows:

(a) Set the DFDR switch, on the maintenance panel, to the TEST position.

(b) Push the power pushbutton on the EHHDLU to turn it on.

(c) On Start menu, select the EHHDLU option.

NOTE: Use the Navigation pad and Enter button to navigate and select the options in the EHHDLU.

Result:

1 The EHHDLU shows the following options:

- Download
- Monitor
- Help
- Exit

(d) On the HHDLU window, select the Download function:

Result:

1 The Download window opens.

(e) On Record Type list box, select the applicable FDR that is connected to the EHHDLU: SSFDR.

(f) On Folder field, select the file destination directory.

NOTE:
- On the EHHDLU there are two options that can be selected: "Storage Card" or "Current Folder". If there is no storage disk inserted, only the current folder is available for selection.
- By default, the downloaded file will be stored in the "Storage Card" (if it is installed) on EHHDLU.
- A storage card is factory-installed in the EHHDLU.

(g) On File Name field, edit the file name.

NOTE:
- By default, the file name is DNLD-YYYYMMDDHHMMSS.dlu, where “YYYYMMDDHHMMSS” is the current date and time as provided by the EHHDLU.

(h) Do not select the "Download Since Last (Flight Data)" option.

NOTE: The Download Since Last option allows to download only the flight data that has been recorded since the recorder was last downloaded. On the SSFDR this option has no effect.

(i) Push the Start button.

Result:

1 The download process starts.

NOTE: When the download process starts, the Close button changes to Abort.

(j) After download process, exit from Download window using either Quit or Ok (close) button.

(k) Set the DFDR switch, on the maintenance panel, to the NORM position.

(3) (Aircraft with FDR Honeywell installed) If you use GSE 583, do the download procedure of FDR System as follows:

(a) Set the DFDR switch, on the maintenance panel, to the TEST position.

(b) Turn on the personal computer (GSE 130).

(c) Run the EHHDLU tool software installed in the personal computer (GSE 130).

NOTE: The typical sequence is: "Start" → "Programs" → EHHDLU. If you installed the software with a different configuration or changed its location after the installation, this sequence can change.

(d) On Start menu, select the EHHDLU option.

Result:

1 The startup screen on EHHDLU shows the following options:

- Download
- Monitor
- Help
- Exit

(e) On the HHDLU window, select the Download function:

Result:

1 The Download window opens.

(f) On Record Type list box, select the applicable FDR that is connected to the EHHDLU: SSFDR.

(g) On Folder field, select the file destination directory using a browse button.

NOTE: • By default, the downloaded file will be stored in the current working directory on personal computer.

(h) On File Name field, edit the file name.

NOTE: • By default, the file name is DNLD-YYYYMMDDHHMMSS.dlu, where “YYYYMMDDHHMMSS” is the current date and time as provided by the EHHDLU.

(i) Do not select the "Download Since Last (Flight Data)" option.

NOTE: The Download Since Last option allows to download only the flight data that has been recorded since the recorder was last downloaded. On the SSFDR this option has no effect.

(j) Push the Start button.

Result:

1 The download process starts.

NOTE: When the download process starts, the Close button changes to Abort.

(k) After download process, exit from Download window using either Quit or Ok (close) button.

(l) Set the DFDR switch, on the maintenance panel, to the NORM position.

(4) (Aircraft with FDR L3 installed) Do the download procedure of FDR System as follows:

(a) Set the DFDR switch, on the maintenance panel, to the TEST position.

(b) On the portable unit (GSE 464), push the SELECT key (8).

Result:

1 The COPY MENU shows on the portable unit (1).

(c) On the COPY MENU page, enter a File ID (identification). To do that, push the arrow keys (7) to move between the character positions in the file name display and then, push the SELECT key (8).

NOTE:
- You input the characters in the file name on at a time.
- The File ID can be up to 11 characters.
- The file name itself is limited to the DOS 8-character set.
- The file extension is *.FDR.
- The File ID can be recovered from the file header when the file is later analyzed.

(d) After you inserted the File ID, move the cursor to the START tag (3) and push the SELECT key (8).

Result:

1 The Start Copy menu shows on the screen.

2 The Full Copy Mode is selected as default.

CAUTION: DO NOT REMOVE THE PC CARD FROM THE PORTABLE UNIT DURING THE COPY PROCESS. IF YOU DO NOT OBEY THIS PRECAUTION THE DATA FROM PC CARD CAN BE CORRUPTED.

(e) Use the arrow key (7) to move the cursor to the START COPY tag (4).

(f) Move the cursor to the START COPY tag (4) and push the SELECT key (8).

Result:

1 The download starts.

2 The copy progress screen identifies the copy mode selected and shows a countdown, in seconds, of a remaining copy time.

(g) Set the DFDR switch, on the maintenance panel, to the NORM position.

K. Follow-on

SUBTASK 842-004-A

(1) Deenergize the aircraft (AMM TASK 20-40-01-860-801-A/200).

(2) Close maintenance panel door 223LZ (AMM MPP 06-41-03/100).

(3) (Aircraft with FDR Honeywell installed) If you use GSE 092, disconnect the HHDLU from the FDR, and remove the PCMCIA card from it.

(4) (Aircraft with FDR Honeywell installed) If you use GSE 582 to download the data from the FDR, disconnect the EHHDLU from the FDR and do any of these three procedures to get the downloaded data from EHHDLU :

- Remove the compact flash card and make a copy of the data (Refer to Extended Handheld Download Unit - User's Manual).
- Attach the USB thumb drive to the EHHDLU and make a copy of the data (Refer to Extended Handheld Download Unit - User's Manual).
- Use the ActiveSync and sync cable to make a copy of the data directly from the EHHDLU to the personal computer (GSE 130) (Refer to Extended Handheld Download Unit - User's Manual).

(5) (Aircraft with Honeywell FDR installed) If you use GSE 583, disconnect the personal computer (GSE 130) from the FDR.

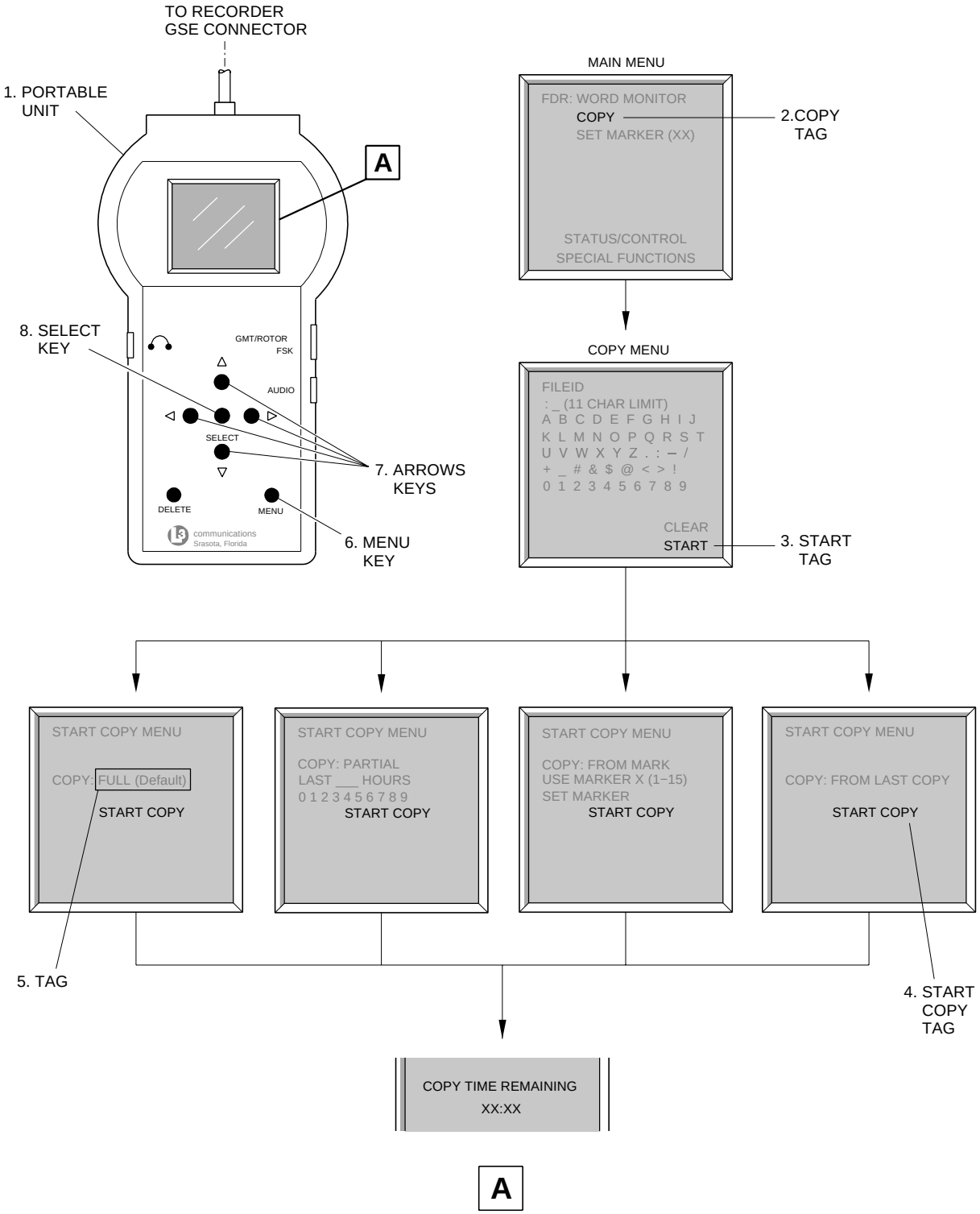
(6) (Aircraft with FDR L3 installed) Disconnect the portable unit from the FDR, and remove the PCMCIA card from it.

(7) Close access door 272DR (AMM MPP 06-41-01/100).

(8) Remove the hydraulic platform (GSE 036).

(9) Disconnect the headsets (GSE 044).

EFFECTIVITY: ALL
GSE 464 - Portable Interface Unit
Figure 513



EM145AMM310521A.DGN

TASK 31-31-00-700-804-A
EFFECTIVITY: AIRCRAFT WITH AFDAU/AFDAMU

5. FLIGHT DATA RECORDER - FUNCTIONAL TEST

A. General

(1) This task gives the procedures to do the functional test of the Flight Data Recorder. In this test, the parameters are measured with the engines off and with the engines in operation.

(2) This functional test gives the procedures for the check of all the inputs to the Flight Data Recorder system.

WARNING: BEFORE PERFORMING A SPECIFIC STEP MAKE SURE THE REQUIRED PREPARATION ACTION(S) FOR THIS STEP IS (ARE) DONE.

(3) As necessary it is possible to do the tests out of sequence and each test independently.

(4) GSEs 058, 059, 070, and 196 will be used only on aircraft with the RVDTs/RVITs installed. The RVDTs/RVITs are used to monitor the control surface positions.

(5) The combination of DAU and ICs P/Ns that make up each EICAS version is shown in a table referred to in IPC 31-41-01.

(6) GSE 091, GSE 490 or GSE 607 can be used to extract, convert, and display digital flight data stored on the Honeywell Solid-State Flight Data Recorder.

(7) ADRAS and ADRAS-related support must be ordered directly from Honeywell. ADRAS is the software solution suggested by EMBRAER, but you can use other software to analyze downloaded FDR data. EMBRAER has no responsibility for the parameter conversion settings if other software is used.

(8) The GSE 092 or GSE 582 or GSE 583 can be used to perform the task.

B. References

REFERENCE	*DESIGNATION*
AMM MPP 06-41-01/100	-
AMM MPP 06-41-03/100	- COMPONENT LOCATION
AMM MPP 06-44-00/100	- COMPONENT LOCATION
AMM MPP 28-00-00/200	- MAINTENANCE PRACTICES
AMM MPP 71-00-00/200	- MAINTENANCE PRACTICES
AMM SDS 21-32-00/1	
AMM SDS 22-10-00/1	
AMM SDS 23-11-00/1	
AMM SDS 23-12-00/1	
AMM SDS 23-31-00/1	
AMM SDS 23-51-00/1	
AMM SDS 23-81-00/1	
AMM SDS 27-10-00/1	
AMM SDS 27-14-00/1	

(Continued)

REFERENCE	*DESIGNATION*
AMM SDS 27-20-00/1	
AMM SDS 27-24-00/1	
AMM SDS 27-30-00/1	
AMM SDS 27-31-00/1	
AMM SDS 27-36-00/1	
AMM SDS 27-40-00/1	
AMM SDS 27-43-00/1	
AMM SDS 27-50-00/1	
AMM SDS 27-53-00/1	
AMM SDS 27-60-00/1	
AMM SDS 27-63-00/1	
AMM SDS 31-21-00/1	
AMM SDS 31-31-00/1	
AMM SDS 31-41-00/1	
AMM SDS 31-42-00/1	
AMM SDS 31-51-00/1	
AMM SDS 32-30-00/1	
AMM SDS 34-15-00/1	
AMM SDS 34-21-00/1	
AMM SDS 34-22-00/1	
AMM SDS 34-27-00/1	
AMM SDS 34-31-00/1	
AMM SDS 34-32-00/1	
AMM SDS 34-41-00/1	
AMM SDS 34-42-00/1	
AMM SDS 34-43-00/1	
AMM SDS 34-51-00/1	
AMM SDS 34-61-00/1	
AMM SDS 73-22-00/1	
AMM TASK 10-10-01-500-801-A/200	AIRCRAFT NORMAL PARKING
AMM TASK 20-40-01-860-801-A/200	ENERGIZATION OF THE AIRCRAFT WITH AN EXTERNAL POWER SOURCE
AMM TASK 23-51-00-700-801-A/500	AUDIO SYSTEM EMERGENCY MODE - OPERATIONAL CHECK
AMM TASK 27-63-01-700-801-A/500	SPOILER SYSTEM - OPERATIONAL CHECK
AMM TASK 28-45-00-700-801-A/500	FUEL LOW-PRESSURE WARNING SYSTEM - OPERATIONAL CHECK
AMM TASK 29-10-00-860-801-A/200	HYDRAULIC SYSTEM - PRESSURIZATION WITH HTS

(Continued)

REFERENCE	*DESIGNATION*
AMM TASK 29-10-00-860-802-A/200	HYDRAULIC SYSTEM - PRESSURIZATION WITH EMDP
AMM TASK 31-21-00-700-802-A/500	DIGITAL CLOCK - OPERATIONAL TEST
AMM TASK 31-31-00-700-803-A/500	FDR DATA - PERSONAL COMPUTER DOWNLOADING
AMM TASK 31-31-03-000-801-A/400	FDR TRIAXIAL ACCELEROMETER - REMOVAL
AMM TASK 31-31-03-400-801-A/400	FDR TRIAXIAL ACCELEROMETER - INSTALLATION
AMM TASK 32-00-01-910-801-A/200	LG SAFETY PIN - INSTALLATION AND REMOVAL
AMM TASK 32-00-02-910-801-A/200	SAFETY PIN OF THE NLG DOORS SOLENOID VALVE - INSTALLATION AND REMOVAL
AMM TASK 32-44-02-910-801-A/200	HYDRAULIC ACCUMULATOR EMERGENCY/PARKING BRAKE - RELEASE
AMM TASK 32-49-02-000-801-A/400	WHEEL ASSEMBLY OF THE MAIN LANDING GEAR - REMOVAL
AMM TASK 32-49-02-400-801-A/400	WHEEL ASSEMBLY OF THE MAIN LANDING GEAR - INSTALLATION
AMM TASK 34-13-00-000-801-A/400	PITOT/STATIC-SYSTEM TEST SET - DISCONNECTION
AMM TASK 34-13-00-400-801-A/400	PITOT/STATIC-SYSTEM TEST SET - CONNECTION
AMM TASK 34-15-00-700-801-A/500	ADC SYSTEM - FUNCTIONAL CHECK
AMM TASK 34-31-00-800-801-A/200	RADIO ALTIMETER - RIGGING
AMM TASK 34-32-00-700-801-A/500	VOR/ILS SYSTEM OPERATIONAL TEST
AMM TASK 34-41-00-700-801-A/500	GPWS/WINDSHEAR - OPERATIONAL CHECK
AMM TASK 34-51-00-700-801-A/500	DME SYSTEM OPERATIONAL TEST
AMM TASK 49-10-00-910-802-A/200	APU - START
AMM TASK 49-10-00-910-803-A/200	APU - SHUTDOWN
AMM TASK 49-13-00-910-802-A/200	APU - START
AMM TASK 49-13-00-910-803-A/200	APU - SHUTDOWN
AMM TASK 71-00-01-910-801-A/200	ENGINE START PROCEDURE (NORMAL)
AMM TASK 71-00-01-910-804-A/200	ENGINE STOP PROCEDURE
AMM TASK 71-12-01-000-801-A/400	ENGINE LOWER COWLING - OPENING
AMM TASK 71-12-01-400-801-A/400	ENGINE LOWER COWLING - CLOSING
AMM TASK 78-31-01-940-801-A/200	THRUST REVERSER - OPENING PROCEDURE
AMM TASK 78-31-01-940-802-A/200	THRUST REVERSER - CLOSURE PROCEDURE
Extended Handheld Download Unit - User's Manual	-
Hand-Held Download Unit - User's Manual	-
SB145-27-0050	-
SB145-32-0036	-

C. Zones and Accesses

ZONE	*PANEL/DOOR*	*LOCATION*
272	272DR	Fuselage rear section I - Right side
223	223LZ	Cockpit - LH side

D. Tools and Equipment

ITEM	*DESCRIPTION*	*PURPOSE*	*QTY*
GSE 036	Platform, Hydraulic	To get access to the work area on the aileron, on the elevator, on the rudder, and in the rear electronic compartment	
GSE 044	Headset - Ramp handling	For communication	
GSE 058	Kit, rigging pins, flight controls	To keep the aileron control surface in the neutral position	
GSE 059	Protractor - Control Surface Deflection	To measure the rudder deflection angle	
GSE 070	Protractor - digital	To measure the aileron, the elevator and the control column deflection angle	
GSE 091	Automated Test Unit (ATU) or IBM - compatible personal computer with Microsoft Windows 3.1 and PCMCIA driver	To process aircraft flight data retrieved from the FDR to the PCMCIA by the HHDLU, with the ADRAS for Windows (Aircraft Data Recovery/Analysis System)	
GSE 092	Hand-Held Download Unit (HHDLU)	To retrieve the stored data from the FDR and make possible the ability to monitor the aircraft data in real time	
GSE 095	Laptop Field Tester	To read brake pressure and brake pedal position status	
GSE 103	Wheel Speed Transducer Adapter	To operate the Wheel Speed Transducer	
GSE 126	Test Set - COMM/VOR/ILS, Ramp and Bench	To simulate VOR, LOC and GS frequencies and deviations	
GSE 127	Test Set - Transponder and DME, Ramp	To simulate DME distances	
GSE 128	Kit - Air Data	To connect the Pitot/Static System Test Set to the pitot/static tubes of the aircraft	
GSE 129	Test Set - Pitot-Static	To simulate altitude and airspeed	
GSE 135	Box-Interface Test	To interface the laptop and the maintenance panel	
GSE 190	Test Set - TCAS	To simulate an intruder	
GSE 196	Clamp-Lock, elevator	To lock the elevator in the neutral position	
GSE 301	Test Set - COMM/VOR/ILS, Ramp and Bench	To simulate VOR, LOC and GS frequencies and deviations	
GSE 302	Test Set - Transponder and DME, Ramp	To simulate DME distances	
GSE 304	Test Set - TCAS	To simulate an intruder	
GSE 474	Test Set - COMM/VOR/ILS, Ramp and Bench	To simulate VOR, LOC and GS frequencies and deviations	
GSE 475	Test Set - Transponder / DME / TCAS Ramp Test Set IFR 6000	To simulate DME distances and an intruder	

(Continued)

ITEM	DESCRIPTION	PURPOSE	QTY
GSE 490	Automated Test Unit (ATU) or IBM - compatible personal computer with Microsoft Windows 2000, PCMCIA driver and USB port	To process aircraft flight data retrieved from the Honeywell Solid-State Flight Data Recorder (SSFDR) to the PCMCIA by the HHDLU, with the ADRAS for Windows (Aircraft Data Recovery/Analysis System)	
GSE 582	Extended Handheld Download Unit (EHHDLU), for Handheld	Used to download flight recorder memory, and view data stream during recording	
GSE 583	Extended Handheld Download Unit (EHHDLU) Set, for PC	Used to download flight recorder memory, and view data stream during recording	
GSE 607	Playback Test-VDR System (PATS II)	Used to extract, convert, and display (in engineering units) digital flight data stored on the Honeywell solid-state flight recorder.	

E. Auxiliary Items

ITEM	DESCRIPTION	PURPOSE	QTY
Commercially available	Workstand	To get access to the engines	1
Commercially available	Hand Drill	To operate the Wheel Speed Transducer	1
Commercially available	Screw, NASM(MS)24694-6 (or similar with #8-32UNC thread, 19/32 in. length)	To attach the base of GSE-059 to the aircraft	1

F. Consumable Materials

SPECIFICATION (BRAND)	DESCRIPTION	QTY
Commercially available	Double-face adhesive-tape	AR

G. Expandable Parts

Not Applicable

H. Persons Recommended

QTY	FUNCTION	PLACE
1	Does the task	Cockpit
1	Does the task	Outside the aircraft

I. Preparation (Figure 501)

SUBTASK 841-005-A

(1) Make sure that the aircraft is safe for maintenance.

(2) Make sure that the sensors (PITOT 1/TAT 1/AOA 1, PITOT 3 and PITOT 2/TAT 2/AOA 2) pushbuttons, on the Overhead Panel (Ice Protection Panel), are set to OFF. Attach DO-NOT-TURN-AUTO tags to them.

WARNING: DO NOT TOUCH THE PITOT, PITOT/STATIC SENSORS, AND ANEMOMETRIC STATIC PORTS IMMEDIATELY AFTER THE HEATER WAS SET TO OFF TO PREVENT INJURY TO PERSONS.

CAUTION: DO NOT APPLY PRESSURE TO THE PITOT TUBES WHEN THE STATIC PORTS ARE WITHOUT PRESSURE. THIS COULD CAUSE DAMAGE TO THE MADC.

(3) Remove the protection cover from the pitot and pitot/static sensors.

(4) Connect the Pitot/Static System Test Set (GSE 129) to the aircraft (AMM TASK 34-13-00-400-801-A/400).

(5) Energize the aircraft with the External DC Power Supply (AMM TASK 20-40-01-860-801-A/200).

(6) Connect the headsets (GSE 044).

(7) Make sure that the systems below are operational and on:

- Autopilot (AMM SDS 22-10-00/1).
- Passenger Address & Cabin Interphone System (AMM SDS 23-31-00/1).
- Airborne Audio System (AMM SDS 23-51-00/1).
- Radio Management System (AMM SDS 23-81-00/1).
- Aileron System (AMM SDS 27-10-00/1).
- Rudder Control System (AMM SDS 27-20-00/1).
- Elevator & TAB Systems (AMM SDS 27-30-00/1).
- Stall Protection System (AMM SDS 27-36-00/1).
- Horizontal Stabilizer (AMM SDS 27-40-00/1).
- Flap System (AMM SDS 27-50-00/1).
- Spoiler (AMM SDS 27-60-00/1).
- EICAS (AMM SDS 31-41-00/1).
- Integrated Computer System (AMM SDS 31-42-00/1).
- Aural Warning System (AMM SDS 31-51-00/1).
- ADC System (AMM SDS 34-15-00/1).
- AHRS (AMM SDS 34-21-00/1) or IRS (AMM SDS 34-27-00/1), as applicable.
- EFIS (AMM SDS 34-22-00/1).
- Radio Altimeter System (AMM SDS 34-31-00/1).
- VOR/ILS/GS/MB System (AMM SDS 34-32-00/1).
- EGPWS/Windshear System or GPWS/Windshear System, as applicable (AMM SDS 34-41-00/1).

– TCAS (AMM SDS 34-43-00/1).

– DME System (AMM SDS 34-51-00/1).

– (Aircraft with dual IRS) FMS (Honeywell) (AMM SDS 34-61-00/1).

– FADEC System (AMM SDS 73-22-00/1).

(8) Install the landing gear safety pins on all main landing gear and nose landing gear (AMM TASK 32-00-01-910-801-A/200).

(9) Put the hydraulic platform (GSE 036) to the necessary height to get access to the rear electronic compartment.

(10) Open access door 272DR (AMM MPP 06-41-01/100).

(11) On the circuit breaker panel, open the FDR circuit breaker (Location Tip: ESSENTIAL DC BUS 1/MISCELLANEOUS/FDR) and attach a DO-NOT-CLOSE tag to it.

(12) Open maintenance panel door 223LZ (AMM MPP 06-41-03/100).

(13) Make sure that the DFDR switch, on the maintenance panel, is at the NORM position.

(14) To connect the GSE to the FDR, do one of these procedures:

1. If you use GSE 092, in the rear electronic compartment, connect the Hand-Held Download Unit (HHDLU) with the PCMCIA card inserted in it to the FDR (Refer to Hand-Held Download Unit - User's Manual).

2. If you use GSE 582, in the rear electronic compartment, connect the Extended Handheld Download Unit (EHHDLU) to the FDR (Refer to Extended Handheld Download Unit - User's Manual).

3. If you use GSE 583, in the rear electronic compartment, connect the personal computer (GSE 130) with EHHDLU software installed to the FDR using the SSFDR download cable (Refer to Extended Handheld Download Unit - User's Manual).

(15) On the circuit breaker panel, remove the DO-NOT-CLOSE tag from the FDR circuit breaker (Location Tip: ESSENTIAL DC BUS 1/MISCELLANEOUS/FDR) and close it.

J. Functionally Check Flight Data Recorder System (Figure 501) (Figure 502) (Figure 503) (Figure 504) (Figure 505) (Figure 506) (Figure 507) (Figure 508) (Figure 509)

SUBTASK 720-003-A

(1) On the maintenance panel, set the DFDR switch to the TEST position.

NOTE: These steps start the recording function of the FDR which will overwrite the data stored in the FDR.

(2) If it is necessary to keep the data stored in the FDR, do an FDR downloading according to AMM TASK 31-31-00-700-803-A/500.

(3) If you use GSE 092, on the HHDLU, select the DSDU (Data Signal Display Unit) function.

(4) If you use either GSE 582 or GSE 583, on the EHHDLU select the Monitor function.

NOTE:
- If you use GSE 092 to set the parameters (SUBFRAME, WORD and BASE) on the HHDLU, obey the instructions in the Hand-Held Download Unit - User's Manual.
- If you use either GSE 582 or GSE 583 to set the Recorder Type and parameters (SUBFRAME, WORD and FORMAT) on the EHHDLU, obey the instructions in the Extended Handheld Download Unit - User's Manual
- To measure the parameters from step (3) to step (38), the engines must be off.

(5) Do the test of the Anemometric Parameters as follows (OCTAL BASE):

(a) On the HHDLU/EHHLDU, select the PRESSURE ALTITUDE parameter. Select WORDS 227 (bits 12-1) and 229 (bits 6-1), and SUBFRAME ALL.

(b) Refer to the table below and, on the pitot/static system test set (GSE 129), adjust the air data parameters. Make sure that the values shown on the HHDLU/ EHHDLU agree with the tolerances:

Table 569 - PRESSURE ALTITUDE

VALUES (ft)	HHDLU/EHHDLU (OCTAL)
4,000	017454 - 017524
10,000	047014 - 047064
30,000	165114 - 165164

NOTE:
- The 18-bit long pressure altitude data from the air data computer was split into two words to be recorded on the SSFDR. The most significant 12 bits (which include a sign bit) are stored as Word 227 and the least significant 6 bits are stored as Word 229.
- The octal number is made of the four digits of Word 227 followed by the two last digits of Word 229.

(c) On the HHDLU/EHHDLU, select the AIRSPEED parameter. Select WORD 37 and SUBFRAME ALL.

(d) On the pitot/static system test set (GSE 129), adjust the air data parameters. Refer to the table below and make sure that the values shown on the HHDLU/ EHHDLU are in the tolerances:

Table 570 - AIRSPEED

VALUES (kt)	HHDLU/EHHDLU (OCTAL)
60	0162 - 0176
180	0533 - 0563
300	1105 - 1151

(e) On the HHDLU/EHHDLU, select the LOSS OF CABIN PRESSURE parameter. Select WORD 88, SUBFRAME ALL, and BINARY BASE.

(f) Remove access panels 224JRW and 224 KRW (AMM MPP 06-41-03/100).

(g) Connect the CPAM test assembly of the Air Data Kit (GSE 128) to the cabin pressure sensing port of the Cabin Pressure Acquisition Module (CPAM) (AMM SDS 21-32-00/1).

(h) Connect the static hose of the anemometric bench (GSE 129) to the CPAM test assembly.

(i) Set the altitude 0 ft on the anemometric bench.

Result:

1 The cabin altitude value is shown on the EICAS.

2 On the HHDLU/EHHDLU, the 1st bit is "1".

(j) Set the altitude to 14,500 ± 100 ft on the anemometric bench.

Result:

1 On the HHDLU/EHHDLU, the 1st bit goes to "0".

(k) Set the altitude to 0 ft on the anemometric bench again.

Result:

1 On the HHDLU/EHHDLU, the 1st bit goes to "1" again.

(l) Remove the bench and the CPAM test assembly.

(m) Install access panels 224JRW and 224KRW (AMM MPP 06-41-03/100).

(6) Do the test of the STATIC AIR TEMPERATURE (SAT) parameter as follows (OCTAL BASE):

(a) On the HHDLU/EHHDLU, select the STATIC AIR TEMPERATURE (SAT) parameter. Select WORD 199 and SUBFRAMES 2 and 4.

(b) On the MFD, on the Static Air Temperature (SAT) indicator, read the temperature.

(c) Refer to the table below and compare the value on the SAT indicator with the value shown on the HHDLU/EHHDLU. Make sure that the difference is in the tolerances.

Table 571 - STATIC AIR TEMPERATURE (SAT)

VALUES (°C)	HHDLU/EHHDLU (OCTAL)
15	317 - 417
20	437 - 537
21	457 - 557
22	477 - 577
23	517 - 617
24	537 - 637
25	557 - 657
26	577 - 677
27	617 - 717
28	637 - 737
29	657 - 757
30	677 - 777
31	717 - 1017

Table 571 - STATIC AIR TEMPERATURE (SAT) (Continued)

VALUES (°C)	HHDLU/EHHDLU (OCTAL)
32	737 - 1037
33	757 - 1057
34	777 - 1077
35	1017 - 1117
36	1037 - 1137
37	1057 - 1157

(7) Do the test of the Triaxial Accelerometer Parameters as follows (OCTAL BASE):

(a) Release the Triaxial Accelerometer from its attaching support (AMM TASK 31-31-03-000-801-A/400).

(b) On the HHDLU/EHHDLU, select the NORMAL ACCELERATION parameter. Select WORDS 9, 41, 73, 105, 137, 169, 201, and 233, and SUBFRAME ALL.

(c) Refer to the table below and put the accelerometer at those positions. Make sure that the values on the HHDLU/EHHDLU are in the tolerances:

NOTE: The arrows in the tables show the axis under test, after the triaxial accelerometer rotation. Refer to the "FDR Triaxial Accelerometer - Removal/Installation" figure in AMM TASK 31-31-03-000-801-A/400.

Table 572 - NORMAL ACCELERATION

ACCELEROMETER POSITION	VALUES (g)	HHDLU/EHHDLU (OCTAL)
Turned 90° (→)	0	1326 - 1356
Turned downwards (↓)	-1	773 - 1023
Normal (↑)	1	1660 - 1710

(d) On the HHDLU/EHHDLU, select the LATERAL ACCELERATION parameter. Select WORDS 13, 77, 141, and 205, and SUBFRAME ALL.

(e) Refer to the table below, put the accelerometer at those positions, and make sure that the values shown on the HHDLUEHHDLU are in the tolerances:

Table 573 - LATERAL ACCELERATION

ACCELEROMETER POSITION	VALUES (g)	HHDLU/EHHDLU (OCTAL)
Neutral (→)	0	1766 - 2131
Left Side Turned Upwards (↓)	-1	037 - 202
Right Side Turned Upwards (↑)	1	3715 - 4060

NOTE: Left and right references are related to the flight line.

(f) On the HHDLU/EHHDLU, select the LONGITUDINAL ACCELERATION parameter. Select WORDS 11, 75, 139, and 203, and SUBFRAME ALL.

(g) Refer to the table below, put the accelerometer at those positions, and make sure that the values shown on the HHDLU/EHHDLU are in the tolerances:

Table 574 - LONGITUDINAL ACCELERATION

ACCELEROMETER POSITION	VALUES (g)	HHDLU/EHHDLU (OCTAL)
Neutral (←)	0	1766 - 2131
Forward Turned Downwards (↓)	-1	037 - 202
Forward Turned Upwards (↑)	1	3715 - 4060

(h) Tighten the Triaxial Accelerometer on its attaching support (AMM TASK 31-31-03-400-801-A/400).

(8) (Aircraft with AHRS) Do the test of the Attitude and Heading Parameters as follows (OCTAL BASE):

(a) Make sure that the AHRS 1 (Location Tip: ESSENTIAL DC BUS 1/NAV/AHRS 1) and AHRS 2 (Location Tip: DC BUS 2/NAV/AHRS 2) circuit breakers are closed.

(b) On the Maintenance Panel, adjust the AHRS TEST 1 switch to TEST to get the indications listed in the tables below (PITCH ATTITUDE, ROLL ATTITUDE, MAGNETIC HEADING), and as shown on the PFDs.

(c) On the HHDLU/EHHDLU, select the PITCH ATTITUDE parameter. Select WORDS 43, 107, 171, and 235, and SUBFRAME ALL. Make sure that the value shown on the HHDLU/EHHDLU is in the tolerance given in the table below:

Table 575 - PITCH ATTITUDE

VALUE (°)	HHDLU/EHHDLU (OCTAL)
0	7751 - 0026
15	0223 - 0301

(d) On the HHDLU/EHHDLU, select the ROLL ATTITUDE parameter. Select WORDS 45 and 173, and SUBFRAME ALL. Make sure that the value shown on the HHDLU/EHHDLU is in the tolerance given in the table below:

Table 576 - ROLL ATTITUDE

VALUE (°)	HHDLU/EHHDLU (OCTAL)
5	0042 - 0117

(e) On the HHDLU/EHHDLU, select the MAGNETIC HEADING parameter. Select WORD 35 and SUBFRAME ALL. Make sure that the value shown on the HHDLU/EHHDLU is in the tolerance given in the table below:

Table 577 - MAGNETIC HEADING

VALUE (°)	HHDLU/EHHDLU (OCTAL)
30	0476 - 0553

(9) Do the test of the Flight Control Parameters as follows (OCTAL BASE):

WARNING: MAKE SURE THAT THERE ARE NO PERSONS AND EQUIPMENT IN THE AILERON, FLAP, RUDDER, HORIZONTAL STABILIZER, AND ELEVATOR TRAVEL AREA.

CAUTION:
- DO NOT DO OTHER TASKS ON THE AILERON, FLAP, RUDDER, ELEVATOR, AND HORIZONTAL STABILIZER SYSTEMS.
- MAKE SURE THAT THE AILERON SYSTEM IS NOT RIG-PINNED AT THE CONTROL WHEEL, TORQUE TUBE QUADRANTS, INTERMEDIARY SECTOR, AND WING SECTOR.
- MAKE SURE THAT THE RUDDER SYSTEM IS NOT RIG-PINNED AT THE RUDDER PEDALS AND FORWARD AND REAR TORQUE TUBES.
- MAKE SURE THAT THE ELEVATOR SYSTEM IS NOT RIG-PINNED AT THE CONTROL COLUMN, TORQUE TUBE, REAR SECTOR, AND SURFACES.

(a) Pressurize the hydraulic system (AMM TASK 29-10-00-860-801-A/200).

(b) On the HHDLU/EHHDLU, select the PITCH TRIM POSITION parameter. Select WORD 163, and SUBFRAME ALL.

(c) Set the TRIM switch, on the Pilot Control Wheel (AMM SDS 27-43-00/1), to the neutral/DOWN/UP position until the PITCH indication on the EICAS shows the positions given in the table below, and make sure that the values shown on the HHDLU/EHHDLU obey the tolerances.

Table 578 - PITCH TRIM POSITION

VALUE (°)	HHDLU/EHHDLU (OCTAL)
0	7760 - 0020
2 (Nose Down)	0060 - 0121
5 (Nose Up)	7516 - 7556
10 (Nose Up)	7253 - 7313

(d) Set the horizontal stabilizer to the neutral position with the TRIM switch, and make sure that the PITCH indication, on the EICAS, shows this position.

(e) On the HHDLU/EHHDLU, select the AILERON (ROLL) TRIM POSITION parameter. Select WORD 135 and SUBFRAME ALL.

(f) Push the ROLL TRIM switch, on the Control Pedestal (AMM SDS 27-14-00/1), to the RWD/neutral/LWD position for approximately 3 seconds, several times, until the ROLL indication on the EICAS shows the positions given in the table below, and make sure that the values shown on the HHDLU/EHHDLU obey the tolerances.

To make sure that the bug is accurately at the last mark of the scale on the EICAS (AMM SDS 27-24-00/1) full at the right side or full at the left side, push the ROLL TRIM switch more than it is necessary to make the bug be at the end of the scale. Then, carefully push the ROLL TRIM switch to the opposite side until you see the bug to move in the direction of the center of the scale. At this moment, stop to push the switch. This is the accurate position of the bug at the end of the scale.

Table 579 - AILERON (ROLL) TRIM POSITION

POSITION	HHDLU/EHHDLU (OCTAL)
Full Right Side (Indicated on EICAS)	1372 - 1512

Table 579 - AILERON (ROLL) TRIM POSITION (Continued)

POSITION	HHDLU/EHHDLU (OCTAL)
Centered (Indicated on EICAS)	7727 - 0050
Full Left Side (Indicated on EICAS)	6265 - 6405

(g) Move the aileron to the neutral position with the ROLL TRIM switch, and make sure that the ROLL indication on the EICAS shows this position.

(h) On the HHDLU/EHHDLU, select the RUDDER (YAW) TRIM POSITION parameter. Select WORD 71 and SUBFRAME ALL.

(i) Move the YAW TRIM switch, on the Control Pedestal (AMM SDS 27-24-00/1), to the RIGHT/neutral/LEFT position until the YAW indication on the EICAS shows the positions given in the table below, and make sure that the values shown on the HHDLU/EHHDLU obey the tolerances.

To make sure that the bug is accurately at the last mark of the scale on the EICAS (AMM SDS 27-24-00/1) full at the right side or full at the left side, turn the YAW TRIM switch more than it is necessary to make the bug be at the end of the scale. Then, carefully turn the YAW TRIM switch to the opposite side until you see the bug to move in the direction of the center of the scale. At this moment, stop the switch movement. This is the accurate position of the bug at the end of the scale.

Table 580 - RUDDER (YAW) TRIM POSITION

POSITION	HHDLU/EHHDLU (OCTAL)
Full Right Side (Indicated on EICAS)	1372 - 1512
Centered (Indicated on EICAS)	7727 - 0050
Full Left Side (Indicated on EICAS)	6265 - 6405

(j) Move the YAW TRIM switch to the neutral position, and make sure that the YAW indication on the EICAS shows this position.

(k) On the HHDLU/EHHDLU, select the CONTROL COLUMN POSITION # 1 parameter. Select WORDS 15, 79, 143, and 207, and SUBFRAME ALL.

(l) Install the digital protractor (GSE 070) on the control column #1 with adhesive tape (see (Figure 503). Make sure that the instrument is aligned with the column.

(m) With the control column in the neutral position and locked (use GSE 058), set the digital protractor to zero.

(n) Refer to the table below and move the pilot control column (AMM SDS 27-31-00/1) to make sure that the values shown on the HHDLU/EHHDLU are in the tolerances.

Table 581 - CONTROL COLUMN POSITION # 1

EFFECTIVITY	POSITION	HHDLU/EHHDLU (OCTAL)
Pre-Mod SB145-27-0050	Neutral and Locked	1751 - 2025
	5 Degrees - Forward	1163 - 1535
	10 Degrees - Rearward	2651 - 3156

Table 581 - CONTROL COLUMN POSITION # 1 (Continued)

EFFECTIVITY	POSITION	HHDLU/EHHDLU (OCTAL)
Post-Mod SB145-27-0050	Neutral and Locked	1751 - 2025
	5 Degrees - Forward	1070 - 1516
	15 Degrees - Rearward	3320 - 3617

(o) On the HHDLU/EHHDLU, select the CONTROL COLUMN POSITION # 2 parameter. Select WORDS 47, 111, 175, and 239, and SUBFRAME ALL.

(p) Install the digital protractor (GSE 070) on the control column #2 with adhesive tape (see (Figure 503). Make sure that the instrument is aligned with the column.

(q) With the control column in the neutral position and locked (use GSE 058), set the digital protractor to zero.

(r) Refer to the table below and move the pilot control column (AMM SDS 27-31-00/1) to make sure that the values shown on the HHDLU/EHHDLU are in the tolerances.

Table 582 - CONTROL COLUMN POSITION # 2

EFFECTIVITY	POSITION	HHDLU/EHHDLU (OCTAL)
Pre-Mod SB145-27-0050	Neutral and Locked	1751 - 2025
	5 Degrees - Forward	1163 - 1535
	10 Degrees - Rearward	2651 - 3156
Post-Mod SB145-27-0050	Neutral and Locked	1751 - 2025
	5 Degrees - Forward	1070 - 1516
	15 Degrees - Rearward	3320 - 3617

(s) On the HHDLU/EHHDLU, select the CONTROL WHEEL POSITION # 1 parameter. Select WORDS 17, 81, 145, and 209, and SUBFRAME ALL.

(t) Refer to the table below and move the control yoke (AMM SDS 27-10-00/1) to make sure that the values shown on the HHDLU/EHHDLU are in the tolerances.

Table 583 - CONTROL WHEEL POSITION # 1

POSITION	HHDLU/EHHDLU (OCTAL)
Neutral and Locked	1771 - 2007
Fully Left	0640 - 1020
Fully Right	3010 - 3170

(u) On the HHDLU/EHHDLU, select the CONTROL WHEEL POSITION # 2 parameter. Select WORDS 49, 113, 177, and 241, and SUBFRAME ALL.

(v) Refer to the table below and move the control yoke (AMM SDS 27-10-00/1) to make sure that the values shown on the HHDLU/EHHDLU are in the tolerances.

Table 584 - CONTROL WHEEL POSITION # 2

POSITION	HHDLU/EHHDLU (OCTAL)
Neutral and Locked	1771 - 2007
Fully Left	0640 - 1020

Table 584 - CONTROL WHEEL POSITION # 2 (Continued)

POSITION	HHDLU/EHHDLU (OCTAL)
Fully Right	3010 - 3170

(w) On the HHDLU/EHHDLU, select the RUDDER PEDAL POSITION parameter. Select WORDS 109, and 237, and SUBFRAME ALL.

NOTE: Make sure that the aircraft is on the ground configuration.

(x) Refer to the table below and, with the pedals, control the rudder (AMM SDS 27-20-00/1) to make sure that the values shown on the HHDLU/EHHDLU are in the tolerances.

Table 585 - RUDDER PEDAL POSITION

POSITION	HHDLU/EHHDLU (OCTAL)
Neutral and Locked	1740 - 2040
Right Pedal Fully Forward	3103 - 4303
Left Pedal Fully Forward	0000 - 0767

(y) Release the pressure from the hydraulic system (AMM TASK 29-10-00-860-801-A/200).

(10) (Aircraft with load cells) Do the test of the Cockpit Flight-Control Input Forces:

(a) Do the test of the cockpit pilot's controls as follows:

1 On the HHDLU/EHHDLU, select the CONTROL COLUMN FORCE #1 parameter. Select WORD 02, SUBFRAME ALL, and OCTAL BASE.

2 Install the rig pin (2) to the pilot's control column. Refer to (Figure 507).

3 Do not apply force on the controls.

4 With the pilot's control column in the neutral position, make sure that the values shown on the HHDLU/EHHDLU screen are between 0000 and 0314 or 7777 and 7463.

5 Apply force on the pilot's control column in the nose-down direction slowly and make sure that the values shown on the HHDLU/EHHDLU screen are between 7777 and 4000.

6 Release the pilot's control column and make sure that it comes back to the neutral position.

7 Apply force on the pilot's control column in the nose-up direction slowly and make sure that the values shown on the HHDLU/EHHDLU screen are between 0000 and 3777.

8 Remove the rig pin (2) from the pilot's control column. Refer to (Figure 507).

9 On the HHDLU/EHHDLU, select the RUDDER PEDAL FORCE #1 parameter. Select WORD 034, SUBFRAME ALL, and OCTAL BASE.

10 Make sure that the hydraulic system is not energized.

11 Install the rig pin to the pilot's rudder control system (2). Refer to (Figure 508).

12 Do not apply force on the controls.

13 With the pilot's rudder pedals in the neutral position, make sure that the values shown on the HHDLU/EHHDLU screen are between 0000 and 0314 or 7777 and 7463.

14 Apply force on the pilot's right rudder pedal slowly and make sure that the values shown on the HHDLU/EHHDLU screen are between 0000 and 3777.

15 Release the pilot's right rudder pedal and make sure that it comes back to the neutral position.

16 Apply force on the pilot's left rudder pedal slowly and make sure that the values shown on the HHDLU/EHHDLU screen are between 7777 and 4000.

17 Remove the rig pin from the pilot's rudder control system (2). Refer to (Figure 508).

WARNING: MAKE SURE THAT THERE ARE NO PERSON OR EQUIPMENT IN THE AILERON TRAVEL AREA.

18 Pressurize the hydraulic system (AMM TASK 29-10-00-860-801-A/200).

19 On the Overhead Panel, push the AILERON SHUTOFF SYS 1 and AILERON SHUTOFF SYS 2 pushbuttons to turn on AILERON system 1 and AILERON system 2.

a Make sure that the pushbutton lights go off and the AIL SYS 1-2 INOP message of the EICAS display goes out of view.

20 On the HHDLU/EHHDLU, select the CONTROL WHEEL CELL #1 PILOT parameter. Select WORD 66, SUBFRAME ALL, and OCTAL BASE.

21 Turn the pilot's control wheel fully counterclockwise and make sure that the values shown on the HHDLU/EHHDLU screen are between 0000 and 0314 or 7777 and 7463.

22 On the HHDLU/EHHDLU, select the CONTROL WHEEL CELL #2 PILOT parameter. Select WORD 98, SUBFRAME ALL, and OCTAL BASE.

23 Turn the pilot's control wheel fully clockwise and make sure that the values shown on the HHDLU/EHHDLU screen are between 0000 and 0314 or 7777 and 7463.

24 On the Overhead Panel, push the AILERON SHUTOFF SYS 1 and AILERON SHUTOFF SYS 2 pushbuttons to turn off AILERON system 1 and AILERON system 2.

a Make sure that the pushbutton lights come on and the EICAS display shows the AIL SYS 1-2 INOP caution message.

25 Release the pressure of the hydraulic system (AMM TASK 29-10-00-860-801-A/200).

26 On the HHDLU/EHHDLU, select the CONTROL WHEEL FORCE #1 parameter. Select WORD 162, SUBFRAME ALL, and OCTAL BASE.

27 Install the rig pin to the pilot's control wheel (1). Refer to (Figure 509).

28 Do not apply force on the controls.

29 Remove the rig pin from the pilot's control wheel (1). Refer to (Figure 509).

NOTE: Make sure that the Control Yoke do not move from its neutral position after the "rig pin" removal.

30 Apply counterclockwise force on the pilot's control wheel slowly and make sure that the values shown on the HHDLU/EHHDLU screen are between 7777 and 4000.

31 Release the pilot's control wheel and make sure that it comes back to the neutral position.

32 Install the rig pin to the pilot's control wheel (1). Refer to (Figure 509).

33 Do not apply force on the controls.

34 Remove the rig pin from the pilot's control wheel (1). Refer to (Figure 509).

NOTE: Make sure that the Control Yoke do not move from its neutral position after the "rig pin" removal.

35 Apply clockwise force on the pilot's control wheel slowly and make sure that the values shown on the HHDLU/EHHDLU screen are between 0000 and 3777.

(b) Do the test of the cockpit copilot's controls as follows:

1 On the HHDLU/EHHDLU, select the CONTROL COLUMN FORCE #2 parameter. Select WORD 108, SUBFRAME ALL, and OCTAL BASE.

2 Install the rig pin (1) to the copilot's control column. Refer to (Figure 507).

3 Do not apply force on the controls.

4 With the copilot's control column in the neutral position, make sure that the values shown on the HHDLU/EHHDLU screen are between 0000 and 0314 or 7777 and 7463.

5 Apply force on the copilot's control column in the nose-down direction slowly and make sure that the values shown on the HHDLU/EHHDLU screen are between 7777 and 4000.

6 Release the copilot's control column and make sure that it comes back to the neutral position.

7 Apply force on the copilot's control column in the nose-up direction slowly and make sure that the values shown on the HHDLU/EHHDLU screen are between 0000 and 3777.

8 Remove the rig pin (1) from the copilot's control column. Refer to (Figure 507).

9 On the HHDLU/EHHDLU, select the RUDDER PEDAL FORCE #2 parameter. Select WORD 172, SUBFRAME ALL, and OCTAL BASE.

10 Make sure that the hydraulic system is not energized.

11 Install the rig pin to the copilot's rudder control system (1). Refer to (Figure 508).

12 Do not apply force on the controls.

13 With the copilot's rudder pedals in the neutral position, make sure that the values shown on the HHDLU/EHHDLU screen are between 0000 and 0314 or 7777 and 7463.

14 Apply force on the copilot's right rudder pedal slowly and make sure that the values shown on the HHDLU/EHHDLU screen are between 7777 and 4000.

15 Release the copilot's right rudder pedal and make sure that it comes back to the neutral position.

16 Apply force on the copilot's left rudder pedal slowly and make sure that the values shown on the HHDLU/EHHDLU screen are between 0000 and 3777.

WARNING: MAKE SURE THAT THERE ARE NO PERSON OR EQUIPMENT IN THE AILERON TRAVEL AREA.

17 Remove the rig pin from the copilot's rudder control system (1). Refer to (Figure 508).

18 Pressurize the hydraulic system (AMM TASK 29-10-00-860-801-A/200).

19 On the Overhead Panel, push the AILERON SHUTOFF SYS 1 and AILERON SHUTOFF SYS 2 pushbuttons to turn on AILERON system 1 and AILERON system 2.

a Make sure that the pushbutton lights go off and the AIL SYS 1-2 INOP message of the EICAS display goes out of view.

20 On the HHDLU/EHHDLU, select the CONTROL WHEEL CELL #1 COPILOT parameter. Select WORD 14, SUBFRAME ALL, and OCTAL BASE.

21 Turn the copilot's control wheel fully counterclockwise and make sure that the values shown on the HHDLU/EHHDLU screen are between 0000 and 0314 or 7777 and 7463.

22 On the HHDLU/EHHDLU, select the CONTROL WHEEL CELL #2 COPILOT parameter. Select WORD 46, SUBFRAME ALL, and OCTAL BASE.

23 Turn the copilot's control wheel fully clockwise and make sure that the values shown on the HHDLU/EHHDLU screen are between 0000 and 0314 or 7777 and 7463.

24 On the Overhead Panel, push the AILERON SHUTOFF SYS 1 and AILERON SHUTOFF SYS 2 pushbuttons to turn off AILERON system 1 and AILERON system 2.

a Make sure that the pushbutton lights come on and the EICAS display shows the AIL SYS 1-2 INOP caution message.

25 Release the pressure of the hydraulic system (AMM TASK 29-10-00-860-801-A/200).

26 On the HHDLU/EHHDLU, select the CONTROL WHEEL FORCE #2 parameter. Select WORD 078, SUBFRAME ALL, and OCTAL BASE.

27 Install the rig pin to the copilot's control wheel (1). Refer to (Figure 509).

28 Do not apply force on the controls.

29 Remove the rig pin from the copilot's control wheel (1). Refer to (Figure 509).

30 Apply counterclockwise force on the copilot's control wheel slowly and make sure that the values shown on the HHDLU/EHHDLU screen are between 7777 and 4000.

31 Release the copilot's control wheel and make sure that it comes back to the neutral position.

32 Install the rig pin to the copilot's control wheel (1). Refer to (Figure 509).

33 Do not apply force on the controls.

34 Remove the rig pin from the copilot's control wheel (1). Refer to (Figure 509).

35 Apply clockwise force on the copilot's control wheel slowly and make sure that the values shown on the HHDLU/EHHDLU screen are between 0000 and 3777.

(11) Do the test of the Flap Control as follows (OCTAL BASE):

(a) On the HHDLU/EHHDLU, select the FLAP POSITION parameter. Select WORD 199, and SUBFRAMES 1 and 3.

(b) Set the Flap Selector Lever, on the Control Pedestal (AMM SDS 27-53-00/1), to the positions listed in the table below, and make sure that the FLAPS position indication on the EICAS shows the same positions. Make sure that the values shown on the HHDLU/EHHDLU obey the tolerances.

Table 586 - FLAP POSITION

VALUES (°)	HHDLU/EHHDLU (OCTAL)
0	0000 - 0137
9	0277 - 0577
22	1137 - 1437
45	2477 - 2777

(12) (Aircraft with load cells and aircraft with FECU -1007 and on) Do the test of the Cockpit Flap Control as follows (OCTAL BASE):

(a) On the HHDLU/EHHDLU, select the FLAP CONTROL POSITION parameter. Select WORD 234, and SUBFRAME ALL.

(b) Set the Flap Selector Lever, on the Control Pedestal (AMM SDS 27-53-00/1), to the positions given in table below, and make sure that the same FLAPS position indications are shown on the EICAS. Make sure that the values shown on the HHDLU/EHHDLU obey the tolerances.

Table 587 - FLAP CONTROL POSITION

VALUES (°)	HHDLU/EHHDLU (OCTAL)
0	1655 - 2121
9	3655 - 4121
18	6655 - 7121
22	5255 - 5521
45	6255 - 6521

(13) Do the test of the Stall Protection System Parameters as follows (OCTAL BASE):

(a) On the HHDLU/EHHDLU, select the ANGLE OF ATTACK # 1 (AOA - Left Side) Sensor parameter. Select WORDS 39, and 167, and SUBFRAME ALL.

(b) Refer to the table below, adjust the Angle of Attack (AOA) # 1 Sensor to those positions, and make sure that the values shown on the HHDLU/EHHDLU are in the tolerances:

Table 588 - ANGLE OF ATTACK # 1

POSITION	HHDLU/EHHDLU (OCTAL)
LOWER STOP	3752 - 4030
UPPER STOP	3747 - 4025

(c) On the HHDLU/EHHDLU, select the ANGLE OF ATTACK # 2 (AOA - Right Side) Sensor parameter. Select WORDS 103, and 231, and SUBFRAME ALL.

(d) Refer to the table below, adjust the Angle of Attack (AOA) # 2 Sensor to those positions, and make sure that the values shown on the HHDLU/EHHDLU are in the tolerances:

Table 589 - ANGLE OF ATTACK # 2

POSITION	HHDLU/EHHDLU (OCTAL)
LOWER STOP	3752 - 4030
UPPER STOP	3747 - 4025

(e) The items (f) thru (j) are applicable to aircraft with EICAS versions 17 and on.

WARNING: FOR THIS TEST, THE PUSHER WILL BE OPERATED. MAKE SURE THAT THERE ARE NO PERSONS OR EQUIPMENT NEAR THE ELEVATOR SURFACES.

(f) On the Overhead Panel, make sure that the BATT1 and BATT2 switches are set at OFF and, on the Circuit Breaker Panel, open the AIR/GND A (Location Tip: DC BUS 1/LDG GEAR/AIR/GND A), AIR/GND B (Location Tip: ESSENTIAL DC BUS 1/LDG GEAR/AIR/GND B), AIR/GND C (Location Tip: DC BUS 2/LDG GEAR/AIR/GND C), and AIR/GND D (Location Tip: ESSENTIAL DC BUS 2/LDG GEAR/AIR/GND D) circuit breakers and attach DO-NOT-CLOSE tags to them.

(g) On the Pitot/Static System Test Set (GSE 129), adjust the air data parameters as follows:

- Climb to 0 feet per minute.

- Airspeed to 200 Knots.

- Altitude to 1,500 feet.

This procedure puts the aircraft in the flight configuration.

(h) On the HHDLU/EHHDLU, select the STICK PUSHER and STICK SHAKER parameters. Select WORD 19 (BINARY BASE) and SUBFRAME ALL.

(i) Pull the control column rearward. Change the position of the Angle-of-Attack (AOA) sensors (outside the aircraft) in order to simulate a nose-up condition.

Result:

1 Shakers 1 and 2 start.

2 The pusher starts and controls the elevator nose down, and the clacker operates.

3 The HHDLU/EHHDLU 3rd and 4th bits go to "1".

(j) Change the position of the angle-of-attack (AOA) sensors (outside the aircraft) in order to simulate the return of the aircraft to the horizontal position.

Result:

1 Shakers 1 and 2 stop.

2 The pusher and clacker sound stop.

3 The HHDLU/EHHDLU 3rd and 4th bits come back to "0".

(k) The items (l) thru (p) are applicable to aircraft with EICAS versions 20.5 and on.

(l) On the HHDLU/EHHDLU, select the SPC # (1,2) FAIL parameter. Select WORD 5 (BINARY BASE) and SUBFRAME 1.

(m) On the circuit breaker panel, open the CHANNEL 1 (Location Tip: ESSENTIAL DC BUS 1/STALL PROT/CHANNEL 1) circuit breaker.

Result:

1 On the EICAS display, the message SPS 1 INOP comes into view.

2 On the HHDLU/EHHDLU, the 2nd bit changes from "0" to "1".

(n) On the circuit breaker panel, close the CHANNEL 1 (Location Tip: ESSENTIAL DC BUS 1/STALL PROT/CHANNEL 1) circuit breaker.

Result:

1 On the EICAS display, the message SPS 1 INOP goes out of view.

2 On the HHDLU/EHHDLU, the 2nd bit changes from "1" to "0".

(o) On the circuit breaker panel, open the CHANNEL 2 (Location Tip: DC BUS 2/ STALL PROT/CHANNEL 2) circuit breaker.

Result:

1 On the EICAS display, the message SPS 2 INOP comes into view.

2 On the HHDLU/EHHDLU, the 3rd bit changes from "0" to "1".

(p) On the circuit breaker panel, close the CHANNEL 2 (Location Tip: DC BUS 2/ STALL PROT/CHANNEL 2) circuit breaker.

Result:

1 On the EICAS display, the message SPS 2 INOP goes out of view.

2 On the HHDLU/EHHDLU, the 3rd bit changes from "1" to "0".

(14) Do the test of the Radio Altitude (Radio Altimeter # 1) Parameter as follows (OCTAL BASE):

(a) On the HHDLU/EHHDLU, select the RADIO ALTITUDE parameter. Select WORD 99 and SUBFRAME ALL.

(b) Simulate the radio altitude values given in the table below (RADIO ALTITUDE). To do this, refer to AMM TASK 34-31-00-800-801-A/200. See the indications on PFD 1 and make sure that the values shown on the HHDLU/EHHDLU are in the tolerance.

Table 590 - RADIO ALTITUDE

RADIO ALTITUDE (ft)	POWER SUPPLY (V DC)	HHDLU/EHHDLU (OCTAL)
250 ± 3%	1.35	0171 - 0200
500 ± 3%	2.74	0362 - 0401
1500 ± 5%	8.20	1310 - 1423
2500 ± 5%	13.65	2243 - 2440

(c) Restore the Radio Altimeter System back to normal. Refer to AMM TASK 34-31-00-800-801-A/200.

(15) (Aircraft with 2nd radio altimeter and EICAS versions 20.5 and on) Do the test of the Radio Altitude (Radio Altimeter # 2) Parameter as follows (OCTAL BASE):

(a) On the HHDLU/EHHDLU, select the RADIO ALTITUDE parameter. Select WORD 243 and SUBFRAME ALL.

(b) Simulate the radio altitude values given in the table below (RADIO ALTITUDE). To do this, refer to AMM TASK 34-31-00-800-801-A/200. See the indications on PFD 2 and make sure that the values shown on the HHDLU/EHHDLU are in the tolerance.

Table 591 - RADIO ALTITUDE

RADIO ALTITUDE (ft)	POWER SUPPLY (V DC)	HHDLU/EHHDLU (OCTAL)
250 ± 3%	1.35	0171 - 0200
500 ± 3%	2.74	0362 - 0401
1500 ± 5%	8.20	1310 - 1423
2500 ± 5%	13.65	2243 - 2440

(c) Restore the Radio Altimeter System back to normal. Refer to AMM TASK 34-31-00-800-801-A/200.

(16) Do the test of the Navigation Analog Parameters as follows:

(a) On the HHDLU/EHHDLU, select the GLIDE SLOPE DEVIATION # 1 parameter. Select WORD 67, SUBFRAME ALL, and OCTAL BASE.

(b) Set RMU1 to the NAV1 window and tune in to VOR/ILS stations (AMM TASK 34-32-00-700-801-A/500).

(c) On the COMM/VOR/ILS Ramp and Bench Test Set (GSE 126 or GSE 301 or GSE 474), set the MODE switch to G/S XTL, and make sure that the frequency of 334.70 MHz is shown.

(d) On RMU1, select the frequency of 108.10 MHz.

(e) On the Test Set (GSE 126 or GSE 301 or GSE 474), set the G/S DDM switch to the values shown in the table below. See the indications shown on PFD 1 and make sure that the values shown on the HHDLU/EHHDLU are in the tolerances:

Table 592 - GLIDE SLOPE DEVIATION # 1

VALUES (DDM)	HHDLU/EHHDLU (OCTAL)	PFD 1 INDICATIONS
0	7702 - 0075	G/S DEVIATION BAR CENTERED
+ 0.175	0662 - 0715	2-DOT DEVIATION UP
- 0.175	7062 - 7115	2-DOT DEVIATION DOWN

(f) On the HHDLU/EHHDLU, select the GLIDE SLOPE DEVIATION # 2 parameter. Select WORD 195, SUBFRAME ALL, and OCTAL BASE.

(g) Set RMU2 to the NAV2 window and tune in to VOR/ILS stations (AMM TASK 34-32-00-700-801-A/500).

(h) On the COMM/VOR/ILS Ramp and Bench Test Set (GSE 126 or GSE 301 or GSE 474), set the MODE switch to G/S XTL and make sure that the frequency of 334.70 MHz is shown.

(i) On RMU2, select the frequency of 108.10 MHz.

(j) On the Test Set (GSE 126 or GSE 301 or GSE 474), set the G/S DDM switch to the values given in the table below. See the indications shown on PFD 2 and make sure that the values shown on the HHDLU/EHHDLU are in the tolerances:

Table 593 - GLIDE SLOPE DEVIATION # 2

VALUES (DDM)	HHDLU/EHHDLU (OCTAL)	PFD 2 INDICATIONS
0	7702 - 0075	G/S DEVIATION BAR CENTERED
+ 0.175	0662 - 0715	2-DOT DEVIATION UP
- 0.175	7062 - 7115	2-DOT DEVIATION DOWN

(k) On the HHDLU/EHHDLU, select the LOCALIZER DEVIATION # 1 parameter. Select WORD 69, SUBFRAME ALL, and OCTAL BASE.

(l) Set RMU1 to the NAV1 window, and tune in to VOR/ILS stations (AMM TASK 34-32-00-700-801-A/500).

(m) On the COMM/VOR/ILS Ramp and Bench Test Set (GSE 126 or GSE 301 or GSE 474), set the MODE switch to LOC XTL, and make sure that the frequency of 108.10 MHz is shown.

(n) On RMU1, select the frequency of 108.10 MHz.

(o) Refer to the table below and, on the Test Set (GSE 126 or GSE 301 or GSE 474), set the LOC DDM switch to those values. See the indications on PFD 1 and make sure that the values shown on the HHDLU/EHHDLU are in the tolerances:

Table 594 - LOCALIZER DEVIATION # 1

VALUES (DDM)	HHDLU/EHHDLU (OCTAL)	PFD 1 INDICATIONS
0	7741 - 0036	LOC DEVIATION BAR CENTERED
+ 0.155	1401 - 1461	2-DOT DEVIATION RIGHT
- 0.155	6316 - 6376	2-DOT DEVIATION LEFT

(p) On the HHDLU/EHHDLU, select the LOCALIZER DEVIATION # 2 parameter. Select WORD 197, SUBFRAME ALL, and OCTAL BASE.

(q) Set the RMU2 to the NAV2 window, and tune in to VOR/ILS stations (AMM TASK 34-32-00-700-801-A/500).

(r) On the COMM/VOR/ILS Ramp and Bench Test Set (GSE 126 or GSE 301 or GSE 474), set the MODE switch to LOC XTL, and make sure that the frequency of 108.10 MHz is shown.

(s) On RMU2, select the frequency of 108.10 MHz.

(t) Refer to the table below and, on the Test Set (GSE 126 or GSE 301 or GSE 474), set the LOC DDM switch to those values. See the indications on PFD 2 and make sure that the values shown on the HHDLU/EHHDLU are in the tolerances:

Table 595 - LOCALIZER DEVIATION # 2

VALUES (DDM)	HHDLU/EHHDLU (OCTAL)	PFD 2 INDICATIONS
0	7741 - 0036	LOC DEVIATION BAR CENTERED
+ 0.155	1401 - 1461	2-DOT DEVIATION RIGHT
- 0.155	6316 - 6376	2-DOT DEVIATION LEFT

(u) On the HHDLU/EHHDLU, select the NAVIGATION FREQUENCY # 1 parameter. Select WORD 193, SUBFRAME 2, and HEXADECIMAL BASE.

(v) Set RMU1 to the NAV1 window, and tune in to VOR/ILS stations (AMM TASK 34-32-00-700-801-A/500).

(w) Refer to the table below and tune in RMU1 to those frequencies. Make sure that the values shown on the HHDLU/EHHDLU are correct:

Table 596 - NAVIGATION FREQUENCY # 1

VALUES (MHz)	HHDLU/EHHDLU (HEXADECIMAL)
108.00	800
110.00	000
114.00	400
116.85	685

(x) On the HHDLU/EHHDLU, select the NAVIGATION FREQUENCY # 2 parameter. Select WORD 193, SUBFRAME 4, and HEXADECIMAL BASE.

(y) Set RMU2 to the NAV2 window and tune in to VOR/ILS stations (AMM TASK 34-32-00-700-801-A/500).

(z) Refer to the table below and tune in RMU2 to those frequencies. Make sure that the values shown on the HHDLU/EHHDLU are correct:

Table 597 - NAVIGATION FREQUENCY # 2

VALUES (MHz)	HHDLU/EHHDLU (HEXADECIMAL)
108.00	800
110.00	000
114.00	400
116.85	685

(aa) On the HHDLU/EHHDLU, select the DME DISTANCE # 1 parameter. Select WORD 193, SUBFRAME 1, and OCTAL BASE.

(ab) On RMU1, push the DME function key and move the cursor of RMU1 to the DME1 window.

(ac) On the TRANSPONDER and DME Ramp Test Set (GSE 127 or GSE 302 or GSE 475), set the XFR DME switch to DME and the VELOCITY switch to RANGE.

(ad) Put the test antenna (GSE 127 or GSE 302 or GSE 475) near DME1 (one meter, approximately).

(ae) Tune in RMU1 to the frequency of 108.00 MHz (DME station) (AMM TASK 34-51-00-700-801-A/500).

(af) Refer to the table below and tune in the Test Set (GSE 127 or GSE 302 or GSE 475) to those values. Make sure that the values shown on the HHDLU/EHHDLU are in the tolerances:

Table 598 - DME DISTANCE # 1

VALUES (Nm)	HHDLU/EHHDLU (OCTAL)
50	610 - 630
100	1430 - 1450
150	2250 - 2270

(ag) On the HHDLU/EHHDLU, select the DME DISTANCE # 2 parameter. Select WORD 193, SUBFRAME 3, and OCTAL BASE.

(ah) On RMU2, push the DME function key and move the cursor of RMU2 to the DME2 window.

(ai) On the TRANSPONDER and DME Ramp Test Set (GSE 127 or GSE 302 or GSE 475), set the XFR DME switch to DME and the VELOCITY switch to RANGE.

(aj) Put the test antenna (GSE 127 or GSE 302 or GSE 475) near DME 2 (one meter, approximately).

(ak) On RMU2, select the frequency of 108.00 MHz (DME station) (AMM TASK 34-51-00-700-801-A/500).

(al) Refer to the table below and tune in the Test Set (GSE 127 or GSE 302 or GSE 475) to those values. Make sure that the values shown on the HHDLU/EHHDLU are in the tolerances:

Table 599 - DME DISTANCE # 2

VALUES (Nm)	HHDLU/EHHDLU (OCTAL)
50	610 - 630
100	1430 - 1450
150	2250 - 2270

(17) Do the test of the Navigation Discrete Parameters as follows (BINARY BASE):

(a) On the HHDLU/EHHDLU, select WORD 51 and SUBFRAME ALL.

(b) On the COMM/VOR/ILS Ramp and Bench Test Set (GSE 126 or GSE 301 or GSE 474), set the MODE switch to MKR XTL.

(c) Do the test of INNER MARKER # 1 (Marker Beacon # 1) as follows: on the Test Set (GSE 126 or GSE 301 or GSE 474), set the TUNE selector to the frequency of 3000 Hz (WHITE).

Result:

1 On the HHDLU/EHHDLU display, make sure that the 1st bit changes from "0" to "1".

(d) Do the test of INNER MARKER # 2 (Marker Beacon # 2) as follows: on the Test Set (GSE 126 or GSE 301 or GSE 474), make sure that the TUNE selector is set to the frequency of 3000 Hz (WHITE).

Result:

1 On the HHDLU/EHHDLU display, make sure that the 4th bit changes from "0" to "1".

(e) Do the test of MIDDLE MARKER # 1 (Marker Beacon # 1) as follows: on the Test Set (GSE 126 or GSE 301 or GSE 474), set the TUNE selector to the frequency of 1300 Hz (YELLOW).

Result:

1 On the HHDLU/EHHDLU display, make sure that the 2nd bit changes from "0" to "1".

(f) Do the test of MIDDLE MARKER # 2 (Marker Beacon # 2) as follows: on the Test Set (GSE 126 or GSE 301 or GSE 474), make sure that the TUNE selector is set to the frequency of 1300 Hz (YELLOW).

Result:

1 On the HHDLU/EHHDLU display, make sure that the 5th bit changes from "0" to "1".

(g) Do the test of OUTER MARKER # 1 (Marker Beacon # 1) as follows: on the Test Set (GSE 126 or GSE 301 or GSE 474), set the TUNE selector to the frequency of 400 Hz (BLUE).

Result:

1 On the HHDLU/EHHDLU display, make sure that the 3rd bit changes from "0" to "1".

(h) Do the test of OUTER MARKER # 2 (Marker Beacon # 2) as follows: on the Test Set (GSE 126 or GSE 301 or GSE 474), make sure that the TUNE selector is set to the frequency of 400 Hz (BLUE).

Result:

1 On the HHDLU/EHHDLU display, make sure that the 6th bit changes from "0" to "1".

(18) Do the test of the PTT (Communication) Parameter as follows (BINARY BASE):

(a) On the HHDLU/EHHDLU, select WORD 19 and SUBFRAME ALL.

(b) Make sure that the pilot and copilot headsets are connected.

(c) On the pilot and copilot DAPs (digital audio panel), push to set the BOOM/MASK pushbutton to the BOOM position.

NOTE: Steps (d) through (g) are applicable only to aircraft with the HF system installed.

(d) On the pilot and copilot DAPs (digital audio panel), push the HF pushbutton.

(e) On the HF control panel (CTL-230), on the control pedestal, tune in an HF frequency (AMM SDS 23-11-00/1).

(f) Momentarily set the PTT/HOT mic switches, on the pilot or copilot control yoke, to the PTT position.

Result:

1 On the HHDLU/EHHDLU display, make sure that the 1st bit changes from "0" to "1".

(g) Momentarily push the PTT mic switch, on the pilot or copilot glareshield panel.

Result:

1 On the HHDLU/EHHDLU display, make sure that the 1st bit changes from "0" to "1".

(h) On the pilot DAP (digital audio panel), push the COM1 pushbutton.

(i) Set RMU1 to the COM1 window (AMM SDS 23-81-00/1).

(j) Tune in the COMM 1 system, on RMU1, to a VHF-1 frequency (AMM SDS 23-12-00/1).

(k) Momentarily set the PTT/HOT mic switches, on the pilot control yoke, to the PTT position.

Result:

1 RMU1 shows the TX indication, on the COM1 window.

2 On the HHDLU/EHHDLU display, make sure that the 1st bit changes from "0" to "1".

(l) Momentarily push the PTT mic switch, on the pilot glareshield panel.

Result:

1 RMU1 shows the TX indication, on the COM1 window.

2 On the HHDLU/EHHDLU display, make sure that the 1st bit changes from "0" to "1".

(m) On the copilot DAP (digital audio panel), push the COM2 pushbutton.

(n) Set RMU2 to the COM2 window (AMM SDS 23-81-00/1).

(o) Tune in the COMM 2 system, on RMU2, to a VHF-2 frequency (AMM SDS 23-12-00/1).

(p) Momentarily set the PTT/HOT mic switches, on the copilot control yoke, to the PTT position.

Result:

1 RMU2 shows the TX indication, on the COM2 window.

2 On the HHDLU/EHHDLU display, make sure that the 1st bit changes from "0" to "1".

(q) Momentarily push the PTT mic switch, on the copilot glareshield panel.

Result:

1 RMU2 shows the TX indication, on the COM2 window.

2 On the HHDLU/EHHDLU display, make sure that the 1st bit changes from "0" to "1".

NOTE: Steps (r) through (u) are applicable only to aircraft with the VHF-3 enabled for voice communication.

(r) On the DAPs (digital audio panel), push the COM3 pushbutton.

(s) Tune in, on the VHF-3 control panel, a VHF-3 frequency (AMM SDS 23-12-00/1).

(t) Momentarily set the PTT/HOT mic switches, on the pilot or copilot control yoke, to the PTT position.

Result:

1 On the HHDLU/EHHDLU display, make sure that the 1st bit changes from "0" to "1".

(u) Momentarily push the PTT mic switch, on the pilot or copilot glareshield panel.

Result:

1 On the HHDLU/EHHDLU display, make sure that the 1st bit changes from "0" to "1".

(19) Do the test of the Landing Gear Parameters as follows (BINARY BASE):

(a) On the Electrical Control Panel, set the BATT 1 and BATT 2 switches to OFF.

(b) To do the test of the AIR/GND SWITCH parameter, select the WORD 19 and SUBFRAME ALL, on the HHDLU/EHHDLU.

(c) On the Circuit Breaker Panel, open the AIR/GND B (Location Tip: ESSENTIAL DC BUS 1/LDG GEAR/AIR/GND B) circuit breaker. This is to put the aircraft in the flight configuration with NLG and MLG shock absorbers extended (AMM SDS 32-30-00/1).

Result:

1 On the HHDLU/EHHDLU display, make sure that the 7th bit changes from "1" to "0".

(d) On the Circuit Breaker Panel, close the AIR/GND B (Location Tip: ESSENTIAL DC BUS 1/LDG GEAR/AIR/GND B) circuit breaker.

Result:

1 On the HHDLU/EHHDLU display, make sure that the 7th bit changes from "0" to "1".

(e) The items (f) thru (h) are applicable to aircraft with EICAS versions 17 and on.

(f) To do the test of the AIR/GND SWITCH parameter, select the WORDS 83, 147 and 211, and SUBFRAME ALL, on the HHDLU/EHHDLU.

(g) On the Circuit Breaker Panel, open again the AIR/GND B (Location Tip: ESSENTIAL DC BUS 1/LDG GEAR/AIR/GND B) circuit breaker. This is to put the aircraft in the flight configuration with NLG and MLG shock absorbers extended (AMM SDS 32-30-00/1).

Result:

1 On the HHDLU/EHHDLU display, make sure that the 12th bit (WORDS 83, 147 and 211) changes from "1" to "0".

(h) On the Circuit Breaker Panel, close the AIR/GND B (Location Tip: ESSENTIAL DC BUS 1/LDG GEAR/AIR/GND B) circuit breaker.

Result:

1 On the HHDLU/EHHDLU display, make sure that the 12th bit changes from "0" to "1".

(i) To do the test of the LANDING GEAR DOWN LOCKED parameter, select WORD 5 and SUBFRAME 4, on the HHDLU/EHHDLU.

(j) On the Circuit Breaker Panel, open the IND 1 (Location Tip: ESSENTIAL DC BUS 1/LDG GEAR/IND 1) and IND 2 (Location Tip: ESSENTIAL DC BUS 2/LDG GEAR/IND 2) circuit breakers and attach DO-NOT-CLOSE tags to them.

Result:

1 On the HHDLU/EHHDLU display, make sure that the 1st bit changes from "1" to "0".

(k) Remove the DO-NOT-CLOSE tags from the circuit breakers opened in (f), and close the circuit breakers.

(l) The items (m) thru (v) are applicable to aircraft with EICAS versions 20.5 and on.

(m) For aircraft PRE-MOD SB145-32-0036, make sure that the pressure in hydraulic system No. 1 is fully released (AMM TASK 29-10-00-860-802-A/200).

(n) For aircraft POST-MOD SB145-32-0036, install safety pin of the NLG doors solenoid valve (AMM TASK 32-00-02-910-801-A/200).

WARNING: MAKE SURE THAT THE LANDING GEAR SAFETY PINS ARE INSTALLED ON ALL MAIN LANDING GEAR AND NOSE LANDING GEAR TO PREVENT INJURIES TO PERSONS AND DAMAGE TO MATERIAL (AMM TASK 32-00-01-910-801-A/200).

(o) Make sure that the hydraulic system is not energized.

(p) On the circuit breaker panel, open the LG CMD (Location Tip: ESSENTIAL DC BUS 2/LDG GEAR/CMD), and the DOOR CMD (Location Tip: DC BUS 2/LDG GEAR/DOOR CMD) circuit breakers and attach a DO-NOT-CLOSE tag to them.

(q) Disconnect the LG solenoid valve connector P0037 and the door solenoid valve connector P0036.

(r) On the HHDLU/EHHDLU, select the LANDING GEAR LEVER DOWN parameter. Select WORD 05 (BINARY BASE) and SUBFRAME 3.

(s) On the main panel, on the landing gear lever control panel, push the down lock override button, while you move the lever to the up position.

Result:

1 On the HHDLU/EHHDLU the1st bit changes from "0" to "1".

(t) Move the landing gear lever to the down position.

Result:

1 On the HHDLU/EHHDLU the1st bit changes from "1" to "0".

(u) Reconnect the LG solenoid valve connector P0037 and the door solenoid valve connector P0036.

(v) On the circuit breaker panel, remove the DO-NOT-CLOSE tag from the LG CMD (Location Tip: ESSENTIAL DC BUS 2/LDG GEAR/CMD), and the DOOR CMD (Location Tip: DC BUS 2/LDG GEAR/DOOR CMD) circuit breakers and close them.

(20) (Aircraft with EICAS versions 20.5 and on) Do the test of the Speed Brake Lever Command Parameter (BINARY BASE):

(a) On the HHDLU/EHHDLU, select the SPEED BRAKE LEVER COMMAND parameter. Select WORD 83 and WORD 211, SUBFRAME ALL.

(b) Make sure that on the Circuit Breaker Panel, the AIR/GND A (Location Tip: DC BUS 1/LDG GEAR/AIR/GND A), AIR/GND B (Location Tip: ESSENTIAL DC BUS 1/LDG GEAR/AIR/GND B), AIR/GND C (Location Tip: DC BUS 2/LDG GEAR/AIR/GND C), and AIR/GND D (Location Tip: ESSENTIAL DC BUS 2/LDG GEAR/AIR/GND D) circuit breakers are closed.

(c) On the control pedestal, set the speed-brake control lever to the OPEN position.

Result:

1 On the HHDLU/EHHDLU display, make sure that on the WORD 83 and on the WORD 211, the 5th bit shows "0".

(d) On the control pedestal, set the speed-brake control lever to the CLOSE position.

Result:

1 On the HHDLU/EHHDLU display, make sure that on the WORD 83 and on the WORD 211, the 5th bit shows "1".

(21) Do the test of the Warning/Caution Parameters as follows (BINARY BASE):

(a) On the HHDLU/EHHDLU, select the MASTER WARNING parameter. Select WORD 19 and SUBFRAME ALL.

(b) Simulate a cancelating warning (EMERGENCY) condition (AMM SDS 31-51-00/1). Make sure that the master warning lights, on the Glareshield Panel, are on.

Result:

1 On the HHDLU/EHHDLU display, make sure that the 5th bit shows "1".

(c) On the Glareshield Panel, push a master warning light.

Result:

1 The master warning lights go off.

(d) On the HHDLU/EHHDLU, select the MASTER CAUTION parameter. Select WORD 19 and SUBFRAME ALL.

(e) Simulate a caution (ABNORMAL) condition (AMM SDS 31-51-00/1). Make sure that the master caution lights, on the Glareshield Panel, are on.

Result:

1 On the HHDLU/EHHDLU display, make sure that the 6th bit shows "1".

(f) On the Glareshield Panel, push a master caution light.

Result:

1 The master caution lights go off.

(22) (Aircraft with EICAS versions 20.5 and on) Do the test of the WARNING CAS MESSAGES Parameters as follows (BINARY BASE):

(a) Make sure that the emergency/parking brake accumulator is fully released (AMM TASK 32-44-02-910-801-A/200).

(b) Put chocks at the landing gear wheels (AMM TASK 10-10-01-500-801-A/200).

(c) On the HHDLU/EHHDLU, select WORD 7 and 25 and SUBFRAME ALL.

(d) On the overhead panel, on the FIRE control panel, push the FIRE TEST switch and hold it for a few seconds.

Result:

1 Some CAS messages come into view on the EICAS display.

2 The warning/caution lights flash.

3 The aural warning operates (bell).

4 On the HHDLU/EHHDLU display, make sure that on the WORD 7, the 12th bit shows "1" and on the WORD 25, the 4th and the 5th bits show "1".

(e) Release the FIRE TEST switch.

Result:

1 The CAS messages caused by the fire test go out of view on the EICAS display.

2 On the HHDLU/EHHDLU display, make sure that on the WORD 7, the 12th bit shows "0" and on the WORD 25, the 4th and the 5th bits show "0".

(f) On the glareshield panel, push a master warning/caution lighted pushbutton.

NOTE: If it is necessary to do this test again, wait 6 seconds for the system to reset.

(g) On the HHDLU/EHHDLU, select WORD 65 and SUBFRAME ALL.

(h) On the maintenance panel, move the "FUEL QTY" toggle switch.

Result:

1 Some CAS messages come into view on the EICAS display.

2 The MFD shows some indications.

3 The warning lights flash.

4 The aural warning operates (bell).

5 On the HHDLU/EHHDLU display, make sure that on the WORD 65, the 11th and the 10th bits shows "1".

(i) Wait 10 seconds and the indications above go back to the normal condition.

Result:

1 On the HHDLU/EHHDLU display, make sure that on the WORD 65, the 11th and the 10th bits shows "0".

(j) On the glareshield panel, push a master warning lighted pushbutton.

WARNING: MAKE SURE THAT THERE ARE NO PERSONS OR EQUIPMENT IN THE FLAP, HORIZONTAL STABILIZER, AND SPOILER TRAVEL AREA.

NOTE: Do not do other tasks on the flap system.

(k) On the HHDLU/EHHDLU, select WORD 129 and SUBFRAME ALL.

(l) Set the flaps to the 9-degree position (AMM SDS 27-53-00/1).

(m) Make sure that the thrust control levers are at the IDLE position.

(n) On the control yoke, operate the pilot trim switch to make the pitch trim indication show 1 DN (indication out of green band) on the EICAS display (AMM SDS 27-43-00/1).

(o) Advance the left (engine 1) thrust control lever to the THRUST SET position.

Result:

1 The TAKEOFF TRIM aural warning will be in operation.

2 On the glareshield panel, the master warning lighted pushbuttons flash.

3 The master warning tone sounds.

4 The EICAS display shows the NO TAKEOFF CONFIG message.

5 On the HHDLU/EHHDLU display, make sure that on the WORD 129, the 12th bit shows "1".

(p) Move the left (engine 1) thrust control lever back to the IDLE position.

Result:

1 The TAKEOFF TRIM aural warning is canceled.

2 On the EICAS display, the NO TAKEOFF CONFIG warning message goes out of view.

3 On the HHDLU/EHHDLU display, make sure that on the WORD 129, the 12th bit shows "0".

(q) On the glareshield panel, push a master warning lighted pushbutton.

Result:

1 The master warning lighted pushbuttons go off.

2 The master warning tone stops.

(r) Set the flaps to the 0-degree position.

(23) (Aircraft with EICAS versions 20.5 and on) Do the test of the Ground Speed Source Parameters as follows (BINARY BASE):

NOTE:
- Make sure that the DME system is operational and on, and tuned in an active DME frequency.
- Make sure that all FMS units have the present position updated.

(a) Push the NAV pushbutton on DC-550 panel.

(b) On the HHDLU/EHHDLU, select WORD 101 and SUBFRAME ALL.

(c) On the circuit breaker panel, open the FMC 1 (Location Tip: DC BUS 1/NAV/FMS/FMC 1 or CMPTR or FMS1 or 1) circuit breaker.

Result:

1 (Aircraft with Dual FMS) On the HHDLU/EHHDLU display, the related status of the 12th, 11th and 10th bits are "1", "1" and "0".

2 (Aircraft with Single FMS and IRS) On the HHDLU/EHHDLU display, the related status of the 12th, 11th and 10th bits are "0", "1" and "1".

3 (Aircraft with Single FMS and AHRS) On the HHDLU/EHHDLU display, the related status of the 12th, 11th and 10th bits are "0", "0" and "1".

(d) (Aircraft with Dual FMS) On the circuit breaker panel, open the FMC 2 (Location Tip: DC BUS 2/NAV/FMS/FMC 2) circuit breaker.

Result:

1 (Aircraft with IRS) On the HHDLU/EHHDLU display, the related status of the 12th, 11th and 10th bits are "0", "1" and "1".

2 (Aircraft with AHRS) On the HHDLU/EHHDLU display, the related status of the 12th, 11th and 10th bits are "0", "0" and "1".

(e) (Aircraft with IRS) On the circuit breaker panel, open the IRS 1 (Location Tip: DC BUS 1/NAV/FMS/IRS 1) circuit breaker.

Result:

1 On the HHDLU/EHHDLU display, the 12th, 11th and 10th bits status are "0", "1" and "0".

(f) (Aircraft with IRS) On the circuit breaker panel, open the IRS 2 (Location Tip: DC BUS 2/NAV/FMS/IRS 2) circuit breaker.

Result:

1 On the HHDLU/EHHDLU display, the 12th, 11th and 10th bits status are "0", "0" and "1".

(g) On the circuit breaker panel, open the DME 1 (Location Tip: DC BUS 1/NAV/FMS/DME 1) circuit breaker.

Result:

1 On the HHDLU/EHHDLU display, the 12th, 11th and 10th bits status are "0", "0" and "0".

(h) Close all the circuit breakers open since step (a).

(i) The items (i) thru (z) are applicable to aircraft with IRS.

(j) Do the alignment procedure for IRS 1, as follows:

(k) Make sure that PFD1 shows red flags ATT FAIL and HDG FAIL.

(l) Make sure that MFD1 shows a red flag HDG FAIL.

(m) Turn the MSU1 rotary switch to the ALIGN position.

Result:

1 The ALIGN annunciator (amber) lights.

2 The ON BATT and the NO AIR annunciators (amber) come on momentarily.

NOTE: The IRS must receive the present position for the alignment to be completed. The FMS position must be updated to permit this data to be read by the IRS.
If the aircraft is moved during the alignment, the IRU stops the alignment and starts a full alignment again 30 seconds after the motion stops.

(n) On FMS1 or FMS2, push the NAV mode key and the NEXT function key.

Result:

1 The NAV INDEX 2/2 page is shown.

(o) Push the POS INIT (3L) left line select key.

Result:

1 The POS INIT 1/1 page is shown.

(p) Push the LOAD (2R) right line select key to update the FMS position with the last saved position.

Result:

1 The CDU shows the LOADED POSITION coordinates.

(q) Wait until the alignment is completed. The alignment time depends on the local latitude. The time of alignment is less than 10 minutes for latitudes of less than 70.25 degrees.

Result:

1 After the alignment of the IRS is completed, the NAV RDY annunciator (green) comes on.

(r) Turn the MSU1 rotary switch to the NAV position.

Result:

1 The ALIGN and NAV RDY annunciators go out of the MSU.

2 The flags ATT FAIL and HDG FAIL go out of PFD1 and MFD1, and a valid attitude and heading data are shown.

(s) Do the alignment procedure for IRS 2, as follows:

(t) Make sure that PFD2 shows red flags ATT FAIL and HDG FAIL.

(u) Make sure that MFD2 shows a red flag HDG FAIL.

(v) Turn the MSU2 rotary switch to the ALIGN position.

Result:

1 The ALIGN annunciator (amber) lights.

2 The ON BATT and the NO AIR annunciators (amber) come on momentarily.

NOTE: The IRS must receive the present position for the alignment to be completed. The FMS position must be updated to permit this data to be read by the IRS.
If the aircraft is moved during the alignment, the IRU stops the alignment and starts a full alignment again 30 seconds after the motion stops.

(w) On FMS1 or FMS2, push the NAV mode key and the NEXT function key.

Result:

1 The NAV INDEX 2/2 page is shown.

(x) Push the POS INIT (3L) left line select key.

Result:

1 The POS INIT 1/1 page is shown.

(y) Push the LOAD (2R) right line select key to update the FMS position with the last saved position.

Result:

1 The CDU shows the LOADED POSITION coordinates.

(z) Wait until the alignment is completed. The alignment time depends on the local latitude. The time of alignment is less than 10 minutes for latitudes of less than 70.25 degrees.

Result:

1 After the alignment of the IRS is completed, the NAV RDY annunciator (green) comes on.

(aa) Turn the MSU2 rotary switch to the NAV position.

Result:

1 The ALIGN and NAV RDY annunciators go out of the MSU.

2 The flags ATT FAIL and HDG FAIL go out of PFD2 and MFD2, and a valid attitude and heading data are shown.

(ab) After all the systems are operational again, make sure that on the HHDLU/EHHDLU display, the 12th, 11th and 10th bits status are "1", "1" and "1".

(24) Do the test of the FMS parameters as follows (OCTAL BASE):

(a) (For aircraft equipped with Honeywell FMS) To test the PRESENT POSITION LATITUDE #1 and PRESENT POSITION LONGITUDE #1 parameters, select on the HHDLU/EHHDLU the word 128 subframe 1 and 2 for latitude and subframe 3 and 4 for longitude.

NOTE: For this step, on the HHDLU/EHHDLU, it is recommended to visualize two subframes of one word at the same time. For latitude, select the correct word and the subframes 1 and 2 to be shown at the same time.

And also for longitude, select the correct word and the subframes 3 and 4 to be shown at the same time.

(b) On the FMS select POS INIT from NAV INDEX menu.

Result:

1 The POSITION INIT 1/1 screen is displayed.

(c) Select LOAD (1R) related to LAST POSITION line.

Result:

1 The LAST POSITION becomes the FMS position.

2 The LOAD prompt changes to LOADED.

(d) (Aircraft with AHRS) On the circuit breaker panel, open the AHRS 1 (Location Tip: ESSENTIAL DC BUS 1/NAV) and AHRS 2 (Location Tip: DC BUS 2/NAV) circuit breakers.

(e) (Aircraft with IRS) On the circuit breaker panel, open the IRS 1 (Location Tip: ESSENTIAL DC BUS 1/NAV) and IRS 2 (Location Tip: DC BUS 2/NAV) circuit breakers.

(f) (Aircraft with single GPS) On the circuit breaker panel, open the GPS (Location Tip: ESSENTIAL DC BUS 1/NAV) circuit breaker.

(g) (Aircraft with dual GPS) On the circuit breaker panel, open the GPS 1 (Location Tip: ESSENTIAL DC BUS 1/NAV) and IRS 2 (Location Tip: DC BUS 2/NAV) circuit breakers.

(h) On the FMS select POS SENSOR from NAV INDEX menu.

(i) Select UPDATE (1R) .

Result:

1 The FMS UPDATE screen is displayed.

(j) Select MANUAL (2L) prompt in the left menu.

(k) Put the values of latitude and longitude, according to the table below and check the octal values in the HHDLU/EHHDLU:

Table 5100 - PRESENT POSITION LATITUDE AND LONGITUDE

LATITUDE	WORD 128-SF1 (OCTAL)	WORD 128-SF2 (OCTAL)	LONGI-TUDE	WORD 128-SF3 (OCTAL)	WORD 128-SF4 (OCTAL)
N32°27.6	0561	233 - 262	W096°27.6	5666	400 - 430
N42°33.0	0744	066 - 115	W078°30.0	6202	662 - 711
N41°32.4	0730	472 - 522	E012°16.2	0213	453 - 502

(l) In the FMS UPDATE screen, insert a value according to the table above, without the degree symbol. Press the line related to latitude and longitude coordinates (2L).

Result:

1 The value will show in the respective line.

(m) Press ENTER (6R) to insert the value to the system.

(n) (Aircraft with AHRS) On the circuit breaker panel, close the AHRS 1 (Location Tip: ESSENTIAL DC BUS 1/NAV) and AHRS 2 (Location Tip: DC BUS 2/NAV) circuit breakers.

(o) (Aircraft with IRS) On the circuit breaker panel, close the IRS 1 (Location Tip: ESSENTIAL DC BUS 1/NAV) and IRS 2 (Location Tip: DC BUS 2/NAV) circuit breakers.

(p) (Aircraft with single GPS) On the circuit breaker panel, close the GPS (Location Tip: ESSENTIAL DC BUS 1/NAV) circuit breaker.

(q) (Aircraft with dual GPS) On the circuit breaker panel, close the GPS 1 (Location Tip: ESSENTIAL DC BUS 1/NAV) and GPS 2 (Location Tip: DC BUS 2/NAV) circuit breakers.

(r) (For aircraft equipped with Universal FMS) To test the PRESENT POSITION LATITUDE #1 and PRESENT POSITION LONGITUDE #1 parameters, select on the HHDLU/EHHDLU the word 128 subframe 1 and 2 for latitude and subframe 3 and 4 for longitude.

NOTE: For this step, on the HHDLU/EHHDLU, it is recommended to visualize two subframes of one word at the same time. For latitude, select the correct word and the subframes 1 and 2 to be shown at the same time. And also for longitude, select the correct word and the subframes 3 and 4 to be shown at the same time.

(s) On the FMS select DATA menu.

Result:

1 The DATA 1/4 screen is displayed.

(t) Select LOAD (1R) related to LAST POSITION line.

Result:

1 The LAST POSITION becomes the FMS position.

2 The LOAD prompt changes to LOADED.

(u) (Aircraft with AHRS) On the circuit breaker panel, open the AHRS 1 (Location Tip: ESSENTIAL DC BUS 1/NAV) and AHRS 2 (Location Tip: DC BUS 2/NAV) circuit breakers.

(v) (Aircraft with IRS) On the circuit breaker panel, open the IRS 1 (Location Tip: ESSENTIAL DC BUS 1/NAV) and IRS 2 (Location Tip: DC BUS 2/NAV) circuit breakers.

(w) Disable the GPS as follows: Push DATA button two times to go to DATA 2/4 screen.

(x) Select the GPS 1.

Result:

1 GPS 1 screen is displayed.

(y) For disable the GPS 1, push DESELECT GPS (4R).

(z) Push DATA button three times to go to DATA 3/4 screen.

Result:

1 The DATA 3/4 screen is displayed.

(aa) Repeat the procedure to disable the GPS 2.

(ab) Push the line related to the latitude and longitude position (1L).

(ac) Push the (2R) line to highlight the latitude field.

(ad) Put the values of latitude and longitude, according to the table below and check the octal values in the HHDLU/EHHDLU:

Table 5101 - PRESENT POSITION LATITUDE AND LONGITUDE

LATITUDE	WORD 128-SF1 (OCTAL)	WORD 128-SF2 (OCTAL)	LONGI-TUDE	WORD 128-SF3 (OCTAL)	WORD 128-SF4 (OCTAL)
N32°27.6	0561	233 - 262	W096°27.6	5666	400 - 430
N42°33.0	0744	066 - 115	W078°30.0	6202	662 - 711
N41°32.4	0730	472 - 522	E012°16.2	0213	453 - 502

(ae) Put the latitude value according to the table above and push ENTER button.

Result:

1 The value will show in the respective line and the longitude value will highlight.

(af) Put the respective longitude value and push ENTER button.

(ag) Push ACCEPT (5L) to insert the values to the system.

(ah) (Aircraft with AHRS) On the circuit breaker panel, close the AHRS 1 (Location Tip: ESSENTIAL DC BUS 1/NAV) and AHRS 2 (Location Tip: DC BUS 2/NAV) circuit breakers.

(ai) (Aircraft with IRS) On the circuit breaker panel, close the IRS 1 (Location Tip: ESSENTIAL DC BUS 1/NAV) and IRS 2 (Location Tip: DC BUS 2/NAV) circuit breakers.

(aj) Enable the GPS as follows: Push DATA button two times to go to DATA 2/4 screen.

(ak) Select the GPS 1.

Result:

1 GPS 1 screen is displayed.

(al) For enable the GPS 1, push SELECT GPS (4R).

(am) Repeat the procedure to enable GPS 2.

(an) (For aircraft equipped with dual Honeywell FMS) To test the PRESENT POSITION LATITUDE #2 and PRESENT POSITION LONGITUDE #2 parameters, select on the HHDLU/EHHDLU the word 122 subframe 1 and 2 for latitude and subframe 3 and 4 for longitude.

NOTE: For this step, on the HHDLU/EHHDLU, it is recommended to visualize two subframes of one word at the same time. For latitude, select the correct word and the subframes 1 and 2 to be shown at the same time. And also for longitude, select the correct word and the subframes 3 and 4 to be shown at the same time.

(ao) On the FMS select POS INIT from NAV INDEX menu.

Result:

1 The POSITION INIT 1/1 screen is displayed.

(ap) Select LOAD (1R) related to LAST POSITION line.

Result:

1 The LAST POSITION becomes the FMS position.

2 The LOAD prompt changes to LOADED.

(aq) (Aircraft with AHRS) On the circuit breaker panel, open the AHRS 1 (Location Tip: ESSENTIAL DC BUS 1/NAV) and AHRS 2 (Location Tip: DC BUS 2/NAV) circuit breakers.

(ar) (Aircraft with IRS) On the circuit breaker panel, open the IRS 1 (Location Tip: ESSENTIAL DC BUS 1/NAV) and IRS 2 (Location Tip: DC BUS 2/NAV) circuit breakers.

(as) (Aircraft with single GPS) On the circuit breaker panel, open the GPS (Location Tip: ESSENTIAL DC BUS 1/NAV) circuit breaker.

(at) (Aircraft with dual GPS) On the circuit breaker panel, open the GPS 1 (Location Tip: ESSENTIAL DC BUS 1/NAV) and IRS 2 (Location Tip: DC BUS 2/NAV) circuit breakers.

(au) On the FMS select POS SENSOR from NAV INDEX menu.

(av) Select UPDATE (1R) .

Result:

1 The FMS UPDATE screen is displayed.

(aw) Select MANUAL (2L) prompt in the left menu.

(ax) Put the values of latitude and longitude, according to the table below and check the octal values in the HHDLU/EHHDLU:

Table 5102 - PRESENT POSITION LATITUDE AND LONGITUDE

LATITUDE	WORD 122-SF1 (OCTAL)	WORD 122-SF2 (OCTAL)	LONGI-TUDE	WORD 122-SF3 (OCTAL)	WORD 122-SF4 (OCTAL)
N32°27.6	0561	233 - 262	W096°27.6	5666	400 - 430
N42°33.0	0744	066 - 115	W078°30.0	6202	662 - 711
N41°32.4	0730	472 - 522	E012°16.2	0213	453 - 502

(ay) In the FMS UPDATE screen, insert a value according to the table above, without the degree symbol. Press the line related to latitude and longitude coordinates (2L).

Result:

1 The value will show in the respective line.

(az) Press ENTER (6R) to insert the value to the system.

(ba) (Aircraft with AHRS) On the circuit breaker panel, close the AHRS 1 (Location Tip: ESSENTIAL DC BUS 1/NAV) and AHRS 2 (Location Tip: DC BUS 2/NAV) circuit breakers.

(bb) (Aircraft with IRS) On the circuit breaker panel, close the IRS 1 (Location Tip: ESSENTIAL DC BUS 1/NAV) and IRS 2 (Location Tip: DC BUS 2/NAV) circuit breakers.

(bc) (Aircraft with single GPS) On the circuit breaker panel, close the GPS (Location Tip: ESSENTIAL DC BUS 1/NAV) circuit breaker.

(bd) (Aircraft with dual GPS) On the circuit breaker panel, close the GPS 1 (Location Tip: ESSENTIAL DC BUS 1/NAV) and GPS 2 (Location Tip: DC BUS 2/NAV) circuit breakers.

(be) (For aircraft equipped with dual Universal FMS) To test the PRESENT POSITION LATITUDE #2 and PRESENT POSITION LONGITUDE #2 parameters, select on the HHDLU/EHHDLU the word 122 subframe 1 and 2 for latitude and subframe 3 and 4 for longitude.

NOTE: For this step, on the HHDLU/EHHDLU, it is recommended to visualize two subframes of one word at the same time. For latitude, select the correct word and the subframes 1 and 2 to be shown at the same time. And also for longitude, select the correct word and the subframes 3 and 4 to be shown at the same time.

(bf) On the FMS select DATA menu.

Result:

1 The DATA 1/4 screen is displayed.

(bg) Select LOAD (1R) related to LAST POSITION line.

Result:

1 The LAST POSITION becomes the FMS position.

2 The LOAD prompt changes to LOADED.

(bh) (Aircraft with AHRS) On the circuit breaker panel, open the AHRS 1 (Location Tip: ESSENTIAL DC BUS 1/NAV) and AHRS 2 (Location Tip: DC BUS 2/NAV) circuit breakers.

(bi) (Aircraft with IRS) On the circuit breaker panel, open the IRS 1 (Location Tip: ESSENTIAL DC BUS 1/NAV) and IRS 2 (Location Tip: DC BUS 2/NAV) circuit breakers.

(bj) Disable the GPS as follows: Push DATA button two times to go to DATA 2/4 screen.

(bk) Select the GPS 1.

Result:

1 GPS 1 screen is displayed.

(bl) For disable the GPS 1, push DESELECT GPS (4R).

(bm) Push DATA button three times to go to DATA 3/4 screen.

Result:

1 The DATA 3/4 screen is displayed.

(bn) Push the line related to the latitude and longitude position (1L).

(bo) Push the (2R) line to highlight the latitude field.

(bp) Put the values of latitude and longitude, according to the table below and check the octal values in the HHDLU/EHHDLU:

Table 5103 - PRESENT POSITION LATITUDE AND LONGITUDE

LATITUDE	WORD 122-SF1 (OCTAL)	WORD 122-SF2 (OCTAL)	LONGI-TUDE	WORD 122-SF3 (OCTAL)	WORD 122-SF4 (OCTAL)
N32°27.6	0561	233 - 262	W096°27.6	5666	400 - 430
N42°33.0	0744	066 - 115	W078°30.0	6202	662 - 711
N41°32.4	0730	472 - 522	E012°16.2	0213	453 - 502

(bq) Put the latitude value according to the table above and push ENTER button.

Result:

1 The value will show in the respective line and the longitude value will highlight.

(br) Put the respective longitude value and push ENTER button.

(bs) Push ACCEPT (5L) to insert the values to the system.

(bt) (Aircraft with AHRS) On the circuit breaker panel, close the AHRS 1 (Location Tip: ESSENTIAL DC BUS 1/NAV) and AHRS 2 (Location Tip: DC BUS 2/NAV) circuit breakers.

(bu) (Aircraft with IRS) On the circuit breaker panel, close the IRS 1 (Location Tip: ESSENTIAL DC BUS 1/NAV) and IRS 2 (Location Tip: DC BUS 2/NAV) circuit breakers.

(bv) Enable the GPS as follows: Push DATA button two times to go to DATA 2/4 screen.

(bw) Select the GPS 1.

Result:

1 GPS 1 screen is displayed.

(bx) For enable the GPS 1, push SELECT GPS (4R).

(by) Repeat the procedure to enable GPS 2.

(25) Do the test of the GPWS/Windshear Parameters as follows (BINARY BASE):

(a) On the HHDLU/EHHDLU, select WORD 19 and SUBFRAME ALL.

(b) To do the test of the GPWS # 2 (INOP) alarm condition parameter, set the GPWS/WDSH TEST switch, on the Maintenance Panel, to the up position (AMM TASK 34-41-00-700-801-A/500) and hold it in that position.

Result:

1 Make sure that the HHDLU/EHHDLU 9th bit changes from "0" to "1", before the Aural Warning gives the GLIDE SLOPE voice warning.

(c) To do the test of the GPWS # 3 (Below GS) alarm condition parameter, set the GPWS/WDSH TEST switch, on the Maintenance Panel, to the up position (AMM TASK 34-41-00-700-801-A/500) and hold it in that position.

Result:

1 Make sure that the HHDLU/EHHDLU 10th bit changes from "0" to "1", after the Aural Warning gives the GLIDE SLOPE voice warning.

(d) To do the test of the GPWS # 1 (Modes 1...4) alarm condition parameter, set the GPWS/WDSH TEST switch, on the Maintenance Panel, to the up position (AMM TASK 34-41-00-700-801-A/500) and hold it in that position.

Result:

1 Make sure that the HHDLU/EHHDLU 8th bit changes from "0" to "1", after the Aural Warning gives the PULL UP voice warning.

(e) To do the test of the WINDSHEAR WARNING parameter, set the GPWS/WDSH TEST switch, on the Maintenance Panel, to the up position (AMM TASK 34-41-00-700-801-A/500) and hold it in that position.

Result:

1 Make sure that the HHDLU/EHHDLU 12th bit changes from "0" to "1", when the PFD shows the WDSHEAR (red) annunciator.

(f) To do the test of the WINDSHEAR CAUTION parameter, set the GPWS/WDSH TEST switch, on the Maintenance Panel, to the up position (AMM TASK 34-41-00-700-801-A/500) and hold it in that position.

Result:

1 Make sure that the HHDLU/EHHDLU 11th bit changes from "0" to "1", when the PFD shows the WDSHEAR (amber) annunciator.

(g) The items (h) thru (k) are applicable to aircraft with EGPWS and EICAS versions 17 and on.

(h) To do the test of the TERRAIN, WINDSHEAR and TERRAIN INHIBIT parameters, on the HHDLU/EHHDLU select word 151, subframe ALL and OCTAL BASE.

(i) Make sure that the ground spoiler is closed. Refer to AMM SDS 27-63-00/1.

(j) On the maintenance panel, set the EGPWS switch to the TEST position. On the circuit breaker panel, make sure that the EGPWS, AWS 1 and AWS 2 circuit breakers are closed.

Result:

1 A sequence of aural messages are heard. Make sure that on the HHDLU/EHHDLU the values in OCTAL change synchronized with the aural messages, as shown in this table:

Table 5104 - AURAL MESSAGES

AURAL MESSAGE / SITUATION	HHDLU/EHHDLU (OCTAL)[1]
(START OF MESSAGES)	X
CHIME	110X
GLIDE SLOPE	004X
PULL UP	X
SIREN WINDSHEAR WINDSHEAR WINDSHEAR	(NO CHANGE)
TERRAIN TERRAIN	040X
PULL UP	043X
SINK RATE	023X
PULL UP	117X
(SUBSEQUENT MESSAGES)	(NO CHANGE)
(END OF MESSAGES)	X

[1] The character "X" means that this digit can be ignored during the test, because it has no relation with the EGPWS.

NOTE: 1 - The values on the HHDLU/EHHDLU change very quickly and they can change during or immediately after the aural message.
2 - If different values are shown, make sure that all the systems given in Preparation are operational and on, and do this step again.

(k) On the HHDLU/EHHDLU, select BINARY BASE. Push the GPWS TERRAIN SYS OVRD button.

Result:

1 Make sure that the message TERRAIN INHIBIT comes into view on the two MFD displays.

2 Make sure that the HHDLU/EHHDLU 11th bit changes from "0" to "1".

(26) Do the test of the Identification/Date/Time Parameters as follows (BINARY BASE):

(a) On the HHDLU/EHHDLU, select the FLIGHT NUMBER parameter. Select WORD 165 and SUBFRAMES 1 and 2.

(b) On the pilot digital clock, adjust the Flight Number (AMM TASK 31-21-00-700-802-A/500).

(c) Refer to the tables below, and compare the pilot digital clock indication with the values shown on the HHDLU/EHHDLU (The example data represents the Flight Number = 6543):

Table 5105 - FLIGHT NUMBER (MOST SIGNIFICANT DIGIT - WORD 165 AND SUBFRAME 1)

BIT POSITION	12	11	10	9	8	7	6	5	4	3	2	1
									8	4	2	1

Table 5105 - FLIGHT NUMBER (MOST SIGNIFICANT DIGIT - WORD 165 AND SUBFRAME 1) (Continued)

BIT POSITION	12	11	10	9	8	7	6	5	4	3	2	1
DATA (EXAMPLE)	X	X	X	X	X	X	X	X	0	1	1	0
	NOT USED				NOT USED				THOU-SANDS			

Table 5106 - FLIGHT NUMBER (THREE LEAST SIGNIFICANT DIGITS - WORD 165 AND SUBFRAME 2)

BIT POSITION	12	11	10	9	8	7	6	5	4	3	2	1
	8	4	2	1	8	4	2	1	8	4	2	1
DATA (EXAMPLE)	0	1	0	1	0	1	0	0	0	0	1	1
	HUN-DREDS				TENS				UNITS			

(d) On the HHDLU/EHHDLU, select the HOURS parameter. Select WORD 5 and SUBFRAME 1.

(e) Refer to the table below and compare the pilot digital clock hour indication (AMM TASK 31-21-00-700-802-A/500) with the values shown on the HHDLU/EHHDLU (The example data represents Hours = 23):

Table 5107 - HOURS

BIT POSITION	12	11	10	9	8	7	6	5	4	3	2	1
	16	8	4	2	1							
DATA (EXAMPLE)	1	0	1	1	1	X	X	X	X	X	X	X
	HOURS					NOT USED						

(f) On the HHDLU/EHHDLU, select the MINUTES/SECONDS parameters. Select WORD 3 and SUBFRAME ALL.

(g) Refer to the table below and compare the pilot digital clock minutes/seconds indication (AMM TASK 31-21-00-700-802-A/500) with the values shown on the HHDLU/EHHDLU (The example data represents Minutes = 59 and Seconds = 59):

Table 5108 - MINUTES/SECONDS

BIT POSITION	12	11	10	9	8	7	6	5	4	3	2	1
	32	16	8	4	2	1	32	16	8	4	2	1
DATA (EXAMPLE)	1	1	1	0	1	1	1	1	1	0	1	1
	MINUTES						SECONDS					

(h) On the HHDLU/EHHDLU, select the YEAR parameter. Select WORD 5 and SUBFRAME 3.

(i) Refer to the table below and compare the pilot digital clock year indication (AMM TASK 31-21-00-700-802-A/500) with the values shown on the HHDLU/EHHDLU (The example data represents the Year = 93):

Table 5109 - YEAR

BIT POSITION	12	11	10	9	8	7	6	5	4	3	2	1
	8	4	2	1	8	4	2	1				
DATA (EXAMPLE)	1	0	0	1	0	0	1	1	X	X	X	X
	TENS				UNITS							
	YEAR								NOT USED			

(j) On the HHDLU/EHHDLU, select the DAY/MONTH parameters. Select WORD 5 and SUBFRAME 2.

(k) Refer to the table below and compare the pilot digital clock day/month indications (AMM TASK 31-21-00-700-802-A/500) with the values shown on the HHDLU/EHHDLU (The example data represents Day = 25 and Month = 12):

Table 5110 - DAY/MONTH

BIT POSITION	12	11	10	9	8	7	6	5	4	3	2	1
	2	1	8	4	2	1	1	8	4	2	1	
DATA (EXAMPLE)	1	0	0	1	0	1	1	0	0	1	0	X
	TENS		UNITS				TENS	UNITS				
	DAY						MONTH					

(27) Do the test of the Flight Director Mode Parameters as follows (BINARY BASE):

NOTE: The following table shows the parameters that are tested in this step. Some of them are automatically validated when other ones are tested using the HHDLU/EHHDLU.

Table 5111 - FDR PARAMETERS

FDR PARAMETERS TO BE TESTED WITH THE HHDLU/EHHDLU	FDR PARAMETERS AUTOMATICALLY VALIDATED WHEN PARAMETER IN THE LEFT IS TESTED
GO AROUND	ALTITUDE HOLD
	ALTITUDE PRESELECT
	SPEED HOLD
	GLIDE SLOPE
	WINDSHEAR
	TAKEOFF

Table 5111 - FDR PARAMETERS (Continued)

FDR PARAMETERS TO BE TESTED WITH THE HHDLU/EHHDLU	FDR PARAMETERS AUTOMATICALLY VALIDATED WHEN PARAMETER IN THE LEFT IS TESTED
HEADING SELECT	VOR NAV
	VOR APPROACH
	LOCALIZER
	BACK COURSE

(a) On the HHDLU/EHHDLU, select WORD 115 and SUBFRAME ALL.

(b) On the Flight Guidance Controller (GC-550), push the AP engage button (AMM SDS 22-10-00/1) to test the AUTOPILOT ENGAGED parameter.

Result:

1 Make sure that the HHDLU/EHHDLU 1st bit changes from "0" to "1".

(c) Make sure that no flight director mode is selected and do the test of the FD Mode Lateral parameter.

Result:

1 Make sure that the HHDLU/EHHDLU 9th, 8th, 7th, and 6th bits show "0", "0", "0", and "0", respectively.

(d) On the GC-550, push the HDG pushbutton (AMM SDS 22-10-00/1).

Result:

1 On the GC-550, the HDG pushbutton comes on.

2 Make sure that the HHDLU/EHHDLU 9th, 8th, 7th, and 6th bits show "0", "0", "1", and "0", respectively.

(e) Reset all flight director modes and do the test of FD Mode Vertical parameter.

Result:

1 Make sure that the HHDLU/EHHDLU 5th, 4th, 3th, and 2th bits show "0", "0", "0", and "0", respectively.

(f) On the pilot's power control lever, push the GA (GO-AROUND) pushbutton.

NOTE: Make sure that the PLI (Pitch Limit Indicator) is not shown on the ADI. If it is shown, turn the AOA (Angle of Attack) vane until the PLI goes out of view on the ADI top.

Result:

1 Make sure that the HHDLU/EHHDLU 5th, 4th, 3th, and 2th bits show "1", "0", "0", and "1", respectively.

(28) Do the test of the Selection parameters as follows:

(a) On the HHDLU/EHHDLU, select the SELECTED DH parameter. Select WORD 155, SUBFRAME ALL, and OCTAL BASE.

(b) Refer to the table below and, with the RA - TEST knob, on the Display Controller (DC-550), adjust the decision height (DH). Compare the values shown on the PFDs (RA) with those shown on the HHDLU/EHHDLU, and make sure that the values on the HHDLU/EHHDLU are in the tolerances:

Table 5112 - SELECTED DH

VALUES (ft)	HHDLU/EHHDLU (OCTAL)
10	0000 - 0047
500	1723 - 1773
900	3363 - 3433

(c) (Aircraft with EICAS up to version 20) On the HHDLU/EHHDLU, select the SELECTED ALTITUDE parameter. Select WORD 187, SUBFRAME ALL, and OCTAL BASE.

(d) (Aircraft with EICAS versions 20.5 and on) On the HHDLU/EHHDLU, select the SELECTED ALTITUDE parameter. Select WORD 179, SUBFRAME ALL, and OCTAL BASE.

(e) Refer to the table below and, with the ASEL knob, on the Flight Guidance Controller (GC-550), adjust the altitude. Make sure that the values on the HHDLU/EHHDLU are in the tolerances:

Table 5113 - SELECTED ALTITUDE

VALUES (ft)	HHDLU/EHHDLU (OCTAL)
1,000	0030 - 0045
10,000	0461 - 0476
30,000	1642 - 1656

(f) (Aircraft with EICAS up to version 20) On the HHDLU/EHHDLU, select the SELECTED AIRSPEED parameter. Select WORD 219, SUBFRAME ALL, and OCTAL BASE.

(g) (Aircraft with EICAS versions 20.5 and on) On the HHDLU/EHHDLU, select the SELECTED AIRSPEED parameter. Select WORD 221, SUBFRAME ALL, and OCTAL BASE.

(h) Refer to the table below and, on the Flight Guidance Controller (GC-550), press the SPD pushbutton and adjust the airspeed with the PUSH IAS/M knob. Make sure that the values on the HHDLU/EHHDLU are in the tolerances:

Table 5114 - SELECTED AIRSPEED

VALUES (kt)	HHDLU/EHHDLU (OCTAL)
120	0333 - 0403
180	0523 - 0573
240	0713 - 0763

(i) On the HHDLU/EHHDLU, select the SELECTED VERTICAL SPEED parameter. Select WORD 251, SUBFRAME ALL, and OCTAL BASE.

(j) Refer to the table below and, on the Flight Guidance Controller (GC-550), push the VS pushbutton and adjust the vertical speed with the PUSH IAS/M knob. Make sure that the values on the HHDLU/EHHDLU are in the tolerances:

Table 5115 - SELECTED VERTICAL SPEED

VALUES (ft/min)	HHDLU/EHHDLU (OCTAL)
-3,000	7175 - 7226

Table 5115 - SELECTED VERTICAL SPEED (Continued)

VALUES (ft/min)	HHDLU/EHHDLU (OCTAL)
000	7764 - 0014
+3,000	0552 - 0603

(k) On the HHDLU/EHHDLU, select the BARO SETTING # 1 parameter. Select WORD 29, and SUBFRAMES 1 and 2 (HEXADECIMAL BASE).

(l) Refer to the tables below (BARO SETTING #1) and, on the PFD 1 bezel controller, with the BARO knob and the IN/HPA pushbutton, select values (1013 HPA, 1000 HPA, and 1083 HPA) for the Baro Correction Display (AMM TASK 34-15-00-700-801-A/500) and compare with the values on the HHDLU/EHHDLU:

NOTE: The values in the TENTHS column must not be considered.

Table 5116 - BARO SETTING # 1 (TWO MOST SIGNIFICANT DIGITS - WORD 29 AND SUBFRAME 1)

BARO SETTING # 1	NOT USED	THOUSANDS	HUNDREDS
1013	X	1	0
1000	X	1	0
1083	X	1	0

Table 5117 - BARO SETTING # 1 (TWO LEAST SIGNIFICANT DIGITS - WORD 29 AND SUBFRAME 2)

BARO SETTING # 1	TENS	UNITS	TENTHS
1013	1	3	X
1000	0	0	X
1083	8	3	X

(m) On the HHDLU/EHHDLU, select the BARO SETTING # 2 parameter. Select WORD 157 and SUBFRAMES 1 and 2 (HEXADECIMAL BASE).

(n) Refer to the tables below (BARO SETTING #2) and, on the PFD 2 bezel controller, with the BARO knob and the IN/HPA pushbutton, select values (1013 HPA, 1000 HPA, and 1083 HPA) for the Baro Correction Display (AMM TASK 34-15-00-700-801-A/500) and compare with the values on the HHDLU/EHHDLU:

NOTE: The values in the TENTHS column must not be considered.

Table 5118 - BARO SETTING # 2 (TWO MOST SIGNIFICANT DIGITS - WORD 157 AND SUBFRAME 1)

BARO SETTING # 2	NOT USED	THOUSANDS	HUNDREDS
1013	X	1	0
1000	X	1	0
1083	X	1	0

Table 5119 - BARO SETTING # 2 (TWO LEAST SIGNIFICANT DIGITS - WORD 157 AND SUBFRAME 2)

BARO SETTING # 2	TENS	UNITS	TENTHS
1013	1	3	X
1000	0	0	X
1083	8	3	X

(29) Do the test of the Thrust Lever parameters as follows (OCTAL BASE):

(a) On the HHDLU/EHHDLU, select the THRUST LEVER ANGLE # 1 (TLA) parameter. Select WORD 53 and SUBFRAME ALL.

(b) Set thrust lever # 1 as shown in the table below, and make sure that the values on the HHDLU/EHHDLU are in the tolerances:

Table 5120 - THRUST LEVER ANGLE # 1

POSITIONS	HHDLU/EHHDLU (OCTAL)
FULLY FORWARD	2420 - 2456
FULLY BACKWARD (Idle Position)	0600 - 0636

(c) On the HHDLU/EHHDLU, select the THRUST LEVER ANGLE # 2 (TLA) parameter. Select WORD 181 and SUBFRAME ALL.

(d) Set thrust lever # 2 as shown in the table below, and make sure that the values on the HHDLU/EHHDLU are in the tolerances:

Table 5121 - THRUST LEVER ANGLE # 2

POSITIONS	HHDLU/EHHDLU (OCTAL)
FULLY FORWARD	2420 - 2456
FULLY BACKWARD (Idle Position)	0600 - 0636

(30) (Aircraft without load cells) Do the test of the Brake Pressure parameters as follows (OCTAL BASE):

(a) Pressurize the hydraulic system (AMM TASK 29-10-00-860-801-A/200).

(b) Make sure that, on the Circuit Breaker Panel, the ELEC PUMP 1 (Location Tip: DC BUS 2/HYD/ELEC PUMP 1) and/or ELEC PUMP 2 (Location Tip: DC BUS 1/HYD/ELEC PUMP 2) circuit breaker(s) is(are) closed.

(c) Make sure that the safety pins are installed on the landing gears.

(d) On the HHDLU/EHHDLU, select the BRAKE PRESSURE # 1 parameter. Select WORD 61 and SUBFRAME ALL.

On the Hydraulic Panel, on the Overhead Panel, set the ELEC PUMP switch of system 1 to ON.

(e) Refer to the table below and push the pilot's brake pedals. Make sure that the values on the HHDLU/EHHDLU are in the tolerances:

Table 5122 - BRAKE PRESSURE # 1

BRAKE CONDITION	HHDLU/EHHDLU (OCTAL)
NOT APPLIED	0000 - 0200

Table 5122 - BRAKE PRESSURE # 1 (Continued)

BRAKE CONDITION	HHDLU/EHHDLU (OCTAL)
APPLIED	2340 - 2734

(f) On the Hydraulic Panel, on the Overhead Panel, set the ELEC PUMP switch of system 1 to OFF.

(g) On the HHDLU/EHHDLU, select the BRAKE PRESSURE # 3 parameter. Select WORD 189 and SUBFRAME ALL.

(h) On the Hydraulic Panel, on the Overhead Panel, set the ELEC PUMP switch of system 2 to ON.

(i) Refer to the table below and push the copilot's brake pedals. Make sure that the values on the HHDLU/EHHDLU are in the tolerances:

Table 5123 - BRAKE PRESSURE # 3

BRAKE CONDITION	HHDLU/EHHDLU (OCTAL)
NOT APPLIED	0000 - 0200
APPLIED	2340 - 2734

(j) Set the ELEC PUMP switch of system 2 to OFF.

(k) Release the pressure from the hydraulic system (AMM TASK 29-10-00-860-801-A/200).

(31) (Aircraft with load cells) Do the test of Brake Pressure and Brake Pedal Position parameter (DECIMAL BASE):

(a) Make sure that, on the Circuit Breaker Panel, the ELEC PUMP 1 (Location Tip: DC BUS 2/HYD/ELEC PUMP 1) and/or ELEC PUMP 2 (Location Tip: DC BUS 1/HYD/ELEC PUMP 2) circuit breaker(s) is(are) closed.

(b) Make sure that the safety pins are installed on the landing gears.

(c) Make sure that the emergency/parking brake accumulator is fully released (AMM TASK 32-44-02-910-801-A/200).

(d) Make sure that the wheel chocks are in position.

(e) Connect the interface test box (GSE 135) to the Maintenance Panel.

(f) Connect the laptop computer (GSE 095) serial port to the OUTBOARD WHEEL connector on the interface test box (GSE 135).

(g) Run the Field Analyzer Software on the laptop. Wait until you see the program window.

(h) On the Hydraulic Panel, on the Overhead Panel, set the ELC PUMP switch of system 1 to ON.

(i) On the laptop, push the F9 key.

(j) On the HHDLU/EHHDLU, select the PILOT LEFT BRAKE PEDAL POSITION parameter. Select WORD 100, subframe ALL.

(k) Do not push the pilot or copilot pedals.

(l) Look at the laptop screen and write down the respective value for the pilot left brake pedal position, given in percentage.

(m) On the HHDLU/EHHDLU, read the value of the PILOT LEFT BRAKE PEDAL POSITION parameter and convert it to engineering unit. To do this, multiply it by 0.0244.

(n) Make sure that the value shown on the HHDLU/EHHDLU is ± 5% the value shown on the laptop.

(o) Push the left pilot pedal until the indication in the respective field on the laptop screen is approximately 50% and do steps l thru n again.

(p) Fully push the left pilot pedal and do steps l thru n again.

(q) On the HHDLU/EHHDLU, select the PILOT RIGHT BRAKE PEDAL POSITION parameter. Select WORD 164, subframe ALL.

(r) Do not push the pilot or copilot pedals.

(s) Look at the laptop screen and write down the respective value for the pilot right brake pedal position, given in percentage.

(t) On the HHDLU/EHHDLU, read the value of the PILOT RIGHT BRAKE PEDAL POSITION parameter and convert it to engineering unit. To do this, multiply it by 0.0244.

(u) Make sure that the value shown on the HHDLU/EHHDLU is ± 5% the value shown on the laptop.

(v) Push the right pilot pedal until the indication in the respective field on the laptop screen is approximately 50% and do steps s thru u again.

(w) Fully push the right pilot pedal and do steps s thru u again.

(x) On the HHDLU/EHHDLU, select the COPILOT LEFT BRAKE PEDAL POSITION parameter. Select WORD 132, subframe ALL.

(y) Do not push the pilot or copilot pedals.

(z) Look at the laptop screen and write down the respective value for the copilot left brake pedal position, given in percentage.

(aa) On the HHDLU/EHHDLU, read the value of the COPILOT LEFT BRAKE PEDAL POSITION parameter and convert it to engineering unit. To do this, multiply it by 0.0244.

(ab) Make sure that the value shown on the HHDLU/EHHDLU is ± 5% the value shown on the laptop.

(ac) Push the left copilot pedal until the indication in the respective field on the laptop screen is approximately 50% and do steps z thru ab again.

(ad) Fully push the left copilot pedal and do steps z thru ab again.

(ae) On the HHDLU/EHHDLU, select the COPILOT RIGHT BRAKE PEDAL POSITION parameter. Select WORD 196, subframe ALL.

(af) Do not push the pilot or copilot pedals.

(ag) Look at the laptop screen and write down the respective value for the copilot right brake pedal position, given in percentage.

(ah) On the HHDLU/EHHDLU, read the value of the COPILOT RIGHT BRAKE PEDAL POSITION parameter and convert it to engineering unit. To do this, multiply it by 0.0244.

(ai) Make sure that the value shown on the HHDLU/EHHDLU is ± 5% the value shown on the laptop.

(aj) Push the right copilot pedal until the indication in the respective field on the laptop screen is approximately 50% and do steps ag thru ai again.

(ak) Fully push the right copilot pedal and do steps ag thru ai again.

(al) On the HHDLU/EHHDLU, select the LEFT OUTBOARD BRAKE PRESSURE parameter. Select WORD 04, subframe ALL.

(am) Do not push the pilot or copilot pedals.

(an) Look at the laptop screen and write down the respective value for the brake pressure sent to the left outboard brake, given in PSI.

(ao) On the HHDLU/EHHDLU, read the value of the LEFT OUTBOARD BRAKE PRESSURE parameter.

(ap) Make sure that the value shown on the HHDLU/EHHDLU is ± 5% the value shown on the laptop.

(aq) Push the left pilot pedal until the indication in the respective field on the laptop screen is approximately 50% and do steps an thru ap again.

(ar) Fully push the left pilot pedal and do steps an thru ap again.

(as) On the HHDLU/EHHDLU, select the RIGHT OUTBOARD BRAKE PRESSURE parameter. Select WORD 68, subframe ALL.

(at) Do not push the pilot or copilot pedals.

(au) Look at the laptop screen and write down the respective value for the brake pressure sent to the right outboard brake, given in PSI.

(av) On the HHDLU/EHHDLU, read the value of the RIGHT OUTBOARD BRAKE PRESSURE parameter.

(aw) Make sure that the value shown on the HHDLU/EHHDLU is ± 5% the value shown on the laptop.

(ax) Push the right pilot pedal until the indication in the respective field on the laptop screen is approximately 50% and do steps au thru aw again.

(ay) Fully push the right pilot pedal and do steps au thru aw again.

(az) Set the switch of the ELEC PUMP of system 1 to OFF.

(ba) Connect the laptop computer (GSE 095) serial port to the INBOARD WHEEL connector on the interface test box (GSE 135).

(bb) Run the Field Analyzer Software on the laptop. Wait until you see the program window.

(bc) Push the F9 key.

(bd) On the Hydraulic Panel, on the Overhead Panel, set the ELC PUMP switch of system 2 to ON.

(be) On the HHDLU/EHHDLU, select the LEFT INBOARD BRAKE PRESSURE parameter. Select WORD 38, subframe ALL.

(bf) Do not push the pilot or copilot pedals.

(bg) Look at the laptop screen and write down the respective value for the brake pressure sent to the left inboard brake, given in PSI.

(bh) On the HHDLU/EHHDLU, read the value of the LEFT INBOARD BRAKE PRESSURE parameter.

(bi) Make sure that the value shown on the HHDLU/EHHDLU is ± 5% the value shown on the laptop.

(bj) Push the left pilot pedal until the indication in the respective field on the laptop screen is approximately 50% and do steps bf thru bh again.

(bk) Fully push the left pilot pedal and do steps bf thru bh again.

(bl) On the HHDLU/EHHDLU, select the RIGHT INBOARD BRAKE PRESSURE parameter. Select WORD 102, subframe ALL.

(bm) Do not push the pilot or copilot pedals.

(bn) Look at the laptop screen and write down the respective value for the brake pressure sent to the right inboard brake, given in PSI.

(bo) On the HHDLU/EHHDLU, read the value of the RIGHT INBOARD BRAKE PRESSURE parameter.

(bp) Make sure that the value shown on the HHDLU/EHHDLU is ± 5% the value shown on the laptop.

(bq) Push the right pilot pedal until the indication in the respective field on the laptop screen is approximately 50% and do steps bm thru bo again.

(br) Fully push the right pilot pedal and do steps bm thru bo again.

(bs) Set the switch of the ELEC PUMP of system 2 to OFF.

(bt) Disconnect the interface test box (GSE 135) and the laptop (GSE 095).

(32) (Aircraft with load cells) Do the test of the Wheel Speed Parameters (DECIMAL BASE):

(a) Connect the interface test box (GSE 135) to the Maintenance Panel.

(b) Remove the hub cap (AMM TASK 32-49-02-000-801-A/400) from the four wheels of the main landing gears.

(c) Connect the laptop computer (GSE 095) serial port to the OUTBOARD WHEEL connector on the interface test box (GSE 135).

(d) Run the Field Analyzer Software on the laptop. Wait until you see the program window.

(e) Push the F9 key.

(f) On the HHDLU/EHHDLU, select the LEFT OUTBOARD WHEEL VELOCITY parameter. Select WORD 228 and subframe ALL.

(g) Install the Wheel Speed Transducer Adapter (GSE 103) to a drill.

(h) Use the drill to turn the left outboard wheel speed transducer.

(i) Look at the laptop screen and write down the respective value for the left outboard wheel speed, given in ft/sec.

(j) On the HHDLU/EHHDLU, read the value of the LEFT OUTBOARD WHEEL VELOCITY parameter and convert it to engineering unit. To do this, multiply it by 0.125 and ignore the decimal places.

NOTE: Do not round up/down the number got.

(k) Make sure that the value shown on the HHDLU/EHHDLU is ± 5% the value shown on the laptop.

(l) Stop the left outboard wheel speed transducer.

(m) On the HHDLU/EHHDLU, select the RIGHT OUTBOARD WHEEL VELOCITY parameter. Select WORD 230, subframe ALL.

(n) Use the drill to turn the right outboard wheel speed transducer.

(o) Look at the laptop screen and write down the respective value for the right outboard wheel speed, given in ft/sec.

(p) On the HHDLU/EHHDLU, read the value of the RIGHT OUTBOARD WHEEL VELOCITY parameter and convert it to engineering unit. To do this, multiply it by 0.125 and ignore the decimal places.

NOTE: Do not round up/down the number got.

(q) Make sure that the value shown on the HHDLU/EHHDLU is ± 5% the value shown on the laptop.

(r) Stop the right outboard wheel speed transducer.

(s) Connect the laptop computer (GSE 095) serial port to the INBOARD WHEEL connector on the interface test box (GSE 135).

(t) Run the Field Analyzer Software on the laptop. Wait until you see the program window.

(u) Push the F9 key.

(v) On the HHDLU/EHHDLU, select the LEFT INBOARD WHEEL VELOCITY parameter. Select WORD 236 and subframe ALL.

(w) Use the drill to turn the left inboard wheel speed transducer.

(x) Look at the laptop screen and write down the respective value for the left inboard wheel speed, given in ft/sec.

(y) On the HHDLU/EHHDLU, read the value of the LEFT INBOARD WHEEL VELOCITY parameter and convert it to engineering unit. To do this, multiply it by 0.125 and ignore the decimal places.

NOTE: Do not round up/down the number got.

(z) Make sure that the value shown on the HHDLU/EHHDLU is ± 5% the value shown on the laptop.

(aa) Stop the left inboard wheel speed transducer.

(ab) On the HHDLU/EHHDLU, select the RIGHT INBOARD WHEEL VELOCITY parameter. Select WORD 240, subframe ALL.

(ac) Use the drill to turn the right inboard wheel speed transducer.

(ad) Look at the laptop screen and write down the respective value for the right inboard wheel speed, given in ft/sec.

(ae) On the HHDLU/EHHDLU, read the value of the RIGHT INBOARD WHEEL VELOCITY parameter and convert it to engineering unit. To do this, multiply it by 0.125 and ignore the decimal places.

NOTE: Do not round up/down the number got.

(af) Make sure that the value shown on the HHDLU/EHHDLU is ± 5% the value shown on the laptop.

(ag) Stop the right inboard wheel speed transducer.

(ah) Disconnect the interface test box (GSE 135) from the Maintenance Panel.

(ai) Install the hub cap (AMM TASK 32-49-02-400-801-A/400) on the four wheels of the main landing gears.

(aj) Remove the Wheel Speed Transducer Adapter (GSE 103) from the drill.

(33) Do the test of the Spoiler parameters (BINARY BASE):

(a) Pressurize the hydraulic system (AMM TASK 29-10-00-860-801-A/200).

(b) Make sure that the flaps are in the 0-degree position.

WARNING: MAKE SURE THAT THERE ARE NO PERSONS OR EQUIPMENT IN THE FLAP AND SPOILER TRAVEL AREA.

(c) Make sure that, on the Circuit Breaker Panel, the AIR/GND A (DC BUS 1/LDG GEAR/AIR/GND A), AIR/GND B (Location Tip: ESSENTIAL DC BUS 1/LDG GEAR/AIR/GND B), AIR/GND C (Location Tip: DC BUS 2/LDG GEAR/AIR/GND C), and AIR/GND D (Location Tip: ESSENTIAL DC BUS 2/LDG GEAR/AIR/GND D) circuit breakers are closed.

(d) On the HHDLU/EHHDLU, select the LEFT INBOARD SPOILER (BIT 1), RIGHT INBOARD SPOILER (BIT 2), LEFT OUTBOARD SPOILER (BIT 3), and RIGHT OUTBOARD SPOILER (BIT 4) parameters. Select WORDS 83, and 211, and SUBFRAME ALL.

(e) Set the engine thrust control levers to the IDLE position.

(f) On the Maintenance Panel, set the SPOILER switch to the TEST position and hold it in this position (AMM TASK 27-63-01-700-801-A/500).

Result:

1 Make sure that the HHDLU/EHHDLU 4th, 3rd, 2nd, and 1st bits change from "1" to "0".

(g) On the Maintenance Panel, release the SPOILER switch to the NORM position (AMM TASK 27-63-01-700-801-A/500).

Result:

1 Make sure that the HHDLU/EHHDLU 4th, 3rd, 2nd, and 1st bits change from "0" to "1".

(h) On the HHDLU/EHHDLU, select the GROUND SPOILER COMMAND parameter. Select WORD 151 and SUBFRAME ALL.

(i) Make sure that the engine thrust control levers are in the IDLE position.

(j) On the Maintenance Panel, set the SPOILER switch to the TEST position and hold it in this position (AMM TASK 27-63-01-700-801-A/500).

Result:

1 Make sure that the HHDLU/EHHDLU 1st bit changes from "1" to "0".

(k) On the Maintenance Panel, release the SPOILER switch to the NORM position (AMM TASK 27-63-01-700-801-A/500).

Result:

1 Make sure that the HHDLU/EHHDLU 1st bit changes from "0" to "1".

(l) Release the pressure from the hydraulic system (AMM TASK 29-10-00-860-801-A/200).

(34) *EFFECTIVITY: Applicable to procedure using TCAS Test Set (GSE 190 or GSE 304)*

Do the test of the TCAS parameters (BINARY BASE):

(a) On the RMU, set the ATC/TCAS window to the TA/RA mode.

NOTE: The best condition to do this test is when there is a line-of-sight path from the two TCAS antennas on the aircraft to the antenna of the TCAS Test Set, without obstacles. The layout conditions around the aircraft also can change the test results, such as buildings, vehicles and other aircraft. If the aircraft is in a hangar, it is recommended that hangar door not to be closed. Read the TCAS Test Set operational manual to get more information.

(b) On the Overhead Panel, make sure that the BATT1 and BATT2 switches are set at OFF and, on the Circuit Breaker Panel, open the AIR/GND A (Location Tip: DC BUS 1/LDG GEAR/AIR/GND A), AIR/GND B (Location Tip: ESSENTIAL DC BUS 1/LDG GEAR/AIR/GND B), AIR/GND C (Location Tip: DC BUS 2/LDG GEAR/AIR/GND C), and AIR/GND D (Location Tip: ESSENTIAL DC BUS 2/LDG GEAR/AIR/GND D) circuit breakers and attach DO-NOT-CLOSE tags to them. This is to put the aircraft in the flight configuration.

(c) Make sure that the flaps are in the 0-degree position.

(d) Simulate a radio altitude of more than 1,500 ft AGL on Radio Altimeter 1. Refer to AMM TASK 34-31-00-800-801-A/200.

(e) On the Pitot/Static System Bench Test Set (GSE 129), simulate an altitude of 2,000 feet.

(f) Prepare the TCAS Test Set (GSE 190 or GSE 304) for operation as follows:

1. Put the antenna of the TCAS Test Set (GSE 190 or GSE 304) at a distance between 20 and 30 feet from the TCAS antennas on the aircraft.

2. Adjust the height of the antenna of the TCAS Test Set (GSE 190 or GSE 304) between 6 and 8 feet.

3. Make sure that the antenna of the TCAS Test Set (GSE 190 or GSE 304) is in a position where there is a line-of-sight path from it to the two TCAS antennas on the aircraft, without obstacles.

(g) When the TCAS Test Set (GSE 190 or GSE 304) is ready for use, push the SET/CONT key until the SETUP#1 screen comes into view. Set the parameters on this screen as follows (the values in parentheses are the recommended range for that parameter):

- INTRUDER TYPE: MODE-S
- SQUITTERS: ON
- UUT DIST: HORIZ = (20 to 30) ft
- VERT = (6 to 8) ft

- ALT REPORTING = ON
- STORE = 0
- RECALL = 0
- GAIN_1030 = 9,3 dB
- LOSS = 1.0 dB

(h) Push the SET/CONT key. The SETUP#2 screen comes into view. Set the parameters on this screen as follows:

- RANGE MAX: 3 nm
- MIN: 0 nm
- ALT MAX: 3000 ft
- MIN: 1000 ft
- MODE: TCAS II

(i) Push the SCEN key. SCENARIO TEST screen comes into view. Set the parameters on this screen as follows (the indications in parentheses are the recommended values for that parameter):

- RANGE: 3.00 nm
- RATE: + 450 kt
- ALT: (1950 or 1975) ft
- RATE: 0 fpm

(j) Push the RUN/STOP key to run the test.

(k) (Applicable to aircraft with EICAS versions 20.5 and on) On the HHDLU/EHHDLU, select the TCAS TA parameter. Select WORD 19 and SUBFRAME ALL.

Result:

1 Make sure that on the HHDLU/EHHDLU, on the WORD 19, the 2nd bit changes from "0" to "1" when the aural message "TRAFFIC - TRAFFIC" is heard.

(l) On the HHDLU/EHHDLU, select the TCAS RA parameter. Select WORD 133 and SUBFRAME ALL.

Result:

1 Make sure that the HHDLU/EHHDLU, on the WORD 133, the 7th and 3rd bits change from "0" to "1" when one of these aural messages is heard:

- (aircraft with TCAS P/N 4066010-904 or 7517900-55001, -71002 or -10002) CLIMB - CLIMB - CLIMB.
- (aircraft with TCAS P/N 4066010-910 or 7517900-55003, -71003 or -10003) CLIMB - CLIMB.

2 After that, when the INCREASE CLIMB - INCREASE CLIMB aural message is heard, the 5th and 4th bits change from "0" to "1".

NOTE: If the messages are not heard, run the test in a same scenario 3 times minimum to get the correct results. If this does not occur, try to change the values in the TCAS Test Set parameters that are recommended in parentheses (SETUP#1 and SCENARIO TEST screens). Also try new adjustments on the antenna of TCAS Test Set, as described before.

(m) On the TCAS Test Set (GSE 190 or GSE 304), push the RUN/STOP key to stop the test.

(n) Set the parameters on the SCENARIO TEST screen as follows (the values in parentheses are the recommended values for that parameter):

- RANGE: 3.00 nm
- RATE: + 450 kt
- ALT: (2025 or 2050) ft
- RATE: 0 fpm

Push the RUN/STOP key to run the test.

Result:

1 Make sure that the HHDLU/EHHDLU, on the WORD 133, the 10th, 3rd, and 1st bits change from "0" to "1" when one of these aural messages is heard:

- (aircraft with TCAS P/N 4066010-904 or 7517900-55001, -71002 or -10002) DESCEND - DESCEND - DESCEND.
- (aircraft with TCAS P/N 4066010-910 or 7517900-55003, -71003 or -10003) DESCEND - DESCEND.

NOTE: If the message is not heard, run the test in a same scenario 3 times minimum to get the correct results. If this does not occur, try to change the values in the TCAS Test Set parameters that are recommended in parentheses (SCENARIO TEST screen).

(o) On the TCAS Test Set (GSE 190 or GSE 304), push the RUN/STOP key to stop the test.

(p) On the Pitot/Static System Bench Test Set (GSE 129), simulate an altitude of 3,000 feet.

(q) On the TCAS Test Set (GSE 190 or GSE 304), push the SCEN key. The SCENARIO TEST screen comes into view. Set the parameters in this screen as follows (the indications in parentheses are the recommended values for that parameter):

- RANGE: 0 nm
- RATE: (- 350 or - 400) kt
- ALT: 2900 ft
- RATE: 1500 fpm

(r) Push the SET/CONT key until SETUP#2 screen comes into view. Set the parameters in this screen, as follows:

- RANGE MAX: 5 nm
- MIN: 0 nm
- ALT MAX: 5000 ft
- MIN: 2900 ft
- MODE: TCAS II

Push the RUN/STOP key to run the test.

Result:

1 Make sure that the HHDLU/EHHDLU, on the WORD 133, the 4th and 3rd bits change from "0" to "1", when the CLIMB - CROSSING - CLIMB, CLIMB - CROSSING - CLIMB aural messages are heard.

2 If the conditions of the area (hangar doors closed, buildings, vehicles and other aircraft around) permits, it is possible that after the previous message, the INCREASE CLIMB - INCREASE CLIMB aural message is heard. If this occurs, make sure that the 5th and 4th bits are "1". It is not mandatory to generate this message, because it was tested before.

NOTE: If the message is not heard, run the test in a same scenario 3 times minimum to get the correct results. If this does not occur, try to change the values in the TCAS Test Set parameters that are recommended in parentheses (SCENARIO TEST screen).

(s) On the TCAS Test Set (GSE 190 or GSE 304), push the RUN/STOP key to stop the test.

(35) *EFFECTIVITY: Applicable to procedure using TCAS Test Set (GSE 475)*

Do the test of the TCAS parameters (BINARY BASE):

(a) On the RMU, set the ATC/TCAS window to the TA/RA mode.

NOTE: The best condition to do this test is when there is a line-of-sight path from the two TCAS antennas on the aircraft to the antenna of the TCAS Test Set, without obstacles. The layout conditions around the aircraft also can change the test results, such as buildings, vehicles and other aircraft. If the aircraft is in a hangar, it is recommended that hangar door not to be closed. Read the TCAS Test Set operational manual to get more information.

(b) On the Overhead Panel, make sure that the BATT1 and BATT2 switches are set at OFF and, on the Circuit Breaker Panel, open the AIR/GND A (Location Tip: DC BUS 1/LDG GEAR/AIR/GND A), AIR/GND B (Location Tip: ESSENTIAL DC BUS 1/LDG GEAR/AIR/GND B), AIR/GND C (Location Tip: DC BUS 2/LDG GEAR/AIR/GND C), and AIR/GND D (Location Tip: ESSENTIAL DC BUS 2/LDG GEAR/AIR/GND D) circuit breakers and attach DO-NOT-CLOSE tags to them. This is to put the aircraft in the flight configuration.

(c) Make sure that the flaps are in the 0-degree position.

(d) Simulate a radio altitude of more than 1,500 ft AGL on Radio Altimeter 1. Refer to AMM TASK 34-31-00-800-801-A/200.

(e) On the Pitot/Static System Bench Test Set (GSE 129), simulate an altitude of 2,000 feet.

(f) Prepare the TCAS Test Set (GSE 475) for operation as follows:

1. Put the antenna of the TCAS Test Set (GSE 475) at a distance between 20 and 30 feet from the TCAS antennas on the aircraft.

2. Adjust the height of the antenna of the TCAS Test Set (GSE 475) between 6 and 8 feet.

3. Make sure that the antenna of the TCAS Test Set (GSE 475) is in a position where there is a line-of-sight path from it to the two TCAS antennas on the aircraft, without obstacles.

(g) When the TCAS Test Set (GSE 475) is ready for use, push the SETUP key until the SETUP TCAS screen comes into view. Set the parameters on this screen as follows (the values in parentheses are the recommended range for that parameter):

- RF REPORT: ANTENNA
- ANT RANGE: (20 to 30) ft
- ANT HEIGHT: (6 to 8) ft
- UUT ADDRESS: AUTO
- ANT CABLE LOSS: As required
- ANT AGAIN: As required
- SQUITTERS: ON
- ALT REPORTING: ON
- DISPLAYED ALT: RELATIVE
- TEST SET AA: A92493

NOTE:
- The antenna cable loss value is written on a tag bonded to the antenna cable.
- The TCAS TEST SET antenna gain values are written on the back of antenna.

(h) Push the TCAS key. The TCAS TEST screen comes into view. Set the parameters on this screen as follows:

- SCENARIO: CUSTOM
- TCAS TYPE: TCAS II
- % REPLY: 100
- INTRUDER TYPE: MODE S
- RANGE START: 3 nm
- RANGE RATE: + 450 kts

- ALT START: (1950 or 1975) ft
- CONVERGE: ON
- ALT DETECT: ON

(i) Push the RUN/STOP key to run the test.

(j) (Applicable to aircraft with EICAS versions 20.5 and on) On the HHDLU/EHHDLU, select the TCAS TA parameter. Select WORD 19 and SUBFRAME ALL.

Result:

1 Make sure that on the HHDLU/EHHDLU, on the WORD 19, the 2nd bit changes from "0" to "1" when the aural message "TRAFFIC - TRAFFIC" is heard.

(k) On the HHDLU/EHHDLU, select the TCAS RA parameter. Select WORD 133 and SUBFRAME ALL.

Result:

1 Make sure that the HHDLU/EHHDLU, on the WORD 133, the 7th and 3rd bits change from "0" to "1" when one of these aural messages is heard:

- (aircraft with TCAS P/N 4066010-904 or 7517900-55001, -71002 or -10002) CLIMB - CLIMB - CLIMB.
- (aircraft with TCAS P/N 4066010-910 or 7517900-55003, -71003 or -10003) CLIMB - CLIMB.

2 After that, when the INCREASE CLIMB - INCREASE CLIMB aural message is heard, the 5th and 4th bits change from "0" to "1".

NOTE: If the messages are not heard, run the test in a same scenario 3 times minimum to get the correct results. If this does not occur, try to change the values in the TCAS Test Set parameters that are recommended in parentheses (TCAS TEST screens). Also try new adjustments on the antenna of TCAS Test Set, as described before.

(l) On the TCAS Test Set (GSE 475), push the STOP TEST key to stop the test.

(m) Set the parameters on the TCAS TEST screen as follows (the values in parentheses are the recommended values for that parameter):

- SCENARIO: CUSTOM
- TCAS TYPE: TCAS II
- % REPLY: 100
- INTRUDER TYPE: MODE S
- RANGE START: 3 nm
- RANGE RATE: + 450 kts
- ALT START: (2025 or 2050) ft
- CONVERGE: ON
- ALT DETECT: ON

Push the RUN TEST key to run the test.

Result:

1 Make sure that the HHDLU/EHHDLU, on the WORD 133, the 10th, 3rd, and 1st bits change from "0" to "1" when one of these aural messages is heard:

- (aircraft with TCAS P/N 4066010-904 or 7517900-55001, -71002 or -10002) DESCEND - DESCEND - DESCEND.
- (aircraft with TCAS P/N 4066010-910 or 7517900-55003, -71003 or -10003) DESCEND - DESCEND.

NOTE: If the messages is not heard, run the test in a same scenario 3 times minimum to get the correct results. If this does not occur, try to change the values in the TCAS Test Set parameters that are recommended in parentheses (TCAS TEST screen).

(n) On the TCAS Test Set (GSE 475), push the STOP TEST key to stop the test.

(o) On the Pitot/Static System Bench Test Set (GSE 129), simulate an altitude of 3,000 feet.

(p) On the TCAS Test Set (GSE 475), push the TCAS key. The TCAS TEST screen comes into view. Set the parameters in this screen as follows (the indications in parentheses are the recommended values for that parameter):

- SCENARIO: CUSTOM
- TCAS TYPE: TCAS II
- % REPLY: 100
- INTRUDER TYPE: MODE S
- RANGE START: 0 nm
- RANGE STOP: 5 nm
- RANGE RATE: (- 350 or - 400) kts
- ALT START: 2900 ft
- ALT STOP: 5000 ft
- CONVERGE: OFF
- ALT DETECT: ON

(q) Push the RUN TEST key to run the test.

Result:

1 Make sure that the HHDLU/EHHDLU, on the WORD 133, the 4th and 3rd bits change from "0" to "1", when the CLIMB - CROSSING - CLIMB, CLIMB - CROSSING - CLIMB aural messages are heard.

2 If the conditions of the area (hangar doors closed, buildings, vehicles and other aircraft around) permits, it is possible that after the previous message, the INCREASE CLIMB - INCREASE CLIMB aural message is heard. If this occurs, make sure that the 5th and 4th bits are "1". It is not mandatory to generate this message, because it was tested before.

NOTE: If the message is not heard, run the test in a same scenario 3 times minimum to get the correct results. If this does not occur, try to change the values in the TCAS Test Set parameters that are recommended in parentheses (TCAS TEST screen).

(r) On the TCAS Test Set (GSE 475), push the STOP TEST key to stop the test.

(36) *EFFECTIVITY: Applicable to procedure using TCAS Test Set (GSE 190 or GSE 304)*

Do the test of the TCAS parameters (OCTAL BASE):

(a) Make sure that the ATC/TCAS window, on the RMU, is at the TA/RA mode.

(b) Make sure that the AIR/GND A (Location Tip: DC BUS 1/LDG GEAR/AIR/GND A), AIR/GND B (Location Tip: ESSENTIAL DC BUS 1/LDG GEAR/AIR/GND B), AIR/GND C (Location Tip: DC BUS 2/LDG GEAR/AIR/GND C), and AIR/GND D (Location Tip: ESSENTIAL DC BUS 2/LDG GEAR/AIR/GND D) circuit breakers, on the Circuit Breaker Panel, are open.

(c) Make sure that the flaps are in the 0-degree position.

(d) Make sure that PFD 1 shows a radio altitude value higher than 1,500 ft (radio altitude simulated as written in step d of item 24).

(e) On the Pitot/Static System Bench Test Set (GSE 129), simulate an altitude of 2,000 feet.

(f) On the HHDLU/EHHDLU, select the TCAS RESOLUTION ADV (Vertical Speed) parameter. Select WORD 131 and SUBFRAME ALL.

(g) Before you run the TCAS Test Set (GSE 190 or GSE 304) program, make sure that the conditions and the parameters are the same as written in steps f and g of item 24 (antenna adjustments and SETUP#1 screen parameters).

(h) On the TCAS Test Set (GSE 190 or GSE 304), push the SET/CONT until the SETUP#2 screen comes into view. Set the parameters on this screen as follows:

- RANGE MAX: 3 nm
- MIN: 0 nm
- ALT MAX: 3000 ft
- MIN: 1000 ft
- MODE: TCAS II

(i) Push the SCEN key. The SCENARIO TEST screen comes into view. Set the parameters on this screen as follows (the indications in parentheses are the recommended values for that parameter):

- RANGE: 3.00 nm
- RATE: + 450 kt

- ALT: (1950 or 1975) ft
- RATE: 0 fpm

Push the RUN/STOP key to run the test.

Result:

1 Make sure that the HHDLU/EHHDLU shows 0017 when one of these aural messages is heard:

- (aircraft with TCAS P/N 4066010-904 or 7517900-55001, -71002 or -10002) CLIMB - CLIMB - CLIMB.
- (aircraft with TCAS P/N 4066010-910 or 7517900-55003, -71003 or -10003) CLIMB - CLIMB.

2 After that, when the INCREASE CLIMB - INCREASE CLIMB aural message is heard, the HHDLU/EHHDLU shows 0031.

NOTE: If the messages are not heard, run the test in a same scenario 3 times minimum to get the correct results. If this does not occur, try to change the values in the TCAS Test Set parameters that are recommended in parentheses (SCENARIO TEST screen).

(j) On the TCAS Test Set (GSE 190 or GSE 304), push the RUN/STOP key to stop the test.

(k) Set the parameters on the SCENARIO TEST screen as follows (the indications in parentheses are the recommended values for that parameter):

- RANGE: 3.00 nm
- RATE: + 450 kt
- ALT: (2025 or 2050) ft
- RATE: 0 fpm

Push the RUN/STOP key to run the test.

Result:

1 Make sure that the HHDLU/EHHDLU shows 0161 when one of these aural messages is heard:

- (aircraft with TCAS P/N 4066010-904 or 7517900-55001, -71002 or -10002) DESCEND - DESCEND - DESCEND.
- (aircraft with TCAS P/N 4066010-910 or 7517900-55003, -71003 or -10003) DESCEND - DESCEND.

NOTE: If the message is not heard, run the test in a same scenario 3 times minimum to get the correct results. If this does not occur, try to change the values in the TCAS Test Set parameters that are recommended in parentheses (SCENARIO TEST screen).

(l) On the TCAS Test Set (GSE 190 or GSE 304), push the RUN/STOP key to stop the test.

(m) Restore the Radio Altimeter System back to normal. Refer to AMM TASK 34-31-00-800-801-A/200.

(n) On the Circuit Breaker Panel, remove the DO-NOT-CLOSE tags from the AIR/GND A (Location Tip: DC BUS 1/LDG GEAR/AIR/GND A), AIR/GND B (Location Tip: ESSENTIAL DC BUS 1/LDG GEAR/AIR/GND B), AIR/GND C (Location Tip: DC BUS 2/LDG GEAR/AIR/GND C), and AIR/GND D (Location Tip: ESSENTIAL DC BUS 2/LDG GEAR/AIR/GND D) circuit breakers and close them in ten seconds maximum.

(37) *EFFECTIVITY: Applicable to procedure using TCAS Test Set (GSE 475)*

Do the test of the TCAS parameters (OCTAL BASE):

(a) Make sure that the ATC/TCAS window, on the RMU, is at the TA/RA mode.

(b) Make sure that the AIR/GND A (Location Tip: DC BUS 1/LDG GEAR/AIR/GND A), AIR/GND B (Location Tip: ESSENTIAL DC BUS 1/LDG GEAR/AIR/GND B), AIR/GND C (Location Tip: DC BUS 2/LDG GEAR/AIR/GND C), and AIR/GND D (Location Tip: ESSENTIAL DC BUS 2/LDG GEAR/AIR/GND D) circuit breakers, on the Circuit Breaker Panel, are open.

(c) Make sure that the flaps are in the 0-degree position.

(d) Simulate a radio altitude of more than 1,500 ft AGL on Radio Altimeter 1. Refer to AMM TASK 34-31-00-800-801-A/200.

(e) On the Pitot/Static System Bench Test Set (GSE 129), simulate an altitude of 2,000 feet.

(f) On the HHDLU/EHHDLU, select the TCAS RESOLUTION ADV (Vertical Speed) parameter. Select WORD 131 and SUBFRAME ALL.

(g) Prepare the TCAS Test Set (GSE 475) for operation as follows:

1. Put the antenna of the TCAS Test Set (GSE 475) at a distance between 20 and 30 feet from the TCAS antennas on the aircraft.

2. Adjust the height of the antenna of the TCAS Test Set (GSE 475) between 6 and 8 feet.

3. Make sure that the antenna of the TCAS Test Set (GSE 475) is in a position where there is a line-of-sight path from it to the two TCAS antennas on the aircraft, without obstacles.

(h) When the TCAS Test Set (GSE 475) is ready for use, push the SETUP key until the SETUP TCAS screen comes into view. Set the parameters on this screen as follows (the values in parentheses are the recommended range for that parameter):

- RF REPORT: ANTENNA
- ANT RANGE: (20 to 30) ft
- ANT HEIGHT: (6 to 8) ft
- UUT ADDRESS: AUTO
- ANT CABLE LOSS: As required
- ANT AGAIN: As required
- SQUITTERS: ON

- ALT REPORTING: ON
- DISPLAYED ALT: RELATIVE
- TEST SET AA: A92493

NOTE:
- The antenna cable loss value is written on a tag bonded to the antenna cable.
- The TCAS TEST SET antenna gain values are written on the back of antenna.

(i) Push the TCAS key. The TCAS TEST screen comes into view. Set the parameters on this screen as follows:

- SCENARIO: CUSTOM
- TCAS TYPE: TCAS II
- % REPLY: 100
- INTRUDER TYPE: MODE S
- RANGE START: 3 nm
- RANGE RATE: + 450 kts
- ALT START: (1950 or 1975) ft
- CONVERGE: ON
- ALT DETECT: ON

(j) Push the RUN TEST key to run the test.

Result:

1 Make sure that the HHDLU/EHHDLU shows 0017 when one of these aural messages is heard:

- (aircraft with TCAS P/N 4066010-904 or 7517900-55001, -71002 or -10002) CLIMB - CLIMB - CLIMB.
- (aircraft with TCAS P/N 4066010-910 or 7517900-55003, -71003 or -10003) CLIMB - CLIMB.

2 After that, when the INCREASE CLIMB - INCREASE CLIMB aural message is heard, the HHDLU/EHHDLU shows 0031.

NOTE: If the messages are not heard, run the test in a same scenario 3 times minimum to get the correct results. If this does not occur, try to change the values in the TCAS Test Set parameters that are recommended in parentheses (TCAS TEST screens). Also try new adjustments on the antenna of TCAS Test Set, as described before.

(k) On the TCAS Test Set (GSE 475), push the STOP TEST key to stop the test.

(l) Set the parameters on the TCAS TEST screen as follows (the values in parentheses are the recommended values for that parameter):

- SCENARIO: CUSTOM

- TCAS TYPE: TCAS II
- % REPLY: 100
- INTRUDER TYPE: MODE S
- RANGE START: 3 nm
- RANGE RATE: + 450 kts
- ALT START: (2025 or 2050) ft
- CONVERGE: ON
- ALT DETECT: ON

Push the RUN TEST key to run the test.

Result:

1 Make sure that the HHDLU/EHHDLU shows 0161 when one of these aural messages is heard:

- (aircraft with TCAS P/N 4066010-904 or 7517900-55001, -71002 or -10002) DESCEND - DESCEND - DESCEND.
- (aircraft with TCAS P/N 4066010-910 or 7517900-55003, -71003 or -10003) DESCEND - DESCEND.

NOTE: If the messages are not heard, run the test in a same scenario 3 times minimum to get the correct results. If this does not occur, try to change the values in the TCAS Test Set parameters that are recommended in parentheses (TCAS TEST screens). Also try new adjustments on the antenna of TCAS Test Set, as described before.

(m) On the TCAS Test Set (GSE 475), push the STOP TEST key to stop the test.

(n) Restore the Radio Altimeter System back to normal. Refer to AMM TASK 34-31-00-800-801-A/200.

(o) On the Circuit Breaker Panel, remove the DO-NOT-CLOSE tags from the AIR/GND A (Location Tip: DC BUS 1/LDG GEAR/AIR/GND A), AIR/GND B (Location Tip: ESSENTIAL DC BUS 1/LDG GEAR/AIR/GND B), AIR/GND C (Location Tip: DC BUS 2/LDG GEAR/AIR/GND C), and AIR/GND D (Location Tip: ESSENTIAL DC BUS 2/LDG GEAR/AIR/GND D) circuit breakers and close them in ten seconds maximum.

(38) (Aircraft with thrust reversers) Do the test of the Thrust Reversers parameters (BINARY BASE):

(a) On the HHDLU/EHHDLU, select the thrust reversers LO T/R DEPLOYED # 1, LO T/R DEPLOYED # 2, UP T/R STOWED # 1, UP T/R STOWED # 2, LO T/R STOWED # 1, LO T/R STOWED # 2, UP T/R DEPLOYED # 1, and UP T/R DEPLOYED # 2) parameters. Select WORD 93 and SUBFRAME ALL.

Result:

1 Make sure that the 5th, 6th, 7th, and 8th bits show "1".

(b) Open the thrust reversers (AMM TASK 78-31-01-940-801-A/200).

Result:

1 Make sure that the 5th, 6th, 7th, and 8th bits change from "1" to "0", and the 3rd, 4th, 9th, and 10th bits change from "0" to "1".

(c) Close the thrust reversers (AMM TASK 78-31-01-940-802-A/200).

(d) The items (e) thru (g) are applicable to aircraft with EICAS versions 17 and on.

(e) On the HHDLU/EHHDLU, select the T/R IN TRANSIT # 1 and T/R IN TRANSIT # 2 parameters. Select WORD 93 and SUBFRAME ALL

Result:

1 The HDDLU 1st and 2nd bits remain in "0".

(f) Open the thrust reversers (AMM TASK 78-31-01-940-801-A/200).

Result:

1 The 1st and 2nd bits change from "0" to "1", while the thrust reversers open.

2 The 3rd and 4th bits change from "0" to "1" when the thrust reversers are open.

(g) Close the thrust reversers (AMM TASK 78-31-01-940-802-A/200).

Result:

1 The 3rd and 4th bits change from "1" to "0", while the thrust reversers close.

2 The 1st and 2nd bits come back to "0" when the thrust reversers are closed.

(39) Do the test of the fuel parameters (BINARY BASE):

WARNING: BEFORE YOU DO THIS ITEM, OBEY THE SAFETY PRECAUTIONS GIVEN IN AMM MPP 28-00-00/200 AND AMM MPP 71-00-00/200 TO PREVENT INJURY TO PERSONS AND DAMAGE TO THE MATERIAL.

(a) On the HHDLU/EHHDLU, select WORD 151 and SUBFRAME ALL.

(b) Do the test of the FUEL LOW PRESSURE # 1 parameter. Refer to step (c) thru step (j) and step (t).

(c) Put the workstand in the work area, under the LH engine.

(d) Open the lower cowling (AMM TASK 71-12-01-000-801-A/400) to get access to the LH engine.

(e) Disconnect electrical connector P0259 from the LH engine-low pressure switch.

(f) Put a jumper between pins A and B of connector P0259.

Result:

1 On the HHDLU/EHHDLU, make sure that the 2nd bit changes from "1" to "0".

(g) Remove the jumper installed in step (f).

(h) Connect the electrical connector disconnected in step (e).

(i) Close the lower cowling (AMM TASK 71-12-01-400-801-A/400).

(j) Remove the workstand.

(k) Do the test of the FUEL LOW PRESSURE # 2 parameter. Refer to step (l) thru step (t).

(l) Put the workstand in the work area, under the RH engine.

(m) Open the lower cowling (AMM TASK 71-12-01-000-801-A/400) to get access to the RH engine.

(n) Disconnect electrical connector P0259 from the RH engine-low pressure switch.

(o) Place a jumper between pins A and B of connector P0259.

Result:

1 On the HHDLU/EHHDLU, make sure that the 3rd bit changes from "1" to "0".

(p) Remove the jumper installed in step (o).

(q) Connect the electrical connector disconnected in step (n).

(r) Close the lower cowling (AMM TASK 71-12-01-400-801-A/400).

(s) Remove the workstand.

NOTE: To do step (t), it is necessary to operate the APU and the engines. You can do this step together with the checks of the parameters with engines in operation.

(t) Do an operational check of the Fuel Low-Pressure Warning System. Refer to AMM TASK 28-45-00-700-801-A/500.

(40) Do the test of the Engine/FADEC parameters (BINARY BASE):

(a) On the HHDLU/EHHDLU, select the FADEC # 1A IN CONTROL parameter. Select WORD 31 and SUBFRAME ALL.

(b) On the Power Plant Panel, on the Overhead Panel, set the FADEC switch to the ALTN position. Make sure that the FADEC 1A indication comes into view on the EICAS display:

Result:

1 On the HHDLU/EHHDLU, make sure that the 1st bit changes from "0" to "1".

(c) On the HHDLU/EHHDLU, select the FADEC # 1B IN CONTROL parameter. Select WORD 31 and SUBFRAME ALL.

(d) On the Power Plant Panel, on the Overhead Panel, set the FADEC switch to the ALTN position. Make sure that the FADEC 1B indication comes into view on the EICAS display:

Result:

1 On the HHDLU/EHHDLU, make sure that the 2nd bit changes from "0" to "1".

(e) On the HHDLU/EHHDLU, select the FADEC # 2A IN CONTROL parameter. Select WORD 159 and SUBFRAME ALL.

(f) On the Power Plant Panel, on the Overhead Panel, set the FADEC switch to the ALTN position. Make sure that the FADEC 2A indication comes into view on the EICAS display:

Result:

1 On the HHDLU/EHHDLU, make sure that the 1st bit changes from "0" to "1".

(g) On the HHDLU/EHHDLU, select the FADEC # 2B IN CONTROL parameter. Select WORD 159 and SUBFRAME ALL.

(h) On the Power Plant Panel, on the Overhead Panel, set the FADEC switch to the ALTN position. Make sure that the FADEC 2B indication comes into view on the EICAS display:

Result:

1 On the HHDLU/EHHDLU, make sure that the 2nd bit changes from "0" to "1".

(i) On the Pitot/Static System Bench Test Set (GSE 129), simulate an altitude of 2,500 feet.

(j) On the HHDLU/EHHDLU, select the ENGINE # 1 MODES parameter. Select WORD 89 and SUBFRAME ALL.

(k) On the Circuit Breaker Panel, open the FADEC 1A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/1A), FADEC 2A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/2A), FADEC 1B (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/1B), and FADEC 2B (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/2B) circuit breakers, and attach DO-NOT-CLOSE tags to them.

(l) On the Overhead Panel, make sure that the BATT1 and BATT2 switches are positioned at OFF and, on the Circuit Breaker Panel, open the AIR/GND A (Location Tip: DC BUS 1/LDG GEAR/AIR/GND A), AIR/GND B (Location Tip: ESSENTIAL DC BUS 1/LDG GEAR/AIR/GND B), AIR/GND C (Location Tip: DC BUS 2/LDG GEAR/AIR/GND C), and AIR/GND D (Location Tip: ESSENTIAL DC BUS 2/LDG GEAR/AIR/GND D) circuit breakers to simulate aircraft in flight, and attach DO-NOT-CLOSE tags to them.

(m) Remove the DO-NOT-CLOSE tags from the circuit breakers opened in (k), and close them simultaneously and wait 15 seconds.

(n) On the Power Plant Panel, on the Overhead Panel, set the FADEC switch to the ALTN position.

(o) Push the pushbutton CON on the THRUST RATING MODULE, on the Control Pedestal.

Result:

1 On aircraft with A1P or A1/3 engine models, on the HHDLU/EHHDLU, make sure that the 4th, 3rd, 2nd and 1st bits change from "1011" to "0110".

2 On aircraft with A, A1, A1/1 or A3 engine models, on the HHDLU/EHHDLU, make sure that the 4th, 3rd, 2nd and 1st bits change from "0000" to "0110".

NOTE: The engine model is shown on a placard installed on the engine; access to it is got through the engine lower cowling opening (refer to AMM TASK 71-12-01-000-801-A/400).

(p) Remove the DO-NOT-CLOSE tags from the circuit breakers opened in (l) and close them in ten seconds maximum.

(q) On the HHDLU/EHHDLU, select the ENGINE # 2 MODES parameter. Select WORD 217 and SUBFRAME ALL.

(r) On the Circuit Breaker Panel, open the FADEC 1A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/1A), FADEC 2A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/2A), FADEC 1B (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/1B), and FADEC 2B (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/2B) circuit breakers, and attach DO-NOT-CLOSE tags to them.

(s) On the Overhead Panel, make sure that the BATT1 and BATT2 switches are at OFF and, on the Circuit Breaker Panel, open the AIR/GND A (Location Tip: DC BUS 1/LDG GEAR/AIR/GND A), AIR/GND B (Location Tip: ESSENTIAL DC BUS 1/LDG GEAR/AIR/GND B), AIR/GND C (Location Tip: DC BUS 2/LDG GEAR/AIR/GND C), and AIR/GND D (Location Tip: ESSENTIAL DC BUS 2/LDG GEAR/AIR/GND D) circuit breakers to simulate aircraft in flight, and attach DO-NOT-CLOSE tags to them.

(t) Remove the DO-NOT-CLOSE tags from the circuit breakers opened in (r), and close them simultaneously and wait 15 seconds.

(u) On the Power Plant Panel, on the Overhead Panel, set the FADEC switch to the ALTN position.

(v) Push the pushbutton CON on the THRUST RATING MODULE, on the Control Pedestal.

Result:

1 On aircraft with A1P or A1/3 engine models, on the HHDLU/EHHDLU, make sure that the 4th, 3rd, 2nd and 1st bits change from "1011" to "0110".

2 On aircraft with A, A1, A1/1 or A3 engine models, on the HHDLU/EHHDLU, make sure that the 4th, 3rd, 2nd and 1st bits change from "0000" to "0110".

NOTE: The engine model is shown on a placard installed on the engine; access to it is got through the engine lower cowling opening (refer to AMM TASK 71-12-01-000-801-A/400).

(w) Remove the DO-NOT-CLOSE tags from the circuit breakers opened in (s) and close them in ten seconds maximum.

(x) Disconnect the Pitot/Static System Bench Test Set (GSE 129) from the aircraft.

(y) On the Circuit Breaker Panel, open the FADEC 1A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/1A), FADEC 2A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/2A) and FADEC 2B (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/2B) circuit breakers.

(z) On the Circuit Breaker Panel, close the FADEC 1A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/1A), FADEC 1B (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/1B), FADEC 2A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/2A) and FADEC 2B (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/2B) circuit breakers simultaneously.

Result:

1 The EICAS message goes out of view.

(aa) On the Circuit Breaker Panel, open the FIRE EXTG BTL A 1 (Location Tip: HOT BUS 1/FIRE EXTG/BTL A/1), FIRE EXTG BTL A 2 (Location Tip: HOT BUS 1/ FIRE EXTG/BTL A/2), FIRE EXTG BTL B 1 (Location Tip: HOT BUS 2/FIRE EXTG/BTL B/1), FIRE EXTG BTL B 2 (Location Tip: HOT BUS 2/FIRE EXTG/BTL B/2), and APU FIRE EXTG (Location Tip: ESSENTIAL DC BUS 2/APU/FIRE/EXTG) circuit breakers, and attach DO-NOT-CLOSE tags to them.

(ab) On the HHDLU/EHHDLU, select the ENG # 1 EMERG STOP ACTUATED parameter. Select WORD 31 and SUBFRAME ALL.

(ac) On the Overhead Panel, pull Fire Extinguishing Handle 1 (Do not turn it).

Result:

1 (Aircraft with EICAS up to version 15B) On the HHDLU/EHHDLU, make sure that the 9th bit changes from "0" to "1":

2 (Aircraft with EICAS versions 16 and on) On the HHDLU/EHHDLU, make sure that the 9th bit changes from "1" to "0":

(ad) Set Fire Extinguishing Handle 1 to its original position.

(ae) On the HHDLU/EHHDLU, select the ENG # 2 EMERG STOP ACTUATED parameter. Select WORD 159 and SUBFRAME ALL.

(af) On the Overhead Panel, pull Fire Extinguishing Handle 2 (Do not turn it).

Result:

1 (Aircraft with EICAS up to version 15B) On the HHDLU/EHHDLU, make sure that the 9th bit changes from "0" to "1":

2 (Aircraft with EICAS versions 16 and on) On the HHDLU/EHHDLU, make sure that the 9th bit changes from "1" to "0":

(ag) Set Fire Extinguishing Handle 2 to its original position.

(ah) Remove the DO-NOT-CLOSE tags from the circuit breakers opened in (aa), and close them.

(ai) The items (aj) thru (bx) are applicable to aircraft with EICAS versions 17 and on.

(aj) On the HHDLU/EHHDLU, select the FADEC ENGINE NO DISPATCH parameters. Select WORDs 89 and 217 and SUBFRAME ALL.

(ak) On the circuit breaker panel, open the FADEC 1B circuit breaker (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/1B).

Result:

1 The EICAS caution message E1 NO DISP is shown.

2 The master caution tone sounds.

3 On the glareshield panel, the master caution lighted pushbuttons flash.

4 On the HHDLU/EHHDLU, make sure that the 7th bit of WORD 89 (FADEC #1A ENGINE NO DISP) changes from "0" to "1".

5 After 30 seconds, the EICAS message changes to E1-2 NO DISP caution message, and the 8th bit of WORD 217 (FADEC #2B ENGINE NO DISP) changes from "0" to "1".

(al) On the glareshield panel, push a master caution lighted pushbutton.

Result:

1 The master caution tone ceases.

2 The master caution lighted pushbuttons goes off.

(am) On the Circuit Breaker Panel, open the FADEC 1A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/1A), FADEC 2A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/2A) and FADEC 2B (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/2B) circuit breakers.

(an) On the Circuit Breaker Panel, close the FADEC 1A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/1A), FADEC 1B (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/1B), FADEC 2A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/2A) and FADEC 2B (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/2B) circuit breakers simultaneously

Result:

1 The EICAS message goes out of view.

2 On the HHDLU/EHHDLU, make sure that the 7th bit of WORD 89 (FADEC #1A ENGINE NO DISP) is "0".

3 On the HHDLU/EHHDLU, make sure that the 8th bit of WORD 217 (FADEC #2B ENGINE NO DISP) is "0".

(ao) On the circuit breaker panel, open the FADEC 1A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/1A) circuit breaker.

Result:

1 The EICAS caution message E1 NO DISP is shown.

2 The master caution tone sounds.

3 On the glareshield panel, the master caution lighted pushbuttons flash.

4 On the HHDLU/EHHDLU, make sure that the 8th bit of WORD 89 (FADEC #1B ENGINE NO DISP) changes from "0" to "1".

5 After 30 seconds, the EICAS message changes to E1-2 NO DISP caution message, and the 7th bit of WORD 217 (FADEC #2A ENGINE NO DISP) changes from "0" to "1".

(ap) On the glareshield panel, push a master caution lighted pushbutton

Result:

1 The master caution tone ceases.

2 The master caution lighted pushbuttons goes off.

(aq) On the Circuit Breaker Panel, open the FADEC 1B (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/1B), FADEC 2A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/2A) and FADEC 2B (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/2B) circuit breakers.

(ar) On the Circuit Breaker Panel, close the FADEC 1A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/1A), FADEC 1B (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/1B), FADEC 2A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/2A) and FADEC 2B (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/2B) circuit breakers simultaneously.

Result:

1 The EICAS message goes out of view.

2 On the HHDLU/EHHDLU, make sure that the 8th bit of WORD 89 (FADEC #1B ENGINE NO DISP) is "0".

3 On the HHDLU/EHHDLU, make sure that the 7th bit of WORD 217 (FADEC #2A ENGINE NO DISP) is "0".

(as) On the HHDLU/EHHDLU, select the FADEC ENGINE SHORT TERM DISPATCH and the FADEC ENGINE LONG TERM DISPATCH. Select WORDs 89 and 217, SUBFRAME ALL.

(at) On the Circuit Breaker Panel, open the ADC1 (Location Tip: ESSENTIAL DC BUS 1/NAV/ADC1) circuit breaker and attach a DO-NOT-CLOSE tag to it.

Result:

1 Some EICAS messages will appear.

2 Make sure that 9th (FADEC 1A ENGINE SHORT TERM DISPATCH) and the 11th (FADEC 1A ENGINE LONG TERM DISPATCH) bits of WORD 89 change from "0" to "1".

3 Make sure that 9th (FADEC 2A ENGINE SHORT TERM DISPATCH) and the 11th (FADEC 2A ENGINE LONG TERM DISPATCH) bits of WORD 217 change from "0" to "1".

4 After 60 seconds, the EICAS Advisory message E1-2 SHORT DISP is shown.

(au) On the Circuit Breaker Panel, open the ADC2 (Location Tip: DC BUS 2/NAV/ADC2) circuit breaker and attach a DO-NOT-CLOSE tag to it.

Result:

1 Some new EICAS messages will appear.

2 Make sure that 10th (FADEC 1B ENGINE SHORT TERM DISPATCH) and the 12th (FADEC 1B ENGINE LONG TERM DISPATCH) bits of WORD 89 change from "0" to "1".

3 Make sure that 10th (FADEC 2B ENGINE SHORT TERM DISPATCH) and the 12th (FADEC 2B ENGINE LONG TERM DISPATCH) bits of WORD 217 change from "0" to "1".

(av) On the Circuit Breaker Panel, remove the DO-NOT-CLOSE tags and close the ADC1 (Location Tip: ESSENTIAL DC BUS 1/NAV/ADC1) and ADC2 (Location Tip: DC BUS 2/NAV/ADC2) circuit breakers.

(aw) On the Circuit Breaker Panel, open the FADEC 1A (Location Tip: ESSENTIAL DC BUS 1/POWRPLANT/FADEC/1A), FADEC 1B (Location Tip: ESSENTIAL DC BUS 2/POWRPLANT/FADEC/1B), FADEC 2A (Location Tip: ESSENTIAL DC BUS 1/POWRPLANT/FADEC/2A) and FADEC 2B (Location Tip: ESSENTIAL DC BUS 2/POWRPLANT/FADEC/2B) circuit breakers and close them simultaneously.

Result:

1 The EICAS Advisory message goes out of view.

2 Make sure that the 9th, 10th, 11th, and 12th bits of WORDS 89 and 217 are "0".

(ax) On the HHDLU/EHHDLU, select the FADEC INCAPABLE parameters. Select WORDs 31 and 159, SUBFRAME ALL.

(ay) In the cockpit, on the Circuit Breaker Panel, open the FADEC 1A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/1A) and FADEC 1B (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/1B) circuit breakers.

Result:

1 Some EICAS messages will appear.

(az) Put the workstand in the work area, under the LH engine.

(ba) Open the lower cowling (AMM TASK 71-12-01-000-801-A/400) to get access to the LH engine.

(bb) On the LH engine, disconnect electrical connector FPMU A (blue harness).

(bc) In the cockpit, on the Circuit Breaker Panel, close the FADEC 1A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/1A) and FADEC 1B (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/1B) circuit breakers.

Result:

1 During the initialization of the FADECs, some bits will change their states.

2 After the initialization, make sure that the 3rd bit of WORD 31 (FADEC 1A INCAPABLE) is "1".

(bd) In the cockpit, on the Circuit Breaker Panel, open the FADEC 1A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/1A) and FADEC 1B (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/1B) circuit breakers.

Result:

1 Some EICAS messages will come into view.

(be) On the LH engine, connect electrical connector FPMU A (blue harness) and disconnect the electrical connector FPMU B (yellow harness).

(bf) In the cockpit, on the Circuit Breaker Panel, close the FADEC 1A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/1A) and FADEC 1B (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/1B) circuit breakers.

Result:

1 During the initialization of the FADECs, some bits will change their state.

2 After the initialization, make sure that the 4th bit of WORD 31 (FADEC 1B INCAPABLE) is "1".

(bg) In the cockpit, on the Circuit Breaker Panel, open the FADEC 1A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/1A) and FADEC 1B (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/1B) circuit breakers.

Result:

1 Some EICAS messages will come into view.

(bh) On the LH engine, connect the electrical connector FPMU B (yellow harness).

(bi) Close the LH engine lower cowling (AMM TASK 71-12-01-400-801-A/400).

(bj) Remove the workstand.

(bk) In the cockpit, on the Circuit Breaker Panel, close the FADEC 1A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/1A) and FADEC 1B (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/1B) circuit breakers.

(bl) In the cockpit, on the Circuit Breaker Panel, open the FADEC 2A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/2A) and FADEC 2B (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/2B) circuit breakers.

Result:

1 Some EICAS messages will come into view.

(bm) Open the lower cowling (AMM TASK 71-12-01-000-801-A/400) to get access to the RH engine.

(bn) On the RH engine, disconnect electrical connector FPMU A (blue harness).

(bo) In the cockpit, on the Circuit Breaker Panel, close the FADEC 2A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/2A) and FADEC 2B (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/2B) circuit breakers.

Result:

1 During the initialization of the FADECs, some bits will change their state.

2 After the initialization, make sure that the 3rd bit of WORD 159 (FADEC 2A INCAPABLE) is "1".

(bp) In the cockpit, on the Circuit Breaker Panel, open the FADEC 2A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/2A) and FADEC 2B (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/2B) circuit breakers.

Result:

1 Some EICAS messages will come into view.

(bq) On the RH engine, connect electrical connector FPMU A (blue harness) and disconnect the electrical connector FPMU B (yellow harness).

(br) In the cockpit, on the Circuit Breaker Panel, close the FADEC 2A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/2A) and FADEC 2B (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/2B) circuit breakers.

Result:

1 During the initialization of the FADECs, some bits will change their states.

2 After the initialization, make sure that the 4th bit of WORD 159 (FADEC 2B INCAPABLE) is "1".

(bs) In the cockpit, on the Circuit Breaker Panel, open the FADEC 2A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/2A) and FADEC 2B (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/2B) circuit breakers.

Result:

1 Some EICAS messages will come into view.

(bt) On the RH engine, connect the electrical connector FPMU B (yellow harness).

(bu) Close the RH engine lower cowling (AMM TASK 71-12-01-400-801-A/400).

(bv) In the cockpit, on the Circuit Breaker Panel, close the FADEC 2A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/2A) and FADEC 2B (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/2B) circuit breakers.

(bw) In the cockpit, on the Circuit Breaker Panel, open the FADEC 1A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/1A), FADEC 1B (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/1B), FADEC 2A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/2A) and FADEC 2B (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/2B) circuit breakers.

(bx) In the cockpit, on the Circuit Breaker Panel, close the FADEC 1A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/1A), FADEC 1B (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/1B), FADEC 2A (Location Tip: ESSENTIAL DC BUS 1/POWERPLANT/FADEC/2A) and FADEC 2B (Location Tip: ESSENTIAL DC BUS 2/POWERPLANT/FADEC/2B) circuit breakers simultaneously.

Result:

1 No EICAS messages related to the engines can be shown. If new message is shown after this test, examine the FPMU connections.

2 After the initialization, make sure that the 3rd and the 4th bits of WORDS 31 and 159 are "0".

(41) Do the test of the Ice Detection parameters (BINARY BASE):

(a) On the HHDLU/EHHDLU, select WORD 23 and SUBFRAME ALL.

(b) On the HHDLU/EHHDLU, select the ICE CONDITION and ICE DETECTION FAIL parameters.

(c) On the Ice Detection Panel, on the Overhead Panel, set the TEST knob to 1 and hold it in this position.

Result:

1 On the HHDLU/EHHDLU, make sure that the 1st bit changes from "1" (No Ice) to "0" (Ice), and that the 2nd bit changes from "0" (Normal) to "1" (Fail).

(d) Set the TEST knob back to its original position.

(e) On the HHDLU/EHHDLU, select the ENG # 1 A/ICE COMMAND parameter.

(f) On the Circuit Breaker Panel, open the ENG AIR INLET 1 (Location Tip: DC BUS 1/ICE AND RAIN PROTECTION/ENG AIR INLET 1) circuit breaker and attach a DO-NOT-CLOSE tag to it.

Result:

1 On the HHDLU/EHHDLU, make sure that the 3rd bit changes from "0" (OFF) to "1" (ON).

(g) Remove the DO-NOT-CLOSE tag from the circuit breaker opened in (f) and close it.

(h) On the HHDLU/EHHDLU, select the ENG # 2 A/ICE COMMAND parameter.

(i) On the Circuit Breaker Panel, open the ENG AIR INLET 2 (Location Tip: DC BUS 2/ICE AND RAIN PROTECTION/ENG AIR INLET 2) circuit breaker and attach a DO-NOT-CLOSE tag to it.

Result:

1 On the HHDLU/EHHDLU, make sure that the 4th bit changes from "0" (OFF) to "1" (ON).

(j) Remove the DO-NOT-CLOSE tag from the circuit breaker opened in (i) and close it.

(k) On the HHDLU/EHHDLU, select the WING A/ICE COMMAND parameter.

(l) On the Ice Protection Panel, on the Overhead Panel, push the WING button.

(m) On the Ice Detection Panel, on the Overhead Panel, set the TEST knob to 1 and hold it in this position.

Result:

1 On the HHDLU/EHHDLU, make sure that the 5th bit changes from "0" (OFF) to "1" (ON).

(n) Set the TEST knob and the WING button back to their original positions.

(o) On the HHDLU/EHHDLU, select the STAB A/I COMMAND parameter.

(p) On the Ice Protection Panel, on the Overhead Panel, push the STAB button.

(q) On the Ice Detection Panel, on the Overhead Panel, set the TEST knob to 1 and hold it in this position.

Result:

1 On the HHDLU/EHHDLU, make sure that the 6th bit changes from "0" (OFF) to "1" (ON).

(r) Set the TEST knob and the STAB button back to their original positions.

(s) On the HHDLU/EHHDLU, select the T/O REF A-ICE # 1 and T/O REF A-ICE # 2 parameters. Select WORDS 95 and 223, and SUBFRAME ALL.

(t) On the MFD's, on the Main Panel, select the T/O (TAKE-OFF) page.

(u) On the Powerplant Panel, on the Overhead Panel, push (three times) the STORE button until the MFD shows REF A-ICE. Then turn the SET control to the INC (increase) position.

Result:

1 On the HHDLU/EHHDLU, make sure that the 1st bit of WORDS 95 and 223 changes from "0" (OFF) to "1" (ON).

(v) Set the SET control back to its original position.

(42) Do the test of the Surface Position (RVDTs/RVITs) Parameters as follows (OCTAL BASE):

NOTE: This step is applicable only to aircraft with the RVDTs/RVITs installed.

WARNING: MAKE SURE THAT THERE ARE NO PERSONS AND EQUIPMENT IN THE AILERON, ELEVATOR, AND RUDDER TRAVEL AREA.

CAUTION:
- DO NOT DO OTHER TASKS ON THE AILERON, ELEVATOR, AND RUDDER SYSTEMS.
- MAKE SURE THAT THE AILERON SYSTEM IS NOT RIG-PINNED AT THE CONTROL WHEEL, TORQUE TUBE QUADRANTS, INTERMEDIARY SECTOR, AND WING SECTOR.
- MAKE SURE THAT THE ELEVATOR SYSTEM IS NOT RIG-PINNED AT THE CONTROL COLUMN, TORQUE TUBE, REAR SECTOR, AND SURFACES.
- MAKE SURE THAT THE RUDDER SYSTEM IS NOT RIG-PINNED AT THE RUDDER PEDALS AND FORWARD AND REAR TORQUE TUBES.

(a) On the HHDLU/EHHDLU, select the AILERON SURFACE POSITION # 1 parameter. Select WORD 33 and SUBFRAME ALL.

(b) Put the left aileron surface at the neutral position as follows:

1. Remove access panel 551CB (AMM MPP 06-44-00/100).
2. Install the rig pin (GSE 058) in the LH wing sector (Figure 504).
3. Make sure that the aileron and aileron/flap torsion box are aligned.
4. Install the digital protractor (GSE 070) to the LH aileron surface. Use double-face adhesive tape for it.
5. Set the digital protractor (GSE 070) to zero (reference), and remove the rig pin (GSE 058) from the aileron wing sector.
6. Install access panel 551CB (AMM MPP 06-44-00/100).

(c) On the HHDLU/EHHDLU, the displayed value is between 1764 and 2012.

(d) Refer to the table below and manually change the LH aileron deflection angle and make sure that the displayed values on the HHDLU/EHHDLU obey the tolerances.

Table 5124 - AILERON SURFACE POSITION # 1

DEFLECTION ANGLE (DIGITAL PROTRACTOR)	HHDLU/EHHDLU (OCTAL)
25 degrees - up	0711 - 1033
15 degrees - down	2437 - 2567

(e) Remove the protractor (GSE 070) from the LH aileron surface.

(f) On the HHDLU/EHHDLU, select the AILERON SURFACE POSITION # 2 parameter. Select WORD 97 and SUBFRAME ALL.

(g) Put the right aileron surface at the neutral position as follows:

1. Remove access panel 651CB (AMM MPP 06-44-00/100).
2. Install the rig pin (GSE 058) in the RH wing sector (Figure 504).
3. Make sure that the aileron and aileron/flap torsion box are aligned.
4. Install the digital protractor (GSE 070) to the RH aileron surface. Use double-face adhesive tape for it.
5. Set the digital protractor (GSE 070) to zero (reference), and remove the rig pin (GSE 058) from the aileron wing sector.
6. Install access panel 651CB (AMM MPP 06-44-00/100).

(h) On the HHDLU/EHHDLU, the displayed value is between 1764 and 2012.

(i) Refer to the table below and manually change the RH aileron deflection angle and make sure that the displayed values on the HHDLU/EHHDLU obey the tolerances.

Table 5125 - AILERON SURFACE POSITION # 2

DEFLECTION ANGLE (DIGITAL PROTRACTOR)	HHDLU/EHHDLU (OCTAL)
25 degrees - up	2741 - 3061
15 degrees - down	1220 - 1344

(j) Remove the protractor (GSE 070) from the RH aileron surface.

(k) (Aircraft with EICAS up to version 20) On the HHDLU/EHHDLU, select the ELEVATOR SURFACE POSITION # 1 parameter. Select WORD 65 and SUBFRAME ALL.

(l) (Aircraft with EICAS versions 20.5 and on) On the HHDLU/EHHDLU, select the ELEVATOR SURFACE POSITION # 1 parameter. Select WORD 59 and SUBFRAME ALL.

(m) Put the left elevator surface at the neutral position as follows:

1. Install the elevator lock clamp (GSE 196) to the LH elevator surface (Figure 505).
2. Install the digital protractor (GSE 070) to the LH elevator surface. Use double-face adhesive tape for it.
3. Set the digital protractor (GSE 070) to zero (reference), and remove the lock clamp from the elevator surface.

(n) On the HHDLU/EHHDLU, the displayed value is between 1760 and 2016.

(o) Refer to the table below and manually change the LH elevator deflection angle and make sure that the displayed values on the HHDLU/EHHDLU obey the tolerances.

Table 5126 - ELEVATOR SURFACE POSITION # 1

DEFLECTION ANGLE (DIGITAL PROTRACTOR)	HHDLU/EHHDLU (OCTAL)	
	AIRCRAFT WITH MECHANICAL GUST LOCK AND WITHOUT PROVISIONS FOR ELECTROMECHANICAL GUST LOCK	AIRCRAFT WITH ELECTROMECHANICAL GUST LOCK OR PROVISIONS FOR IT
25 degrees - up	3045 - 3205	3147 - 3322
10 degrees - down	1177 - 1367	1276 - 1451

(p) Remove the protractor (GSE 070) from the LH elevator surface.

(q) On the HHDLU/EHHDLU, select the ELEVATOR SURFACE POSITION # 2 parameter. Select WORD 91 and SUBFRAME ALL.

(r) Put the right elevator surface at the neutral position as follows:

1. Install the elevator lock clamp (GSE 196) to the RH elevator surface (Figure 505).
2. Install the digital protractor (GSE 070) to the RH elevator surface. Use double-face adhesive tape for it.
3. Set the digital protractor (GSE 070) to zero (reference), and remove the lock clamp from the elevator surface.

(s) On the HHDLU/EHHDLU, the displayed value is between 1760 and 2016.

(t) Refer to the table below and manually change the RH elevator deflection angle and make sure that the displayed values on the HHDLU/EHHDLU obey the tolerances.

Table 5127 - ELEVATOR SURFACE POSITION # 2

DEFLECTION ANGLE (DIGITAL PROTRACTOR)	HHDLU/EHHDLU (OCTAL)	
	AIRCRAFT WITH MECHANICAL GUST LOCK AND WITHOUT PROVISIONS FOR ELECTROMECHANICAL GUST LOCK	AIRCRAFT WITH ELECTROMECHANICAL GUST LOCK OR PROVISIONS FOR IT
25 degrees - up	0602 - 0706	0454 - 0627
10 degrees - down	2402 - 2572	2325 - 2500

(u) Remove the protractor (GSE 070) from the RH elevator surface.

(v) On the HHDLU/EHHDLU, select the RUDDER SURFACE POSITION parameter. Select WORD 55 and SUBFRAME ALL.

(w) Put the rudder surface at the neutral position as follows:

1. Pressurize the hydraulic system (AMM TASK 29-10-00-860-801-A/200).
2. On the overhead panel, turn on rudder systems 1 and 2. Make sure that the RUDDER SHUTOFF SYS 1 and 2 pushbutton lights are off.
3. Make sure that the yaw trim indicator on the EICAS shows zero.
4. Install the protractor (GSE 059) to the fin/rudder I, with screw NASM(MS)24694-6 or with a double face adhesive tape, and set it to the zero position (reference) (Figure 506).
5. On the overhead panel, turn off rudder systems 1 and 2. Make sure that the RUDDER SHUTOFF SYS 1 and 2 pushbutton lights are on.
6. Release the pressure from the hydraulic system (AMM TASK 29-10-00-860-801-A/200).

(x) On the HHDLU/EHHDLU, the value shown is between 1756 and 2020.

(y) Refer to the table below and manually change the rudder deflection angle and make sure that the values shown on the HHDLU/EHHDLU obey the tolerances.

Table 5128 - RUDDER SURFACE POSITION

DEFLECTION ANGLE (DIGITAL PROTRACTOR)	HHDLU/EHHDLU (OCTAL)
10 degrees - left	1205 - 1400
10 degrees - right	2332 - 2562

(z) Remove the protractor (GSE 059) from fin/rudder I.

(43) (Aircraft with dual IRS) Do the test of the Attitude and Heading Parameters as follows (OCTAL BASE):

(a) Make sure that the IRS 1 (Location Tip: ESSENTIAL DC BUS 1/NAV/IRS 1) and IRS 2 (Location Tip: DC BUS 2/NAV/IRS 2) circuit breakers are closed.

(b) If PFD1 shows the red flags ATT FAIL and HDG FAIL and MFD1 shows the red flag HDG FAIL, align the IRS as follows:

1 Make sure that the aircraft is in the on-ground configuration and the indicated airspeed on the PFD is lower than 20 knots.

2 Make sure that the rotary switch on MSU1 is in the OFF position.

3 Turn the MSU1 rotary switch to the ALIGN position.

- The ALIGN annunciator (amber) on the MSU comes on.
- The ON BATT and the NO AIR annunciators (amber) on the MSU come on briefly.

NOTE:
- The IRS must receive the present position for the alignment to be completed. The FMS position must be updated to let this data be read by the IRS.
- If the aircraft is moved during the alignment, the IRU stops the current alignment and starts a full alignment again 30 seconds after the movement stops.

4 Do the FMS position update as follows:

a On FMS1 or FMS2, push the NAV mode key and the NEXT function key.

- The NAV INDEX 2/2 page is shown.

b Push the POS INIT (3L) left line select key.

- The POS INIT 1/1 page is shown.

c Push the LOAD (2R) right line select key to update the FMS position with the last saved position.

- The CDU shows the LOADED POSITION coordinates.

5 Wait until the alignment is completed. The alignment time depends on the local latitude. The time of alignment is less than 10 minutes for latitudes shorter than 70.25 degrees.

- After the alignment of the IRS is completed, the NAV RDY annunciator (green) on the MSU comes on.

6 Turn the MSU1 rotary switch to the NAV position.

- The ALIGN and NAV RD annunciators go off on the MSU.
- The flags ATT FAIL and HDG FAIL go out of view on PFD1 and MFD1 and a valid attitude and heading data are shown.

(c) On the MSU1 panel, push the test switch.

- All MSU1 annunciators come on for eight seconds.
- PFD1 shows ATT TEST and HDG TEST (red) and MFD1 shows HDG TEST (red).

- PFD1 shows these indications: 30 degrees for Magnetic Heading, 15 degrees for Pitch Angle, and 5 degrees for Roll Angle.

NOTE: When the test switch is pushed, the above test data is available for three cycles of eight seconds each. If this time is not sufficient for the reading, keep the switch pushed or push it as many times as necessary.

(d) On the HHDLU/EHHDLU, select the PITCH ATTITUDE parameter. Select WORDS 43, 107, 171, and 235, and SUBFRAME ALL. Make sure that the value shown on the HHDLU/EHHDLU is in the tolerance given in the table below:

Table 5129 - PITCH ATTITUDE

VALUE (°)	HHDLU/EHHDLU (OCTAL)
0	7751 - 0026
15	0223 - 0301

(e) On the HHDLU/EHHDLU, select the ROLL ATTITUDE parameter. Select WORDS 45 and 173, and SUBFRAME ALL. Make sure that the value shown on the HHDLU/EHHDLU is in the tolerance given in the table below:

Table 5130 - ROLL ATTITUDE

VALUE (°)	HHDLU/EHHDLU (OCTAL)
5	0042 - 0117

(f) On the HHDLU/EHHDLU, select the MAGNETIC HEADING parameter. Select WORD 35 and SUBFRAME ALL. Make sure that the value shown on the HHDLU/EHHDLU is in the tolerance given in the table below:

Table 5131 - MAGNETIC HEADING

VALUE (°)	HHDLU/EHHDLU (OCTAL)
30	0476 - 0553

(g) Set the MSU1 rotary switch to the OFF position.

- The ALIGN annunciator on the MSU comes on.
- After three seconds, the flags ATT FAIL and HDG FAIL come on, on PFD1 and the flag HDG FAIL comes into view on MFD1.

(44) (Aircraft with EICAS versions 17 and on) Do the test of the Displays parameters as follows (BINARY BASE).

(a) Make sure that PFD 1 and PFD 2 are in the full compass format (AMM SDS 34-21-00/1).

(b) On the HHDLU/EHHDLU, select the PFD FORMAT (FULL/WX) #1 parameter. Select WORD 95 and SUBFRAMES 1 and 3.

(c) Make sure that the HHDLU/EHHDLU 11th bit is "0".

(d) Press the FULL/WX key on DC-550 1.

Result:

1 PFD 1 changes to the arc format.

2 The HHDLU/EHHDLU 11th bit changes from "0" to "1".

(e) Press the FULL/WX key on DC-550 1 again.

Result:

1 PFD 1 comes back to the full format.

2 The HHDLU/EHHDLU 11th bit changes from "1" to "0".

(f) Make sure that MFD 1 and MFD 2 are in the MAP format (AMM SDS 34-21-00/1).

(g) On the HHDLU/EHHDLU, select the MFD FORMAT (PLAN/MAP) #1 parameter. Select WORD 95 and SUBFRAME 1 and 3.

(h) Make sure that the HHDLU/EHHDLU 12th bit is "0".

(i) Through the MFD 1 primary menu, select the PLAN format.

Result:

1 MFD 1 changes to the PLAN format.

2 The HHDLU/EHHDLU 12th bit changes from "0" to "1".

(j) On the HHDLU/EHHDLU, select the PILOT PFD WX DISPLAYED HALF RANGES parameter. Select WORD 95 and SUBFRAMES 1 and 3.

(k) On DC 550 1, on the glareshield panel, push the FULL/WX pushbutton, to start the WX mode on PDF 1 (AMM SDS 34-42-00/1).

Result:

1 PFD 1 shows the WX inscription in amber, on the left corner.

2 The compass card of PFD 1 goes to the ARC mode.

(l) (Aircraft with dual weather radar controller panel) Set the RADAR rotary switch, on the pilot weather radar controller panel, on the glareshield panel, to the SBY position.

(m) (Aircraft with single weather radar controller panel) Set the RADAR rotary switch, on the weather radar controller panel, on the control pedestal, to the SBY position.

(n) Wait until the FSBY indication is shown in green on the PFD 1 display.

(o) Push the "UP ARROW" pushbutton to increase the range, or the "DOWN ARROW" pushbutton to decrease the range, on the weather radar controller, and make sure that the 2nd, 3rd, 4th, and 5th bits on the HHDLU/EHHDLU agree with the table below.

Table 5132 - PILOT PFD WX DISPLAYED HALF RANGES

SELECTED RANGE	HHDLU/EHHDLU (5th, 4th, 3rd and 2nd bits)
2.5	0011
5	0100
12.5	0101
25	0110
50	0111
100	1001
150	1010

(p) (Aircraft with dual weather radar controller panel) Set the RADAR rotary switch, on the pilot weather radar controller panel, on the glareshield panel, to the OFF position.

(q) (Aircraft with single weather radar controller panel) Set the RADAR rotary switch, on the weather radar controller panel, on the control pedestal, to the OFF position.

(r) Press the FULL/WX key on DC-550 1 again.

Result:

1 PFD 1 comes back to the full format.

(s) On the HHDLU/EHHDLU, select the PRIMARY NAVIGATION SYSTEM REFERENCE (PILOT) parameter. Select the WORD 95 and SUBFRAMES 1 and 3.

(t) Push the NAV or FMS pushbutton on DC 550 1.

Result:

1 The primary navigation system is displayed on PFD 1.

2 The parameter is displayed on the HHDLU/EHHDLU according to the table below.

Table 5133 - PRIMARY NAVIGATION SYSTEM REFERENCE (PILOT)

PRIMARY NAVIGATION SYSTEM DISPLAYED ON PFD 1	HHDLU/EHHDLU (9th, 8th, 7th, and 6th bits)
VOR 1	0000
VOR 2	0001
ILS 1	0010
ILS 2	0011
FMS 1	0100
FMS 2	0101

(u) On the HHDLU/EHHDLU, select the PFD FORMAT (FULL/WX) #2 parameter. Select WORD 95 and SUBFRAMES 2 and 4.

(v) Make sure that the HHDLU/EHHDLU 11th bit is "0".

(w) Press the FULL/WX key on DC-550 2.

Result:

1 PFD 2 changes to the arc format.

2 The HHDLU/EHHDLU 11th bit changes from "0" to "1".

(x) Press the FULL/WX key on DC-550 2 again.

Result:

1 PFD 2 comes back to the full format.

2 The HHDLU/EHHDLU 11th bit changes from "1" to "0".

(y) On the HHDLU/EHHDLU, select the MFD FORMAT (PLAN/MAP) #2 parameter. Select WORD 95 and SUBFRAMES 2 and 4.

(z) Make sure that the HHDLU/EHHDLU 12th bit is "0".

(aa) Through the MFD 2 primary menu, select the PLAN format.

Result:

1 MFD 2 changes to the PLAN format.

2 The HHDLU/EHHDLU 12th bit changes from "0" to "1".

(ab) On the HHDLU/EHHDLU, select the COPILOT PFD WX DISPLAYED HALF RANGES parameter. Select WORD 95 and SUBFRAMES 2 and 4.

(ac) On DC 550 2, on the glareshield panel, push the FULL/WX pushbutton, to start the WX mode on PFD 2.

Result:

1 PFD 2 shows the WX inscription in amber, on the left corner.

2 The compass card of PFD 2 goes to the ARC mode.

(ad) (Aircraft with dual weather radar controller panel) Set the RADAR rotary switch, on the copilot weather radar controller panel, on the glareshield panel, to the SBY position.

(ae) (Aircraft with single weather radar controller panel) Set the RADAR rotary switch, on the weather radar controller panel, on the control pedestal, to the SBY position.

(af) Wait until the FSBY indication is shown in green on the PFD 2 display.

(ag) Push the "UP ARROW" pushbutton to increase the range, or the "DOWN ARROW" pushbutton to decrease the range, on the weather radar controller, and make sure that the 2nd, 3rd, 4th, and 5th bits on the HHDLU/EHHDLU agree with the table below.

Table 5134 - COPILOT PFD WX DISPLAYED HALF RANGES

SELECTED RANGE	HHDLU/EHHDLU (5th, 4th, 3rd and 2nd bits)
2.5	0011
5	0100
12.5	0101
25	0110
50	0111
100	1001
150	1010

(ah) (Aircraft with dual weather radar controller panel) Set the RADAR rotary switch, on the copilot weather radar controller panel, on the glareshield panel, to the OFF position.

(ai) (Aircraft with single weather radar controller panel) Set the RADAR rotary switch, on the weather radar controller panel, on the control pedestal, to the OFF position .

(aj) Press the FULL/WX key on DC-550 2 again.

Result:

1 PFD 2 comes back to the full format.

(ak) On the HHDLU/EHHDLU, select the PRIMARY NAVIGATION SYSTEM REFERENCE (COPILOT) parameter. Select WORD 95 and SUBFRAMES 2 and 4.

(al) Push the NAV or FMS pushbutton on DC 550 2.

Result:

1 The primary navigation system is displayed on PFD 2.

2 The parameter is displayed on the HHDLU/EHHDLU according to the table below.

Table 5135 - PRIMARY NAVIGATION SYSTEM REFERENCE (COPILOT)

PRIMARY NAVIGATION SYSTEM DISPLAYED ON PFD 2	HHDLU/EHHDLU (9th, 8th, 7th, and 6th bits)
VOR 1	0000
VOR 2	0001
ILS 1	0010
ILS 2	0011
FMS 1	0100
FMS 2	0101

(am) On the HHDLU/EHHDLU, select the PILOT PFD (DU #1) STATUS parameter. Select WORD 101 and SUBFRAMES 1 and 3.

(an) On the circuit breaker panel, open the PFD 1 circuit breaker.

Result:

1 PFD 1 goes off.

2 The HHDLU/EHHDLU 1st bit goes to "1".

(ao) On the circuit breaker panel, close the PFD 1 circuit breaker.

Result:

1 PFD 1 comes on.

2 The HHDLU/EHHDLU 1st bit comes back to "0".

(ap) On the HHDLU/EHHDLU, select the EICAS (DU #3) STATUS parameter. Select WORD 101 and SUBFRAMES 1 and 3.

(aq) On the circuit breaker panel, open the EICAS DISPLAY circuit breaker.

Result:

1 The EICAS display goes off.

2 The HHDLU/EHHDLU 3rd bit goes to "1".

(ar) On the circuit breaker panel, close the EICAS DISPLAY circuit breaker.

Result:

1 The EICAS display comes on.

2 The HHDLU/EHHDLU 3rd bit goes to "0".

(as) On the HHDLU/EHHDLU, select the PILOT DU REVERSION parameter. Select WORD 101 and SUBFRAMES 1 and 3.

(at) On the pilot reversionary panel, make sure that the MFD rotate switch is on the NORM position.

Result:

1 MFD remains in the normal operation mode.

2 The HHDLU/EHHDLU 4th and 5th bits remain in "0".

(au) On the pilot reversionary panel, turn the MFD rotate switch to the PFD position.
Result:

1 MFD 1 is configured to operate as a PFD 1.

2 The image of PFD 1 is shown on the MDF 1 display.

3 The HHDLU/EHHDLU 5th bit remains in "0" and the 4th bit goes to "1".

(av) On the pilot reversionary panel, turn the MFD rotate switch to the EICAS position.
Result:

1 MFD 1 is configured to work as an EICAS display.

2 The image of the EICAS is shown on the MDF 1 display.

3 The HHDLU/EHHDLU 4th bit goes to "0" and the 5th bits goes to "1".

(aw) Restore the MFD rotate switch to the NORM position.

(ax) On the HHDLU/EHHDLU, select the PILOT SG REVERSION parameter. Select WORD 101 and SUBFRAMES 1 and 3.

(ay) On the pilot reversionary panel, push the SG pushbutton.
Result:

1 The SG pushbutton striped bar light comes on.

2 PFD 1 shows SG 2 (amber).

3 The HHDLU/EHHDLU 6th bit goes to "1".

(az) On the pilot reversionary panel, push the SG again.
Result:

1 The SG pushbutton striped bar light goes off.

2 The HHDLU/EHHDLU 6th bit changes to "0".

3 The SG 2 indication on PFD 1 (amber) disappears.

(ba) On the HHDLU/EHHDLU, select the PILOT ADC REVERSION parameter. Select WORD 101 and SUBFRAMES 1 and 3.

(bb) Push the ADC pushbutton, on the pilot reversionary panel.
Result:

1 PFD 1 shows ADC 2 (amber).

2 The ADC button striped bar light comes on.

3 The HHDLU/EHHDLU 7th bit changes to "1".

(bc) Push the ADC pushbutton again, on the pilot reversionary panel.
Result:

1 The PFD goes back to the normal configuration.

2 The HHDLU/EHHDLU 7th bit comes back to "0".

3 The ADC 2 indication on PFD 1 (amber) disappears.

(bd) On the HHDLU/EHHDLU, select the PILOT AHRS/IRS REVERSION parameter,. Select WORD 101 and SUBFRAMES 1 and 3.

(be) Push the AHRS (or IRS) pushbutton, on the pilot reversionary panel.

Result:

1 (Aircraft with AHRS) PFD 1 shows MAG 2 or DG2 (amber) and ATT 2 (amber).

2 (Aircraft with Dual IRS) PFD 1 shows MAG 2 (amber) and ATT 2 (amber).

3 The HHDLU/EHHDLU 8th bit changes to "1".

(bf) Push the AHRS (or IRS) pushbutton again, on the pilot reversionary panel.

Result:

1 The PFDs go back to the normal configuration.

2 The HHDLU/EHHDLU 8th bit changes to "0".

3 (Aircraft with AHRS) The MAG 2 or DG2 (amber) and ATT 2 (amber) indications, disappear, on the PFD 1.

4 (Aircraft with Dual IRS) The MAG 2 (amber) and ATT 2 (amber) indications disappear, on the PFD 1.

(bg) On the HHDLU/EHHDLU, select the COPILOT PFD (DU #5) STATUS parameter. Select WORD 101 and SUBFRAMES 2 and 4.

(bh) On the circuit breaker panel, open the PFD 2 circuit breaker.

Result:

1 PFD 2 goes off.

2 The HHDLU/EHHDLU 1st bit goes to "1".

(bi) On the circuit breaker panel, close the PFD 2 circuit breaker.

Result:

1 PFD 2 comes on.

2 The HHDLU/EHHDLU 1st bit comes back to "0".

(bj) On the HHDLU/EHHDLU, select the COPILOT MFD (DU #4) STATUS parameter. Select WORD 101 and SUBFRAMES 2 and 4.

(bk) On the circuit breaker panel, open the MFD 2 circuit breaker.

Result:

1 MFD 2 goes off.

2 The HHDLU/EHHDLU 2nd bit goes to "1".

(bl) On the circuit breaker panel, close the MFD 2 circuit breaker.

Result:

1 MFD 2 comes on.

2 The HHDLU/EHHDLU 2nd bit comes back to "0".

(bm) On the HHDLU/EHHDLU, select the COPILOT DU REVERSION parameter. Select WORD 101 and SUBFRAMES 2 and 4.

(bn) On the copilot reversionary panel, make sure that the MFD rotate switch is on the NORM position.

Result:

1 MFD remains in the normal operation mode.

2 The HHDLU/EHHDLU 4th and 5th bits remain in "0".

(bo) On the copilot reversionary panel, turn the MFD rotate switch to the PFD position.

Result:

1 MFD 2 is configured to operate as a PFD 2.

2 The image of PFD 2 is shown on the MDF 2 display.

3 The HHDLU/EHHDLU 5th bit remains in "0" and the 4th bit goes to "1".

(bp) On the copilot reversionary panel, turn the MFD rotate switch on the EICAS position.

Result:

1 MFD 2 is configured to work as an EICAS display.

2 The image of EICAS is shown on the MDF 2 display.

3 The HHDLU/EHHDLU 4th bit goes to "0" and the 5th bits goes to "1".

(bq) Restore the MFD rotate switch to the NORM position.

(br) On the HHDLU/EHHDLU, select the COPILOT SG REVERSION parameter. Select WORD 101 and SUBFRAMES 2 and 4.

(bs) On the copilot reversionary panel, push the SG.

Result:

1 The SG pushbutton striped bar light comes on.

2 PFD 2 shows SG 1 (amber).

3 The HHDLU/EHHDLU 6th bit goes to "1".

(bt) On the copilot reversionary panel, push the SG again.

Result:

1 The SG button striped bar light goes off.

2 The HHDLU/EHHDLU 6th bit changes to "0".

3 On the PFD 2, the SG 1 (amber) indication disappears.

(bu) On the HHDLU/EHHDLU, select the COPILOT ADC REVERSION parameter. Select WORD 101 and SUBFRAMES 2 and 4.

(bv) Push the ADC pushbutton, on the copilot reversionary panel.

Result:

1 PFD 2 shows ADC 1 (amber).

2 The ADC button striped bar light comes on.

3 The HHDLU/EHHDLU 7th bit changes to "1".

(bw) Push the ADC pushbutton again, on the copilot reversionary panel.

Result:

1 The PFD goes back to the normal configuration.

2 The HHDLU/EHHDLU 7th bit comes back to "0".

3 On the PFD 2, the ADC 1 (amber) indication disappears.

(bx) On the HHDLU/EHHDLU, select the COPILOT AHRS/IRS REVERSION parameter. Select the WORD 101 and SUBFRAMES 2 and 4.

(by) Push the AHRS (or IRS) pushbutton, on the copilot reversionary panel.

Result:

1 (Aircraft with AHRS) PFD 2 shows MAG 1 or DG1 (amber) and ATT 1 (amber).

2 (Aircraft with Dual IRS) PFD 2 shows MAG 1 (amber) and ATT 1 (amber).

3 The HHDLU/EHHDLU 8th bit changes to "1".

(bz) Push the AHRS (or IRS) pushbutton again, on the copilot reversionary panel

Result:

1 The PFDs go back to the normal configuration.

2 The HHDLU/EHHDLU 8th bit changes to "0" in all subframes.

3 (Aircraft with AHRS) On the PFD 2, the MAG 1 or DG1 (amber) and ATT 1 (amber) indications disappear.

4 (Aircraft with Dual IRS) On the PFD 2, the MAG 1 (amber) and ATT 1 (amber) indications disappear.

(ca) On the HHDLU/EHHDLU, select the PILOT MFD MAP DISPLAYED RANGES parameter. Select WORD 223 and SUBFRAMES 1 and 3.

(cb) On MFD 1, push the WX mode pushbutton (AMM SDS 34-42-00/1).

Result:

1 MFD 1 shows the WX inscription in amber, on the left corner.

2 MFD 1 is shown in MAP format.

(cc) (Aircraft with dual weather radar controller panel) Set the RADAR rotary switch, on the pilot weather radar controller panel, on the glareshield panel, to the SBY position.

(cd) (Aircraft with single weather radar controller panel) Set the RADAR rotary switch, on the weather radar controller panel, on the control pedestal, to the SBY position.

(ce) Wait until the FSBY indication is shown in green on the MFD 1 display.

(cf) Push the "UP ARROW" pushbutton to increase the range, or the "DOWN ARROW" pushbutton to decrease the range, on the weather radar controller, and make sure that the 2nd, 3rd, 4th, and 5th bits on the HHDLU/EHHDLU agree with the table below.

Table 5136 - PILOT MFD MAP DISPLAYED RANGES

SELECTED RANGE	HHDLU/EHHDLU (5th, 4th, 3rd and 2nd bits)
2.5	0011
5	0100
12.5	0101
25	0110
50	0111
100	1001
150	1010

NOTE: If the Map format is selected on MFD 1, the ranges are half ranges. But, if the Plan format is selected, the ranges are full ranges and the values are 5, 10, 25, 50, 100, 200, 300, 500, and 1000.

(cg) (Aircraft with dual weather radar controller panel) Set the RADAR rotary switch, on the pilot weather radar controller panel, on the glareshield panel, to the OFF position.

(ch) (Aircraft with single weather radar controller panel) Set the RADAR rotary switch, on the weather radar controller panel, on the control pedestal, to the OFF position .

(ci) On the HHDLU/EHHDLU, select the PILOT MFD TCAS FORMAT (BIT) parameter. Select WORD 223 and SUBFRAMES 1 and 3.

(cj) Push the TCAS menu button on the MFD 1 bezel controller (AMM SDS 34-43-00/1).

Result:

1 The TCAS display is shown on the MFD 1 map mode.

2 The HHDLU/EHHDLU 11th bit goes to "1".

(ck) (Aircraft with EGPWS) On the HHDLU/EHHDLU, select the PILOT MFD WX/EGPWS FORMAT (2 bits) parameter. Select WORD 223 and SUBFRAMES 1 and 3.

(cl) Make sure that MFD 1 is in the MAP format (AMM SDS 34-22-00/1).

(cm) Push many times the TERR/WX menu button on the MFD 1 bezel controller.

(cn) Compare the information shown on MFD 1 with the values in the table below.

Table 5137 - PILOT MFD WX/EGPWS FORMAT

INFORMATION ON MFD	HHDLU/EHHDLU (10th and 9th bits)
none	00
WX	01
TERRAIN	10

(co) On the HHDLU/EHHDLU, select the PILOT MFD CHECKLIST FORMAT (BIT) parameter. Select WORD 223 and SUBFRAMES 1 and 3.

(cp) Make sure that CKLIST is not selected on MFD 2.

(cq) Push the CKLST menu button on the MFD 1 bezel controller.

Result:

1 The MASTER INDEX display is shown on MFD 1.

2 The HHDLU/EHHDLU 12th bit goes to "1".

(cr) Push the RTN menu button on MFD 1 bezel controller.

Result:

1 The HHDLU/EHHDLU 12th bit comes back to "0".

(cs) On the HHDLU/EHHDLU, select the COPILOT MFD MAP DISPLAYED RANGES parameter. Select WORD 223 and SUBFRAMES 2 and 4.

(ct) On MFD 2, push the WX mode pushbutton (AMM SDS 34-42-00/1).

Result:

1 MFD 2 shows the WX inscription in amber, on the left corner.

2 MFD 2 is shown in MAP format.

(cu) (Aircraft with dual weather radar controller panel) Set the RADAR rotary switch, on the pilot weather radar controller panel, on the glareshield panel, to the SBY position.

(cv) (Aircraft with single weather radar controller panel) Set the RADAR rotary switch, on the weather radar controller panel, on the control pedestal, to the SBY position.

(cw) Wait until the FSBY indication is shown in green on the MFD 1 display.

(cx) Push the "UP ARROW" pushbutton to increase the range, or the "DOWN ARROW" pushbutton to decrease the range, on the weather radar controller, and make sure that the 2nd, 3rd, 4th, and 5th bits on the HHDLU/EHHDLU agree with the table below.

Table 5138 - COPILOT MFD MAP DISPLAYED RANGES

SELECTED RANGE	HHDLU/EHHDLU (5th, 4th, 3rd and 2nd bits)
2.5	0011
5	0100
12.5	0101
25	0110
50	0111
100	1001
150	1010

NOTE: If the Map format is selected on MFD 2, the ranges are half ranges. But, if the Plan format is selected, the ranges are full ranges and the values are 5, 10, 25, 50, 100, 200, 300, 500, and 1000.

(cy) (Aircraft with dual weather radar controller panel) Set the RADAR rotary switch, on the pilot weather radar controller panel, on the glareshield panel, to the OFF position.

(cz) (Aircraft with single weather radar controller panel) Set the RADAR rotary switch, on the weather radar controller panel, on the control pedestal, to the OFF position .

(da) On the HHDLU/EHHDLU, select the COPILOT MFD TCAS FORMAT (BIT) parameter. Select WORD 223 and SUBFRAMES 2 and 4.

(db) Push the TCAS menu button on the MFD 2 bezel controller (AMM SDS 34-43-00/1).

Result:

1 The TCAS display is shown on the MFD 2 map mode.

2 The HHDLU/EHHDLU 11th bit goes to "1".

(dc) (Aircraft with EGPWS) On the HHDLU/EHHDLU, select the COPILOT MFD WX/EGPWS FORMAT (2 bits) parameter. Select WORD 223 and SUBFRAMES 2 and 4.

(dd) Make sure that MFD 2 is in MAP format (AMM SDS 34-22-00/1).

(de) Push many times the TERR/WX menu button on the MFD 2 bezel controller.

(df) Compare the information shown on MFD 2 with the values in the table below.

Table 5139 - COPILOT MFD WX/EGPWS FORMAT

INFORMATION ON MFD	HHDLU/EHHDLU (10th and 9th bits)
none	00
WX	01
TERRAIN	10

(dg) On the HHDLU/EHHDLU, select the COPILOT MFD CHECKLIST FORMAT (BIT) parameter. Select WORD 223 and SUBFRAMES 2 and 4.

(dh) Make sure that CKLIST is not selected on MFD 1.

(di) Push the CKLST menu button on the MFD 2 bezel controller.

Result:

1 The MASTER INDEX display is shown on MFD 2.

2 The HHDLU/EHHDLU 12th bit goes to "1".

(dj) Push the RTN menu button on MFD 1 bezel controller.

Result:

1 The HHDLU/EHHDLU 12th bit comes back to "0".

(45) Do the test of the Aircraft Type (BINARY BASE).

(a) On the HHDLU/EHHDLU, select the AIRCRAFT TYPE parameter. Select WORD 8, SUBFRAME 2.

(b) On the HHDLU/EHHDLU, make sure that the aircraft type "1" or "2" is shown.

(46) Do the test of the Aircraft Serial Number (BINARY BASE).

(a) On the HHDLU/EHHDLU, select the AIRCRAFT SERIAL NUMBER parameter. Select WORD 8, SUBFRAME 2.

(b) On the HHDLU/EHHDLU, read the value shown for bit 2 and record it on the appropriate field from the table below.

Result:

1 The HHDLU/EHHDLU shows the first part of the aircraft serial number.

(c) On the HHDLU/EHHDLU, select the AIRCRAFT SERIAL NUMBER parameter. Select WORD 8, SUBFRAME 1.

(d) On the HHDLU/EHHDLU, read the value shown for bits 10 to 1 and record them on the appropriate fields from the table below.

Result:

1 The HHDLU/EHHDLU shows the second part of the aircraft serial number.

Table 5140 - AIRCRAFT SERIAL NUMBER

Subframe 2	**Subframe 1**									
Bit 2	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1

(e) Convert the number obtained on the table above from binary base to decimal base.

Result:

1 The value is equal to the aircraft serial number.

(47) Do the test of the Hydraulic Low Pressure parameters (BINARY BASE)

WARNING: BEFORE YOU TURN ON THE EMDP, MAKE SURE THAT THE CONTROL SURFACES OPERATED BY THE HYDRAULIC POWER (RUDDER, AILERON, SPOILERS, ETC) ARE CLEAR OF OBSTACLES.

(a) On the HHDLU/EHHDLU, select the HYDRAULIC LOW PRESSURE # 1 parameter. Select WORD 51, SUBFRAME ALL.

(b) On the overhead panel, set the SYS 1 ELEC PUMP switch to AUTO.

(c) On the HHDLU/EHHDLU, the 9th bit changes from 1 to 0.

(d) On the overhead panel, set SYS 1 ELEC PUMP to OFF.

(e) On the HHDLU/EHHDLU, the 9th bit changes from 0 to 1.

(f) On the HHDLU/EHHDLU, select the HYDRAULIC LOW PRESSURE # 2 parameter. Select WORD 51, SUBFRAME ALL.

(g) On the overhead panel, set the SYS 2 ELEC PUMP switch to AUTO.

(h) On the HHDLU/EHHDLU, the 10th bit changes from 1 to 0.

(i) On the overhead panel, set SYS 2 ELEC PUMP to OFF.

(j) On the HHDLU/EHHDLU, the 10th bit changes from 0 to 1.

(48) Do the test of the Hydraulic Pressure parameters (OCTAL BASE).

WARNING: BEFORE YOU TURN ON THE EMDP, MAKE SURE THAT THE CONTROL SURFACES OPERATED BY THE HYDRAULIC POWER (RUDDER, AILERON, SPOILERS, ETC) ARE CLEAR OF OBSTACLES.

(a) On the HHDLU/EHHDLU, select the HYDRAULIC PRESSURE # 1 parameters. Select WORD 80, SUBFRAME 1 and 3.

(b) Make sure that the Hydraulic Pressure displayed on the MFD 1 is between 0 and 150 psi.

(c) On the HHDLU/EHHDLU, read the values shown.

Result:

1 They must be between 0000 and 0045.

(d) On the overhead panel, set the SYS 1 ELEC PUMP switch to AUTO.

Result:

1 The EMDP 1 is turned on.

2 The MFD shows the status message (ON) of EMDP 1.

3 The pressure is 3000 ± 150 psi.

(e) On the HHDLU/EHHDLU, read the values shown.

Result:

1 They must be between 1310 and 1423.

(f) On the overhead panel, set SYS 1 ELEC PUMP to OFF.

Result:

1 EMDP 1 is turned off.

2 The MFD shows the status message (OFF) of EMDP 1.

(g) On the HHDLU/EHHDLU, select the HYDRAULIC PRESSURE # 2 parameters. Select WORD 80, SUBFRAME 2 and 4.

(h) Make sure that the Hydraulic Pressure displayed on the MFDs is between 0 and 150 psi.

(i) On the HHDLU/EHHDLU, read the values shown.

Result:

1 They must be between 0000 and 0045.

(j) On the overhead panel, set the SYS 2 ELEC PUMP switch to AUTO.

Result:

1 The EMDP 2 is turned on.

2 The MFD shows the status message (ON) of EMDP 2.

3 The pressure is 3000 ± 150 psi.

(k) On the HHDLU/EHHDLU, read the values shown.

Result:

1 They must be between 1310 and 1423.

(l) On the overhead panel, set SYS 2 ELEC PUMP to OFF.

Result:

1 EMDP 2 is turned off.

2 The MFD shows the status message (OFF) of EMDP 2.

(49) (Aircraft with EICAS versions 17 and on) Do the test of the AC/DC Distribution parameters (BINARY BASE).

(a) On the HHDLU/EHHDLU, select the AC/DC DISTRIBUTION STATUS parameters. Select WORD 5 and SUBFRAME 4.

(b) Make sure that the DC BUS 1 and 2, ESSENTIAL DC BUS 1 and 2, CENTRAL DC BUS, SHED DC BUS 1 and 2, and the 115 V AC BUS are operational. Observe that there are no EICAS messages indicating that any of the buses is off.

Result:

1 Make sure that the 2nd, 3rd, 4th, 5th, 6th, 7th, 8th, and 9th bits show "1".

(c) On the Left Power Control and Distribution Box (behind the pilot seat), open the ESSENTIAL DC BUS 1 VOLTAGE (Location Tip: RB ESSENTIAL DC BUS 1/ VOLTAGE) circuit breaker.

Result:

1 The 4th bit changes from "1" to "0".

2 The ESS BUS 1 OFF Caution message is shown on the EICAS display.

3 The master caution tone sounds.

4 On the glareshield panel, the master caution lighted pushbuttons flash.

(d) On the glareshield panel, push a master caution lighted pushbutton.

Result:

1 The master caution tone ceases.

2 The master caution lighted pushbuttons goes off.

(e) On the Left Power Control and Distribution Box (behind the pilot seat), close the ESSENTIAL DC BUS 1 VOLTAGE (Location Tip: RB ESSENTIAL DC BUS 1/ VOLTAGE) circuit breaker.

Result:

1 The 4th bit changes from "0" to "1".

2 The ESS BUS 1 OFF Caution message goes out of view on the EICAS display.

(f) On the Left Power Control and Distribution Box (behind the pilot seat), open the SHED DC BUS 1 VOLTAGE (Location Tip: RB SHED DC BUS 1/VOLTAGE) circuit breaker.

Result:

1 The 7th bit changes from "1" to "0".

2 The SHED BUS 1 OFF Caution message is shown on the EICAS display.

3 The master caution tone sounds.

4 On the glareshield panel, the master caution lighted pushbuttons flash.

(g) On the glareshield panel, push a master caution lighted pushbutton.

Result:

1 The master caution tone ceases.

2 The master caution lighted pushbuttons goes off.

(h) On the Left Power Control and Distribution Box (behind the pilot seat), close the SHED DC BUS 1 VOLTAGE (Location Tip: RB SHED DC BUS 1/VOLTAGE) circuit breaker.

Result:

1 The 7th bit changes from "0" to "1".

2 The SHED BUS 1 OFF Caution message goes out of view on the EICAS display.

(i) On the Left Power Control and Distribution Box (behind the pilot seat), open the DC BUS 1 VOLTAGE (Location Tip: RB DC BUS 1/VOLTAGE) circuit breaker.

Result:

1 The 2nd bit changes from "1" to "0".

2 The DC BUS 1 OFF Caution message is shown on the EICAS display.

3 The master caution tone sounds.

4 On the glareshield panel, the master caution lighted pushbuttons flash.

(j) On the glareshield panel, push a master caution lighted pushbutton.

Result:

1 The master caution tone ceases.

2 The master caution lighted pushbuttons goes off.

(k) On the Left Power Control and Distribution Box (behind the pilot seat), close the DC BUS 1 VOLTAGE (Location Tip: RB DC BUS 1/VOLTAGE) circuit breaker.

Result:

1 The 2nd bit changes from "0" to "1".

2 The DC BUS 1 OFF Caution message goes out of view on the EICAS display.

(l) On the Left Power Control and Distribution Box (behind the pilot seat), open the INVERTER (Location Tip: RB DC BUS 1/INVERTER) circuit breaker.

Result:

1 The 9th bit changes from "1" to "0".

2 The 115 V AC BUS OFF Caution message is shown on the EICAS display.

3 The master caution tone sounds.

4 On the glareshield panel, the master caution lighted pushbuttons flash.

(m) On the glareshield panel, push a master caution lighted pushbutton.

Result:

1 The master caution tone ceases.

2 The master caution lighted pushbuttons goes off.

(n) On the Left Power Control and Distribution Box (behind the pilot seat), close the INVERTER (Location Tip: RB DC BUS 1/INVERTER) circuit breaker.

Result:

1 The 9th bit changes from "0" to "1".

2 The 115 V AC BUS OFF Caution message goes out of view on the EICAS display.

(o) On the Right Power Control and Distribution Box (behind the copilot seat), open the ESS DC BUS 2 VOLTAGE (Location Tip: RB ESSENTIAL DC BUS 2/ VOLTAGE) circuit breaker.

Result:

1 The 5th bit changes from "1" to "0".

2 The ESS BUS 2 OFF Caution message is shown on the EICAS display.

3 The master caution tone sounds.

4 On the glareshield panel, the master caution lighted pushbuttons flash.

(p) On the glareshield panel, push a master caution lighted pushbutton.

Result:

1 The master caution tone ceases.

2 The master caution lighted pushbuttons goes off.

(q) On the Right Power Control and Distribution Box (behind the copilot seat), close the ESS DC BUS 2 VOLTAGE (Location Tip: RB ESSENTIAL DC BUS 2// VOLTAGE) circuit breaker.

Result:

1 The 5th bit changes from "0" to "1".

2 The ESS BUS 2 OFF Caution message goes out of view on the EICAS display.

(r) On the Right Power Control and Distribution Box (behind the copilot seat), open the SHED DC BUS 2 VOLTAGE (Location Tip: RB SHED DC BUS 2/VOLTAGE) circuit breaker

Result:

1 The 8th bit changes from "1" to "0".

2 The SHED BUS 2 OFF Caution message is shown on the EICAS display.

3 The master caution tone sounds.

4 On the glareshield panel, the master caution lighted pushbuttons flash.

(s) On the glareshield panel, push a master caution lighted pushbutton

Result:

1 The master caution tone ceases.

2 The master caution lighted pushbuttons goes off.

(t) On the Right Power Control and Distribution Box (behind the copilot seat), close the SHED DC BUS 2 VOLTAGE (Location Tip: RB SHED DC BUS 2/VOLTAGE) circuit breaker.

Result:

1 The 8th bit changes from "0" to "1".

2 The SHED BUS 2 OFF Caution message goes out of view on the EICAS display.

(u) On the Right Power Control and Distribution Box (behind the copilot seat), open the DC BUS 2 VOLTAGE (Location Tip: RB DC BUS 2/VOLTAGE) circuit breaker.

Result:

1 The 3th bit changes from "1" to "0".

2 The DC BUS 2 OFF Caution message is shown on the EICAS display.

3 The master caution tone sounds.

4 On the glareshield panel, the master caution lighted pushbuttons flash.

(v) On the glareshield panel, push a master caution lighted pushbutton.

Result:

1 The master caution tone ceases.

2 The master caution lighted pushbuttons goes off.

(w) On the Right Power Control and Distribution Box (behind the copilot seat), close the DC BUS 2 VOLTAGE (Location Tip: RB DC BUS 2/VOLTAGE) circuit breaker.

Result:

1 The 3th bit changes from "0" to "1".

2 The DC BUS 2 OFF Caution message goes out of view on the EICAS display.

(x) On the Right Power Control and Distribution Box (behind the copilot seat), open the CENTRAL DC BUS VOLTAGE (Location Tip: RB CENTRAL DC BUS/ VOLTAG) circuit breaker.

Result:

1 The 6th bit changes from "1" to "0".

(y) On the Right Power Control and Distribution Box (behind the copilot seat), close the CENTRAL DC BUS VOLTAGE (Location Tip: RB CENTRAL DC BUS/ VOLTAG) circuit breaker.

Result:

1 The 6th bit changes from "0" to "1".

(50) On the Maintenance Panel, set the DFDR switch to the NORM position.

(51) Deenergize the aircraft (AMM TASK 20-40-01-860-801-A/200).

(52) Disconnect the Pitot/Static System Test Set (GSE 129) from the aircraft (AMM TASK 34-13-00-000-801-A/400).

NOTE: To do the check of the parameters with the engines in operation, refer to one of the alternative procedures, on-aircraft check or downloading check:

(53) Put the aircraft in the engine test area.

NOTE: To do the check of the parameters with the engines in operation, refer to one of the alternative procedures , on-aircraft check or downloading check:

- The procedure called on-aircraft check, permits the check of the parameters in aircraft at the same time as they are recorded in the FDR.
- The procedure called downloading check, permits the check of the parameters in a laboratory, after a downloading is done. For this procedure, it is necessary to have an Automated Test Unit (ATU) or an IBM-compatible personal computer with Microsoft Windows 3.1 and PCMCIA driver, and ADRAS for Windows to process the aircraft flight data. Get the EMB-145 Parameter Conversion Database, necessary for the ADRAS, from EMBRAER - Customer Support Division.
- If you need the data stored in the FDR for a different purpose, do a downloading of the stored data before you do the next steps. That is because you can overwrite the data stored in the FDR.
- During the downloading process, the FDR do not record data.

(54) (On-aircraft test) Do the on-aircraft test of the parameters with the engines in operation, at the same time as they are recorded in the FDR.

(a) On the Maintenance Panel, set the DFDR switch to the TEST position.

NOTE: Setting the DFDR switch to the test position, all data recorded in FDR will be overwritten.

(b) Make sure that the systems below are operational and on:

- FDR System (AMM SDS 31-31-00/1).
- EICAS (AMM SDS 31-41-00/1).

(c) On the HHDLU/EHHDLU, select the OIL PRESSURE LOW #1 and OIL PRESSURE LOW #2 parameters. Select WORD 130, SUBFRAME ALL, and BINARY BASE.

Result:

1 On the HHDLU/EHHDLU, the 2nd and 3rd bits are "1".

(d) Start the APU (AMM TASK 49-10-00-910-802-A/200 for APU T-62T-40C11 or AMM TASK 49-13-00-910-802-A/200 for APU T-62T-40C14).

(e) On the HHDLU/EHHDLU, select the APU BLEED POSITION parameter. Select WORD 130, SUBFRAME 4 and BINARY BASE.

(f) On the overhead panel, make sure that the XBLEED switch is not set to the CLOSED position and push the APU BLEED pushbutton.

Result:

1 The pushbutton striped bar light comes on.

2 The HHDLU/EHHDLU 1st bit goes to "1".

(g) On the overhead panel, push the APU BLEED pushbutton again.

Result:

1 The pushbutton striped bar light goes off.

2 The HHDLU/EHHDLU 1st bit goes to "0".

(h) Start the engines using the APU (AMM TASK 71-00-01-910-801-A/200).

NOTE: When you do the engine start up procedure, make sure to set the takeoff temperature, as given in the task. This step is important for the correct reading of the TAKEOFF TEMPERATURE parameter.

(i) Shutdown the APU (AMM TASK 49-10-00-910-803-A/200 for APU T-62T-40C11 or AMM TASK 49-13-00-910-803-A/200 for APU T-62T-40C14).

(j) (Aircraft with load cells) On the HHDLU/EHHDLU, select the ENGINE #1 BLEED POSITION parameter. Select WORD 130, SUBFRAME 4 and BINARY BASE.

(k) On the overhead panel, make sure that the XBLEED switch is not set to the CLOSED position and push the BLEED 1 pushbutton.

Result:

1 The pushbutton striped bar light goes off.

2 The HHDLU/EHHDLU 4st bit goes to "1".

(l) On the overhead panel, push the BLEED 1 pushbutton again.

Result:

1 The pushbutton striped bar light comes on.

2 The HHDLU/EHHDLU 4st bit goes to "0".

(m) (Aircraft with load cells) On the HHDLU/EHHDLU, select the ENGINE #2 BLEED POSITION parameter. Select WORD 130, SUBFRAME 4 and BINARY BASE.

(n) On the overhead panel, make sure that the XBLEED switch is not set to the CLOSED position and push the BLEED 2 pushbutton.

Result:

1 The pushbutton striped bar light goes off.

2 The HHDLU/EHHDLU 5st bit goes to "1".

(o) On the overhead panel, push the BLEED 2 pushbutton again.

Result:

1 The pushbutton striped bar light comes on.

2 The HHDLU/EHHDLU 5st bit goes to "0".

(p) Items (q) thru (v) are applicable to aircraft with EICAS versions 17 and on.

(q) On the HHDLU/EHHDLU, select the FADEC #1A and FADEC #1B IGNITION ON parameters. Select WORD 31, SUBFRAME ALL, BINARY BASE.

(r) On the POWERPLANT control panel, on the Overhead Panel, set the Engine #1 Ignition switch to "ON" position.

Result:

1 On the HHDLU/EHHDLU, make sure that the 6th (FADEC #1A) and the 8th (FADEC #1B) bits change from "0" to "1".

(s) Return the Engine #1 Ignition switch to the "AUTO" position.

Result:

1 On the HHDLU/EHHDLU, make sure that the 6th and the 8th bits change from "1" to "0".

(t) On the HHDLU/EHHDLU, select the FADEC #2A and FADEC #2B IGNITION ON parameters. Select WORD 159, SUBFRAME ALL, BINARY BASE.

(u) On the POWERPLANT control panel, on the Overhead Panel, set the Engine #2 Ignition switch to the "ON" position.

Result:

1 On the HHDLU/EHHDLU, make sure that the 6th (FADEC #2A) and the 8th (FADEC #2B) bits change from "0" to "1".

(v) Return the Engine #2 Ignition switch to the "AUTO" position.

Result:

1 On the HHDLU/EHHDLU, make sure that the 6th and the 8th bits change from "1" to "0".

(w) On the HHDLU/EHHDLU, select the ENGINE N1 # 1 parameter. Select WORD 21, SUBFRAME ALL, and DECIMAL BASE.

(x) With the engine # 2 thrust control lever at the IDLE position, set the engine # 1 thrust control lever to 30% N1. Stop until the engine indications on the EICAS become stable:

Result:

1 Write the engine N1 # 1 values shown on the HHDLU/EHHDLU, and on the EICAS.

2 Multiply the value shown on the HHDLU/EHHDLU by the conversion coefficient 0.125061.

3 Make sure that the value found is the same as the engine N1 # 1 indication on the EICAS, with a tolerance of ± 2% RPM.

(y) Repeat the last step again with 40% and 50% N1.

(z) On the HHDLU/EHHDLU, select the ENGINE N1 # 2 parameter. Select WORD 149, SUBFRAME ALL, and DECIMAL BASE.

(aa) With the engine # 1 thrust control lever at the IDLE position, set the engine # 2 thrust control lever to 30% N1. Stop until the engine indications on the EICAS become stable:

Result:

1 Write the engine N1 # 2 values shown on the HHDLU/EHHDLU and on the EICAS.

2 Multiply the value shown on the HHDLU/EHHDLU by the conversion coefficient 0.125061.

3 Make sure that the value found is the same as the engine N1 # 2 indication on the EICAS, with a tolerance of ± 2% RPM.

(ab) Repeat the last step again with 40% and 50% N1.

(ac) On the HHDLU/EHHDLU, select the ENGINE N2 # 1 parameter. Select WORD 85, SUBFRAME ALL, and DECIMAL BASE.

(ad) With the engine # 2 thrust control lever at the IDLE position, set the engine # 1 thrust control lever to 30% N1. Stop until the engine indications on the EICAS become stable:

Result:

1 Write the engine N2 # 1 values shown on the HHDLU/EHHDLU and on the EICAS.

2 Multiply the value shown on the HHDLU/EHHDLU by the conversion coefficient 0.125061.

3 Make sure that the value found is the same as the engine N2 # 1 indication on the EICAS, with a tolerance of ± 2% RPM.

(ae) Do the last step again with 40% and 50% N1.

(af) On the HHDLU/EHHDLU, select the ENGINE N2 # 2 parameter. Select WORD 213, SUBFRAME ALL, and DECIMAL BASE.

(ag) With the engine # 1 thrust control lever at the IDLE position, set the engine # 2 thrust control lever to 30% N1. Stop until the engine indications on the EICAS become stable:

Result:

1 Write the engine N2 # 2 values shown on the HHDLU/EHHDLU and on the EICAS.

2 Multiply the value shown on the HHDLU/EHHDLU by the conversion coefficient 0.125061.

3 Make sure that the value found is the same as the engine N2 # 2 indication on the EICAS, with a tolerance of ± 2% RPM.

(ah) Do the last step again with 40% and 50% N1.

(ai) On the HHDLU/EHHDLU, select the TAKEOFF TEMPERATURE # 1 parameter. Select WORD 119, SUBFRAME ALL, and DECIMAL BASE.

(aj) With the engine # 2 thrust control lever at the IDLE position, set the engine # 1 thrust control lever to 30% N1. Stop until the engine indications on the EICAS become stable:

Result:

1 Write the TAKEOFF TEMPERATURE # 1 values shown on the HHDLU/EHHDLU and on the EICAS.

2 If the value is greater than 2047, subtract 4096 from the value read on the HHDLU/EHHDLU.

3 Multiply the value shown on the HHDLU/EHHDLU by the conversion coefficient 0.031265.

4 Make sure that the value found is the same as the TAKEOFF TEMPERATURE # 1 indication on the EICAS, with a tolerance of ± 1°C.

(ak) Do the last step again with 40% and 50% N1.

(al) On the HHDLU/EHHDLU, select the FUEL FLOW # 1 parameter. Select WORD 121, SUBFRAME ALL, and DECIMAL BASE.

(am) With the engine # 2 thrust control lever at the IDLE position, set the engine # 1 thrust control lever to 30% N1. Stop until the engine indications on the EICAS become stable:

Result:

1 Write the FUEL FLOW # 1 values shown on the HHDLU/EHHDLU and on the EICAS.

2 Multiply the value shown on the HHDLU/EHHDLU by the conversion coefficient 4.

3 Make sure that the value found is the same as the FUEL FLOW # 1 indication on the EICAS, with a tolerance of ± 20 PPH.

NOTE: If the EICAS indications are in metric units, convert the value shown on the EICAS display. Use this factor: 1 kg = 2.2046 pounds.

(an) Do the last step again with 40% and 50% N1.

(ao) On the HHDLU/EHHDLU, select the FUEL FLOW # 2 parameter. Select WORD 249, SUBFRAME ALL, and DECIMAL BASE.

(ap) With the engine # 1 thrust control lever at the IDLE position, set the engine # 2 thrust control lever to 30% N1. Stop until the engine indications on the EICAS become stable:

Result:

1 Write the FUEL FLOW # 2 values shown on the HHDLU/EHHDLU and on the EICAS.

2 Multiply the value shown on the HHDLU/EHHDLU by the conversion coefficient 4.

3 Make sure that the value found is the same as the FUEL FLOW # 2 indication on the EICAS, with a tolerance of ± 20 PPH.

NOTE: If the EICAS indications are in metric units, convert the value shown on the EICAS display. Use this factor: 1 kg = 2.2046 pounds.

(aq) Do the last step again with 40% and 50% N1.

(ar) On the HHDLU/EHHDLU, select the N1 TARGET # 1 parameter. Select WORD 87, SUBFRAME ALL, and DECIMAL BASE.

(as) With the engine # 2 thrust control lever at the IDLE position, set the engine # 1 thrust control lever to 30% N1. Stop until the engine indications on the EICAS become stable:

Result:

1 Write the N1 TARGET # 1 values shown on the HHDLU/EHHDLU and on the EICAS.

2 Multiply the value shown on the HHDLU/EHHDLU by the conversion coefficient 0.125061.

3 Make sure that the value found is the same as the N1 TARGET # 1 indication on the EICAS, with a tolerance of ± 2% RPM.

(at) Do the last step again with 40% and 50% N1.

(au) On the HHDLU/EHHDLU, select the N1 TARGET # 2 parameter. Select WORD 215, SUBFRAME ALL, and DECIMAL BASE.

(av) With the engine # 1 thrust control lever at the IDLE position, set the engine # 2 thrust control lever to 30% N1. Stop until the engine indications on the EICAS become stable:

Result:

1 Write the N1 TARGET # 2 values shown on the HHDLU/EHHDLU and on the EICAS.

2 Multiply the value shown on the HHDLU/EHHDLU by the conversion coefficient 0.125061.

3 Make sure that the value found is the same as the N1 TARGET # 2 indication on the EICAS, with a tolerance of ± 2% RPM.

(aw) Do the last step again with 40% and 50% N1.

(ax) On the HHDLU/EHHDLU, select the ENGINE LP VIBRATION # 1 parameter. Select WORD 125, SUBFRAME ALL, and DECIMAL BASE.

(ay) With the engine # 2 thrust control lever at the IDLE position, set the engine # 1 thrust control lever to 30% N1. Stop until the engine indications on the EICAS become stable:

Result:

1 Write the ENGINE LP VIBRATION # 1 values shown on the HHDLU/ EHHDLU and on the EICAS.

2 Multiply the value shown on the HHDLU/EHHDLU by the conversion coefficient 0,00390815828.

3 Make sure that the value found is the same as the ENGINE LP VIBRATION # 1 indication on the EICAS, with a tolerance of ± 0.1 IPS (RMS).

NOTE: The analog indication on the EICAS display is limited to 0 (lower limit) and 2.5 IPS (upper limit). The converted value from the HHDLU/EHHDLU must be compared visually with the EICAS indication.

(az) Do the last step again with 40% and 50% N1.

(ba) On the HHDLU/EHHDLU, select the ENGINE LP VIBRATION # 2 parameter. Select WORD 127, SUBFRAME ALL, and DECIMAL BASE.

(bb) With the engine # 1 thrust control lever at the IDLE position, set the engine # 2 thrust control lever to 30% N1. Stop until the engine indications on the EICAS become stable:

Result:

1 Write the ENGINE LP VIBRATION # 2 values shown on the HHDLU/ EHHDLU and on the EICAS.

2 Multiply the value shown on the HHDLU/EHHDLU by the conversion coefficient 0,00390815828.

3 Make sure that the value found is the same as the ENGINE LP VIBRATION # 2 indication on the EICAS, with a tolerance of ± 0.1 IPS (RMS).

NOTE: The analog indication on the EICAS display is limited to 0 (lower limit) and 2.5 IPS (upper limit). The converted value from the HHDLU/EHHDLU must be compared visually with the EICAS indication.

(bc) Do the last step again with 40% and 50% N1.

(bd) (Aircraft with load cells) On the HHDLU/EHHDLU, select the ENGINE HP VIBRATION # 1 parameter. Select WORD 58, SUBFRAME ALL, and DECIMAL BASE.

(be) With the engine # 2 thrust control lever at the IDLE position, set the engine # 1 thrust control lever to 30% N1. Stop until the engine indications on the EICAS become stable:

Result:

1 Write the ENGINE HP VIBRATION # 1 values shown on the HHDLU/ EHHDLU and on the EICAS.

2 Multiply the value shown on the HHDLU/EHHDLU by the conversion coefficient 0,00390815828.

3 Make sure that the value found is the same as the ENGINE HP VIBRATION # 1 indication on the EICAS, with a tolerance of ± 0.1 IPS (RMS).

NOTE: The analog indication on the EICAS display is limited to 0 (lower limit) and 2.5 IPS (upper limit). The converted value from the HHDLU/EHHDLU must be compared visually with the EICAS indication.

(bf) Do the last step again with 40% and 50% N1.

(bg) (Aircraft with load cells) On the HHDLU/EHHDLU, select the ENGINE HP VIBRATION # 2 parameter. Select WORD 188, SUBFRAME ALL, and DECIMAL BASE.

(bh) With the engine # 1 thrust control lever at the IDLE position, set the engine # 2 thrust control lever to 30% N1. Stop until the engine indications on the EICAS become stable:

Result:

1 Write the ENGINE HP VIBRATION # 2 values shown on the HHDLU/EHHDLU and on the EICAS.

2 Multiply the value shown on the HHDLU/EHHDLU by the conversion coefficient 0,00390815828.

3 Make sure that the value found is the same as the ENGINE HP VIBRATION # 2 indication on the EICAS, with a tolerance of ± 0.1 IPS (RMS).

NOTE: The analog indication on the EICAS display is limited to 0 (lower limit) and 2.5 IPS (upper limit). The converted value from the HHDLU/EHHDLU must be compared visually with the EICAS indication.

(bi) Do the last step again with 40% and 50% N1.

(bj) On the HHDLU/EHHDLU, select the ENGINE ITT # 1 parameter. Select WORD 117, SUBFRAME ALL, and DECIMAL BASE.

(bk) With the engine # 2 thrust control lever at the IDLE position, set the engine # 1 thrust control lever to 30% N1. Stop until the engine indications on the EICAS become stable:

Result:

1 Make sure that the HHDLU/EHHDLU shows the same ENGINE ITT # 1 indication as the EICAS, with a tolerance of ± 10°C.

(bl) Do the last step again with 40% and 50% N1.

(bm) On the HHDLU/EHHDLU, select the ENGINE ITT # 2 parameter. Select WORD 245, SUBFRAME ALL, and DECIMAL BASE.

(bn) With the engine # 1 thrust control lever at the IDLE position, set the engine # 2 thrust control lever to 30% N1. Stop until the engine indications on the EICAS become stable:

Result:

1 Make sure that the HHDLU/EHHDLU shows the same ENGINE ITT # 2 indication as the EICAS, with a tolerance of ± 10°C.

(bo) Do the last step again with 40% and 50% N1.

(bp) On the HHDLU/EHHDLU, select the N1 REQUEST # 1 parameter. Select WORD 57, SUBFRAME ALL, and DECIMAL BASE.

(bq) With the engine # 2 thrust control lever at the IDLE position, set the engine # 1 thrust control lever to 30% N1. Stop until the engine indications on the EICAS become stable:

Result:

1 Write the N1 REQUEST # 1 values shown on the HHDLU/EHHDLU and on the EICAS.

2 Multiply the value shown on the HHDLU/EHHDLU by the conversion coefficient 0.125061.

3 Make sure that the value found is the same as the N1 REQUEST # 1 indication on the EICAS, with a tolerance of ± 2% RPM.

(br) Do the last step again with 40% and 50% N1.

(bs) On the HHDLU/EHHDLU, select the N1 REQUEST # 2 parameter. Select WORD 185, SUBFRAME ALL, and DECIMAL BASE.

(bt) With the engine # 1 thrust control lever at the IDLE position, set the engine # 2 thrust control lever to 30% N1. Stop until the engine indications on the EICAS become stable:

Result:

1 Write the N1 REQUEST # 2 values shown on the HHDLU/EHHDLU and on the EICAS.

2 Multiply the value shown on the HHDLU/EHHDLU by the conversion coefficient 0.125061.

3 Make sure that the value found is the same as the N1 REQUEST # 2 indication on the EICAS, with a tolerance of ± 2% RPM.

(bu) Do the last step again with 40% and 50% N1.

(bv) On the HHDLU/EHHDLU, select the OIL PRESSURE LOW #1 parameter. Select WORD 130, SUBFRAME ALL, and BINARY BASE.

Result:

1 On the HHDLU/EHHDLU, the 2nd and 3rd bits are "0".

(bw) On the HHDLU/EHHDLU, select the ENGINE # 1 FUEL SHUTOFF ON and ENG # 1 SHUTDOWN REQTD. Select WORD 31, SUBFRAME ALL, and BINARY BASE.

(bx) Stop engine # 1 (AMM TASK 71-00-01-910-804-A/200).

Result:

1 On the HHDLU/EHHDLU, make sure that the 5th and 7th bits (WORD 31) change from "0" to "1".

2 On the HHDLU/EHHDLU, make sure that the 2nd bit (WORD 130) changes from "0" to "1".

(by) On the HHDLU/EHHDLU, select the ENGINE # 2 FUEL SHUTOFF ON and ENG # 2 SHUTDOWN REQTD. Select WORD 159, SUBFRAME ALL, and BINARY BASE.

(bz) On the HHDLU/EHHDLU, select the OIL PRESSURE LOW #2 parameter. Select WORD 130, SUBFRAME ALL, and BINARY BASE.

Result:

1 On the HHDLU/EHHDLU, the 2nd bit is "1" and the 3rd bit is"0".

(ca) Stop engine # 2 (AMM TASK 71-00-01-910-804-A/200).

Result:

1 On the HHDLU/EHHDLU, make sure that the 5th and 7th bits (WORD 159) change from "0" to "1".

2 On the HHDLU/EHHDLU, make sure that the 3rd bit (WORD 130) changes from "0" to "1".

(55) (Download check) Do the test of the parameters with the engines in operation and do an FDR downloading.

(a) Make sure that these systems are operational and on:

- FDR System (AMM SDS 31-31-00/1).
- EICAS (AMM SDS 31-41-00/1).

(b) Start the APU (AMM TASK 49-10-00-910-802-A/200 for APU T-62T-40C11 or AMM TASK 49-13-00-910-802-A/200 for APU T-62T-40C14).

(c) On the Pilot Glareshield Panel, push and release the PTT mic switch (AMM TASK 23-51-00-700-801-A/500).

(d) Do the test of the APU BLEED POSITION parameter. To do this, on the overhead panel, make sure that the XBLEED switch is not set to the CLOSED position and push the APU BLEED pushbutton.

Result:

1 The pushbutton striped bar light comes on.

(e) After 10 seconds, on the overhead panel, push the APU BLEED pushbutton again.

Result:

1 The pushbutton striped bar light goes off.

(f) Start the engines with the APU (AMM TASK 71-00-01-910-801-A/200).

NOTE: When you do the engine start up procedure, make sure to set the takeoff temperature, as given in the task. This step is important for the correct reading of the TAKEOFF TEMPERATURE parameter.

(g) Shutdown the APU (AMM TASK 49-10-00-910-803-A/200 for APU T-62T-40C11 or AMM TASK 49-13-00-910-803-A/200 for APU T-62T-40C14).

NOTE: When you set the engine thrust control levers to a new value of N1, write down the hours and minutes shown on the pilot digital clock and the related N1 value.

(h) On the Pilot Glareshield Panel, push and release the PTT mic switch (AMM TASK 23-51-00-700-801-A/500).

(i) (Aircraft with load cells) Do the test of the ENGINE #1 BLEED POSITION parameter. To do this, on the overhead panel, make sure that the XBLEED switch is not set to the CLOSED position and push the BLEED 1 pushbutton.

Result:

1 The pushbutton striped bar light goes off.

(j) After 10 seconds, on the overhead panel, push the BLEED 1 pushbutton again.

Result:

1 The pushbutton striped bar light comes on.

(k) On the Pilot Glareshield Panel, push and release the PTT mic switch (AMM TASK 23-51-00-700-801-A/500).

(l) (Aircraft with load cells) Do the test of the ENGINE #2 BLEED POSITION parameter. To do this, on the overhead panel, make sure that the XBLEED switch is not set to the CLOSED position and push the BLEED 2 pushbutton.

Result:

1 The pushbutton striped bar light goes off.

(m) After 10 seconds, on the overhead panel, push the BLEED 2 pushbutton again.

Result:

1 The pushbutton striped bar light comes on.

(n) Set the engine thrust control levers to 30% N1. Stop until the engines indications, on the EICAS, become stable.

(o) On the Pilot Glareshield Panel, push and release the PTT mic switch (AMM TASK 23-51-00-700-801-A/500), and write these values: ENGINE N1 # 1, ENGINE N1 # 2, ENGINE N2 # 1, ENGINE N2 # 2, TAKEOFF TEMPERATURE # 1, FUEL FLOW # 1, FUEL FLOW # 2, N1 TARGET #1, N1 TARGET # 2, ENGINE LP VIBRATION # 1, ENGINE LP VIBRATION # 2, (Aircraft with load cells) ENGINE HP VIBRATION # 1, (Aircraft with load cells) ENGINE HP VIBRATION # 2, ENGINE ITT # 1, ENGINE ITT # 2, N1 REQUEST # 1, and N1 REQUEST # 2 shown on the EICAS; DATE, HOURS, and MINUTES shown on the pilot digital clock (AMM SDS 31-21-00/1). In the end, push and release the PTT mic switch.

(p) Do the two last steps again with 40% and 50% N1.

(q) Items (r) thru (w) are applicable to aircraft with EICAS versions 17 and on.

(r) On the Pilot Glareshield Panel, push and release the PTT mic switch (AMM TASK 23-51-00-700-801-A/500).

(s) On the POWERPLANT control panel, on the Overhead Panel, set the Engine #1 Ignition switch to the "ON" position.

(t) After 10 seconds, move the Engine #1 Ignition switch back to the "AUTO" position.

(u) On the Pilot Glareshield Panel, push and release the PTT mic switch (AMM TASK 23-51-00-700-801-A/500).

(v) On the POWERPLANT control panel, on the Overhead Panel, set the Engine #2 Ignition switch to the "ON" position.

(w) After 10 seconds, move the Engine #2 Ignition switch back to the "AUTO" position.

(x) On the Pilot Glareshield Panel, push and release the PTT mic switch (AMM TASK 23-51-00-700-801-A/500).

(y) Stop engine # 1 (AMM TASK 71-00-01-910-804-A/200).

(z) Stop engine # 2 (AMM TASK 71-00-01-910-804-A/200).

(aa) On the Pilot Glareshield Panel, push and release the PTT mic switch (AMM TASK 23-51-00-700-801-A/500).

(ab) Do a download of the Flight Data Recorder (AMM TASK 31-31-00-700-803-A/500).

NOTE: • During the downloading process, the FDR do not record data.

- On the HHDLU/EHHDLU, set a time longer than that used to do steps (b) thru (u).
- Make sure that you write down the file name.

(ac) In a laboratory, make sure that the values recorded by the FDR for engines 1 and 2 are in the tolerance range. Refer to the table below:

NOTE:
- Use the PTT indications to find the parameters in the downloaded data.
- Refer to steps (c) thru (e) and make sure that the APU BLEED POSITION indication is "1" (OPEN) for 10 seconds, before the engines are started.
- Refer to steps (h) thru (j) and make sure that the ENGINE # 1 BLEED POSITION indication is "1" (OPEN) for 10 seconds, after the engines are started.
- Refer to steps (k) thru (m) and make sure that the ENGINE # 2 BLEED POSITION indication is "1" (OPEN) for 10 seconds, after the engines are started.
- Refer to steps (q) thru (x) and make sure that the ignition indications for the four FADECS stay ON for 10 seconds (first for FADECs #1A and #1B, and then for FADECs #2A and #2B) after the test for 30%, 40% and 50% N1.
- After the ignition indications, make sure that there is a transition on the ENGINE #1 FUEL SHUTOFF ON parameter from "0" (NOT ACTIVE) to "1" (ACTIVE) and ENG #1 SHUTDOWN REQTD parameter from "0" (NOT REQTD) to "1" (SHUTDOWN), followed by a transition on the ENGINE #2 FUEL SHUTOFF ON parameter from "0" (NOT ACTIVE) to "1" (ACTIVE) and ENG #2 SHUTDOWN REQTD parameter from "0" (NOT REQTD) to "1" (SHUTDOWN).

Table 5141 - PARAMETERS WITH ENGINES IN OPERATION

ENGINE PARAMETER	TOLERANCE RANGE
ENGINE N1 # 1	± 2% RPM
ENGINE N1 # 2	± 2% RPM
ENGINE N2 # 1	± 2% RPM
ENGINE N2 # 2	± 2% RPM
TAKEOFF TEMPERATURE # 1	± 1°C
FUEL FLOW # 1	± 20 PPH
FUEL FLOW # 2	± 20 PPH
N1 TARGET # 1	± 2% RPM
N1 TARGET # 2	± 2% RPM
ENGINE LP VIBRATION # 1	± 0.1 IPS (RMS)
ENGINE LP VIBRATION # 2	± 0.1 IPS (RMS)
ENGINE HP VIBRATION # 1	± 0.1 IPS (RMS)

Table 5141 - PARAMETERS WITH ENGINES IN OPERATION (Continued)

ENGINE PARAMETER	TOLERANCE RANGE
ENGINE HP VIBRATION # 2	± 0.1 IPS (RMS)
ENGINE ITT # 1	± 10°C
ENGINE ITT # 2	± 10°C
N1 REQUEST # 1	± 2% RPM
N1 REQUEST # 2	± 2% RPM

(56) On the Maintenance Panel, set the DFDR switch to the NORM position.

K. Follow-on (Figure 501)

SUBTASK 842-005-A

(1) Close maintenance panel door 223LZ (AMM MPP 06-41-03/100).

(2) If you use GSE 092, disconnect the HHDLU from the FDR, and remove the PCMCIA card from it.

(3) If you use either GSE 582 or GSE 583, disconnect the EHHDLU/personal computer (GSE 130) from the FDR.

(4) Close access door 272DR (AMM MPP 06-41-01/100).

(5) Remove the hydraulic platform (GSE 036).

(6) Put the protection cover again on the pitot and pitot/static sensors.

(7) On the Ice Protection Panel, on the Overhead Panel, remove the DO-NOT-TURN-AUTO tags from the PITOT 1/TAT 1/AOA 1, PITOT 3, and PITOT 2/TAT 2/AOA 2 pushbuttons.

(8) Disconnect the headsets (GSE 044).

TASK 31-31-00-700-805-A
EFFECTIVITY: ALL

6. FLIGHT DATA RECORDER - FUNCTIONAL TEST BY ANALYSIS OF DOWNLOADED DATA

A. General

(1) This task gives an alternative procedure to do the functional test of the Flight Data Recorder.

(2) The functional test is divided into two parts:

- The first part is accomplished with the airplane on the ground and consists of testing in real time the parameters that belong to the FDRS or that may not be activated during a normal flight.
- The second part consists in analyzing the retrieved data from the FDRS.

NOTE: On the second part the test, it is described how to analyze data retrieved from the FDRS after a normal flight and how to interpret the engineering values of each parameter. Through this procedure, it is possible to functionally check the FDRS parameters from a personal computer (PC), thus reducing the airplane downtime.

(3) GSEs 058, 059, 070, and 196 will be used only on aircraft with the RVDTs/RVITs installed. The RVDTs/RVITs are used to monitor the control surface positions.

(4) The combination of DAU and ICs P/Ns that make up each EICAS version is shown in a table referred to in IPC 31-41-01.

(5) GSE 091, GSE 490 or GSE 607 can be used to extract, convert, and display digital flight data stored on the Honeywell Solid-State Flight Data Recorder.

(6) (Aircraft with Honeywell FDR installed) ADRAS and ADRAS-related support must be ordered directly from Honeywell. ADRAS is the software solution suggested by EMBRAER, but you can use other software to analyze downloaded FDR data. EMBRAER has no responsibility for the parameter conversion settings if other software is used. The parameters mnemonics contained in this task are the same used in ADRAS database, and may be not be the same for other software.

(7) (Aircraft with Honeywell FDR installed) The GSE 092 or GSE 582 or GSE 583 can be used to perform the task.

(8) (Aircraft with FDR L3 installed) Process the aircraft flight data with the ROSE for Windows (GSE 473) or other similar FDR raw data analyzer software.

NOTE: ROSE for Windows is the software solution suggested by EMBRAER, but you can use other software to analyze downloaded FDR data. EMBRAER has no responsibility for the parameter conversion settings if other software is used.

(9) Flight Phases: In most of the description of the parameters, flight phases are indicated to help understand when the parameters suffer significant changes or when they present more stable values. Flight phases are described below:

(a) TAKEOFF:

1. When Air/ground (A/G) parameter condition is Gnd, it means the airplane is on the ground. Radio Altitude (RAlt) value is approximately 0 ft.

2. When Air/ground (A/G) condition changes from Gnd to Air, it indicates that the airplane is in the air. Also, Airspeed (Airspd) increases during this process.

3. Soon after Air/ground (A/G) condition changes from Gnd to Air, there is a sudden change in Elevator Surface #1 and 2 (ELVSF#1 and ELVSF#2) to positive values.

4. Make sure that Pitch Attitude (Pitch) parameter shows positive values (about 14°), what indicates nose up.

5. As Pressure Altitude (PrAlt) value increases, Radio Altitude (RAlt) value increases proportionally, up to approximately 2500 ft (Radio Altitude limit). Also, Static Air Temperature (SAT) value decreases as Pressure Altitude (PrAlt) value increases.

(b) LANDING:

1. As the aircraft approaches for landing, Radio Altitude (RAlt) and Pressure Altitude (PrAlt) values decrease.

2. Before Air/ground (A/G) value changes from Air to Gnd, when Radio Altitude (RAlt) value is approximately 1000 ft, Flap Position (Flap) value changes from 0 to more than 15 degrees, keeping this value until some seconds after landing, when Air/ground (A/G) parameter changes from Air to Gnd.

3. Make sure that Static Air Temperature (SAT) value increases as Radio Altitude (RAlt) and Pressure Altitude (PrAlt) values decrease.

4. When Air/ground (A/G) parameter changes from Air to Gnd, there is a sudden change in Pitch Control Surface Position (ELVSF#1 and ELVSF#2) to negative values.

(c) STABLE CRUISE:

1. Pitch Attitude (Pitch) and Roll Attitude (Roll) values are approximately constant.

2. Lateral Control Surface Position (AILSF#1 and AILSF#2), Pitch Control Surface Position (ELVSF#1 and ELVSF#2) and Yaw Control Surface Position (RUDDERSF) values are approximately constant.

3. Airspeed (Airspd) value is approximately constant.

4. Pressure Altitude (PrAlt) value is approximately constant.

5. Angle of Attack (AOA#1, AOA#2) values are approximately –7 degrees.

6. Longitudinal Acceleration (LgAcc) and Lateral Acceleration (LtAcc) values are approximately 0.

7. N2 Engine 1 (N2#1) and N2 Engine 2 (N2#2) parameters values are approximately 85%.

8. Normal Acceleration (NrAcc) value is around 1.0.

(d) GROUND RUN:

1. This phase goes from the moment when the airplane starts running on the runway to takeoff.

2. When Air/ground (A/G) parameter is Gnd, it means the airplane is on the ground. Radio Altitude (RAlt) value is approximately 0 ft.

3. When Airspeed (Airspd) value increases, it indicates the ground run phase is starting.

4. Longitudinal Acceleration (LgAcc) value increases, and can reach approximately 0.3 G.

5. N2 Engine 1 (N2#1) and N2 Engine 2 (N2#2) parameters values are approximately 100%

6. When Air/ground (A/G) parameter changes from Gnd to Air, it indicates takeoff. It is the end of the ground run phase.

(e) GROUND ROLL:

1. This phase goes from the moment when the aircraft's landing gear touches the ground, to the moment when the airplane is totally stopped on the runway.

2. When Air/ground (A/G) parameter changes from Air to Gnd, it indicates the aircraft touched the ground.

3. Soon after, Airspeed (Airspd) value decreases abruptly, indicating the use of the brakes.

4. Longitudinal Acceleration (LgAcc) values decrease, and can go down to –0.6 G.

5. (Aircraft with thrust reversers) Soon after Air/ground (A/G) parameter changes from Air to Gnd, if the thrust reversers are commanded to open, LO T/R-1 Deploy (LoDp#1), LO T/R-2 Deploy (LoDp#2), UP T/R-1 Deploy (UpDp#1) and UP T/R-2 Deploy (UpDp#2) parameters change from NotDep to Deplyd. Then, during the thrust reversers movement, parameters Thrust Rev Trans.1 (TRTr#1) and Thrust Rev Trans.2 (TRTr#2) change from Not Transit to Transit and LO T/R-1 Stowed (LoSt#1), LO T/R-2 Stowed (LoSt#2), UP T/R-1 Stowed-1 (UpSt#1) and UP T/R-2 Stowed (UpSt#2) change from Stowd to NStow.
When the thrust reversers are commanded to open, the N1 ENGINE #1 (N1#1) and N1 ENGINE #2 (N1#2) or N2 ENGINE #1 (N2#1) and N2 ENGINE #2 (N2#2) parameters increase and decrease quickly.
After a few seconds, when the thrust reversers are commanded to close, all these parameters change to their original conditions.

(f) TAXI:

1. This phase corresponds to the period when the aircraft is moving on the ground with engine power, before takeoff and after landing.

2. Air/ground (A/G) value condition is Gnd.

3. Thrust/Power Engines parameters N1 Engine 1 (N1#1), N1 Engine 2 (N1#2), N2 Engine 2 (N2#1) and N2 Engine 2 (N2#2) values show variation.

4. Magnetic Heading (HDG) value shows variation.

5. (Aircraft with thrust reversers) The thrust reversers position parameters LO T/R-1 Deploy (LoDp#1), LO T/R-2 Deploy (LoDp#2), LO T/R-1 Stowed (LoSt#1), LO T/R-2 Stowed (LoSt#2), UP T/R-1 Deploy (UpDp#1), UP T/R-2 Deploy (UpDp#2),

UP T/R-1 Stowed-1 (UpSt#1),UP T/R-2 Stowed (UpSt#2), Thrust Rev Trans.1 (TRTr#1) and Thrust Rev Trans.2 (TRTr#2) can change their status for several seconds during aircraft movements on the ground.

B. References

REFERENCE	*DESIGNATION*
AMM MPP 06-41-01/100	-
AMM MPP 06-41-03/100	- COMPONENT LOCATION
AMM SDS 22-10-00/1	
AMM SDS 23-31-00/1	
AMM SDS 23-51-00/1	
AMM SDS 23-81-00/1	
AMM SDS 27-10-00/1	
AMM SDS 27-20-00/1	
AMM SDS 27-30-00/1	
AMM SDS 27-36-00/1	
AMM SDS 27-40-00/1	
AMM SDS 31-41-00/1	
AMM SDS 31-42-00/1	
AMM SDS 31-51-00/1	
AMM SDS 34-15-00/1	
AMM SDS 34-21-00/1	
AMM SDS 34-22-00/1	
AMM SDS 34-27-00/1	
AMM SDS 34-31-00/1	
AMM SDS 34-32-00/1	
AMM SDS 34-41-00/1	
AMM SDS 34-43-00/1	
AMM SDS 34-51-00/1	
AMM SDS 34-61-00/1	
AMM SDS 73-22-00/1	
AMM TASK 20-40-01-860-801-A/200	ENERGIZATION OF THE AIRCRAFT WITH AN EXTERNAL POWER SOURCE
AMM TASK 31-31-00-700-801-A/500	FLIGHT DATA RECORDER - FUNCTIONAL TEST
AMM TASK 31-31-00-700-803-A/500	FDR DATA - PERSONAL COMPUTER DOWNLOADING
AMM TASK 31-31-00-700-804-A/500	FLIGHT DATA RECORDER - FUNCTIONAL TEST
Extended Handheld Download Unit - User's Manual	-
Hand-Held Download Unit - User's Manual	-
Portable Interface Unit - User's Manual	-

C. Zones and Accesses

ZONE	PANEL/DOOR	LOCATION
272	272DR	Fuselage rear section I - Right side
223	223LZ	Cockpit - LH side

D. Tools and Equipment

ITEM	DESCRIPTION	PURPOSE	QTY
GSE 036	Platform, Hydraulic	To get access to the work area on the aileron, on the elevator, on the rudder, and in the rear electronic compartment	
GSE 044	Headset - Ramp handling	For communication	
GSE 058	Kit, rigging pins, flight controls	To keep the aileron control surface in the neutral position	
GSE 059	Protractor - Control Surface Deflection	To measure the rudder deflection angle	
GSE 070	Protractor - digital	To measure the aileron, the elevator and the control column deflection angle	
GSE 091	Automated Test Unit (ATU) or IBM - compatible personal computer with Microsoft Windows 3.1 and PCMCIA driver	To process aircraft flight data retrieved from the FDR to the PCMCIA by the HHDLU, with the ADRAS for Windows (Aircraft Data Recovery/Analysis System)	
GSE 092	Hand-Held Download Unit (HHDLU)	To retrieve the stored data from the FDR and make possible the ability to monitor the aircraft data in real time	
GSE 196	Clamp-Lock, elevator	To lock the elevator in the neutral position	
GSE 473	Read-Out Support Equipment/Recorder Interface	To read FDR Data for aircraft with FDR L3 installed.	
GSE 490	Automated Test Unit (ATU) or IBM - compatible personal computer with Microsoft Windows 2000, PCMCIA driver and USB port	To process aircraft flight data retrieved from the Honeywell Solid-State Flight Data Recorder (SSFDR) to the PCMCIA by the HHDLU, with the ADRAS for Windows (Aircraft Data Recovery/Analysis System)	
GSE 582	Extended Handheld Download Unit (EHHDLU), for Handheld	Used to download flight recorder memory, and view data stream during recording	
GSE 583	Extended Handheld Download Unit (EHHDLU) Set, for PC	Used to download flight recorder memory, and view data stream during recording	
GSE 607	Playback Test-VDR System (PATS II)	Used to extract, convert, and display (in engineering units) digital flight data stored on the Honeywell solid-state flight recorder.	

E. Auxiliary Items

Not Applicable

F. Consumable Materials

Not Applicable

G. Expandable Parts

Not Applicable

H. Persons Recommended

QTY	*FUNCTION*	*PLACE*
1	Does the task	Cockpit
1	Does the task	Outside the aircraft

I. Preparation

SUBTASK 841-006-A

(1) Make sure that the aircraft is safe for maintenance.

(2) Energize the aircraft with the External DC Power Supply (AMM TASK 20-40-01-860-801-A/200).

(3) Connect the headsets (GSE 044).

(4) Make sure that the systems below are operational and on:

- Autopilot (AMM SDS 22-10-00/1).
- Passenger Address & Cabin Interphone System (AMM SDS 23-31-00/1).
- Airborne Audio System (AMM SDS 23-51-00/1).
- Radio Management System (AMM SDS 23-81-00/1).
- Aileron System (AMM SDS 27-10-00/1).
- Rudder Control System (AMM SDS 27-20-00/1).
- Elevator & TAB Systems (AMM SDS 27-30-00/1).
- Stall Protection System (AMM SDS 27-36-00/1).
- Horizontal Stabilizer (AMM SDS 27-40-00/1).
- EICAS (AMM SDS 31-41-00/1).
- Integrated Computer System (AMM SDS 31-42-00/1).
- Aural Warning System (AMM SDS 31-51-00/1).
- ADC System (AMM SDS 34-15-00/1).
- AHRS (AMM SDS 34-21-00/1) or IRS (AMM SDS 34-27-00/1), as applicable.
- EFIS (AMM SDS 34-22-00/1).
- Radio Altimeter System (AMM SDS 34-31-00/1).
- VOR/ILS/GS/MB System (AMM SDS 34-32-00/1).
- EGPWS/Windshear System or GPWS/Windshear System, as applicable (AMM SDS 34-41-00/1).
- TCAS (AMM SDS 34-43-00/1).
- DME System (AMM SDS 34-51-00/1).

– (Aircraft with dual IRS) FMS (Honeywell) (AMM SDS 34-61-00/1).

– FADEC System (AMM SDS 73-22-00/1).

(5) Put the hydraulic platform (GSE 036) to the necessary height to get access to the rear electronic compartment.

(6) Open access door 272DR (AMM MPP 06-41-01/100).

(7) On the circuit breaker panel, open the FDR circuit breaker (Location Tip: ESSENTIAL DC BUS 1/MISCELLANEOUS/FDR) and attach a DO-NOT-CLOSE tag to it.

(8) Open maintenance panel door 223LZ (AMM MPP 06-41-03/100).

(9) Make sure that the DFDR switch, on the maintenance panel, is at the NORM position.

(10) (Aircraft with FDR Honeywell installed) To connect the GSE to the FDR, do one of these procedures:

1. If you use GSE 092, in the rear electronic compartment, connect the Hand-Held Download Unit (HHDLU) with the PCMCIA card inserted in it to the FDR (Refer to Hand-Held Download Unit - User's Manual).

2. If you use GSE 582, in the rear electronic compartment, connect the Extended Handheld Download Unit (EHHDLU) to the FDR (Refer to Extended Handheld Download Unit - User's Manual).

3. If you use GSE 583, in the rear electronic compartment, connect the personal computer (GSE 130) with EHHDLU software installed to the FDR using the SSFDR download cable (Refer to Extended Handheld Download Unit - User's Manual).

(11) (Aircraft with FDR L3 installed) In the rear electronic compartment, connect to the FDR the Portable Interface Unit (PIU) (GSE 464) with the PCMCIA card inserted in it (Refer to Portable Interface Unit - User's Manual).

(12) On the circuit breaker panel, remove the DO-NOT-CLOSE tag from the FDR circuit breaker (Location Tip: ESSENTIAL DC BUS 1/MISCELLANEOUS/FDR) and close it.

J. Functionally Check Flight Data Recorder System

SUBTASK 720-004-A

(1) This section contains the parameters that receive information from the sensors that are part of the FDR system or parameters that may not be activated during a normal flight. It is necessary to test these parameters with the aircraft on the ground, using a GSE.

(Aircraft without AFDAU/AFDAMU) Do the test of the following FDR system parameters. To do this, refer to AMM TASK 31-31-00-700-801-A/500:

(Aircraft with AFDAU/AFDAMU) Do the test of the following FDR system parameters. To do this, refer to AMM TASK 31-31-00-700-804-A/500:

(a) (Aircraft with AFDAU/AFDAMU) Loss of Cabin Pressure

(b) Normal Acceleration

(c) Lateral Acceleration

(d) Longitudinal Acceleration

(e) Pitch Trim Position

(f) Aileron Trim Position

(g) Rudder Trim Position

(h) Control Column Position #1

(i) Control Column Position #2

(j) Control Wheel Position #1

(k) Control Wheel Position #2

(l) SPC #1

(m) SPC #2

(n) Rudder Pedal Position

(o) (Aircraft with load cells):

1 Control Column Force #1

2 Rudder Pedal Force #1

3 Control Wheel Force #1 (Pilot)

4 Control Wheel Force #2 (Pilot)

5 Control Column Force #2

6 Rudder Pedal Force #2

7 Control Wheel Force #1 (Copilot)

8 Control Wheel Force #2 (Copilot)

(p) Stick Pusher

(q) Stick Shaker

(r) WARNING CAS MESSAGES

(s) Ground Speed Source

(t) GPWS # 2 (INOP)

(u) GPWS # 3 (Below GS)

(v) GPWS # 1 (Modes 1...4)

(w) Windshear Warning

(x) Windshear Caution

(y) Terrain (TerrAwCaut/TerrAwIn/TerrAwNoAv/TerrAwWarn)

(z) Terrain Inhibit (TerrInhibit):

(aa) Go Around

(ab) Heading Select

(ac) Selected Altitude

(ad) Selected Airspeed

(ae) TCAS TA

(af) Tcas RA - up advisory

(ag) Tcas RA - down advisory

(ah) Tcas RA - combined control

(ai) Tcas resolution advisory - vertical speed

(aj) Engine #1 Emerg Stop Actuated

(ak) Engine #2 Emerg Stop Actuated

(al) FADEC Engine No Dispatch

(am) FADEC Incapable

(an) FADEC engine short term dispatch

(ao) FADEC engine long term dispatch

(ap) Engine #1 A/ICE command and Engine #2 A/ICE command

(aq) Wing A/ICE command

(ar) Stab A/ICE command

(as) Ice Condition

(at) Ice Detection Fail

(au) (Aircraft with RVDTs/RVITs):

1 Aileron Surface Position #1

2 Aileron Surface Position #2

3 Elevator Surface Position #1

4 Elevator Surface Position #2

5 Rudder Surface Position

(av) Pilot PFD Status

(aw) EICAS STATUS

(ax) Pilot DUreversion

(ay) Pilot SG reversion

(az) Pilot ADC reversion

(ba) Pilot AHRS/IRS reversion

(bb) Copilot PFD status

(bc) Copilot MFD status

(bd) Copilot DU reversion

(be) Copilot SG reversion

(bf) Copilot ADC reversion

(bg) Copilot AHRS/IRS reversion

(bh) Pilot MFD MAP displayed ranges

(bi) Pilot MFD TCAS format

(bj) Pilot MFD checklist format

(bk) Copilot MFD MAP displayed ranges

(bl) Copilot MFD TCAS format

(bm) Copilot MFD checklist format

(2) (Aircraft with FDR Honeywell installed) This section contains the procedure that permits the check of the parameters that are normally excited during a normal flight in a laboratory, after a downloading is done. For this procedure, it is necessary to have an Automated Test Unit (ATU) or an IBM-compatible personal computer with Microsoft Windows 3.1 and PCMCIA driver, and ADRAS for Windows to process the aircraft flight data. Get the EMB-145 Parameter Conversion Database, necessary for the ADRAS, from EMBRAER - Customer Support Division.

(Aircraft with FDR L3 installed) This section contains the procedure that permits the check of the parameters that are normally excited during a normal flight in a laboratory, after a downloading is done. For this procedure, it is necessary to have an Automated Test Unit (ATU) or an IBM-compatible personal computer with Microsoft Windows and PCMCIA driver, and ROSE for Windows to process the aircraft flight data. Get the EMB-145 Parameter Conversion Database, necessary for the ROSE, from EMBRAER - Customer Support Division.

NOTE: Every time you identify in the download analysis a different parameter behavior from what is described in this task, refer to AMM TASK 31-31-00-700-801-A/500 or AMM TASK 31-31-00-700-804-A/500 (as applicable) to do the on-aircraft check of it.

(a) Do a download of the Flight Data Recorder (AMM TASK 31-31-00-700-803-A/500).

(b) In a laboratory, do the download analysis and check the behavior of each parameter as described below:

(c) PRESSURE ALTITUDE (PrAlt):

1 During takeoff:

- When Air/ground (A/G) condition changes from Gnd to Air, it indicates that the airplane is in the air. Also, Pressure Altitude (PrAlt) value increases and Radio Altitude (RAlt) value increases proportionally. Airspeed (Airspd) also increases during this process.
- As Pressure Altitude (PrAlt) value increases, Radio Altitude (RAlt) value increases proportionally, up to approximately 2500 ft. (Radio Altitude limit). Also, Static Air Temperature (SAT) value decreases as Pressure Altitude (PrAlt) value increases.

2 During Landing:

- As aircraft approaches for landing, Radio Altitude (RAlt) and Pressure Altitude (PrAlt) values decrease. Also, Static Air Temperature (SAT) value increases.
- When Air/ground (A/G) condition changes from Air to Gnd, Radio Altitude (RAlt) value is approximately 0 and Pressure Altitude (PrAlt) value stays constant (runway altitude).

3 During Stable Cruise:

- Pressure Altitude (PrAlt) value is approximately constant.

(d) AIRSPEED (Airspd):

1 During Ground Run / Takeoff:

- A few seconds before Air/ground (A/G) status change from Gnd to Air, Airspeed (Airspd) value increases quickly. Also, after Air/ground (A/G) status change from Gnd to Air, Airspeed (Airspd) value continues to increase.
- A few seconds before Airspeed (Airspd) value starts to increase, the parameters N1 Engine 1 (N1#1), N1 Engine 2 (N1#2), N2 Engine 1 (N2#1) and N2 Engine 2 (N2#2) values increase quickly and stabilizes at approximately 85% (for N1) and 95% (for N2).

2 During Stable Cruise:

- Airspeed (Airspd) value is approximately constant.

3 During Ground Roll:

- Soon after Air/ground (A/G) status changes from Air to GND, Airspeed (Airspd) value decreases abruptly, indicating the use of the brakes.

(e) STATIC AIR TEMPERATURE (SAT):

1 During Takeoff:

- After Air/ground (A/G) status changes from Gnd to Air, Static Air Temperature (SAT) value decreases as Pressure Altitude (PrAlt) value increases.

2 During Landing:

- Static Air Temperature (SAT) value increases as Radio Altitude (RAlt) and Pressure Altitude (PrAlt) values decrease.

(f) PITCH ATTITUDE (Pitch):

1 During Takeoff:

- (Aircraft with RVDTs/RVITs) When Air/ground (A/G) switch changes from Gnd to Air, Pitch Attitude (Pitch) and Elevator Surface 1 and 2 (ELVSF#1 and ELVSF#2) values suddenly increase. Normally PITCH ATTITUDE (Pitch) assumes values around 14°.
- When Air/ground (A/G) switch changes from Gnd to Air, Pitch Attitude (Pitch) value suddenly increases. Normally PITCH ATTITUDE (Pitch) assumes values around 14°.
- From takeoff until stable cruise, Pitch Attitude (Pitch) parameter shows positive values, what indicates nose up.

2 During Stable Cruise:

- Pitch Attitude (Pitch) is approximately 0.

(g) ROLL ATTITUDE (Roll):

1 During Ground Run:

- Identify the moment when Airspeed (Airspd) starts increasing, before Air/ground (A/G) switch changes from Gnd to Air. This phase indicates the aircraft run for takeoff and Roll Attitude (Roll) parameter is 0.

2 During Normal Flight:

- (Aircraft with RVDTs/RVITs) When Aileron Surface 1 (AILSF#1) value is negative and Aileron Surface 2 (AILSF#2) value is positive, Roll Attitude (Roll) value is positive and Magnetic Heading (HDG) value increases. When Aileron Surface 1 (AILSF#1) value is positive and Aileron Surface 2 (AILSF#2) value is negative, Roll Attitude (Roll) value is negative and Magnetic Heading (HDG) value decreases.
- When Magnetic Heading (HDG) value increases, the aircraft is turning to right and Roll Attitude (Roll) value is positive. And when Magnetic Heading (HDG) value decreases, the aircraft is turning to left and Roll Attitude (Roll) value is negative.

NOTE: It is possible that Roll Attitude (Roll) value changes with no Magnetic Heading (HDG) variation.

(h) MAGNETIC HEADING (HDG):

NOTE: Magnetic Heading (HDG) value range is from -180° to +180°. When the aircraft is turning to the right (clockwise), the value increases. When the aircraft is turning to the left (counterclockwise) the value decreases.

1 During Taxi:

- Air/ground (A/G) status is Gnd and Magnetic Heading (HDG) presents variation. When Magnetic Heading (HDG) value increases (curve to the right) Lateral Acceleration (LtAcc) value is positive.

2 During flight:

- (Aircraft with RVDTs/RVITs) When Aileron Surface 1 (AILSF#1) value is negative and Aileron Surface 2 (AILSF#2) value is positive, Roll Attitude (Roll) value is positive and Magnetic Heading (HDG) value increases. When Aileron Surface 1 (AILSF#1) value is positive and Aileron Surface 2 (AILSF#2) value is negative, Roll Attitude (Roll) value is negative and Magnetic Heading (HDG) value decreases.

(i) FLAP POSITION (Flap)

1 During Takeoff:

- After the engines startup and before Air/ground (A/G) status changes from Gnd to Air, Flap Control Position (FlapCtPos) and Flap Position (Flap) values change from 0 to 9°, keeping this value for about one minute after takeoff.

2 During Stable Cruise:

- Flap Control Position (FlapCtPos) and Flap Position (Flap) values are 0 during this phase.

3 During Landing:

- A few minutes before Air/ground (A/G) status changes from Air to Gnd, when Landing Gear Down Locked (LGDwn) status changes from Up to Down, Flap Control Position (FlapCtPos) and Flap Position (Flap) values also change from 0 to 22°. At outer marker (instrument approach) or when Radio Altitude is approximately 500 ft (500/800 ft) (visual approach), Flap Control Position (FlapCtPos) and Flap Position (Flap) values change from 22° to 45° (22° if CAT II operation).

(j) ANGLE OF ATTACK-1 (AOA#1) and ANGLE OF ATTACK-2 (AOA#2)

NOTE: The parameters ANGLE OF ATTACK (AOA#1 and AOA#2) refer to the angle of the vanes.

1 During Takeoff:

- Soon after takeoff, when Air/Ground (A/G) status changes from Ground to Air, Pitch Attitude (Pitch) Value is positive (around 14º what indicates nose up), and Angle of Attack –1 and 2 (AOA#1 and AOA#2) change from negative to positive values

2 During Stable Cruise:

- With Heading (HDG) and Roll Attitude (ROLL) parameters constant, Angle of Attack –1 and 2 (AOA#1 and AOA#2) parameters keep a negative value around –7º.

(k) RADIO ALTITUDE (RAlt):

1 During Takeoff:

- When Air/ground (A/G) condition is Gnd, Radio Altitude (RAlt) value is approximately 0 ft.
- When Air/ground (A/G) condition changes from Gnd to Air, Radio Altitude (RAlt) value starts to increase.
- As Pressure Altitude (PrAlt) value increases, Radio Altitude (RAlt) value increases proportionally, up to approximately 2500 ft (Radio Altitude limit).

2 During Stable Cruise

- Radio Altitude (RAlt) value is constantly 2500 ft during this phase, because that is the Radio Altitude limit.

3 During Landing:

- As aircraft approaches for landing, Radio Altitude (RAlt) and Pressure Altitude (PrAlt) values decrease.
- When Air/ground (A/G) condition changes from Air to Gnd, Radio Altitude (RAlt) value is approximately 0.

(l) GLIDE SLOPE DEVIATION -1 (GSDev#1) and GLIDE SLOPE DEVIATION -2 (GSDev#2):

1 During Takeoff and Flight:

- Normally these parameters values are 0, because it is not necessary for the pilots to use the Glide Slope system in these phases.

2 During Approach:

- This parameter value (given in DDM) shows the aircraft vertical deviation from the glide slope, which can be positive or negative. Its range goes from -0,8 to 0,8 DDM. The nearer its value is to 0, the nearer the airplane is to the glide slope.
- Normally these parameters values tend to oscillate very near 0 when the aircraft is near the ILS ground station, (when Radio Altitude (RAlt) goes below 2500ft and DME Distance - 1 (DME#1) or DME Distance - 2 (DME#2) value is approximately 8MN) and Vertical FD Mode (FDMode-Vert) parameter status is GLIDE SLOPE. This situation remains the same until Air/ground (A/G) parameter changes from Air to Gnd.

NOTE: In some cases, depending on the pilot action, these parameters can present more oscillation during approach.

(m) LOCALIZER DEVIATION -1 (LDev#1) and LOCALIZER DEVIATION -2 (LDev#2):

1 During Takeoff and Flight:

- Normally these parameters values are 0, because it is not necessary for the pilots to use the Localizer system in these phases.

2 During Approach:

- This parameter value (given in DDM) shows the aircraft lateral deviation from the runway axis, which can be positive or negative.
- Normally these parameters values tend to oscillate around 0 when the aircraft is near the ILS ground station, (when Radio Altitude (RAlt) goes below 2500ft and DME Distance - 1 (DME#1) or DME Distance - 2 (DME#2) value is approximately 8MN) and Lateral FD Mode (FDMode-Lat) parameter status is LOC. This situation remains the same until Air/ground (A/G) parameter changes from Air to Gnd.

NOTE: In some cases, depending on the pilot action, these parameters can present more oscillation during approach.

(n) NAVIGATION FREQUENCY -1 (NFr#1) and NAVIGATION FREQUENCY -2 (NFr#2):

1 During Flight:

a These parameters can assume different values of frequencies. If these parameters assume two or more different frequencies for at least a few seconds, consider that they are being recorded correctly by the FDR.

NOTE: If these parameters do not change in all FDR retrieved data, it is recommended testing them with the airplane on the ground, in real time.

(o) DME DISTANCE - 1 (DME#1) and DME DISTANCE - 2 (DME#2):

These parameters values indicate the line-of-sight distance from the airplane to a fixed ground station in NM.

1 During Flight:

- DME Distance parameter (DME#1 or DME#2) value decreases when the airplane approaches the ground station, usually for landing.
- DME Distance parameter (DME#1 or DME#2) value increases when the airplane is becoming more distant from ground station.
- When DME Distance (DME#1 or DME#2) value is approximately constant and Magnetic Heading (HDG) value is increasing or decreasing constantly, it means the airplane is surrounding a ground station (usually an airport).

NOTE: It can occur that DME Distance - 1 (DME#1) and DME Distance - 2 (DME#2) values are different and with different behavior. For example, DME#1 parameter is increasing and DME#2 is decreasing. This is a normal situation because each DME system can receive signals from different ground stations at the same time.

(p) INNER MARKER - 1 (IM#1) and INNER MARKER - 2 (IM#2):

1 During Landing:

- The status of these parameters will momentarily change from OFF to ON during approach, a few seconds before the aircraft touches the ground, when Air/ground (A/G) parameter condition changes from Air to Gnd.

2 During Flight:

- The status of these parameters can change momentarily from OFF to ON if the aircraft is flying over a marker beacon (this is not a mandatory occurrence).

(q) MIDDLE MARKER - 1 (MM#1) and MIDDLE MARKER -2 (MM#2):

1 During approach:

- The status of these parameters will momentarily change from OFF to ON during approach, usually when Radio Altitude (RAlt) is approximately 200 ft.

2 During Flight:

- The status of these parameters can change momentarily from OFF to ON if the aircraft is flying over a marker beacon (this is not a mandatory occurrence).

(r) OUTER MARKER -1 (OM#1) and OUTER MARKER - 2 (OM#2):

1 During approach:

- The status of these parameters will momentarily change from OFF to ON during approach, usually when DME Distance - 1 (DME#1) or DME Distance - 2 (DME#2) values are from 4 to 9 NM.

2 During Flight:

- The status of these parameters can change momentarily from OFF to ON if the aircraft is flying over a marker beacon (this is not a mandatory occurrence).

(s) PRESS-TO-TALK (PTT):

The state of this parameter is normally OFF. It can change randomly to XMIT for a few seconds during any flight phase (mainly before takeoff and during approach). That indicates the use of communications systems by the pilots.

(t) AIR/GROUND SWITCH (A/G):

Refer to Flight Phases in the beginning of this task, and identify when this parameter changes during Takeoff, Landing, Ground Run and Ground Roll.

(u) LANDING GEAR DOWN LOCKED (LGDwn):

The Landing Gear Down Locked (LGDwn) parameter status is DOWN when the Landing Gear is extended and UP when the Landing Gear is retracted.

1 During Takeoff:

- This parameter is DOWN when Air/ground Switch (A/G) parameter is Gnd (aircraft on ground).
- When Air/ground Switch (A/G) parameter changes from Gnd to Air, the Landing Gear Down Locked (LGDwn) parameter changes from DOWN to UP after a few seconds.

2 During Approach:

- This parameter changes from UP to DOWN a few minutes before Air/ground Switch (A/G) parameter changes from Air to Gnd (aircraft touches the ground).

(v) (Aircraft with EICAS 20.5 and on) LANDING GEAR LEVER DOWN (LGLeDwn):

The Landing Gear Lever Down (LGLeDwn) parameter status is DOWN when the landing gear lever is in the DOWN position and NOT DOWN when the landing gear lever is in up position.

1 During Takeoff:

- This parameter is DOWN when Air/ground Switch (A/G) parameter is Gnd (aircraft on ground).
- A few seconds after Air/ground Switch (A/G) parameter changes from Gnd to Air, the Landing Gear Lever Down (LGLeDwn) parameter changes from DOWN to NOT DOWN and soon after, the parameter Landing Gear Down Locked (LGDwn) changes from DOWN to UP.

2 During Approach:

- A few minutes before Air/ground Switch (A/G) parameter changes from Air to Gnd (aircraft touches the ground), this parameter change from NOT DOWN to DOWN and soon after the parameter Landing Gear Down Locked (LGDwn) changes from UP to DOWN.

(w) MASTER WARNING (MWrn):

This parameter state is normally OFF (no Master Warning alarm). It can change randomly to ON for a few seconds during any flight phase.

NOTE: If the state of this parameter does not change in all the FDR retrieved data, it is recommended testing it with the airplane on the ground, in real time.

(x) MASTER CAUTION (MCau):

This parameter state is normally OFF (no Master Caution alarm). It can change randomly to ON for a few seconds during any flight phase.

NOTE: If the state of this parameter does not change in all the FDR retrieved data, it is recommended testing it with the airplane on the ground, in real time.

(y) FLIGHT NUMBER (FltNbr):

This parameter presents the flight number, and it does not change during the entire flight leg, from takeoff thru landing. Its value is normally changed with the aircraft on the ground (Air/ground (A/G) status is Gnd) and before engines startup (when N1 ENGINE #1 (N1#1) or N1 ENGINE #2 (N1#2) parameters are 0 and start to increase).

(z) HOURS (Hours):

Its range is from 0 to 23 and it increases by 1 every time the parameter Minutes (Minutes) changes from 59 to 0.

(aa) MINUTES (Minutes):

It increases by 1 every time the parameter Seconds (Seconds) changes from 59 to 0.

(ab) SECONDS (Seconds):

It increases by 1 at every subframe

(ac) DATE (Date):

This parameter is composed by 6 digits. It indicates day, month and year (DDMMYY).

(ad) LATERAL FLIGHT DIRECTOR MODE (FDMode-Lat):

1 During Flight:

a This parameter can assume the following modes:

- FD Off.
- Roll Mode (HDGHold or Roll Hold or Basic Roll).
- HDGSel.
- VOR Nav.
- VOR Appr.
- LOC.
- BkCourse.
- LNav.

b If this parameter assumes at least two modes listed above, you can consider that it is being recorded by the FDR.

NOTE: If this parameter does not change in all the FDR retrieved data, it is recommended testing it with the airplane on the ground, in real time.

(ae) VERTICAL FLIGHT DIRECTOR MODE (FDMode-Vert):

1 During Flight:

a This parameter can assume the following modes:

- FD Off.
- Pitch Hold.
- Alt Hold.
- Alt Presele.
- Speed Hold.
- V Spd Hold.
- FLCH CLB.
- FLCH DES.
- Glide Slope.
- Windshear.
- Go Around.
- Takeoff.

b If this parameter assumes at least two modes listed above, you can consider that it is being correctly recorded by the FDR.

NOTE: If this parameter does not change in all the FDR retrieved data, it is recommended testing it with the airplane on the ground, in real time.

(af) AUTOPILOT ENGAGED (A/P ENG):

1 During Flight:

a This parameter can present two states: NotEng or Engd. If this parameter assumes these states in the retrieved data for at least a few seconds, consider that it is being correctly recorded by the FDR.

NOTE: If the state of this parameter does not change in all the FDR retrieved data, it is recommended testing it with the airplane on the ground, in real time.

(ag) DH SELECTED (SelDH):

1 During Approach:

a Minutes before the Air/Ground (A/G) parameter changes from Air to Ground, when the aircraft starts the approach, DH SELECTED (SelDH) parameter is selected by the pilot and keeps a constant value until ground roll.

(ah) THRUST LEVER ANGLE#1 (TLA#1) and THRUST LEVER ANGLE#2 (TLA#2):

1 During Taxi until Ground Roll:

a These parameters are proportional to the related parameters N1 ENGINE #1 (N1#1) and N1 ENGINE #2 (N1#2) and N1 REQUEST #1 (N1Req#1) and N1 REQUEST #2 (N1Req#2).

(ai) (Aircraft without load cells) BRAKE PRESSURE #1 (BrkPr#1):

1 During Ground Roll:

a After Air/ground (A/G) parameter changes from Air to Gnd, this parameter increases, indicating that the pilot or the copilot is pressing the left pedal of its respective sides. In this moment, AIRSPEED (Airspd) parameter value decreases quickly.

(aj) (Aircraft without load cells) BRAKE PRESSURE # 3 (BrkPr#3):

The same as BRAKE PRESSURE #1 (BrkPr#1).

(ak) (Aircraft with load cells) PILOT LEFT BRAKE PEDAL POSITION (PilBrPd#1) and PILOT RIGHT BRAKE PEDAL POSITION (PilBrPd#2):

1 During Flight:

a In flight these parameters oscillate around the value of 5.5 %.

2 During Ground Roll:

a After Air/ground (A/G) parameter changes from Air to Gnd, this parameter increases quickly indicating that the brakes are in use by the pilot. If this is not happening, it could mean that the copilot is using the brakes, what is identified by the increasing of the parameters COPILOT LEFT BRAKE PEDAL POSITION (CopilBrPd#1) and COPILOT RIGHT BRAKE PEDAL POSITION (CopilBrPd#2).

NOTE: If the state of these parameters does not change in all the FDR retrieved data, it is recommended testing them with the airplane on the ground, in real time.

(al) (Aircraft with load cells) COPILOT LEFT BRAKE PEDAL POSITION (CopilBrPd#1) and COPILOT RIGHT BRAKE PEDAL POSITION (CopilBrPd#2):

1 During Flight:

a In flight these parameters oscillate around the value of 5.5 %.

2 During Ground Roll:

a After Air/ground (A/G) parameter changes from Air to Gnd, these parameters increase quickly indicating that the brakes are in use by the copilot. If this is not happening, it could mean that the pilot is using the brakes, what is identified by the increasing of the parameters PILOT LEFT BRAKE PEDAL POSITION (PilBrPd#1) and PILOT RIGHT BRAKE PEDAL POSITION (PilBrPd#2).

NOTE: If the state of these parameters does not change in all the FDR retrieved data, it is recommended testing them with the airplane on the ground, in real time.

(am) (Aircraft with load cells) LEFT OUTBOARD BRAKE PRESSURE (OtBrPr#1) and LEFT INBOARD BRAKE PRESSURE (InBrPr#1):

1 During Ground Roll:

a After Air/ground (A/G) parameter changes from Air to Gnd, these parameters increase, indicating that the pilot or the copilot is pressing the left pedal of its respective sides. The PILOT LEFT BRAKE PEDAL POSITION (PilBrPd#1) or COPILOT LEFT BRAKE PEDAL POSITION (CopilBrPd#1) parameter will increase at this moment.

(an) (Aircraft with load cells) RIGHT OUTBOARD BRAKE PRESSURE (OtBrPr#2) and RIGHT INBOARD BRAKE PRESSURE (InBrPr#2):

1 During Ground Roll:

a After Air/ground (A/G) parameter changes from Air to Gnd, these parameters, indicating that the pilot or the copilot is pressing the right pedal of its respective sides. The PILOT RIGHT BRAKE PEDAL POSITION (PilBrPd#2) or COPILOT RIGHT BRAKE PEDAL POSITION (CopilBrPd#2) parameter will increase at this moment.

(ao) (Aircraft with load cells) LEFT OUTBOARD WHEEL VELOCITY (OtWhSp#1), LEFT INBOARD WHEEL VELOCITY (InWhSp#1), RIGHT OUTBOARD WHEEL VELOCITY (OtWhSp#2) and RIGHT INBOARD WHEEL VELOCITY (InWhSp#2):

1 During Ground Run:

a Before Air/ground (A/G) parameter changes from Gnd to Air, these parameters increase as Airspeed (Airspd) parameter increases. This is valid until Air/ground (A/G) parameter changes from Gnd to Air.

2 During Flight:

a In this phase these parameters present no variation (approximately 0 kts).

3 During Landing:

a These parameters increase quickly when the airplane touches the ground (Air/ground (A/G) parameter changes from Air to Gnd) and starts the ground roll. Soon after, they decrease as Airspeed (Airspd) parameter decreases.

(ap) LEFT INBOARD SPOILER (LISpl) and RIGHT INBOARD SPOILER (RISpl):

1 During Flight:

a During flight LEFT INBOARD SPOILER (LISpl) and RIGHT INBOARD SPOILER (RISpl) parameters must stay in the status Closd.

2 During Landing:

- When Air/ground (A/G) parameter changes from Air to Gnd, LEFT INBOARD SPOILER (LISpl) and RIGHT INBOARD SPOILER (RISpl) parameters change from Closd to Open. The parameters returns to the status Closd when the Airspeed (Airspd) parameter presents no more variation.

NOTE: It is not mandatory that the parameters LEFT INBOARD SPOILER (LISpl) and RIGHT INBOARD SPOILER (RISpl) change their status synchronized with the parameters LEFT OUTBOARD SPOILER (LOSpl) and RIGHT OUTBOARD SPOILER (ROSpl).

(aq) LEFT OUTBOARD SPOILER (LOSpl) and RIGHT OUTBOARD SPOILER (ROSpl):

1 During Flight:

a When the pilot uses the Speed Brake function, the LEFT OUTBOARD SPOILER (LOSpl) and RIGHT OUTBOARD SPOILER (ROSpl) parameters change from Closd to Open.

2 During Landing:

- When Air/ground (A/G) parameter changes from Air to Gnd, LEFT OUTBOARD SPOILER (LOSpl) and RIGHT OUTBOARD SPOILER (ROSpl) parameters change from Closd to Open. The parameters return to the status Closd when Airspeed (Airspd) parameter presents no more variation.

NOTE: It is not mandatory that the parameters LEFT OUTBOARD SPOILER (LOSpl) and RIGHT OUTBOARD SPOILER (ROSpl) change their status synchronized with the parameters LEFT INBOARD SPOILER (LISpl) and RIGHT INBOARD SPOILER (RISpl).

(ar) GROUND SPOILER COMMAND (GSpCmd):

1 During Landing.

a When Air/ground Switch (A/G) parameter changes from Air to Gnd, GROUND SPOILER COMMAND (GSpCmd) parameter changes from Closd to Open. The parameter returns to the status Closd when Airspeed (Airspd) parameter presents no more variation.

(as) (Aircraft with EICAS 20.5 and on) SPEED BRAKE LEVER COMMAND (SpBrLeCmd):

1 During Flight:

a When the pilot uses the Speed Brake function, the parameter SPEED BRAKE LEVER COMMAND change from Closd to Open.

NOTE: If the state of this parameter does not change in all the FDR retrieved data, it is recommended testing it with the airplane on the ground, in real time.

(at) (Aircraft with thrust reversers) LO T/R DEPLOYED #1 (LoDp#1) and LO T/R DEPLOYED #2 (LoDp#2):

1 During Ground Roll:

- Soon after Air/ground (A/G) parameter changes from Air to Gnd, if the thrust reversers are commanded to open, LO T/R-1 Deploy (LoDp#1), LO T/R-2 Deploy (LoDp#2), UP T/R-1 Deploy (UpDp#1) and UP T/R-2 Deploy (UpDp#2) parameters change from NotDep to Deplyd. Then, during the thrust reversers movement, parameters Thrust Rev Trans.1 (TRTr#1) and Thrust Rev Trans.2 (TRTr#2) change from Not Transit to Transit and LO T/R-1 Stowed (LoSt#1), LO T/R-2 Stowed (LoSt#2), UP T/R-1 Stowed-1 (UpSt#1) and UP T/R-2 Stowed (UpSt#2) change from Stowd to NStow.
  When the thrust reversers are commanded to open, the N1 ENGINE #1 (N1#1) and N1 ENGINE #2 (N1#2) or N2 ENGINE #1 (N2#1) and N2 ENGINE #2 (N2#2) parameters increase and decrease quickly.
  After a few seconds, when the thrust reversers are commanded to close, all these parameters change to their original conditions.

NOTE: If none of the parameters above change their status during Ground Roll, it just means that the thrust reversers were not activated. It does not mean necessarily that the FDR is not recording those parameters. Anyway, if this situation happens, it is recommended doing an on-aircraft check of those parameters.

(au) (Aircraft with thrust reversers) UP T/R STOWED #1 (UpSt#1) and UP T/R STOWED #2 (UpSt#2):

Refer to the description of parameters LO T/R DEPLOYED #1 (LoDp#1) and LO T/R DEPLOYED #2 (LoDp#2) above.

(av) (Aircraft with thrust reversers) LO T/R STOWED #1 (LoSt#1) and LO T/R STOWED #2 (LoSt#2):

Refer to the description of parameters LO T/R DEPLOYED #1 (LoDp#1) and LO T/R DEPLOYED #2 (LoDp#2) above.

(aw) (Aircraft with thrust reversers) UP T/R DEPLOYED #1 (LoDp#1) and UP T/R DEPLOYED #2 (LoDp#2):

Refer to the description of parameters LO T/R DEPLOYED #1 (LoDp#1) and LO T/R DEPLOYED #2 (LoDp#2) above.

(ax) FUEL LOW PRESSURE #1 (FPLo#1) and FUEL LOW PRESSURE #2 (FPLo#2):

1 During the taxi until ground roll:

a These parameters can present two states: Low or Normal. They are associated with the Fuel Flow #1 and #2 (FF#1 and FF#2) parameters. Seconds after the FUEL FLOW #1 and #2 (FF#1 and FF#2) parameters increases from 0 to higher values, the state of FUEL LOW PRESSURE #1 (FPLo#1) and FUEL LOW PRESSURE #2 (FPLo#2) parameters change from Low to Normal. And when FUEL FLOW #1 and #2 (FF#1 and FF#2) parameter go down to 0, the FUEL LOW PRESSURE #1 (FPLo#1) and FUEL LOW PRESSURE #2 (FPLo#2) change from Normal to Low.

(ay) FADEC #1A IN CONTROL (Fd-1A), FADEC #1B IN CONTROL (Fd-1B), FADEC #2A IN CONTROL (Fd-2A) and FADEC #2B IN CONTROL (Fd-2B):

1 During Taxi until Ground Roll.

a When FADEC #1A IN CONTROL (Fd-1A) parameter status is InCtr, FADEC #1B IN CONTROL (Fd-1B) parameter status is NICtr and vice-versa.

When FADEC #2A IN CONTROL (Fd-2A) parameter status is InCtr, FADEC #2B IN CONTROL (Fd-2B) parameter status is NICtr and vice-versa.

(az) ENGINE #1 MODES (EngMode#1) and ENGINE #2 MODES (EngMode#2):

1 These parameters can present the following states:

- T/O-1
- T/O-2
- T/O-3
- AT/O-1
- AT/O-2
- AT/O-3
- CON
- CLB
- CRZ
- R-MODE
- T/O RSV
- T/O
- PWT

2 If this parameter assumes at least two modes listed above for a few seconds, consider that it is being recorded correctly by the FDR.

NOTE: If this parameter does not change in all the FDR retrieved data, it is recommended testing it with the airplane on the ground, in real time.

(ba) T/O REF A-ICE #1 (TOA/I#1) and T/O REF A-ICE #2 (TOA/I#2):

1 During Taxi until Ground Roll:

a These parameters can present two states: On or Off. Normally they can change from Off to On before takeoff. If this parameter assume this two status for at least a few seconds, consider that it is being recorded correctly by the FDR.

NOTE: If the state of these parameters do not change in all the FDR retrieved data, it is recommended testing them with the airplane on the ground, in real time.

(bb) (Aircraft with EICAS versions 17 and on) PFD FORMAT 1 (F/WX #1) or PFD1 COMPASS MODE (PFD1CpMd) and PFD FORMAT 2 (F/WX #2) or PFD2 COMPASS MODE (PFD2CpMd):

1 These parameters can present two states: FULL or WX. If these parameters assume these two states for at least for a few seconds, consider that they are being recorded correctly by the FDR.

NOTE: If the state of any of these parameters do not change in all the FDR retrieved data, it is recommended testing them with the airplane on the ground, in real time.

(bc) (Aircraft with EICAS versions 17 and on) MFD FORMAT1 (MAP/PLAN#1) and MFD FORMAT 2 (MAP/PLAN#2)

1 These parameters can present two states: MAP or PLAN. If these parameters assume these two states for at least for a few seconds, consider that they are being recorded correctly by the FDR.

NOTE: If the state of these parameters do not change in all the FDR retrieved data, it is recommended testing them with the airplane on the ground, in real time.

(bd) (Aircraft with EICAS versions 17 and on) PILOT PFD WX DISPLAYED HALF RANGES (PFD1WxDHR):

1 These parameters can present the following states: 2.5 , 5 , 12.5 , 25 , 50 , 100 and 150. If this parameter assumes at least two of the states listed for a few seconds, consider that it is being recorded correctly by the FDR.

NOTE: If the state of this parameter does not change in all the FDR retrieved data, it is recommended testing it with the airplane on the ground, in real time.

(be) (Aircraft with EICAS versions 17 and on) COPILOT PFD WX DISPLAYED HALF RANGES (PFD2WxDHR):

1 These parameters can present the following states: 2.5 , 5 , 12.5 , 25 , 50 , 100 and 150. If this parameter assumes at least two of the states listed for a few seconds, consider that it is being recorded correctly by the FDR.

NOTE: If the state of this parameter does not change in all the FDR retrieved data, it is recommended testing it with the airplane on the ground, in real time.

(bf) (Aircraft with EICAS versions 17 and on) PRIMARY NAVIGATION SYSTEM REFERENCE - PILOT (PNSR#1) and PRIMARY NAVIGATION SYSTEM REFERENCE - COPILOT (PNSR#2):

1 These parameters can present the following states: VOR1/2 , FMS1/2 and ILS1/2.

a VOR 1 and VOR 2 (These states are normally indicated during stable cruise).

b FMS 1 and FMS 2 (These states are normally indicated during stable cruise)

c ILS 1 and ILS 2 (These states are normally indicated during approach).

If these parameters assume at least two of the states listed above for a few seconds, consider that they are being recorded correctly by the FDR.

NOTE: If the state of these parameters do not change in all the FDR retrieved data, it is recommended testing them with the airplane on the ground, in real time.

(bg) (Aircraft with EICAS versions 17 and on) PILOT MFD WX/EGPWS FORMAT (WxEGPWS#1):

1 This parameter can present three states: NONE, WX and TERR. If this parameter assumes at least two of the states listed for a few seconds, consider that it is being recorded correctly by the FDR.

NOTE: If the state of this parameter do not change in all the FDR retrieved data, it is recommended testing it with the airplane on the ground, in real time.

(bh) (Aircraft with EICAS versions 17 and on) COPILOT MFD WX/EGPWS FORMAT (WxEGPWS#2):

1 This parameter can present three states: NONE, WX and TERR. If this parameter assumes at least two of the states listed for a few seconds, consider that it is being recorded correctly by the FDR.

NOTE: If the state of this parameter does not change in all the FDR retrieved data, it is recommended testing it with the airplane on the ground, in real time.

(bi) (Aircraft with AFDAU/AFDAMU) AIRCRAFT TYPE (AcftTyp):

1 This parameter value indicates the aircraft model (135 , 140 or 145). It does not change during all flight phases.

(bj) (Aircraft with AFDAU/AFDAMU) AIRCRAFT SERIAL NUMBER (Acfnumb):

1 This parameter value determines the aircraft serial identification number. It does not change during all the flight phases.

(bk) HYDRAULIC LOW PRESSURE #1 (HyLo#1) and HYDRAULIC LOW PRESSURE #2 (HyLo#2):

1 During Ground Run until Landing

a These parameter can present two status: Normal or Low. When N1 ENGINE #1 (N1#1) and N1 ENGINE #2 (N1#2) are, at least, 25%, HYDRAULIC LOW PRESSURE #1 (HyLo#1) and HYDRAULIC LOW PRESSURE #2 (HyLo#2) status are Normal.

Normally, when N1 ENGINE #1 (N1#1) and N1 ENGINE #2 (N1#2) parameters are 0, HYDRAULIC LOW PRESSURE #1 (HyLo#1) and HYDRAULIC LOW PRESSURE #2 (HyLo#2) status are Low. But this is not a mandatory situation, because the electrical-motor-driven pumps can be activated, and the status of these parameters would be Normal.

(bl) (Aircraft with AFDAU/AFDAMU) HYDRAULIC PRESSURE #1 (HyPress#1) and HYDRAULIC PRESSURE #2 (HyPress#2):

1 During Ground Run until Landing

a These parameters values indicate the hydraulic pressure in the aircraft (hydraulic system #1 and #2). These parameters normally present a value about 3000 psi when the related parameters HYDRAULIC LOW PRESSURE #1 (HyLo#1) and HYDRAULIC LOW PRESSURE #2 (HyLo#2) parameters status are Normal.

(bm) (Aircraft with AFDAU/AFDAMU) OIL PRESSURE LOW #1 (OilPreLo#1) and OIL PRESSURE LOW #2 (OilPreLo#2):

1 During Taxi:

a These parameters status change from Low to Normal when the related parameters FUEL FLOW #1 (FF#1) and FUEL FLOW #2 (FF#2) start to increase and N1 ENGINE #1 (N1#1) and N1 ENGINE #2 (N1#2) are, at least, 25%.

2 During Flight.

a These parameters status are Normal.

3 During Ground Roll:

a These parameters status change from Normal to Low when the related parameters FUEL FLOW #1 (FF#1) and FUEL FLOW #2 (FF#2) start to decrease and N1 ENGINE #1 (N1#1) and N1 ENGINE #2 (N1#2) are below 25%.

(bn) (Aircraft with AFDAU/AFDAMU) APU BLEED POSITION (APUBP):

1 During taxi until ground roll:

a This parameter can present two states: Open or Closed. If this parameter assumes these two status for at least a few seconds, consider that it is being recorded correctly by the FDR.

NOTE: If the state of this parameter does not change in all the FDR retrieved data, it is recommended testing it with the airplane on the ground, in real time.

(bo) (Aircraft with load cells) ENGINE #1 BLEED POSITION (Eblvp#1) and ENGINE #2 BLEED POSITION (Eblvp#2):

1 These parameters can present two states: Open or Closed. If these parameters assume the two states for at least a few seconds, consider that they are being recorded correctly by the FDR.

NOTE: If the state of these parameters do not change in all the FDR retrieved data, it is recommended testing them with the airplane on the ground, in real time.

(bp) FADEC #1A IGNITION ON (F1AIgOn) and FADEC #1B IGNITION ON (F1BIgOn) and FADEC #2A IGNITION ON (F2AIgOn) and FADEC #2B IGNITION ON (F2BIgOn):

1 On the Ground:

a These parameters can present two status: On or Off.

When engine 2 is started (when N1 ENGINE #2 (N1#2) parameter value increases quickly from 0%), if FADEC #2A IGNITION ON (F2AIgOn) status is On, FADEC #2B IGNITION ON (F2BIgOn) is OFF, and vice-versa. The same happens when engine 1 is started (when N1 ENGINE #1 (N1#1) parameter value increases quickly from 0%), if FADEC #1A IGNITION ON (F1AIgOn) is ON, FADEC #1B IGNITION ON (F1BIgOn) is OFF, and vice-versa.

NOTE: Before engines startup, these four parameters status is Off.

2 During Flight:

a If engine 1 has to be started in flight (when ENGINE #1 (N1#1) parameter value increases quickly from approximately 20%), FADEC #1A IGNITION ON (F1AIgOn) and FADEC #1B IGNITION ON (F1BIgOn) are On for a few seconds. The same happens if engine 2 has to be started in flight (when ENGINE #2 (N1#2) parameter value increases quickly from approximately 20%), FADEC #2A IGNITION ON (F2AIgOn) and FADEC #2B IGNITION ON (F2BIgOn) are On for a few seconds.

(bq) N1 ENGINE #1 (N1#1) and N1 ENGINE #2 (N1#2):

1 During Taxi until Ground Roll:

a These parameters are proportional to the related parameters N2 ENGINE#1 (N2#1) and N2 ENGINE #2 (N2#2), FUEL FLOW #1 (FF#1) and FUEL FLOW #2 (FF#2).

(br) N2 ENGINE#1 (N2#1) and N2 ENGINE #2 (N2#2):

1 During Taxi until Ground Roll:

a These parameters are proportional to the related parameters N1 ENGINE #1 (N1#1) and N1 ENGINE #2 (N1#2), FUEL FLOW #1 (FF#1) and FUEL FLOW #2 (FF#2).

(bs) TAKEOFF TEMPERATURE #1 (TOT#1) and TAKEOFF TEMPERATURE #2 (TOT#2):

1 During Taxi until Ground Roll:

a Normally before takeoff, these parameters change from 0 to a value adjusted by the pilot that corresponds to the local temperature. Then these parameters do not change until the next takeoff.

NOTE: If the state of these parameters do not change in all the FDR retrieved data, it is recommended testing them with the airplane on the ground, in real time.

(bt) FUEL FLOW #1 (FF#1) and FUEL FLOW #2 (FF#2):

1 During Taxi until Ground Roll:

a These parameters are proportional to the related parameters N1 ENGINE #1 (N1#1) and N1 ENGINE #2 (N1#2), N2 ENGINE#1 (N2#1) and N2 ENGINE #2 (N2#2).

(bu) N1 TARGET #1 (N1Tgt#1) and N1 TARGET #2 (N1Tgt#2):

1 During Ground Run and Takeoff:

a In these phases, these parameters are normally similar to the related parameters N1 ENGINE #1 (N1#1) and N1 ENGINE #2 (N1#2):

NOTE: N1 TARGET #1 (N1Tgt#1) and N1 TARGET #2 (N1Tgt#2) parameters are the maximum available thrust for each engine, calculated in accordance with some conditions. Because of

this, it is normal that in some periods, N1 ENGINE #1 (N1#1) and N1 ENGINE #2 (N1#2) behavior is not so close to N1 TARGET #1 (N1Tgt#1) and N1 TARGET #2 (N1Tgt#2)

(bv) ENGINE LP VIBRATION #1 (LPVib#1) and ENGINE LP VIBRATION #2 (LPVib#2):

1 During Taxi until ground Roll:

a When N1 ENGINE #1 (N1#1) and N1 ENGINE #2 (N1#2) parameters are zero (engines are off), ENGINE LP VIBRATION #1 (LPVib#1) and ENGINE LP VIBRATION #2 (LPVib#2) parameters present constant values very near zero.

b When engine #1 and engine #2 are running, (FUEL FLOW #1 (FF#1) and FUEL FLOW #2 (FF#2) are higher than zero), ENGINE LP VIBRATION #1 (LPVib#1) and ENGINE LP VIBRATION #2 (LPVib#2) parameters present variation.

NOTE: If the state of these parameters do not change in all the FDR retrieved data, it is recommended testing them with the airplane on the ground, in real time.

(bw) (Aircraft with load cells) ENGINE HP VIBRATION #1 (HPvib#1) and ENGINE HP VIBRATION #2 (HPvib#2):

1 During Taxi until ground Roll:

a When N1 ENGINE #1 (N1#1) and N1 ENGINE #2 (N1#2) parameters are zero, ENGINE HP VIBRATION #1 (HPvib#1) and ENGINE HP VIBRATION #2 (HPvib#2) parameters present constant values very near zero.

b When engine #1 and engine #2 are running, (FUEL FLOW #1 (FF#1) and FUEL FLOW #2 (FF#2) are higher than zero), ENGINE LP VIBRATION #1 (LPVib#1) and ENGINE LP VIBRATION #2 (LPVib#2) parameters present variation.

NOTE: If the state of these parameters do not change in all the FDR retrieved data, it is recommended testing them with the airplane on the ground, in real time.

(bx) ENGINE ITT #1 (ITT#1) and ENGINE ITT #2 (ITT#2):

1 During Taxi until Ground Roll:

a The parameters N1 ENGINE #1 (N1#1), N1 ENGINE #2 (N1#2), FUEL FLOW #1 (FF#1) and FUEL FLOW #2 (FF#2) are proportional to the related parameters ENGINE ITT #1 (ITT#1) and ENGINE ITT #2 (ITT#2).

(by) N1 REQUEST #1 (N1Req#1) and N1 REQUEST #2 (N1Req#2):

1 During Taxi until Ground Roll:

a These parameters are proportional to the related parameters N1 ENGINE #1 (N1#1), N1 ENGINE #2 (N1#2), THRUST LEVER ANGLE#1 (TLA#1) and THRUST LEVER ANGLE#2 (TLA#2).

(bz) ENGINE #1 FUEL SHUTOFF (FSOf#1):

1 On the Ground:

a When Engine #1 FUEL SHUTOFF (FSOf#1) parameter changes from NAct to Activ, FUEL FLOW #1 (FF#1) value decreases quickly until 0.

NOTE: If the state of this parameter does not change in all the FDR retrieved data, it is recommended testing it with the airplane on the ground, in real time.

(ca) ENGINE #2 FUEL SHUTOFF (FSOf#2):

The same as Engine #1 FUEL SHUTOFF (FSOf#1).

(cb) ENGINE #1 SHUT DOWN REQUESTED (SDR#1):

1 On the Ground:

a When N1 ENGINE #1 (N1#1) parameter value is higher than 25%, ENGINE #1 SHUT DOWN REQUESTED (SDR#1) status is NReq. When ENGINE #1 SHUT DOWN REQUESTED (SDR#1) changes from NReq to Shdn, N1 ENGINE #1 (N1#1) value decreases quickly until 0% (engine shutdown).

NOTE: If the state of this parameter does not change in all the FDR retrieved data, it is recommended testing it with the airplane on the ground, in real time.

2 During flight:

a In normal conditions, this parameter does not change, keeping the status NReq.

(cc) ENGINE #2 SHUT DOWN REQUESTED (SDR#2):

The same as ENGINE #1 SHUT DOWN REQUESTED (SDR#1).

K. Follow-on

SUBTASK 842-006-A

(1) Close maintenance panel door 223LZ (AMM MPP 06-41-03/100).

(2) If you use either GSE 092 or GSE 464, disconnect the HHDLU/PIU from the FDR, and remove the PCMCIA card from it.

(3) If you use either GSE 582 or GSE 583, disconnect the EHHDLU/personal computer (GSE130) from the FDR.

(4) Close access door 272DR (AMM MPP 06-41-01/100).

(5) Remove the hydraulic platform (GSE 036).

(6) Disconnect the headsets (GSE 044).