

B757 MANUAL SUPPLEMENT - ATP 3510
SECTION 1 CHAPTER 31
CONTROL PAGE - ISSUE 8

- A. File the attached Temporary Revision/Alerts in the Manual Supplement in ATA Chapter/Section/Subject/Page sequence
- B. File this Control Page in front of the Chapter TRs/Alerts.
- C. The following list shows active TRs/Alerts together with TRs/Alerts added by this control page.

Chapter Section Subject	Page	TR/Alert No.
31-25-01	401 Para 2 & 3	* 31-613
31-31-01	201	31-580
31-35-01-2	201	31-584
31-35-01-4	401	31-585
31-41-00	3	31-592
31-41-00-5	507	31-595
31-41-03	401 Para 2 & 3	* 31-610
31-41-05	401 Para 2 & 3	* 31-607
31-51-00	501	31-582

- D. Remove and Destroy the following TRs/Alerts:

* Indicates TRs/Alerts issued with this control page

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10 August, 1999

MAINTENANCE MANUAL

TEMPORARY REVISION No. 31-613

THIS TEMPORARY REVISION IS ISSUED BY BRITISH AIRWAYS ENGINEERING (TECHNICAL INFORMATION SERVICES, G2, TBA, S401, P. O. BOX 10, HEATHROW AIRPORT, HOUNSLOW, MIDDLESEX TW6 2JA).
CAA DESIGN APPROVAL No. DAI/8566/78.

Manual Reference 31-25-01 Page 401 para 2 and 3

(Tasks 31-25-01-004-001 and 3125-01-404-026)

REASON FOR REVISION

To carry out the requirements of the Safety and Technical Strategy Board Cross-Connection Project G/38/98.

ACTION

After the existing paragraph 2.B.(4) and before 2.B.(5) add the following:

CAUTION: CROSS CONNECTION POSSIBILITY WHEN WORKING WITH THIS COMPONENT. CLEARLY IDENTIFY CONNECTIONS UPON DISCONNECTION AND FUNCTION CHECK UPON RECONNECTION.

After the existing paragraph 3.C.(2)(b) and before 3.C.(3) add the following:

CAUTION: CROSS CONNECTION POSSIBILITY WHEN WORKING WITH THIS COMPONENT. POSITIVELY IDENTIFY CONNECTIONS PRIOR TO RECONNECTION.

Originator: Gary Kerr
Reference: 757-W-MCR-31-GK-99-501 31-25-01
Workbook: JS 31-029 Page 401

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BRITISH AIRWAYS

B757 G-CPEP

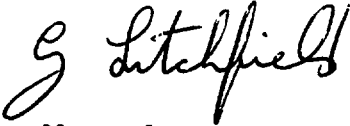
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21 July, 1997

TEMPORARY REVISION No. 31-580

THIS TEMPORARY REVISION IS ISSUED BY BRITISH AIRWAYS ENGINEERING (TECHNICAL INFORMATION SERVICES, G2, TBA, S401, P. O. BOX 10, HEATHROW AIRPORT, HOUNSLOW, MIDDLESEX TW6 2JA) AND COMPLIES WITH BCAR'S CHAPTER A5-3, B5-3 AND/OR TSS No. 0-2 AS REQUIRED. CAA DESIGN APPROVAL No. DAI/8566/78.



For CHIEF ENGINEER QUALITY

Manual Reference 31-31-01 Page 201

REASON FOR REVISION

To include the procedure to make a copy of the flight data recorder that records on solid state memory.

ACTION

Include this task as part of section 1.A. on page 201

- (2) A task to make a copy of the flight data recorder (FDR) data with a Sundstrand Hand Held Download Unit (HHDLU).

Add this as Item 3. On page 205.

3. Make a Copy of the Flight Data with a Sundstrand Hand Held Download Unit

A. General

- (1) This task uses a hand held download unit (HHDLU) to make a copy of the flight data from a flight data recorder that records on solid state.
- (2) You can use the HHDLU to make a copy of the flight data without the removal of the solid state flight data recorder (FDR) from the airplane. A different procedure to access the flight data is to remove the FDR from the airplane (AMM 31-31-01/401). The flight data is then removed from the FDR.
- (3) The ATE connector is on the front of the FDR.

B. Equipment

- (1) 964-0446-001 Unit - Hand Held Download
97896 Sundstrand Data Control Inc.
15001 NE 36TH ST.
P.O. Box 97001
Redmond, WA 98073-9701
- (2) Download disk - AlliedSignal P/N 700-1679-001 or
P/N 700-1679-003 or British Airways P/N 3-98887
- (3) Download disk record sheet, reference EED2.RS.0284.T6 (provided with Download disk)

C. References

- (1) AMM 24-22-00/201, Electrical Power - Control
- (2) AMM 25-22-02/401, Lower Ceiling Panel

D. Access

- (1) Location Zone
253 Area Above Passenger Cable Ceiling, LH

Originator: M HANIM
Reference: EED2.HN.0675.T6
Workbook: CV 31-95

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TEMPORARY REVISION No. 31-580 (Cont'd)

E. Procedure

- S862-002
- (1) Supply electrical power (AMM 24-22-00/201)
S862-001
 - (2) Open these circuit breakers and attach DO-NOT-CLOSE tags:
 - (a) On the P11 panel:
 - 1) 11J7, FLIGHT RECORDER AC
 - 2) 11J8, FLIGHT RECORDER DC
- S 012-233
- (3) To get access to the FDR, lower the ceiling panel No. 1 above the aft galley (AMM 25-22-02/401).
 - (a) Make sure the HHDLU power switch is OFF.
- S 422-226
- (4) Connect the connector of the HHDLU cable to the FDR ATE connector.
- S 422-227
- (5) Install the removable media into the HHDLU.
- S 862-184
- (6) Remove the DO-NOT-CLOSE tags and close these circuit breakers:
 - (a) On the P11 panel:
 - 1) 11J7, FLIGHT RECORDER AC
 - 2) 11J8, FLIGHT RECORDER DC
- S 862-185
- (7) Set the ON-NORM-TEST switch on the flight recorder control panel (FRCP) to the ON position.
- S 862-186
- (8) Set the red power switch, installed adjacent to the HHDLU's RS-422 port, to the ON position.
- NOTE: When power is first applied to the HHDLU, the HHDLU display will not be on. After approximately 30 seconds. The HHDLU display will show the main menu.
- (a) Make sure the HHDLU display shows DNLD in the main menu.

F. Procedure to include instructions on allocating correct filename for ease of replay.

- S 912-187
- (1) Press the DNLD key.
 - (a) Make sure that the DOWNLOAD MENU shows on the display.
 - (b) The HHDLU will suggest a filename for the download, this filename is described alongside FILE: display.
 - (2) Change the filename.

NOTE: The recommended filename uses aircraft tail number and date e.g. MRJ15037.DLU for G-BMRJ downloaded on 15 March 1997. The first three characters of the filename must be the last three letters of the aircraft registration. The extension (.DLU) must NOT be changed.

- (a) Press the FILE key. The display will show the current filename with the ^ symbol under the first character.
 - (b) Move the ^ cursor under the character to be changed by using the <- or -> keys then press the SEL key.
 - (c) The MODIFY CHARACTER screen will be displayed. Press the <- or -> keys to scroll the selected character until the required character is displayed.
 - (d) When the correct character is displayed press CHNG key. The display will return to the SELECT POSITION display
 - (e) If further characters need to be changed repeat steps (b). to (d). When the filename is correct press the DONE key.
 - (f) The DOWNLOAD MENU should be displayed. Ensure that the filename is correct.
- (3) Write the filename with the other information required on the download record sheet.
 - (4) Press the GO key.
 - (a) The DOWNLOADING menu should be displayed and the data dump will begin. The number of blocks left to transfer will be counted down. The REC BLKS and XFER BLKS fields will change during the copy procedure. The download will take about 11 minutes.
 - (b) On completion, the DOWNLOAD COMPLETE message will be displayed, press any key and the initial power on menu will be displayed.
 - (5) Return Download Disk to BA FDR Group for processing. Disks are returned to FDR via the Stores (TIME) system.

- NOTES:
1. If further aircraft downloads are to be carried out the Download Disk may be left in the HHDLU and used for up to five recorder downloads.
 2. Once the Download Disk is full, or if no further downloads are required, the disk must be removed and routed to the Flight Data Recording Department for readout.
 3. If a Download Disk is used for more than one download, it must be forwarded to the FDR group within 72 hours of the first download that was carried out on the disk.

- G. Put the Airplane to Its Usual Condition
 - S 862-229
 - (1) At the P61 panel, set the FRCP to the NORM position.
S 862-230
 - (2) Disconnect the interface cable from the FDR.
S 862-231
 - (3) Put the cover on the FDR ATE connector.
S 862-232
 - (4) Remove electrical power if it is not necessary (AMM 24-22-00/201).

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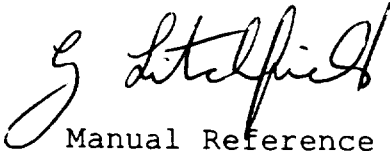
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MAINTENANCE MANUAL

TEMPORARY REVISION No. 31-584

THIS TEMPORARY REVISION IS ISSUED BY BRITISH AIRWAYS ENGINEERING (TECHNICAL INFORMATION SERVICES, G2, TBA, S401, P. O. BOX 10, HEATHROW AIRPORT, HOUNSLOW, MIDDLESEX TW6 2JA) AND COMPLIES WITH BCAR'S CHAPTER A5-3, B5-3 AND/OR TSS No. 0-2 AS REQUIRED. CAA DESIGN APPROVAL No. DA1/8566/78.



For CHIEF ENGINEER QUALITY AND TRAINING

Manual Reference 31-35-01-2 Page 201

REASON FOR REVISION

To add information regarding the QAR fitted as part of Mod 31G118.

ACTION

1. General

- A. There are three task in this procedure. The first task is the removal of the tape cartridge from the QAR. The second task is the installation of the tape cartridge in the QAR. The third task is to clean the magnetic head of the QAR.
- B. The QAR is installed on the E3-3 rack in the main E/E bay.

TASK 31-35-01-002-001

2. Remove the Tape Cartridge from the QAR

A. References

- (1) AMM 24-22-00/201, Electrical Power Control

B. Access

- (1) Location Zone

119 Main Equipment Centre (Left)

C. Procedure

S 862-002

- (1) Supply electrical power (AMM 24-22-00/201).

S 862-003

- (2) Make sure these circuit breakers are closed:

(a) On the overhead equipment panel P11:

- 1) 11J7, FLIGHT RECORDER AC
- 2) 11J8, FLIGHT RECORDER DC

S 012-038

- (3) Open the QAR access panel.

S 702-039

- (4) Make sure the power 'ON' lamp and the 'READY' Lamp comes on, and the busy lamp flashes about once per second.

Originator: M Sinclair
Reference: EOC-757-031G118
Workbook: CC 31-005

31-35-01-2
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TEMPORARY REVISION No. 31-584 (Cont'd)

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S 862-040

- (5) Push the 'EJECT' switch until the cassette is electrically driven out of the recorder.

NOTE: It is not possible to remove the cassette without electrical power.

S 702-041

- (6) Make sure both the 'BUSY' and 'READY' lamps goes off.

S 942-042

- (7) Remove the cassette and put it in a protective container.

S 412-043

- (8) Close the recorder access panel.

TASK 31-35-01-402-052

3. Install the QAR Tape Cartridge

A. References

- (1) AMM 24-22-00 201, Electrical Power Control

B. Access

- (1) Location Zone
119 Main Equipment Centre (Left)

C. Procedure

S 862-041

- (1) Make sure these circuit breakers are closed:

(a) On the P11 panel:

1. LIGHT RECORDER AC
2. LIGHT RECORDER DC

S 412-044

- (2) Open the recorder door.

S 702-045

- (3) Make sure the 'POWER ON' lamp comes on.

S 032-046

- (4) Remove the cassette from its protective container.

S 432-047

- (5) Install the cassette with the metal plate of the cassette, on the left hand side

S 702-048

- (6) Make sure the cassette is electrically drawn into the recorder.

S 702-049

- (7) Make sure the 'BUSY' and 'READY' lights comes on while the recorder runs.

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S 702-050

- (8) Make sure the busy lamp change to a steady flash after a few seconds.

S 412-051

- (9) Close the recorder access panel.

NOTE: Circuit breaker do not need to be closed to install the tape cassette. The cassette is electrically locked on power up.

TASK 31-35-01-102-030

4. Cleaning Magnetic Head

A. Procedure to Clean the Magnetic Head

S 862-031

- (1) Supply electrical power (AMM 24-22-00/201).

S 862-032

- (2) Make sure these circuit breakers are closed:
 - (a) On the P11 panel:
 - 1) 11J7, FLIGHT RECORDER AC
 - 2) 11J8, FLIGHT RECORDER DC

S 022-033

- (3) Remove the DC300XL Cassette as outlined in Section 3.

S 102-034

- (4) With a SAFE10 cleaner sachet and spatula, clean the head which is situated in the lower half of the cassette orifice.

NOTE: Avoid the micro switches situated in the upper half of the orifice.

S 432-035

- (5) Install the DC300XL Cassette as outlined in Section 4.

S 862-036

- (6) Remove electrical power if it is not necessary (AMM 24-22-00/201).

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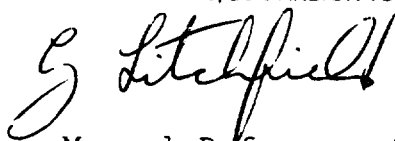
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12 December, 1997

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TEMPORARY REVISION No. 31-585

THIS TEMPORARY REVISION IS ISSUED BY BRITISH AIRWAYS ENGINEERING (TECHNICAL INFORMATION SERVICES, G2, TBA, S401, P. O. BOX 10, HEATHROW AIRPORT, HOUNSLOW, MIDDLESEX TW6 2JA) AND COMPLIES WITH BCAR'S CHAPTER A5-3, B5-3 AND/OR TSS No. 0-2 AS REQUIRED. CAA DESIGN APPROVAL No. DAI/8566/78.



For CHIEF ENGINEER QUALITY AND TRAINING

Manual Reference 31-35-01-4 Page 401

REASON FOR REVISION

To add information regarding the QAR fitted as part of Mod 31G118.

ACTION

1. General

- A. There are two tasks in this procedure. The first task is the removal of the Quick Access Recorder (QAR). The second task is the installation of the QAR.
- B. The recorder, Part Nr. D1766, is installed on the E3-3 equipment rack located in the main equipment centre E3-3.

TASK 31-35-01-004-001

2. Remove the QAR_

A. Access

(1) Location Zone

119 Main Equipment Centre (Left)

B. Procedure

S 014-040

- (1) Open these circuit breakers and attach the DO-NOT-CLOSE tags:
 - (a) On the overhead circuit breaker panel, P11:
 - 1) 11J7, FLIGHT RECORDER AC
 - 2) 11J8, FLIGHT RECORDER DC
 - 3) 11J34, ACMS SENSOR

S 014-041

- (2) Remove the QAR as follows:

CAUTION: DO NOT TOUCH THE CONNECTOR PINS OR OTHER CONDUCTORS ON THE QAR. IF YOU TOUCH THESE CONDUCTORS, ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE QAR.

- (a) Remove the screw from the clamp nuts on the recorder mounting tray front panel hold-down hooks.
- (b) Using the front panel handle, draw the recorder forward to clear the rear connector and locating pins. Remove the recorder from the racking. Do not grip the electrical connector shell at the rear of the unit as the sockets are easily bent.

Originator: M Sinclair
Reference: EOC-757-031G118
Workbook: CC 31-005

31-35-01-4
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TEMPORARY REVISION No. 31-585 (Cont'd)

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- (c) Fit dust covers to electrical connector.
- (d) Remove the screws from the clamp nuts on the mounting tray.
- (e) Pull the recorder away from the rear connector.
- (f) Remove the recorder from the equipment rack.

NOTE: Do not touch the electrical connector shell at the rear of the unit as the sockets are easily bent.

- (g) Put the dust covers on the electrical connector.

TASK 31-35-01-404-035

3. Install the QAR

A. References

- (1) AMM 20-10-01/401, EE Rack Mounted Components
- (2) AMM 24-22-00/201, Electrical Power Control

B. Access

- (1) Location Zone
119 Main Equipment Centre (Left)

C. Procedure

S 204-045

- (1) Make sure these circuit breakers are not closed:
 - (a) On the P11 panel:
 - 1) 11J7, FLIGHT RECORDER AC
 - 2) 11J8, FLIGHT RECORDER DC
 - 3) 11J34, ACMS SENSOR

S 414-044

- (2) Install the QAR as follows:

CAUTION: DO NOT TOUCH THE CONNECTOR PINS OR OTHER CONDUCTORS ON THE QAR. IF YOU TOUCH THESE CONDUCTORS, ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE QAR.

- (a) Remove the unit dust covers. Inspect connector for bent pins.
- (b) Place the recorder on the mounting tray and align the recorder with the backplate locating pins. Engage the hold down hooks with the clamp nuts and tighten the nuts to secure the recorder on the mounting tray in accordance with 20-10-01.
- (c) Remove the unit dust cover from the electrical connector.
- (d) Make sure the pins on the electrical connector are not bent.
- (e) Put the recorder on the mounting tray.
- (f) Align the recorder with the backplate pins.
- (g) Engage the hold down hooks with the clamp nuts.
- (h) Refer to 20-10-01 for tighten the nuts to the recorder on the mounting tray.

S 864-047

- (3) Supply electrical power (AMM 24-22-00/201).

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TEMPORARY REVISION No. 31-585 (Cont'd)

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S 414-046

- (4) Remove the DO-NOT-CLOSE tags and close these circuit breakers:
 - (a) On the P11 panel:
 - 1) 11J7, FLIGHT RECORDER AC
 - 2) 11J8, FLIGHT RECORDER DC
 - 3) 11J34, ACMS SENSOR
 - (b) Insert a cassette and check that the "POWER ON" Lamp illuminates.
 - (c) Close the front panel door of the QAR.

S 864-019

- (5) Remove electrical power if it is not necessary (AMM 24-22-00/201).

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9 March, 1998

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TEMPORARY REVISION No. 31-592

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For CHIEF ENGINEER QUALITY AND TRAINING

Manual Reference 31-41-00 Page 3

REASON FOR REVISION

Revised MM description due to Mod 31G022

ACTION

At paragraph 2 G (1) remove the following text:-

"The Maintenance panel functions only on the ground"

Originator: S Craft
Reference: 757-W-MCR-GC-98-0146
Workbook: CC 31-009

31-41-00
Page 3

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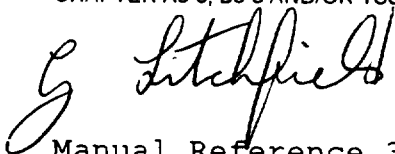
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10 March, 1998

MAINTENANCE MANUAL

TEMPORARY REVISION No. 31-595

THIS TEMPORARY REVISION IS ISSUED BY BRITISH AIRWAYS ENGINEERING (TECHNICAL INFORMATION SERVICES, G2, TBA, S401, P. O. BOX 10, HEATHROW AIRPORT, HOUNSLOW, MIDDLESEX TW6 2JA) AND COMPLIES WITH BCAR'S CHAPTER A5-3, B5-3 AND/OR TSS No. 0-2 AS REQUIRED. CAA DESIGN APPROVAL No. DAI/8566/78.



For CHIEF ENGINEER QUALITY AND TRAINING

Manual Reference 31-41-00-5 Page 507

REASON FOR REVISION

Revised MM procedure due to the embodiment of Mod 31G022.

ACTION

Replace the existing text with the following at sections 3 F (2) (t) and (u):-

- (t) For Aircraft GUI002. Push the TEST switch on the EICAS MAINT panel. Make sure that the TEST page shows on the upper display.
For Aircraft GUI001, GUI003 to GUI011 AND GUI115. Push the TEST switch on the EICAS MAINT panel.
- (u) For Aircraft GUI002. Push the TEST switch on the EICAS MAINT panel. Make sure that the TEST page clears from the upper display.
For Aircraft GUI001, GUI003 to GUI011 AND GUI115. Make sure that there are no changes in the top or bottom displays.

Originator: S Craft

Reference: 757-w-MCR-GC-98-0147

Workbook: CC 31-007

31-41-00-5

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TEMPORARY REVISION No. 31-610

THIS TEMPORARY REVISION IS ISSUED BY BRITISH AIRWAYS ENGINEERING (TECHNICAL INFORMATION SERVICES, G2, TBA, S401, P. O. BOX 10, HEATHROW AIRPORT, HOUNSLOW, MIDDLESEX TW6 2JA).
CAA DESIGN APPROVAL No. DAI/8566/78.

Manual Reference 31-41-03 Page 401 para 2 and 3

(Tasks 31-41-03-004-002 and 31-41-03-404-007)

REASON FOR REVISION

To carry out the requirements of the Safety and Technical Strategy Board Cross-Connection Project G/38/98.

ACTION

After the existing paragraph 2.C.(4) and before 2.C.(5) add the following:

CAUTION: CROSS CONNECTION POSSIBILITY WHEN WORKING WITH THIS COMPONENT. CLEARLY IDENTIFY CONNECTIONS UPON DISCONNECTION AND FUNCTION CHECK UPON RECONNECTION.

After the existing paragraph 3.C.(1)(a) and before 3.C.(2) add the following:

CAUTION: CROSS CONNECTION POSSIBILITY WHEN WORKING WITH THIS COMPONENT. POSITIVELY IDENTIFY CONNECTIONS PRIOR TO RECONNECTION.

Originator: Gary Kerr
Reference: 757-W-MCR-31-GK-99-440 31-41-03
Workbook: JS 31-027 Page 401

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TEMPORARY REVISION No. 31-607

THIS TEMPORARY REVISION IS ISSUED BY BRITISH AIRWAYS ENGINEERING (TECHNICAL INFORMATION SERVICES, G2, TBA, S401, P. O. BOX 10, HEATHROW AIRPORT, HOUNSLOW, MIDDLESEX TW6 2JA).
CAA DESIGN APPROVAL No. DAI/8566/78.

Manual Reference 31-41-05 Page 401 para 2 and 3

(Tasks 31-41-05-004-001 and 31-41-05-404-007)

REASON FOR REVISION

To carry out the requirements of the Safety and Technical Strategy Board Cross-Connection Project G/38/98.

ACTION

After the existing paragraph 2.B.(3) and before 2.B.(4) add the following:

CAUTION: CROSS CONNECTION POSSIBILITY WHEN WORKING WITH THIS COMPONENT. CLEARLY IDENTIFY CONNECTIONS UPON DISCONNECTION AND FUNCTION CHECK UPON RECONNECTION.

After the existing paragraph 3.C.(1)(a) and before 3.C.(2) add the following:

CAUTION: CROSS CONNECTION POSSIBILITY WHEN WORKING WITH THIS COMPONENT. POSITIVELY IDENTIFY CONNECTIONS PRIOR TO RECONNECTION.

Originator: Gary Kerr
Reference: 757-W-MCR-31-GK-99-444 31-41-05
Workbook: JS 31-026 Page 401

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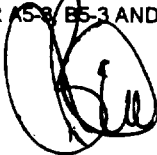
**BRITISH AIRWAYS
(NB322) B757**

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18 August, 1997

MAINTENANCE MANUAL

TEMPORARY REVISION No. 31-582

THIS TEMPORARY REVISION IS ISSUED BY BRITISH AIRWAYS QUALITY AND TECHNICAL SERVICES AND COMPLIES WITH BCAR'S CHAPTER ASR/B5-3 AND/OR TSS No. 0-2 AS REQUIRED. CAA DESIGN APPROVAL No. DAI/8566/78.



For CHIEF ENGINEER QUALITY AND TECHNICAL SERVICES.

Manual Reference 31-51-00 Page 501

This is an AMS item

REASON FOR REVISION

The AMS calls for a Confidence Check for Take-Off and Landing Configuration Warnings. This procedure does not currently exist in these aircraft's MM. This task is a copy of the check that was inserted into the MM for the BA aircraft in the MM ATP 07104.

ACTION

1. CONFIDENCE CHECK FOR "TAKE OFF" AND "LANDING" CONFIGURATION WARNINGS

A. Preparation

- (1) Ensure that all relevant circuit breakers are closed.
- (2) The EICAS is powered up.
- (3) Locate the CONFIG TEST switch on P61.

B. Take-off Configuration Warning

- (1) Check that parking brake is on.
- (2) Hold the CONFIG switch on the TEST panel P61 in the T/O position.
 - (a) Make sure the red CONFIG warning light illuminates.
 - (b) Make sure the WARNING lights on glareshield illuminate.
 - (c) Make sure the aural warning siren comes on.
 - (d) The following warning message, or a combination of messages, appear on EICAS as appropriate:-

PARKING BRAKE	Always displayed.
FLAPS	If the leading edge slats and/or trailing edge flaps are not in the take-off position.
SPOILERS	If the spoiler lever is not in the down position.
STABILIZER	If the stabilizer position is outside the take-off range.

Originator: D TREEVES

Reference: 757/W/MCR/DT/970535

Workbook: CV 31-102

31-51-00
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TEMPORARY REVISION No. 31-582 (Cont'd)

- (3) Release the CONFIG test switch.
 - (a) Make sure the red CONFIG warning light extinguish.
 - (b) Make sure the WARNING lights on glareshield extinguish.
 - (c) Make sure the aural warning siren stops.

NOTE: THE EICAS MESSAGES THAT WERE DISPLAYED ABOVE WILL REMAIN UNTIL THE AIRCRAFT IS PROPERLY CONFIGURED FOR TAKE-OFF.

C. Landing Configuration Warning

- (1) Hold the CONFIG switch on the TEST panel P61 in the LDG position.
 - (a) Make sure the red CONFIG warning light illuminates.
 - (b) Make sure the WARNING lights on glareshield illuminate.
 - (c) Make sure the aural warning siren comes on.
 - (d) Make sure the GEAR NOT DOWN warning message appears on EICAS.
- (2) Release the CONFIG test switch.
 - (a) Make sure the red CONFIG warning light extinguish.
 - (b) Make sure the WARNING lights on glareshield extinguish.
 - (c) Make sure the aural warning siren stops.
 - (d) Make sure the GEAR NOT DOWN warning message is not displayed EICAS.

D. Put the airplane back to its usual condition.

- (1) Remove electrical power if no longer required.

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102	SEP 20/92	01	102	SEP 20/98	01	105	MAR 20/95	06
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101	SEP 20/94	01	101	DEC 20/92	03	31-31-00 CONFIG 1		
102	JAN 20/98	01	102	JAN 20/98	02	501	MAY 28/07	14
103	SEP 20/94	01	31-01-86			502	MAY 28/02	12
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525	MAY 28/02	07	507	MAY 28/02	18	203	MAY 28/02	28
526	MAY 28/02	05	508	SEP 28/04	10	204	MAY 28/01	03
527	MAY 28/02	11	509	SEP 28/04	10	205	MAR 20/94	02
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532	MAY 28/02	03	514	SEP 28/02	08	R 210	JAN 20/09	05.1
533	MAY 28/02	03	515	SEP 28/02	08	R 211	JAN 20/09	06.1
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502	MAY 28/00	12	520	MAY 28/02	07	202	SEP 28/01	21
503	JAN 28/07	10	521	MAY 28/02	09	203	MAY 28/02	20
504	SEP 28/00	12	522	MAY 28/02	14	204	SEP 28/01	07
505	SEP 28/00	12	523	MAY 28/02	19	205	SEP 28/01	07
506	SEP 28/00	12	524	MAY 28/02	14	206	SEP 28/01	10
507	SEP 28/04	11	525	MAY 28/02	14	207	MAY 28/03	08
508	SEP 28/04	11	526	MAY 28/02	14	208	SEP 28/01	08
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513	JAN 28/07	11	531	MAY 28/05	09	213	JAN 28/03	08
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520	MAY 28/02	12	538	MAY 28/05	12	304	MAY 28/02	10
521	SEP 28/01	09	539	MAY 28/02	08	305	MAY 28/02	07
522	MAY 28/00	12	540	MAY 28/02	08	306	MAY 28/02	10
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528	MAY 28/00	12	202	SEP 15/85	02	403	SEP 28/01	16
529	MAY 28/00	12	203	JAN 28/02	03	404	BLANK	
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			101	SEP 20/92	04	27	SEP 20/08	06
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402	MAY 28/02	26	31-35-00			30	JAN 28/02	06
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404	MAY 28/02	25	502	SEP 20/92	05	32	JAN 28/02	02
405	MAY 28/02	26	503	JUN 20/96	03	33	SEP 28/06	05
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402	MAY 28/02	04	2	JAN 28/02	20	60	JAN 28/00	15
403	MAY 28/02	10	R 3	JAN 20/09	21.1	61	JAN 28/00	15
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408	SEP 28/04	16	8	MAR 20/92	13	102	JUN 20/91	02
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3	SEP 20/92	02	17	JAN 28/02	20	205	SEP 28/00	08
4	DEC 20/92	02	18	JAN 28/02	11	206	DEC 20/96	10
5	SEP 20/92	02	19	JAN 28/02	24	207	MAY 28/07	14
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507	SEP 28/00	02	402	JAN 28/00	02	512	JAN 28/03	26
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509	MAY 28/01	12	404	BLANK		514	JAN 28/03	01
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511	SEP 28/00	07	1	MAY 28/06	09	516	JAN 28/03	28
512	SEP 28/00	08	2	JUN 20/91	02	517	JAN 28/03	02
513	MAY 28/01	14	3	SEP 20/92	22	518	JAN 28/03	02
514	SEP 28/00	13	4	SEP 28/01	04	519	JAN 28/03	01
515	MAY 28/07	27	5	JAN 28/02	25	520	JAN 28/03	29
516	SEP 28/00	15	6	JAN 28/07	06	521	SEP 28/06	01
517	SEP 28/00	12	7	JAN 28/02	27	522	SEP 28/06	01
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403	SEP 20/94	03	12	JAN 28/02	10	527	SEP 28/00	01
404	SEP 20/94	06	13	JAN 28/02	09	528	SEP 20/98	01
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406	BLANK		15	SEP 28/01	22	530	MAY 28/99	01
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203	MAY 28/02	20	19	JAN 28/02	09	534	JAN 20/99	01
204	MAY 28/02	24	20	JAN 28/02	10	535	SEP 28/00	29
205	MAY 28/02	26	21	JAN 28/02	11	536	JAN 20/99	13
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403	MAY 28/07	10	28	JAN 28/02	05	543	SEP 28/00	13
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31-41-03			101	MAR 20/94	22	547	SEP 20/98	13
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404	MAR 20/94	01						
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402	JUN 20/91	01						
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406	BLANK							
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Component Location			
<u>INDEPENDENT INSTRUMENTS</u>	31-20-00		
CLOCKS	31-25-00		
Description and Operation		1	ALL
General		1	
Component Details		1	
Clock Switch		3	
Clocks		1	
FMC		3	
Operation		3	
BITE		5	
Control		5	
Functional Description		3	
Component Location		101	ALL
Component Index			
Component Location			
Adjustment/Test		501	ALL
Operational Test - Clocks		501	

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General		1	
Component Details		1	
Accelerometer		5	
Flight Recorder/System		5	
Relays			
Recorder - Digital Flight		7	
Data (DFDR)			
Unit - Flight Data		5	
Acquisition			
Operation		7	
Functional Description		7	
Component Location		101	ALL
Component Index			
Component Location			
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Flight Data Recorder		501	
Operational Test			
Flight Data Recorder System		507	
Test			
[*] GUI 010, 011 PRE-SB 31-0094; GUI 001-009, 012-014			
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Flight Data Recorder		501	
Operational Test			
Flight Data Recorder System		507	
Test			
[*] GUI 115			
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[*] GUI 010, 011 POST-SB 31-0094			
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FLIGHT DATA RECORDERS WITH DATASONICS ULBs		207	
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[*] GUI 115			
PANEL - FLIGHT RECORDER CONTROL Removal/Installation	31-31-04	401	[*]
[*] GUI 001-114			
RECORDER - FLIGHT DATA	31-31-01		
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TRANSDUCER - CONTROL COLUMN POSITION	31-31-08		
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[*] GUI 001-011			

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TRANSDUCER - RUDDER PEDAL POSITION Removal/Installation [*] GUI 001-011	31-31-10	401	[*]
TRANSMITTER - BRAKE PRESSURE Removal/Installation [*] GUI 001-011	31-31-13	401	[*]
UNIT - FLIGHT DATA ACQUISITION Servicing [*] GUI 010, 011 PRE-SB 31-0094; GUI 001-009, 012-115	31-31-03	301	[*]
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AIRPLANE CONDITION MONITORING SYSTEM	31-35-00		
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Component Details		4	
Data Management Entry Panel (DMEP)		4	
Printer		4	
Quick Access Recorder (QAR)		5	
TAPE		6	
Operation		6	
BITE		9	
Functional Description		6	
[*] GUI 115			
Component Location		101	[*]
Component Index			
Component Location			
[*] GUI 115			

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[*] GUI 115			
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[*] GUI 115			
<u>CENTRAL COMPUTERS</u>	31-40-00		
ENGINE INDICATION AND CREW	31-41-00		
ALERTING SYSTEM			
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General		1	
Configuration		3	
Component Details		3	
Cancel/Recall Switches		7	
EICAS Computers		3	
EICAS Display Pages		8	
EICAS Display Select Panel		6	
EICAS Display Units		7	
EICAS Maintenance Panel		8	
EICAS Switching Modules		3	
Master Caution Lights		6	
Operation		27	
BITE		47	
Control		59	
Functional Description		27	
Component Location		101	ALL
Component Index			
Component Location			

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Software Installation			
[*] AIRPLANES WITH -1001 THRU -9999 EICAS COMPUTERS			
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Removal/Installation		401	ALL
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SWITCH - ALTITUDE PRESSURE	31-41-08		
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General		1	
Component Details		1	
Configuration Warning Test		5	
Switch			
Discrete Warning Light		6	
GND PROX/CONFIG Gear OVRD		5	
Switch			
Loudspeakers		6	
Master Warning Lights		5	
Master Warning Reset Switch		6	
Speed Brake Handle Position		6	
Switch			
Warning Electronics Unit		1	
(WEU)			
Operation		6	
BITE		29	
Functional Description		6	
Component Location		101	ALL
Component Index			
Component Location			
Adjustment/Test		501	ALL
Takeoff Configuration Warning		542	
Test			
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Removal/Installation		401	ALL
MODULES - WARNING ELECTRONICS	31-51-04		
UNIT (WEU) CARD			
Removal/Installation		401	ALL
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POSITION			
Removal/Installation		401	ALL

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1. General

A. The data in this section, 31-01-XX, will help you find the electrical components that are installed in the electrical/electronic panels in the airplane.

NOTE: In general, the XX is the panel number.

Examples: P6 panel is in 31-01-06

P36 panel is in 31-01-36.

(1) These components are shown and identified:

NOTE: Examples of the electrical equipment numbers for these components are shown in parentheses.

- (a) Contactors (Txxxx)
- (b) Current Sensors (TSxxxx)
- (c) Modules (Mxxxxx)
- (d) Relays (Kxxxxx)
- (e) Terminal Blocks (TBxxxx)
- (f) Transformers (Txxxxx)

(2) These components are shown for reference only:

- (a) Circuit Breakers
- (b) Panel Switches

(3) The resistors and diodes that are usually installed on the terminal blocks are not shown.

B. Instructions to Help You Use the Data in this Section

(1) Assumptions

- (a) You know the electrical equipment number of the component you want to find.
- (b) You know the panel number where the component is installed.

(2) Find the Component

- (a) Figure 101A has a list of the components in order of component type and electrical equipment number.

NOTE: Figure 101 in this procedure gives you a list of the panels that are shown in this section, 31-01-XX.

- 1) Find the component in the component list.
- 2) The number below the "Fig. 102 Sht" column tells you which sheet shows the component. The (X) below the Access/Area refers to the view on Figure 102 that shows the component.
- 3) Go to the applicable Figure 102 sheet to find the illustration of the panel.

Electrical/Electronic Panels - Component Location
Figure 101 (Sheet 1)

EFFECTIVITY

ALL

31-01-00

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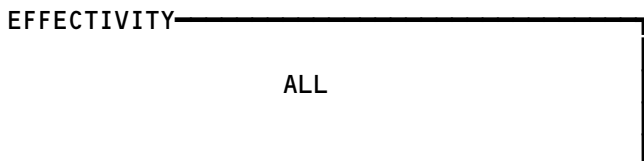
FAULT ISOLATION/MAINT MANUAL

- (b) Figure 102 shows the location of the panel and the components that are in the panels.

NOTE: Figure 102 in this procedure shows the location of the panels that are in this section, 31-01-XX.

- 1) These illustrations will show the area that contains the component.
- 2) The list of components shown for each area on Fig. 102 are in numeric order to help you find the component. They are not listed in the order that they are installed on the panel.
- 3) Use the placards in the panel to identify the specific location of the component.

Electrical/Electronic Panels - Component Location
Figure 101 (Sheet 2)



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ELECTRICAL/ELECTRONIC PANELS

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	AMM/FIM REFERENCE
E2, MAIN EQUIPMENT CENTER	2	1	119BL, MAIN EQUIP CTR, E2	31-01-12
E6, AFT EQUIPMENT CENTER	2	1	822, AFT CARGO COMPT, E6	31-01-86
P6, POWER DISTRIBUTION PANEL	2	1	FLT COMPT, RIGHT SIDE	31-01-06
P26, LIGHTING EQUIPMENT PANEL	2	1	119BL, FLIGHT COMPARTMENT	31-01-26
P31, LEFT GENERATOR POWER PANEL	2	1	119BL, MAIN EQUIP CTR, CENTER	31-01-31
P32, RIGHT GENERATOR POWER PANEL	2	1	119BL, MAIN EQUIP CTR, RIGHT SIDE	31-01-32
P33, MISCELLANEOUS ELECTRICAL EQUIPMENT PANEL	2	1	119BL, MAIN EQUIP CTR, CENTERLINE	31-01-33
P34, APU EXTERNAL POWER PANEL	2	1	119BL, MAIN EQUIP CTR, LEFT OF CENTERLINE	31-01-34
P36, LEFT MISCELLANEOUS ELECTRICAL EQUIPMENT PANEL	2	1	119BL, MAIN EQUIP CTR	31-01-36
P37, RIGHT MISCELLANEOUS ELECTRICAL EQUIPMENT PANEL	2	1	119BL, MAIN EQUIP CTR	31-01-37
P65, MISCELLANEOUS ELECTRICAL EQUIPMENT	2	1	119BL, MAIN EQUIP CTR, LEFT SIDE	31-01-65
P70, MISCELLANEOUS ELECTRICAL EQUIPMENT	2	1	119BL, MAIN EQUIP CTR, LEFT SIDE	31-01-70
P71, HYDRAULIC GENERATOR POWER PANEL	2	1	119BL, MAIN EQUIP CTR	31-01-71

Electrical/Electronic Panels - Component Index
Figure 101A

EFFECTIVITY

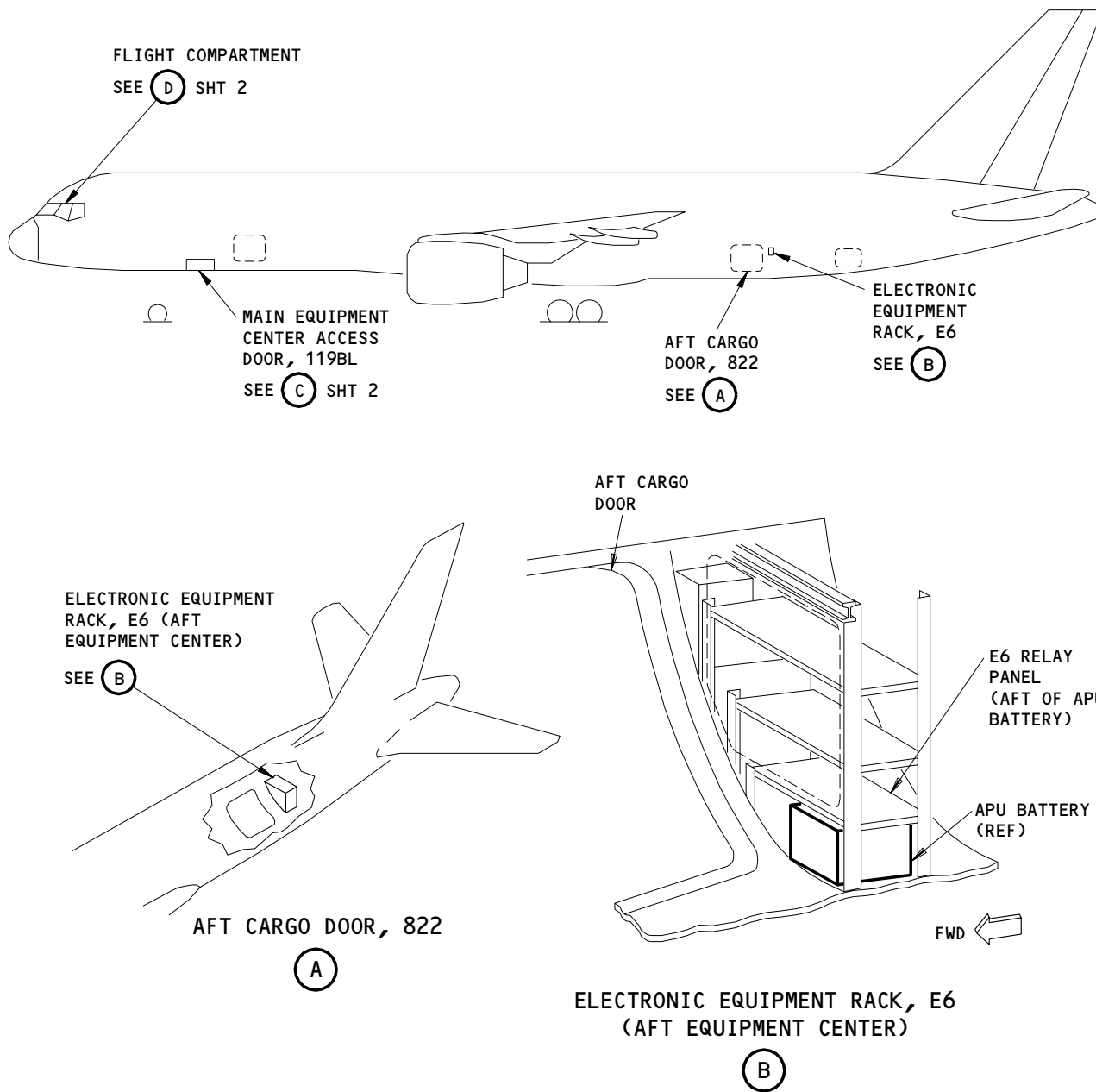
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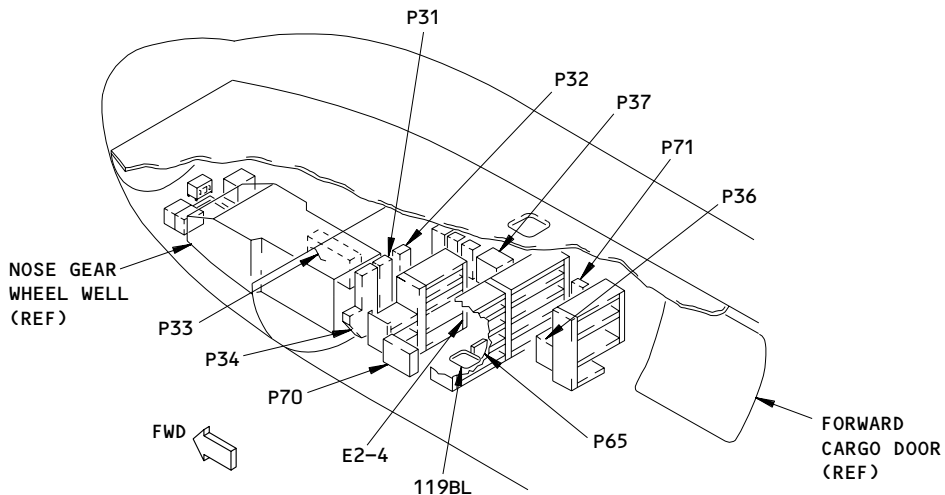
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Electrical/Electronic Panels - Component Location
Figure 102 (Sheet 1)

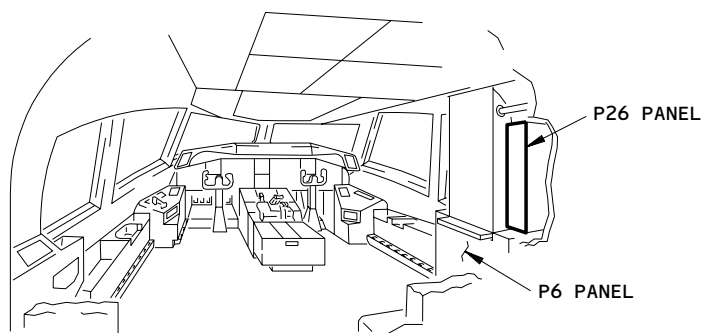
EFFECTIVITY	ALL

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MAIN EQUIPMENT CENTER

(C)



FLIGHT COMPARTMENT

(D)

Electrical/Electronic Panels - Component Location (Details from Sht 1)
Figure 102 (Sheet 2)

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POWER DISTRIBUTION PANEL, P6

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	AMM REFERENCE
MODULE -			FLT COMPT, P6	
M540		1	(C)	*
M10213		1	(A)	*
M10374		1	(A)	*
M10375		1	(A)	*
RELAY -			FLT COMPT, P6	
K104		1	(A)	*
K105		1	(A)	*
K106		1	(A)	*
K107		1	(C)	*
K108		1	(A)	*
K109		1	(B)	*
K110		1	(B)	*
K113		1	(A)	*
K115		1	(B)	*
K122		1	(C)	*
K123		1	(C)	*
K137		1	(B)	*
K138		1	(B)	*
K10416		1	(B)	*
K10424		1	(B)	*
K10425		1	(B)	*
K10588		1	(A-A)	*
K10589		1	(A-A)	*
K10679		1	(A-A)	*
TERMINAL BLOCK -	2		FLT COMPT, P6	
TB24		1	(A)	*
TB5007		1	(A)	*
TB5008		1	(A)	*
TB5009		1	(A)	*
TB5012		1	(A)	*
TB5013		1	(A)	*
TB5014		1	(A)	*
TB5016		1	(A)	*
TB5017		1	(A)	*
TRANSFORMER -			FLT COMPT, P6	
T106		1	(A)	*
T108		1	(A)	*
T10040		1	(A)	*
T10041		1	(A)	*

* SEE THE WDM EQUIPMENT LIST

NOTE: THE (X) BELOW THE ACCESS/AREA REFERS TO THE VIEW SHOWN ON FIG. 102. THIS HELPS YOU FIND THE COMPONENTS ON THE ILLUSTRATION. FOR EXAMPLE, (A) REFERS TO VIEW A.

Power Distribution Panel, P6 - Component Index
Figure 101

EFFECTIVITY

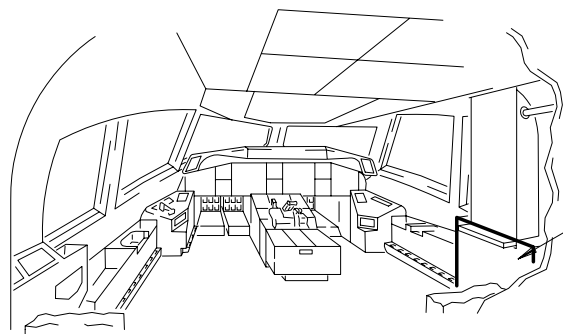
ALL

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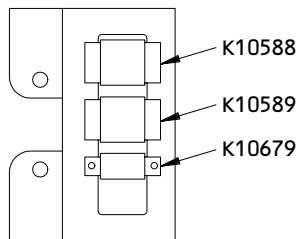
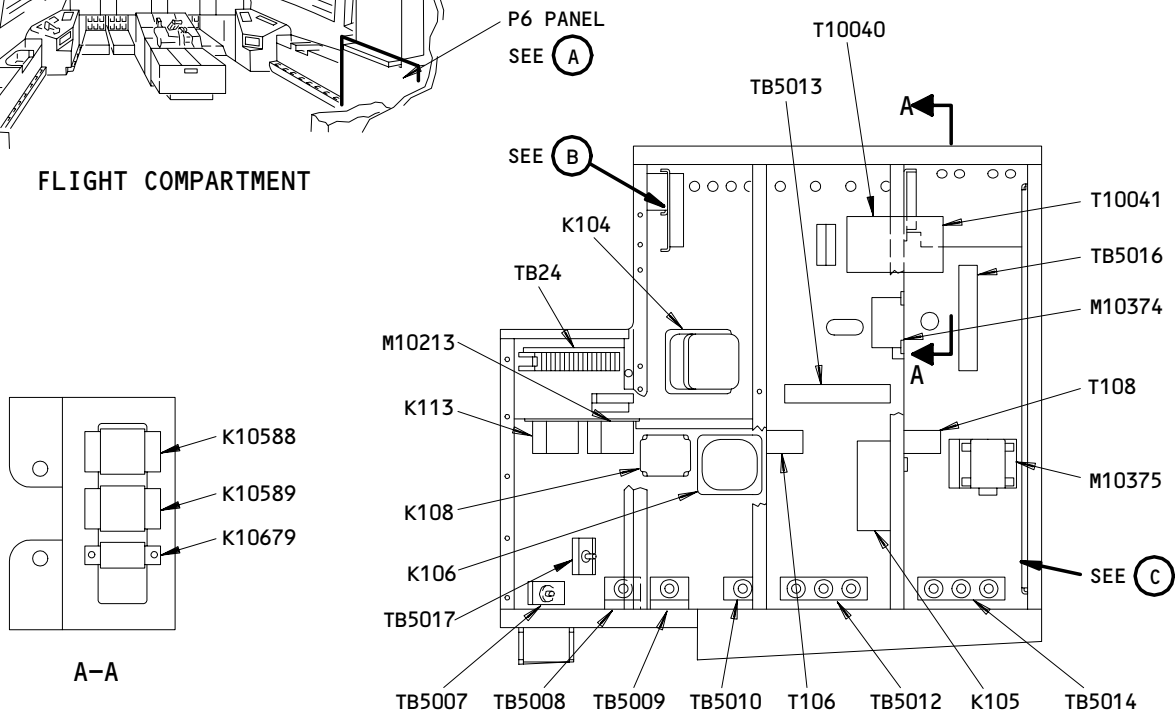
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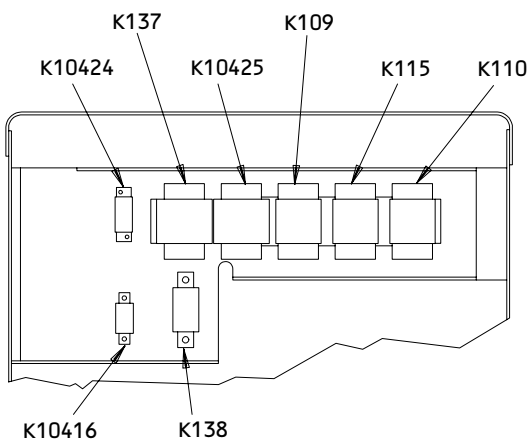
FLIGHT COMPARTMENT



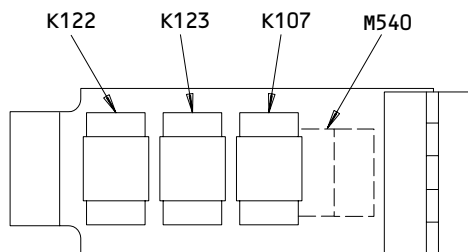
A-A

P6 PANEL

(A)



(B)



(C)

Power Distribution Panel, P6 - Component Location
Figure 102

EFFECTIVITY

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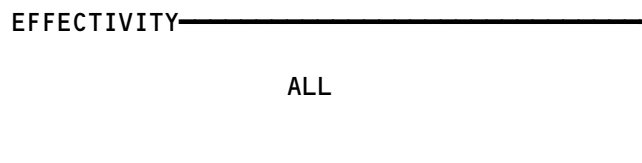
E2 ELECTRONIC SHELF

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	AMM REFERENCE
RELAY - K10802 K10803	--	1 1	119BL, MAIN EQUIP CTR, E2	* *

* SEE THE WDM EQUIPMENT LIST

NOTE: THE (X) BELOW THE ACCESS/AREA REFERS TO THE VIEW SHOWN ON FIG. 102. THIS HELPS YOU FIND THE COMPONENTS ON THE ILLUSTRATION. FOR EXAMPLE, (A) REFERS TO VIEW A.

E2 Electronic Shelf - Component Index
Figure 101



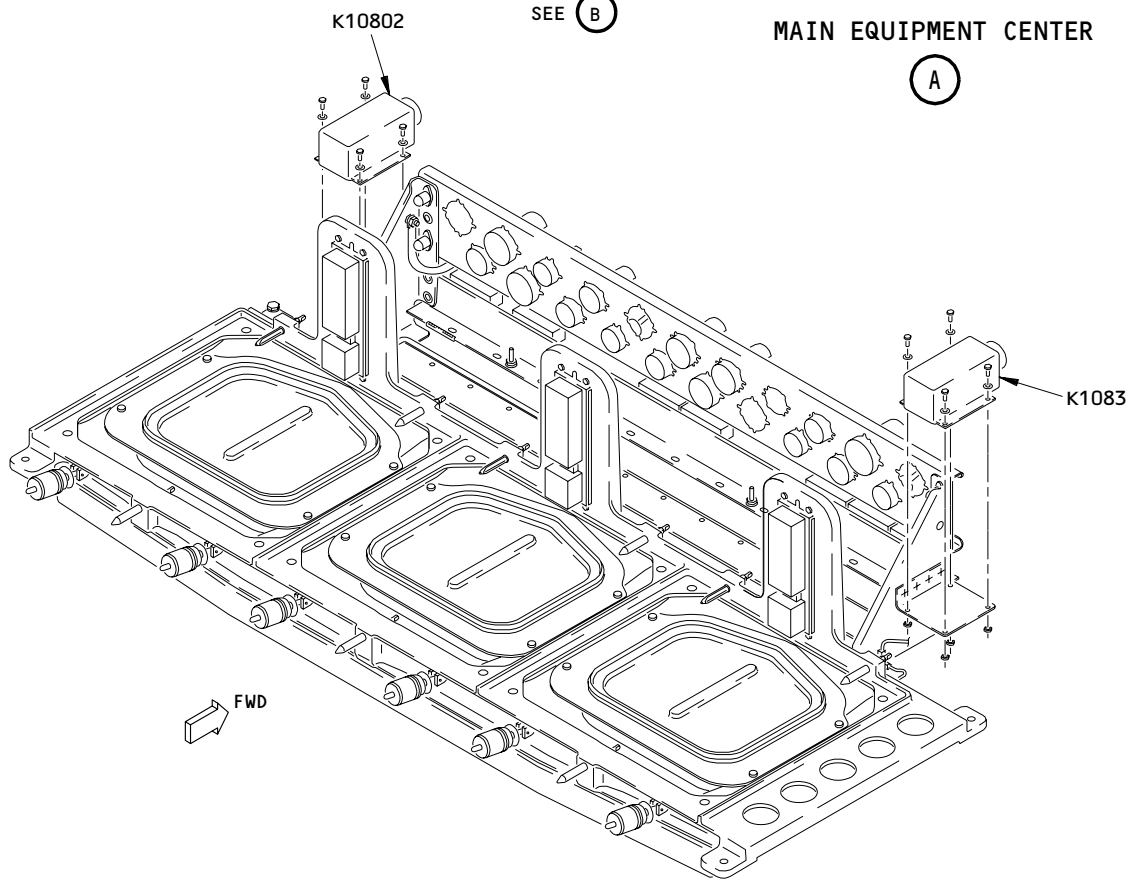
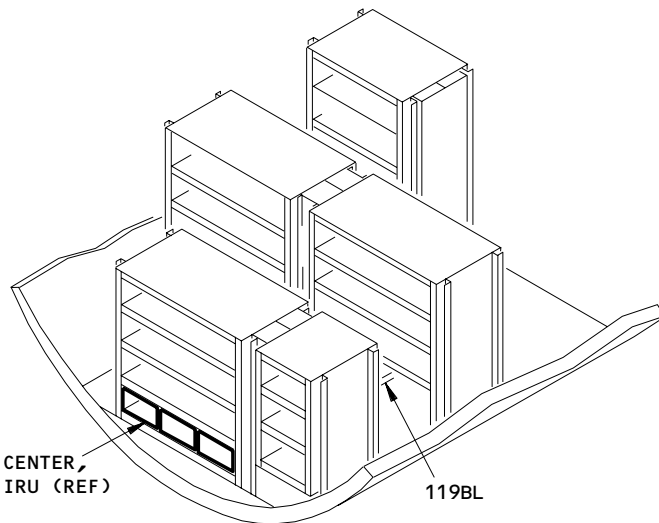
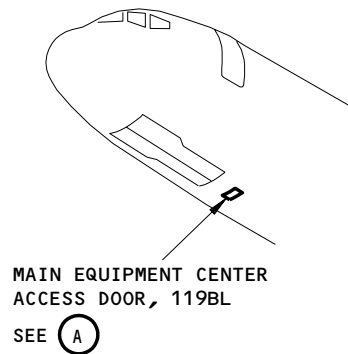
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ELECTRONIC SHELF (E2-4)

E2 Electronic Shelf - Component Location
Figure 102

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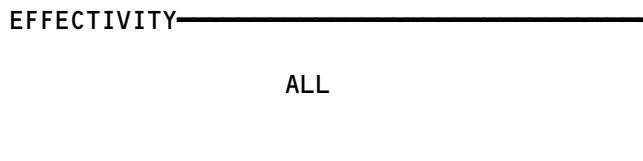
LIGHTING EQUIPMENT PANEL, P26

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	REFERENCE
MODULES -			FLT COMPT, P26	
M10261		1	(A)	*
M10262		1	(A)	*
M10263		1	(A)	*
M10264		1	(A)	*
M10265		1	(A)	*
M10266		1	(A)	*
M10267		1	(A)	*
M10268		1	(A)	*
M10269		1	(A)	*
M10270		1	(A)	*
M10438		1	(A)	*
M10480		1	(A)	*
RELAYS -			FLT COMPT, P26	
K10137		1	(A)	*
K10138		1	(A)	*
K10139		1	(A)	*
K10140		1	(A)	*
K10141		1	(A)	*
K10142		1	(A)	*
K10143		1	(A)	*
K10144		1	(A)	*
K10145		1	(A)	*
K10146		1	(A)	*
K10147		1	(A)	*
K10148		1	(A)	*
K10149		1	(A)	*
K10150		1	(A)	*
K10151		1	(A)	*
K10152		1	(A)	*
K10153		1	(A)	*
K10155		1	(A)	*
K10156		1	(A)	*
K10271		1	(A)	*
K10272		1	(A)	*
K10274		1	(A)	*
K10451		1	(A)	*
K10452		1	(A)	*

* SEE THE WDM EQUIPMENT LIST

NOTE: THE (X) BELOW THE ACCESS/AREA REFERS TO THE VIEW SHOWN ON FIG. 102. THIS HELPS YOU FIND THE COMPONENTS ON THE ILLUSTRATION. FOR EXAMPLE, (A) REFERS TO VIEW A.

Lighting Equipment Panel, P26 - Component Index
 Figure 101

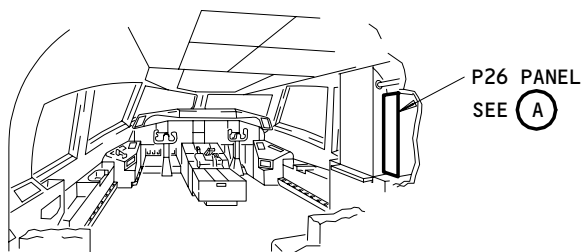


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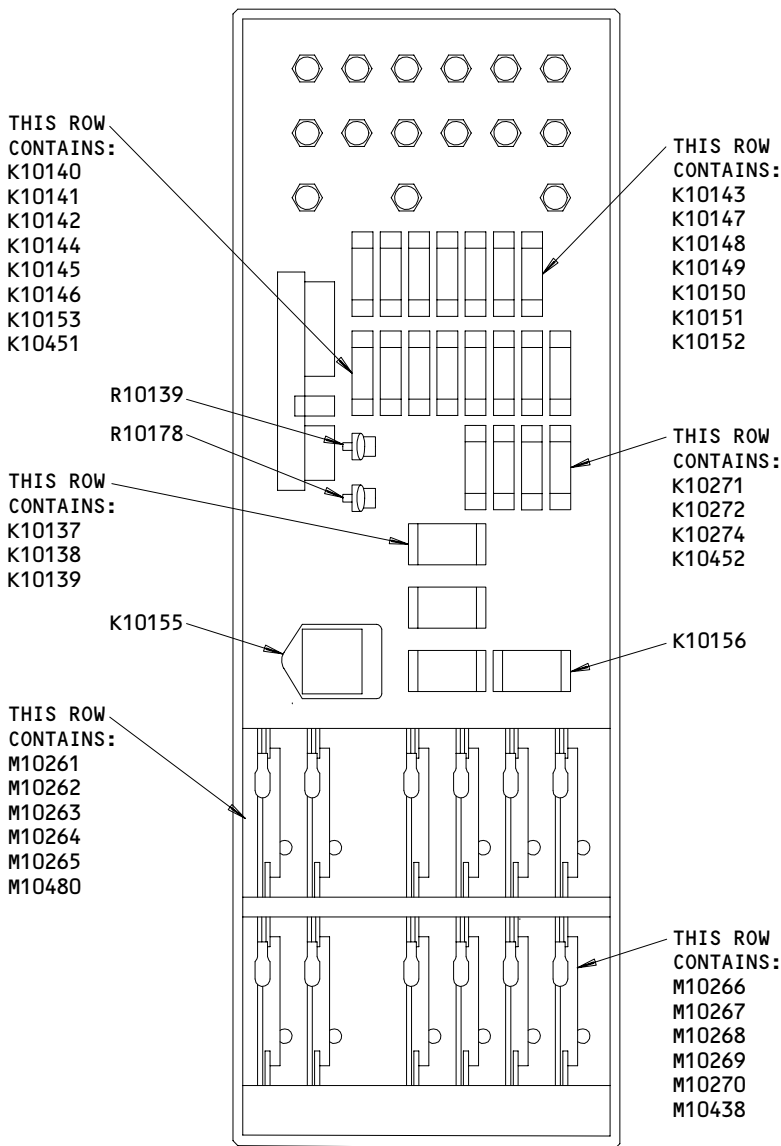
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FLIGHT COMPARTMENT



P26 PANEL



Lighting Equipment Panel, P26 - Component Location
Figure 102

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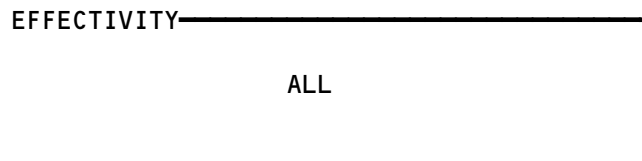
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LEFT GENERATOR POWER PANEL, P31

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	AMM REFERENCE
MODULE - M227 M10005 M10006 M10561	2	1 1 1 1	119BL, MAIN EQUIP CTR, P31	* * * *
RELAY - K199 K415 K526 K10136	2	1 1 1 1	119BL, MAIN EQUIP CTR, P31	* * * *
TERMINAL BLOCK - TB131	2	1	119BL, MAIN EQUIP CTR, P31	*
TRANSFORMER - T105 T112 T127 T155 T157	2	1 1 1 1 1	119BL, MAIN EQUIP CTR, P31	* * * * *

* SEE THE WDM EQUIPMENT LIST

Left Generator Power Panel, P31 - Component Index
 Figure 101



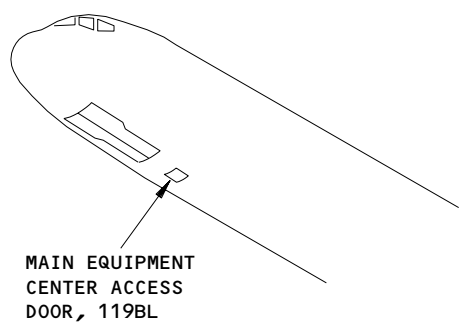
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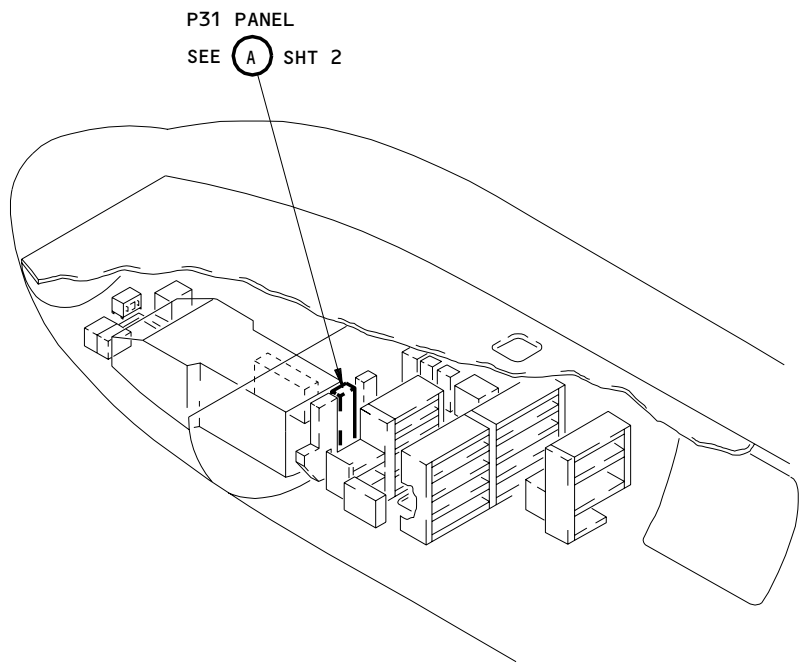
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MAIN EQUIPMENT
 CENTER ACCESS
 DOOR, 119BL



P31 PANEL
 SEE (A) SHT 2

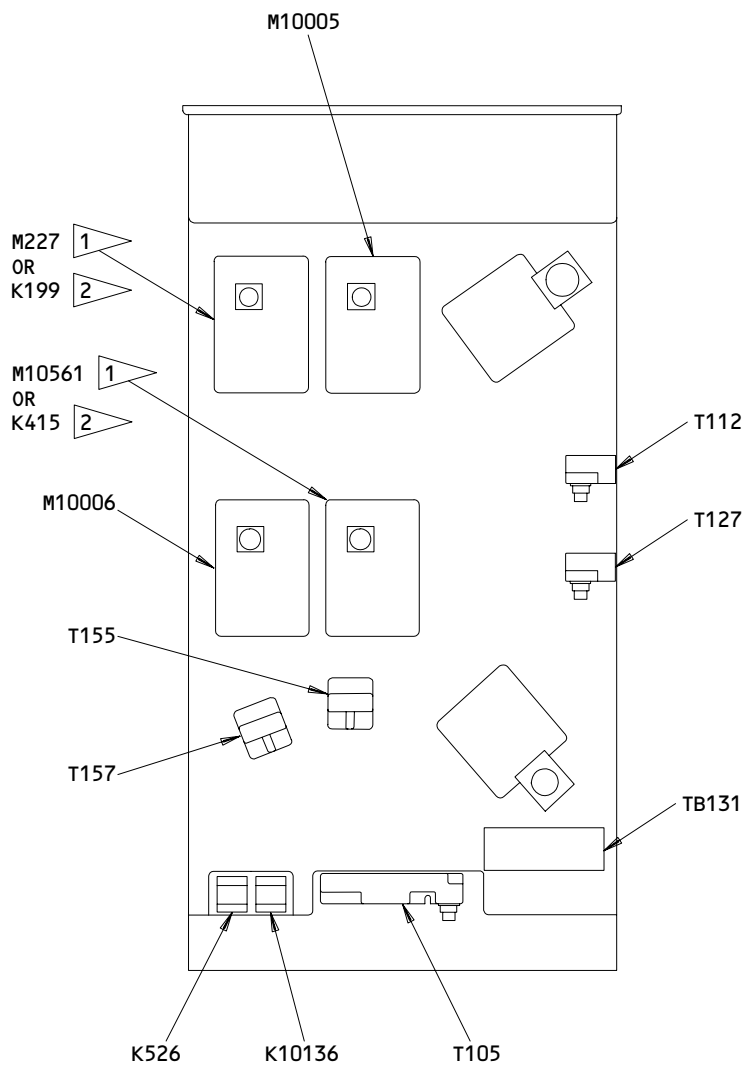
MAIN EQUIPMENT CENTER

Left Generator Power Panel, P31 - Component Location
 Figure 102 (Sheet 1)

EFFECTIVITY	
	ALL



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P31 PANEL

(A)

-  AIRPLANES WITH MODULES INSTALLED
-  AIRPLANES WITH RELAYS INSTALLED

Left Generator Power Panel, P31 - Component Location (Detail from Sht 1)
Figure 102 (Sheet 2)

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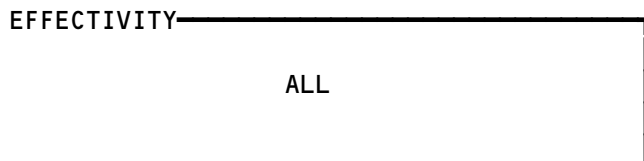
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 FAULT ISOLATION/MAINT MANUAL

RIGHT GENERATOR POWER PANEL, P32

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	AMM REFERENCE
MODULE - M225 M226 M546 M10001 M10022		1 1 1 1 1	119AL, MAIN EQUIP CTR, P32 (A)	* * * * *
RELAY - K527		1	119AL, MAIN EQUIP CTR, P32	*
TERMINAL BLOCK - TB132 TB5032		1 1	119AL, MAIN EQUIP CTR, P32	* *
TRANSFORMER - T107 T113 T128 T156		1 1 1 1	119AL, MAIN EQUIP CTR, P32	* * * *

* SEE THE WDM EQUIPMENT LIST

Right Generator Power Panel, P32 - Component Index
 Figure 101

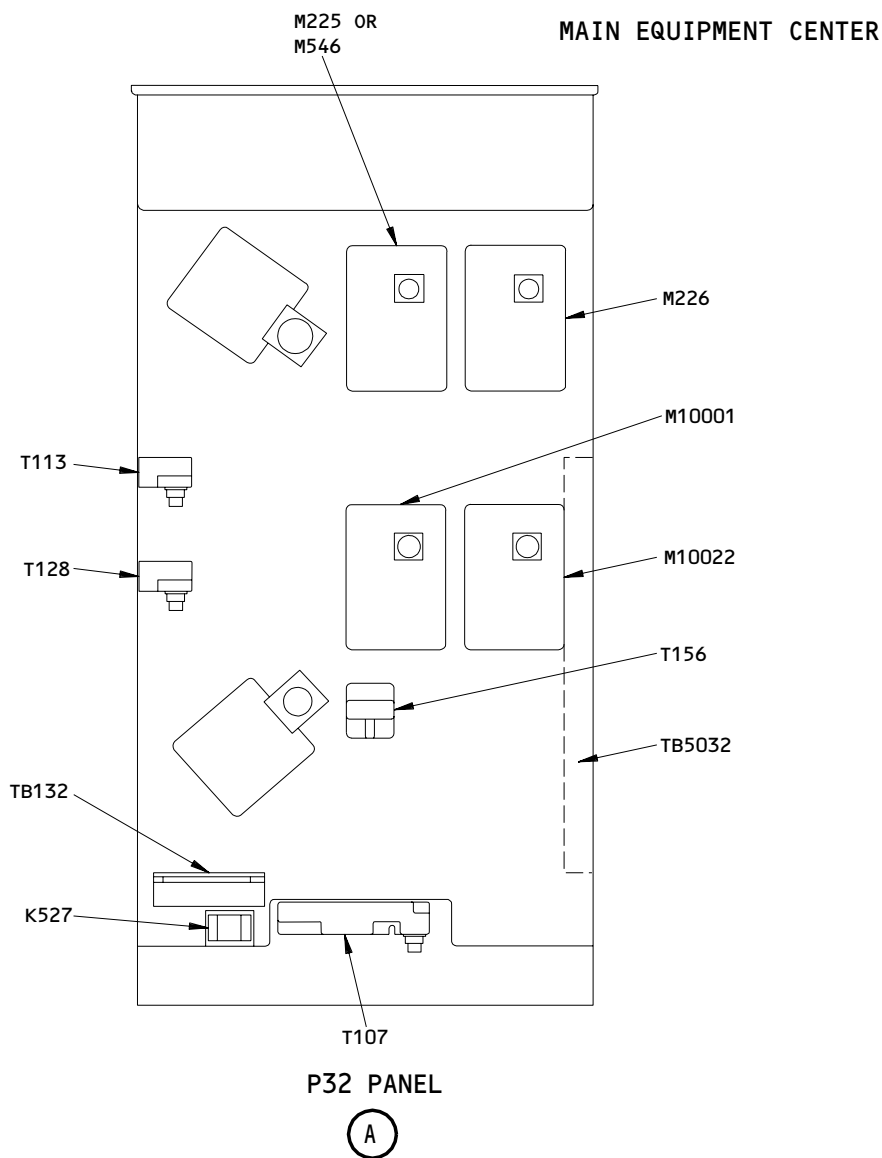
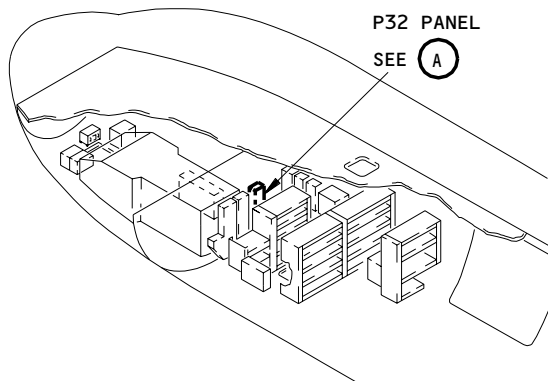
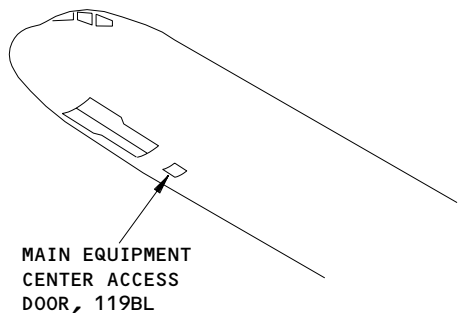


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Right Generator Power Panel, P32 - Component Location
Figure 102

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MISCELLANEOUS ELECTRICAL POWER PANEL, P33

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	REFERENCE
MODULES -	2		119BL, MAIN EQUIP CTR, P33	
M499		1	(A)	*
M10145		1	(A)	*
M10146		1	(A)	*
M10323		1	(A)	*
M10557		1	(A)	*
M10558		1	(A)	*
RELAYS -	2		119BL, MAIN EQUIP CTR, P33	
K144		1	(A)	*
K161		1	(A)	*
K179		1	(A)	*
K180		1	(A)	*
K181		1	(A)	*
K187		1	(A)	*
K190		1	(A)	*
K242		1	(A)	*
K243		1	(A)	*
K356		1	(A)	*
K357		1	(A)	*
K359		1	(A)	*
K360		1	(A)	*
K401		1	(A)	*
K420		1	(A)	*
K421		1	(A)	*
K449		1	(A)	*
K450		1	(A)	*
K452		1	(A)	*
K453		1	(A)	*
K551		1	(A)	*
K10011		1	(A)	*
K10013		1	(A)	*
K10024		1	(A)	*
K10025		1	(A)	*
K10051		1	(A)	*
K10052		1	(A)	*
K10059		1	(A)	*
K10093		1	(A)	*

* SEE THE WDM EQUIPMENT LIST

NOTE: THE (X) BELOW THE ACCESS/AREA REFERS TO THE VIEW SHOWN ON FIG. 102. THIS HELPS YOU FIND THE COMPONENTS ON THE ILLUSTRATION. FOR EXAMPLE, (A) REFERS TO VIEW A.

Miscellaneous Electrical Power Panel, P33 - Component Index
Figure 101 (Sheet 1)

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COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	REFERENCE
RELAYS (CONT) -	2		119BL, MAIN EQUIP CTR, P33	
K10094		1	(A)	*
K10095		1	(A)	*
K10097		1	(A)	*
K10098		1	(A)	*
K10104		1	(A)	*
K10110		1	(A)	*
K10111		1	(A)	*
K10157		1	(A)	*
K10253		1	(A)	*
K10265		1	(A)	*
K10494		1	(A)	*
K10714		1	(A)	*
K10715		1	(A)	*
TERMINAL BLOCKS -	2		119BL, MAIN EQUIP CTR, P33	
TB46		1		*
TB80		1		*
TB81		1		*
TRANSFORMER -	2		119BL, MAIN EQUIP CTR, P33	
T124		1	(A)	*

* SEE THE WDM EQUIPMENT LIST

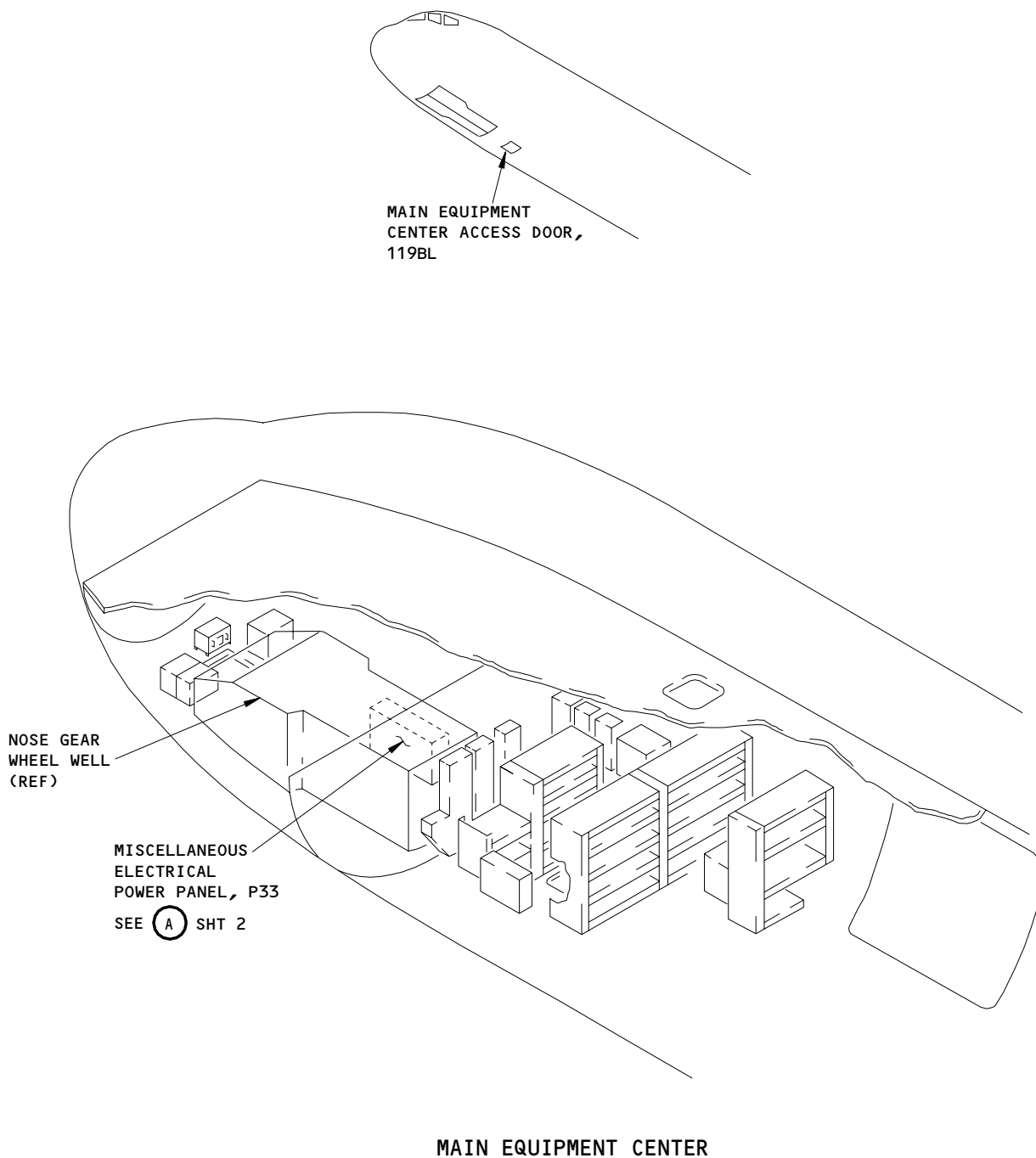
NOTE: THE (X) BELOW THE ACCESS/AREA REFERS TO THE VIEW SHOWN ON FIG. 102. THIS HELPS YOU FIND THE COMPONENTS ON THE ILLUSTRATION. FOR EXAMPLE, (A) REFERS TO VIEW A.

Miscellaneous Electrical Power Panel, P33 - Component Index
 Figure 101 (Sheet 2)

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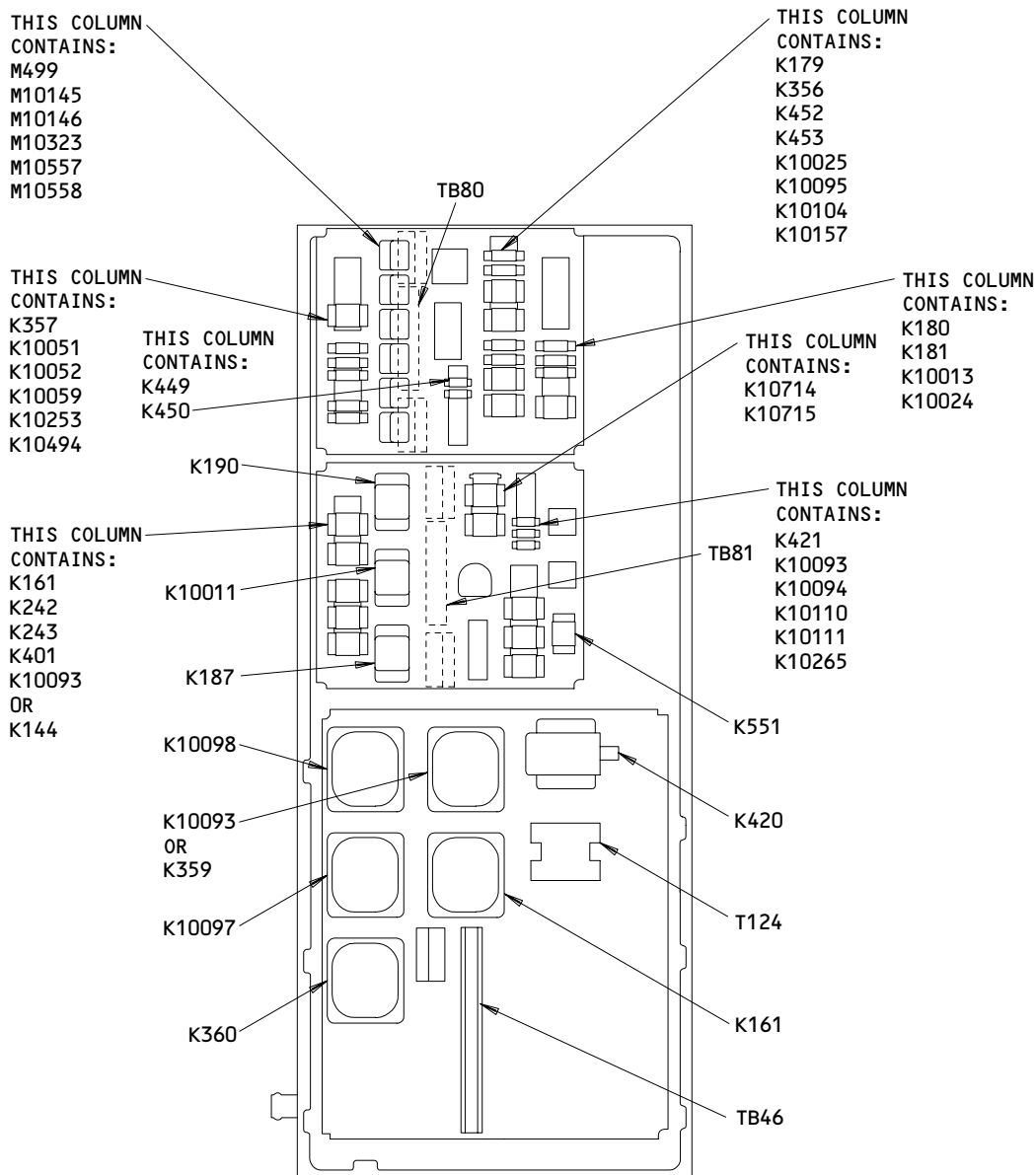
Miscellaneous Electrical Power Panel, P33 - Component Location
Figure 102 (Sheet 1)

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P33 PANEL

A

Miscellaneous Electrical Power Panel, P33 - Component Location (Detail from Sht 1)
Figure 102 (Sheet 2)

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APU/EXTERNAL POWER PANEL, P34

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	AMM REFERENCE
RELAY -			119BL, MAIN EQUIP CTR, P34	
K5	3	1	(B)	*
K101	2	1	(A)	*
K102	2	1	(A)	*
K103	2	1	(A)	*
K114	2	1	(A)	*
K162	3	1	(B)	*
K191	3	1	(B)	*
K435	3	1	(B)	*
K505	3	1	(B)	*
K512	3	1	(B)	*
K10028	3	1	(B)	*
K10029	3	1	(B)	*
K10057	3	1	(B)	*
K10064	3	1	(B)	*
K10073	3	1	(B)	*
K10075	3	1	(B)	*
K10159	3	1	(B)	*
K10219	3	1	(B)	*
K10256	3	1	(B)	*
K10257	3	1	(B)	*
K10405	3	1	(B)	*
K10421	3	1	(B)	*
K10437	3	1	(B)	*
K10483	3	1	(B)	*
K10490	3	1	(B)	*
K10491	3	1	(B)	*
K10492	3	1	(B)	*
K10493	3	1	(B)	*
K10495	3	1	(B)	*
K10496	3	1	(B)	*
K10574	3	1	(B)	*
K10578	3	1	(B)	*
K10579	3	1	(B)	*
K10580	3	1	(B)	*
K10606	3	1	(B)	*
K10607	3	1	(B)	*
K10608	3	1	(B)	*
K10612	3	1	(B)	*
K10613	3	1	(B)	*
K10707	3	1	(B)	*

* SEE THE WDM EQUIPMENT LIST

NOTE: THE (X) BELOW THE ACCESS/AREA REFERS TO THE VIEW SHOWN ON FIG. 102. THIS HELPS YOU FIND THE COMPONENTS ON THE ILLUSTRATION. FOR EXAMPLE, (A) REFERS TO VIEW A.

APU/External Power Panel, P34 - Component Index
 Figure 101 (Sheet 1)

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COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	AMM REFERENCE
SWITCH - S10259	3	1	119BL, MAIN EQUIP CTR, P34 (B)	*
TERMINAL BLOCK - TB47	3	1	119BL, MAIN EQUIP CTR, P34 (B)	*
TB5034	2	1	(A)	*
TRANSFORMER -			119BL, MAIN EQUIP CTR, P34	
T103	2	1	(A)	*
T111	2	1	(A)	*
T115	2	1	(A)	*
T116	2	1	(A)	*
T122	2	1	(A)	*
K123	3	1	(B)	*
T126	3	1	(B)	*
K153	3	1	(B)	*
T10003	3	1	(B)	*
T10004	3	1	(B)	*
T10005	3	1	(B)	*
T10006	3	1	(B)	*
T10022	3	1	(B)	*

* SEE THE WDM EQUIPMENT LIST

NOTE: THE (X) BELOW THE ACCESS/AREA REFERS TO THE VIEW SHOWN ON FIG. 102. THIS HELPS YOU FIND THE COMPONENTS ON THE ILLUSTRATION. FOR EXAMPLE, (A) REFERS TO VIEW A.

APU/External Power Panel, P34 - Component Index
 Figure 101 (Sheet 2)

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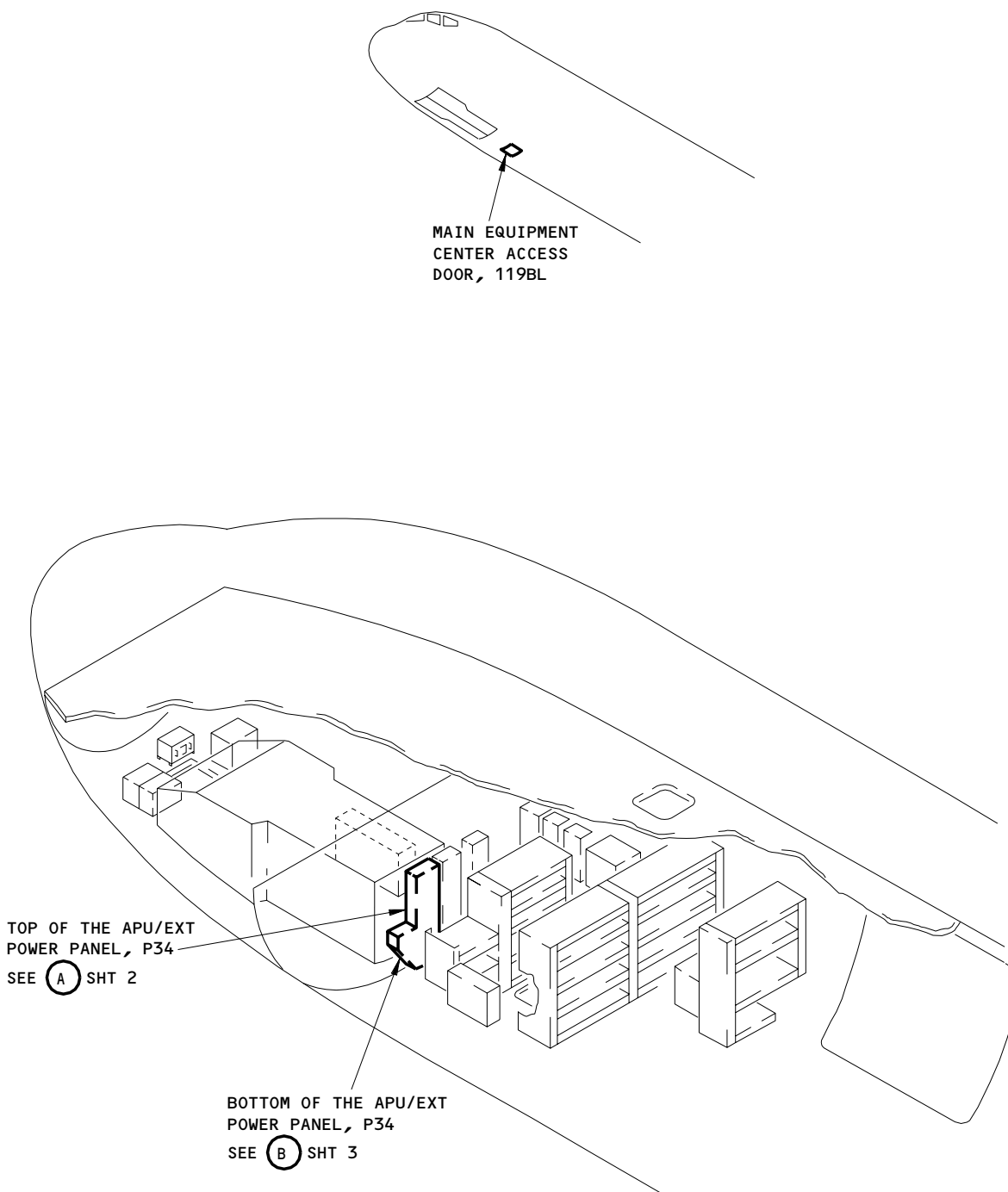
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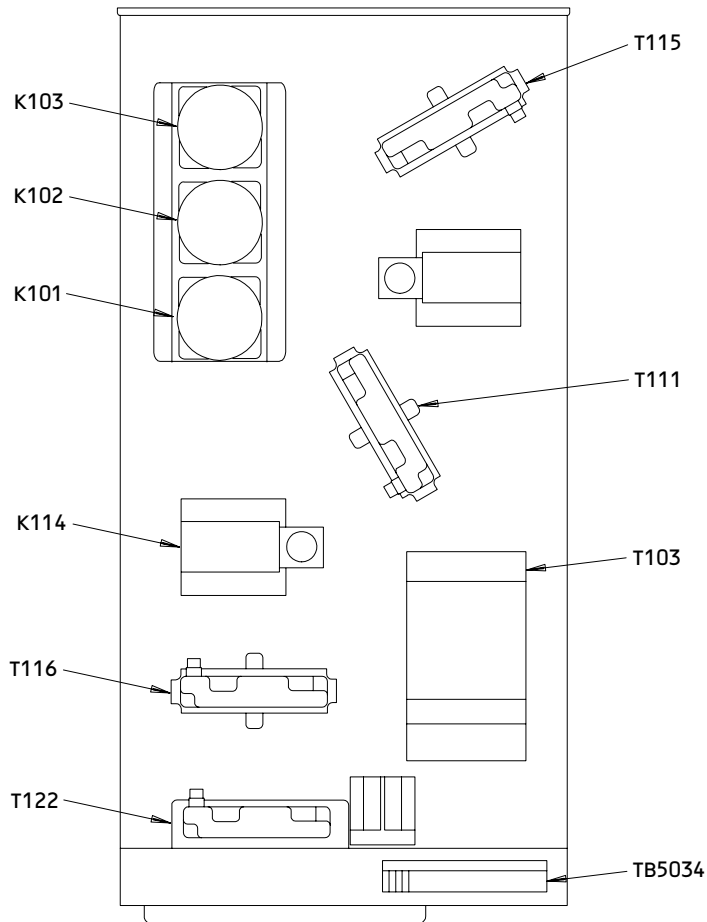


MAIN EQUIPMENT CENTER

APU/External Power Panel, P34 - Component Location
Figure 102 (Sheet 1)

EFFECTIVITY	
	ALL

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TOP OF THE APU/EXTERNAL POWER PANEL, P34

A

APU/External Power Panel, P34 - Component Location (Detail from Sht 1)
Figure 102 (Sheet 2)

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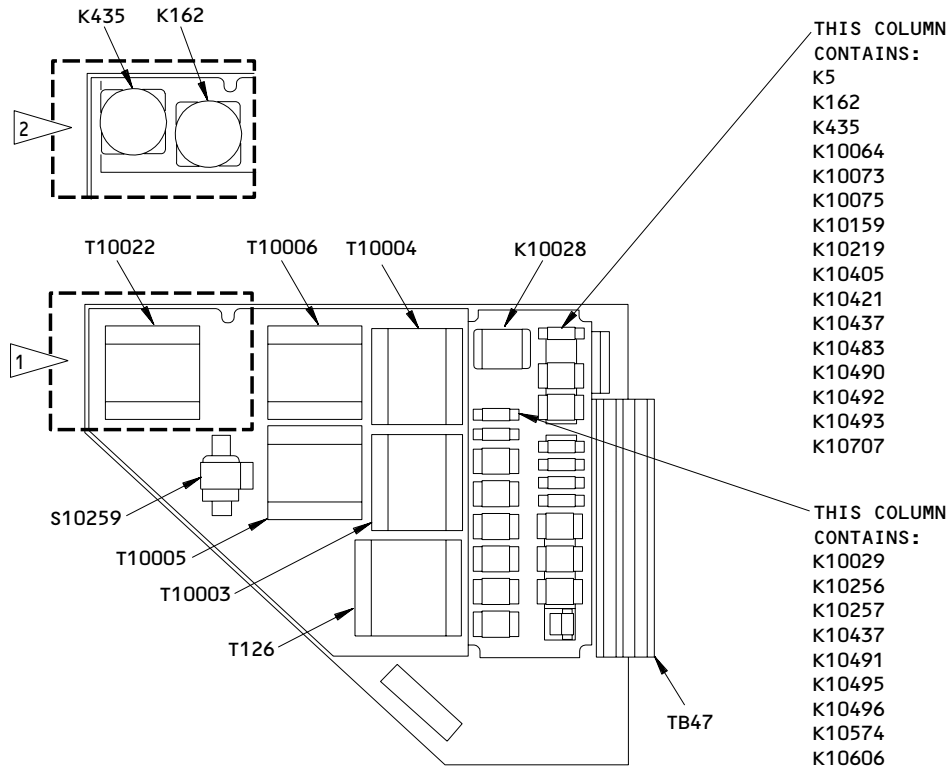
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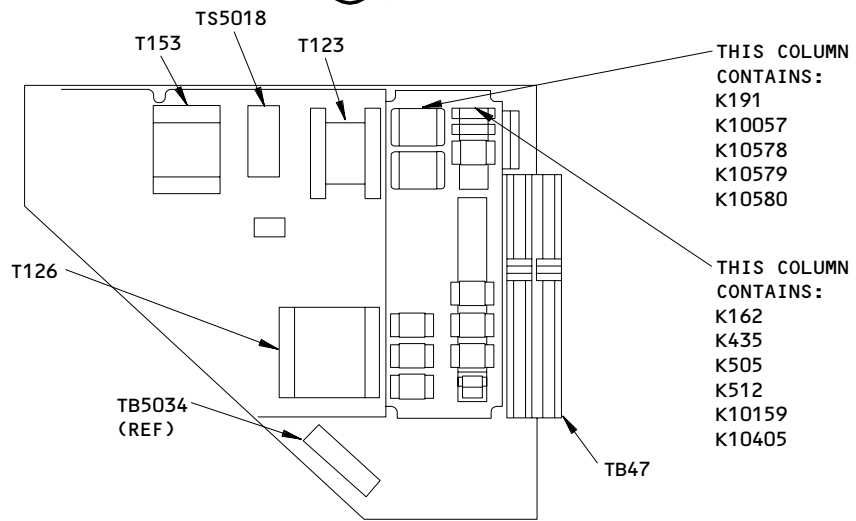


THIS COLUMN CONTAINS:
 K5
 K162
 K435
 K10064
 K10073
 K10075
 K10159
 K10219
 K10405
 K10421
 K10437
 K10483
 K10490
 K10492
 K10493
 K10707

THIS COLUMN CONTAINS:
 K10029
 K10256
 K10257
 K10437
 K10491
 K10495
 K10496
 K10574
 K10606
 K10607
 K10608
 K10612
 K10613

BOTTOM OF THE APU/EXTERNAL POWER PANEL, P34

(B) 3



THIS COLUMN CONTAINS:
 K191
 K10057
 K10578
 K10579
 K10580

THIS COLUMN CONTAINS:
 K162
 K435
 K505
 K512
 K10159
 K10405

BOTTOM OF THE APU/EXTERNAL POWER PANEL, P34

(B) 3

- 1 AIRPLANES WITH TRANSFORMER INSTALLED
- 2 AIRPLANES WITH RELAYS INSTALLED
- 3 NOT INSTALLED ON ALL AIRPLANES

APU/External Power Panel, P34 - Component Location (Detail from Sht 1)
 Figure 102 (Sheet 3)

EFFECTIVITY	ALL
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FAULT ISOLATION/MAINT MANUAL

LEFT MISCELLANEOUS ELECTRICAL EQUIPMENT PANEL, P36

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	REFERENCE
MODULES -			119BL, MAIN EQUIP CTR, P36	
M500	2	1	(C)	*
M963	2	1	(C)	*
M10004	2	1	(C)	*
M10020	2	1	(C)	*
M10222	2	1	(C)	*
M10334	2	1	(C)	*
M10440	2	1	(C)	*
M10482	2	1	(C)	*
M10559	2	1	(C)	*
M10560	2	1	(C)	*
M10689	2	1	(C)	*
M10690	2	1	(C)	*
M10691	2	1	(C)	*
RELAYS -			119BL, MAIN EQUIP CTR, P36	
K26	3	1	(D)	*
K57	3	1	(D)	*
K58	3	1	(D)	*
K59	3	1	(D)	*
K60	3	1	(D)	*
K61	3	1	(D)	*
K62	3	1	(D)	*
K63	2	1	(B)	*
K64	2	1	(B)	*
K87	3	1	(D)	*
K88	3	1	(D)	*
K124	2	1	(B)	*
K128	3	1	(D)	*
K135	2	1	(B)	*
K140	2	1	(B)	*
K141	2	1	(B)	*
K142	2	1	(B)	*
K143	2	1	(B)	*
K144	2	1	(B)	*
K145	2	1	(B)	*
K148	2	1	(B)	*
K149	2	1	(B)	*
K167	2	1	(B)	*
K170	2	1	(B)	*
K177	2	1	(B)	*
K178	2	1	(B)	*
K199	2	1	(B)	*

* SEE THE WDM EQUIPMENT LIST

NOTE: THE (X) BELOW THE ACCESS/AREA REFERS TO THE VIEW SHOWN ON FIG. 102. THIS HELPS YOU FIND THE COMPONENTS ON THE ILLUSTRATION. FOR EXAMPLE, (A) REFERS TO VIEW A.

Left Miscellaneous Electrical Equipment Panel, P36 - Component Index
Figure 101 (Sheet 1)

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FAULT ISOLATION/MAINT MANUAL

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	AMM REFERENCE
RELAY (CONT) -			119BL, MAIN EQUIP CTR, P36	
K217	3	1	(D)	*
K218	3	1	(D)	*
K220	3	1	(D)	*
K343	2	1	(B),(C)	*
K347	2	1	(B)	*
K369	2	1	(B)	*
K419	2	1	(B)	*
K511	2	1	(B)	*
K757	3	1	(D)	*
K2065	2	1	(B)	*
K2067	2	1	(B)	*
K10058	3	1	(D)	*
K10060	2	1	(B)	*
K10079	2	1	(B)	*
K10080	2	1	(B)	*
K10103	2	1	(B)	*
K10107	2	1	(B)	32-09-00
K10108	2	1	(B)	32-09-00
K10124	3	1	(D)	*
K10126	3	1	(D)	*
K10167	2,3	1	(B),(D)	*
K10188	3	1	(D)	*
K10189	3	1	(D)	*
K10197	3	1	(D)	*
K10198	3	1	(D)	*
K10199	3	1	(D)	*
K10208	3	1	(D)	*
K10209	3	1	(D)	*
K10212	3	1	(D)	*
K10229	2	1	(B)	*
K10230	2	1	(B)	*
K10231	2	1	(B)	*
K10232	2	1	(B)	*
K10233	2	1	(B)	*
K10234	3	1	(D)	*
K10236	3	1	(D)	*
K10238	2	1	(B)	32-09-00
K10240	2	1	(B)	*
K10244	3	1	(D)	*
K10245	3	1	(D)	*
K10246	3	1	(D)	*
K10247	3	1	(D)	*
K10248	3	1	(D)	*

* SEE THE WDM EQUIPMENT LIST

NOTE: THE (X) BELOW THE ACCESS/AREA REFERS TO THE VIEW SHOWN ON FIG. 102. THIS HELPS YOU FIND THE COMPONENTS ON THE ILLUSTRATION. FOR EXAMPLE, (A) REFERS TO VIEW A.

Left Miscellaneous Electrical Equipment Panel, P36 - Component Index
Figure 101 (Sheet 2)

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COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	AMM REFERENCE
RELAY (CONT) -			119BL, MAIN EQUIP CTR, P36	
K10255	3	1	(D)	*
K10282	3	1	(D)	*
K10296	2	1	(B)	*
K10306	2	1	(B)	32-09-00
K10307	2	1	(B)	32-09-00
K10315	3	1	(D)	*
K10317	3	1	(D)	*
K10319	2	1	(B)	*
K10323	2	1	(B)	*
K10329	3	1	(D)	74-11-00
K10334	3	1	(D)	*
K10335	3	1	(D)	*
K10336	3	1	(D)	*
K10337	3	1	(D)	*
K10340	3	1	(D)	*
K10345	3	1	(D)	*
K10349	3	1	(D)	*
K10358	3	1	(D)	*
K10360	3	1	(D)	*
K10369	2	1	(B)	*
K10370	3	1	(D)	*
K10373	3	1	(D)	*
K10374	3	1	(D)	*
K10378	3	1	(D)	*
K10379	3	1	(D)	*
K10384	2	1	(B)	32-09-00
K10385	2	1	(B)	32-09-00
K10388	2	1	(B)	32-09-00
K10394	2	1	(C)	*
K10398	2	1	(B)	*
K10401	3	1	(D)	*
K10404	3	1	(D)	*
K10420	3	1	(D)	*
K10435	3	1	(D)	*
K10442	3	1	(D)	*
K10443	3	1	(D)	*
K10446	2	1	(B)	*
K10453	3	1	(D)	*
K10460	3	1	(D)	*
K10462	3	1	(D)	*
K10463	3	1	(D)	*
K10465	3	1	(D)	*
K10466	3	1	(D)	*
K10467	3	1	(D)	*

* SEE THE WDM EQUIPMENT LIST

NOTE: THE (X) BELOW THE ACCESS/AREA REFERS TO THE VIEW SHOWN ON FIG. 102. THIS HELPS YOU FIND THE COMPONENTS ON THE ILLUSTRATION. FOR EXAMPLE, (A) REFERS TO VIEW A.

Left Miscellaneous Electrical Equipment Panel, P36 - Component Index
 Figure 101 (Sheet 3)

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COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	AMM REFERENCE
RELAY (CONT) -			119BL, MAIN EQUIP CTR, P36	
K10468	3	1	(D)	*
K10478	3	1	(D)	*
K10484	2	1	(B)	*
K10497	2	1	(B)	*
K10505	2	1	(B)	*
K10506	3	1	(D)	*
K10507	2	1	(B)	*
K10509	3	1	(D)	*
K10511	3	1	(D)	*
K10513	2	1	(B)	*
K10519	3	1	(D)	*
K10520	3	1	(D)	*
K10523	3	1	(D)	*
K10525	3	1	(D)	*
K10526	3	1	(D)	*
K10527	3	1	(D)	*
K10528	2	1	(B)	*
K10529	2	1	(B)	*
K10541	3	1	(D)	*
K10542	3	1	(F)	*
K10550	3	1	(D)	*
K10554	3	1	(D)	*
K10556	2	1	(B)	*
K10559	3	1	(D)	*
K10569	3	1	(D)	*
K10583	2	1	(B)	*
K10587	3	1	(D)	*
K10591	3	1	(D)	*
K10593	3	1	(D)	*
K10599	3	1	(D)	*
K10600	3	1	(D)	*
K10601	2	1	(B)	*
K10614	3	1	(D)	*
K10637	3	1	(D)	*
K10639	2,3	1	(B),(D)	*
K10645	3	1	(D)	*
K10805	2	1	(C)	*
K10825	2	1	(C)	*

* SEE THE WDM EQUIPMENT LIST

NOTE: THE (X) BELOW THE ACCESS/AREA REFERS TO THE VIEW SHOWN ON FIG. 102. THIS HELPS YOU FIND THE COMPONENTS ON THE ILLUSTRATION. FOR EXAMPLE, (A) REFERS TO VIEW A.

Left Miscellaneous Electrical Equipment Panel, P36 - Component Index
Figure 101 (Sheet 4)

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COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	AMM REFERENCE
RELAY (CONT) -			119BL, MAIN EQUIP CTR, P36	
K10675	3	1	(D)	*
K10682	3	1	(D)	*
K10691	2	1	(B)	*
K10695	3	1	(D)	*
K10696	3	1	(D)	*
K10708	2	1	(B)	*
K10712	2	1	(B)	*
K10716	2	1	(B)	*
K10725	2	1	(B)	*
K10730	3	1	(D)	*
K10856	2	1	(B)	*
K10611	3	1	(D)	*
SENSOR, CURRENT -			119BL, MAIN EQUIP CTR, P36	
TS102	2	1	(B)	*
TS246	2	1	(B)	*
TS5084	3	1	(D)	*
TS5136	2	1	(B)	*
SWITCH -			119BL, MAIN EQUIP CTR, P36	
S431	2	1	(C)	*
S10553	2	1	(C)	*
TERMINAL BLOCK -			119BL, MAIN EQUIP CTR, P36	
TB160	2	1	(B)	*
TB161	2		(B)	*
TB163	3		(D)	*
TB164	2		(C)	*
TB165	3		(D)	*
TB166	3		(D)	*
TB168	2		(C)	*
TB360	2		(C)	*
TB361	2		(C)	*
TB362	2		(C)	*
TRANSFORMER -			119BL, MAIN EQUIP CTR, P36	
T139	2	1	(C)	*
T10031	2	1	(C)	*
T10058	2	1	(C)	*
T10059	2	1	(C)	*

* SEE THE WDM EQUIPMENT LIST

NOTE: THE (X) BELOW THE ACCESS/AREA REFERS TO THE VIEW SHOWN ON FIG. 102. THIS HELPS YOU FIND THE COMPONENTS ON THE ILLUSTRATION. FOR EXAMPLE, (A) REFERS TO VIEW A.

Left Miscellaneous Electrical Equipment Panel, P36 - Component Index
 Figure 101 (Sheet 5)

EFFECTIVITY

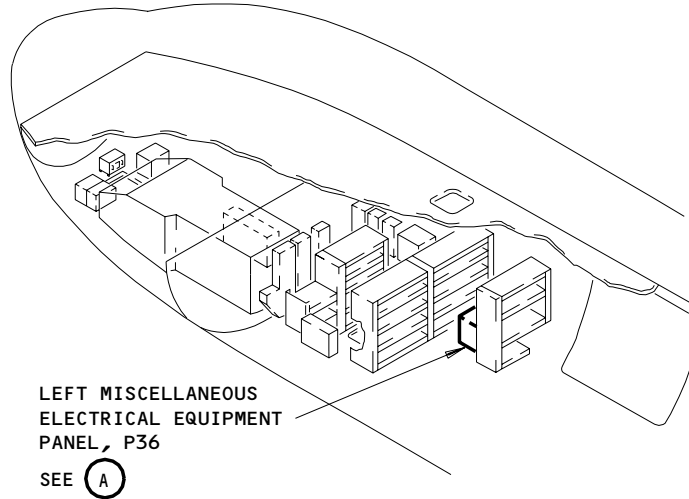
ALL

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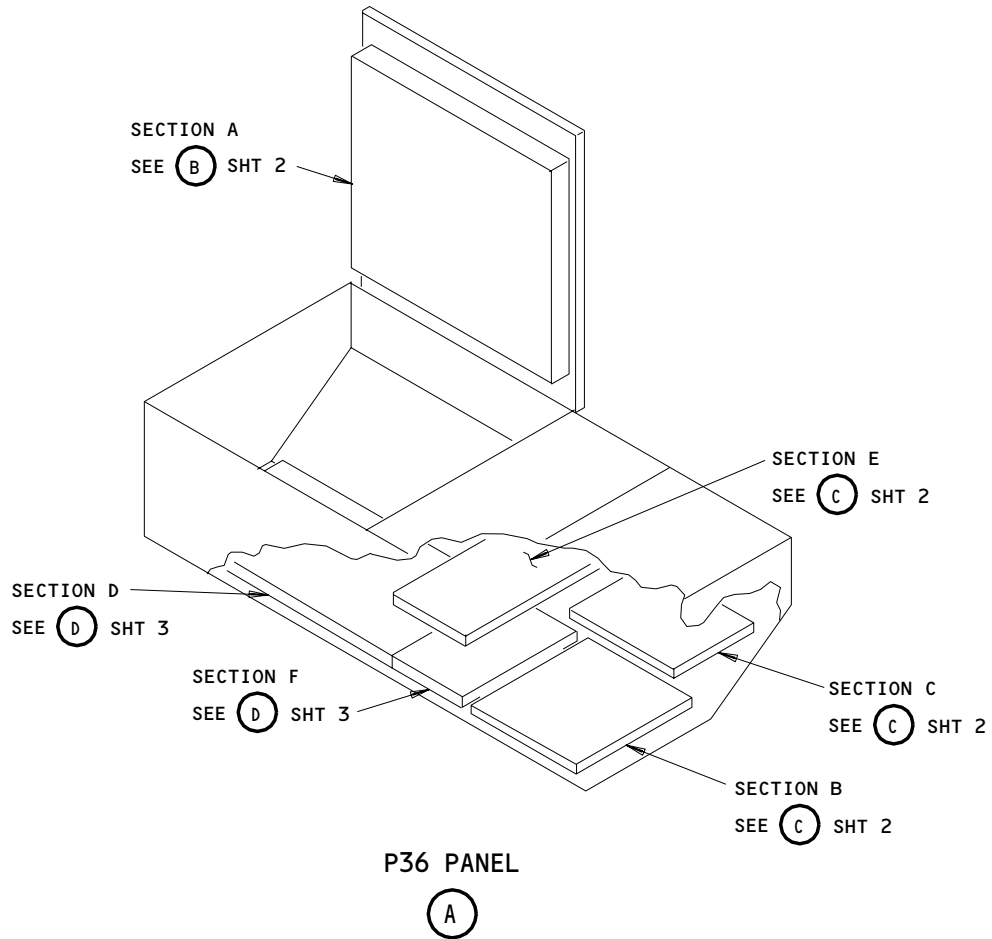
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MAIN EQUIPMENT CENTER



Left Miscellaneous Electrical Equipment Panel, P36 - Component Location
Figure 102 (Sheet 1)

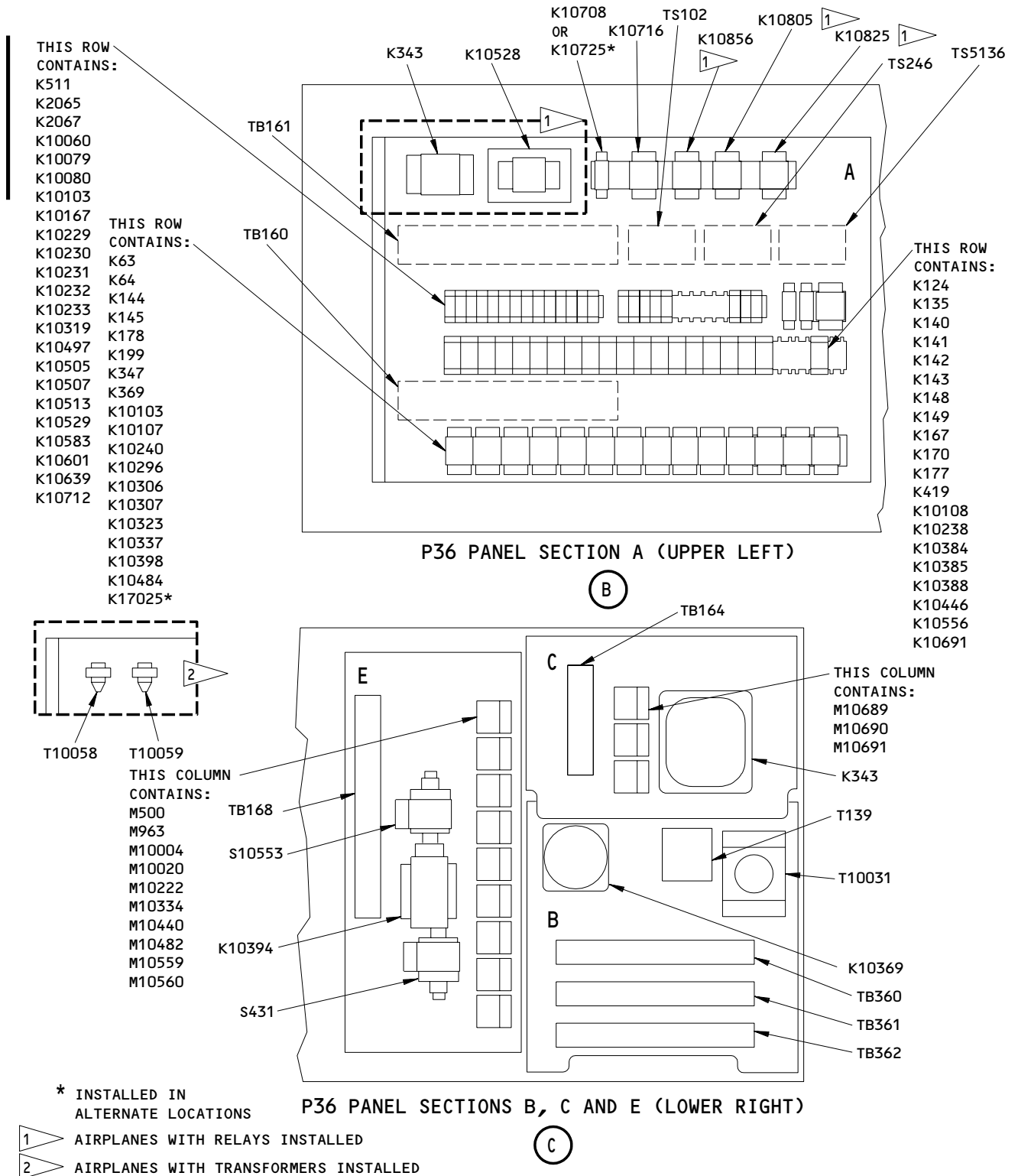
EFFECTIVITY	
	ALL

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FAULT ISOLATION/MAINT MANUAL



Left Miscellaneous Electrical Equipment Panel, P36 - Component Location
 Figure 102 (Sheet 2)

EFFECTIVITY

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FAULT ISOLATION/MAINT MANUAL

THIS ROW
CONTAINS:
K87
K88
K10197
K10198
K10208
K10212
K10245
K10247
K10248
K10315
K10334
K10336
K10401
K10435
K10506
K10587
K10591
K10593
K10639

THIS ROW
CONTAINS:
K10124
K10209
K10244
K10370

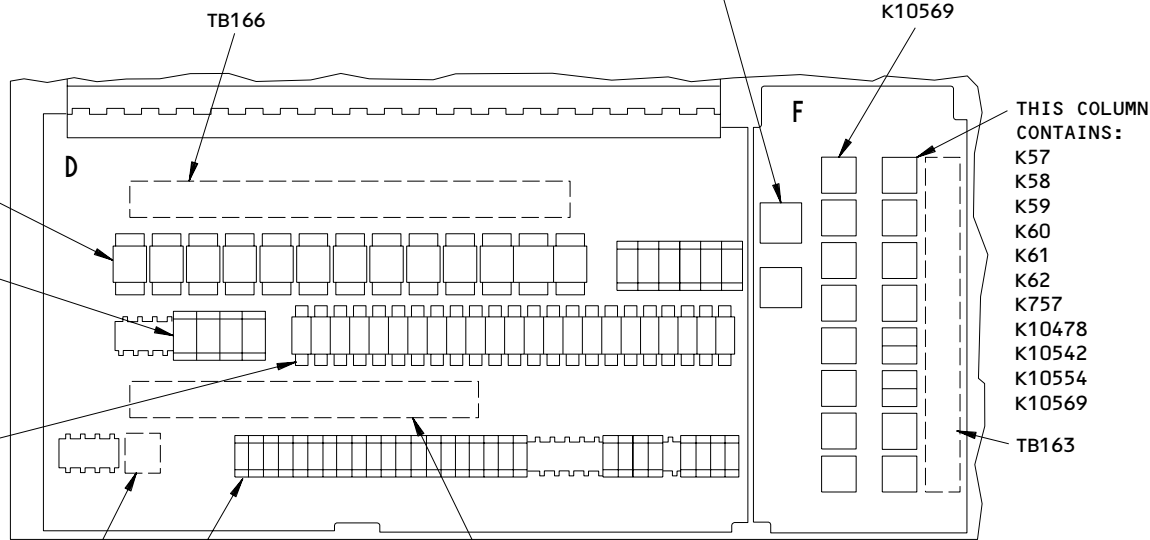
THIS ROW
CONTAINS:
K26
K128
K217
K218
K10058
K10167
K10188
K10189
K10199
K10246
K10255
K10329
K10340
K10374
K10404
K10442
K10443
K10460
K10465
K10466
K10525
K10526
K10527
K10541
K10550
K10559
K10600
K10675

THIS ROW
CONTAINS:
K220
K10124
K10126
K10234
K10236
K10282
K10317
K10335
K10349
K10358
K10373
K10420
K10443
K10465
K10466
K10509
K10519
K10520
K10523
K10645
K10682
K10695
K10696
K10730
K10611

THIS COLUMN
CONTAINS:
K10506
K10511

THIS COLUMN
CONTAINS:
K10360
K10378
K10379
K10453
K10462
K10463
K10467
K10468
K10569

THIS COLUMN
CONTAINS:
K57
K58
K59
K60
K61
K62
K757
K10478
K10542
K10554
K10569



P36 PANEL SECTIONS D AND F
(LOWER LEFT)

(D)

Left Miscellaneous Electrical Equipment Panel, P36 - Component Location
Figure 102 (Sheet 3)

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FAULT ISOLATION/MAINT MANUAL

RIGHT MISCELLANEOUS ELECTRICAL EQUIPMENT PANEL, P37

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	REFERENCE
MODULE -			119BL, MAIN EQUIP CTR, P37	
M10010	3	1	(F)	*
M10223	3	1	(F)	*
M10335	3	1	(F)	*
M10439	3	1	(F)	*
M10479	3	1	(E)	*
M10688	3	1	(E)	*
M10736	3	1	(E)	*
M10737	3	1	(E)	*
RELAY -			119BL, MAIN EQUIP CTR, P37	
K4	3	1	(E)	*
K6	3	1	(E)	*
K7	3	1	(E)	*
K8	3	1	(E)	*
K15	2	1	(D)	*
K21	3	1	(E)	*
K22	3	1	(E)	*
K23	3	1	(E)	*
K24	3	1	(E)	*
K25	3	1	(E)	*
K27	3	1	(F)	*
K42	3	1	(E)	*
K49	2	1	(D)	*
K50	2	1	(D)	*
K51	2	1	(D)	*
K52	2	1	(D)	*
K53	2	1	(D)	*
K54	2	1	(D)	*
K55	2	1	(D)	*
K56	2	1	(D)	*
K102	2	1	(B)	*
K120	2	1	(B)	*
K188	3	1	(E)	*
K189	3	1	(E)	*
K200	2	1	(D)	*
K201	2	1	(D)	*
K202	2	1	(D)	*
K203	2	1	(D)	*
K204	2	1	(D)	*
K205	2	1	(D)	*
K206	2	1	(D)	*
K207	2	1	(D)	*
K208	2	1	(D)	*
K209	2	1	(D)	*
K211	2	1	(D)	*
K213	2	1	(D)	*
K214	2	1	(D)	*
K215	2	1	(D)	*

* SEE THE WDM EQUIPMENT LIST

NOTE: THE (X) BELOW THE ACCESS/AREA REFERS TO THE VIEW SHOWN ON FIG. 102. THIS HELPS YOU FIND THE COMPONENTS ON THE ILLUSTRATION. FOR EXAMPLE, (A) REFERS TO VIEW A.

Right Miscellaneous Electrical Equipment Panel, P37 - Component Index
Figure 101 (Sheet 1)

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COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	AMM REFERENCE
RELAY (CONT) -			119BL, MAIN EQUIP CTR, P37	
K219	2	1	(D)	*
K238	2	1	(D)	*
K239	2	1	(D)	*
K240	2	1	(D)	*
K263	2	1	(D)	*
K310	3	1	(E)	*
K312	3	1	(E)	*
K334	2	1	(B)	*
K344	3	1	(E)	*
K346	2	1	(D)	*
K375	2	1	(D)	*
K400	2	1	(D)	*
K410	2	1	(D)	*
K416	2,3	1	(B),(E)	*
K510	2	1	(D)	*
K550	3	1	(E)	*
K554	2	1	(D)	*
K758	2	1	(D)	*
K2066	3	1	(E),(F)	
K2068	3	1	(E),(F)	
K2069	3	1	(E),(F)	
K10012	3	1	(E)	*
K10038	3	1	(E)	*
K10062	2	1	(D)	*
K10063	2	1	(D)	*
K10084	3	1	(E)	*
K10086	2	1	(D)	*
K10102	3	1	(E),(F)	*
K10109	3	1	(E)	*
K10125	3	1	(F)	*
K10127	3	1	(F)	*
K10136	3	1	(E)	*
K10164	3	1	(E)	*
K10166	2	1	(D)	*
K10168	3	1	(E)	*
K10192	3	1	(C)	*
K10196	2	1	(D)	*
K10201	2	1	(D)	*
K10202	2	1	(D)	*
K10203	2	1	(D)	*
K10204	2	1	(D)	*
K10205	2	1	(D)	*
K10206	2	1	(D)	*
K10220	3	1	(F)	*
K10221	3	1	(F)	*
K10224	3	1	(F)	*
K10235	3	1	(F)	*
K10237	3	1	(F)	*
K10239	2	1	(D)	*

* SEE THE WDM EQUIPMENT LIST

NOTE: THE (X) BELOW THE ACCESS/AREA REFERS TO THE VIEW SHOWN ON FIG. 102. THIS HELPS YOU FIND THE COMPONENTS ON THE ILLUSTRATION. FOR EXAMPLE, (A) REFERS TO VIEW A.

Right Miscellaneous Electrical Equipment Panel, P37 - Component Index
 Figure 101 (Sheet 2)

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COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	REFERENCE
RELAYS (CONT) -			119BL, MAIN EQUIP CTR, P37	
K10250	3	1	(F)	*
K10251	3	1	(F)	*
K10258	2	1	(D)	*
K10264	2	1	(D)	*
K10266	2	1	(D)	*
K10267	2	1	(D)	*
K10277	3	1	(E)	*
K10280	3	1	(E)	*
K10281	3	1	(E)	*
K10293	2	1	(D)	*
K10294	2	1	(D)	*
K10298	2	1	(B)	*
K10308	2	1	(D)	*
K10309	2	1	(D)	*
K10311	2	1	(D)	*
K10312	2	1	(D)	*
K10313	2	1	(D)	*
K10316	2	1	(D)	*
K10318	2	1	(D)	*
K10322	2	1	(D)	*
K10324	2	1	(D)	*
K10331	3	1	(F)	*
K10338	3	1	(F)	*
K10339	3	1	(F)	*
K10341	3	1	(F)	*
K10342	3	1	(F)	*
K10348	3	1	(F)	*
K10359	3	1	(F)	*
K10362	2	1	(D)	*
K10363	2	1	(D)	*
K10364	2	1	(D)	*
K10386	2	1	(D)	*
K10387	2	1	(D)	*
K10391	3	1	(E)	*
K10395	2	1	(C)	*
K10399	3	1	(F)	*
K10402	3	1	(F)	*
K10403	3	1	(E)	*
K10426	2	1	(D)	*
K10432	2	1	(D)	*
K10436	2	1	(D)	*
K10444	3	1	(E)	*
K10448	2	1	(D)	*
K10454	2	1	(D)	*
K10461	2	1	(D)	*

* SEE THE WDM EQUIPMENT LIST

NOTE: THE (X) BELOW THE ACCESS/AREA REFERS TO THE VIEW SHOWN ON FIG. 102. THIS HELPS YOU FIND THE COMPONENTS ON THE ILLUSTRATION. FOR EXAMPLE, (A) REFERS TO VIEW A.

Right Miscellaneous Electrical Equipment Panel, P37 - Component Index
 Figure 101 (Sheet 3)

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COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	AMM REFERENCE
RELAY (CONT) -			119BL, MAIN EQUIP CTR, P37	
K10462	2	1	(D)	*
K10470	2	1	(D)	*
K10471	2	1	(D)	*
K10472	2	1	(D)	*
K10473	2	1	(D)	*
K10474	2	1	(D)	*
K10475	2	1	(D)	*
K10479	3	1	(F)	*
K10482	2	1	(D)	*
K10485	3	1	(F)	*
K10504	3	1	(E)	*
K10521	3	1	(E)	*
K10522	3	1	(E)	*
K10524	2	1	(D)	*
K10530	3	1	(E)	*
K10531	3	1	(E)	*
K10543	3	1	(E)	*
K10544	3	1	(E)	*
K10549	3	1	(F)	*
K10555	3	1	(E)	*
K10570	2	1	(D)	*
K10575	2	1	(D)	*
K10582	3	1	(E)	*
K10584	3	1	(E)	*
K10585	3	1	(E)	*
K10586	3	1	(E)	*
K10598	3	1	(E)	*
K10602	3	1	(F)	*
K10615	3	1	(F)	*
K10631	3	1	(E)	*
K10642	2	1	(D)	*
K10646	2	1	(D)	*
K10647	2	1	(D)	*
K10648	2	1	(D)	*
K10649	3	1	(E)	*
K10676	3	1	(E)	*
K10677	3	1	(E)	*
K10681	2	1	(D)	*
K10683	2	1	(D)	*
K10688	2	1	(D)	*
K10689	2	1	(D)	*
K10694	2	1	(D)	*
K10699	3	1	(F)	*
K10700	3	1	(F)	*
K10701	3	1	(F)	*
K10709	2	1	(D)	*
K10713	2	1	(D)	*
K10717	2	1	(D)	*
K10718	2	1	(D)	*
K10723	2	1	(D)	*

* SEE THE WDM EQUIPMENT LIST

NOTE: THE (X) BELOW THE ACCESS/AREA REFERS TO THE VIEW SHOWN ON FIG. 102. THIS HELPS YOU FIND THE COMPONENTS ON THE ILLUSTRATION. FOR EXAMPLE, (A) REFERS TO VIEW A.

Right Miscellaneous Electrical Equipment Panel, P37 - Component Index
Figure 101 (Sheet 4)

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COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	AMM REFERENCE
RELAY (CONT) -				
K10724	2	1	(D)	*
K10726	2	1	(D)	*
K10731	3	1	(E)	*
K10735	3	1	(E)	*
K10781	3	1	(E)	*
K10799	3	1	(E)	*
K10801	3	1	(E)	*
K10807	3	1	(E)	*
K10813	3	1	(E)	*
K10816	3	1	(E)	*
K10818	3	1	(E)	*
K10829	3	1	(E)	*
K10857	3	1	(E)	*
SENSORS, CURRENT -				
TS103	3	1	119BL, MAIN EQUIP CTR, P37 (E)	*
TS193	2	1	(E)	*
TS245	2	1	(D)	*
TS5044	3	1	(E)	*
TS5137	2	1	(D)	*
SWITCH -				
S119	2	1	119BL, MAIN EQUIP CTR, P37 (C)	*
TERMINAL BLOCKS -				
TB170	2	1	119BL, MAIN EQUIP CTR, P37 (D)	*
TB171	2	1	(D)	*
TB172	3	1	(E)	*
TB173	3	1	(E)	*
TB174	3	1	(F)	*
TB179	2	1	(D)	*
TB180	2	1	(D)	*
TRANSFORMERS -				
T126	2	1	119BL, MAIN EQUIP CTR, P37 (B)	*
T140	2	1	(C)	*
T147	2	1	(B)	*

* SEE THE WDM EQUIPMENT LIST

NOTE: THE (X) BELOW THE ACCESS/AREA REFERS TO THE VIEW SHOWN ON FIG. 102. THIS HELPS YOU FIND THE COMPONENTS ON THE ILLUSTRATION. FOR EXAMPLE, (A) REFERS TO VIEW A.

Right Miscellaneous Electrical Equipment Panel, P37 - Component Index
 Figure 101 (Sheet 5)

EFFECTIVITY

ALL

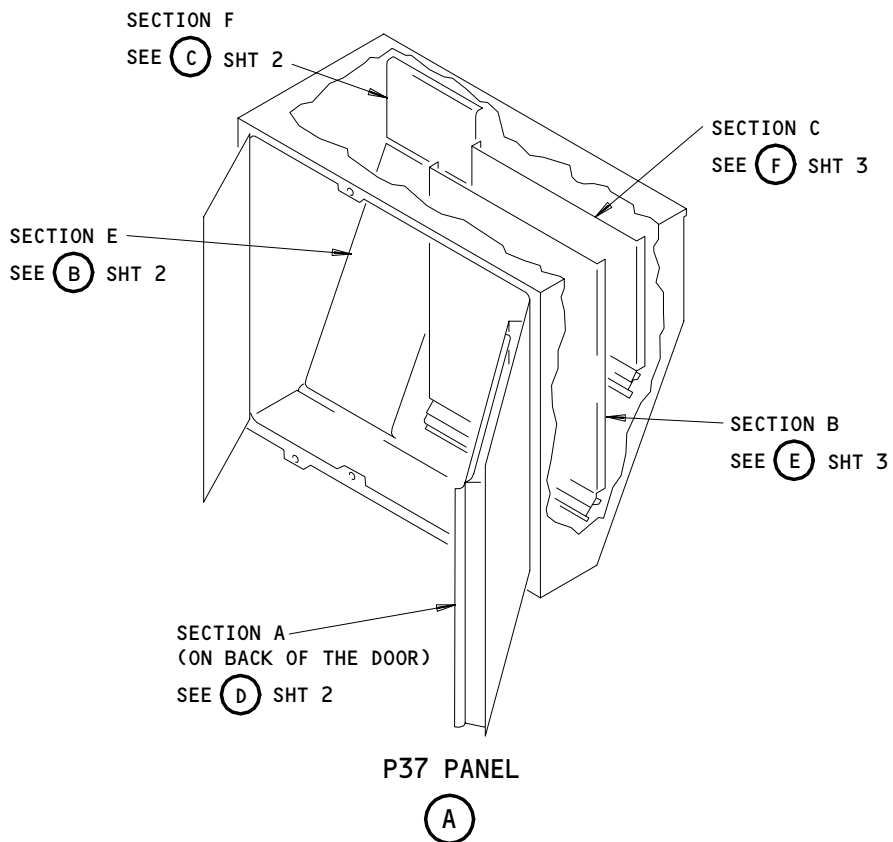
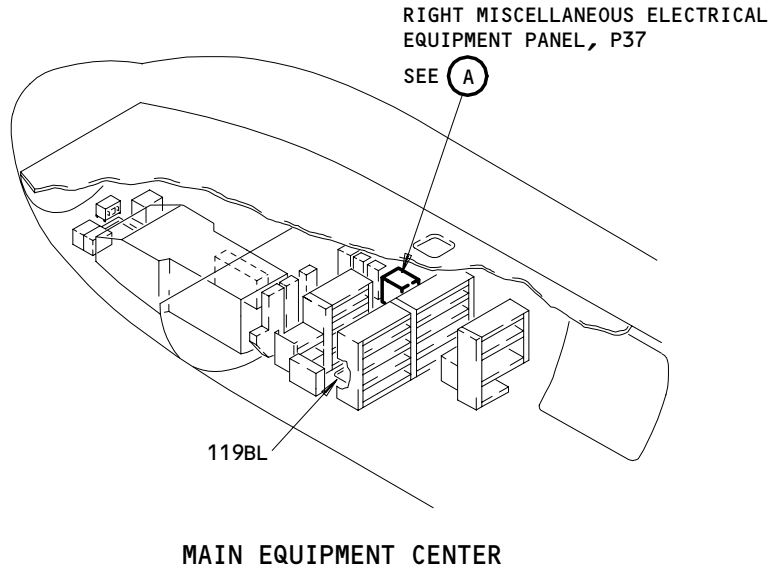
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Right Miscellaneous Electrical Equipment Panel, P37 - Component Location
Figure 102 (Sheet 1)

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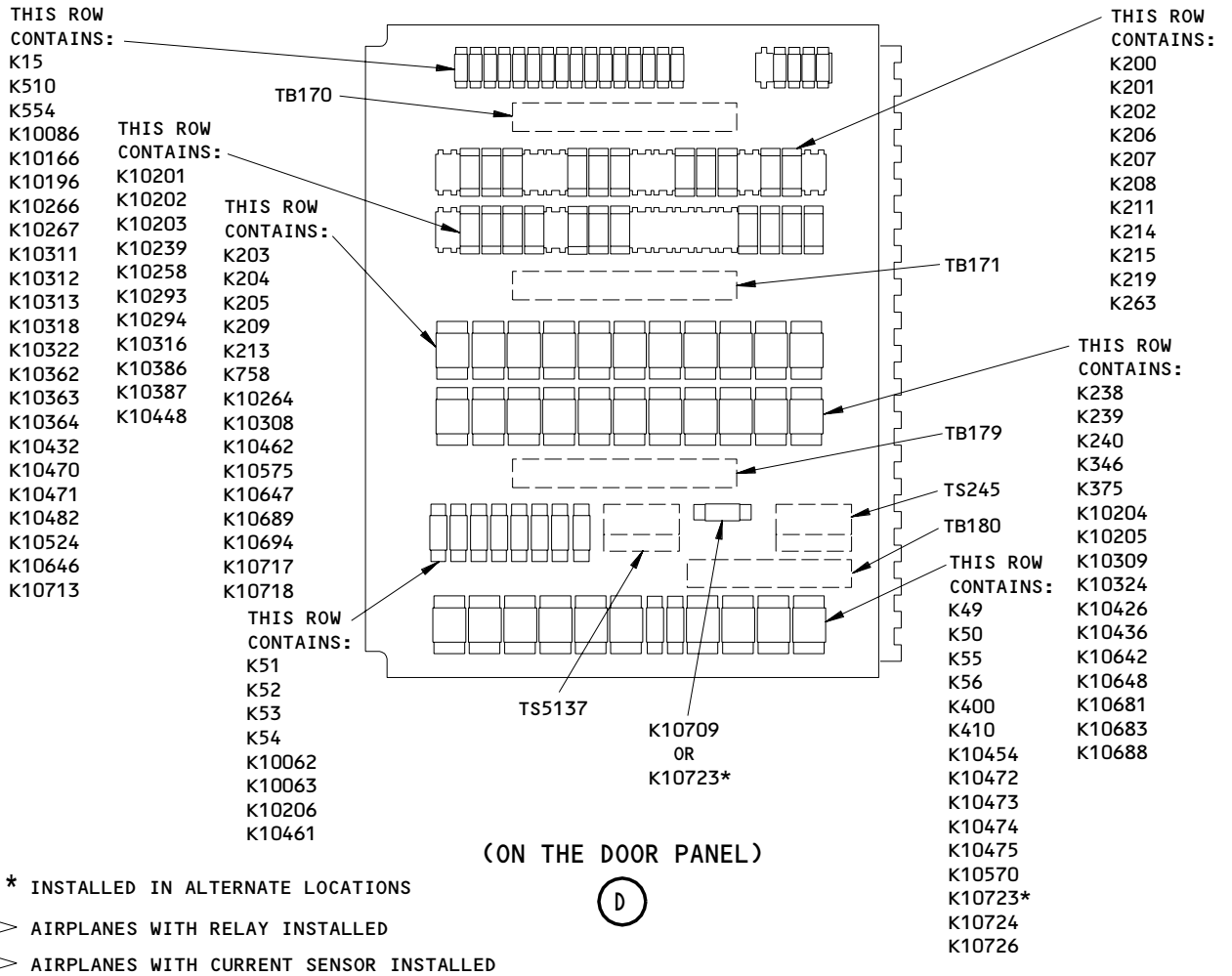
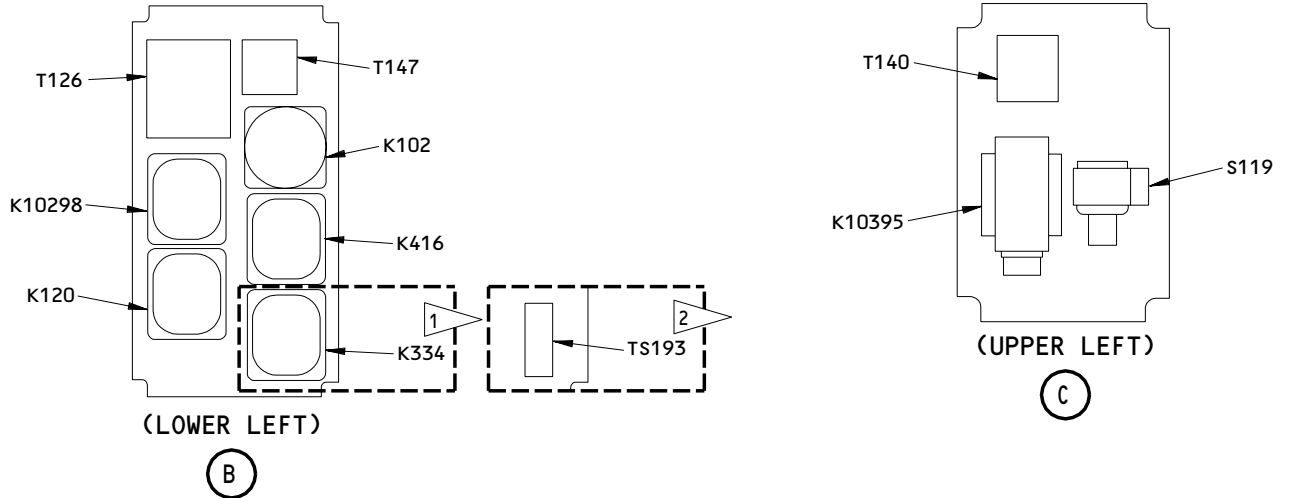
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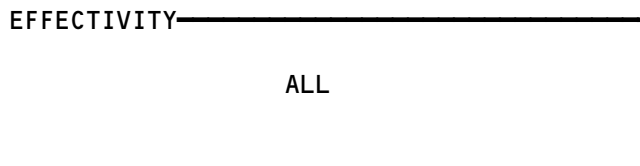
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FAULT ISOLATION/MAINT MANUAL



Right Miscellaneous Electrical Equipment Panel, P37 - Component Location
(Details from Sht 1)
Figure 102 (Sheet 2)

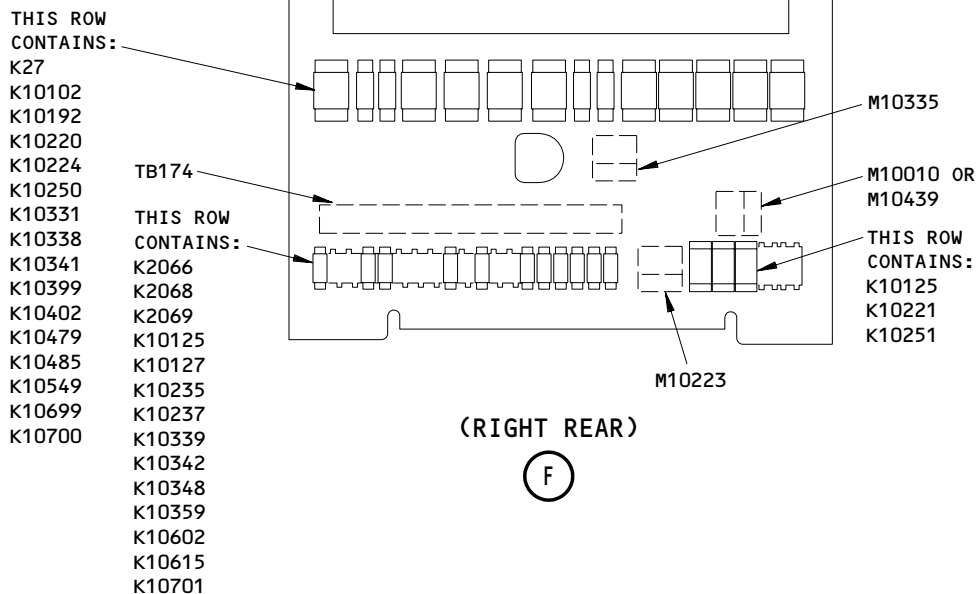
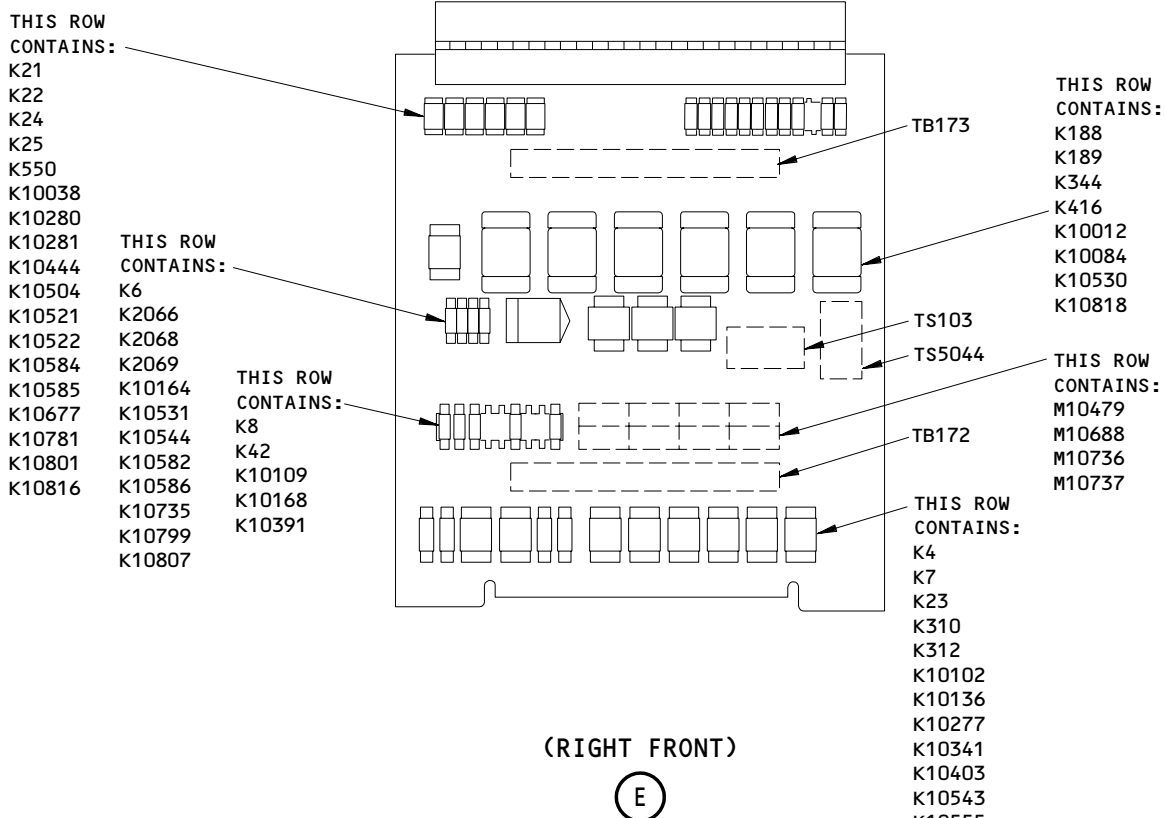


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Right Miscellaneous Electrical Equipment Panel, P37 - Component Location
Figure 102 (Sheet 3)

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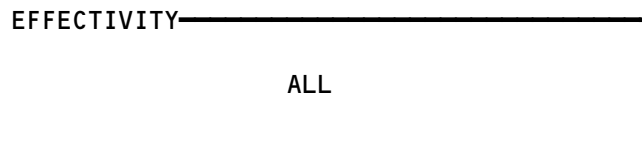
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 FAULT ISOLATION/MAINT MANUAL

MISCELLANEOUS ELECTRICAL EQUIPMENT PANEL, P65

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	REFERENCE
RELAYS - K31 K10048 K10186 K10215 K10217 K10411 K10412 K10476 K10477 K10516		1 1 1 1 1 1 1 1 1 1 1	119BL, MAIN EQUIP CTR, P65	* * * * * * * * * *
TERMINAL BLOCK - TB188		1	119BL, MAIN EQUIP CTR, P65	*
TRANSFORMER - T148		1	119BL, MAIN EQUIP CTR, P65	*

* SEE THE WDM EQUIPMENT LIST

Miscellaneous Electrical Equipment Panel, P65 - Component Index
 Figure 101

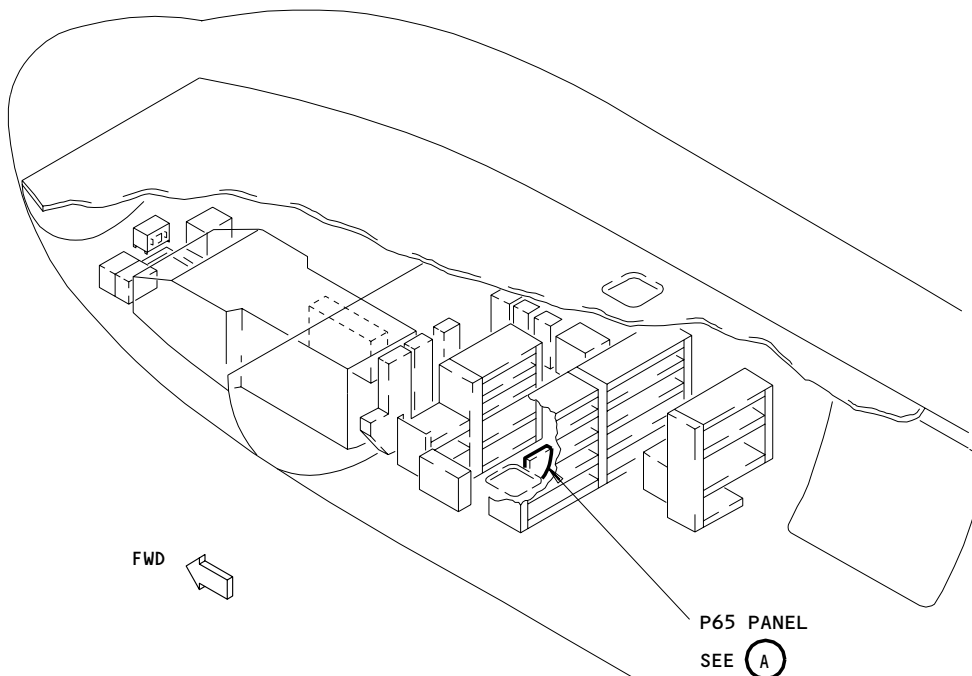


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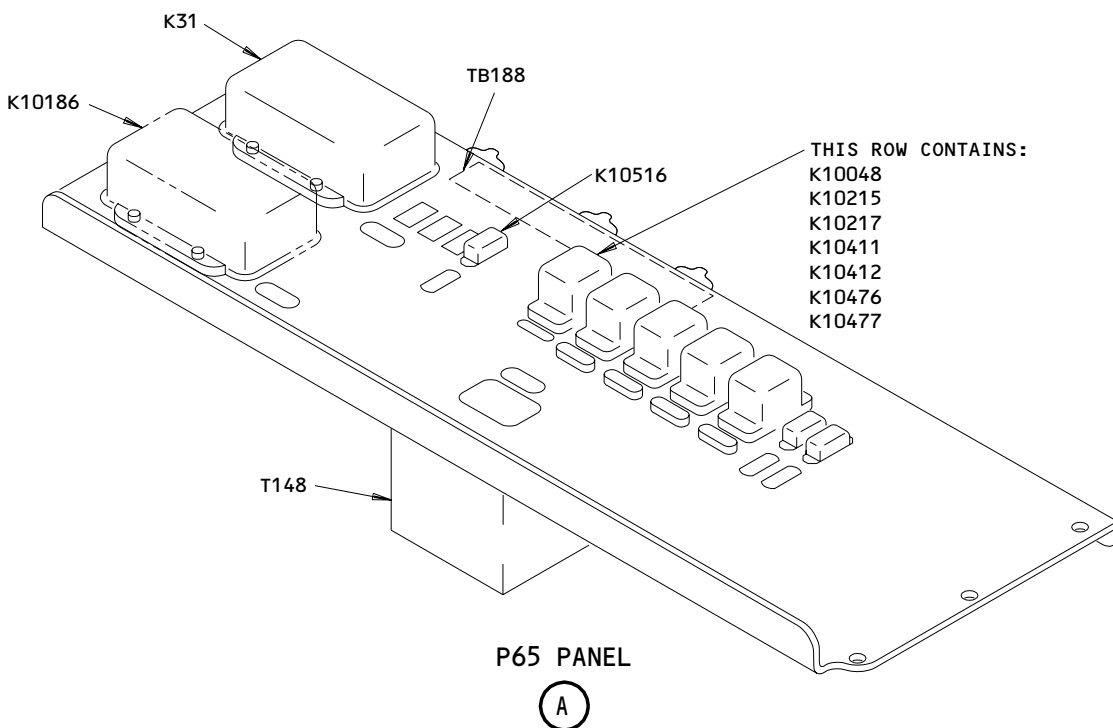
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MAIN EQUIPMENT CENTER



Miscellaneous Electrical Equipment Panel, P65 - Component Location
Figure 102

EFFECTIVITY	
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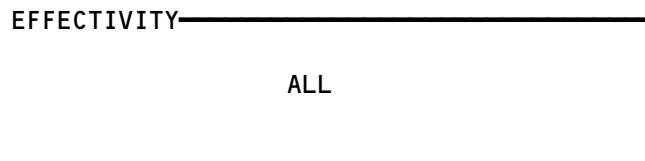
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MISCELLANEOUS ELECTRICAL EQUIPMENT PANEL, P70

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	AMM REFERENCE
SENSOR, CURRENT -			119BL, MAIN EQUIP CTR, P70	
TS192		1		*
TS5018		1		*
RELAY -			119BL, MAIN EQUIP CTR, P70	
K119		1		*
K191		1		*
K415		1		*
K505		1		*
K512		1		*
K10057		1		*
K10083		1		*
K10157		1		*
K10159		1		*
K10297		1		*
K10405		1		*
K10597		1		*
K10734		1		*
TERMINAL BLOCK -			119BL, MAIN EQUIP CTR, P70	
TB155		1		*
TRANSFORMER -			119BL, MAIN EQUIP CTR, P70	
T123		1		*
T153		1		*

* SEE THE WDM EQUIPMENT LIST

Miscellaneous Electrical Equipment Panel, P70 - Component Index
Figure 101

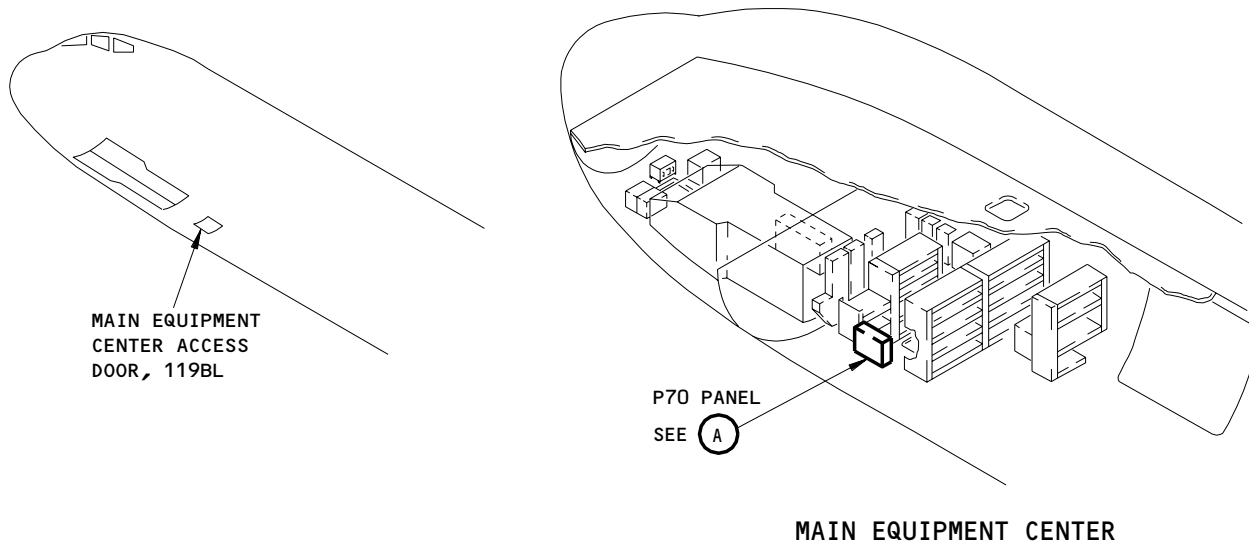


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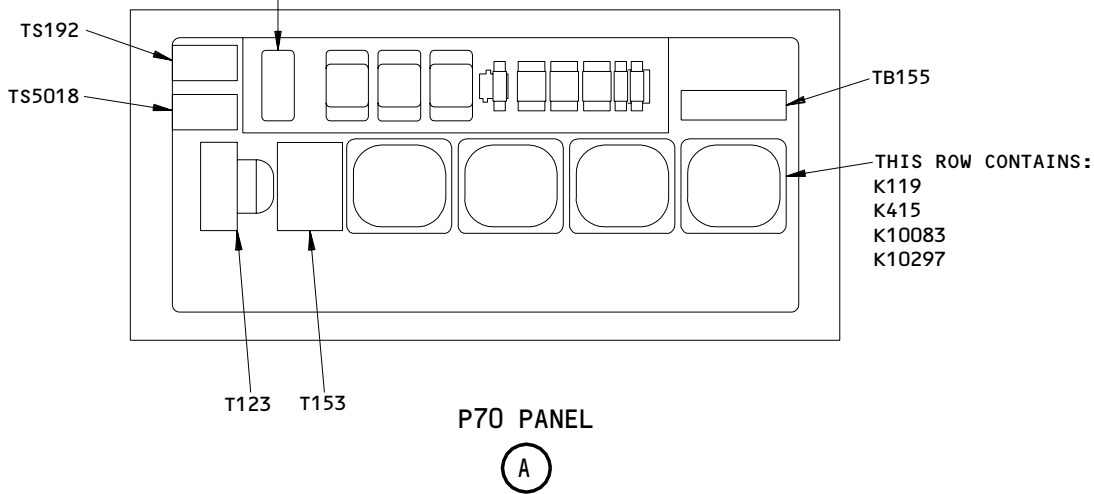
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THIS ROW CAN CONTAIN:

- K191
- K415
- K505
- K512
- K10057
- K10157
- K10159
- K10405
- K10597
- K10734



Miscellaneous Electrical Equipment Panel, P70 - Component Location
Figure 102

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 FAULT ISOLATION/MAINT MANUAL

HYDRAULIC GENERATOR POWER PANEL, P71

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	REFERENCE
MODULES -			119BL, MAIN EQUIP CTR, P71	
M10662		1		*
M10663		1		*
M10664		1		*
RELAYS -			119BL, MAIN EQUIP CTR, P71	
K10561		1		*
K10562		1		*
K10563		1		*
K10564		1		*
K10565		1		*
K10566		1		*
K10567		1		*
K10568		1		*
K10640		1		*
K10690		1		*
K10698		1		*
TERMINAL BLOCK -			119BL, MAIN EQUIP CTR, P71	
TB103		1		*

* SEE THE WDM EQUIPMENT LIST

NOTE: THE (X) BELOW THE ACCESS/AREA REFERS TO THE VIEW SHOWN ON FIG. 102. THIS HELPS YOU FIND THE COMPONENTS ON THE ILLUSTRATION. FOR EXAMPLE, (A) REFERS TO VIEW A.

Hydraulic Generator Power Panel, P71 - Component Index
Figure 101

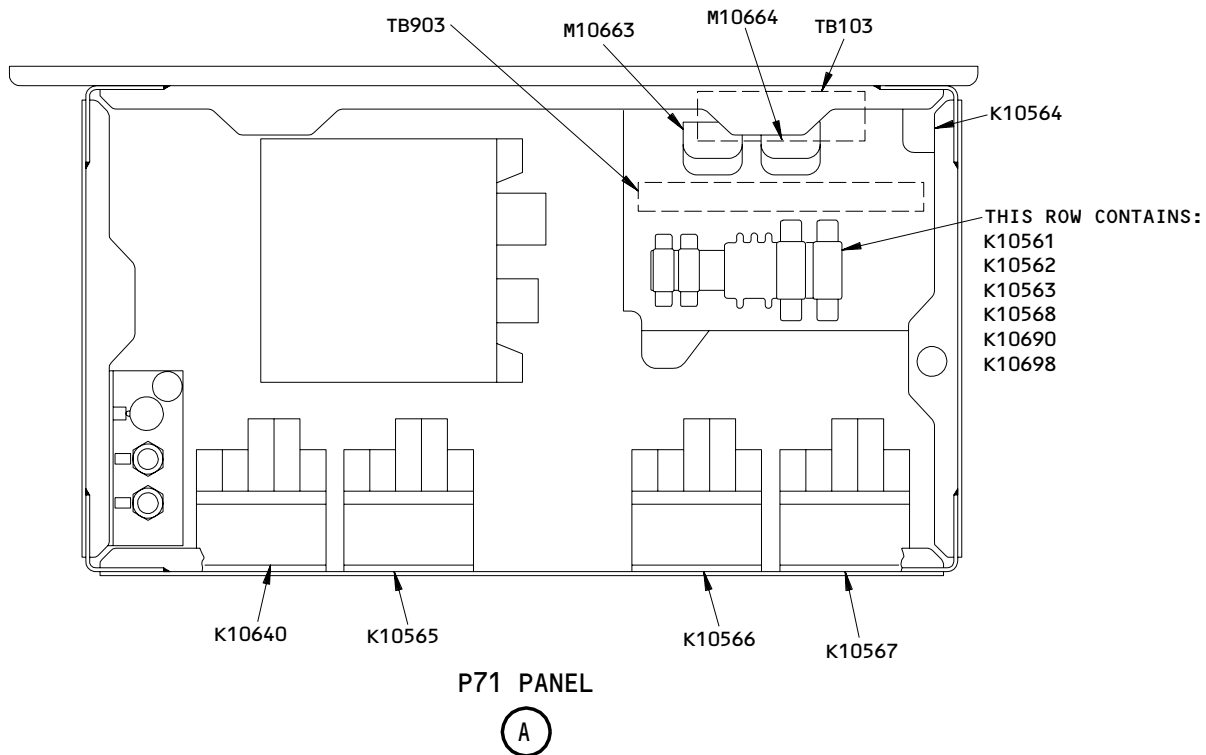
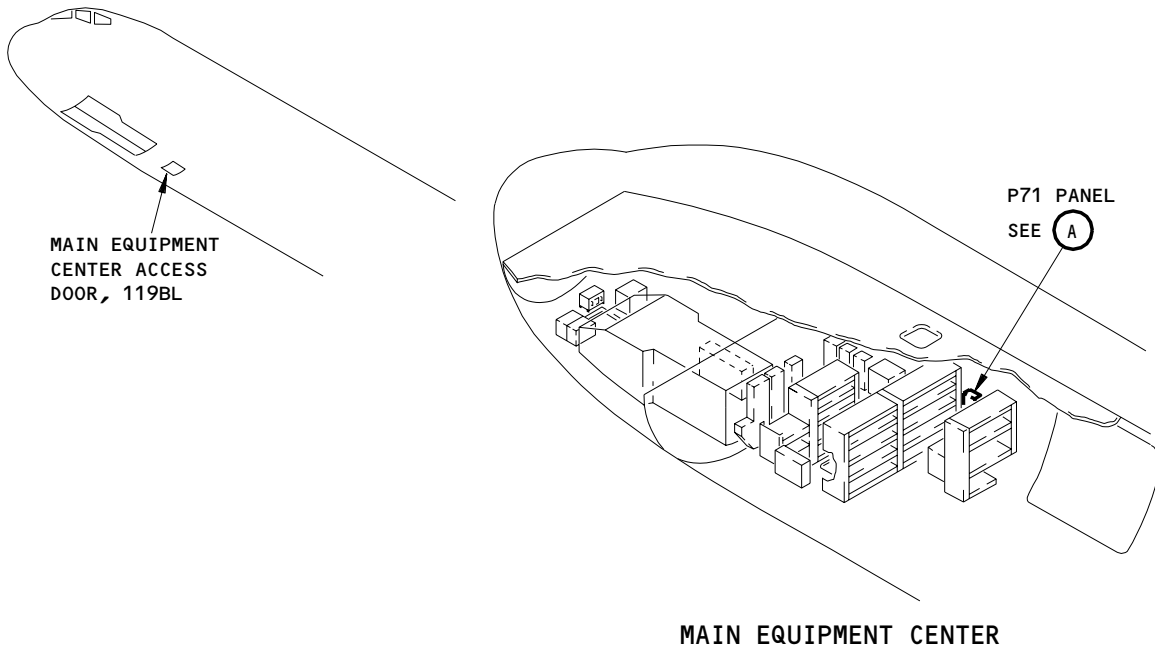
EFFECTIVITY _____
ALL

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03

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Hydraulic Generator Power Panel, P71 - Component Location
Figure 102

EFFECTIVITY	
ALL	

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 FAULT ISOLATION/MAINT MANUAL

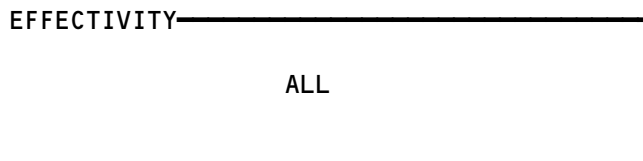
E6 RELAY PANEL

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	AMM REFERENCE
CONTACTOR - K117		1	822, AFT CARGO COMPT, E6	*
RELAY -	--		822, AFT CARGO COMPT, E6	
K6		1		*
K36		1		*
K116		1		*
K117		1		*
K175		1		*
K176		1		*
K197		1		*
K616		1		*
K619		1		*
K10010		1		*
K10030		1		*
K10033		1		*
K10047		1		*
K10160		1		*
K10162		1		*
K10163		1		*
K10187		1		*
K10216		1		*
K10218		1		*
K10413		1		*
K10414		1		*
K10418		1		*
K10422		1		*
K10517		1		*
K10706		1		*
TERMINAL BLOCK -			822, AFT CARGO COMPT, E6	
TB37		1		*
TB5047		1		*
TB5048		1		*
TRANSFORMER -			822, AFT CARGO COMPT, E6	
T10002		1		*

* SEE THE WDM EQUIPMENT LIST

NOTE: THE (X) BELOW THE ACCESS/AREA REFERS TO THE VIEW SHOWN ON FIG. 102. THIS HELPS YOU FIND THE COMPONENTS ON THE ILLUSTRATION. FOR EXAMPLE, (A) REFERS TO VIEW A.

E6 Relay Panel - Component Index
Figure 101



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03

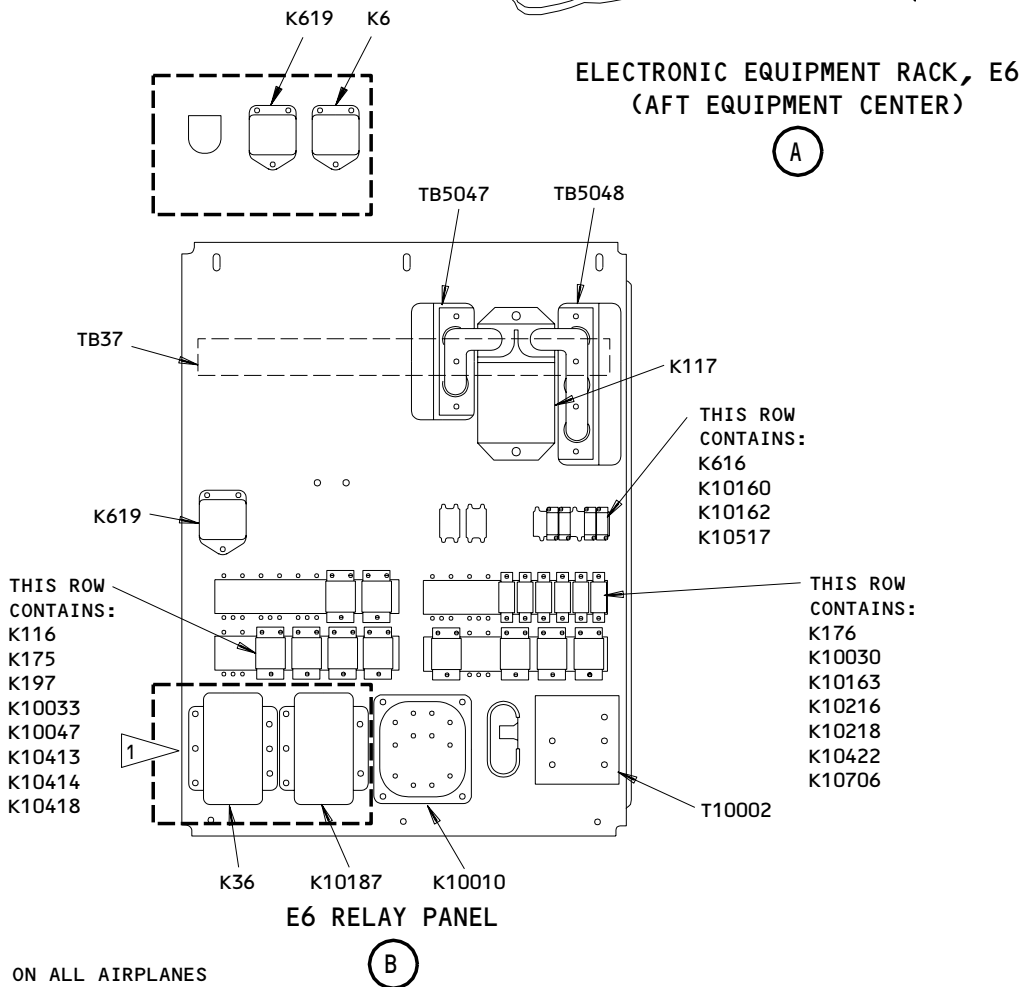
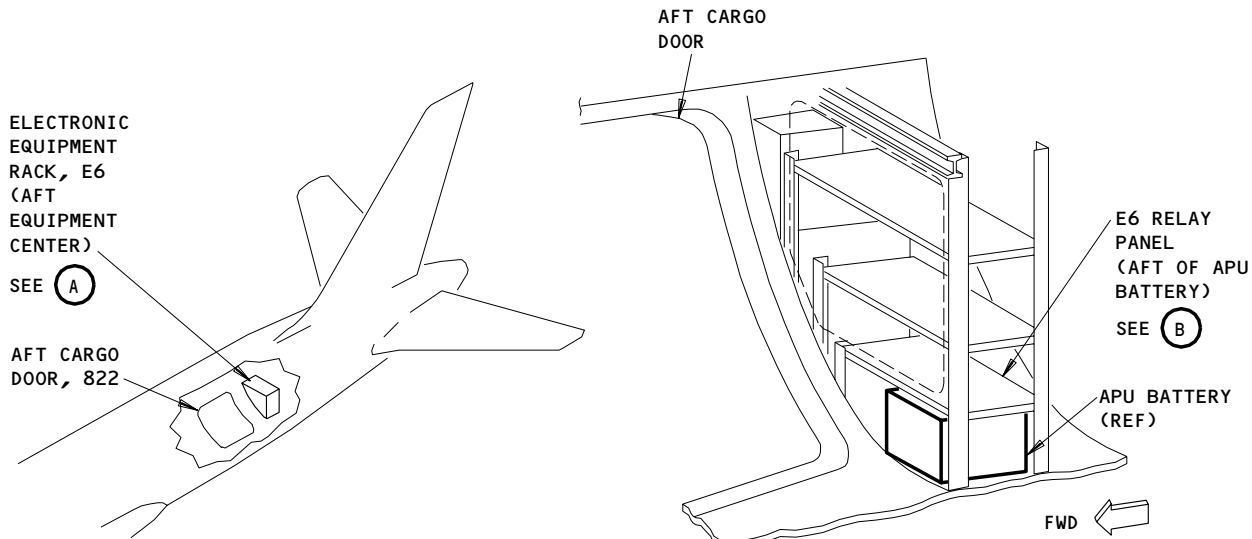
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E6 Relay Panel - Component Location
Figure 102

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CLOCKS - DESCRIPTION AND OPERATION

1. General (Fig. 1)

- A. The clocks provide the flight crew with a primary time reference. They display Greenwich Mean Time (GMT) continuously and when selected, elapsed time or chronograph time. There is one captain's and one first officer's clock. Both are identical.
- B. The clocks also provide GMT as a data output on an ARINC 429 digital data bus. The captain's clock provides GMT to the left flight management computer and the digital flight data acquisition unit (DFDAU). The first officer's clock provides GMT to the right flight management computer. The FMC-CDUs (AMM 34-61-00) also display the clock's GMT output. The GMT output is provided in hours, minutes, seconds and tenths of minutes. The time is accurate to ± 1 second per 200 hours at 25°C unless power to the clock is interrupted.

2. Component Details (Fig. 1)

A. Clocks

- (1) The electronic clocks are located on the captain's and first officer's instrument panels, respectively. They are microprocessor controlled with two LCD displays, controls, and a sweep second hand.
- (2) The upper display (GMT) provides GMT continuously from 00 hours 00 minutes to 23 hours 59 minutes. The GMT display is controlled by the GMT switch located in the lower corner of the indicator as follows:
 - (a) The RUN setting of this switch is the normal operating position for the clock. GMT is shown continuously while in this mode.
 - (b) The HLD (hold) setting is used to freeze the GMT display. Setting the switch to this position will hold the display at its present indicated value.
 - (c) The SS setting is used for slow slew operation. When set to this position the seconds display is reset to zero. The minute display automatically advances at a rate of 1 minute/second. The hours display is frozen at its present indicated value.
 - (d) The FS setting is used for fast slew operation. When in this position, the hours display automatically advances at a rate of 1 hour/second. The minutes display is frozen at its present indicated value and the seconds display is reset to zero.
- (3) The lower display provides elapsed time (ET) from 00 hours 00 minutes to 99 hours 59 minutes and chronographic time (CHR) from 00 minutes to 99 minutes. (The sweep second hand shows the seconds for chronographic time.) Control of this display is provided by the ET and CHR switches.
- (4) The elapsed time (ET) control switch is located in the lower left corner. This switch operates as follows:
 - (a) In the RESET position, the ET display is blanked and the elapsed time indication is set to zero. The RESET position is spring loaded to return the switch to the HLD position.

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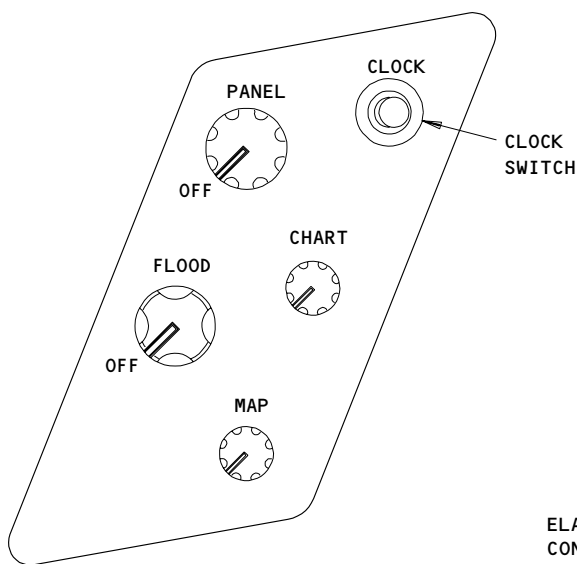
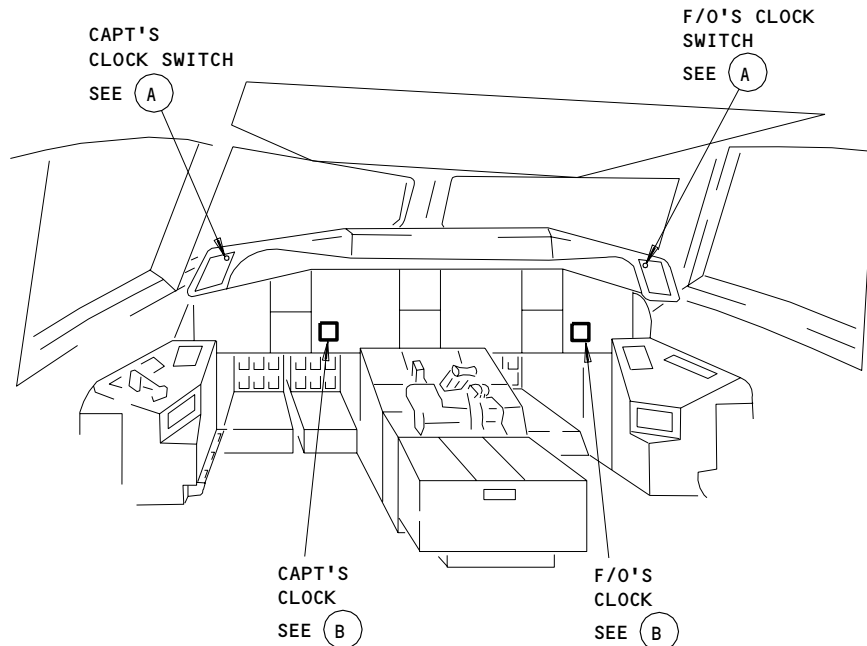
31-25-00

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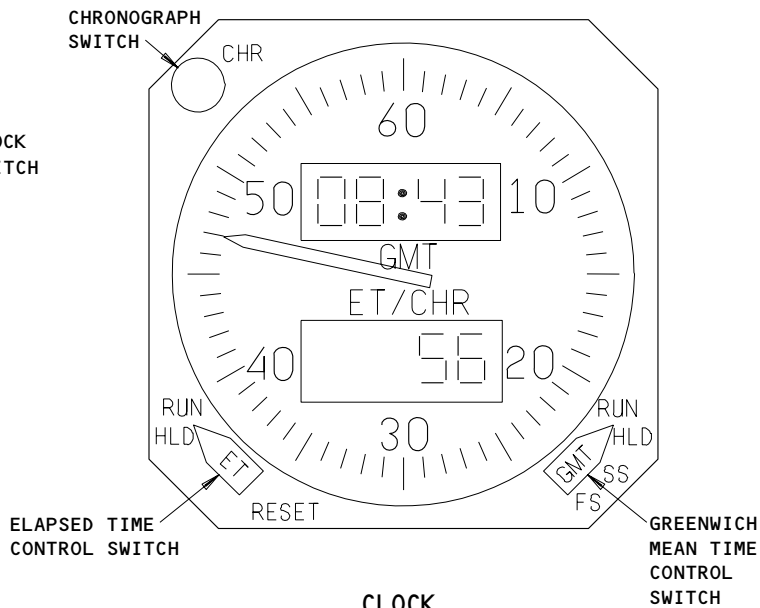
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(A)



CLOCK

(B)

Clock - Component Location
Figure 1

EFFECTIVITY	
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- (b) The HLD (hold) position of the switch freezes the ET display at the present indicated value.
- (c) In the RUN position, time is accumulated from the last hold or reset condition. The display automatically advances from this indicated value.
- (5) The CHR switch is located in the upper left corner. This switch operates as follows:
 - (a) The first press of the switch starts the chronograph running.
 - (b) A second press of the switch freezes the chronograph display at the present indicated value.
 - (c) A third press of the switch resets the CHR accumulator to zero. The contents of the ET accumulator is then displayed. If the ET accumulator contains zero, the elapsed time display is blanked with the sweep second hand to zero.
 - (d) Chronograph operation replaces the display of the elapsed time, but does not affect the internal operation of the ET accumulator.

B. Clock Switch

- (1) The Captain's and F/O's clock switches are located on either side of the glareshield (P7).
- (2) The CHR and remote clock switches are connected in parallel and operate the chronograph display. Both switches cycle the chronograph through the start, hold and reset functions of the chronograph mode.

C. FMC

- (1) The clock GMT output is displayed on the FMC-CDU (AMM 34-61-00) POS INIT page. Since the FMCs have a cross talk connection, they both use the same clock output. Both CDUs display GMT from the captain's clock, unless it has failed. Both FMCs would then switch over automatically and display GMT from the F/O's clock. The FMC-CDU GMT hour display can be manually changed through the FMC, but the minutes and seconds will still be that which is received from the clocks.

3. Operation (Fig. 2)

A. Functional Description

(1) Power

- (a) The 28 vdc hot battery bus operates the digital displays, the sweep second hand, and the time base electronics. The 28 vdc primary bus is monitored by the clock for failure.
- (b) When primary dc power is interrupted, or it drops below 18V, or is lost, the LED in the voltage detector (optoisolator) dims or turns off. This causes the photo transistor to switch off informing the power supply that the primary dc power has failed.
- (c) Loss of 28V dc primary power causes inactivation of all clock controls, blanks the display, and freezes the sweep second hand. When 28V dc primary power comes on again, all functions are restored to the correct times without loss of accuracy.

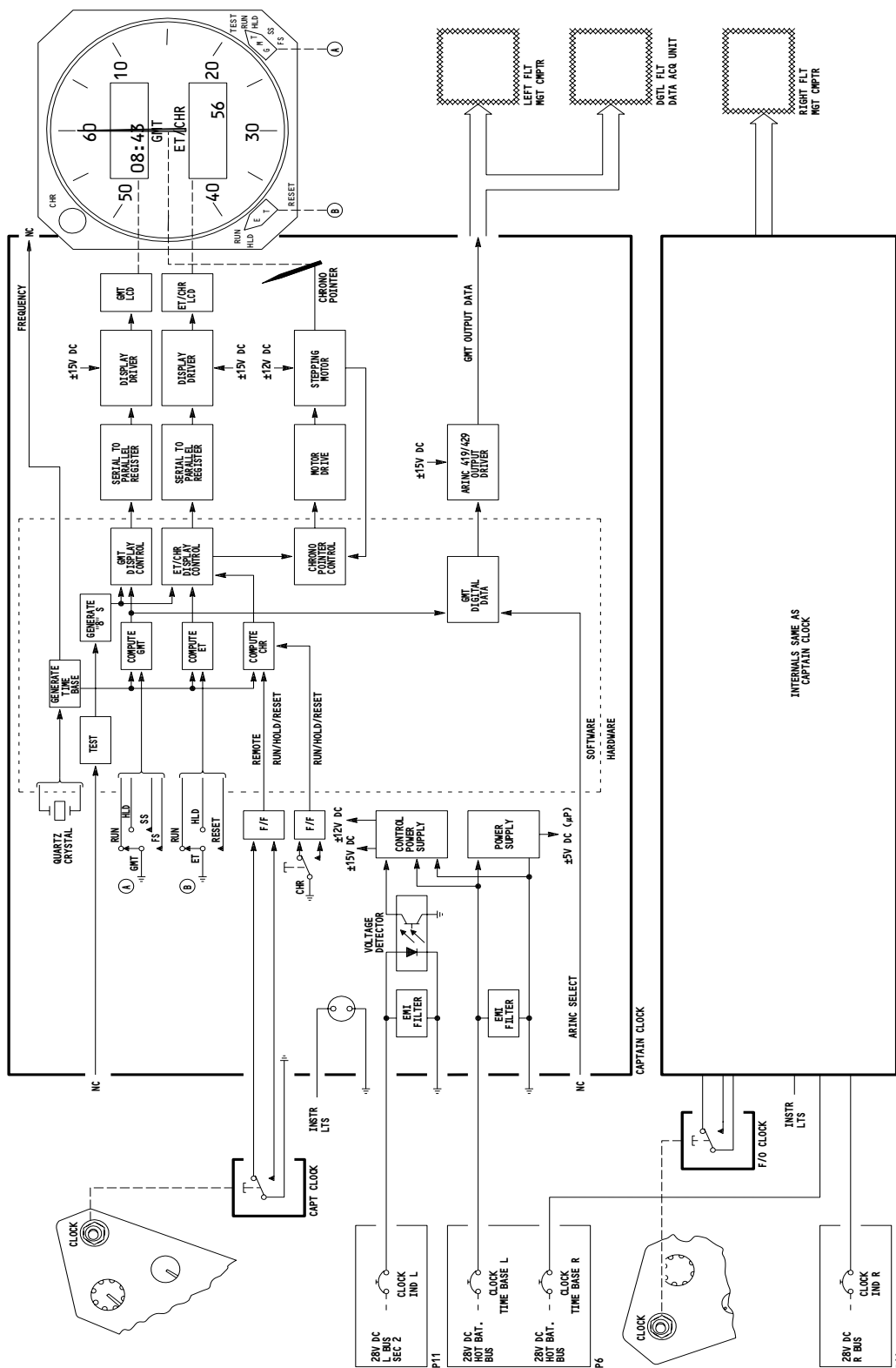
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Clock System Schematic
Figure 2

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- (d) Loss of back-up battery power for more than 200 ms disables all clock controls, indications, and outputs. When power comes on again, all functions return to zero. They hold at zero until the GMT control is turned to slew for a minimum of one count on the GMT display. This restores all functions to normal.

NOTE: Partial loss of battery power may cause the time base microprocessor to "latch up" such that the unit displays are blank when normal power is reapplied. If this occurs, the microprocessor can be reinitialized by cycling the time base battery bus circuit breakers. Clock reset can then be accomplished per par. 3.C.(1) thru (5) of this section.

(2) Clock

- (a) A crystal controlled oscillator provides the time reference. The microprocessor, under software control, uses the oscillator signal to generate the time base. Computation of GMT, ET, and CHR time is done by software. Countdown functions produce hours, minutes, and seconds. Microprocessor output data is converted to serial form to drive the LCD's. With pin 16 floating, data is sent out in ARINC 429 digital format. Binary and BCD GMT data words are transmitted sequentially for a total of 10 words/sec. The chronograph pointer is driven by seconds data from the microprocessor using a stepping motor with a closed loop controller.
- (b) Loss of the time base will blank GMT and disable all the indications.
- (c) The control switches provide electrical grounds for logic circuits in the microprocessor. The clock and CHR switches are latch (F/F) circuits to prevent interference from the switch contacts. Grounding the test pin (10) causes the seven segment display to show all 8's.

B. BITE

- (1) All clock failures are indicated in the same manner. The clock displays go blank and the sweep second hand is frozen. In addition, transmission of GMT output data words is halted.

C. Control

- (1) Provide electrical power (AMM 24-22-00).
- (2) Check that the following main power distribution panel P6 circuit breakers are closed:
 - (a) 6G2, CLOCK TIME BASE L
 - (b) 6G3, CLOCK TIME BASE R
- (3) Check that the following overhead panel P11 circuit breakers are closed:
 - (a) 11B17, CLOCK IND LEFT
 - (b) 11J35, CLOCK IND RIGHT
- (4) Operate the GMT switch to control and display Greenwich Mean Time.
- (5) Operate the ET switch to control and display Elapsed Time or operate the CHR switch or the remote CLOCK switch to display the Chronographic Time, as applicable.

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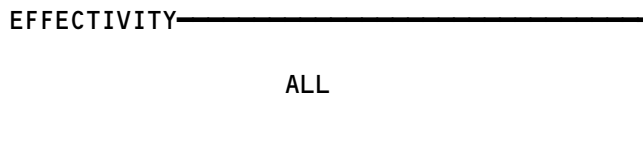

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CLOCKS

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	REFERENCE
CIRCUIT BREAKERS	--		FLT COMPT, P6	
CLOCK TIME BASE L, C563		1	6G2	*
CLOCK TIME BASE R, C576		1	6G3	*
CIRCUIT BREAKERS	--		FLT COMPT, P11	
CLOCK IND LEFT, C573		1	11B17	*
CLOCK IND RIGHT, C574		1	11J35	*
CLOCK - CAPT, N2	--	1	FLT COMPT, P1	31-25-01
CLOCK - F/O, N42	--	1	FLT COMPT, P3	31-25-01
COMPUTER - (REF 34-61-00, FIG. 101)				
FLT MGT L, M134				
FLT MGT R, M135				
SWITCH - CAPT CLOCK, S320	--	1	FLT COMPT, P7	*
SWITCH - F/O CLOCK, S321	--	1	FLT COMPT, P7	*
UNIT - (REF 31-31-00, FIG. 101)				
DGTL FLT DATA ACQUISITION, M138				

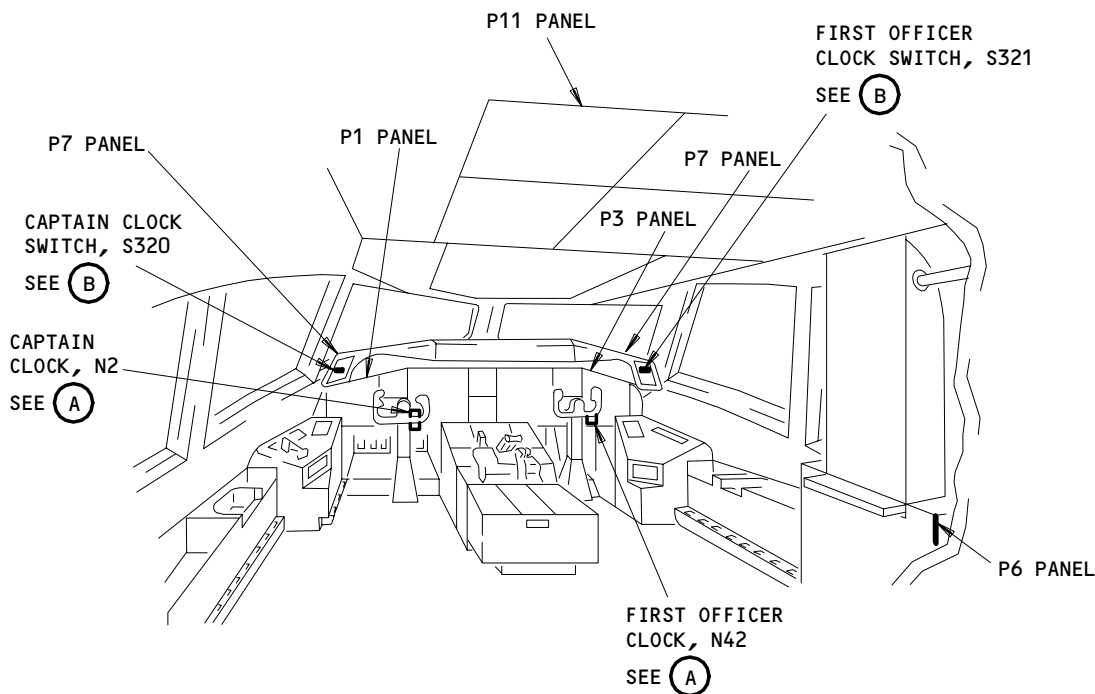
* SEE THE WDM EQUIPMENT LIST

Clocks - Component Index
Figure 101

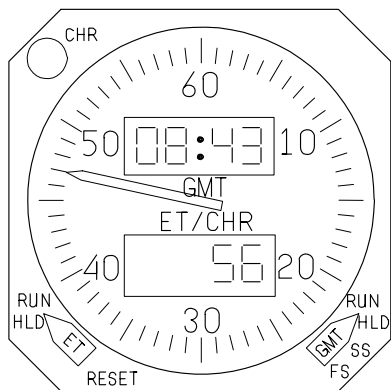


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FLIGHT COMPARTMENT



CLOCK, N2 OR N42

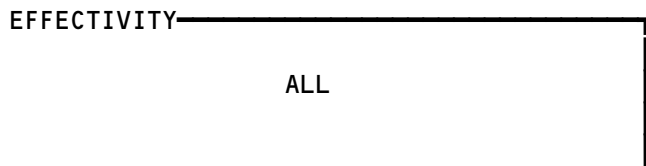
(A)



CLOCK SWITCH, S320 OR S321

(B)

**Clocks - Component Location
Figure 102**



31-25-00

CLOCKS - ADJUSTMENT/TEST

1. General

- A. This Task is an operational test to make sure the basic operation of each clock and its controls work correctly. A system test is not necessary.
- B. The captain's clock is on the captain's main instrument panel, P1. The first officer's clock is on the first officer's main instrument panel, P3.
- C. The captain's CLOCK switch is on the left side of the glareshield, P7. The first officer's CLOCK switch is on the right side of the glareshield.

TASK 31-25-00-715-001

2. Operational Test - Clocks

A. Equipment

- (1) Stopwatch or equivalent (watch with second hand)

B. References

- (1) AMM 24-22-00/201, Electrical Power - Control

C. Access

- (1) Location Zone

211 Control Cabin - sect 41 (LH side)
212 Control Cabin - sect 41 (RH side)

D. Procedure

S 865-002

- (1) Supply electrical power (AMM 24-22-00/201).

S 865-004

- (2) Open these circuit breakers on the main power distribution panel, P6, and attach the DO-NOT-CLOSE tags.
 - (a) 6G2 or 6G3, CLOCK TIME BASE L
 - (b) 6G3 or 6G4, CLOCK TIME BASE R

S 865-003

- (3) Open these circuit breakers on the overhead panel, P11, and attach the DO-NOT-CLOSE tags:
 - (a) 11J9 or 11B17, CLOCK IND LEFT
 - (b) 11J35, CLOCK IND RIGHT

S 715-091

- (4) Make sure the captain's and the first officer's clock displays go out of view for five seconds.

S 865-125

- (5) On the captain's and first officer's clocks, set the ET and GMT switches to the RUN position.

S 865-010

- (6) Remove the DO-NOT-CLOSE tags and close the circuit breakers on the P6 panel:
 - (a) 6G2 or 6G3, CLOCK TIME BASE L

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(b) 6G3 or 6G4, CLOCK TIME BASE R

S 865-053

(7) Remove the DO-NOT-CLOSE tags and close the circuit breakers on the P11 panel:

(a) 11J9 or 11B17, CLOCK IND LEFT

(b) 11J35, CLOCK IND RIGHT

S 715-012

(8) Make sure the GMT and ET/CHR displays show all zeros on the clock.

S 715-101

(9) Do a check of the GMT display control for the captain's and the first officer's clocks:

NOTE: When you set the GMT switch to the FS or SS position, the digit(s) will change at a rate of once for each second.

(a) On the bottom right hand corner of the clock, set the GMT switch to the SS position.

1) Make sure the minutes digits in the GMT display change in sequence (0 to 59).

(b) Set the GMT switch to the FS position.

1) Make sure the hours digits in the GMT display change in sequence (0 to 23).

(c) Set the GMT switch to the RUN position.

(d) Make a note of the time on the GMT display.

(e) Start the stopwatch.

(f) After at least 3 minutes, use the stopwatch as a reference to make sure the clock time is correct.

1) You can continue the procedure while you do the stopwatch check.

S 715-000

(10) Do a check of chronograph time and elapsed time (ET) for the captain's and first officer's clocks:

(a) On the bottom left hand corner of the clock, set the ET control switch to the RESET position.

(b) Let the ET switch go back to the HLD position.

(c) Set the ET switch to the RUN position.

(d) Push the CLOCK switch on the glareshield, P7.

NOTE: The captain's CLOCK switch is on the left side. The first officer's CLOCK switch is on the right side.

(e) Make sure the ET/CHR display shows one zero.

(f) Make sure the sweep second hand on the clock starts to turn from the 12 o'clock position.

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- (g) After the sweep second hand completes two full revolutions, continue the procedure.
 - (h) Push the CHR switch on the clock.
 - 1) Make sure the sweep second hand stops.
 - 2) Make sure the ET/CHR display holds the correct minute value.
 - (i) Push the CLOCK switch on the glareshield.
 - 1) Make sure the sweep second hand goes back to the 12 o'clock position.
 - (j) Make sure the ET/CHR display shows more than zero minutes (elapsed time).
- E. Set the airplane back to its usual condition.

S 865-165

- (1) On the clock, set the GMT switch to the RUN position.

S 865-198

- (2) Set the clock for the correct time:
 - (a) Set the GMT switch to:
 - 1) FS, to set the hours.
 - 2) SS, to set the minutes.
 - 3) RUN, to set clock to operate.

S 865-232

- (3) Let the clock operate for two minutes.

S 205-233

- (4) Make sure the clock shows the correct time.

S 865-009

- (5) Remove electrical power if it is not necessary (AMM 24-22-00/201).

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CLOCKS - REMOVAL/INSTALLATION

1. General

- A. This procedure has two tasks. The first task is the removal of the clock. The second task is the installation of the clock.
- B. The clocks are installed on the captain's instrument panel, P1, and the first officer's instrument panel, P3.

TASK 31-25-01-004-001

2. Remove the Clock

A. Access

- (1) Location Zones
211/212 Flight Compartment

B. Procedure

S 864-002

- (1) Open these circuit breakers on the main power distribution panel, P6, and attach the DO-NOT-CLOSE tags:
 - (a) For the left clock:
 - 1) 6G2, CLOCK TIME BASE L
 - (b) For the right clock:
 - 1) 6G3, CLOCK TIME BASE R

S 864-003

- (2) Open these circuit breakers on the overhead circuit breaker panel, P11, and attach the DO-NOT-CLOSE tags:
 - (a) For the left clock:
 - 1) 11B17, CLOCK IND LEFT
 - (b) For the right clock:
 - 1) 11J35, CLOCK IND RIGHT

S 034-004

- (3) Loosen the bottom left screw and the top right screw which hold the clock against the mounting clamp.

NOTE: It is not necessary to loosen the top left screw and the bottom right screw which hold the clock mounting clamp to the instrument panel.

S 024-005

- (4) Move the clock out of the panel.

S 034-006

- (5) Disconnect the electrical cable.

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TASK 31-25-01-404-026

3. Install the Clock

A. Reference

- (1) 24-22-00/201, Eletrical Power Control

B. Access

- (1) Location Zones
211/212 Flight Compartment

C. Procedure

S 204-007

- (1) Make sure the circuit breakers on the main power distribution panel, P6, are open:
 - (a) For the left clock:
 - 1) 6G2, CLOCK TIME BASE L
 - (b) For the right clock:
 - 1) 6G3, CLOCK TIME BASE R

S 204-008

- (2) Make sure the circuit breakers on the overhead circuit breaker panel, P11, are open:
 - (a) For the left clock:
 - 1) 11B17, CLOCK IND LEFT
 - (b) For the right clock:
 - 1) 11J35, CLOCK IND RIGHT

S 434-009

- (3) Connect the electrical cable to the clock.

S 424-010

- (4) Move the clock into the panel.

S 434-011

- (5) Tighten the bottom left screw and the top right screw to hold the clock to the mounting clamp.

S 864-012

- (6) Supply electrical power (Ref 24-22-00).

S 864-013

- (7) Remove the DO-NOT-CLOSE tags and close the P6 panel circuit breakers:
 - (a) For the left clock:
 - 1) 6G2, CLOCK TIME BASE L
 - (b) For the right clock:
 - 1) 6G3, CLOCK TIME BASE R

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S 864-014

- (8) Remove the DO-NOT-CLOSE tags and close the P11 panel circuit breakers:
- (a) For the left clock:
 - 1) 11B17, CLOCK IND LEFT
 - (b) For the right clock:
 - 1) 11J35, CLOCK IND RIGHT

S 864-015

- (9) On the clock, set the GMT switch to the RUN position.

S 864-034

- (10) Set the clock for the correct time:
- (a) Set the GMT switch to:
 - 1) FS, to set the hours.
 - 2) SS, to set the minutes.
 - 3) RUN, to set clock to operate.

S 864-016

- (11) Let the clock operate for two minutes.

S 204-017

- (12) Make sure the clock shows the correct time.
- D. Put the airplane back to the usual condition.

S 864-018

- (1) Remove electrical power if it is not necessary (AMM 24-22-00).

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FLIGHT DATA RECORDER SYSTEM – DESCRIPTION AND OPERATION

1. General (Fig. 1)

- A. The system consists of a digital flight data acquisition unit (DFDAU), a digital flight data recorder (DFDR), and accelerometer, and relay sensors.
- B. GUI 115;
The system also consist of a data management entry panel (DMEP).
- C. GUI 001-114;
The Flight Recorder Control Panel (FRCP) is also installed on the flight recorder system.
- D. All input signals are connected to the DFDAU. The DFDAU conditions the input signals to produce a digital output which is sent to the DFDR for recording. The recorded data is stored in a crash protected container inside the DFDR.
- E. The system is turned on automatically when the airplane is in flight, or on the ground when an engine is running. The system may also be turned on manually or tested by means of a toggle switch on the FRCP or the DMEP.
- F. The flight recorder system is monitored continuously by BITE during operation. System failures are displayed on the FRCP or the DMEP and on the DFDAU and EICAS.

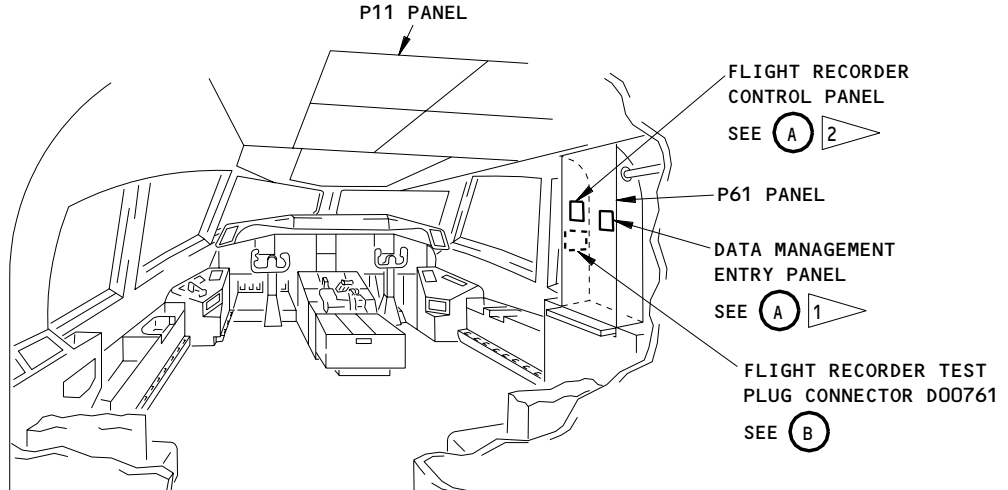
2. Component Details (Fig. 1)

- A. GUI 001-114;
Flight Recorder Control Panel
 - (1) The flight recorder control panel (FRCP) provides system manual power control and indicates system status. The control panel consists of a function (ON-NORM-TEST) switch, a relay and OFF annunciator.
 - (2) The function switch is normally set to the NORM position. In this position, power to the system is automatically controlled through the system power relays. The ON position is used manually to turn on the DFDAU and the DFDR. The TEST position is spring-loaded and is used to turn on power to the DFDAU and the DFDR for testing purposes.
 - (3) The OFF light on the FRCP comes on when the DFDR and/or the DFDAU fails, the system is not turned on, or in the absence of electrical power.

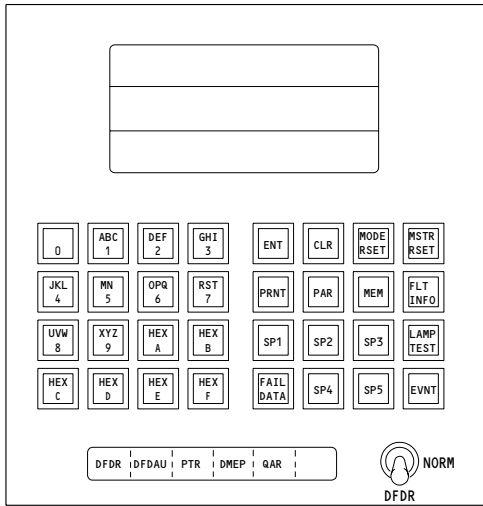
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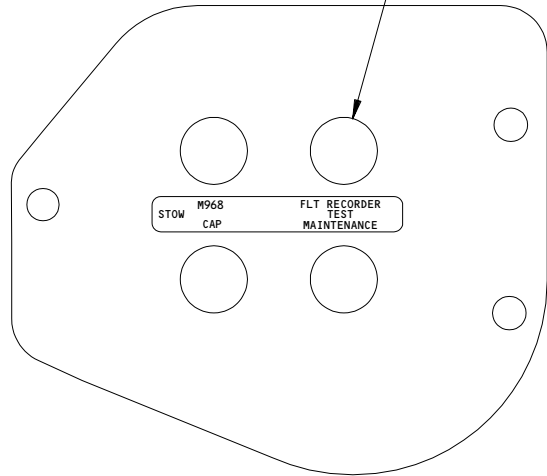
FLIGHT COMPARTMENT



DATA MANAGEMENT ENTRY PANEL

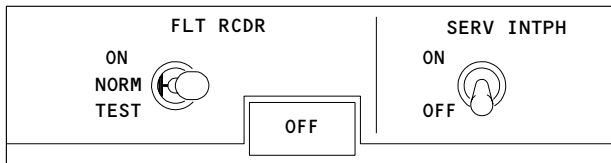
(A) 1

FLIGHT RECORDER TEST PLUG CONNECTOR D00761 (FORWARD SIDE OF P61 PANEL)



TEST PLUG

(B)



FLIGHT RECORDER CONTROL PANEL

(A) 2

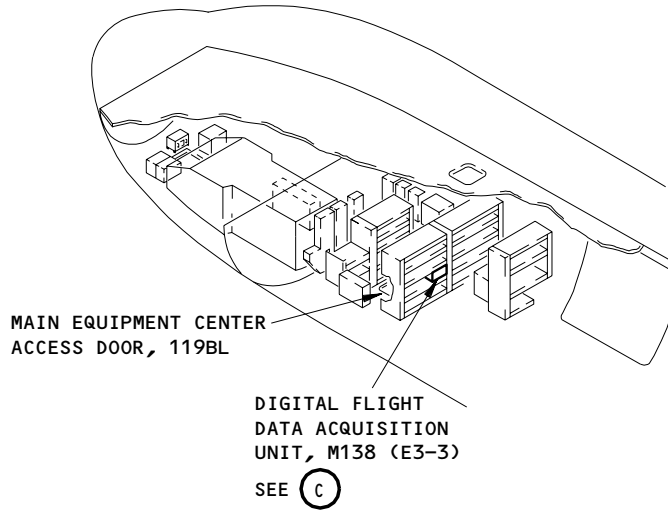
- 1 GUI 115
- 2 GUI 001-114

Flight Data Recorder System Component Location
Figure 1 (Sheet 1)

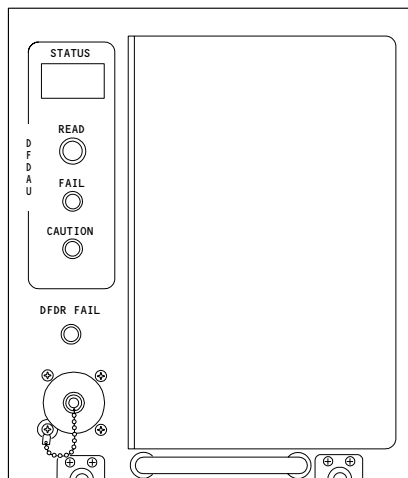
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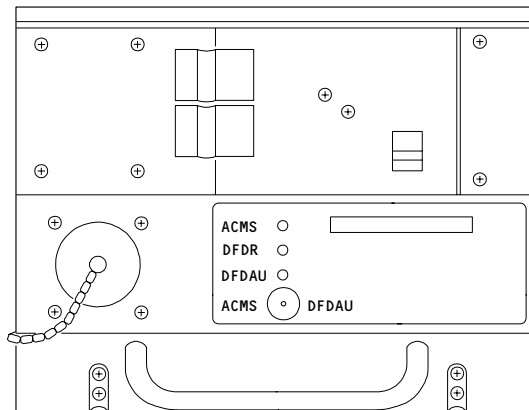


MAIN EQUIPMENT CENTER



**DIGITAL FLIGHT DATA
ACQUISITION UNIT, M138**

(C) 3



**DIGITAL FLIGHT DATA
ACQUISITION UNIT**

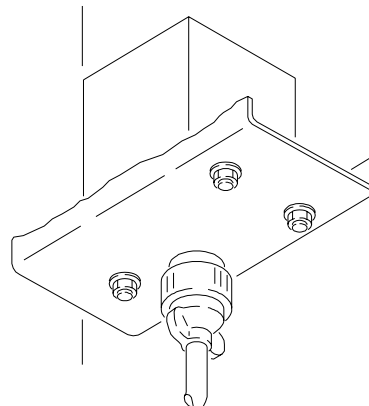
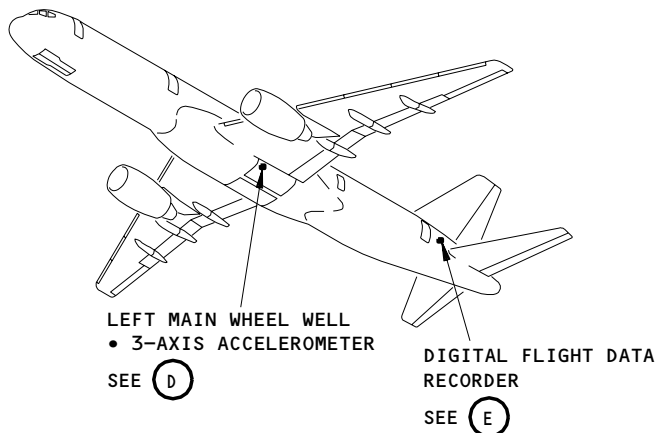
(C) 4

- 3 GUI 010, 011 PRE-SB 31-0094;
GUI 001-009, 012-015
- 4 GUI 010, 011 POST-SB 31-0094

**Flight Data Recorder System - Component Location
Figure 1 (Sheet 2)**

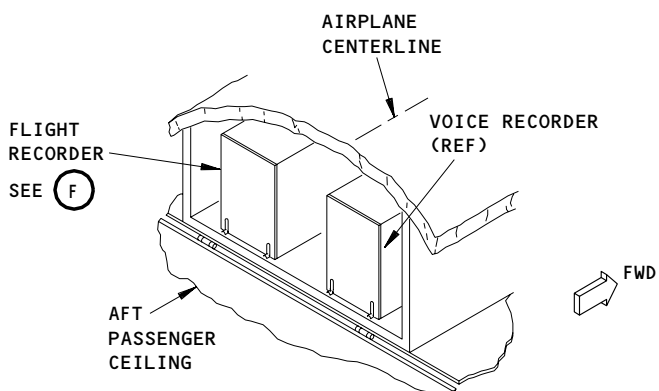
EFFECTIVITY	ALL
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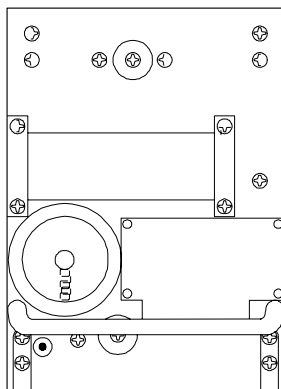
3-AXIS ACCELEROMETER

(D)

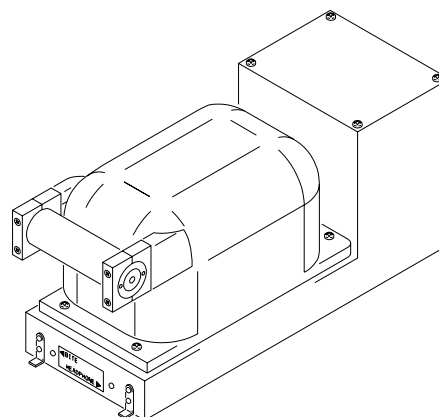


VOICE AND FLIGHT RECORDER RACK ASSEMBLY

(E)



FLIGHT DATA RECORDER (FDR)



FLIGHT DATA RECORDER (FDR)

3 GUI 010, 011 PRE-SB 31-0094;
GUI 001-009, 012-015 (F) 3

4 GUI 010, 011 POST-SB-0094

(F) 4

Flight Data Recorder System - Component Location
Figure 1 (Sheet 3)

EFFECTIVITY	ALL
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B. GUI 115;

Data Management Entry Panel

- (1) The data management entry panel (DMEP) is located on the right side panel (P61). The DMEP consists of a function switch, labelled NORM-DFDR, fault lights, keyboard switches and a display window.
- (2) The function switch is normally set to the NORM position. In this position, power to the DFDR is automatically controlled through the system power relays. The DFDR position is spring-loaded and is used to turn on the DFDR for testing purposes.
- (3) The DFDR, DFDAU, and DMEP fault lights come on when the respective LRU's have failed. The PTR and QAR lights are part of the AIDS (Ref 31-35-00).

C. Accelerometer

- (1) The flight recorder accelerometer is installed in the left wheel well.
- (2) The accelerometer provides vertical, lateral, and longitudinal acceleration signals to the DFDAU. The accelerometer measures vertical acceleration from -3G to +6G. It measures lateral and longitudinal accelerations from -1G to +1G.

D. Flight Recorder/System Relays.

- (1) The flight recorder system relays include the left and right ENG START-TO-STOP relays and the SYS NO. 2 AIR/GND relay. The ENG START-TO-STOP relays provide AC power to the DFDR when the corresponding engine is running. The SYS NO. 2 AIR/GND relay also provides AC power to the DFDR when the airplane is airborne.

E. Flight Data Acquisition Unit (FDAU)

- (1) The FDAU is a microprocessor controlled unit that sequentially receives specific data from various airplane systems and sensors. The acquired data is scaled and formatted into a digital data format. The FDAU outputs this data to the DFDR for recording.
- (2) GUI 115;
The functions of the FDAU are as follows:
 - (a) A READ switch, an ATE connector, fault indicators and a fault display are located on the front panel of the FDAU. The READ switch is used to display stored fault display. These fault codes are used for bench maintenance. The READ switch is also used to test the fault indicators. ATE connector is provided to connect external test equipment. The FDAU FAIL and DFDR FAIL lights come on to indicate that the corresponding component has failed. The CAUTION light comes on if the FDAU input circuits are at fault.
 - (b) An ATE connector and fault indicator are located on the front panel of the FDAU. The ATE connector is provided to connect external test equipment.
- (3) GUI 010, 011 PRE-SB 31-0094;
GUI 001-009, 012-114;
The functions of the FDAU are as follows:

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- (a) A READ switch, an ATE connector, fault indicators, a fault display and the disk drive are located on the front panel of the FDAU. The READ switch is used to display stored fault display. These fault codes are used for bench maintenance. The READ switch is also used to test the fault indicators. ATE connector is provided to connect external test equipment. The FDAU FAIL and DFDR FAIL lights come on to indicate that the corresponding component has failed. The CAUTION light comes on if the FDAU input circuits are at fault.
 - (b) An ATE connector and fault indicator are located on the front panel of the FDAU. The ATE connector is provided to connect external test equipment.
 - (c) Mounted on the front of the FDAU is a three and one - half inch disk drive. Access to the disk is obtained by opening a hinged door on the right side of the disk drive. A drive LED flashes to indicate information is being written onto the disk. The disk drive is hinged on the left side so that the drive can swing outward, providing easier access to the disk door.
 - (d) The FDAU will automatically format a new disk when it is installed.
 - (e) The disk can be used to upload an airplane integrated data system (AIDS) or airplane condition monitoring system (ACMS) software to the FDAU. This software is an airline option and can be customized by the airline. The airline chooses the DFDAU software it wants to use. The disk can also be used for storing AIDS/ACMS reports depending upon the software in the FDAU.
- (4) GUI 010, 011 POST-SB 31-0094;
The functions of the FDAU are as follows:
- (a) A BITE and S/W PN positions switch - the toggle switch allows the operator to perform the BITE check of the FDAU and initiate the software configuration check.
 - 1) Setting the switch to the S/W PN position enables the FDAU to display the software configuration and part number.
 - (b) LED fault indicators - There are three fault indicators on front of the FDAU. They are the FDAU, DFDR and the DMM or ACMS. If a fault occurs, the appropriate LED indicator will illuminate to identify the culprit.

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(c) ATE connector - the connector allows the operator to connect the test equipment to the FDAU for testing and trouble shooting the FDAU.

F. Digital Flight Data Recorder (DFDR)

- (1) GUI 010, 011 POST-SB 31-0094;
GUI 001-009, 012-115;

The DFDR records the data output by the FDAU. Data from the last 25 hours of operation is stored on 1/4-inch wide magnetic tape. The tape is located in a crash-proof container within the DFDR.

- (2) GUI 010, 011 POST-SB 31-0094;
GUI 001-009, 012-115;

The flight data recorder writes the data for the last 25 hours of airplane operation. The data is stored in solid state memory. The solid state memory is in a crash-proof container in the flight data recorder.

- (3) The DFDR is installed on the voice and flight recorder rack E7. This rack is located above the aft galley ceiling. The exterior of the DFDR is painted bright orange and has reflective tape affixed to it to aid in its location in the event of an accident.

- (4) The underwater locator beacon (ULB) aids in location of a submerged DFDR by sending out an acoustic signal when the unit is submerged in water.

- (5) The ULB is contained in a cylindrical watertight case designed to withstand high impact shock and deep water immersion. It is mounted on the front panel of the DFDR.

- (6) The ULB is battery operated and is designed to operate for at least 30 days when immersed. It will withstand water depths of 20,000 feet and has a maximum detection range of 2,000 to 4,000 yards.

3. Operation

A. Functional Description

- (1) Power Distribution and Control

(a) During normal operation, ac power is supplied to the flight recorder system through the left and right ENG START-TO-STOP relays. The relays are wired in parallel so that any one relay can provide power to the DFDR.

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- (b) The left and right ENG START-TO-STOP relays are actuated when the corresponding engine is first started. The engine ignition switches control the operation. At engine start, when an engine ignition switch is first turned on, the corresponding ENG START-TO-STOP relay (left or right) is energized. After the fuel control switch is set to RUN, it will cause the flight recorder control relay to remain energized after the ignition switch is selected to OFF. The relays remain energized until the fuel control switches are set to CUTOFF.
- (c) The system No. 2 AIR/GND relay is also wired in parallel with the ENG START-TO-STOP relays to provide power to the DFDR. This relay de-energizes when the airplane becomes airborne, resulting in a contact closure that provides an additional means to maintain power to the DFDR during flight.
- (d) GUI 115;
Manual power switching is accomplished with the NORM-DFDR switch on the data management entry panel. During normal operation, the switch is set to NORM and power is controlled by the automatic switching network. When the switch is set to the DFDR position, ac power is supplied to the system.
- (e) GUI 001-114;
Manual power switching is accomplished with the ON-NORM-TEST switch on the flight recorder control panel. During normal operation, the switch is set to NORM and power is controlled by the automatic switching network. When the switch is set to either ON or to the momentary TEST position, power is supplied to the system.
- (f) GUI 001-114;

The OFF light on the flight recorder control panel is a status indicator. It is controlled by the status relay within the control panel. When the flight recorder system is powered and no faults exist, the status relay is energized and the OFF light is off. 28v dc from the DFDR system status output and a ground from the FDAU BITE output energizes the relay. If power is interrupted or if a system fault occurs, the network opens, the status relay de-energizes and the OFF light comes on.

(2) Parameter Inputs

- (a) The FDAU receives inputs from sensors and signals from other airplane systems. The inputs are grouped as analog, discrete, and ARINC 429 digital inputs.
- (b) Accelerometer
 - 1) The accelerometer receives 28-volt dc power from the DFDAU.

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17.101

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- 2) The unit consists of three independent accelerometers, one for each axis. Each accelerometer operates as a closed loop servo system that is responsive to linear acceleration along its sensitive axis. An applied acceleration results in a force on a seismic pendulum which disturbs the servos capacitive balanced bridge. As a result of this imbalance, the servo applies current to a torquer coil to return the pendulum to its original position. A sensing resistor in series with the torquer coil, provides a voltage that is proportional to the acceleration input. The voltage is then amplified and output to the FDAU.
- (c) ARINC 429 DITS Inputs
 - 1) The left and right engine EPR transmitters provide the EPR signals.
 - 2) The left or right EICAS computer, via the EICAS select switch provides control surface signals. These signals are:
 - a) Thrust Reverser In-Transit and Deployed
 - b) Left and Right Aileron position
 - c) Left and Right Elevator Position
 - d) Left and Right Rudder Position
 - 3) The left or right ADC provides altitude and airspeed signals.
 - 4) The left or center EFIS symbol generator provides pitch and roll attitude and magnetic heading signals.
 - 5) The captain's clock provides GMT signals.
- (3) Flight Data Acquisition Unit Function
 - (a) The FDAU receives 115v ac power from the FLIGHT RECORDER AC circuit breaker. The FDAU contains a switching regulator power supply that generates the necessary internal voltages and provides excitation outputs as follows:
 - (b) The FDAU receives the flight parameters to be recorded. It processes and formats the signals. It then transmits the data to the DFDR for recording. Data acquisition, signal processing and output data streams are controlled by the central processing unit (CPU).
 - (c) The FDAU BITE continuously performs internal circuit checks as soon as power is applied. A BITE detected fault is output in a status word to the DFDR and stored in a non-volatile memory for access by shop test equipment. The stored fault data provides a history of intermittent faults as well as identifying current faults. Current faults are indicated by the fault indicator on the FDAU's front panel.
- (4) DFDR Functions
 - (a) The DFDR receives 115V ac power from the FLIGHT RECORDER AC circuit breaker through either the manual or automatic switching network. The DFDR contains a regulated power supply that generates the necessary operating voltages.

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17.101

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- (b) Under normal operation the FLT DATA REC message are not shown on the EICAS status message. If the DFDR malfunctions this will cause a discrete signal to be sent to the EICAS to generate the FLT DATA REC status message (Ref 31-41-00).
 - (5) Underwater Locator Beacon
 - (a) The underwater locator beacon is powered by a self contained battery. The ULB is activated when its water switch is immersed in water. The water switch is part of a low-current trigger circuit that turns on the oscillator circuit. The oscillator output drives a transducer that is mechanically coupled to the units case, radiating 37 kHz acoustic energy into the surrounding water. It sends out acoustic rf pulses when it is immersed in water up to 20,000 feet. It has a detection range of 2,000 to 4,000 yards.
 - (6) System Self Test
 - (a) A system self-test may be performed by momentarily setting the function switch on the control panel to the TEST position. The OFF light will extinguish if no fault is detected.
 - (b) A system self-test may be performed by momentarily setting the function switch on the DMEP to the DFDR position. The DFDR light will extinguish if no fault is detected. The DFDR, DFDAU, and DMEP lights will stay on if a failure exists.
- B. For more details on the Flight Data Recorder System, refer to the applicable Wiring Diagram Manual and System Schematic Manual.

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FAULT ISOLATION/MAINT MANUAL

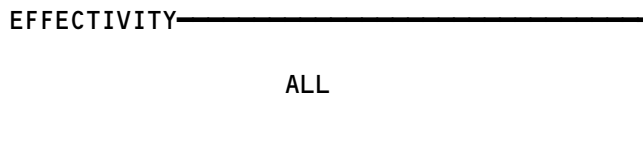
FLIGHT DATA RECORDER SYSTEM

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	AMM REFERENCE
ACCELEROMETER - FLIGHT RECORDER, TS28	4	1	733, LEFT WHEEL WELL	31-31-05
BEACON - UNDERWATER LOCATOR	3	1	834, VOICE AND FLT RECORDER RACK	31-31-02
CIRCUIT BREAKER -			FLT COMPT, P11	
AIDS SENSOR, C564		1	11S1	*
FLIGHT RECORDER AC, C561		1	11J7	*
FLIGHT RECORDER DC, C578		1	11J8	*
PANEL - DATA MANAGEMENT ENTRY, M10301	1	1	FLT COMPT, P61	31-31-06
PANEL - FLIGHT RECORDER CONTROL, M33	1	1	FLT COMPT, P61	31-31-04
PLUG - FLIGHT RECORDER TEST, M968	1	1	FLT COMPT, FWD END OF P61 PANEL	*
PRINTER - (FIM 31-35-00/101)				
M10386				
RECEPTACLE - SHORTING, M976				
RECORDER - (FIM 31-35-00/101)				
QUICK ACCESS, M10387				
RECORDER - DIGITAL FLIGHT DATA, M200	3	1	834, VOICE AND FLT RECORDER RACK	31-31-01
RELAY - (FIM 31-01-37/101)				
FLT REC ADC I/P SWITCH, K554				
FLT REC EFIS I/P SWITCH, K15				
TRANSDUCER -				
CONTROL COLUMN POSITION, TS5302	4	1	113AL, FWD EQUIP BAY	31-31-08
CONTROL WHEEL POSITION, TS5301	4	1	119AL, MAIN EQUIP CTR	31-31-09
LEFT BRAKE PRESSURE, T10055 AND T10053	4	2	730, LEFT MAIN LANDING GEAR	31-31-13
RIGHT BRAKE PRESSURE, T10056 AND T10054	4	2	740, RIGHT MAIN LANDING GEAR	31-31-13
RUDDER PEDAL POSITION, TS5303	4	1	113AL, FWD EQUIP BAY	31-31-10
UNIT - DIGITAL FLIGHT DATA ACQUISITION, M138	2	1	119BL, MAIN EQUIP CTR, E3-3	31-31-03

* SEE THE WDM EQUIPMENT LIST

- GUI 115
 GUI 001-114,116-999

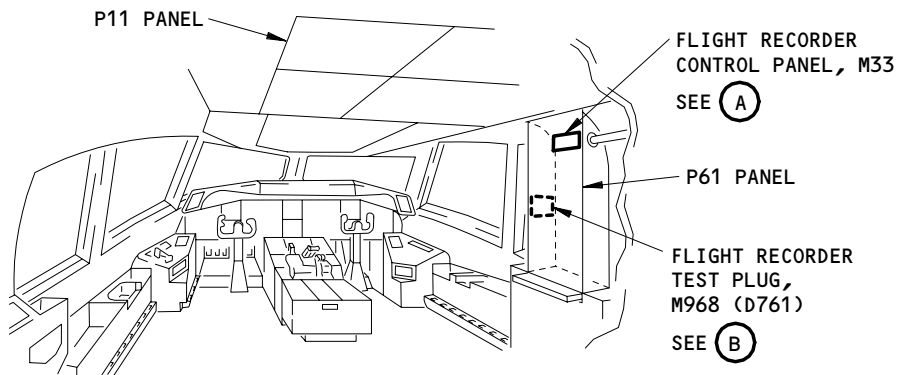
Flight Data Recorder System - Component Index
Figure 101



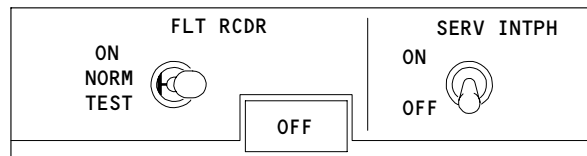
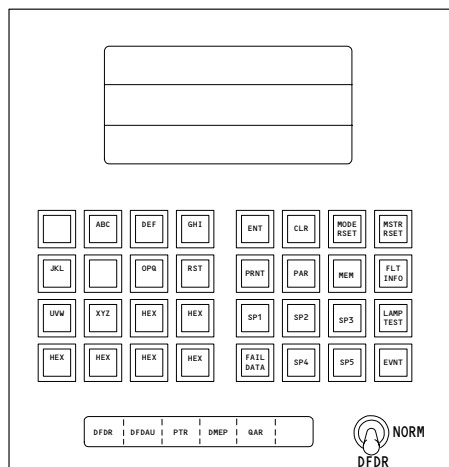
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BOEING

757 FAULT ISOLATION/MAINT MANUAL



FLIGHT COMPARTMENT

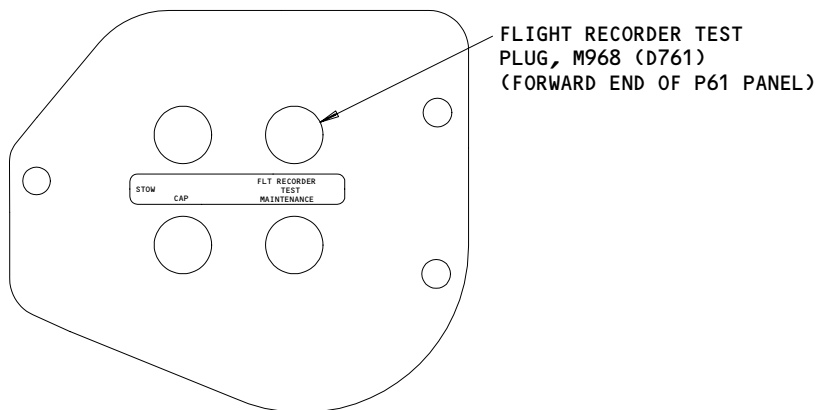


FLIGHT RECORDER CONTROL PANEL, M33

DATA MANAGEMENT ENTRY PANEL, M10301

(A) 1

(A) 2



(B)

- 1 GUI 115
- 2 GUI 001-114, 116-999

Flight Data Recorder System - Component Location
Figure 102 (Sheet 1)

EFFECTIVITY

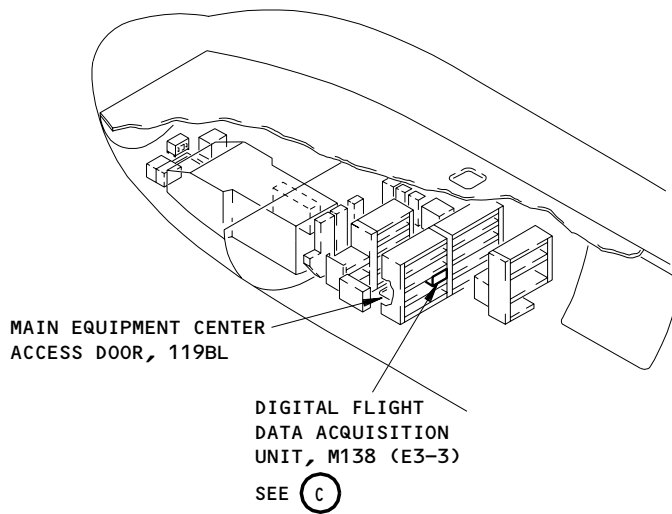
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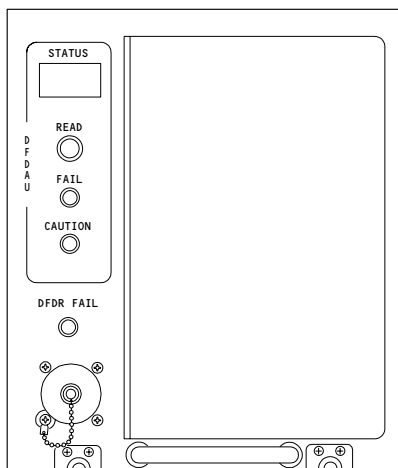
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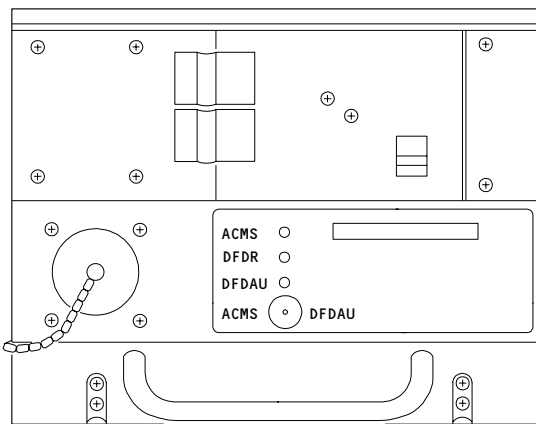


MAIN EQUIPMENT CENTER



DIGITAL FLIGHT DATA ACQUISITION UNIT, M138

(C) 3



DIGITAL FLIGHT DATA ACQUISITION UNIT

(C) 4

3 GUI 010, 011 PRE-SB 31-0094;
GUI 001-009, 012-015

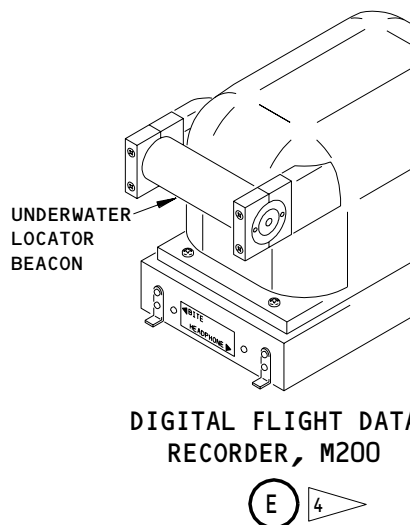
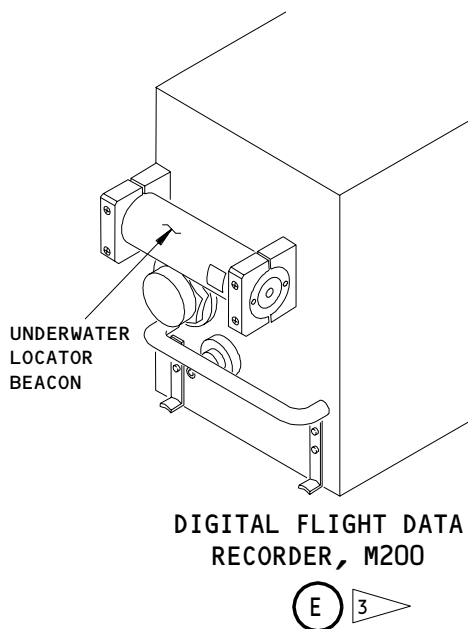
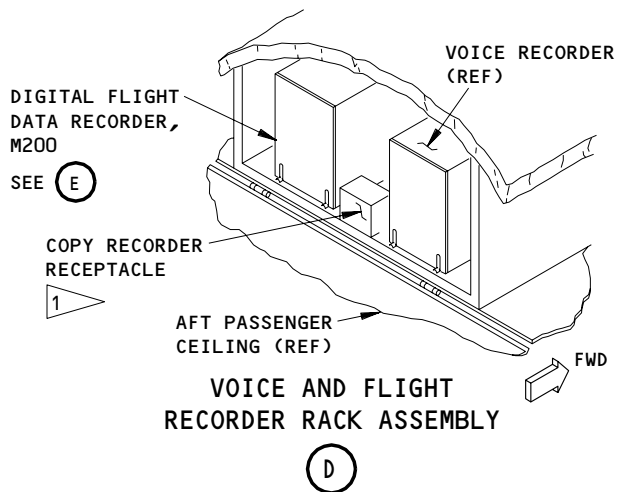
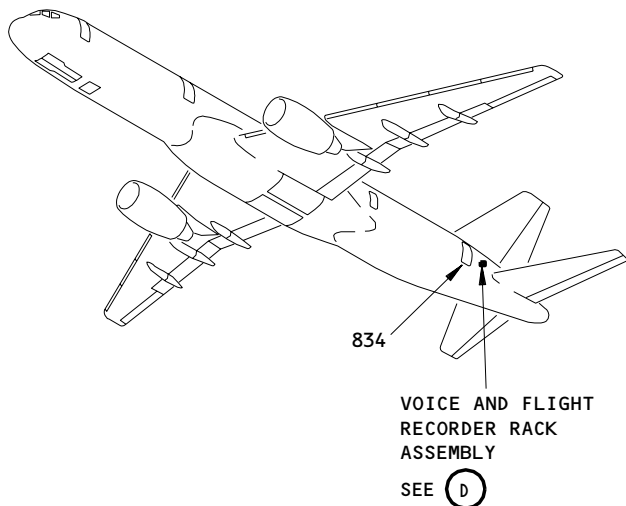
4 GUI 010, 011 POST-SB 31-0094

**Flight Data Recorder System - Component Location
Figure 102 (Sheet 2)**

EFFECTIVITY

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3 GUI 010, 011 PRE-SB 31-0094;
GUI 001-009, 012-115

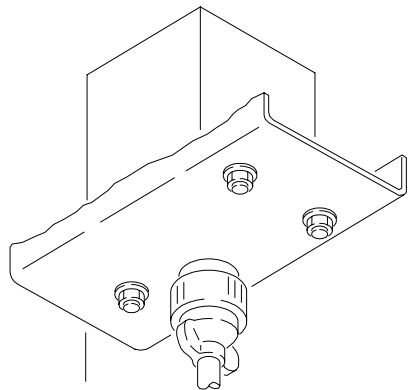
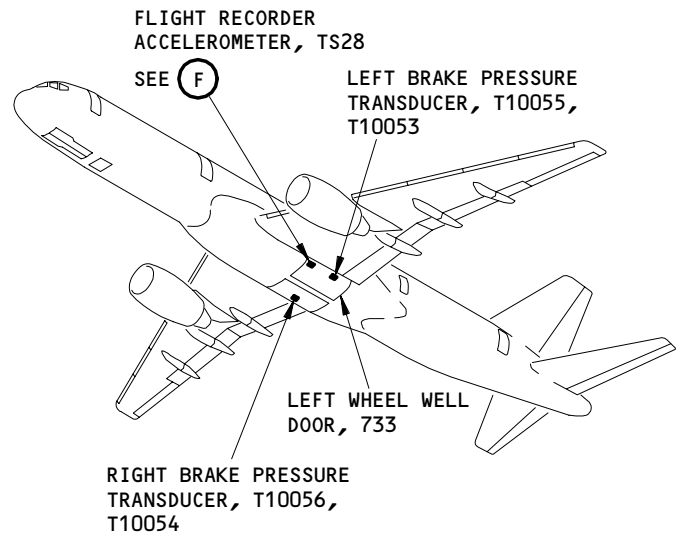
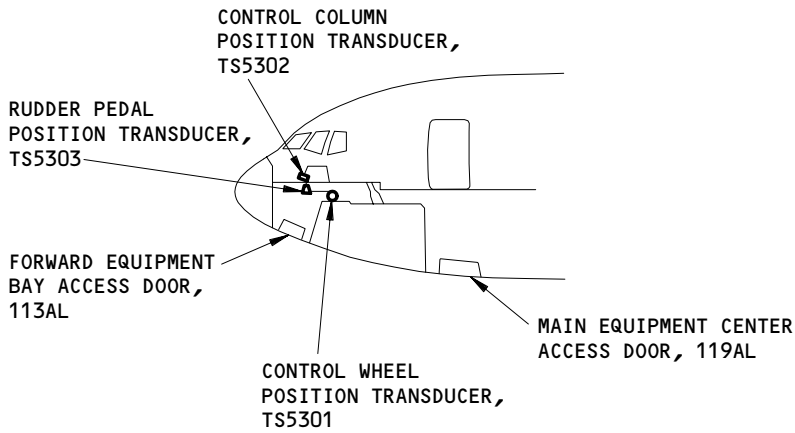
4 GUI 010-011 POST-SB 31-0094

Flight Data Recorder System - Component Location
Figure 102 (Sheet 3)

EFFECTIVITY	ALL
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BOEING
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FAULT ISOLATION/MAINT MANUAL



FLIGHT RECORDER ACCELEROMETER, TS28

(F)

Flight Data Recorder System - Component Location
Figure 102 (Sheet 4)

EFFECTIVITY	
	ALL

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06

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FLIGHT DATA RECORDER SYSTEM – ADJUSTMENT/TEST

1. General

A. This procedure has these tasks:

- (1) An operational test of the flight data recorder system
- (2) A system test of the flight data recorder system

TASK 31-31-00-715-787-001

2. Flight Data Recorder Operational Test

A. General

- (1) The operational test makes sure the switches for the manual and automatic power sources operate correctly. A BITE test is also included in this operational test. No test equipment is necessary.

B. References

- (1) AMM 24-22-00/201, Electrical Power Control
- (2) AMM 31-31-01/201 DFDR Removal and Installation

C. Prepare for the Test

S 865-865-001

- (1) Supply electrical power (AMM 24-22-00/201).

S 865-891-001

- (2) Make sure these circuit breakers on the overhead circuit breaker panel, P11, are closed:
 - (a) 11J2, EICAS CMPTR LEFT
 - (b) 11J3, EICAS UPPER IND
 - (c) 11J7, FLIGHT RECORDER AC
 - (d) 11J8, FLIGHT RECORDER DC
 - (e) 11J29, EICAS CMPTR RIGHT
 - (f) 11J30, EICAS LOWER IND
 - (g) 11J31, EICAS DISPLAY SW
 - (h) 11J32, EICAS PILOTS DISPLAY
 - (i) 11S1, AIDS
 - (j) 11S15, AIR/GND SYS 1
 - (k) 11S19, AIR/GND SYS 2

S 865-897-001

- (3) Open these circuit breakers on the main power distribution panel, P6, and attach DO-NOT-CLOSE tags:
 - (a) 6E1, FUEL VALVES L SPAR
 - (b) 6E2, FUEL VALVES R SPAR

EFFECTIVITY
GUI 010, 011 PRE-SB 31-0094;
GUI 001-009, 012-014

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CONFIG 1
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S 865-898-001

- (4) Open these circuit breakers on the overhead circuit breaker panel, P11, and attach DO-NOT-CLOSE tags:
 - (a) 11D19, ENGINE START CONT LEFT
 - (b) 11D20, ENGINE START CONT RIGHT

D. Flight Recorder Operational Test

S 715-785-001

- (1) Do the Flight Recorder Control Panel (FRCP) Test
 - (a) Make sure the function switch on the FRCP is in the NORM position.
 - (b) On the FRCP, make sure the OFF light is on.
 - (c) On the FRCP, set the function switch to the TEST position and hold.
 - (d) Make sure the OFF light goes off.
 - (e) Set the function switch to the ON position.

NOTE: The OFF light will come on momentarily when you turn the function switch from the TEST position to the ON position.

- (f) Make sure the OFF light stays off.
- (g) Set the function switch to the NORM position.

E. Air/Ground Switch Test

S 735-606-001

- (1) Do the air/ground test that follow:

WARNING: DO THE DEACTIVATION PROCEDURE FOR FLIGHT MODE SIMULATION BEFORE YOU OPEN THE AIR/GROUND CIRCUIT BREAKERS. WHEN YOU OPEN THE AIR/GROUND CIRCUIT BREAKERS THE AIRPLANE IS IN FLIGHT MODE. IN FLIGHT MODE, MANY OF THE AIRPLANE SYSTEMS CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (a) Do the deactivation procedure for flight mode simulation (AMM 32-09-02/001).
- (b) Open these circuit breakers on the overhead panel, P11:
 - 1) 11C19, LANDING GEAR POS SYS 2 ALTN (If installed).
 - 2) 11S19, AIR/GND SYS 2

EFFECTIVITY
GUI 010, 011 PRE-SB 31-0094;
GUI 001-009, 012-014

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CONFIG 1
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(c) Make sure the FRCP OFF light goes off.

S 865-899-001

- (2) Close these circuit breakers on the overhead panel, P11:
- (a) 11C19, LANDING GEAR POS SYS 2 ALTN (If installed).
 - (b) 11S19, AIR/GND SYS 2
 - (c) Make sure the FRCP OFF light comes on.

F. Engine Automatic Switch Test

S 735-607-001

- (1) Do the engine switch test that follows:
- (a) Open these circuit breakers on the overhead circuit breaker panel, P11, and attach DO-NOT-CLOSE tags:
 - 1) 11D7, ENGINES STBY IGNITION LEFT 1
 - 2) 11D8, ENGINES STBY IGNITION LEFT 2
 - 3) 11D9, ENGINES STBY IGNITION RIGHT 1
 - 4) 11D10, ENGINES STBY IGNITION RIGHT 2
 - 5) 11D20, BATTERY POWER ENGINE START CONT, R
 - 6) 11L1, LEFT ENGINE IGN 1
 - 7) 11L28, RIGHT ENGINE IGN 1
 - (b) Remove the DO-NOT-CLOSE tag and close this P11 panel circuit breaker(s):
 - 1) 11D19, ENGINE START CONT LEFT
 - (c) Make sure the L and R FUEL CONT switch on the control stand is set to the CUTOFF position.
 - (d) Make sure the FRCP function switch is set to the NORM position and the OFF light is on.
 - (e) On the pilots overhead panel, set the left engine start switch on the engine start/RAT control panel to the GND position.
 - (f) Make sure the FRCP OFF light is off.
 - (g) Set the left engine start switch to the AUTO position.

S 865-900-001

- (2) Open the circuit breaker on the main power distribution panel, P6, and attach DO-NOT-CLOSE tags:
- (a) 6C1, FUEL COND CONT L

EFFECTIVITY
GUI 010, 011 PRE-SB 31-0094;
GUI 001-009, 012-014

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(b) Make sure the FRCP OFF light goes off.

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- (3) Open the circuit breaker on the overhead circuit breaker panel, P11, and attach a DO-NOT-CLOSE tag:
- (a) 11D19, ENGINE START CONT LEFT
 - (b) Remove the DO-NOT-CLOSE tag and close this P11 panel circuit breaker:
 - 1) 11D20, ENGINE START CONT RIGHT
 - (c) Make sure the L and R FUEL CONT switch is set to the CUTOFF position.
 - (d) At the pilots overhead panel, set the right engine start switch on the engine start/RAT control panel to the GND position.
 - (e) Make sure the FRCP OFF light is off.
 - (f) Set the right engine start switch to the AUTO position.
 - (g) Make sure the FRCP OFF light comes on.

S 865-902-001

- (4) Open the circuit breaker on the main power distribution panel, P6, and attach DO-NOT-CLOSE tags:
- (a) 6C2, FUEL COND CONT R
 - (b) Make sure the FRCP OFF light goes off.

S 865-903-001

- (5) Open the circuit breaker on the overhead panel, P11, and attach DO-NOT-CLOSE TAG:
- (a) 11D20, ENGINE START CONT RIGHT

G. BITE Test

S 735-608-001

- (1) Do the BITE test that follows:
- (a) Set the FRCP function switch to the ON position.
 - (b) Make sure the DFDAU FAULT indicator on the DFDAU is off.
 - (c) Make sure the FRCP OFF light is off.
 - (d) Push the READ switch on the DFDAU front panel and hold.
 - (e) Make sure the FAIL, CAUTION, and DFDR FAIL indicators on the DFDAU front panel comes on momentarily.
 - (f) Make sure the STATUS display reads FFF and then 888.

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- (g) Make sure that after approximately 4 seconds, the FAIL, CAUTION and DFDR FAIL lights goes off and the STATUS display changes to 000.

NOTE: If status shows any other code(s) prior to 000 and the CAUTION FAIL and DFDR FAIL lights are off, do the steps that follow:

- With power applied to the DFDAU, remove the protective cover from the ATE connector on the front panel of the DFDAU and insert a jumper wire between ATE connector pins 17 and 14.
- Wait a minimum of one minute, then remove the jumper and do the BITE test again.
- If the status window shows any other code(s) prior to 000, do the fault isolation.

- (h) Release the DFDAU READ switch.
- (i) Set the function switch to the NORM position.
- (j) Make sure the FRCP OFF light comes on.

H. EICAS MESSAGE TEST

S 735-609-001

- (1) Do the EICAS message test that follows:
 - (a) Open these circuit breakers on the overhead panel, P11, and attach DO-NOT-CLOSE tags:
 - 1) 11K9, LEFT ENGINE OIL PRESS
 - 2) 11K35, RIGHT ENGINE OIL PRESS
 - (b) Make sure these circuit breakers on the overhead panel, P11, are closed:
 - 1) 11D19, ENGINE START CONT LEFT
 - 2) 11D20, ENGINE START CONT RIGHT
 - (c) Remove the DO-NOT-CLOSE tags and close the P6 panel circuit breakers:
 - 1) 6C1, FUEL COND CONT L
 - 2) 6C2, FUEL COND CONT R
 - (d) Set the FRCP switch to the ON position.
 - (e) Push the ECS MSG and AUTO EVENT switch on the EICAS MAINT panel on the right side panel, P61.
 - (f) Push the ERASE switch on the EICAS MAINT panel for one second.
 - (g) Set the L and R FUEL CONT switches on the P10 panel to the RUN position and wait a minimum of four minutes.
 - (h) Set the COMPUTER switch on the EICAS DISPLAY select panel to the L position.
 - (i) Make sure these EICAS messages, FLT DATA REC and FLT DATA ACQ, are not shown on the bottom display.
 - (j) Set the COMPUTER switch on the EICAS DISPLAY select panel to the R position.
 - (k) Make sure these EICAS message, FLT DATA REC and FLT DATA ACQ, are not shown on the bottom display.

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- (l) Open these circuit breakers on the overhead panel, P11, and attach DO-NOT-CLOSE tags:
 - 1) 11J7, FLIGHT RECORDER AC
 - 2) 11J8, FLIGHT RECORDER DC
- (m) Remove the DFDR from its mounting tray (AMM 31-31-01/201).

NOTE: Wait a minimum of 60 seconds before you do the next step.

S 865-904-001

- (2) Remove the DO-NOT-CLOSE tags and close the P11 panel circuit breakers:
 - (a) 11J7, FLIGHT RECORDER AC
 - (b) 11J8, FLIGHT RECORDER DC
 - (c) Set the COMPUTER switch on the EICAS DISPLAY select panel to the L position.
 - (d) Make sure the EICAS message, FLT DATA REC, is shown on the bottom display.
 - (e) Make sure the EICAS message, FLT DATA AQC, does not show on the bottom display.
 - (f) Set the COMPUTER switch on the EICAS DISPLAY select panel to the R position.
 - (g) Make sure the EICAS message, FLT DATA REC is shown on the bottom display.
 - (h) Make sure the EICAS message, FLT DATA AQC, does not show on the bottom display.
 - (i) Open the circuit breaker on the overhead panel, P11, and attach DO-NOT-CLOSE tag:
 - 1) 11J7, FLIGHT RECORDER AC
 - (j) Remove the DFDAU from its mounting tray (AMM 31-31-03/401).

S 865-905-001

- (3) Remove the DO-NOT-CLOSE tag and close the P11 panel circuit breaker:
 - (a) 11J7, FLIGHT RECORDER AC
 - (b) Make sure the EICAS message, FLT DATA AQC, is shown on the bottom display.
 - (c) Make sure the EICAS message, FLT DATA REC, does not show on the bottom display.
 - (d) Set the COMPUTER switch on the EICAS DISPLAY select panel to the L position.
 - (e) Make sure the EICAS message, FLT DATA AQC, is shown on the bottom display.
 - (f) Make sure the EICAS message, FLT DATA REC, does not show on the bottom display.
 - (g) Open these circuit breakers on the overhead circuit breaker panel, P11, and attach the DO-NOT-CLOSE tags:
 - 1) 11J7, FLIGHT RECORDER AC
 - 2) 11J8, FLIGHT RECORDED DC
 - (h) Install the DFDR to the mounting tray (AMM 31-31-01/401).
 - (i) Install the DFDAU to the mounting tray (AMM 31-31-03/401).

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- (4) Remove the DO-NOT-CLOSE tags and close the P11 panel circuit breakers:
- (a) 11J7, FLIGHT RECORDER AC
 - (b) 11J8, FLIGHT RECORDED DC
 - (c) Return the L and R FUEL CONT SWITCHES to the CUTOFF position.
 - (d) Set the FRCP to the NORM position.

S 865-893-001

- (5) Remove the DO-NOT CLOSE tags and close the P11 panel circuit breakers:
- (a) 11D7, ENGINES STBY IGNITION LEFT 1
 - (b) 11D8, ENGINES STBY IGNITION LEFT 2
 - (c) 11D9, ENGINES STBY IGNITION RIGHT 1
 - (d) 11D10, ENGINES STBY IGNITION RIGHT 2
 - (e) 11K9, LEFT ENGINE OIL PRESS
 - (f) 11K35, RIGHT ENGINE OIL PRESS
 - (g) 11L1, LEFT ENGINE IGN 1
 - (h) 11L28, RIGHT ENGINE IGN 1

S 865-894-001

- (6) Remove the DO-NOT-CLOSE tags and close the P6 panel circuit breakers:
- (a) 6E1, FUEL VALVES L SPAR
 - (b) 6E2, FUEL VALVES R SPAR

TASK 31-31-00-705-786-001

3. Flight Data Recorder System Test

A. General

- (1) This subject is a system test that test all input parameters that are connected to the flight data recorder.
- (2) A test equipment is necessary to do the flight recorder system test.
- (3) These tasks use the word SUBFRAME 0, 5, or 6 to make a selection of a parameter. Some portable testers or on board test equipment do not have a switch position for SUBFRAME 0, 5, or 6. On these test sets, make a selection of SUBFRAMES as follow:
 - For SUBFRAME 0, use SUBFRAME 1, 2, 3, and 4.
 - For SUBFRAME 5, use SUBFRAME 1 and 3.
 - For SUBFRAME 6, use SUBFRAME 2 and 4.

B. Equipment

- (1) 981-6301-002 Data Signal Display Unit (DSDU)
Alliedsignal Air Transport Avionics
P.O. BOX 97001
15001 NE 36TH ST
Redmond, WA 98073-9701
- (2) A31007-49 Adapter Cable - Tester (recommended)
A31007-30 Adapter Cable - Tester (alternative)

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- (3) Portable Tester - Teledyne P/N 2222786
Teledyne Controls
12333 West Olympic Boulevard West
Los Angeles, CA 90064
- (4) A31007-1 Adapter Cable - Tester
- (5) Portable Tester - Teledyne P/N 2229738-1
Teledyne Controls
12333 West Olympic Boulevard West
Los Angeles, CA 90064
- (6) A31007-59 Adapter Cable - Tester
- (7) 964-0446-001 Hand Held Download Unit (HHDLU)
27914 AlliedSignal Inc., DBA AlliedSignal Aerospace
2100 Northwest 62nd Street
Fort Lauderdale, FL 33309
- (8) 704-2567-001 Adapter Cable - Tester
- (9) Multi-Purpose AIDS Display Units - AACO Inc.
FAA-0032-001
AACO Inc.
5011 Barton Place
Seattle, WA 98118
- (10) EGA-0005-001, Adapter Cable - MADU

C. References

- (1) AMM 22-10-00/501, Autopilot/Flight Control System
- (2) AMM 22-21-00/501, Yaw Damper System
- (3) AMM 22-32-00/501, Thrust Management System
- (4) AMM 23-12-00/501, VHF Communications System
- (5) AMM 24-22-00/201, Electrical Power - Control
- (6) AMM 27-11-00/501, Aileron and Aileron Trim Control System
- (7) AMM 27-21-00/501, Rudder and Rudder Trim Control System
- (8) AMM 27-31-00/501, Elevator Control System
- (9) AMM 27-32-00/501, Stall Warning System
- (10) AMM 27-41-00/501, Horizontal Stabilizer Trim Control System
- (11) AMM 27-51-00/501, Trailing Edge Flap System
- (12) AMM 27-61-00/201, Spoiler/Speedbrake Control System
- (13) AMM 27-81-00/501, Leading Edge Slat System
- (14) AMM 29-11-00/201, Main Hydraulic Systems
- (15) AMM 31-25-00/501, Clocks
- (16) AMM 32-00-20/201, Landing Gear Downlocks
- (17) AMM 32-09-02/201, Air/Ground Relays
- (18) AMM 34-12-00/501, Air Data Computing System
- (19) AMM 34-21-00/501, Inertial Reference System
- (20) AMM 34-22-00/501, Flight Instrument System
- (21) AMM 34-32-00/501, Marker Beacon System
- (22) AMM 32-42-00/501, Antiskid/Autobrake System
- (23) AMM 34-46-00/501, Ground Proximity Warning System
- (24) AMM 34-61-00/501, Flight Management Computer System
- (25) AMM 71-00-00/201, Power Plant

- (26) AMM 78-31-00/051, Fan Thrust Reverser System

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D. Access

- (1) Location Zone
212 Control Cabin - Sect 41 (Right)

E. Prepare for test

S 865-906-001

- (1) Open these circuit breakers on the overhead panel, P11, and attach DO-NOT-CLOSE tags:
(a) 11J7, FLIGHT RECORDER AC
(b) 11J8, FLIGHT RECORDER DC

S 025-939-001

- (2) If you use test equipment other than the hand-held download unit (HHDLU), install the tester to the test connector at the right side panel, P61.

S 425-941-001

- (3) If you use the hand-held download unit (HHDLU), attach the HHDLU to the test connector at the front side of the flight data recorder.

NOTE: To get access to the FDR, open the lower ceiling panel No. 1 above the aft galley (AMM 25-22-02/401). The HHDLU can only be connected to the AlliedSignal flight data recorder (FDR).

S 865-867-001

- (4) Remove the DO-NOT-CLOSE tags and close the P11 panel circuit breakers:
(a) 11J7, FLIGHT RECORDER AC
(b) 11J8, FLIGHT RECORDER DC

S 865-868-001

- (5) Supply electrical power (Ref 24-22-00).

S 865-942-001

- (6) With the Data Signal Display Unit (DSDU), set the control switches on the tester as follows:
(a) Set the power switch to the ON position.
(b) Set the INPUT switch to the ARINC INPUT DATA position.
(c) Set the SYNC switch to the SYNC B position.
(d) Set the DATA PARAMETER/DOCUMENTARY switch to the DATA PARAMETER position.
(e) Set the OCTAL DISPLAY switch to the 12 BIT position.
(f) Set the SUBFRAME and WORD as specified.

S 865-943-001

- (7) With the Teledyne tester (P/N 2222786), set the switches on the tester as follows:
(a) Set the POWER switch to the ON position.
(b) Set the READOUT switch to the ACTF DATA position.
(c) Set the UPDATE switch to the AUTO position.

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- (d) Set the DFDAU/DFDR DATA SELECTOR switch to the DFDAU position.
- (e) Set the DATA switch to the 12 BIT position.
- (f) Set the SUBFRAME and WORD as specified.

S 865-944-001

- (8) With the Teledyne tester (P/N 2229738), set the switches on the tester as follows:
 - (a) Push the CLR switch two or three times to clear all inputs.
 - (b) Push the DFDR switch and then the ENT switch.
 - (c) Set the SUBFRAME and WORD as specified.

S 865-945-001

- (9) With the hand-held download unit (HHDLU), do the steps that follow:

NOTE: These steps are for airplanes equipped with AlliedSignal FDR only.

- (a) On the flight recorder control panel (FRCP), set the function switch to the ON position.
- (b) Push the red button on top of the HHDLU.
- (c) Set the DSDU switch.
- (d) Set the word number to WRD1, WRD2, or WRD3.
- (e) Set the BASE switch.
- (f) In the BASE SELECT menu, set OCT for octal values.
- (g) Set the SUBFRAME and WORD as specified.

S 865-946-001

- (10) With the MADU, set the switches as follows:
 - (a) Set the power switch to the ON position.
 - (b) Push the FUN switch, then enter the number 5 to set the LRU A on the tester.
 - (c) Push the DATA switch, then the number 03 to set the DFDAU-H on the tester.
 - (d) Push the FUN switch, then the number 03 for SUBFRAME.
 - (e) Set a subframe (1 thru 4) on the keyboard switch.
 - (f) Push the DATA switch, then the number 04 for WORD.
 - (g) Set a word (1 thru 64) on the keyboard.
 - (h) Push the FUN switch, then the number 02 to set the FORMAT field on the tester.
 - (i) Push the number 02 to set the OCTAL 10 on the tester.
 - (j) Set the SUBFRAME and WORD as specified.

F. GMT Test

S 735-610-001

- (1) Do the GMT test that follows:
 - (a) Make sure the that clock system is operational (AMM 31-25-00/501).

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- (b) Set the SUBFRAME to 3 and the WORD to 30.
- (c) Set the captain's clock to 10 hrs, 42 min and put the clock in the HOLD mode (AMM 31-25-00/501).
- (d) Make sure the tester display reads 252X.

NOTE: Test data X may have any value.

- (e) Set the captain's clock to its correct time.

G. Captain's ADC Select Switch Test

S 735-611-001

- (1) Do the ADC switch test that follows:
 - (a) Make sure the air data computing system is operational (AMM 34-12-00/501).
 - (b) On the tester, set the SUBFRAME to 3 and the WORD to 31.
 - (c) Set the captain's ADC source select switch to the NORM position.
 - (d) Make sure the BIT (DISCRETE) 4 shows a 1.
 - (e) Set the captain's ADC source select switch to the ALTN position.
 - (f) Make sure the BIT (DISCRETE) 4 shows a 0.

H. ADC Data Bus Test

S 735-612-001

- (1) Do the ADC data bus test that follows:
 - (a) Make sure the air data computing system is operational (AMM 34-12-00/501).
 - (b) Set the Captain's ADC Source Select switch to the NORM position.
 - (c) Push and hold the left air data computer switch on the P61 test panel for more than 7 seconds.
 - (d) Set the SUBFRAME and WORD for each signal as shown in the ADC DATA BUS table.

ADC DATA BUS SIGNAL TEST			
SIGNAL	TESTER SETUP		TESTER DISPLAY
	SUBFRAME	WORD	
ALTITUDE	0	63	4622 TO 4766
AIRSPEED	0	33	2040 TO 2160

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- (e) Set the captain's ADC source select switch to the ALTN position.
- (f) Push and hold the right air data computer switch on the P61 test panel for more than 7 seconds.
- (g) Set the SUBFRAME and WORD for each signal as shown in the ADC DATA BUS table.

S 865-896-001

- (2) Set the Capt's ADC select switch to the NORM position.

I. Radio Altimeter (RA) Data Bus Test

S 735-613-001

- (1) Do the RA test that follows:
 - (a) Make sure the RA is operational (AMM 34-33-00/001).
 - (b) On the tester, set the SUBFRAME to 2 and the WORD to 55.
 - (c) On the left RA, push the test switch.
 - (d) Make sure the tester shows the value between 0074 and 0120.
 - (e) Set the SUBFRAME to 3.
 - (f) On the right RA, push the test switch.
 - (g) Make sure the tester shows the value between 0074 and 0120.
 - (h) Set the SUBFRAME to 4.
 - (i) On the center RA, push the test switch.
 - (j) Make sure the tester shows the value between 0074 and 0120.

J. Captain's FMC Switch Position Test

S 735-614-001

- (1) Do the FMC switch test that follows:
 - (a) Make sure the flight management computer system is operational (AMM 34-61-00/501).
 - (b) On the tester, set the SUBFRAME to 3 and the WORD to 31.
 - (c) On the FMC NAV source select switch, set the FMC NAV switch to the CDU-L position.
 - (d) Make sure the BIT (DISCRETE) 1 and 2 shows a 1.
 - (e) Set the FMC NAV switch to the FMC-R position.
 - (f) Make sure the BIT (DISCRETE) 2 shows a 0.

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- (g) Make sure the BIT (DISCRETE) 1 shows 1.
- (h) Set the FMC NAV switch to the FMC-L position.
- (i) Make sure the BIT (DISCRETE) 1 and 2 shows a 1.

S 865-869-001

- (2) Set the captain's FMC select switch to the NORM position.

K. Captain's IRS Switch Position Test

S 735-616-001

- (1) Do the IRS switch test that follows:
 - (a) Make sure the inertial reference system is operational (AMM 34-21-00/501).
 - (b) On the tester, set the SUBFRAME to 3 and the WORD to 31.
 - (c) Set the Captain's IRS source select switch to the NORM position.
 - (d) Make sure the BIT (DISCRETE) 3 shows a 1.
 - (e) Set the captain's IRS source select switch to ALTN position.
 - (f) Make sure the BIT (DISCRETE) 3 shows a 0.

S 865-870-001

- (2) Set the Captain's IRS select switch back to the NORM position.

L. IRS Data Bus Test

S 735-617-001

- (1) Do the IRS data bus test that follows:
 - (a) Make sure the IRS is operational (Ref 34-21-00)
 - (b) Open these circuit breakers on the P11 circuit breaker panel.
 - (c) 11E9, FMC CMPT L
 - (d) 11E30, FMC CMPT R
 - (e) Set the left IRS mode select switch to the NAV position.

NOTE: Alignment may take about 10 minutes.

- (f) On the tester, set the SUBFRAME to 2 and the WORD to 14.
- (g) Push and hold the TEST switch on the left IRU for at least 10 seconds.

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(h) Make sure the tester shows between 6736 and 7224.

S 865-871-001

(2) Return the IRS back to normal.

M. Captain's EFIS Select Switch Test

S 735-618-001

(1) Do the EFIS switch test that follows:

(a) Make sure the EFIS system is operational (AMM 34-22-00/501).

(b) On the tester, set the SUBFRAME to 3 and the WORD to 31.

(c) Set the Left EFI instrument source select switch to the NORM position.

(d) Make sure the BIT (DISCRETE) 6 shows a 1.

(e) Set the Left EFI instrument select switch to the ALTN position.

(f) Make sure the BIT (DISCRETE) 6 shows a 0.

S 865-872-001

(2) Set the left EFIS switch to the NORM position.

N. EFIS Data Bus Test

S 735-619-001

(1) Do the EFIS data bus test that follows:

(a) Make sure the EFIS system is operational (AMM 34-22-00/501).

(b) Make sure the L EFIS instrument source select switch is at the NORM position.

(c) Make sure the left IRU is operational (AMM 34-21-00/501).

(d) Set the left IRU source select switch to the NORM position.

(e) Set the left IRS mode select switch to the NAV position.

NOTE: Alignment may take about 10 minutes.

(f) On the tester, set the SUBFRAME to 0 and the WORD to 8.

(g) Push and hold the TEST switch on the LEFT IRU for at least 10 seconds.

(h) Make sure the tester display shows between 0750 and 1030.

(i) Set the left EFIS instrument source select switch to the ALTN position.

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- (j) On the tester, set the SUBFRAME to 0 and the WORD to 22.
- (k) Push and hold the TEST switch on the LEFT IRU for at least 10 seconds.
- (l) Make sure the tester display shows between 0104 and 0234.

S 865-873-001

- (2) Set the L EFIS select switch to the NORM position.

0. FCC Data Bus Test

S 735-620-001

- (1) Do the FCC data bus test that follows:
 - (a) Make sure the autopilot/flight control system is operational (AMM 22-10-00/001).
 - (b) At the main equipment center, set the MCDP to the GND TEST position.
 - (c) Set the SUBFRAME and WORD in the FCC TEST TABLE that follows:

NOTE: Only activate one autopilot at a time.

FCC TEST TABLE				
SUFRAME	WORD	AUTOPILOT CMD SW	BIT (DISCRETE)	TEST DATA
1	41	LEFT A/P ENGAGE	2	1
1	41	LEFT A/P DISENGAGE	2	0
2	40	RIGHT A/P ENGAGE	2	1
2	40	RIGHT A/P DISENGAGE	2	0
4	40	CNTR A/P ENGAGE	1	1
4	40	CNTR A/P DISENGAGE	1	0

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P. Mode Control Panel (MCP) Switch Position Test

S 735-791-001

- (1) Do the MCP switch test that follows:
 - (a) On the tester, set the SUBFRAME to 3 and the WORD to 45.
 - (b) Set the captain's F/D switch to the ON position.
 - (c) Make sure the BIT (DISCRETE) 5 shows a 1.
 - (d) Set the captain's F/D switch to the OFF position.
 - (e) Make sure the BIT (DISCRETE) 5 shows a 0.

Q. TMC Data Bus Test

S 735-850-001

- (1) Do the TMC data bus test that follows:
 - (a) Make sure the thrust management system is operational (AMM 22-32-00/501).
 - (b) Make sure the EICAS system is operational (AMM 31-41-00/001).
 - (c) On the tester, set the SUBFRAME to 0 and the WORD to 13.
 - (d) Make sure the MCDP is off.
 - (e) Set the autothrottle arm switch on the autopilot mode control panel to the ARM position.
 - (f) Make sure the TMC is in the T/O mode on the EICAS display (AMM 22-32-00/001).
 - (g) Push the thrust reference set control on the EICAS display select panel.
 - (h) Make sure that BIT (DISCRETE) 9 shows a 1.
 - (i) On the TMSP, remove the T/O mode.
 - (j) Make sure the BIT (DISCRETE) 9 shows a 0.

R. DME Data Bus Test

S 735-788-001

- (1) Do the DME data bus test that follows:
 - (a) Make sure the DME is operational (Ref 34-55-00).
 - (b) Make sure the VOR is operational (Ref 34-51-00).
 - (c) On the left VOR control panel, set the frequency to 108.00 MHZ.
 - (d) On the transponder/ DME ramp test, set the tester NAV control dial to 108.00 MHZ with a distance of 50 NM.

- (e) On the tester, set the SUBFRAME to 2 and the WORD to 30.
- (f) Make sure the tester display shows between 1320 and 1560.
- (g) On the right VOR control panel, set the frequency to 108.00 MHZ.
- (h) On the transponder/ DME ramp test, set the distance to 100 NM.
- (i) On the tester, set the SUBFRAME to 4.
- (j) Make sure the teste display shows between 2760 and 3220.

S 865-789-001

- (2) Set the DME back to normal (Ref 34-55-00).

S 865-790-001

- (3) Set the VOR back to normal (Ref 34-51-00).

S. Yaw Damper Test

S 735-623-001

- (1) Do the yaw damper test that follows:
 - (a) Make sure the yaw damper system is operational (Ref 22-21-00).
 - (b) Make sure the IRS is operational (Ref 34-21-00).
 - (c) Set the IRS mode select switch to the Nav mode.
 - (d) Make sure at least one IRU is ALIGNED.
 - (e) Make sure the left and right yaw dampers are not engaged.
 - (f) On the tester, set the SUBFRAME to 0.
 - (g) Make sure the BIT (DISCRETE) 1 shows a 0 for WORDs 60 and 33.
 - (h) Engage the left yaw damper (Ref 22-21-00).
 - (i) Make sure the BIT (DISCRETE) 1 shows a 1 for WORD 60.
 - (j) Disengage the left yaw damper and engage the right yaw damper (Ref 22-21-00).
 - (k) Make sure the BIT (DISCRETE) 1 shows a 1 for WORD 33.
 - (l) Disengage the right yaw damper (Ref 22-21-00).

S 865-880-001

- (2) Set the yaw damper system back to normal (Ref 22-21-00).

T. VHF Omnidirectional Range (VOR) Data Bus Test

S 735-792-001

- (1) Do the VOR data bus test that follows:
 - (a) Make sure the VOR is operational (Ref 34-51-00).

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- (b) Set the frequency to 110.00 MHZ on the left VOR control panel.
- (c) Set the SUBFRAME to 4 and the WORD to 31.
- (d) Make sure the tester display shows 4000 or 4001.
- (e) Set the frequency to 109.60 MHZ on the right VOR control panel.
- (f) Set the SUBFRAME to 2.
- (g) Make sure the tester display shows 2260 or 2261.

S 865-861-001

- (2) Set the VOR control panel back to normal (Ref 34-51-00).

U. Master Warning Test

S 735-794-001

- (1) Do the master warning test that follows:
 - (a) Make sure these circuit breakers on the overhead circuit breaker panel, P11, are closed:
 - 1) 11A31, IND LTS TEST
 - 2) 11A34, IND LTS 3
 - 3) 11F4, GND PROX CMPTR
 - (b) On the tester, set the SUBFRAME to 0 and the WORD to 29.
 - (c) Momentarily set the test switch on the miscellaneous test panel to the GND PROX position.
 - (d) Make sure the BIT (DISCRETE) 2 shows a 0.
 - (e) Push the MASTER WARNING light switch.
 - (f) Make sure the BIT (DISCRETE) 2 shows a 1.

V. EICAS Computer Switch Test

S 735-624-001

- (1) Do the EICAS switch test that follows:
 - (a) Make sure the EICAS computer is operational (Ref 31-41-00).
 - (b) On the tester, set the SUBFRAME to 3 and the WORD to 31.
 - (c) Set the COMPUTER switch on the EICAS DISPLAY select panel to the R position.
 - (d) Make sure the BIT (DISCRETE) 5 shows a 0.
 - (e) Set the COMPUTER switch on the EICAS DISPLAY select panel in the AUTO position.

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- (f) Make sure the BIT (DISCRETE) 5 shows a 1.
- W. Flight Control Surface Position Test

S 865-853-001

WARNING: KEEP PERSONS AND EQUIPMENT AWAY FROM ALL CONTROL SURFACES WHEN HYDRAULIC POWER IS APPLIED. AILERON, ELEVATORS, RUDDER, FLAPS, SLATS, SPOILERS, AND STABILIZER ARE FULLY POWERED SURFACES. INJURY TO PERSON OR EQUIPMENT CAN OCCUR WHEN HYDRAULIC POWER IS SUPPLIED.

- (1) Supply hydraulic power (Ref 29-11-00).

S 735-718-001

- (2) Elevator Position Test
- (a) Make sure the elevator control system is operational (AMM 27-31-00/501)
- (b) Set the SUBFRAME and WORD for each signal and set the elevator position as shown in the table that follows:

SIGNAL		TESTER SETUP		TESTER DISPLAY
ELEVATOR	POSITION	SUBFRAME	WORD	
RIGHT	NEUTRAL	1	37	7570 to 0054
	FULL UP			2370 to 2660

S 865-874-001

- (3) Set the elevator system back to normal (Ref 27-31-00).

S 735-719-001

- (4) Aileron Position Test
- (a) Make sure the aileron and aileron trim control system are operational (Ref 27-11-00).

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- (b) Set the SUBFRAME and WORD for each signal and set the aileron position as shown in the table that follows:

SIGNAL		TESTER SETUP		TESTER DISPLAY
AILERON	POSITION	SUBFRAME	WORD	
LEFT	NEUTRAL	0	12	7514 to 0264
	FULL UP			3010 to 3564

- (c) Set the aileron back to normal (Ref 27-11-00).

S 735-797-001

- (5) Control Column Position (Syncro) Test
- (a) Set the SUBFRAME to 0 and the WORD to 21.
- (b) Set the control column to the position as shown in the table that follows:
- (c) Make sure the the tester display shows the correct value as listed in the table.

TEST	POSITION	TESTER DISPLAY
CONTROL COLUMN	FULLY FORWARD	7253 to 7616
	FULLY AFT	0315 to 0661

- (d) Set the control column to the neutral position.

S 735-798-001

- (6) Control Wheel Position (Syncro) Test
- (a) Set the SUBFRAME to 0 and the WORD to 28.

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- (b) Set the control wheel to the position as shown in the table that follows:
- (c) Make sure the tester display shows the correct value as listed in the table.

TEST	POSITION	TESTER DISPLAY
CONTROL WHEEL	FULLY CLOCKWISE	6700 to 6760
	FULLY COUNTERCLOCKWISE	1020 to 1100

- (d) Set the control wheel back to the neutral position.

S 735-720-001

(7) Rudder Position Test

- (a) Make sure the rudder and rudder trim control system are operational (Ref 27-21-00).
- (b) Make sure the rudder is at the neutral position.
- (c) On the tester, set the SUBFRAME to 0 and the WORD to 49.
- (d) Make sure the tester display shows between 0014 and 7764.
- (e) Set the left rudder pedal to the full forward position.
- (f) Make sure the tester display shows between 0367 and 0655.
- (g) Set the right rudder pedal to the full forward position.
- (h) Make sure the tester display shows between 7140 and 7401.

S 865-875-001

- (8) Set the rudder position back to normal (Ref 27-21-00).

S 735-725-001

(9) Leading Edge Slat Position Test

- (a) Make sure the leading edge slat system is operational (Ref 27-81-00).

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- (b) Set the SUBFRAME and WORD for each parameter condition as shown in the table that follows.
- (c) Make sure the tester display shows the correct data for each position.

L.E. SLATS/CONDITION	TESTER SETUP		TESTER DISPLAY	
	SUBFRAME	WORD	BIT (DISCRETE)	VALUE
FULL EXTEND	0	03	1	1
NOT FULLY EXTEND				0
PART EXTEND	0	11	1	1
NOT PART EXTEND				0
RETRACTED	0	19	1	1
NOT RETRACTED				0
FAIL *[1]	0	27	1	1
NOT FAIL				0

*[1] Uncommanded motion (UCM) or Asymmetry. Refer to 27-81-00 to make the slat condition of the UCM. To created the UCM condition, turn off the hydraulic system, remove the eletrical connector D1710 from the slat bypass valve V10059 (Ref 27-51-00) and manually position the valve to the bypass position. Then turn the hydraulic system back on and set the flap lever to the 5 position.

- (d) Set the L.E. slats back to the normal position.

S 865-926-001

- (10) Remove the power from the left hydraulic system (Ref 29-11-00).

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X. Alternate Slats Position Test

S 705-847-001

- (1) Do the alternate slat test that follows:
 - (a) Set the SUBFRAME to 2 and the WORD to 15.
 - (b) On the P3 panel, make sure the L.E FLAP arm switch is not push in.
 - (c) Make sure the BIT (DISCRETE) 1 shows a 0.
 - (d) On the P3 panel, set the L.E FLAP arm switch to the in position.
 - (e) Make sure the BIT (DISCRETE) 1 shows a 1.
 - (f) On the P3 panel, set the L.E FLAPS arm switch to the out position.

S 735-722-001

- (2) Automatic/Manual Electrical Pitch Trim Test
 - (a) Make sure the horizontal stabilizer trim control system is operational (Ref 27-41-00).
 - (b) Make sure the captain's control wheel trim switch is in the center position.
 - (c) On the tester set the SUBFRAME to 0 and the WORD 20.
 - 1) Make sure the BIT (DISCRETE) 1 and 2 shows a 1.
 - (d) Set the WORD to 35.
 - 1) Make sure the BIT (DISCRETE) 2 shows a 1.
 - (e) Set the WORD to 38.
 - 1) Make sure the BIT (DISCRETET) 2 shows a 1.
 - (f) Set the captain's control wheel trim switch to the TRIM UP position.
 - (g) Set the WORD to 20.
 - 1) Make sure the BIT (DISCRETE) 1 AND 2 shows a 0.
 - (h) Set the captain's control wheel trim switch to the TRIM DOWN position.
 - (i) Set the WORD to 35.
 - 1) Make sure the BIT (DISCRETE) 2 shows a 0.
 - (j) Set the WORD to 38.
 - 1) Make sure the BIT (DISCRETE) 2 shows a 0.

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- (3) Release the control wheel trim switch.

Y. Manual Mechanical Pitch Trim Test

S 735-631-001

- (1) Do the mechanical pitch trim test that follows:
- (a) Make sure the ALTN STAB TRIM switch on the quadrant stand is set at the neutral position.
 - (b) On the tester, set the SUBFRAME to 0 and the WORD to 23.
 - (c) Make sure the BIT (DISCRETE) 1 and 2 shows a 1.
 - (d) Set the ALTN STAB TRIM switch to the NOSE UP position.
 - (e) Make sure the BIT (DISCRETE) 1 shows a 1 and BIT (DISCRETE) 2 shows a 0.
 - (f) Set the ALTN STAB TRIM switch to the NOSE DOWN position.
 - (g) Make sure the BIT (DISCRETE) 1 shows a 0 and BIT (DISCRETE) 2 shows a 1.

S 865-933-001

- (2) Set the ALTN STAB TRIM switch lever to the neutral position.

Z. Pilot's Manual Stab Trim Test

S 735-795-001

- (1) Do the pilot's manual stab trim test that follows:
- (a) Make sure the horizontal stabilizer trim control system is operational (Ref 27-41-00).
 - (b) On the tester, set the SUBFRAME to 0 and the WORD to 39.
 - (c) Make sure the BIT (DISCRETE) 1 shows a 0.
 - (d) On the captain's control wheel, set the trim switch to the TRIM UP position.
 - (e) Make sure the BIT(DISCRETE) 1 shows a 1.
 - (f) Release the trim switch on the control wheel.
 - (g) On the tester, set the WORD to 38.
 - (h) Make sure the BIT (DISCRETE) 1 shows a 0.
 - (i) On the captain's control wheel, set the trim switch to the TRIM DOWN position.

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(j) Make sure the BIT (DISCRETE) 1 shows a 1

S 865-930-001

(2) Release the trim switch on the control wheel.

AA. Flap Alternate Test

S 735-793-001

- (1) Do the flap alternate test that follows:
- (a) Make sure the trailing edge flap is operational (Ref 27-51-00).
 - (b) On the tester, set the SUBFRAME to 1 and the WORD to 15.
 - (c) On the P3-1 panel, make sure the T.E. FLAP arm switch is not in the in position.
 - (d) Make sure the BIT (DISCRETE) 1 shows a 0.
 - (e) On the P3-1 panel, push the TE FLAP arm switch to the in position.
 - (f) Make sure the BIT (DISCRETE) 1 shows a 1.
 - (g) On the P3-1 panel, push the TE FLAP arm switch to the out position.

AB. Flap Handle Position Test

S 735-657-001

- (1) Do the flap handle test that follows:
- (a) Make sure these circuit breakers on the overhead circuit breaker panel, P11, are close:
 - 1) 11G12, FLAP/SLAT ELEC UNIT-1 PWR
 - 2) 11G13, FLAP/SLAT ELEC UNIT-1 CONT
 - 3) 11G14, FLAP/SLAT ELEC UNIT-1 SENSOR
 - (b) Set the SUBFRAME to 1 and the WORD to 14.
 - (c) Set the flap handle position, and make sure the tester display shows the value as shown in the table that follows:

FLAP HANDLE POSITION	TESTER DISPLAY
UP	0000 to 2211
15	4426 to 5156

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- (2) Set the flap handle to the UP position.

AC. Brake Pressure Test

S 735-658-001

- (1) Do the brake pressure test that follows:
- (a) Pressurize the right hydraulic system and reservoir (Ref 29-11-00).
 - (b) Make sure the EICAS is operational (Ref 31-41-00).
 - (c) Push the ELEC/HYD switch on the EICAS MAINT panel on the right side panel, P61.
 - (d) Make sure the parking brake is released.
 - (e) On the tester, set the SUBFRAME to 0 and the WORD to 47.
 - (f) Push the captain's left brake pedal to the full stop position.
 - (g) Make sure the tester display shows the value shown in Table 501.

NOTE: The value must agree with the nearest hydraulic system pressure.

NOTE: X = DON'T CARE

Table 501	
HYDRAULIC SYSTEM (Pressure as displayed on EICAS status page)	TESTER DISPLAY
2300	52XX-60XX
2400	54XX-62XX
2500	55XX-63XX
2600	57XX-65XX
2700	61XX-67XX
2800	63XX-71XX
2900	65XX-74XX
3000	67XX-75XX
3100	71XX-77XX
3200	73XX-77XX

NOTE: X = DON'T CARE

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- (h) Release the Captain's left brake pedal.
- (i) Push the captain's right brake pedal to the full stop position.

S 735-854-001

- (2) Make sure the tester display shows the value shown in Table 502.

NOTE: The value must agree with the nearest hydraulic system pressure.

NOTE: X = DON'T CARE

Table 502	
HYDRAULIC SYSTEM (Pressure as displayed on EICAS status page)	TESTER DISPLAY
2300	XX52-XX60
2400	XX54-XX62
2500	XX55-XX63
2600	XX57-XX65
2700	XX61-XX67
2800	XX63-XX71
2900	XX65-XX74
3000	XX67-XX75
3100	XX71-XX77
3200	XX73-XX77

- (a) Release the captain's right brake pedal.
- (b) Remove the pressure from the right hydraulic system and reservoir (Ref 29-11-00).

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- (c) Pump the brake pedals at least six times to fully deplete the accumulator.
- (d) Pressurize the left hydraulic system and reservoir (Ref 29-11-00).
- (e) Push the captain's left brake pedal to the full stop position.
- (f) Make sure the tester display shows the value shown in Table 501.

NOTE: The value must agree with the nearest hydraulic system pressure.

- (g) Release the captain's left brake pedal.
- (h) Push the captain's right brake pedal to the full stop position.
- (i) Make sure the tester display shows the value shown in Table 502.

NOTE: The value must agree with the nearest hydraulic system pressure.

S 865-921-001

- (3) Release the Captain's right brake pedal.

AD. Seat Belt Signal Test

S 735-796-001

- (1) Prepare to do the seat belt test.
 - (a) Make sure the this circuit breaker on the P11 panel is closed:
 - 1) 11P9, PASS SIGN CONT
 - (b) On the overhead panel, P5, set the SEATBELTS switch on the passenger signs control panel to the ON position.

S 735-864-001

- (2) Do the seat belt test that follows:
 - (a) On the tester, set the SUBFRAME to 1 and the WORD to 3.
 - (b) Make sure the BIT (DISCRETE) 2 shows a 0 on the tester.

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- (c) On the passenger signs control panel, set the SEATBELTS switch to the OFF position.
- (d) On the tester, make sure the BIT (DISCRETE) 2 shows a 1.

AE. VHF Test

S 735-639-001

- (1) Do the VHF test that follows:
 - (a) Make sure the VHF communication systems are operational (AMM 23-12-00/501).
 - (b) Tune the left, center and right VHF transceivers to an approved test frequency.

NOTE: Key only one transceiver at a time.

- (c) On the tester, set the SUBFRAME to 0 and the WORD to 12.
- (d) Make sure the BIT (DISCRETE) 1 shows a 1.
- (e) On the audio selector panel, put the switch to the L VHF position.
- (f) Push the PTT switch on the captain's or first officer's control wheel.
- (g) Make sure the BIT (DISCRETE) 1 shows a 0.
- (h) Release the PTT switch.
- (i) On the audio selector panel, put the switch to the R VHF position.
- (j) Set the WORD to 6.
- (k) Push the PTT switch on the control wheel.
- (l) Make sure the BIT (DISCRETE) 1 shows a 0.
- (m) Release the PTT switch.
- (n) On the tester, set the WORD to 14.
- (o) Make sure the BIT (DISCRETE) 1 shows a 1
- (p) On the audio selector panel, put the switch to the C VHF position.
- (q) Push PTT switch on the captain's or first officer's control wheel.
- (r) Make sure the BIT (DISCRETE) 1 shows a 0.

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- (2) Release the PTT switch.

AF. HF Test

S 735-640-001

- (1) Do the HF test that follows:
- (a) Make sure the HF communication systems are operational (Ref 23-11-00).
 - (b) Tune the left HF transceiver to an approved test frequency.
 - (c) Tune the left and right HF transceiver to an approved test frequency.
 - (d) On the tester, set the SUBFRAME to 0 and the WORD to 9.
 - (e) Make sure the BIT (DISCRETE) 1 shows a 1.
 - (f) On the audio selector panel, put the switch to the L HF position.
 - (g) Push the PTT switch on the captain's or the first officer's control wheel.
 - (h) Make sure the BIT (DISCRETE) 1 shows a 0.
 - (i) Release the PTT switch.
 - (j) On the audio selector panel, set the switch to the R HF position.
 - (k) Set the WORD to 14.
 - (l) Make sure the BIT (DISCRETE) 2 shows a 1.
 - (m) Push the PTT switch on the control wheel.
 - (n) Make sure the BIT (DISCRETE) 2 shows a 0.

S 865-879-001

- (2) Release the PTT switch.

AG. Ground Proximity Warning System (GPWS) Test

S 735-642-001

- (1) Do the GPWS test that follows:
- (a) Make sure the ground proximity warning system is operational (Ref 34-46-00).

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- (b) On the tester, set the SUBFRAME to 0 and the WORD to 24.
- (c) Make sure the BIT (DISCRETE) 8 shows a 0.
- (d) Set the test switch on the miscellaneous test panel to the GND PROX position.
- (e) Make sure the GLIDESLOPE, WHOOP-WHOOP PULL UP aural warning comes on.
- (f) Make sure the BIT (DISCRETE) 8 shows a 1.

NOTE: When the push the GND PROX test switch, the glideslope aural warning will operate for approximately 1 to 2 seconds and then the PULL-UP warning will operate. The tester display will indicate a 1 for only a short time. It may be necessary to repeat the GND PROX test to determine the proper sequence and test data.

S 865-886-001

- (2) Set the ground proximity warning system back to normal.
- AH. ILS Digital Data Bus Test

S 735-644-001

- (1) Do the ILS data bus test that follows:
 - (a) Make sure the ILS is operational(Ref 34-31-00).
 - (b) On the tester, set the SUBFRAME to 2 and the WORD to 48.
 - (c) Push the ILS control panel test switch on the P8 panel and wait for a one dot right indication on the EHSI.
 - (d) On the tester, make sure the tester display shows between 0574 and 0634.
 - (e) Set the SUBFRAME to 3.
 - (f) Push the ILS control panel test switch on the P8 panel and wait for a one dot right indication on the EHSI.
 - (g) Make sure the tester display shows between 0574 and 0634.
 - (h) Set the SUBFRAME 4.
 - (i) Push the ILS control panel self-test switch on the P8 panel and wait for a one dot right indication on the EHSI.
 - (j) Make sure the tester display shows between 0574 and 0634.

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AI. Stick Shaker Test

S 735-645-001

- (1) Do the stick shaker test that follows:
 - (a) Make sure the stall warning system is operational (Ref 27-32-00).

NOTE: If the Hydraulic Power is used, the STALL TEST will also start the auto slat if the flaps are in the takeoff range and slats are sealed.

- (b) On the tester, set the SUBFRAME to 0 and the WORD to 46.
- (c) Make sure the BIT (DISCRETE) 1 shows a 1.
- (d) Set the L STALL switch on miscellaneous test panel to the TEST position.
- (e) Make sure the BIT (DISCRETE) 1 shows a 0.
- (f) Release L STALL TEST switch on the miscellaneous.
- (g) Set the R STALL switch on miscellaneous test panel to the TEST position.
- (h) Make sure the BIT (DISCRETE) 1 shows a 0.
- (i) Release the R STALL switch on the miscellaneous test panel.

S 865-887-001

- (2) Set the stall warning system back to normal.

AJ. AIR/GROUND Discrete Signal Test

S 735-650-001

- (1) Do the air/ground test that follows:
 - (a) On the tester, set the SUBFRAME to 0 and the WORD to 4.

WARNING: DO THE DEACTIVATION PROCEDURE FOR FLIGHT MODE SIMULATION BEFORE YOU OPEN THE AIR /GROUND CIRCUIT BREAKER. WHEN YOU OPEN THE AIR/GROUND CIRCUIT BREAKER THE AIRPLANE IS IN FLIGHT MODE. IN FLIGHT MODE, MANY OF THE AIRPLANE SYSTEMS CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (b) Do the deactivation procedure for flight mode simulation (AMM 32-09-02).
- (c) Open the circuit breaker on the overhead circuit breaker panel, P11:
 - 1) 11S19, AIR/GND SYS 2
- (d) Make sure the BIT (DISCRETE) 1 shows a 0.

S 865-915-001

- (2) Close the P11 panel circuit breaker:
 - (a) 11S19, AIR/GND SYS 2

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(b) Make sure the BIT (DISCRETE) 1 shows a 1.
AK. Accelerometer Test

S 735-655-001

- (1) Do the accelerometer test that follows:
 - (a) On the tester, set the SUBFRAME and WORD as shown in the table that follows.
 - (b) Make sure the tester display shows the correct data as shown in the table that follows:

SIGNAL	TESTER SETUP		TESTER DISPLAY
	SUBFRAME	WORD	
VERTICAL	0	2	3442 to 3706
LATERAL	0	3	4000 to 4243
LONGITUDINAL	0	11	4000 to 4243

AL. Put the airplane back to the usual condition.

S 865-937-001

- (1) If you used the HHDLU, do the steps that follow:
 - (a) Set the function switch on the flight recorder control panel to the NORM position.
 - (b) Push the red button on top of the HHDLU.
 - (c) Remove the HHDLU adapter cable from the flight data recorder.
 - (d) Install the test plug to the test connector at the flight data recorder.

S 865-938-001

- (2) If you used test equipment other than the HHDLU, do the steps that follow:
 - (a) Turn the tester off.

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- (b) Open these P11 panel circuit breakers:
 - 1) 11J7, FLIGHT RECORDER AC
 - 2) 11J8, FLIGHT RECORDER DC
 - (c) Disconnect the tester from the right side of the P61 panel.
 - (d) Install the test plug to the test connector at the P61 panel.
 - (e) Close these P11 panel circuit breakers:
 - 1) 11J7, FLIGHT RECORDER AC
 - 2) 11J8, FLIGHT RECORDER DC
- S 865-923-001
- (3) Remove electrical power if it is no longer necessary (Ref 24-22-00).

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FLIGHT DATA RECORDER SYSTEM – ADJUSTMENT/TEST

1. General

- A. This procedure has two tasks. They are the operational test and the system test.

TASK 31-31-00-715-754-002

2. Flight Data Recorder Operational Test

A. General

- (1) The operational test makes sure the switches for the manual and automatic power sources operate correctly. A BITE test is also included in this operational test. No test equipment is necessary.

B. References

- (1) 24-22-00/201, Electrical Power Control
(2) 31-31-01/201, DFDR Removal and Installation

C. Prepare for the Test

S 865-812-002

- (1) Supply electrical power (AMM 24-22-00/201).

S 865-824-002

- (2) Make sure these circuit breakers on the overhead circuit breaker panel, P11, are closed:
- (a) 11J2, EICAS CMPTR LEFT
 - (b) 11J3, EICAS UPPER IND
 - (c) 11J7, FLIGHT RECORDER AC
 - (d) 11J8, FLIGHT RECORDER DC
 - (e) 11J29, EICAS CMPTR RIGHT
 - (f) 11J30, EICAS LOWER IND
 - (g) 11J31, EICAS DISPLAY SW
 - (h) 11J32, EICAS PILOTS DISPLAY
 - (i) 11S1, AIDS
 - (j) 11S15, AIR/GND SYS 1
 - (k) 11S19, AIR/GND SYS 2

S 865-827-002

- (3) Open these circuit breakers on the main power distribution panel, P6, and attach DO-NOT-CLOSE tags:
- (a) 6E1, FUEL VALVES L SPAR
 - (b) 6E2, FUEL VALVES R SPAR

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S 865-828-002

- (4) Open these circuit breakers on the overhead circuit breaker panel, P11, and attach DO-NOT-CLOSE tags:
 - (a) 11D19, ENGINE START CONT LEFT
 - (b) 11D20, ENGINE START CONT RIGHT

D. Flight Recorder Operational Test

S 735-756-002

- (1) Do the Data Management Entry Panel (DMEP) Test
 - (a) Make sure the function switch on the DMEP is in the NORM position.
 - (b) On the DMEP, make sure the DFDR light is on.
 - (c) Make sure the tape cassette is installed in the Quick Access Recorder (QAR).
 - (d) On the DMEP, make sure the DFDAU light is off.
 - (e) On the DMEP, set the function switch to the DFDR position and hold.
 - (f) Make sure the DFDR light goes off.
 - (g) Make sure the DFDAU light remains off.
 - (h) Set the function switch to the NORM position.
 - (i) Make sure the DFDR light on the DMEP comes on.

E. Air/Ground Switch Test

S 735-696-002

- (1) Do the air/ground switch test that follows:

WARNING: PREPARE THE SAFETY-SENSITIVE SYSTEMS FOR THE AIR MODE BEFORE YOU OPEN THE AIR/GROUND CIRCUIT BREAKERS. IN THE AIR MODE, MANY OF THE AIRPLANE SYSTEMS CAN OPERATE AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (a) Prepare the safety-sensitive systems for air mode simulation (AMM 32-09-02/201).
- (b) Open these circuit breakers on the overhead panel, P11:
 - 1) 11C19, LANDING GEAR POS SYS 2 ALTN (If installed).
 - 2) 11S19, AIR/GND SYS 2

(c) On the DMEP, make sure the DFDR light goes off.

S 865-829-002

- (2) Close these circuit breakers on the overhead panel, P11:
- (a) 11C19, LANDING GEAR POS SYS 2 ALTN (If installed).
 - (b) 11S19, AIR/GND SYS 2
 - (c) On the FRCP, make sure the OFF light comes on.
 - (d) Put the safety-sensitive systems back to their initial conditions (AMM 32-09-02/201).

F. Engine Automatic Switch Test

S 735-697-002

- (1) Do the engine switch test that follows:
- (a) Open these circuit breakers on the overhead circuit breaker panel, P11, and attach DO-NOT-CLOSE tags:
 - 1) 11D7, ENGINES STBY IGNITION LEFT 1
 - 2) 11D8, ENGINES STBY IGNITION LEFT 2
 - 3) 11D9, ENGINES STBY IGNITION RIGHT 1
 - 4) 11D10, ENGINES STBY IGNITION RIGHT 2
 - 5) 11D20, BATTERY POWER ENGINE START CONT, R
 - 6) 11L1, LEFT ENGINE IGN 1
 - 7) 11L28, RIGHT ENGINE IGN 1
 - (b) Remove the DO-NOT-CLOSE tag and close this P11 panel circuit breaker:
 - 1) 11D19, ENGINE START CONT LEFT
 - (c) Remove the DO-NOT-CLOSE tag and close this P6 panel circuit breaker:
 - 1) 6C2, FUEL COND CONT, R
 - (d) Make sure the L and R FUEL CONT switch on the control stand is set to the CUTOFF position.
 - (e) Make sure the DMEP function switch is set to the NORM position and the DFDR light is on.
 - (f) On the pilots overhead panel, set the left engine start switch on the engine start/RAT control panel to the GND position.
 - (g) On the DMEP, make sure the DFDR light is off.
 - (h) Set the left engine start switch to the AUTO position.

S 865-831-002

- (2) Open the circuit breaker on the overhead circuit breaker panel, P11, and attach a DO-NOT-CLOSE tag:
- (a) 11D19, ENGINE START CONT LEFT
 - (b) Remove the DO-NOT-CLOSE tag and close this P11 panel circuit breaker:
 - 1) 11D20, ENGINE START CONT RIGHT

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- (c) Make sure the L and R FUEL CONT switch is set to the CUTOFF position.
- (d) At the pilots overhead panel, set the right engine start switch on the engine start/RAT control panel to the GND position.
- (e) On the DMEP, make sure the DFDR light is off.
- (f) Set the right engine start switch to the AUTO position.
- (g) On the DMEP, make sure the DFDR light comes on.

S 865-832-002

- (3) Open this circuit breaker on the main power distribution panel, P6, and attach DO-NOT-CLOSE tag:
 - (a) 6C2, FUEL COND CONT R
 - (b) On the FRCP, make sure the OFF light goes off.

S 865-833-002

- (4) Open the circuit breaker on the overhead panel, P11, and attach DO-NOT-CLOSE TAG:
 - (a) 11D20, ENGINE START CONT RIGHT

G. BITE Test

S 735-698-002

- (1) Do the BITE test that follows:
 - (a) Set the DMEP function switch to the DFDR position.
 - (b) Make sure the DFDR light on the DMEP goes off.
 - (c) Cycle the FLIGHT RECORDER AC circuit breaker, 11J7, on panel P11.
 - (d) Push the READ switch on the DFDAU front panel and hold.
 - (e) Make sure the FAIL, CAUTION, and DFDR FAIL indicators on the DFDAU front panel comes on momentarily.
 - (f) Make sure the STATUS display reads FFF and then 888.
 - (g) Make sure that after approximately 4 seconds, the FAIL, CAUTION and DFDR FAIL lights goes off and the STATUS display changes to 000.
 - 1) If status shows any other code(s) prior to 000 and the CAUTION FAIL and DFDR FAIL lights are off, do the steps that follow:
 - a) With power applied to the DFDAU, remove the protective cover from the ATE connector on the front panel of the DFDAU and insert a jumper wire between ATE connector pins 17 and 14.

- b) Wait a minimum of one minute, then remove the jumper and do the BITE test again.
 - c) If the status window shows any other code(s) prior to 000, do the fault isolation.
 - (h) Release the DFDAU READ switch.
 - (i) Set the function switch on the DMEP to the NORM position.
 - (j) Make sure the OFF light comes on.
- H. EICAS Message Test

S 735-699-002

- (1) Do the EICAS message test that follows:
- (a) Open these circuit breakers on the overhead panel, P11, and attach DO-NOT-CLOSE tags:
 - 1) 11K9, LEFT ENGINE OIL PRESS
 - 2) 11K35, RIGHT ENGINE OIL PRESS
 - (b) Make sure these circuit breakers on the overhead panel, P11, are closed:
 - 1) 11D19, ENGINE START CONT LEFT
 - 2) 11D20, ENGINE START CONT RIGHT
 - (c) Remove the DO-NOT-CLOSE tags and close the P6 panel circuit breakers:
 - 1) 6C1, FUEL COND CONT L
 - 2) 6C2, FUEL COND CONT R
 - (d) Set the function switch on the DMEP to the DFDR position.
 - (e) Push the ECS MSG and AUTO EVENT switch on the EICAS MAINT panel on the right side panel, P61.
 - (f) Push the ERASE switch on the EICAS MAINT panel for one second.
 - (g) Set the L and R FUEL CONT switches on the P10 panel to the RUN position and wait a minimum of four minutes.
 - (h) Set the COMPUTER switch on the EICAS DISPLAY select panel to the L position.
 - (i) Make sure these EICAS messages, FLT DATA REC and FLT DATA ACQ, are not shown on the bottom display.
 - (j) Set the COMPUTER switch on the EICAS DISPLAY select panel to the R position.
 - (k) Make sure these EICAS message, FLT DATA REC and FLT DATA ACQ, are not shown on the bottom display.
 - (l) Open these circuit breakers on the overhead panel, P11, and attach DO-NOT-CLOSE tags:
 - 1) 11J7, FLIGHT RECORDER AC
 - 2) 11J8, FLIGHT RECORDER DC
 - (m) Remove the DFDR from its mounting tray (AMM 31-31-01/401).

NOTE: Wait a minimum of 60 seconds before you do the next step.

S 865-834-002

- (2) Remove the DO-NOT-CLOSE tags and close the P11 panel circuit breakers:
- (a) 11J7, FLIGHT RECORDER AC

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- (b) 11J8, FLIGHT RECORDER DC
- (c) Set the COMPUTER switch on the EICAS DISPLAY select panel to the L position.
- (d) Make sure the EICAS message, FLT DATA REC, is shown on the bottom display.
- (e) Make sure the EICAS message, FLT DATA AQC, does not show on the bottom display.
- (f) Set the COMPUTER switch on the EICAS DISPLAY select panel to the R position.
- (g) Make sure the EICAS message, FLT DATA REC is shown on the bottom display.
- (h) Make sure the EICAS message, FLT DATA AQC, does not show on the bottom display.
- (i) Open the circuit breaker on the overhead panel, P11, and attach DO-NOT-CLOSE tag:
 - 1) 11J7, FLIGHT RECORDER AC
- (j) Remove the DFDAU from its mounting tray (AMM 31-31-03/401).

S 865-835-002

- (3) Remove the DO-NOT-CLOSE tag and close the P11 panel circuit breaker:
 - (a) 11J7, FLIGHT RECORDER AC
 - (b) Make sure the EICAS message, FLT DATA AQC, is shown on the bottom display.
 - (c) Make sure the EICAS message, FLT DATA REC, does not show on the bottom display.
 - (d) Set the COMPUTER switch on the EICAS DISPLAY select panel to the L position.
 - (e) Make sure the EICAS message, FLT DATA AQC, is shown on the bottom display.
 - (f) Make sure the EICAS message, FLT DATA REC, does not show on the bottom display.
 - (g) Open these circuit breakers on the overhead circuit breaker panel, P11, and attach the DO-NOT-CLOSE tags:
 - 1) 11J7, FLIGHT RECORDER AC
 - 2) 11J8, FLIGHT RECORDED DC
 - (h) Install the DFDR to the mounting tray (AMM 31-31-02).
 - (i) Install the DFDAU to the mounting tray (AMM 31-31-03).

S 865-839-002

- (4) Remove the DO-NOT-CLOSE tags and close the P11 panel circuit breakers:
 - (a) 11J7, FLIGHT RECORDER AC
 - (b) 11J8, FLIGHT RECORDED DC
 - (c) Return the L and R FUEL CONT SWITCHES to the CUTOFF position.

- (d) Set the DMEP switch to the NORM position.
- (e) Remove the DO-NOT CLOSE tags and close the P11 panel circuit breakers:
 - 1) 11D7, ENGINES STBY IGNITION LEFT 1
 - 2) 11D8, ENGINES STBY IGNITION LEFT 2
 - 3) 11D9, ENGINES STBY IGNITION RIGHT 1
 - 4) 11D10, ENGINES STBY IGNITION RIGHT 2
 - 5) 11K9, LEFT ENGINE OIL PRESS
 - 6) 11K35, RIGHT ENGINE OIL PRESS
 - 7) 11L1, LEFT ENGINE IGN 1
 - 8) 11L28, RIGHT ENGINE IGN 1
- (f) Remove the DO-NOT-CLOSE tags and close the P6 panel circuit breakers:
 - 1) 6E1, FUEL VALVES L SPAR
 - 2) 6E2, FUEL VALVES R SPAR

TASK 31-31-00-705-753-002

3. Flight Data Recorder System Test

A. General

- (1) This subject is a system test that test all input parameters that are connected to the flight data recorder.
- (2) A test equipment is necessary to do the flight recorder system test.
- (3) These tasks use the word SUBFRAME 0, 5, or 6 to make a selection of a parameter. Some portable testers or on board test equipment do not have a switch position for SUBFRAME 0, 5, or 6. On these test sets, make a selection of SUBFRAMES as follow:
For SUBFRAME 0, use SUBFRAME 1, 2, 3, and 4.
For SUBFRAME 5, use SUBFRAME 1 and 3.
For SUBFRAME 6, use SUBFRAME 2 and 4.

B. Equipment

- (1) 981-6301-002 Data Signal Display Unit (DSDU)
Alliedsignal Air Transport Avionics
P.O. BOX 97001
15001 NE 36TH ST
Redmond, WA 98073-9701
- (2) A31007-49 Adapter Cable - Tester (recommended)
A31007-30 Adapter Cable - Tester (alternative)
- (3) Portable Tester - Teledyne P/N 2222786
Teledyne Controls
12333 West Olympic Boulevard West
Los Angeles, CA 90064
- (4) A31007-1 Adapter Cable - Tester
- (5) Portable Tester - Teledyne P/N 2229738-1
Teledyne Controls
12333 West Olympic Boulevard West
Los Angeles, CA 90064
- (6) A31007-59 Adapter Cable - Tester
- (7) 964-0446-001 Hand Held Download Unit (HHDLU)
27914 AlliedSignal Inc., DBA AlliedSignal Aerospace
2100 Northwest 62nd Street
Fort Lauderdale, FL 33309

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- (8) 704-2567-001 Adapter Cable - Tester
- (9) Multi-Purpose AIDS Display Units - AACO Inc.
FAA-0032-001
AACO Inc.
5011 Barton Place
Seattle, WA 98118

(10) EGA-0005-001, Adapter Cable - MADU

C. References

- (1) AMM 22-10-00/501, Autopilot/Flight Control System
- (2) AMM 22-21-00/501, Yaw Damper System
- (3) AMM 22-32-00/501, Thrust Management System
- (4) AMM 23-12-00/501, VHF Communications System
- (5) AMM 24-22-00/201, Electrical Power - Control
- (6) AMM 27-11-00/501, Aileron and Aileron Trim Control System
- (7) AMM 27-21-00/501, Rudder and Rudder Trim Control System
- (8) AMM 27-31-00/501, Elevator Control System
- (9) AMM 27-32-00/501, Stall Warning System
- (10) AMM 27-41-00/501, Horizontal Stabilizer Trim Control System
- (11) AMM 27-51-00/501, Trailing Edge Flap System
- (12) AMM 27-61-00/201, Spoiler/Speedbrake Control System
- (13) AMM 27-81-00/501, Leading Edge Slat System
- (14) AMM 29-11-00/201, Main Hydraulic Systems
- (15) AMM 31-25-00/501, Clocks
- (16) AMM 32-00-20/201, Landing Gear Downlocks
- (17) AMM 32-09-02/201, Air/Ground Relays
- (18) AMM 34-12-00/501, Air Data Computing System
- (19) AMM 34-21-00/501, Inertial Reference System
- (20) AMM 34-22-00/501, Flight Instrument System
- (21) AMM 34-32-00/501, Marker Beacon System
- (22) AMM 32-42-00/501, Antiskid/Autobrake System
- (23) AMM 34-46-00/501, Ground Proximity Warning System
- (24) AMM 34-61-00/501, Flight Management Computer System
- (25) AMM 71-00-00/201, Power Plant

(26) AMM 78-31-00/501, Fan Thrust Reverser System

D. Access

- (1) Location Zone
212 Control Cabin - Sect 41 (Right)

E. Prepare for test

S 215-879-002

- (1) Do this task: DFDAU Software Configuration Check (AMM 31-31-03/201).

S 735-700-002

- (2) Do the steps that follow:
 - (a) Open these circuit breakers on the overhead panel, P11, and attach DO-NOT-CLOSE tags:
 - 1) 11J7, FLIGHT RECORDER AC
 - 2) 11J8, FLIGHT RECORDER DC

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S 865-857-002

- (3) If you use test equipment other than the hand-held download unit (HHDLU), install the tester to the test connector at the right side panel, P61.

S 865-858-002

- (4) If you use the hand-held download unit (HHDLU), attach the HHDLU to the test connector at the front side of the flight data recorder.

NOTE: To get access to the FDR, open the lower ceiling panel No. 1 above the aft galley (AMM 25-22-02/401). The HHDLU can only be connected to the AlliedSignal flight data recorder (FDR).

S 865-813-002

- (5) Remove the DO-NOT-CLOSE tags and close the P11 panel circuit breakers:
- (a) 11J7, FLIGHT RECORDER AC
 - (b) 11J8, FLIGHT RECORDER DC

S 865-892-002

- (6) Supply electrical power (AMM 24-22-00/201).

S 865-859-002

- (7) With the Data Signal Display Unit (DSDU), set the control switches on the tester as follows:
- (a) Set the power switch to the ON position.
 - (b) Set the INPUT switch to the ARINC INPUT DATA position.
 - (c) Set the SYNC switch to the SYNC B position.
 - (d) Set the DATA PARAMETER/DOCUMENTARY switch to the DATA PARAMETER position.
 - (e) Set the OCTAL DISPLAY switch to the 12 BIT position.
 - (f) Set the SUBFRAME and WORD as specified.

S 865-860-002

- (8) With the Teledyne tester (P/N 222786), set the switches on the tester as follows:
- (a) Set the POWER switch to the ON position.
 - (b) Set the READOUT switch to the ACTF DATA position.
 - (c) Set the UPDATE switch to the AUTO position.
 - (d) Set the DFDAU/DFDR DATA SELECTOR switch to the DFDAU position.
 - (e) Set the DATA switch to the 12 BIT position.
 - (f) Set the SUBFRAME and WORD as specified.

S 865-861-002

- (9) With the Teledyne tester (P/N 2229738), set the switches on the tester as follows:
- (a) Push the CLR switch two or three times to clear all inputs.
 - (b) Push the DFDR switch and then the ENT switch.
 - (c) Set the SUBFRAME and WORD as specified.

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S 865-862-002

- (10) With the hand-held download unit (HHDLU), do the steps that follow:

NOTE: These steps are for airplanes equipped with AlliedSignal FDR only.

- (a) On the flight recorder control panel (FRCP), set the function switch to the ON position.
- (b) Push the red button on top of the HHDLU.
- (c) Set the DSDU switch.
- (d) Set the word number to WRD1, WRD2, or WRD3.
- (e) Set the BASE switch.
- (f) In the BASE SELECT menu, set OCT for octal values.
- (g) Set the SUBFRAME and WORD as specified.

S 865-863-002

- (11) With the MADU, set the switches as follows:

- (a) Set the power switch to the ON position.
- (b) Push the FUN switch, then enter the number 5 to set the LRU A on the tester.
- (c) Push the DATA switch, then the number 03 to set the DFDAU-H on the tester.
- (d) Push the FUN switch, then the number 03 for SUBFRAME.
- (e) Set a subframe (1 thru 4) on the keyboard switch.
- (f) Push the DATA switch, then the number 04 for WORD.
- (g) Set a word (1 thru 64) on the keyboard.
- (h) Push the FUN switch, then the number 02 to set the FORMAT field on the tester.
- (i) Push the number 02 to set the OCTAL 10 on the tester.
- (j) Set the SUBFRAME and WORD as specified.

F. GMT Test

S 735-701-002

- (1) Do the GMT test that follows:

- (a) Make sure that the clock system is operational (AMM 31-25-00/501).
- (b) On the tester, set the SUBFRAME to 1 and the WORD to 52.
- (c) Set the captain's clock to 10 hrs, 42 min and put the clock in the HOLD mode (AMM 31-25-00/501).
- (d) Make sure the tester display reads 252X.

NOTE: Test data X may have any value.

- (e) Set the SUBFRAME to 2.
- (f) Make sure the tester display reads 24XX or 25XX.

S 205-814-002

- (2) Set the captain's clock to the correct time.

G. Captain's ADC Select Switch Test

S 735-702-002

- (1) Do the ADC switch test that follows:
 - (a) Make sure the air data computing system is operational (AMM 34-12-00/501).
 - (b) On the tester, set the SUBFRAME to 2 and the WORD to 31.
 - (c) Set the captain's ADC source select switch to the NORM position.
 - (d) Make sure the BIT (DISCRETE) 2 shows a 1.
 - (e) Set the captain's ADC source select switch to the ALTN position.
 - (f) Make sure the BIT (DISCRETE) 2 shows a 0.
 - (g) Set the captain's ADC source select switch to the NORM position.

H. ADC Data Bus Test

S 735-703-002

- (1) Do the ADC data bus test that follows:
 - (a) Make sure the air data computing system is operational (AMM 34-12-00/501).
 - (b) Set the Captain's ADC Source Select switch to the NORM position.
 - (c) Push and hold the left air data computer switch on the P61 test panel for more than 7 seconds.
 - (d) Set the SUBFRAME and WORD for each signal as shown in the ADC DATA BUS table.

ADC DATA BUS SIGNAL TEST			
SIGNAL	TESTER SETUP		TESTER DISPLAY
	SUBFRAME	WORD	
ALTITUDE	0	23	0471
AIRSPEED	0	22	1044

S 865-826-002

- (2) Set the Capt's ADC source select switch to the NORM position.

I. Radio Altimeter (RA) Data Bus Test

S 735-704-002

- (1) Do the RA data bus test that follows:
 - (a) Make sure the RA is operational (AMM 34-33-00).
 - (b) On the DMEP, do the steps that follows:
 - 1) Push the RSET switch.
 - 2) Enter the mnemonic code RALC.

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- (c) On the center RA, push the test switch.
- (d) Make sure the DMEP display shows 40 ft.
- (e) On the DMEP, do the steps that follows:
 - 1) Push the RSET switch.
 - 2) Enter the mnemonic code RALR.
- (f) On the right RA at the E 5-2 rack, push and hold the TEST switch.
- (g) Make sure the DMEP display shows 40 ft.

J. Captain's FMC Switch Position Test

S 735-705-002

- (1) Do the FMC switch test that follows:
 - (a) Make sure the flight management computer system is operational (AMM 34-61-00/501).
 - (b) On the tester, set the SUBFRAME to 2 and the WORD to 32.
 - (c) Set the Captain's FMC source select switch to the NORM position.
 - (d) Make sure the BIT (DISCRETE) 1 shows a 1.
 - (e) Set the captain's FMC source select switch to the ALTN position.
 - (f) Make sure the BIT (DISCRETE) 1 shows a 0.

S 865-738-002

- (2) Set the captain's FMC select switch to the NORM position.
- K. FMC Data Bus Test

S 735-805-002

- (1) Do the FMC data bus test that follows:
 - (a) On the DMEP, do the step that follows:
 - 1) Push the RSET switch.
 - 2) Push the mnemonic code GWTL.
 - 3) Push the ENT switch.
 - (b) On the left FMC, push the self test switch.
 - (c) Make sure the DMEP display reads 440000XX on its third line (X = don't care).
 - (d) On the DMEP, do the steps that follows:
 - 1) Push the RSET switch.
 - 2) Push the mnemonic code GWTR.
 - 3) Push the ENT switch.
 - (e) On the left FMC, push the test switch.
 - (f) Make sure the DMEP display shows 440000XX on its third line. (X= don't care)

S 865-638-002

- (2) Set the FMC and the IRS back to the usual condition.
- L. Captain's IRS Switch Position Test

S 735-707-002

- (1) Do the IRS switch test that follows:
 - (a) Make sure the Inertial Reference System (IRS) is operational (AMM 34-21-00/501).

- (b) On the tester, set the SUBFRAME to 3 and the WORD to 32.
- (c) Set the Captain's IRS source select switch to the NORM position.
- (d) Make sure the BIT (DISCRETE) 2 shows a 1.
- (e) Set the captain's IRS source select switch to ALTN position.
- (f) Make sure the BIT (DISCRETE) 2 shows a 0.

S 865-750-002

- (2) Set the Captain's IRS source select switch back to the NORM position.

M. Captain's EFI Instrument Select Switch Test

S 735-742-002

- (1) Do the EFIS switch test that follows:
 - (a) Make sure the EFIS system is operational (AMM 34-22-00/501).
 - (b) On the tester, set the SUBFRAME to 1 and the WORD to 32.
 - (c) Set the captain's EFIS instrument source select switch to the NORM position.
 - (d) Make sure the BIT (DISCRETE) 2 shows a 1.
 - (e) Set the captain's EFI instrument select switch to the ALTN position.
 - (f) Make sure the BIT (DISCRETE) 2 shows a 0.
 - (g) Set the captain's EFIS select switch to the NORM position.

N. EFIS Data Bus Test

S 735-709-002

- (1) Do the EFIS data bus test that follows:
 - (a) Make sure the EFIS system is operational (AMM 34-22-00).
 - (b) Make sure the captain's EFIS instrument source select switch are at the NORM position.
 - (c) Make sure the left IRU is operational (AMM 34-21-00/501).
 - (d) Set the captain's IRU source select switch to the NORM position.
 - (e) Set the left IRS mode select switch to the NAV position.

NOTE: Alignment may take about 10 minutes.

- (f) Set the SUBFRAME and WORD for each signal in the EFIS DATA BUS SIGNAL table.
- (g) Make sure the tester shows the correct value as shown in the EFIS DATA BUS SIGNAL table that follows:
- (h) At the E 2-1 rack, Push and hold the TEST switch on the left IRU for 10 seconds.

EFIS DATA BUS SIGNAL			
SIGNAL	TESTER SETUP		TESTER DISPLAY
	SUBFRAME	WORD	
Pitch Attitude	0	3	0160, 0161 0162 or 0163
Roll Attitude	0	13	1000 or 1001
Magnetic Heading	0	54	0252 or 0253

- (i) Set the left EFI instrument source select switch to the ALTN position.
- (j) Set the SUBFRAME and WORD for each signal in the EFIS DATA BUS SIGNAL table.
- (k) At the E 2-1 rack, Push and hold the TEST switch on the left IRU for 10 seconds.

EFIS DATA BUS SIGNAL			
SIGNAL	TESTER SETUP		TESTER DISPLAY
	SUBFRAME	WORD	
Pitch Attitude	0	3	0000, 0001, 0002 or 0003
Roll Attitude	0	13	0000 or 0001
Magnetic Heading	0	54	0000 or 0001

- S 865-817-002
- (2) Set the L EFIS instrument select switch to the NORM position.
0. FCC Data Bus Test

- S 735-710-002
- (1) Do the FCC data bus test that follows:
 - (a) Make sure the autopilot/flight control system operates correctly (AMM 22-10-00/501).

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- (b) Make sure the Maintenance Control Display Panel (MCDP) operates correctly (AMM 22-41-00/501).
- (c) Make sure hydraulic pressure is removed from the hydraulic systems (AMM 29-11-00/201).
- (d) Push FLT FAULTS on the Maintenance Control Display Panel (MCDP).
- (e) Push GND TEST on the MCDP.
- (f) Make sure the A/P ENGAGE switches on the MCP are set to the OFF position.
- (g) On the tester, set the SUBFRAME to 0 and the WORD to 59.
- (h) Make sure the tester display shows the value as shown in the table that follows:

NOTE: Engage the A/P one at a time.

SIGNAL	TESTER DISPLAY
A/P ENGAGED L	0040
A/P ENGAGED R	0020
A/P ENGAGED C	0010

- (i) Set the captain's INSTR SOURCE SEL - FLT DIR TO the C position.
- (j) Set the two F/D switches on the MCP to the ON position.
- (k) Push the SPD and the FL CH switch lights on the MCP.
- (l) Make sure the SPD and FL-CH modes are engage.
- (m) Push FLT FAULTS on the MCDP.

S 735-799-002

- (2) Do the MCP switch test that follows:

P. MCP Data Bus Test

S 735-762-002

- (1) Do the MCP test that follows:
 - (a) Push the RESET switch on the DMEP.
 - (b) Push the mnemonic code SLHDG.
 - (c) Set the HDG switch on the MCP to 100°.
 - (d) Make sure the DMEP display shows 100°.

S 865-806-002

- (2) Set the autopilot/flight control system back to normal (Ref 22-10-00).

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Q. TMC Data Bus Test

S 735-711-002

- (1) Do the TMC data bus test that follows:
 - (a) Make sure the thrust management system is operational (AMM 22-32-00).
 - (b) On the tester, set the SUBFRAME to 1 and the WORD to 43.
 - (c) Set the autothrottle arm switch on the autopilot mode control panel to the ARM position.
 - (d) Make sure the TMC is in the T/O mode on the EICAS display (AMM 22-32-00).
 - (e) Push the thrust reference set control on the EICAS display select panel.
 - (f) Push the thrust reference set control on the EICAS display select panel.
 - (g) Make sure the tester display shows a 0040.

S 865-818-002

- (2) Set the TMC and the EICAS back to normal.

R. Yaw Damper Engage Test

S 735-739-002

- (1) Do the yaw damper test that follows:
 - (a) Make sure the yaw damper system is operational (AMM 22-21-00).
 - (b) Make sure the IRS is operational (AMM 34-21-00/501).
 - (c) Set the IRS mode select switch to the Nav mode.
 - (d) Make sure at least one IRU is ALIGNED.
 - (e) Make sure the left and right yaw dampers are not engaged.
 - (f) On the tester, set the SUBFRAME to 2 and the WORD to 17.
 - (g) Make sure the BIT (DISCRETE) 1 and 2 shows a 0.
 - (h) Engage the left yaw damper (AMM 22-21-00).
 - (i) Make sure the BIT (DISCRETE) 1 shows a 1.
 - (j) Disengage the left yaw damper (AMM 22-21-00).
 - (k) Engage the right yaw damper (AMM 22-21-00).
 - (l) Make sure the BIT (DIACRETE) 2 shows a 1.
 - (m) Disengage the right yaw damper (AMM 22-21-00/501).

S 865-819-002

- (2) Set the yaw damper system to the usual condition (AMM 22-21-00/501).

S. EICAS Computer Switch Test

S 735-714-002

- (1) Do the EICAS switch test that follows:
 - (a) Make sure the EICAS computer is operational (AMM 31-41-00).
 - (b) On the tester, set the SUBFRAME to 1 and the WORD to 56.
 - (c) Set the COMPUTER switch on the EICAS DISPLAY select panel to the R position.
 - (d) Make sure the BIT (DISCRETE) 1 shows a 0.
 - (e) Set the COMPUTER switch on the EICAS DISPLAY select panel in the AUTO position.
 - (f) Make sure the BIT (DISCRETE) 1 shows a 1.

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T. Automatic/Manual Electrical Pitch Trim Test

S 735-715-002

- (1) Do the electrical pitch trim test that follows:
 - (a) Make sure the horizontal stabilizer trim control system is operational (Ref 27-41-00).
 - (b) Make sure the captain's control wheel trim switch is in the center position.
 - (c) On the tester, set the SUBFRAME to 0.
 - (d) Make sure the BIT (DISCRETE) 2 shows a 1 when the WORDs are set to 7 and 39.
 - (e) Set the captain's control wheel trim switch to the TRIM UP position.
 - (f) Make sure the BIT (DISCRETE) 2 shows a 0 when the WORDs are set to 7 and 39.
 - (g) Set the captain's control wheel trim switch to the TRIM DOWN position.
 - (h) Make sure the BIT (DISCRETE) 2 shows a 0 when the WORDs are set to 5 and 16.

S 865-820-002

- (2) Release the control wheel trim switch.

U. Speed Brake Handle Position Test

S 735-763-002

- (1) Do the speed brake test that follows:
 - (a) On the tester, set the SUBFRAME to 0 and the WORD 16.
 - (b) Set the speed brake handle position, and make sure the tester display shows the value as shown in the table that follows:

SPEED BRAKE HANDLE POSITION	TESTER DISPLAY
DOWN	7751 to 0026
UP	1540 to 1616
ARMED	0117 to 0175

S 865-807-002

(2) Set the speed brake handle back to normal.

V. Flight Control Surface Position Test

S 915-683-002

WARNING: KEEP PERSONS AND EQUIPMENT AWAY FROM ALL CONTROL SURFACES WHEN HYDRAULIC POWER IS APPLIED. AILERON, ELEVATORS, RUDDER, FLAPS, SLATS, SPOILERS, AND STABILIZER ARE FULLY POWERED SURFACES. INJURY TO PERSON OR EQUIPMENT CAN OCCUR WHEN HYDRAULIC POWER IS SUPPLIED.

(1) Supply hydraulic power (AMM 29-11-00/201).

S 735-717-002

(2) Elevator Position Test

(a) Make sure the elevator control system is operational (AMM 27-31-00/501).

(b) Set the SUBFRAME and WORD for each signal and set the elevator position as shown in the table that follows:

SIGNAL		TESTER SETUP		TESTER DISPLAY
ELEVATOR	POSITION	SUBFRAME	WORD	
LEFT	NEUTRAL	0	14, 46	0000 to 0100, or 7670 to 7777
	FULL UP	0	14, 46	2510 to 2720
RIGHT	NEUTRAL	0	30, 62	0000 to 0100, or 7670 to 7777
	FULL UP	0	30, 62	2510 to 2720

(c) Set the elevator system back to the usual condition (AMM 27-31-00/501).

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S 735-718-002

(3) Aileron Position Test

- (a) Make sure the aileron and aileron trim control system are operational (AMM 27-11-00/501).
- (b) Set the SUBFRAME and WORD for each signal and set the aileron position as shown in the table that follows:

SIGNAL		TESTER SETUP		TESTER DISPLAY
AILERON	POSITION	SUBFRAME	WORD	
RIGHT	NEUTRAL	0	25, 57 25, 57	0000 to 0100, or 7670 to 7777
	FULL UP	0		1510 to 1720
LEFT	NEUTRAL	0	9, 41 9, 41	0000 to 0100, or 7670 to 7777
	FULL UP	0		1510 to 1720

- (c) Set the aileron back to the usual condition (AMM 27-11-00).
- (d) Set the control column to the neutral position.

S 735-721-002

(4) Rudder Pedal Position (Syncro) Test

- (a) Make sure the rudder and rudder trim control system are operational (AMM 27-21-00/501).
- (b) Make sure the rudder is at the neutral position.
- (c) On the tester, set the SUBFRAME to 0.
- (d) Make sure the tester display shows between 7670 and 0102 when the WORDs are set to 12, 28, 44, and 60.

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- (e) Set the left rudder pedal to the full forward position.
- (f) Make sure the tester display shows between 6050 and 6262 when the WORDs are set to 12, 28, 44 and 60.
- (g) Set the right rudder pedal to the full forward position.
- (h) Make sure the tester display shows between 1510 and 1722 when the WORDs are set to 12, 28, 44, and 60.
- (i) Set the rudder position back to the neutral position.

S 735-757-002

(5) Horizontal Stabilizer Position Test

- (a) Make sure the horizontal stabilizer trim control system is operational (AMM 27-41-00/501).
- (b) On the tester, the WORD to 24.
- (c) Set the stabilizer to the 0 trim position.
- (d) Make sure the tester display shows between 0660 and 0740 when the SUBFRAMEs are set to 2 and 4.
- (e) Set the stablizer to 15.5 trim position.
- (f) Make sure the tester display shows between 7040 and 7120 when the SUBFRAMEs are set to 2 and 4.
- (g) Set the stabilizer back to the normal position (AMM 27-41-00/501).

W. Flap Handle Position Test

S 735-755-002

(1) Do the flap handle test that follows:

- (a) Make sure these circuit breakers on the overhead circuit breaker panel, P11, are close:
 - 1) 11G12, FLAP/SLAT ELEC UNIT-1 PWR
 - 2) 11G13, FLAP/SLAT ELEC UNIT-1 CONT
 - 3) 11G14, FLAP/SLAT ELEC UNIT-1 SENSOR
- (b) On the tester, set the SUBFRAME to 0 and the WORD to 40.
- (c) Set the flap handle position, and make sure the tester display shows the value as shown in the table that follows:

FLAP HANDLE POSITION	TESTER DISPLAY
UP	0000 to 2211
15	4426 to 5156

FLAP HANDLE POSITION	TESTER DISPLAY
UP	1341 to 1604
1	2517 to 2763
5	3554 to 4017
15	4560 to 5023
20	5614 to 6060
25	6630 to 7074
DOWN/30	7655 to 0120

(d) Set the flap handle to the UP position.

S 735-722-002

(2) Trailing Edge Flaps Position Test

- (a) Make sure the trailing edge (T.E.) flap system is operational (Ref 27-51-00).
- (b) Make sure the trailing edge flaps are up.
- (c) Open these circuit breakers on the overhead circuit breaker panel, P11, and attach DO-NOT-CLOSE tags
 - 1) 11H12, FLAP POS IND LEFT
- (d) Make sure the circuit breaker on the overhead circuit breaker panel, P11, is closed:
 - 1) 11H13, FLAP POS IND RIGHT
- (e) On the tester, set the SUBFRAME to 0 and the WORD to 49.
- (f) Make sure the tester display shows between 6734 and 7044.
- (g) Set the T.E. flaps to the 15 units detent position.
- (h) Make sure the tester display shows between 1734 and 2044.
- (i) Set the T.E. flaps to the full up position.
- (j) Remove the DO-NOT-CLOSE tag and close the P11 panel circuit breaker:
 - 1) 11H12, FLAP POS IND LEFT
- (k) On the tester, set the SUBFRAME to 0 and the WORD to 17.
- (l) Make sure the tester display shows between 6734 and 7044.
- (m) Set the left T.E. flaps to the 20 unit detent position.
- (n) Make sure the tester display shows between 2734 and 3044.
- (o) Set the T.E. flap system back to the full up position.

S 735-746-002

(3) Leading Edge Slat Position Test

- (a) Make sure the leading edge slat system is operational (AMM 27-81-00).

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- (b) Set the SUBFRAME and WORD for each parameter condition as shown in the table that follows.
- (c) Make sure the tester display shows the correct data for each position.

L.E. SLATS/CONDITION	TESTER SETUP		TESTER DISPLAY	
	SUBFRAME	WORD	BIT (DISCRETE)	VALUE
FULL EXTEND	1 (3)	17	2	1
NOT FULLY EXTEND				0
PART EXTEND	1 (3)	24	1	1
NOT PART EXTEND				0
RETRACTED	1 (3)	24	2	1
NOT RETRACTED				0
FAIL *[1]	1 (3)	17	1	1
NOT FAIL				0

*[1] Uncommanded motion (UCM) or Asymmetry. Refer to 27-81-00 to make the slat condition of the UCM. To created the UCM condition, turn off the hydraulic system, remove the eletrical connector D1710 from the slat bypass valve V10059 (AMM 27-51-00) and manually position the valve to the bypass position. Then turn the hydraulic system back on and set the flap lever to the 5 position.

(d) Set the L.E. slats back to the normal position.

X. Thrust Reverser Position Test

S 735-760-002

- (1) Do the thrust reverser position test that follows:
 - (a) Make sure the thrust reverser system is operational (AMM 78-31-00/501).

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WARNING: OPERATION OF TRANSLATING COWL IS ACHIEVED IN APPROXIMATELY 2 SECONDS. MAKE SURE ALL PERSONNEL ARE CLEAR OF IMMEDIATE AREA OR INJURY TO PERSONNEL MAY OCCUR.

CAUTION: MAKE SURE THE THRUST REVERSER IS CLEAR OF EQUIPMENT, TOOLS, AND LOOSE ARTICLES. IF NOT REMOVED, DAMAGE WILL OCCUR TO REVERSER DURING TRANSITION.

- (b) Move equipment and personnel away from the thrust reverser area.
- (c) Set the thrust levers to the idle position.
- (d) Set the SUBFRAME and WORD for each signal and set the thrust reverser levers as shown in the table that follows:

NOTE: The Reverser IN TRANSIT condition exists when REV in amber letters is shown on the upper EICAS Display Unit.

NOTE: The Reverser FULLY DEPLOYED condition exists when REV in green letters is shown on the upper EICAS Display Unit.

THRUST REVERSER	CONDITION	TESTER SETUP		TESTER DISPLAY	
		SUBFRAME	WORD	BIT (DISCRETE)	VALUE
LEFT	IN-TRANSIT	0	28	1	1
	NOT IN-TRANSIT			1	0
	FULLY DEPLOYED	0	35	1	1
	NOT FULLY DEPLOYED			1	0
RIGHT	IN-TRANSIT	0	28	2	1
	NOT IN-TRANSIT			2	0
	FULLY DEPLOYED	0	35	2	1
	NOT FULLY DEPLOYED			2	0

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S 865-761-002

- (2) Set the thrust reversers back to the stow position (AMM 78-31-00/501).

Y. Spoiler Panel Failure Test

S 735-723-002

- (1) Do the spoiler failure test that follows:
- (a) Open these circuit breakers on the overhead circuit breaker panel, P11, and attach the DO-NOT-CLOSE tags:
 - 1) 11G11, AUTO SPEED BRAKE
 - (b) Make sure the these circuit breakers on the overhead circuit breaker panel, P11, are closed:
 - 1) 11C6, CSEU 1L AC
 - 2) 11C7, CSEU 1L DC
 - 3) 11C8, CSEU 2L AC
 - 4) 11C9, CSEU 2L DC
 - 5) 11G17, CSEU 1R AC
 - 6) 11G18, CSEU 1R DC
 - 7) 11G27, CSEU 2R AC
 - 8) 11G28, CSEU 2R DC
 - (c) Set the Spoiler Control modules in the E/E Compartment if the fault is latched.
 - (d) Make sure there is no hydraulic power (Ref 29-11-00).
 - (e) Set the captain's control wheel to the NEUTRAL position.
 - (f) Set the speedbrake lever to the DOWN position.
 - (g) On the tester, set the SUBFRAME to 0.
 - (h) Make sure the BIT (DISCRETE) 2 shows a 1 when the WORDS are set to 9, 11, 30, and 41.
 - (i) Set the speed brake lever to the full up position.
 - (j) Make sure the BIT (DISCRETE) 2 shows a 0 when the WORDS are set to 9, 11, 30, and 41.

S 865-825-002

- (2) Remove the DO-NOT-CLOSE tag and close the P11 panel circuit breaker:
- (a) 11G11, AUTO SPEED BRAKE

Z. Wheel Brake Application Test

S 735-727-002

- (1) Do the wheel brake test that follows:
 - (a) Make sure the parking brake is off.
 - (b) Make sure the captain's brake pedals are at the neutral position.
 - (c) On the tester, set the SUBFRAME to 0 and the WORD to 38.
 - (d) Make sure the BIT (DISCRETE) 2 shows a 1.
 - (e) Operate the captain's left brake pedal.
 - (f) Make sure the BIT (DISCRETE) 2 shows a 0.
 - (g) Set the captain's left brake pedal back to the neutral position.
 - (h) On the tester, set the SUBFRAME to 0 and the WORD to 55.
 - (i) Make sure the BIT (DISCRETE) 1 shows a 1.
 - (j) Operate the captain's right brake pedal.
 - (k) Make sure the BIT (DISCRETE) 1 shows a 0.

S 865-822-002

- (2) Set the captain's right brake pedal to the neutral position.
- AA. Autobrake Mode Select Switch Test

S 735-775-002

- (1) Do the autobrake test that follows:
 - (a) Make sure the Antiskid/Autobrake system is operational (Ref 32-42-00).
 - (b) Set the autobrake selector switch, the SUBFRAME and WORD as shown in the table that follows.
 - (c) Make sure the tester display shows the correct data for each position.

AUTOBRAKE SELECT SW POSITION	TESTER SETUP		TESTER DISPLAY	
	SUBFRAME	WORD	BIT (DISCRETE)	STATE
OFF	0	51	1	0
DISARM	0	51	1	1
LEVEL 1	0	51	2	1
LEVEL 2	0	57	1	1
LEVEL 3	0	57	2	1
LEVEL 4	0	62	1	1
MAX AUTO	0	62	2	1

AB. EPR Data Bus Test

S 735-758-002

- (1) Do the EPR data bus test that follows:
 - (a) On the tester, set the SUBFRAME to 0 and the WORD to 38 for the right EPR.
 - (b) Make sure the EPR reads 1.0, and the tester display shows between 3750 and 4030 with the engine not in operation.
 - (c) Make sure the EPR reads 1.0, and the tester display shows between 3750 and 4030 with the engine not in operation.
 - (d) On the tester, set the SUBFRAME to 0 and the WORD to 6 for the left EPR.
 - (e) Make sure the EPR reads 1.0 and the tester display shows between 3753 and 4033 with the engine not in operation.

S 865-759-002

- (2) Set the EPR system back to normal.

AC. VHF Test

S 735-728-002

- (1) Do the VHF test that follows:
 - (a) Make sure the VHF communication systems are operational (AMM 23-12-00/501).
 - (b) Tune the VHF transceivers to an approved test frequency.

NOTE: Key only one transceiver at a time.

- (c) On the tester, set the SUBFRAME to 0 and the WORD to 4.
- (d) Make sure the BIT (DISCRETE) 1 and 2 shows a 1.

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- (e) On the audio selector panel, put the switch to the L VHF position.
- (f) Push the PTT switch on the captain's or first officer's control wheel.
- (g) Make sure the BIT (DISCRETE) 1 shows a 0.
- (h) Release the PTT switch.
- (i) Make sure that BIT (DISCRETE) 1 shows a 1.
- (j) On the audio selector panel, put the switch to the R VHF position.
- (k) Push the PTT switch on the control wheel.
- (l) Make sure the BIT (DISCRETE) 2 shows a 0.
- (m) Release the PTT switch.

S 865-676-002

- (2) Release the PTT switch.

AD. HF Test

S 735-729-002

- (1) Do the HF test that follows:
 - (a) Make sure the HF communication systems are operational (Ref 23-11-00).
 - (b) Tune the left HF transceiver to an approved test frequency.
 - (c) On the tester, set the SUBFRAME to 0 and the WORD to 6.
 - (d) Make sure the BIT (DISCRETE) 1 shows a 1.
 - (e) On the audio selector panel, put the switch to the L HF position.
 - (f) Push the PTT switch on the captain's or the first officer's control wheel.
 - (g) Make sure the BIT (DISCRETE) 1 shows a 0.
 - (h) Release the PTT switch.

S 865-791-002

- (2) Release the PTT switch.

AE. Event Test

S 735-776-002

- (1) Do the event test that follows:
 - (a) On the tester, set the SUBFRAME to 0 and the WORD to 44.
 - (b) On the DMEP, prush and hold the EVENT switch.
 - (c) Make sure the BIT (DISCRETE) 1 shows a 1.
 - (d) Release the EVENT switch.

- (e) Make sure the BIT (DISCRETE) 1 shows a 0.
AF. Ground Proximity Warning System (GPWS) Test

S 735-777-002

- (1) Do the GPWS test that follows:
- (a) Make sure the ground proximity warning system is operational (AMM 34-46-00/501).
 - (b) On the tester, set the SUBFRAME to 0 and the WORD to 11.
 - (c) Make sure the BIT (DISCRETE) 1 shows a 1.
 - (d) Set the test switch on the miscellaneous test panel to the GND PROX position.
 - (e) Make sure the GLIDESLOPE, WHOOP-WHOOP PULL UP aural warning comes on.
 - (f) Make sure the BIT (DISCRETE) 1 shows a 0.

NOTE: When the push the GND PROX test switch, the glideslope aural warning will operate for approximately 1 to 2 seconds and then the PULL-UP warning will operate. The tester display will indicate a 1 for only a short time. It may be necessary to repeat the GND PROX test to determine the proper sequence and test data.

- (g) Set the SUBFRAME to 0 and the WORD to 19.
- (h) Make sure the BIT (DISCRETE) 2 shows a 1.
- (i) Set the test switch on the miscellaneous test panel to the GND PROX position.
- (j) Make sure the GLIDESLOPE, WHOOP-WHOOP PULL UP aural warning comes on.
- (k) Make sure the BIT (DISCRETE) 2 shows a 0.

NOTE: When the push the GND PROX test switch, the glideslope aural warning will operate for approximately 1 to 2 seconds and then the PULL-UP warning will operate. The tester display will indicate a 1 for only a short time. It may be necessary to repeat the GND PROX test to determine the proper sequence and test data.

S 865-792-002

- (2) Set the ground proximity warning system back to normal.
AG. Marker Beacon Test

S 735-730-002

- (1) Do the marker beacon test that follows:
- (a) Make sure the marker beacon system is operational (AMM 34-32-00/501).
 - (b) Push and hold the TEST switch on the left VOR/MKR receiver for 5 seconds.
 - (c) On the tester, set the SUBFRAME and WORD for each signal and make sure the data are shown in the table that follows.

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SIGNAL		TESTER SETUP		TESTER DISPLAY	
		SUBFRAME	WORD	BIT (DISCRETE)	VALUE
INNER MARKER	OFF	0	37	1	1
	ON	0	37	1	0
MIDDLE MARKER	OFF	0	37	2	1
	ON	0	37	2	0
OUTER MARKER	OFF	0	38	1	1
	ON	0	38	1	0

AH. ILS Digital Data Bus Test

S 735-778-002

- (1) Do the ILS data bus test that follows:
 - (a) Make sure the ILS is operational(AMM 34-31-00/501).
 - (b) Push the REST switch on the DMEP.
 - (c) Push in the DMEP mnemonic code LOCL.
 - (d) Push the ILS control panel test switch on the P8 panel and wait for a one dot right indication on the EHSI.
 - (e) Make sure the DMEP display shows +.0771 to +.0779 DDM.
 - (f) Push the RSET switch on the DMEP.
 - (g) Push in the DMEP mnemonic code LOCR.
 - (h) Push the ILS control panel test switch on the P8 panel and wait for a one dot right indication on the EHSI.
 - (i) Make sure the DMEP display shows +.0771 to +.0779 DDM.
 - (j) Push the RSET switch on the DMEP.
 - (k) Push in the DMEP mnemonic code LOCC.
 - (l) Push the ILS control panel self-test switch on the P8 panel and wait for a one dot right indication on the EHSI.

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(m) Make sure the DMEP display shows +.0771 to +.0779 DDM.

AI. Stick Shaker Test

S 735-731-002

- (1) Do the stick shaker test that follows:
- (a) Make sure the stall warning system is operational (AMM 27-32-00/501).

NOTE: If the Hydraulic Power is used, the STALL TEST will also start the auto slat if the flaps are in the takeoff range and slats are sealed.

- (b) On the tester, set the SUBFRAME to 0 and the WORD to 25.
- (c) Make sure the BIT (DISCRETE) 1 shows a 1.
- (d) Set the L STALL switch on miscellaneous test panel to the TEST position.
- (e) Make sure the BIT (DISCRETE) 1 shows a 0.
- (f) Release L STALL TEST switch on the miscellaneous.
- (g) Set the R STALL switch on miscellaneous test panel to the TEST position.
- (h) Make sure the BIT (DISCRETE) 2 shows a 0.
- (i) Release the R STALL switch on the miscellaneous test panel.

S 865-823-002

- (2) Set the stall warning system to the usual condition.

AJ. EEC Data Bus Test

S 735-732-002

- (1) Do the EEC data bus test that follows:
- (a) Make sure the circuit breaker on the overhead circuit breaker panel, P11, is closed:
 - 1) 11L5, LEFT ENGINE ELECTRONIC ENGINE CONTROL SUPV
 - (b) Open these circuit breaker on the overhead circuit breaker panel, P11, and attach the DO-NOT-CLOSE tag:
 - 1) 11L32, RIGHT ENGINE ELECTRONIC ENGINE CONTROL SUPV

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- (c) On the P10 panel, set the L ELEC ENG control switch to the ON position.
- (d) Set the left throttle lever to the idle position.
- (e) Push RSET switch on DMEP.
- (f) Push in the mnemonic code THLAL.
- (g) Push the L EEC GND Test Switch (S10379) located below the E1-1 rack next to the left EEC.
- (h) Make sure the DMEP display shows between 48 and 52°.
- (i) Open these circuit breaker on the overhead circuit breaker panel, P11, and attach the DO-NOT-CLOSE tag:
 - 1) 11L5, LEFT ENGINE ELECTRONIC ENGINE CONTROL SUPV

S 865-809-002

- (2) Remove the DO-NOT-CLOSE tag and close the P11 panel circuit breaker:
 - (a) 11L32, RIGHT ENGINE ELECTRONIC ENGINE CONTROL SUPV
 - (b) On the P10 panel, set the R EEC ENG CONTROL switch to the ON position.
 - (c) Set the right throttle lever to the idle position.
 - (d) Push the RSET switch on the DMEP.
 - (e) Push in the mnemonic code THLAR.
 - (f) Push the R EEC GND test switch S10380 located below the E3-1 rack next to the right EEC.
 - (g) Make sure the DMEP display shows between 48 and 52°.

S 865-779-002

- (3) Remove the DO-NOT-CLOSE tag and close the P11 panel circuit breaker:
 - (a) 11L5, LEFT ENGINE ELECTRONIC ENGINE CONTROL SUPV

AK. Engine Start Test

S 735-765-002

- (1) Do the engine start test that follows:
 - (a) Make sure the pneumatic power is not available to the engines (AMM 36-00-00).
 - (b) Open these circuit breakers on the overhead circuit breaker panel, P11, and attach the DO-NOT-CLOSE tags:
 - 1) 11D19, ENGINE START CONT LEFT
 - 2) 11D20, ENGINE START CONT RIGHT

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- (c) Set the L and R ENG START switches on the start control panel located on the overhead panel to the OFF position.
- (d) On the tester, set the SUBFRAME to 0 and the WORD to 49.
- (e) Make sure the BIT (DISCRETE) 2 shows a 0.

S 865-766-002

- (2) Remove the DO-NOT-CLOSE tag and close the P11 panel circuit breaker:
 - (a) 11D19, ENGINE START CONT LEFT
 - (b) Set the L ENG START switch to the GND position.
 - (c) Make sure the BIT (DISCRETE) 2 shows a 1.
 - (d) On the tester, set the SUBFRAME to 0 and the WORD to 48.
 - (e) Make sure the BIT (DISCRETE) 1 shows a 0.

S 865-767-002

- (3) Remove the DO-NOT-CLOSE tag and close the P11 panel circuit breaker:
 - (a) 11D20, ENGINE START CONT RIGHT
 - (b) Set the R ENG START switch to the GND position.
 - (c) Make sure the BIT (DISCRETE) 1 shows a 1.
 - (d) Set the L and R ENG START switches to the off position.

AL. Start Valve Position Test

S 735-768-002

- (1) Do the start valve position test that follows:
 - (a) Make sure the pneumatic power is not available (AMM 36-00-00).
 - (b) Open these circuit breakers on the overhead panel, P11, and attach the DO-NOT-CLOSE tags:
 - 1) 11D19, ENGINE START CONT LEFT
 - 2) 11D20, ENGINE START CONT RIGHT
 - (c) On the tester, set the SUBFRAME to 0 and the WORD to 43.
 - (d) Make sure the BIT (DISCRETE) 1 shows a 0.
 - (e) Ground pin 5 of the left engine start valve connector D1306.

S 865-769-002

- (2) Remove the DO-NOT-CLOSE tag and close the P11 panel circuit breaker:
 - (a) 11D19, ENGINE START CONT LEFT
 - (b) Make sure the BIT (DISCRETE) 1 shows a 1.
 - (c) On the tester, set the SUBFRAME to 0 and the WORD to 46.
 - (d) Make sure the BIT (DISCRETE) 1 shows a 0.
 - (e) Ground pin 5 of the right engine start valve connector D1306.

S 865-770-002

- (3) Remove the DO-NOT-CLOSE tag and close the P11 panel circuit breaker:
 - (a) 11D20, ENGINE START CONT RIGHT
 - (b) Make sure the BIT (DISCRETE) 1 shows a 1.
 - (c) Remove the ground from the connector D1306, Pin 5 on each engine and connect the connectors again.

AM. Fuel Valve Position Test

S 865-771-002

- (1) Do the fuel valve position test that follows:
 - (a) Make sure the pneumatic power is not available (AMM 36-00-00).
 - (b) Open the se circuit breakers on the main power distribution panel, P6, and attach the DO-NOT-CLOSE tags:
 - 1) 6E1, FUEL VALVES L SPAR
 - 2) 6E2, FUEL VALVES R SPAR
 - (c) Disconnect the fuel valve/position connectors D41050P from each engine FFR fuel shutoff valve
 - (d) Add the jumper pin to pin 1 and to pin 7 on each D41050P connector.
 - (e) On the tester, set the SUBFRAME to 0 and the WORD to 48.
 - (f) Open the circuit breaker on the main power distribution panel, P6:
 - 1) 6C1, FUEL COND CONT L
 - (g) Make sure the BIT (DISCRETE) 2 shows a 0.

S 865-772-002

- (2) Close the P6 panel circuit breaker:
 - (a) 6C1, FUEL COND CONT L
 - (b) Set the L FUEL CONT SW to the RUN position.
 - (c) Make sure the BIT (DISCRETE) 2 shows a 1.
 - (d) Remove the landing gear locking pins if it is no longer necessary (Ref 32-00-20).
 - (e) On the tester, set the SUBFRAME to 0 and the WORD to 43.
 - (f) Open the circuit breaker on the main power distribution Panel, P6:
 - 1) 6C2, FUEL COND CONT R
 - (g) Make sure the BIT (DISCRETE) 2 shows a 0.

S 865-773-002

- (3) Close the P6 panel circuit breaker:
 - (a) 6C2, FUEL COND CONT R
 - (b) Set the R FUEL CONT SW to the RUN position.
 - (c) Make sure the BIT (DISCRETE) 2 shows a 1.
 - (d) Set the R FUEL CONT SW to the OFF position.
 - (e) Remove the jumper from each D41050P connector on each engine and connect the connectors.

S 865-774-002

- (4) Remove the DO-NOT-CLOSE tags and close P6 panel circuit breakers:
 - (a) 6E1, FUEL VALVES L SPAR
 - (b) 6E2, FUEL VALVES R SPAR

AN. AIR/GROUND Test

S 735-733-002

- (1) Do the air/ground test that follows:
(a) On the tester, set the SUBFRAME to 0 and the WORD to 15.

WARNING: PREPARE THE SAFETY-SENSITIVE SYSTEMS FOR THE AIR MODE BEFORE YOU OPEN THE AIR/GROUND CIRCUIT BREAKERS. IN THE AIR MODE, MANY OF THE AIRPLANE SYSTEMS CAN OPERATE AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (b) Prepare the safety-sensitive systems for air mode simulation (AMM 32-09-02/201).
(c) Open the circuit breaker on the overhead circuit breaker panel, P11:
1) 11S19, AIR/GND SYS 2
(d) Make sure the BIT (DISCRETE) 1 shows a 0.

S 865-837-002

- (2) Close the P11 panel circuit breaker:
(a) 11S19, AIR/GND SYS 2
(b) Make sure the BIT (DISCRETE) 1 shows a 1.
(c) Put the safety-sensitive systems back to their initial conditions (AMM 32-09-02/201).

A0. Landing Gear Lever Position Test

S 735-734-002

- (1) Do the landing gear test that follows:
(a) Make sure the circuit breaker on the overhead circuit breaker panel, P11, is closed:
1) 11C30, LANDING GEAR POS SYS 1
(b) Make sure the hydraulic power is not available to the airplane (Ref 29-11-00).
(c) Make sure the landing gear lever is at the DOWN position.
(d) Make sure the landing gear lockpins are installed (Ref 32-00-20).

- (e) On the tester, set the SUBFRAME to 0 and the WORD to 14.
- (f) Make sure the BIT (DISCRETE) 1 shows a 0.
- (g) Set the landing gear lever to the OFF position.
- (h) Make sure the BIT (DISCRETE) 1 shows a 1.
- (i) Set the landing gear lever to the DOWN position.
- (j) Remove the landing gear locking pins if it is no longer necessary (AMM 32-00-20/201).

AP. Undercarriage Position Test

S 735-810-002

- (1) Do the undercarriage test that follows:
 - (a) Make sure the hydraulic power is not available to airplane (AMM 29-11-00/201).
 - (b) Make sure the landing gear lockpins are installed (AMM 32-00-20/201).

WARNING: DO THE DEACTIVATION PROCEDURE FOR FLIGHT MODE SIMULATION BEFORE YOU OPEN THE AIR /GROUND CIRCUIT BREAKER. WHEN YOU OPEN THE AIR/GROUND CIRCUIT BREAKER THE AIRPLANE IS IN FLIGHT MODE. IN FLIGHT MODE, MANY OF THE AIRPLANE SYSTEMS CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (c) Do the deactivation procedure for flight mode simulation (AMM 32-09-02/201).
- (d) Open the circuit breakers on the overhead circuit breaker panel, P11, and attach the DO-NOT-CLOSE tags:
 - 1) 11C30, LANDING GEAR POS SYS 1
 - 2) 11S23, POS SYS 2
- (e) Set the landing gear lever to the OFF position.
- (f) On the tester, set the SUBFRAME and WORD as shown in the table that follows:
- (g) Make sure the tester display shows the correct data as shown in the table that follows.

TESTER SETUP		TESTER DISPLAY	
SUBFRAME	WORD	BIT (DISCRETE)	STATE
0	7	1	1
1(3)	32	1	1

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S 865-780-002

- (2) Remove the DO-NOT-CLOSE tag and close the P11 panel circuit breaker:
- (a) 11S23, POS SYS 2
 - (b) On the tester, set the SUBFRAME to 0 and the WORD to 12.
 - (c) Make sure the BIT (DISCRETE) 2 shows a 0.

S 865-781-002

- (3) Remove the DO-NOT-CLOSE tag and close the P11 panel circuit breaker:
- (a) 11C30, LANDING GEAR POS SYS 1
 - (b) Set the landing gear level to the DOWN position.
 - (c) On the tester, set the SUBFRAME and WORD as shown in the table that follows.
 - (d) Make sure the tester display shows the correct data as shown in the table that follows:

TESTER SETUP		TESTER DISPLAY	
SUBFRAME	WORD	BIT (DISCRETE)	STATE
0	7	1	0
1(3)	32	1	0
0	12	2	1

- (e) Set the landing gear lever to the OFF position.

AQ. Landing Gear Bogie Tilt Test

S 735-764-002

- (1) Do the landing gear test that follows:
- (a) Make sure the circuit breaker on the overhead circuit breaker panel, P11 is closed:
 - 1) 11S19, AIR/GND SYS 2
 - (b) On the tester, set the SUBFRAME to 0 and the WORD to 46.

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- (c) Make sure the BIT (DISCRETE) 2 shows a 1.
- (d) On the tester, set the SUBFRAME to 0 and the WORD to 14.
- (e) Make sure the BIT (DISCRETE) 2 shows a 1.

WARNING: DO THE DEACTIVATION PROCEDURE FOR FLIGHT MODE SIMULATION BEFORE YOU OPEN THE AIR /GROUND CIRCUIT BREAKER. WHEN YOU OPEN THE AIR/GROUND CIRCUIT BREAKER THE AIRPLANE IS IN FLIGHT MODE. IN FLIGHT MODE, MANY OF THE AIRPLANE SYSTEMS CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (f) Do the deactivation procedure for flight mode simulation (AMM 32-09-02/201).
- (g) Open the circuit breaker on the overhead circuit breaker panel, P11, and attach the DO-NOT-CLOSE tag:
 - 1) 11S19, AIR/GND SYS 2
- (h) Make sure the BIT (DISCRETE) 2 shows a 0.
- (i) On the tester, Set the SUBFRAME to 0 and the WORD to 46.
- (j) Make sure the BIT (DISCRETE) 2 shows a 0.

S 865-811-002

- (2) Remove the DO-NOT-CLOSE tag and close the P11 panel circuit breaker:
 - (a) 11S19, AIR/GND SYS 2

AR. Accelerometer Test

S 735-736-002

- (1) Do the accelerometer test that follows:
 - (a) On the tester, set the SUBFRAME and WORD as shown in the table that follows.
 - (b) Make sure the tester display shows the correct data as shown in the table that follows:

SIGNAL	TESTER SETUP		TESTER DISPLAY
	SUBFRAME	WORD	
VERTICAL	0	50	3442 to 3706
LATERAL	0	47	4000 to 4243
LONGITUDINAL	0	55	4000 to 4243

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(c) Remove the DO-NOT-CLOSE tag and close the P11 panel circuit breaker:

1) 11S19, AIR/GND SYS 2

AS. Put the airplane back to the usual condition.

S 865-864-002

- (1) If you used the HHDLU, do the steps that follow:
- (a) Set the function switch on the flight recorder control panel to the NORM position.
 - (b) Push the red button on top of the HHDLU.
 - (c) Remove the HHDLU adapter cable from the flight data recorder.
 - (d) Install the test plug to the test connector at the flight data recorder.

S 865-865-002

- (2) If you used test equipment other than the HHDLU, do the steps that follow:
- (a) Turn the tester off.
 - (b) Open these P11 panel circuit breakers:
 - 1) 11J7, FLIGHT RECORDER AC
 - 2) 11J8, FLIGHT RECORDER DC
 - (c) Disconnect the tester from the right side of the P61 panel.
 - (d) Install the test plug to the test connector at the P61 panel.
 - (e) Close these P11 panel circuit breakers:
 - 1) 11J7, FLIGHT RECORDER AC
 - 2) 11J8, FLIGHT RECORDER DC

S 865-841-002

- (3) Remove electrical power if it is no longer necessary (AMM 24-22-00/201).

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FLIGHT DATA RECORDER SYSTEM – ADJUSTMENT/TEST

1. General

A. This procedure has these tasks.

- (1) An operational test of the flight data recorder system.
- (2) A system test of the flight data recorder system.

TASK 31-31-00-715-001-003

2. Flight Data Recorder System – Operational Test

A. General

- (1) The operational test makes sure the switches for the manual and automatic power sources operate correctly. A BITE test is also included in this operational test. No test equipment is necessary.

B. References

- (1) AMM 24-22-00/201, Electrical Power Control
- (2) AMM 31-31-01/401, Flight Data Recorder
- (3) AMM 31-31-03/401, Digital Flight Data Acquisition Unit
- (4) AMM 32-09-02/201, Air/Ground Relays
- (5) FIM 31-31-00/101, Fig. 104

C. Prepare for the Test

S 865-002-003

- (1) Supply electrical power (AMM 24-22-00/201).

S 865-003-003

- (2) Make sure these circuit breakers are closed:

(a) On the overhead equipment panel P11:

- 1) 11J2, EICAS CMPTR LEFT
- 2) 11J3, EICAS UPPER DISPLAY
- 3) 11J7, FLIGHT RECORDER AC
- 4) 11J8, FLIGHT RECORDER DC
- 5) 11J29, EICAS CMPTR RIGHT
- 6) 11J30, EICAS LOWER DISPLAY
- 7) 11J31, EICAS DISPLAY SW
- 8) 11S15, AIR/GND SYS 1
- 9) 11S19, AIR/GND SYS 2

S 865-004-003

- (3) Open these circuit breakers and attach DO-NOT-CLOSE tags:

(a) On the miscellaneous equipment panel P6:

- 1) 6E1, FUEL VALVES L SPAR
- 2) 6E2, FUEL VALVES R SPAR

(b) On the overhead equipment panel P11:

- 1) 11D19, ENGINE START CONT LEFT

2) 11D20, ENGINE START CONT RIGHT

D. Flight Recorder Control Panel (FRCP) Test

S 715-005-003

- (1) Make sure the function switch on the FRCP is in the NORM position.

S 715-006-003

- (2) Make sure the OFF light on the FRCP is on.

S 715-007-003

- (3) Push and hold the function switch on the FRCP in the TEST position.
(a) Make sure the OFF light goes off.

S 715-008-003

- (4) Set the FRCP function switch in the ON position.

NOTE: The OFF light will come on momentarily when you turn the function switch from the TEST position to the ON position.

- (a) Make sure the OFF light stays off.

S 865-009-003

- (5) Set the function switch to the NORM position.

E. Air/Ground Switch Test

S 865-010-003

WARNING: PREPARE THE SAFETY-SENSITIVE SYSTEMS FOR THE AIR MODE BEFORE YOU OPEN THE AIR/GROUND CIRCUIT BREAKERS. IN THE AIR MODE, MANY OF THE AIRPLANE SYSTEMS CAN OPERATE AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) Prepare the safety-sensitive systems for air mode simulation (AMM 32-09-02/201).

S 865-011-003

- (2) Open these circuit breakers:
(a) On the P11 panel:
1) 11C19, LANDING GEAR POS SYS 2 ALTN
2) 11S19, AIR/GND SYS 2

S 715-012-003

- (3) Make sure the OFF light on the FRCP goes off.

- S 865-013-003
- (4) Close these circuit breakers:
- (a) On the P11 panel:
- 1) 11C19, LANDING GEAR POS SYS 2 ALTN
 - 2) 11S19, AIR/GND SYS 2
- S 715-014-003
- (5) Make sure the OFF light on the FRCP comes on.
- S 865-015-003
- (6) Put the safety-sensitive systems back to their initial conditions (AMM 32-09-02/201).
- F. Engine Automatic Switch Test

- S 865-016-003
- (1) Open these circuit breakers and attach DO-NOT-CLOSE tags:
- (a) On the overhead equipment panel P11:
- 1) 11D7, ENGINES STBY IGNITION LEFT 1
 - 2) 11D8, ENGINES STBY IGNITION LEFT 2
 - 3) 11D9, ENGINES STBY IGNITION RIGHT 1
 - 4) 11D10, ENGINES STBY IGNITION RIGHT 2
 - 5) 11D20, BATTERY POWER ENGINE START CONT, R
 - 6) 11L1, LEFT ENGINE IGN 1
 - 7) 11L28, RIGHT ENGINE IGN 1

- S 865-017-003
- (2) Remove the DO-NOT-CLOSE tags and close these circuit breakers:
- (a) On the P11 panel:
- 1) 11D19, ENGINE START CONT LEFT

- S 715-018-003
- (3) Make sure the L and R FUEL CONT switches on the control stand is in the CUTOFF position.

- S 715-019-003
- (4) Make sure the function switch on the FRCP is in the NORM position.
- (a) Make sure the OFF light on the FRCP is on.

- S 715-020-003
- (5) On the pilots overhead panel, set the left engine start switch on the engine start/RAT control panel to the GND position.
- (a) Make sure the OFF light on the FRCP goes off.

- S 715-021-003
- (6) Set the left engine start switch to the AUTO position.
- (a) Make sure the OFF light on the FRCP comes on.
- S 865-022-003
- (7) Open this circuit breaker and attach DO-NOT-CLOSE tags:
- (a) On the P6 panel:
- 1) 6C1, FUEL COND CONT L
- (b) Make sure the OFF light on the FRCP goes off.
- S 865-023-003
- (8) Open this circuit breaker and attach a DO-NOT-CLOSE tag:
- (a) On the P11 panel:
- 1) 11D19, ENGINE START CONT LEFT
- S 865-024-003
- (9) Remove the DO-NOT-CLOSE tags and close these circuit breakers:
- (a) On the P11 panel:
- 1) 11D20, ENGINE START CONT RIGHT
- S 715-025-003
- (10) Make sure the L and R FUEL CONT switch is set to the CUTOFF position.
- S 715-026-003
- (11) At the pilots overhead panel, set the right engine start switch on the engine start/RAT control panel to the GND position.
- (a) Make sure the OFF light on the FRCP is off.
- S 715-027-003
- (12) Set the right engine start switch to the AUTO position.
- (a) Make sure the OFF light on the FRCP comes on.
- S 865-028-003
- (13) Open this circuit breaker and attach a DO-NOT-CLOSE tag:
- (a) On the P6 panel:
- 1) 6C2, FUEL COND CONT R
- (b) Make sure the OFF light on the FRCP goes off.
- S 865-029-003
- (14) Open this circuit breaker and attach a DO-NOT-CLOSE tag:
- (a) On the P11 panel:
- 1) 11D20, ENGINE START CONT RIGHT

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(b) Make sure the OFF light on the FRCP comes on.

G. BITE Test

S 745-342-003

- (1) Do the steps that follow:
 - (a) Set the FRCP function switch to the ON position.
 - 1) Make sure the OFF light on the FRCP go off.
 - (b) At the main equipment rack, set the BITE S/W PN switch on the DFDAU to the BITE position then release.
 - 1) On the DFDAU make sure the eight character display segments and the all BITE LED's come on then go off.
 - 2) Make sure the DFDAU display shows NO FAULT.
 - (c) Set the function switch on the FRCP to the NORM position.
 - 1) Make sure the OFF light comes on.

H. EICAS Message Test

S 865-032-003

- (1) Open these circuit breakers and attach DO-NOT-CLOSE tags:
 - (a) On the P11 panel:
 - 1) 11K9, LEFT ENGINE OIL PRESS
 - 2) 11K35, RIGHT ENGINE OIL PRESS

S 865-033-003

- (2) Make sure these circuit breakers are closed:
 - (a) On the P11 panel:
 - 1) 11D19, ENGINE START CONT LEFT
 - 2) 11D20, ENGINE START CONT RIGHT

S 865-034-003

- (3) Remove the DO-NOT-CLOSE tags and close these circuit breakers:
 - (a) On the P6 panel:
 - 1) 6C1, FUEL COND CONT L
 - 2) 6C2, FUEL COND CONT R

S 865-035-003

- (4) Set the function switch on the FRCP to the ON position.

S 865-036-003

- (5) Push the ECS MSG and AUTO EVENT switch on the EICAS MAINT panel on the right side panel, P61.

- S 865-037-003
- (6) Push the ERASE switch on the EICAS MAINT panel for 1 second.
- S 865-038-003
- (7) Set the L and R FUEL CONT switches on the P10 panel to the RUN position and wait a minimum of 4 minutes.
- S 715-039-003
- (8) Set the COMPUTER switch on the EICAS DISPLAY select panel to the L position.
- (a) Make sure these EICAS messages, FLT DATA REC and FLT DATA ACQ, do not show on the bottom display.
- S 715-040-003
- (9) Set the COMPUTER switch on the EICAS DISPLAY select panel to the R position.
- (a) Make sure these EICAS message, FLT DATA REC and FLT DATA ACQ, do not show on the bottom display.
- S 865-041-003
- (10) Open these circuit breakers and attach DO-NOT-CLOSE tags:
- (a) On the P11 panel:
- 1) 11J7, FLIGHT RECORDER AC
 - 2) 11J8, FLIGHT RECORDER DC
- S 025-042-003
- (11) Remove the flight data recorder (FDR) (AMM 31-31-01/401).
- NOTE:** Wait a minimum of 60 seconds before you do the next step.
- S 865-043-003
- (12) Remove the DO-NOT-CLOSE tags and close these circuit breakers:
- (a) On the P11 panel:
- 1) 11J7, FLIGHT RECORDER AC
 - 2) 11J8, FLIGHT RECORDER DC
- S 715-044-003
- (13) Set the COMPUTER switch on the EICAS DISPLAY select panel to the L position.
- (a) Make sure the EICAS message, FLT DATA REC, shows on the bottom display.
- (b) Make sure the EICAS message, FLT DATA AQC, does not show on the bottom display.

- S 715-045-003
- (14) Set the COMPUTER switch on the EICAS DISPLAY select panel to the R position.
- (a) Make sure the EICAS message, FLT DATA REC, shows on the bottom display.
 - (b) Make sure the EICAS message, FLT DATA AQC, does not show on the bottom display.
- S 865-046-003
- (15) Open this circuit breaker and attach the DO-NOT-CLOSE tag:
- (a) On the P11 panel:
 - 1) 11J7, FLIGHT RECORDER AC
- S 025-047-003
- (16) Remove the DFDAU (AMM 31-31-03/401).
- S 865-048-003
- (17) Remove the DO-NOT-CLOSE tag and close this circuit breaker:
- (a) On the P11 panel:
 - 1) 11J7, FLIGHT RECORDER AC
- S 715-049-003
- (18) Make sure the EICAS message, FLT DATA AQC, shows on the bottom display.
- S 715-050-003
- (19) Make sure the EICAS message, FLT DATA REC, does not show on the bottom display.
- S 715-051-003
- (20) Set the COMPUTER switch on the EICAS DISPLAY select panel to the L position.
- (a) Make sure the EICAS message, FLT DATA AQC, shows on the bottom display.
 - (b) Make sure the EICAS message, FLT DATA REC, does not show on the bottom display.
- S 015-052-003
- (21) Open these circuit breakers and attach the DO-NOT-CLOSE tags:
- (a) On the P11 panel:
 - 1) 11J7, FLIGHT RECORDER AC
 - 2) 11J8, FLIGHT RECORDED DC
- S 425-053-003
- (22) Install the FDR (AMM 31-31-01/401).

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S 425-054-003

- (23) Install the DFDAU (AMM 31-31-03/401).

S 865-055-003

- (24) Remove the DO-NOT-CLOSE tags and close these circuit breakers:
- (a) On the P11 panel:
 - 1) 11J7, FLIGHT RECORDER AC
 - 2) 11J8, FLIGHT RECORDED DC
 - (b) Return the L and R FUEL CONT SWITCHES to the CUTOFF position.
 - (c) Set the FRCP to the NORM position.

S 865-056-003

- (25) Remove the DO-NOT CLOSE tags and close these circuit breakers:
- (a) On the P11 panel:
 - 1) 11D7, ENGINES STBY IGNITION LEFT 1
 - 2) 11D8, ENGINES STBY IGNITION LEFT 2
 - 3) 11D9, ENGINES STBY IGNITION RIGHT 1
 - 4) 11D10, ENGINES STBY IGNITION RIGHT 2
 - 5) 11K9, LEFT ENGINE OIL PRESS
 - 6) 11K35, RIGHT ENGINE OIL PRESS
 - 7) 11L1, LEFT ENGINE IGN 1
 - 8) 11L28, RIGHT ENGINE IGN 1

S 865-057-003

- (26) Remove the DO-NOT-CLOSE tags and close these circuit breakers:
- (a) On the P6 panel:
 - 1) 6E1, FUEL VALVES L SPAR
 - 2) 6E2, FUEL VALVES R SPAR

TASK 31-31-00-705-058-003

3. Flight Data Recorder System - System Test

A. General

- (1) The system test does a test of the input parameters that are connected to the flight data recorder.
- (2) Test equipment is necessary to do this task.

- (3) These tasks use the word SUBFRAME 0, 5, or 6 to make a selection of a parameter. Some portable testers or on board test equipment do not have a switch position for SUBFRAME 0, 5, or 6. On these test sets, make a selection of SUBFRAMES as follow:
For SUBFRAME 0, use SUBFRAME 1, 2, 3, and 4.
For SUBFRAME 5, use SUBFRAME 1 and 3.
For SUBFRAME 6, use SUBFRAME 2 and 4.

B. Equipment

- (1) Portable Tester - Teledyne P/N 2229738-1
Teledyne Controls
12333 West Olympic Boulevard West
Los Angeles, CA 90064
- (2) A31007-59 Adapter Cable - Tester
- (3) 964-0446-001 Hand Held Download Unit (HHDLU)
27914 AlliedSignal Inc., DBA AlliedSignal Aerospace
2100 Northwest 62nd Street
Fort Lauderdale, FL 33309
- (4) 704-2567-001 Adapter Cable - Tester
- (5) Multi-Purpose AIDS Display Units - AACO Inc.
FAA-0032-001
AACO Inc.
5011 Barton Place
Seattle, WA 98118
- (6) EGA-0005-001, Adapter Cable - MADU
- (7) T-24B Set - Test, DME, RAMP (alternative)
Tel-Instrument Electronics Corp.
728 Garden St.
Carlstadt, NJ 07072-1621

- 01-0331-00 Set - Test, DME, RAMP (alternative)
400 Industrial Pky.
Industrial Airport, KS 66031

- ATC600A Set - Test, ATC Transponder / DME, RAMP (alternative)
IFR Systems Inc.
10200 West York St.
Wichita, KS 67215-8935

C. References

- (1) AMM 22-10-00/501, Autopilot/Flight Control System
- (2) AMM 22-32-00/501, Thrust Management System
- (3) AMM 22-21-00/501, YAW Damper System
- (4) AMM 22-41-00/501, Maintenance Control Display Panel
- (5) AMM 23-11-00/501, HF Communications System
- (6) AMM 23-12-00/501, VHF Communications System
- (7) AMM 24-22-00/201, Electrical Power - Control
- (8) AMM 27-32-00/501, Stall Warning System
- (9) AMM 27-41-00/501, Horizontal Stabilizer Trim Control System
- (10) AMM 27-51-00/501, Trailing Edge Flap System
- (11) AMM 27-81-00/501, Leading Edge Slat System

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- (12) AMM 29-11-00/201, Main Hydraulic Systems
- (13) AMM 31-25-00/501, Clocks
- (14) AMM 31-41-00/501, Engine Indicating and Crew Altering System
- (15) AMM 32-09-02/201, Air/Ground Relays
- (16) AMM 34-12-00/501, Air Data Computing System
- (17) AMM 34-21-00/201, Inertial Reference System
- (18) AMM 34-21-00/501, Inertial Reference System
- (19) AMM 34-22-00/501, Flight Instrument System
- (20) AMM 34-31-00/501, Instrument Landing System
- (21) AMM 34-33-00/501, Radio Altimeter System
- (22) AMM 34-46-00/501, Ground Proximity Warning System (GPWS)
- (23) AMM 34-51-00/501, VOR Navigation System
- (24) AMM 34-55-00/501, Distance Measurement Equipment System
- (25) AMM 34-61-00/501, Flight Management Computer System

D. Access

- (1) Location Zone
212 Flight Compartment, Right

E. Prepare for the Test

S 215-396-003

- (1) Do this task: DFDAU Software Configuration Check (AMM 31-31-03/201).

S 865-059-003

- (2) Open these circuit breakers and attach DO-NOT-CLOSE tags:
 - (a) On the overhead equipment panel P11:
 - 1) 11J7, FLIGHT RECORDER AC
 - 2) 11J8, FLIGHT RECORDER DC

S 865-060-003

- (3) If you use test equipment other than the hand-held download unit (HHDLU), install the tester to the test connector at the right side panel, P61.

S 865-061-003

- (4) If you use the hand-held download unit (HHDLU), attach the HHDLU to the test connector at the front side of the flight data recorder.

NOTE: To get access to the FDR, open the lower ceiling panel No. 1 above the aft galley (AMM 25-22-02/401). The HHDLU can only be connected to the AlliedSignal flight data recorder (FDR).

S 865-062-003

- (5) Remove the DO-NOT-CLOSE tags and close these circuit breakers:
 - (a) On the P11 panel:
 - 1) 11J7, FLIGHT RECORDER AC
 - 2) 11J8, FLIGHT RECORDER DC

- S 865-063-003
- (6) Supply electrical power (AMM 24-22-00/201).
- S 865-064-003
- (7) With the Data Signal Display Unit (DSDU), set the control switches on the tester as follows:
- (a) Set the power switch to the ON position.
 - (b) Set the INPUT switch to the ARINC INPUT DATA position.
 - (c) Set the SYNC switch to the SYNC B position.
 - (d) Set the DATA PARAMETER/DOCUMENTARY switch to the DATA PARAMETER position.
 - (e) Set the OCTAL DISPLAY switch to the 12 BIT position.
 - (f) Set the SUBFRAME and WORD as specified.
- S 865-065-003
- (8) With the Teledyne tester (P/N 2222786), set the switches on the tester as follows:
- (a) Set the POWER switch to the ON position.
 - (b) Set the READOUT switch to the ACTF DATA position.
 - (c) Set the UPDATE switch to the AUTO position.
 - (d) Set the DFDAU/DFDR DATA SELECTOR switch to the DFDAU position.
 - (e) Set the DATA switch to the 12 BIT position.
 - (f) Set the SUBFRAME and WORD as specified.
- S 865-066-003
- (9) With the Teledyne tester (P/N 2229738), set the switches on the tester as follows:
- (a) Push the CLR switch two or three times to clear all inputs.
- NOTE: The tester will default to 64 words per second frame rate. This setting will need to be changed in order for the tester to interface properly with the DFDR system.
- (b) Push the WPS switch.

- (c) Enter 256 and push the ENTER switch.
- (d) Set the SUBFRAME and WORD as specified.

S 865-067-003

- (10) With the hand-held download unit (HHDLU), do the steps that follow:

NOTE: These steps are for airplanes equipped with AlliedSignal FDR only.

- (a) On the flight recorder control panel (FRCP), set the function switch to the ON position.
- (b) Push the red button on top of the HHDLU.
- (c) Set the DSDU switch.
- (d) Set the word number to WRD1, WRD2, or WRD3.
- (e) Set the BASE switch.
- (f) In the BASE SELECT menu, set OCT for octal values.
- (g) Set the SUBFRAME and WORD as specified.

S 865-068-003

- (11) With the MADU, set the switches as follows:

- (a) Set the power switch to the ON position.
- (b) Push the FUN switch, then enter the number 5 to set the LRU A on the tester.
- (c) Push the DATA switch, then the number 03 to set the DFDAU-H on the tester.
- (d) Push the FUN switch, then the number 03 for SUBFRAME.
- (e) Set a subframe (1 thru 4) on the keyboard switch.
- (f) Push the DATA switch, then the number 04 for WORD.
- (g) Set a word (1 thru 64) on the keyboard.
- (h) Push the FUN switch, then the number 02 to set the FORMAT field on the tester.
- (i) Push the number 02 to set the OCTAL 10 on the tester.
- (j) Set the SUBFRAME and WORD as specified.

F. Greenwich Mean Time (GMT) Test

S 715-069-003

- (1) Make sure the clock system operates correctly (AMM 31-25-00/501).

S 865-070-003

- (2) On the tester, set the SUBFRAME to 1 and the WORD to 255.

S 865-071-003

- (3) Set the captain's clock to 1 hour 5 minutes.

S 735-072-003

- (4) Put the captain's clock in the RUN mode.
(a) Make sure the tester display shows 0212 or 0213.

S 865-073-003

- (5) Set the captain's clock to the correct time.

G. Traffic Collision Avoidance System (TCAS) Test

S 705-074-003

- (1) Make sure these circuit breakers are closed:
 - (a) On the P11 panel:
 - 1) 11S15, LANDING GEAR-AIR/GND SYS 1
 - 2) 11S19, LANDING GEAR-AIR/GND SYS 2

S 705-075-003

- (2) Do the the TCAS test that follows:
 - (a) Set the SUBFRAME to 0 and the WORD to 223.
 - (b) On the TCAS/ATC control panel, push and release the TEST switch.
 - 1) Make sure the BIT (DISCRETE) 12 shows a 1.
 - 2) Make sure the TCAS is not in the self test mode and no resolution advisories are shown.
 - 3) Make sure the BIT (DISCRETE) 12 shows a 0.

H. Captain's Air Data Computer (ADC) Select Switch Test

S 715-076-003

- (1) Make sure the air data computing system operates correctly (AMM 34-12-00/501).

S 865-077-003

- (2) Set the ADC switch on the left instrument source panel to the NORM position.

S 735-078-003

- (3) On the tester, set the SUBFRAME to 0 and the WORD to 97.
 - (a) Make sure the BIT (DISCRETE) 1 shows a 1.

S 735-079-003

- (4) Set the ADC switch on the left instrument source select panel to the ALTN position.
 - (a) Make sure the BIT (DISCRETE) 1 shows a 0.

I. ADC Data Bus Test

S 715-080-003

- (1) Make sure the air data computing system operates correctly (AMM 34-12-00/501).

S 865-081-003

- (2) Set the ADC switch on the left instrument source select panel to the NORM position.

S 865-082-003

- (3) Push and hold the test switch for the left air data computer on the P61 test panel in the test position for more than 7 seconds.

- S 735-083-003
- (4) On the tester, set the SUBFRAME to 0 and the WORD 96.
(a) Make sure the tester display shows between 2040 and 2160.
- S 865-084-003
- (5) Set the ADC switch on the left instrument source select panel to the ALTN position.
- S 865-085-003
- (6) Push and hold the test switch for the right air data computer on the P61 test panel in the test position for more than 7 seconds.
- S 735-086-003
- (7) Set the SUBFRAME to 0 and the WORD to 96.
(a) Make sure the tester display shows between 2040 and 2160.
- S 865-087-003
- (8) Set the ADC switch on the left instrument source select panel to the NORM position.

J. Radio Altimeter (RA) Data Bus Test

- S 715-088-003
- (1) Make sure the RA system operates correctly (AMM 34-33-00/501).
- S 865-089-003
- (2) On the tester, set the SUBFRAME to 2 and the WORD to 31.
- S 735-090-003
- (3) On the left RA receiver/transmitter, push the test switch.
(a) Make sure the tester display shows between 0036 and 0062.
- S 865-091-003
- (4) On the tester, set the SUBFRAME to 3.
- S 735-092-003
- (5) On the right RA receiver/transmitter, push the test switch.
(a) Make sure the tester displays between 0036 and 0062.
- S 865-093-003
- (6) On the tester, set the SUBFRAME to 4.
- S 735-094-003
- (7) On the center RA receiver/transmitter, push the test switch.
(a) Make sure the tester displays between 0036 and 0062.

K. Captain's Flight Management Computer (FMC) Switch Position Test

- S 715-095-003
- (1) Make sure the flight management computer system operates correctly (AMM 34-61-00/501).

- S 735-096-003
- (2) On the tester, set the SUBFRAME to 0 and the WORD to 193.
- S 865-097-003
- (3) Set the FMC switch on the left instrument source select panel to the NORM position.
- (a) On the tester display, make sure the BIT (DISCRETE) 1 and 2 shows a 1.
- S 735-098-003
- (4) Set the FMC switch on the left instrument source select panel to the ALTN position.
- (a) On the tester display, make sure the BIT (DISCRETE) 2 shows a 0.
- (b) On the tester display, make sure the BIT (DISCRETE) 1 shows 1.
- S 865-099-003
- (5) Set the FMC switch on the left instrument source select panel to the NORM position.
- L. Captain's Inertial Reference System (IRS) Switch Test
- S 715-100-003
- (1) Make sure the inertial reference system operates correctly (AMM 34-21-00/501).
- S 865-101-003
- (2) Set the IRS switch on the left instrument source select panel to the NORM position.
- S 735-102-003
- (3) On the tester, set the SUBFRAME to 0 and the WORD to 97.
- (a) Make sure the BIT (DISCRETE) 2 shows a 1.
- S 735-103-003
- (4) Set the IRS switch on the left instrument source select panel to ALTN position.
- (a) On the tester display, make sure the BIT (DISCRETE) 2 shows a 0.
- S 865-104-003
- (5) Set the IRS switch on the left instrument source select panel back to the NORM position.
- M. IRS Data Bus Test
- S 715-105-003
- (1) Make sure the IRS operates correctly (AMM 34-21-00/501).

- S 865-106-003
- (2) Open these circuit breakers:
- (a) On the P11 panel:
- 1) 11E9, FMCS CMPTR L
 - 2) 11E30, FMCS CMPTR R
- S 865-107-003
- (3) Set the IRS switch on the left instrument source select panel to the NORM position.
- S 735-108-003
- (4) Make sure the left IRU is aligned (AMM 34-21-00/201).
- S 865-109-003
- (5) On the tester, set the SUBFRAME to 0 and the WORD to 45.
- S 735-110-003
- (6) Push and hold the TEST switch on the left IRU for at least 10 seconds.
- (a) Make sure the tester display shows between 2760 and 3220.
- S 865-111-003
- (7) Close these circuit breakers:
- (a) On the P11 panel:
- 1) 11E9, FMCS CMPTR L
 - 2) 11E30, FMCS CMPTR R

N. Captain's EFIS Select Switch Test

- S 715-112-003
- (1) Make sure the EFIS system operates correctly (AMM 34-22-00/501).
- S 865-113-003
- (2) Set the EFI switch on the left instrument source select panel to the NORM position.
- S 735-114-003
- (3) On the tester, set the SUBFRAME to 0 and the WORD to 191.
- (a) Make sure the BIT (DISCRETE) 2 shows a 1.
- S 865-115-003
- (4) Set the EFI switch on the left instrument source select panel to the ALTN position.
- (a) On the tester display, make sure the BIT (DISCRETE) 2 shows a 0.

- S 865-116-003
- (5) Set the EFI switch on the left instrument source select panel to the NORM position.
0. EFIS Data Bus Test
- S 715-117-003
- (1) Make sure the EFIS system operates correctly (AMM 34-22-00/501).
- S 865-118-003
- (2) Make sure the EFIS switch on the left instrument source select panel is at the NORM position.
- S 715-119-003
- (3) Make sure the left IRS operates correctly (AMM 34-21-00/501).
- S 865-120-003
- (4) Set the IRS switch on the left instrument source select panel to the NORM position.
- S 865-121-003
- (5) Make sure the left IRU is aligned (AMM 34-21-00/501).
- S 865-122-003
- (6) On the tester, set the SUBFRAME to 0 and the WORD to 238.
- S 735-123-003
- (7) Push and hold the TEST switch on the left IRU for at least 10 seconds.
- (a) Make sure the tester display shows between 0750 and 1030.
- S 865-124-003
- (8) Set the EFI switch on the left instrument source select panel to the ALTN position.
- S 865-125-003
- (9) On the tester, set the SUBFRAME to 0 and the WORD to 228.
- S 735-126-003
- (10) Push and hold the TEST switch on the left IRU for at least 10 seconds.
- (a) Make sure the tester display shows between 0104 and 0234.
- S 865-127-003
- (11) Set the EFI switch on the left instrument source select panel to the NORM position.

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P. FCC Data Bus Test

- S 715-128-003
- (1) Make sure the autopilot/flight control system operates correctly (AMM 22-10-00/501).
- S 715-129-003
- (2) Make sure the Maintenance Control Display Panel (MCDP) operates correctly (AMM 22-41-00/501).
- S 865-130-003
- (3) Make sure hydraulic pressure is removed from the hydraulic systems (AMM 29-11-00/201).
- S 735-131-003
- (4) Push FLT FAULTS on the Maintenance Control Display Panel (MCDP).
- S 735-132-003
- (5) Push GND TEST on the MCDP.
- S 865-133-003
- (6) Push the L CMD switch on the Mode Control Panel (MCP) until the L CMD switch light comes on.
- S 735-134-003
- (7) On the tester, set the SUBFRAME to 1 and the WORD to 190.
- (a) Make sure the BIT (DISCRETE) 1 shows a 1.
- S 735-135-003
- (8) Push the L CMD switch on the MCP.
- (a) On the tester display, make sure the BIT (DISCRETE) 1 shows a 0.
- S 865-136-003
- (9) Push the R CMD switch on the MCP until the R CMD switch light comes on.
- S 735-137-003
- (10) On the tester, set the WORD to 33 and the SUBFRAME to 2.
- (a) Make sure the BIT (DISCRETE) 2 shows a 1.
- S 735-138-003
- (11) Push the R CMD switch on the MCP.
- (a) On the tester display, make sure the BIT (DISCRETE) 2 shows a 0.

S 865-139-003

- (12) Push the C CMD switch on the MCP until the C CMD switch light comes on.

S 735-140-003

- (13) On the tester, set the WORD to 33 and the SUBFRAME to 4.
(a) Make sure the BIT (DISCRETE) 1 shows a 1.

S 735-141-003

- (14) Push the C CMD switch.
(a) On the tester display, make sure the BIT (DISCRETE) 1 shows a 0.

S 865-142-003

- (15) Push FLT FAULTS on the MCDP.

Q. Mode Control Panel (MCP) Switch Test

S 865-143-003

- (1) Set the SUBFRAME to 0 and the WORD to 250 on the tester.

S 735-144-003

- (2) Set the F/D switch on the left side of the MCP to the ON position.
(a) On the tester display, make sure the BIT (DISCRETE) 2 shows a 1.

S 735-145-003

- (3) Set the F/D switch on the left side of the MCP to the OFF position.
(a) On the tester display, make sure the BIT (DISCRETE) 2 shows a 0.

R. Thrust Management Computer (TMC) Data Bus Test

S 715-146-003

- (1) Make sure the thrust management system operates correctly (AMM 22-32-00/501).

S 715-147-003

- (2) Make sure the EICAS system is operational (AMM 31-41-00/501).

S 865-148-003

- (3) On the tester, set the SUBFRAME to 0 and the WORD to 122.

S 865-149-003

- (4) Make sure the MCDP is off.

- S 865-150-003
- (5) Set the autothrottle arm switch on the autopilot mode control panel to the ARM position.
- S 865-151-003
- (6) Make sure the TMC is in the T/O mode on the EICAS display (AMM 22-32-00/501).
- S 735-152-003
- (7) Push the thrust reference set control on the EICAS display select panel.
- (a) On the tester display, make sure that BIT (DISCRETE) 2 shows a 1.
- S 735-153-003
- (8) On the TMSP, remove the T/O mode.
- (a) On the tester display, make sure the BIT (DISCRETE) 2 shows a 0.
- S 865-154-003
- (9) Set the TMC and the EICAS back to normal.
- S. Electronic Engine Control (EEC) Data Bus Test
- S 865-155-003
- (1) Make sure this circuit breaker is closed:
- (a) On the overhead equipment panel, P11:
- 1) 11L5, LEFT ENGINE EEC SUPV
- S 865-156-003
- (2) Set the left throttle lever to the full forward position.
- S 865-157-003
- (3) Set the right throttle lever to the full aft position.
- S 865-158-003
- (4) At the E1-1 rack next the left EEC unit, set the LEFT EEC GND TEST switch (S10379) to the up position.
- S 865-159-003
- (5) At the E3-1 rack next the right EEC unit, set the RIGHT EEC GND TEST switch (S10380) to the up position.
- S 735-160-003
- (6) On the tester, set the SUBFRAME to 0 and the WORD to 23.
- (a) Make sure the tester display shows between 5434 and 6000.

- S 735-161-003
- (7) On the tester, set the SUBFRAME to 0 and the WORD to 151.
(a) Make sure the tester display shows between 2000 and 2344.
- S 865-162-003
- (8) At the E1-1 rack next the left EEC unit, set the LEFT EEC GND TEST switch (S10379) to the down position.
- S 865-163-003
- (9) At the E3-1 rack next the right EEC unit, set the RIGHT EEC GND TEST switch (S10380) to the down position.
- S 865-164-003
- (10) Open this circuit breaker:
(a) On the P11 panel:
1) 11L5, LEFT ENGINE EEC SUPV
- S 865-165-003
- (11) Make sure this circuit breaker is closed:
(a) On the P11 panel:
1) 11L32, RIGHT ENGINE EEC SUPV
- S 865-166-003
- (12) Set the left throttle lever to the full aft position.
- S 865-167-003
- (13) Set the right throttle lever to the full forward position.
- S 865-168-003
- (14) At the E1-1 rack next the left EEC unit, set the LEFT EEC GND TEST switch (S10379) to the up position.
- S 865-169-003
- (15) At the E3-1 rack next the right EEC unit, set the RIGHT EEC GND TEST switch (S10380) to the up position.
- S 735-170-003
- (16) On the tester, set the SUBFRAME to 0 and the WORD to 151.
(a) Make sure the tester display shows between 5434 and 6000.
- S 735-171-003
- (17) On the tester, set the SUBFRAME to 0 and the WORD to 23.
(a) Make sure the tester display shows between 2000 and 2344.

S 865-172-003

- (18) At the E1-1 rack next the left EEC unit, set the LEFT EEC GND TEST switch (S10379) to the down position.

S 865-173-003

- (19) At the E3-1 rack next the right EEC unit, set the RIGHT EEC GND TEST switch (S10380) to the down position.

S 865-174-003

- (20) Close this circuit breaker:
(a) On the P11 panel:
1) 11L5, LEFT ENGINE EEC SUPV

T. Distance Measuring Equipment (DME) Data Bus Test

S 715-175-003

- (1) Make sure the DME system operates correctly (AMM 34-55-00/501).

S 715-176-003

- (2) Make sure the VOR navigation system operates correctly (AMM 34-51-00/501).

S 865-177-003

- (3) On the left VOR control panel, set the frequency to 108.00 MHZ.

S 865-178-003

- (4) On the DME ramp test set, set the tester NAV control dial to 108.00 MHZ with a distance of 50 NM.

S 735-179-003

- (5) On the tester, set the SUBFRAME to 3 and the WORD to 222.
(a) Make sure the tester display shows between 1320 and 1560.

S 865-180-003

- (6) On the right VOR control panel, set the frequency to 108.00 MHZ.

S 865-181-003

- (7) On the DME ramp test set, set the distance to 100 NM.

S 735-182-003

- (8) On the tester, set the SUBFRAME to 1.
(a) Make sure the tester display shows between 2760 and 3220.

U. Instrument Landing System (ILS) Data Bus Test

S 715-183-003

- (1) Make sure the ILS operates correctly (AMM 34-31-00/501).

- S 865-184-003
- (2) Open these circuit breakers:
- (a) On the P11 panel:
 - 1) 11A3, ILS C (MMR C)
 - 2) 11E31, ILS R
- S 865-185-003
- (3) On the tester, set the SUBFRAME to 2 and the WORD to 159.
- S 865-186-003
- (4) Push the self test button on the ILS control panel, P8.
- S 735-187-003
- (5) Wait for a one dot right indication on the EHSI.
- (a) Make sure the tester display shows between 0574 to 0634.
- S 865-188-003
- (6) Open this circuit breaker:
- (a) On the P11 panel:
 - 1) 11E10, ILS L (MMR L)
- S 865-189-003
- (7) Close this circuit breaker:
- (a) On the P11 panel:
 - 1) 11E31, ILS R (MMR R)
- S 865-190-003
- (8) On the tester, set the SUBFRAME to 3.
- S 865-191-003
- (9) Push the self test button on the ILS control panel, P8.
- S 735-192-003
- (10) Wait for a one dot right indication on the EHSI.
- (a) Make sure the tester display shows between 0574 to 0634.
- S 865-193-003
- (11) Open this circuit breaker:
- (a) On the P11 panel:
 - 1) 11E31, ILS R (MMR R)
- S 865-194-003
- (12) Close this circuit breaker:
- (a) On the P11 panel:
 - 1) 11A3, ILS C (MMR C)

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S 865-195-003
(13) On the tester, set the SUBFRAME to 4.

S 865-196-003
(14) Push the self test button on the ILS control panel, P8.

S 735-197-003
(15) Wait for a one dot right indication on the EHSI.
(a) Make sure the tester display shows between 0574 and 0634.

S 865-198-003
(16) Close these circuit breakers:
(a) On the P11 panel:
1) 11E10, ILS L (MMR L)
2) 11E31, ILS R (MMR R)

V. Yaw Damper Engage Test

S 715-199-003
(1) Make sure the yaw damper system operates correctly (AMM 22-21-00/501).

S 865-200-003

WARNING: KEEP PERSONS AND EQUIPMENT CLEAR OF THE FLIGHT CONTROL SURFACES, THE THRUST REVERSERS, AND THE LANDING GEAR. THESE COMPONENTS CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(2) Supply hydraulic power (AMM 29-11-00/201).

S 715-201-003
(3) Make sure the IRS operates correctly (AMM 34-21-00/501).

S 865-202-003
(4) Make sure the IRUs are aligned (AMM 34-21-00/201).

S 715-203-003
(5) Make sure the left and right yaw dampers are not engaged.

S 735-204-003
(6) On the tester, set the SUBFRAME to 0 and the WORD to 120.
(a) Make sure the BIT (DISCRETE) 2 shows a 0.
(b) Make sure the BIT (DISCRETE) 1 shows a 0.

- S 865-205-003
- (7) Push the left yaw damper switch on the P5 panel to the ON position.
(a) Make sure the BIT (DISCRETE) 2 shows a 1.
- S 865-206-003
- (8) Push the left yaw damper switch on the P5 panel to disengage the left yaw damper.
- S 865-207-003
- (9) Push the right yaw damper switch on the P5 panel to the ON position.
(a) Make sure the BIT (DISCRETE) 1 shows a 1.
- S 865-208-003
- (10) Push the right yaw damper switch on the P5 panel to disengage the right yaw damper.
- W. VHF Omnidirectional Range (VOR) Data Bus Test
- S 715-209-003
- (1) Make sure the VOR navigation system operates correctly (AMM 34-51-00/501).
- S 865-210-003
- (2) Set a frequency of 110.00 MHZ on the left VOR control panel.
- S 735-211-003
- (3) On the tester, set the SUBFRAME to 4 and the WORD to 222.
(a) Make sure the tester display shows 4000 or 4001.
- S 865-212-003
- (4) Set a frequency of 109.60 MHZ on the right VOR control panel.
- S 735-213-003
- (5) On the tester, set the SUBFRAME 2.
(a) Make sure the tester display shows 2260 or 2261.
- X. Master Warning Test
- S 865-214-003
- (1) Make sure these circuit breakers are closed:
(a) On the P11 panel:
1) 11A31, IND LTS TEST
2) 11A34, IND LTS 3
3) 11F4, GND PROX CMPTR
- S 865-215-003
- (2) On the tester, set the SUBFRAME to 0 and the WORD to 134.

S 735-216-003

- (3) Momentarily set the test switch on the miscellaneous test panel to the GND PROX position.
 - (a) On the tester display, make sure the BIT (DISCRETE) 2 shows a 0.

S 735-217-003

- (4) Push the MASTER WARNING light switch.
 - (a) Make sure the BIT (DISCRETE) 2 shows a 1.

Y. Brake Pressure Test

S 715-218-003

- (1) Make sure you put chocks on the wheels.

S 865-219-003

WARNING: KEEP PERSONS AND EQUIPMENT CLEAR OF THE FLIGHT CONTROL SURFACES, THE THRUST REVERSERS, AND THE LANDING GEAR. THESE COMPONENTS CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (2) Pressurize the right hydraulic system and reservoir (AMM 29-11-00/201).

S 715-220-003

- (3) Make sure the engine indicating and crew alerting system (EICAS) operates correctly (AMM 31-41-00/501).

S 865-221-003

- (4) Push the ELEC/HYD switch on the EICAS MAINT panel on the right side panel, P61.

S 715-222-003

- (5) Make sure the parking brake is released.

S 865-223-003

- (6) On the tester, set the SUBFRAME to 0 and the WORD to 187.

S 735-224-003

- (7) Push and hold the captain's left brake pedal to the full stop position.
(a) Make sure the tester display shows the value in the Table 501.

NOTE: The value must agree with the nearest hydraulic system pressure. Test data X can have all values.

Table 501	
HYDRAULIC SYSTEM (Pressure as displayed on EICAS status page)	TESTER DISPLAY
2300	52XX-60XX
2400	54XX-62XX
2500	55XX-63XX
2600	57XX-65XX
2700	61XX-67XX
2800	63XX-71XX
2900	65XX-74XX
3000	67XX-75XX

S 865-225-003

- (8) Release the captain's left brake pedal.

S 865-226-003

- (9) On the tester, set the SUBFRAME to 0 and the WORD to 188.

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S 735-227-003

- (10) Push and hold the captain's right brake pedal to the full stop position.
(a) Make sure the tester display shows the value in the Table 502.

NOTE: The value must agree with the nearest hydraulic system pressure. Test data X can have all values.

Table 502	
HYDRAULIC SYSTEM (Pressure as displayed on EICAS status page)	TESTER DISPLAY
2300	52XX-60XX
2400	54XX-62XX
2500	55XX-63XX
2600	57XX-65XX
2700	61XX-67XX
2800	63XX-71XX
2900	65XX-74XX
3000	67XX-75XX

S 865-228-003

- (11) Release the captain's right brake pedal.

S 865-229-003

- (12) Remove the pressure from the right hydraulic system and reservoir (AMM 29-11-00/201).

S 865-230-003

- (13) Pump the brake pedals at least six times to fully deplete the accumulator.

S 865-231-003

- (14) Pressurize the left hydraulic system and reservoir (AMM 29-11-00/201).

S 865-428-003

- (15) On the tester, set the SUBFRAME to 0 and the WORD to 191.

S 735-232-003

- (16) Push and hold the captain's left brake pedal to the full stop position.
(a) Make sure the tester display shows the value in the Table 501.

NOTE: The value must agree with the nearest hydraulic system pressure. Test data X can have all values.

S 865-233-003

- (17) Release the captain's left brake pedal.

S 865-429-003

- (18) On the tester, set the SUBFRAME to 0 and the WORD to 192.

S 735-234-003

- (19) Push and hold the captain's right brake pedal to the full stop position.
(a) Make sure the tester display shows the value in Table 502.

NOTE: The value must agree with the nearest hydraulic system pressure. Test data X can have all values.

S 865-235-003

- (20) Release the captain's right brake pedal.

S 865-236-003

- (21) Remove the pressure from the left hydraulic system and reservoir (AMM 29-11-00/201).

Z. Brake Pedal Test

S 735-394-003

- (1) For the captain's brake pedal, do the steps that follow:
(a) On the tester, set the SUBFRAME to 0 and the WORD to 192.

- (b) Push the captain's brake pedal.
 - 1) Make sure the value of bit 2 is 0.
- (c) Release the captain's brake pedal.
 - 1) Make sure the value of bit 2 is 1.

S 735-395-003

- (2) For the first officer's brake pedal, do the steps that follow:
 - (a) On the tester, set the SUBFRAME to 0 and the WORD to 192.
 - (b) Push the first officer's brake pedal.
 - 1) Make sure the value of bit 1 is 0.
 - (c) Release the first officer's brake pedal.
 - 1) Make sure the value of bit 1 is 1.

AA. Seat Belt Signal Test

S 865-237-003

- (1) Make sure this circuit breaker is closed:
 - (a) On the P11 panel:
 - 1) 11P9, PASS SIGN CONT

S 865-238-003

- (2) On the overhead panel, P5, set the SEATBELTS switch on the passenger signs control panel to the ON position.

S 735-239-003

- (3) On the tester, set the SUBFRAME to 0 and the WORD to 105.
 - (a) On the tester, make sure the BIT (DISCRETE) 1 shows a 0.

S 735-240-003

- (4) On the passenger signs control panel, set the SEATBELTS switch to the OFF position.
 - (a) On the tester, make sure the BIT (DISCRETE) 1 shows a 1.

AB. EICAS Computer Switch Test

S 715-241-003

- (1) Make sure the EICAS operates correctly (AMM 31-41-00/501).

S 865-242-003

- (2) Set the COMPUTER select switch on the EICAS DISPLAY select panel to the R position.

S 735-243-003

- (3) On the tester, set the SUBFRAME to 0 and the WORD to 161
 - (a) Make sure the BIT (DISCRETE) 1 shows a 0.

S 735-244-003

- (4) Set the COMPUTER switch on the EICAS DISPLAY select panel in the AUTO position.
 - (a) On the tester, make sure the BIT (DISCRETE) 1 shows a 1.

AC. Captain's Control Column Position (Syncro) Test

- S 865-245-003
- (1) Make sure the left, center, and right hydraulic systems are depressurized (AMM 29-11-00/201).
- S 865-246-003
- (2) On the tester, set the SUBFRAME to 0 and the WORD to 101.
- S 865-423-003
- (3) Make sure the control column is in the neutral position.
 - (a) Make sure the test display shows between 7764 and 0014.
- S 735-247-003
- (4) Set the control column to the full aft position against the stop.
 - (a) Make sure the tester shows between 0416 and 0560.
- S 735-248-003
- (5) Set the control column to the full forward position against the stop.
 - (a) Make sure the tester shows between 7351 and 7520.
- S 865-364-003
- (6) Set the control column to the neutral position.

AD. Captain's Control Wheel Position (Syncro) Test

- S 865-250-003
- (1) Make sure the left, center, and right hydraulic systems are depressurized (AMM 29-11-00/201).
- S 865-251-003
- (2) On the tester, set the SUBFRAME to 0 and the WORD to 111.
- S 865-424-003
- (3) Make sure the control wheel is in the neutral position.
 - (a) Make sure the test display shows between 7764 and 0014.
- S 735-252-003
- (4) Turn the control wheel to the full counter clockwise against the stop.
 - (a) Make sure the tester display shows between 1020 and 1100.
- S 735-253-003
- (5) Turn the control wheel to the full clockwise against the stop.
 - (a) Make sure the tester display shows between 6700 and 6760.
- S 865-254-003
- (6) Set the control wheel back to the neutral position.

AE. Rudder Pedal Position (Syncro) Test

- S 865-255-003
- (1) Make sure the left, center, and right hydraulic systems are depressurized (AMM 29-11-00/201).
- S 865-256-003
- (2) On the tester, set the SUBFRAME to 0 and the WORD to 121.
- S 865-427-003
- (3) Make sure the rudder pedal is in the neutral position.
 - (a) Make sure the test display shows between 7764 and 0014.
- S 735-257-003
- (4) Set the left rudder pedal to the full forward against the stop.
 - (a) Make sure the tester display shows between 0367 and 0655.
- S 735-258-003
- (5) Set the right rudder pedal to the full forward against the stop.
 - (a) Make sure the tester shows between 7140 and 7401.
- S 865-259-003
- (6) Set the rudder pedals back to the neutral position.

AF. Captain's Manual Stab Trim Test

- S 865-260-003
- (1) Make sure the horizontal stabilizer trim control system operates correctly (AMM 27-41-00/501).
- S 735-261-003
- (2) On the tester, set the SUBFRAME to 0 and the WORD to 180.
 - (a) Make sure the BIT (DISCRETE) 2 shows a 0.
- S 735-262-003
- (3) On the captain's control wheel, set the trim switch to the down position.
 - (a) On the tester display, make sure the BIT(DISCRETE) 2 shows a 1.
- S 865-263-003
- (4) Release the trim switch on the control wheel.
 - (a) Make sure the BIT (DISCRETE) 2 shows a 0.
- S 735-264-003
- (5) On the captain's control wheel, set the trim switch to the up position.
 - (a) On the tester display, make sure the BIT (DISCRETE) 1 shows a 1.
- S 865-265-003
- (6) Release the trim switch on the control wheel.
 - (a) Make sure the BIT (DISCRETE) 1 shows a 0.

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AG. Automatic/Manual Electrical Pitch Trim Test

- S 865-266-003
- (1) Make sure the horizontal stabilizer trim control system operates correctly (AMM 27-41-00/501).
- S 865-267-003
- (2) On the tester, set the SUBFRAME to 0 and the WORD 46.
- S 865-268-003
- (3) On the control wheel, set the control wheel trim switch to the NOSE DOWN position.
 - (a) On the tester display, make sure the BIT (DISCRETE) 2 shows a 0.
- S 735-269-003
- (4) Release the control wheel trim switch.
 - (a) On the tester display, make sure the BIT (DISCRETE) 2 shows a 1.
- S 865-270-003
- (5) On the tester, set the WORD to 41.
- S 735-271-003
- (6) On the control wheel, set the control wheel trim switch to the NOSE UP position.
 - (a) On the tester display, make sure the BIT (DISCRETE) 2 shows a 0.
- S 735-272-003
- (7) Release the control wheel trim switch.
 - (a) On the tester display, make sure the BIT (DISCRETET) 2 shows a 1.

AH. Flap Alternate Test

- S 715-273-003
- (1) Make sure the trailing edge flap operates correctly (AMM 27-51-00/501).
- S 865-274-003
- (2) On the P3-1 panel, push the T.E. FLAP arm switch to the armed position.
- S 735-275-003
- (3) On the tester, set the SUBFRAME to 0 and the WORD to 106.
 - (a) Make sure the BIT (DISCRETE) 2 shows a 1.

S 735-276-003

- (4) On the P3-1 panel, push the TE FLAP arm switch to the disarmed position.
 - (a) On the tester display, make sure the BIT (DISCRETE) 2 shows a 0.

AI. Slat Alternate Test

S 865-277-003

- (1) On the P3-1 panel, set the LE flap arm switch to the armed position.

S 735-278-003

- (2) On the tester, set the SUBFRAME to 0 and the WORD to 106.
 - (a) Make sure the BIT (DISCRETE) 1 shows a 1.

S 735-279-003

- (3) Set the LE flap switch to the disarmed position.
 - (a) On the tester display, make sure the BIT (DISCRETE) 1 shows a 0.

AJ. Flap Handle Position Test

S 865-280-003

- (1) Make sure the flap handle operates correctly (AMM 27-51-00/501).

S 865-281-003

- (2) Make sure the flap handle is set at the 0 (UP) position.

S 735-282-003

- (3) On the tester, set the SUBFRAME to 0 and the WORD to 107.
 - (a) Make sure the tester display shows between 0000 and 2211.

S 735-283-003

- (4) Set the flap handle to 15.
 - (a) Make sure the tester display shows between 4426 and 5156.

S 865-284-003

- (5) Set the flap handle back to the normal position.

AK. Leading Edge Slat Position Test

S 865-285-003

- (1) Make sure the leading edge slat system operates correctly (AMM 27-81-00/501).

S 865-286-003

WARNING: KEEP PERSONS AND EQUIPMENT CLEAR OF THE FLIGHT CONTROL SURFACES, THE THRUST REVERSERS, AND THE LANDING GEAR. THESE COMPONENTS CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (2) Pressurize the left hydraulic system and reservoir (AMM 29-11-00/201).

S 865-287-003

- (3) On the tester, set the SUBFRAME to 0 and the WORD to 44.

S 735-288-003

- (4) Set the LE slats to the full extended position.
(a) On the tester display, make sure the BIT (DISCRETE) 2 shows a 1.

S 735-289-003

- (5) Set the LE slats to the not fully extended position.
(a) On the tester display, make sure the BIT (DISCRETE) 2 shows a 0.

S 865-290-003

- (6) On the tester, set the SUBFRAME to 0 and the WORD to 45.

S 735-291-003

- (7) Set the LE slats to the partial extended position.
(a) On the tester display, make sure the BIT (DISCRETE) 2 shows a 1.

S 735-292-003

- (8) Set the LE slats to the not partial extended position.
(a) On the tester display, make sure the BIT (DISCRETE) 2 shows a 0.

S 865-293-003

- (9) On the tester, set the SUBFRAME to 0 and the WORD to 44.

S 735-294-003

- (10) Set the LE slats to the retracted position.
(a) On the tester display, make sure the BIT (DISCRETE) 1 shows a 1.

S 735-295-003

- (11) Set the LE slats to the not retracted position.
(a) On the tester display, make sure the BIT (DISCRETE) 1 shows a 0.

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S 865-296-003

- (12) Set the LE slats back to the normal position.

S 865-297-003

- (13) Remove the power from the left hydraulic system (AMM 29-11-00/201).

AL. Left and Right VHF Test

S 865-298-003

- (1) Make sure the VHF communication systems operate correctly (AMM 23-12-00/501).

S 865-299-003

- (2) Tune the VHF transceivers to an approved test frequency.

NOTE: Key only one transceiver at a time.

S 735-300-003

- (3) On the tester, set the SUBFRAME to 0 and the WORD to 5.
(a) Make sure the BIT (DISCRETE) 2 shows a 1.

S 865-301-003

- (4) On the captain's audio selector panel, push the L VHF MIC switch.

S 735-302-003

- (5) Push the PTT switch on the captain's or first officer's control wheel.
(a) On the tester display, make sure the BIT (DISCRETE) 2 shows a 0.

S 865-303-003

- (6) Release the PTT switch.
(a) Make sure the BIT (DISCRETE) 1 shows a 1.

S 865-304-003

- (7) On the captain's audio selector panel, push the R VHF MIC switch.

S 735-305-003

- (8) Push the PTT switch on the control wheel.
(a) On the tester display, make sure the BIT (DISCRETE) 1 shows a 0.

S 865-306-003

- (9) Release the PTT switch.

AM. Center VHF Test

S 735-307-003

- (1) On the tester, set the WORD to 6.
(a) Make sure the BIT (DISCRETE) 1 shows a 1

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- S 865-308-003
- (2) On the captain's audio selector panel, push the C VHF MIC switch.
- S 735-309-003
- (3) Push PTT switch on the captain's or first officer's control wheel.
- (a) On the tester display, make sure the BIT (DISCRETE) 1 shows a 0.
- S 865-310-003
- (4) Release the PTT switch.
- AN. Left HF Test
- S 865-311-003
- (1) Make sure the HF communication systems operates correctly (AMM 23-11-00/501).
- S 865-312-003
- (2) Tune the left HF transceiver to an approved test frequency.
- S 735-313-003
- (3) On the tester, set the SUBFRAME to 0 and the WORD to 3.
- (a) Make sure the BIT (DISCRETE) 2 shows a 1.
- S 865-314-003
- (4) On the captain's audio selector panel, push the L HF MIC switch.
- S 735-315-003
- (5) Push the PTT switch on the captain's control wheel.
- (a) Make sure the BIT (DISCRETE) 2 shows a 0.
- S 865-316-003
- (6) Release the PTT switch.
- (a) Make sure the BIT (DISCRETE) 1 shows a 1.
- S 865-317-003
- (7) On the captain's audio selector panel, push the R HF MIC switch.
- S 735-318-003
- (8) Push the PTT switch on the captain's control wheel.
- (a) On the tester display, make sure the BIT (DISCRETE) 1 shows a 0.
- S 865-319-003
- (9) Release the PTT switch.
- A0. Ground Proximity Warning System Test
- S 865-320-003
- (1) Make sure the ground proximity warning system operates correctly (AMM 34-46-00/501).

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- S 735-321-003
- (2) On the tester, set the SUBFRAME to 0 and the WORD to 253.
 - (a) Make sure the BIT (DISCRETE) 8 shows a 0.
- S 735-322-003
- (3) Set the test switch on the miscellaneous test panel to the GND PROX position.
 - (a) Make sure the GLIDESLOPE lamp illuminates.
 - (b) On the tester display, make sure the BIT (DISCRETE) 8 shows a 1.
- S 865-323-003
- (4) Set the ground proximity warning system back to normal.
- AP. Stick Shaker Test
- S 865-324-003
- (1) Make sure the stall warning system operates correctly (AMM 27-32-00/501).
- NOTE:** If the Hydraulic Power is used, the STALL TEST will also start the auto slat if the flaps are in the takeoff range and slats are sealed.
- S 735-325-003
- (2) On the tester, set the SUBFRAME to 0 and the WORD to 115.
 - (a) Make sure the BIT (DISCRETE) 2 shows a 1.
- S 735-326-003
- (3) Set the L STALL switch on miscellaneous test panel to the TEST position.
 - (a) On the tester display, make sure the BIT (DISCRETE) 2 shows a 0.
- S 735-327-003
- (4) Release L STALL TEST switch on the miscellaneous test panel.
 - (a) On the tester display, make sure the BIT (DISCRETE) 1 shows a 1.
- S 735-328-003
- (5) Set the R STALL switch on miscellaneous test panel to the TEST position.
 - (a) On the tester display, make sure the BIT (DISCRETE) 1 shows a 0.
- S 865-329-003
- (6) Release the R STALL switch on the miscellaneous test panel.

S 865-330-003

- (7) Set the stall warning system back to normal.
AQ. Air/Ground Test

S 865-331-003

WARNING: PREPARE THE SAFETY-SENSITIVE SYSTEMS FOR THE AIR MODE BEFORE YOU OPEN THE AIR/GROUND CIRCUIT BREAKERS. IN THE AIR MODE, MANY OF THE AIRPLANE SYSTEMS CAN OPERATE AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) Do the deactivation procedure for flight mode simulation (AMM 32-09-02/201).

S 865-332-003

- (2) Open the circuit breaker:
(a) On the P11 panel:
1) 11S19, AIR/GND SYS 2

S 735-333-003

- (3) On the tester, set the SUBFRAME to 0 and the WORD to 227.
(a) Make sure the BIT (DISCRETE) 1 shows a 0.

S 865-334-003

- (4) Close this circuit breaker:
(a) On the P11 panel:
1) 11S19, AIR/GND SYS 2
(b) Make sure the BIT (DISCRETE) 1 shows a 1.

AR. Accelerometer Test

S 865-335-003

- (1) On the tester, set the SUBFRAME and WORD as shown in the table that follows.

S 735-336-003

- (2) Make sure the tester display shows the correct data as shown in the table that follows:

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SIGNAL	TESTER SETUP		TESTER DISPLAY
	SUBFRAME	WORD	
VERTICAL	0	2	3442 to 3706
LATERAL	0	35	4000 to 4243
LONGITUDINAL	0	33	4000 to 4243

AS. Put the Airplane Back to its Usual Condition

S 865-337-003

- (1) If you used the HHDLU, do the steps that follow:
 - (a) Set the function switch on the flight recorder control panel to the NORM position.
 - (b) Push the red button on top of the HHDLU.
 - (c) Remove the HHDLU adapter cable from the flight data recorder.
 - (d) Install the test plug to the test connector at the flight data recorder.

S 865-338-003

- (2) If you used test equipment other than the HHDLU, do the steps that follow:
 - (a) Turn the tester off.
 - (b) Open these P11 panel circuit breakers:
 - 1) 11J7, FLIGHT RECORDER AC
 - 2) 11J8, FLIGHT RECORDER DC
 - (c) Disconnect the tester from the right side of the P61 panel.
 - (d) Install the test plug to the test connector at the P61 panel.
 - (e) Close these P11 panel circuit breakers:
 - 1) 11J7, FLIGHT RECORDER AC

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2) 11J8, FLIGHT RECORDER DC

S 865-339-003

(3) Remove electrical power if it is not necessary (AMM 24-22-00/201).

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FLIGHT DATA RECORDER – MAINTENANCE PRACTICES

1. General

- A. Use the applicable copy recorder to make a copy of the flight data recorder (FDR) data.
- B. The FDR is installed in the voice and flight recorder rack, E7.

TASK 31-31-01-912-022

2. A Copy of the Data from the FDR with a Sundstrand Copy Recorder (Fig. 201)

A. General

- (1) The copy recorder makes a copy of the data from the Sundstrand tape base FDR without the removal of the FDR from the airplane. Approximately 30 minutes is necessary to make a copy of the data from the FDR.
- (2) The copy recorder is connected to the ATE connector on the front panel of the FDR.

B. Equipment

- (1) UFDR Copy Recorder – Sundstrand 981-6024-002,
Sundstrand Aviation Division, P.O. Box 7002,
4747 Harrison Ave., Rockford, IL 61101
- (2) Magnetic Tape

C. References

- (1) AMM 24-22-00/201, Electrical Power – Control
- (2) AMM 25-22-02/401, Lower Ceiling Panel

D. Access

- (1) Location Zone
253 Area above passenger cabin ceiling (Left)

E. Procedure

S 862-002

- (1) Supply electrical power (AMM 24-22-00/201).

S 862-001

- (2) Open these circuit breakers and attach DO-NOT-CLOSE tags:
 - (a) On the overhead equipment panel, P11:
 - 1) 11J7, FLIGHT RECORDER AC
 - 2) 11J8, FLIGHT RECORDER DC

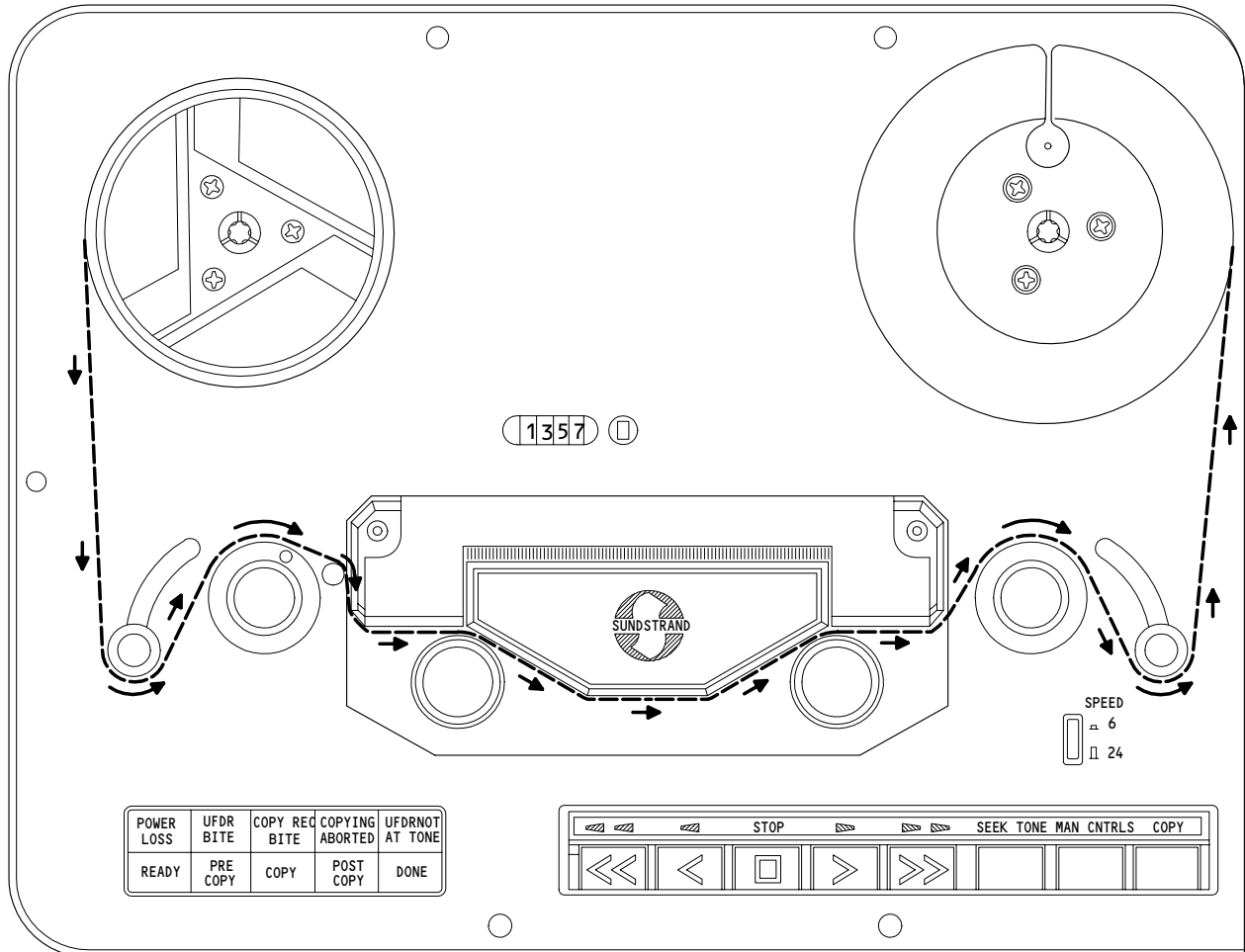
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Copy Recorder
Figure 201

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- S 862-193
- (3) AIRPLANES WITH FLIGHT RECORDER CONTROL PANEL (FRCP) INSTALLED;
Set the ON-NORM-TEST switch on the FRCP to the NORM position.
- S 862-191
- (4) AIRPLANES WITH DATA MANAGEMENT ENTRY PANEL (DMEP) INSTALLED;
Set the NORM/DFDR switch on the DMEP to the NORM position.
- S 012-012
- (5) At the aft galley, open the ceiling panel No. 1 to get access to the FDR (AMM 25-22-02/401).
- S 432-014
- (6) Connect the copy recorder to the front connector of the FDR with the cable supplied with the copy recorder.
- S 862-070
- (7) Set the tape speed switch to 6 IPS.
- S 862-020
- (8) Remove the DO-NOT-CLOSE tags and close these circuit breakers:
(a) On the P11 panel:
1) 11J7, FLIGHT RECORDER AC
2) 11J8, FLIGHT RECORDER DC
- S 862-197
- (9) AIRPLANES WITH FRCP INSTALLED;
Set the ON-NORM-TEST switch on the FRCP to the ON position.
- S 862-237
- (10) AIRPLANES WITH DMEP INSTALLED;
Set the NORM/DFDR switch on the DMEP to the DFDR position.
(a) Make sure the POWER LOSS light flashes.
- S 862-025
- (11) Push the STOP switch to extinguish the POWER LOSS light.
(a) Make sure the READY light comes on and the copy recorder is set to 6 IPS.
- NOTE: If the COPY ABORTED light comes on when the power is supplied to the copy recorder, ignored the light.
- S 862-029
- (12) Install a full reel of tape on the left hub.

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- S 862-030
(13) Install an empty reel on the right hub.
- S 862-031
(14) Put the tape along the path (Fig. 201).
- S 862-032
(15) Wind the Tape 3 to 5 turns on the right reel.
- S 862-034
(16) Set the counter to zero.
- S 862-036
(17) Turn the right reel counterclockwise until the counter shows 0003.
- S 862-035
(18) Set the counter to zero.
- S 862-072
(19) Push the COPY switch one time.
- NOTE:** Do not push the COPY switch again or the FDR will not find its initial position.
- S 212-196
(20) Make sure the steps occur as follows:
(a) The light sequence is PRE COPY, COPY, POST COPY and DONE.
(b) The UFDR NOT AT TONE light will go off approximately 12 seconds before the DONE light comes on.
(c) The UFDR BITE, COPY REC BIT, POWER LOSS, and COPY ABORTED lights must stay off during the copy procedure.
(d) The copy recorder tape will go forward for approximately 1 minute after the POST COPY light turns on.
(e) When the copy procedure is completed, only the DONE light will stay on.
- S 862-073
(21) Push the STOP switch.
- S 862-074
(22) At the same time, push the MAN CNTRLS switch and the REWIND switch.

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- S 862-200
(23) AIRPLANES WITH FRCP INSTALLED;
Set the ON-NORM-TEST switch on the FRCP to the NORM position.

- S 862-239
(24) AIRPLANES WITH DMEP INSTALLED;
Set the NORM/DFDR switch on the DMEP to the NORM position.

- S 032-053
(25) Disconnect the copy recorder from the FDR.

- S 862-054
(26) Put the connector cover on the front of the FDR.

TASK 31-31-01-912-219

3. Make a Copy of the Flight Data with a Sundstrand Hand Held Download Unit

A. General

- (1) This task uses a hand held download unit (HHDLU) to make a copy of the flight data from a flight data recorder that records on solid state.
- (2) You can use the HHDLU to make a copy of the flight data without the removal of the solid state flight data recorder (FDR) from the airplane. A different procedure to access the flight data is to remove the FDR from the airplane (AMM 31-31-01/401). The flight data is then removed from the FDR.
- (3) The ATE connector is on the front of the FDR.

B. Equipment

- (1) 964-0446-001 Unit - Hand Held Download
97896 Sundstrand Data Control Inc.
15001 NE 36TH ST.
P.O. Box 97001
Redmond, WA 98073-9701
- (a) AIRPLANES WITH FDR P/N 980-4700-042;
The HHDLU must have mod 1 completed.

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C. References

- (1) AMM 24-22-00/201, Electrical Power - Control
- (2) AMM 25-22-02/401, Lower Ceiling Panel

D. Access

- (1) Location Zone
253 Area Above Passenger Cable Ceiling, LH

E. Prepare to Make a Copy of the Flight Data from the FDR

S 862-224

- (1) Supply electrical power (AMM 24-22-00/201).

S 862-183

- (2) Open these circuit breakers and attach DO-NOT-CLOSE tags:
 - (a) On the overhead equipment panel, P11:
 - 1) 11J7, FLIGHT RECORDER AC
 - 2) 11J8, FLIGHT RECORDER DC

S 012-233

- (3) To get access to the FDR, lower the ceiling panel No. 1 above the aft galley (AMM 25-22-02/401).

S 422-226

- (4) Connect the connector of the HHDLU cable to the FDR ATE connector.

S 422-227

- (5) Install the removable media into the HHDLU.

S 862-184

- (6) Remove the DO-NOT-CLOSE tags and close these circuit breakers:
 - (a) On the P11 panel:
 - 1) 11J7, FLIGHT RECORDER AC
 - 2) 11J8, FLIGHT RECORDER DC

S 862-185

- (7) At the P61 panel, set the ON-NORM-TEST switch on the flight recorder control panel (FRCP) to the ON position.

S 862-186

- (8) Push the power switch, installed adjacent to the HHDLU's RS-422 port.

NOTE: When power is first applied to the HHDLU, the HHDLU display will not be on. After approximately 30 seconds. The HHDLU display will show the main menu.

- (a) Make sure the HHDLU display shows DNLD in the main menu.

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F. Procedure

S 912-187

- (1) Push the DNL D key.
 - (a) Make sure the DOWNLOAD MENU shows on the display.

NOTE: The maximum quantity of flight data the HHDLU can make a copy of is 27.2 hrs. If file DOWNLOAD01.DLU already exists on the removable media, the HHDLU will change the filename until a filename that is not used is found. To change the time or filename, push the TIME or FILE key.

S 862-228

- (2) Push the GO key.
 - (a) If the HHDLU display shows DISK FULL, do these steps:
 - 1) Push a key.
 - 2) Make sure the DELETE FILE menu shows on the display.
 - 3) Use the NEXT or PREV key to move up and down the filenames.
 - 4) Push the DEL key to make a selection of the file to be erased.
 - a) Make sure the CONFIRM DELETE menu shows on the display.
 - 5) Push the YES key to erase the file.
 - 6) Erase files until sufficient memory is available to make a copy of the flight data.

NOTE: After each file is erased, the HHDLU makes sure the HHDLU has sufficient memory space. If there is sufficient memory, the HHDLU will start to make a copy.

- 7) Make sure the HHDLU display shows REC BLKS and XFER BLKS.

NOTE: REC BLKS is the number of blocks the HHDLU will move to the removable media. XFER BLKS is the number of blocks the HHDLU will move from the FDR. The REC BLKS and XFER BLKS fields will change during the copy procedure.

- (b) After the copy procedure is completed, push a key to show the main menu.

G. Put the Airplane to Its Usual Condition

S 862-267

- (1) On the HHDLU, push the red power switch to remove the power.

S 022-266

- (2) Remove the media from the HHDLU.

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- S 862-229
- (3) At the P61 panel, set the FRCP to the NORM position.
- S 862-230
- (4) Disconnect the interface cable from the FDR.
- S 862-231
- (5) Put the cover on the FDR ATE connector.
- S 862-232
- (6) Remove electrical power if it is not necessary (AMM 24-22-00/201).

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FLIGHT DATA RECORDER – REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
 - (1) A removal of the flight data recorder (FDR).
 - (2) An installation of the FDR.
- B. The FDR is installed in the E7 equipment rack.

TASK 31-31-01-004-001

2. Flight Data Recorder (FDR) Removal (Fig. 401)

- A. References
 - (1) AMM 20-10-01/401, E/E Rack-Mounted Components
 - (2) AMM 20-41-01/201, Electrostatic Sensitive Devices
 - (3) AMM 25-22-02/401, Lowered Ceiling Panels
- B. Access
 - (1) Location Zone
253 Area above passenger cabin ceiling (left)

C. Procedure

S 864-003

- (1) Open these circuit breakers and attach the DO-NOT-CLOSE tags:
 - (a) On the overhead equipment panel, P11:
 - 1) 11J7, FLIGHT RECORDER AC
 - 2) 11J8, FLIGHT RECORDER DC

S 864-004

- (2) To get access to the FDR, lower the ceiling panel No. 1 above the aft galley (AMM 25-22-02/401).

S 864-059

CAUTION: DO NOT TOUCH THE CONNECTOR PINS OR OTHER CONDUCTORS ON THE FDR. IF YOU TOUCH THESE CONDUCTORS, ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE FDR.

- (3) To remove the FDR, do this task: E/E Box Removal (AMM 20-10-01/401).

NOTE: If the replacement flight recorder does not have an underwater locator beacon (ULB) installed, do this task: Underwater Locator Beacon Removal (AMM 31-31-02/201).

TASK 31-31-01-404-010

3. Flight Data Recorder (FDR) Installation (Fig. 401)

- A. References
 - (1) AMM 20-10-01/401, E/E Rack-Mounted Components

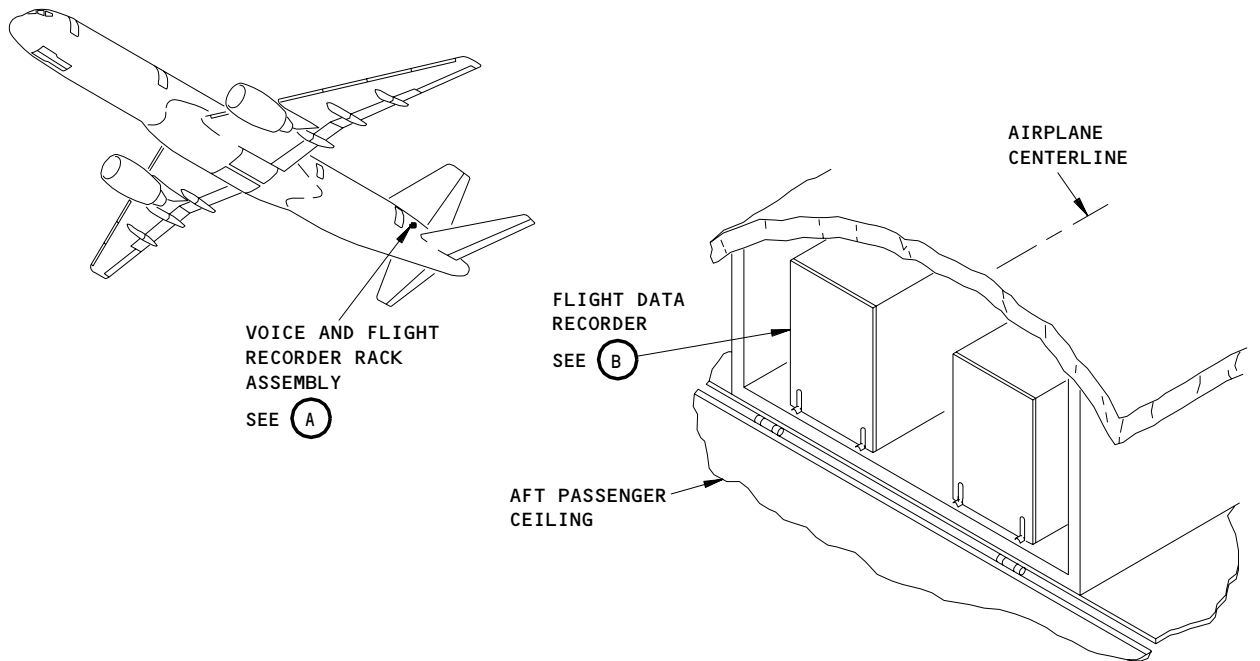
EFFECTIVITY

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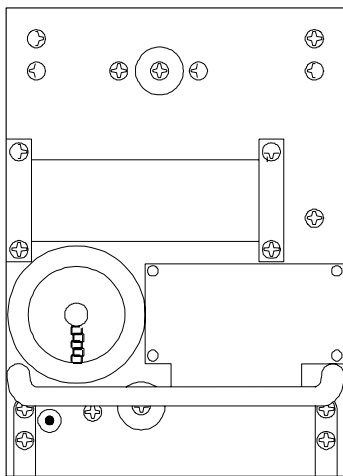
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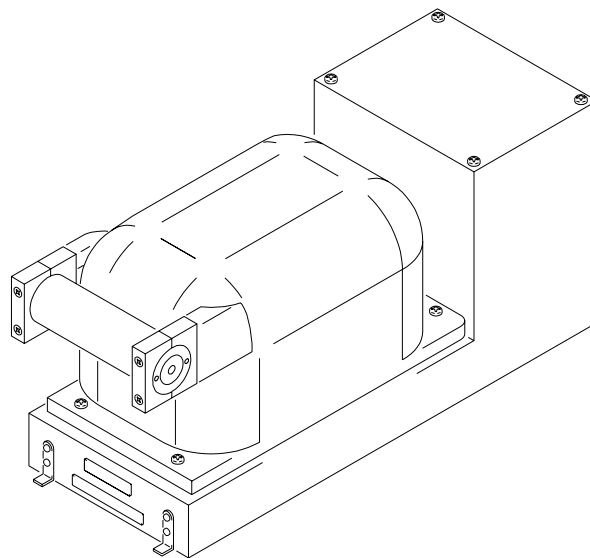
VOICE AND FLIGHT RECORDER RACK ASSEMBLY

(A)



FLIGHT DATA RECORDER

(B) 1



FLIGHT DATA RECORDER

(B) 2

1 GUI 010, 011 PRE-SB 31-0094;
GUI 001-009, 012-015

2 GUI 010, 011 POST-SB 31-0094

Flight Data Recorder Location
Figure 401

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- (2) AMM 20-41-01/201, Electrostatic Sensitive Devices
- (3) AMM 24-22-00/201, Electrical Power Control
- (4) AMM 25-22-02/401, Lower Ceiling Panel

B. Access

- (1) Location Zone
253 Area above passenger cabin ceiling (left)

C. Procedure

S 864-012

- (1) Make sure these circuit breakers are open:
 - (a) On the overhead equipment panel P11:
 - 1) 11J7, FLIGHT RECORDER AC
 - 2) 11J8, FLIGHT RECORDER DC

S 414-062

CAUTION: DO NOT TOUCH THE CONNECTOR PINS OR OTHER CONDUCTORS ON THE FDR. IF YOU TOUCH THESE CONDUCTORS, ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE FDR.

- (2) To install the FDR, do this task: E/E Box Installation (AMM 20-10-01/401).

NOTE: If the flight recorder does not have an underwater locator beacon (ULB) installed, do this task: "Underwater Locator Beacon Removal" (AMM 31-31-02/201).

S 414-015

- (3) Close the lower ceiling panel No. 1 (AMM 25-22-02/401).

S 864-019

- (4) Remove the DO-NOT-CLOSE tags and close these circuit breakers:
 - (a) On the P11 panel:
 - 1) 11J7, FLIGHT RECORDER AC
 - 2) 11J8, FLIGHT RECORDER DC

D. FDR Test

S 864-020

- (1) Supply electrical power (AMM 24-22-00/201).

S 864-048

- (2) AIRPLANES WITH A FLIGHT RECORDER CONTROL PANEL (FRCP) INSTALLED;
Do the steps that follows:
 - (a) Set the ON-NORM-TEST switch on the FRCP to the ON position.
 - 1) Make sure the OFF light on the FRCP goes off.
 - (b) Set the ON-NORM-TEST switch on the FRCP to the NORM position.

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S 714-053

- (3) AIRPLANES WITH A DATA MANAGEMENT ENTRY PANEL (DMEP) INSTALLED;
Do the steps that follow:
- (a) Set the NORM DFDR switch on the DMEP to the DFDR position.
 - 1) Make sure the DFDR light on the DMEP goes off.
 - (b) Set the switch on the DMEP to the NORM position.

S 864-047

- (4) Remove electrical power if it is not necessary (AMM 24-22-00/201).

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UNDERWATER LOCATOR BEACON (ULB) – MAINTENANCE PRACTICES

1. General

- A. This procedure has these tasks:
 - (1) A removal of the underwater locator beacon (ULB).
 - (2) A replacement of the ULB battery.
 - (3) An operational test of the ULB.
 - (4) An installation of the ULB.
- B. The underwater locator beacon (ULB) is attached to the front of the flight data recorder.
- C. The flight data recorder is installed on the E7 rack in the aft overhead passenger compartment.

TASK 31-31-02-002-001

2. Underwater Locator Beacon Removal (Fig. 201)

- A. General
 - (1) The ULB has a battery as the power source. The ULB has no external electrical connections.
- B. References
 - (1) AMM 25-22-02/401, Lowered Ceiling Panels
- C. Access
 - (1) Location Zones
 - 253 Area Above Passenger Compartment Ceiling, Left – Section 46
 - 254 Area Above Passenger Compartment Ceiling, Right – Section 46
- D. Removal Procedure
 - S 012-038
 - (1) Open the ceiling panel (AMM 25-22-02/401) in the aft passenger compartment to get access to the flight data recorder.
 - S 022-061
 - (2) Remove the underwater locator beacon from the flight data recorder:
 - (a) Loosen the four screws that hold the ULB.
 - (b) Remove the two screws and the clamp from one end of the ULB.
 - (c) Remove the ULB.

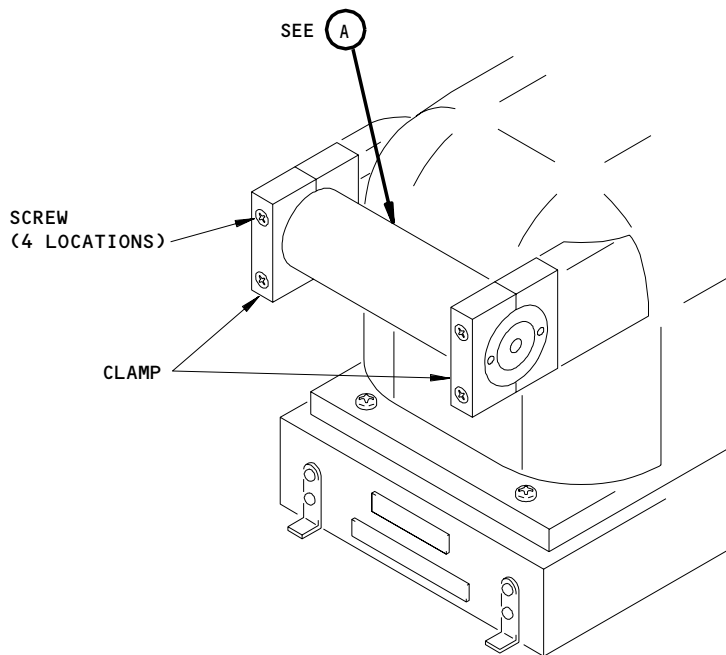
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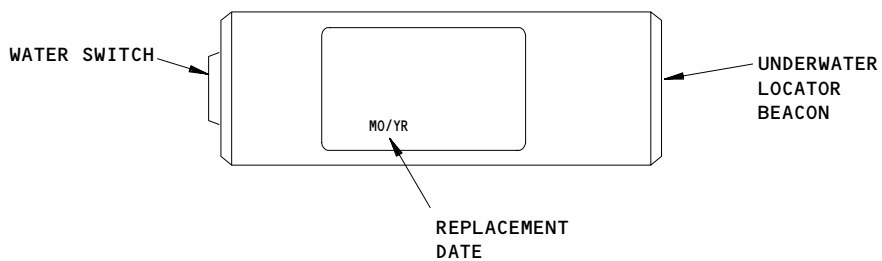
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DIGITAL FLIGHT DATA RECORDER



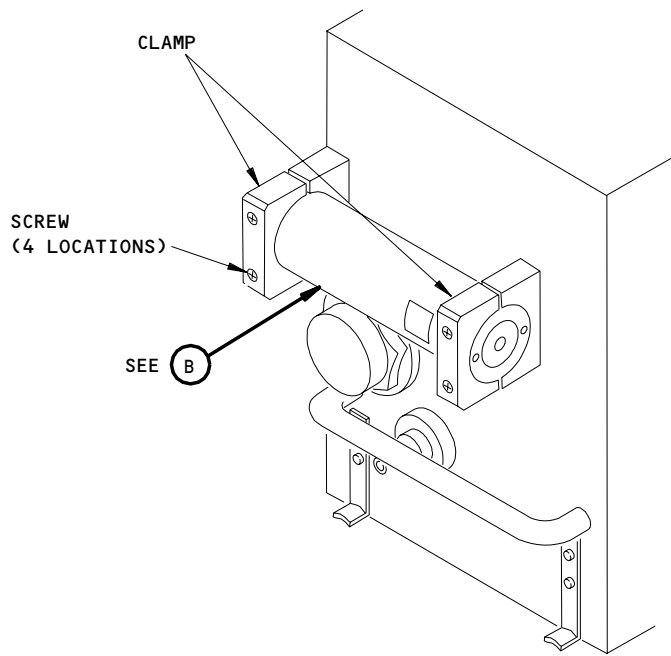
UNDERWATER LOCATOR BEACON

(A)

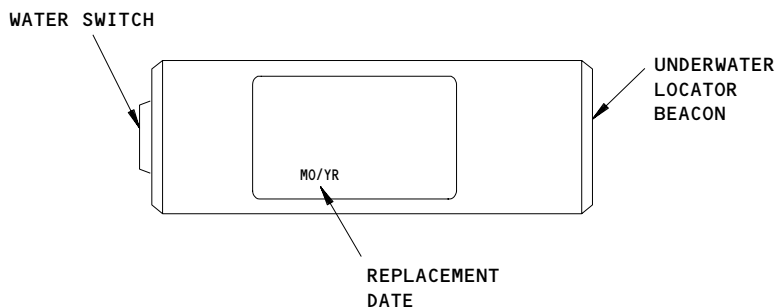
Underwater Locator Beacon Installation
Figure 201 (Sheet 1)

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GUI 010, 011 POST-SB 31-0094

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DIGITAL FLIGHT DATA RECORDER



UNDERWATER LOCATOR BEACON

B

Underwater Locator Beacon Installation
Figure 201 (Sheet 2)

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GUI 010, 011 PRE-SB 31-0094
GUI 001-009, 012-015

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(d) Keep the two screws and the clamp.

TASK 31-31-02-962-044

3. FLIGHT DATA RECORDERS WITH DUKANE ULBs;

Underwater Locator Beacon Battery Replacement (Fig. 202)

A. General

- (1) Do not replace the battery in the DK100 underwater locator beacon (ULB). On or before the expired date, send the DK100 to the manufacturer for servicing.

B. Equipment

- (1) 810-325 Spanner Wrench
Dukane Corporation
2900 Dukane Drive
St. Charles, IL 60174
- (2) Split Radiator Hose
1-1/4-inch diameter, 5 inches in length

C. Consumable Materials

- (1) D00318 Lubricant, Dukane 810-346
- (2) G02440 Battery, Dukane 810-2007K
- (3) G00751 O-ring, Dukane 810-342
- (4) G01523 Lubricated O-ring, Datasonics 2-022

D. Removal Procedure

S 512-055

WARNING: DO NOT REMOVE THE BATTERY FROM THE DK100 ULB. DO NOT CAUSE DAMAGE TO THE DK100 ULB. DO NOT DISCARD THE DK100 ULB. THE MANUFACTURER HAS A REPLACEMENT PROGRAM FOR EXPIRED ULBs. ON OR BEFORE THE EXPIRED DATE, SEND THE DK100 ULB TO THE MANUFACTURER FOR SERVICING. THE BATTERY CONTAINS DANGEROUS CHEMICAL MATERIALS WHICH CAN CAUSE INJURIES TO PERSONNEL.

- (1) If you have a DK100 ULB, send the ULB to the manufacturer for servicing.

S 022-011

- (2) If you do not have a DK100 ULB, remove the ULB battery:

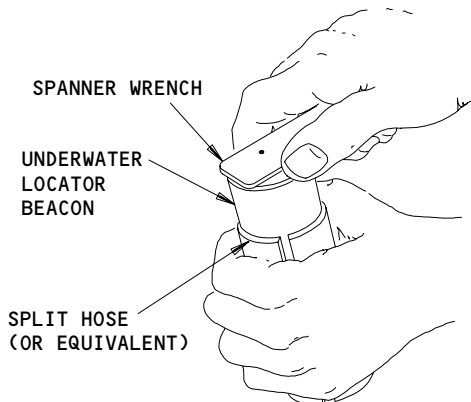
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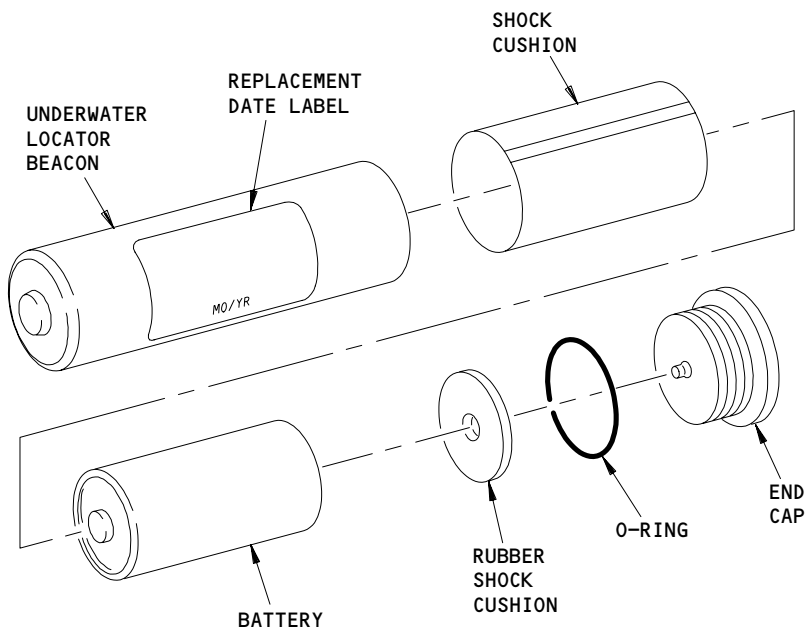
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ULB DISASSEMBLY (BATTERY ACCESS)



BATTERY INSTALLATION

Underwater Locator Beacon Battery Installation
Figure 202

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CAUTION: DO NOT HOLD THE UNDERWATER LOCATOR BEACON WITH A VISE.
THIS CAN CAUSE DAMAGE TO THE UNDERWATER LOCATOR BEACON.

- (a) Hold the ULB body with a split radiator hose.
- (b) Use a spanner wrench to remove the end cap that is identified BATTERY ACCESS.
- (c) Remove the rubber shock cushion from the battery end if it is not removed with the cap.
- (d) Hit the ULB body lightly to remove the battery.

E. Installation Procedure

S 422-011

- (1) Install the ULB battery:

NOTE: The Dukane 810-2007K battery is a 6 year lithium battery used in the Dukane model DK120 ULB.

- (a) Put the new battery replacement date label on the ULB body.
- (b) Write the next scheduled replacement date for the new ULB that you installed.

NOTE: The date label is blank so you can write in a replacement date based on your maintenance schedule.

- (c) Make sure the shock cushion is in the ULB.

CAUTION: INSTALL THE ULB BATTERY CORRECTLY. INCORRECT POLARITY WILL CAUSE PERMANENT DAMAGE TO THE ULB.

- (d) Put the battery in the ULB with the end identified by INSERT THIS END in first.
- (e) Remove and discard the used O-ring from the end cap.

CAUTION: DIRT OR OTHER UNWANTED MATERIALS CAN CAUSE DAMAGE TO THE THREADS AND THE O-RING SEAL. THIS CAN PERMIT WATER LEAKAGE.

- (f) Clean the threads and the O-ring groove in the ULB body.
- (g) Apply a thin layer of the lubricant to the O-ring, O-ring groove and threads.
- (h) Install a new O-ring on the end cap.
- (i) Put the rubber shock cushion smoothly on the end cap.
- (j) Put the end cap into the ULB.
- (k) Tighten the end cap until the cap flange touches the ULB body.

NOTE: Only use hand force on the spanner wrench.

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TASK 31-31-02-962-050

4. FLIGHT DATA RECORDERS WITH DATASONICS ULBs;
Underwater Locator Beacon Battery Replacement (Fig. 202)

A. General

- (1) Do not replace the battery in a series S underwater locator beacon (ULB). If the serial number on the ULB starts with an S, on or before the expired date, send the ULB to the manufacturer for servicing.

B. Equipment

- (1) B362-04180A, Spanner Wrench, Used on Underwater Locator Beacon
4U270 Datasonics Inc
P.O Box 8, Cataumet, MA 02534
1400RT 28A
- (2) Split Radiator Hose
1-1/4-inch diameter, 5 inches in length

C. Consumable Materials

- (1) G01524 Battery, Datasonics B362-04270
- (2) G01523 Lubricated O-ring, Datasonics 2-022

D. Removal Procedure

S 512-056

WARNING: DO NOT REMOVE THE BATTERY FROM A SERIES S ULB. DO NOT DISCARD THE ULB. THE MANUFACTURER HAS A REPLACEMENT PROGRAM FOR EXPIRED ULBs. ON OR BEFORE THE EXPIRED DATE, SEND THE ULB TO THE MANUFACTURER FOR SERVICING. THE BATTERY CONTAINS DANGEROUS CHEMICAL MATERIALS WHICH CAN CAUSE INJURIES TO PERSONNEL.

- (1) If you have a series S ULB, send the ULB to the manufacturer for servicing.

S 022-054

- (2) If you don't have a series S ULB, remove the ULB battery:
 - (a) Hold the ULB body with a split radiator hose.

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- (b) Use a spanner wrench to remove the end cap that is identified BATTERY ACCESS.
- (c) Remove the rubber shock cushion from the battery end if it is not removed with the cap.
- (d) Hit the ULB body lightly to remove the battery.
- (e) Discard the battery.

NOTE: Refer to local instructions when you discard the battery.

E. Installation Procedure

S 422-048

- (1) Install the ULB battery:

NOTE: The Datasonics B362-04270 battery is a six year battery.

- (a) Put a new battery replacement label on the ULB body.
- (b) Write the next scheduled replacement date for the new ULB that you installed.

NOTE: The date label is blank so you can write in a replacement date based on your maintenance schedule.

- (c) Make sure the shock cushion is in the ULB body.

CAUTION: INSTALL THE ULB BATTERY CORRECTLY. INCORRECT POLARITY WILL CAUSE PERMANENT DAMAGE TO THE ULB.

- (d) Put the new battery in the ULB with the end identified by INSERT THIS END in first.
- (e) Remove and discard the used O-ring from the end cap.

CAUTION: DIRT OR OTHER UNWANTED MATERIALS CAN CAUSE DAMAGE TO THE THREADS AND THE O-RING SEAL. THIS CAN PERMIT WATER LEAKAGE.

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- (f) Clean the threads and the O-ring groove in ULB body.
- (g) Install a new lubricated o-ring on the end cap.
- (h) Put the rubber shock cushion smoothly on the end cap.
- (i) Put the end cap into the body.
- (j) Tighten the end cap until the cap flange touches the ULB body.

NOTE: Only use hand force on the spanner wrench.

TASK 31-31-02-702-023

5. Underwater Locator Beacon - Operational Test

A. Equipment

- (1) 42A12 Ultrasonic Test Set
Dukane Corporation
2900 Dukane Drive
St. Charles, IL 60174
- (2) PL1 Ultrasonic Test Set
Dukane Corporation
2900 Dukane Drive
St. Charles, IL 60174
- (3) PL3 Ultrasonic Test Set
Dukane Corporation
2900 Dukane Drive
St. Charles, IL 60174
- (4) ATS-260 Acoustic Test Set
Datasonics INC.
1400 Route 28A
Cataumet, MA 02534
- (5) Ultrasonic Test Set, TS200
Dukane Corporation
2900 Dukane Drive
St. Charles, IL 60174

B. Procedure

S 712-012

- (1) If you have a 42A12C test set, do this test of the ULB:

NOTE: 42A12 can do a test for all Dukane and Teledyne Benthos ULBs.

- (a) Put the test set approximately 3 feet from the ULB.

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- (b) Set the ON-OFF-GAIN control on the test set to the middle position.
 - 1) Make sure you hear sounds through the earphone on the test set.
- (c) Set the TUNING CONTROL to 37±1 kHz.
- (d) Set the INPUT SELECTOR switch to the INT position.
- (e) Make sure the test set operates correctly.
 - 1) Shake a set of keys or some coins in front of the microphone to make sure it operates.

NOTE: This will supply ultrasonic sound.

- a) Make sure you hear sounds through the test set earphone.
- (f) Use any kind of tape to attach a piece of flexible metal conductor to the ULB case and the center of the water switch.

NOTE: This will make a short circuit from the center of the water switch to the outer part of the ULB.

- 1) Make sure you hear a pulsed tone at 1-second intervals.
- (g) Remove the flexible metal conductor from the ULB case and center of the water switch.
 - 1) Make sure you do not hear a pulsed tone.
- (h) Set the ON-OFF-GAIN control switch to the OFF position.

S 712-013

- (2) If you have a PL1 test set, do this test of the ULB:

NOTE: PL1 can only do a test for the DK100 ULB.

- (a) Use tape to attach a piece of flexible metal conductor to the ULB case and the center of the water switch.

NOTE: This will make a short circuit from the center of the water switch to the outer part of the ULB.

- (b) Put the end of the test set against the ULB, approximately one inch from the water switch.
- (c) Push and hold the operation switch on the test set.
 - 1) Make sure the BEACON ACTIVE WHEN FLASHING light flashes.

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- 2) Remove the flexible metal conductor from the ULB case and the center of the water switch.
- 3) Make sure the BEACON ACTIVE WHEN FLASHING light does not flash.
- (d) Release the operation switch on the test set.
- (e) Remove the test set.

S 712-068

- (3) If you have a PL3 test set, do this test of the ULB.

NOTE: PL3 can only do a test for the DK100 and DK120 ULBs.

- (a) Put the end of the PL3 test set against the ULB water switch.
 - 1) Make sure you hear a tone.
 - 2) Make sure the LED light flashes.
- (b) Remove the PL3 test set from the ULB.

S 712-049

- (4) If you have an ATS-260 test set, do this test of the ULB:

NOTE: ATS-260 can only do a test for the ELP-362D ULB.

- (a) Put the test set clip on the ULB.
- (b) Push and hold the PUSH TO TEST button.
- (c) Put the test set probe on the ULB water switch.
 - 1) Make sure a green LED shows.
 - 2) Make sure you can hear sounds from the test set.
 - 3) Make sure the amber LED flashes.
- (d) Release the PUSH TO TEST button.
- (e) Remove the test set.

S 712-113

- (5) If you have a TS200 test set, do this test of the ULB:

NOTE: TS200 can do a test for all Dukane ULBs.

- (a) Attach the test probe clip to the beacon case.
- (b) Place the tip of the probe in contact with the silver pad at the end of the beacon.
- (c) Examine the battery replacement label to find the voltage code.

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- (d) Refer to the applicable battery code for the permitted range of the beacon battery voltage:
 - 1) Code A - 3.55 Volts
 - 2) Code B - 2.97 Volts
 - 3) Code C - 2.97 Volts
 - 4) Code D - 2.97 Volts
- (e) Push the red button on the TS200.
 - 1) Make sure that you can hear the pinging sound from the test set.

NOTE: High levels of background noise can interfere with this test.

- (f) Remove the test probe clip from the beacon case.

TASK 31-31-02-402-034

6. Underwater Locator Beacon Installation (Fig. 201)

- A. Consumable Materials
 - (1) B00541 Detergent, General Purpose
- B. References
 - (1) AMM 25-22-02/401, Lowered Ceiling Panels
- C. Access
 - (1) Location Zones
 - 253 Area Above Passenger Compartment Ceiling, Left - Section 46
 - 254 Area Above Passenger Compartment Ceiling, Right - Section 46
- D. Installation Procedure

S 422-032

- (1) Install the underwater locator beacon on the flight data recorder:
 - (a) Make sure the water switch end of the ULB has no grease or dirt.
 - 1) Clean the water switch on the ULB with a weak detergent.
 - (b) Put the ULB into its bracket.
 - (c) Install the clamp on the end of the ULB with the two screws.
 - (d) Make sure you can read the replacement date on the ULB.
 - (e) Tighten the four screws.

S 412-028

- (2) Close the ceiling panel (AMM 25-22-02/401) in the aft passenger compartment.

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FLIGHT DATA ACQUISITION UNIT (FDAU) – MAINTENANCE PRACTICES

1. General

- A. The Flight Data Acquisition Unit (FDAU) is also referred to as the DFDAU, DFDMU, or DFDAMU.
- B. This procedure has these tasks:
 - (1) The DFDAU software configuration check.
 - (2) An installation of the flight data acquisition unit (FDAU) software with the use of an airborne data loader.
 - (3) An installation of the flight data acquisition unit (FDAU) software with the use of a portable data loader.
 - (4) An installation of the flight data acquisition unit (FDAU) software with the use of the AlliedSignal personal computer memory card international association (PCMCIA) interface on the FDAU.
 - (5) An installation of the flight data acquisition unit (FDAU) software with the use of the Teledyne personal computer memory card international association (PCMCIA) interface on the FDAU.
 - (6) A task to make a copy of ACMS data from the FDAU to a PCMCIA card.
- C. DFDAU WITHOUT PCMCIA INTERFACE;
These are the requirements for software installation in the DFDAU:
 - (1) The DFDAU can receive a software installation through an on-airplane data loader.
 - (2) There is a data loader control panel with a DFDAU or ACMS switch position on the P61 panel.
 - (3) There is an airborne data loader or an interface connector for a portable data loader on the P61 panel.
 - (4) If there is an airborne data loader on the P61 panel in the flight compartment, then do the software installation procedure with the airborne data loader.
 - (5) If there is a DATA TRANSFER UNIT RECEPTACLE connector on the P61 panel, then do the software installation procedure with the portable data loader.
- D. DFDAU WITH PCMCIA INTERFACE;
This is the requirement for software installation in the DFDAU:
 - (1) There is a PCMCIA card interface on the front panel of the DFDAU.

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- (2) If there is a PCMCIA interface, then do the software installation procedure with the use of the PCMCIA interface.

TASK 31-31-03-402-046

2. DFDAU Software Configuration Check

A. General

- (1) This procedure tells you how to make sure the correct DFDAU software is installed.

B. References

- (1) AMM 24-22-00/201, Supply Electrical Power

C. Access

- (1) Location Zone
212 Flight Compartment - Right

D. Procedure

S 862-047

- (1) Do this task: Supply Electrical Power (AMM 24-22-00/201)

S 212-048

- (2) Make sure these circuit breakers are closed:

- (a) On the P11 panel:
1) 11J4, ACMS AC
2) 11J7, FLIGHT RECORDER AC
3) 11J8, FLIGHT RECORDER DC

S 862-049

- (3) AIRPLANES WITH TWO SWITCHES ON THE DATA LOADER CONTROL PANEL (P61); Make sure the upper switch on the data loader control panel is set to SINGLE SYS.

S 862-050

- (4) Set the system select switch on the data loader control panel (P61) to the applicable position.
(a) DFDAU position for the FDAU mandatory software.
(b) ACMS position for the FDAU non-mandatory software.

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S 212-120

- (5) GUI 010, 011 PRE-SB 31-0094;
GUI 001-009, 012-015;

Do these steps to do the software configuration check of the DFDAU:

NOTE: You must know the correct DFDAU software part number for the DFDAU or the ACMS. For the DFDAU or the ACMS to be approved installation, the correct software part number must be installed.

- (a) On the MCDU, do these steps:
- 1) Set the line select key (LSK) labeled DFDAU OR DFDAMU.
 - a) Do the task to install the software if DFDAU or DFDAMU does not show on the MCDU.
 - 2) Set the LSK labeled VERSIONS.
 - a) Make sure the the screen shows VERSIONS.
 - b) Make sure the correct ACMS software part number shows in line labeled APPLICATION appears.

NOTE: If the ACMS software part number is not correct, then install the correct ACMS software (AMM 31-31-03/201) or replace the the DFDAU (AMM 31-31-03/401).

- 3) Set the LSK labeled RETURN.
- 4) Push the MENU function key to get back to the original screen.

S 862-092

- (6) Do these steps to put the airplane back to its usual condition:
- (a) Set the system select switch on the data loader control panel to NORMAL.

S 212-121

- (7) GUI 010, 011 POST-SB 31-0094;

Do these steps to do the software configuration check of the DFDAU:

NOTE: You must know the correct DFDAU software part number for the DFDAU or the ACMS. For the DFDAU or the ACMS to be approved installation, the correct software part number must be installed.

- (a) On the MCDU, do these steps:
- 1) Set the line select key (LSK) labeled ACMS
 - a) Do the task to install the software if ACMS does not show on the MCDU.
 - 2) Set the LSK labeled SOFTWARE PART NUMBERS.
 - a) Make sure the the screen shows ACMS LOADABLE SOFTWARE PART NUMBERS.

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- b) Make sure the ACMS software is shown as ACMS UPLOAD AND TEST CODE DISK.
- 3) Set the line select key (LSK) DFDAU PART NUMBERS.
 - a) Make sure the screen shows ACMS DFDAU SOFTWARE PART NUMBERS .
 - b) Make sure the correct DFDAU non-mandatory software part number in line labeled ARINC 429 BROADCAST DISK appears.

NOTE: If the software part number is not correct, then install the correct software (AMM 31-31-03/201) or replace the the DFDAU (AMM 31-31-03/401).

- c) Make sure the correct DFDAU software part number in line labeled DFDAU UPLOAD DISK appears.
- 4) Set the LSK labeled RETURN.
- 5) Push the MENU function key to get back to the original screen.

S 862-090

- (8) Do these steps to put the airplane back to its usual condition:
 - (a) Set the system select switch on the data loader control panel to NORMAL.
 - (b) Do this task: Remove Electrical Power (AMM 24-22-00/201).

TASK 31-31-03-402-001

3. Flight Data Acquisition Unit (FDAU) Software Installation with an Airborne Data Loader (ADL)

A. General

- (1) This procedure tells you how to install software in flight data acquisition unit (FDAU).
 - (a) The FDAU must contain these pieces of software:
 - 1) mandatory FDAU software
 - 2) ACMS non-mandatory FDAU software

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- (2) An airborne data loader (ADL), data loader control panel, and a control display unit (CDU) are necessary for this procedure. The data loader control panel is installed above the airborne data loader on the P61 panel.
 - (3) The airplane must be on the ground with the engines shut down before you can install software.
 - (4) To read about software installation times and data loaders, do this task: On-Airplane Software Installation (AMM 20-15-11/201).
 - (5) Some airlines keep the circuit breaker for the data loader open when the data loader is not necessary. This increases the length of time that the data loader is serviceable. Make sure this circuit breaker is closed before you start the procedure:
 - (a) Circuit Breaker Panel, P11 or P37:
 - 1) 11F23, DATA LOADER
- B. Reference
- (1) AMM 20-15-11/201 On-Airplane Software Installation
 - (2) AMM 24-22-00/201, Electrical Power Control
- C. Access
- (1) Location Zone
 - 212 Flight Compartment - Right
- D. Procedure
- S 862-002
- (1) Do this task: Supply Electrical Power (AMM 24-22-00/201).
- S 702-003
- (2) Make sure this circuit breaker is closed:
 - (a) On the P11 or P37 panel:
 - 1) 11F23, DATA LOADER
- S 412-004
- (3) Do these steps to prepare for the software installation:
 - (a) Make sure you know the correct software part number for the FDAU. For the FDAU to be an approved installation, the correct software part number must be installed.

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- (b) Make sure the system select switch on the data loader control panel (P61) is set to NORM or NORMAL.
- (c) AIRPLANES WITH ONE SWITCH ON THE DATA LOADER CONTROL PANEL (P61);
Set the system select switch on the data loader control panel to the applicable position.
 - 1) DFDAU position to install the mandatory FDAU software.
 - 2) ACMS position to install the non-mandatory FDAU software.
- (d) AIRPLANES WITH TWO SWITCHES ON THE DATA LOADER CONTROL PANEL (P61);
Do these steps at the data loader control panel:
 - 1) Set the upper switch to SINGLE SYS.
 - 2) Set the system select switch to the applicable position.
 - a) DFDAU position to install the mandatory FDAU software.
 - b) ACMS position to install the non-mandatory FDAU software.

S 022-005

- (4) Do these steps to install the software:
 - (a) Put the correct disk in the disk drive.
 - (b) Follow the prompts on the data loader to complete the installation.
 - 1) If there are more than one disk to install, wait for 10 seconds after each disk is completed before you remove and install the subsequent disk.

NOTE: CHNG, CHANGE DISK, DISK CHANGE, and INSERT DISK are examples of data loader prompts for subsequent disk.

- (c) Remove the disk from the disk drive when the software installation is completed.

NOTE: COMP, LOAD COMPLETE, and TRANSF COMPLETE are examples of the data loader prompts for a completed installation.

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- S 862-006
- (5) Set the system select switch on the data loader control panel to NORMAL.
- S 022-007
- (6) Do these steps to do a software configuration check of the FDAU (AMM 31-31-03/201).
- S 022-008
- (7) Do these steps to put the airplane back to its usual condition:
- (a) Set the system select switch on the data loader control panel to NORM or NORMAL.
 - (b) Do this task: Remove Electrical Power (AMM 24-22-00/201).

TASK 31-31-03-472-009

4. Flight Data Acquisition Unit (FDAU) Software Installation with a Portable Data Loader

A. General

- (1) This procedure tells you how to install software in the flight data acquisition unit (FDAU).
 - (a) The FDAU must contain these pieces of software:
 - 1) mandatory FDAU software
 - 2) ACMS non-mandatory FDAU software
- (2) A portable data loader (PDL), PDL interface connector on the P61 panel, and a control display unit (CDU) are necessary for this procedure. A data loader control panel is also necessary. The data loader control panel is installed above the DATA TRANSFER UNIT RECEPTACLE connector on the P61 panel.
- (3) A PDL is not a Boeing supplied part. Refer to the PDL supplier for instructions for operation. PDLs have a disk drive for software installation from disks. Some PDLs have an internal mass storage device. If the software is stored in the PDL, then disks are not necessary.
- (4) The airplane must be on the ground with the engines shutdown before you can install software.

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(5) To read about software installation times and data loaders, do this task: On-Airplane Software Installation (AMM 20-15-11/201).

B. Reference

- (1) AMM 20-15-11/201 On-Airplane Software Installation
- (2) AMM 24-22-00/201, Electrical Power Control

C. Equipment

- (1) Loader (or alternative tool)
 - (a) 11615-02 Loader - Data, Portable, ARINC 615-3 (alternative)
Qualtair Equipment and Engineering (Vendor Code 1HEC2)
15720 Mill Creek Boulevard, Suite 200, Mill Creek, WA 98012
 - (b) 11615-20 Loader - Data, Portable, ARINC 615-3, Includes Mass
Storage Device (alternative)
Qualtair Equipment and Engineering (Vendor Code 1HEC2)
15720 Mill Creek Boulevard, Suite 200, Mill Creek, WA 98012
 - (c) 18000-02 Loader - Data, Portable, ARINC 615/A with Mass
Storage Device (alternative)
Qualtair Equipment and Engineering (Vendor Code 1HEC2)
15720 Mill Creek Boulevard, Suite 200, Mill Creek, WA 98012
 - (d) 2231560-1-B Loader - Data, Portable, ARINC 615, with Two 3.5
Inch Disk Drives (alternative)
Teledyne Controls (Vendor Code 98571)
12333 W. Olympic Blvd., Los Angeles, CA 90064-1021
 - (e) 30100 Loader - Data, Portable, ARINC 615, 3.5 Inch Diskette
(alternative)
Demo Systems, Inc. (Vendor Code OBAW0)
379 Science Dr., MoorPark, CA 93021
 - (f) 465130-01-01 Loader - Data, Portable, ARINC 615, 3.5 Inch
Diskette (alternative)
Litton Systems, Inc. (Vendor Code 30782)
6101 Condor Drive, Moorpark, CA 93021-2602
 - (g) 80000-03-01010203 Loader - Data, Portable, ARINC 615/A with
Mass Storage Device (alternative)
Demo Systems, Inc. (Vendor Code OBAW0)
379 Science Dr., MoorPark, CA 93021
 - (h) 964-0400-024 Loader - Data, Portable, ARINC 615, 3.5 Inch
Diskette (alternative)
Honeywell, Inc. (Vendor Code 97896)
15001 N.E. 36th St., P.O. Box 97001, Redmond WA 98073-9701
 - (i) 964-0400-025 Loader - Data, Portable, ARINC 615, 3.5 Inch
Diskette (alternative)
Honeywell, Inc. (Vendor Code 97896)
15001 N.E. 36th St., P.O. Box 97001, Redmond WA 98073-9701
 - (j) YV68A110 Loader - Data, Portable, ARINC 615 (alternative)
SFIM (Vendor Code F6158)
SA 13 AV Marcel Ramofo Garmier, Massy, 91301 France

D. Access

- (1) Location Zone
212 Flight Compartment - Right

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E. Procedure

S 862-010

- (1) Do this task: Supply Electrical Power (AMM 24-22-00/201).

S 412-011

- (2) Do these steps to prepare for the software installation:
- (a) Make sure you know the correct software part number for the FDAU. For the FDAU to be an approved installation, the correct software part number must be installed.
 - (b) Make sure the system select switch on the data loader control panel (P61) is set to NORM or NORMAL.

CAUTION: MAKE SURE THE DATA LOADER CIRCUIT BREAKER IS OPEN BEFORE YOU CONNECT OR REMOVE THE DATA LOADER CABLE. IF THE CIRCUIT BREAKER IS NOT OPEN, DAMAGE TO EQUIPMENT CAN OCCUR.

- (c) Open this circuit breaker and attach a DO-NOT-CLOSE tag:
- 1) Circuit Breaker Panel, P11 or P37:
 - a) 11F23, DATA LOADER

CAUTION: MAKE SURE THE POWER SWITCH FOR THE PORTABLE DATA LOADER IS SET TO OFF BEFORE YOU CONNECT OR REMOVE THE INTERFACE CABLE. IF THE POWER SWITCH IS NOT OFF, DAMAGE TO THE PORTABLE DATA LOADER CAN OCCUR.

- (d) Connect the interface cable of the portable data loader to the DATA TRANSFER UNIT RECEPTACLE on the P61 panel.
- (e) Remove the DO-NOT-CLOSE tag and close this circuit breaker:
 - 1) Circuit Breaker Panel, P11 or P37:
 - a) 11F23, DATA LOADER
- (f) AIRPLANES WITH ONE SWITCH ON THE DATA LOADER CONTROL PANEL (P61);
Set the system select switch on the data loader control panel to the applicable position.
 - 1) DFDAU position to install the mandatory FDAU software.
 - 2) ACMS position to install non-mandatory FDAU software.
- (g) AIRPLANES WITH TWO SWITCHES ON THE DATA LOADER CONTROL PANEL (P61);
Do these steps at the data loader control panel:
 - 1) Set the upper switch to SINGLE SYS.
 - 2) Set the system select switch to the applicable position:
 - a) DFDAU position to install the mandatory FDAU software
 - b) ACMS position to install the non-mandatory FDAU software

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S 022-012

- (3) SOFTWARE INSTALLATION WITH A PDL DISK DRIVE;
Do these steps to install the software:

NOTE: For more information on how to use the data loader, refer to the supplier's instructions for the data loader.

- (a) Set the power switch on the data loader to the on position.
- (b) Put the correct disk in the disk drive.
- (c) Follow the prompts on the data loader to complete the installation.
 - 1) If there is more than one disk to install, wait 10 seconds after each disk is completed before you remove and install the subsequent disk.

NOTE: CHNG, CHANGE DISK, DISK CHANGE, and INSERT DISK are examples of data loader prompts for subsequent disk.

- (d) Remove the disk from the disk drive when the software installation is completed.

NOTE: COMP, LOAD COMPLETE, and TRANSF COMPLETE are examples of the data loader prompts for a completed installation.

S 862-094

- (4) SOFTWARE INSTALLATION WITH A PDL MASS STORAGE DEVICE;
Follow the PDL supplier instructions to install the software.

S 862-013

- (5) Set the system select switch on the data loader control panel to NORM or NORMAL.

S 862-095

- (6) Set the power switch on the data loader to the off position.

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S 022-014

- (7) Do the task: DFDAU Software Configuration Check (AMM 31-31-03/201).

S 022-015

- (8) Do these steps to put the airplane back to its usual condition:

CAUTION: MAKE SURE THE DATA LOADER CIRCUIT BREAKER IS OPEN BEFORE YOU CONNECT OR REMOVE THE DATA LOADER CABLE. IF THE CIRCUIT BREAKER IS NOT OPEN, DAMAGE TO EQUIPMENT CAN OCCUR.

- (a) Open this circuit breaker and attach a DO-NOT-CLOSE tag:
 - 1) Circuit Breaker Panel, P11 or P37:
 - a) 11F23, DATA LOADER
- (b) Remove the interface cable from the DATA TRANSFER UNIT RECEPTACLE.
- (c) Remove the DO-NOT-CLOSE tag and close this circuit breaker:
 - 1) Circuit Breaker Panel, P11 or P37:
 - a) 11F23, DATA LOADER
- (d) Do this task: Remove Electrical Power (AMM 24-22-00/201).

TASK 31-31-03-402-160

5. GUI 010, 011 POST-SB 31-0094;

Flight Data Acquisition Unit (FDAU) Software Installation with the use of the AlliedSignal PCMCIA Interface

A. General

- (1) This procedure tells you how to install software in the flight data acquisition unit (FDAU) with the use of a personal computer memory card international association (PCMCIA) interface.
- (2) The FDAU must contain these pieces of software:
 - (a) Mandatory FDAU software
 - (b) ACMS non-mandatory FDAU software
- (3) The airplane must be on the ground with the engines shut down before you can install software.
- (4) Make sure you know the correct software part number for the FDAU. For the FDAU to be approved installation, the correct software part number must be installed.
- (5) To read about software installation times and data loaders, do this task: On-Airplane Software Installation (AMM 20-15-11/201).

B. Reference

- (1) AMM 20-15-11/201 On-Airplane Software Installation

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(2) AMM 24-22-00/201, Electrical Power Control

C. Access

- (1) Access Panel
119BL Main Equipment Center, E3-3

D. Procedure

S 862-017

- (1) Do this task: Supply Electrical Power (AMM 24-22-00/201).

S 012-018

- (2) Open the PCMCIA door on the front of the FDAU.

S 202-019

- (3) Make sure the PCMCIA slots are empty.

S 412-020

- (4) Install the load card into the left slot of the PCMCIA interface.
(a) Make sure the IN PROG LED light is ON.

NOTE: Do not remove the load card from the FDAU while the IN PROG LED is ON. This will cause the FDAU to abort the upload. The upload takes approximately 5 minutes.

- (b) Make sure the XFER COMP LED light comes on when the load is complete.

S 022-021

- (5) Push the eject button.

S 022-022

- (6) Remove the load card from the PCMCIA interface.

S 472-023

- (7) Move and release the ACMS/DFDAU switch to the applicable position:
(a) DFDAU position to display mandatory software configuration number.
(b) ACMS position to display non-mandatory software configuration number.
(c) Make sure the software part numbers show on the FDAU display.

NOTE: The part numbers will scroll across the display screen since the part numbers are 10 digits and the display screen is only an 8-digit field.

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S 862-024

- (8) Do this task: Remove Electrical Power (AMM 24-22-00/201).

TASK 31-31-03-402-170

6. GUI 010, 011 POST-SB 31-0094;

ACMS Data Output from the FDAU to an AlliedSignal PCMCIA Card

A. General

- (1) This procedure tells you how to make a copy of ACMS data onto a personal computer memory card international association (PCMCIA) card.
- (2) You must format the PCMCIA card with your applicable instructions before you can make a copy of the ACMS data.

B. Reference

- (1) AMM 24-22-00/201, Electrical Power Control

C. Access

- (1) Access Panel
119BL Main Equipment Center, E3-3

D. Procedure

S 862-026

- (1) Do this task: Supply Electrical Power (AMM 24-22-00/201).

S 012-027

- (2) Open the PCMCIA door on the front of the FDAU.

S 202-028

- (3) Make sure the PCMCIA slots are empty.
- (a) If the PCMCIA slots are not empty, make sure the IN PROG LED is off before you remove an existing card.

S 412-029

- (4) Install the load card into the left slot of the PCMCIA interface.

S 862-030

- (5) Make sure the IN PROG LED light comes on after approximately 5 seconds.

S 862-031

- (6) Make sure the XFER COMP LED does not blink at an approximately 1-second interval.

NOTE: This indicates that there is not sufficient space on the PCMCIA card. When this occurs, remove the PCMCIA card and install another PCMCIA card to complete the copy process.

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S 862-032

- (7) Make sure the XFER FAIL LED does not come on.

NOTE: This indicates that there is a failure during the copy process.

S 862-033

- (8) Make sure the IN PROG LED light goes out when the copy process is complete.

S 012-034

- (9) Push the eject button.

S 022-035

- (10) Remove the PCMCIA card.

S 862-036

- (11) Do this task: Remove Electrical Power (AMM 24-22-00/201).

EFFECTIVITY

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FLIGHT DATA ACQUISITION UNIT – SERVICING

1. General

A. This procedure has these tasks:

- (1) An installation of the ACMS application program software into the flight data acquisition unit (FDAU).

NOTE: The digital flight data acquisition unit (DFDAU) is referred to as the flight data acquisition unit (FDAU).

- (2) A replacement of the diskette in the FDAU.

TASK 31-31-03-403-022

2. Install the ACMS Application Program Software into the FDAU

A. References

- (1) AMM 24-22-00/201, Electrical Power Control

B. Access

- (1) Location Zone
119BL Main Equipment Center E3-3

C. Procedure

S 863-023

- (1) Open this circuit breaker and attach a DO-NOT-CLOSE tag:
 - (a) On the overhead equipment panel P11:
 - 1) 11J7, FLIGHT RECORDER AC

S 013-040

- (2) Open the diskette door on the side of the flight data acquisition unit (FDAU).

S 013-024

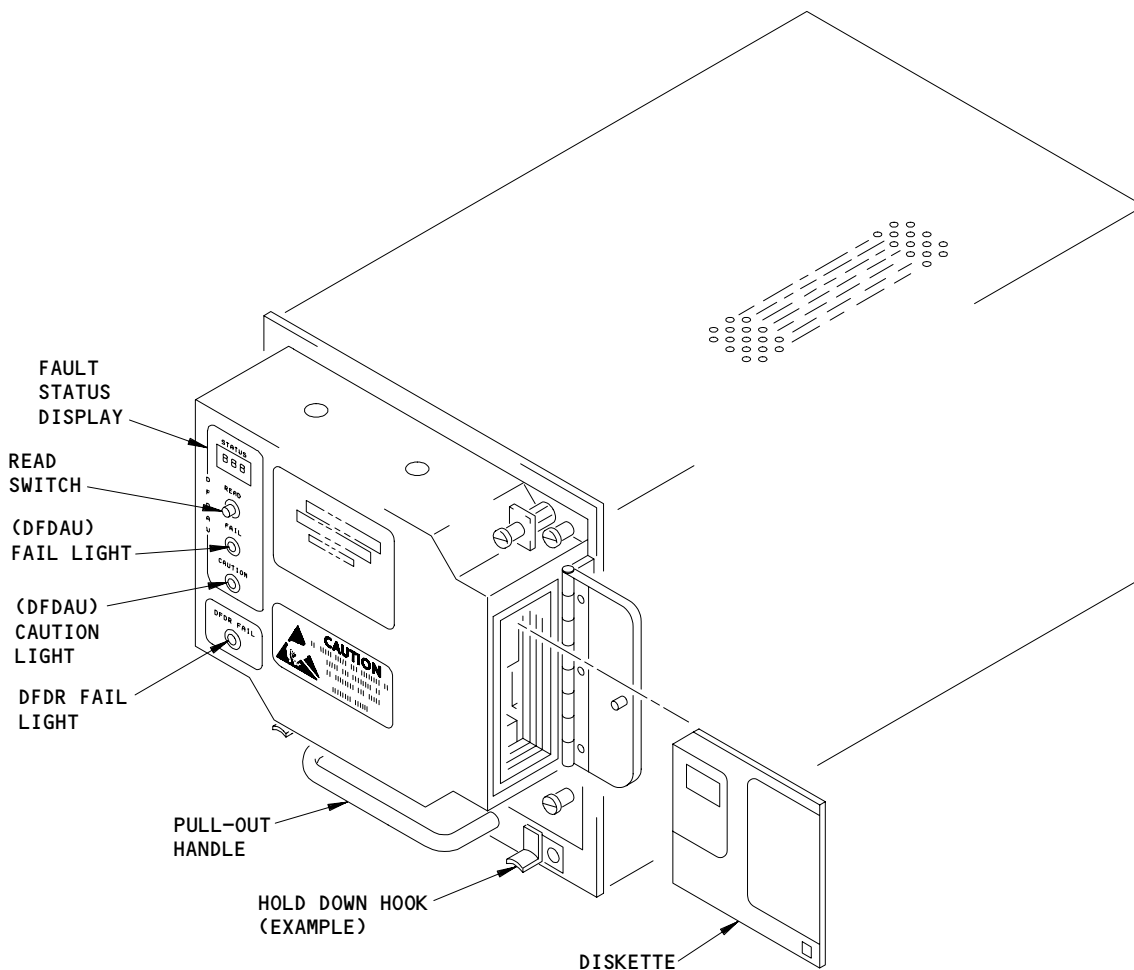
- (3) If the diskette door is blocked, do these steps:
 - (a) Loosen the screws on the top and bottom of the FDAU face.

NOTE: The face of the FDAU moves on hinges.

- (b) Pull the face of the FDAU forward to get access to the diskette door.
- (c) Loosen the screw on the diskette door.

EFFECTIVITY
GUI 010, 011 PRE-SB 31-0094;
GUI 001-009, 012-115

31-31-03



Digital Flight Data Acquisition Unit - Servicing
Figure 301

EFFECTIVITY
GUI 010, 011 PRE-SB 31-0094;
GUI 001-009, 012-115

31-31-03

(d) Open the diskette door.

S 013-025

(4) Push the eject button on the diskette drive.

S 013-026

(5) Remove the diskette from the diskette drive.

S 423-027

(6) Install the PROGRAM diskette.

(a) Make sure the enable/disable access hole on the PROGRAM diskette is opened.

NOTE: This is to make sure the PROGRAM diskette will not be written by the FDAU.

(b) Put the PROGRAM diskette into the diskette drive with the end that has the shutter that moves first.

S 863-028

(7) Remove the DO-NOT-CLOSE tag and close this circuit breaker:

(a) On the P11 panel:
1) 11J7, FLIGHT RECORDER AC

S 863-039

(8) Supply electrical power (AMM 24-22-00/201).

S 713-029

(9) Make sure this sequence occurs:

(a) The light on the diskette drive comes on.

NOTE: This shows that the software program is being installed into the random access memory (RAM) of the FDAU. It can take from three to five minutes to install the software.

(b) The light on the diskette drive goes out after 3 to 5 minutes.

NOTE: This shows that the software is installed into the RAM.

(c) The light on the diskette drive comes on after approximately 3 to 5 minutes.

S 713-030

(10) Push and hold the READ switch on the front panel of the FDAU.

(a) Make sure the code D0D shows in the STATUS display window.

NOTE: This shows that the program is moved from RAM into the Flash Memory.

EFFECTIVITY
GUI 010, 011 PRE-SB 31-0094;
GUI 001-009, 012-115

31-31-03

S 713-031

- (11) Release the READ switch.

S 013-032

- (12) Push the eject switch on the diskette drive.

S 013-033

- (13) Remove the PROGRAM diskette from the diskette drive.

S 423-034

- (14) Put a new data diskette into the diskette drive.
(a) Make sure the enable/disable access hole on the diskette is closed.

NOTE: This is to make sure data can be written onto the diskette.

- (b) Make sure the diskette has a DOS format, no volume label, no files, and no more than 12 bad sectors.

NOTE: If files were on the diskette, you must reformat the diskette. Do not use format options that save format recovery information ("safe formatting") or reserve space for system files on the diskette. Do not use the "quick" format options.

- (c) Make sure the light on the diskette drive is on or flashes several times.

S 413-035

- (15) Close the diskette door.

S 423-036

- (16) Tighten the screw on the diskette door.

S 413-037

- (17) If the face of the FDAU is open, do these steps:
(a) Close the face of the FDAU.
(b) Tighten the screws on the top and bottom of the FDAU face.

S 713-038

- (18) Push and hold the READ switch.
(a) Make sure the code XXX shows in the STATUS display window.

NOTE: This code is the CPU 2 software part number and it is shown on the PROGRAM diskette label. X is a hexadecimal number. If the CPU 2 code did not show, push the READ switch again.

EFFECTIVITY
GUI 010, 011 PRE-SB 31-0094;
GUI 001-009, 012-115

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TASK 31-31-03-963-006

3. Flight Data Acquisition Unit Diskette Replacement (Fig. 301)

A. General

- (1) The FDAU is in the main equipment center on shelf E3-3.
- (2) If the diskette is installed in the FDAU while the power is on, the FDAU will do a format of the diskette. The FDAU will erase all the data on the diskette.
- (3) When a diskette is in the FDAU and the power is off, then, when you supply power, these effects can occur:
 - (a) The FDAU will do a format of a new diskette.
 - (b) The FDAU will not do a format of a diskette that is already formatted. The FDAU will not erase the data on the diskette.

B. References

- (1) AMM 24-22-00/201, Electrical Power Control

C. Access

- (1) Location Zone
119BL Main Equipment Center E3-3

D. Procedure

S 863-008

CAUTION: OPEN THE FLIGHT RECORDER CIRCUIT BREAKERS BEFORE YOU REMOVE OR INSTALL A DISKETTE. THE FDAU WILL DO A FORMAT OF THE DISKETTE IF THE FDAU HAS POWER WHEN YOU REMOVE OR INSTALL THE DISKETTE. A FORMAT OF THE DISKETTE WILL ERASE ALL THE DATA ON THE DISKETTE.

- (1) Open these circuit breakers:
 - (a) On the overhead equipment panel P11:
 - 1) 11J7, FLIGHT RECORDER AC
 - 2) 11J8, FLIGHT RECORDER DC

S 023-004

- (2) Remove the diskette.
 - (a) Open the diskette door on the side of the FDAU.
 - 1) If the diskette door is blocked, do these steps:
 - a) Loosen the screws on the top and bottom of the FDAU face.

NOTE: The face of the FDAU moves on hinges.

EFFECTIVITY
GUI 010, 011 PRE-SB 31-0094;
GUI 001-009, 012-115

31-31-03

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MAINTENANCE MANUAL

- b) Pull the face of the FDAU forward to get access to the diskette door.
 - 2) Loosen the screw on the diskette door.
 - 3) Open the diskette door.
 - (b) Push the eject button on the diskette drive.
 - (c) Remove the diskette from the diskette drive.
- S 423-007
- (3) Install the diskette.
 - (a) Put a new diskette into the diskette drive.
 - (b) Push the diskette into the diskette drive until you feel a click.
 - (c) Close the diskette door.
 - (d) Tighten the screw on the diskette door.
 - (e) If the face of the FDAU is open, do these steps:
 - 1) Close the face of the FDAU.
 - 2) Tighten the screws on the top and bottom of the FDAU face.
- S 863-005
- (4) Close these circuit breakers:
 - (a) On the P11 panel:
 - 1) 11J7, FLIGHT RECORDER AC
 - 2) 11J8, FLIGHT RECORDER DC
- S 863-046
- (5) Remove electrical power if it is not necessary (AMM 24-22-00/201).

EFFECTIVITY
GUI 010, 011 PRE-SB 31-0094;
GUI 001-009, 012-115

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FLIGHT DATA ACQUISITION UNIT (FDAU) – REMOVAL/INSTALLATION

1. General

- A. This procedure has two tasks. The first task is the removal of the flight data acquisition unit (FDAU) and the second task is the installation of the FDAU.

NOTE: The digital flight data acquisition unit (DFDAU) is referred to as the flight data acquisition unit (FDAU).

- B. The FDAU (M138) is installed in the main equipment center, E3. All electrical connections are made through connectors at the rear of the unit.

TASK 31-31-03-004-026

2. Flight Data Acquisition Unit (FDAU) Removal

NOTE: The digital flight data acquisition unit (DFDAU) is referred to as the flight data acquisition unit (FDAU) in this task.

A. References

- (1) AMM 20-10-01/401, E/E Rack Mounted Components
- (2) AMM 20-41-01/201, Electrostatic Sensitive Devices

B. Access

- (1) Location Zones
119BL Main Equipment Center E3-3

C. Procedure

S 864-028

- (1) Open these overhead panel P11 circuit breakers and attach DO-NOT-CLOSE Tags:
 - (a) 11J7, FLIGHT RECORDER AC
 - (b) 11J8, FLIGHT RECORDER DC

S 864-041

CAUTION: DO NOT TOUCH THE CONNECTOR PINS OR OTHER CONDUCTORS ON THE FDAU. IF YOU TOUCH THESE CONDUCTORS, ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE FDAU.

- (2) Remove the FDAU from the E3-3 equipment rack (AMM 20-10-01/401).

TASK 31-31-03-404-025

3. Flight Data Acquisition Unit (FDAU) Installation

NOTE: The digital flight data acquisition unit (DFDAU) is referred to as the flight data acquisition unit (FDAU) in this task.

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A. References

- (1) AMM 20-10-01/401, E/E Rack Mounted Components
- (2) AMM 24-22-00/201, Electrical Power Control
- (3) AMM 31-31-03/201, Flight Data Acquisition Unit (FDAU) - Maintenance
- (4) AMM 31-31-03/301, Flight Data Acquisition Unit (FDAU) - Servicing

B. Access

- (1) Location Zone
119BL Main Equipment Center, E3-3

C. Procedure

S 864-039

- (1) Make sure these overhead P11 panel circuit breakers are open:
 - (a) 11J7, FLIGHT RECORDER AC
 - (b) 11J8, FLIGHT RECORDER DC

S 914-025

CAUTION: DO NOT TOUCH THE CONNECTOR PINS OR OTHER CONDUCTORS ON THE FDAU. IF YOU TOUCH THESE CONDUCTORS, ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE FDAU.

- (2) Install the FDAU to the E3-3 equipment rack (AMM 20-10-01/401).

D. FDAU Test

S 864-007

- (1) Remove the DO-NOT-CLOSE tags and close these P11 panel circuit breakers:
 - (a) 11J7, FLIGHT RECORDER AC
 - (b) 11J8, FLIGHT RECORDER DC

S 864-008

- (2) Supply the electrical power (AMM 24-22-00/201).

S 864-033

- (3) GUI 001-114;
Do the steps that follow:

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- (a) Make sure that the OFF light on the flight recorder control panel is on.
- (b) Set the function switch on the flight recorder control panel to the TEST position.
- (c) Make sure that the OFF light on the flight recorder control panel goes off.
- (d) Release the function switch on the flight recorder control panel.

S 704-027

- (4) GUI 115;
make sure that the DFDAU light on the DMEP is off.

S 864-042

- (5) Do this task: Install the application program into the FDAU task (AMM 31-31-03/301).

S 214-141

- (6) Do this task: Software Configuration check task (AMM 31-31-03/201).

S 864-024

- (7) Remove electrical power if it is not necessary (AMM 24-22-00/201).

EFFECTIVITY

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FLIGHT RECORDER CONTROL PANEL (FRCP) – REMOVAL/INSTALLATION

1. General

- A. Two tasks are provided in this procedure. The first task is the removal of the flight recorder control panel (FRCP) and the second task is the installation of the FRCP.
- B. The FRCP is installed on the right side panel P61.

TASK 31-31-04-004-001

2. Remove the FRCP

A. Access

- (1) Location Zone
212 Flight Compartment – section 41 (Right)

B. Procedure

S 864-002

- (1) Open these circuit breakers on the overhead circuit breaker panel, P11, and attach DO-NOT-CLOSE tags:
 - (a) 11C23, INTERPHONE CABIN SERVICE
 - (b) 11J7, FLIGHT RECORDER AC
 - (c) 11J8, FLIGHT RECORDER DC

S 034-003

- (2) Loosen the screws that hold the FRCP to the side panel.

S 864-004

- (3) Move the FRCP out of the side panel.

S 034-005

- (4) Disconnect the electrical connectors from the FRCP.

S 024-006

- (5) Remove the FRCP from the side panel.

TASK 31-31-04-404-007

3. Install the FRCP

A. References

- (1) AMM 23-41-00/501, Service Interphone
- (2) AMM 24-22-00/201, Electrical Power Control

B. Access

- (1) Location Zone
212 Flight Compartment – section 41 (Right)

C. Procedure

S 864-008

- (1) Make sure these circuit breakers are open:
 - (a) 11C23, INTERPHONE CABIN SERVICE
 - (b) 11J7, FLIGHT RECORDER AC
 - (c) 11J8, FLIGHT RECORDER DC

EFFECTIVITY
GUI 001-114

31-31-04

- S 434-009
- (2) Install the electrical connectors to the FRCP.
- S 864-010
- (3) Move the FRCP into the right side panel
- S 434-011
- (4) Tighten the screws that hold the FRCP to the side panel.
- S 864-012
- (5) Remove the DO-NOT-CLOSE tags and close these circuit breakers:
- (a) 11C23, INTERPHONE CABIN SERVICE
 - (b) 11J7, FLIGHT RECORDER AC
 - (c) 11J8, FLIGHT RECORDER DC
- D. FRCP Test
- S 864-013
- (1) Supply the electrical power (AMM 24-22-00/201).
- S 214-014
- (2) Make sure the OFF light on the FRCP is on.
- S 864-015
- (3) Momentarily set the function switch on the FRCP to the TEST position.
- S 214-016
- (4) Make sure the OFF light goes off.
- S 864-017
- (5) Set the SERV INTPH switch to the ON position.
- S 864-018
- (6) Make a service interphone voice communication from the audio selector panel to an exterior jack location (AMM 23-41-00/501).
- S 864-019
- (7) Set the SERV INTPH switch to the OFF position.
- S 864-020
- (8) Remove electrical power if it is not necessary (AMM 24-22-00/201).

FLIGHT RECORDER (3-AXIS) ACCELEROMETER – REMOVAL/INSTALLATION

1. General

- A. There are two tasks in this procedure. The first task is the removal of the accelerometer. The second task is the installation and testing of the accelerometer.
- B. The accelerometer is installed on a bracket attached to the inboard wall of the left main landing gear wheel well. The accelerometer measures the vertical, lateral, and longitudinal accelerations for input to the flight recorder system.

TASK 31-31-05-004-001

2. Remove the Accelerometer

A. References

- (1) AMM 32-00-15/201, Landing Gear Door Ground Operation and Locking Procedure
- (2) AMM 32-00-20/201, Landing Gear Downlocks

B. Access

- (1) Location Zone
731 Main Landing Gear

C. Procedure

S 864-002

- (1) Open these overhead panel P11 circuit breakers and attach DO-NOT-CLOSE tags:
 - (a) 11J7, FLIGHT RECORDER AC
 - (b) 11J8, FLIGHT RECORDER DC

S 834-003

- (2) Make sure the main gear downlock pins are installed (AMM 32-00-20/201).

S 494-032

WARNING: OBEY THE INSTALLATION PROCEDURE FOR THE DOOR LOCKS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (3) Open the doors for the landing gear and install the door locks (AMM 32-00-15/201).

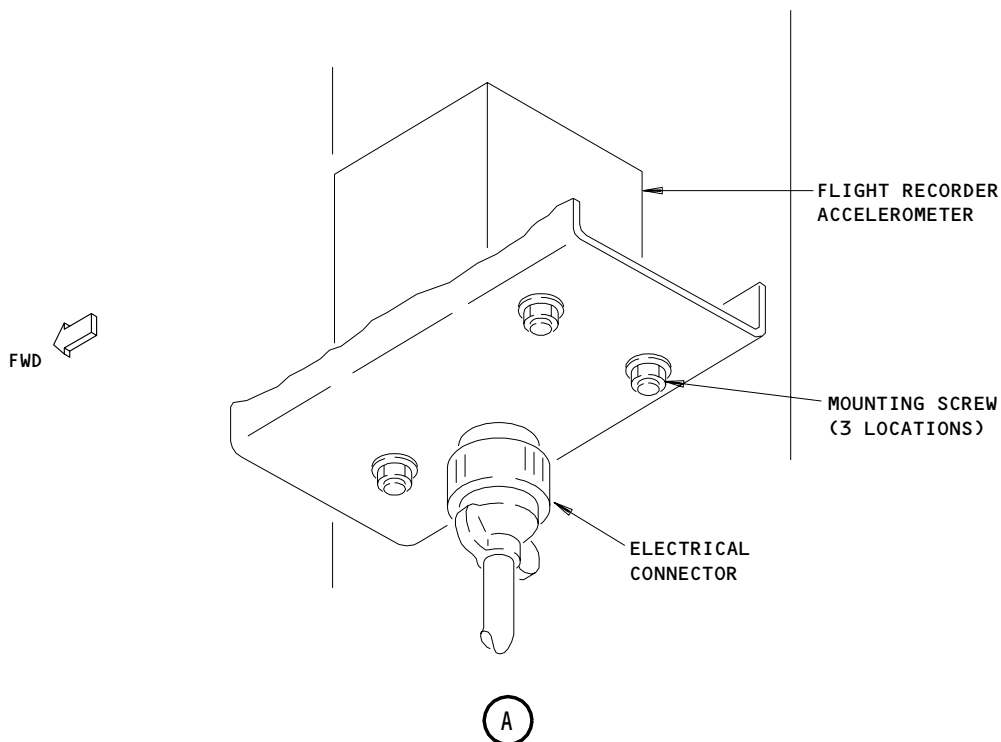
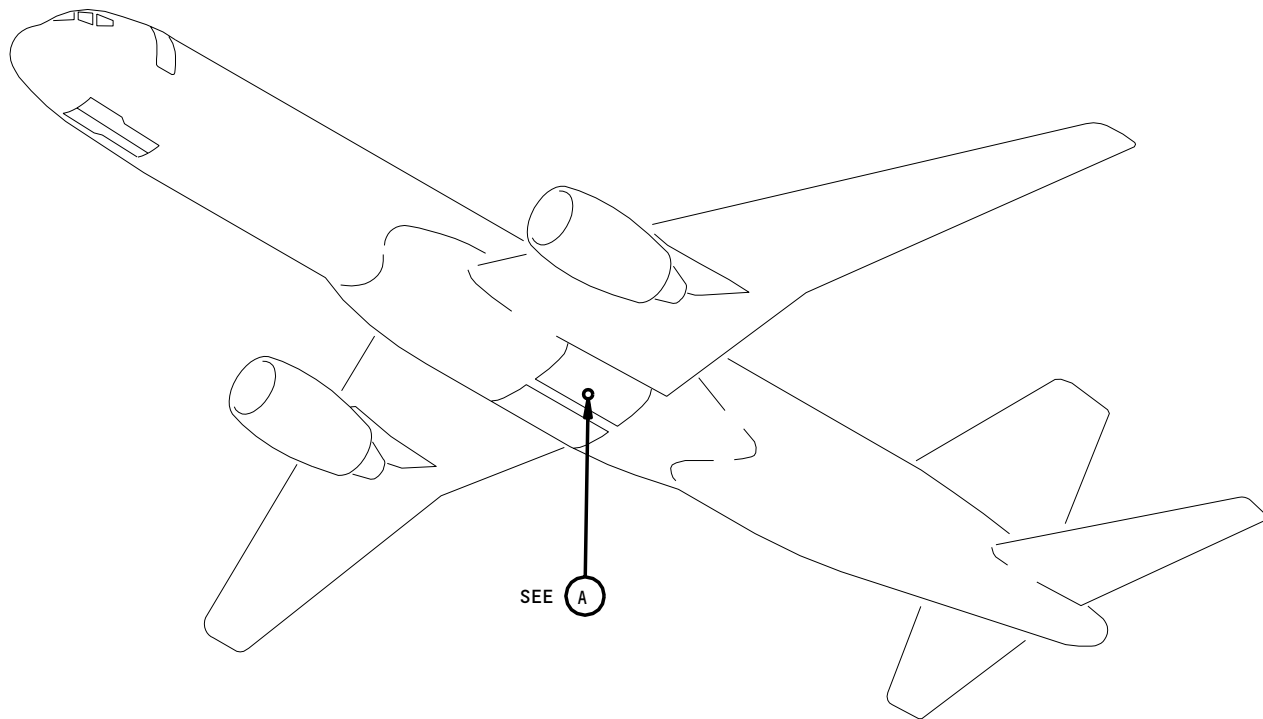
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Flight Recorder Accelerometer Installation
Figure 401

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- S 034-005
- (4) Disconnect the electrical cable from the accelerometer.
- S 024-006
- (5) Remove the screws from the accelerometer.
- S 034-007
- (6) Remove the accelerometer from the airplane.

TASK 31-31-05-404-008

3. Install Accelerometer (Fig. 401)

A. Equipment

- (1) 9540 System Test Panel (STP) - Hamilton
Standard 775419
Hamilton Standard Division
United Technologies
Bradley Field Road
Windsor Locks, CT 06096
- (2) 981-6301-002 Data Signal Display Unit (DSDU)
AlliedSignal Air Transport Avionics
P.O. Box 97001
15001 Northeast 36th Street
Redmond, WA 98073-9701
- (3) A31007-49 Adapter Cable - Tester (recommended)
A31007-30 Adapter Cable - Tester (alternative)
- (4) Portable Tester - Teledyne P/N 2222786
Teledyne Controls
12333 West Olympic Boulevard West
Los Angeles, CA 90064
- (5) A31007-1 Adapter Cable - Tester
- (6) Portable Tester - Teledyne P/N 2229738-1
Teledyne Controls
12333 West Olympic Boulevard West
Los Angeles, CA 90064
- (7) A31007-59 Adapter Cable - Tester
- (8) 964-0446-001 Hand Held Download Unit (HHDLU)
27914 AlliedSignal Inc., DBA AlliedSignal Aerospace
2100 Northwest 62nd Street
Fort Lauderdale, FL 33309
 - (a) AIRPLANES WITH FDR P/N 980-4700-042;
The HHDLU must have mod 1 completed.
- (9) 704-2567-001 Adapter Cable - Tester
- (10) Multi-Purpose AIDS Display Units - AACO Inc.
FAA-0032-001
AACO Inc.
5011 Barton Place
Seattle, WA 98118
- (11) EGA-0005-001, Adapter Cable - MADU

B. References

- (1) AMM 24-22-00/201, Electrical Power

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- (2) AMM 32-00-15/201, Landing Gear Door Ground Operation and Locking Procedure
- (3) AMM 32-00-20/201, Landing Gear Downlocks

C. Access

- (1) Location Zone
731 Main Landing Gear

D. Procedure

S 864-009

- (1) Make sure these circuit breakers on the P11 panel are open:
 - (a) 11J7, FLIGHT RECORDER AC
 - (b) 11J8, FLIGHT RECORDER DC

S 424-010

- (2) Install the accelerometer to the mounting bracket.

S 434-011

- (3) Connect the electrical cable to the accelerometer.

S 494-033

WARNING: OBEY THE INSTALLATION PROCEDURE FOR THE DOOR LOCKS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (4) Remove the door locks from the landing gear doors and close the doors (AMM 32-00-15/201).

E. Accelerometer Test

S 864-083

- (1) If you use test equipment other than the hand-held download unit (HHDLU), install the tester to the test connector at the right side panel, P61.

S 864-084

- (2) If you use the hand-held download unit (HHDLU), attach the HHDLU to the test connector at the front side of the flight data recorder.

NOTE: To get access to the FDR, open the lower ceiling panel No. 1 above the aft galley (AMM 25-22-02/401). The HHDLU can only be connected to the AlliedSignal flight data recorder (FDR).

S 864-015

- (3) Remove DO-NOT-CLOSE tags and close the P11 panel circuit breakers:
 - (a) 11J7, FLIGHT RECORDER AC
 - (b) 11J8, FLIGHT RECORDER DC

S 864-016

- (4) Supply electrical power (AMM 24-22-00/201).

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NOTE: These tasks use the word SUBFRAME 0, 5, or 6 to make a selection of a parameter. Some portable testers or on board test equipment do not have a switch position for SUBFRAME 0, 5, or 6. On these test sets, make a selection of SUBFRAMES as follow:

For SUBFRAME 0, use SUBFRAME 1, 2, 3, and 4.

For SUBFRAME 5, use SUBFRAME 1 and 3.

For SUBFRAME 6, use SUBFRAME 2 and 4.

S 864-085

- (5) With the Data Signal Display Unit (DSDU), set the control switches on the tester as follows:
- (a) Set the power switch to the ON position.
 - (b) Set the INPUT switch to the ARINC INPUT DATA position.
 - (c) Set the SYNC switch to the SYNC B position.
 - (d) Set the DATA PARAMETER/DOCUMENTARY switch to the DATA PARAMETER position.
 - (e) Set the OCTAL DISPLAY switch to the 12 BIT position.
 - (f) Set the SUBFRAME and WORD as specified.
 - (g) With the STP tester, set the control switches on the tester as follows:
 - 1) Set the ON/OFF switch to the ON position.
 - 2) Push the SYS TEST switch and make sure there is no failure message on the tester display.
 - 3) Push the CLR switch.
 - 4) Push the FDAU switch.
 - 5) Set the UPDATE switch to the AUTO position.
 - 6) Set the data switch to the 12 BIT position.
 - 7) Set the SUBFRAME and WORD as specified.

S 864-086

- (6) With the Teledyne tester (P/N 2222786), set the switches on the tester as follows:
- (a) Set the POWER switch to the ON position.
 - (b) Set the READOUT switch to the ACTF DATA position.
 - (c) Set the UPDATE switch to the AUTO position.
 - (d) Set the DFDAU/DFDR DATA SELECTOR switch to the DFDAU position.
 - (e) Set the DATA switch to the 12 BIT position.
 - (f) Set the SUBFRAME and WORD as specified.

S 864-087

- (7) With the Teledyne tester (P/N 2229738), set the switches on the tester as follows:
- (a) Push the CLR switch two or three times to clear all inputs.
 - (b) Push the DFDR switch and then the ENT switch.
 - (c) Set the SUBFRAME and WORD as specified.

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S 864-088

- (8) With the hand-held download unit (HHDLU), do the steps that follow:

NOTE: These steps are for airplanes equipped with AlliedSignal FDR only.

- (a) On the flight recorder control panel (FRCP), set the function switch to the ON position.
- (b) Push the red button on top of the HHDLU.
- (c) Set the DSDU switch.
- (d) Set the word number to WRD1, WRD2, or WRD3.
- (e) Set the BASE switch.
- (f) In the BASE SELECT menu, set OCT for octal values.
- (g) Set the SUBFRAME and WORD as specified.

S 864-089

- (9) With the MADU, set the switches as follows:

- (a) Set the power switch to the ON position.
- (b) Push the FUN switch, then enter the number 5 to set the LRU A on the tester.
- (c) Push the DATA switch, then the number 03 to set the DFDAU-H on the tester.
- (d) Push the FUN switch, then the number 03 for SUBFRAME.
- (e) Set a subframe (1 thru 4) on the keyboard switch.
- (f) Push the DATA switch, then the number 04 for WORD.
- (g) Set a word (1 thru 64) on the keyboard.
- (h) Push the FUN switch, then the number 02 to set the FORMAT field on the tester.
- (i) Push the number 02 to set the OCTAL 10 on the tester.
- (j) Set the SUBFRAME and WORD as specified.

S 864-060

- (10) GUI 115;
Set the SUBFRAME to 0 and the WORD to 50.

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(a) Make sure the tester display is between 3442 and 3706.

S 864-072

(11) GUI 001-114;

Set the SUBFRAME 0 and the WORD to 2.

(a) Make sure the tester display is between 3442 and 3706.

F. Put the airplane back to the usual condition.

S 864-090

(1) If you used the HHDLU, do the steps that follow:

(a) Set the function switch on the flight recorder control panel to the NORM position.

(b) Push the red button on top of the HHDLU.

(c) Remove the HHDLU adapter cable from the flight data recorder.

(d) Install the test plug to the test connector at the flight data recorder.

S 864-091

(2) If you used test equipment other than the HHDLU, do the steps that follow:

(a) Turn the tester off.

(b) Open these P11 panel circuit breakers:

1) 11J7, FLIGHT RECORDER AC

2) 11J8, FLIGHT RECORDER DC

(c) Disconnect the tester from the right side of the P61 panel.

(d) Install the test plug to the test connector at the P61 panel.

(e) Close these P11 panel circuit breakers:

1) 11J7, FLIGHT RECORDER AC

2) 11J8, FLIGHT RECORDER DC

S 864-046

(3) Remove electrical power if it is not necessary (AMM 24-22-00/201).

EFFECTIVITY

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DATA MANAGEMENT ENTRY PANEL - REMOVAL/INSTALLATION

1. General

- A. Two tasks are provided in this procedure. The first task is the removal of the Data Management Entry Panel (DMEP) and the second task is the installation of the DMEP. The DMEP is installed on the right side panel P61.

TASK 31-31-06-004-001

2. Remove the DMEP

A. Access

- (1) Location Zone
212 Flight Compartment - section 41 (Right)

B. Procedure

S 864-003

- (1) Open these overhead panel P11 circuit breakers and attach DO-NOT-CLOSE tags:
(a) 11J7, FLIGHT RECORDER AC
(b) 11J8, FLIGHT RECORDER DC

S 034-006

- (2) Loosen the screws that hold the DMEP to the P61 panel.

S 914-042

CAUTION: DO NOT TOUCH THE CONNECTOR PINS OR OTHER CONDUCTORS ON THE DMEP. IF YOU TOUCH THESE CONDUCTORS, ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE DMEP.

- (3) Carefully move the DMEP out of the right side panel.

S 034-010

- (4) Disconnect the electrical connector from the rear of the DMEP.

S 024-012

- (5) Remove the DMEP from the right side panel.

EFFECTIVITY
GUI 115

31-31-06

03

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TASK 31-31-06-404-014

3. Install the DMEP

A. References

- (1) AMM 24-22-00/201, Electrical Power - Control

B. Access

- (1) Location Zone
212 Flight Compartment - section 41 (Right)

C. Procedure

S 864-016

- (1) Make sure these overhead P11 panel circuit breaker are open:
(a) 11J7, FLIGHT RECORDER AC
(b) 11J8, FLIGHT RECORDER DC

S 914-040

CAUTION: DO NOT TOUCH THE CONNECTOR PINS OR OTHER CONDUCTORS ON THE DMEP. IF YOU TOUCH THESE CONDUCTORS, ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE DMEP.

- (2) Install the electrical connector to the rear of the DMEP.

S 424-020

- (3) Install the DMEP in the right side panel.

S 864-023

- (4) Remove DO-NOT-CLOSE tags and close these P11 panel circuit breakers:
(a) 11J7, FLIGHT RECORDER AC
(b) 11J8, FLIGHT RECORDER DC

D. DMEP Test

S 864-024

- (1) Supply the electrical power (AMM 24-22-00/201).

S 214-032

- (2) Make sure the DFDR indicator on the DMEP is on.

- S 864-034
- (3) Momentarily set the function switch on the DMEP to the DFDR position.
- S 704-036
- (4) Make sure the DFDR indicator goes off.
- S 864-038
- (5) Remove electrical power if it is not necessary.

EFFECTIVITY
GUI 115

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02

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CONTROL COLUMN POSITION TRANSDUCER – REMOVAL/INSTALLATION

1. General

- A. There are two tasks in this procedure. The first task is the removal of the control column position transducer. The second task is the installation of the control column position transducer.
- B. The control column position transducer is installed on the pilot's column torque tube.

TASK 31-31-08-004-001

2. Control Column Position Transducer Removal (Fig. 401)

A. Equipment

- (1) B20003-XX Rig Pin Set (AMM 20-10-24/201)
 - (a) Rig Pin E/ST6

B. References

- (1) AMM 20-10-24/201, Rig Pins
- (2) AMM 29-11-00/201, Main (Left, Right, and Center) Hydraulic Systems

C. Access

- (1) Location Zone
113 Area forward of NLG wheel well (left)

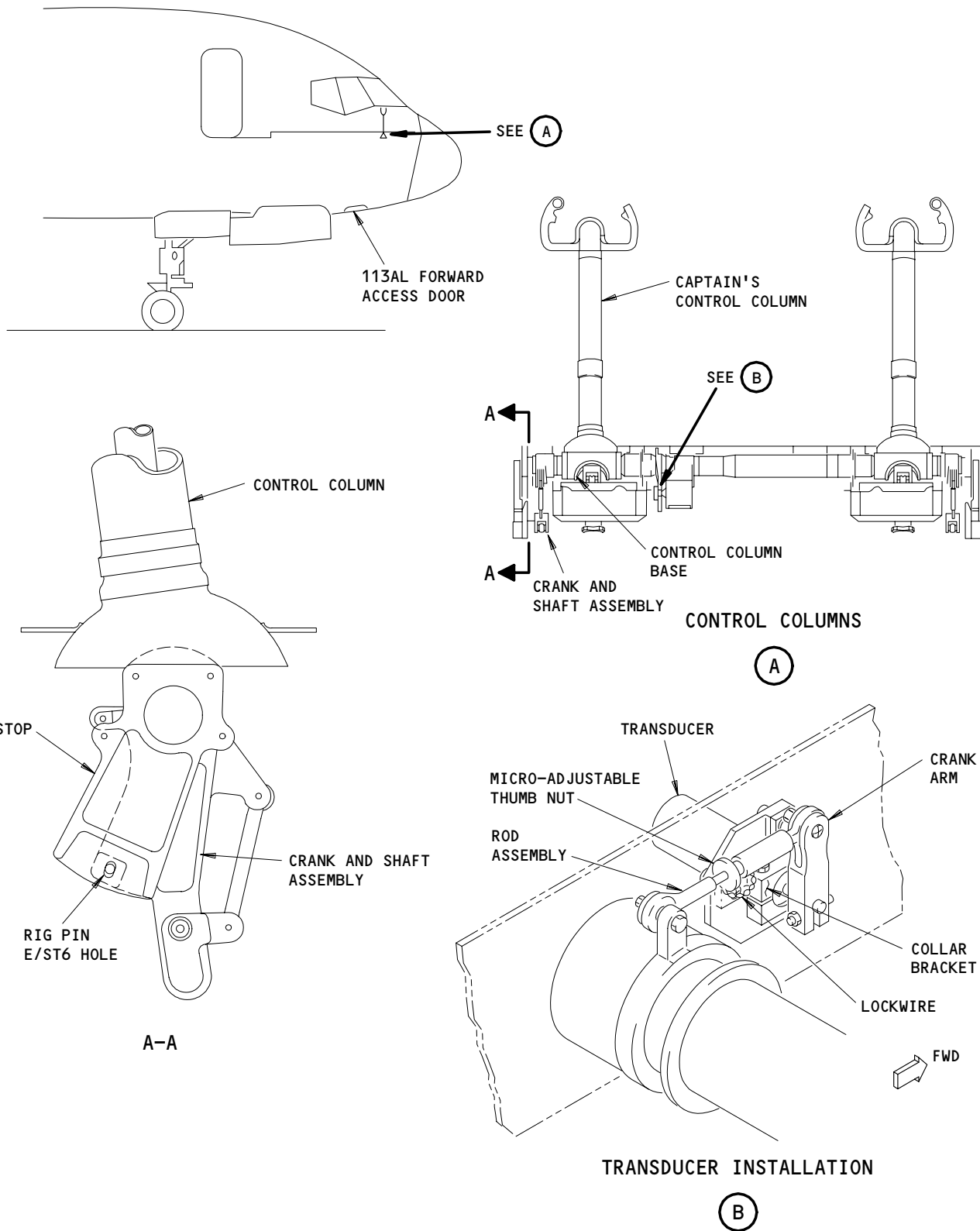
D. Prepare for Removal

S 864-002

- (1) Open these circuit breakers on the overhead circuit breaker panel, P11, and attach DO-NOT-CLOSE tags:
 - (a) 11C11, STICK SHAKER LEFT
 - (b) 11E17, FLT CONT COMPUTER POWER LEFT
 - (c) 11E20, FLT CONT COMPUTER PWR CENTER
 - (d) 11E35, FLT CONT COMPUTER PWR RIGHT
 - (e) 11H11, STAB TRIM CONT L
 - (f) 11H17, FLT CONT SHUTOFF TAIL LEFT
 - (g) 11H18, FLT CONT SHUTOFF TAIL CENTER
 - (h) 11H20, STAB TRIM CONT RIGHT
 - (i) 11H28, FLT CONT SHUTOFF TAIL RIGHT

EFFECTIVITY
GUI 001-011

31-31-08



Control Column Position Transducer Installation
Figure 401

EFFECTIVITY
GUI 001-011

31-31-08

- (j) 11J7, FLIGHT RECORDER AC
- (k) 11J8, FLIGHT RECORDER DC
- (l) 11J21, STICK SHAKER RIGHT
- (m) 11S1, AIDS SENSOR

S 864-003

- (2) Remove the power from the left, right, and center hydraulic systems (AMM 29-11-00/201).

S 864-004

- (3) Set the control column in the neutral position and attach DO-NOT-OPERATE tags to the two control wheels.

S 434-005

- (4) Install the rig pin E/ST6 into the crank and shaft assembly on the control column (AMM 20-10-24/201).

E. Procedure

S 034-006

- (1) Disconnect the control column position transducer electrical connector.

S 034-007

- (2) Remove the screw from the crank arm assembly that holds the serrated shaft of the transducer.

S 034-008

- (3) Remove the screw from the collar bracket that holds the transducer in position.

S 024-009

- (4) Remove the transducer from the collar bracket.

TASK 31-31-08-404-034

3. Control Column Position Transducer Installation (Fig. 401)

A. Equipment

- (1) 981-6301-002 Data Signal Display Unit (DSDU)
Alliedsignal Air Transport Avionics
P.O. BOX 97001
15001 NE 36TH ST
Redmond, WA 98073-9701

EFFECTIVITY
GUI 001-011

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 **BOEING**
757
MAINTENANCE MANUAL

- (2) A31007-49 Adapter Cable - Tester (recommended)
A31007-30 Adapter Cable - Tester (alternative)
- (3) Portable Tester - Teledyne P/N 2222786
Teledyne Controls
12333 West Olympic Boulevard West
Los Angeles, CA 90064
- (4) A31007-1 Adapter Cable - Tester
- (5) Portable Tester - Teledyne P/N 2229738-1
Teledyne Controls
12333 West Olympic Boulevard West
Los Angeles, CA 90064
- (6) A31007-59 Adapter Cable - Tester
- (7) 964-0446-001 Hand Held Download Unit (HHDLU)
27914 Allied-Signal Inc., DBA Allied-Signal Aerospace
2100 Northwest 62nd Street
Fort Lauderdale, FL 33309
(a) AIRPLANES WITH FDR P/N 980-4700-042;
The HHDLU must have mod 1 completed.
- (8) 704-2567-001 Adapter Cable - Tester
- (9) Multi-Purpose AIDS Display Units - AACO Inc.
FAA-0032-001
AACO Inc.
5011 Barton Place
Seattle, WA 98118
- (10) EGA-005-001, Adapter Cable - MADU

B. References

- (1) AMM 20-10-23/401, Lockwire
- (2) AMM 20-10-24/201, Rig Pins
- (3) AMM 24-22-00/201, Electrical Power Control
- (4) AMM 29-11-00/201, Main (Left, Right, and Center) Hydraulic Systems

C. Access

- (1) Location Zone
113 Area forward of NLG wheel well (left)

D. Procedure

- S 214-010
 - (1) Make sure the control column is in the neutral position.
- S 434-011
 - (2) Install the control column position transducer into the collar bracket.
- S 204-035
 - (3) Make sure the transducer mark EZ is align with the collar bracket mark.
- S 434-012
 - (4) Install and tighten the screw to the collar bracket.

EFFECTIVITY
GUI 001-011

31-31-08

- S 434-013
- (5) Install the crank arm into the transducer.
- S 434-014
- (6) Align the crank arm slot with the index mark on the transducer's serrated shaft.
- S 434-015
- (7) Install and tighten the screw that holds the crank arm.
- S 434-016
- (8) Connect the electrical connector to the transducer.
- S 034-017
- (9) Remove the rig pin E/ST6 from the crank and shaft assembly on the control column.

E. Control Column Position Transducer Test

- S 864-058
- (1) If you use test equipment other than the hand-held download unit (HHDLU), install the tester to the test connector at the right side panel, P61.
- S 864-059
- (2) If you use the hand-held download unit (HHDLU), attach the HHDLU to the test connector at the front side of the flight data recorder.

NOTE: To get access to the FDR, open the lower ceiling panel No. 1 above the aft galley (AMM 25-22-02/401). The HHDLU can only be connected to the AlliedSignal flight data recorder (FDR).

- S 864-019
- (3) Supply electrical power (AMM 24-22-00/201).

- S 864-020
- (4) Remove the DO-NOT-CLOSE tags and close these P11 panel circuit breakers :
- (a) 11C11, STICK SHAKER LEFT
 - (b) 11E17, FLT CONT COMPUTER POWER LEFT
 - (c) 11E20, FLT CONT COMPUTER PWR CENTER
 - (d) 11E35, FLT CONT COMPUTER PWR RIGHT
 - (e) 11H11, STAB TRIM CONT L
 - (f) 11H17, FLT CONT SHUTOFF TAIL LEFT
 - (g) 11H18, FLT CONT SHUTOFF TAIL CENTER
 - (h) 11H20, STAB TRIM CONT RIGHT
 - (i) 11H28, FLT CONT SHUTOFF TAIL RIGHT
 - (j) 11J7, FLIGHT RECORDER AC
 - (k) 11J8, FLIGHT RECORDER DC
 - (l) 11J21, STICK SHAKER RIGHT

EFFECTIVITY
GUI 001-011

31-31-08

(m) 11S1, AIDS SENSOR

S 864-021

- (5) Remove the DO-NOT-OPERATE tags and push the L, C, and R FLT CONTROL SHUTOFF switches to the on position.

NOTE: These tasks use the word SUBFRAME 0, 5, or 6 to make a selection of a parameter. Some portable testers or on board test equipment do not have a switch position for SUBFRAME 0, 5, or 6. On these test sets, make a selection of SUBFRAMES as follow:

- For SUBFRAME 0, use SUBFRAME 1, 2, 3, and 4.
- For SUBFRAME 5, use SUBFRAME 1 and 3.
- For SUBFRAME 6, use SUBFRAME 2 and 4.

S 864-060

- (6) With the Data Signal Display Unit (DSDU), set the control switches on the tester as follows:
- (a) Set the power switch to the ON position.
 - (b) Set the INPUT switch to the ARINC INPUT DATA position.
 - (c) Set the SYNC switch to the SYNC B position.
 - (d) Set the DATA PARAMETER/DOCUMENTARY switch to the DATA PARAMETER position.
 - (e) Set the OCTAL DISPLAY switch to the 12 BIT position.
 - (f) Set the SUBFRAME and WORD as specified.

S 864-061

- (7) With the Teledyne tester (P/N 2222786), set the switches on the tester as follows:
- (a) Set the POWER switch to the ON position.
 - (b) Set the READOUT switch to the ACTF DATA position.
 - (c) Set the UPDATE switch to the AUTO position.
 - (d) Set the DFDAU/DFDR DATA SELECTOR switch to the DFDAU position.
 - (e) Set the DATA switch to the 12 BIT position.
 - (f) Set the SUBFRAME and WORD as specified.

S 864-062

- (8) With the Teledyne tester (P/N 2229738), set the switches on the tester as follows:
- (a) Push the CLR switch two or three times to clear all inputs.
 - (b) Push the DFDR switch and then the ENT switch.
 - (c) Set the SUBFRAME and WORD as specified.

S 864-063

- (9) With the hand-held download unit (HHDLU), do the steps that follow:

NOTE: These steps are for airplanes equipped with AlliedSignal FDR only.

- (a) On the flight recorder control panel (FRCP), set the function switch to the ON position.
- (b) Push the red button on top of the HHDLU.
- (c) Set the DSDU switch.
- (d) Set the word number to WRD1, WRD2, or WRD3.
- (e) Set the BASE switch.
- (f) In the BASE SELECT menu, set OCT for octal values.
- (g) Set the SUBFRAME and WORD as specified.

S 864-066

- (10) With the MADU, set the switches as follows:

- (a) Set the power switch to the ON position.
- (b) Push the FUN switch, then enter the number 5 to set the LRU A on the tester.
- (c) Push the DATA switch, then the number 03 to set the DFDAU-H on the tester.
- (d) Push the FUN switch, then the number 03 for SUBFRAME.
- (e) Push the desired subframe (1 thru 4) on the keyboard switch.
- (f) Push the DATA switch, then the number 04 for WORD.
- (g) Push the desired word (1 thru 64) on the keyboard.
- (h) Push the FUN switch, then the number 02 to set the FORMAT field on the tester.
- (i) Push the number 02 to set the OCTAL 10 on the tester.
- (j) Set the SUBFRAME and WORD as specified.

S 864-153

- (11) GUI 010, 011 PRE-SB 31-0094;
GUI 001-009;
On the tester, set the SUBFRAME to 0 and the WORD to 21.

S 864-152

- (12) GUI 010, 011 POST-SB 31-0094;
On the tester, set the SUBFRAME to 0 and the WORD to 101.

S 864-024

- (13) For the captain's control column, move the control column to the full forward position.

S 204-041

- (14) Make sure the tester display shows between 7253 and 7616.

S 864-026

- (15) For the captain's control column, move the control column to the full aft position.

EFFECTIVITY
GUI 001-011

31-31-08

S 204-049

- (16) Make sure the tester display shows between 0315 and 0661.

S 864-028

- (17) If the tester display is not in tolerance, do the steps that follow:
- (a) Remove the lockwire from the thumbnut and the rod end assembly.
 - (b) Adjust the rod length with the micro-adjustable thumbnut to get the correct value on the tester display.
 - (c) Install the lockwire the the thumb nut and the rod end assembly (AMM 20-10-23/401).

F. Put the Airplane Back to its Usual Condition.

S 864-064

- (1) If you used the HHDLU, do the steps that follow:
- (a) Set the function switch on the flight recorder control panel to the NORM position.
 - (b) Push the red button on top of the HHDLU.
 - (c) Remove the HHDLU adapter cable from the flight data recorder.
 - (d) Install the test plug to the test connector at the flight data recorder.

S 864-065

- (2) If you used test equipment other than the HHDLU, do the steps that follow:
- (a) Turn the tester off.
 - (b) Open these P11 panel circuit breakers:
 - 1) 11J7, FLIGHT RECORDER AC
 - 2) 11J8, FLIGHT RECORDER DC
 - (c) Disconnect the tester from the right side of the P61 panel.
 - (d) Install the test plug to the test connector at the P61 panel.
 - (e) Close these P11 panel circuit breakers:
 - 1) 11J7, FLIGHT RECORDER AC
 - 2) 11J8, FLIGHT RECORDER DC

S 864-033

- (3) Remove electrical power if it is not necessary (AMM 24-22-00/201).

CONTROL WHEEL POSITION TRANSDUCER – REMOVAL/INSTALLATION

1. General

- A. There are two tasks in this procedure. The first task is the removal of the control wheel position transducer. The second task is the installation of the control wheel position transducer.
- B. The transducer is installed on the aileron control drum assembly.

TASK 31-31-09-004-141

2. Remove the Control Wheel Position Transducer (Fig. 401 and 402)

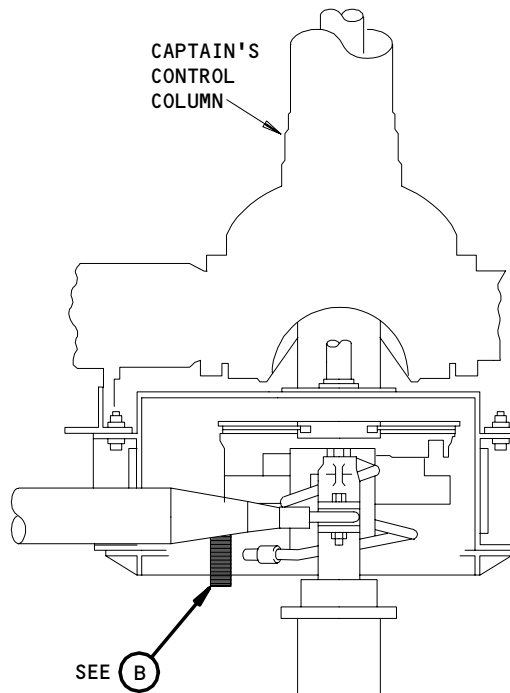
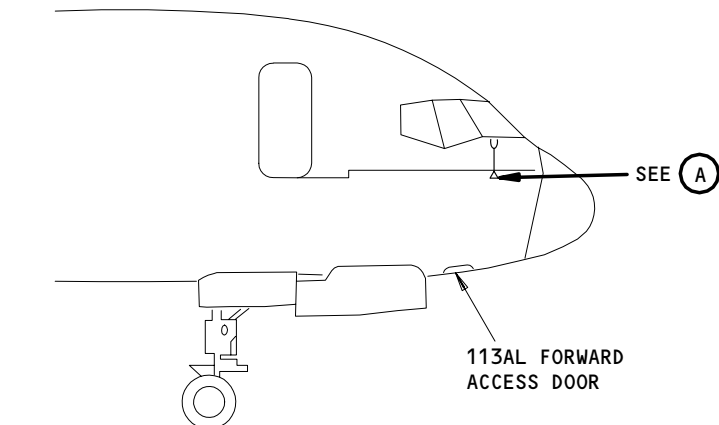
- A. Equipment
 - (1) B27049-1 Control Wheels Rigging Beam
- B. References
 - (1) AMM 20-10-24/201, Rig Pins
- C. Access
 - (1) Location Zone
113 Area forward of NLG wheel well (left)

D. Procedure

- S 864-002
 - (1) Open these circuit breakers on the overhead circuit panel, P11, and attach DO-NOT-CLOSE tags:
 - (a) 11J7, FLIGHT RECORDER AC
 - (b) 11J8, FLIGHT RECORDER DC
 - (c) 11S1, AIDS SENSOR
- S 864-003
 - (2) Set the captain's and the first officer's control wheel in the neutral position.
- S 434-004
 - (3) Install the rig beam across the lower surface of each control wheel (AMM 20-10-24/201).
- S 434-031
 - (4) Tighten the clamp on the rig beam.
- S 034-005
 - (5) Disconnect the transducer electrical connector.

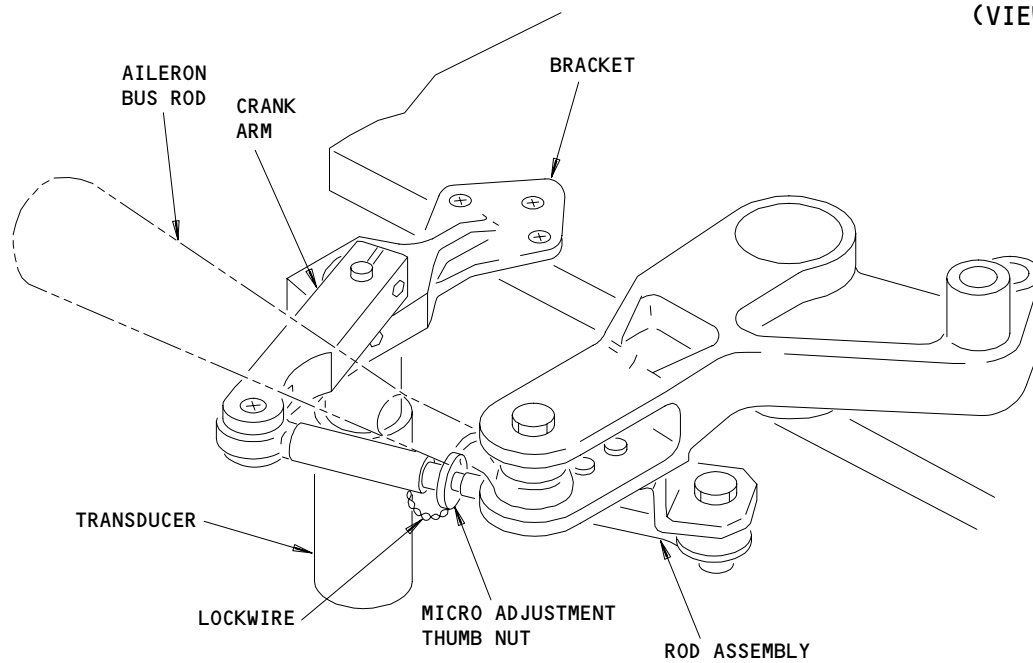
EFFECTIVITY
GUI 001-011

31-31-09



AILERON CONTROL DRUMS
(VIEW LOOKING AFT)

(A)



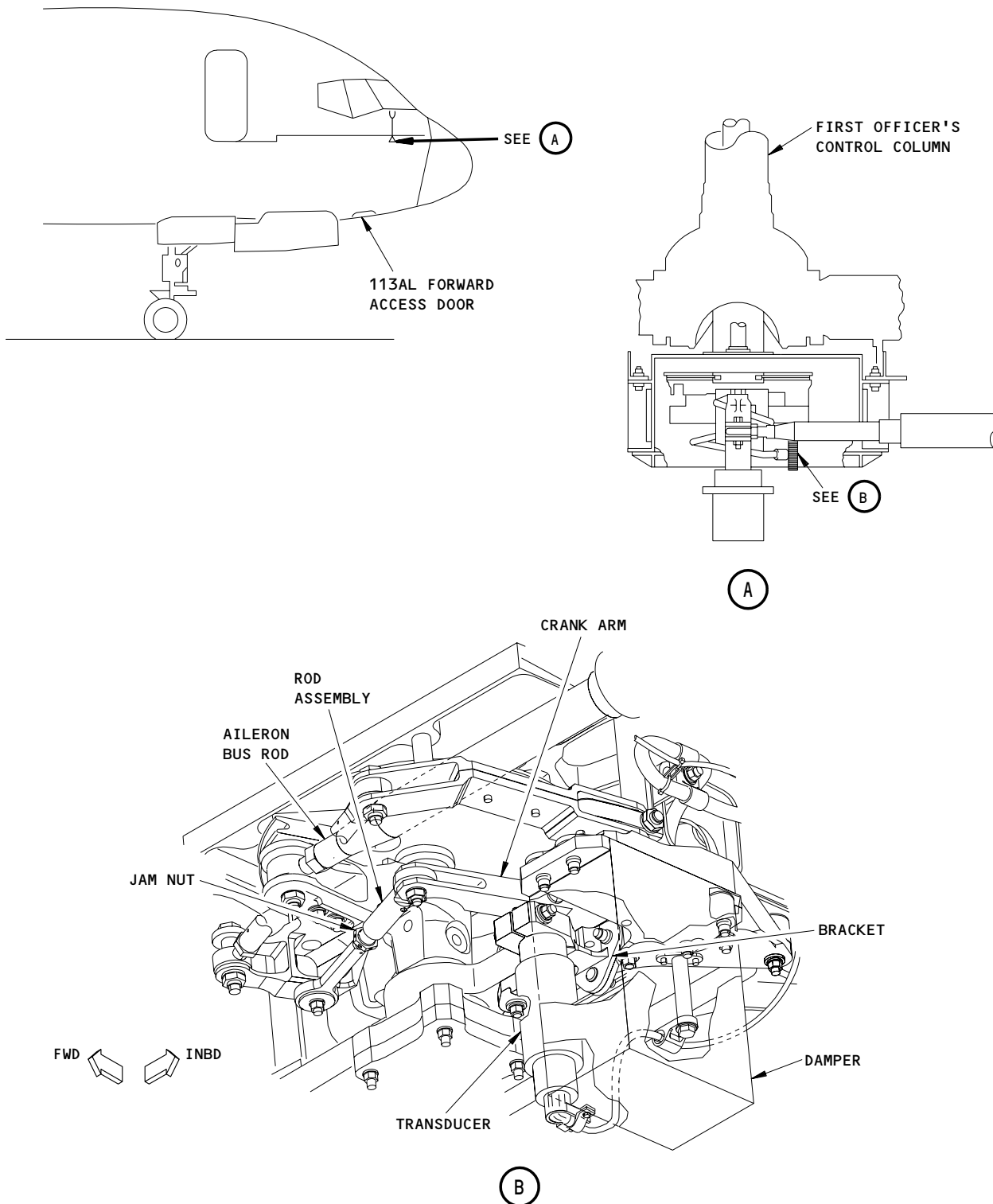
TRANSDUCER INSTALLATION

(B)

Control Wheel Position Transducer Installation
Figure 401

EFFECTIVITY
GUI 001-011

31-31-09



Control Wheel Position Transducer Installation
Figure 402

EFFECTIVITY
AIRPLANES WITH CONTROL WHEEL DAMPER
(POST S.B. 27A0146)

31-31-09

- S 034-033
- (6) Remove the screw from the crank arm near the serrated shaft of the transducer.
- S 034-007
- (7) Remove the screw from the bracket on the serrated shaft of the transducer.
- S 034-008
- (8) Remove the transducer from the bracket.

TASK 31-31-09-404-142

3. Install the Control Wheel Position Transducer (Fig. 401 and 402)

A. Equipment

- (1) 981-6301-002 Data Signal Display Unit (DSDU)
Alliedsignal Air Transport Avionics
P.O. BOX 97001
15001 NE 36TH ST
Redmond, WA 98073-9701
- (2) A31007-49 Adapter Cable - Tester (recommended)
A31007-30 Adapter Cable - Tester (alternative)
- (3) Portable Tester - Teledyne P/N 2222786
Teledyne Controls
12333 West Olympic Boulevard West
Los Angeles, CA 90064
- (4) A31007-1 Adapter Cable - Tester
- (5) Portable Tester - Teledyne P/N 2229738-1
Teledyne Controls
12333 West Olympic Boulevard West
Los Angeles, CA 90064
- (6) A31007-59 Adapter Cable - Tester
- (7) 964-0446-001 Hand Held Download Unit (HHDLU)
27914 AlliedSignal Inc., DBA AlliedSignal Aerospace
2100 Northwest 62nd Street
Fort Lauderdale, FL 33309
(a) AIRPLANES WITH FDR P/N 980-4700-042;
The HHDLU must have mod 1 completed.
- (8) 704-2567-001 Adapter Cable - Tester
- (9) Multi-Purpose AIDS Display Units - AACO Inc.
FAA-0032-001
AACO Inc.
5011 Barton Place
Seattle, WA 98118
- (10) EGA-0005-001, Adapter Cable - MADU

B. References

- (1) AMM 20-10-23/401, Lockwires
- (2) AMM 24-22-00/201, Electrical Power Control

C. Procedure

S 434-010

- (1) Install the transducer into the bracket with the EZ mark on the transducer housing aligned with mark on the bracket.

S 434-011

- (2) Install and tighten the mounting screw to the bracket.

S 434-012

- (3) Install the crank arm into the transducer shaft.

S 864-013

- (4) Align the crank arm slot with the index mark on the transducer's serrated shaft.

S 434-014

- (5) Install and tighten the mounting screw to the crank arm.

S 434-015

- (6) Connect the electrical connector to the transducer.

S 034-016

- (7) Remove the rig beam from the control wheel.

D. Control Wheel Position Transducer Test

S 864-056

- (1) If you use test equipment other than the hand-held download unit (HHDLU), install the tester to the test connector at the right side panel, P61.

S 864-048

- (2) If you use the hand-held download unit (HHDLU), attach the HHDLU to the test connector at the front side of the flight data recorder.

NOTE: To get access to the FDR, open the lower ceiling panel No. 1 above the aft galley (AMM 25-22-02/401). The HHDLU can only be connected to the AlliedSignal flight data recorder (FDR).

S 864-018

- (3) Supply electrical power (AMM 24-22-00/201).

S 864-019

- (4) Remove the DO-NOT-CLOSE tags and close the P11 panel circuit breakers :
 - (a) 11J7, FLIGHT RECORDER AC
 - (b) 11J8, FLIGHT RECORDER DC
 - (c) 11S1, AIDS SENSOR

EFFECTIVITY
GUI 001-011

31-31-09

NOTE: These tasks use the word SUBFRAME 0, 5, or 6 to make a selection of a parameter. Some portable testers or on board test equipments do not have a switch position for SUBFRAME 0, 5, or 6. On these test sets, make a selection of SUBFRAMES as follow:

- For SUBFRAME 0, use SUBFRAME 1, 2, 3, and 4.
- For SUBFRAME 5, use SUBFRAME 1 and 3.
- For SUBFRAME 6, use SUBFRAME 2 and 4.

S 864-049

- (5) With the Data Signal Display Unit (DSDU), set the control switches on the tester as follows:
- (a) Set the power switch to the ON position.
 - (b) Set the INPUT switch to the ARINC INPUT DATA position.
 - (c) Set the SYNC switch to the SYNC B position.
 - (d) Set the DATA PARAMETER/DOCUMENTARY switch to the DATA PARAMETER position.
 - (e) Set the OCTAL DISPLAY switch to the 12 BIT position.
 - (f) Set the SUBFRAME and WORD as specified.

S 864-050

- (6) With the Teledyne tester (P/N 2222786), set the switches on the tester as follows:
- (a) Set the POWER switch to the ON position.
 - (b) Set the READOUT switch to the ACTF DATA position.
 - (c) Set the UPDATE switch to the AUTO position.
 - (d) Set the DFDAU/DFDR DATA SELECTOR switch to the DFDAU position.
 - (e) Set the DATA switch to the 12 BIT position.
 - (f) Set the SUBFRAME and WORD as specified.

S 864-051

- (7) With the Teledyne tester (P/N 2229738), set the switches on the tester as follows:
- (a) Push the CLR switch two or three times to clear all inputs.
 - (b) Push the DFDR switch and then the ENT switch.
 - (c) Set the SUBFRAME and WORD as specified.

S 864-052

- (8) With the hand-held download unit (HHDLU), do the steps that follow:

NOTE: These steps are for airplanes equipped with AlliedSignal FDR only.

- (a) On the flight recorder control panel (FRCP), set the function switch to the ON position.
- (b) Push the red button on top of the HHDLU.
- (c) Set the DSDU switch.
- (d) Set the word number to WRD1, WRD2, or WRD3.
- (e) Set the BASE switch.

- (f) In the BASE SELECT menu, set OCT for octal values.
- (g) Set the SUBFRAME and WORD as specified.

S 864-053

- (9) With the MADU, set the switches as follows:
 - (a) Set the power switch to the ON position.
 - (b) Push the FUN switch, then enter the number 5 to set the LRU A on the tester.
 - (c) Push the DATA switch, then the number 03 to set the DFDAU-H on the tester.
 - (d) Push the FUN switch, then the number 03 for SUBFRAME.
 - (e) Set a subframe (1 thru 4) on the keyboard switch.
 - (f) Push the DATA switch, then the number 04 for WORD.
 - (g) Set a word (1 thru 64) on the keyboard.
 - (h) Push the FUN switch, then the number 02 to set the FORMAT field on the tester.
 - (i) Push the number 02 to set the OCTAL 10 on the tester.
 - (j) Set the SUBFRAME and WORD as specified.

S 864-139

- (10) GUI 010, 011 PRE-SB 31-0094;
GUI 001-009;
On the tester, set the SUBFRAME to 0 and the WORD to 28.

S 864-140

- (11) GUI 010, 011 POST-SB 31-0094;

S 864-022

- (12) For the captain's control wheel, move the control wheel to the full counter clockwise position.

S 214-039

- (13) Make sure the tester display shows between 1020 and 1100.

S 864-024

- (14) For the captain's control wheel, move the control wheel fully clockwise to the stop position.

S 214-041

- (15) Make sure the tester display shows between 6700 and 6760.

S 864-025

- (16) If the tester display is not in tolerance do the steps that follows:
 - (a) Remove the lockwire from the thumbnut.
 - (b) Adjust the rod length with the micro-adjustable thumbnut to get the correct value on the tester display.
 - (c) Install the lockwire to the micro-adjustable thumbnut and rod end assembly (AMM 20-10-23/401).

EFFECTIVITY
GUI 001-011

31-31-09

E. Put the Airplane Back to its Usual Condition

S 864-054

- (1) If you used the HHDLU, do the steps that follow:
 - (a) Set the function switch on the flight recorder control panel to the NORM position.
 - (b) Push the red button on top of the HHDLU.
 - (c) Remove the HHDLU adapter cable from the flight data recorder.
 - (d) Install the test plug to the test connector at the flight data recorder.

S 864-055

- (2) If you used test equipment other than the HHDLU, do the steps that follow:
 - (a) Turn the tester off.
 - (b) Open these P11 panel circuit breakers:
 - 1) 11J7, FLIGHT RECORDER AC
 - 2) 11J8, FLIGHT RECORDER DC
 - (c) Disconnect the tester from the right side of the P61 panel.
 - (d) Install the test plug to the test connector at the P61 panel.
 - (e) Close these P11 panel circuit breakers:
 - 1) 11J7, FLIGHT RECORDER AC
 - 2) 11J8, FLIGHT RECORDER DC

S 864-030

- (3) Remove electrical power if it is not necessary (AMM 24-22-00/201).

RUDDER PEDAL POSITION TRANSDUCER – REMOVAL/INSTALLATION

1. General

- A. There are two tasks in this procedure. The first task is the removal of the transducer for the rudder pedal. The second task is the installation of the transducer for the rudder pedal.
- B. The transducer is installed on the outboard side of the captain's jack shaft housing.

TASK 31-31-10-004-001

2. Remove the Rudder Pedal Position Transducer (Fig. 401)

A. Equipment

- (1) B20003-XX Rig Pin Set (AMM 20-10-24/201)
 - (a) Rig Pin R1A
 - (b) Rig Pin R1B
 - (c) Rig Pin R2

B. References

- (1) AMM 06-41-00/201, Fuselage Access Doors and Panel
- (2) AMM 20-10-23/401, Lockwire
- (3) AMM 20-10-24/201, Rig Pins

C. Access

- (1) Location Zone
113 Area forward of NLG wheel well (left)

D. Procedure

S 864-002

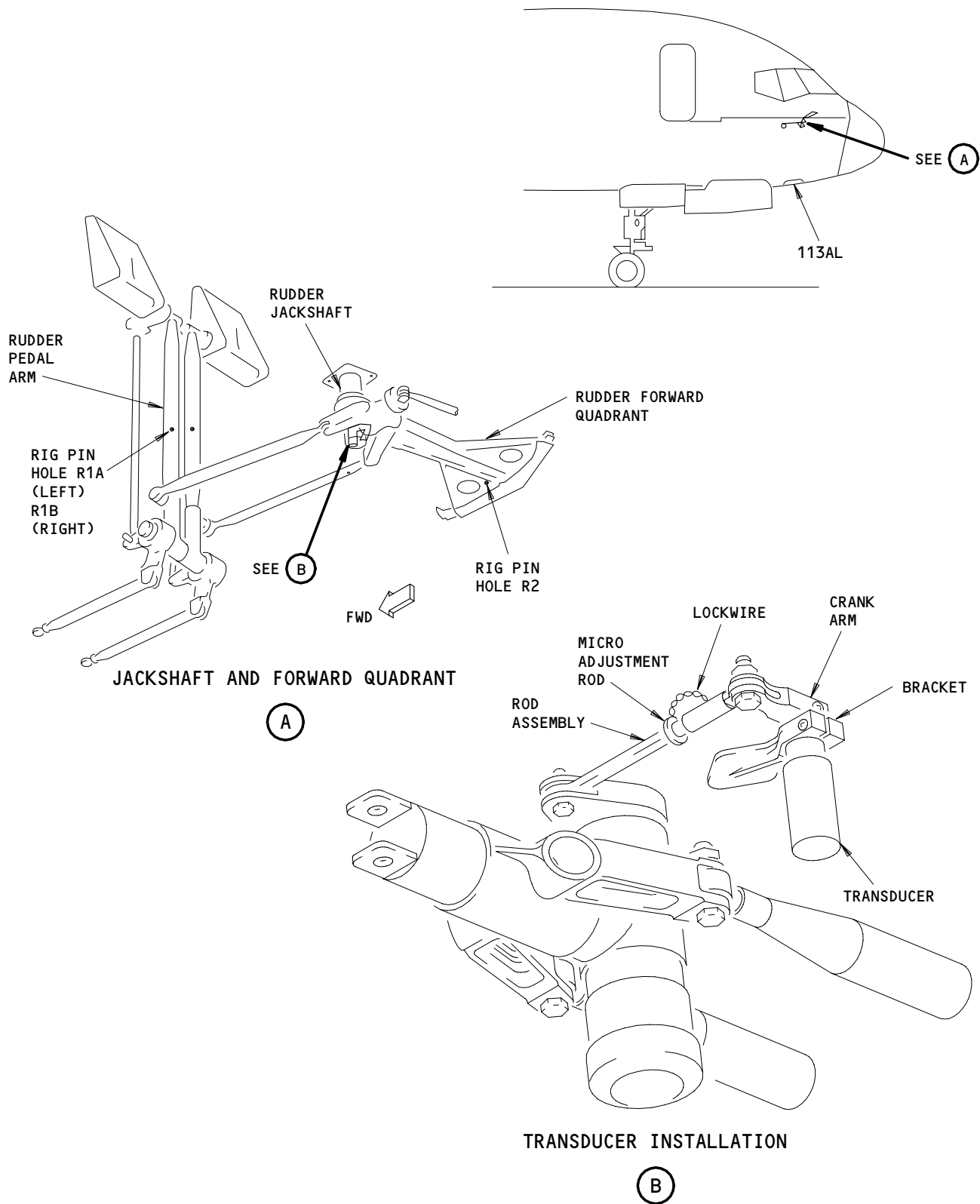
- (1) Open these circuit breakers on the overhead circuit breaker panel, P11, and attach DO-NOT-CLOSE tags:
 - (a) 11J7, FLIGHT RECORDER AC
 - (b) 11J8, FLIGHT RECORDER DC
 - (c) 11S1, AIDS SENSOR

S 864-003

- (2) Set the rudder pedals in the neutral position.

EFFECTIVITY
GUI 001-011

31-31-10



Rudder Pedal Position Transducer Installation
Figure 401

EFFECTIVITY
GUI 001-011

31-31-10

- S 864-034
- (3) Attach DO-NOT-OPERATE tags to the captain's and first officer's rudder pedals.
- S 014-004
- (4) Open the forward access door to get to the forward quadrant (AMM 06-41-00/201).
- S 834-005
- (5) Install the rig pin R2 into the forward quadrant.
- S 834-006
- (6) Install the rig pins R1A and R1B into the rudder pedal arms through the rudder pedal housing.
- S 034-007
- (7) Disconnect the transducer electrical connector.
- S 034-008
- (8) Remove the screw from the crank arm assembly near the serrated shaft of the transducer.
- S 034-009
- (9) Remove the screw from the bracket that holds the transducer in position.
- S 034-010
- (10) Remove the transducer from the bracket.

TASK 31-31-10-404-011

3. Install the Rudder Pedal Position Transducer (Fig. 401)

A. Equipment

- (1) 981-6301-002 Data Signal Display Unit (DSDU)
Alliedsignal Air Transport Avionics
P.O. BOX 97001
15001 NE 36TH ST
Redmond, WA 98073-9701

EFFECTIVITY
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- (2) A31007-49 Adapter Cable - Tester (recommended)
A31007-30 Adapter Cable - Tester (alternative)
- (3) Portable Tester - Teledyne P/N 2222786
Teledyne Controls
12333 West Olympic Boulevard West
Los Angeles, CA 90064
- (4) A31007-1 Adapter Cable - Tester
- (5) Portable Tester - Teledyne P/N 2229738-1
Teledyne Controls
12333 West Olympic Boulevard West
Los Angeles, CA 90064
- (6) A31007-59 Adapter Cable - Tester
- (7) 964-0446-001 Hand Held Download Unit (HHDLU)
27914 AlliedSignal Inc., DBA AlliedSignal Aerospace
2100 Northwest 62nd Street
Fort Lauderdale, FL 33309
- (8) 704-2567-001 Adapter Cable - Tester
- (9) Multi-Purpose AIDS Display Units - AACO Inc.
FAA-0032-001
AACO Inc.
5011 Barton Place
Seattle, WA 98118
- (10) EGA-0005-001, Adapter Cable - MADU

B. References

- (1) AMM 20-10-23/401, Lockwire
- (2) AMM 24-22-00/201, Electrical Power Control
- (3) AMM 29-11-00/201, Main (Left, Right, and Center) Hydraulic System

C. Access

- (1) Location Zone
113 Area forward of NLG wheel well (left)

D. Procedure

- S 434-012
- (1) Install the transducer into the bracket.
- S 864-013
- (2) Make sure the transducer mark EZ is align with the bracket mark.
- S 434-014
- (3) Install and tighten the screw to the bracket.
- S 434-015
- (4) Install the crank arm into the transducer shaft.
- S 864-016
- (5) Align the crank arm slot with the mark EZ on the transducer's serrated shaft.
- S 434-017
- (6) Install and tighten the screw to the crank arm.

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GUI 001-011

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- S 434-018
- (7) Connect the electrical connector to the transducer.
- S 034-019
- (8) Remove the rig pins R1A and R1B from the rudder pedal arm.
- S 034-020
- (9) Remove the R2 rig pin from the forward quadrant jack shaft.
- E. Rudder Pedal Position Transducer Test
- S 864-051
- (1) If you use test equipment other than the hand-held download unit (HHDLU), install the tester to the test connector at the right side panel, P61.
- S 864-052
- (2) If you use the hand-held download unit (HHDLU), attach the HHDLU to the test connector at the front side of the flight data recorder.
- NOTE: To get access to the FDR, open the lower ceiling panel No. 1 above the aft galley (AMM 25-22-02/401). The HHDLU can only be connected to the AlliedSignal flight data recorder (FDR).
- S 864-044
- (3) Supply electrical power (AMM 24-22-00/201).
- S 864-022
- (4) Remove the DO-NOT-CLOSE tags and close the P11 panel circuit breakers:
- (a) 11J7, FLIGHT RECORDER AC
 - (b) 11J8, FLIGHT RECORDER DC
 - (c) 11S1, AID SENSOR
- S 864-045
- (5) Pressurize the left, right, and center hydraulic systems and hydraulic systems reservoirs (AMM 29-11-00/201).

NOTE: These tasks use the word SUBFRAME 0, 5, or 6 to make a selection of a parameter. Some portable testers or on board test equipment do not have a switch position for SUBFRAME 0, 5, or 6. On these test sets, make a selection of SUBFRAMES as follow:

- For SUBFRAME 0, use SUBFRAME 1, 2, 3, and 4.
- For SUBFRAME 5, use SUBFRAME 1 and 3.
- For SUBFRAME 6, use SUBFRAME 2 and 4.

S 864-055

- (6) With the Data Signal Display Unit (DSDU), set the control switches on the tester as follows:
- (a) Set the power switch to the ON position.
 - (b) Set the INPUT switch to the ARINC INPUT DATA position.
 - (c) Set the SYNC switch to the SYNC B position.
 - (d) Set the DATA PARAMETER/DOCUMENTARY switch to the DATA PARAMETER position.
 - (e) Set the OCTAL DISPLAY switch to the 12 BIT position.
 - (f) Set the SUBFRAME and WORD as specified.

S 864-056

- (7) With the Teledyne tester (P/N 2222786), set the switches on the tester as follows:
- (a) Set the POWER switch to the ON position.
 - (b) Set the READOUT switch to the ACTF DATA position.
 - (c) Set the UPDATE switch to the AUTO position.
 - (d) Set the DFDAU/DFDR DATA SELECTOR switch to the DFDAU position.
 - (e) Set the DATA switch to the 12 BIT position.
 - (f) Set the SUBFRAME and WORD as specified.

S 864-057

- (8) With the Teledyne tester (P/N 2229738), set the switches on the tester as follows:
- (a) Push the CLR switch two or three times to clear all inputs.
 - (b) Push the DFDR switch and then the ENT switch.
 - (c) Set the SUBFRAME and WORD as specified.

S 864-058

- (9) With the hand-held download unit (HHDLU), do the steps that follow:

NOTE: These steps are for airplanes equipped with AlliedSignal FDR only.

- (a) On the flight recorder control panel (FRCP), set the function switch to the ON position.
- (b) Push the red button on top of the HHDLU.
- (c) Set the DSDU switch.
- (d) Set the word number to WRD1, WRD2, or WRD3.
- (e) Set the BASE switch.

- (f) In the BASE SELECT menu, set OCT for octal values.
- (g) Set the SUBFRAME and WORD as specified.

S 864-049

- (10) With the MADU, set the switches as follows:
 - (a) Set the power switch to the ON position.
 - (b) Push the FUN switch then enter the number 5 to set the LRU A on the tester.
 - (c) Push the DATA switch then the number 03 to set the DFDAU-H on the tester.
 - (d) Push the FUN switch then the number 03 for SUBFRAME.
 - (e) Push the desire subframe (1 thru 4) on the keyboard switch.
 - (f) Push the DATA switch then the number 04 for WORD.
 - (g) Push the desire word (1 thru 64) on the keyboard
 - (h) Push the FUN switch then the number 02 to set the FORMAT field on the tester.
 - (i) Push the number 02 to set the OCTAL 10 on the tester.
 - (j) Set the SUBFRAME and WORD as specified.

S 864-129

- (11) GUI 010, 011 PRE-SB 31-0094;
GUI 001-009;
On the tester, set the SUBFRAME to 0 and the WORD to 49.

S 864-130

- (12) GUI 010, 011 POST-SB 31-0094;
Set the SUBFRAME to 0 and the WORD to 121.

S 864-025

- (13) Move the left rudder pedal to the full forward position.

S 214-048

- (14) Make sure the tester display shows between 0367 and 0655.

S 864-027

- (15) Move the right rudder pedal to the full forward position.

S 204-042

- (16) Make sure the tester display shows between 7140 and 7401.
 - (a) Set the rudder pedals back to the neutral position.

S 864-029

- (17) If the tester display is not in tolerance, do the steps that follow:
 - (a) Remove the lockwire from the thumbnut.
 - (b) Adjust the the rod length with the micro-adjustable thumbnut to get the correct value on the tester display.
 - (c) Install the lockwire to the micro-adjustable thumbnut and the rod end assembly (AMM 20-10-23/401).

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F. Put the Airplane Back to its Usual Condition.

S 864-053

- (1) If you used the HHDLU, do the steps that follow:
 - (a) Set the function switch on the flight recorder control panel to the NORM position.
 - (b) Push the red button on top of the HHDLU.
 - (c) Remove the HHDLU adapter cable from the flight data recorder.
 - (d) Install the test plug to the test connector at the flight data recorder.

S 864-054

- (2) If you used test equipment other than the HHDLU, do the steps that follow:
 - (a) Turn the tester off.
 - (b) Open these P11 panel circuit breakers:
 - 1) 11J7, FLIGHT RECORDER AC
 - 2) 11J8, FLIGHT RECORDER DC
 - (c) Disconnect the tester from the right side of the P61 panel.
 - (d) Install the test plug to the test connector at the P61 panel.
 - (e) Close these P11 panel circuit breakers:
 - 1) 11J7, FLIGHT RECORDER AC
 - 2) 11J8, FLIGHT RECORDER DC

S 864-033

- (3) Remove electrical power if it is not necessary (AMM 24-22-00/201).

BRAKE PRESSURE TRANSMITTER – REMOVAL/INSTALLATION

1. General

- A. There are two tasks in this procedure. The first task is the removal of the Brake Pressure Transmitters. The second task is the installation of the Transmitters.
- B. The left (T10055 and T10053) and right (T10056 and T10054) Brake Pressure Transmitters are installed in the left and right wheel wells.

TASK 31-31-13-004-004

2. Remove the Brake Pressure Transmitter (Fig. 401)

A. References

- (1) AMM 24-22-00/201, Electrical Power – Control
- (2) AMM 29-11-00/201, Main Hydraulic Systems
- (3) AMM 32-00-15/201, Landing Gear Door Locks
- (4) AMM 32-00-20/201, Landing Gear Downlocks
- (5) AMM 32-42-01/401, Antiskid/Autobrake Control Unit

B. Equipment

- (1) Main Gear Door Locks (AMM 32-00-15/201)

C. Access

- (1) Location Zones
 - 730 Left Main Landing Gear
 - 740 Right Main Landing Gear

D. Procedure

S 864-001

- (1) Open these circuit breakers on the overhead circuit breaker panel, P11, and attach DO-NOT-CLOSE tags:
 - (a) 11J7, FLIGHT RECORDER AC
 - (b) 11J8, FLIGHT RECORDER DC
 - (c) 11S1, AIDS SENSOR

S 424-018

WARNING: MAKE SURE THAT THE DOWNLOCKS ARE INSTALLED IN ALL OF THE LANDING GEAR. WITHOUT THE DOWNLOCKS, THE LANDING GEAR CAN RETRACT AND CAUSE INJUIRES TO PERSONS AND DAMAGE TO EQUIPMENT.

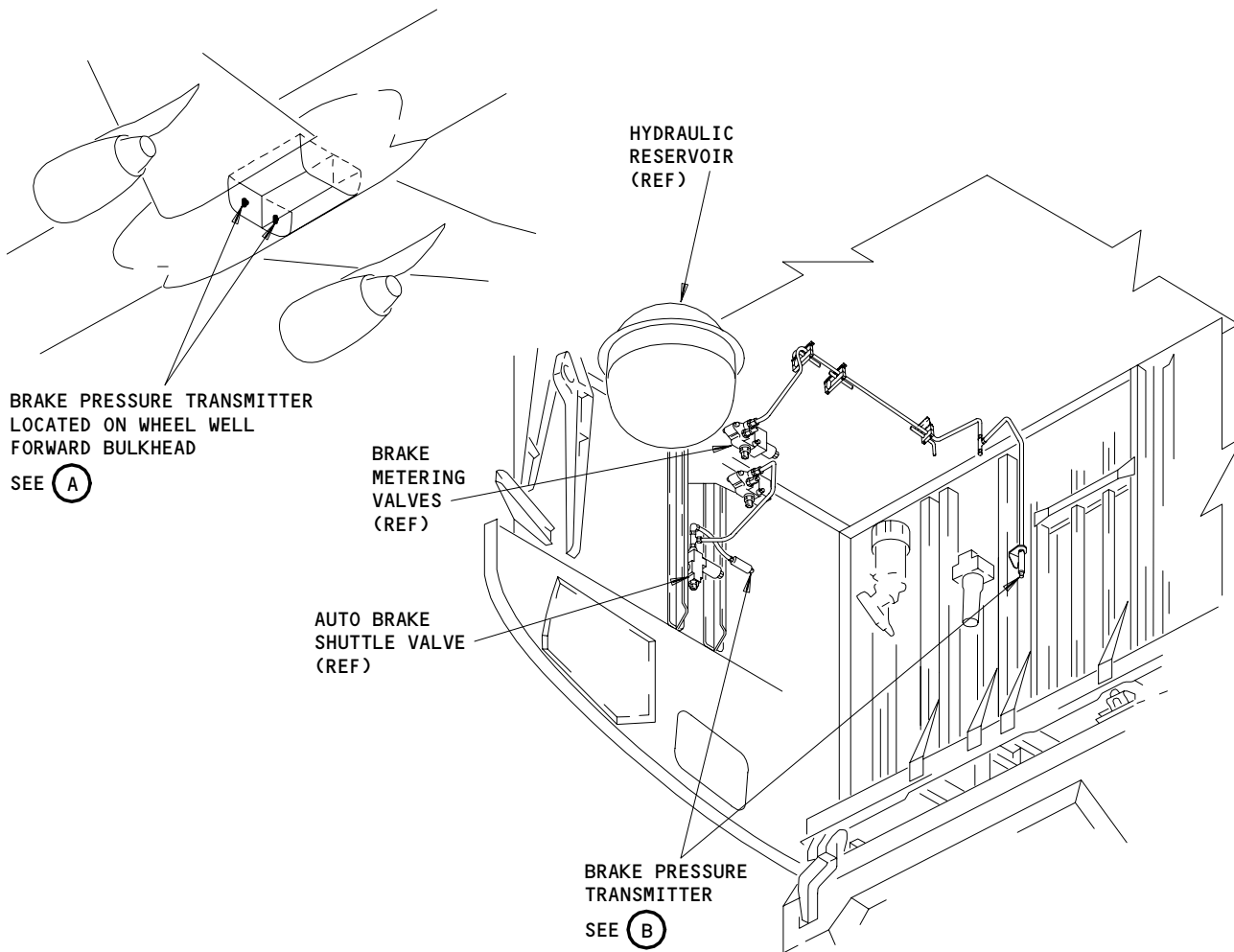
- (2) Make sure the downlocks for the main landing gear are installed in the nose and main landing gear (AMM 32-00-20/201).

S 204-003

- (3) Make sure to put the chocks on the wheels.

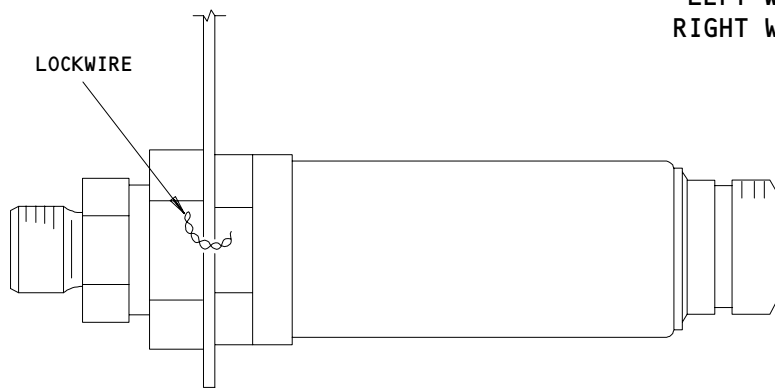
EFFECTIVITY
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LEFT WHEEL SHOWN,
RIGHT WHEEL SIMILAR

(A)



LEFT BRAKE INSTALLATION SHOWN,
RIGHT BRAKE TRANSMITTER INSTALLATION SIMILAR

(B)

Brake Pressure Transmitter Installation
Figure 401

EFFECTIVITY
GUI 001-011

31-31-13

S 494-019

WARNING: OBEY THE INSTALLATION PROCEDURE FOR THE DOOR LOCKS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(4) Open the doors for the landing gear and install the door locks (AMM 32-00-15/201).

S 864-005

(5) Supply electrical power (AMM 24-22-00/201).

S 864-006

(6) Release the parking brake.

S 864-007

(7) Remove the pressure from the left, right, and center hydraulic systems and the hydraulic reservoirs (AMM 29-11-00/201).

S 864-008

(8) Operate the brake pedal fully from seven to eight times to let out the hydraulic pressure from the brake accumulator.

S 034-009

(9) Disconnect the electrical connector from the brake pressure transmitter.

S 034-010

(10) Remove the lockwires from the transducer.

S 034-011

(11) Remove the transmitter from the hydraulic line.

S 434-012

(12) Install a plug to the hole.

S 034-013

(13) Remove and discard the transmitter O-rings.

EFFECTIVITY
GUI 001-011

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TASK 31-31-13-404-014

3. Install the Brake Pressure Transmitter (Fig. 401)

A. Equipment

- (1) 981-6301-002 Data Signal Display Unit (DSDU)
Alliedsignal Air Transport Avionics
P.O. BOX 97001
15001 NE 36TH ST
Redmond, WA 98073-9701
- (2) A31007-49 Adapter Cable - Tester (recommended)
A31007-30 Adapter Cable - Tester (alternative)
- (3) 9540 System Test Panel (STP) - Hamilton
Standard 775419
Hamilton Standard Division
United Technologies
Bradley Field Road
Windsor Locks, CT 06096
- (4) Portable Tester - Teledyne P/N 2222786
Teledyne Controls
12333 West Olympic Boulevard West
Los Angeles, CA 90064
- (5) A31007-1 Adapter Cable - Tester
- (6) Portable Tester - Teledyne P/N 2229738-1
Teledyne Controls
12333 West Olympic Boulevard West
Los Angeles, CA 90064
- (7) A31007-59 Adapter Cable - Tester
- (8) 964-0446-001 Hand Held Download Unit (HHDLU)
27914 AlliedSignal Inc., DBA AlliedSignal Aerospace
2100 Northwest 62nd Street
Fort Lauderdale, FL 33309
(a) AIRPLANES WITH FDR P/N 980-4700-042;
The HHDLU must have mod 1 completed.
- (9) 704-2567-001 Adapter Cable - Tester
- (10) Multi-Purpose AIDS Display Units - AACO Inc.
FAA-0032-001
AACO Inc.
5011 Barton Place
Seattle, WA 98118
- (11) EGA-0005-001, Adapter Cable - MADU
- (12) Main Gear Door Locks (AMM 32-00-15/201)

B. Consumable Material

- (1) D00153 Hydraulic Fluid - BMS 3-11 (AMM 20-30-04/201)

C. References

- (1) AMM 20-10-23/401, Lockwires
- (2) AMM 24-22-00/201, Electrical Power - Control
- (3) AMM 29-11-00/201, Main Hydraulic Systems
- (4) AMM 31-41-00/501, Engine Indicator and Crew Alert System (EICAS)
- (5) AMM 32-00-15/201, Landing Gear Door Locks
- (6) AMM 32-00-20/201, Landing Gear Downlocks
- (7) AMM 32-42-01/401, Antiskid/Autobrake Control Unit

EFFECTIVITY
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D. Access

- (1) Location Zones
- | | |
|-----|-------------------------|
| 730 | Left Main Landing Gear |
| 740 | Right Main Landing Gear |

E. Procedure

- S 434-015
- (1) Install the new O-rings on the transducer.
- S 644-016
- (2) Lubricate the O-rings with the hydraulic fluid.
- S 434-017
- (3) Install and tighten the transducer into the hydraulic line.
- S 434-018
- (4) Install a lockwire between the transmitter and the hydraulic line (AMM 20-10-23/401).
- S 434-019
- (5) Connect the electrical connector to the transmitter.

F. Brake Pressure Transmitter Test

- S 864-059
- (1) If you use test equipment other than the hand-held download unit (HHDLU), install the tester to the test connector at the right side panel, P61.

- S 864-060
- (2) If you use the hand-held download unit (HHDLU), attach the HHDLU to the test connector at the front side of the flight data recorder.

NOTE: To get access to the FDR, open the lower ceiling panel No. 1 above the aft galley (AMM 25-22-02/401). The HHDLU can only be connected to the AlliedSignal flight data recorder (FDR).

- S 864-063
- (3) Supply electrical power (AMM 24-22-00/201).

- S 864-022
- (4) Remove the DO-NOT-CLOSE tags and close these P11 panel circuit breakers:
- (a) 11J7, FLIGHT RECORDER AC
 - (b) 11J8, FLIGHT RECORDER DC
 - (c) 11S1, AIDS SENSOR

EFFECTIVITY
GUI 001-011

31-31-13

NOTE: These tasks use the word SUBFRAME 0, 5, or 6 to make a selection of a parameter. Some portable testers or on board test equipment do not have a switch position for SUBFRAME 0, 5, or 6. On these test sets, make a selection of SUBFRAMES as follow:

- For SUBFRAME 0, use SUBFRAME 1, 2, 3, and 4.
- For SUBFRAME 5, use SUBFRAME 1 and 3.
- For SUBFRAME 6, use SUBFRAME 2 and 4.

S 864-055

- (5) With the Data Signal Display Unit (DSDU), set the control switches on the tester as follows:
- (a) Set the power switch to the ON position.
 - (b) Set the INPUT switch to the ARINC INPUT DATA position.
 - (c) Set the SYNC switch to the SYNC B position.
 - (d) Set the DATA PARAMETER/DOCUMENTARY switch to the DATA PARAMETER position.
 - (e) Set the OCTAL DISPLAY switch to the 12 BIT position.
 - (f) Set the SUBFRAME and WORD as specified.
 - (g) With the STP tester, set the control switches on the tester as follows:
 - 1) Set the ON/OFF switch to the ON position.
 - 2) Push the SYS TEST switch and make sure there is no failure message on the tester display.
 - 3) Push the CLR switch.
 - 4) Push the FDAU switch.
 - 5) Set the UPDATE switch to the AUTO position.
 - 6) Set the data switch to the 12 BIT position.
 - 7) Set the SUBFRAME and WORD as specified.

S 864-056

- (6) With the Teledyne tester (P/N 2222786), set the switches on the tester as follows:
- (a) Set the POWER switch to the ON position.
 - (b) Set the READOUT switch to the ACTF DATA position.
 - (c) Set the UPDATE switch to the AUTO position.
 - (d) Set the DFDAU/DFDR DATA SELECTOR switch to the DFDAU position.
 - (e) Set the DATA switch to the 12 BIT position.
 - (f) Set the SUBFRAME and WORD as specified.

S 864-057

- (7) With the Teledyne tester (P/N 2229738), set the switches on the tester as follows:
- (a) Push the CLR switch two or three times to clear all inputs.
 - (b) Push the DFDR switch and then the ENT switch.
 - (c) Set the SUBFRAME and WORD as specified.

S 864-058

- (8) With the hand-held download unit (HHDLU), do the steps that follow:

NOTE: These steps are for airplanes equipped with AlliedSignal FDR only.

- (a) On the flight recorder control panel (FRCP), set the function switch to the ON position.
- (b) Push the red button on top of the HHDLU.
- (c) Set the DSDU switch.
- (d) Set the word number to WRD1, WRD2, or WRD3.
- (e) Set the BASE switch.
- (f) In the BASE SELECT menu, set OCT for octal values.
- (g) Set the SUBFRAME and WORD as specified.

S 864-016

- (9) With the MADU, set the switches as follows:
- (a) Set the power switch to the ON position.
 - (b) Push the FUN switch then enter the number 5 to set the LRU A on the tester.
 - (c) Push the DATA switch then the number 03 to set the DFDAU-H on the tester.
 - (d) Push the FUN switch then the number 03 for SUBFRAME.
 - (e) Push the desire subframe (1 thru 4) on the keyboard switch.
 - (f) Push the DATA switch then the number 04 for WORD.
 - (g) Push the desire word (1 thru 64) on the keyboard
 - (h) Push the FUN switch then the number 02 to set the FORMAT field on the tester.
 - (i) Push the number 02 to set the OCTAL 10 on the tester.
 - (j) Set the SUBFRAME and WORD as specified.

S 204-008

- (10) Make sure the wheels are chocks.

S 864-020

WARNING: KEEP PERSONS AND EQUIPMENT CLEAR OF THE FLIGHT CONTROL SURFACES, THE THRUST REVERSERS, AND THE LANDING GEAR. THESE COMPONENTS CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJUIRES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (11) Pressurize the right hydraulic system and reservoir (AMM 29-11-00/201).

S 864-025

- (12) Make sure the EICAS is operational (AMM 31-41-00/501).

S 864-026

- (13) Push the ELEC/HYD switch on the EICAS MAINT panel on the right side panel, P61.

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- S 864-027
- (14) Make sure the parking brake is released.
- S 864-110
- (15) GUI 010, 011 PRE-SB 31-0094;
 GUI 001-009;
 On the tester, set the SUBFRAME to 0 and the WORD to 47.
- S 864-111
- (16) GUI 010, 011 POST-SB 31-0094;
 On the tester, set the SUBFRAME to 0 and the WORD to 187.
- S 864-030
- (17) Push the Captain's left brake pedal to the full forward position.
- S 204-031
- (18) Make sure the tester display shows the value shown in Table 401.
- NOTE:** The value shown must agree with the nearest hydraulic system pressure.
- NOTE:** X = DON'T CARE

Table 401	
HYDRAULIC SYSTEM (Pressure as displayed on EICAS status page)	TESTER DISPLAY
2300	52XX-60XX
2400	54XX-62XX
2500	55XX-63XX
2600	57XX-65XX
2700	61XX-67XX
2800	63XX-71XX
2900	65XX-74XX
3000	67XX-75XX

- S 864-032
- (19) Release the Captain's left brake pedal.
- S 864-033
- (20) Push the Captain's right brake pedal to the full forward position.

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S 204-034

(21) Make sure the tester display shows the value shown in Table 402.

NOTE: The value shown must agree with the nearest hydraulic system pressure.

NOTE: X = DON'T CARE

Table 402	
HYDRAULIC SYSTEM (Pressure as displayed on EICAS status page)	TESTER DISPLAY
2300	XX52-XX60
2400	XX54-XX62
2500	XX55-XX63
2600	XX57-XX65
2700	XX61-XX67
2800	XX63-XX71
2900	XX65-XX74
3000	XX67-XX75

S 864-035

(22) Release the Captain's right brake pedal.

S 864-036

(23) Remove the power from the right hydraulic system (AMM 29-11-00/201).

S 864-037

(24) Push the brake pedals at least 6 times.

S 864-038

(25) Pressurize the left hydraulic system and reservoir (AMM 29-11-00/201).

S 864-039

(26) Push the Captain's left brake pedal to the full forward position.

S 204-040

(27) Make sure the tester display shows the value shown in Table 401.

NOTE: The value shown must agree with the nearest hydraulic system pressure.

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S 864-041

- (28) Release the Captain's left brake pedal.

S 864-042

- (29) Push the Captain's right brake pedal to the full forward position.

S 204-043

- (30) Make sure the tester display shows the value shown in Table 402.

NOTE: The value shown must agree with the nearest hydraulic system pressure.

S 864-045

- (31) Release the Captain's right brake pedal.
G. Put the Airplane Back to its Usual Condition.

S 864-061

- (1) If you used the HHDLU, do the steps that follow:
(a) Set the function switch on the flight recorder control panel to the NORM position.
(b) Push the red button on top of the HHDLU.
(c) Remove the HHDLU adapter cable from the flight data recorder.
(d) Install the test plug to the test connector at the flight data recorder.

S 864-062

- (2) If you used test equipment other than the HHDLU, do the steps that follow:
(a) Turn the tester off.
(b) Open these P11 panel circuit breakers:
1) 11J7, FLIGHT RECORDER AC
2) 11J8, FLIGHT RECORDER DC
(c) Disconnect the tester from the right side of the P61 panel.
(d) Install the test plug to the test connector at the P61 panel.
(e) Close these P11 panel circuit breakers:
1) 11J7, FLIGHT RECORDER AC
2) 11J8, FLIGHT RECORDER DC

S 864-048

- (3) Set the parking brake.

S 024-022

WARNING: OBEY THE REMOVAL PROCEDURE FOR THE DOOR LOCKS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (4) Remove the door locks from the landing gear doors and close the doors (AMM 32-00-15/201).

EFFECTIVITY
GUI 001-011

31-31-13

- S 864-014
- (5) Remove the power from the left hydraulic system (AMM 29-11-00/201) .
- S 864-050
- (6) Remove electrical power if it is not necessary (AMM 24-22-00/201).
- S 914-051
- (7) Keep the landing gear downlocks and the chock installed until the airplane is prepared for operation.

EFFECTIVITY
GUI 001-011

31-31-13

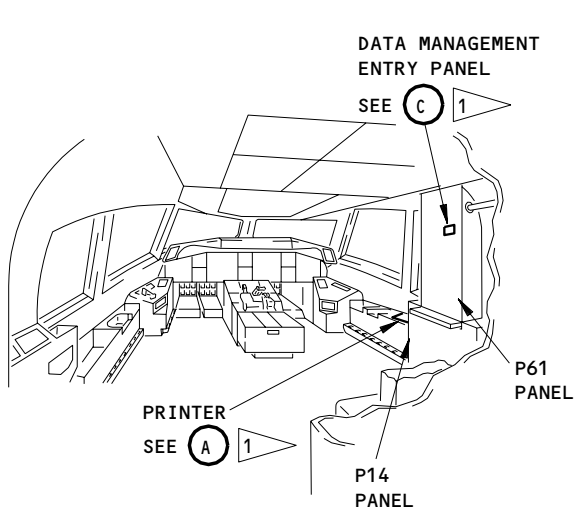
AIRPLANE CONDITION MONITORING SYSTEM – DESCRIPTION AND OPERATION

1. General (Fig. 1)

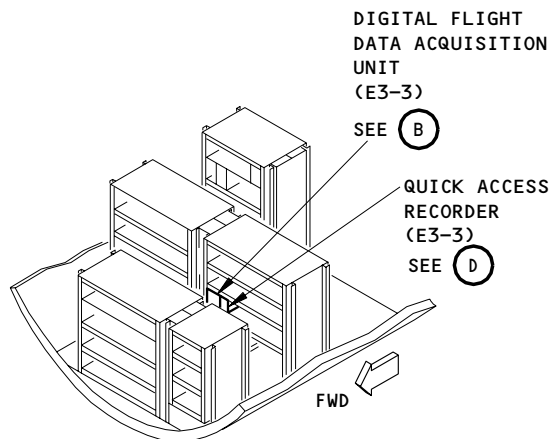
- A. The airplane condition monitoring system (ACMS) collects and records operational data to permit detailed analysis of airplane performance and maintenance requirements. This data is acquired by the acquisition unit. The data is recorded on magnetic tape in a quick access recorder.
- B. The ACMS consists of a digital flight data acquisition unit (DFDAU), a quick access recorder (QAR), a data management entry panel (DMEP), an airborne printer, and sensors.
- C. The DFDAU is shared with the digital flight data recorder system. It is located on E3-3 of the main equipment center. The acquisition unit receives and processes selected airplane parameters for recording. The acquisition unit is a dual-microprocessor controlled unit. One microprocessor provides the processed parameter signals to be recorded by the digital flight data recorder (Ref 31-31-00). The second microprocessor provides processed parameter signals to be recorded by the QAR.
- D. The DMEP is located on the right side panel P61. It consists of keyboard switches, fault indicators and a function switch. The keyboard switches provide the means to enter parameter ident codes to the system. They also provide the means to call up parameters for display. It also provides a printer command to the airborne printer. The fault lights come on to annunciate the relevant AIDS and flight recorder system component failures. The function switch is normally set to NORM position where power to the DFDR is automatically controlled through the system power relays. The DFDR position is spring loaded and is used to turn on the DFDR for testing purposes (Ref 31-31-00).
- E. The QAR is located on E3-3 of the main equipment center. It records the parameter data on magnetic tape. The tape cartridge has a capacity of 14 hours of data storage. The tape cartridge is replaceable. The QAR is able to search for and replay data from a specified GMT reference, and return to the current recording position.
- F. The airborne printer is located on the first officer's side panel P14. Upon command from the DMEP, it is capable of printing 40, 66 and 80 characters per line.

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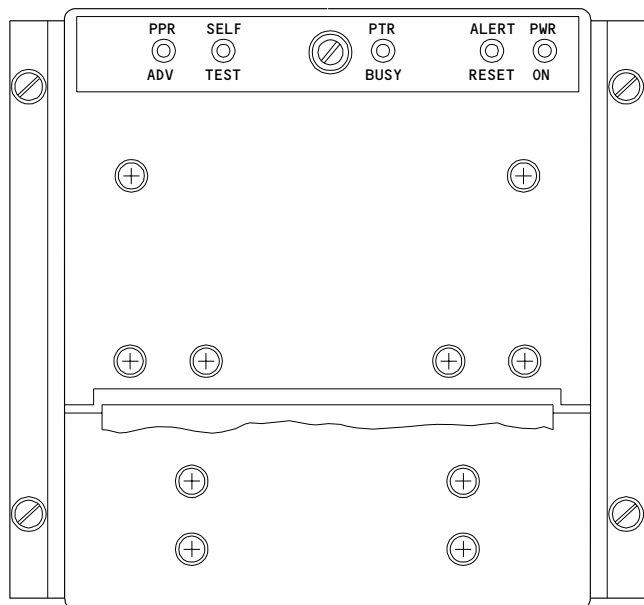
31-35-00



FLIGHT COMPARTMENT

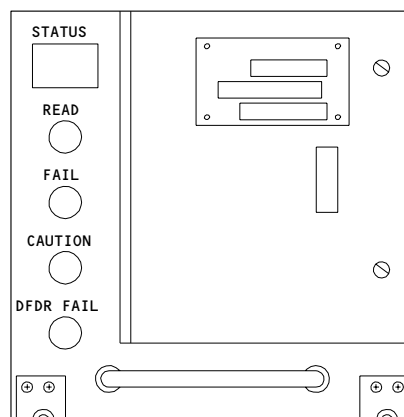


MAIN EQUIPMENT CENTER



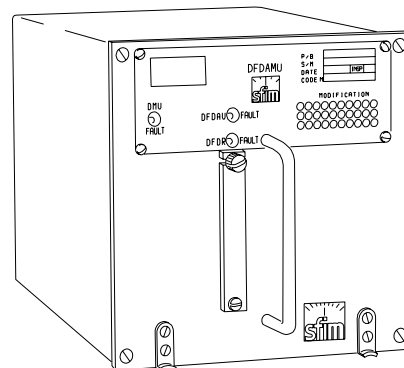
PRINTER

(A) 1



DIGITAL FLIGHT DATA ACQUISITION UNIT

(B) 1



DIGITAL FLIGHT DATA ACQUISITION UNIT

(B) 2

1 INT 005, 014, 101-109, 111-115

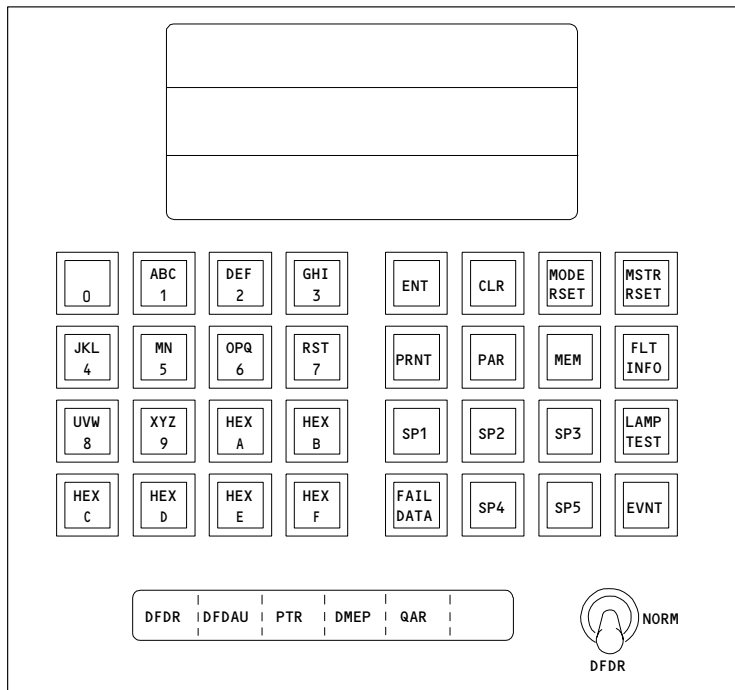
2 INT 117, 118

Airplane Condition Monitoring System Components
Figure 1 (Sheet 1)

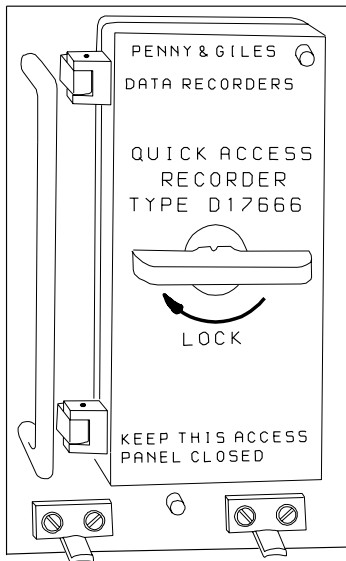
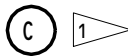
EFFECTIVITY
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A10275



DATA MANAGEMENT ENTRY PANEL



QUICK ACCESS RECORDER



**Airplane Condition Monitoring System Components
Figure 1 (Sheet 2)**

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G. The printer is located on the on the control stand, P8, Upon command from the FMC CDU, it is capable of printing out data for pilots information.

2. Component Details (Fig. 1)

A. Data Management Entry Panel (DMEP)

(1) The DMEP is located on the P61 panel. It interfaces with the DFDAU. It provides controls and keys to request for data display of any DFDAU parameter and print command for printout on the AIDS printer. It consists of a keyboard, function switches, a data display and status lights. It receives 115v ac, 400 Hz single phase power from the main AC BUS.

(2) The front panel keyboard and switches operate in the following manner:

(a) Keyboard - The alpha-numeric keys are used for data entry or to request specific parameters to be displayed. The depression of any key causes the corresponding numerical value to appear on the LED data display. The CLR (clear) key terminates the display. After the entry of the last character of the data the ENT (enter) key must be depressed to activate the desired function.

(b) Data Display - The display consists of 3 rows of LED displays. Each row has the capability to display up to 16 alpha-numeric characters. The DMEP has the capability to display any parameter or parameters (up to 3) processed by the DFDAU. Parameter displays may be requested by keying in the mnemonic code of the parameters, or by subframe and word assignment.

(c) A row of LRU failure annunciator lights are mounted in the lower position of the DMEP front panel. The AIDS failure annunciators (PTR/Printer, DMEP, and QAR/Quick Access Recorder) are illuminated using two paralld LEDs and controlled by the Central Processing Unit (CPU) in the DMEP. A power switch is mounted on the lower righthand corner of the panel. The power switch has two positions, NORM and DFDR which is a momentary test position.

B. Printer

(1) The printer prints out reports of selected data. The printing function is controlled by the DFDAU. The printout is initiated automatically in certain modes, or manually from the DMEP. The printer receives 115v ac, 400 Hz single phase power from the main AC BUS.

- (2) The front panel controls operate in the following manner:
 - (a) Paper Advance Pushbutton – The pushbutton labeled PPR ADV advances paper as long as the pushbutton is pressed.
 - (b) Self-Test Pushbutton – Actuation of the pushbutton labeled SELF TEST causes the printer to print a test pattern. Printing occurs as long as the pushbutton is pressed.
 - (c) Power ON Light – The green PWR ON indicator comes on when power is applied.
 - (d) ALERT RESET Pushbutton – The ALERT RESET pushbutton is used to reset the PTR BUSY light alert function.
 - (e) Printer Busy Light – The amber light labeled PTR BUSY comes on steady when the printer is printing. This light flashes after the paper has advanced three lines beyond the tear-off edge. When the reset pushbutton is pushed, the light stops flashing.
 - (3) Printer status and message indications include:
 - (a) Low Paper – The last 5 feet of paper on each roll is marked with a warning stripe to indicate a low paper condition.
 - (b) Message Incomplete – If a message that is being received by the printer is interrupted for more than 1.7 minutes, the printer will print MESSAGE INCOMPLETE. It then returns to the ready state to wait for the next message.
 - (c) Unrecognizable character or Parity Error – If the printer receives a character it does not recognize, the printer will print a question mark (?) in that character position. This also occurs if the printer detects a parity error in the incoming data
 - (d) Paper Out Switch – Switch closure causes the print control circuits to drop the ready line to the user's terminal which prevents further printing until a new roll of paper is loaded.
- C. Quick Access Recorder (QAR)
- (1) The Quick Access Recorder (QAR) is an airborne microprocessor controlled cartridge drive system. It is used for logging flight data from the acquisition unit on a magnetic tape and can be replayed for reference. The unit is located on rack E3-3 of the electronic compartment. It receives 115VAC, 400Hz single phase power from the circuit breaker main AC bus.

- (2) The QAR has three front panel lights to indicate POWER ON, BUSY and READY. Ejection of the cartridge is an eletro-mechanical function initiated by pressing the eject push button. This is located beneath the front access door of the QAR.
- (3) The QAR records the data on four tracks with tape marks being used as file seperators. The tape marks are BEGINNING OF TAPE (BOT), END OF TAPE (EOT), LOAD POINT (LP) and END WRITING (EW). The cartridge drive is controlled by acquisition unit during normal operation (reading, writing and searching). The QAR is completely automatic in all operation other than loading and ejection of the cartridge.

D. TAPE

- (1) The tape normal recording time is 14 hours with a tape speed XX inches per second. The cartridge has 4 tracks.

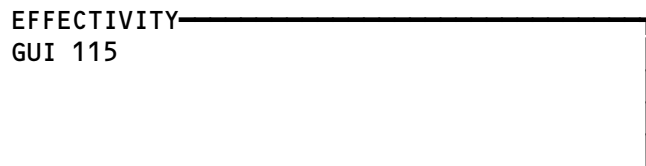
3. Operation (Fig. 2)

A. Functional Description

- (1) The QAR receives data from DFDAU. The data is received by a B1-Polar circuit which interfaces with the C.P.U. Once the C.P.U. interprets the data it is transmitted to the data formatter circuit. This then sends the data to the cartridge. The data status circuit sends out signals to the DFDAU to indicate if the QAR is in normal operation or in the fail mode.
- (2) When the data is received, it is formatted into blocks. These are a preamble, a cyclic redundancy check character (CRCC) and post amble which are added before being written to tape. Read-after write error detection and automatic rewrite procedures are used to check transmission to tape accuracy. If writing is terminated and the data is incomplete, a tape mark is written followed by an end of track erase gap.
- (3) A write operation is initiated by inserting a blank cartridge in the QAR.
- (4) Reading of data is initiated by specifying the GMT reference for the required data.
- (5) The tape drive assembly has a single servo controller capstan with optical tachometer for speed control. This allows for a system free of mechanical clutches or belts. Accurate cartridge position is insured due to a three point suspension by which the cartridge is locked in place.

THE AIRPLANE CONDITION MONITORING SYSTEM SCHEMATIC IS PART OF THE FLIGHT DATA RECORDER SYSTEM SCHEMATIC. SEE FLIGHT DATA RECORDER SYSTEM DESCRIPTION AND OPERATION (31-31-00).

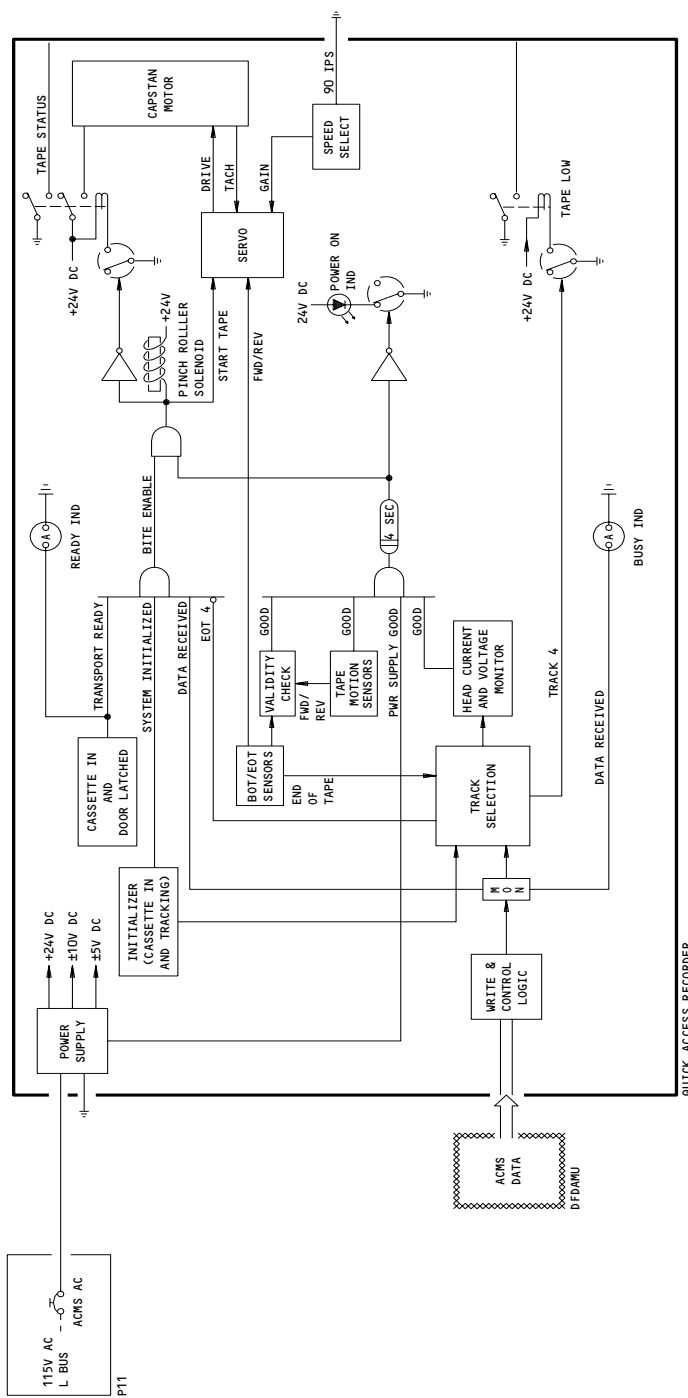
Airplane Condition Monitoring System Components
Figure 2



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Quick Access Recorder Schematic
Figure 3

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- (6) Data is read from the tape in blocks. After the preamble and postamble are removed the data is checked against CRCC. If correct it is also removed and the data is output to the DFDAU.
- (7) The ACMS provides a printout of operational and flight data. The printing function is controlled by the DFDAU. Printout is initiated automatically or manually from the DMEP.

B. BITE

- (1) The Data Management Entry Panel (DMEP) indicator lights when the DMEP fails its EPROM, and RAM self-tests. The tests are performed by the DMEP when it receives a test character from the DFDAU. At the same time, the DMEP lights its DMEP indicator when it trasmits a memory error character to the DFDAU.

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 FAULT ISOLATION/MAINT MANUAL

AIRPLANE CONDITION MONITORING SYSTEM

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	REFERENCE
CIRCUIT BREAKERS -				
ACMS, C4459	--	1	FLT COMPT, P11 11S39	*
FLIGHT RECORDER AC, C561	--	1	11J7	*
FLIGHT RECORDER DC, C578	--	1	11J8	*
PANEL (31-31-00/101)				
DATA MANAGEMENT ENTRY, M10301				
PRINTER - AIRBORNE, M10386	--	1	FLT COMPT, P14	31-35-06
RECORDER - QUICK ACCESS, M10387	--	1	119BL MAIN EQUIP CTR, E3-3	31-35-01
UNIT - (31-31-00/101)				
DIGITAL FLIGHT DATA ACQUISITION UNIT				

* SEE THE WDM EQUIPMENT LIST

Airplane Condition Monitoring System - Component Index
 Figure 101

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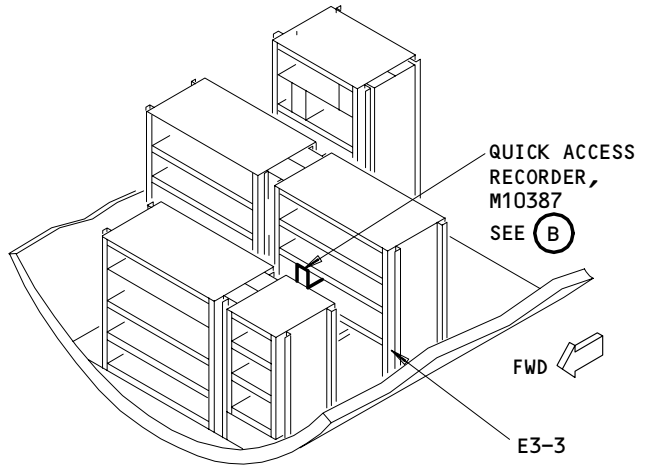
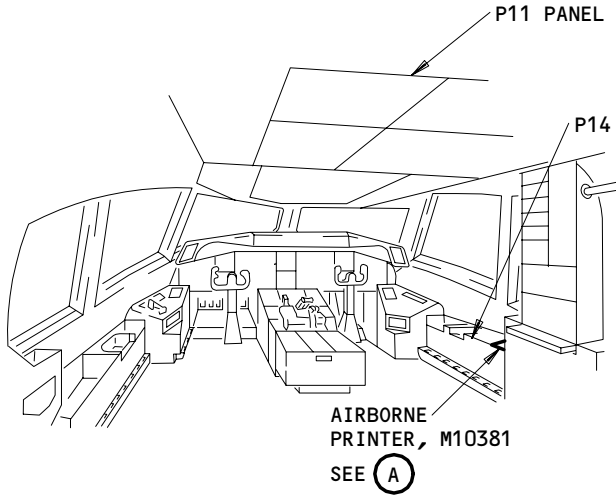
31-35-00

04

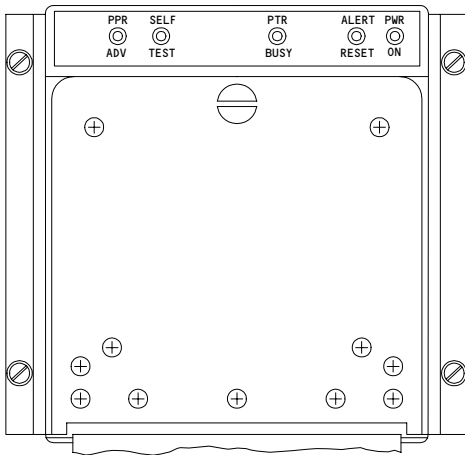
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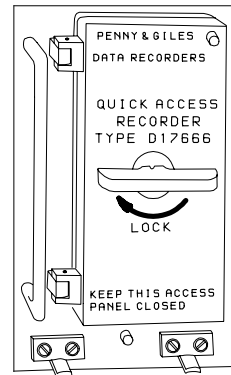


MAIN EQUIP CTR



AIRBORNE PRINTER, M10386

(A)



QUICK ACCESS RECORDER, M10387

(B)

Components Location
Figure 102

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AIRPLANE CONDITION MONITORING SYSTEM – ADJUSTMENT/TEST

1. General

- A. There is only one task in this procedure. That one task is the operational test of the Quick Access Recorder (QAR) and the Printer.

TASK 31-35-00-715-038

2. ACMS – Operational Test

A. General

- (1) The operational test make sure the printer and the QAR works properly. No test equipment is necessary.

B. References

- (1) AMM 24-22-00/201, Electrical Power Control

C. Access

- (1) Location Zone
212 Flight Compartment (Right)
119BL Main Equipment Bay E3-3

D. Prepare for the test

S 865-001

- (1) Supply electrical power (AMM 24-22-00/201).

S 865-036

- (2) Make sure these circuit breakers are closed:

(a) On the overhead equipment panel P11:

- 1) 11J8, FLIGHT RECORDER DC
2) 11J7, FLIGHT RECORDER AC

S 715-041

- (3) Make sure the DMEP and DFDAU failure lights on the DMEP are off.

E. Quick Access Recorder (QAR) Test

S 205-004

- (1) Make sure the QAR failure light on the DMEP is off.

S 865-005

- (2) Open the front panel door on the QAR.

S 205-006

- (3) Make sure the READY and the POWER lights on the QAR are on.

S 205-007

- (4) Make sure the tape cartridge is installed in the QAR.

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S 865-008

- (5) On the P61 Panel, push the RSET switch on the DMEP.

S 205-009

- (6) Make sure the BUSY light flashes on the QAR.

S 865-010

- (7) On the DMEP, push in the letters Q, U, and T then the ENT switch.

S 865-011

- (8) Push in the number 5 then the ENT switch.

S 205-012

- (9) Make sure the BUSY light on the QAR is on steady.

S 205-013

- (10) Make sure the QAR peripheral drive belt moves intermittently (approx. every 12 seconds).

S 865-014

- (11) On the DMEP, push in the number 6 then the ENT switch.

S 205-015

- (12) Make sure the BUSY lamp flashes on the QAR.

S 865-016

- (13) Close the front panel door of the QAR.

F. Printer Test

S 205-017

- (1) Make sure the PTR failure light on the DMEP is off.

S 865-018

- (2) Push the RSET switch on the DMEP

S 205-019
(3) Make sure the green POWER ON lamp on the printer is on.

S 205-020
(4) Make sure the amber PTR BUSY lamp on the printer is off.

S 865-042
(5) On the DMEP, push in the PRNT switch.

S 205-021
(6) Make sure the printer print out the message that follows:

NOTE: The PTR BUSY lamp will be on steady and will flash on and off at the completion of the message.

(a) TEST MESSAGE
ABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMN
OPQRSTUVWXYZ
0123456789
0
1
2
3
4
5
6
7
8
9
END OF TEST MESSAGE

S 865-022
(7) On the printer, push the ALERT RESET switch.

S 205-023
(8) Make sure the PTR BUSY lamp is off.

- S 865-083
- (9) Remove electrical power if it is no longer necessary (AMM 24-22-00/201).

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QUICK ACCESS RECORDER – MAINTENANCE PRACTICES

1. General

- A. This procedure contains:
 - (1) A removal of the tape cartridge from the QAR.
 - (2) An installation of the tape cartridge in the QAR.
- B. The QAR is installed on the E3-3 rack in the main E/E bay.

TASK 31-35-01-002-001

2. Remove the Tape Cartridge from the QAR

- A. References
 - (1) AMM 24-22-00/201, Electrical Power Control
- B. Access
 - (1) Location Zone
119 Main Equipment Center (Left)
- C. Procedure
 - S 862-002
 - (1) Supply electrical power (AMM 24-22-00/201).
 - S 862-003
 - (2) Make sure these circuit breakers are closed:
 - (a) On the overhead equipment panel P11:
 - 1) 11J7, FLIGHT RECORDER AC
 - 2) 11J8, FLIGHT RECORDER DC
 - S 412-010
 - (3) Open the front panel door of the QAR.
 - S 212-011
 - (4) Make sure the POWER ON light is on.
 - S 212-012
 - (5) Make sure the BUSY light is off.
 - S 862-013
 - (6) Push the EJECT switch to eject the cartridge.
 - S 022-014
 - (7) Remove the cassette from the QAR.

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S 432-015

- (8) Install a cassette cover on the cassette.

TASK 31-35-01-402-016

3. Install the QAR Tape Cartridge

A. References

- (1) AMM 24-22-00/201, Electrical Power Control

B. Access

- (1) Location Zone
119 Main Equipment Center (Left)

C. Procedure

S 862-017

- (1) Make sure these circuit breakers are closed:
 - (a) On the P11 panel:
 - 1) 11J7, FLIGHT RECORDER AC
 - 2) 11J8, FLIGHT RECORDER DC

S 412-024

- (2) Remove the cassette cover.

S 422-025

- (3) Put the cartridge with its bottom (aluminum plate) to the left side and the capstan into the QAR.

S 412-026

- (4) Install the cartridge into the QAR.

S 212-027

- (5) Make sure the READY and the BUSY lights come on.

S 862-028

- (6) Make sure the BUSY light flashes after the tape is set in the QAR.

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S 412-029
(7) Close the QAR front panel door.

S 862-036
(8) Remove electrical power if it is not necessary (AMM 24-22-00/201).

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QUICK ACCESS RECORDER – REMOVAL/INSTALLATION

1. General

- A. There are two tasks in this procedure. The first task is the removal of the Quick Access Recorder (QAR). The second task is the installation of the QAR.
- B. The QAR is installed on the E3-3 rack in the Main E/E Bay.

TASK 31-35-01-004-001

2. Remove the QAR

- A. References
 - (1) AMM 20-10-01/401, EE Rack Mounted Components
- B. Access
 - (1) Location Zone
119 Main Equipment Center (Left)

C. Procedure

S 014-040

- (1) Open these circuit breakers and attach the DO-NOT-CLOSE tags:
 - (a) On the overhead circuit breaker panel, P11:
 - 1) 11J7, FLIGHT RECORDER AC
 - 2) 11J8, FLIGHT RECORDER DC

S 014-041

- (2) Remove the QAR as follows:

CAUTION: DO NOT TOUCH THE CONNECTOR PINS OR OTHER CONDUCTORS ON THE QAR. IF YOU TOUCH THESE CONDUCTORS, ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE QAR.

- (a) Remove the QAR from the equipment rack (AMM 20-10-01/401).

TASK 31-35-01-404-035

3. Install the QAR

- A. References
 - (1) AMM 20-10-01/401, EE Rack Mounted Components
 - (2) AMM 24-22-00/201, Electrical Power Control
- B. Access
 - (1) Location Zone
119 Main Equipment Center (Left)

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C. Procedure

S 204-045

- (1) Make sure these circuit breakers are not closed:
 - (a) On the P11 panel:
 - 1) 11J7, FLIGHT RECORDER AC
 - 2) 11J8, FLIGHT RECORDER DC

S 414-044

- (2) Install the QAR as follows:

CAUTION: DO NOT TOUCH THE CONNECTOR PINS OR OTHER CONDUCTORS ON THE QAR. IF YOU TOUCH THESE CONDUCTORS, ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE QAR.

- (a) Install the QAR in the equipment rack (AMM 20-10-01/401).

S 864-047

- (3) Supply electrical power (AMM 24-22-00/201).

S 414-046

- (4) Remove the DO-NOT-CLOSE tags and close these circuit breakers:
 - (a) On the P11 panel:
 - 1) 11J7, FLIGHT RECORDER AC
 - 2) 11J8, FLIGHT RECORDER DC

D. Test QAR

S 704-039

- (1) Test the QAR as follows:
 - (a) Open the front panel door of the QAR.
 - (b) Make sure the tape cartridge is installed.
 - (c) Close the front panel door of the QAR.
 - (d) Set the NORM-DFDR switch on the Data Management Entry Panel (DMEP) to the DFDR position and hold.
 - (e) Make sure the DFDAU, DMEP, and QAR lights on the DMEP are off.
 - (f) Release the function switch on the DMEP.

- S 864-019
- (2) Remove electrical power if it is not necessary (AMM 24-22-00/201).

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AIRBORNE PRINTER - SERVICING

1. General

- A. There is one task in this procedure. That task is to install the paper to the printer. The printer is installed on the first officer's side panel P14.
- B. The paper low indicator is a coloured margin on the paper which appears 1 meter before the end of the paper.

TASK 31-35-06-613-001

2. Install the Paper into the Printer

- A. Consumable Materials
 - (1) Paper Roll
- B. Reference
 - (1) AMM 24-22-00/201, Electrical Power - Control
- C. Access
 - (1) Location Zone
 - 212 Control Cabin - Flight Deck
- D. Procedure

S 863-002

- (1) Open the circuit breaker on the overhead panel, P11, and attach the DO-NOT-CLOSE tag:
 - (a) 11J7, FLIGHT RECORDER AC

S 433-003

- (2) To install the paper into the printer, do the steps that follow:
 - (a) Loosen the screw on the front panel of the printer door.
 - (b) Pull the screw to open the printer door.
 - (c) Remove the cardboard tube from the mount, attach behind the printer door.
 - (d) Push the plastic roller thru the middle of the cardboard tube.
 - (e) Discard the cardboard tube.
 - (f) Push in a new roll of paper along the plastic roller.
 - (g) Separate the end of the paper that is attached to the roll of paper.

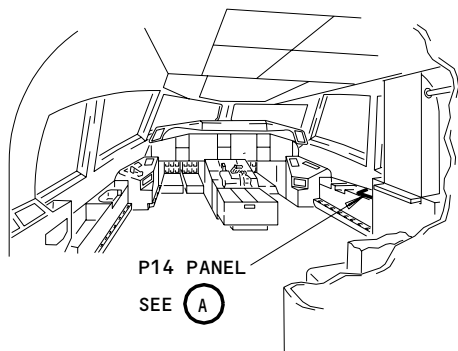
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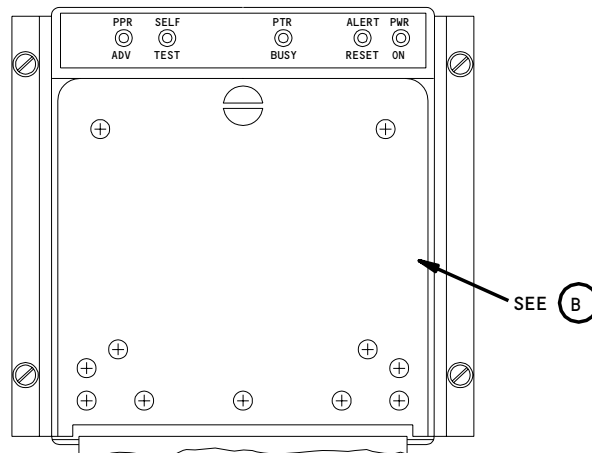
31-35-06

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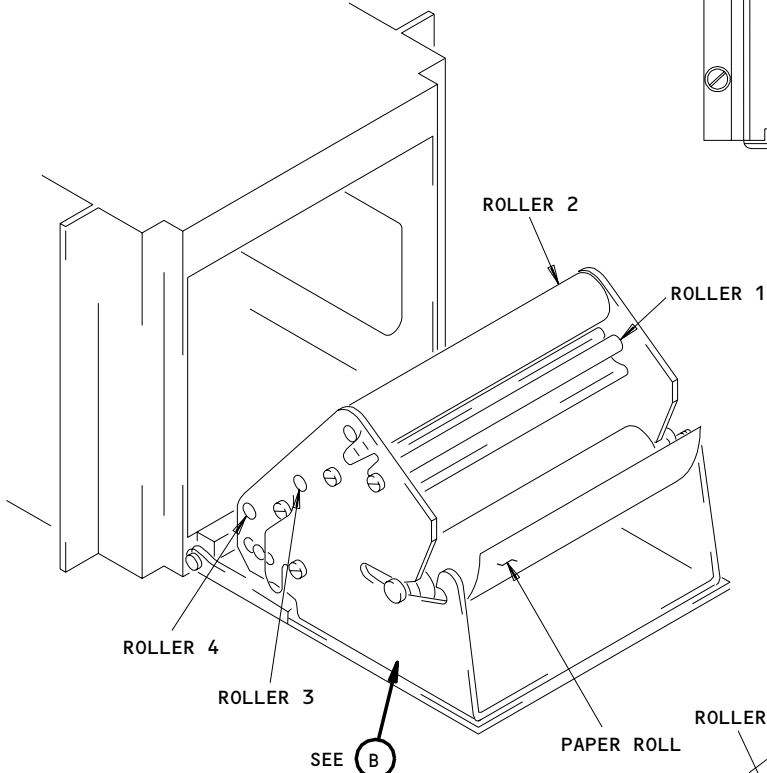


FLIGHT COMPARTMENT



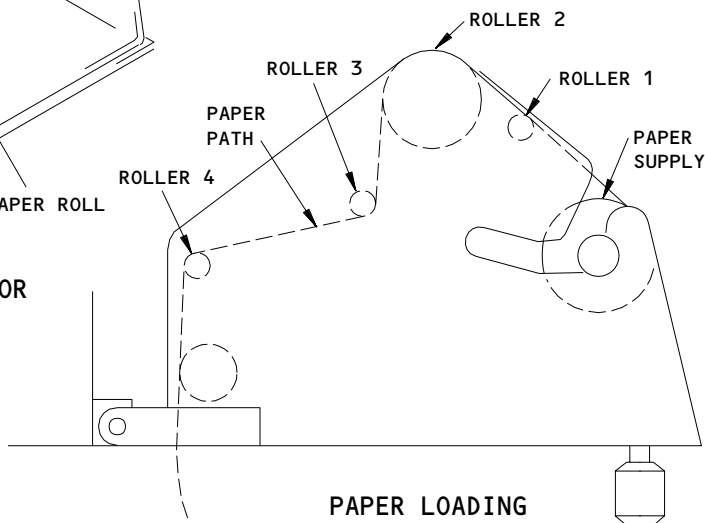
AIRBORNE PRINTER

(A)



BACK VIEW OF AIRBORNE PRINTER DOOR

(A)



(B)

Printer Servicing
Figure 301

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- (h) Install the roll of paper into the mount.
- (i) Put the paper below roller 1, above roller 2, below roller 3, above roller 4 and then thru the paper cutter.
- (j) Lift the printer door.
- (k) Make sure the paper comes out through the orifice at the bottom of the door.
- (l) Close and tighten the screw on the front printer door.

S 713-004

- (3) Do the Printer Operational Test as follows:
 - (a) Remove the DO-NOT-CLOSE tag and close the circuit breaker on the P11 panel:
 - 1) 11J7, FLIGHT RECORDER AC
 - (b) Supply electrical power (AMM 24-22-00/201).
 - (c) On the printer, push the PPR ADV switch.
 - (d) Make sure the paper moved forward.
 - (e) Push the SELF TEST switch.
 - (f) Make sure the printer gives a short test pattern.

S 863-011

- (4) Remove electrical power if it is not necessary (AMM 24-22-00/201).

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AIRBORNE PRINTER – REMOVAL/INSTALLATION

1. General

- A. There are two tasks in this procedure. The first task is the removal of the printer and the second task is the installation of the printer.
- B. The printer is installed at the right side panel P14.

TASK 31-35-06-004-001

2. Remove the Printer

A. Access

- (1) Location Zone
212 Flight Compartment – section 41 (Right)

B. Procedure

S 864-002

- (1) Open these circuit breakers on the overhead circuit breaker panel, P11, and attach DO-NOT-CLOSE tags:

S 024-032

- (2) Do these steps to remove the printer from the side panel, P14:
 - (a) Loosen the screws that hold the printer to the side panel.
 - (b) Move the printer from the side panel.
 - (c) Disconnect the electrical connector from the printer.
 - (d) Remove the printer from the side panel.

TASK 31-35-06-404-007

3. Install the Printer

A. References

- (1) AMM 24-22-00/201, Eletrical Power Control

B. Access

- (1) Location Zone
212 Flight Compartment – section 41 (Right)

C. Procedure

S 214-023

- (1) Make sure these circuit breakers on the P11 panel are open:
 - (a) 11J7, FLIGHT RECORDER AC

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- S 434-008
(2) Install the electrical connectors to the printer.

- S 424-036
(3) Do these steps to install the printer into the side panel, P14:
(a) Move the printer into the right side panel.
(b) Tighten the mounting screws to the side panel.

- S 864-011
(4) Remove the DO-NOT-CLOSE tags and close the circuit breakers on the P11 panel:
(a) 11J7, FLIGHT RECORDER AC

D. Printer Test

- S 864-012
(1) Supply the electrical power (AMM 24-22-00/201).

- S 214-015
(2) Make sure the printer is filled with paper.

- S 864-016
(3) Push the PPR ADV switch on the printer.

- S 214-018
(4) Make sure the paper move forward.

- S 864-019
(5) Push the SELF TEST switch on the printer.

- S 214-021
(6) Make sure the printer print out the test pattern.

- S 864-022
(7) Remove electrical power if it is not necessary.

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ENGINE INDICATION AND CREW ALERTING SYSTEM – DESCRIPTION AND OPERATION

1. General (Fig. 1)

- A. The Engine Indication and Crew Alerting System (EICAS) is an automatic engine monitoring and centralized alerting system. The system provides display for engine parameters and crew alerts. It also provides status information and ground maintenance data.
- B. EICAS consists of two multicolored display cathode ray tubes, two control panels, and two redundant computers. Each computer receives analog and digital input signals from airplane systems and sensors. This information is analyzed and the desired data is displayed on the two CRTs. Only one computer drives the display units at any one time. The other computer is used as a backup.
- C. AIRPLANES WITH -1000 SERIES EICAS COMPUTERS;
the EICAS computers are software loadable. There are two types of software, the OPS and the OPC. The OPS (Operational Program Software) is the core software and application software that contains the EICAS functions. The OPS is installed in all airplanes with EICAS computers and will possibly not change. The OPC (Operational Program Configuration file) is the specified software that sets the EICAS configuration of your airplane. The OPC will change when your EICAS configuration changes.
- D. The two display units are centrally located one above the other in the flight deck. The top display mainly provides primary engine thrust information and crew alerting messages. The bottom display provides secondary engine parameters and airplane status information. In addition, the bottom display can provide maintenance data while on the ground. All information can be shown on either the top or bottom display in case of in-flight failure of one of the units.
- E. EICAS incorporates automatic display changes. These changes occur only to indicate engine or system abnormality. Continuous BITE monitoring circuits detect faults that can affect the integrity of the displays. If a fault is detected in EICAS, automatic failure modes and system redundancy provide for maximum data display.
- F. Control of EICAS is provided by two different control panels in the flight deck. The EICAS display select panel is used for in-flight selection of display formats. The EICAS maintenance panel is used for selection of ground maintenance displays.
- G. Discrete warning and caution lights provide back-up for EICAS displays and messages. In addition, the standby engine indicator will provide primary engine thrust information if both computers or both display units fail.

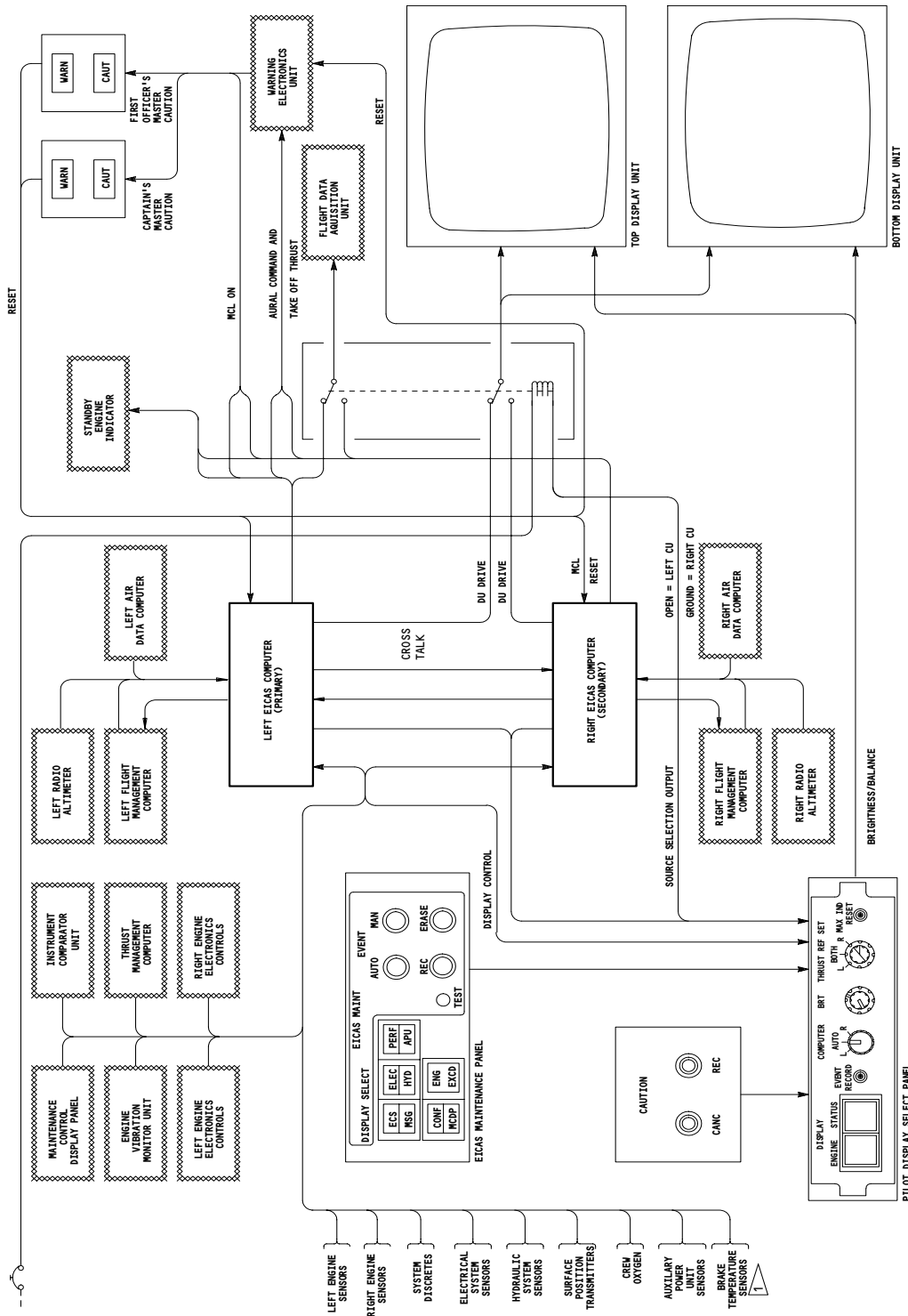
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EICAS Simplified Block Diagram
Figure 1

GUI 115

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H. Configuration

- (1) EICAS Computer
- (2) The following EICAS computer are installed:
-110 -111 -1001

GUI 001-008, 115	BASIC	SB 31-59
GUI 009-114	BASIC	SB 31-59
GUI 116-999		BASIC

- (3) EICAS DISPLAY select panel
 - (a) The -206 EICAS DISPLAY Select Panel is basic.

2. Component Details (Fig. 2)

A. EICAS Computers

- (1) Each EICAS computer receives inputs in the form of both analog signals and ARINC 429 digital data words. These inputs are processed and formulated into various display formats for presentation of engine, status, and maintenance data.
- (2) Each computer also receives analog discrete inputs for the generation of EICAS messages. These messages are processed and included in the proper fomats for display.
- (3) Each computer has program pins for selection of display options. These options reflect customer requirements and the type and model of engines.
- (4) Each EICAS computer receives control input data from the EICAS display select panel. The computer uses this data to determine the desired mode of operation. The proper display format is then selected for display.
- (5) The EICAS computers assemble data from their analog and digital inputs and from internal programming into analog output signals. These analog outputs are used to drive the video display units.
- (6) The computers incorporate BITE for self checks and to monitor overall system health. Digital input words are checked for presence and validity. In addition, all data processed by each computer is sent to the other computer over high speed crosstalk data buses. This allows cross comparison of analog signals received by both computers to determine if their processed values are valid, invalid, or disagree between computers. A test mode can also be initiated manually by pressing a TEST button in the flight deck. This test mode processes signals through the computers and checks the results. The test also monitors for system LRU fail discretets, and displays the test results on the EICAS display units.

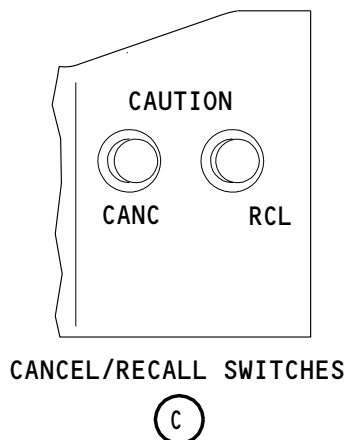
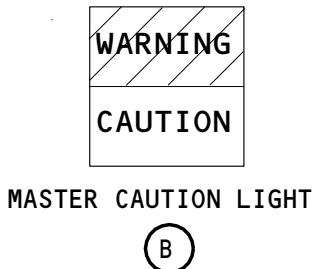
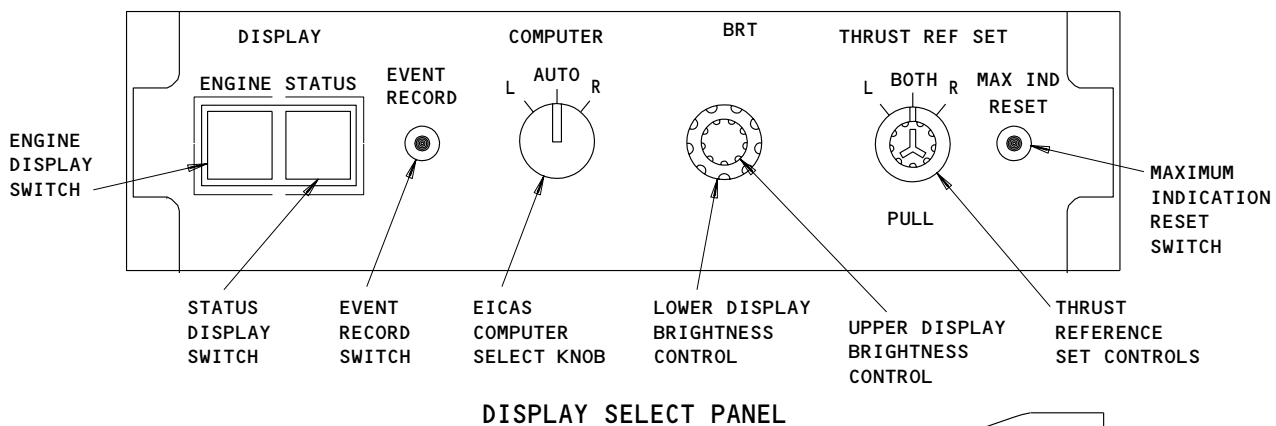
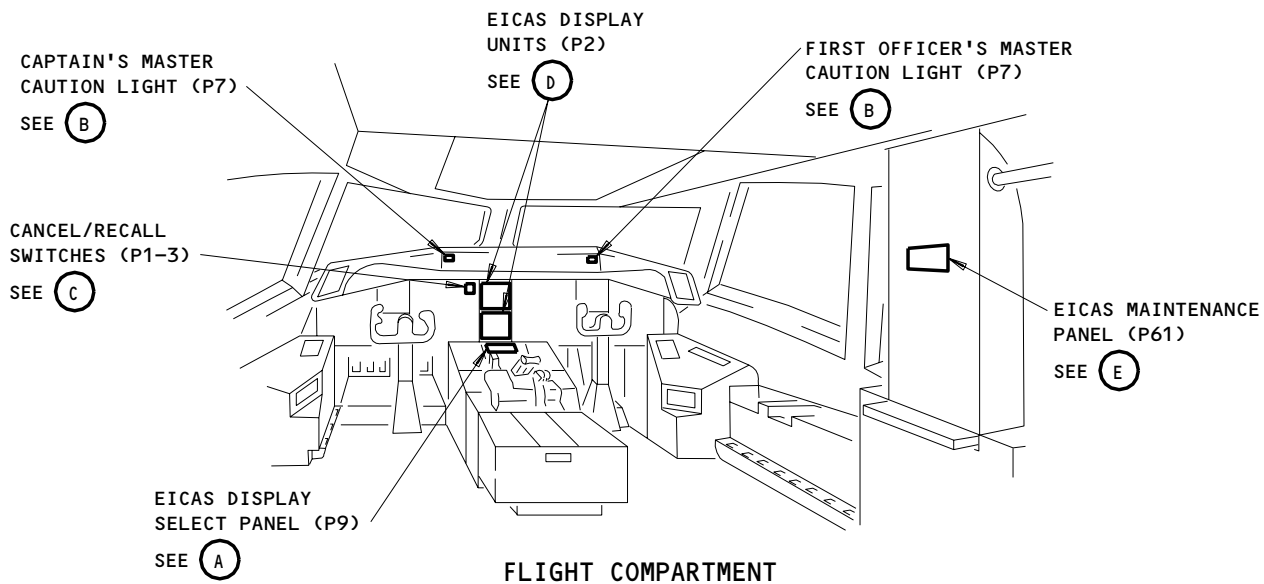
B. EICAS Switching Modules

- (1) The two EICAS switching modules interface between the EICAS computers and the EICAS display units. Each EICAS computer provides video signals to both switching modules. Video driving signals for the top display unit come from the upper switching module. Signals for the bottom display unit come from the lower switching module.

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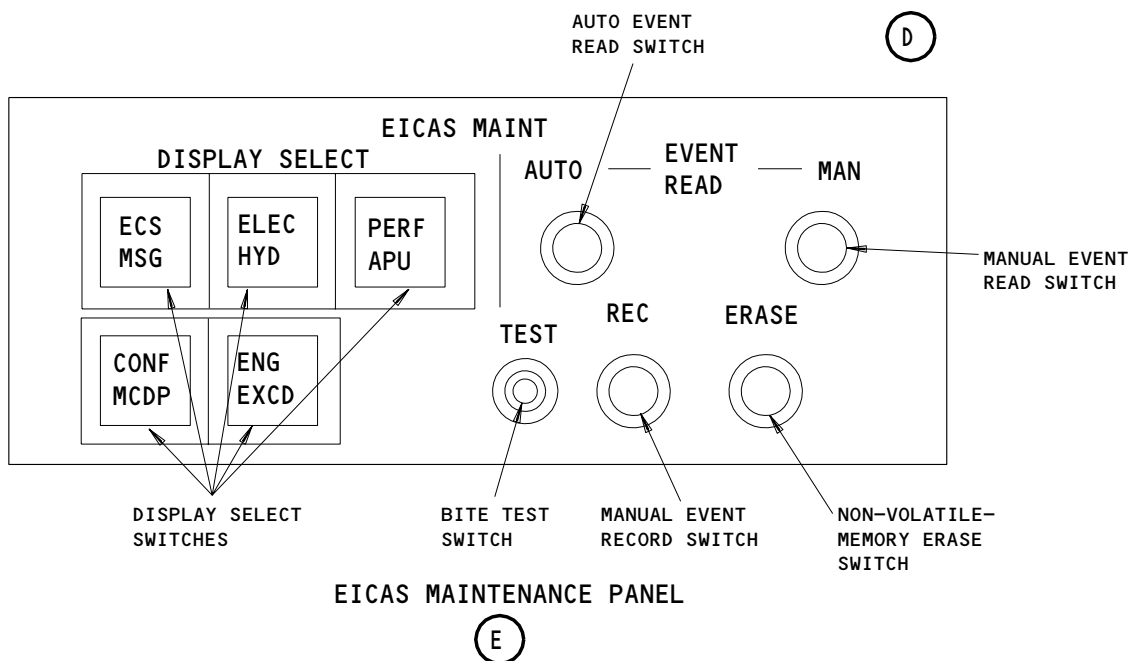
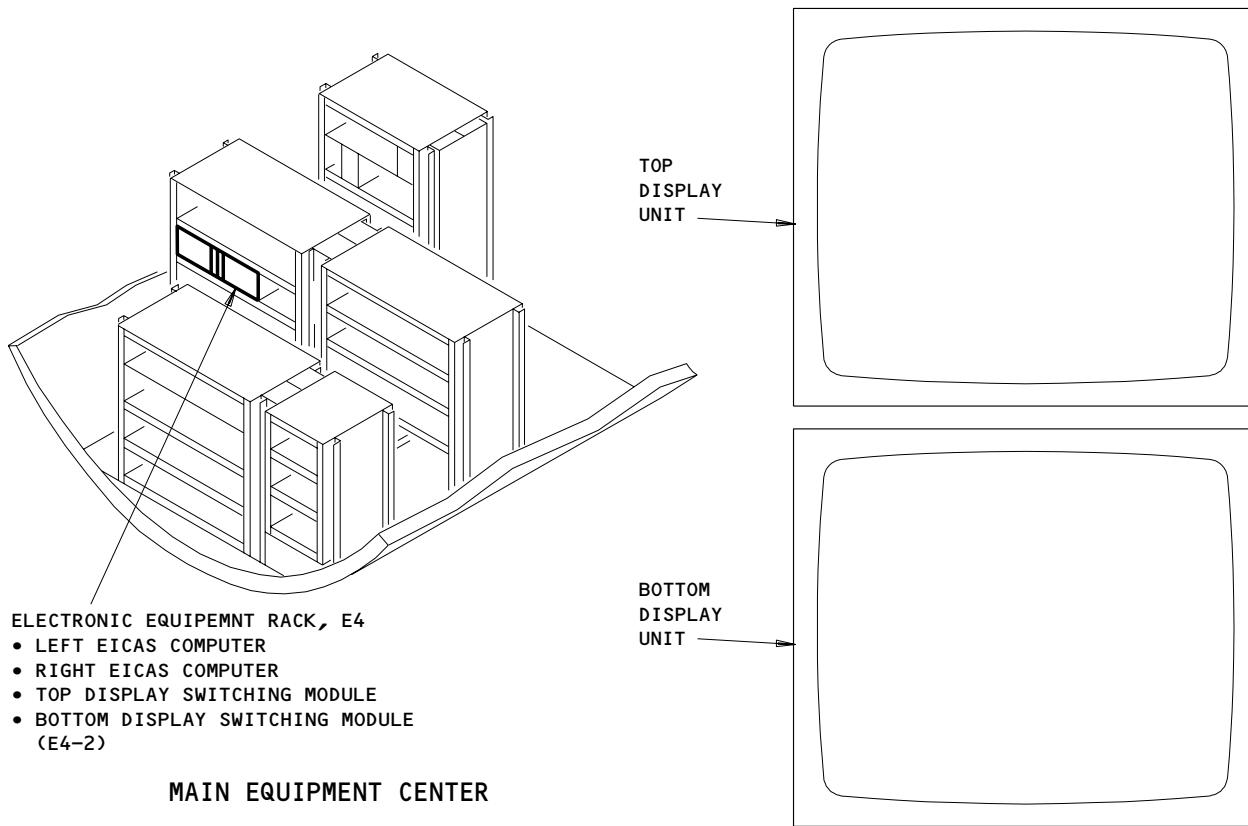
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EICAS - Component Detail
Figure 2 (Sheet 1)

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EICAS - Component Detail
Figure 2 (Sheet 2)

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- (2) The EICAS switching modules also interface between the EICAS computers and the Flight Data Recording System. The EICAS, which is currently driving the displays, sends high speed digital data to the flight data recorder.
 - (3) The EICAS computers and switching modules are located on rack E4-2 in the main equipment center. Their front panels have no controls or indicators.
- C. Master Caution Lights
- (1) The yellow master CAUTION light/switches are located on both ends of the pilots' glareshield (P7). The lights come on when either EICAS computer generates a caution signal, which is done in conjunction with the display of a level B alert message. Pressing either indicator light cap will turn off both lights.
- D. EICAS Display Select Panel
- (1) The display select panel provides control functions to the EICAS computers for system operation. These functions include display format selection, computer source selection, display brightness/balance control, and thrust reference setting control. Controls for clearing displayed engine exceedance data and for recording system parameters are also provided. The panel is located on the forward electronics panel (P9).
 - (2) The two DISPLAY switches are momentary pushbutton switches. They control the mode of the EICAS computers as follows:
 - (a) Pressing the ENGINE switch will display all secondary engine parameters. This data will be displayed in full secondary format on the bottom display unit under normal conditions. Pressing ENGINE a second time will clear secondary parameters from the display.
 - (b) GUI 001-114, 116-999; the fuel flow data will remain on the lower display.
 - (c) Pressing the STATUS switch will display status mode information on the bottom display unit. Status information includes dedicated system information such as control surface positioning and a single page of status messages. The STATUS switch is also used to page through additional status messages, if necessary. Pressing the STATUS switch will cycle through the status message list. Once all messages have been displayed, pressing the STATUS switch again will clear the status format. In the event of a display unit failure, the STATUS switch is inhibited when the airplane is in the air.
 - (3) The EVENT RECORD button is used to store the instantaneous values of system parameters in non-volatile memory. This is known as a Manual Event recording. Pressing EVENT RECORD will record a Manual Event for the ECS, ELEC/HYD, and PERF/APU formats.
 - (4) The COMPUTER select switch provides automatic or manual switching of the EICAS computers. When the select switch is in L or R position, the left or right computer, respectively, will drive the EICAS display units. When the select switch is in the AUTO position, the left computer will normally drive the EICAS displays. If the left computer fails, the system automatically switches to the right computer.

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- (5) The BRT controls consist of two concentric rotary knobs. When rotated clockwise, the inner knob increases the brightness of the top display unit, and the outer knob increases the brightness of the bottom display unit. The knobs are mechanically clutched together so that under normal operation they rotate together.
 - (6) The THRUST REF SET controls are used to manually set the thrust reference readout. They also set the reference cursor on the left and right primary thrust indicators.
 - (a) The engine selector switch (outer control knob) is a three position rotary switch. This switch is used to select the L (left), BOTH, or R (right) primary thrust indicator references.
 - (b) The inner control knob is a 12-detent rotary switch combined with a two-way push-pull switch. When initially set (pulled out), the reference readout (and cursor) are set to 1.55 EPR on the selected EPR indicator(s). Rotating the knob clockwise will increase the reference readout (and cursor) by 0.01 EPR per detent.
 - (c) EPR reference values can be set between 0.965 and 2.05 EPR.
 - (7) The MAX IND RESET button is a momentary switch that clears maximum engine exceedance readouts from the display. Pressing this button will clear only engine exceedance data for which the exceedance no longer exists.
- E. Cancel/Recall Switches
- (1) The CANCEL and RECALL switches are momentary pushbutton switches located on the pilots center instrument panel (P1). Pressing CANCEL will remove the caution (level B) and advisory (level C) messages that are currently displayed. The next page of B and C messages will then be displayed. Pressing RECALL will return the first page of B and C messages to the display. Level A messages are unaffected by these switches.
- F. EICAS Display Units
- (1) The EICAS display units are installed, one above the other, on the pilots' center instrument panel (P2). These units are identical to the EHSIs and are interchangeable with them.
 - (2) The top display unit is used to display the primary engine format and level A, B, and C alert messages. The bottom display unit is used to display the secondary engine, status, or maintenance formats. All formats can be shown on either display in the event of a single unit failure. A compacted format is used when both primary and secondary engine parameters need to be displayed.
 - (3) The EICAS display units provide a multicolor (red, yellow, cyan (light blue), magenta (pink), white, and green) CRT presentation of EICAS data. Video display and deflection signals from the EICAS switching modules are provided to drive the CRTs. Manual and automatic intensity signals are provided from the display select panel and from remote light sensors. Temperature sensor circuits and monitor circuits are also included to provide signals to the EICAS computers for BITE monitoring. The display units require 115 Vac, 400 Hz single phase power.

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- (4) A local integral light sensor is located on each display unit in the upper right hand corner of the front panel. Each local sensor provides an automatic dimming signal to both display units. The integral light sensors require 0-5 Vac, 400 Hz single phase airplane power.

G. EICAS Maintenance Panel

- (1) The EICAS maintenance panel provides for selection of ground maintenance displays. It has momentary pushbuttons for display selection, memory control, and self-test. The maintenance panel functions only on the ground. The panel is located on the right side panel (P61).
- (2) The DISPLAY SELECT switches control which maintenance page is to be displayed. These switches are the ECS/MSG, ELEC/HYD, PERF/APU, CONF/MCDP, and ENG EXCD (for EXC format). When a DISPLAY SELECT switch is pressed, its respective maintenance data format is displayed. In addition, the ECS/MSG switch is used to cycle through additional maintenance messages, if necessary.
- (3) The EVENT READ buttons allow display of pre-recorded maintenance data. After a maintenance display page has been selected, pressing an EVENT READ button will display data recorded for that page. Pressing AUTO displays data recorded automatically by the EICAS system. Pressing MAN displays data that has been recorded manually with either the EVENT RECORD or REC buttons.
- (4) The REC button is used to record maintenance data in non-volatile memory. When REC is pressed, the parameters of only the maintenance page that is currently displayed are stored in memory. Data previously stored manually is lost.
- (5) The ERASE button is used to erase data that has been previously stored in non-volatile memory. This includes both manually and automatically stored data. Only the page currently displayed will be erased.
- (6) The TEST button is used to initiate the BITE self-test routine. When pressed, BITE signals are processed through the system and a test pattern is displayed on the top and bottom display units. When the BITE routine is finished, EICAS will display TEST OK or TEST FAIL. Any EICAS failure messages for BITE-detected LRU faults will be displayed at this time. When TEST is pressed a second time, EICAS will return to its normal mode.

H. EICAS Display Pages

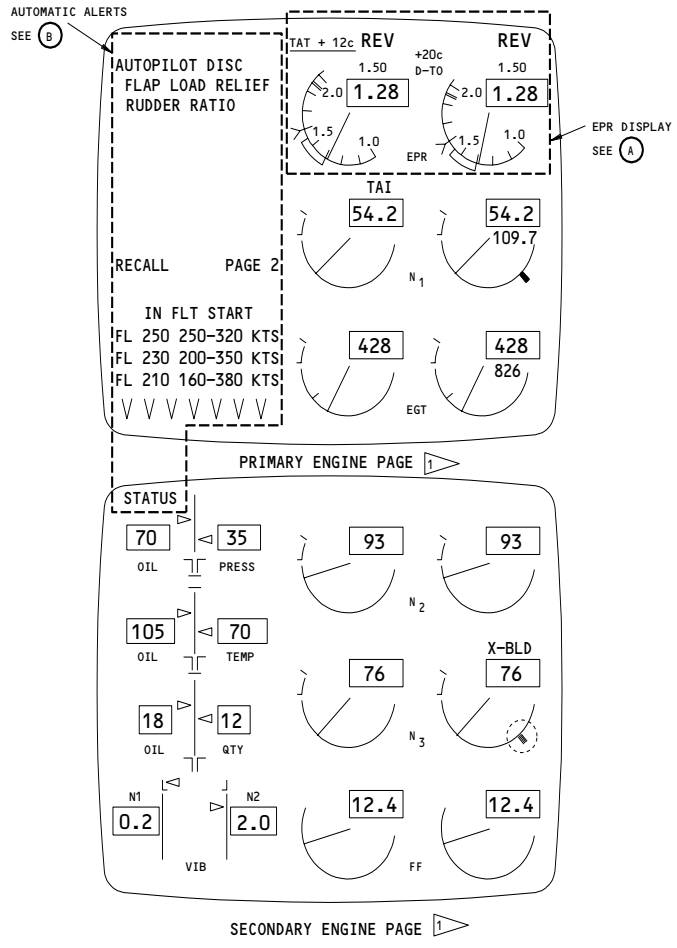
- (1) Engine Primary Parameters (Fig. 3)
 - (a) The primary engine page is shown on the top EICAS display unit. Engine parameters shown on this page are only those that are required to set and monitor engine thrust. These parameters are displayed continuously in both an analog round dial and a digital readout for both left and right engines. The primary engine parameters shown are Engine Pressure Ratio (EPR), N1, and Exhaust Gas Temperature (EGT).

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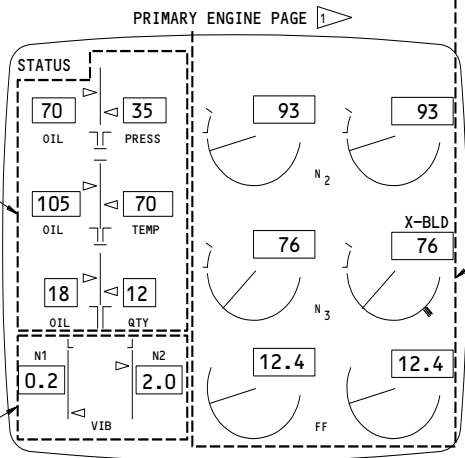
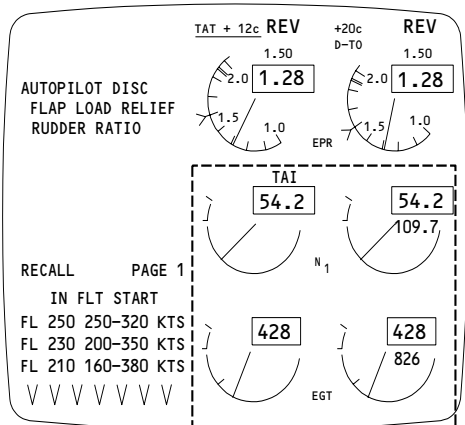
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SYMBOL	NAME	PRIME/SEC SOURCE	REMARKS
(A) EPR INDICATOR			
	ACTUAL EPR	EPR TRANSMITTER	COLOR - WHITE FUNCTION - SHOWS ACTUAL THRUST WITH BOTH ANALOG POINTER AND DIGITAL READOUT
	COMMAND SECTOR	EEC	COLOR - WHITE FUNCTION - SHOWS MOMENTARY DIFFERENCE BETWEEN COMMANDED THRUST AND ACTUAL THRUST
	MAXIMUM LIMIT MARKER	EEC/TMC	COLOR - YELLOW FUNCTION - SHOWS MAXIMUM THRUST LIMIT
	REFERENCE TARGET READOUT AND CURSOR	TMC/FMC/ EICAS DSP	COLOR - READOUT IS GREEN - CURSOR IS PINK (FMC) OR GREEN (TMC OR MANUAL CONTROL)
	SELECTED THRUST MODE AND DERATE TEMPERATURE	TMC	COLOR - GREEN FUNCTION - SHOWS SELECTIONS MADE ON THRUST MODE SELECT PANEL
	THRUST REVERSER READOUT	THRUST REVERSER	COLOR - GREEN (DEPLOYED) OR YELLOW (INTRANSIT) FUNCTION - SHOWS POSITION OF THRUST REVERSERS. BLANK FOR INFLIGHT MODE.
	TOTAL AIR TEMPERATURE	TMC/ADC	COLOR - WHITE FUNCTION - SHOWS TOTAL AIR TEMPERATURE AS CALCULATED BY ADC
(B) AUTOMATIC ALERTS			
	STATUS CUE	EICAS COMPUTER	COLOR - BLUE FUNCTION - SHOWS PRESENCE OF NEW STATUS MESSAGE
	AUTOPILOT DISC FLAP LOAD RELIEF RUDDER RATIO	ALERT MESSAGES	VARIOUS (SEE TEXT) COLOR - WARNINGS ARE RED - CAUTIONS AND ADVISORIES ARE YELLOW FUNCTION - SEE TEXT
	RECALL PAGE 2	PAGE INDEX	CANCEL/RECALL SWITCHES COLOR - WHITE FUNCTION - SEE TEXT
	IN FLT START FL250 250-320 KTS FL230 200-350 KTS FL210 160-380 KTS	RESTART ENVELOPE	EICAS COMPUTER COLOR - PINK FUNCTION - SHOWS FLIGHT CONDITIONS NEEDED FOR INFLIGHT START
	V V V V V V V	SECONDARY DATA CUE	EICAS COMPUTER COLOR - BLUE FUNCTION - SHOWS PRESENCE OF SECONDARY ENGINE DATA ON LOWER DISPLAY



DISPLAY PARAMETERS AND INDICATIONS ARE FOR ILLUSTRATION PURPOSES ONLY.
 CURSOR REMAINS GREEN WITH FMC INPUT UNLESS AUTOTHROTTLE IS DISENGAGED OR FMC IS IN THRUST MODE.

EICAS Display - Engine Pages
Figure 3 (Sheet 1)



OIL PARAMETER INDICATORS SEE (D)

VIBRATION INDICATORS SEE (E)

ADDITIONAL ENGINE INDICATORS SEE (C)

1 DISPLAY PARAMETERS AND INDICATIONS ARE FOR ILLUSTRATION PURPOSES ONLY.
2 SEE TEXT FOR EXCEEDANCE OPERATIONS

EICAS Display - Engine Pages
Figure 3 (Sheet 2)

SYMBOL	NAME	PRIME SOURCE	REMARKS
(C) ADDITIONAL ENGINE INDICATORS			
	ACTUAL PARAMETER VALUE	N1, N2 - PULSE PROBES N3 - TACH TRANSMITTER EGT - THERMOCOUPLE PROBE FF - FUEL FLOW SENSOR	COLOR - WHITE, YELLOW, RED FUNCTION - SHOWS ACTUAL PARAMETER VALUE WITH BOTH ANALOG POINTER AND DIGITAL READOUT
	EXCEEDANCE LIMITS	EICAS COMPUTER	COLOR - YELLOW, RED FUNCTION - SHOW ENGINE OPERATIONAL EXCEEDANCES FOR N1, EGT, N2, AND N3
	TAI ANNUNCIATION	NACELLE TAI SWITCH	COLOR - GREEN FUNCTION - READOUT SHOWS TAI SYSTEM IS ACTIVATED
	INFLIGHT START ANNUNCIATIONS	READOUT - EICAS COMPUTER CURSORS - EICAS COMPUTER/ADC	COLOR - PINK FUNCTION - CURSOR SHOWS WINDMILLING RPM REQUIRED ON N3 FOR RESTART - READOUT SHOWS WHEN CROSSBLEEDING ACTION IS REQUIRED
	HOT START LIMIT	EICAS COMPUTER	COLOR - RED FUNCTION - SHOWS EGT LIMIT DURING ENGINE START
	MAXIMUM EXCEEDANCE	EICAS COMPUTER	COLOR - WHITE FUNCTION - SHOWS HIGHEST RED LINE EXCEEDANCE VALUE REACHED FOR N1, EGT, N2, N3
(D) OIL PARAMETER INDICATORS			
	ACTUAL OIL PARAMETER VALUE	ENGINE SENSOR	COLOR - SEE TEXT FUNCTION - SHOWS ACTUAL VALUE WITH BOTH ANALOG POINTER AND DIGITAL READOUT
	EXCEEDANCE LIMITS	EICAS COMPUTER	COLOR - YELLOW, RED FUNCTION - SHOWS OIL PARAMETER OPERATIONAL EXCEEDANCES
(E) VIBRATION INDICATORS			
	ACTUAL VIBRATION VALUE	TRACKING FILTER ENGINE VIBRATION MONITOR	COLOR - WHITE, YELLOW FUNCTION - SHOWS ROTOR WITH CURRENT HIGHEST ACTUAL ENGINE VIBRATION

- (b) EPR Indicators
 - 1) Actual engine thrust, as measured by engine sensors, is indicated both by an actual thrust pointer and by digital readout. Any momentary difference between actual thrust and commanded thrust is shown by the command sector. The maximum thrust limit is shown by an amber marker on the analog scale. The EEC is the primary source for maximum thrust limit display; the TMC is the secondary source.
 - 2) Target thrust is shown by both a reference cursor on the analog scale and a digital readout above the actual thrust readout. Thrust mode readout and derate temperature readout, if selected, are shown above the thrust indicators.
 - 3) Also shown above the thrust indicators are readouts for Total Air Temperature (TAT) and thrust reverser status. If a thrust reverser is fully deployed, the readout will be green. If in transit, the readout will be yellow. For normal in-flight mode position, the readout will be blank.
- (c) N1 Indicators
 - 1) The low compressor rotor speed is indicated by both an actual N1 pointer and by digital readout. The maximum N1 rpm exceedance reached is shown beneath the actual N1 readout.
 - 2) A thermal anti-ice (TAI) readout is shown above the left or right N1 display when the respective engine inlet TAI system is activated.
- (d) EGT Indicators
 - 1) Actual exhaust gas temperature (EGT) is indicated by both an analog EGT pointer and digital readout. The maximum EGT exceedance readout is shown beneath the respective actual EGT readout for each engine.
 - 2) An EGT Hot Start Limit is displayed on the EGT scale during engine start. When actual EGT exceeds the hot start limit, the analog pointer changes to red in color (Ref 77-21-00).
- (e) In-Flight Start Annunciations
 - 1) An IN FLT START envelope in table form is also shown. This table lists airspeed for the present and next two lower two thousand foot interval flight levels where start is possible.
- (f) Alert messages are automatically shown in the upper left corner of the display when necessary. These messages are discussed in a later section.
- (g) Secondary Data Cue
 - 1) The secondary data cue is present whenever data is being displayed on the bottom display unit. This includes both when an exceedance is automatically displayed and when the ENGINE switch is pressed to select the engine page. The data cue protects against loss of data display when a display unit fails in a way that might go undetected by the EICAS computers.

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- (2) Secondary Engine Parameters (Fig. 3)
- (a) The secondary engine page is shown on the bottom display unit. Oil pressure, temperature, and quantity, engine vibration, N2, N3, and Fuel Flow (FF) are displayed for each engine.
 - (b) GUI 115;
the bottom display is normally blank.
 - (c) GUI 001-114, 116-999;
The bottom display unit is normally blank except for the fuel flow display.
 - (d) If an exceedance condition occurs for either engine for N2, N3, or vibration, both displays for the respective parameter automatically come on. If it occurs for either engine for oil pressure or temperature, all oil parameters for both engines are automatically displayed.
 - (e) Status Cue
 - 1) A STATUS cue appears in the upper left corner when a new status message has been generated and maintained for 15 seconds. These status messages will be discussed in a later section. This cue only appears if the status page is not already selected for display. The status cue will disappear as soon as the status page is selected.
 - (f) Oil Parameter Indicators
 - 1) The engine oil parameters are shown in a vertical scale format. Actual values are shown by both analog pointers and by digital readouts.
 - (g) Engine Vibration Indicators
 - 1) Engine vibration indicators are also shown in a vertical scale format. Actual values are shown by both analog pointers and digital readouts.
 - 2) A rotor identification readout is located above the actual vibration readout. EICAS will automatically select and display the rotor with the most severe vibration. If any rotor vibration sensor should fail, EICAS will display an overall broad band (BB) vibration value for that engine.
 - (h) N2, N3 Indicators
 - 1) N2 and N3 compressor rotor speeds are shown in a round dial format. Maximum rpm exceedance readouts are located below the actual rotor speed digital readouts.
 - 2) An In-flight-start windmilling "FUEL ON" cursor appears on the analog N3 scale during ground start or inflight XBLD start. In flight, it is displayed in conjunction with the in-flight start annunciators on the primary engine format and always indicates the minimum N3 required for FUEL ON. If crossbleed action is required, an X-BLD readout appears above the N3 indicator.

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- (i) Fuel Flow Indicators
 - 1) The rate of fuel flow for each engine is shown in round dial format. Actual values are shown as both pointers and digital readouts.
- (3) Exceedance Operations
 - (a) Primary Engine Parameters
 - 1) Red band exceedance areas are displayed at the upper end of the analog scales for N1 and EGT. If an actual value pointer reaches or exceeds the red band area, the pointer and digital readout become red in color.
 - 2) The highest red band exceedance reached is displayed in white digital form below the actual digital readout. This maximum exceedance can be cleared from the display using the MAX IND RESET button only if the exceedance no longer exists.
 - 3) The EGT indicator also have a yellow band exceedance area. This area is at the upper end of the scale immediately below the red line. If the actual value pointer enters the yellow band area, both the pointer and digital readout become yellow in color.
 - (b) Secondary Engine Parameters
 - 1) When a yellow band exceedance area is entered by any secondary engine parameter, automatic display of that parameter occurs. The yellow band and red band color changes for secondary parameters operate the same way as the primary engine parameters.
 - 2) N2 and N3 exceedance limits operate the same way as the primary (N1 and EGT) parameter limits. N2 and N3 also have maximum red band exceedance readouts.
 - 3) The oil pressure indicators have lower level red band and yellow band limits. The yellow band limits vary as a function of N3 speed (Ref 71-00-00). When an oil pressure exceedance has been reached, all oil parameters are automatically displayed.
 - 4) The oil temperature display has three exceedance band limits as shown in the table that follows. All oil parameters will automatically show when a temperature exceedance occurs.

OIL TEMPERATURE EXCEEDANCE BANDS	LIMIT (°C)
red upper level	170
yellow upper level	None
yellow lower level	0
red lower level	-40

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 **BOEING**
757
MAINTENANCE MANUAL

- 5) The oil quantity indicators have lower white band limits. When an oil quantity indicator enters this area, no color changes take place. This does however, cause a PERF auto-event (Oil Q). The other oil parameters (pressure and temperature) are not automatically displayed when an oil quantity enters the white band area.
 - 6) The engine vibration displays have half scale (2.5) limits. When vibration exceeds this limit, both displays will automatically come on. The vibration displays are white under normal conditions. During an exceedance condition, the pointer and digital readout turn yellow.
- (c) Takeoff/go-around Mode
- 1) When the thrust management computer is in either the takeoff or go-around mode, the yellow band exceedance operations are inhibited for five minutes. Automatic secondary data initiation does not occur until the red band area is entered. All parameter pointers and readouts remain white until the red band area is entered.
- (4) Status Page (Fig. 4)
- (a) The status page is displayed, when selected, on the bottom EICAS display unit. This selection is made using the STATUS switch on the EICAS display select panel.
 - (b) The status page consists of subsystem digital readouts and control surface positions shown on the left side of the display. Status messages are displayed along the right side of the page.
 - (c) GUI 001-114, 116-999;
Fuel flow is also displayed along the right side of the page.
 - (d) GUI 115;
Brake temperature is also displayed along the right side of the page.
 - (e) Control surface position indicators are provided for the rudder, left and right ailerons, and left and right elevators.
 - (f) GUI 001-114, 116-999;
actual fuel flow readout normally appears as two round dial indicators on the bottom display. When the status page is selected, fuel flow is shown in two boxed digital readouts above the status message list.
 - (g) The status message list indicates conditions critical only to dispatch of the airplane and, while available to the pilot, are not needed in flight. They are explained later in the EICAS messages section.

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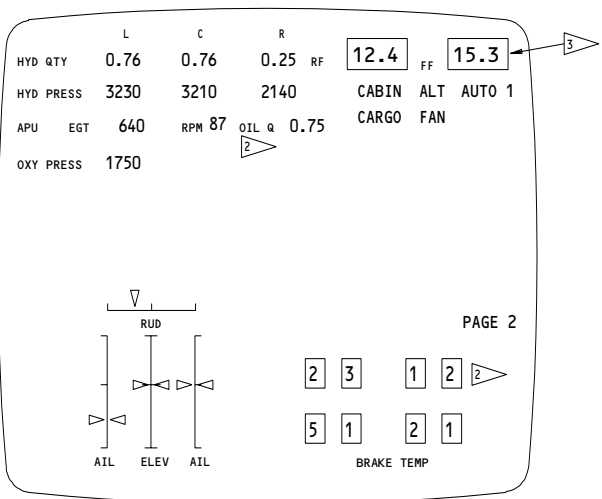
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SYMBOL	NAME	PRIME SOURCE	REMARKS								
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">L</td> <td style="text-align: center;">C</td> <td style="text-align: center;">R</td> <td></td> </tr> <tr> <td>HYD QTY</td> <td>0.76</td> <td>0.76</td> <td>0.25 RF</td> </tr> </table>	L	C	R		HYD QTY	0.76	0.76	0.25 RF	HYDRAULIC QUANTITY	QUANTITY MONITOR MODULE	LIMITS: 0.00 TO 1.00% FULL NORMAL COLOR IS WHITE. REFILL (RF) IS PINK.
L	C	R									
HYD QTY	0.76	0.76	0.25 RF								
<table style="width: 100%; border-collapse: collapse;"> <tr> <td>HYD PRESS</td> <td>3230</td> <td>3210</td> <td>2140</td> </tr> </table>	HYD PRESS	3230	3210	2140	HYDRAULIC PRESSURE	HYD. PRES. SENSOR	LIMITS: 0 TO 4000 PSI				
HYD PRESS	3230	3210	2140								
<table style="width: 100%; border-collapse: collapse;"> <tr> <td>APU EGT</td> <td>640</td> <td>RPM 87</td> <td>OIL Q 0.75</td> </tr> </table>	APU EGT	640	RPM 87	OIL Q 0.75	APU PARAMETERS	APU SENSORS	LIMITS: EGT, 0 TO 900°C RPM, 0 TO 120% OIL Q, 0 TO 1.00% FULL				
APU EGT	640	RPM 87	OIL Q 0.75								
OXY PRESS	OXYGEN PRESSURE	CREW OXYGEN SYSTEM PRESSURE	LIMITS: 0 TO 2500 PSI								
	SURFACE POSITION INDICATORS	POSITION TRANSMITTERS	RUDDER LIMITS: -31° TO +31° AILERON LIMITS: -21° TO +21° ELEVATOR LIMITS: -22° TO +32°								
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">12.4</td> <td style="text-align: center;">FF</td> <td style="text-align: center;">15.3</td> </tr> </table>	12.4	FF	15.3	FUEL FLOW	FUEL FLOW SENSOR	PROVIDES DIGITAL FUEL FLOW READOUT WHEN STATUS IS SELECTED LIMITS: 0 TO 12,000 KG/HOUR LIMITS: 0 TO 27,000 LB/HOUR					
12.4	FF	15.3									
<table style="width: 100%; border-collapse: collapse;"> <tr> <td>CABIN CARGO</td> <td>ALT FAN</td> <td>AUTO 1</td> </tr> </table>	CABIN CARGO	ALT FAN	AUTO 1	STATUS MESSAGES	VARIOUS	SEE TEXT					
CABIN CARGO	ALT FAN	AUTO 1									
PAGE 2	PAGE INDEX	EICAS COMPUTER	SHOWS OVERFLOW OF STATUS MESSAGES (PRESENT ONLY WHEN STATUS LIST IS FULL)								
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">2</td> <td style="text-align: center;">3</td> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> </tr> <tr> <td style="text-align: center;">5</td> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> <td style="text-align: center;">1</td> </tr> </table>	2	3	1	2	5	1	2	1	BRAKE TEMPERATURE READOUTS	BRAKE TEMP SENSORS	LIMITS: 0 TO 9 UNITS COLOR: SEE TEXT
2	3	1	2								
5	1	2	1								

- 1 PARAMETER VALUES AND INDICATIONS ARE FOR ILLUSTRATION PURPOSES ONLY.
- 2 GUI 115
- 3 GUI 001-114,116-999
- 4 GUI 001-003,005,009-114,116-999
- 5 GUI 004,006-008

EICAS Displays - Status Page
Figure 4



STATUS PAGE
(BOTTOM DISPLAY)

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- (h) GUI 115;
Brake temperature readouts are provided for each individual brake. Both box and readout are normally light blue in color. When at threshold temperatures the box of the brake with the highest temperature will change to white. If the temperature reaches abnormal conditions, both the box and number turn white.
 - (i) In the event of an EICAS display unit failure, the status page cannot be selected while the airplane is in the air. The status page can still be selected when the airplane is on the ground. When this is done, the standby engine indicator will display primary engine parameters.
- (5) **Compacted Mode Page**
- (a) The compacted mode page displays both primary and secondary engine indicators and alert messages on a single display unit. The compacted mode appears under both normal operating conditions and during failure modes.
 - (b) The full compacted page is displayed when a maintenance page is selected. The compacted page will then appear on the top display unit and the maintenance page on the bottom display unit.
 - (c) When a pilot's display unit fails, the primary engine page, including alert messages, appears normally on the remaining display unit. If a secondary engine parameter goes into an exceedance condition, it will automatically be displayed as usual. The parameter will be shown only in digital readout form. This is known as a partial-compacted format.
 - (d) The full compacted page is displayed when a display unit has failed and the ENGINE key has been pressed. All primary and secondary parameters are then displayed.
- (6) **Maintenance Display Pages (Fig. 5A-5E)**
- (a) Five different maintenance pages can be displayed on the bottom display unit. These pages are controlled using the EICAS maintenance panel.
 - 1) The ECS/MSG page contains both Environmental Control System (ECS) parameters and EICAS maintenance messages (MSG). This message list consists of repeats of most status messages, as well as additional maintenance only messages. Maintenance messages are discussed further in a later section.
 - 2) The ELEC/HYD page contains both Electrical (ELEC) and Hydraulic (HYD) System parameters.

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SYMBOL	NAME	PRIME SOURCE	REMARKS
	FORMAT IDENTIFIER	EICAS COMPUTER	INDICATES ENVIRONMENTAL CONTROL SYSTEM/MESSAGES FORMAT
OR	NON-VOLATILE MEMORY IDENTIFIER	EICAS COMPUTER	INDICATES EITHER THE AUTO EVENT OR MANUAL EVENT MEMORY HAS BEEN SELECTED FOR DISPLAY

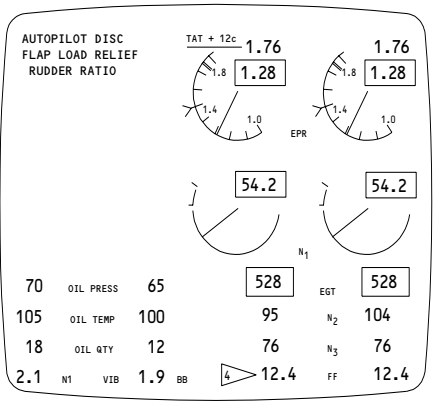
A ENVIRONMENTAL CONTROL SYSTEM

DUCT TEMP	30 28 17	DUCT TEMPERATURE	L AND R PACK CONTROL UNIT	-60 TO +200°C
TRIM VALVE	0.75 0.80 0.00	TRIM VALVE POSITION	L AND R PACK CONTROL UNIT	0.00 (CLOSED) TO 1.00 (OPEN)
PACK OUT	2 3	PACK OUTLET TEMPERATURE	L AND R PACK CONTROL UNIT	-60 TO +200°C
TURB IN	9 10	TURBINE INLET TEMPERATURE	L AND R PACK CONTROL UNIT	-60 TO +200°C
SEC HX OUT	1 3	PRIMARY HEAT EXCHANGER OUTLET TEMPERATURE	L AND R PACK CONTROL UNIT	-60 TO +200°C
COMPR OUT	96 98	COMPRESSOR OUTLET TEMPERATURE	L AND R PACK CONTROL UNIT	-60 TO +300°C
PRIM HX OUT	44 46	PRIMARY HEAT EXCHANGER OUTLET TEMPERATURE	L AND R PACK CONTROL UNIT	-60 TO +200°C
PRIM HX IN	171 173	PRIMARY HEAT EXCHANGER INLET TEMPERATURE	L AND R PACK CONTROL UNIT	-60 TO +300°C
PRECOOL OUT	193 196	PRECOOLER OUTLET TEMPERATURE	L AND R PACK CONTROL UNIT	-60 TO +200°C
DUCT PRESS	40 42	DUCT PRESSURE	L AND R PACK CONTROL UNIT	0 TO 100 PSI
PACK FLOW	9 8	INLET PACK AIRFLOW	L AND R PACK CONTROL UNIT	0 TO 70 CUBIC METERS/MINUTE
TEMP VALVE	0.75 0.80	TEMPERATURE CONTROL VALVE POSITION	L AND R PACK CONTROL UNIT	0 (CLOSED) TO 1.00 (OPEN)
RAM IN DOOR	0.62 0.71	RAM INLET DOOR POSITION	L AND R PACK CONTROL UNIT	0 (OPEN) TO 1.00 (CLOSED)
AFT CABIN TEMP		AUTO EVENT FAILURE MESSAGE (EXAMPLE)	VARIOUS	INDICATES CONDITION THAT CAUSED ECS AUTO EVENT

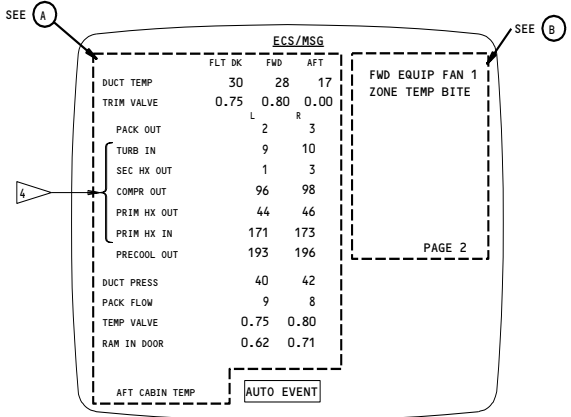
B MAINTENANCE MESSAGES

FWD EQUIP FAN 1 ZONE TEMP BITE	MAINTENANCE MESSAGE LIST	VARIOUS	REFER TO TEXT
PAGE 2	PAGE INDEX	EICAS COMPUTER	INDICATES OVERFLOW OF MAINTENANCE MESSAGES

- EICAS COMPUTER IS SOURCE FOR FUNCTION IDENTIFIERS. IDENTIFIERS ARE LIGHT BLUE IN COLOR; DIGITAL READOUTS ARE WHITE IN COLOR.
- SEE TEXT FOR EXPLANATION
- PARAMETER VALUES AND INDICATIONS ARE FOR ILLUSTRATION PURPOSES ONLY.
- GUI 115; FULL TIME FUEL FLOW AND ECS TEMPERATURE PACKAGE ARE NOT SHOWN



COMPACTED PAGE (TOP DISPLAY)



ECS/MSG PAGE (BOTTOM DISPLAY)

EICAS Displays - Compacted and ECS/MSG Pages
Figure 5A

SYMBOL ¹ ▽	NAME	PRIME SOURCE	REMARKS
ELEC/HYD	PAGE IDENTIFIER	EICAS COMPUTER	INDICATES ELECTRICAL/HYDRAULIC PAGE
AUTO EVENT OR MAN EVENT	NON-VOLATILE MEMORY IDENTIFIER	EICAS COMPUTER	INDICATES EITHER AN AUTO EVENT OR MANUAL EVENT MEMORY HAS BEEN SELECTED FOR DISPLAY

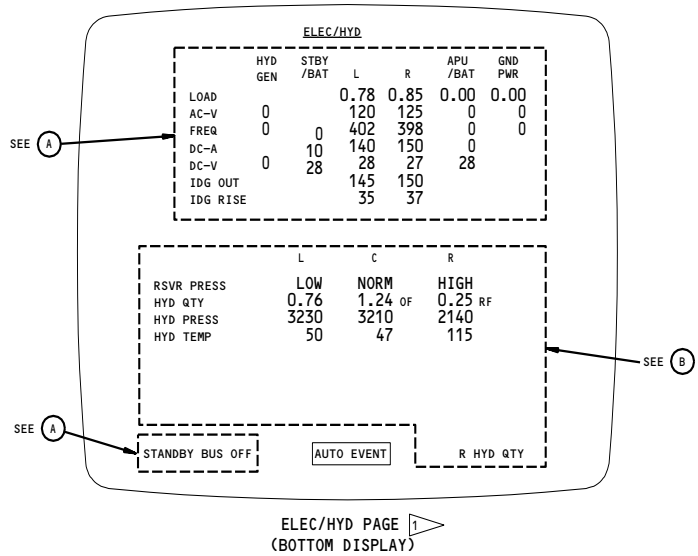
(A) ELECTRICAL SYSTEMS

HYD GEN /BAT	STBY /BAT	L	R	APU /BAT	GND PWR		HYD GEN - HYDRAULIC MOTOR DRIVEN GENERATOR	LOAD - 0 TO 150% LOAD ⁴ ▽
LOAD		0.78	0.85	0.00	0.00			AC-V - 100 TO 130V AC < 100 VAC, DISPLAY = 0
AC-V	0	120	125	0	0	ELECTRICAL POWER SYSTEM PARAMETERS	STBY/BAT-STANDBY INVERTER	FREQ - 380 TO 420 Hz < 380 HZ, DISPLAY = 0
FREQ	0	402	398	0	0		L AND R - LEFT AND RIGHT GENERATORS	DC-A - 0 TO 150 AMPS (TRU) -150 TO +150 AMPS (BAT)
DC-A	10	140	150	0			APU/BAT - APU GENERATOR	DC-V - 0 TO 40V DC
DC-V	0	28	27	28			GND PWR - GROUND POWER	IDG OUT - 0 TO 180°C
IDG OUT		145	150					IDG RISE - 0 TO 180°C
IDG RISE		35	37					
STANDBY BUS OFF						ELECTRICAL AUTO EVENT MESSAGE (EXAMPLE)	VARIOUS	INDICATES CONDITION THAT CAUSED AUTO EVENT




(B) HYDRAULIC SYSTEMS


RSVR PRESS	LOW	NORM	HIGH			LOW (MAGENTA) - P < 17 PSI NORM (WHITE) - 17 < P < 55 HIGH (MAGENTA) - P > 55 PSI	
HYD QTY	0.76	1.24 OF	0.25 RF		HYDRAULIC SYSTEM PARAMETERS	QUANTITY MONITOR MODULE	LIMITS - 0 TO 1.5 (RF < 0.75) (OF > 1.0) ² ▽
HYD PRESS	3230	3210	2140			HYDRAULIC PRESSURE SENSOR	LIMITS - 0 TO 4000 PSI
HYD TEMP	50	47	115			L AND R HYDRAULIC CONTROL UNIT	LIMITS - -60 TO +200°C
R HYD QTY						HYDRAULIC AUTO EVENT MESSAGE (EXAMPLE MESSAGE)	VARIOUS







- ¹ ▽ EICAS COMPUTER IS SOURCE FOR FUNCTION IDENTIFIERS. UNLESS OTHERWISE NOTED, IDENTIFIERS ARE LIGHT BLUE IN COLOR, DIGITAL READOUTS ARE WHITE IN COLOR.
- ² ▽ NORMAL COLOR IS WHITE. OVERFULL (OF) AND REFILL (RF) ARE PINK.
- ³ ▽ PARAMETER VALUES AND INDICATIONS ARE FOR ILLUSTRATION PURPOSES ONLY.
- ⁴ ▽ FOR SYSTEMS NOT IN USE, LOAD VALUES OF 0.10 (10%) OR LESS WILL BE CONSIDERED RESIDUAL VALUES CAUSED BY STRAY VOLTAGES OR NOISE ON THE EICAS LOAD INPUTS FROM THE BPCU/GCU AND ARE TO BE IGNORED.




EICAS Displays - ELEC/HYD Page
Figure 5B

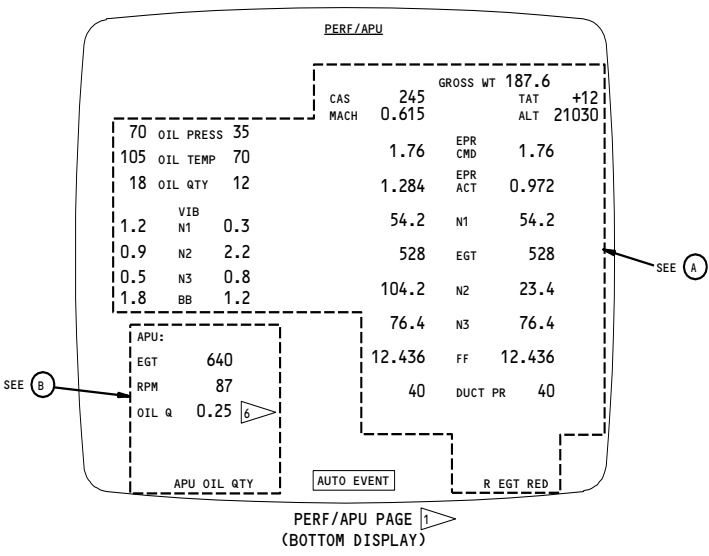
SYMBOL	NAME	PRIME SOURCE	REMARKS
 <u>PERF/APU</u>	PAGE IDENTIFIER	EICAS COMPUTER	INDICATES PERFORMANCE/AUXILIARY POWER UNIT PAGE
 AUTO EVENT OR  MAN EVENT	NON-VOLATILE MEMORY IDENTIFIER	EICAS COMPUTER	INDICATES EITHER AN AUTO EVENT OR MANUAL EVENT MEMORY HAS BEEN SELECTED FOR DISPLAY







A PERFORMANCE DISPLAYS 

GROSS WT 187.6	AIRPLANE GROSS WEIGHT	FMC	SHOWN IN 1000 KG  SHOWN IN 1000 LB 
245 TAT +12 0.615 ALT 21030	AIR DATA PARAMETERS	CAS-ADC MACH-ADC TAT-TMC/ADC ALT-ADC	LIMITS - CAS (30 TO 450 KNOTS) - MACH (0.1 TO 1.0 MACH) - TAT (-60 TO +90°C) - ALT (-1000 TO +50,000 FT)
1.76 EPR CMD 1.76	EPR COMMANDED	EEC	LIMITS - 0.965 TO 2.05 EPR
1.284 EPR ACT 0.902	EPR ACTUAL	EPR TRANSMITTER	LIMITS - 0.965 TO 2.05 EPR
54.2 N1 21.3	N1 SPEED	EEC/SENSOR	LIMITS - 0 TO 120% RPM
528 EGT 825	EXHAUST GAS TEMPERATURE	EEC/SENSOR	LIMITS - 0 TO 1000°C
104.2 N2 23.4	N2 SPEED	EEC/SENSOR	LIMITS - 0 TO 120% RPM
76.4 N3 19.2	N3 SPEED	EEC/SENSOR	LIMITS - 0 TO 120% RPM
12.436 FF 15.312	FUEL FLOW	FUEL FLOW SENSOR	LIMITS - 0 TO 12,000 KG/HOUR  0 TO 27,000 LB/HOUR 
40 DUCT PR 40	DUCT PRESSURE	L AND R PACK CONTROL UNIT	LIMITS - 0 TO 100 PSI
70 OIL PRESS 35 105 OIL TEMP 70 18 OIL QTY 12	ENGINE OIL PARAMETERS	ENGINE SENSORS (DUAL TEMP BULBS)	LIMITS - PRESSURE (0 TO 100 PSI) - TEMPERATURE (-60 TO 200°C) - QUANTITY (0 TO 20 LITERS)  (0 TO 21 U.S. QUARTS) 
1.2 VIB N1 0.3 0.9 N2 2.2 0.5 N3 0.8 1.8 BB 1.2	ENGINE ROTOR VIBRATION	ENGINE VIBRATION MONITOR	LIMITS - SCALE RANGE IS 0 TO 5. SCALE SHOWS THE RELATIVE AMOUNT OF ENGINE VIBRATION.
R EGT RED	PERFORMANCE AUTO EVENT MESSAGE (EXAMPLE)	EICAS COMPUTER	INDICATES CONDITION THAT CAUSED PERFORMANCE AUTO EVENT

B APU DISPLAYS

APU: EGT 640 RPM 87 OIL Q 0.25 	APU PARAMETERS	APU SENSORS	LIMITS - EGT (0 TO 900°C) - RPM (0 TO 120% RPM) - OIL Q (0 TO 1.0 FULL)
APU OIL QTY	APU AUTO EVENT MESSAGE (EXAMPLE)	VARIOUS	INDICATES CONDITION THAT CAUSED APU AUTO EVENT



-  PARAMETER VALUES AND INDICATIONS ARE FOR ILLUSTRATION PURPOSES ONLY.
-  EICAS COMPUTER IS SOURCE FOR FUNCTION IDENTIFIERS. IDENTIFIERS ARE LIGHT BLUE IN COLOR. DIGITAL READOUTS ARE WHITE IN COLOR.
-  SOME PERFORMANCE DATA ALSO SHOWS ON THE ENGINE PAGES (FIG. 3).
-  GUI 001-003,005,009-999
-  GUI 004,006-008
-  GUI 115

EICAS Displays - PERF/APU Page
Figure 5C

EFFECTIVITY

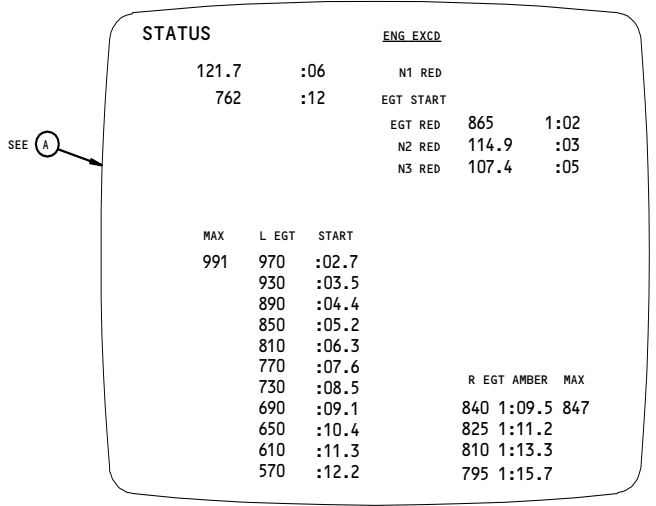
ALL

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SYMBOL ¹	NAME	PRIME SOURCE	REMARKS
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A ENGINE EXCEEDANCE DISPLAYS ²

ENG_EXCD	PAGE IDENTIFIER	EICAS COMPUTER	INDICATES ENGINE EXCEEDANCE PAGE
121.7 :06 N1 RED	N1 RED LIMIT EXCEEDANCE	EICAS COMPUTER	SHOWS MAXIMUM VALUE OF N1, EGT START, EGT, N2 AND N3 FOR LEFT AND RIGHT ENGINES. ALSO SHOWS TOTAL ACCUMULATED TIME (IN MINUTES AND SECONDS) THAT EACH PARAMETER WAS IN EXCEEDANCE RANGE.
762 :12 EGT START	EGT START LIMIT EXCEEDANCE		
EGT RED 865 1:02	EGT RED LIMIT EXCEEDANCE		
N2 RED 114.9 :03	N2 RED LIMIT EXCEEDANCE		
N3 RED 107.4 :05	N3 RED LIMIT EXCEEDANCE		
MAX L EGT START	START LIMIT EXCEEDANCE PROFILE	EICAS COMPUTER	SHOWS PROFILE OF START LIMIT EXCEEDANCE OR YELLOW BAND/REDLINE EXCEEDANCE FOR LEFT AND RIGHT ENGINES.
991 970 :02.7			
930 :03.5			
890 :04.4			
850 :04.4			
810 :06.3			
770 :07.6			
730 :08.5			
690 :09.1			
650 :10.4			
610 :11.3			
570 :12.2			
R EGT AMBER MAX	EGT AMBER EXCEEDANCE PROFILE	EICAS COMPUTER	
840 1:09.5 847			
825 1:11.2			
810 1:13.3			
795 1:15.7			



ENG_EXCD PAGE ³
(BOTTOM DISPLAY)

¹ EICAS COMPUTER IS SOURCE FOR FUNCTION IDENTIFIERS. IDENTIFIERS ARE LIGHT BLUE IN COLOR, READOUTS ARE WHITE IN COLOR.
² SEE TEXT FOR EXPLANATION.
³ PARAMETER VALUES AND INDICATIONS ARE FOR ILLUSTRATION PURPOSES ONLY.

EICAS Display - ENG_EXCD Page
Figure 5D

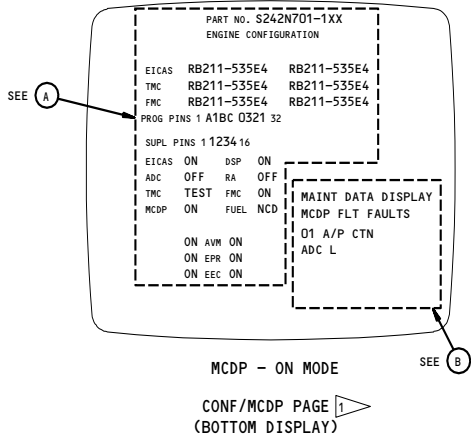
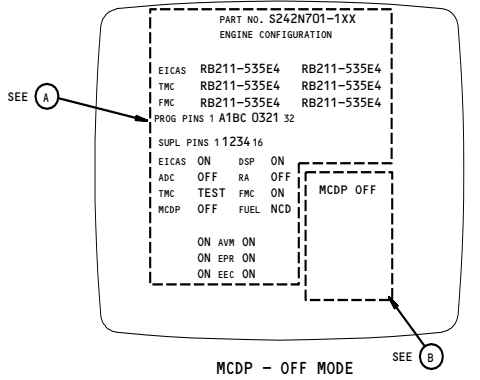
SYMBOL ²	NAME	PRIME SOURCE	REMARKS
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A CONFIGURATION DISPLAYS ³

PART NO. S242N701-1XX	EICAS COMPUTER PART NUMBER	EICAS COMPUTER	SHOWS PART NUMBER OF EICAS COMPUTER
ENGINE CONFIGURATION	LRU LEFT AND RIGHT ENGINE CONFIGURATION	EICAS TMC FMC	SHOWS ENGINE TYPE CONFIGURATION OF SOFTWARE FOR EACH INDICATED LRU.
PROG PINS 1 A1BC 0321 32 SUPL PINS 1 1234 16	EICAS PROGRAM PIN READOUT (EXAMPLE)	EICAS COMPUTER	SHOWS BY HEXADECIMAL NUMBER WHICH PROGRAM PINS ARE GROUNDED ON THE EICAS COMPUTER
EICAS ON DSP ON ADC OFF RA OFF TMC TEST FMC ON MCDP OFF FUEL NCD	EICAS INPUT DATA BUS ACTIVITY (EXAMPLE)	EICAS/INTER-FACING COMPUTERS	OFF-EICAS DETECTS LOSS OF ACTIVITY ON- TEST- NCD- FAIL- } DEPENDANT ON SSM FROM INPUTING SYSTEM ⁴
ON AVN ON ON EPR ON ON EEC ON			

B MAINTENANCE CONTROL DISPLAY PANEL - MESSAGES ³

MCDP OFF	MCDP OFF MESSAGE	EICAS COMPUTER	INDICATES MCDP IS NOT SENDING DATA TO EICAS
MAINT DATA DISPLAY MCDP FLT FAULTS 01 A/P CTN ADC L	MCDP EXAMPLE DISPLAY	MCDP	REPEAT OF MESSAGES BEING DISPLAYED ON FRONT PANEL OF MCDP



¹ PARAMETER VALUES AND INDICATIONS ARE FOR ILLUSTRATION PURPOSES ONLY.
² THE EICAS COMPUTER IS THE SOURCE FOR FUNCTION IDENTIFIERS. IDENTIFIERS ARE LIGHT BLUE IN COLOR; READOUTS ARE WHITE IN COLOR.
³ SEE TEXT FOR EXPLANATION.

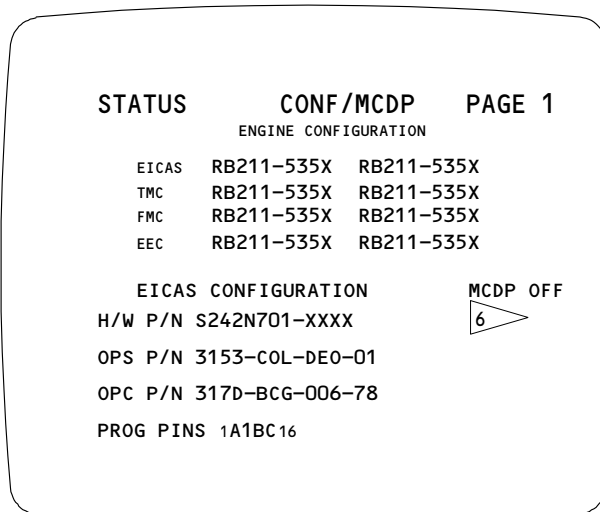
⁴ INDICATIONS DEFINED AS FOLLOWS:
 ON- SYSTEM ACTIVE, TRANSMITTING VALID DATA.
 TEST-SYSTEM IN TEST.
 NCD-NO COMPUTED DATA; INVALID DATA OR DATA NOT BEING UPDATED AT MINIMUM REQUIRED RATE.
 FAIL- SYSTEM-DETECTED FAILURE.

EICAS Display - CONF/MCDP Page
Figure 5E (Sheet 1)

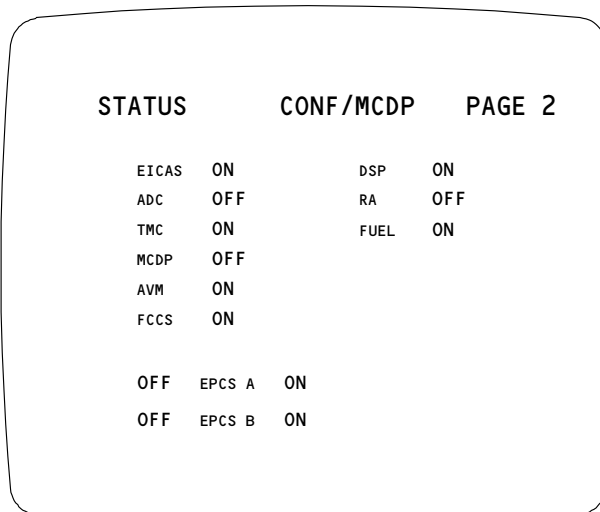
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AIRPLANES WITH PRE
-1000 SERIES EICAS

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757
MAINTENANCE MANUAL



CONF/MCDP PAGE 1
(BOTTOM DISPLAY)



CONF/MCDP PAGE 1
(BOTTOM DISPLAY)

1 PARAMETER VALUES AND INDICATIONS ARE FOR ILLUSTRATION PURPOSES ONLY.

6 WHEN MCDP IS ON, THE MESSAGES THAT ARE DISPLAYED ON THE MCDP FRONT PANEL ARE REPEATED HERE.

EICAS Display - CONF/MCDP Page
Figure 5E (Sheet 2)

EFFECTIVITY
AIRPLANES WITH POST
-1000 SERIES EICAS

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- 3) The PERF/APU page contains both engine performance (PERF) parameters and Auxiliary Power Unit (APU) parameters. The PERF parameters include all those displayed on the primary and secondary engine pages. They also include additional parameters from the air data system and the FMC.
 - 4) The CONF/MCDP page provides configuration (CONF) data and Maintenance Control Display Panel (MCDP) readouts. The CONF data includes engine configurations for avionics computers, input data bus activity, and EICAS part number and program pins. The MCDP readout provides a flight deck display of the MCDP, but no MCDP controls are provided.
 - 5) AIRPLANES WITH POST -1000 SERIES EICAS COMPUTERS; the configuration data also includes the EICAS software part numbers (OPS and OPC).
 - 6) The ENG EXC page contains the maximum exceedances of engine parameters. It also displays the accumulated time of the exceedance.
- (b) EICAS continuously receives data from many systems for maintenance purposes. This data is in the form of either real-time data, or single maintenance message signals. Even though this data cannot be displayed in flight, it is all still present for the EICAS computers.
- 1) Maintenance pages will be displayed, when selected, during primary and secondary engine exceedances. This includes instances when fuel control switches are out of cutoff. Exceedances will be displayed on the top display unit in a full-compacted mode while maintenance messages will be displayed on the bottom display unit.
- (c) Maintenance Data - Event Recording
- 1) Two non-volatile memories are dedicated to each maintenance subsystem monitored by EICAS. One of these memories is for data stored automatically by EICAS. The other memory is for manually stored data. Manual data storage is initiated by either the flight crew in the air or by the maintenance crew while on the ground. Once data is stored in these memories it cannot be lost, even during electrical power failure.
 - 2) The ECS, ELEC, HYD, and APU sets of maintenance subsystem parameters can be automatically recorded by EICAS. This happens when certain messages are initiated by the subsystem. Which messages will cause an automatic recording to be taken, known as an Auto Event, are determined by software programming. Auto Event messages are noted in the message table which appears later in this text. A subsequent Auto Event occurring in these subsystems will be ignored. This leaves the initial failure message and associated values stored in memory.

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- 3) The PERF subsystem parameters can also be stored in an auto event. If any primary or secondary engine parameter enters an exceedance area, an auto event is recorded of the PERF format. A subsequent exceedance will be ignored unless an exceedance of a higher order occurs. If a parameter on the same engine later has an exceedance of a higher order, a subsequent auto event will be recorded that overrides and erases the previous auto event. The auto events message stored identifies the parameter and level of the exceedance.
 - 4) If an auto event occurs for an engine, and an auto event already exists for the other engine, the data that was recorded for the first engine exceedance will remain displayed for the first engine, but the new data for the second engine's exceedance will be displayed for the second engine. An indication will show in the upper right corner of the display to show the last engine on which an auto event has occurred. You will be able to tell if an auto event has occurred on both engines, because an auto event message will show below both engine indication columns on the PERF/APU page. Environmental data on the PERF/APU page will be updated with the recording of the first and all subsequent auto events.
 - 5) Maintenance subsystem parameters can also be manually recorded. This is known as a Manual Event and can be done in two ways. Pressing EVENT RECORD on the display select panel will record all parameters of all subsystems in their respective manual event memories. Pressing REC on the maintenance panel will record all parameters of just the maintenance subsystems currently displayed. The EVENT RECORD button would normally be used by the flight crew while in the air. The REC button can only be used on the ground. Both buttons record subsystem data into the same memory. Subsequent presses of either button will overwrite new data into memory and erase any data previously recorded.
- (7) EICAS Messages
- (a) EICAS monitors over 450 analog input discretes from airplane systems and sensors. When an abnormal condition is detected, an EICAS message is generated. This message will be an alert, status, or maintenance message, depending on the urgency of the detected abnormality.
 - (b) Alert messages are automatically displayed in the upper left corner of the primary engine page. These alert messages are further divided into three levels.
 - 1) Level A-Warning messages indicate an abnormal condition that requires immediate corrective or compensatory action. Warning messages are red in color and are displayed at the top of the alert message list.

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- 2) Level B-Caution messages indicate an abnormal condition that requires immediate crew awareness with some future compensatory action. Caution messages are yellow in color and are displayed below the last warning message.
 - 3) Level C-Advisory messages indicate an abnormal condition that requires only immediate crew awareness. Advisory messages are also yellow in color and are displayed below the last Caution message. Advisory messages are indented one space to distinguish them from Caution messages.
- (c) Alert messages are displayed in order of occurrence. The latest occurring message is positioned on the top line of its proper A, B, or C level. Any alert message is cleared from the display when the condition causing the alert is cleared.
- (d) When a new level A warning message appears, the Warning System provides siren and bell warning aural and drives the master warning lights (Ref 31-51-00). The Warning System also provides an owl caution aural when a new level B caution message appears, unless inhibited by the engines being shut down. The master caution lights also come on with a new level B message. Level C advisory messages have no aural indications.
- (e) Level S (status messages) are shown on the right half of the status page. They are only seen if the status page has been selected for display. Status messages, white in color, indicate a condition for which crew awareness is only required at dispatch.
- (f) Level M (maintenance messages) for all systems are displayed on the right half of the ECS/MSG maintenance data page. They are only seen if the ECS/MSG page has been selected. Maintenance messages, white in color, indicate conditions which do not require flight crew attention. They are generated only to assist the maintenance crew. The maintenance message list also includes a repeat of most of the conditions currently indicated in the status message list.
- (g) Message Inhibits
- 1) An Engine Start inhibit is applied to all messages (except level A; level B L ENG SHUTDOWN, R ENG SHUTDOWN; level B L STARTER CUTOUT, R STARTER CUTOUT; level C L ENGINE STARTER, R ENGINE STARTER; and Master Caution and owl Aural), master caution lights, the beeper tone, and AUTO EVENT displays during either engine start. This inhibit prevents nuisance displays of messages and associated alerts that occur during engine start. The engine start inhibit begins when starter is engaged and ends when engine is running, engine start is aborted, or after 2 min.
 - 2) The engine start inhibit is removed in one of the following ways:
 - a) Successful completion of the engine start sequence (Ref 71-00-00).
 - b) Display of level B message STARTER CUTOUT.
 - c) Display of level C message (L or R) ENG STARTER.

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- d) Power removed and then reapplied to both left and right EICAS computers.
- 3) Another type of inhibit occurs during an engine starter cutout condition. If the (Level B) STARTER CUTOUT message has been generated, all other currently existing level B and level C messages are removed from display. If a new level C message is generated during this inhibit period, they are not displayed.
- 4) this STARTER CUTOUT inhibit is removed in one of the following ways:
 - a) When the starter cutout condition no longer exists.
 - b) When a new level B message has been generated.
 - c) When 20 seconds have elapsed since initiation.
- 5) An Engine Shutdown inhibit is in effect when the fuel control switch is in the CUTOFF position or when the engine fire switch is pulled. The level B L or R ENG SHUTDOWN EICAS message will show. All other currently existing level B (except for level B L STARTER CUTOUT, R STARTER CUTOUT) and level C messages are removed from display. If a new level C message is generated during this inhibit period, they are not displayed.
- 6) This Engine Shutdown inhibit is removed in one of the following ways:
 - a) When the respective fuel control switch is shut off, or when the engine fire switch is disengaged.
 - b) When a new level B message has been generated,
 - c) Pushing the CANCEL/RECALL SWITCH on the P1-3 panel.
- (h) Message Paging and Overflow
 - 1) Each category of messages has multiple paging capability. Up to eleven messages will be displayed in each list. If more than eleven messages exist, only ten will be displayed. The bottom message will be replaced by a page indicator. The additional messages can be accessed by incrementing to the next page. A different control is used for each list to increment to the next page.
 - 2) Alert messages are cycled using the CANCEL and RECALL switches. Pressing CANCEL will remove all level B and level C messages presently displayed and cause subsequent level B and C messages to be displayed. Level A messages are unaffected. If a new message is generated after all current B and C messages are cleared, it will still be automatically displayed. Pressing RECALL will return the message list to page 1. The word RECALL will momentarily be displayed on the bottom line of the list.
 - 3) Status messages are cycled using the STATUS switch. Once the status page is selected, subsequent presses of STATUS will display additional pages of status messages. The PAGE readout will also be incremented. Pressing STATUS once more after all messages have been cycled will clear the status page from the display.

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- 4) Maintenance messages are cycled using the ECS/MSG switch. Once the ECS/MSG page is selected, subsequent presses of the ECS/MSG switch will display additional pages of maintenance messages. The PAGE readout will also be incremented. Pressing ECS/MSG after all messages have been cycled will clear the ECS/MSG page and display the secondary engine page.
 - (i) Messages – Non-volatile Memory
 - 1) Certain status/maintenance and maintenance messages are stored in non-volatile memory (NVM). These messages will still be displayed even after the condition generating them no longer exists.
 - 2) Maintenance messages displayed when the ECS/MSG auto-event page is selected are those that are stored in NVM. They are also displayed in the real time list of status or maintenance messages, as applicable. ECS/MSG messages stored NVM can only be erased when the ECS/MSG Auto Event page is displayed.
 - (8) EICAS Messages
 - (a) A complete list of EICAS Messages is in FIM EICAS MESSAGE LIST.
3. Operation (Fig. 6)
- A. Functional Description
- (1) The EICAS maintenance panel and caution CANCEL/RECALL switches provide signals to the display select panel. The display select panel then provides all control signals through data buses to the EICAS computers.
 - (2) The internal operation of the left and right computers is similar therefore, only the left computer is shown. The input functions of the computer can be divided into the following:
 - (a) Power up routines
 - (b) Digital data bus receivers.
 - (c) Analog signal conditioning and multiplexing.
 - (d) Warning, caution, and advisory message discrete logic and display.
 - (e) Status and maintenance message discrete logic and display.
 - (3) The computer assembles data from all its inputs into display formats. It then provides outputs to the display switching modules, caution and warning system, the other EICAS computer, and other airplane systems.
 - (4) The display switching modules route video driving signals from the left or right computer to the EICAS display units for display.
 - (5) EICAS Power (Fig. 7)

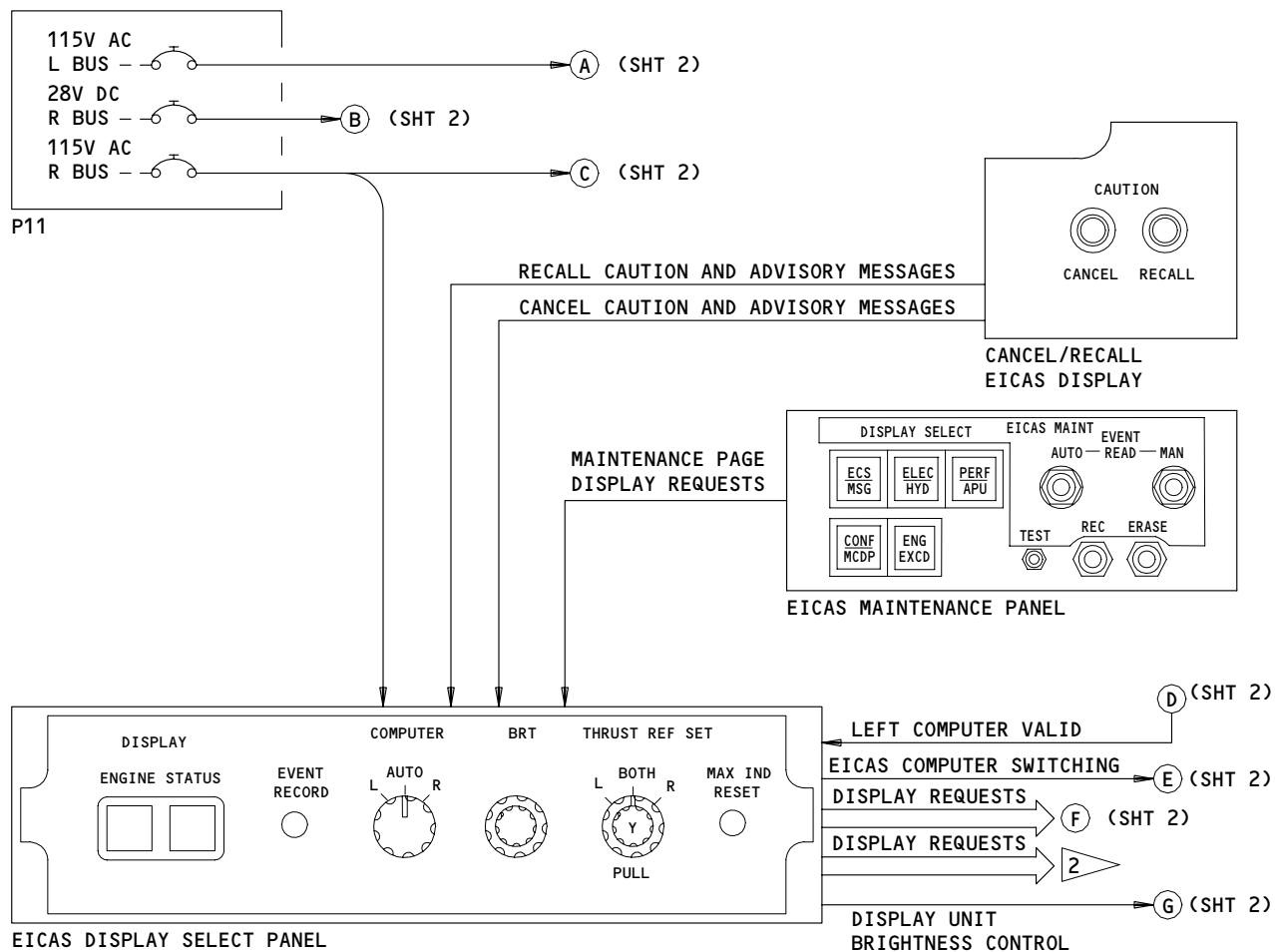
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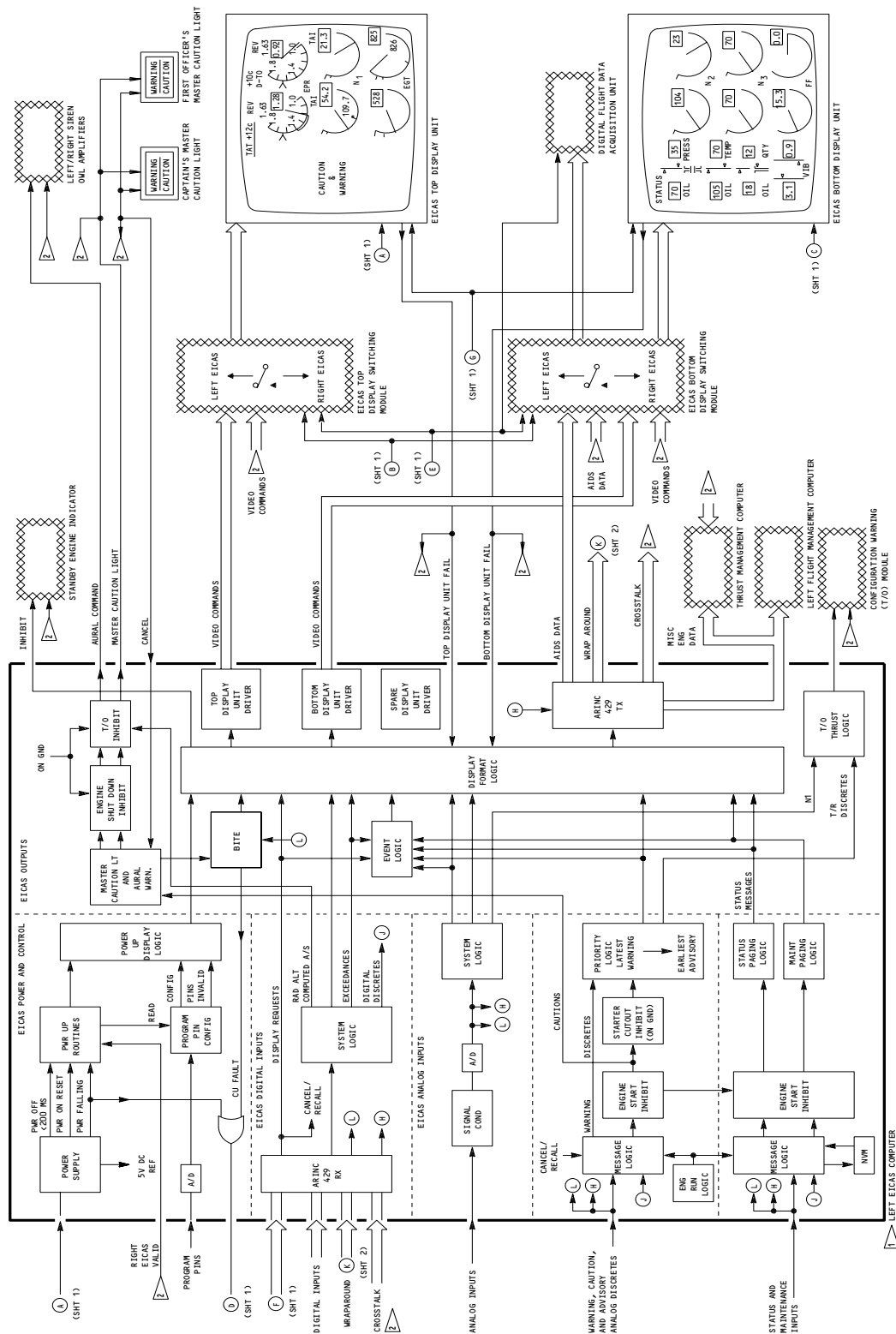


- 1 LEFT SHOWN, RIGHT EQUIVALENT
- 2 TO/FROM RIGHT SYSTEM

EICAS Computer Schematic
Figure 6 (Sheet 1)

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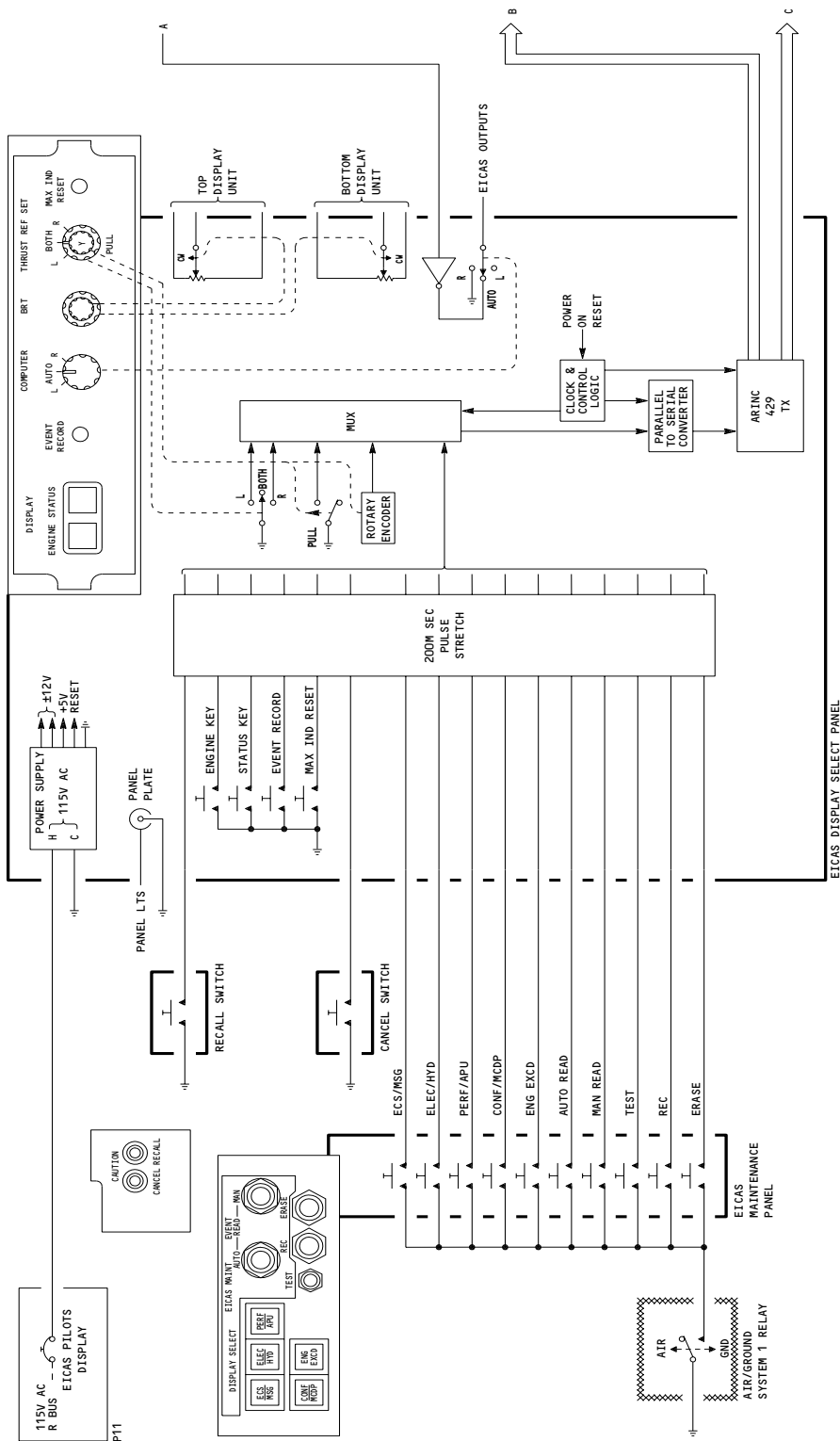
EICAS Computer Schematic
Figure 6 (Sheet 2)

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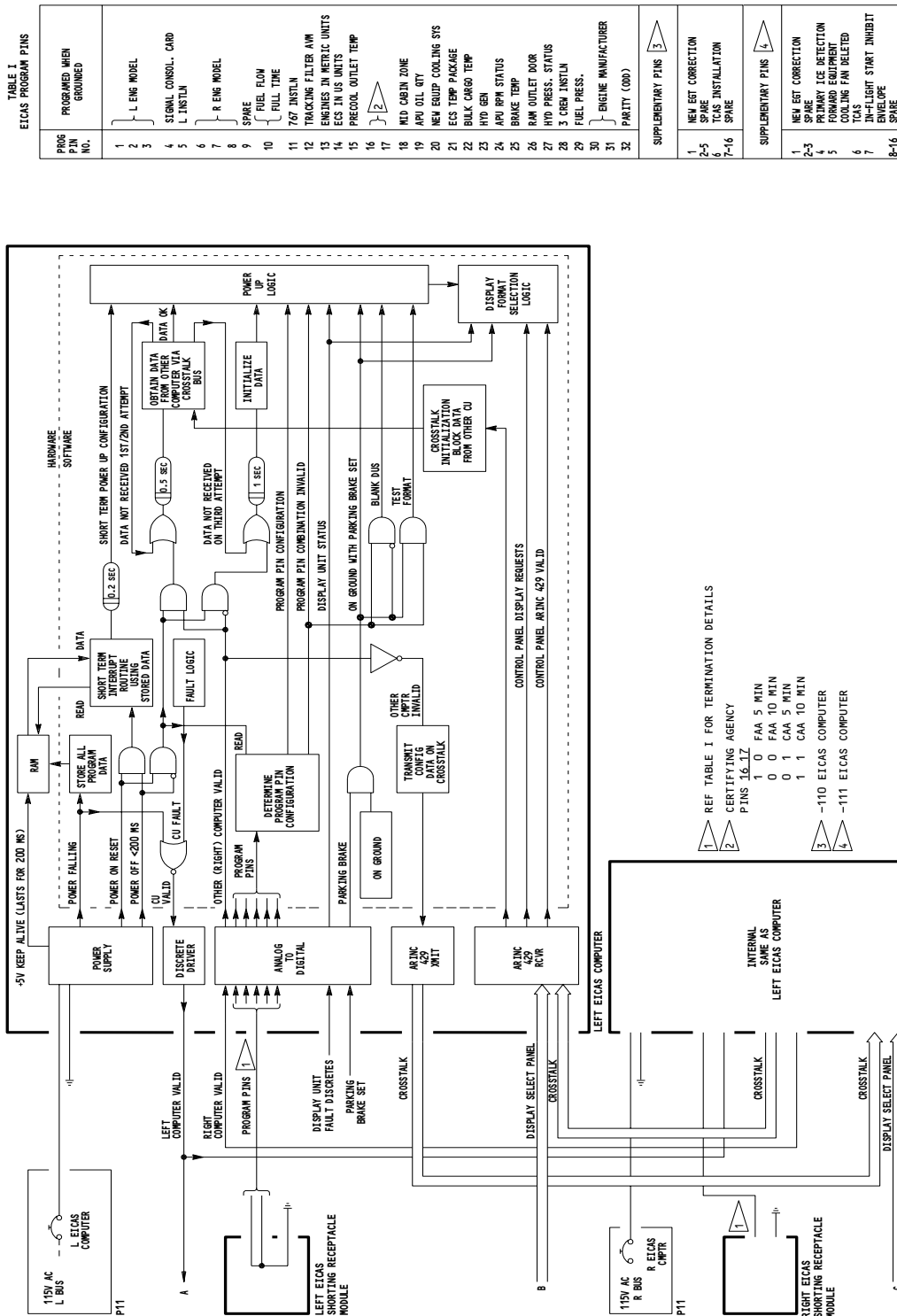
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EICAS Power and Control Schematic
Figure 7 (Sheet 1)

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EICAS Power and Control Schematic
Figure 7 (Sheet 2)

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EXAMPLE EICAS PROGRAM PIN CODE	BINARY TO HEXADECIMAL CONVERSION	BIT	EXAMPLE PROGRAM PIN FUNCTION DESCRIPTION
 (A) D1A B3A5	HEXADECIMAL CODE 0 1 2 3 4 5 6 7 8 9 A B C D E F		
	0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1	1	L ENG MODEL
	0 0 0 0 1 1 1 1 0 0 0 0 1 1 1 1	2	L ENG MODEL
	0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1	3	L ENG MODEL
	0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1	4	SIGNAL CONSOLIDATION CARD
 A(D)1A B3A5	HEXADECIMAL CODE 0 1 2 3 4 5 6 7 8 9 A B C D E F		
	0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1	5	L INSTALLATION
	0 0 0 0 1 1 1 1 0 0 0 0 1 1 1 1	6	R ENG MODEL
	0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1	7	R ENG MODEL
	0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1	8	R ENG MODEL
 AD(1)A B3A5	HEXADECIMAL CODE 0 1 2 3 4 5 6 7 8 9 A B C D E F		
	0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1	9	THRUST REV POS IND MOD
	0 0 0 0 1 1 1 1 0 0 0 0 1 1 1 1	10	FUEL FLOW FULL TIME
	0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1	11	767 INSTALLATION
	0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1	12	TRACKING FILTER AVM
 AD1(A) B3A5	HEXADECIMAL CODE 0 1 2 3 4 5 6 7 8 9 A B C D E F		
	0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1	13	ENGINES IN METRIC UNITS
	0 0 0 0 1 1 1 1 0 0 0 0 1 1 1 1	14	ECS IN US UNITS
	0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1	15	PRECOOL OUTLET TEMP
	0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1	16	CERT AGENCY
 AD1A (B)3A5	HEXADECIMAL CODE 0 1 2 3 4 5 6 7 8 9 A B C D E F		
	0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1	17	CERT AGENCY
	0 0 0 0 1 1 1 1 0 0 0 0 1 1 1 1	18	MID CABIN ZONE
	0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1	19	APU OIL Q SENSOR
	0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1	20	NEW EQUIP COOLING SYSTEM
 AD1A B(3)A5	HEXADECIMAL CODE 0 1 2 3 4 5 6 7 8 9 A B C D E F		
	0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1	21	ECS TEMP PACKAGE
	0 0 0 0 1 1 1 1 0 0 0 0 1 1 1 1	22	BULK CARGO TEMP
	0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1	23	HYD GEN
	0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1	24	APU RPM ON STATUS
 AD1A B3(A)5	HEXADECIMAL CODE 0 1 2 3 4 5 6 7 8 9 A B C D E F		
	0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1	25	BRAKE TEMP
	0 0 0 0 1 1 1 1 0 0 0 0 1 1 1 1	26	RAM OUT DOOR
	0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1	27	HYD PRESS ON STATUS
	0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1	28	3 CREW INSTLN
 AD1A B3A(5)	HEXADECIMAL CODE 0 1 2 3 4 5 6 7 8 9 A B C D E F		
	0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1	29	FUEL PRESSURE
	0 0 0 0 1 1 1 1 0 0 0 0 1 1 1 1	30	ENG MANUF.
	0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1	31	ENG MANUF.
	0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1	32	ODD PARITY

1 EXAMPLE: IF A "1" IS SHOWN, THEN BITS 9,10,11 ARE NOT SET AND BIT 12 IS SET. ONLY THE "TRACKING FILTER AVM" OPTION IS SELECTED.

2 EXAMPLE: IF AN "A" IS SHOWN, THEN BITS 13,15 ARE SET, AND BITS 14,16 ARE NOT SET. "ENGINES IN METRIC UNITS" AND "PRECOOL OUTLET TEMP" OPTIONS ARE SELECTED.

EICAS Program Pin Selections
Figure 7A

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AIRPLANES WITH PRE
-1000 SERIES EICAS

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- (a) The left EICAS computer and top EICAS display unit receive 115 Vac, 400 Hz single phase power from the left ac bus. The right EICAS computer, bottom EICAS display unit, EICAS display select panel, and both EICAS switching modules receive 115 Vac, 400 Hz single phase power from the right ac bus.
- (b) The EICAS display select panel receives 5 Vac from the master dim and test circuits for panel lighting.
- (c) Power interrupts.
 - 1) If a power interrupt of less than 200 msec is sensed by the EICAS computer, a short term power interrupt routine is initiated. During this routine, the same pages appearing on both displays prior to the interrupt are retained. All messages retain their correct order.
 - 2) Long term power interrupts (greater than 200 msec) are handled with a different routine as follows:
 - a) When the EICAS computer powers up after the power interrupt, it first determines if the other, or offside computer, is running. If it is, a request is sent for a block transfer of synchronization data. If this data is received within 2.5 seconds and all validity tests pass, power up is complete. The computer is now running with page and data from the offside computer.
 - b) If offside synchronization cannot be performed, the computer initializes a cold start. The computer first reads the program pins to determine if a proper and valid configuration has been selected. If not, the computer automatically displays the EICAS test page if on ground with parking brake set. If the program pins are properly configured, the computer will display the primary engine parameters on the top display unit. The secondary engine parameters will be displayed on the bottom display unit.
- (6) Control (Fig. 7)
 - (a) Display Intensity Control
 - 1) The right EFIS remote light sensor is located on the upper side of the glareshield. The sensor measures outside ambient light intensity. An automatic dimming signal is provided by the sensor to both top and bottom EICAS displays.

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- 2) Each EICAS display receives automatic dimming signals from a local light sensor on each EICAS display. A day/night discrete is also received by each EICAS display from the master dim and test system.
 - 3) A manual brightness control signal is sent to each EICAS display from the EICAS display select panel. Each display uses these automatic and manual signals to set intensity of the display stroke signals.
- (b) The EICAS Maintenance Panel contains no logic components and has no power inputs. A test switch and nine display control switches are located on this panel. All are single grounding discrete switches, and except for AUTO, MAN, and REC, are enabled by the air/ground relay. The AUTO, MAN, and REC switches are enabled by software, but only when one of the five maintenance pages have been selected.
 - (c) The EICAS Display Select Panel receives input discrettes from the maintenance panel and the CANCEL and RECALL switches. These discrettes, along with discrettes from controls on the display select panel, are used by the data management controller to formulate display requests. These requests are sent in identical digital data words to both EICAS computers over separate ARINC 429 buses.
 - (d) A computer select discrete is sent from the display select panel to relays in the EICAS switching modules. If this line is an open circuit, the left computer will drive the displays. If this line is grounded, the right computer will drive the displays.
 - (e) An LCU fail discrete is used to accomplish automatic switching to the right computer if the left computer fails. This grounding discrete is sent from the left computer to the display select panel. If the computer select switch is sent to AUTO, the computer select discrete line is grounded, switching the display units and modules over to the right computer.
- (7) Digital Inputs (Fig. 8)
- (a) Each EICAS computer receives digital inputs in both high and low speed ARINC 429 formats.

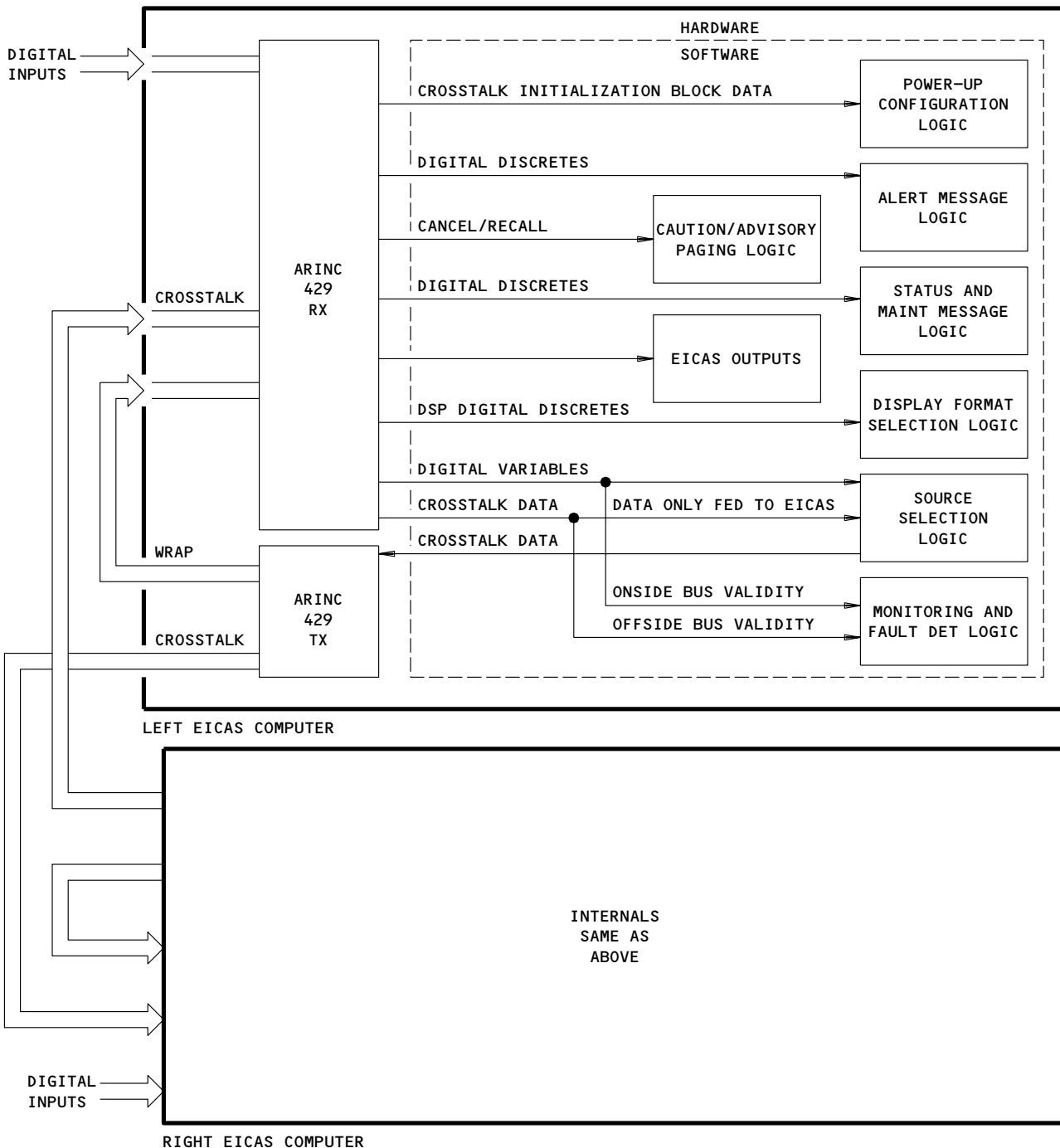
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EICAS Digital Inputs Schematic
Figure 8

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- (b) These sources send low speed data to the EICAS computers listed:

<u>SOURCE</u>	<u>EICAS COMPUTER (S)</u>
Air data computer, left	L
Air data computer, right	R
Airborne vibration monitor, left	L,R
Airborne vibration monitor, right	L,R
Electronic Engine Control, left	L,R
Electronic Engine Control, right	L,R
EICAS Display select panel	L,R
Engine Pressure Ratio (EPR) transmitter, left	L,R
Engine Pressure Ratio (EPR) transmitter, right	L,R
Flight management computer (FMC), left	L
Flight management computer (FMC), right	R
Fuel quantity processor unit, left	L,R
Instrument comparator unit	L,R
Radio altimeter, left	L
Radio altimeter, right	R
Thrust management computer	L,R

- (c) The EICAS display select panel sends identical low speed data to both computers over separate data buses.
- (d) Each EICAS computer receives high speed ARINC 429 data from the maintenance control display panel (MCDP) and from the other EICAS computer over a crosstalk bus. The crosstalk buses are used to share uniquely received parameters, as well as to compare parameters received by both computers for BITE disagreement checks.

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- (e) All unused input ports on the left computer are tied to an output EICAS wraparound bus from the left computer. The right computer operates the same way.
- (8) Analog Signal Inputs (Fig. 9)
 - (a) Analog signals are received from engine sensors and airplane subsystems. These parameters are received as dc voltage and current inputs, ac voltage inputs, variable frequency and pulse sensing inputs, and temperature resistance bulb inputs.
 - (b) All analog inputs are paralleled to both computers except temperature resistance bulb inputs. The left system temperature parameters are received by the left computer only. The right temperatures are received by the right computer only. These parameters are then shared using the crosstalk bus.
 - (c) In the case of engine oil temperature, there are two temperature sensing bulbs on each engine. One bulb is connected to the left computer, and the other is connected to the right computer. This enables engine oil temperature parameters to be displayed even in the event of an EICAS computer failure.
 - (d) Analog inputs enter the computer and are all multiplexed down to a common A/D converter. Each input is read at a rate required by its particular characteristics.
 - (e) Filtering and/or smoothing of the signals is done mostly under software control. Each type of signal is filtered differently. Considerations are made for iteration rate and frequency response requirements. They are also made for resolution requirements and noise characteristics of the input data.
- (9) Analog Discrete Inputs (Fig. 10 and 11)
 - (a) Signals sent by airplane subsystems for the generation of EICAS messages are analog discrete inputs. These include all alert, status, and maintenance messages.
 - (b) Thirty-two analog discretely are received as program pin inputs. These program pins define airplane and engine model configuration and also define all customer selected display options.

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ANALOG INPUT PORT TYPES

DC VOLTS - VOLTAGE QUANTITY READ DIRECTLY, AS IN THE CASE OF BATTERY VOLTAGE, OR IN PROPORTION TO ANOTHER QUANTITY, SUCH AS APU OIL QUANTITY, OR BRAKE TEMPERATURE. EXAMPLES: RAM OUT DOOR, TRIM VALVE.

DC RATIO - DETERMINES % OPENING OF VALVE OR DOOR BY RATIO OF DC VOLTAGES.

DISCRETE - ANALOG SIGNAL INDICATES COMPONENT OR SYSTEM STATUS CHANGE. EXAMPLES: IDG TEMP RISE SWITCH, ENG TAI, BK TEMP WARN, THRUST REVERSER IN TRANSIT.

TEMP BULB - RESISTANCE MEASUREMENT FOR TEMPERATURE. USED TO MEASURE TEMPERATURES IN COMPARTMENTS, HEAT EXCHANGER INLETS AND OUTLETS, OIL TEMPERATURE.

THERMOCOUPLE - USED TO MEASURE EXHAUST GAS TEMPERATURE (EGT).

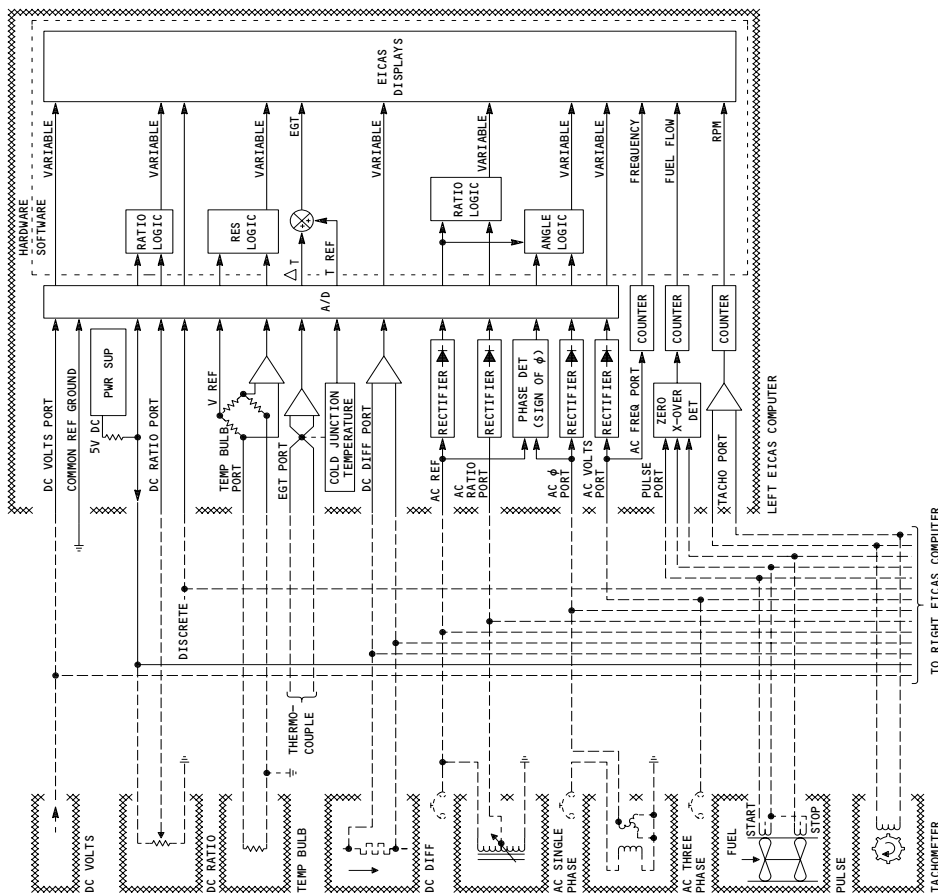
DC DIFF - MEASURES VOLTAGE DIFFERENCE ACROSS A SET RESISTANCE. USED FOR BATTERY CURRENT OUTPUT MEASUREMENT, ALSO FOR CREW OXYGEN PRESSURE.

FREQ/AC VOLTS - MEASURES FREQUENCY AND AC VOLTS UTILIZING INTERNAL EICAS COUNTERS AND RECTIFIERS USED FOR ELECTRICAL POWER BUS INDICATION.

Aφ - MEASURES AC PHASE DIFFERENCE FROM SYNCHRO TRANSMITTERS TO DETERMINE POSITION CHANGE OF ALLERONS, RUDDER, ELEVATORS.

PULSE - FUEL FLOW IS MEASURED BY A FUEL FLOW TRANSMITTER, WHICH CONVERTS THE FUEL FLOW RATE TO ELECTRICAL PULSE SIGNALS. EICAS MEASURES THE START AND STOP TIMES OF THE PULSES TO DETERMINE FLOW RATE.

TACHOMETER - COIL MEASURES RPM TURNING RATE OF ROTORS N1, N2, AND N3.



EICAS Analog Inputs Schematic
Figure 9

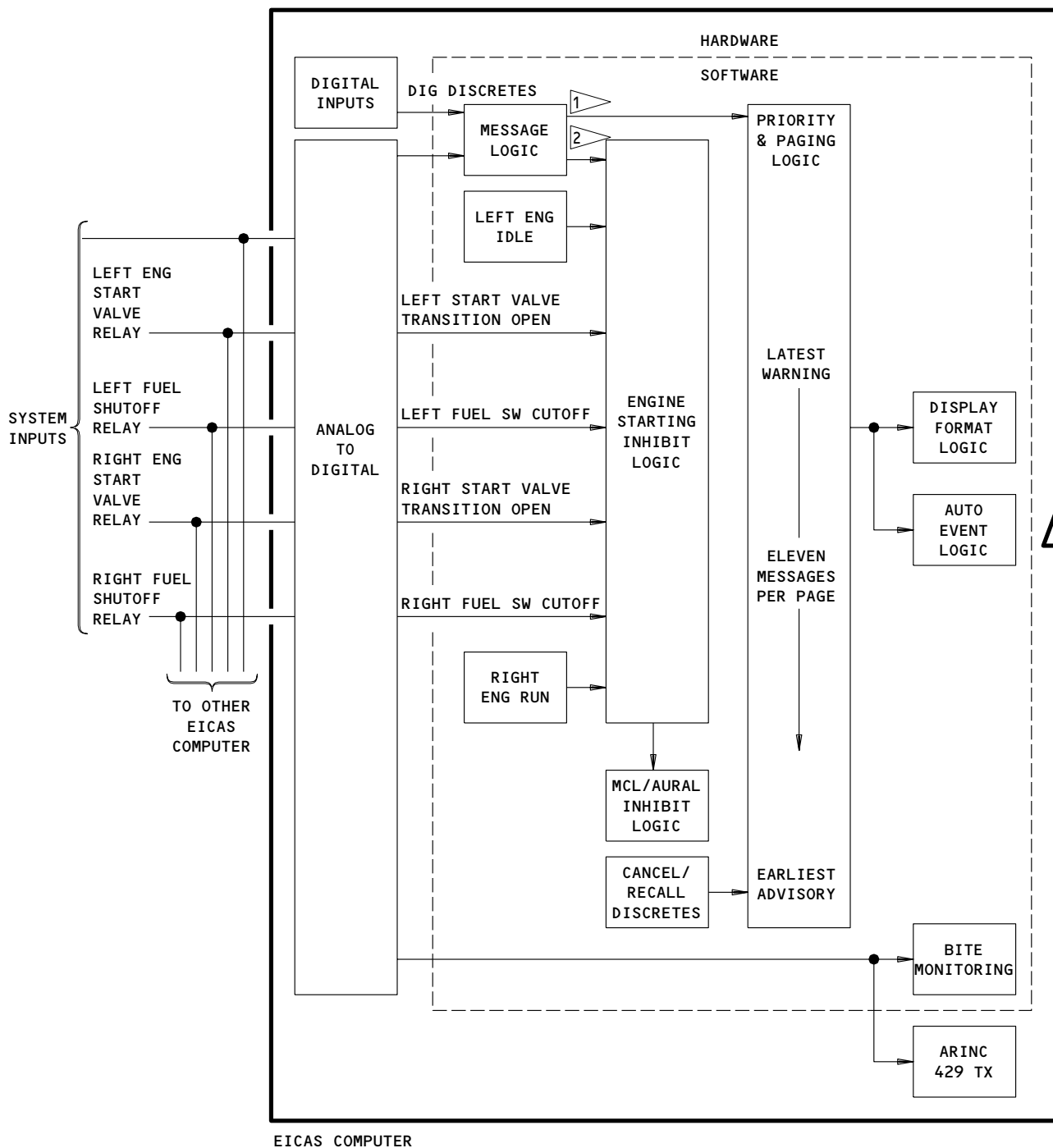
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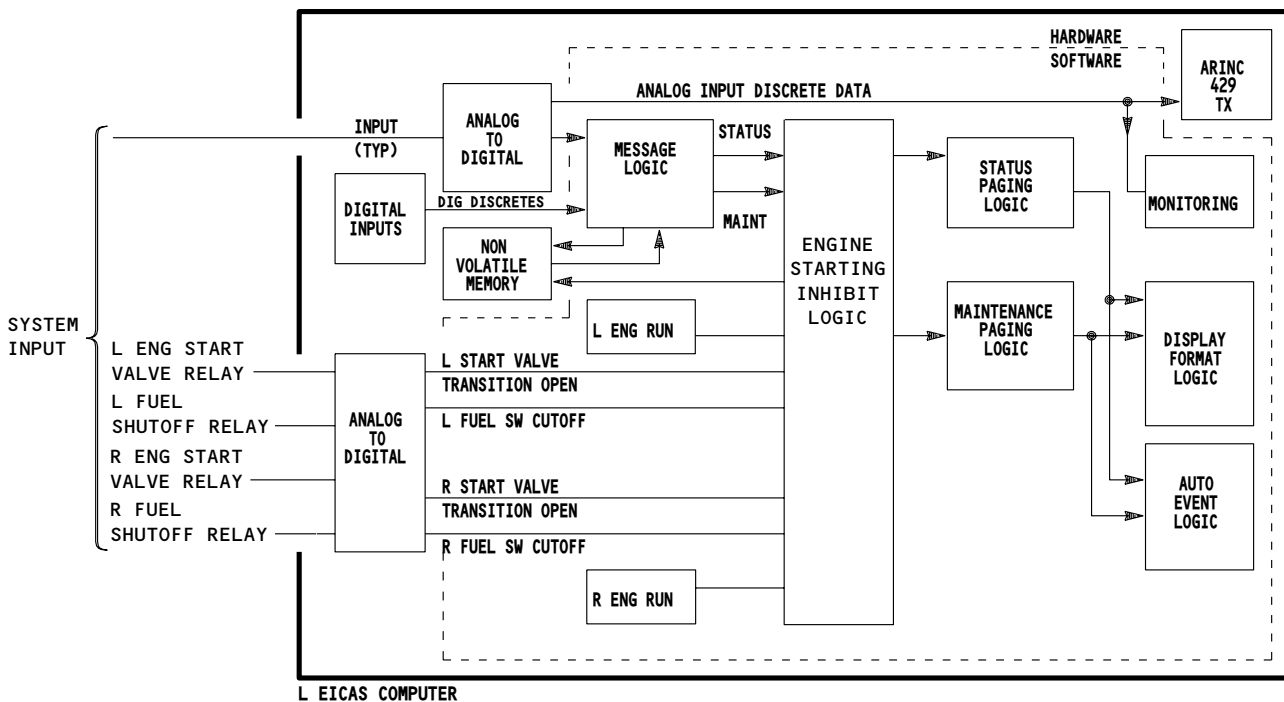
- 1 ALL LEVEL A MESSAGES AND SELECTED LEVEL B AND C MESSAGES
- 2 LEVEL B AND C MESSAGES

EICAS Warning, Caution, and Advisory Analog Discretes Schematic (Typical)
Figure 10

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EICAS Status and Maintenance Messages (Typical)
Figure 11

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- (c) Airplane switch inputs are received from the air/ground and nose compression systems #1 and #2. These signals are used by the computers for display format and central warning interface inhibits. Other switch inputs are received from the Master Caution Light Reset and the IDG Temp Switch.
 - (d) The EICAS display units send failure discretes for DU Beam Test Fail, DU anomaly, and DU Overheat to both computers (Fig. 12).
 - (e) Each computer has spare discrete inputs that can be allocated for any category using only software modification. These spare inputs provide for growth in the system.
 - (f) All analog discrete inputs are paralleled and thus both EICAS computers receive the same inputs.
- (10) EICAS Outputs (Fig. 12)
- (a) Analog Discrete Outputs
 - 1) Two output discretes control operation of the master CAUTION light and owl aural. Each computer sends a discrete to both master CAUTION light/switches to turn on the light. A separate discrete is routed to the WEU from each computer to enable the caution owl aural.
 - 2) The master CAUTION light/switches are turned on and the caution owl aural is sounded when level B alert messages are displayed, unless inhibited as follows:
 - a) Master CAUTION lights will not come on when Air/Ground systems 1 or 2 indicate the airplane is on the ground and both fuel control switches are at cutoff. Any level B message present when the inhibit is removed will not turn on the lights.
 - b) During takeoff, the master CAUTION lights will not come on when computed airspeed is greater than 80 knots and radio altitude is less than 400 feet, unless 20 seconds has elapsed. The 20 second timer starts at nose wheel lift-off. Any non-reset condition present when the inhibit is removed will turn on the lights.
 - c) The output to the WEU for caution owl aural tone generation is inhibited in the same manner as the master CAUTION lights.

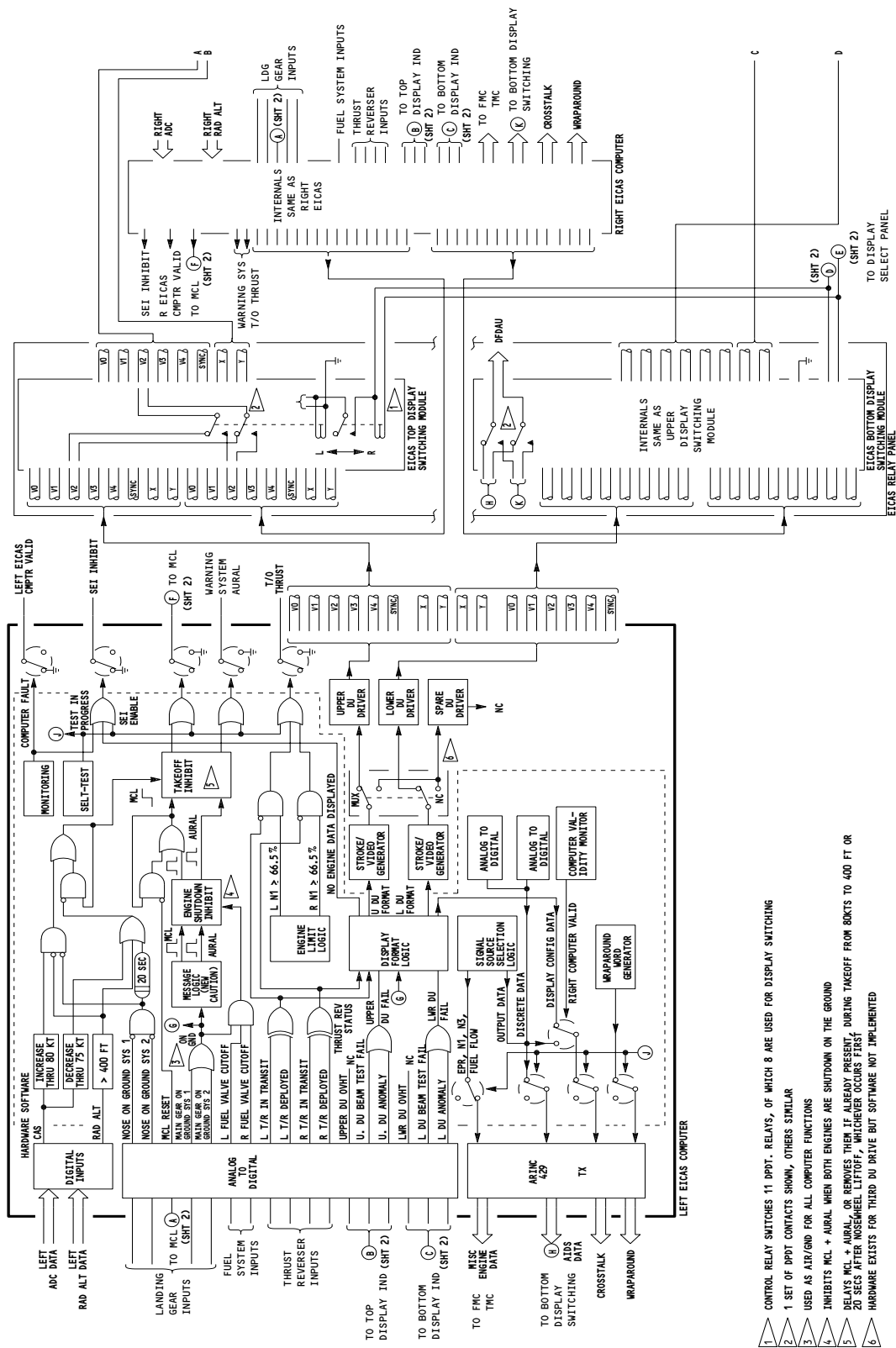
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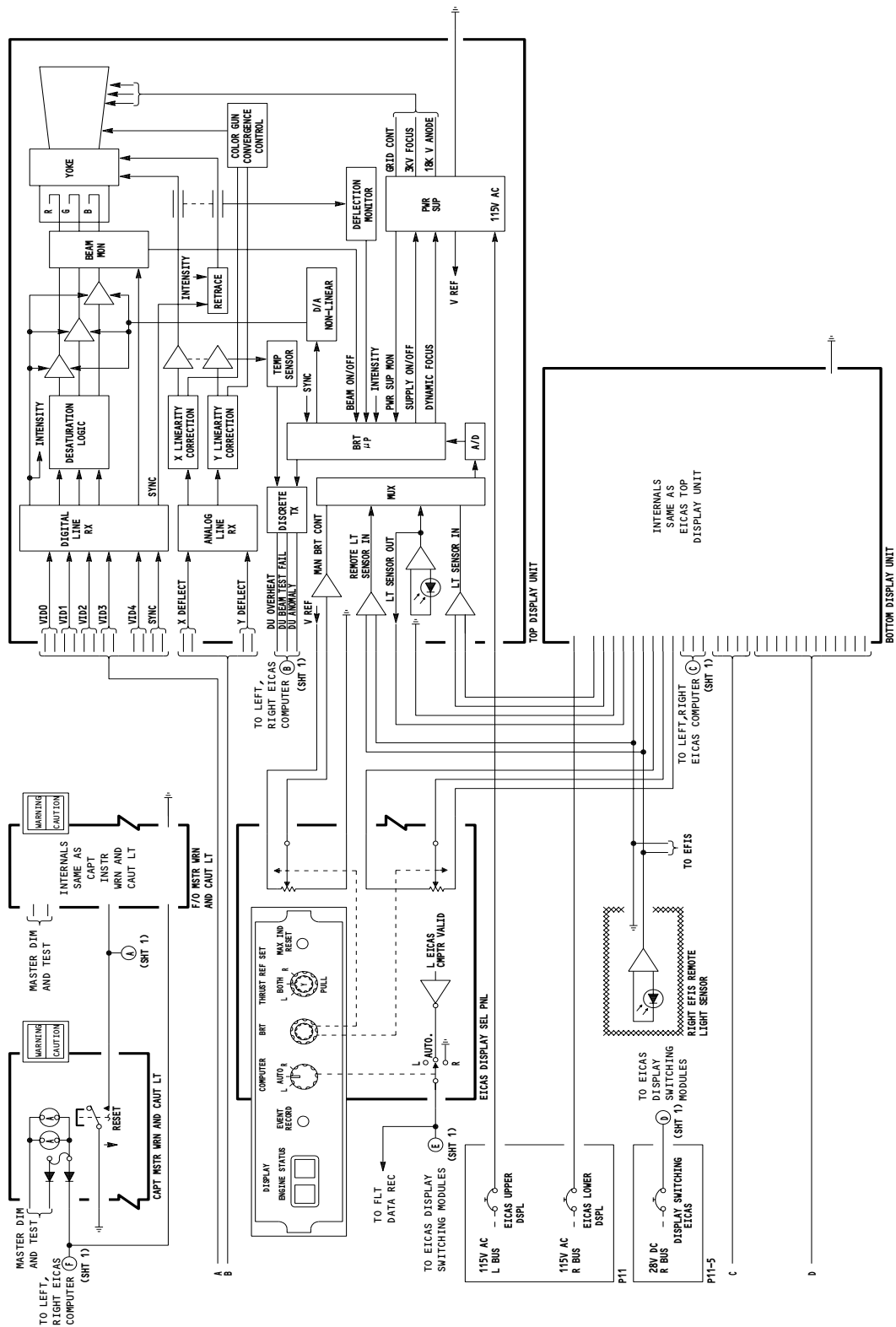


- 1 CONTROL RELAY SWITCHES 11 DPDT. RELAYS, OF WHICH 8 ARE USED FOR DISPLAY SWITCHING
- 2 1 SET OF DPDT CONTACTS SHOWN, OTHERS SIMILAR
- 3 USED AS AIR/GND FOR ALL COMPUTER FUNCTIONS
- 4 INHIBITS MCL + AIRRAIL WHEN BOTH ENGINES ARE SHUTDOWN ON THE GROUND
- 5 DELAYS MCL + AIRRAIL, OR REMOVES THEM IF ALREADY PRESENT, DURING TAKEOFF FROM 80KTS TO 400 FT OR 20 SECS AFTER NOSEWHEEL LIFTOFF, WHICHEVER OCCURS FIRST
- 6 HARDWARE EXISTS FOR THIRD DU DRIVE BUT SOFTWARE NOT IMPLEMENTED

EICAS Outputs Schematic
Figure 12 (Sheet 1)

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EICAS Outputs Schematic
Figure 12 (Sheet 2)

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- 3) Each computer sends a computer fail discrete to the other EICAS computer. In addition, the left computer fail discrete is sent to the display select panel for automatic display switching.
 - 4) An SEI enable discrete is sent by both computers to the Standby Engine Indicator. This enable will be set to an open circuit whenever both pilots display units are faulty, both computers are faulty, the BITE Test Format has been selected, or a single display has failed and the Status page is being displayed.
 - 5) A Take-off Thrust discrete is sent to the WEU for T/O configuration warning. This discrete is set to ground when engine thrust exceeds a fixed value and the thrust reversers are stowed properly.
- (b) Digital Outputs
- 1) Once display format logic determines the data that is to be displayed. An ARINC 429 transmitter converts this data into serial data words. The data is then transmitted to other airplane systems.
 - 2) Both left and right EICAS computers have two low speed ARINC 429 digital output ports. One bus is connected to the related left or right FMC to provide the FMC with fuel flow data. The other port is connected to a general EICAS output bus. All unused 429 inputs of the EICAS computers are connected to their respective (left or right) output bus. This wraparound is essential to proper software operation.
 - 3) A hi-speed ARINC 429 data bus is connected from the left EICAS computer to the right and one from the right EICAS computer back to the left.
 - 4) A hi-speed ARINC 429 bus is connected from each computer to the bottom display switching module. A single data bus is then connected from this switching module to the DFDAU. The DFDAU will be switched to receive data from only the computer that is currently providing information to the EICAS display units.
 - 5) All digital outputs transmitted are also internally fed back into 429 receivers. This internal wraparound is used by BITE for failure detection.
- (c) Data Display
- 1) Analog discrettes are received by each computer from the top and bottom display units. These discrettes indicate a display unit failure. When received, the caution discrete logic will generate a level C message EICAS CRT. The display format logic uses Display Unit fail information to establish proper display states.

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- 2) Once the proper display states have been selected, instructions are sent to the display controller. The display controller also receives commands from the display generator file. The display controller uses these instructions to control the video/timing generator and display sequencers.
 - 3) The video/timing generator provides red, green, and blue color signals, strobe intensity, beam test, and video sync signals to both top and bottom display units. The display sequences provide signals to stroke generators, which in turn control the X and Y display drivers. The display drivers then provide X-deflection and Y-deflection signals to drive both top and bottom display units.
- (d) Analog Signal Outputs
- 1) Each EICAS computer provides 16 analog signal outputs for driving the color CRTs of the display units. Six video and two deflection signals from the left and right computers are sent to the top display switching module. Eight signals from the left computer and eight more from the right are also routed to the bottom display switching module.
 - 2) Each switching module has eight dedicated outputs to their respective display units. When the computer select switch on the display select panel is set to L or R position, relays in the switching modules are switched to received video signals from the left or right computer, respectively.
 - 3) When the computer select switch is set to AUTO position, the relays in the switching modules are set to the left computer inputs. If the left computer fails, it will ground its LCU fail discrete, which in turn causes the relays to switch to the right computer inputs.
- (e) Display Units
- 1) Each display unit receives intensity control signals from its own local light sensor, the other display unit light sensor, the left EFIS remote light sensor, and from the display select panel. These signals, along with a day/night discrete from the master dim and test system, provide information to the brightness control microprocessor.
 - 2) Digital line receivers take red, green, and blue analog signals and send them on through color desaturation logic to the beam monitor. The monitor then uses the X and Y deflection signals, sync and strobe/intensity signals, and the bright intensity microprocessor outputs to drive the display crt.

(11) Display Pages (Fig. 13)

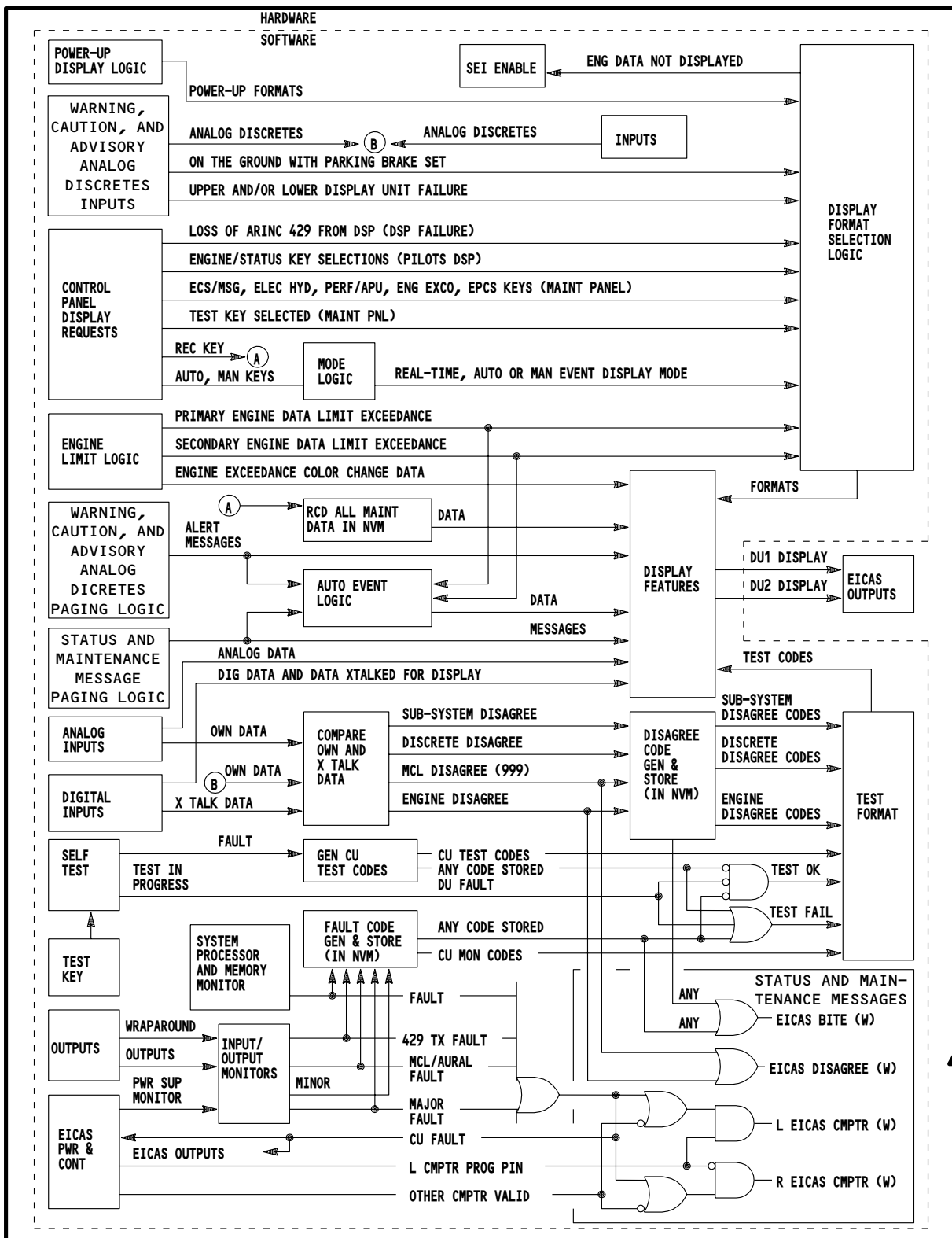
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L EICAS COMPUTER

EICAS Display Formats Schematic (Typical)
Figure 13

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- (a) The display page logic uses inputs to the computer to assemble display pages. Analog and digital inputs provide direct input to the logic for parameter indicators, as well as providing information for automatic exceedance display state changes. If an exceedance occurs, this information is also used to take an auto event snapshot, if necessary. Alert, status, and maintenance message page logic provides inputs to include messages on the display pages.
 - (b) Manual and Auto Event data for ECS/MSG, ELEC/HYD, and PERF/APU pages is stored in non-volatile memory (NVM). When the display page logic chooses maintenance data for display, it selects Manual Event, Auto Event, or real-time for display.
 - (c) Display requests for the display select panel control which format is to be displayed. When an event occurs to cause a display change, the display state logic looks at the present display conditions on the top and bottom display units to decide what new formats should be displayed. Display commands are then set to the display controller.
- B. BITE (Fig. 14)
- (1) EICAS incorporates extensive BITE monitoring. This monitoring isolates system failures to LRU's, if possible. It provides detected faults using EICAS messages. A self-test mode can also be initiated manually.
 - (2) Automatic Monitoring
 - (a) EICAS display unit anomalies are detected within each display unit. These abnormalities include beam stuck on or off, no beam test, overtemperature condition and no X/Y deflection. Once a problem has been detected, the display unit will output a discrete to the EICAS computers.
 - (b) The EICAS display select panel does not monitor itself. In case of failure the EICAS computers will detect a loss of data or invalid data from the display select panel.
 - (c) The EICAS computer is divided into three subsystems for BITE self-monitoring purposes. These subsystems are input/output (I/O) interface, central processing unit (CPU) and display generator. The three subsystems detect faults in each other by means of a heartbeat monitor. If any one of the three subsystems stops, all activity in the other two subsystems stops also.

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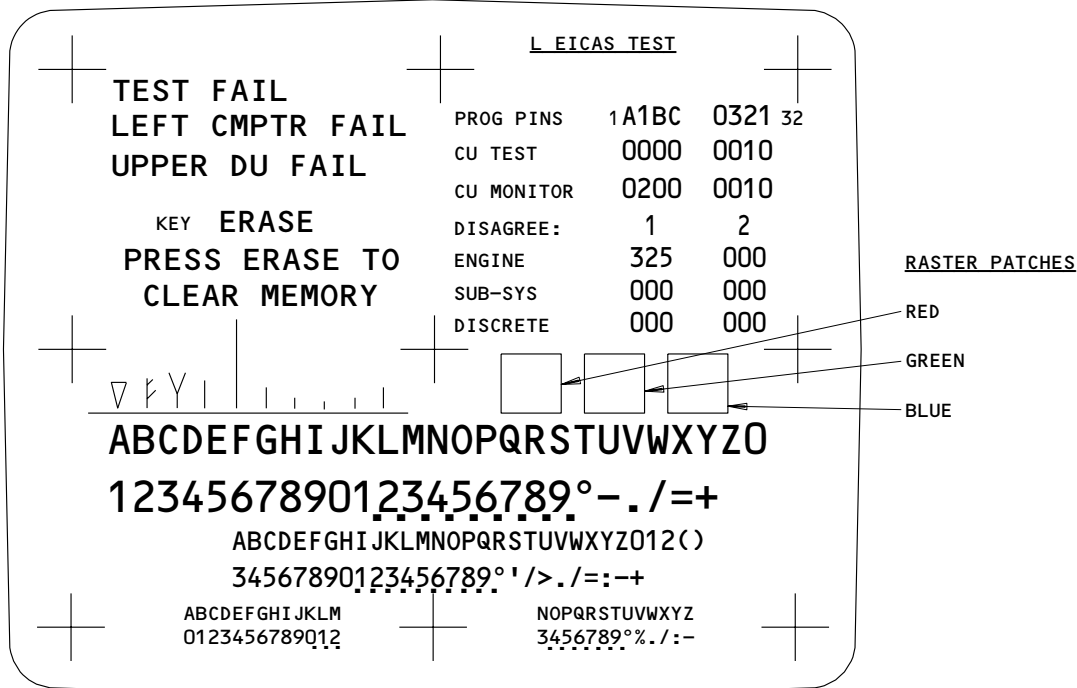
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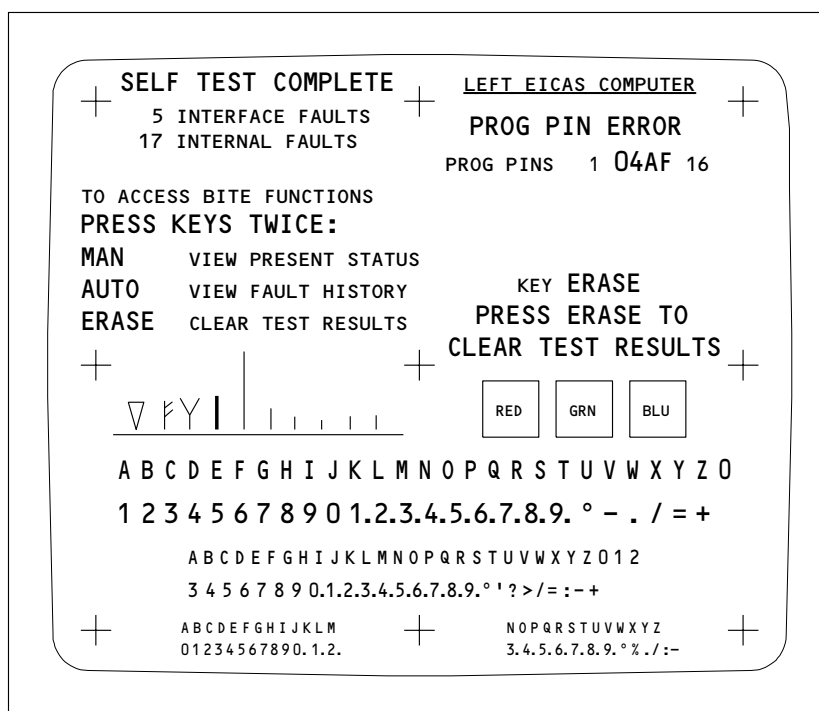
TEST DISPLAY	EXPLANATION
TEST FAIL OR TEST OK	INDICATES RESULTS OF EICAS SYSTEM BITE TEST
LEFT CMPTR FAIL UPPER DU FAIL LOWER DU FAIL RIGHT CMPTR FAIL	MESSAGE DISPLAYED INDICATES BITE-DETECTED FAILURE WITHIN THAT LRU.
KEY	DISPLAYED KEY MESSAGE INDICATES EICAS DISPLAY CONTROL SWITCH THAT IS CURRENTLY DEPRESSED.
PRESS ERASE TO CLEAR MEMORY	INDICATES ERASE SWITCH HAS BEEN PRESSED ONCE. SECOND PRESS OF ERASE SWITCH WILL ERASE FAULTS STORED ON TEST FORMAT.
<u>L EICAS TEST</u> OR <u>R EICAS TEST</u> PROG PINS 1 A1BC 0321 32	INDICATES COMPUTER CURRENTLY DISPLAYING TEST RESULTS. DISPLAYED HEXADECIMAL CODE INDICATES CONFIGURATION OF GROUNDED PROGRAM PINS OF SELECTED COMPUTER (EXAMPLE SHOWN-SEE TEXT FOR CORRECT CODE).
CU TEST 0000 0010 CU MONITOR 0200 0010	HEXADECIMAL CODES WHICH SHOW INTERNAL COMPUTER FAILURES FOUND DURING TEST OR SELF-MONITORING (REF. FIG. 15 FOR HEX CODE EXAMPLES AND A LIST OF FAILURES)
DISAGREE: 1 2 ENGINE 325 000 SUB-SYS 000 000 DISCRETE 000 000	ENGINE ANALOG INPUT DISAGREES BETWEEN COMPUTERS (FIM 31-41-00, TABLE 101). STATUS MESSAGE "EICAS DISAGREE" DISPLAYED WHEN SELECTED.
	SUBSYSTEM (NON-ENGINE) OR DISCRETE ANALOG INPUT DISAGREES BETWEEN COMPUTERS (FIM 31-41-00, TABLE 101). MAINT MESSAGE "EICAS BITE" DISPLAYED WHEN SELECTED.



EICAS Test Format
Figure 14 (Sheet 1)

EFFECTIVITY
AIRPLANES WITH PRE
-1000 SERIES EICAS

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EICAS Self Test Page Format
Figure 14 (Sheet 2)

EFFECTIVITY
AIRPLANES WITH POST
-1000 SERIES EICAS

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LEFT EICAS COMPUTER

PRESENT STATUS

1 PRESENT LEG INTERFACE FAULT REPORTS

1 ARINC 429 RECEIVER FAULT <SELECTED

NO ARINC 429 TRANSMITTER FAULT

NO ANALOG DISCRETE OUTPUT FAULT

NO FREQUENCY INPUT FAULT

NO ANALOG INPUT FAULT

NO ANALOG PARAMETER DISAGREE

NO PRESENT LEG INTERNAL FAULTS

TO ACCESS BITE FUNCTIONS PRESS KEYS:

MAN VIEW SELECTED FAULT REPORTS

REC RETURN TO SELF TEST PAGE

PRESENT STATUS
(SUMMARY PAGE)

LEFT EICAS COMPUTER

ARINC 429 RECEIVER FAULT RPT 1 OF 1
LEG NUMBER: 0

DETECTED INTERFACE FAULT

ARINC 429 INPUT AVM-L CROSS VALIDITY FAIL

RECORD DATE: 12-22-2003

RECORD TIME: 20:36

AIR/GND: GND

THRUST MODE: -

DETAILS: REFERENCE DATA:

EVENT TYPE: HARD FAIL CODE: ---

LEFT VALUE: INACTIVE

RIGHT VALUE: ACTIVE

TO ACCESS BITE FUNCTIONS PRESS KEYS:

AUTO VIEW PREVIOUS FAULT REPORT

MAN VIEW NEXT FAULT REPORT

REC RETURN TO PRESENT STATUS PAGE

PRESENT STATUS
(FAULT REPORT PAGE)

EICAS Self Test Page Format
Figure 14 (Sheet 3)

EFFECTIVITY
AIRPLANES WITH POST
-1000 SERIES EICAS

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LEFT EICAS COMPUTER

FAULT HISTORY

5 INTERFACE FAULT REPORTS

2 ARINC 429 RECEIVER FAULT <SELECTED

NO ARINC 429 TRANSMITTER FAULT

2 ANALOG DISCRETE OUTPUT FAULT

1 FREQUENCY INPUT FAULT

NO ANALOG INPUT FAULT

NO ANALOG PARAMETER DISAGREE

1 INTERNAL FAULTS

TO ACCESS BITE FUNCTIONS PRESS KEYS:

AUTO	SCROLL TO NEXT FAULT CATEGORY
MAN	VIEW SELECTED FAULT REPORTS
REC	RETURN TO SELF TEST PAGE
ERASE	ERASE FAULT HISTORY

FAULT HISTORY
 (SUMMARY PAGE)

LEFT EICAS COMPUTER

ARINC 429 RECEIVER FAULT RPT 1 OF 2

LEG NUMBER: 1

DETECTED INTERFACE FAULT

ARINC 429 INPUT	AVM-L	CROSS VALIDITY FAIL
-----------------	-------	---------------------

RECORD DATE: 12-20-2003

RECORD TIME: 11:14

AIR/GND: AIR

THRUST MODE: TO

<u>DETAILS:</u>	<u>REFERENCE DATA:</u>
EVENT TYPE: HARD	FAIL CODE: ---
LEFT VALUE: INACTIVE	
RIGHT VALUE: ACTIVE	

TO ACCESS BITE FUNCTIONS PRESS KEYS:

AUTO	VIEW PREVIOUS FAULT REPORT
MAN	VIEW NEXT FAULT REPORT
REC	RETURN TO FAULT HISTORY PAGE

FAULT HISTORY
 (FAULT REPORT PAGE)

EICAS Self Test Page Format
 Figure 14 (Sheet 4)

EFFECTIVITY
 AIRPLANES WITH POST
 -1000 SERIES EICAS

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CU TEST/CU MONITOR CODE	BINARY TO HEXADECIMAL CONVERSION	BIT	FAILURE
() 000 0000 ↙	HEXADECIMAL CODE 0 1 2 3 4 5 6 7 8 9 A B C D E F ↘ ↘		
	0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1	1	CROSS VALIDITY
	0 0 0 0 1 1 1 1 1 0 0 0 0 1 1 1 1 1	2	WRAPAROUND
	0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 1	3	NO HANDSHAKE
	0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1	4	IOC RAM TEST
0C)00 0000 ↙	HEXADECIMAL CODE 0 1 2 3 4 5 6 7 8 9 A B C D E F ↘ ↘		
	0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1	5	READ AFTER WRITE
	0 0 0 0 1 1 1 1 1 0 0 0 0 1 1 1 1 1	6	READ/WRITE ALT "1"/"0"
	0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 1	7	WRAPAROUND
	0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1	8	CHECK SUM
00C)0 0000 ↙	HEXADECIMAL CODE 0 1 2 3 4 5 6 7 8 9 A B C D E F ↘ ↘		
	0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1	9	BACKGROUND SLOW
	0 0 0 0 1 1 1 1 1 0 0 0 0 1 1 1 1 1	10	FOREGROUND SLOW
	0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 1	11	TEST INSTRUCTION
	0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1	12	FROZEN PAGE 1
000C) 0000 ↙	HEXADECIMAL CODE 0 1 2 3 4 5 6 7 8 9 A B C D E F ↘ ↘		
	0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1	13	UNDEFINED INSTRUCTION
	0 0 0 0 1 1 1 1 1 0 0 0 0 1 1 1 1 1	14	STACK UNDERFLOW
	0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 1	15	STACK OVERFLOW
	0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1	16	FROZEN PAGE 2

- 1 EXAMPLE: IF "CU MONITOR 8000 0000" IS SHOWN, THEN ONLY BIT 1 IS SET AND THE ONLY FAILURE IS CROSS VALIDITY
- 2 EXAMPLE: IF "CU MONITOR C000 0000" IS SHOWN, THEN BITS 1 AND 2 ARE SET AND THERE ARE CROSS VALIDITY AND WRAPAROUND FAILURES
- 3 WRAPAROUND FOR MASTER CAUTION LIGHT, AURAL WARNING, AND TAKEOFF THRUST
- 4 WRAPAROUND FOR CU VALID AND STANDBY ENGINE INDICATOR

CU TEST/CU MONITOR Hex Codes and Failures
Figure 14A (Sheet 1)

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CU TEST/CU MONITOR CODE	BINARY TO HEXADECIMAL CONVERSION	BIT	FAILURE
0000 ()000	HEXADECIMAL CODE 0 1 2 3 4 5 6 7 8 9 A B C D E F		
	0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1	17	Y DEFLECTION
	0 0 0 0 1 1 1 1 0 0 0 0 1 1 1 1	18	X DEFLECTION
	0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1	19	SEQUENCER ACTIVITY
	0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1	20	SEQUENCER ACTIVITY
0000 0()00	HEXADECIMAL CODE 0 1 2 3 4 5 6 7 8 9 A B C D E F		
	0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1	21	UNDEFINED INSTRUCTION
	0 0 0 0 1 1 1 1 0 0 0 0 1 1 1 1	22	NO HANDSHAKE
	0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1	23	BITE
	0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1	24	BITE
0000 00()0	HEXADECIMAL CODE 0 1 2 3 4 5 6 7 8 9 A B C D E F		
	0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1	25	WRAPAROUND
	0 0 0 0 1 1 1 1 0 0 0 0 1 1 1 1	26	BITE
	0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1	27	CROSS VALIDITY
	0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1	28	BITE
0000 000()	HEXADECIMAL CODE 0 1 2 3 4 5 6 7 8 9 A B C D E F		
	0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1	29	CROSS VALIDITY
	0 0 0 0 1 1 1 1 0 0 0 0 1 1 1 1	30	TEST VOLTAGES
	0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1	31	CROSS VALIDITY
	0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1	32	TEST VOLTAGES

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CU TEST/CU MONITOR Hex Codes and Failures
Figure 14A (Sheet 2)

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- (d) If the I/O interface, CPU, and display generator subsystems are all functioning properly, the CPU then monitors and analyzes the system in the following areas:
- 1) It tests itself, the program memory, scratch pad memory, and non-volatile memory.
 - 2) It detects sensor input values that are out of range, and ARINC 429 sensors that are not transmitting frequently enough.
 - 3) It exchanges sensor data that is received by both computers with that of the other computer. It does this in order to isolate the device responsible for invalid sensor data.
 - 4) It confirms that all discrete and ARINC 429 output transmitters are operating correctly. It does so by comparing the value sent with the value read from receivers connected to each transmitter.
 - 5) It monitors the power supply voltages used by the I/O interface.
 - 6) It isolates display faults to the computer or a display unit by analyzing the data supplied by the display generator.
 - 7) It monitors an over-temperature indication from the power supply.
- (e) Once BITE has detected an abnormality in the system, EICAS will respond in one of the following ways:
- 1) For a detected display unit problem, the affected display is shut down or blanked. The level C message EICAS DISPLAY will be displayed on the remaining display unit.
 - 2) If either computer detects invalid or loss of data from the display select panel, the computers revert to the full up mode display. In addition, the level C message EICAS CONT PNL is displayed.
 - 3) For a detected fault in a computer that affects in-flight operation of the system, the faulty computer is shut down. Display switching to the right computer is accomplished if the left computer has failed and the computer select switch is set to AUTO. The status message L EICAS CMPTR or R EICAS CMPTR, as applicable, is generated for display when selected.
 - 4) If an invalid or improper program pin configuration is detected at power up, the system will respond by blanking all displays. For the same detected fault, the computers will automatically display the self-test formats if the parking brake is set.
 - 5) Crosstalk Comparison
 - a) Each computer receives analog signals, and then filters, scales, and analyzes them. The results are sent to the other computer. The other computer receives the same analog signals, processes them in the same manner, and sends its own results back to the first computer. Each computer then compares the two values.

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- b) If both computers decide an analog signal is outside of the allowable range, or invalid, the corresponding section of the affected display page is blanked.
 - c) If one computer determines an analog signal is invalid, but the other determines the signal is valid, a fault condition exists. The EICAS computer that processed the invalid signal is shut down. The remaining computer displays the status message (L or R) EICAS CMPTR, as applicable.
 - d) If both computers process a valid analog signal, but yet they disagree on the final result, a fault exists. The fault could be in the wiring circuit between the two computers, or in the input receiving circuitry of either computers.
 - e) If the disagreement exists with an engine parameter, the status message EICAS DISAGREE and the maintenance message EICAS BITE are displayed. A decimal code, identified as ENGINE DISAGREE, is displayed on the BITE test format when the self test is run.
 - f) If the disagreement exists with a non-engine parameter or an analog discrete, only the maintenance message EICAS BITE is displayed. A decimal code is displayed on the test page as SUB-SYS DISAGREE or DISCRETE DISAGREE, as applicable.
 - g) The cross comparison of the discrete inputs is inhibited if the state of the comparison has changed since the previous comparison. Three consecutive cycles (20 seconds per cycle) are required to register a disagree code.
 - h) The disagree codes and their respective input pin numbers are listed in Table 101.
- 6) The Maintenance message EICAS BITE will also be generated for any other BITE-detected faults not covered by other messages. These faults include failures in nonvolatile memories or other faults not affecting in-flight operation of the system.
- 7) Any fault detected during self-monitoring will set a fault bit in the CU MONITOR code, displayed on the BITE test page. This hexadecimal code readout provides data to the shop personnel for use in fault isolation of the LRU. If the CU MONITOR code displays all zeros, no faults were detected during self monitoring.
- 8) When a computer receives invalid data from a parameter that is not connected in parallel to the other computer (i.e., temperatures), the corresponding section of display will be blanked.
- (3) Manual Self-Test
- (a) In addition to automatic monitoring, an EICAS system self-test routine can be requested. This request is only honored when the airplane is on the ground and the parking brake is set.

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- (b) The BITE self-test mode is initiated by pressing the TEST button on the EICAS Maintenance Panel. A second press of the TEST button or release of the parking brake will cause the computers to exit the test mode.
- (c) AIRPLANES WITH -1001 AND SUBSEQUENT EICAS COMPUTERS; the BITE self-test mode is also initiated by a program pin error.
- (d) A self-test routine involves an end-to-end test of system health. When the TEST button is pressed, internally generated signals drive the input receivers of each computer. Each EICAS computer responds independently to the test. All the automatic monitoring described above continues except for crosstalk input data comparison. Any disagreement detected previously during system operation is retained in memory for display on the test page.
- (e) The system conducts a single self-test cycle and responds in the following manner.
 - 1) The master caution light output discrete is set to ground. This causes the two master CAUTION lights to come on.
 - 2) The aural command output discrete is set to ground. This signal causes the WEU to sound the caution owl aural (Ref 31-51-00).
 - 3) The take-off thrust output discrete is set to ground. This signal enables the WEU to output its takeoff-configuration warning siren signals (Ref 31-51-00).
 - 4) The test page displays TEST IN PROGRESS during test signal processing. After processing is finished, the ground is removed from the output discretes. The warning siren from the WEU will cease, but the master CAUTION lights will remain on until they are manually reset.
- (f) AIRPLANES WITH PRE -1001 EICAS COMPUTERS; the results of the test are displayed as follows:
 - 1) Results of the test are displayed on the test page. If any failures were detected in the computer during test, a hexadecimal CU TEST code is displayed. This code provides data to the shop personnel for use in fault isolation of the LRU. If any disagree conditions exist between the left and right EICAS computers, the non-zero codes corresponding to the disagree conditions are displayed on the DISAGREE: 1 and 2 columns. The 1 column corresponds to the first occurrence of the disagree condition. The 2 column corresponds to the second occurrence of the disagree condition. A maximum of two disagree codes of each type can be stored in memory at one time. If a third disagree condition occurs, it will not be displayed until the previous disagree conditions are resolved and the disagree codes are erased.

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- 2) Fail messages are also displayed at the completion of self-test as follows:
 - a) LEFT CMPTR FAIL is displayed when the left computer detects a fault within itself (a fault bit is set in the left computer CU TEST code).
 - b) RIGHT CMPTR FAIL is displayed when the right computer detects a fault within itself (a fault bit is set in the right computer CU TEST code).
 - c) UPPER DU FAIL or LOWER DU FAIL is displayed if any fault discrete is set from the top or bottom display unit, respectively.
 - 3) If any fail messages are displayed, the message TEST FAIL is also displayed at the top of the test page.
 - 4) If no faults are detected during test, the message TEST OK is displayed.
- (g) AIRPLANES WITH POST -1001 EICAS COMPUTERS;
the results of the test are displayed as follows:
- 1) The message SELF TEST COMPLETE appears in the top left.
 - 2) The two classes of faults, INTERFACE FAULTS and INTERNAL FAULTS, appear below the SELF TEST COMPLETE message.
 - a) If faults are found, the quantity of faults appear to the left of fault type.
 - b) If there are no faults, the word NO appears instead of the quantity.
 - 3) The faults are stored in fault reporting pages; PRESENT STATUS and FAULT HISTORY.
 - 4) VIEW PRESENT STATUS and CLEAR TEST RESULTS show if there were any faults recorded during the current flight leg.
 - 5) The faults for the current flight leg are found in the PRESENT STATUS fault reporting page(s).
 - 6) From the EICAS self test page, you push the MAN switch twice to show the PRESENT STATUS summary page.

NOTE: The PRESENT STATUS page will only show if there are faults. The display will not change if there are no faults.

- 7) The title LEFT(RIGHT) EICAS COMPUTER, along with PRESENT STATUS, appears at the top center of the summary page.
- 8) The PRESENT STATUS summary page shows the faults, grouped by types, for flight leg 0.
- 9) You can have PRESENT LEG INTERFACE FAULTS and PRESENT LEG INTERNAL FAULTS.
- 10) The PRESENT LEG INTERFACE FAULTS are further divided into these types:
 - a) ARINC 429 RECEIVER FAULTS,
ARINC 429 TRANSMITTER FAULTS,
ANALOG DISCRETE OUTPUT FAULTS,
FREQUENCY INPUT FAULTS,
ANALOG INPUT FAULTS and
ANALOG PARAMETER DISAGREE

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- 11) If no faults are found, the word NO is shown to the left of the fault type.
- 12) If faults are found, the <SELECTED cursor points to the first type with a fault.
- 13) You push the AUTO switch to move the <SELECTED cursor to next category.
- 14) You push the MAN switch to show the selected FAULT REPORT page within a category.
 - a) The FAULT REPORT page shows more details about the fault.
 - b) You push the MAN switch to show the next fault report.
 - c) You push the AUTO switch to show the previous fault report.
 - d) You push the REC switch to return to the PRESENT STATUS summary page.
- 15) From the summary page, you push the REC switch to return to the self test page.
 - a) You push the TEST switch to return the EICAS to normal operation.
- 16) The faults for the previous flight legs are found in FAULT HISTORY fault reporting page(s).
- 17) VIEW FAULT HISTORY shows on the self test page if there were any faults recorded during the previous flight leg(s).
- 18) From the EICAS self test page, you push the AUTO switch twice to show the FAULT HISTORY summary page.

NOTE: The FAULT HISTORY page will only show if there are faults. The display will not change if there are no faults.

- 19) The title LEFT(RIGHT) EICAS COMPUTER, along with FAULT HISTORY, appears at the top center of the summary page.
- 20) The FAULT HISTORY summary page shows the faults, grouped by types, for flight legs 1 through 9.
- 21) You can have INTERFACE FAULTS and INTERNAL FAULTS.
- 22) The INTERFACE FAULTS are further divided into these types:
 - a) ARINC 429 RECEIVER FAULTS,
ARINC 429 TRANSMITTER FAULTS,
ANALOG DISCRETE OUTPUT FAULTS,
FREQUENCY INPUT FAULTS,
ANALOG INPUT FAULTS and
ANALOG PARAMETER DISAGREE
- 23) If no faults are found, the word NO is shown to the left of the fault type.
- 24) If faults are found, the <SELECTED cursor points to the first type with a fault.
- 25) You push the AUTO switch to move the <SELECTED cursor to next category.
- 26) You push the MAN switch to show the selected FAULT REPORT page within a category.
 - a) The FAULT REPORT page shows more details about the fault, including the flight leg number.

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- b) You push the ERASE switch to erase all fault records for flight legs 1 through 9.
 - c) You push the MAN switch to show the next fault report.
 - d) You push the AUTO switch to show the previous fault report.
 - e) You push the REC switch to return to the PRESENT STATUS summary page.
- 27) From the summary page, you push the REC switch to return to the self test page.
- a) You push the TEST switch to return the EICAS to normal operation.
- 28) From the EICAS self test page, you press the ERASE switch twice to clear all present leg (flight leg 0) faults.
- (h) LRU failure messages do not indicate results of self-monitoring. If a fault is detected during self-monitoring (the CU MONITOR code is non-zero) but not during the manually initiated test, the message TEST OK will still be displayed.
 - (i) Proper switch operation can be verified by BITE while in self-test mode. When the following switches are pressed, a corresponding KEY message will be displayed: ENGINE, STATUS, CANCEL, RECALL, ECS/MSG, ELEC/HYD, PERF/APU, CONF/MCDP, ENG EXC, AUTO, MAN, REC, and ERASE.

C. Control

- (1) To turn on EICAS, perform the following steps:
 - (a) Provide electrical power (Ref 24-22-00).
 - (b) Check that EICAS circuit breakers (6 places) on panel P11 are closed.
 - (c) Adjust display intensity as desired using BRT/BAL controls on the display select panel.
- (2) To select computer display control, set COMPUTER switch on display select panel as follows:
 - (a) Set switch to L position for left computer display,
 - (b) Set switch to R position for right computer display,
 - (c) Set switch to AUTO position for automatic display switching.
- (3) To clear engine maximum exceedances from the display, press the MAX IND RESET switch on display select panel.
- (4) Display Pages - Selection and Control
 - (a) To select or clear the Secondary Engine page on the bottom display unit, press the ENGINE switch on the display select panel.
 - (b) To select or clear the Status page on the bottom display unit, press the STATUS switch on the display select panel.
 - (c) To select or clear a Maintenance page (ECS/MSG, PERF/APU, ELEC/HYD, CONF/MCDP, ENG EXC) on the bottom display unit, press the corresponding DISPLAY SELECT switch on the EICAS Maintenance Panel.
 - (d) To select a non-volatile memory (NVM) Maintenance page for display, perform the following steps:
 - 1) Select the desired page as described in the previous step.
 - 2) Press the AUTO switch on the maintenance panel to select Auto Event memory for display.

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- 3) Press the MAN switch on the maintenance panel to select Manual Event memory or display.
 - (e) To record a maintenance normal event page, perform the following steps:
 - 1) Select the desired page as described above.
 - 2) Press the EVENT REC key on the maintenance panel.
 - (f) To erase a maintenance Auto Event or Manual Event page, perform the following steps:
 - 1) Select the desired maintenance page.
 - 2) Press (AUTO or MAN) EVENT READ switch as desired.
 - 3) Press and hold ERASE switch for about 3 seconds.
- (5) Message Selection and Control
- (a) To cycle level B and level C alert messages, operate the CANCEL and RECALL switches as follows:
 - 1) Press the CANCEL switch to remove currently displayed level B and level C messages and to view any additional messages, if present.
 - 2) Press the RECALL switch to return to the beginning of the alert message list.
 - (b) To cycle status messages, operate the STATUS switch as follows:
 - 1) Press the STATUS switch to remove any currently displayed status messages and to view any additional messages, if present. The Status page will blank when all status messages have been displayed.
 - 2) Press STATUS again to return to the beginning of the status message list.
 - (c) To cycle maintenance messages, operate the ECS/MSG switch as follows:
 - 1) Press ECS/MSG to remove currently displayed maintenance messages and view additional messages, if present. The ECS/MSG page will blank when all maintenance messages have been displayed.
 - 2) Press ECS/MSG again to return to the beginning of the maintenance message list.
 - (d) To erase a status/maintenance message or maintenance message, perform the following steps:
 - 1) On EICAS maintenance panel at P61, press ECS/MSG switch and check that ECS/MSG page appears.
 - 2) Press AUTO-EVENT READ switch and check that AUTO EVENT readout appears at bottom display.

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3) Press and hold ERASE switch for about 3 seconds.

NOTE: The ERASE switch is used to both erase the currently displayed page of messages and, at the same time, advance the display to the next page of NVM messages, if present.

All data displayed on ECS/MSG Auto Event page will be erased when the ERASE switch is pressed. To track intermittent faults, maintenance messages may be recorded for future reference.

- 4) Check for PAGE readout. If readout is blank, skip this step. If readout indicates an additional page of messages, press and hold ERASE switch for about 3 seconds. The next page of messages will appear.
- 5) Repeat previous two steps until page readout goes blank or indicates PAGE 1.

NOTE: All maintenance messages remaining after erase procedure indicate currently existing conditions. Messages erased by above procedure represent transitory or intermittent conditions.

- (e) To erase LRU failure messages from the BITE self-test mode, perform the following steps:
- 1) Initiate manual self-test.
 - 2) Press and hold ERASE switch and check that KEY message ERASE and that PRESS ERASE TO CLEAR MEMORY appear. Release switch.
 - 3) Press and hold ERASE switch for about 3 seconds.

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





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

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ENGINE INDICATION AND CREW ALERTING SYSTEM

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	REFERENCE
CIRCUIT BREAKERS -	2		P11, FLIGHT COMPARTMENT	
EICAS CMPTR LEFT, C4078		1	11J2	*
EICAS CMPTR RIGHT, C4079		1	11J29	*
EICAS DISPLAY SW, C4189		1	11J31	*
EICAS DISPLAY SELECT, C4094 		1	11J32	*
EICAS LOWER DISPLAY, C4082 		1	11J30	*
EICAS LOWER IND, C4082 		1	11J30	*
EICAS PILOTS DSP, C4094 		1	11J32	*
EICAS UPPER DISPLAY, C4081 		1	11J3	*
EICAS UPPER IND, C4081 		1	11J3	*
COMPUTER - EICAS LEFT, M10181	1	1	119BL, MAIN EQUIPMENT CENTER, E4-2	31-41-02
COMPUTER - EICAS RIGHT, M10182	1	1	119BL, MAIN EQUIPMENT CENTER, E4-2	31-41-02
INDICATOR - EICAS DISPLAY TOP, N10013	2	1	FLIGHT COMPARTMENT, P2	31-41-01
INDICATOR - EICAS DISPLAY BOTTOM, N10014	2	1	FLIGHT COMPARTMENT, P2	31-41-01
MODULE - EICAS DISPLAY SWITCHING, BOTTOM, M10418	1	1	119BL, MAIN EQUIPMENT CENTER, E4-2	31-41-04
MODULE - EICAS DISPLAY SWITCHING, TOP, M10417	1	1	119BL, MAIN EQUIPMENT CENTER, E4-2	31-41-04
PANEL - EICAS DISPLAY SELECT, M10195	2	1	FLIGHT COMPARTMENT, P9	31-41-03
PANEL - EICAS MAINTENANCE, M10372	2	1	FLIGHT COMPARTMENT, P61	31-41-05
RELAY - (31-01-36/101)				
SYSTEM NO. 1 AIR/GND, K140				
SENSOR - (34-22-00/101)				*
EFIS REMOTE LIGHT RIGHT, TS188	2	1	FLIGHT COMPARTMENT, P1	
SWITCH - CANCEL, S10170				
SWITCH - CAPT'S MASTER WARNING AND CAUTION LIGHTED, S507	2	1	FLIGHT COMPARTMENT, P7	*
SWITCH - F/O'S MASTER WARNING AND CAUTION LIGHTED, S508	2	1	FLIGHT COMPARTMENT, P7	*
SWITCH - RECALL, S10230	2	1	FLIGHT COMPARTMENT, P1	*

* SEE THE WDM EQUIPMENT LIST

-  GUI 115
-  GUI 001-114,116-999

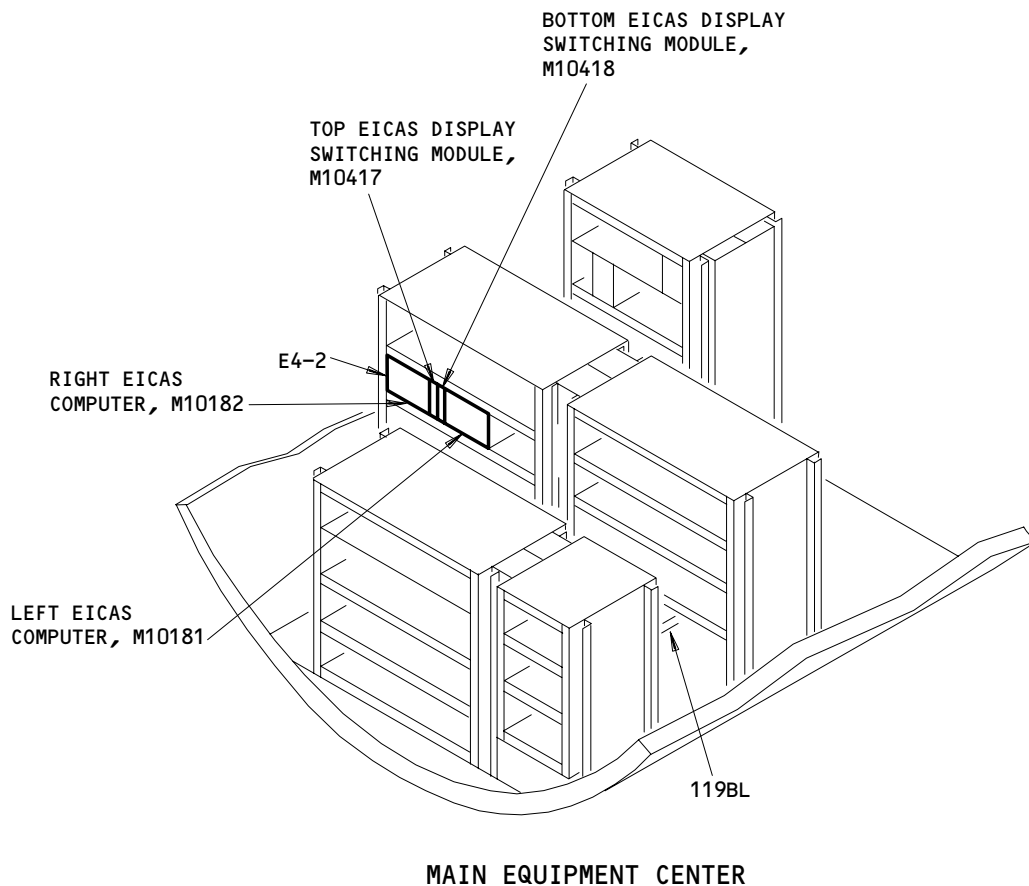
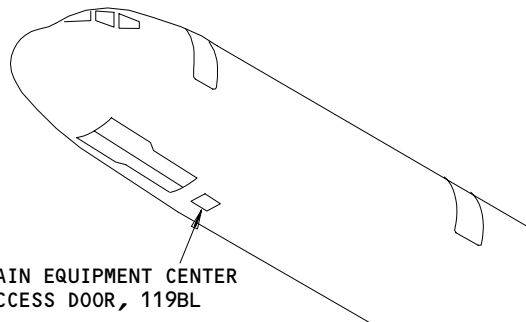
Engine Indication and Crew Alerting System - Component Index
Figure 101

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Engine Indication and Crew Alerting System - Component Location
Figure 102 (Sheet 1)

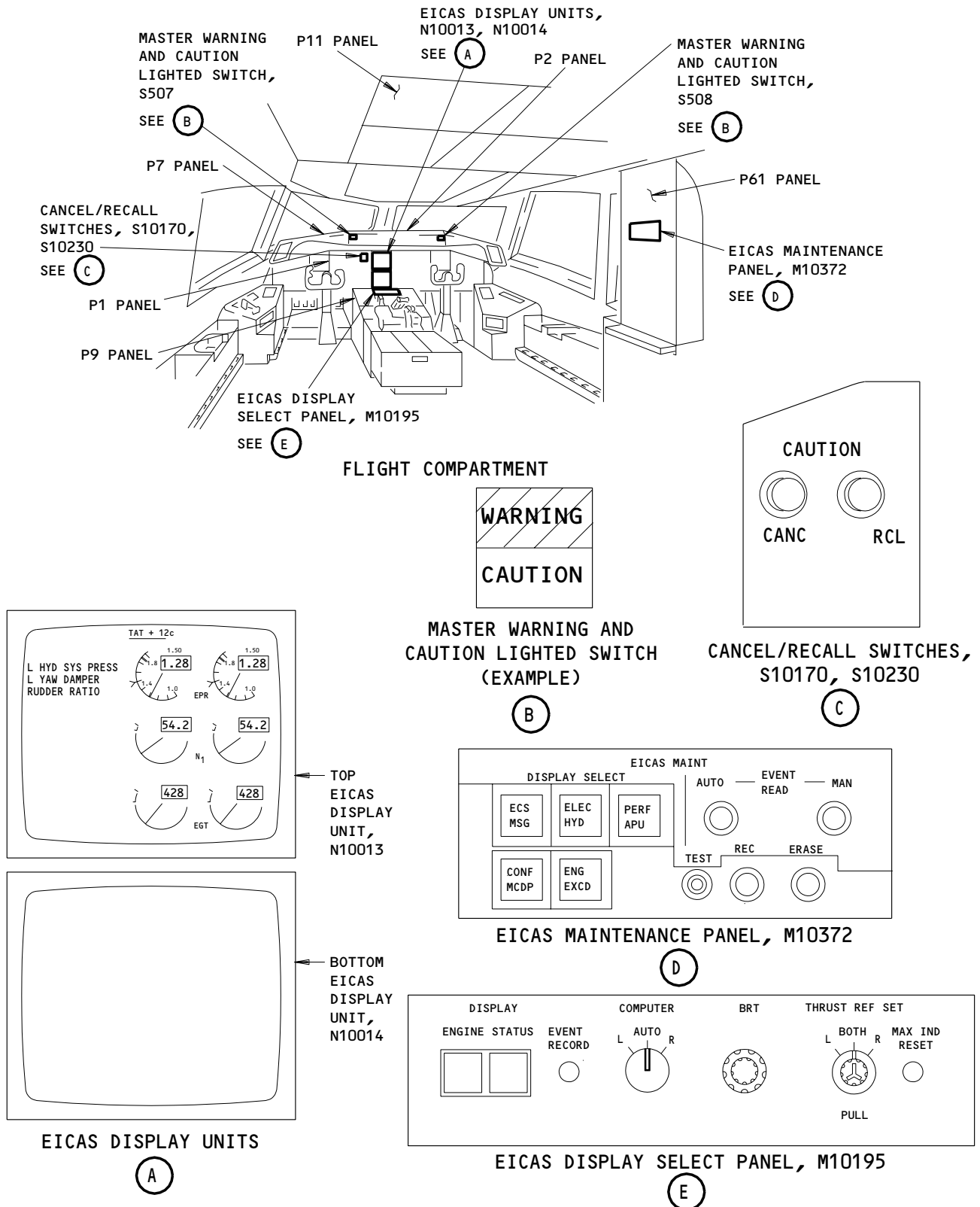
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Engine Indication and Crew Alerting System - Component Location
Figure 102 (Sheet 2)

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ENGINE INDICATION AND CREW ALERTING SYSTEM – MAINTENANCE PRACTICES

1. General

- A. The Engine Indication and Crew Alerting System (EICAS) – Maintenance Practices include the procedures that follow:
- (1) Message Display and Paging (Step 2)
 - (2) Maintenance Message Erase Procedure (Step 3)
 - (3) AUTO EVENT, MAN EVENT, and ENG EXCD Erase Procedures (Step 4)
 - (4) Engine Shutdown Input Removal (Step 5)
 - (5) How to Show an EICAS Software Part Number
 - (6) How to Show an EICAS Fault Reporting Page
 - (7) How to Clear EICAS Faults from the Fault Reporting Pages

TASK 31-41-00-912-001

2. EICAS Message Display Procedure

A. General

- (1) EICAS messages are divided into alert, status, and maintenance message lists. Alert messages, which include level A (Warning), level B (Caution), and level C (Advisory) messages, show on the upper display. Status messages show on the STATUS page on the on the lower display. Maintenance messages show on the ECS MSG page on the lower display.

B. References

- (1) AMM 24-22-00/201, Electrical Power – Control

C. Access

- (1) Location Zones
211/212 Flight Compartment

D. Procedure

S 862-029

- (1) Supply electrical power (AMM 24-22-00/201).

S 862-030

- (2) Make sure that these circuit breakers on the overhead circuit breaker panel, P11, are closed:
 - (a) 11J2, EICAS CMPTR LEFT
 - (b) 11J3, EICAS UPPER IND
 - or
 - 11J3, EICAS UPPER DISPLAY
 - (c) 11J29, EICAS CMPTR RIGHT

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- (d) 11J30, EICAS LOWER IND
or
11J30, EICAS LOWER DISPLAY
- (e) 11J31, EICAS DISPLAY SW
- (f) 11J32, EICAS PILOTS DSP
or
11J32, EICAS DISPLAY SELECT

S 912-004

- (3) Do the steps that follow to show all the EICAS alert messages:

NOTE: The first page of Warning, Caution, and Advisory messages show automatically.

- (a) If PAGE 1 shows, push the CANC switch on the captain's main instrument panel, P1.
- (b) Continue to push the CANC switch as necessary to see all the additional pages.
- (c) Push the RCL switch to go back to the start of the message list.

S 912-005

- (4) Do the steps that follow to show all the EICAS status messages:
- (a) Push the STATUS switch on the EICAS DISPLAY select panel, P9, to show the status page and the first page of status messages.
 - (b) If PAGE 1 shows, push the STATUS switch again.
 - (c) Continue to push the STATUS switch as necessary to see all the additional pages.
 - (d) The lower EICAS display will go out of view after all of the status messages show. Push the STATUS switch again to go back to the start of the message list.

S 912-085

- (5) Do the steps that follow to show all the EICAS maintenance messages:
- (a) Push the ECS/MSG switch on the EICAS MAINT panel on the right side panel, P61, to show the ECS MSG page and the first page of maintenance messages.
 - (b) If PAGE 1 shows, push the ECS MSG switch again.
 - (c) Continue to push the ECS MSG switch as necessary to see all the additional pages.
 - (d) After all of the pages of messages show, the ECS MSG page will show without the message list. Push the ECS MSG switch again to go back to the secondary engine page.

S 862-032

- (6) Remove electrical power if it is not necessary (AMM 24-22-00/201).

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TASK 31-41-00-912-009

3. Maintenance Message Erase Procedure

A. General

- (1) The EICAS computer keeps a record of some EICAS status and maintenance messages in non-volatile memory (NVM) because these messages have intermittent conditions or only show with special input logic. An example of special input logic is engine operation.
- (2) If a failure which caused an NVM message is removed, the message will still show until it is erased from the EICAS computer memory. This procedure gives steps to manually erase these messages.
- (3) NVM messages that have special input logic will not show after they are erased. If the failure condition continues, they still will not show until the special input logic again occurs.

B. References

- (1) AMM 24-22-00/201, Electrical Power - Control

C. Access

- (1) Location Zones
 - 119/120 Main Equipment Center
 - 211/212 Flight Compartment

D. Message Erase Procedure

S 862-010

- (1) Supply electrical power (AMM 24-22-00/201).

S 862-011

- (2) Make sure that these circuit breakers on the P11 panel are closed:
 - (a) 11J2, EICAS CMPTR LEFT
 - (b) 11J3, EICAS UPPER IND
 - or
 - 11J3, EICAS UPPER DISPLAY
 - (c) 11J29, EICAS CMPTR RIGHT
 - (d) 11J30, EICAS LOWER IND
 - or
 - 11J30, EICAS LOWER DISPLAY
 - (e) 11J31, EICAS DISPLAY SW
 - (f) 11J32, EICAS PILOTS DSP
 - or
 - 11J32, EICAS DISPLAY SELECT

S 912-012

- (3) Do the steps that follow to erase an EICAS maintenance message:
 - (a) Push the ECS MSG switch on the EICAS MAINT panel on the right side panel, P61, to see the ECS MSG page.
 - (b) Make a record of all of the messages on the ECS MSG pages for trouble-shooting.

NOTE: Additional messages can show during trouble-shooting. Ignore these messages.

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- (c) Push the AUTO-EVENT READ switch.
- (d) Make sure that AUTO EVENT shows at the bottom of the lower display.
- (e) Push and hold the ERASE switch for 3 seconds.

NOTE: The ERASE switch has two functions as follows:
- It erases all messages that are in view.
- It moves the display forward to show the next page of NVM messages.

- (f) Continue to push the ERASE switch until PAGE does not show or until PAGE 1 shows again.

NOTE: All maintenance messages that still show after the erase procedure identify continued failures.

S 862-014

- (4) Remove electrical power if it is not necessary (AMM 24-22-00/201).

TASK 31-41-00-912-015

4. AUTO EVENT, MAN EVENT, and ENG EXCD Erase Procedures

A. General

- (1) Auto Events occur for the ECS, ELEC, HYD, PERF, and APU systems when given EICAS messages show (Ref Table 1 or FIM Table 102).
- (2) Auto Events also occur for the PERF system when an engine value is in the exceedance range. At the same time, the EICAS computer keeps a record of the exceedance on the ENG EXCD page.
- (3) The EICAS computer keeps a record of a MAN EVENT for the ECS, ELEC/HYD, or PERF/APU systems page when you push the REC switch on the EICAS MAINT panel. The EICAS computer keeps a record of a MAN EVENT for the ESC, ELEC/HYD, and PERF/APU systems pages when you push the EVENT REC switch on the EICAS DISPLAY select panel.

B. References

- (1) AMM 24-22-00/201, Electrical Power - Control

C. Access

- (1) Location Zones
211/212 Flight Compartment

D. Prepare to Erase

S 862-016

- (1) Supply electrical power (AMM 24-22-00/201).

S 862-017

- (2) Make sure that these circuit breakers on the P11 panel are closed:
 - (a) 11J2, EICAS CMPTR LEFT

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- (b) 11J3, EICAS UPPER IND
or
11J3, EICAS UPPER DISPLAY
- (c) 11J29, EICAS CMPTR RIGHT
- (d) 11J30, EICAS LOWER IND
or
11J30, EICAS LOWER DISPLAY
- (e) 11J31, EICAS DISPLAY SW
- (f) 11J32, EICAS PILOTS DSP
or
11J32, EICAS DISPLAY SELECT

E. AUTO EVENT Erase Procedure

S 862-025

- (1) Push the ECS/MSG, ELEC/HYD, or PERF/APU switch for the maintenance page that has an unwanted AUTO EVENT.

S 752-024

- (2) Make sure that the correct page shows.

S 862-026

- (3) Push the AUTO EVENT READ switch.

S 752-027

- (4) Make sure that AUTO EVENT shows at the bottom of the lower display.

S 862-028

- (5) Push and hold the ERASE switch for 3 seconds.

NOTE: The ERASE switch has two functions as follows:

- It erases all the data on the maintenance AUTO EVENT page.
- If you erase an ECS AUTO EVENT page, the ERASE switch will also erase the NVM maintenance messages.

F. MAN EVENT Erase Procedure

S 912-024

- (1) Push the ECS/MSG, ELEC/HYD, or PERF/APU switch for the maintenance page that has an unwanted MAN EVENT.

S 912-025

- (2) Make sure that the correct page shows.

S 912-026

- (3) Push the MAN EVENT READ switch.

S 912-027

- (4) Make sure that MAN EVENT shows at the bottom of the lower display.

S 912-028

- (5) Push and hold the ERASE switch for 3 seconds.

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G. ENG EXCD Erase Procedure

S 912-029

- (1) Push the ENG EXCD switch on the EICAS maintenance panel, P61.

S 912-030

- (2) Make sure that the ENG EXCD page shows.

S 912-087

- (3) Push and hold the ERASE switch for 3 seconds.

H. Put the Airplane Back to Its Usual Condition

S 842-032

- (1) Remove electrical power if it is not necessary (AMM 24-22-00/201).

TASK 31-41-00-912-033

5. Engine Shutdown Input Removal

A. General

- (1) An Engine Shutdown Input in the EICAS computers prevents the output to the CAUTION lights and caution owl aural when the engines are not operating. The messages that have engine operation logic also will not show.
- (2) The procedures that follow give steps to remove the EICAS engine shutdown input and to put the EICAS back to its usual condition.

B. References

- (1) AMM 24-22-00/201, Electrical Power - Control

C. Access

- (1) Location Zones
211/212 Flight Compartment

D. Remove Engines Shutdown Input

S 862-034

- (1) Supply electrical power (AMM 24-22-00/201).

S 862-041

- (2) Make sure that these circuit breakers on the P11 panel are closed:
 - (a) 11J2, EICAS CMPTR LEFT

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- (b) 11J3, EICAS UPPER IND
or
11J3, EICAS UPPER DISPLAY
- (c) 11J29, EICAS CMPTR RIGHT
- (d) 11J30, EICAS LOWER IND
or
11J30, EICAS LOWER DISPLAY
- (e) 11J31, EICAS DISPLAY SW
- (f) 11J32, EICAS PILOTS DSP
or
11J32, EICAS DISPLAY SELECT

S 862-035

- (3) Make sure that the L and R FUEL CONTROL switches are set to OFF.

S 862-044

WARNING: MAKE SURE THE IGNITION SELECTOR SWITCH IS SET TO OFF. IF THE SLATS ARE NOT UP AND THE IGNITION SELECTOR SWITCH IS SET TO AUTO, IGNITERS WILL BE ENERGIZED WHEN YOU OPEN THE 6C1 AND 6C2 L(R) FUEL COND CONT CIRCUIT BREAKERS. ENERGIZED IGNITERS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (4) Set the ignition selector to OFF.

S 862-105

- (5) Open these circuit-breakers on the miscellaneous circuit-breaker panel, P6, and attach DO-NOT-CLOSE tags:

NOTE: A low oil pressure exceedance will show on the secondary page on the lower EICAS display after 300 seconds for -1001 EICAS computer and 180 seconds for pre -1001 EICAS computers. If you want to show the STATUS page or a maintenance page, push the STATUS switch on the EICAS DISPLAY select panel or a maintenance switch on the EICAS MAINT panel.

- (a) 6C1, L FUEL COND CONT
- (b) 6C2, R FUEL COND CONT

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S 912-123

- (6) AIRPLANES WITH -1001 THRU -9999 EICAS COMPUTERS;
After 300 seconds, make sure the EICAS message, ENGINE SHUTDOWN, is removed from the display.

E. Put the Engine Shutdown Input to EICAS Back to Its Usual Condition

S 862-086

- (1) Remove the DO-NOT-CLOSE tags and close these circuit-breakers:
(a) 6C1, L FUEL COND CONT
(b) 6C2, R FUEL COND CONT

S 862-039

- (2) If the L or the R FUEL COND CONT circuit-breaker was open for more than 180 seconds, do the steps that follow:
(a) Push the PERF/APU switch on the EICAS MAINT panel.
(b) Push the AUTO EVENT READ switch on the EICAS MAINT panel.
(c) Push and hold the ERASE switch for 3 seconds.
(d) Push the ENG EXCD switch on the EICAS MAINT panel.
(e) Push the AUTO EVENT READ switch on the EICAS MAINT panel.
(f) Push and hold the ERASE switch for 3 seconds.
(g) Push the ECS MSG switch on the EICAS MAINT panel.
(h) Push the AUTO EVENT READ switch on the EICAS MAINT panel.
(i) Push and hold the ERASE switch for 3 seconds.

S 862-040

- (3) Remove electrical power if it is not necessary (AMM 24-22-00/201).

TASK 31-41-00-752-119

6. AIRPLANES WITH -1001 THRU -9999 EICAS COMPUTERS;
How to Show an EICAS Software Part Number

A. General

- (1) This task shows how to retrieve EICAS software part numbers from the EICAS configuration maintenance page.

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- (2) The EICAS software contains two part numbers, the OPS (Operational Program Software) and the OPC (Operational Program Configuration).
- B. References
 - (1) 24-22-00/201, Electrical Power Control
- C. Access
 - (1) Location Zones
 - 211/212 Flight Compartment
- D. Procedure

S 862-092

- (1) Supply electrical power (AMM 24-22-00/201).

S 862-093

- (2) Make sure that the EICAS circuit breakers that follow are closed:
 - (a) 11J2, EICAS CMPTR LEFT
 - (b) 11J3, EICAS UPPER DSPL
 - (c) 11J29, EICAS CMPTR RIGHT
 - (d) 11J30, EICAS LOWER DSPL
 - (e) 11J31, EICAS DSPL SW
 - (f) 11J32, EICAS DSPL SELECT

S 752-094

- (3) Do the steps that follow to show the EICAS software part numbers:
 - (a) Push the CONF/MCDP switch on the EICAS MAINT panel.
 - (b) Observe the OPS and OPC P/Ns (part numbers) on the bottom EICAS display.

NOTE: The OPS and OPC P/Ns (part numbers) show on the lower half of page 1 on the CONF/MCDP page.

S 862-095

- (4) Remove electrical power if it is not necessary (AMM 24-22-00/201).

TASK 31-41-00-752-120

7. AIRPLANES WITH -1001 THRU -9999 EICAS COMPUTERS;
How to Show an EICAS Fault Reporting Page

A. General

- (1) This task shows how to retrieve EICAS fault reporting pages from the EICAS self test page.
- (2) The fault reporting pages contain either PRESENT STATUS faults or FAULT HISTORY faults.
 - (a) The PRESENT STATUS faults occurred during flight leg 0.

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(b) The FAULT HISTORY faults occurred during flight leg 1 through flight leg 9.

B. References

(1) 24-22-00/201, Electrical Power Control

C. Access

(1) Location Zones
211/212 Flight Compartment

D. Procedure

S 862-098

(1) Supply electrical power (AMM 24-22-00/201).

S 862-099

(2) Make sure that the EICAS circuit breakers that follow are closed:

- (a) 11J2, EICAS CMPTR LEFT
- (b) 11J3, EICAS UPPER DSPL
- (c) 11J29, EICAS CMPTR RIGHT
- (d) 11J30, EICAS LOWER DSPL
- (e) 11J31, EICAS DSPL SW
- (f) 11J32, EICAS DSPL SELECT

S 862-115

(3) AIRPLANES WITH PREDICTIVE WINDSHEAR;

Open these circuit breakers on the overhead circuit breaker panel, P11, and attach DO-NOT-CLOSE tags:

- (a) 11F2, WX RADAR L
- (b) AIRPLANES WITH DUAL WEATHER RADAR R/T'S;
11F27, WX RADAR R

S 752-100

(4) Do the steps that follow to show the fault reporting pages:

(a) Push the TEST switch on the EICAS MAINT panel.

NOTE: Stop for 1 to 3 minutes. Some faults have time delays.

(b) Push the MAN switch twice to show PRESENT STATUS faults.

NOTE: The PRESENT STATUS page will only show if there are faults. The display will not change if there are no faults.

1) Follow the instruction on the screen to show the fault reporting page(s).

(c) Push the AUTO switch twice to show FAULT HISTORY faults.

NOTE: The FAULT HISTORY page will only show if there are faults. The display will not change if there are no faults.

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- 1) Follow the instruction on the screen to show the fault reporting page(s).

S 862-116

- (5) AIRPLANES WITH PREDICTIVE WINDSHEAR;
Close these circuit breakers on the overhead circuit breaker panel, P11, and remove the DO-NOT-CLOSE tags:
 - (a) 11F2, WX RADAR L
 - (b) AIRPLANES WITH DUAL WEATHER RADAR R/T'S;
11F27, WX RADAR R

S 862-101

- (6) Remove electrical power if it is not necessary (AMM 24-22-00/201).

TASK 31-41-00-752-121

8. AIRPLANES WITH -1001 THRU -9999 EICAS COMPUTERS;

How to Clear EICAS Faults from the Fault Reporting Pages

A. General

- (1) After you repair an EICAS fault, you must remove it from the fault reporting pages.
- (2) This task shows how to remove EICAS faults from the fault reporting pages.
- (3) The fault reporting pages contain either PRESENT STATUS faults or FAULT HISTORY faults.
 - (a) The PRESENT STATUS faults occurred during flight leg 0.
 - (b) The FAULT HISTORY faults occurred during flight leg 1 through flight leg 9.

B. References

- (1) 24-22-00/201, Electrical Power Control

C. Access

- (1) Location Zones
211/212 Flight Compartment

D. Procedure

S 862-109

- (1) Supply electrical power (AMM 24-22-00/201).

S 862-110

- (2) Make sure that the EICAS circuit breakers that follow are closed:
 - (a) 11J2, EICAS CMPTR LEFT
 - (b) 11J3, EICAS UPPER DSPL
 - (c) 11J29, EICAS CMPTR RIGHT
 - (d) 11J30, EICAS LOWER DSPL
 - (e) 11J31, EICAS DSPL SW
 - (f) 11J32, EICAS DSPL SELECT

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S 862-111

- (3) AIRPLANES WITH PREDICTIVE WINDSHEAR;
Open these circuit breakers on the overhead circuit breaker panel, P11, and attach DO-NOT-CLOSE tags:
(a) 11F2, WX RADAR L
(b) AIRPLANES WITH DUAL WEATHER RADAR R/T'S;
11F23, WX RADAR R

S 752-112

- (4) Do the steps that follow to remove EICAS faults:
(a) Push the TEST switch on the EICAS MAINT panel.

NOTE: Stop for 1 to 3 minutes. Some faults have time delays.

- (b) Record any faults you find.
(c) If you have present leg faults, push the ERASE key two times to erase the present leg faults.
(d) If you have previous leg faults, push the AUTO key two times to show the fault history page.
1) Push the ERASE key two times to erase the previous leg faults.
(e) Push the TEST switch on the EICAS MAINT panel to exit the test.

NOTE: Stop for 1 to 3 minutes. Some faults have time delays.

- 1) Make sure the faults are removed.
(f) If necessary, repeat the procedure for the right (left) EICAS computer.

S 862-113

- (5) AIRPLANES WITH PREDICTIVE WINDSHEAR;
Close these circuit breakers on the overhead circuit breaker panel, P11, and remove the DO-NOT-CLOSE tags:
(a) 11F2, WX RADAR L
(b) AIRPLANES WITH DUAL WEATHER RADAR R/T'S;
11F23, WX RADAR R

S 862-114

- (6) Remove electrical power if it is not necessary (AMM 24-22-00/201).

TASK 31-41-00-912-035

9. EICAS Message Display Procedure

NOTE: This is a scheduled maintenance task.

A. References

- (1) AMM 24-22-00/201, Electrical Power Control

B. Access

- (1) Location Zones

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211/212 Flight Compartment

C. Procedure

S 862-037

- (1) Supply electrical power (AMM 24-22-00/201).

S 862-088

- (2) Make sure that these circuit breakers on the overhead circuit breaker panel, P11, are closed:

(a) 11J2, EICAS CMPTR LEFT

(b) 11J3, EICAS UPPER IND

or

11J3, EICAS UPPER DISPLAY

(c) 11J29, EICAS CMPTR RIGHT

(d) 11J30, EICAS LOWER IND

or

11J30, EICAS LOWER DISPLAY

(e) 11J31, EICAS DISPLAY SW

(f) 11J32, EICAS PILOTS DSP

or

11J32, EICAS DISPLAY SELECT

S 912-034

- (3) Do the steps that follow to show all the EICAS maintenance messages:

(a) Push the ECS/MSG switch on the EICAS MAINT panel on the right side panel, P61, to show the ECS MSG page and the first page of maintenance messages.

(b) If PAGE 1 shows, push the ECS MSG switch again.

(c) Continue to push the ECS MSG switch as necessary to see all the additional pages.

(d) After all of the pages of messages show, the ECS MSG page will show without the message list. Push the ECS MSG switch again to go back to the secondary engine page.

S 862-036

- (4) Remove electrical power if it is not necessary (AMM 24-22-00/201).

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ENGINE INDICATION AND CREW ALERTING SYSTEM – ADJUSTMENT/TEST

1. General

- A. This procedure has two tasks. The first task is the Operational Test which uses only equipment on the airplane. The second task is the System Test which uses equipment on the airplane and external test equipment.
- B. The Engine Indication and Crew Alerting System (EICAS) has an interface with many other airplane systems. This EICAS adjustment/test does not include an input test for all of the interface systems. Tests for the correct installation and operation of the EICAS components are included.

TASK 31-41-00-715-012

2. EICAS – Operational Test

A. References

- (1) AMM 24-22-00/201, Electrical Power – Control
- (2) AMM 31-41-02/201, EICAS Computer – Maintenance Practices

B. Access

- (1) Location Zones
211/212 Flight Compartment – Left/Right

C. Procedure

S 865-013

- (1) Supply electrical power (AMM 24-22-00/201).

S 865-001

- (2) Make sure that these circuit breakers on the overhead circuit breaker panel, P11, are closed:
 - (a) 11B16, AURAL WARN SPKR LEFT
 - (b) 11B18, WARN ELEX B
 - (c) GUI 001, 002, 115 WITH SB 78-32, AND GUI 003-114, 116-999; 11C19, LANDING GEAR POS SYS 2
 - (d) 11C30, LANDING GEAR POS SYS 1
 - (e) 11H35, AURAL WARN SPKR RIGHT
 - (f) 11J2, EICAS CMPTR LEFT
 - (g) 11J3, EICAS UPPER IND or EICAS UPPER DISPLAY
 - (h) 11J29, EICAS CMPTR RIGHT

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- (i) 11J30, EICAS LOWER IND or EICAS LOWER DISPLAY
- (j) 11J31, EICAS DISPLAY SW
- (k) 11J32, EICAS PILOTS DSP or EICAS DISPLAY SELECT
- (l) 11J33, WARN ELEX A
- (m) 11S23, POS SYS 2

S 755-067

- (3) AIRPLANES WITH -1001 THRU -9999 EICAS COMPUTERS;
Perform this configuration check:

NOTE: Make sure you know the correct software part number for the EICAS computer you will check. For the EICAS computer to be an approved installation, the correct software must be checked.

- (a) Press the CONF/MCDP switch on the EICAS MAINT panel (P61).
 - 1) Make sure the correct OPS software part number shows on the CONF/MCDP page.
 - 2) Make sure the correct OPC software part number shows on the CONF/MCDP page.
 - 3) If the correct software part number does not show, install the correct software (AMM 31-41-02/201).

S 865-062

- (4) AIRPLANES WITH PREDICTIVE WINDSHEAR;
Open these circuit breakers on the overhead circuit breaker panel, P11, and attach DO-NOT-CLOSE tags:
- (a) 11F2, WX RADAR L
 - (b) AIRPLANES WITH DUAL WEATHER RADAR R/T'S;
11F27, WX RADAR R

S 865-014

- (5) Make sure that the airplane parking brake is engaged.

S 865-015

- (6) Set the COMPUTER select switch on the DISPLAY select panel to the L position.

S 715-016

- (7) Make sure that the engine primary page shows on the top display unit and engine secondary page shows on the bottom display unit.

S 715-017

- (8) Push and release the TEST button on the EICAS MAINT panel.

S 715-002

- (9) Make sure that the indications that follow show:
- (a) Both master CAUTION switch/lights come on.
 - (b) Caution owl aural and warning siren aural indications come on.

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- (c) Test page shows on the two display units.
- (d) L EICAS TEST shows at the top of the right side of the two display units.
- (e) TEST IN PROGRESS message shows in the message list at the top of the left side of the two display units for approximately 5 seconds.
- (f) AIRPLANES WITH -1001 THRU -9999 EICAS COMPUTERS;
SELF TEST COMPLETE replaces the TEST IN PROGRESS message.
- (g) AIRPLANES WITH -1001 THRU -9999 EICAS COMPUTERS;
Make sure NO INTERFACE FAULTS shows and NO INTERNAL FAULTS shows.
- (h) All aural indications stop.
- (i) CMPTR FAIL and DU FAIL messages do not show.
- (j) Red, green, and blue color blocks show on the two displays.

S 715-018

- (10) Push the left master CAUTION switch/light after the TEST OK message (or the SELF TEST COMPLETE message) shows.

S 715-019

- (11) Make sure that both master CAUTION switch/lights go off.

S 715-066

- (12) Make sure that the EICAS program pin codes that follow show for the left (right) computer as applicable:

- (a) GUI 001 PRE-SB 31-59;
AD5A 9B25 (A55A 9B24)
- (b) GUI 002 PRE SB 31-64 AND PRE-SB 31-59;
AD5B 1B25 (A55B 1B24)
- (c) GUI 002 POST SB 31-64 AND PRE-SB 31-59;
AD5B 9B24 (A55B 9B25)
- (d) GUI 003, 005, 010-114, 116-999 PRE-SB 31-59;
AD5B 1B25 (A55B 1B24)

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- (e) GUI 004, 006-008 PRE-SB 31-59;
AD53 1B24 (A553 1B25)
- (f) GUI 009 PRE-SB 31-59;
AD5A 9B25 (A55A 9B24)
- (g) GUI 115 PRE-SB 31-59;
AD1A B3A5 (A51A B3A4)
- (h) GUI 001-011,015 POST-SB 31-59;
AD05 (A504)

S 715-003

- (13) Set the COMPUTER switch on the DISPLAY select panel to the R position and do the step before to test the program pin codes for the right EICAS computer.

S 715-004

- (14) Make sure that the correct program pin codes show for the right EICAS computer:

- (a) AIRPLANES WITH -1001 THRU -9999 EICAS COMPUTERS;
Make sure NO INTERFACE FAULTS shows and NO INTERNAL FAULTS shows.
- (b) CMPTR FAIL and DU FAIL messages do not show.
- (c) Red, green, and blue color blocks show on the two displays.

S 715-005

- (15) Push and release the test switch on the EICAS MAINT panel two times to stop the test mode and start it again.

S 715-059

- (16) Make sure that after 10 seconds, the message TEST OK or SELF TEST COMPLETE shows.

S 715-006

- (17) Push the right master CAUTION switch/lights and make sure that both master CAUTION lights go off.

S 715-021

- (18) Set the COMPUTER switch to L.

S 715-007

- (19) Make sure that the message TEST OK or SELF TEST COMPLETE shows.

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S 715-008

- (20) Push and release each of the switches listed in the table that follows.

S 715-009

- (21) Make sure that the message related to each switch shown in the table shows on the TEST page:

DISPLAY SELECT PANEL	ENGINE STATUS EVENT RECORD MAX IND RESET	ENGINE STATUS RECORD MAX RESET
CAPTAINS CENTER INSTRUMENT PANEL, P1	CAUTION CANCEL CAUTION RECALL	CANC RCL
EICAS MAINT PANEL	ECS MSG ELEC HYD PERF APU CONF MCDP ENG EXCD AUTO READ MAN READ ERASE REC	ECS/MSG ELEC/HYD PERF/APU CONF/MCDP ENG/EXCD AUTO MAN ERASE - PRESS ERASE TO CLEAR TEST RESULTS REC

S 715-022

- (22) Push and release the TEST switch.

S 715-010

- (23) Make sure that the primary page shows on the top display and the secondary page shows on the bottom display.

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S 865-063

- (24) AIRPLANES WITH PREDICTIVE WINDSHEAR;
Close these circuit breakers on the overhead circuit breaker panel,
P11, and remove the DO-NOT-CLOSE tags:
(a) 11F2, WX RADAR L
(b) AIRPLANES WITH DUAL WEATHER RADAR R/T'S;
11F27, WX RADAR R

S 845-041

- (25) Remove electrical power if it is not necessary (AMM 24-22-00/201).

TASK 31-41-00-725-025

3. EICAS - System Test

A. General

- (1) This task includes tests for brightness control, air/ground relay interfaces, EICAS connections, and maintenance panel operation.

B. Equipment

- (1) Light source - commercially available

C. References

- (1) AMM 24-22-00/201, Electrical Power - Control
(2) AMM 32-09-02/201, Air Ground Relays

D. Access

- (1) Location Zones

115/116 NLG Wheel Well - Left/Right
211/212 Flight Compartment - Section 41

E. Prepare for Test

S 845-026

- (1) Supply electrical power (AMM 24-22-00/201).

S 845-027

- (2) Make sure that these P11 panel circuit breakers are closed:

- (a) 11B16, AURAL WARN SPKR LEFT
(b) 11B18, WARN ELEX B
(c) GUI 001, 002, 115 WITH SB 78-32, AND GUI 003-114, 116-999;
11C19, LANDING GEAR POS SYS 2
(d) 11C30, LANDING GEAR POS SYS 1
(e) 11H35, AURAL WARN SPKR RIGHT
(f) 11J2, EICAS CMPTR LEFT
(g) 11J3, EICAS UPPER IND or EICAS UPPER DISPLAY
(h) 11J29, EICAS CMPTR RIGHT
(i) 11J30, EICAS LOWER IND or EICAS LOWER DISPLAY
(j) 11J31, EICAS DISPLAY SW
(k) 11J32, EICAS PILOTS DSP or EICAS DISPLAY SELECT
(l) 11J33, WARN ELEX A
(m) 11S23, POS SYS 2

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S 865-064

- (3) AIRPLANES WITH PREDICTIVE WINDSHEAR;
Open these circuit breakers on the overhead circuit breaker panel, P11, and attach DO-NOT-CLOSE tags:
- (a) 11F2, WX RADAR L
 - (b) AIRPLANES WITH DUAL WEATHER RADAR R/T'S;
11F27, WX RADAR R

F. EICAS Test

S 715-028

- (1) Do the EICAS Operational Test.

S 725-031

- (2) Air/Ground Connections Test

WARNING: MAKE SURE THE AIRPLANE IS ON LEVEL GROUND. PUT CHOCKS AROUND THE WHEELS BEFORE YOU RELEASE THE PARKING BRAKE. YOU CAN CAUSE INJURY OR EQUIPMENT DAMAGE IF YOU DO NOT PUT CHOCKS AROUND THE WHEELS.

- (a) Put chocks around the wheels.
- (b) Release the parking brake.
- (c) Set the COMPUTER switch on the DISPLAY select panel to AUTO.
- (d) Open this circuit breaker on the P11 panel:
 - 1) 11J29, EICAS CMPTR RIGHT
- (e) Push the TEST switch on the EICAS MAINT panel.
- (f) Make sure that there are no changes in the top or bottom displays.
- (g) Engage the parking brake.

WARNING: DO THE DEACTIVATION PROCEDURE FOR THE SPOILERS OR MOVE ALL PERSONS AND EQUIPMENT AWAY FROM THE SPOILERS. THE SPOILERS CAN RETRACT QUICKLY AND CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (h) Do the deactivation procedure for the spoilers (AMM 27-61-00) or move all persons and equipment away from the spoilers.

WARNING: MAKE SURE YOU DO THE FLIGHT MODE SIMULATION CORRECTLY. IF THE PROCEDURE IS NOT DONE CORRECTLY, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

- (i) Do the Flight Mode Simulation procedure for the No. 1 air/ground system (AMM 32-09-02/201).
- (j) Push the TEST switch on the EICAS MAINT panel.

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- (k) Make sure that there is no changes in the top or bottom displays.

WARNING: MAKE SURE YOU DO THE FLIGHT MODE SIMULATION CORRECTLY. IF THE PROCEDURE IS NOT DONE CORRECTLY, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

- (l) Do the Flight Mode Simulation procedure for the No. 2 air/ground system (AMM 32-09-02/201).
- (m) Open this circuit breaker on the P11 panel:
 - 1) 11J30, EICAS LOWER IND or EICAS LOWER DISPLAY
- (n) Push the STATUS switch on the DISPLAY select panel.
- (o) Make sure that the STATUS page does not show on the top display.
- (p) Put the No. 1 air/ground system back to the ground mode by deactivating switches S10060, S10062, and S10067 (AMM 32-09-02/201).
- (q) Push the STATUS switch on the DISPLAY select panel.
- (r) Make sure that the STATUS page shows on the top display.
- (s) Push the TEST switch on the EICAS MAINT panel.
- (t) Make sure that the TEST page shows on the top display.
- (u) Close this circuit breaker on the P11 panel:
 - 1) 11J30, EICAS LOWER IND or EICAS LOWER DISPLAY
 - 2) Put the No. 2 air/ground system back to the ground mode by deactivating switches S10059, S10064, and S10068 (AMM 32-09-02/201).
- (v) Push the TEST switch on the EICAS MAINT panel.
- (w) Make sure that the TEST page shows on the two displays.
- (x) Push and release the TEST switch to stop the test mode.
- (y) After 30 seconds, open this circuit breaker on the P11 panel:
 - 1) 11J2, EICAS CMPTR LEFT
- (z) Close this circuit breaker on the P11 panel:
 - 1) 11J29, EICAS CMPTR RIGHT

WARNING: MAKE SURE THAT THE AIRPLANE IS ON LEVEL GROUND. PUT CHOCKS AROUND THE WHEELS BEFORE YOU RELEASE THE PARKING BRAKE. INJURY OR DAMAGE CAN OCCUR IF YOU DO NOT PUT CHOCKS AROUND THE WHEELS.

- (aa) Put chocks around the wheels.
- (ab) Release the parking brake.
- (ac) Push the TEST switch on the EICAS MAINT panel.
- (ad) Make sure that there are no changes in the top or bottom displays.
- (ae) Engage the parking brake.

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WARNING: MAKE SURE YOU DO THE FLIGHT MODE SIMULATION CORRECTLY. IF THE PROCEDURE IS NOT DONE CORRECTLY, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

- (af) Do the Flight Mode Simulation procedure for the No. 1 air/ground system (AMM 32-09-02/201).
- (ag) Push the TEST switch on the EICAS MAINT panel.
- (ah) Make sure that there are no changes in the top or bottom displays.

WARNING: MAKE SURE YOU DO THE FLIGHT MODE SIMULATION CORRECTLY. IF THE PROCEDURE IS NOT DONE CORRECTLY, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

- (ai) Do the Flight Mode Simulation procedure for the No. 2 air/ground system (AMM 32-09-02/201).
- (aj) Open these circuit breakers on the P11 panel:
 - 1) 11J30, EICAS LOWER IND or EICAS LOWER DISPLAY
- (ak) Push the STATUS switch on the DISPLAY select panel.
- (al) Make sure that the STATUS page does not show on the top display.

WARNING: MAKE SURE YOU DO THE FLIGHT MODE SIMULATION CORRECTLY. IF THE PROCEDURE IS NOT DONE CORRECTLY, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

- (am) Put the No. 1 air/ground back to the ground mode by deactivating switches S10060, S10062, and S10067 (AMM 32-09-02/201).
- (an) Push the STATUS switch on the DISPLAY select panel.
- (ao) Make sure that the STATUS page shows on the top display.
- (ap) Push the TEST switch on the EICAS MAINT panel.
- (aq) Make sure that the TEST page shows on the top display.
- (ar) Push and release the TEST switch to stop the test mode.
- (as) Close this circuit breaker on the P11 panel:
 - 1) 11J30, EICAS LOWER IND or EICAS LOWER DISPLAY
- (at) Put the No. 2 air/ground system back to the ground mode by deactivating switches S10059, S10064, and S10068 (AMM 32-09-02/201).
- (au) Do the activation procedure for the spoilers if you did the deactivation procedure (AMM 27-61-00).
- (av) Push the TEST switch on the EICAS MAINT panel.
- (aw) Make sure that the TEST page shows on the top and bottom displays.
- (ax) Push and release the TEST switch to stop the test mode.
- (ay) Close this circuit breaker on the P11 panel:
 - 1) 11J2, EICAS CMPTR LEFT

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S 725-029

(3) EICAS Brightness Test

- (a) Put covers on the EICAS display photosensors.

NOTE: The display photosensors are located near the top right corner of the metal bezel.

- (b) Set the COMPUTER switch on the DISPLAY select panel to the L position.
- (c) Make sure that the primary page shows on the top display and the secondary page shows on the bottom display.
- (d) Change the brightness control on the DISPLAY select panel.
- (e) Make sure that the light intensity of the displays change as follows:
- 1) Turn the outer BRT control in a clockwise direction.

NOTE: During usual operation, the inner and outer BRT controls are connected together and rotate together.

- 2) Make sure that the light intensity of the bottom display increases.
- 3) Turn the inner BRT control in a clockwise direction.
- 4) Make sure that the light intensity of the top display increases.

S 725-032

(4) EICAS Connections Test

- (a) Make sure that these circuit breakers on the P11 panel are closed:
- 1) 11D23, ENGINE STBY IND 1 OR ENGINE STBY IND
 - 2) 11D24, ENGINE STBY IND 2, IF APPLICABLE

CAUTION: OPEN THE LEFT AND RIGHT ENGINE FIRE EXTINGUISHING BOTTLE CIRCUIT BREAKERS. THE FIRE EXTINGUISHING BOTTLES WILL OPERATE ACCIDENTALLY IF THESE CIRCUIT BREAKERS ARE CLOSED.

- (b) Open these circuit breakers on the main power distribution panel, P6, and install DO-NOT-CLOSE tags:
- 1) 6H1, FIRE EXTINGUISHING ENG L BTL 1
 - 2) 6H2, FIRE EXTINGUISHING ENG L BTL 2
 - 3) 6H3, FIRE EXTINGUISHING ENG R BTL 1
 - 4) 6H4, FIRE EXTINGUISHING ENG R BTL 2
- (c) Make sure that the ENG START switches on panel P5 are in the OFF position.
- (d) Install DO-NOT-OPERATE tags on the ENG START switches.
- (e) Make sure that the four fuel boost pump switches and the two fuel override pump switches on panel P5 are OFF.
- (f) Make sure that these circuit breakers on the P6 panel are closed:
- 1) 6C1, FUEL COND CONT L

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- 2) 6C2, FUEL COND CONT R
 - 3) 6E1, FUEL VALVES L SPAR
 - 4) 6E2, FUEL VALVES R SPAR
- (g) Make sure that both of the left and right fuel control switches on the control stand, panel P10, are in the CUTOFF position.

WARNING: OPEN THESE CIRCUIT BREAKERS ON THE OVERHEAD CIRCUIT BREAKER PANEL, P11, AND THE MAIN POWER DISTRIBUTION PANEL, P6. AN ENGINE FUEL LEAK CAN OCCUR WHICH CAN CAUSE INJURY OR DAMAGE IF THESE CIRCUIT BREAKERS ARE CLOSED.

- (h) Open these circuit breakers on the P11 panel and attach DO-NOT-CLOSE tags:
- 1) 11D7, ENGINES STBY IGNITION LEFT 1
 - 2) 11D8, ENGINES STBY IGNITION LEFT 2
 - 3) 11D9, ENGINES STYB IGNITION RIGHT 1
 - 4) 11D10, ENGINES STBY IGNITION RIGHT 2
 - 5) 11L1, LEFT ENGINE IGN 1
 - 6) 11L28, RIGHT ENGINE IGN 1
- (i) Open these circuit breakers on the P6 panel and attach DO-NOT-CLOSE tags:
- 1) 6F14, L FUEL OVRD PUMP
 - 2) 6F20, R FUEL OVRD PUMP
 - 3) 6H14, L AFT FUEL BOOST PUMP
 - 4) 6H17, R FWD FUEL BOOST PUMP
 - 5) 6H20, R AFT FUEL BOOST PUMP
 - 6) 6H23, L FWD FUEL BOOST PUMP
- (j) Make sure that the left and right ENG VALVE and SPAR VALVE lights are off.
- (k) Open these circuit breakers on the P11 panel and attach DO-NOT-CLOSE tags:
- 1) 11J29, EICAS CMPTR RIGHT
 - 2) 11J31, EICAS DISPLAY SW
 - 3) 11K9, LEFT ENG OIL PRESS
 - 4) 11K35, RIGHT ENG OIL PRESS
- (l) Set the switch on the standby Engine Indicator to the AUTO position.
- (m) Set the COMPUTER switch on the DISPLAY select panel to the L position.
- (n) Make sure that the top display shows the primary engine page and the bottom display shows the secondary engine page.
- (o) Make sure that the message L ENG SHUTDOWN and R ENG SHUTDOWN show on the top display.
- (p) Set the L FUEL CONTROL switch on the control stand to the RUN position.
- (q) Make sure that the message L ENG SHUTDOWN does not show on the top display.
- (r) Push the L manual override switch under the L FIRE HANDLE on the control stand, panel P10.
- (s) Pull, but do not rotate, the left engine fire handle.
- (t) Install a DO-NOT-OPERATE tag on the left engine fire handle.

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- (u) Make sure that the message L ENG SHUTDOWN shows on the top display.
- (v) Set the right engine fuel control switch to the RUN position.
- (w) Make sure that the message R ENG SHUTDOWN does not show on the top display.
- (x) Push the R manual override switch under the R FIRE HANDLE on the control stand, panel P10.
- (y) Pull, but do not rotate, the right engine fire handle.
- (z) Install a DO-NOT-OPERATE tag on the right engine fire handle.
- (aa) Make sure that the message R ENG SHUTDOWN shows on the top display.
- (ab) Push the STATUS switch on the DISPLAY select panel.
- (ac) Make sure that the STATUS page and the message R EICAS CMPTR shows on bottom display.

NOTE: If there are more than 11 STATUS messages, R EICAS CMPTR may show on PAGE 2 of the STATUS pages.

- (ad) Close this circuit breaker on the P11 panel:
 - 1) 11J31, EICAS DISPLAY SW
- (ae) Make sure that there are no changes in the top or bottom displays.
- (af) Set the COMPUTER switch on the DISPLAY select panel to AUTO.
- (ag) Make sure that there are no changes in the top or bottom displays.
- (ah) Set the COMPUTER switch to the R position.
- (ai) Make sure that both displays go out of view.
- (aj) Set the COMPUTER switch to the AUTO position.
- (ak) Close this circuit breaker on the P11 panel:
 - 1) 11J29, EICAS CMPTR RIGHT
- (al) Make sure that the message R EICAS CMPTR does not show on the bottom display.
- (am) Set the COMPUTER switch to the R position.
- (an) Make sure that there are no changes in the top or bottom displays.
- (ao) Open this circuit breaker on the P11 panel:
 - 1) 11J2, EICAS CMPTR LEFT
- (ap) Make sure that the message L EICAS CMPTR shows on the bottom display.
- (aq) Make sure that the messages L ENG SHUTDOWN and R ENG SHUTDOWN show on the top display.
- (ar) Remove the left engine fire handle DO-NOT-OPERATE tag.
- (as) Push the left engine fire handle.
- (at) Make sure that the message L ENG SHUTDOWN does not show on the top display.

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- (au) Set the left engine fuel control switch to the CUTOFF position.
- (av) Make sure that the message L ENG SHUTDOWN shows on the top display.
- (aw) Remove the right engine fire handle DO-NOT-OPERATE tag.
- (ax) Push the right engine fire handle.
- (ay) Make sure that the message R ENG SHUTDOWN does not show on the top display.
- (az) Set the right engine fuel control switch to the CUTOFF position.
- (ba) Make sure that the message R ENG SHUTDOWN shows on the top display.
- (bb) Set the COMPUTER switch to the AUTO position.
- (bc) Make sure that there are no changes in the top or bottom displays.
- (bd) Set the COMPUTER SWITCH to the R position.
- (be) Close this circuit breaker on the P11 panel:
 - 1) 11J2, EICAS CMPTR LEFT
- (bf) Make sure that the message L EICAS CMPTR does not show on the bottom display.
- (bg) Push the ENGINE switch on the DISPLAY select panel.
- (bh) Make sure that the SECONDARY page shows on the bottom display.
- (bi) Open this circuit breaker on the P11 panel:
 - 1) 11J3, EICAS UPPER IND or EICAS UPPER DISPLAY
- (bj) Make sure that the COMPACTED page shows on the bottom display and the top display shows no data.
- (bk) Set the COMPUTER switch to the L position.
- (bl) Make sure that there are no changes in the top or bottom displays.
- (bm) Close this circuit breaker on the P11 panel:
 - 1) 11J3, EICAS UPPER IND or EICAS UPPER DISPLAY
- (bn) After 30 seconds, open this circuit breaker on the P11 panel:
 - 1) 11J30, EICAS LOWER IND or EICAS LOWER DISPLAY
- (bo) Make sure that the COMPACTED page shows on the top display and the bottom display shows no data.
- (bp) Set the COMPUTER switch to the R position.

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- (bq) Make sure that there are no changes in the top or bottom displays.
- (br) Open this circuit breaker on the P11 panel:
 - 1) 11J3, EICAS UPPER IND or EICAS UPPER DISPLAY
- (bs) Make sure that both display units show no data.
- (bt) Make sure that the Standby Engine Indicator (SEI) is operating.
- (bu) Close these circuit breakers on the P11 panel:
 - 1) 11J3, EICAS UPPER IND or EICAS UPPER DISPLAY
 - 2) 11J30, EICAS LOWER IND or EICAS LOWER DISPLAY
- (bv) Make sure that the two displays go back to usual operation.
- (bw) Make sure that the SEI does not operate.
- (bx) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the main power distribution panel, P6:
 - 1) 6F14, L FUEL OVRD PUMP
 - 2) 6F20, R FUEL OVRD PUMP
 - 3) 6H1, FIRE EXTINGUISHING ENG L BTL 1
 - 4) 6H2, FIRE EXTINGUISHING ENG L BTL 2
 - 5) 6H3, FIRE EXTINGUISHING ENG R BTL 1
 - 6) 6H4, FIRE EXTINGUISHING ENG R BTL 2
 - 7) 6H14, L AFT FUEL BOOST PUMP
 - 8) 6H17, R FWD FUEL BOOST PUMP
 - 9) 6H20, R AFT FUEL BOOST PUMP
 - 10) 6H23, L FWD FUEL BOOST PUMP
- (by) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the overhead panel, P11:
 - 1) 11D7, ENGINES STBY IGNITION LEFT 1
 - 2) 11D8, ENGINES STBY IGNITION LEFT 2
 - 3) 11D9, ENGINES STBY IGNITION RIGHT 1
 - 4) 11D10, ENGINES STBY IGNITION RIGHT 2
 - 5) 11K9, LEFT ENGINE OIL PRESS
 - 6) 11K35, RIGHT ENGINE OIL PRESS
 - 7) 11L1, LEFT ENGINE IGN 1
 - 8) 11L28, RIGHT ENGINE IGN 1

S 715-042

- (5) EICAS Maintenance Panel Test
 - (a) Make sure that this circuit breaker on the P11 panel is closed:
 - (b) Make sure that this circuit breaker on the P11 panel is closed:
 - 1) 11S15, AIR/GND SYS 1

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- (c) Push the ECS MSG switch on the EICAS MAINT panel.
- (d) Make sure that the ECS/MSG page shows on the bottom display.
- (e) Push the PERF APU switch on the EICAS MAINT panel.
- (f) Make sure that the PERF/APU page shows on the bottom display.
- (g) Push the AUTO-READ switch on the EICAS MAINT panel.
- (h) Make sure that AUTO EVENT shows on the bottom of the PERF/APU page.
- (i) Push the MAN-READ switch on the EICAS MAINT panel.
- (j) Make sure that MAN EVENT shows at the bottom of the PERF/APU page.
- (k) Push the ENG EXCD switch on the EICAS MAINT panel.
- (l) Make sure that the ENG/EXCD page shows on the bottom display.
- (m) Push the CONF/MCDP switch on the EICAS MAINT panel.
- (n) Make sure that the CONF/MCDP page shows on the bottom display.
- (o) Push the ELEC HYD switch on the EICAS MAINT panel.
- (p) Make sure that the ELEC/HYD page shows on the bottom display.
- (q) Push the REC switch on the EICAS MAINT panel.
- (r) Push the MAN-READ switch on the EICAS MAINT panel.
- (s) Make sure that the ELEC/HYD data still shows.
- (t) Push the ERASE switch on the EICAS MAINT panel and hold it for 1 second.
- (u) Make sure that no numerical data shows on the bottom display.

S 715-047

- (6) EICAS Digital Bus Input Tests
 - (a) Set the two flight director (F/D) switches on the mode control panel to the OFF position.
 - (b) Make sure that these circuit breakers on the P11 panel are closed:
 - 1) 11A10, AIR DATA CMPTR LEFT
 - 2) 11E9, FMCS CMPTR LEFT
 - 3) 11F5, RADIO ALTM LEFT
 - (c) Open these circuit breakers on the P11 panel:
 - 1) 11E30, FMCS CMPTR RIGHT

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- 2) 11F26, RADIO ALTM RIGHT
 - 3) 11F30, AIR DATA CMPTR RIGHT
- (d) Set the COMPUTER switch on the DISPLAY select panel to the "L" position.
- (e) Push the CONF/MCDP switch on the EICAS MAINT panel.
- (f) Make sure that the CONF/MCDP page shows on the bottom display.
- (g) Make sure that the data that follows shows on the bottom display:
- 1) EICAS: ON
 - 2) ADC: ON or NCD or TEST or FAIL
 - 3) RA: ON or NCD or TEST or FAIL
 - 4) FMC: ON or NCD or TEST or FAIL
 - 5) All other digital data sources: ON or NCD or TEST or FAIL or OFF
- (h) Set the COMPUTER switch to on the DISPLAY select panel to the "R" position.
- (i) Make sure that the data that follows shows on the bottom display:
- 1) EICAS: ON
 - 2) ADC: OFF
 - 3) RA: OFF
 - 4) FMC: OFF
 - 5) All other digital data sources: ON or NCD or TEST or FAIL or OFF
- (j) Close the following P11 panel circuit breakers:
- 1) 11E30, FMCS CMPTR RIGHT
 - 2) 11F26, RADIO ALTM RIGHT
 - 3) 11F30, AIR DATA CMPTR RIGHT
- (k) Open these circuit breakers on the P11 panel:
- 1) 11A10, AIR DATA CMPTR LEFT
 - 2) 11E9, FMCS CMPTR LEFT
 - 3) 11F5, RADIO ALTM LEFT
- (l) Make sure that the data that follows shows on the bottom display:
- 1) EICAS ON

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- 2) ADC: ON or NCD or TEST
 - 3) RA: ON or NCD or TEST
 - 4) FMC: ON or NCD or TEST
 - (m) Set the COMPUTER switch on the DISPLAY select panel to the "L" position.
 - (n) Make sure that the data that follows shows on the bottom display:
 - 1) EICAS: ON
 - 2) ADC: OFF
 - 3) RA: OFF
 - 4) FMC: OFF
 - (o) Close these circuit breakers on the P11 panel:
 - 1) 11A10, AIR DATA CMPTR LEFT
 - 2) 11E9, FMCS CMPTR LEFT
 - 3) 11F5, RADIO ALTM LEFT
- G. Put the Airplane Back to Its Usual Condition

S 865-050

- (1) Set the AIR/GND system to the ground condition (AMM 32-09-02/201).

S 865-065

- (2) AIRPLANES WITH PREDICTIVE WINDSHEAR;
Close these circuit breakers on the overhead circuit breaker panel, P11, and remove the DO-NOT-CLOSE tags:
 - (a) 11F2, WX RADAR L
 - (b) AIRPLANES WITH DUAL WEATHER RADAR R/T'S;
11F27, WX RADAR R

S 865-051

- (3) Remove electrical power if it is not necessary (AMM 24-22-00/201).

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EICAS DISPLAY UNITS - REMOVAL/INSTALLATION

1. General

- A. Two EICAS display units (N10013 - top, N10014 -bottom) are installed in pilots center instrument panel, P2. Each unit has a handle that turns out from the unit for removal. All electrical connectors are located at the rear of the unit. The EICAS display units are the same as the EHSI display units. All of these units are interchangeable.
- B. This procedure has two tasks.
 - (1) One is for the EICAS display unit removal.
 - (2) The other is for the EICAS display unit installation.

TASK 31-41-01-004-027

2. EICAS Display Unit Removal (Fig. 401)

- A. References
 - (1) 20-41-01/201, Electrostatic Discharge Sensitive Devices
- B. Access
 - (1) Location Zone
211/212 Flight Compartment

C. Procedure

S 864-002

- (1) Open these circuit breakers on the overhead circuit breaker panel, P11, and attach DO-NOT-CLOSE tags:
 - (a) 11J3, EICAS UPPER IND or
EICAS UPPER DISPLAY
 - (b) 11J30, EICAS LOWER IND or
EICAS LOWER DISPLAY

S 034-023

CAUTION: DO NOT TOUCH THE EICAS DISPLAY UNITS BEFORE YOU DO THE PROCEDURE "REMOVAL/INSTALLATION OF ESDS METAL UNITS" (AMM 20-41-01). ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE EICAS DISPLAY UNITS.

- (2) Do the procedure Removal/Installation of ESDS Metal Units (Ref 20-41-01).

S 024-036

CAUTION: DO NOT PULL THE CRT HANDLE. THE HANDLE TURNS OUT AUTOMATICALLY WHEN THE SPRING IS RELEASED. HOLD THE HANDLE UNTIL IT IS COMPLETELY RELEASED FROM THE SCREWS. YOU CAN CAUSE DAMAGE TO THE HANDLE IF YOU TURN IT OUT BEFORE IT IS RELEASED FROM THE SCREWS.

- (3) Hold the handle in the flat position against the unit.

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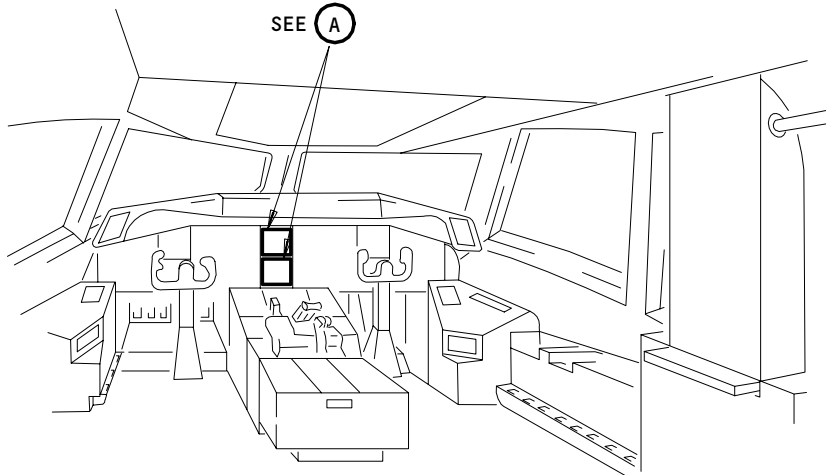
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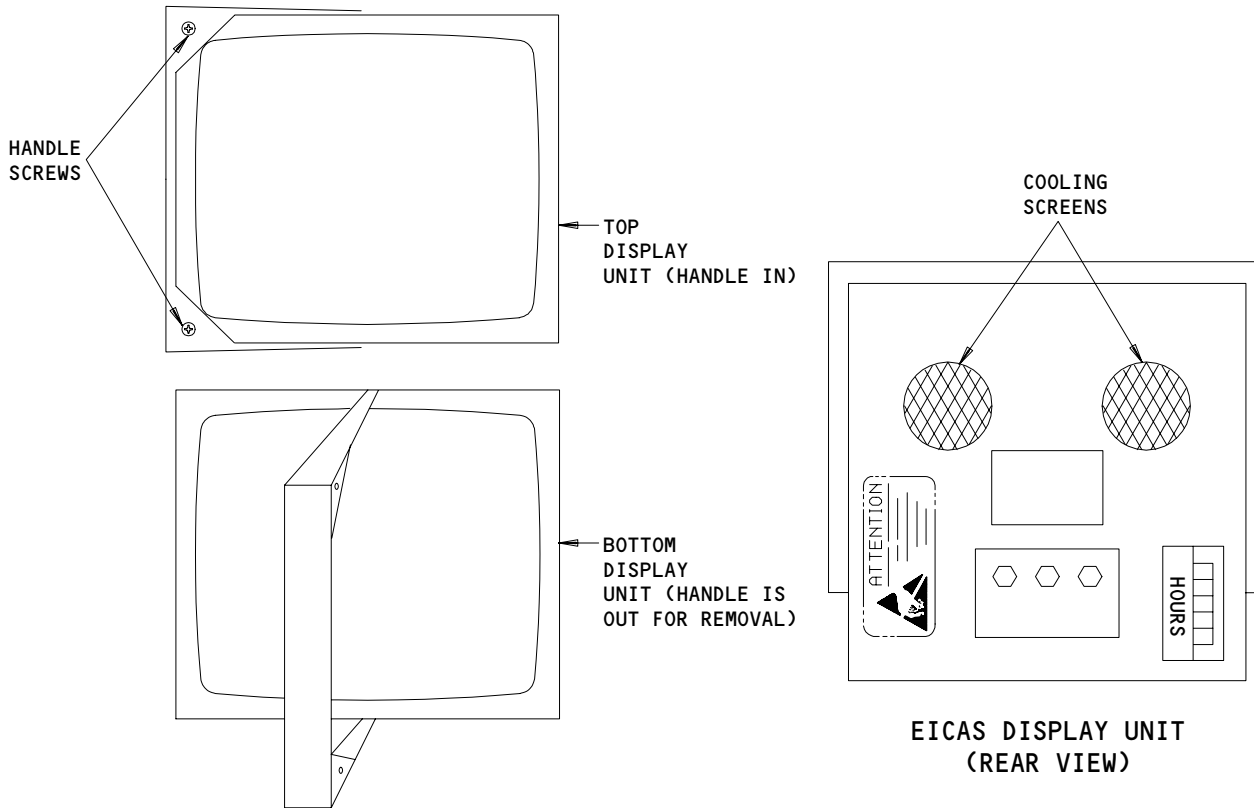
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EICAS DISPLAY
UNITS (P2)

SEE (A)



FLIGHT COMPARTMENT



EICAS DISPLAY UNIT

(A)

EICAS Display Units
Figure 401

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S 024-035

- (4) Loosen the handle screws at the top left and bottom left corners of the display unit.

NOTE: Do not completely remove the handle screws.

S 024-034

- (5) Pull the handle out and to the right.

NOTE: If the handle is not fully extended when you remove the CRT, springs installed in the instrument panel can come out.

S 024-026

- (6) Carefully pull the display unit from the center instrument panel, P2.

TASK 31-41-01-404-025

3. EICAS Display Unit Installation (Fig. 401)

A. References

- (1) 20-41-01/201, Electrostatic Discharge Sensitive Devices
- (2) 24-22-00/201, Electrical Power - Control
- (3) 34-22-00/201, Cathode Ray Tube (CRT)

B. Access

- (1) Location Zone
211/212 Flight Compartment

C. Procedure

S 864-006

- (1) Make sure that these P11 panel circuit breakers are open:
 - (a) 11J3, EICAS UPPER IND or
EICAS UPPER DISPLAY
 - (b) 11J30, EICAS LOWER IND or
EICAS LOWER DISPLAY

S 434-007

CAUTION: DO NOT TOUCH THE EICAS DISPLAY UNITS BEFORE YOU DO THE PROCEDURE "REMOVAL/INSTALLATION OF ESDS METAL UNITS" (AMM 20-41-01). ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE EICAS DISPLAY UNITS.

- (2) Do the procedure Removal/Installation of ESDS Metal Units (Ref 20-41-01).

S 164-012

- (3) Clean the cooling air inlet screen at the rear of the display unit as necessary (Fig. 401).

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S 424-008

- (4) Make sure that the handle is in the fully extended position.

S 424-013

- (5) Carefully move the display unit into the correct position.

S 434-009

CAUTION: HOLD THE CRT HANDLE IN THE FLAT POSITION AGAINST THE UNIT WHILE YOU TURN THE SCREWS IN. YOU CAN CAUSE DAMAGE TO THE HANDLE IF YOU DO NOT HOLD IT UNTIL THE SCREWS ARE TIGHT.

- (6) Turn and hold the CRT handle to the left and into the flat position.

S 434-010

CAUTION: DO NOT TIGHTEN THE SCREWS TOO MUCH. TOO MUCH PRESSURE CAN DAMAGE THE THREADS.

- (7) Tighten the CRT handle screws.

S 864-028

- (8) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P11 panel:

- (a) 11J3, EICAS UPPER IND or
EICAS UPPER DISPLAY
(b) 11J30, EICAS LOWER IND or
EICAS LOWER DISPLAY

D. Display Unit Test

S 864-015

- (1) Make sure these circuit breakers are closed:

- (a) 11J2, EICAS CMPTR LEFT
(b) 11J3, EICAS UPPER IND
or
11J3, EICAS UPPER DISPLAY
(c) 11J29, EICAS CMPTR RIGHT
(d) 11J30, EICAS LOWER IND
or
11J30, EICAS LOWER DISPLAY
(e) 11J31, EICAS DISPLAY SW

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- (f) 11J32, EICAS PILOTS DSP
or
11J32, EICAS DISPLAY SELECT

S 864-029

- (2) Supply electrical power (AMM 24-22-00/201).

S 864-017

- (3) Make sure that the airplane parking brake is engaged.

S 744-030

- (4) Push and release the TEST switch on the EICAS MAINT panel.

S 754-031

- (5) Make sure that the TEST page shows on both of the display units.

S 754-032

- (6) After TEST IN PROGRESS message goes out of view, make sure that the UPPER DU FAIL and the LOWER DU FAIL messages do not show.

S 744-033

- (7) Push and release the TEST switch to go out of the TEST page.

E. Put the Airplane Back to Its Usual Condition

S 114-021

- (1) Clean the CRT face (AMM 34-22-00/201).

S 864-022

- (2) Remove electrical power if it is not necessary (AMM 24-22-00/201).

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EICAS COMPUTER - MAINTENANCE PRACTICES

1. General

- A. This procedure has these tasks:
 - (1) How to install software in the EICAS computer with the Portable Data Loader (PDL) through the connector in the front of the EICAS computer.
- B. To install software in the EICAS computer in the flight compartment, these requirements must be met:
 - (1) There is a data loader control panel on the P61 panel.
 - (2) There are EICAS switch positions on the data loader control panel.
- C. If you cannot install the software from the flight compartment, then you can install the software through the connector at the front of the EICAS computer.
- D. Each task is an independent task and can be performed individually, as required.
- E. You will possibly install the OPC. The OPS is the core software and will possibly not change.
- F. AIRPLANES WITH -1001 THRU -9999 EICAS COMPUTERS AND OPS S/W 3171-COL-DE0-02.
You can load the one EICAS computer using the diskettes and the other EICAS computer via cross-loading. You can cross-load the OPC. The OPS cannot be cross-loaded.

TASK 31-41-02-402-006

2. Software Installation - Portable Data Loader Through The Front of The EICAS

- A. General
 - (1) This procedure tells you how to install software in the EICAS computer through the connector on the front of the EICAS.
 - (a) The EICAS computer must contain these pieces of software:
 - 1) operational program software (OPS)
 - 2) operational program configuration (OPC)
 - (2) There is no required order in loading the OPS and OPC software. The loading of one does not affect the loading of the other.
 - (3) You must install the same OPS(OPC) part numbers in the two EICAS computers. "EICAS SOFTWARE" will show if you install different OPS(OPC) part numbers.
 - (4) A portable data loader (PDL) is necessary for this procedure.

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- (5) A PDL is not a Boeing supplied part. Refer to the PDL supplier for instructions for operation. PDLs have a disk drive for software installation from disks. Some PDLs have an internal mass storage device. If the software is stored in the PDL, then disks are not necessary.
- (6) These conditions must be exist before you install software:
 - (a) The airplane is on the ground,
 - (b) The engines are off and
 - (c) The parking brake is set.
- (7) To read about software installation times and data loaders, do this task: On-Airplane Software Installation (AMM 20-15-11/201).

B. Equipment

- (1) The most up to date disk(s) for the EICAS computer.
- (2) Data Loader (or alternative tool)
 - (a) 11615-02 Loader - Data, Portable, ARINC 615-3 (alternative)
Qualtair Equipment and Engineering (Vendor Code 1HEC2)
15720 Mill Creek Boulevard, Suite 200, Mill Creek, WA 98012
 - (b) 11615-20 Loader - Data, Portable, ARINC 615-3, Includes Mass Storage Device (alternative)
Qualtair Equipment and Engineering (Vendor Code 1HEC2)
15720 Mill Creek Boulevard, Suite 200, Mill Creek, WA 98012
 - (c) 18000-02 Loader - Data, Portable, ARINC 615/A with Mass Storage Device (alternative)
Qualtair Equipment and Engineering (Vendor Code 1HEC2)
15720 Mill Creek Boulevard, Suite 200, Mill Creek, WA 98012
 - (d) 2231560-1-B Loader - Data, Portable, ARINC 615, with Two 3.5 Inch Disk Drives (alternative)
Teledyne Controls (Vendor Code 98571)
12333 W. Olympic Blvd., Los Angeles, CA 90064-1021
 - (e) 30100 Loader - Data, Portable, ARINC 615, 3.5 Inch Diskette (alternative)
Demo Systems, Inc. (Vendor Code OBAW0)
379 Science Dr., MoorPark, CA 93021
 - (f) 465130-01-01 Loader - Data, Portable, ARINC 615, 3.5 Inch Diskette (alternative)
Litton Systems, Inc. (Vendor Code 30782)
6101 Condor Drive, Moorpark, CA 93021-2602

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- (g) 80000-03-01010203 Loader - Data, Portable, ARINC 615/A with Mass Storage Device (alternative)
Demo Systems, Inc. (Vendor Code OBAW0)
379 Science Dr., MoorPark, CA 93021
- (h) 964-0400-024 Loader - Data, Portable, ARINC 615, 3.5 Inch Diskette (alternative)
Honeywell, Inc. (Vendor Code 97896)
15001 N.E. 36th St., P.O. Box 97001, Redmond WA 98073-9701
- (i) 964-0400-025 Loader - Data, Portable, ARINC 615, 3.5 Inch Diskette (alternative)
Honeywell, Inc. (Vendor Code 97896)
15001 N.E. 36th St., P.O. Box 97001, Redmond WA 98073-9701
- (j) YV68A110 Loader - Data, Portable, ARINC 615 (alternative)
SFIM (Vendor Code F6158)
SA 13 AV Marcel Ramofo Garmier, Massy, 91301 France

C. References

- (1) AMM 20-15-11/201, On-Airplane Software Installation
- (2) AMM 24-22-00/201, Electrical Power - Control

D. Access

- (1) Location Zone
 - 119/120 Main Equipment Center
 - 211/212 Flight Compartment

E. Procedure

- S 862-030
 - (1) Set the airplane parking brake.
- S 862-012
 - (2) Supply electrical power (AMM 24-22-00/201).
- S 472-017
 - (3) Use a PDL to install software in the EICAS computer.

NOTE: You must know the correct software part number for the EICAS computer you are loading. For the EICAS computer to be an approved installation, the correct software part number must be loaded.

- S 862-014
 - (4) Make sure these conditions exist before loading software:
 - (a) The airplane is on the ground,
 - (b) The engines are off and
 - (c) The parking brake is set.

S 472-007

- (5) Prepare for the software installation:

NOTE: There is no required order in loading the OPS and OPC software. The loading of one does not affect the loading of the other.

NOTE: You must install the same OPS(OPC) part numbers in the two EICAS computers. "EICAS SOFTWARE" will show if you install different OPS(OPC) part numbers.

CAUTION: MAKE SURE THE POWER SWITCH FOR THE PORTABLE DATA LOADER IS SET TO OFF BEFORE YOU CONNECT OR REMOVE THE INTERFACE CABLE. IF THE POWER SWITCH IS NOT OFF, DAMAGE TO THE PORTABLE DATA LOADER CAN OCCUR.

- (a) Set the power switch on the PDL to the off position.

CAUTION: MAKE SURE THE CIRCUIT BREAKER FOR THE DATA LOADER IS OPEN BEFORE YOU CONNECT OR REMOVE THE INTERFACE CABLE FOR THE PORTABLE DATA LOADER. IF THE CIRCUIT BREAKER IS NOT OPEN, DAMAGE TO EQUIPMENT CAN OCCUR.

- (b) Open these circuit breakers on the overhead circuit breaker panel, P11, and attach DO-NOT-CLOSE tags:

- 1) 11J2, EICAS CMPTR LEFT
- 2) 11J3, EICAS UPPER IND
- 3) 11J29, EICAS CMPTR RIGHT
- 4) 11J30, EICAS LOWER IND
- 5) 11J31, EICAS DSPL SW
- 6) 11J32, EICAS PILOT DSPL

- (c) Connect the PDL interface cable to the ARINC 615 connector on the front of the left (right) EICAS computer.

- (d) Close these circuit breakers on the overhead circuit breaker panel, P11, and remove the DO-NOT-CLOSE tags:

- 1) 11J3, EICAS UPPER IND
- 2) 11J30, EICAS LOWER IND
- 3) 11J31, EICAS DSPL SW
- 4) 11J32, EICAS PILOT DSPL

- (e) Make sure these circuit breakers on the overhead circuit breaker panel, P11, are closed:

- 1) 11S15 LDG GEAR AIR/GND SYS1
- 2) 11S19, LDG GEAR AIR/GND SYS2
- 3) 11C30, LDG GEAR POS SYS1
- 4) 11S23, LDG GEAR POS SYS2

- (f) Make sure this circuit breaker on the overhead circuit breaker panel, P6, is closed:

- 1) 6F4, LDG GEAR PARKING BRAKE VLV.

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- (g) If you are loading the left EICAS computer, close this circuit breaker on the overhead circuit breaker panel, P11, and remove the DO-NOT-CLOSE tag:

NOTE: The circuit breaker for the EICAS computer you are not loading must be open while you are installing software.

1) 11J2, EICAS CMPTR LEFT

- (h) If you are loading the right EICAS computer, close this circuit breaker on the overhead circuit breaker panel, P11, and remove the DO-NOT-CLOSE tag:

NOTE: The circuit breaker for the EICAS computer you are not loading must be open while you are installing software.

1) 11J29, EICAS CMPTR RIGHT

S 472-043

- (6) Do these steps to install software:

- (a) SOFTWARE INSTALLATION WITH A PDL DISK DRIVE;
Do these steps at the PDL:

NOTE: For more information on how to use the PDL, refer to supplier's instructions for the PDL.

- 1) Set the power switch on the PDL to the on position.
- 2) Put the correct disk in the disk drive.

NOTE: It may take 1 to 2 minutes for loading to begin.

- 3) Follow the prompts of the data loader to complete the installation.
- 4) Remove the disk from the disk drive when the data load is complete.

NOTE: COMP, LOAD COMPLETE and TRANSF COMPLETE are examples of data loader prompts for completed installations.

- (b) SOFTWARE INSTALLATION WITH A PDL MASS STORAGE DEVICE;
Follow the PDL supplier instructions to install the software.
(c) Set the power switch on the PDL to the off position.

S 862-037

- (7) Remove the DO-NOT-CLOSE tag and close the applicable circuit breaker on the P11 panel:

- (a) 11J2, EICAS CMPTR LEFT
- (b) 11J29, EICAS CMPTR RIGHT

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- (8) Do these steps to do a software configuration check for the EICAS computer:
- Press the CONF/MCDP switch on the EICAS MAINT panel.
 - Make sure the correct OPS software part number shows on the CONF/MCDP page.
 - Make sure the correct OPC software part number shows on the CONF/MCDP page.
 - Remove the disk from the data loader when the load is complete.
 - AIRPLANES WITH -1001 THRU -9999 EICAS COMPUTERS AND OPS S/W 3171-COL-DE0-02.
If necessary, you can load the right (left) EICAS computer via cross-loading.

NOTE: You can cross-load the OPC only. The OPS cannot be cross-loaded.

- Make sure these conditions exist before cross-loading:
 - The airplane is on the ground,
 - The engines are off and
 - The parking brake is set.
- Press the CONF/MCDP switch until you get to the cross-loading page.
- Press and hold the ECS/MSG, ELEC/HYD and PERF/APU switches for 3 seconds.
- Follow the instructions to perform the cross-load.

S 862-041

- (9) If necessary, repeat the procedure for the right(left) EICAS computer.

S 752-046

- (10) If you installed the OPS, push each of the display select switches on the EICAS Maintenance Panel to examine the maintenance pages.

NOTE: The display select switches are ECS/MSG, ELEC/HYD etc.

- (a) If incorrect displays are shown, push the ERASE switch on the EICAS Maintenance Panel to erase the NVM.

NOTE: Incorrect displays can occur on the maintenance pages after you install the OPS. You remove the incorrect displays when you erase the NVM.

S 842-039

(11) Put the Airplane Back to Its Usual Condition.

NOTE: You must stop for 30 seconds to let the start-up sequence complete before you remove power to disconnect the PDL.

CAUTION: MAKE SURE THE CIRCUIT BREAKER FOR THE DATA LOADER IS OPEN BEFORE YOU CONNECT OR REMOVE THE INTERFACE CABLE FOR THE PORTABLE DATA LOADER. IF THE CIRCUIT BREAKER IS NOT OPEN, DAMAGE TO EQUIPMENT CAN OCCUR.

- (a) Open these circuit breakers and attach DO-NOT-CLOSE tags:
 - 1) On the P11 panel:
 - a) 11J2, EICAS CMPTR LEFT
 - b) 11J3, EICAS UPPER IND
 - c) 11J29, EICAS CMPTR RIGHT
 - d) 11J30, EICAS LOWER IND
 - e) 11J31, EICAS DSPL SW
 - f) 11J32, EICAS PILOT DSPL
- (b) Remove the PDL interface cable from the connector on the front of the left (right) EICAS computer.
- (c) Close these circuit breakers and remove the DO-NOT-CLOSE tags:
 - 1) On the P11 panel:
 - a) 11J2, EICAS CMPTR LEFT
 - b) 11J3, EICAS UPPER IND
 - c) 11J29, EICAS CMPTR RIGHT
 - d) 11J30, EICAS LOWER IND
 - e) 11J31, EICAS DSPL SW
 - f) 11J32, EICAS PILOT DSPL
- (d) Return the airplane into a serviceable condition.

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AIRPLANES WITH
-1001 THRU -9999
EICAS COMPUTERS

31-41-02

EICAS COMPUTER - REMOVAL/INSTALLATION

1. General

- A. Two EICAS computers (M10181 - left, M10182 - right) are installed on rack E4-2 in the main equipment center. The front of the computers do not have system condition lights or BITE test buttons. All electrical connections are at the rear of the unit.
- B. This procedure has two tasks. One is for EICAS computer removal; the other is for EICAS computer installation.
- C. AIRPLANES WITH -1001 THRU -9999 EICAS COMPUTERS;
you will possibly have to install new software when you install the EICAS computer. You will possibly install the OPC. The OPS is the core software and will possibly not change.

TASK 31-41-02-004-027

2. EICAS Computer Removal

- A. References
 - (1) AMM 20-10-01/401, E/E Rack-Mounted Components
 - (2) AMM 20-41-01/201, Electrostatic Discharge Sensitive Devices
- B. Access
 - (1) Location Zones
 - 119 Main Equipment Center
 - 211/212 Flight Compartment
- C. Prepare for Removal
 - S 864-003
 - (1) Open these circuit breakers on the overhead circuit breaker panel, P11, and attach DO-NOT-CLOSE tags:
 - (a) 11J2, EICAS CMPTR LEFT
 - (b) 11J29, EICAS CMPTR RIGHT
- D. Procedure

S 914-028

CAUTION: DO NOT TOUCH THE EICAS COMPUTER BEFORE YOU DO THE PROCEDURE REMOVAL/INSTALLATION OF ESDS METAL UNITS (AMM 20-41-01/201). ELECTROSTATIC DISCHARGE CAN DAMAGE THE EICAS COMPUTER.

- (1) Do the procedure Removal/Installation of ESDS Metal Units (AMM 20-41-01/201).

S 024-022

- (2) Remove the EICAS computer (AMM 20-10-01/401).

TASK 31-41-02-404-029

3. EICAS Computer Installation

- A. References
 - (1) AMM 20-10-01/401, E/E Rack-Mounted Components

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- (2) AMM 20-41-01/201, Electrostatic Discharge Sensitive Devices
- (3) AMM 24-22-00/201, Electrical Power - Control
- (4) AMM 31-41-00/201, EICAS
- (5) AMM 31-41-02/201, EICAS Computer

B. Access

- (1) Location Zones
 - 119 Main Equipment Center
 - 211/212 Flight Compartment

C. Prepare for Installation

S 864-010

- (1) Make sure that these P11 panel circuit breakers are open:
 - (a) 11J2, EICAS CMPTR LEFT
 - (b) 11J29, EICAS CMPTR RIGHT

D. Procedure

S 914-030

CAUTION: DO NOT TOUCH THE EICAS COMPUTER BEFORE YOU DO THE PROCEDURE "REMOVAL/INSTALLATION OF ESDS METAL UNITS" (AMM 20-41-01/201). ELECTROSTATIC DISCHARGE CAN DAMAGE THE EICAS COMPUTER.

- (1) Do the procedure Removal/Installation of ESDS Metal Units (AMM 20-41-01/201).

S 424-024

- (2) Install the EICAS computer (AMM 20-10-01/401).

S 424-062

- (3) AIRPLANES WITH -1001 THRU -9999 EICAS COMPUTERS; supply electrical power (AMM 24-22-00/201).

S 424-063

- (4) AIRPLANES WITH -1001 THRU -9999 EICAS COMPUTERS; make sure that these circuit breakers on the P11 panel are closed:
 - (a) 11J2, EICAS CMPTR LEFT

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(b) 11J29, EICAS CMPTR RIGHT

S 754-058

(5) AIRPLANES WITH -1001 THRU -9999 EICAS COMPUTERS;
make sure these conditions exist before you verify the software configuration:

- (a) The airplane is on the ground,
- (b) The engines are off and,
- (c) The parking brake is set.

S 754-061

(6) AIRPLANES WITH -1001 THRU -9999 EICAS COMPUTERS;
do these steps to make sure that the correct software is installed:

NOTE: Make sure you know the correct software part number for the EICAS computer you will check. For the EICAS computer to be an approved installation, the correct software must be checked.

- (a) Press the CONF/MCDP switch on the EICAS MAINT panel (P61).
- (b) If the correct OPS software does not show, install the correct OPS (AMM 31-41-02/201).
- (c) If the correct OPC software does not show, install the correct OPC (AMM 31-41-02/201).

S 844-025

(7) Do the AUTO EVENT, MAN EVENT, and ENG EXCD Erase Procedure (AMM 31-41-00/201).

E. EICAS Computer Test

S 864-026

(1) Supply electrical power (AMM 24-22-00/201).

S 864-011

(2) Make sure that these circuit breakers on the P11 panel are closed:

- (a) 11J2, EICAS CMPTR LEFT
- (b) 11J3, EICAS UPPER IND or EICAS UPPER DISPLAY
- (c) 11J29, EICAS CMPTR RIGHT
- (d) 11J30, EICAS LOWER IND or EICAS LOWER DISPLAY
- (e) 11J31, EICAS DISPLAY SW
- (f) 11J32, EICAS PILOTS DSP or EICAS DISPLAY SELECT

S 714-012

(3) Turn the COMPUTER switch on the EICAS DISPLAY select panel to the L or R position as applicable.

S 714-013

(4) Make sure that the top display shows the primary engine page and the bottom display shows the secondary engine page.

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- S 864-014
- (5) Make sure that the parking brake is engaged.
- S 744-015
- (6) Push and release the TEST switch on the EICAS maintenance panel, P61.
- S 754-037
- (7) Make sure that the TEST page shows on both displays.
- S 864-040
- (8) Continue after the message TEST IN PROGRESS goes out of view.
- S 724-060
- (9) AIRPLANES WITH -1001 THRU -9999 EICAS COMPUTERS;
If the message X INTERNAL FAULTS shows, do the EICAS BITE procedure (FIM 31-41-00/101).
- S 754-057
- (10) Make sure that the EICAS program pin codes that follow show for the left (right) computer as applicable:
- (a) GUI 001 PRE-SB 31-59;
AD5A 9B25 (A55A 9B24)
 - (b) GUI 002 PRE SB 31-64 AND PRE-SB 31-59;
AD5B 1B25 (A55B 1B24)
 - (c) GUI 002 POST SB 31-64 AND PRE-SB 31-59;
AD5B 9B24 (A55B 9B25)
 - (d) GUI 003, 005, 010-114, 116-999 PRE-SB 31-59;
AD5B 1B25 (A55B 1B24)
 - (e) GUI 004, 006-008 PRE-SB 31-59;
AD53 1B24 (A553 1B25)
 - (f) GUI 009 PRE-SB 31-59;
AD5A 9B25 (A55A 9B24)
 - (g) GUI 115 PRE-SB 31-59;
AD1A B3A5 (A51A B3A4)

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(h) GUI 001-011,015 POST-SB 31-59;
AD05 (A504)

S 864-031

(11) Turn the COMPUTER switch on the EICAS DISPLAY select panel to the other computer.

S 754-032

(12) Make sure that the EICAS program pin code for the other computer is correct.

NOTE: The codes for both computers are given before this step.

S 754-033

(13) Make sure that the CMPTR FAIL messages do not show.

S 744-019

(14) Push and release the TEST switch to go out of the TEST mode.

F. Put the Airplane Back to Its Usual Condition

S 864-020

(1) Remove electrical power if it is not necessary (AMM 24-22-00/201).

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EICAS DISPLAY SELECT PANEL – REMOVAL/INSTALLATION

1. General

- A. This procedure has two tasks. One is for the EICAS DISPLAY select panel removal; the other is for the EICAS DISPLAY select panel installation.
- B. The EICAS DISPLAY select panel, M10195, is installed on the forward electronics control stand, P9. All electrical connections are made at the rear of the unit.

TASK 31-41-03-004-002

2. Remove the EICAS Display Select Panel

- A. References
 - (1) AMM 20-41-01/201, Electrostatic Sensitive Devices
- B. Access
 - (1) Location Zones
211/212 Flight Compartment

C. Procedure

S 914-019

CAUTION: DO NOT MOVE THE EICAS DISPLAY SELECT PANEL BEFORE YOU DO THE PROCEDURE FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE EICAS DISPLAY SELECT PANEL.

- (1) Do the procedure for devices that are sensitive to electrostatic discharge (AMM 20-41-01/201).

S 864-020

- (2) Open this circuit breaker on the overhead circuit breaker panel, P11 and attach a DO-NOT-CLOSE tag:
 - (a) 11J32, EICAS PILOTS DSP or
EICAS DISPLAY SELECT

S 034-021

- (3) Loosen the screws that hold the control panel.

S 014-022

- (4) Move the panel out.

S 034-023

- (5) Disconnect the electrical cable.

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S 024-006

- (6) Remove the panel.

TASK 31-41-03-404-007

3. Install the EICAS Display Select Panel

A. References

- (1) AMM 20-41-01/201, Electrostatic Sensitive Devices
(2) AMM 24-22-00/201, Electrical Power - Control

B. Access

- (1) Location Zones
211/212 Flight Compartment

C. Procedure

S 864-024

- (1) Make sure that this circuit breaker on the P11 panel is open:
(a) 11J32, EICAS PILOTS DSP or
EICAS DISPLAY SELECT

S 434-025

- (2) Connect the electrical cable to the control panel.

S 424-010

- (3) Install the panel.

S 434-026

- (4) Tighten the screws that hold the control panel.

S 864-027

- (5) Remove the DO-NOT-CLOSE tag and close this circuit breaker on the P11 panel:
(a) 11J32, EICAS PILOTS DSP or
EICAS DISPLAY SELECT

D. EICAS Display Select Panel Test

S 864-013

- (1) Supply electrical power (AMM 24-22-00/201).

S 864-014

- (2) Make sure that these circuit breakers on the P11 panel are closed:
(a) 11J2, EICAS CMPTR LEFT

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- (b) 11J3, EICAS UPPER IND
or
11J3, EICAS UPPER DISPLAY
- (c) 11J29, EICAS CMPTR RIGHT
- (d) 11J30, EICAS LOWER IND
or
11J30, EICAS LOWER DISPLAY
- (e) 11J31, EICAS DISPLAY SW
- (f) 11J32, EICAS PILOTS DSP
or
11J32, EICAS DISPLAY SELECT

S 754-028

- (3) Make sure that the top display shows the primary engine page and that the bottom display shows the secondary engine page.

S 754-029

- (4) Make sure that the EICAS message EICAS CONT PNL does not show on the top display.

E. Put the Airplane Back to Its Usual Condition

S 864-017

- (1) Remove electrical power if it is not necessary (AMM 24-22-00/201).

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EICAS DISPLAY SWITCHING MODULE - REMOVAL/INSTALLATION

1. General

- A. Two display switching modules (M10417 - top, M10418 - bottom) are installed. They are mounted inside the P69 panel on the E4-2 rack in the main equipment center. The modules are the same and interchangeable.
- B. This procedure has two tasks. One is for the EICAS Display Switching Module removal and the other is for the EICAS Display Switching Module installation.

TASK 31-41-04-004-001

2. Remove the EICAS Display Switching Module

- A. References
 - (1) AMM 20-10-01/401, E/E Rack Mounted Components
- B. Access
 - (1) Location Zones
 - 119/120 Main Equipment Center
 - 211/212 Flight Compartment

C. Procedure

S 044-002

- (1) Open these circuit breakers on the overhead circuit breaker panel, P11, and install DO-NOT-CLOSE tags:
 - (a) 11J2, EICAS CMPTR LEFT
 - (b) 11J29, EICAS CMPTR RIGHT
 - (c) 11J31, EICAS DISPLAY SW

S 024-003

- (2) Open the door on panel P69.

S 024-004

- (3) Remove the display switching module (AMM 20-10-01/401).

TASK 31-41-04-404-021

3. Install the EICAS Display Switching Module

- A. References
 - (1) AMM 20-10-01/401, E/E Rack Mounted Components

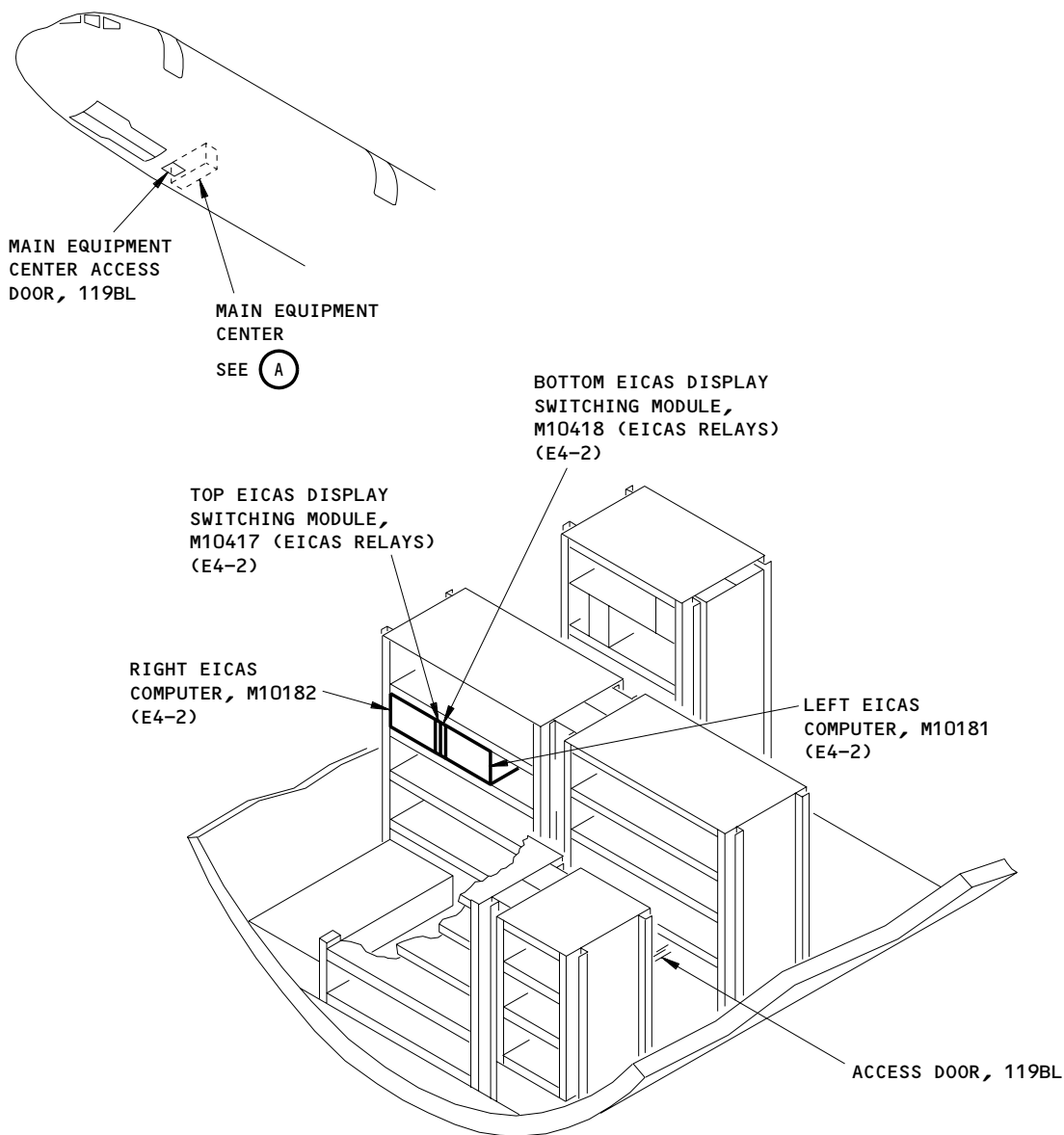
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MAIN EQUIPMENT CENTER

(A)

Engine Indication and Crew Alerting System Installation
Figure 401

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- (2) AMM 24-22-00/201, Electrical Power - Control
- (3) AMM 31-41-02/401, EICAS Computer - Removal/Installation

B. Access

- (1) Location Zones
 - 119/120 Main Equipment Center
 - 211/212 Flight Compartment - Section 41

C. Procedure

S 044-005

- (1) Make sure that these circuit breakers on the P11 panel are open:
 - (a) 11J2, EICAS CMPTR LEFT
 - (b) 11J29, EICAS CMPTR RIGHT
 - (c) 11J31, EICAS DISPLAY SW

S 424-006

- (2) Install the display switching module.

S 424-007

- (3) Close the door on panel P69.

S 444-009

- (4) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P11 panel:
 - (a) 11J2, EICAS CMPTR LEFT
 - (b) 11J29, EICAS CMPTR RIGHT
 - (c) 11J31, EICAS DISPLAY SW

D. Display Switching Module Test

S 864-010

- (1) Make sure that these circuit breakers on the P11 panel are closed:
 - (a) 11J2, EICAS CMPTR LEFT
 - (b) 11J3, EICAS UPPER IND or
11J3, EICAS UPPER DISPLAY
 - (c) 11J29, EICAS CMPTR RIGHT
 - (d) 11J30, EICAS LOWER IND or
11J30, EICAS LOWER DISPLAY
 - (e) 11J31, EICAS DISPLAY SW
 - (f) 11J32, EICAS PILOTS DSP or
11J32, EICAS DISPLAY SELECT

S 864-011

- (2) Supply electrical power (AMM 24-22-00/201).

S 744-012

- (3) Set the COMPUTER switch on the display select panel to the AUTO position.

S 754-032

- (4) Make sure EICAS indications show on both EICAS displays.

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- S 864-033
- (5) Open this circuit breaker on the overhead circuit breaker panel, P11:
(a) 11J2, EICAS CMPTR LEFT
- S 754-034
- (6) Make sure the EICAS indications show on both EICAS displays.
- S 864-035
- (7) Close this circuit breaker on the overhead circuit breaker panel, P11:
(a) 11J2, EICAS CMPTR LEFT
- S 864-036
- (8) Set the COMPUTER switch on the EICAS display select panel to the L position.
- S 754-037
- (9) Make sure the EICAS indications show on both EICAS displays.
- S 864-038
- (10) Set the COMPUTER switch on the EICAS display select panel to the R position.
- S 754-039
- (11) Make sure the EICAS indications show on both EICAS displays.
- S 864-040
- (12) Set the COMPUTER switch on the EICAS display select panel to the AUTO position.
- E. Put the Airplane Back to Its Usual Condition
- S 864-019
- (1) Remove electrical power if it is not necessary (AMM 24-22-00/201).

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EICAS MAINTENANCE PANEL – REMOVAL/INSTALLATION

1. General

- A. The EICAS maintenance panel, M10372, is installed on the right side panel, P61. All electrical connections are at the rear of the panel.
- B. This procedure has two tasks. One is for the EICAS maintenance panel removal; the other is for the EICAS maintenance panel installation.

TASK 31-41-05-004-001

2. Remove the EICAS Maintenance Panel

A. Access

- (1) Location Zones
211/212 Flight Compartment

B. Procedure

S 864-019

- (1) Open this circuit breaker on the overhead circuit breaker panel, P11, and install a DO-NOT-CLOSE tag:
 - (a) 11J32, EICAS PILOTS DSP or
EICAS DISPLAY SELECT

S 034-020

- (2) Loosen the screws that hold the control panel.

S 014-021

- (3) Move the panel out.

S 034-022

- (4) Disconnect the electrical cables.

S 024-006

- (5) Remove the panel.

TASK 31-41-05-404-007

3. Install the EICAS Maintenance Panel

A. References

- (1) AMM 24-22-00/201, Electrical Power – Control

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B. Access

- (1) Location Zones
211/212 Flight Compartment

C. Procedure

S 864-023

- (1) Make sure that this circuit breaker on the P11 panel is open:
(a) 11J32, EICAS PILOTS DSP or
EICAS DISPLAY SELECT

S 434-025

- (2) Connect the electrical cables to the control panel.

S 424-010

- (3) Install the panel.

S 434-026

- (4) Tighten the screws that hold the control panel.

S 444-012

- (5) Remove the DO-NOT-CLOSE tag and close this circuit breaker on the P11 panel:
(a) 11J32, EICAS PILOTS DSP
EICAS DISPLAY SELECT

D. Maintenance Panel Test

S 864-013

- (1) Supply electrical power (AMM 24-22-00/201).

S 864-014

- (2) Make sure that these circuit breakers on the P11 panel are closed:
(a) 11J2, EICAS CMPTR LEFT
(b) 11J3, EICAS UPPER IND
or
11J3, EICAS UPPER DISPLAY
(c) 11J29, EICAS CMPTR RIGHT

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- (d) 11J30, EICAS LOWER IND
or
11J30, EICAS LOWER DISPLAY
- (e) 11J31, EICAS DISPLAY SW
- (f) 11J32, EICAS PILOTS DSP
or
11J32, EICAS DISPLAY SELECT

S 864-015

- (3) Make sure that the airplane parking brake is engaged.

S 744-027

- (4) Push the TEST switch on the EICAS maintenance panel.

S 754-028

- (5) Make sure that the TEST page shows on the two displays.

S 864-029

- (6) Push each of the switches that follow and make sure that the message that shows is the same as the name on the switch:
 - (a) ECS/MSG
 - (b) ELEC/HYD
 - (c) PERF/APU
 - (d) CONF/MCDP
 - (e) ENG EXCD
 - (f) AUTO
 - (g) MAN
 - (h) REC
 - (i) ERASE

E. Put the Airplane Back to Its Usual Condition

S 864-030

- (1) Remove electrical power if it is not necessary (AMM 24-22-00/201).

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ALTITUDE PRESSURE SWITCH – REMOVAL/INSTALLATION

1. General

- A. There is one altitude pressure switch, S10618. These procedures give instructions for removal, installation, and a check of the altitude pressure switch.

TASK 31-41-08-004-001

2. Altitude Pressure Switch Removal

A. Access

- (1) Location Zones
119 Main Equipment Center

B. Procedure

S 034-003

- (1) Loosen the two larger mounting clamp screws adjacent to the switch.

S 024-004

CAUTION: CAREFULLY MOVE THE SWITCH OUT OF THE BRACKET. THIS WILL PREVENT DAMAGE TO THE CABLE AND THE PNEUMATIC HOSE AT THE BACK OF THE SWITCH.

- (2) Move the switch out of the bracket.

S 034-005

- (3) Disconnect the electrical cable.

S 034-006

CAUTION: MAKE SURE THE PITOT-STATIC SYSTEM IS AT AMBIENT PRESSURE BEFORE YOU DISCONNECT THE PNEUMATIC HOSE. THIS WILL PREVENT DAMAGE TO THE INSTRUMENTS.

- (4) Use the quick disconnect to disconnect the static pressure hose.

TASK 31-41-08-404-007

3. Altitude Pressure Switch Installation

A. General

- (1) You do not have to do a leak test when you connect a quick-disconnect fitting. A visual examination of the quick-disconnect for a complete seal is necessary. You must do a leak test when you cannot make sure that the quick-disconnect has a complete seal.

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B. References

- (1) AMM 34-11-00/501, Pitot-Static System

C. Access

- (1) Location Zones
119 Main Equipment Center

D. Procedure

S 434-008

- (1) If the new switch does not have a quick-disconnect installed on it, remove the quick-disconnect from the old switch.

S 434-009

- (2) Inspect the O-ring for damage and replace if necessary.

S 434-010

- (3) Install the quick-disconnect on the new switch.

S 434-011

- (4) Connect the electrical cable to the switch.

S 434-012

CAUTION: MAKE SURE THE PITOT-STATIC SYSTEM IS AT AMBIENT PRESSURE BEFORE YOU CONNECT THE PNEUMATIC HOSE. THIS WILL PREVENT DAMAGE TO THE INSTRUMENTS.

- (5) Connect the static hose to switch.

S 754-013

- (6) Visually make sure the quick-disconnect fittings are fully mated and the connection is locked in a sealed position.

S 794-015

- (7) If you installed the quick-disconnect fitting on the new indicator, do a low range leakage test on the alternate static system (AMM 34-11-00/501).

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S 424-017

CAUTION: CAREFULLY PUT THE SWITCH INTO THE BRACKET. THIS WILL PREVENT DAMAGE TO THE CABLE AND PNEUMATIC HOSE AT THE BACK OF THE SWITCH.

- (8) Put the switch into position in the bracket and tighten the mounting clamp screws.

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WARNING SYSTEM - DESCRIPTION AND OPERATION

1. General (Fig. 1)

- A. The warning system provides the flight crew with visual and aural warnings. Warnings are provided for abnormal airplane system conditions. They are also provided for airplane out of configuration conditions for various operating modes.
- B. The warning system consists of a warning electronics unit, master WARNING switch-lights, discrete warning light, and a SPEEDBRAKE light. It also includes aural warning loudspeakers, Master Warning Reset switch, and test switches.
- C. Input signals are received from airplane sensors, other airplane systems, or generated by the pilots. Signals are processed within the warning electronics unit (WEU).
 - (1) The visual displays are level A warning messages on the EICAS display unit (Ref 31-41-00), master WARNING lights, and discrete warning lights.
 - (2) GUI 001-008, 010-999;
The aural signals are the bell, chime, siren, and owl sounds.
 - (3) GUI 009;
The aural signals are the bell, chime, siren, owl, clacker, wailer, and 925 Hz decision height tone sounds.

2. Component Details (Fig. 1)

- A. Warning Electronics Unit (WEU)
 - (1) The Warning Electronics Unit (WEU), P51, is located in the forward electrical/electronic equipment area, at station 260, RBL 33.
 - (2) The WEU contains plug-in modules which generate warning signals. It generates warning signals for stall warning, configuration warning (takeoff and landing) and altitude alert. It also provides signals to the master warning lights and generates associated warning sounds. The unit weighs 33 lbs and is cooled by external blowing air.
 - (3) The system also provides speedbrake warning.
 - (4) Two fault balls monitor operation of the two power supplies. A reset switch is provided to return tripped fault balls to their operational mode.
 - (5) The modules located in the WEU and their functions are as follows:
 - (a) Power Supply Modules
 - 1) The two redundant power supplies receive 115 volts ac power and develop the +5 volts and ± 12 volts dc power required for all warning modules. There are two ball type fault indicators, one for each module. Each ball latches to black when the corresponding power supply is operating properly and latches to yellow when a fault occurs. The RESET switch next to the fault indicator is provided to set the fault balls back to the operational mode.

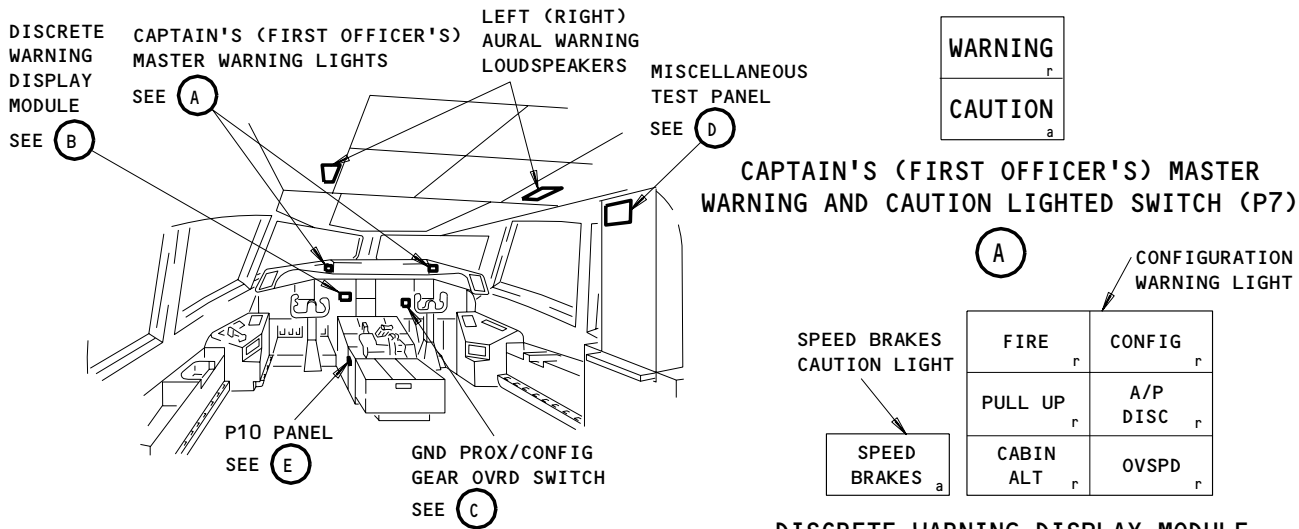
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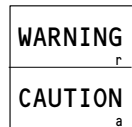
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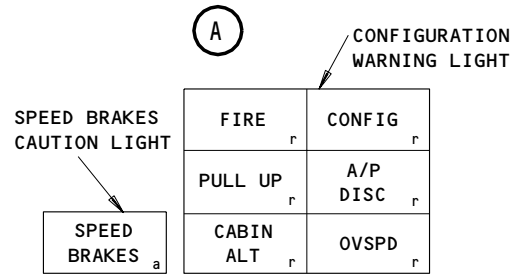
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FLIGHT COMPARTMENT

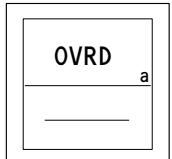


CAPTAIN'S (FIRST OFFICER'S) MASTER WARNING AND CAUTION LIGHTED SWITCH (P7)



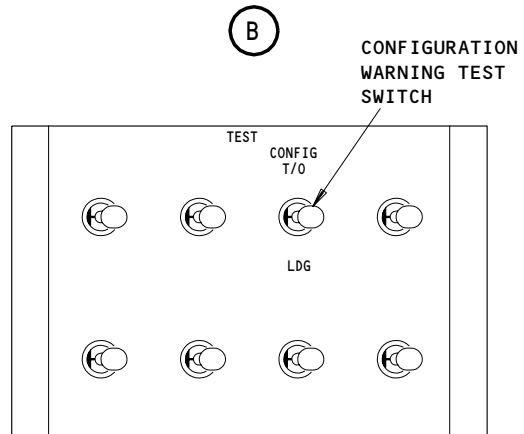
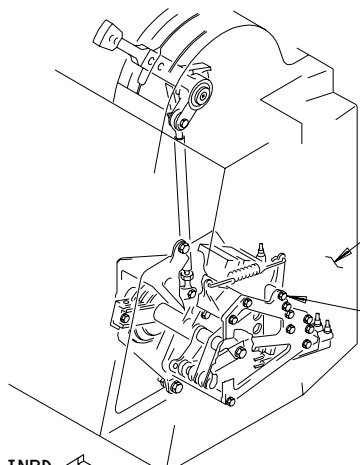
DISCRETE WARNING DISPLAY MODULE

GND PROX/CONFIG GEAR OVRD



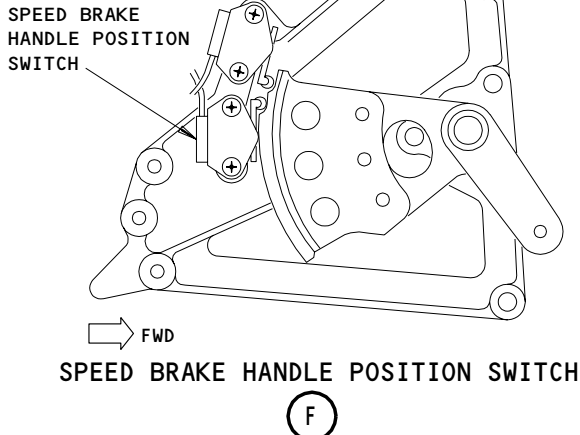
GND PROX/CONFIG GEAR OVRD SWITCH

(C)



MISCELLANEOUS TEST PANEL

(D)

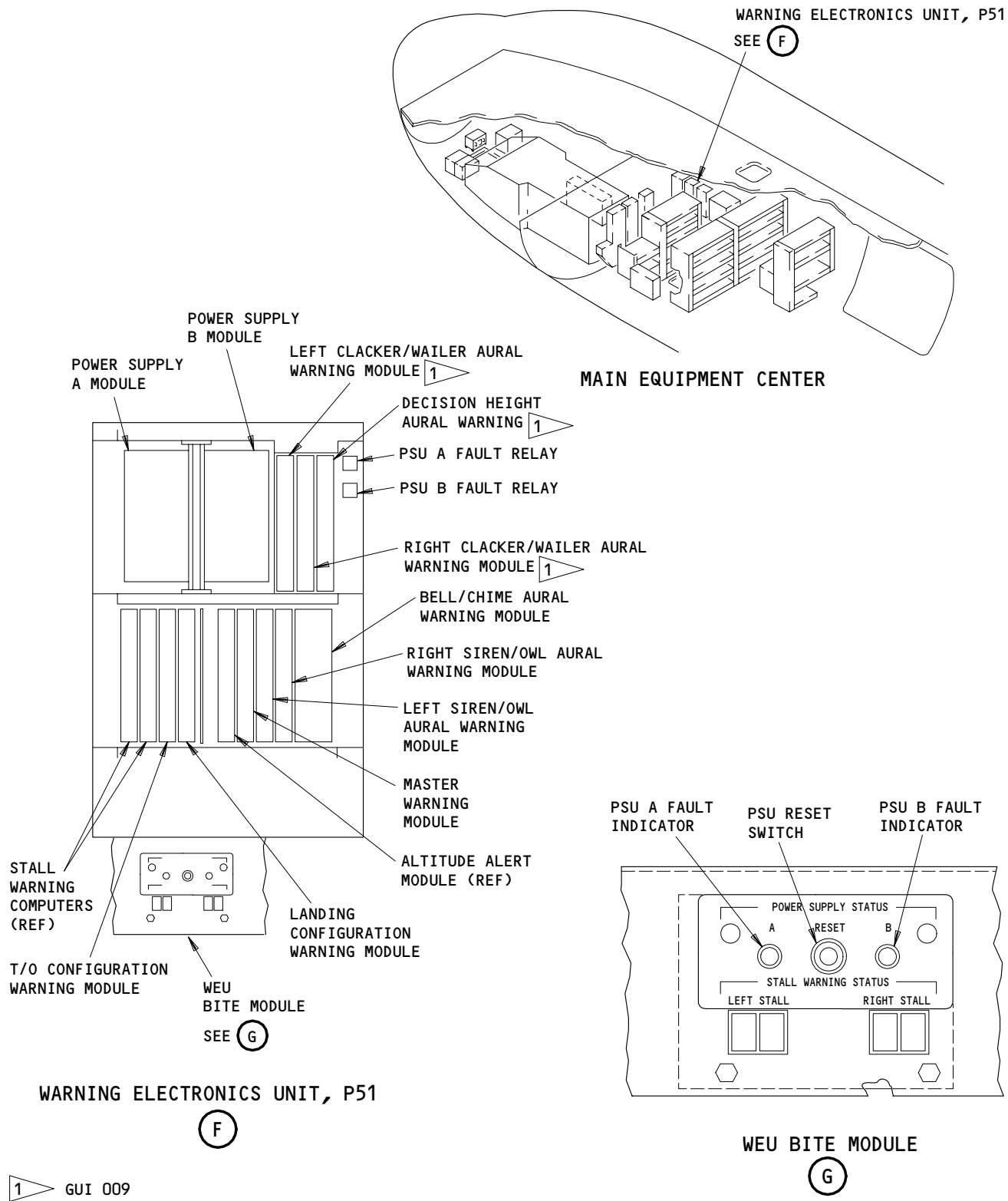


Warning System - Component Location
Figure 1 (Sheet 1)

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Warning System - Component Location
Figure 1 (Sheet 2)

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- (b) EMI Filter Module
 - 1) There are two EMI filter modules in the WEU. Each filter module is paired with a power supply module. The EMI filter module connects to the power line and filters the AC line noise.
- (c) Stall Warning Module
 - 1) Two Stall Warning modules are installed. The left module provides the captain's warning signals and the right one the first officer's warning signals. The modules are each microprocessor controlled. Refer to AMM 27-32-00 for a detailed description of the Stall Warning modules.
- (d) WEU BITE Module
 - 1) The WEU BITE module provides fault indications for the two power supplies and the two Stall Warning computers. Refer to AMM 27-32-00 for a detailed description of the WEU BITE module.
- (e) Takeoff Configuration Warning Module
 - 1) The Takeoff Configuration Warning module provides warning signals for improper airplane configuration during takeoff.
- (f) Landing Configuration Warning Module
 - 1) The Landing Configuration Warning module is microprocessor controlled. It provides warning signals for improper airplane configuration during landing. The Landing Configuration Warning module also provides speedbrake caution signals.
- (g) Altitude Alert Module
 - 1) The Altitude Alert module is microprocessor controlled. It provides altitude acquisition advisory and deviation cautions. Refer to AMM 34-16-00 for a detailed description of the Altitude Alert module.
- (h) Master Warning Module
 - 1) The Master Warning module is microprocessor controlled and provides the warning signals to turn on the Master Warning lights.
- (i) Bell/Chime Aural Warning Module
 - 1) The Bell/Chime Aural Warning module provides fire bell warning and crew call chime signals to the audio amplifiers in the Siren/Owl Aural Warning modules.
- (j) Siren/Owl Aural Warning Module
 - 1) The left and right Siren/Owl Aural Warning modules supply level A warning and level B caution signals.

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- 2) The siren warning is activated by cabin altitude exceedance, T/O configuration warnings, and landing configuration warnings.
 - 3) GUI 001-008, 010-999;
The siren warning is also activated by autopilot disconnect and overspeed.
 - 4) The owl warning is activated by level B EICAS messages and altitude alert.
 - 5) The siren/owl modules also supply amplification of the bell/chime warnings and ground proximity voice.
 - 6) GUI 009;
The siren/owl modules also amplify the clacker/wailer warnings and the decision height tone.
- (k) GUI 009;
Clacker/Wailer Aural Warning Module
- 1) The clacker/wailer aural warning modules provide autopilot and overspeed warning signals to the audio amplifiers in the siren/owl aural warning modules.
- (l) GUI 009;
Decision Height (DH) Aural Warning Module
- B. Configuration Warning Test Switch
- (1) The configuration warning test switch is located on the miscellaneous test panel on the right side panel. It is a two-position, spring loaded switch. The T/O position is for testing the takeoff configuration warning circuits. The LDG position is for testing the landing configuration warning circuits.
- C. GND PROX/CONFIG GEAR OVRD Switch
- (1) The GND PROX/CONFIG GEAR OVRD switch is located on the first officer's instrument panel. It is an alternate action light switch. The switch cancels the landing configuration aural warning and displays the amber OVRD message when pressed.
- D. Master Warning Lights
- (1) AIRPLANES WITHOUT RESETTABLE OVERSPEED SIREN AURAL WARNING;
The red master WARNING lights are located on both ends of the pilots' glare shield P7. The lights come on when the Master Warning module in the Warning Electronics Unit generates a warning signal. Pressing the indicator light cap will turn off the light.

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- (2) AIRPLANES WITH RESETTABLE OVERSPEED SIREN AURAL WARNING (POST-SB 31-68 OR PRR 54813);
The red master WARNING lights are located on both ends of the pilots' glare shield P7. The lights come on when the Master Warning module in the Warning Electronics Unit generates a warning signal. Pressing the indicator light cap will turn off the light and the siren overspeed warning.

E. Discrete Warning Light

- (1) The red CONFIG discrete warning light is located on the center instrument panel. The light comes on when the Configuration Warning module in the Warning Electronics Unit generates a warning signal. The light is powered by the master dim and test circuit (AMM 33-16-00).

F. Loudspeakers

- (1) The aural warning loudspeakers are located above the captain's and first officer's seats. Each loudspeaker is a permanent magnet speaker driven by an internal single stage amplifier. The two speakers provide aural tones and messages when turned on by either the left or right Siren/Owl Aural Warning module. The aural warning loudspeaker amplifiers are powered from the 28 volt dc standby bus.

G. Master Warning Reset Switch.

- (1) The reset switch generates a ground signal to the Aural Warning module to stop the fire bell sounds.

H. Speed Brake Handle Position Switch

- (1) The speed brake handle position switch is located inside the P10 panel. The switch is a thru-contact microswitch with a roller control arm. If the switch is set at the down detent position, a ground is applied to the configuration warning module. This activates a warning during takeoff.

3. Operation

A. Functional Description

- (1) Warning System Interfaces (Fig. 2)
- (a) The Warning Electronics Unit (WEU) power supply modules receive 115 volts ac from the WARN ELEX A and B circuit breakers. The warning speakers receive 28 volts dc from the AURAL WARN circuit breakers. The master WARNING lights receive 28 volts dc from the master dim and test circuits (AMM 33-16-00).
- (b) The WEU receives digital input signals from four sources. These include the Radio Altimeter, Ground Proximity warning computer, Air Data computer, and the Autopilot systems on the ARINC 429 digital bus. It also receives analog status discrete signals from many airplane systems. These signals are processed by different modules in the WEU under microprocessor control to provide the warning signals.
- (c) The WEU modules provide analog discrete signals to the loudspeakers. They also provide discrete signals to turn on the master warning lights, the discrete warning light, and to the EICAS computers.

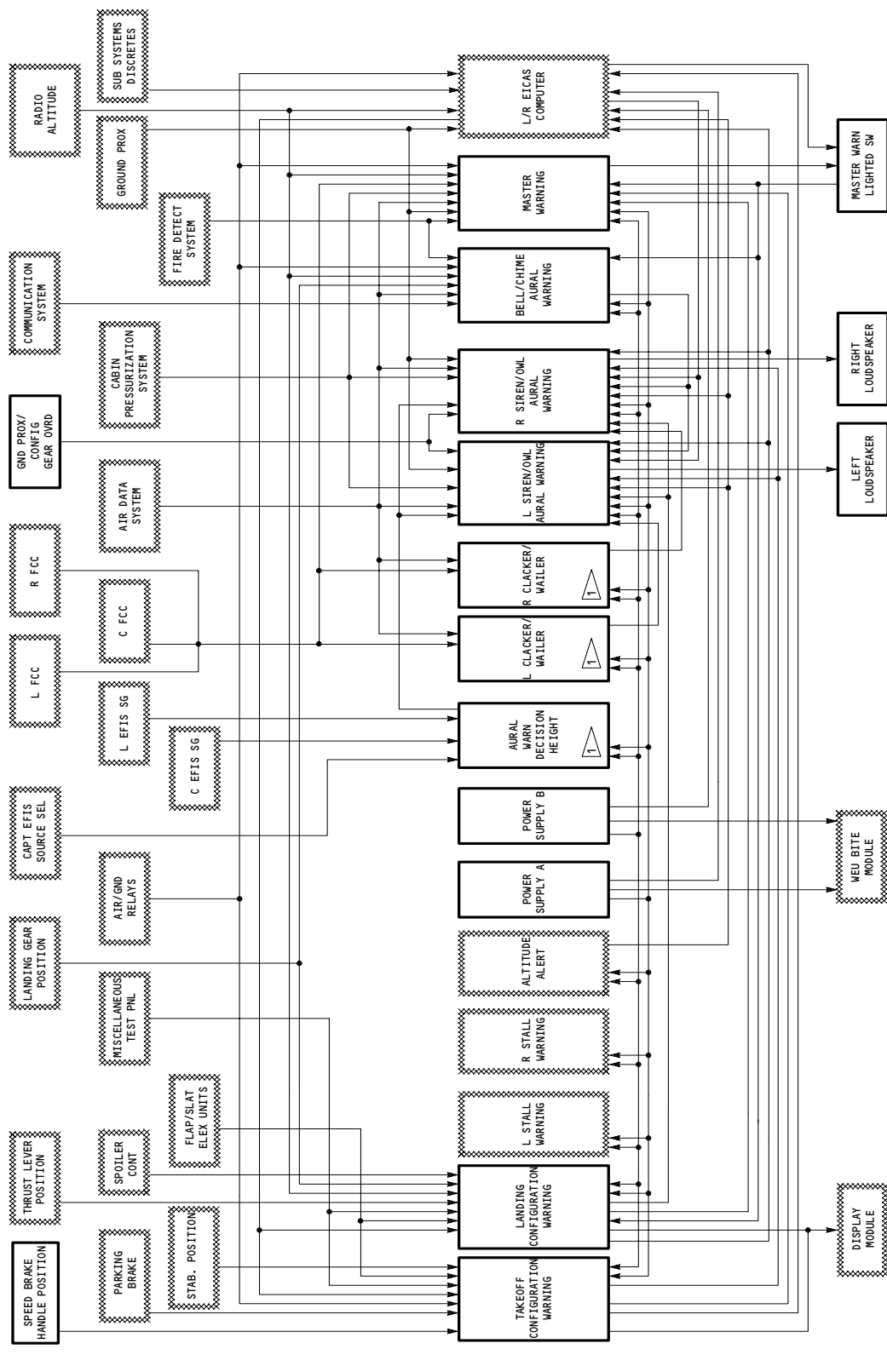
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Warning System Block Diagram
Figure 2

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- (d) The Landing configuration warning module also provides discrete signals to turn on the SPEEDBRAKES light.
- (e) The WEU monitor circuits continuously perform operational checks of the input and output power supply circuits. The fault balls on the front of the WEU come on when a fault is detected.
- (f) The warning visual indications consist of the master and CONFIG warning lights. The aural indications are the fire bell and the siren.
- (g) The red master WARNING lights come on continuously when Level A warnings are displayed on the EICAS display unit. The lights come on for 16 level A warnings associated with five conditions. These are fire, overspeed, autopilot disconnect, and takeoff and landing configuration warnings. There is a one-half second delay for the autopilot disconnect warnings. The light contains a manual reset switch. Pressing the light will provide a ground signal to the master warning module to extinguish the light. The warning circuit is then rearmed for the next warning.
- (h) The CONFIG light is turned on by either the takeoff or landing configuration warning function.
- (i) The fire bell comes on and operates on an intermittent cycle during fire warnings. The fire bell is repeated until the warning is cancelled. The bell may be cancelled by pressing either master warning light, or cancelled by pulling one of the engine or the APU fire handles or by setting the cargo compartment fire select switch to the FWD or AFT position. Wheel well fire warnings may be cancelled by lowering the nose gear.
- (j) The bell may be cancelled by pressing either master warning light, by pulling one of the engine or APU fire handles, or by setting the cargo-compartment fire-select switch to the FWD or AFT position. Wheel-well fire warnings may be cancelled by lowering the nose gear.
- (k) When the nose wheel oleo switch is extended during takeoff, the master WARNING lights and the fire bell are inhibited. At this time, a 20-second delay timer is also initiated. The inhibit function is cancelled after 20 seconds, or when the radio altitude is greater than 400 feet. The stored warnings will turn on the WARNING lights as soon as the inhibit function is cancelled.

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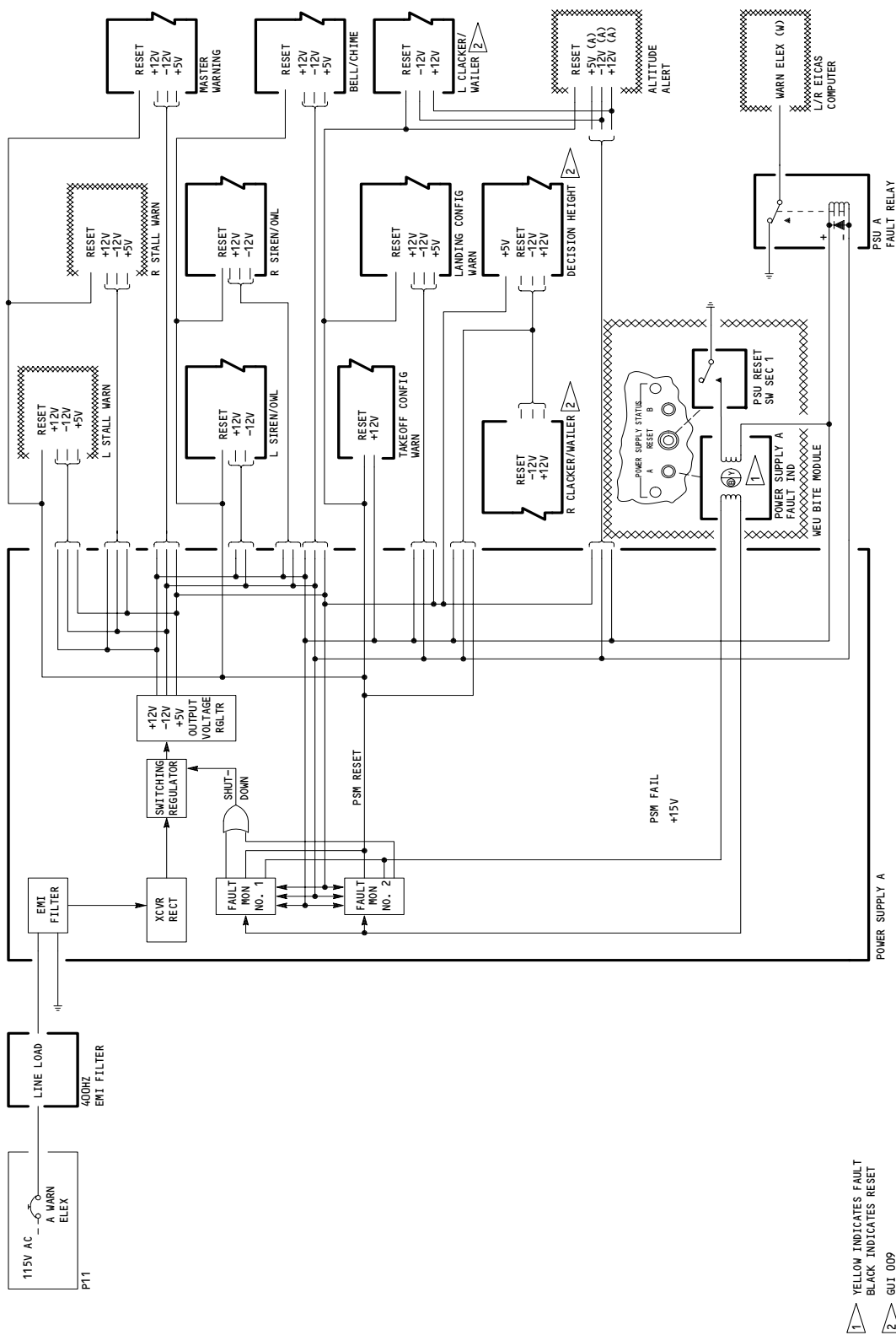
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- (l) GUI 001-008, 010-999;
The siren comes on during the configuration, overspeed, cabin altitude exceedance, and autopilot (A/P) disconnect warning. There is a one-half second delay for A/P disconnect warnings.
 - (m) GUI 009;
The siren comes on during the configuration warning and cabin altitude exceedance.
 - (n) GUI 004, 006;
The siren will sound for cabin altitude exceedance above 10,000 feet (standard altitude warning selected) or 14,680 feet (high altitude warning selected).
 - (o) GUI 001-003, 005, 007-999;
The siren will sound for cabin altitude exceedance above 10,000 feet.
 - (p) The siren will continue until the warning condition is corrected. The GND PROX/CONFIG GEAR OVRD switch can be used to cancel the siren during a landing configuration warning.
 - (q) The SPEEDBRAKES light and level B EICAS message SPEEDBRAKE EXT are generated in either of the following conditions:
 - 1) RA >15 feet and speedbrake lever is above the trip point (spoilers extended) and flaps are in the landing position.
 - 2) 15 feet < RA < 800 feet and speedbrake lever is above the trip point (spoilers extended).
 - (r) GUI 009;
The wailer comes on during the autopilot (A/P) disconnect warning. There is a one-half second delay for the wailer warning. The clacker comes on during airplane overspeed warning. The wailer and clacker remain on for as long as the warning condition exists.
 - (s) GUI 009;
The Decision Height tone comes on when the airplane is 50 feet above decision height. The tone ceases when decision height is reached.
- (2) WEU Power Supply Function (Fig. 3)
- (a) The Warning Electronics Unit (WEU) power supply A receives 115 volts ac through the WARN ELEX A circuit breaker from the right unswitched ac bus. It rectifies the input ac voltage and provides +5 volts and ±12 volts dc output to the warning modules.

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1 YELLOW INDICATES FAULT
2 BLACK INDICATES RESET
GJI 009

Warming Electronics Unit (WEU) Power Supply Schematic (Example)
Figure 3

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- (b) During normal operation, the fault ball on the front of the WEU shows black. The presence of ± 12 volt dc also energizes the fault relay to remove the ground from the power supply failure discrete signal to the EICAS computers.
 - (c) Each regulated power output is monitored for an under or over voltage condition. These conditions will relax the fault relay to provide a WARN ELEX failure discrete signal to the EICAS computers. The fault ball also latches to yellow to show a fault condition.
 - (d) Pressing the RESET switch on the warning electronics unit resets the fault ball to black (normal). When the Warning Electronics Unit returns to normal, the ± 12 volts dc is applied to the fault relay. The relay is energized, WARN ELEX failure discrete signal to the EICAS computers is removed.
- (3) Master Warning Module Function (Fig. 4)
- (a) The Master Warning module provides the warning signals to turn on the master WARNING lights. The Master Warning module receives ± 12 volts dc and +5 volts dc generated by the power supply modules.
 - (b) The following warning signals are applied to the Master Warning modules when they occur.
 - 1) Takeoff and landing configuration warning ground signals from the configuration warning module.
 - 2) An overspeed ground signal from the left or right Air Data Computer.
 - 3) Mode 1 and mode 2 ground signals from the Ground Proximity warning computer.
 - 4) An Autopilot warning No. 2 normal and battery ground signals from the left, center and right Flight Control Computer.
 - 5) Fire warning ground signals from the left and right Engine, Auxiliary Power Unit, Wheel Well and the forward and aft Cargo compartments.
 - (c) The warning signals are received by the interface circuits, and are processed when the reset switch is open. In addition, the fire detection warning signals are processed when the Takeoff Inhibit function is not operating. The processed warning signals are applied to the output circuits if not inhibited by the power supply monitor reset signal. This enables the solid state switches to turn on the master WARNING lights.

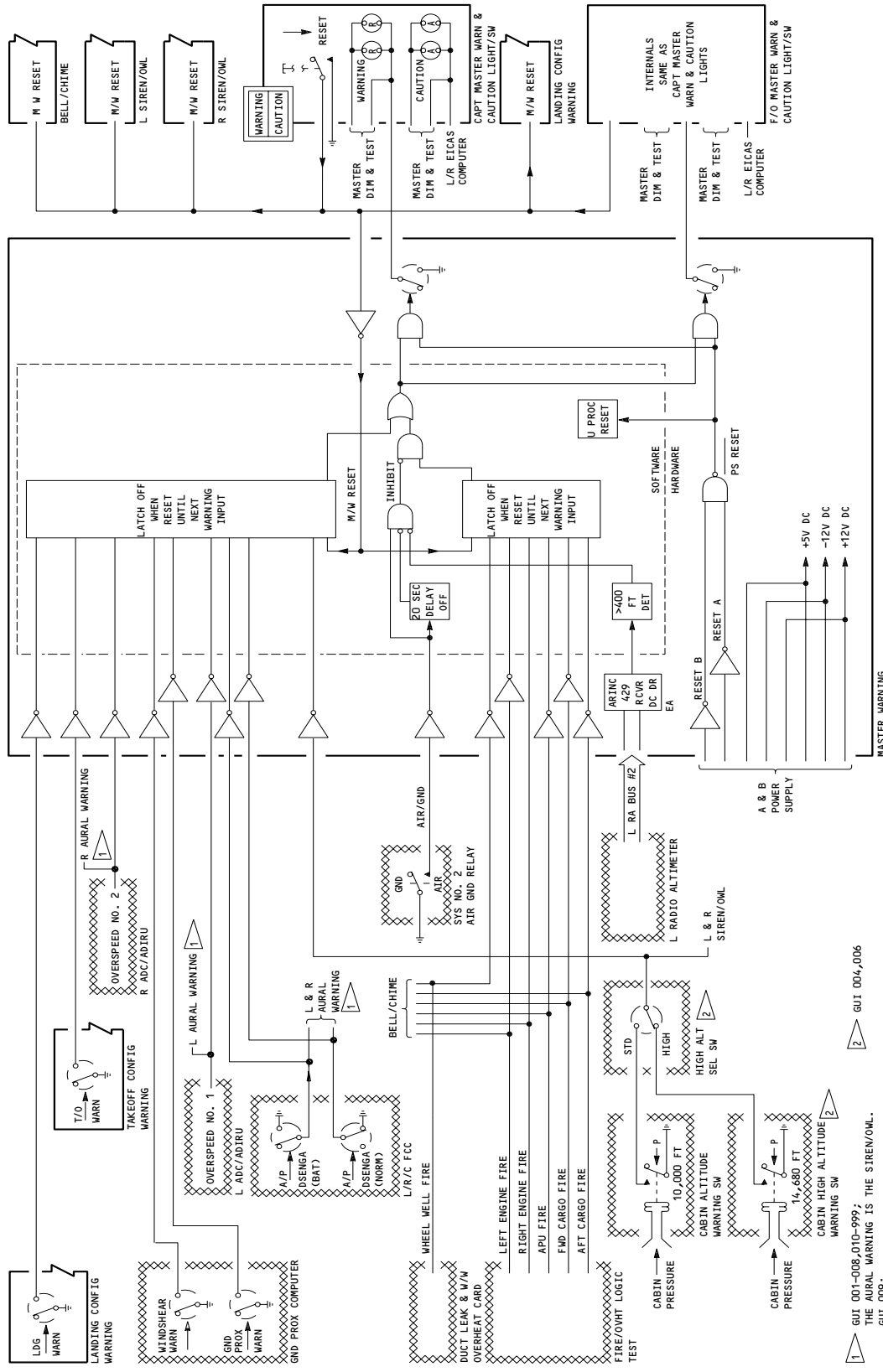
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Master Warning Module Schematic
Figure 4

1 GUI 001-008,010-999;
THE AURAL WARNING IS THE SIREN/OVL.
GUI 005;
THE AURAL WARNING IS THE CLACKER/WAILER

2 GUT 004,006

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- (d) When the nose wheel oleo switch is extended during takeoff, the fire detection master warning output circuits are inhibited. It also initiates a 20-second time delay. The Inhibit function expires after 20 seconds, or when the radio altitude attains to more than 400 feet.
 - (e) Pressing the master warning light applies a ground signal to the output interface circuits. It disables the solid state switch which extinguishes the Master WARNING lights. The reset signal is removed when the original warning signal is removed.
- (4) Bell/Chime Aural Warning Module Function (Fig. 5)
- (a) The Bell/Chime Aural Warning module generates the signals to drive the firebells and the communication system chimes. The module receives +5 volts dc and ± 12 volts dc generated by the power supply modules.
 - (b) Fire bell function
 - 1) The fire bell logic circuit receives five analog discrete fire warning signals from the fire detector control panel. These signals are the left and right Engine, the Auxiliary Power Unit, and the forward and aft Cargo compartment Fire signals. The analog discrete inputs provide a logic 0 signal to the inverting input buffer circuits.
 - 2) The buffer circuit digital output is sent to the microprocessor that controls the firebell sequence. The processed signal is routed to the firebell aural generator through the takeoff inhibit logic. If there is no inhibit signal, the warning is routed through to the preamplifier and out to the loudspeakers.
 - 3) The processed signal is routed to the firebell aural generator through the takeoff inhibit logic. If there is no inhibit signal, the warning is routed through to the preamplifier and out to the loudspeakers.
 - 4) The preamplifier gain control provides either high or low volume for the aural signal. A high gain will occur if one or more of these conditions are true:
 - a) Landing gear is down and locked.

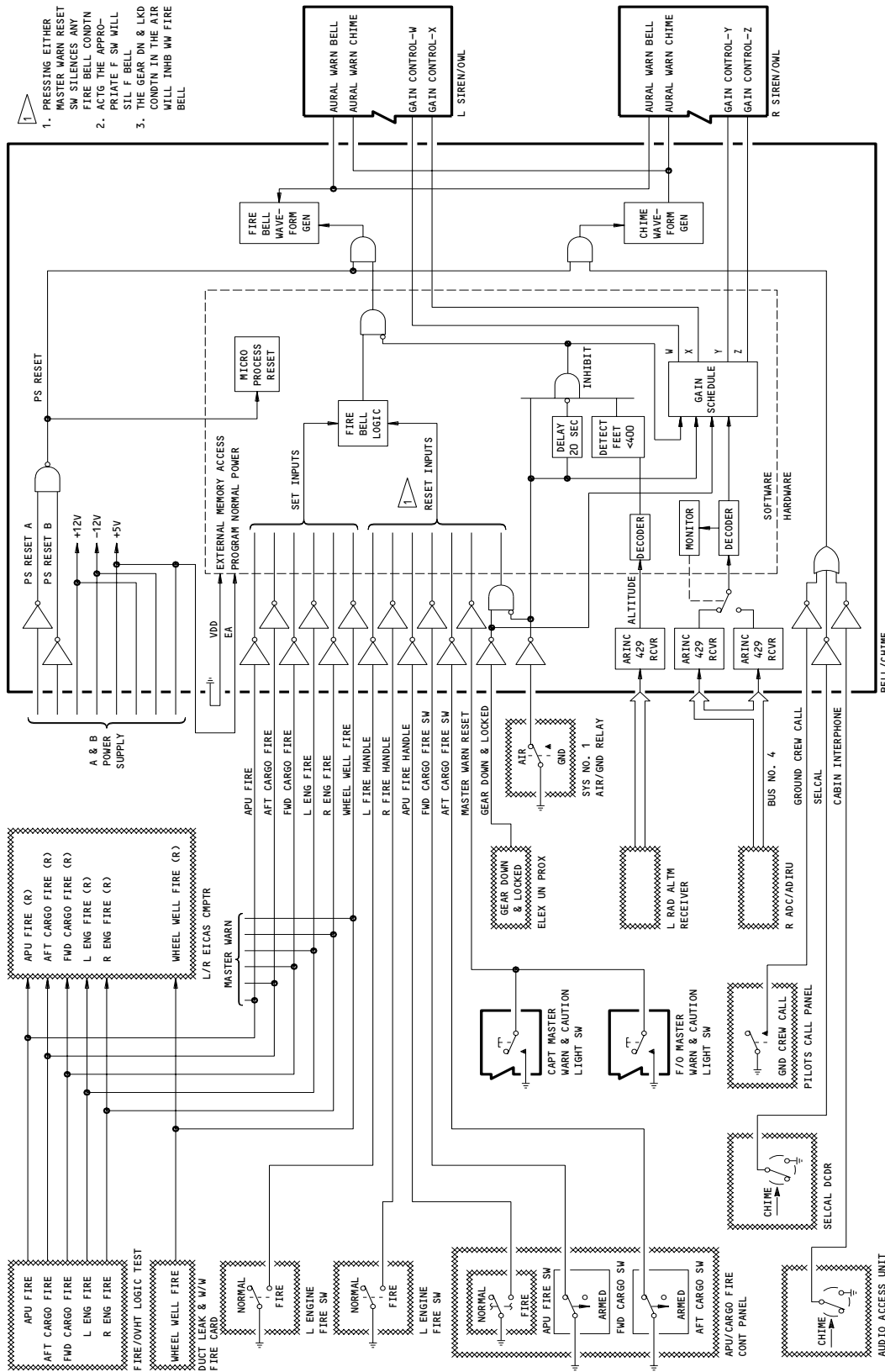
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1. PRESSING EITHER MASTER WARN RESET SW SILENCES ANY FIRE BELL COND'TN. ACT'G THE APPRO-PRATE F SW WILL STL F BELL.
2. THE GEAR DN & LKD COND'TN IN THE AIR WILL INHB WW FIRE BELL.

Bell/Chime Aural Warning Schematic
Figure 5

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- b) Airplane is on the ground.
 - c) T/O inhibit mode is activated.
 - d) Altitude is less than 32,000 feet and MACH number is greater than 0.6.
 - 5) The firebell warning is inhibited during takeoff. The inhibit is initiated when a logic 0 signal from the No. 2 AIR/GND relay is applied to the interface buffer circuit. The buffer circuit output is fed to the microprocessor. It processes the signal through the inhibit override logic to generate a logic 1 takeoff inhibit signal. It also starts the 20-second delay timer.
 - 6) After 20 seconds or after 400 feet of radio altitude is reached, the microprocessor generates a logic 0. This signal is applied to the inhibit logic to cancel the inhibit functions.
 - 7) The firebell function is cancelled if one of the following occurs:
 - a) The left or right Engine Fire handle switch is pulled.
 - b) The Auxiliary Power Unit Fire handle switch is pulled.
 - c) The Cargo Compartment Fire switch is set to the FWD or AFT position.
 - d) The landing gear is down and locked (wheel well fire only).
 - e) Either the captain's or first officer's Master Warning light is pressed.
 - 8) A fire bell self test is initiated by pressing the ENG/APU/CARGO switch on the FIRE/OVHT TEST panel on the pilots' aft control stand. The bell rings when the test switch is pressed.
- (c) Chime Function
- 1) There are three analog discrete input signals that turn on the chime function on the aural warning module. These inputs provide logic 0 to the interface inverting buffer circuits. The discrete signals are generated when any of the following operations occur:
 - a) The Audio Accessory Unit sends a signal to the aural warning module, when it receives an input from an attendant call to the flight compartment.
 - b) A Crew Call is made from the P62 control panel in the nose Wheel Well.

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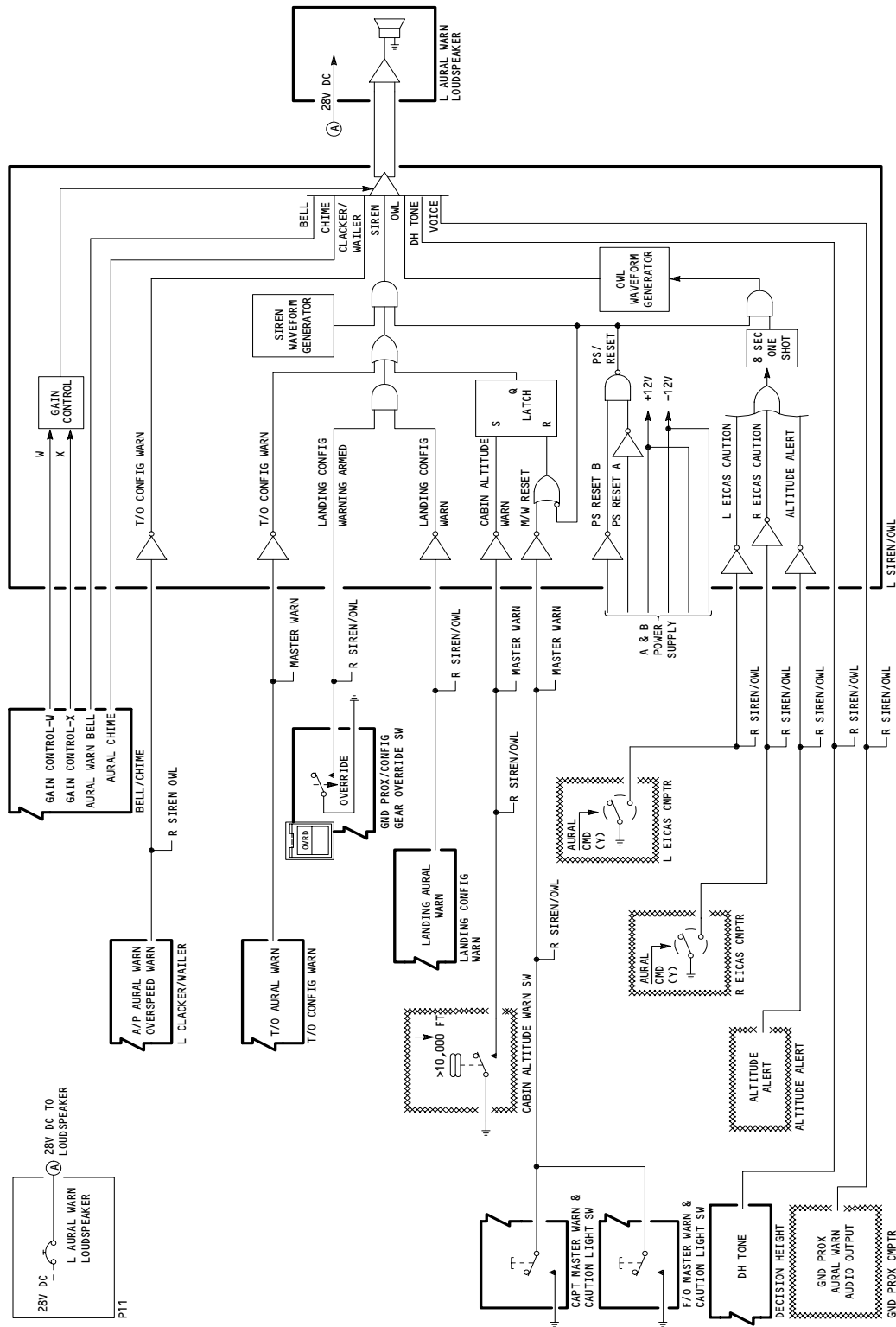
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- c) A Selcal signal is generated from the Selcal decoder, when installed.
 - 2) The inverting buffer output signals enable the logic circuits which control the chime generator. The chime output is routed through the preamplifiers to the loudspeakers to provide the chime sound. The chime sound lasts for .9 second.
- (5) Siren/Owl Aural Warning Module (Fig. 6)
- (a) Two Siren/Owl Aural Warning modules are installed. The operation of the modules are identical and paralleled. The left module drives the left aural warning loudspeaker. The right module drives the right aural warning loudspeaker.
 - (b) Siren Function
 - 1) GUI 001-008, 010-999;
There are five analog discrete input signals that enable the siren function on the aural warning module. These are Overspeed, Autopilot Disconnect, Cabin Altitude, and Takeoff and Landing configuration warning signal discretets. The Overspeed discrete is supplied from the left or right Air Data Computer. Autopilot disconnect No. 1 and No. 2 signals are supplied from the left, center, and right Flight Control Computers. Takeoff and landing warnings are supplied from the Configuration Warning modules. The analog discretets provide a logic 0 to the module interface buffer circuit.
 - 2) GUI 009;
The analog discrete input signals that enable the siren function on the aural warning module are the cabin altitude, takeoff, and landing configuration warnings. Takeoff and landing warnings are supplied from the configuration warning modules. The analog discretets provide a logic 0 to the module interface buffer circuit.
 - 3) The inverting buffer output signals enable two sets of logic circuits. These circuits control two identical siren aural generators. The output signals are then routed through preamplifiers to the loudspeakers to give the siren sound. The siren sounds continuously until the warning condition is corrected or manually cancelled for the Landing warning.
 - 4) The Landing configuration warning aural can be cancelled by pressing the GND PROX/CONFIG GEAR OVRD switch. This provides a logic 0 signal to the inverting input buffer circuit. The inverter buffer output signal controls the Landing Warning cancel circuit.
 - (c) Owl Caution Aural (Level B) Function
 - 1) There are two analog discrete input signals from other systems that enable the owl caution aural. These signals provide a logic 0 to the interface inverter buffer circuits. The discrete input signals are the following:
 - a) Altitude alert signals from the WEU altitude alert module

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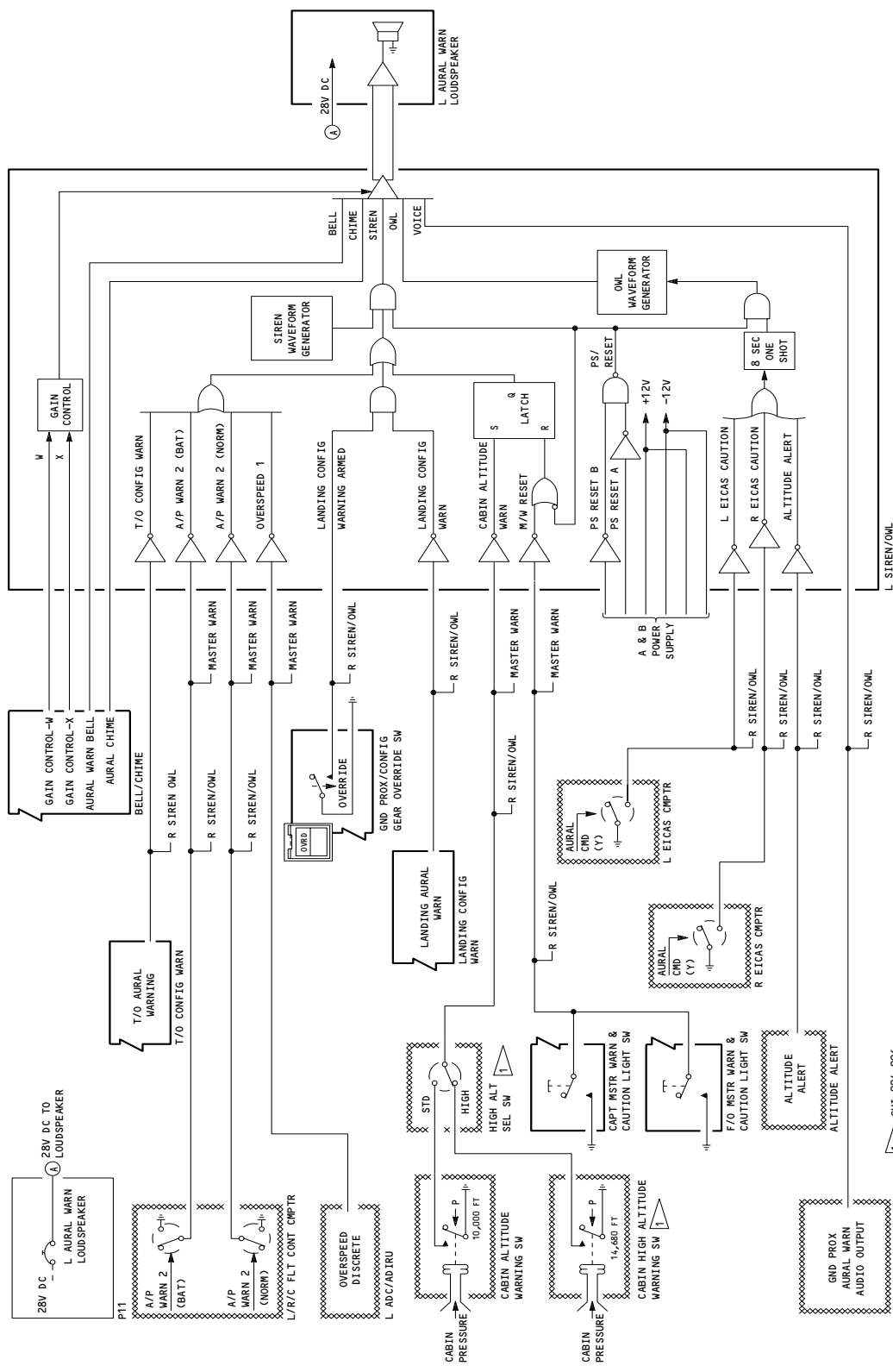
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Siren/Owl Aural Warning Schematic (Example Le)
Figure 6 (Sheet 1)

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GUI 009

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Siren/Owl Aural Warning Schematic (Example)
Figure 6 (Sheet 2)

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GUI 001-008, 010-999

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- b) Level B cautions generated from the EICAS computer
- 2) The inverting buffer output signals enable two sets of logic circuits. These circuits control two identical owl aural generators. The output signals are then routed through the preamplifiers to the loudspeakers to provide the owl aural sound. The owl aural generators function in a leader/follower manner same as the siren generators.
- (d) The siren/owl modules supply amplification of the bell/chime warnings and the ground proximity voice.
- (e) GUI 009;
The siren/owl modules also amplify the clacker/wailer warnings and the decision height tone.
- (6) Takeoff Configuration Warning Module Function (Fig. 7)
 - (a) The Takeoff Configuration warning module provides aural and visual warnings for improper airplane configuration during takeoff. The module receives a dual input of +12 volts dc from power supply modules A and B. Each voltage input line is diode-isolated and fuse protected.
 - (b) Seven areas are monitored for takeoff configuration warning. These are the flaps, slats, horizontal stabilizer, speed brake, parking brake, air/ground logic, and N1.
 - (c) The takeoff warning logic is armed by signals from the air/ground relay(s) and N1. The air/ground relay(s) must be in the ground position and N1 from either engine must be greater than 66.7 percent. The enabled output of the takeoff arm logic circuit is routed to the four arm/warning logic circuits.
 - (d) One of the arm/warning logic gates is enabled for each of the following conditions:
 - 1) The FLAPS message logic circuit is enabled when one of the following conditions occur:
 - a) When the leading edge slats are not in the takeoff position.
 - b) When the trailing edge flaps are not in the takeoff position of 1, 5, 15, or 20.
 - 2) The STABILIZER message logic circuit is enabled when the horizontal stabilizer is not in the takeoff position (green band).

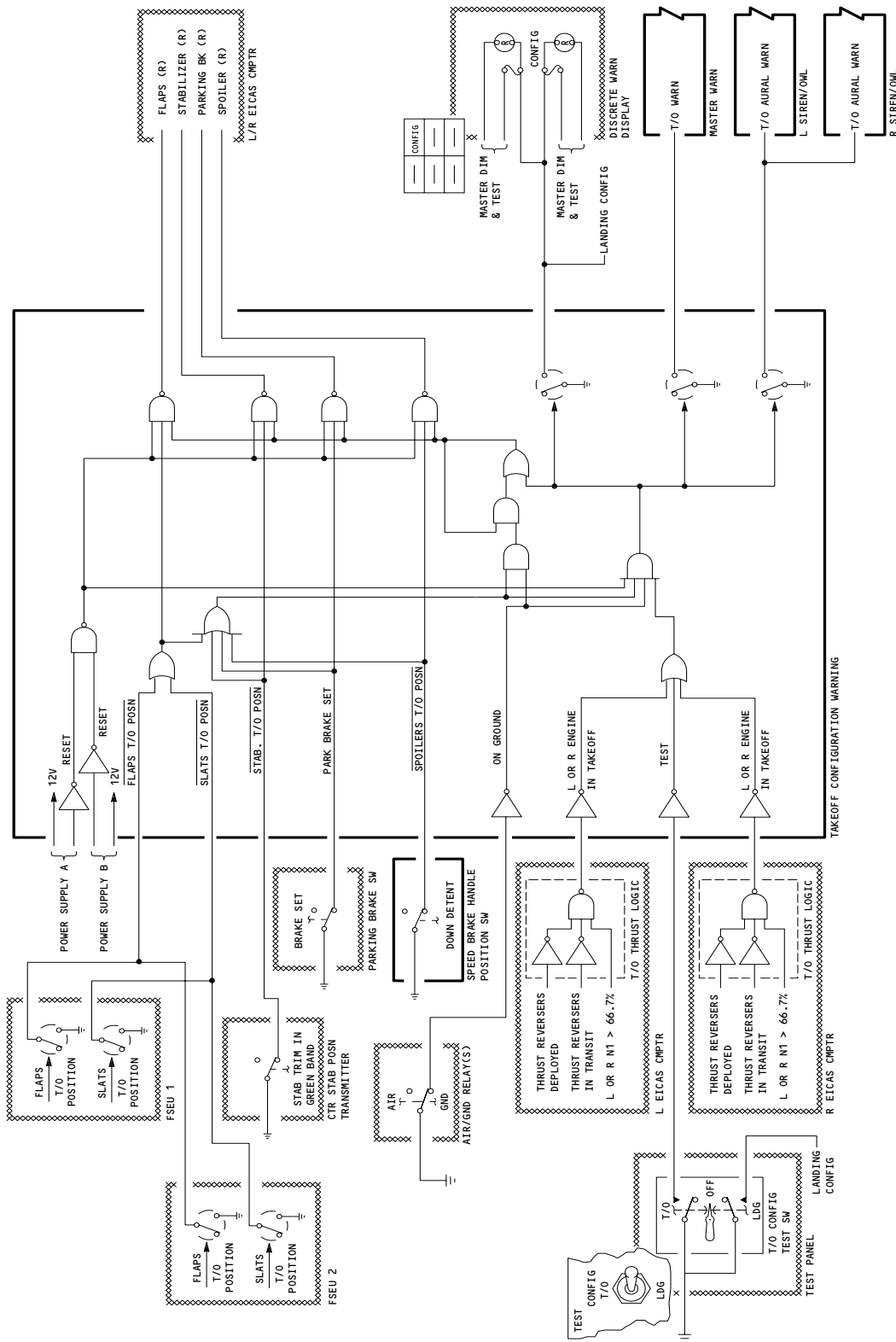
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Takeoff Configuration Warning Schematic
Figure 7

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- 3) The PARKING BRAKE message logic circuit is enabled when the parking brake is in the SET position.
 - 4) The SPOILERS message logic circuit is enabled when the speed brake handle is not in the down detent position.
 - (e) The output signal from each message logic circuit is applied to the latch circuit in the thrust lever logic path. This holds the warning condition after the thrust lever is returned to the idle position. It is then removed when the warning condition is corrected.
 - (f) The logic circuit control switching output circuits provide ground signals to the EICAS computer (AMM 31-41-00). The EICAS computer formats the FLAP, STABILIZER, PARKING BRAKE and SPOILERS messages for the Upper EICAS display. Ground signals are also applied to the Master Warning module and configuration warning light. This turns on the master WARNING and CONFIG warning lights. In addition, a ground discrete is provided to the aural warning module which causes it to sound the European siren.
 - (g) A Takeoff configuration warning test is initiated by the CONFIG T/O - LDG test switch. Setting the test switch to T/O position simulates that the N1 is greater than 66.7 percent, which arms the takeoff warning logic. One or all configuration error conditions must be set to generate a takeoff configuration warning. The master warning turns on the CONFIG light and the siren. In addition, the EICAS displays the associated configuration error. The test stops when the test switch is released. The EICAS message displays remain on for 8 to 15 seconds.
- (7) Landing Configuration Warning Module Function (Fig. 8)
- (a) The Landing configuration warning module provides aural and visual warnings for improper airplane configuration during landing. The module receives a dual input of ± 12 volts dc and +5 volts dc from power supply modules A and B. Each voltage input line is diode-isolated and fuse protected.
 - (b) The landing configuration warning consists of the master WARNING light, siren aural warning, CONFIG light, and Level A EICAS message GEAR NOT DOWN.

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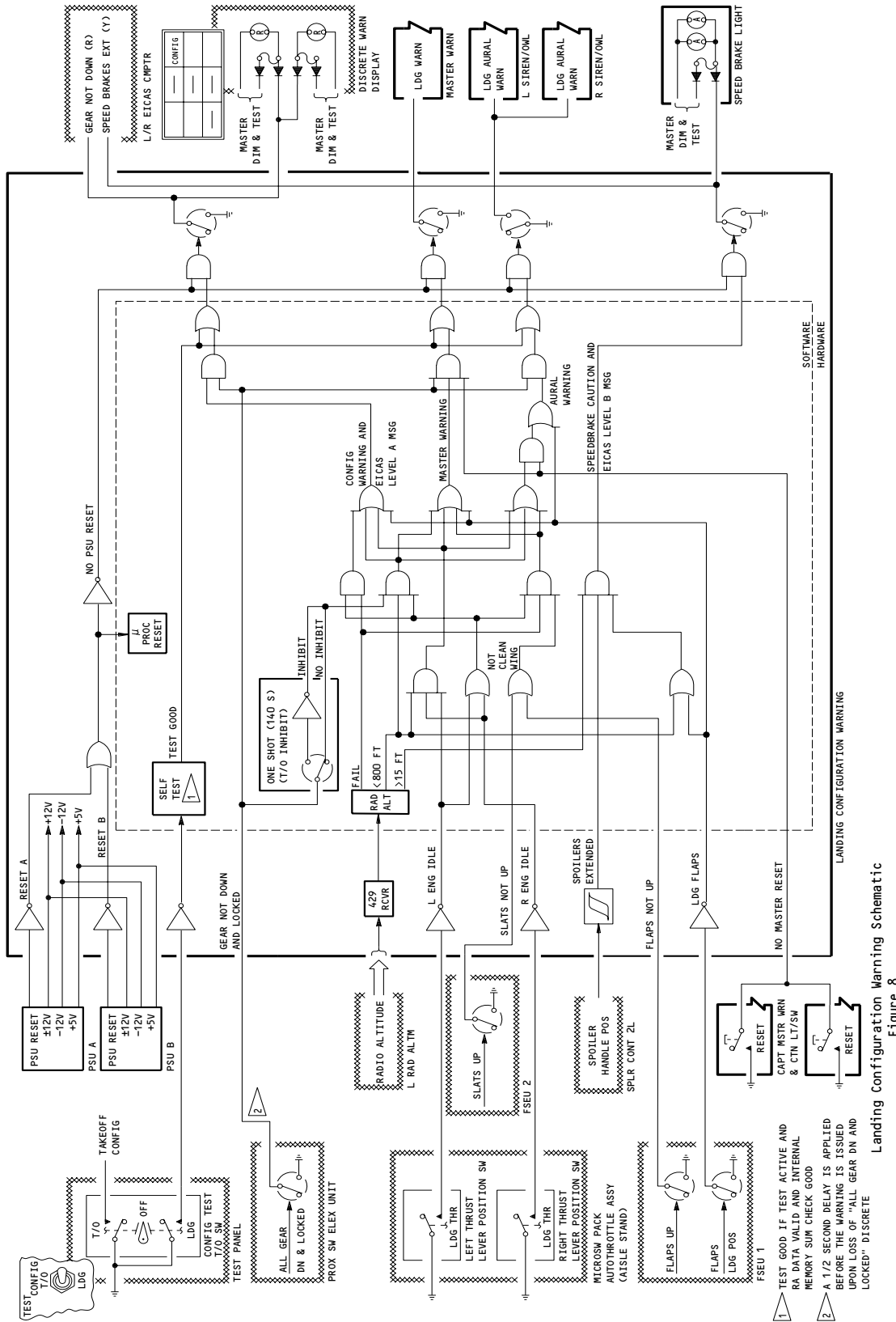


Figure 8
Landing Configuration Warning Schematic

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- (c) The landing configuration warning logic is enabled when the module receives the landing gear not down and locked discrete signal from the proximity switch electronics unit.
- (d) When this logic is enabled and any of the following conditions occur, the landing configuration warning is provided. The outputs for each condition are as listed below:
 - 1) The trailing edge flaps are set to 25 or 30 degrees:
 - a) red master WARNING lights
 - b) red CONFIG light
 - c) siren aural warning
 - d) Level A EICAS message GEAR NOT DOWN
 - 2) Both left and right thrust levers are set to idle and the radio altitude is below 800 feet:
 - a) red master WARNING lights
 - b) red CONFIG light
 - c) siren aural warning
 - d) Level A EICAS message GEAR NOT DOWN
 - 3) Either left or right thrust lever is set to idle, the radio altitude is below 800 feet, and the time delay as noted below has expired:
 - a) red master WARNING lights
 - b) red CONFIG light
 - c) siren aural warning
 - d) Level A EICAS message GEAR NOT DOWN

NOTE: A one time delay of 140 seconds is triggered by the edge of the landing-gear-up transition pulse. This delay allows the airplane to reach an altitude of greater than 800 feet and prevents a warning if only one engine is throttled back at takeoff or go-around. If either 140 seconds have elapsed or the airplane has exceeded 800 feet altitude, the system reverts back to providing a warning from a single engine throttle back.

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- 4) A radio altimeter failure exists and either thrust lever is set to the idle position:
 - a) red CONFIG light
 - b) Level A EICAS message GEAR NOT DOWN
- 5) A radio altimeter failure exists, either left or right thrust lever is set to idle, and either the flaps or slats are not fully retracted (NOT CLEAN WING):
 - a) red master WARNING
 - b) siren aural warning
 - c) Level A EICAS message GEAR NOT DOWN
- (e) The microprocessor switching output circuits provides a ground signal to turn on the CONFIG warning light. It also provides ground signals to the master warning module for the master WARNING light, to the siren/owl aural warning module for the siren aural, and to the EICAS computers for the EICAS message GEAR NOT DOWN.
- (f) Pressing either master WARNING light will close the reset switch and inhibit some output signals from the microprocessor switching circuits. This reset will always cancel the master WARNING lights. It will inhibit all aural warnings with the exception of the configuration of landing flaps and gear not down and locked. The CONFIG light and EICAS message GEAR NOT DOWN will remain on until the improper configuration is corrected.
- (g) The landing configuration aural warning may also be cancelled by pressing the GND PROX/CONFIG GEAR OVRD switch on the P1 panel. This is a L/R siren/owl aural warning module function (Fig. 6).
- (h) A landing configuration warning test is initiated by means of the CONFIG T/O - LDG test switch on the miscellaneous test panel. Setting the test switch to LDG position provides a logic 0 discrete signal to the microprocessor. This initiates a circuit check and generates the siren aural warning and display of the master WARNING lights, CONFIG light, and Level A EICAS message GEAR NOT DOWN.
- (i) The speedbrake warning is generated by the landing configuration warning module in either of the following conditions:
 - 1) RA >15 feet and speedbrake lever is above the trip point (spoilers extended) and flaps are in the landing position.

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- 2) 15 feet < RA <800 feet and speedbrake lever is above the trip point (spoilers extended).
- (j) The speedbrake warning output from the landing warning module consists of the SPEEDBRAKES light and discrete output to EICAS. The microprocessor switching output circuits provide a ground signal to turn on the SPEEDBRAKES light. Ground signals are also provided to the EICAS computers which generate the EICAS message SPEEDBRAKES EXT, master CAUTION lights and owl aural caution.
 - 1) Pressing the Master Caution light will reset only the caution light and owl aural caution. The SPEEDBRAKES amber light and the EICAS message SPEEDBRAKE EXT will remain on until the improper configuration is corrected by retracting the speedbrakes, climbing to 800 feet, or retracting the flaps.
 - 2) The speedbrakes circuit can be tested by deploying the speedbrakes and pressing the LDG CONFIG test switch. This initiates a circuit test and generates the master CAUTION light, owl aural caution, SPEEDBRAKES light, and level B EICAS message SPEEDBRAKES EXT.
- (8) GUI 009;
Clacker/Wailer Aural Warning Module (Fig. 9)
 - (a) The clacker/wailer aural warning modules provide wailer output signals whenever the autopilot (A/P) is disconnected and a clacker output signal for an overspeed condition. These output signals are sent to the siren/owl modules. There are two clacker/wailer modules installed. The left module drives the left siren/owl aural warning module. The right module drives the right siren/owl module. Each clacker/wailer module receives ± 12 volts dc from the power supply modules.
 - (b) Whenever an autopilot disconnect warning occurs, the A/P DISENGAGED signal is provided from the left, right, or center flight control computer. This signal is provided to both clacker/wailer modules. Also, whenever an overspeed condition occurs, an overspeed signal is provided from the respective air data computers. These signals are logic transitions from 1 to 0. The AP DISENGAGED signal or overspeed signal sets the latch flip flop (both modules work in the same manner). This enables the wailer or clacker frequency generator.

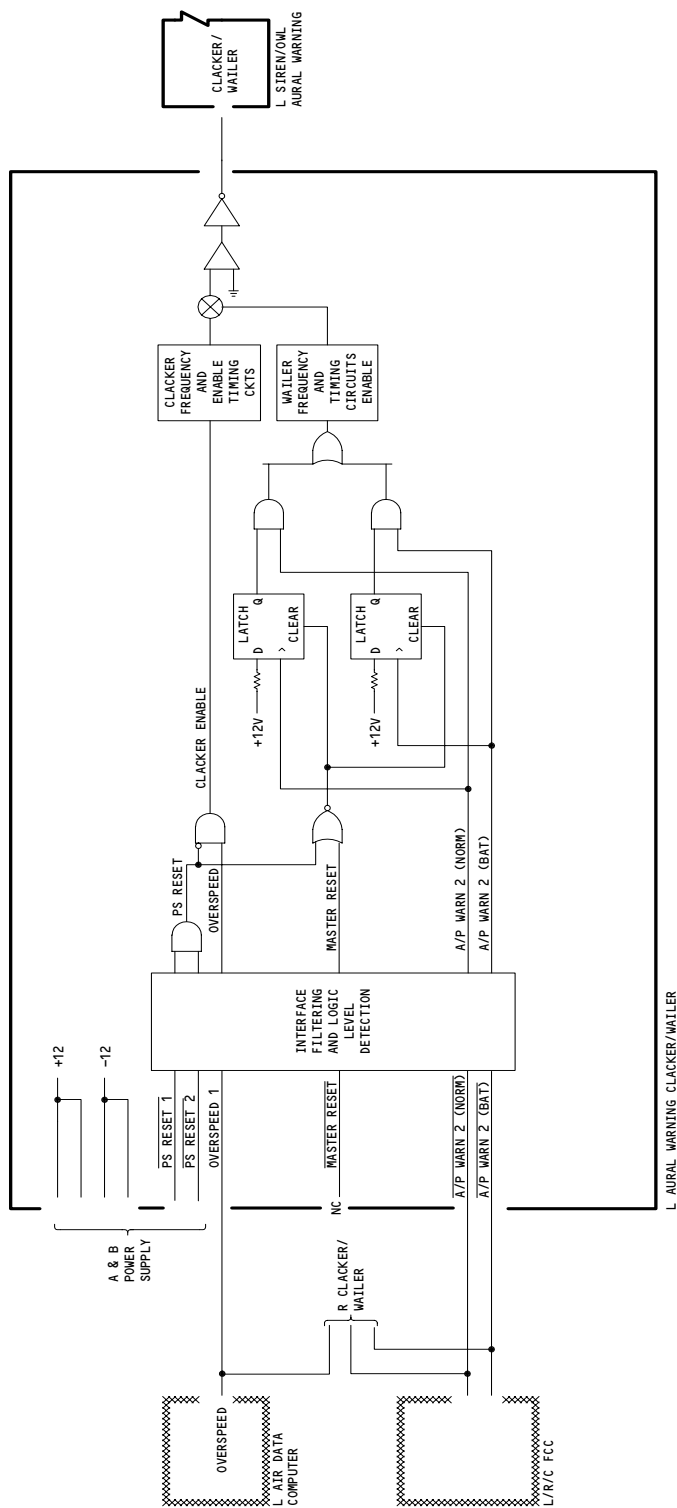
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Clacker/Mailer Aural Warning Schematic
Figure 9

EFFECTIVITY
GUI 009

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- (c) The wailer or clacker signal is transmitted to the siren/owl module. The siren/owl module in turn drives the aural warning loudspeakers with the wailer or clacker sound.
 - (d) The clacker/wailer modules are reset for an autopilot disconnect when the master WARNING light is pressed. The master WARNING reset switch will close providing a reset signal to the master reset of the flip flop. The flip flop is cleared and the wailer aural is shut off. An overspeed warning can only be reset by correcting the overspeed condition.
- (9) GUI 009;
Decision Height Aural Warning Module (Fig. 10)
- (a) The decision height (DH) is set with the DH set knob on the left EFIS control panel.

NOTE: The captain's DH, set on the left EFIS control panel, is independent of the first officer's DH set on the right EFIS control panel. The captain and first officer may choose different DH's which are indicated accordingly on their respective EADI's, but only the captain's DH selection will produce an aural warning.

- (b) The left and center EFIS symbol generators add 50 feet to the captain's selected DH and these discretes are sent to the DH aural warning module. The DH module then checks the status of the EFI switch on the left instrument source select panel to choose either the left or center EFIS symbol generator inputs.
- (c) The DH aural warning is enabled when the airplane descends toward the set DH from a radio altitude which is 75 feet or more above the set DH.
- (d) When the airplane is 50 feet from the established decision height (radio altitude equals symbol generator discrete), the decision height card module provides a repetitive signal rate to the 925 Hz oscillator. The 925 Hz oscillator then provide signals to the left and right siren/owl aural warning modules to generate the DH tone.
- (e) As the airplane descends from DH + 50 to DH, the repetition rate increases from 1.3 times/second to 6.5 times/second, respectively. The DH aural warning module receives ARINC 429 data bus inputs from the left and center radio altimeters for this calculation.
- (f) The decision height card module receives +5 volts and ± 12 volts dc input from power supply modules A and B. The decision height reset switch is located on the left EFIS control panel.

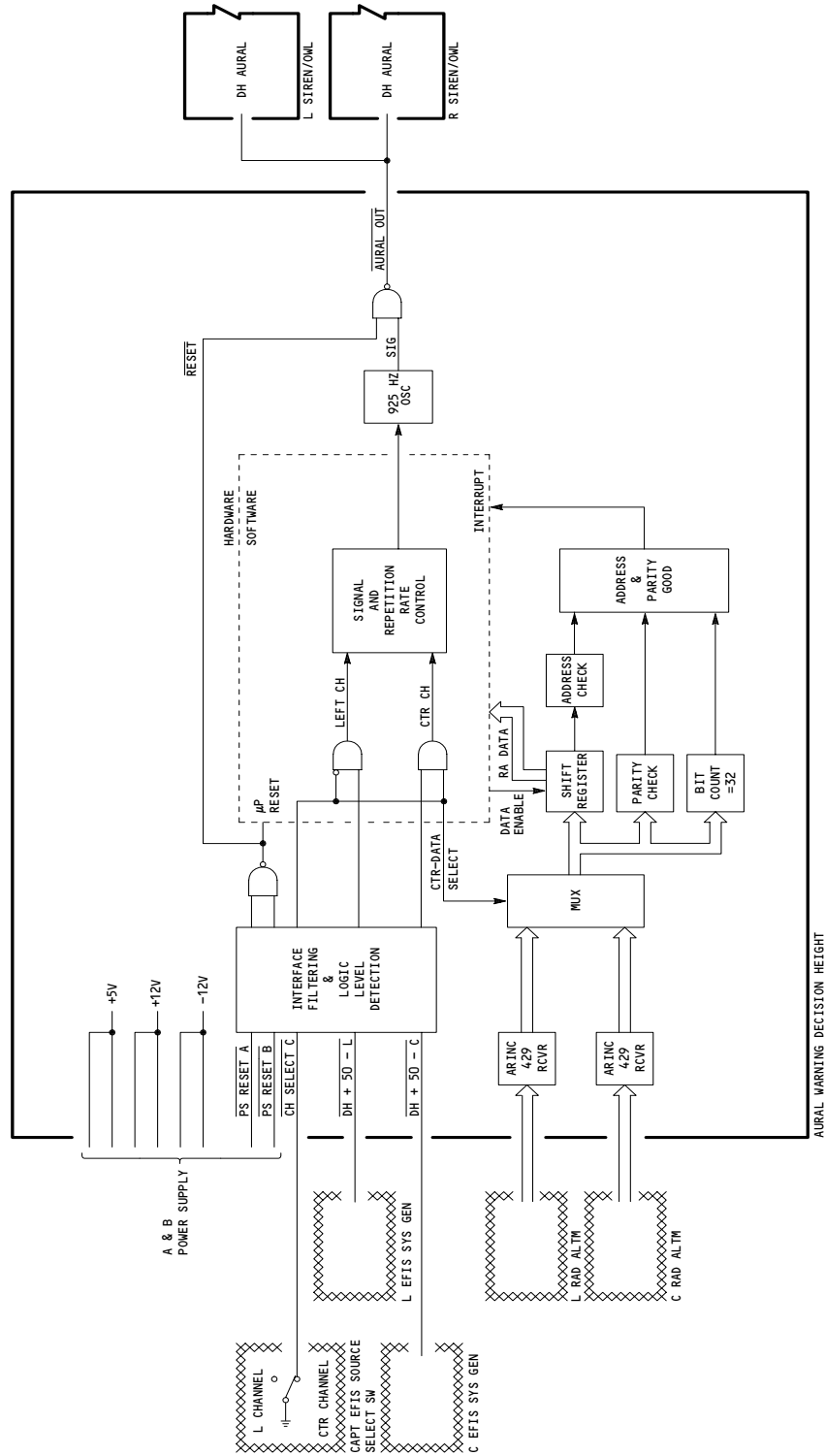
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Decision Height Aural Warning Module Schematic
Figure 10

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GUI 009

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B. BITE

- (1) The WEU power supply fault indicators, one for each module, latches to black when the corresponding power supply is operating properly. When a fault occurs, the indicator latches to yellow. In addition, a fault discrete signal is sent to the EICAS computer, to display a STATUS message on the upper EICAS display unit. Pressing the STATUS switch on the EICAS display select panel will display the WARN ELEX status message on the lower EICAS display unit.

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





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WARNING SYSTEM

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	AMM REFERENCE
CIRCUIT BREAKER -	2		FLIGHT COMPARTMENT, P11	
AURAL WARN SPKR LEFT, C567		1	11B16	*
AURAL WARN SPKR RIGHT, C568		1	11H35	*
WARN ELEX A, C565		1	11J33	*
WARN ELEX B, C566		1	11B18	*
FILTER - 400 Hz EMI, M1102 (PSU A)	1	1	119BL, MAIN EQUIP CTR, P51	31-51-01
FILTER - 400 Hz EMI, M1103 (PSU B)	1	1	119BL, MAIN EQUIP CTR, P51	31-51-01
INDICATOR - WEU PSU A FAULT 	1	1	119BL, MAIN EQUIP CTR, P51	*
INDICATOR - WEU PSU B FAULT 	1	1	119BL, MAIN EQUIP CTR, P51	*
LIGHT - SPEEDBRAKES, L716	2	1	FLIGHT COMPARTMENT, P1-3	*
LOUDSPEAKER - LEFT AURAL WARNING, B56	2	1	FLIGHT COMPARTMENT - OVHD	*
LOUDSPEAKER - RIGHT AURAL WARNING, B57	2	1	FLIGHT COMPARTMENT - OVHD	*
MODULE - (FIM 27-32-00/101)				
LEFT STALL WARNING, M615				
RIGHT STALL WARNING, M938				
WEU BITE, M1411				
MODULE - (FIM 34-16-00/101)				
ALTITUDE ALERT, M617				
MODULE - BELL/CHIME AURAL WARNING, M1000	1	1	119BL, MAIN EQUIP CTR, P51	31-51-04
MODULE - DECISION HEIGHT AURAL WARNING, M10423 	1	1	119BL, MAIN EQUIP CTR, P51	31-51-04
MODULE - DISCRETE WARNING DISPLAY, M779	1	1	FLIGHT COMPARTMENT, P1-3	*
MODULE - LANDING CONFIGURATION WARN, M983	1	1	119BL, MAIN EQUIP CTR, P51	31-51-04
MODULE - LEFT CLACKER/WAILER AURAL WARNING, M10421 	1	1	119BL, MAIN EQUIP CTR, P51	31-51-04
MODULE - LEFT SIREN/OWL AURAL WARNING, M999	1	2	119BL, MAIN EQUIP CTR, P51	31-51-04
MODULE - MASTER WARNING, M618	1	1	119BL, MAIN EQUIP CTR, P51	31-51-04
MODULE - POWER SUPPLY A, M616	1	1	119BL, MAIN EQUIP CTR, P51	31-51-04
MODULE - POWER SUPPLY B, M621	1	1	119BL, MAIN EQUIP CTR, P51	31-51-04
MODULE - RIGHT CLACKER/WAILER AURAL WARNING, M10422 	1	1	119BL, MAIN EQUIP CTR, P51	31-51-04
MODULE - RIGHT SIREN/OWL AURAL WARNING, M619	1	1	119BL, MAIN EQUIP CTR, P51	31-51-04
MODULE - T/O CONFIGURATION WARN, M620	1	1	119BL, MAIN EQUIP CTR, P51	31-51-04
PANEL - (FIM 30-32-00/101)				
MISCELLANEOUS TEST, M10398				
RELAY - (FIM 31-01-36/101)				
AIR/GND SYSTEM NO. 1, K135				
AIR/GND SYSTEM NO. 1, K148				
AIR/GND SYSTEM NO. 1, K10108				
RELAY - PSU A FAULT, K10343	1	1	119BL, MAIN EQUIP CTR, P51	*
RELAY - PSU B FAULT, K10344	1	1	119BL, MAIN EQUIP CTR, P51	*
SWITCH - CAPTAIN'S MASTER WARNING AND CAUTION LIGHTED, S507	2	1	FLIGHT COMPARTMENT, P7	*
SWITCH - CONFIGURATION WARNING TEST, S3	2	1	FLIGHT COMPARTMENT, P61	*
SWITCH - FIRST OFFICER'S MASTER WARNING AND CAUTION LIGHTED, S508	2	1	FLIGHT COMPARTMENT, P7	*
SWITCH - GND PROX/CONFIG GEAR OVRD, S10231	2	1	FLIGHT COMPARTMENT, P3-1	*
SWITCH - SPEEDBRAKE HANDLE POSITION, S493	2	1	FLIGHT COMPARTMENT, P10	31-51-03
SWITCH - WEU PSU RESET 	1	1	119BL, MAIN EQUIP CTR, P51	*

* SEE THE WDM EQUIPMENT LIST

-  THE PSU RESET AND THE PSU A AND B FAULT INDICATORS ARE IN THE WEU BITE MODULE.
 GUI 009

Warning System - Component Index
Figure 101

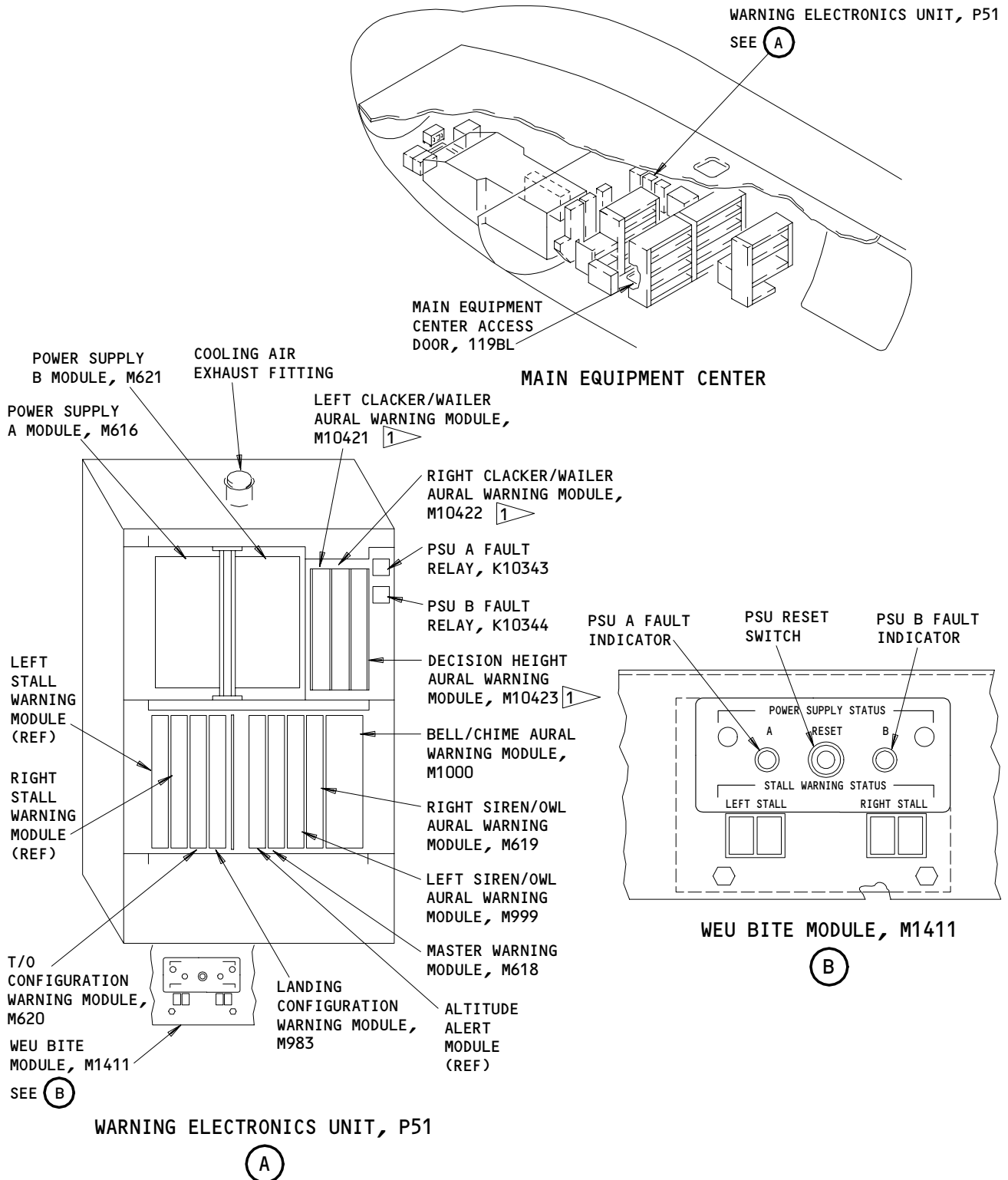
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1 GUI 009

Warning System - Component Location
Figure 102 (Sheet 1)

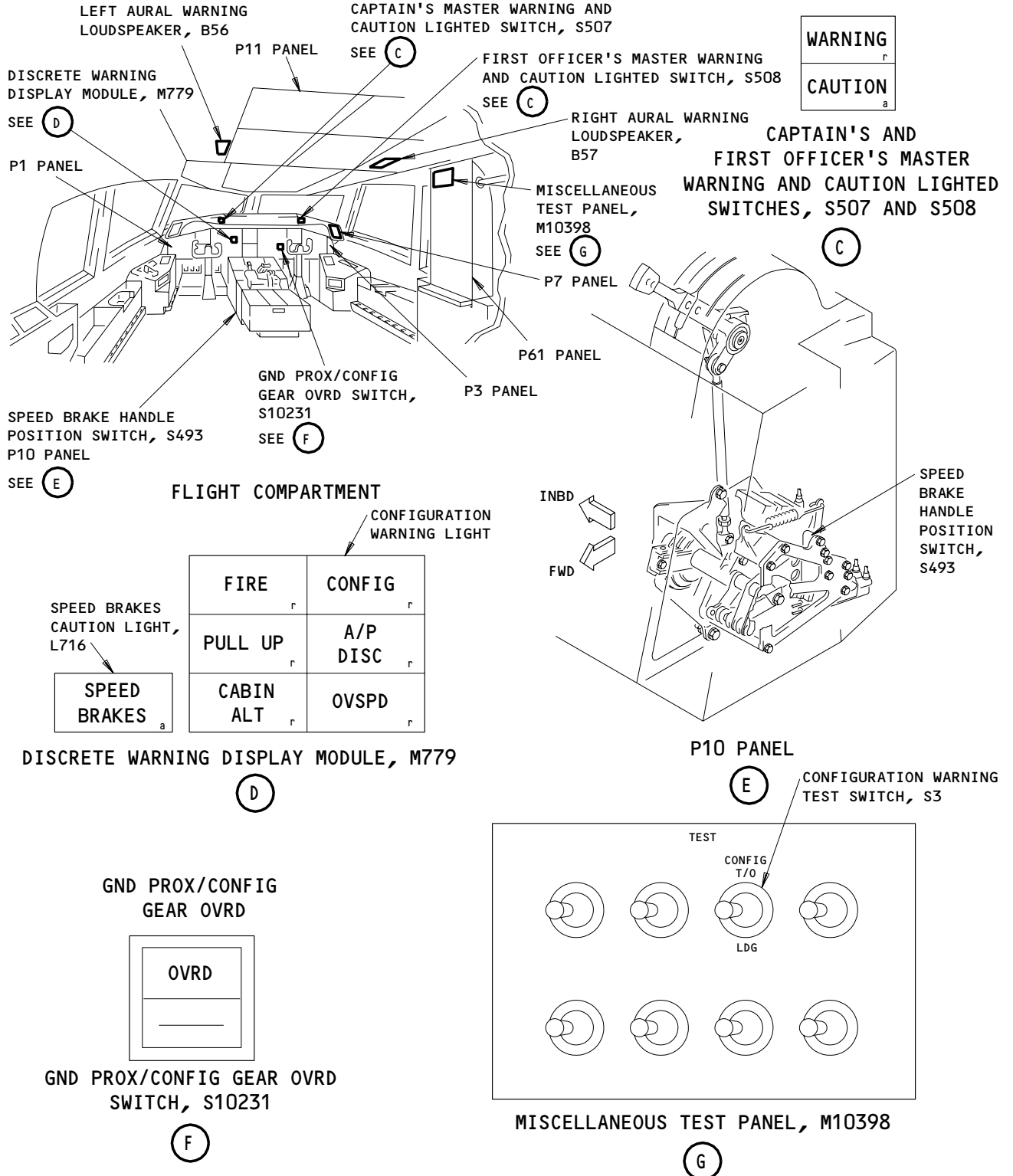
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Warning System - Component Location
Figure 102 (Sheet 2)

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WARNING SYSTEM – ADJUSTMENT/TEST

1. General

- A. The Warning System – Adjustment/Test supplies procedures for a test of the inputs to the system. Tests of the warning electronics unit (refer to as the WEU) power supply, master warning, aural warning, and configuration warning modules for correct operation are also done. The stall warning and altitude alert module tests are done in chapters 27-32-00 and 34-16-00.

TASK 31-51-00-735-002

2. Warning System – System Test

A. Equipment

- (1) Airspeed/Altitude Simulator – ERA 82305
Era Manufacturing Company
Division of Ocean Technology Corporation
789 Front Street
Burbank, CA 91505
- (2) Proximity Sensor Actuator/Deactuator Set – A27092-84
- (3) Shorting Module – A31006-7
- (4) Sound Level Meter – General Radio 1565-9910
Genrad Inc.
300 Baker Avenue
Concord, MA 01742

B. References

- (1) AMM 10-11-01/201, Normal Parking
- (2) AMM 20-10-01/401, E/E Rack Mounted Components
- (3) AMM 20-41-01/201, Electrostatic Sensitive Devices
- (4) AMM 21-31-00/501, Pressurization Control
- (5) AMM 23-21-00/501, Selcal System
- (6) AMM 23-41-00/501, Service Interphone System
- (7) AMM 23-42-00/501, Cabin Crew Call System
- (8) AMM 23-43-00/501, Ground Crew Call System
- (9) AMM 24-22-00/201, Electrical Power – Control
- (10) AMM 26-11-00/501, Engine Fire Detection System
- (11) AMM 26-15-00/501, APU Fire Detection System
- (12) AMM 26-16-00/501, Lower Cargo Compartment Smoke Detection System
- (13) AMM 27-48-00/501, Stabilizer Trim Position Indicating System
- (14) AMM 27-61-00/201, Spoiler/Speedbrakes System
- (15) AMM 29-11-00/201, Pressurize/Depressurize Main Hydraulic System
- (16) AMM 31-41-00/201, Engine Indication and Crew Alerting System
- (17) AMM 31-51-04/401, Warning Electronics Unit Card Modules
- (18) AMM 32-09-02/201, Air/Ground Relays
- (19) AMM 34-11-00/201, Pitot-Static System
- (20) AMM 34-12-00/501, Air Data Computing System or 34-26-00/501

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- (21) AMM 34-33-00/201, Radio Altimeter System
- (22) AMM 34-46-00/501, Ground Proximity Warning System

C. Access

- (1) Location Zones
211/212 Flight Compartment

D. Prepare for Test

S 865-580

- (1) Supply electrical power (AMM 24-22-00/201).

S 865-152

- (2) Make sure that the six EICAS circuit breakers are closed.

S 865-004

- (3) Do the procedure for the removal of the EICAS Engine Shutdown Inhibit (AMM 31-41-00/201).

S 485-005

- (4) Connect the RA test set to the left radio altimeter transceiver in the E/E compartment (AMM 34-33-00/201).

E. Master Warning/Caution Light Test

S 865-007

- (1) On the right overhead light control panel, push the TEST switch.

S 755-026

- (2) On the glareshield, make sure that the captain's and first officer's WARNING and CAUTION lights come on.

S 755-027

- (3) On the instrument panel, make sure that the red CONFIG light comes on.

S 865-010

- (4) On the right overhead light control panel, push the TEST switch to remove the electrical power from the test circuits.

F. Power Supply Fault Indicators Test

S 865-153

- (1) Open these P11 panel circuit breakers:
 - (a) 11B18, WARN ELEX B
 - (b) 11J33, WARN ELEX A

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S 845-012

CAUTION: DO NOT TOUCH THE MASTER WARNING MODULE BEFORE YOU DO THE PROCEDURE FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE MASTER WARNING MODULE.

- (2) Do the procedure for devices that are sensitive to electrostatic discharge (AMM 20-41-01/201).

S 035-013

- (3) Remove the master warning module, M618, from the WEU, P51 panel, and replace with the shorting module (AMM 31-51-04/401).

S 865-581

- (4) Close and then open the P11 panel circuit breakers that follow within five seconds:
(a) 11B18, WARN ELEX B
(b) 11J33, WARN ELEX A

S 755-030

- (5) On the WEU BITE module, make sure that the two power supply fault indicators show a yellow fault ball.

NOTE: The left fault indicator identifies a PSU B, M621, failure.
The right fault indicator identifies a PSU A, M616, failure.

S 485-018

- (6) Remove the shorting module and replace with the master warning module (AMM 31-51-04/401).

S 865-019

- (7) Close the P11 panel circuit breaker that follows:
(a) 11J33, WARN ELEX A

S 865-020

- (8) Push the POWER SUPPLY RESET switch on the P51 panel.
(a) Make sure that the PSU A failure indicator shows black.

S 865-021

- (9) Close the P11 panel circuit breaker that follows:
(a) 11B18, WARN ELEX B

S 865-582

- (10) Push the POWER SUPPLY RESET switch on the P51 panel.
(a) Make sure that the PSU B failure indicator shows black.

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- S 755-104
- (11) GUI 009, 115;
Make sure that the two hexadecimal indicators on the WEU BITE module show the hex code 4F.
- S 755-110
- (12) GUI 001-008, 010-114, 116-999;
Make sure that the two hexadecimal indicators on the WEU BITE module show the hex code 43.
- S 865-051
- (13) Open these P11 panel circuit breakers:
(a) 11B18, WARN ELEX B
(b) 11J33, WARN ELEX A
- S 865-052
- (14) Push the STATUS switch on the EICAS DISPLAY select panel.
(a) Make sure the EICAS message, WARN ELEX, shows on the bottom display when L and R are selected on the EICAS COMPUTER switch.
- S 865-054
- (15) Close this P11 panel circuit breaker:
(a) 11J33, WARN ELEX A
- S 755-033
- (16) Make sure the EICAS message, WARN ELEX, stays on.
- S 865-056
- (17) Close this P11 panel circuit breaker:
(a) 11B18, WARN ELEX B
- S 755-034
- (18) Make sure the EICAS message, WARN ELEX, does not show.
- S 865-058
- (19) Push the POWER SUPPLY RESET switch on the P51 panel.
- G. Level B OWL Signal Test
- S 865-059
- (1) Open these P11 panel circuit breakers:
(a) 11B18, WARN ELEX B
(b) 11H35, AURAL WARN SPKR R

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S 865-060

- (2) On the EICAS MAINT panel, push the TEST switch.
(a) Make sure that the owl aural warning comes on from the captain's aural warning speaker.

NOTE: The siren aural warning and CAUTION lights will also come on. These signals can be ignored.

S 865-061

- (3) Close the P11 panel circuit breaker that follows:
(a) 11B18, WARN ELEX B

S 865-062

- (4) Open the P11 panel circuit breaker that follows:
(a) 11J33, WARN ELEX A

S 865-063

- (5) Push and release the TEST switch on the EICAS MAINT panel two times.
(a) Make sure that the owl aural warning comes on from the captain's aural warning speaker.

S 865-583

- (6) Close the P11 panel circuit breaker that follows:
(a) 11H35, AURAL WARN SPKR R

S 865-157

- (7) Open the P11 panel circuit breaker that follows:
(a) 11B16, AURAL WARN SPKR L

S 865-584

- (8) Push and release the TEST switch on the EICAS MAINT panel two times.
(a) Make sure that the owl aural warning comes on from the first officer's aural warning speaker.

NOTE: The siren aural warning and CAUTION lights will also come on.

S 865-585

- (9) Close this P11 panel circuit breaker:
(a) 11J33, WARN ELEX A

S 865-586

- (10) Open this P11 panel circuit breaker:
(a) 11B18, WARN ELEX B

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S 865-587

- (11) Push and release the TEST switch on the EICAS MAINT panel two times.
(a) Make sure that the owl aural warning comes on from the first officer's aural warning speaker.

S 865-588

- (12) Push and release the TEST switch on the EICAS MAINT panel.

S 865-589

- (13) Close these P11 panel circuit breakers:
(a) 11B16, AURAL WARN SPKR L
(b) 11B18, WARN ELEX B

S 865-590

- (14) On the glareshield, push the captain's or first officer's CAUTION light.

H. Crew Call Signals Test

S 865-076

- (1) Make sure that these P11 circuit breakers are closed:
(a) 11B16, AURAL WARN SPKR L
(b) 11B18, WARN ELEX B
(c) 11C23, INTERPHONE CABIN SERVICE
(d) 11H31, GND CALL
(e) 11H35, AURAL WARN SPKR RIGHT
(f) 11J33, WARN ELEX A

S 865-591

- (2) Make sure that the cabin interphone system operates correctly (AMM 23-42-00/501).

S 865-592

- (3) Momentarily push the FLIGHT DECK CALL SW on the P62 control panel in the nose wheel well.
(a) Make sure that a chime sound is heard.

S 865-593

- (4) Open this P11 panel circuit breaker:
(a) 11B18, WARN ELEX B

S 865-594

- (5) Momentarily push the PILOT switch on a cabin interphone headset.
(a) Make sure that a chime sound is heard from the two aural warning speakers.

S 865-595

- (6) Close this P11 panel circuit breaker:
(a) 11B18, WARN ELEX B

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S 865-596

- (7) Open this P11 panel circuit breaker:
(a) 11J33, WARN ELEX A

S 865-597

- (8) Momentarily push the PILOT switch on a cabin interphone headset.
(a) Make sure that a chime sound is heard from the two aural warning speakers.

S 845-084

- (9) Do the SELCAL System Adjustment/Test to make sure that a chime sound can be made from the SELCAL system (AMM 23-21-00/501).

I. Fire Bell Warning Signals Test

S 865-086

- (1) Adjust the radio altimeter test set to 390 feet.

S 865-087

- (2) Activate the nose gear not-compressed system 1 sensor switch (S10067) to simulate an IN-AIR condition.

NOTE: The switch can be activated with a sensor actuator. The actuator is to be held within 0.15 inches of the sensor. Masking tape or the equivalent can be used to hold the actuator in the necessary position. When the switch is activated, the switch will be in a target near condition.

S 845-088

WARNING: DO THE DEACTIVATION PROCEDURE FOR THE SPOILERS OR MOVE ALL PERSONS AND EQUIPMENT AWAY FROM THE SPOILERS. THE SPOILERS CAN MOVE QUICKLY AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (3) Do the deactivation procedure for the spoilers (AMM 27-61-00/201) or move all persons and equipment away from the control surfaces.

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S 865-089

- (4) Open and close this P11 panel circuit breaker:
(a) 11C30, LANDING GEAR POSITION SYS 1

NOTE: This starts the 20 second timer for the fire bell so it will not come on during takeoff. Perform the next four steps within these 20 seconds. If these steps are not completed within the time limit, open and close the POSITION AIR/GND SYS 1 circuit breaker and begin again.

S 865-090

- (5) Push and hold the ENG/APU CARGO switch on the FIRE/OVHT TEST panel.
(a) Make sure that the fire bell does not come on.

S 865-444

- (6) Close the P11 panel circuit breaker:
(a) 11J33, WARN ELEX A

S 865-445

- (7) Open this P11 panel circuit breaker:
(a) 11B18, WARN ELEX B

S 865-447

- (8) Set the radio altitude test set to 410 feet.
(a) Make sure that the master warning lights come on.
(b) Make sure that the fire bell aural warning comes on.

NOTE: GUI 001-008, 010-999;
The fire bell operates on a cycle of 0.8 second on and 9.2 seconds off.

NOTE: GUI 009;
The fire bell operates on a cycle of 2 seconds on and 3 seconds off.

S 865-092

- (9) Momentarily push the captain's or first officer's master warning lights.
(a) Make sure the master warning lights and the fire bell go off.

S 865-093

- (10) Release the ENG/APU CARGO switch.

S 865-446

- (11) Close the P11 panel circuit breaker:
(a) 11B18, WARN ELEX B

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S 865-094

- (12) Make sure that these gear down-and-locked proximity switches are activated:

NOTE: The switches can be activated with a sensor actuator. The actuator is to be held within 0.15 inches of the sensor. Masking tape or the equivalent can be used to hold the actuator in the necessary position. When these switches are activated, the switches will be in a target near condition.

- (a) S10066 Nose Gear Down
- (b) S10065 Nose Gear Locked
- (c) S10061 Left Gear Down and Locked
- (d) S10057 Right Gear Down and Locked

S 845-097

WARNING: PREPARE THE SAFETY-SENSITIVE SYSTEMS FOR THE AIR MODE BEFORE YOU OPEN THE AIR/GROUND CIRCUIT BREAKERS. IN THE AIR MODE, MANY OF THE AIRPLANE SYSTEMS CAN OPERATE AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (13) Prepare the safety-sensitive systems for air mode simulation (AMM 32-09-02/201).

S 865-448

- (14) Make sure that the two throttles are in the takeoff position.

S 865-098

- (15) Open these P11 panel circuit breakers:
- (a) GUI 001, 002 POST-SB 78-32;
GUI 003-999;
11C19, LDG GEAR POS SYS 2 ALTN
 - (b) 11C30, LANDING GEAR POSITION SYS 1
 - (c) 11S23, LANDING GEAR POSITION SYS 2

S 865-099

- (16) Push and hold the WHL WELL switch on the FIRE/OVHT TEST panel.
- (a) Make sure that the master warning lights come on.
 - (b) Make sure that the fire bell aural warning comes on.

S 865-100

- (17) Release the WHL WELL test switch.

S 865-101

- (18) Close this P11 panel circuit breaker:
- (a) 11C30, LANDING GEAR POSITION SYS 1

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S 865-102

- (19) Push and hold the WHL WELL test switch for a minimum of 20 seconds.
(a) Make sure the fire bell does not come on.

S 865-103

- (20) Release the WHL WELL test switch.

S 865-104

- (21) Deactuate the nose gear not-compressed sensor switch (S10067).

S 845-105

- (22) Put the safety-sensitive systems back to their initial conditions (AMM 32-09-02/201).

NOTE: It is not necessary to do tests on the other fire bell inputs. The other fire bell inputs are examined in these adjustment/tests:

- Engine Fire Detection (AMM 26-11-00/501)
- APU Fire Detection (AMM 26-15-00/501)
- Lower Cargo Compartment Smoke Detection (AMM 26-16-00/501)

J. Ground Proximity Warning System Aural Signals Test

S 845-106

- (1) Make sure that the Ground Proximity Warning System operates correctly (AMM 34-46-00/501).

S 865-107

- (2) Open these P11 panel circuit breakers:
(a) 11B18, WARN ELEX B
(b) 11H35, AURAL WARN SPKR R

S 865-108

- (3) Set the GND PROX switch on the TEST panel to the test position for approximately three seconds.
(a) Make sure you hear these aural warnings on the captain's aural warning speaker.
1) GLIDESLOPE

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- 2) PULL-UP
- 3) Siren aural, and
WINDSHEAR WINDSHEAR WINDSHEAR
- (b) Make sure that the master warning lights come on.

S 865-109

- (4) Open these P11 panel circuit breakers:
 - (a) 11B16, AURAL WARN SPKR L
 - (b) 11J33, WARN ELEX A

S 865-110

- (5) Close these P11 panel circuit breakers:
 - (a) 11B18, WARN ELEX B
 - (b) 11H35, AURAL WARN SPKR R

S 865-111

- (6) Set the GND PROX switch on the TEST panel to the test position for approximately three seconds.
 - (a) Make sure you hear these aural warnings from the first officer's aural warning speaker.
 - 1) GLIDESLOPE
 - 2) PULL-UP
 - 3) Siren aural, and
WINDSHEAR WINDSHEAR WINDSHEAR
 - (b) Make sure that the master warning lights come on.

S 865-112

- (7) Close these P11 panel circuit breakers:
 - (a) 11B16, AURAL WARN SPKR L
 - (b) 11J33, WARN ELEX A

K. Cabin Altitude Warning Signals Test

S 485-113

- (1) Connect the airspeed/altitude simulator to the cabin altitude warning switch, S431 (AMM 21-31-00/501).

S 865-018

- (2) GUI 004, 006;
Make sure that the HIGH ALT SELECT switch is set to the standard altitude position (AMM 21-31-00/501).

S 865-115

- (3) Slowly adjust the simulator to increase the flight compartment altitude.
 - (a) Make sure that the WARNING lights come on when the flight compartment altitude is 10,000 +/-300 feet.

S 865-116

- (4) Slowly decrease the flight compartment altitude to 0 feet.
 - (a) Make sure that the WARNING lights go off.

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S 085-117

- (5) Disconnect the airspeed/altitude simulator (AMM 21-31-00/501).

L. Airplane Overspeed Signal Test

S 865-599

- (1) Make sure that the pitot-static system operates correctly (AMM 34-11-00/201).

S 865-600

- (2) Set one of the two AIR DATA switches on the TEST panel to the L or R position for approximately five seconds.
(a) Make sure that the WARNING lights come on.
(b) Make sure that the siren comes on.

S 865-601

- (3) Release the AIR DATA switch.

M. Aural Amplifier Gain Signal Test

S 485-122

- (1) Connect the pitot-static test set to the F/O's pitot-static system (AMM 34-11-00/201).

S 865-449

- (2) Set the sound level meter to the "A" scale.

S 865-602

- (3) Make sure that these P11 panel circuit breakers are closed:
(a) 11B16, AURAL WARN SPKR L
(b) GUI 001, 002 POST-SB 78-32;
GUI 003-999;
11C19, LDG GEAR POS SYS 2 ALTN
(c) 11S15, LANDING GEAR AIR/GND SYS 1
(d) 11S23, LANDING GEAR POS SYS 2

S 865-603

- (4) Open this P11 panel circuit breaker:
(a) 11H35, AURAL WARN SPKR R

S 865-604

- (5) Set the parking brake to the ON position.

S 865-126

- (6) Make sure that the GND PROX/CONFIG GEAR OVRD switch on the instrument panel is not set.

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- S 745-127
- (7) Push and hold the CONFIG switch on the TEST panel in the T/O position.
(a) Make sure that the siren comes on.
- S 755-128
- (8) Hold the sound level meter 24 ($\pm 1/2$) inches perpendicular from the center of the captain's aural warning speaker.
(a) Make sure that the output is 91 (± 5) dba.
- S 745-129
- (9) Release the CONFIG switch.
- S 865-450
- (10) Close the P11 panel circuit breaker:
(a) 11H35, AURAL WARN SPKR R
- S 865-451
- (11) Open this P11 panel circuit breaker:
(a) 11B16, AURAL WARN SPKR L
- S 865-452
- (12) Push and hold the CONFIG switch on the TEST panel in the T/O position.
(a) Make sure that the siren comes on.
- S 865-453
- (13) Hold the sound level meter 24 ($\pm 1/2$) inches perpendicular from the center of the first officer's aural warning speaker.
(a) Make sure that the output is 91 (± 5) dba.
- S 865-454
- (14) Release the CONFIG switch.
- S 865-877
- (15) Set the LEFT RAD ALT to 850 feet.

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S 865-455

- (16) Deactivate one of the SYSTEM 1 and one of the SYSTEM 2 switches that follow:

NOTE: When the switches are deactivated, the switches will be in a target far condition.

SYSTEM 1	SYSTEM 2	NOTE
S10057	S10070	Right gear down and locked
S10061	S10074	Left gear down and locked
S10065	S10078	Nose gear locked
S10066	S10079	Nose gear down

S 865-456

WARNING: OBEY THE PROCEDURE THAT PUTS THE AIRPLANE IN THE AIR MODE. IF YOU DO THE PROCEDURE INCORRECTLY, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (17) Put the air/ground relay system in the air mode (AMM 32-09-02/201).

S 865-457

- (18) Activate this gear proximity switch.

NOTE: When the switch is activated, the switch will be in a target near condition.

- (a) S10067 Nose gear not compressed

S 865-130

- (19) Make an altitude equivalent to 1000 feet and an airspeed equivalent to 325 knots on the right ADC (AMM 34-11-00/201).

S 865-131

- (20) Push and hold the CONFIG switch on the TEST panel in the LDG position.
 (a) Make sure that the siren comes on.

S 865-132

- (21) Hold the sound level meter 24 ($\pm 1/2$) inches perpendicular from the center of the first officer's aural warning speaker.
 (a) Make sure that the output is 85 (± 2) dba.

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- S 865-133
(22) Release the CONFIG switch.
- S 865-458
(23) Close this P11 panel circuit breaker:
(a) 11B16, AURAL WARN SPKR L
- S 865-459
(24) Open this P11 panel circuit breaker:
(a) 11H35, AURAL WARN SPKR R
- S 865-461
(25) Push and hold the CONFIG switch on the TEST panel in the LDG position.
(a) Make sure that the siren comes on.
- S 865-462
(26) Hold the sound level meter 24 ($\pm 1/2$) inches perpendicular from the center of the captain's aural warning speaker.
(a) Make sure that the output is 85 (± 2) dba.
- S 865-463
(27) Release the CONFIG switch.
- S 865-134
(28) Slowly put the pitot-static system back to the ambient pressure condition.
- S 865-135
(29) Close this P11 panel circuit breaker:
(a) 11H35, AURAL WARN SPKR R
- S 085-146
(30) Remove the pitot-static test equipment (AMM 34-11-00/201).
- S 865-464
(31) Put the proximity switches in their usual condition.
- S 865-137
(32) Put the air/ground relay system back to the ground mode (AMM 32-09-02/201).

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N. Landing Configuration Warning Signals Test

S 865-147

- (1) Make sure that these P11 panel circuit breakers are closed:
- (a) Six EICAS circuit breakers
 - (b) 11A32, IND LIGHTS 1
 - (c) 11A33, IND LIGHTS 2
 - (d) 11A34, IND LIGHTS 3
 - (e) 11B16, AURAL WARN SPKR L
 - (f) 11C6, FLT CONT ELEC 1L AC
 - (g) 11C7, FLT CONT ELEC 1L DC
 - (h) 11C8, FLT CONT ELEC 2L AC
 - (i) 11C9, FLT CONT ELEC 2L DC
 - (j) 11H35, AURAL WARN SPKR R
 - (k) 11P29, RIGHT IND LTS 2

S 865-148

- (2) Open these P11 panel circuit breakers:
- (a) 11B18, WARN ELEX B
 - (b) 11F5, RAD ALTM LEFT
 - (c) 11G11, AUTO SPEED BRAKE
 - (d) 11J33, WARN ELEX A

S 845-149

WARNING: PREPARE THE SAFETY-SENSITIVE SYSTEMS FOR THE AIR MODE BEFORE YOU OPEN THE AIR/GROUND CIRCUIT BREAKERS. IN THE AIR MODE, MANY OF THE AIRPLANE SYSTEMS CAN OPERATE AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (3) Prepare the safety-sensitive systems for air mode simulation (AMM 32-09-02/201).

S 865-150

- (4) Open this P11 panel circuit breaker:
- (a) GUI 001, 002 POST-SB 78-32;
GUI 003-999;
11C19, LDG GEAR POS SYS 2 ALTN
 - (b) 11S23, LANDING GEAR POS SYS 2

S 865-605

- (5) Set the left and right engine throttles fully forward to the takeoff position.
- (a) Make sure the red CONFIG light on the instrument panel is off.
 - (b) Make sure the WARNING lights on the glareshield are off.

NOTE: Push one of the two switch-lights if they are on.

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S 865-606

- (6) Set the COMPUTER switch on the EICAS control panel to the L and then the R position.
- (a) Make sure the EICAS message, GEAR NOT DOWN, does not show on the top display.

S 865-607

- (7) Make sure that the GND PROX/CONFIG GEAR OVRD switch is not set.

S 865-608

- (8) Close this P11 panel circuit breaker:
- (a) 11F5, RAD ALTM LEFT

S 845-157

WARNING: DO THE DEACTIVATION PROCEDURE FOR THE SPOILERS OR MOVE ALL PERSONS AND EQUIPMENT AWAY FROM THE SPOILERS. THE SPOILERS CAN MOVE QUICKLY AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (9) Do the deactivation procedure for the spoilers (AMM 27-61-00/201) or move all persons and equipment away from the control surfaces.

S 865-609

- (10) Set the speedbrake control to the UP position.

S 865-610

- (11) Close this P11 panel circuit breaker:
- (a) 11J33, WARN ELEX A

S 865-611

- (12) Hold the CONFIG switch on the TEST panel in the LDG position.
- (a) Make sure the red CONFIG light comes on.
- (b) Make sure the WARNING lights come on.
- (c) Make sure the siren aural warning comes on.
- (d) Make sure the SPEEDBRAKE light comes on.

S 865-612

- (13) Set the COMPUTER switch on the EICAS control panel to the L and then the R position.
- (a) Make sure the EICAS message, GEAR NOT DOWN, shows on the top display.
- (b) Make sure the EICAS message, SPEEDBRAKES EXT, shows on the top display.

S 865-613

- (14) Release the CONFIG switch.

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S 865-614

- (15) Close this P11 panel circuit breaker:
(a) 11B18, WARN ELEX B

S 865-615

- (16) Open this P11 panel circuit breaker:
(a) 11J33, WARN ELEX A

S 865-616

- (17) Hold the CONFIG switch on the TEST panel in the LDG position.
(a) Make sure the red CONFIG light comes on.
(b) Make sure the WARNING lights come on.
(c) Make sure the siren aural warning comes on.
(d) Make sure the SPEEDBRAKE light comes on.

S 865-113

- (18) Set the COMPUTER switch on the EICAS control panel to the L and then the R position.
(a) Make sure the EICAS message, GEAR NOT DOWN, shows on the top display.
(b) Make sure the EICAS message, SPEEDBRAKES EXT, shows on the top display.

S 865-617

- (19) Release the CONFIG switch.

S 865-167

- (20) Close this P11 panel circuit breaker:
(a) 11J33, WARN ELEX A

S 865-168

WARNING: KEEP PERSONS AND EQUIPMENT AWAY FROM ALL CONTROL SURFACES WHEN POWER IS SUPPLIED. AILERONS, ELEVATORS, RUDDER, FLAPS, SLATS, SPOILERS, AND STABILIZER ARE FULLY POWERED SURFACES. INJURY OR DAMAGE CAN OCCUR WHEN POWER IS SUPPLIED.

CAUTION: DO NOT OPERATE ALTERNATE DRIVE MOTOR FOR LONGER THAN FOUR MINUTES. PERMIT AT LEAST 20 MINUTES BETWEEN OPERATION SO THAT THE MOTOR CAN BECOME COOL. DAMAGE CAN OCCUR IF THE MOTOR BECOMES TOO HOT.

- (21) Make sure that this P6 panel circuit breakers is closed:
(a) 6D23, ALTN FLAP PWR

S 865-171

- (22) Put the TE switch on the instrument panel in the ALTN position.

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S 865-172

- (23) Set the ALTN FLAPS control on the instrument panel to the 25 position.

NOTE: Permit time for the flaps to reach the 25-unit position.

S 865-173

- (24) Make sure that these switches are activated:

NOTE: The switches can be activated with a sensor actuator. The actuator is to be held within 0.15 inches of the sensor. Masking tape or the equivalent can be used to hold the actuator in the necessary position. When the switches are activated, the switches will be in a target near condition.

- (a) S10066 and S10079 - Nose Gear Down
- (b) S10065 and S10078 - Nose Gear Locked
- (c) S10057 and S10070 - Left Gear Down and Locked
- (d) S10061 and S10074 - Right Gear Down and Locked

S 755-038

- (25) Make sure the red CONFIG light is not on.

S 755-039

- (26) Make sure the WARNING lights are not on.

S 755-040

- (27) Make sure the EICAS message, GEAR NOT DOWN, does not show on the top display.

S 845-177

WARNING: PREPARE THE SAFETY-SENSITIVE SYSTEMS FOR THE AIR MODE BEFORE YOU OPEN THE AIR/GROUND CIRCUIT BREAKERS. IN THE AIR MODE, MANY OF THE AIRPLANE SYSTEMS CAN OPERATE AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (28) Prepare the safety-sensitive systems for air mode simulation (AMM 32-09-02/201).

S 865-178

- (29) Open this P11 panel circuit breaker:
(a) 11C30, LANDING GEAR POS SYS 1

S 755-041

- (30) Make sure the red CONFIG light comes on.

S 755-042

- (31) Make sure the WARNING lights come on.

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S 755-043

- (32) Make sure the siren aural warning comes on.

S 755-044

- (33) Make sure the EICAS message, GEAR NOT DOWN, shows on the top display.

S 865-183

- (34) Close this P11 panel circuit breaker:
(a) GUI 001, 002 POST-SB 78-32;
GUI 003-999;
11C19, LDG GEAR POS SYS 2 ALTN
(b) 11S23, LANDING GEAR POS SYS 2

S 755-045

- (35) Make sure the EICAS message, GEAR NOT DOWN, does not show.

S 845-185

WARNING: PREPARE THE SAFETY-SENSITIVE SYSTEMS FOR THE AIR MODE BEFORE YOU OPEN THE AIR/GROUND CIRCUIT BREAKERS. IN THE AIR MODE, MANY OF THE AIRPLANE SYSTEMS CAN OPERATE AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (36) Prepare the safety-sensitive systems for air mode simulation (AMM 32-09-02/201).

S 865-186

- (37) Open this P11 panel circuit breaker:
(a) GUI 001, 002 POST-SB 78-32;
GUI 003-999;
11C19, LDG GEAR POS SYS 2 ALTN
(b) 11S23, LANDING GEAR POS SYS 2

S 865-187

- (38) Push the first officer's WARNING switch-light.
(a) Make sure the red CONFIG light comes on.
(b) Make sure the WARNING lights go off.
(c) Make sure the siren aural warning comes on.
(d) Make sure the EICAS message, GEAR NOT DOWN, shows.

S 865-192

- (39) Set the ALTN FLAPS control on the instrument panel to the 5 position.

NOTE: Permit time for the flaps to reach the 5-unit position.

S 755-046

- (40) Make sure all of the warning signals go off.

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S 865-884

- (41) Set the the Radio altimeter test set to 790 feet.

S 865-194

- (42) Set the left engine throttle to the idle position.

NOTE: Make sure that at least 2 1/2 minutes have gone by since the LANDING GEAR POS SYS 2 circuit breaker was opened.

S 865-195

- (43) Push the captain's WARNING switch-light.
(a) Make sure the red CONFIG light shows.
(b) Make sure the WARNING lights go off.
(c) Make sure the siren aural warning goes off.
(d) Make sure the EICAS message, GEAR NOT DOWN, shows.

S 865-200

- (44) Set the left engine throttle to the takeoff position.

S 865-201

- (45) Set the right engine throttle to the idle position.

S 755-047

- (46) Make sure the red CONFIG light comes on.

S 755-048

- (47) Make sure the WARNING lights come on.

S 755-049

- (48) Make sure the siren aural warning comes on.

S 755-050

- (49) Make sure the EICAS message, GEAR NOT DOWN, shows.

S 865-204

- (50) Open this P11 panel circuit breaker:
(a) 11F5, RAD ALTM LEFT

S 755-051

- (51) Make sure the warning signals stay on.

S 865-206

- (52) Set the ALTN FLAPS control on the instrument panel to the UP position.

NOTE: Permit time for the flaps to reach the full UP position.

- (a) Make sure the red CONFIG light is on.
(b) Make sure the WARNING lights are off.

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- (c) Make sure the siren aural warning is off.
- (d) Make sure the EICAS message, GEAR NOT DOWN, shows.

S 865-208

- (53) Put the TE switch in the NORM position to deactivate the TE flaps alternate electric power.

S 865-209

- (54) Put the LE switch in the ALTN position.

S 865-210

- (55) Set the ALTN FLAPS control on the instrument panel to the 5 position.

NOTE: Permit time for the slats to reach the 5-unit position.

- (a) Make sure the red CONFIG light is on.
- (b) Make sure the WARNING lights come on.
- (c) Make sure the siren aural warning comes on.
- (d) Make sure the EICAS message, GEAR NOT DOWN, shows.

S 865-215

- (56) Put the TE switch in the ALTN position.

S 865-472

- (57) Put the ALTN FLAPS control in the UP position.

NOTE: Permit time for the flaps to reach the UP position.

S 865-216

- (58) Set the FLAP control to the UP position.

S 865-217

- (59) Put the TE and LE switches in the NORM position to deactivate the TE and LE alternate electric power.

S 865-218

- (60) Close this P11 panel circuit breaker:
 - (a) 11F5, RAD ALTM LEFT

S 865-219

- (61) Set the radio altitude to 810 feet.

S 755-052

- (62) Make sure no warnings come on.

S 865-221

- (63) Set the radio altitude to 790 feet.

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- S 755-053
(64) Make sure the red CONFIG light comes on.
- S 755-054
(65) Make sure the WARNING lights come on.
- S 755-055
(66) Make sure the siren aural warning comes on.
- S 755-056
(67) Make sure the EICAS message, GEAR NOT DOWN, shows on the top display.
- S 865-226
(68) Set the right engine throttle to the takeoff position.
- S 755-057
(69) Make sure the EICAS message, GEAR NOT DOWN, does not show.
- S 865-230
(70) Set the radio altitude to 400 feet.
- S 755-058
(71) Make sure the SPEEDBRAKE light comes on.

S 845-231

WARNING: DO THE DEACTIVATION PROCEDURE FOR THE SPOILERS OR MOVE ALL PERSONS AND EQUIPMENT AWAY FROM THE SPOILERS. THE SPOILERS CAN MOVE QUICKLY AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (72) Do the deactivation procedure for the spoilers (AMM 27-61-00/201) or move all persons and equipment away from the control surfaces.

S 865-232

- (73) Slowly move the SPEED BRAKE control forward until the SPEEDBRAKES light goes off.

S 755-059

- (74) Make sure the EICAS message, SPEEDBRAKE EXT, does not show when the COMPUTER switch on the EICAS control panel is in the L and R positions.

S 755-060

- (75) Make sure the black indicator on the SPEED BRAKE control is between 0.2 and 0.9 inches rearward of the ARMED line.

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- S 865-236
- (76) Slowly move the SPEED BRAKE control rearward until the SPEEDBRAKES light comes on.
- S 755-061
- (77) Make sure the EICAS message, SPEEDBRAKES EXT, shows on the top display.
- S 755-062
- (78) Make sure the black indicator on the SPEED BRAKE control is between 0.2 and 0.9 inches rearward of the ARMED line.
- S 865-239
- (79) Set the radio altitude to 0 feet.
- S 865-240
- (80) Open this P11 panel circuit breaker:
- (a) 11F5, RAD ALTM LEFT
- S 085-241
- (81) Disconnect the RA test set (AMM 34-33-00/201).
- S 865-618
- (82) Close this P11 panel circuit breaker:
- (a) 11F5, RAD ALTM LEFT
- S 085-242
- (83) Remove the actuators and deactuators from the landing gear position sensors.
- S 865-568
- (84) Close these P11 panel circuit breakers:
- (a) GUI 001, 002 POST-SB 78-32;
GUI 003-999;
11C19, LDG GEAR POS SYS 2 ALTN
 - (b) 11C30, LANDING GEAR POS SYS 1
 - (c) 11F5, RAD ALTM LEFT
 - (d) 11S23, LANDING GEAR POS SYS 2
- S 865-443
- (85) Put the airplane back to its usual condition.
0. Takeoff Configuration Warning Signals Test
- S 865-619
- (1) Open these P11 panel circuit breakers:
- (a) 11B18, WARN ELEX B
 - (b) 11C6, FLT CONT ELEC 1L AC
 - (c) 11C7, FLT CONT ELEC 1L DC
 - (d) 11C8, FLT CONT ELEC 2L AC
 - (e) 11C9, FLT CONT ELEC 2L DC

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- (f) 11G11, AUTO SPEED BRAKE
- (g) 11G17, FLT CONT ELEC 1R AC
- (h) 11G18, FLT CONT ELEC 1R DC
- (i) 11G27, FLT CONT ELEC 2R AC
- (j) 11G28, FLT CONT ELEC 2R DC
- (k) 11J29, EICAS CMPTR RIGHT
- (l) 11J33, WARN ELEX A

S 865-622

- (2) Set the left and right engine throttles to the takeoff position.

S 755-623

- (3) Make sure the siren aural warning is not on.

S 215-684

- (4) Make sure the red CONFIG light is not on.

S 215-685

- (5) Make sure the WARNING lights are not on.

NOTE: If the WARNING lights are on, push the captain's or first officer's WARNING light-switch.

S 755-009

- (6) Make sure these red warning messages do not show on the top EICAS display:

NOTE: The yellow EICAS messages, SPOILERS or PARKING BRAKE, may show on the top display.

- (a) SPOILERS
- (b) FLAPS
- (c) PARKING BRAKE
- (d) STABILIZER

S 865-686

- (7) Close this P11 panel circuit breaker:

- (a) 11J33, WARN ELEX A

S 845-687

WARNING: DO THE DEACTIVATION PROCEDURE FOR THE SPOILERS OR MOVE ALL PERSONS AND EQUIPMENT AWAY FROM THE SPOILERS. THE SPOILERS CAN MOVE QUICKLY AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (8) Do the deactivation procedure for the spoilers (AMM 27-61-00/201) or move all persons and equipment away from the control surfaces.

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- S 865-688
(9) Supply hydraulic power (AMM 29-11-00/201).
- S 865-689
(10) Set the FLAP control to a takeoff position between 1 and 20 units.
- S 865-690
(11) Set the parking brake to the OFF position.
- S 865-691
(12) Move the STAB TRIM control into the greenband range.
- S 865-692
(13) Move the SPEED BRAKE control to the DOWN position.
- S 865-693
(14) Hold the CONFIG switch on the TEST panel in the T/O position.
(a) Make sure the red CONFIG light is not on.
(b) Make sure the WARNING lights are off.
(c) Make sure the siren aural warning is not on.
(d) Make sure these red warning messages do not show on the top EICAS display:
- NOTE: The yellow EICAS messages, SPOILERS or PARKING BRAKE, may show on the top display.
- 1) SPOILERS
 - 2) FLAPS
 - 3) PARKING BRAKE
 - 4) STABILIZER
- S 865-694
(15) Release the CONFIG switch.
- S 865-695
(16) Set the parking brake to the ON position.

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S 745-264

- (17) Hold the CONFIG switch on the TEST panel in the T/O position.
- (a) Make sure the red CONFIG light comes on.
 - (b) Make sure the WARNING lights come on.
 - (c) Make sure the siren aural warning comes on.
 - (d) Make sure the red EICAS message, PARKING BRAKE, shows on the top display.

S 745-132

- (18) Release the CONFIG switch.

S 865-696

- (19) Open these P11 panel circuit breakers:
- (a) 11J2, EICAS CMPTR L
 - (b) 11J33, WARN ELEX A

S 865-697

- (20) Close these P11 panel circuit breakers:
- (a) 11B18, WARN ELEX B
 - (b) 11J29, EICAS CMPTR R

S 865-698

- (21) Hold the CONFIG switch on the TEST panel in the T/O position.
- (a) Make sure the red CONFIG light comes on.
 - (b) Make sure the WARNING lights come on.
 - (c) Make sure the siren aural warning comes on.
 - (d) Make sure the red EICAS message, PARKING BRAKE, shows on the top display.

S 865-699

- (22) Release the CONFIG switch.

S 865-700

- (23) Close these P11 panel circuit breakers:
- (a) 11J2, EICAS CMPTR L
 - (b) 11J33, WARN ELEX A

S 865-701

- (24) Set the parking brake to the OFF position.

S 865-702

- (25) Hold the CONFIG switch on the TEST panel in the T/O position.
- (a) Make sure the red EICAS message, PARKING BRAKE, does not show on the top display when the EICAS COMPUTER switch is in the L and R positions.

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S 865-703

(26) Release the CONFIG switch.

S 865-704

WARNING: KEEP PERSONS AND EQUIPMENT AWAY FROM ALL CONTROL SURFACES WHEN POWER IS SUPPLIED. AILERONS, ELEVATORS, RUDDER, FLAPS, SLATS, SPOILERS, AND STABILIZER ARE FULLY POWERED SURFACES. INJURY OR DAMAGE CAN OCCUR WHEN POWER IS SUPPLIED.

CAUTION: DO NOT OPERATE ALTERNATE DRIVE MOTOR FOR LONGER THAN FOUR MINUTES. PERMIT AT LEAST 20 MINUTES BETWEEN OPERATION SO THAT THE MOTOR CAN BECOME COOL. DAMAGE CAN OCCUR IF THE MOTOR BECOMES TOO HOT.

- (27) Open these P11 panel circuit breakers:
- (a) 11G12, FLAP/SLAT ELEC UNIT 1 POWER
 - (b) 11G13, FLAP/SLAT ELEC UNIT 1 CONT
 - (c) 11G14, FLAP/SLAT ELEC UNIT 1 SENSOR

S 865-826

(28) Put the LE and TE switches in the NORM position.

S 865-705

(29) Set the FLAP control to the UP position.

S 865-706

(30) Hold the CONFIG switch on the TEST panel in the T/O position.

NOTE: During the takeoff configuration warning test, messages will show on the EICAS display. The messages will show for only 5 to 15 seconds after the CONFIG switch is released. To make sure of the message status, the CONFIG switch should be put in the T/O position.

- (a) Make sure the red CONFIG light comes on.
- (b) Make sure the WARNING lights come on.
- (c) Make sure the siren aural warning comes on.
- (d) Make sure the red EICAS message, FLAPS, shows on the top display.

S 865-707

(31) Release the CONFIG switch.

S 865-708

(32) Set the FLAP control to the 20-unit position.

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S 865-709

- (33) Hold the CONFIG switch on the TEST panel in the T/O position.
(a) Make sure the red EICAS message, FLAPS, does not show on the top display when the EICAS COMPUTER switch is in the L and R positions.

S 865-710

- (34) Release the CONFIG switch.

S 865-711

- (35) Put the ALTN FLAPS control in the 25-unit position.

S 865-712

- (36) Put the TE switch in the ALTN position to activate the TE flaps electric drive.

NOTE: Permit time for the flaps to get to the 25-unit position.

S 865-713

- (37) Hold the CONFIG switch on the TEST panel in the T/O position.
(a) Make sure the red EICAS message, FLAPS, shows on the top display when the EICAS COMPUTER switch is in the L and R positions.

S 865-714

- (38) Release the CONFIG switch.

S 865-715

- (39) Put the TE switch in the NORM position to deactivate the TE flaps electric drive.

NOTE: The flaps will move to the 20-unit position. The slats will start to move to the fully extended position then reverse direction and stop at the intermediate position.

S 865-716

- (40) Put the LE switch in the ALTN position to activate the LE slats electric drive.

NOTE: Permit time for the slats to get to the fully extended position.

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S 865-717

- (41) Hold the CONFIG switch on the TEST panel in the T/O position.
(a) Make sure the red EICAS message, FLAPS, shows on the top display.

S 865-718

- (42) Release the CONFIG switch.

S 865-719

- (43) Put the FLAP Lever in the 5-unit position.

S 865-720

- (44) Make sure that the flaps and slats do not move.

S 865-721

- (45) Put the LE switch in the NORM position to deactivate the LE slats electric drive.

NOTE: The flaps will move to the 5-unit position. The slats will move to the intermediate position.

S 865-824

- (46) Open these P11 panel circuit breakers:
(a) 11C14, FLAP/SLAT ELEC UNIT 2 POWER
(b) 11C15, FLAP/SLAT ELEC UNIT 2 CONT
(c) 11C16, FLAP/SLAT ELEC UNIT 2 SENSOR

S 865-825

- (47) Close these P11 panel circuit breakers:
(a) 11G12, FLAP/SLAT ELEC UNIT 1 POWER
(b) 11G13, FLAP/SLAT ELEC UNIT 1 CONT
(c) 11G14, FLAP/SLAT ELEC UNIT 1 SENSOR

S 865-827

- (48) Put the LE and TE switches in the NORM position.

S 865-805

- (49) Set the FLAP control to the UP position.

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S 865-806

- (50) Hold the CONFIG switch on the TEST panel in the T/O position.

NOTE: During the takeoff configuration warning test, messages will show on the EICAS display. The messages will show for only 5 to 15 seconds after the CONFIG switch is released. To make sure of the message status, the CONFIG switch should be put in the T/O position.

- (a) Make sure the red CONFIG light comes on.
- (b) Make sure the WARNING lights come on.
- (c) Make sure the siren aural warning comes on.
- (d) Make sure the red EICAS message, FLAPS, shows on the top display.

S 865-807

- (51) Release the CONFIG switch.

S 865-808

- (52) Set the FLAP control to the 20-unit position.

S 865-809

- (53) Hold the CONFIG switch on the TEST panel in the T/O position.
- (a) Make sure the red EICAS message, FLAPS, does not show on the top display when the EICAS COMPUTER switch is in the L and R positions.

S 865-810

- (54) Release the CONFIG switch.

S 865-811

- (55) Put the ALTN FLAPS control in the 25-unit position.

S 865-812

- (56) Put the TE switch in the ALTN position to activate the TE flaps electric drive.

NOTE: Permit time for the flaps to get to the 25-unit position.

S 865-813

- (57) Hold the CONFIG switch on the TEST panel in the T/O position.
- (a) Make sure the red EICAS message, FLAPS, shows on the top display when the EICAS COMPUTER switch is in the L and R positions.

S 865-814

- (58) Release the CONFIG switch.

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S 865-815

- (59) Put the TE switch in the NORM position to deactivate the TE flaps electric drive.

NOTE: The flaps will move to the 20-unit position. The slats will start to move to the fully extended position then reverse direction and stop at the intermediate position.

S 865-816

- (60) Put the LE switch in the ALTN position to activate the LE slats electric drive.

NOTE: Permit time for the slats to get to the fully extended position.

S 865-817

- (61) Hold the CONFIG switch on the TEST panel in the T/O position.
(a) Make sure the red EICAS message, FLAPS, shows on the top display.

S 865-818

- (62) Release the CONFIG switch.

S 865-819

- (63) Put the FLAP lever in the 5-unit position.

S 865-820

- (64) Make sure that the flaps and slats do not move.

S 865-821

- (65) Put the LE switch in the NORM position to deactivate the LE slats electric drive.

NOTE: The flaps will move to the 5-unit position. The slats will move to the intermediate position.

S 865-822

- (66) Put the ALTN FLAPS control in the NORM position.

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P. Takeoff Configuration Warning Signals Test (Continued)

S 865-828

- (1) Close these P11 panel circuit breakers:
 - (a) 11C14, FLAP/SLAT ELEC UNIT 2 POWER
 - (b) 11C15, FLAP/SLAT ELEC UNIT 2 CONT
 - (c) 11C16, FLAP/SLAT ELEC UNIT 2 SENSOR

S 865-723

- (2) Make sure that the SPEED BRAKE lever is in the DOWN position.

S 865-724

- (3) Hold the CONFIG switch on the TEST panel in the T/O position.
 - (a) Make sure the red EICAS message, SPOILERS, does not show on the top display when the EICAS COMPUTER switch is in the L and R positions.

NOTE: The yellow EICAS message, SPOILERS, may show on the top display if there is a fault in the spoiler system.

S 865-725

- (4) Release the CONFIG switch.

S 865-726

- (5) Put the SPEED BRAKE lever in the UP position.

S 865-727

- (6) Hold the CONFIG switch on the TEST panel in the T/O position.
 - (a) Make sure the red CONFIG light comes on.
 - (b) Make sure the WARNING lights come on.
 - (c) Make sure the siren aural warning comes on.
 - (d) Make sure the red EICAS message, SPOILERS, shows on the top display when the EICAS COMPUTER switch is in the L and R positions.

S 865-728

- (7) Release the CONFIG switch.

S 865-729

- (8) Put the SPEED BRAKE lever in the DOWN position.

S 865-730

- (9) Set the parking brake to the ON position.

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S 865-731

WARNING: PREPARE THE SAFETY-SENSITIVE SYSTEMS FOR THE AIR MODE BEFORE YOU OPEN THE AIR/GROUND CIRCUIT BREAKERS. IN THE AIR MODE, MANY OF THE AIRPLANE SYSTEMS CAN OPERATE AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(10) Prepare the safety-sensitive systems for air mode simulation (AMM 32-09-02/201).

S 865-734

(11) Open this P11 panel circuit breaker:
(a) 11C30, LANDING GEAR POS SYS 1

S 865-735

(12) Hold the CONFIG switch on the TEST panel in the T/O position.
(a) Make sure the siren aural warning is not on.
(b) Make sure the red EICAS message, PARKING BRAKE, does not show on the top display.

NOTE: The yellow EICAS message, PARKING BRAKE, may show on the top display.

S 865-736

(13) Release the CONFIG switch.

S 865-737

(14) Close this P11 panel circuit breaker:
(a) 11C30, LANDING GEAR POS SYS 1

S 865-738

(15) Hold the CONFIG switch on the TEST panel in the T/O position.
(a) Make sure the red CONFIG light comes on.
(b) Make sure that the WARNING lights come on.
(c) Make sure the siren aural warning comes on.
(d) Make sure the red EICAS message, PARKING BRAKE, shows on the top display.

S 865-739

(16) Release the CONFIG switch.

S 865-740

(17) Open this P11 panel circuit breaker:
(a) 11S15, LANDING GEAR AIR/GND SYS 1

S 865-741

(18) Hold the CONFIG switch on the TEST panel in the T/O position.
(a) Make sure the red EICAS message, PARKING BRAKE, does not show on the top display.

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- S 865-742
(19) Release the CONFIG switch.
- S 865-743
(20) Close this P11 panel circuit breaker:
(a) 11S15, LANDING GEAR AIR/GND SYS 1
- S 865-624
(21) Put the safety-sensitive systems back to their initial conditions (AMM 32-09-02/201).
- S 865-012
(22) Set the parking brake to the OFF position.
- S 865-625
(23) Make sure that this P11 panel circuit breaker is closed:
(a) GUI 001-004 POST-SB 27-104;
GUI 005-114, 116-999;
11C5, STAB TRIM LEFT CONT
(b) GUI 001-004 PRE-SB 27-104;
GUI 115;
11H11, STAB TRIM LEFT CONT
- S 865-626
(24) Make sure the C STAB TRIM switch on the aisle control stand is in the NORM position.
- S 865-627
(25) Put the R STAB TRIM switch on the aisle control stand in the CUT OUT position.
- S 865-628
(26) Use the control wheel STAB TRIM controls to move the stabilizer such that dimension B is between 15 and 21 inches (AMM 27-48-00/501).
- S 865-629
(27) Hold the CONFIG switch on the TEST panel in the T/O position.
(a) Make sure the red CONFIG light is not on.

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- (b) Make sure the WARNING lights are not on.
- (c) Make sure the siren aural warning is not on.
- (d) Make sure the red EICAS message, STABILIZER, does not show on the top display.

S 865-630

- (28) Slowly move the control wheel STAB TRIM controls forward until the takeoff configuration warnings come on.
 - (a) Measure dimension B on the ballscrew actuator (AMM 27-48-00/501).
 - (b) Make sure that dimension B is 22.76 (+.30/-.20) inches.

S 865-631

- (29) Use the control wheel STAB TRIM controls to move the stabilizer such that dimension B is between 15 and 21 inches.
 - (a) Make sure the takeoff configuration warnings are not on.

S 865-632

- (30) Slowly move the control wheel STAB TRIM controls rearward until the takeoff configuration warnings come on.
 - (a) Measure dimension B on the ballscrew actuator (AMM 27-48-00/501).
 - (b) Make sure that dimension B is 13.78 (+.20/-.30) inches.

S 865-136

- (31) Use the control wheel STAB TRIM controls to move the stabilizer such that dimension B is between 15 and 21 inches.
 - (a) Make sure the takeoff configuration warnings are not on.

S 865-088

- (32) Release the CONFIG switch.

S 865-633

- (33) Set the parking brake to the ON position.

S 865-634

- (34) Put the FLAP lever in the UP position.

NOTE: Permit time for the flaps and slats to retract.

S 865-635

- (35) Remove hydraulic power (AMM 29-11-00/201).

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S 865-636

(36) Close these P11 panel circuit breakers:

- (a) 11C6, FLT CONT ELEC 1L AC
- (b) 11C7, FLT CONT ELEC 1L DC
- (c) 11C8, FLT CONT ELEC 2L AC
- (d) 11C9, FLT CONT ELEC 2L DC
- (e) 11G11, AUTO SPEED BRAKE
- (f) 11G17, FLT CONT ELEC 1R AC
- (g) 11G18, FLT CONT ELEC 1R DC
- (h) 11G27, FLT CONT ELEC 2R AC
- (i) 11G28, FLT CONT ELEC 2R DC
- (j) 11J33, WARN ELEX A

Q. Overspeed Warning Signals Test

S 865-533

(1) Make sure that there is no pressure on the pilot-static system.

S 865-534

(2) Open these P11 panel circuit breakers:

- (a) 11B18, WARN ELEX B
- (b) 11H35, AURAL WARN SPKR RIGHT
- (c) 11J2, EICAS CMPTR LEFT

S 865-535

(3) Put the two throttles in the takeoff position.

S 865-536

(4) Set the angle of attack vanes to 0 degrees.

S 865-537

(5) Hold the AIR DATA switch on the TEST panel in the R position.

(a) Make sure that no warnings come on.

S 865-538

(6) Release the AIR DATA switch.

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- S 865-539
- (7) Hold the AIR DATA switch on the TEST panel in the L position.
- (a) GUI 001-008, 010-999;
Make sure the siren aural warning comes on.
 - (b) GUI 009;
Make sure the clacker aural warning comes on.
- S 865-540
- (8) Release the AIR DATA switch.
- S 865-541
- (9) Open this P11 panel circuit breaker:
- (a) 11J33, WARN ELEX A
- S 865-117
- (10) Close this P11 panel circuit breaker:
- (a) 11B18, WARN ELEX B
- S 865-542
- (11) Hold the AIR DATA switch in the L position.
- (a) GUI 001-008, 010-999;
Make sure the siren aural warning comes on.
 - (b) GUI 009;
make sure the clacker aural warning comes on.
- S 865-543
- (12) Release the AIR DATA switch.
- S 865-544
- (13) Open this P11 panel circuit breaker:
- (a) 11B16, AURAL WARN SPKR LEFT
- S 865-545
- (14) Close this P11 panel circuit breaker:
- (a) 11H35, AURAL WARN SPKR RIGHT
- S 865-546
- (15) Hold the AIR DATA switch in the R position.
- (a) GUI 001-008, 010-999;
Make sure the siren aural warning comes on.
 - (b) GUI 009;
Make sure the clacker aural warning comes on.
- S 865-547
- (16) Release the AIR DATA switch.

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- S 865-548
(17) Open this P11 panel circuit breaker:
(a) 11B18, WARN ELEX B
- S 865-549
(18) Close this P11 panel circuit breaker:
(a) 11J33, WARN ELEX A
- S 745-550
(19) Hold the AIR DATA switch in the R position.
(a) GUI 001-008, 010-999;
Make sure the siren aural warning comes on.
(b) GUI 009;
Make sure the clacker aural warning comes on.
- S 745-006
(20) Release the AIR DATA switch.
- S 745-005
(21) Hold the AIR DATA switch in the L position.
(a) Make sure that no warnings occur.
- S 745-131
(22) Release the AIR DATA switch.
- S 865-003
(23) Close these P11 panel circuit breakers:
(a) 11B16, AURAL WARN SPKR LEFT
(b) 11B18, WARN ELEX B
(c) 11J2, EICAS CMPTR LEFT
- R. Autopilot Disconnect Warning Signals Test
- S 865-551
(1) Make sure that these P11 panel circuit breakers are closed:
(a) 11E16, MODE CONT PNL LEFT
(b) 11E17, FLT CONT COMPUTER POWER LEFT
(c) 11E18, FLT CONT COMPUTER SERVO LEFT
(d) 11E20, FLT CONT CMPTR PWR CTR
(e) 11E21, FLT CONT CMPTR SERVO CTR
(f) 11E34, MODE CONT PNL RIGHT
(g) 11E35, FLT CONT CMPTR PWR RIGHT
(h) 11E36, FLT CONT CMPTR SERVO RIGHT
(i) 11S15, LANDING GEAR AIR/GND SYS 1
(j) 11S19, LANDING GEAR AIR/GND SYS 2
- S 865-552
(2) Open this P11 panel circuit breaker:
(a) 11A17, AUTO FLIGHT WARN

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- S 865-553
(3) Make sure that the MCDP is off.

- S 865-554
(4) Push and hold the autopilot disconnect switch on the captain's control column.
(a) Make sure that the left side of the A/P DISC light comes on.
(b) GUI 001-008, 010-999;
Make sure that a siren aural warning comes from the left and right speakers.
(c) GUI 009;
Make sure that a wailer aural warning comes from the left and right speakers.

- S 865-555
(5) Release the autopilot disconnect switch.
(a) Make sure that the A/P DISC light goes off.
(b) Make sure that the aural warning goes off.

- S 865-556
(6) Close this P11 panel circuit breaker:
(a) 11A17, AUTO FLIGHT WARN

S. GUI 009;
Decision Height Signal Test

- S 865-557
(1) Set the throttles to the takeoff position.

- S 865-138
(2) Open this P11 panel circuit breaker:
(a) 11F5, RAD ALTM LEFT

- S 485-558
(3) Connect the RA test set to the left radio altimeter transceiver (AMM 34-33-00/201).

- S 865-559
(4) Close this P11 panel circuit breaker:
(a) 11F5, RAD ALTM LEFT

- S 865-560
(5) Make sure that these P11 panel circuit breakers are closed:
(a) 11B16, AURAL WARN SPKR LEFT
(b) 11E4, EFIS CONT PNL LEFT
(c) 11J33, WARN ELEX A

- S 865-139
(6) Open these P11 panel circuit breakers:
(a) 11B18, WARN ELEX B
(b) 11F20, RAD ALTM CENTER

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(c) 11H35, AURAL WARN SPKR RIGHT

S 865-561

(7) Make sure that the electronic flight instrument system operates correctly (AMM 34-22-00).

S 865-562

(8) Make sure that the EFI switches on the left and right instrument source select panels are in the NORM position.

S 865-563

(9) Adjust the RA test set to 200 feet.

S 865-564

(10) On the left EFIS control panel, adjust the DH REF to 50 feet.

S 865-565

(11) Make sure that these P11 panels are closed:

(a) 11A7, EFIS DSPL SW LEFT

(b) 11E3, ADI LEFT

(c) 11F8, EFIS SYM GEN LEFT

S 865-566

(12) Push the RESET switch on the left EFIS symbol generator.

S 865-567

(13) On the RA test set, decrease the altitude from 200 feet to 100 feet with a 50 feet per minute rate of descent.

NOTE: Do the subsequent two steps within 30 seconds after the altitude starts to decrease.

(a) On the overhead light control panel, push the TEST switch.

(b) On the left EFIS control panel, set the DH REF to 105 feet.

1) Make sure that the DH aural warning comes on when the altitude reaches 175 feet.

2) Make sure that the DH aural warning rate increases as the altitude decreases.

(c) Push the TEST switch on the overhead light control panel.

(d) Open this P11 panel circuit breaker:

1) 11F5, RAD ALTM LEFT

(e) Disconnect the RA test set from the left radio altimeter transceiver (AMM 34-33-00/201).

(f) Open these P11 panel circuit breakers:

1) 11B16, AURAL WARN SPKR LEFT

2) 11J33, WARN ELEX A

(g) Connect the RA test set to the center radio altimeter transceiver (AMM 34-33-00/201).

(h) Adjust the RA test set to 200 feet.

(i) Close these P11 panel circuit breakers:

1) 11B18, WARN ELEX B

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- 2) 11F20, RAD ALTM CENTER
 - 3) 11H35, AURAL WARN SPKR RIGHT
 - (j) On the left EFIS control panel, set the DH REF to 50 feet.
 - (k) Close this P11 panel circuit breaker:
 - 1) 11F9, EFIS SYS GEN CENTER
 - (l) Open this P11 panel circuit breaker:
 - 1) 11F8, EFIS SYM GEN LEFT
 - (m) On the left instrument source select panel, set the EFI switch to the ALTN position.
 - (n) Push the RESET switch on the center EFIS symbol generator.
 - (o) On the RA test set, decrease the altitude from 200 feet to 100 feet with a 50 feet per minute rate of descent.
 - (p) On the overhead light control panel, push the TEST switch.
 - (q) On the left EFIS control panel, set the DH REF to 105 feet.
 - 1) Make sure that the DH aural warning comes on when the altitude reaches 175 feet.
 - 2) Make sure that the DH aural warning rate increases as the altitude decreases.
 - (r) Push the TEST switch on the overhead light control panel.
 - (s) Open this P11 panel circuit breaker:
 - 1) 11F20, RAD ALTM CENTER
 - (t) Disconnect the RA test set from the center radio altimeter transceiver (AMM 34-33-00/201).
- T. Put the Airplane Back to Its Usual Condition

S 865-637

- (1) Return the flaps and slats to their usual position.

S 865-015

- (2) Put the R STAB TRIM switch to its NORM position.

S 865-638

- (3) Push the POWER SUPPLY RESET switch on the P51 panel.

S 865-639

- (4) Remove electrical power if it is not necessary (Ref 24-22-00).

TASK 31-51-00-725-010

3. Takeoff Configuration Warning Test

NOTE: This is a scheduled maintenance task.

A. References

- (1) AMM 24-22-00/201, Electrical Power - Control
- (2) AMM 27-48-00/501, Stabilizer Trim Position Indicating System
- (3) AMM 27-61-00/201, Spoiler/Speedbrakes System
- (4) AMM 29-11-00/201, Pressurize/Depressurize Main Hydraulic System

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- (5) AMM 32-09-02/201, Air/Ground Relays
- B. Access
 - (1) Location Zones
 - 211/212 Flight Compartment
- C. Prepare for Test
 - S 865-001
 - (1) Supply electrical power (AMM 24-22-00/201).
 - S 865-002
 - (2) Make sure that the six EICAS circuit breakers are closed.
- D. Takeoff Configuration Warning Signals Test
 - S 865-640
 - (1) Open these P11 panel circuit breakers:
 - (a) 11B18, WARN ELEX B
 - (b) 11C6, FLT CONT ELEC 1L AC
 - (c) 11C7, FLT CONT ELEC 1L DC
 - (d) 11C8, FLT CONT ELEC 2L AC
 - (e) 11C9, FLT CONT ELEC 2L DC
 - (f) 11G11, AUTO SPEED BRAKE
 - (g) 11G17, FLT CONT ELEC 1R AC
 - (h) 11G18, FLT CONT ELEC 1R DC
 - (i) 11G27, FLT CONT ELEC 2R AC
 - (j) 11G28, FLT CONT ELEC 2R DC
 - (k) 11J29, EICAS CMPTR RIGHT
 - (l) 11J33, WARN ELEX A
 - S 865-643
 - (2) Set the left and right engine throttles to the takeoff position.
 - S 755-644
 - (3) Make sure the siren aural warning is not on.
 - S 215-645
 - (4) Make sure the red CONFIG light is not on.

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S 215-646

- (5) Make sure the WARNING lights are not on.

NOTE: If the WARNING lights are on, push the captain's or first officer's WARNING light-switch.

S 755-008

- (6) Make sure these red warning messages do not show on the top EICAS display:

NOTE: The yellow EICAS messages, SPOILERS or PARKING BRAKE, may show on the top display.

- (a) SPOILERS
- (b) FLAPS
- (c) PARKING BRAKE
- (d) STABILIZER

S 865-647

- (7) Close this P11 panel circuit breaker:
(a) 11J33, WARN ELEX A

S 845-648

WARNING: DO THE DEACTIVATION PROCEDURE FOR THE SPOILERS OR MOVE ALL PERSONS AND EQUIPMENT AWAY FROM THE SPOILERS. THE SPOILERS CAN MOVE QUICKLY AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (8) Do the deactivation procedure for the spoilers (AMM 27-61-00/201) or move all persons and equipment away from the control surfaces.

S 865-649

- (9) Supply hydraulic power (AMM 29-11-00/201).

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S 865-650

- (10) Set the FLAP control to a takeoff position between 1 and 20 units.

S 865-651

- (11) Set the parking brake to the OFF position.

S 865-652

- (12) Move the STAB TRIM control into the greenband range.

S 865-653

- (13) Move the SPEED BRAKE control to the DOWN position.

S 865-654

- (14) Hold the CONFIG switch on the TEST panel in the T/O position.
(a) Make sure the red CONFIG light is not on.
(b) Make sure the WARNING lights are off.
(c) Make sure the siren aural warning is not on.
(d) Make sure these red warning messages do not show on the top EICAS display:

NOTE: The yellow EICAS messages, SPOILERS or PARKING BRAKE, may show on the top display.

- 1) SPOILERS
- 2) FLAPS
- 3) PARKING BRAKE
- 4) STABILIZER

S 865-655

- (15) Release the CONFIG switch.

S 865-656

- (16) Set the parking brake to the ON position.

S 865-264

- (17) Hold the CONFIG switch on the TEST panel in the T/O position.
(a) Make sure the red CONFIG light comes on.

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- (b) Make sure the WARNING lights come on.
- (c) Make sure the siren aural warning comes on.
- (d) Make sure the red EICAS message, PARKING BRAKE, shows on the top display.

S 865-022

- (18) Release the CONFIG switch.

S 865-657

- (19) Open these P11 panel circuit breakers:
 - (a) 11J2, EICAS CMPTR L
 - (b) 11J33, WARN ELEX A

S 865-658

- (20) Close these P11 panel circuit breakers:
 - (a) 11B18, WARN ELEX B
 - (b) 11J29, EICAS CMPTR R

S 865-659

- (21) Hold the CONFIG switch on the TEST panel in the T/O position.
 - (a) Make sure the red CONFIG light comes on.
 - (b) Make sure the WARNING lights come on.
 - (c) Make sure the siren aural warning comes on.
 - (d) Make sure the red EICAS message, PARKING BRAKE, shows on the top display.

S 865-660

- (22) Release the CONFIG switch.

S 865-661

- (23) Close these P11 panel circuit breakers:
 - (a) 11J2, EICAS CMPTR L
 - (b) 11J33, WARN ELEX A

S 865-662

- (24) Set the parking brake to the OFF position.

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S 865-663

- (25) Hold the CONFIG switch on the TEST panel in the T/O position.
(a) Make sure the red EICAS message, PARKING BRAKE, does not show on the top display when the EICAS COMPUTER switch is in the L and R positions.

S 865-664

- (26) Release the CONFIG switch.

S 865-665

WARNING: KEEP PERSONS AND EQUIPMENT AWAY FROM ALL CONTROL SURFACES WHEN POWER IS SUPPLIED. AILERONS, ELEVATORS, RUDDER, FLAPS, SLATS, SPOILERS, AND STABILIZER ARE FULLY POWERED SURFACES. INJURY OR DAMAGE CAN OCCUR WHEN POWER IS SUPPLIED.

CAUTION: DO NOT OPERATE ALTERNATE DRIVE MOTOR FOR LONGER THAN FOUR MINUTES. PERMIT AT LEAST 20 MINUTES BETWEEN OPERATION SO THAT THE MOTOR CAN BECOME COOL. DAMAGE CAN OCCUR IF THE MOTOR BECOMES TOO HOT.

- (27) Put the LE and TE switches in the NORM position.

S 865-666

- (28) Set the FLAP control to the UP position.

S 865-667

- (29) Hold the CONFIG switch on the TEST panel in the T/O position.

NOTE: During the takeoff configuration warning test, messages will show on the EICAS display. The messages will show for only 5 to 15 seconds after the CONFIG switch is released. To make sure of the message status, the CONFIG switch should be put in the T/O position.

- (a) Make sure the red CONFIG light comes on.

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- (b) Make sure the WARNING lights come on.
- (c) Make sure the siren aural warning comes on.
- (d) Make sure the red EICAS message, FLAPS, shows on the top display.

S 865-668

- (30) Release the CONFIG switch.

S 865-669

- (31) Set the FLAP control to the 20-unit position.

S 865-670

- (32) Hold the CONFIG switch on the TEST panel in the T/O position.
 - (a) Make sure the red EICAS message, FLAPS, does not show on the top display when the EICAS COMPUTER switch is in the L and R positions.

S 865-671

- (33) Release the CONFIG switch.

S 865-672

- (34) Put the ALTN FLAPS control in the 25-unit position.

S 865-673

- (35) Put the TE switch in the ALTN position to activate the TE flaps electric drive.

NOTE: Permit time for the flaps to get to the 25-unit position. The LEADING EDGE light and the EICAS message LE SLAT DISAGREE will come on.

S 865-674

- (36) Hold the CONFIG switch on the TEST panel in the T/O position.
 - (a) Make sure the red EICAS message, FLAPS, shows on the top display when the EICAS COMPUTER switch is in the L and R positions.

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S 865-675

- (37) Release the CONFIG switch.

S 865-676

- (38) Put the TE switch in the NORM position to deactivate the TE flaps electric drive.

NOTE: The flaps will move to the 20-unit position. The slats will start to move to the fully extended position then reverse direction and stop at the intermediate position. The LEADING EDGE light and the EICAS message LE SLAT DISAGREE will go off.

S 865-677

- (39) Put the LE switch in the ALTN position to activate the LE slats electric drive.

NOTE: Permit time for the slats to get to the fully extended position. The TRAILING EDGE light and the EICAS message TE FLAP DISAGREE will come on.

S 865-678

- (40) Hold the CONFIG switch on the TEST panel in the T/O position.
(a) Make sure the red EICAS message, FLAPS, shows on the top display.

S 865-679

- (41) Release the CONFIG switch.

S 865-680

- (42) Put the FLAP lever in the 5-unit position.

S 865-681

- (43) Make sure that the flaps and slats do not move.

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S 865-682

- (44) Put the LE switch in the NORM position to deactivate the LE slats electric drive.

NOTE: The flaps will move to the 5-unit position. The slats will move to the intermediate position. The TRAILING EDGE light and the EICAS message TE FLAP DISAGREE will go off.

S 865-683

- (45) Put the ALTN FLAPS control in the NORM position.

S 865-744

- (46) Make sure that the SPEED BRAKE lever is in the DOWN position.

S 865-745

- (47) Hold the CONFIG switch on the TEST panel in the T/O position.
(a) Make sure the red EICAS message, SPOILERS, does not show on the top display when the EICAS COMPUTER switch is in the L and R positions.

NOTE: The yellow EICAS message, SPOILERS, may show on the top display if there is a fault in the spoiler system.

S 865-746

- (48) Release the CONFIG switch.

S 865-747

- (49) Put the SPEED BRAKE lever in the UP position.

S 865-748

- (50) Hold the CONFIG switch on the TEST panel in the T/O position.
(a) Make sure the CONFIG light comes on.

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- (b) Make sure the WARNING lights come on.
- (c) Make sure the siren aural warning comes on.
- (d) Make sure the red EICAS message, SPOILERS, shows on the top display when the EICAS COMPUTER switch is in the L and R positions.

S 865-749

- (51) Release the CONFIG switch.

S 865-750

- (52) Put the SPEED BRAKE lever in the DOWN position.

S 865-751

- (53) Set the parking brake to the ON position.

S 865-752

WARNING: PREPARE THE SAFETY-SENSITIVE SYSTEMS FOR THE AIR MODE BEFORE YOU OPEN THE AIR/GROUND CIRCUIT BREAKERS. IN THE AIR MODE, MANY OF THE AIRPLANE SYSTEMS CAN OPERATE AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (54) Prepare the safety-sensitive systems for air mode simulation (AMM 32-09-02/201).

S 865-755

- (55) Open this P11 panel circuit breaker:
 - (a) 11C30, LANDING GEAR POS SYS 1

S 865-756

- (56) Hold the CONFIG switch on the TEST panel in the T/O position.
 - (a) Make sure the siren aural warning is not on.
 - (b) Make sure the red EICAS message, PARKING BRAKE, does not show on the top display.

NOTE: The yellow EICAS message, PARKING BRAKE, may show on the top display.

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- S 865-757
(57) Release the CONFIG switch.
- S 865-758
(58) Close this P11 panel circuit breaker:
(a) 11C30, LANDING GEAR POS SYS 1
- S 865-759
(59) Hold the CONFIG switch on the TEST panel in the T/O position.
(a) Make sure the CONFIG light comes on.
(b) Make sure the WARNING lights come on.
(c) Make sure the siren aural warning comes on.
(d) Make sure the red EICAS message, PARKING BRAKE, shows on the top display.
- S 865-760
(60) Release the CONFIG switch.
- S 865-761
(61) Open this P11 panel circuit breaker:
(a) 11S15, LANDING GEAR AIR/GND SYS 1
- S 865-762
(62) Hold the CONFIG switch on the TEST panel in the T/O position.
(a) Make sure the red EICAS message, PARKING BRAKE, does not show on the top display.
- S 865-763
(63) Release the CONFIG switch.
- S 865-764
(64) Close this P11 panel circuit breaker:
(a) 11S15, LANDING GEAR AIR/GND SYS 1
- S 865-765
(65) Put the safety-sensitive systems back to their initial conditions (AMM 32-09-02/201).

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S 865-013

- (66) Set the parking brake to the OFF position.

S 865-766

- (67) Make sure that this P11 panel circuit breaker is closed:
- (a) GUI 001-004 POST-SB 27-104;
GUI 005-114, 116-999;
11C5, STAB TRIM LEFT CONT
 - (b) GUI 001-004 PRE-SB 27-104;
GUI 115;
11H11, STAB TRIM LEFT CONT

S 865-767

- (68) Make sure the C STAB TRIM switch on the aisle control stand is in the NORM position.

S 865-768

- (69) Put the R STAB TRIM switch on the aisle control stand in the CUT OUT position.

S 865-769

- (70) Use the control wheel STAB TRIM controls to move the stabilizer such that dimension B is between 15 and 21 inches (AMM 27-48-00/501).

S 865-770

- (71) Hold the CONFIG switch on the TEST panel in the T/O position.
- (a) Make sure the red CONFIG light is not on.
 - (b) Make sure the WARNING lights are not on.
 - (c) Make sure the siren aural warning is not on.
 - (d) Make sure the red EICAS message, STABILIZER, does not show on the top display.

S 865-771

- (72) Slowly move the control wheel STAB TRIM controls forward until the takeoff configuration warnings come on.
- (a) Measure dimension B on the ballscrew actuator (AMM 27-48-00/501).
 - (b) Make sure that dimension B is 22.76 (+.30/-.20) inches.

S 865-772

- (73) Use the control wheel STAB TRIM controls to move the stabilizer such that dimension B is between 15 and 21 inches.
- (a) Make sure the takeoff configuration warnings are not on.

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S 865-773

- (74) Slowly move the control wheel STAB TRIM controls down until the takeoff configuration warnings come on.
- (a) Measure dimension B on the ballscrew actuator (AMM 27-48-00/501).
 - (b) Make sure that dimension B is 13.78 (+.20/- .30) inches.

S 865-023

- (75) Use the control wheel STAB TRIM controls to move the stabilizer such that dimension B is between 15 and 21 inches.
- (a) Make sure the takeoff configuration warnings are not on.

S 865-024

- (76) Release the CONFIG switch.

S 865-774

- (77) Set the parking brake to the ON position.

S 865-775

- (78) Put the FLAP Lever in the UP position.

NOTE: Permit time for the flaps and slats to retract.

S 865-776

- (79) Remove hydraulic power (AMM 29-11-00/201).

S 865-777

- (80) Close these P11 panel circuit breakers:
- (a) 11C6, FLT CONT ELEC 1L AC
 - (b) 11C7, FLT CONT ELEC 1L DC
 - (c) 11C8, FLT CONT ELEC 2L AC
 - (d) 11C9, FLT CONT ELEC 2L DC
 - (e) 11G11, AUTO SPEED BRAKE

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- (f) 11G17, FLT CONT ELEC 1R AC
- (g) 11G18, FLT CONT ELEC 1R DC
- (h) 11G27, FLT CONT ELEC 2R AC
- (i) 11G28, FLT CONT ELEC 2R DC
- (j) 11J33, WARN ELEX A

E. Put the Airplane Back to Its Usual Condition

S 865-778

- (1) Return the flaps and slats to their usual position.

S 865-014

- (2) Put the R STAB TRIM switch to its NORM position.

S 865-779

- (3) Push the POWER SUPPLY RESET switch on the P51 panel.

S 865-780

- (4) Remove electrical power if it is not necessary (AMM 24-22-00/201).

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WARNING SYSTEM – INSPECTION/CHECK

1. General

- A. The Warning System inspection and check procedure is an operational test of the fire bell, siren and electronic owl, and chime aural indicators.
- B. This procedure also does a check of the wailer aural warning.

TASK 31-51-00-716-011

2. WEU Aural Indicators Check

A. References

- (1) 22-10-00/501, Autoflight System
- (2) 24-22-00/201, Electrical Power – Control

B. Access

- (1) Location Zones
211/212 Flight Compartment

C. Prepare for the Checks

S 866-012

- (1) Supply electrical power (Ref 24-22-00/201).

S 866-002

- (2) Make sure these circuit breakers on the overhead circuit breaker panel, P11, are closed:
 - (a) 11B10, WW FIRE/DUCT LEAK 1
 - (b) 11B16, AURAL WARN SPKR L
 - (c) 11B18, WARN ELEX B
 - (d) 11C23, INTERPHONE CABIN SERVICE
 - (e) 11H35, AURAL WARN SPKR R
 - (f) 11J33, WARN ELEX A
 - (g) EICAS (6 locations)

D. Fire Bell Check

S 746-013

- (1) On the P8 electronics panel, push and hold the WHL WELL switch on the FIRE/OVHT test panel and make sure of this indication:
 - (a) Make sure that the fire bell comes on.

NOTE: GUI 001-008, 010-999;
the fire bell comes on for approximately 0.8 second each 10 seconds.
GUI 009;
the fire bell comes on for approximately 2 seconds each 5 seconds.

E. Siren/Owl Check

S 866-005

- (1) Make sure that the parking brake is engaged.
 - (a) Make sure that the EICAS message, PARKING BRAKE, shows in red on the top EICAS display.

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S 746-014

- (2) On the right side panel, P61, momentarily push the TEST switch on the EICAS MAINT panel and make sure that these indications occur:
- (a) Make sure that the siren aural warning comes on.

NOTE: The siren comes on for approximately 4 seconds at a time.

- (b) Make sure that the owl aural warning comes on.

NOTE: The owl comes on for approximately 1 second at a time.

- (c) Make sure that the MASTER WARNING lights on the glareshield come on.

S 866-008

- (3) On the glareshield, momentarily push one of the MASTER WARNING switch-lights and make sure that these indications occur:
- (a) Make sure that the siren goes off.

NOTE: The siren can take up to 4 seconds before it goes off.

- (b) Make sure that the owl goes off.

NOTE: The owl can take up to 1 second before it goes off.

- (c) Make sure that the MASTER WARNING lights go off.

S 746-015

- (4) On the EICAS MAINT panel, momentarily push the TEST switch to remove electrical power from the test circuits.
- (a) Make sure that the CAUTION WARNING lights go off.

F. Chime Check

S 866-009

- (1) On a cabin interphone handset, momentarily push the PILOT switch.
- (a) Make sure that one chime sound is heard.

G. GUI 009;
Wailer Check

S 866-016

- (1) Make sure the Autoflight System is operational (Ref 22-10-00/501).

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- S 866-017
- (2) Open this circuit breaker on the P11 panel:
(a) 11A17, AUTO FLIGHT WARN
- S 866-018
- (3) Make sure that the MCDP is off.
- S 866-019
- (4) Push and hold the autopilot disconnect switch on the captain's control column.
(a) Make sure that the left side of the A/P DISC light comes on.
(b) Make sure that the wailer aural warning comes from the captain's and first officer's speakers.
- S 866-020
- (5) Release the autopilot disconnect switch.
(a) Make sure that the A/P DISC light goes off.
(b) Make sure that the aural warning goes off.
- S 866-021
- (6) Close this circuit breaker on the P11 panel:
(a) 11A17, AUTO FLIGHT WARN
- H. Put the Airplane Back to Its Usual Condition
- S 866-055
- (1) Remove electrical power if it is not necessary (Ref 24-22-00/201).

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EMI FILTER MODULE - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
 - (1) A removal of the EMI filter module
 - (2) An installation of the EMI filter module.
- B. The EMI filter modules are installed in the warning electronics unit (WEU), P51. The WEU is in the forward electrical/electronic equipment area.

TASK 31-51-01-004-001

2. EMI Filter Module Removal (Fig. 401)

- A. References
 - (1) AMM 20-41-01/201, Electrostatic Sensitive Devices
- B. Access
 - (1) Location Zones
 - 119/120 Main Equipment Center
 - 211/212 Flight Compartment

C. Removal Procedure

S 864-002

- (1) Open these circuit breakers on the overhead circuit breaker panel, P11, and attach DO-NOT-CLOSE tags:
 - (a) 11B18, WARN ELEX B
 - (b) 11J33, WARN ELEX A

S 914-095

CAUTION: DO NOT TOUCH THE WEU BEFORE YOU DO THE PROCEDURE FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE WEU.

- (2) Before you touch the WEU, do the procedure for devices that are sensitive to electrostatic discharge (AMM 20-41-01/201).

S 014-086

- (3) Remove the four fasteners that attach the WEU, P51, to the airplane.

S 014-087

- (4) Carefully pull the WEU out to get access to the rear panel.

S 014-088

- (5) Remove the twelve fasteners from the rear panel of the WEU.

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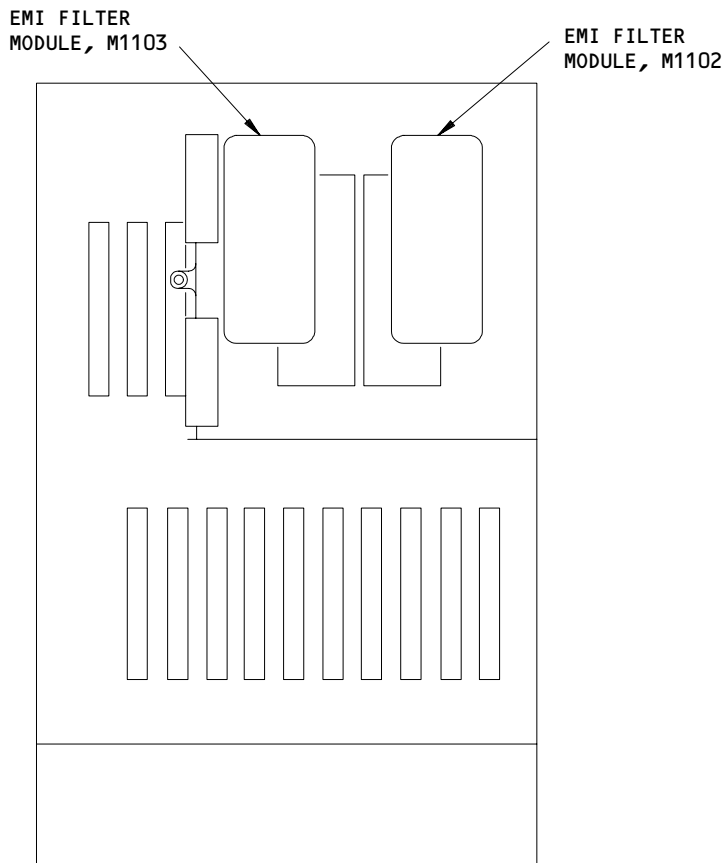
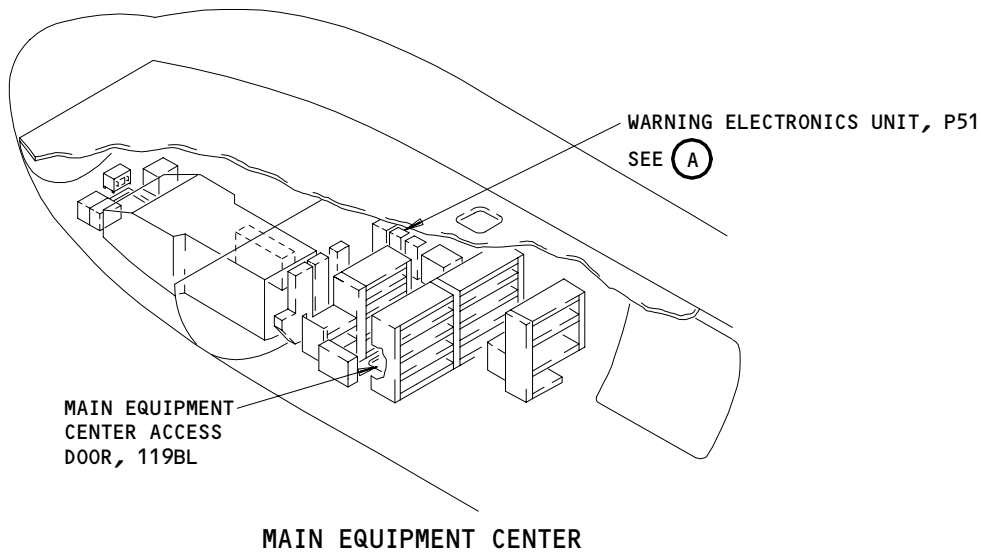
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BOEING
757
MAINTENANCE MANUAL



WARNING ELECTRONICS UNIT, P51 (REAR VIEW)

(A)

EMI Filter Module Installation
Figure 401

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S 014-089

- (6) Remove the rear panel from the WEU.

S 024-005

- (7) Remove the EMI filter module:
- (a) Remove the three fasteners that attach the filter plate to the WEU.
 - (b) Remove the two fasteners that attach the EMI filter module to the filter plate.
 - (c) Remove the EMI filter module from the filter plate.

TASK 31-51-01-404-006

3. EMI Filter Module Installation (Fig. 401)

A. References

- (1) AMM 20-41-01/201, Electrostatic Sensitive Devices
- (2) AMM 24-22-00/201, Electrical Power - Control
- (3) AMM 27-32-00/501, Stall Warning System
- (4) AMM 31-51-04/401, Warning Electronics Unit (WEU) Card Modules

B. Access

- (1) Location Zones
 - 119/120 Main Equipment Center
 - 211/212 Flight Compartment

C. Installation Procedure

S 864-008

- (1) Make sure that these P11 panel circuit breakers are open:
- (a) 11B18, WARN ELEX B
 - (b) 11J33, WARN ELEX A

S 914-096

CAUTION: DO NOT TOUCH THE WEU BEFORE YOU DO THE PROCEDURE FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE WEU.

- (2) Before you touch the WEU, do the procedure for devices that are sensitive to electrostatic discharge (AMM 20-41-01/201).

S 424-009

- (3) Install the EMI filter module:
- (a) Put the EMI filter module into position on the filter plate.
 - (b) Install the two fasteners to attach the module to the filter plate.

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(c) Install the three fasteners to attach the filter plate to the WEU.

S 414-090

(4) Put the rear panel into position on the WEU.

S 424-091

(5) Install the twelve fasteners to attach the rear panel to the WEU.

S 414-091

(6) Put the WEU into position for installation.

S 414-092

(7) Install the four fasteners to attach the WEU to the airplane.

S 864-011

(8) Remove the DO-NOT-CLOSE tags and close these P11 panel circuit breakers:

(a) 11B18, WARN ELEX B

(b) 11J33, WARN ELEX A

D. Installation Test

S 864-093

(1) Supply electrical power (AMM 24-22-00/201).

S 724-094

(2) Do the WEU Card Modules Test (AMM 31-51-04/401).

S 724-093

(3) Do the Stall Warning System - Operational Test (AMM 27-32-00/501).

S 864-094

(4) Remove electrical power if it is not necessary (AMM 24-22-00/201).

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SPEED BRAKE HANDLE POSITION SWITCH – REMOVAL/INSTALLATION

1. General

- A. This procedure has two tasks. The first task is the switch removal. The second task is the switch installation.
- B. The speed brake handle position switch is installed on the speedbrake mechanism. The speedbrake mechanism is located in the aisle control stand on the left side.

TASK 31-51-03-004-001

2. Speed Brake Handle Position Switch Removal (Fig. 401)

- A. References
 - (1) 27-62-00/501, Auto Speedbrake Control System
- B. Access
 - (1) Location Zones
211/212 Flight Compartment
- C. Prepare for the Removal
 - S 864-003
 - (1) Open these circuit breakers on the overhead panel, P11, and attach DO-NOT-CLOSE tags:
 - (a) 11B18, WARN ELEX B
 - (b) 11J33, WARN ELEX A
- D. Procedure
 - S 014-004
 - (1) Remove the left access panel from the aisle control stand.
 - S 034-005
 - (2) Remove the two screws from the speed brake handle position switch.
 - S 034-006
 - (3) Remove the wire-bundle connectors.
 - S 034-007
 - (4) Disconnect the switch wires from the terminal blocks.
 - S 024-008
 - (5) Remove the speed brake handle position switch from the mechanism.

TASK 31-51-03-404-009

3. Speed Brake Handle Position Switch Installation (Fig. 401)

- A. References
 - (1) 24-22-00/201, Electrical Power – Control
 - (2) 27-62-00/501, Auto Speedbrake Control System
- B. Consumable Materials
 - (1) Heat-shrink

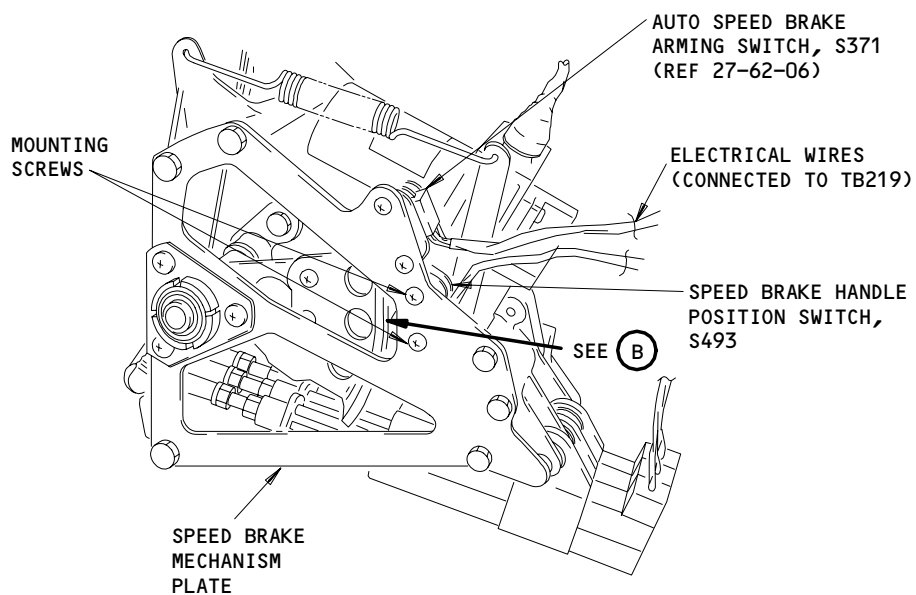
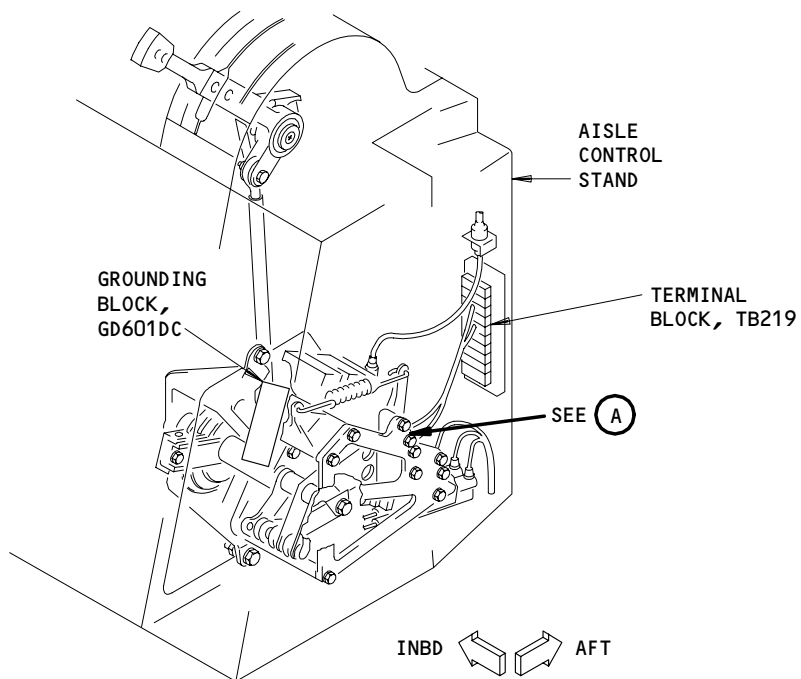
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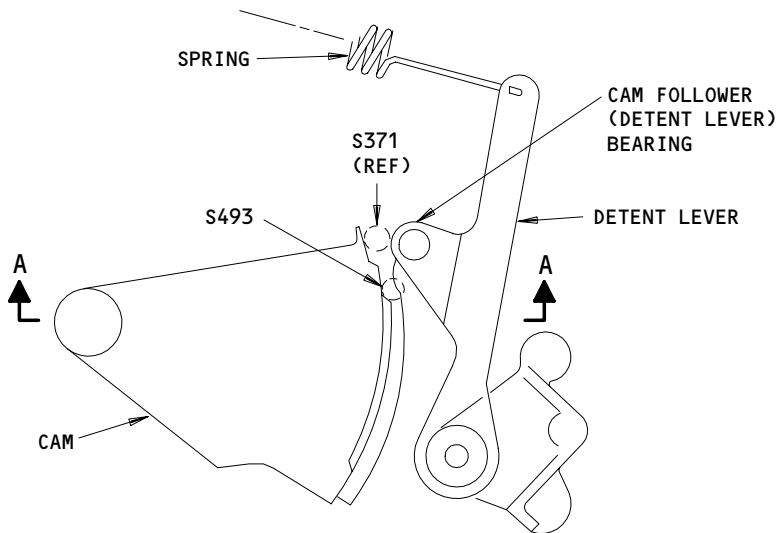


(A)

Speed Brake Handle Position Switch
Figure 401 (Sheet 1)

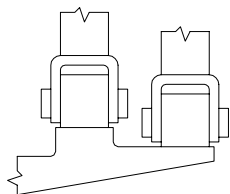
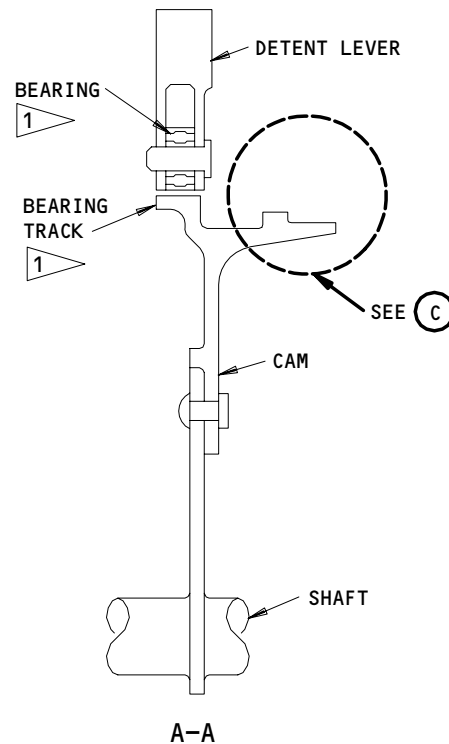
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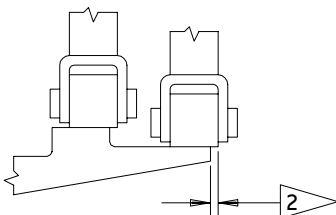


DETENT LEVER AND SWITCH ROLLERS
(SPEED BRAKE HANDLE DOWN POSITION)

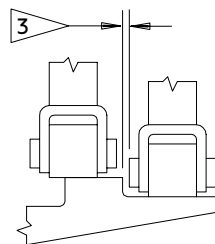
(B)



NORMAL TRACKING



TRACKING LIMITS



TRACKING LIMITS

S493 SWITCH

(C)

- 1 THE OUTER EDGE OF THE BEARING SHOULD NOT EXTEND OVER THE TRACK FOR THE FULL RANGE OF CAM MOTION
- 2 0.03 INCH MAXIMUM (EITHER SIDE)
- 3 0.002 INCH MINIMUM CLEARANCE OVER THE FULL TRACK

Speed Brake Handle Position Switch
Figure 401 (Sheet 2)

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C. Access

- (1) Location Zones
211/212 Flight Compartment

D. Prepare for Installation

S 864-010

- (1) Make sure that these P11 panel circuit breakers are open:
(a) 11B18, WARN ELEX B
(b) 11J33, WARN ELEX A

E. Procedure

S 424-011

- (1) Install the speed brake handle position switch on the mechanism.

S 434-012

- (2) Install the speed brake mechanism with the two screws.

S 864-013

- (3) Make sure that the two switch rollers are on the cam. Do the procedure for cam adjustments if necessary (Ref 27-62-00/501).

S 624-014

- (4) Apply yellow heat-shrink from the switch wire handle to the terminal block, TB219.

S 434-015

- (5) Connect the switch wires to the terminal blocks.

S 434-016

- (6) Connect the wire-bundle together.

S 864-018

- (7) Remove the DO-NOT-CLOSE tags and close these P11 panel circuit breakers:
(a) 11B18, WARN ELEX B
(b) 11J33, WARN ELEX A

F. Speed Brake Handle Position Switch Test

S 864-019

- (1) Supply electrical power (Ref 24-22-00/201).

S 864-020

- (2) Make sure that the EICAS circuit breakers (six locations) are closed.

S 864-021

- (3) Set the speed brake handle in the UP position.

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- S 864-022
- (4) Hold the CONFIG switch on the TEST panel in the T/O position.
(a) Make sure that the EICAS message, SPOILERS, shows on the top display.
- S 864-023
- (5) Release the CONFIG switch.
- S 864-024
- (6) Return the speed brake handle to the DOWN position.
- S 864-025
- (7) Hold the CONFIG switch in the T/O position.
(a) Make sure that the EICAS message, SPOILERS, does not show on the top display.
- S 864-027
- (8) Release the CONFIG switch.
- S 864-026
- (9) Remove electrical power if it is not necessary (Ref 24-22-00/201).

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WARNING ELECTRONICS UNIT (WEU) CARD MODULES – REMOVAL/INSTALLATION

1. General

A. The card modules are installed in the warning electronics unit (WEU), P51. The WEU is found right of forward in the main equipment center. The modules included in these procedures are as follows:

- (1) M616 – Power Supply Module A
- (2) M618 – Master Warning Module
- (3) M619 – Right Siren/Owl Module
- (4) M620 – Takeoff (T/O) Configuration Warning Module
- (5) M621 – Power Supply Module B
- (6) M983 – Landing Configuration Warning Module
- (7) M999 – Left Siren/Owl Module
- (8) M1000 – Bell/Chime Module
- (9) GUI 009;
M10421 – Left Clacker/Wailer Module
- (10) GUI 009;
M10422 – Right Clacker/Wailer Module
- (11) GUI 009;
M10423 – Decision Height Module

TASK 31-51-04-004-001

2. Remove the Card Modules (Fig. 401)

A. References

- (1) AMM 20-10-01/401, E/E Rack Mounted Components
- (2) AMM 20-41-01/201, Electrostatic Discharge Sensitive Devices

B. Access

- (1) Location Zones
 - 119 Main Equipment Center
 - 211/212 Flight Compartment

C. Prepare for the Removal

S 844-002

- (1) Open these circuit breakers on the overhead circuit breaker panel, P11, and attach DO-NOT-CLOSE tags:
 - (a) 11B18, WARN ELEX B
 - (b) 11J33, WARN ELEX A

S 014-003

- (2) Open the WEU door.

D. Procedure

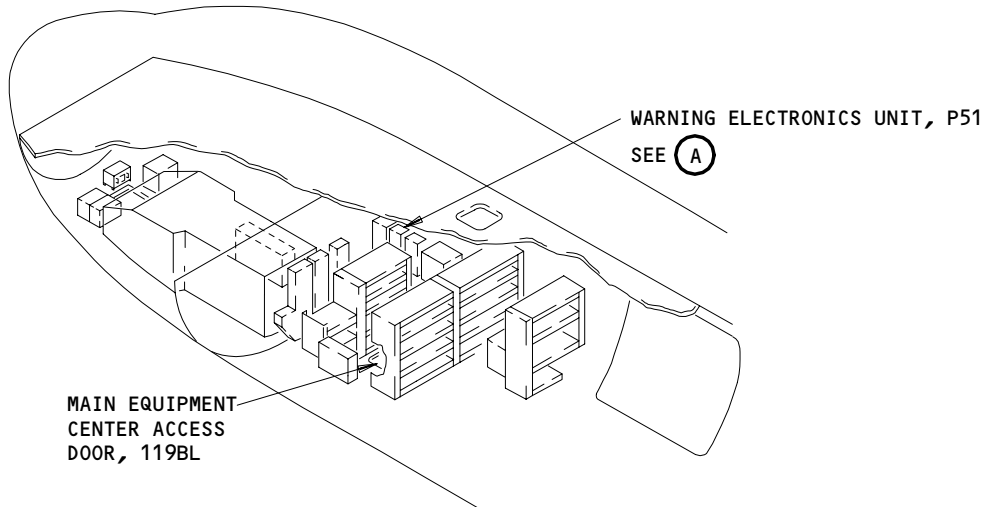
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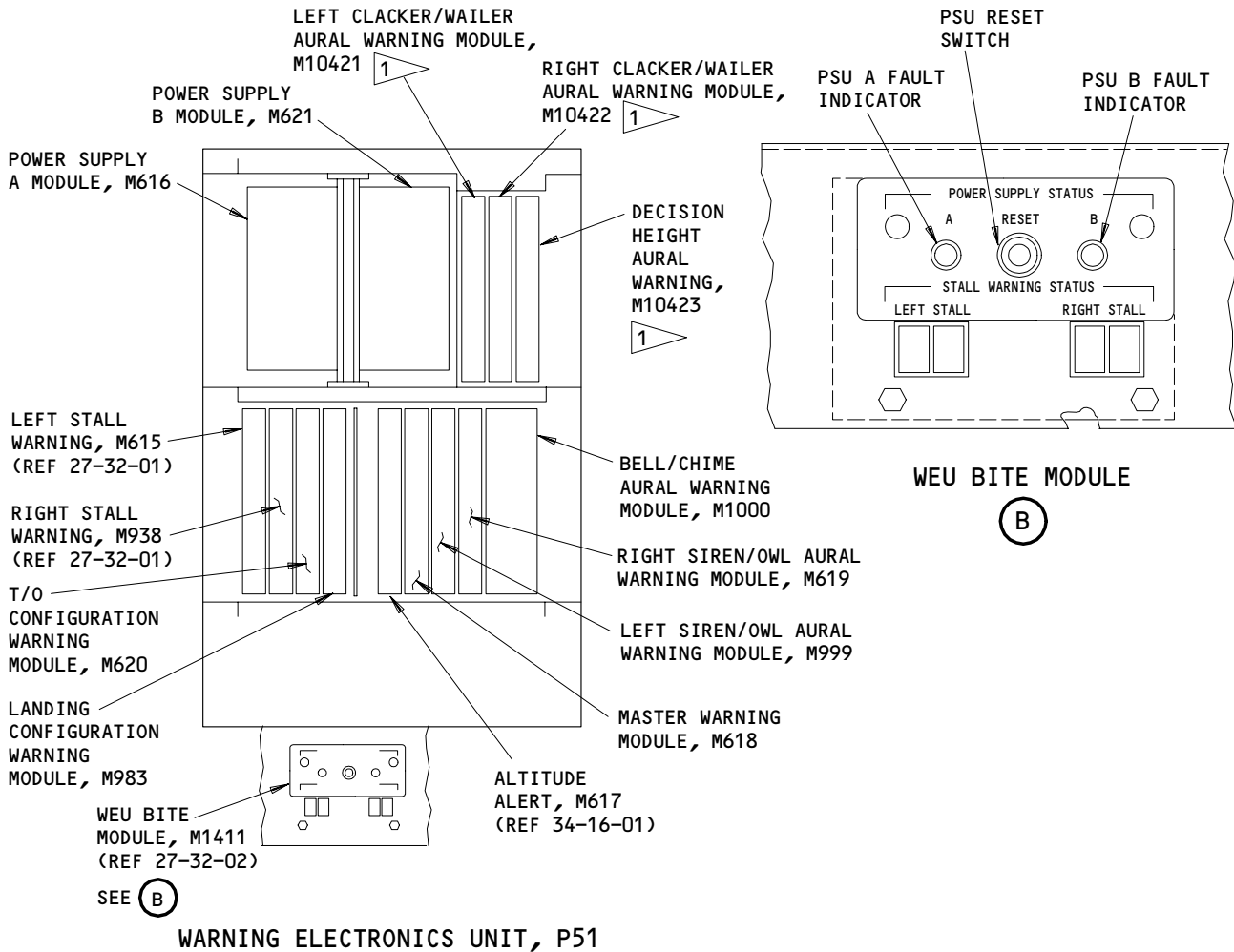
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MAIN EQUIPMENT CENTER



1 GUI 009

(A)

Warning Electronics Unit Card Module Installation
Figure 401

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S 914-004

CAUTION: DO NOT TOUCH THE CARD MODULES BEFORE YOU DO THE PROCEDURE FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE CARD MODULES.

- (1) Do the procedure for devices that are sensitive to electrostatic discharge (AMM 20-41-01/201).

S 024-006

- (2) Remove the applicable card module (AMM 20-10-01/401).

TASK 31-51-04-404-007

3. Install the Card Modules

A. References

- (1) AMM 20-10-01/401, E/E Rack-mounted Components
- (2) AMM 20-41-01/201, Electrostatic Discharge Sensitive Devices

B. Access

- (1) Location Zones
 - 119/120 Main Equipment Center
 - 211/212 Flight Compartment

C. Prepare for Installation

S 844-008

- (1) Make sure that these P11 panel circuit breakers are open:
 - (a) 11B18, WARN ELEX B
 - (b) 11J33, WARN ELEX A

S 014-121

- (2) Open the access door, 119BL, for the Warning Electronics Unit, P51 (AMM 06-41-00/201).

S 014-122

- (3) Open the WEU door, P51.

D. Procedure

S 424-009

CAUTION: DO NOT TOUCH THE CARD MODULES BEFORE YOU DO THE PROCEDURE FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE CARD MODULES.

- (1) Do the procedure for devices that are sensitive to electrostatic discharge (AMM 20-41-01/201).

S 424-010

- (2) Install the applicable card module (AMM 20-10-01/401).

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- S 414-086
(3) Close the WEU access door, P51.

- S 864-011
(4) Remove the DO-NOT-CLOSE tags and close these P11 panel circuit breakers:
(a) 11B18, WARN ELEX B
(b) 11J33, WARN ELEX A

E. Installation Test

- S 424-118
(1) AIRPLANES WITHOUT POWER SUPPLY MODULE P/N 285T0035-201;
For the applicable card module, do this task: WEU Card Module Test (AMM 31-51-04/401).

- S 424-119
(2) AIRPLANES WITH POWER SUPPLY MODULE P/N 285T0035-201;
Do the steps that follow:
(a) If you install a power supply module, do this task: WEU Card Module Test (AMM 31-51-04/401).
(b) If you install other card modules, then for each card installed do this task: WEU Card Module Test (AMM 31-51-04/401).

TASK 31-51-04-724-088

4. WEU Card Module Test

A. References

- (1) AMM 24-22-00/201, Electrical Power - Control
- (2) AMM 31-41-00/501, Engine Indication and Crew Alerting System (EICAS)
- (3) AMM 31-51-00/501, Warning System
- (4) AMM 32-09-02/201, Air/Ground Relay System
- (5) AMM 32-09-02/501, Air/Ground Relay System
- (6) AMM 34-22-00/501, Electronic Flight Instrument System (EFIS)
- (7) AMM 34-33-00/201, Radio Altimeter System
- (8) AMM 34-33-00/501, Radio Altimeter System

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- (9) AMM 34-12-00/501, Air Data Computer system
- B. Access
 - (1) Location Zones
 - 119 Main Equipment Center
 - 211/212 Flight Compartment

C. Prepare for the Test

NOTE: The procedures that follow make sure that the card modules are installed correctly. The complete system test is found in (AMM 31-51-00/501).

- S 844-012
 - (1) Supply electrical power (AMM 24-22-00/201).
- S 864-089
 - (2) Make sure the EICAS system operates correctly (AMM 31-41-00/501).
- S 864-150
 - (3) Make sure that the Air Data Computer system is energized (AMM 34-12-00).
- S 864-151
 - (4) Make sure the Radio Altimeter system is energized (AMM 34-33-00).
- S 864-152
 - (5) Make sure that the Warning system is energized (AMM 31-51-00).
- S 864-153
 - (6) Make sure that the Parking Brake is set.
- S 844-013
 - (7) Make sure that these P11 panel circuit breakers are closed:
 - (a) 11B16, AURAL WARN SPKR LEFT
 - (b) 11B18, WARN ELEX B
 - (c) 11H35, AURAL WARN SPKR RIGHT
 - (d) 11J33, WARN ELEX A
- S 844-014
 - (8) Make sure that the air/ground relay system is operational (AMM 32-09-02/501).

NOTE: The procedures that follow make sure that the card modules are installed correctly. The complete system test is found in (AMM 31-51-00/501).

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D. Power Supply Card Modules Test

S 744-015

- (1) Push the RESET switch on the WEU.
 - (a) Make sure that the PS-A indicator shows black.
 - (b) Make sure that the PS-B fault indicator shows black.

E. Master Warning Card Module Test

S 864-017

- (1) Open this P11 panel circuit breaker:
 - (a) 11B18, WARN ELEX B

S 214-018

- (2) Make sure that the WARNING lights on the P7 panel and the CONFIG light the on P2 panel are off.

S 744-019

- (3) Push and hold the CONFIG switch on the Miscellaneous Test panel in the LDG position.
 - (a) Make sure that the WARNING lights and the CONFIG light come on.

S 744-020

- (4) Momentarily push the captain's or first officer's WARNING light.
 - (a) Make sure that the two master warning lights go off.

S 864-021

- (5) Release the CONFIG switch.

S 864-022

- (6) Close this P11 panel circuit breaker:
 - (a) 11B18, WARN ELEX B

S 864-023

- (7) Open this P11 panel circuit breaker:
 - (a) 11J33, WARN ELEX A

S 214-024

- (8) Make sure that the WARNING and CONFIG lights are off.

S 744-025

- (9) Push and hold the CONFIG switch on the miscellaneous test panel in the LDG position.
 - (a) Make sure that the WARNING lights and CONFIG light come on.

S 744-026

- (10) Momentarily push the captain's or first officer's WARNING light.
 - (a) Make sure that the two master warning lights go off.

S 864-027

- (11) Release the CONFIG switch.

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S 214-028

- (12) Make sure that the WARNING and CONFIG lights go off.

S 864-029

- (13) Close this P11 panel circuit breaker:
(a) 11J33, WARN ELEX A

F. Bell/Chime Aural Warning Card Module Test

S 864-036

- (1) Make sure this circuit breaker on the P11 panel is closed:
(a) 11B10, WW FIRE/DUCT LEAK 1

S 864-031

- (2) Open this P11 panel circuit breaker:
(a) 11B18, WARN ELEX B

S 864-030

- (3) Push and hold the WHL WELL test switch on the FIRE/OVHT test panel on the aft electronic control panel, P8.
(a) Make sure the fire bell aural warning comes on.

NOTE: GUI 001-008, 010-999;
the fire bell sequence is 0.8 second on and 9.2 seconds off.
GUI 009;
the firebell sequence is 2 seconds on and 3 seconds off.

S 864-037

- (4) Release the WHL WELL switch.
(a) Make sure that the fire bell aural warning goes off.

NOTE: Do not continue the test for at least 20 seconds.

S 864-038

- (5) Close this P11 panel circuit breaker:
(a) 11B18, WARN ELEX B

G. Left Siren/Owl Card Module Test

S 864-145

- (1) Put the Air/Ground Relay System in the Ground Mode (AMM 32-09-02/201).

S 864-149

- (2) Make sure this P11 panel circuit breaker is closed:
(a) 11S19, AIR/GND SYS 2

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- S 864-016
- (3) Open this P11 panel circuit breaker and attach DO-NOT-CLOSE tag:
(a) 11H35, AURAL WARN SPKR RIGHT

- S 864-040
- (4) Make sure that the parking brake is on.

- S 744-041
- (5) Set and hold the CONFIG test switch on the P61 TEST panel to the T/O position.

- S 754-042
- (6) Make sure that the siren aural comes on.

- S 844-043
- (7) Release the CONFIG test switch.

- S 844-044
- (8) Remove the DO-NOT-CLOSE tags and close this circuit breaker:
(a) 11H35, AURAL WARN SPKR RIGHT

H. Right Siren/Owl Card Module Test

- S 864-147
- (1) Put the Air/Ground Relay System in the Ground Mode (AMM 32-09-02/201).

- S 864-046
- (2) Open this P11 panel circuit breaker and attach DO-NOT-CLOSE tag:
(a) 11B16, AURAL WARN SPKR LEFT

- S 864-148
- (3) Make sure that this P11 panel circuit breaker is closed:
(a) 11S19, AIR/GND SYS 2

- S 864-047
- (4) Make sure that the parking brake is on.

- S 744-048
- (5) Set and hold the CONFIG test switch on the P61 TEST panel to the T/O position.

- S 754-049
- (6) Make sure that the siren aural comes on.

- S 844-050
- (7) Release the CONFIG test switch.

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S 844-051

- (8) Remove the DO-NOT-CLOSE tags and close this P11 panel circuit breaker:
(a) 11B16, AURAL WARN SPKR LEFT

I. Landing Configuration Warning Card Module Test

S 864-104

- (1) Make sure the Radio Altimeter is operational (AMM 34-33-00/501).

S 864-053

- (2) Make sure that the red CONFIG light on the center instrument panel is off.

S 864-054

- (3) If the master WARNING lights are on, push the captain's or first officers WARNING light.

S 744-055

- (4) Set and hold the CONFIG switch on the Miscellaneous Test panel to the LDG position.

S 754-056

- (5) Do a check for the indications that follow:
(a) Red CONFIG light
(b) Master WARNING lights
(c) Siren aural warning
(d) The EICAS message, GEAR NOT DOWN, on the top EICAS display unit

S 844-057

- (6) Release the CONFIG switch.

J. Takeoff Configuration Warning Card Module Test

S 864-059

- (1) Make sure that the parking brake is engaged.

S 214-060

- (2) Make sure that the red CONFIG light on the center instrument panel is off.

S 864-061

- (3) If the master WARNING lights are on, push the captain's or first officer's master WARNING light.

S 744-062

- (4) Set and hold the CONFIG switch on the Miscellaneous Test panel to the T/O position.

S 744-063

- (5) Do a check for the indications that follow:
(a) Red CONFIG light

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- (b) Master WARNING lights
- (c) Siren aural warning
- (d) The EICAS message, PARKING BRAKE, shows on the top display

S 844-064

- (6) Release the CONFIG switch.

K. GUI 009;

Left and Right Clacker/Wailer Modules Test

S 864-095

- (1) Open this circuit breaker on the P11 panel:
 - (a) 11A17, AUTO FLIGHT WARN

S 864-096

- (2) Make sure that the MCDP is off.

S 864-097

- (3) Push and hold the Autopilot Disconnect switch on the captain's control column.
 - (a) Make sure the wailer aural warning comes on from the left and right speakers.

S 864-098

- (4) Release the Autopilot Disconnect switch.
 - (a) Make sure the wailer aural warning stops.

S 864-099

- (5) Close this circuit breaker on the P11 panel:
 - (a) 11A17, AUTO FLIGHT WARN

L. GUI 009;

Decision Height Card Module Test

S 564-072

- (1) Set the two throttles to the takeoff position.

S 844-073

- (2) Connect the radio altimeter (RA) test set to the left RA R/T unit (AMM 34-33-00/201).

S 844-074

- (3) Make sure that these P11 panel circuit breakers are closed:
 - (a) 11A7, EFIS DSPL SW LEFT
 - (b) 11E3, ADI LEFT

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- 11B16, AURAL WARN SPKR LEFT
- (c) 11E4, EFIS CONT PNL LEFT
- 11J33, WARN ELEX A
- (d) 11F5, RADIO ALTM LEFT
- (e) 11F8, EFIS SYM GEN LEFT

S 864-087

- (4) Make sure that the captain's EFI instrument source select switch is set to the NORM position.

S 864-075

- (5) Adjust the RA test set to an input radio altitude of 200 feet.

S 744-076

- (6) Set the left EFIS control panel to get a DH indication of 50.

S 864-124

- (7) Make sure that these circuit breakers on Overhead Panel P11-1 are close:

- 11A7, EFIS DSPL SW LEFT
- 11E3 ADI LEFT
- 11F8, EFIS SYM GEN LEFT

S 744-077

- (8) Push the RESET switch on the left EFIS symbol generator.

S 864-126

- (9) On the RA test set, decrease the Radio Altitude Test Signal from 200 feet to 100 feet with a 50 feet per minute rate of descent.

NOTE: Do the subsequent two steps within 30 seconds after the altitude starts to decrease.

S 744-160

- (10) Set the left EFIS control panel DH REF to get a DH indication of 105 feet.
 - (a) Verify that the DH aural warning comes on when the altitude reaches 155 feet.
 - (b) Verify that the DH aural warning rate increases as the altitude decreases.

S 844-143

- (11) Open this P11 panel circuit breaker:
 - 11F5, RAD ALTM LEFT

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- S 844-144
(12) Disconnect the RA test set from the Left Radio Altimeter (AMM 34-33-00/201).
- S 844-128
(13) Open these P11 panel circuit breakers:
11B16, AURAL WARN SPKR LEFT
11J33, WARN ELEX A
- S 844-129
(14) Connect the RA test set to the Center Radio Altimeter transceiver (AMM 34-33-00/201).
- S 844-130
(15) Adjust the RA test set to 200 feet.
- S 844-161
(16) Make sure these P11 panel circuit breakers are closed:
11B18, WARN ELEX B
11F20, RAD ALTM CENTER
11H35, AURAL WARN SPKR RIGHT
- S 844-132
(17) On the left EFIS control panel, set the DH REF to 50 feet.
- S 844-133
(18) Close this P11 panel circuit breaker:
11F9, EFIS SYM GEN CENTER
- S 844-134
(19) Open this P11 panel circuit breaker:
11F8, EFIS SYM GEN LEFT
- S 844-135
(20) On the left instrument source select panel, set the EFI switch to the ALTN position.
- S 844-136
(21) Push the RESET switch on the Center EFIS symbol generator.
- S 844-137
(22) On the RA test set, decrease the altitude from 200 feet to 100 feet with a 50 feet per minute rate of descent.
- S 844-138
(23) On the overhead light control panel, push and hold the TEST switch.

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S 844-139

- (24) On the left EFIS control panel, set the DH REF to 105 feet.
- (a) Make sure that the DH aural warning comes on when the altitude reaches 155 feet.
 - (b) Make sure that the DH aural warning rate increases as the altitude decreases.

S 844-140

- (25) Release the TEST switch on the overhead light control panel.

S 844-141

- (26) Open this P11 panel circuit breaker:
11F20, RAD ALTM CENTER

S 844-142

- (27) Disconnect the RA test set from the center RADIO ALTIMETER transceiver (AMM 34-33-00/201).

M. Put the Airplane Back to Its Usual Condition

S 844-082

- (1) Put the EFIS system back to its usual condition (AMM 34-22-00/501).

S 844-083

- (2) Put the RA system back to its usual condition, and remove the RA test set (AMM 34-33-00/201).

S 844-084

- (3) Put the Safety-Sensitive systems back to their initial conditions (AMM 32-09-02/201).

S 414-123

- (4) Close the access door, 119BL
(AMM 06-41-00/201).

S 844-085

- (5) Remove electrical power if it is not necessary
(AMM 24-22-00/201).

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