

CHAPTER

74

IGNITION



FAULT ISOLATION MANUAL

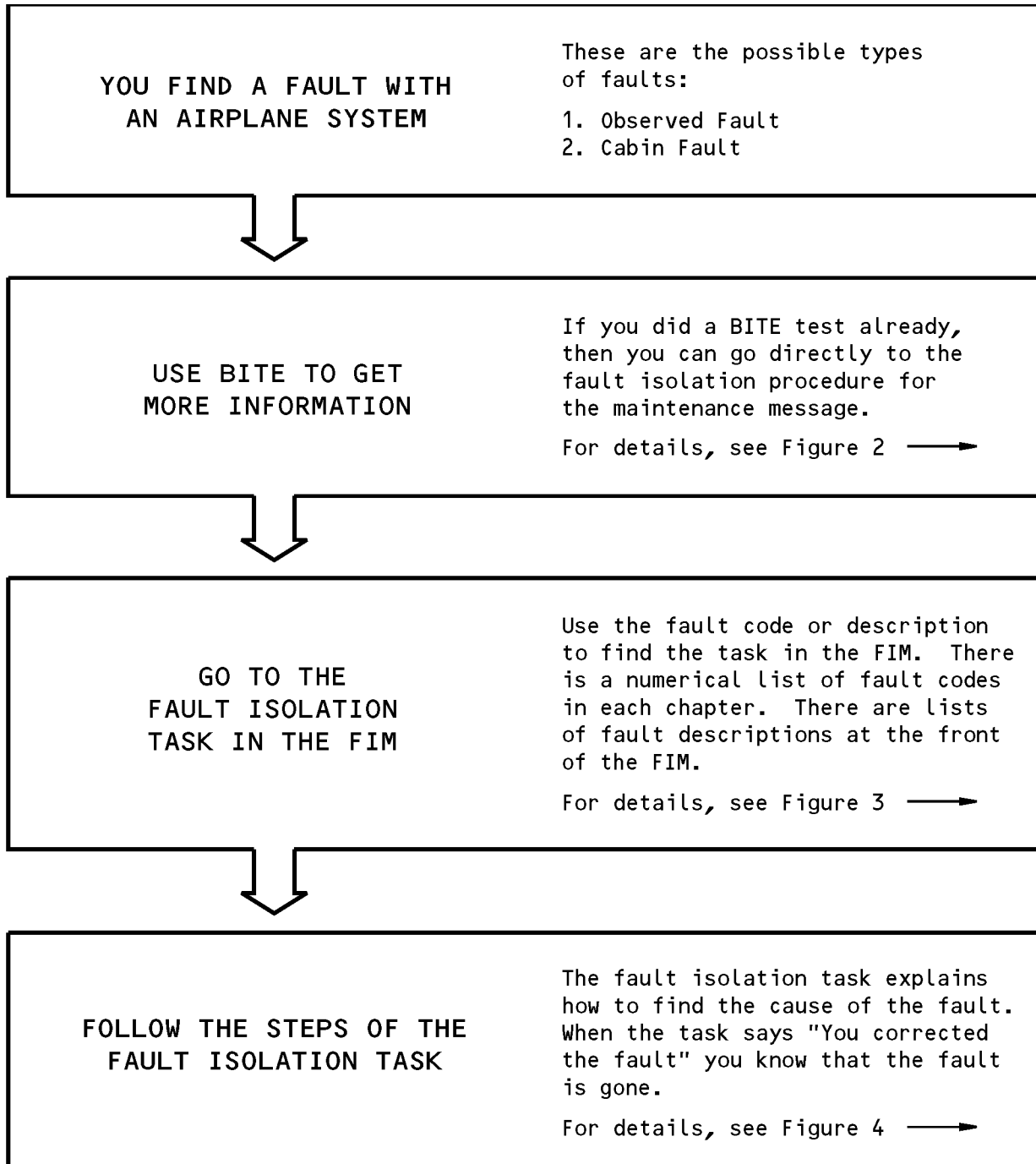
CHAPTER 74

IGNITION

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A = Added, R = Revised, D = Deleted, O = Overflow, C = Customer Originated

74-EFFECTIVE PAGES

FAULT ISOLATION MANUAL

Basic Fault Isolation Process
Figure 1

FAULT ISOLATION MANUAL

Some airplane systems have built-in test equipment (BITE). IF the system finds a fault when you do a BITE test, it will give you a maintenance message.

A maintenance message can be any of these:

- a code
- a text message
- a light
- an indication.

To find the fault isolation task for a maintenance message, go to the Maintenance Message Index in the chapter for the applicable system.

If you do not know which chapter is the correct one, look at the list at the front of any Maintenance Message Index. For each system or component (LRU) that has BITE, this list gives the chapter number where you can find the Index that you need.

Find the maintenance message for the applicable LRU or system in the Index. Then find the task number on the same line as the maintenance message. Go to the task in the FIM and do the steps of the task (see Figure 4).

Getting Fault Information from BITE
Figure 2

FAULT ISOLATION MANUAL**IF YOU HAVE:****THEN DO THIS TO FIND THE TASK IN THE FIM:****FAULT CODE**

1. The first two digits of the fault code are the FIM chapter that you need. Go to the Fault Code Index in that chapter and find the fault code. If the fault code starts with a letter, then go to the Cabin Fault Code Index at the front of the FIM.
2. Find the task number on the same line as the fault code. Go to the task in the FIM and do the steps in the task (see Figure 4).

OBSERVED FAULT DESCRIPTION

1. Go to the Observed Fault List at the front of the FIM and find the best description for the fault.
2. Find the task number on the same line as the fault description. Go to the task in the FIM and do the steps of the task (see Figure 4).

CABIN FAULT DESCRIPTION

1. Go to the Cabin Fault List at the front of the FIM and find the best description for the fault.
2. Find the task number on the same line as the fault description. Go to the task in the FIM and do the steps of the task (see Figure 4).

MAINTENANCE MESSAGE (FROM BITE)

1. Go to the Maintenance Message Index in the chapter for the LRU (the front of each Index gives you the chapter number for all LRUs). Find the maintenance message in the Index.
2. Find the task number on the same line as the maintenance message. Go to the task in the FIM and do the steps in the task (see Figure 4).

Finding the Fault Isolation Task in the FIM
Figure 3

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FAULT ISOLATION MANUALASSUMED CONDITIONS AT START OF TASK

- External electrical power is ON
- Hydraulic power and pneumatic power are OFF
- Engines are shut down
- No equipment in the system is deactivated

POSSIBLE CAUSES

- The list of possible causes has the most likely cause first and the least likely cause last.
- You can use the maintenance records of your airline to determine if the fault occurred before. Compare the list of possible causes to the past maintenance actions. This will help prevent repetition of the same maintenance actions.

INITIAL EVALUATION PARAGRAPH

- The primary purpose of the Initial Evaluation paragraph at the start of the task is to help you find out if you can detect the fault right now:
 - If you cannot detect the fault right now, then the task cannot isolate the fault and the Initial Evaluation paragraph will say that there was an intermittent fault.
 - If you have an intermittent fault, you must use your judgement (and follow your airline's policy) to decide which maintenance action to take. Then monitor the airplane to see if the fault happens again on subsequent flights.
- The Initial Evaluation paragraph can also help you find out which Fault Isolation Procedure to use to isolate and correct the fault.

FAULT ISOLATION STEPS

- Do the steps of the task in the specified order. The "If ... then" statements that you see will guide you along the correct path.
- When you are at the endpoint of the path, the step says "...you corrected the fault." Complete the step and exit the procedure.

Doing the Fault Isolation Task
Figure 4

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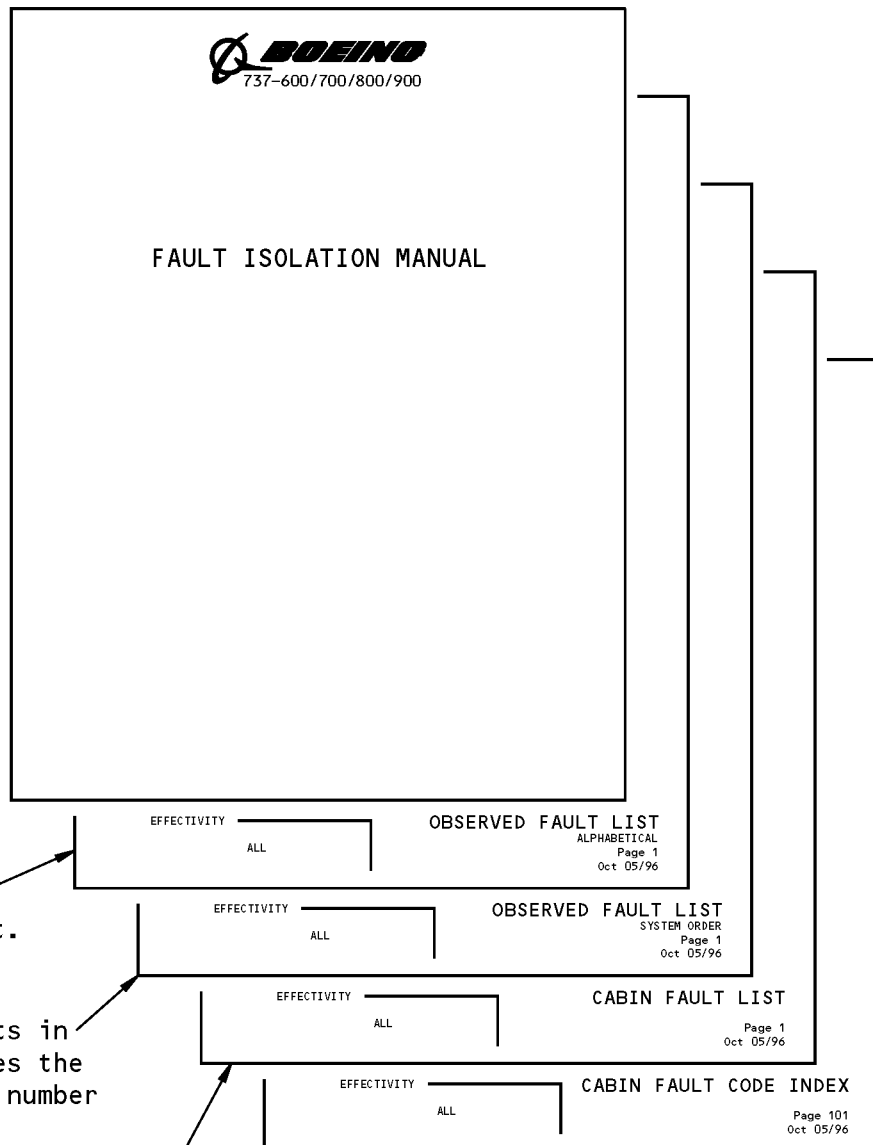
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Alphabetical list of all observed faults. Gives the fault code and a FIM task number for each fault.

List of all observed faults in order by ATA system. Gives the fault code and a FIM task number for each fault.

List of all cabin faults arranged in order by cabin function. Gives the fault code and a FIM task number for each fault.

Numerical list of all cabin faults in order by fault code. Gives a FIM task reference for each fault.

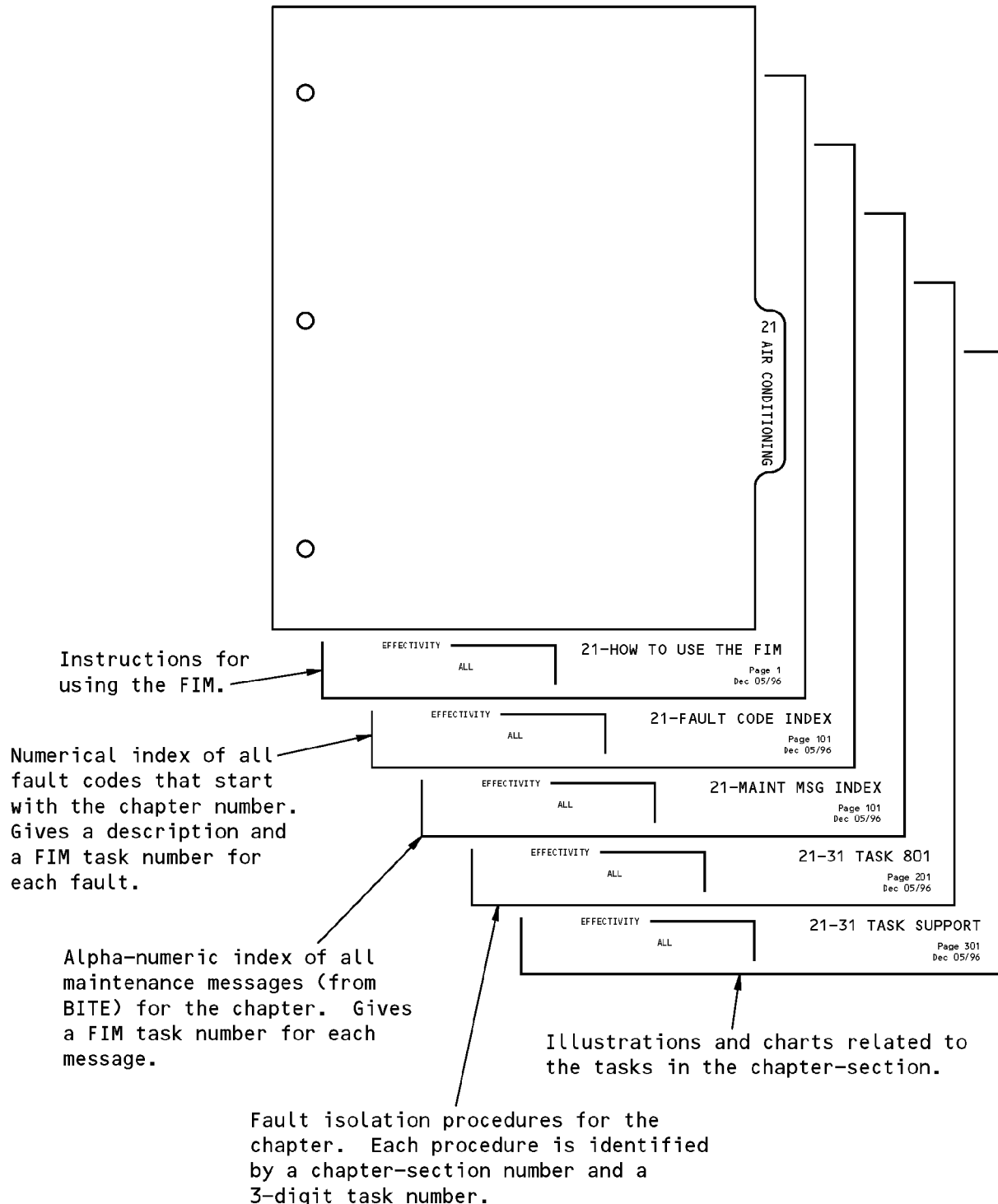
Subjects at Front of FIM
Figure 5

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Subjects in Each FIM Chapter
Figure 6

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<u>LRU/SYSTEM</u>	<u>SHORT NAME</u>	<u>CHAPTER</u>
Air Data Inertial Reference System	ADIRS	34
Air Traffic Controller Transponder - 1 (Left)	ATC XPDR - 1 (L)	34
Air Traffic Controller Transponder - 2 (Right)	ATC XPDR - 2 (R)	34
Airborne Vibration Monitor System Signal Conditioner	AVM SIG COND	77
Antiskid Control Unit	ANTISKID	32
Automatic Direction Finder Receiver - 1	ADF RECVR - 1	34
Autothrottle System	A/T	22
Auxiliary Power Unit	APU	49
Auxiliary Power Unit Generator Control Unit	APU GCU	24
Bus Power Control Unit	BPCU	24
Cabin Pressure Controller	CAB PRESS CON	21
Cabin Temperature Controller	CAB TEMP CONT	21
Cargo Electronic Unit - Forward	CEU - FWD	26
Cargo Electronic Unit - Lower	CEU - LOWER	26
Cargo Electronic Unit - Main Aft	CEU - MAIN AFT	26
Cargo Electronic Unit - Main Forward	CEU - MAIN FWD	26
Common Display System	CDS	31
Compartment Overheat Detection Control Module	WING/BODY OHT	26
Digital Flight Control System	DFCS	22
Distance Measurement Equipment Interrogator	DME INTRROGTR	34
Electrical Meters, Battery, and Galley Power Module	P5-13	24
Electronic Engine Controller - 1	ENGINE - 1	73
Electronic Engine Controller - 2	ENGINE - 2	73
Emergency Locator Transmitter	ELT	23
Engine Accessory Unit	ENG ACCY UNIT	78
Engine and Auxiliary Power Unit Fire Detection Control Module	ENG/APU FIRE	26
Flap/Slat Electronics Unit	FSEU	27
Flight Data Acquisition Unit	FDAU	31
Flight Management Computer System	FMCS	34
Fuel Quantity Indicating System	FQIS	28
Generator Control Unit - 1	GCU - 1	24
Generator Control Unit - 2	GCU - 2	24
Ground Proximity Computer	GROUND PROX	34
Head Up Display	HUD	34

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<u>LRU/SYSTEM</u>	<u>SHORT NAME</u>	<u>CHAPTER</u>
High Frequency Transceiver	HF XCVR	23
Low Limit (35 Degree F) Controller - Left	35 DEG CONT L	21
Low Limit (35 Degree F) Controller - Right	35 DEG CONT R	21
Multi-Mode Receiver	MMR	34
Pack/Zone Temperature Controller - Left	PACK/ZN CON - L	21
Pack/Zone Temperature Controller - Right	PACK/ZN CON - R	21
Proximity Switch Electronics Unit	PSEU	32
Radio Altimeter Receiver/Transmitter	RADIO ALTIMTR	34
Stall Management Yaw Damper Computer - 1	SMYD - 1	27
Stall Management Yaw Damper Computer - 2	SMYD - 2	27
Traffic Alert and Collision Avoidance System Computer	TCAS COMPUTER	34
VHF Omnidirectional Ranging Marker Beacon Receiver	VOR/MKR RCVR	34
Very High Frequency Transceiver	VHF XCVR	23
Waste Tank Logic Control Module	WASTE TANK	38
Weather Radar Receiver/Transmitter	WEATHER RADAR	34
Window Heat Control Unit - Left Forward	WHCU - L FWD	30
Window Heat Control Unit - Left Side	WHCU - L SIDE	30
Window Heat Control Unit - Right Forward	WHCU - R FWD	30
Window Heat Control Unit - Right Side	WHCU - R SIDE	30

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LRU/SYSTEM	MAINTENANCE MESSAGE	GO TO FIM TASK
ENGINE - 1	74-10951 IGN L (IGN 1) IS FAILED	74-21 TASK 806
ENGINE - 1	74-10961 IGN R (IGN 2) IS FAILED	74-21 TASK 807
ENGINE - 1	74-10971 THE APL INPUT VOLTAGE FOR THE L EXCITER (IGN 1) IS OUT OF RANGE	74-21 TASK 801
ENGINE - 1	74-10981 THE APL INPUT VOLTAGE FOR THE R EXCITER (IGN 2) IS OUT OF RANGE	74-21 TASK 802
ENGINE - 1	74-10991 THE APL INPUT VOLTAGE FOR THE L EXCITER (IGN 1) IS ALWAYS ON	74-21 TASK 803
ENGINE - 1	74-11001 THE APL INPUT VOLTAGE FOR THE R EXCITER (IGN 2) IS ALWAYS ON	74-21 TASK 804
ENGINE - 1	74-11301 DEU1 IGNITER DATA IS NOT CORRECT	74-21 TASK 805
ENGINE - 1	74-11311 DEU2 IGNITER DATA IS NOT CORRECT	74-21 TASK 805
ENGINE - 1	74-20951 IGN L (IGN 1) IS FAILED	74-21 TASK 806
ENGINE - 1	74-20961 IGN R (IGN 2) IS FAILED	74-21 TASK 807
ENGINE - 1	74-20971 THE APL INPUT VOLTAGE FOR THE L EXCITER (IGN 1) IS OUT OF RANGE	74-21 TASK 801
ENGINE - 1	74-20981 THE APL INPUT VOLTAGE FOR THE R EXCITER (IGN 2) IS OUT OF RANGE	74-21 TASK 802
ENGINE - 1	74-20991 THE APL INPUT VOLTAGE FOR THE L EXCITER (IGN 1) IS ALWAYS ON	74-21 TASK 803
ENGINE - 1	74-21001 THE APL INPUT VOLTAGE FOR THE R EXCITER (IGN 2) IS ALWAYS ON	74-21 TASK 804
ENGINE - 1	74-21301 DEU1 IGNITER DATA IS NOT CORRECT	74-21 TASK 805
ENGINE - 1	74-21311 DEU2 IGNITER DATA IS NOT CORRECT	74-21 TASK 805
ENGINE - 1	74-30951 IGN L (IGN 1) IS FAILED	74-21 TASK 806
ENGINE - 1	74-30961 IGN R (IGN 2) IS FAILED	74-21 TASK 807
ENGINE - 1	74-30971 THE APL INPUT VOLTAGE FOR THE L EXCITER IS OUT OF RANGE	74-21 TASK 801
ENGINE - 1	74-30981 THE APL INPUT VOLTAGE FOR THE R EXCITER (IGN 2) IS OUT OF RANGE	74-21 TASK 802
ENGINE - 1	74-30991 THE APL INPUT VOLTAGE FOR THE L EXCITER IS ALWAYS ON	74-21 TASK 803
ENGINE - 1	74-31001 THE APL INPUT VOLTAGE FOR THE R EXCITER (IGN 2) IS ALWAYS ON	74-21 TASK 804
ENGINE - 1	74-31301 DEU1 IGNITER DATA IS NOT CORRECT	74-21 TASK 805

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LRU/SYSTEM	MAINTENANCE MESSAGE	GO TO FIM TASK
ENGINE - 1	74-31311 DEU2 IGNITER DATA IS NOT CORRECT	74-21 TASK 805
ENGINE - 2	74-10952 IGN L (IGN 1) IS FAILED	74-21 TASK 806
ENGINE - 2	74-10962 IGN R (IGN 2) IS FAILED	74-21 TASK 807
ENGINE - 2	74-10972 THE APL INPUT VOLTAGE FOR THE L EXCITER (IGN 1) IS OUT OF RANGE	74-21 TASK 801
ENGINE - 2	74-10982 THE APL INPUT VOLTAGE FOR THE R EXCITER (IGN 2) IS OUT OF RANGE	74-21 TASK 802
ENGINE - 2	74-10992 THE APL INPUT VOLTAGE FOR THE L EXCITER (IGN 1) IS ALWAYS ON	74-21 TASK 803
ENGINE - 2	74-11002 THE APL INPUT VOLTAGE FOR THE R EXCITER (IGN 2) IS ALWAYS ON	74-21 TASK 804
ENGINE - 2	74-11302 DEU1 IGNITER DATA IS NOT CORRECT	74-21 TASK 805
ENGINE - 2	74-11312 DEU2 IGNITER DATA IS NOT CORRECT	74-21 TASK 805
ENGINE - 2	74-20952 IGN L (IGN 1) IS FAILED	74-21 TASK 806
ENGINE - 2	74-20962 IGN R (IGN 2) IS FAILED	74-21 TASK 807
ENGINE - 2	74-20972 THE APL INPUT VOLTAGE FOR THE L EXCITER (IGN 1) IS OUT OF RANGE	74-21 TASK 801
ENGINE - 2	74-20982 THE APL INPUT VOLTAGE FOR THE R EXCITER (IGN 2) IS OUT OF RANGE	74-21 TASK 802
ENGINE - 2	74-20992 THE APL INPUT VOLTAGE FOR THE L EXCITER (IGN 1) IS ALWAYS ON	74-21 TASK 803
ENGINE - 2	74-21002 THE APL INPUT VOLTAGE FOR THE R EXCITER (IGN 2) IS ALWAYS ON	74-21 TASK 804
ENGINE - 2	74-21302 DEU1 IGNITER DATA IS NOT CORRECT	74-21 TASK 805
ENGINE - 2	74-21312 DEU2 IGNITER DATA IS NOT CORRECT	74-21 TASK 805
ENGINE - 2	74-30952 IGN L (IGN 1) IS FAILED	74-21 TASK 806
ENGINE - 2	74-30962 IGN R (IGN 2) IS FAILED	74-21 TASK 807
ENGINE - 2	74-30972 THE APL INPUT VOLTAGE FOR THE L EXCITER (IGN 1) IS OUT OF RANGE	74-21 TASK 801
ENGINE - 2	74-30982 THE APL INPUT VOLTAGE FOR THE R EXCITER (IGN 2) IS OUT OF RANGE	74-21 TASK 802
ENGINE - 2	74-30992 THE APL INPUT VOLTAGE FOR THE L EXCITER (IGN 1) IS ALWAYS ON	74-21 TASK 803
ENGINE - 2	74-31002 THE APL INPUT VOLTAGE FOR THE R EXCITER (IGN 2) IS ALWAYS ON	74-21 TASK 804

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LRU/SYSTEM	MAINTENANCE MESSAGE	GO TO FIM TASK
ENGINE - 2	74-31302 DEU1 IGNITER DATA IS NOT CORRECT	74-21 TASK 805
ENGINE - 2	74-31312 DEU2 IGNITER DATA IS NOT CORRECT	74-21 TASK 805

FAULT ISOLATION MANUAL**801. Airplane Input Voltage For The Left Exciter (IGN 1) Is Out of Range - Fault Isolation****A. Description**

- (1) This task is for these maintenance message numbers:
 - (a) 74-10971, 74-10972, 74-20971, 74-20972, 74-30971, and 74-30972.
 - (b) For the maintenance message 74-X097Y; where X = EEC Channel (1 = Channel A, 2 = Channel B, 3 = Dual Channel), and Y = Engine Position (1 = Eng 1, 2 = Eng 2), do the applicable Fault Isolation:
 - (c) If X = 1 or 2, do the Fault Isolation Procedure - Single Channel Fault.
 - (d) If X = 1 and 2 (two messages), or if X = 3, do the Fault Isolation Procedure - Dual Channel Fault.
- (2) This message can be set by one of these conditions:
 - (a) The EEC senses that the left igniter power (115 VAC) is less than 89 V with the start lever in the IDLE position.
 - (b) The EEC senses that the left igniter power (115 VAC) is more than 141 V with the start lever in the IDLE position.
- (3) This fault is reported when the EEC has electrical power.
 - (a) This fault should show as a dual channel message. If a single channel message shows, there is an internal EEC problem.

B. Possible Causes

- (1) For the single channel maintenance message:
 - (a) EEC, M1818.
- (2) For the dual channel maintenance message:
 - (a) The wires, the connectors and the ignition switches between the ignition circuit breakers and the EEC
 - (b) EEC, M1818.

C. Circuit Breakers

- (1) For Engine 1,
 - (a) This is the primary circuit breaker related to the fault:

CAPT Electrical System Panel, P18-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C00153	ENGINE 1 IGNITION LEFT

- (2) For Engine 2,
 - (a) This is the circuit breaker:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	6	C00151	ENGINE 2 IGNITION LEFT

D. Related Data

- (1) Component Location (Figure 301)
- (2) Simplified Schematic (Figure 302)

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(3) (SSM 74-11-11)

(4) (WDM 74-11-11)

E. Initial Evaluation

- (1) To find out if the fault is still active, do this task: Audible Test of the Ignition System - EEC BITE Igniters Test, AMM TASK 74-00-00-750-801-F00
 - (a) If maintenance message number 74-10971, 74-10972, 74-20971, or 74-20972 shows, then do the Fault Isolation Procedure - Single Channel Fault.
 - (b) If maintenance message number 74-30971 or 74-30972 shows, then do the Fault Isolation Procedure - Dual Channel Fault.
 - (c) If the maintenance message does not show on the FMCS CDU, then there was a momentary loss of electrical power to the left exciter or EEC, or an intermittent fault.
 - 1) For a momentary loss of electrical power, do a check of the pilots' log for an indication of a momentary power interruption on the airplane or on the 115 VAC transfer bus 1 (Eng 1) or 2 (Eng 2).
 - a) If you find a report, then this was the cause of this fault. If no report was made, then there was an intermittent fault.
 - 2) For an intermittent fault you must use your judgment, your airline policies, and the Possible Causes list to make the decision if you will try to correct the fault.
 - 3) If you will try to correct the fault, it is recommended that you do these steps:
 - a) Do the visual checks of the electrical connectors in the applicable fault isolation procedure below.
 - b) Use the WDM references to identify intermediate electrical connections in the wire harness and do a visual check.
 - c) If you find no problems, then replace components as listed in the Possible Causes list above.
 - 4) Monitor the airplane on the subsequent flight.

F. Fault Isolation Procedure - Single Channel Fault

- (1) If the fault was found by the Initial Evaluation, then replace the EEC, M1818.

These are the tasks:

EEC Removal, AMM TASK 73-21-60-000-801-F00,

EEC Installation, AMM TASK 73-21-60-400-801-F00.

- (a) Do the Repair Confirmation at the end of this task.

G. Fault Isolation Procedure - Dual Channel Fault

- (1) Do these steps to prepare for the procedure:
 - (a) For Engine 1,
 - 1) Make sure that these circuit breakers are open and have safety tags:

CAPT Electrical System Panel, P18-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C00153	ENGINE 1 IGNITION LEFT
A	4	C01390	ENGINE 1 ALTN PWR CHAN B
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

- (b) For Engine 2,



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- 1) Make sure that these circuit breakers are open and have safety tags:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	6	C00151	ENGINE 2 IGNITION LEFT
D	7	C01391	ENGINE 2 ALTN PWR CHAN B
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

- (c) Make sure that the applicable start lever is in the CUTOFF position.
- (d) If not already done, do this task: Open the Fan Cowl Panels, AMM TASK 71-11-02-010-801-F00.

- (2) Examine the electrical connector DP0101 at the EEC:

NOTE: The electrical connector DP0101 is on the MW0301 wire harness at the J1 receptacle.

- (a) Make sure that the electrical connector DP0101 is correctly connected to the EEC.
- (b) Disconnect the electrical connector DP0101 from the EEC.
- (c) Visually examine the EEC J1 receptacle and wire harness connector.

- 1) If the EEC J1 receptacle is damaged, then replace the EEC, M1818.

These are the tasks:

EEC Removal, AMM TASK 73-21-60-000-801-F00,

EEC Installation, AMM TASK 73-21-60-400-801-F00.

- a) Do the Repair Confirmation at the end of this task.
- b) If the Repair Confirmation is not satisfactory then continue.
- 2) If the harness connector is damaged, then replace the MW0301 wire harness.

These are the tasks:

Nacelle Wiring Harnesses Removal, AMM TASK 71-51-03-000-801-F00,

Nacelle Wiring Harnesses Installation, AMM TASK 71-51-03-400-801-F00.

- a) Do the Repair Confirmation at the end of this task.
- b) If the Repair Confirmation is not satisfactory, then continue.
- 3) If the connector was not correctly connected, and no other problem was found, then do the Repair Confirmation at the end of this task.
- 4) If the Repair Confirmation is not satisfactory, then continue.
- (d) If you did not find a problem, then continue.

- (3) To examine the applicable left ignition switches, S88 (Eng 1) or S90 (Eng 2), in the engine start brake assembly, you can use input monitoring to see if the switch operation agrees with the selected start lever position.

NOTE: 737-SL-76-020 notes that some switches in the engine start brake assembly cause engine start problems.

- (a) For Engine 1,

- 1) Remove the safety tag and close this circuit breaker:

CAPT Electrical System Panel, P18-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C00153	ENGINE 1 IGNITION LEFT

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(b) For Engine 2,

1) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	6	C00151	ENGINE 2 IGNITION LEFT

(c) Get access to the input monitoring screen on the CDU:

1) Push the INIT REF key two times.

NOTE: This causes the PERF INIT INDEX to show.

2) Push the INDEX line select key (LSK).

3) Push the MAINT LSK.

4) Push the ENGINE LSK.

5) Push the line select key for the applicable engine (ENGINE 1 or ENGINE 2).

NOTE: This causes the ENGINE X BITE TEST MAIN MENU to show.

6) Push the INPUT MONITORING LSK.

NOTE: An alert message will show to tell you that only data from one channel is available.

7) Push the CONTINUE LSK.

NOTE: This causes the INPUT MONITORING MENU to show. Push the NEXT PAGE key to go to page 2 of the menu

8) Push the DISCRETES LSK.

NOTE: This causes the INPUT MONITORING GMM DISCRETES screen to show.

9) Push the NEXT PAGE key twice to see page 3/3 and find the L IGNITER 115V line on the screen.

(d) With the applicable start lever in the CUTOFF position, make sure the value is OFF.

(e) Put the applicable start lever to the IDLE position and make sure the value is ON for each line.

(f) Operate the start lever several times and see if the switch operates correctly.

(g) If the switch does not operate correctly, replace the switch, S88 or S90.

These are the tasks:

Engine Start Brake Assembly Switch Removal, AMM TASK 76-11-11-010-801-F00,

Engine Start Brake Switch Installation, AMM TASK 76-11-11-420-801-F00.

1) Do the Repair Confirmation at the end of the task.

(h) If the switch operates correctly, then continue.

(4) Do these steps to measure the input voltage at the EEC electrical connector DP0101:

(a) Put the applicable start lever to the IDLE position.

(b) Do a check for 115 VAC from pin A to pin B (ground) of the electrical connector DP0101.

1) Put the applicable start lever to the CUTOFF position.

(c) If 115 VAC is not found, then examine and repair the wires, connectors from the left ignition switch S88 (Engine 1) or S90 (Engine 2) to the EEC.

1) Do the Repair Confirmation at the end of this task.

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- (d) If 115 VAC is found, then continue.
- (5) Do the audible test again. To do the test, do this task: Audible Test of the Ignition System - EEC BITE Igniters Test, AMM TASK 74-00-00-750-801-F00.
- (a) If the maintenance message shows, then replace the EEC, M1818.
- These are the tasks:
- EEC Removal, AMM TASK 73-21-60-000-801-F00,
EEC Installation, AMM TASK 73-21-60-400-801-F00.
- 1) Do the Repair Confirmation at the end of this task.
- (b) If the maintenance message does not show, then there was an intermittent fault.
- H. Repair Confirmation

- (1) Do these steps to prepare for the procedure:
- (a) Make sure that the electrical connector DP0101 is correctly connected to the EEC.
- (b) For Engine 1,
- 1) Make sure that these circuit breakers are closed:

CAPT Electrical System Panel, P18-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C00153	ENGINE 1 IGNITION LEFT
A	4	C01390	ENGINE 1 ALTN PWR CHAN B
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

- (c) For Engine 2,
- 1) Make sure that these circuit breakers are closed:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	6	C00151	ENGINE 2 IGNITION LEFT
D	7	C01391	ENGINE 2 ALTN PWR CHAN B
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

- (2) Do this task: Audible Test of the Ignition System - EEC BITE Igniters Test, AMM TASK 74-00-00-750-801-F00.
- (a) If the maintenance message does not show, then you corrected the fault.
- (3) Do this task: Close the Fan Cowl Panels, AMM TASK 71-11-02-410-801-F00.

END OF TASK**802. Airplane Input Voltage For The Right Exciter (IGN 2) Is Out of Range - Fault Isolation****A. Description**

- (1) This task is for these maintenance message numbers:
- (a) 74-10981, 74-10982, 74-20981, 74-20982, 74-30981, and 74-30982.
- (b) For the maintenance message 74-X098Y; where X = EEC Channel (1 = Channel A, 2 = Channel B, 3 = Dual Channel), and Y = Engine Position (1 = Eng 1, 2 = Eng 2), do the applicable Fault Isolation:
- (c) If X = 1 or 2, do the Fault Isolation Procedure - Single Channel Fault.

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- (d) If X = 1 and 2 (two messages), or if X = 3, do the Fault Isolation Procedure - Dual Channel Fault.
- (2) This message can be set by one of these condition:
- The EEC senses that the right igniter power (115 VAC) is less than 89 V with the start lever in the IDLE position.
 - The EEC senses that the right igniter power (115 VAC) is more than 141 V with the start lever in the IDLE position.
- (3) This fault is reported when the EEC has electrical power.
- This fault should show as a dual channel message. If a single channel message shows there is an internal EEC problem.
- B. Possible Causes**
- For the single channel maintenance message:
 - EEC, M1818.
 - For the dual channel maintenance message:
 - The wires, the connectors and the ignition switches between the ignition circuit breakers and the EEC
 - EEC, M1818.
- C. Circuit Breakers**
- For Engine 1:
 - This is the primary circuit breaker related to the fault:
CAPT Electrical System Panel, P18-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	1	C00458	ENGINE 1 IGNITION RIGHT
 - For Engine 2:
 - This is the primary circuit breaker related to the fault:
F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	4	C00459	ENGINE 2 IGNITION RIGHT
- D. Related Data**
- Component Location (Figure 301)
 - Simplified Schematic (Figure 302)
 - (SSM 74-11-11)
 - (WDM 74-11-11)
- E. Initial Evaluation**
- To find out if the fault is still active, do this task: Audible Test of the Ignition System - EEC BITE Igniters Test, AMM TASK 74-00-00-750-801-F00
 - If maintenance message number 74-10981, 74-10982, 74-20981, or 74-20982 shows, then do the Fault Isolation Procedure - Single Channel Fault.

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- (b) If maintenance message number 74-30981 or 74-30982 shows, then do the Fault Isolation Procedure - Dual Channel Fault.
- (c) If the maintenance message does not show on the FMCS CDU, then the Initial Evaluation has shown that the fault is not active at this time and you have an intermittent fault.
 - 1) If you cannot find the fault at this time, then the Fault Isolation Procedure cannot isolate the fault.
 - 2) For an intermittent fault you must use your judgment, your airline policies, and the Possible Causes list to make the decision if you will try to correct the fault.
 - 3) If you will try to correct the fault, it is recommended that you do these steps:
 - a) Do the visual checks of the electrical connectors in the applicable fault isolation procedure below.
 - b) Use the WDM references to identify intermediate electrical connections in the wire harness and do a visual check.
 - c) If you find no problems, then replace components as listed in the Possible Causes list above.
 - 4) Monitor the airplane on the subsequent flight.

F. Fault Isolation Procedure - Single Channel Fault

- (1) If the fault was found by the Initial Evaluation, then replace the EEC, M1818.

These are the tasks:

EEC Removal, AMM TASK 73-21-60-000-801-F00,

EEC Installation, AMM TASK 73-21-60-400-801-F00.

- (a) Do the Repair Confirmation at the end of this task.

G. Fault Isolation Procedure - Dual Channel Fault

- (1) Do these steps to prepare for the procedure:

- (a) For Engine 1:

- 1) Make sure that these circuit breakers are open and have safety tags:

CAPT Electrical System Panel, P18-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	1	C00458	ENGINE 1 IGNITION RIGHT
A	4	C01390	ENGINE 1 ALTN PWR CHAN B
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

- (b) For Engine 2:

- 1) Make sure that these circuit breakers are open and have safety tags:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	4	C00459	ENGINE 2 IGNITION RIGHT
D	7	C01391	ENGINE 2 ALTN PWR CHAN B
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

- (c) Make sure that the applicable start lever is in the CUTOFF position.
- (d) If not already done, do this task: Open the Fan Cowl Panels, AMM TASK 71-11-02-010-801-F00.



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- (2) Examine the electrical connector DP0202 at the EEC:

NOTE: The electrical connector DP0202 is on the MW0302 wire harness at the J2 receptacle

- (a) Make sure that the electrical connector DP0202 is correctly connected to the EEC.
- (b) Disconnect the electrical connector DP0202 from the EEC.
- (c) Visually examine the EEC J2 receptacle and wire harness connector.
 - 1) If the EEC J2 receptacle is damaged, then replace the EEC, M1818.

These are the tasks:

EEC Removal, AMM TASK 73-21-60-000-801-F00,

EEC Installation, AMM TASK 73-21-60-400-801-F00.

- a) Do the Repair Confirmation at the end of this task.
 - b) If the Repair Confirmation is not satisfactory, then continue.
- 2) If the harness connector is damaged, then replace the MW0302 wire harness.
- These are the tasks:
- Nacelle Wiring Harnesses Removal, AMM TASK 71-51-03-000-801-F00,
Nacelle Wiring Harnesses Installation, AMM TASK 71-51-03-400-801-F00.
- a) Do the Repair Confirmation at the end of this task.
 - b) If the Repair Confirmation is not satisfactory, then continue.
- 3) If the connector was not correctly connected, and no other problem was found, then do the Repair Confirmation at the end of this task.
- 4) If the Repair Confirmation is not satisfactory, then continue.

- (d) If you did not find a problem, then continue.

- (3) To examine the applicable right ignition switch, S89 (Eng 1) or S91 (Eng 2) in the engine start brake assembly, you can use input monitoring the see if the switch position agrees with the selected start lever position.

NOTE: 737-SL-76-020 notes some switches in the engine start brake assembly cause engine start problems.

- (a) For Engine 1:

- 1) Remove the safety tag and close this circuit breaker:

CAPT Electrical System Panel, P18-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	1	C00458	ENGINE 1 IGNITION RIGHT

- (b) For Engine 2:

- 1) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	4	C00459	ENGINE 2 IGNITION RIGHT

- (c) Get access to the input monitoring screen on the CDU:

- 1) Push the INIT REF key two times.

NOTE: This causes the PERF INIT INDEX to show.

- 2) Push the INDEX line select key (LSK).

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- 3) Push the MAINT LSK.
- 4) Push the ENGINE LSK.
- 5) Push the line select key for the applicable engine (ENGINE 1 or ENGINE 2).

NOTE: This causes the ENGINE X BITE TEST MAIN MENU to show.

- 6) Push the INPUT MONITORING LSK.

NOTE: An alert message will show to tell you that only data from one channel is available.

- 7) Push the CONTINUE LSK.

NOTE: This causes the INPUT MONITORING MENU to show. Push the NEXT PAGE key to go to page 2 of the menu

- 8) Push the DISCRETES LSK.

NOTE: This causes the INPUT MONITORING GMM DISCRETES screen to show.

- 9) Push the NEXT PAGE key twice to see page 3/3 and find the R IGNITER 115V line on the screen.

- (d) With the applicable start lever in the CUTOFF position, make sure the value is OFF.
- (e) Put the applicable start lever to the IDLE position and make sure the value is ON.
- (f) Operate the start lever several times to see if the switch operates correctly.
- (g) If the switch does not operate correctly, replace the switch, S89 or S91.

These are the tasks:

Engine Start Brake Assembly Switch Removal, AMM TASK 76-11-11-010-801-F00,
Engine Start Brake Switch Installation, AMM TASK 76-11-11-420-801-F00.

- 1) Do the Repair Confirmation at the end of the task.

- (h) If the switch operates correctly, then continue.

- (4) Do these steps to measure the input voltage at the EEC electrical connector DP0202:

- (a) Put the applicable start lever to the IDLE position.
- (b) Do a check for 115 VAC from pin A to pin B (ground) of the electrical connector DP0202.
 - 1) Put the applicable start lever to the CUTOFF position.
- (c) If 115 VAC is not found, then examine and repair the wires, connectors from the right ignition switch S89 (Engine 1) or S91 (Engine 2) to the EEC.
 - 1) Do the Repair Confirmation at the end of this task.
- (d) If 115 VAC is found, then continue.

- (5) Do the audible test again. To do the test, do this task: Audible Test of the Ignition System - EEC BITE Igniters Test, AMM TASK 74-00-00-750-801-F00.

- (a) If the maintenance message shows, then replace the EEC, M1818.

These are the tasks:

EEC Removal, AMM TASK 73-21-60-000-801-F00,

EEC Installation, AMM TASK 73-21-60-400-801-F00.

- 1) Do the Repair Confirmation at the end of this task.

- (b) If the maintenance message does not show, then there was an intermittent fault.

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H. Repair Confirmation

- (1) Do these steps to prepare for the procedure:
 - (a) Make sure that the electrical connector DP0202 is correctly connected to the EEC.
 - (b) For Engine 1:
 - 1) Remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	1	C00458	ENGINE 1 IGNITION RIGHT
A	4	C01390	ENGINE 1 ALTN PWR CHAN B
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

- (c) For Engine 2:
 - 1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	4	C00459	ENGINE 2 IGNITION RIGHT
D	7	C01391	ENGINE 2 ALTN PWR CHAN B
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

- (2) Do this task: Audible Test of the Ignition System - EEC BITE Igniters Test, AMM TASK 74-00-00-750-801-F00.
 - (a) If the maintenance message does not show, then you corrected the fault.
- (3) Do this task: Close the Fan Cowl Panels, AMM TASK 71-11-02-410-801-F00.

END OF TASK

803. Airplane Input Voltage For The Left Exciter (IGN 1) Is Always On - Fault Isolation

A. Description

- (1) This task is for these maintenance message numbers:
 - (a) 74-10991, 74-10992, 74-20991, 74-20992, 74-30991, and 74-30992.
 - (b) For the maintenance message 74-X099Y; where X = EEC Channel (1=Channel A, 2=Channel B, 3=Dual Channel), and Y = Engine Position (1=Eng 1, 2=Eng 2), do the applicable Fault Isolation:
 - (c) If X=1 or 2, do the Fault Isolation Procedure - Single Channel Fault.
 - (d) If X=1 and 2 (two messages), or If X=3, do the Fault Isolation Procedure - Dual Channel Fault.
- (2) This message can be set by this condition:
 - (a) The EEC senses that the left igniter power (115 VAC) is 89 V or more with the start lever in the CUTOFF position.
- (3) This fault is reported when the EEC has electrical power.
 - (a) This fault should show as a dual channel message. If a single channel message shows, there is an internal EEC problem.

B. Possible Causes

- (1) For the single channel maintenance message:

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- (a) EEC, M1818.
- (2) For the dual channel maintenance message:
 - (a) The wires, the connectors and the ignition switches between the ignition circuit breakers and the EEC
 - (b) EEC, M1818.
- C. Circuit Breakers
 - (1) For Engine 1:
 - (a) This is the primary circuit breaker related to the fault:
CAPT Electrical System Panel, P18-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C00153	ENGINE 1 IGNITION LEFT
 - (2) For Engine 2:
 - (a) This is the primary circuit breaker related to the fault:
F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	6	C00151	ENGINE 2 IGNITION LEFT
- D. Related Data
 - (1) Component Location (Figure 301)
 - (2) Simplified Schematic (Figure 302)
 - (3) (SSM 74-11-11)
 - (4) (WDM 74-11-11)
- E. Initial Evaluation
 - (1) To find out if the fault is still active, do this task: EEC TEST, AMM TASK 73-21-00-700-804-F00.
 - (a) If maintenance message number 74-10991, 74-10992, 74-20991, or 74-20992 shows, then do the Fault Isolation Procedure - Single Channel Fault.
 - (b) If maintenance message number 74-30991 or 74-30992 shows, then do the Fault Isolation Procedure - Dual Channel Fault.
 - (c) If the maintenance message does not show on the FMCS CDU, then the Initial Evaluation has shown that the fault is not active at this time and you have an intermittent fault.
 - 1) If you cannot find the fault at this time, then the Fault Isolation Procedure cannot isolate the fault.
 - 2) For an intermittent fault you must use your judgment, your airline policies, and the Possible Causes list to make the decision if you will try to correct the fault.
 - 3) If you will try to correct the fault, it is recommended that you do these steps:
 - a) Do the visual checks of the electrical connectors in the applicable fault isolation procedure below.
 - b) Use the WDM references to identify intermediate electrical connections in the wire harness and do a visual check.
 - c) If you find no problems, then replace components as listed in the Possible Causes list above.

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(d) Monitor the airplane on the subsequent flight.

F. Fault Isolation Procedure - Single Channel Fault

(1) If the fault was found by the Initial Evaluation, then replace the EEC, M1818.

These are the tasks:

EEC Removal, AMM TASK 73-21-60-000-801-F00,

EEC Installation, AMM TASK 73-21-60-400-801-F00.

(a) Do the Repair Confirmation at the end of this task.

G. Fault Isolation Procedure - Dual Channel Fault

(1) Do these steps to prepare for the procedure:

(a) For Engine 1:

1) Open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C00153	ENGINE 1 IGNITION LEFT
A	4	C01390	ENGINE 1 ALTN PWR CHAN B
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

(b) For Engine 2:

1) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	6	C00151	ENGINE 2 IGNITION LEFT
D	7	C01391	ENGINE 2 ALTN PWR CHAN B
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

(c) Make sure that the applicable start lever is in the CUTOFF position.

(d) If not already done, do this task: Open the Fan Cowl Panels, AMM TASK 71-11-02-010-801-F00.

(2) Examine the electrical connector DP0101 at the EEC:

NOTE: The electrical connector DP0101 is on the MW0301 wire harness at the J1 receptacle.

(a) Make sure that the electrical connector DP0101 is correctly connected to the EEC.

(b) Disconnect the electrical connector DP0101 from the EEC.

(c) Visually examine the EEC J1 receptacle and wire harness connector.

1) If the EEC J1 receptacle is damaged, then replace the EEC, M1818.

These are the tasks:

EEC Removal, AMM TASK 73-21-60-000-801-F00,

EEC Installation, AMM TASK 73-21-60-400-801-F00.

a) Do the Repair Confirmation at the end of this task.

b) If the Repair Confirmation is not satisfactory, then continue.

2) If the harness connector is damaged, then replace the MW0301 wire harness.

These are the tasks:

Nacelle Wiring Harnesses Removal, AMM TASK 71-51-03-000-801-F00,

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Nacelle Wiring Harnesses Installation, AMM TASK 71-51-03-400-801-F00.

- a) Do the Repair Confirmation at the end of this task.
- b) If the Repair Confirmation is not satisfactory, then continue.
- 3) If the connector was not correctly connected and no other problem was found, then do the Repair Confirmation at the end of this task.
 - a) If the Repair Confirmation is not satisfactory, then continue.
- (d) If you did not find a problem, then continue.
- (3) Do these steps to measure the input voltage at the electrical connector DP0101 at the EEC:
 - (a) For Engine 1:
 - 1) Remove the safety tag and close this circuit breaker:

CAPT Electrical System Panel, P18-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C00153	ENGINE 1 IGNITION LEFT

- (b) For Engine 2:
 - 1) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	6	C00151	ENGINE 2 IGNITION LEFT

- (c) Do a check for 0 VAC from pin A to pin B (ground) of the DP0101 electrical connector.
 - (d) If the voltage is 0 VAC and the fault was found by the Initial Evaluation, then replace the EEC, M1818.
- These are the tasks:
- EEC Removal, AMM TASK 73-21-60-000-801-F00,
EEC Installation, AMM TASK 73-21-60-400-801-F00.
- 1) Do the Repair Confirmation at the end of this task.
 - (e) If the voltage is not 0 VAC, then continue.

- (4) Do this check of the applicable left ignition switch S88 (Engine 1) or S90 (Engine 2):

NOTE: The S88 switch is in the engine 1 start brake assembly M1824 in the control stand. The S90 switch is in the engine 2 start brake assembly M1825.

- (a) Remove the upper and side panels from the control stand.
- (b) Disconnect the electrical connector D11286P or D11290P from the control stand.
- (c) Do a continuity check from the pin 11 to pin 13 of the connector.
- (d) If there is continuity, then replace the applicable S88 or S90 switch for a faulty ignition switch.

These are the tasks:

Engine Start Brake Assembly Switch Removal, AMM TASK 76-11-11-010-801-F00,
Engine Start Brake Switch Installation, AMM TASK 76-11-11-420-801-F00.

- 1) Do the Repair Confirmation at the end of this task.
- (e) If there is not continuity, then examine and repair the wires and connectors between the ignition switch and the EEC.

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1) Do the Repair Confirmation at the end of this task.

H. Repair Confirmation

(1) Prepare for the procedure:

- (a) Make sure that the electrical connector DP0101 is correctly connected to the EEC.
- (b) Make sure that the electrical connectors D11286P and D11290P are correctly connected to the control stand.
- (c) For Engine 1:
 - 1) Make sure that these circuit breakers are closed:

CAPT Electrical System Panel, P18-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C00153	ENGINE 1 IGNITION LEFT
A	4	C01390	ENGINE 1 ALTN PWR CHAN B
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

(d) For Engine 2:

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

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	6	C00151	ENGINE 2 IGNITION LEFT
D	7	C01391	ENGINE 2 ALTN PWR CHAN B
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

- (2) Do this task: EEC TEST, AMM TASK 73-21-00-700-804-F00.
 - (a) If the maintenance message does not show, you corrected the fault.
- (3) Install the upper and side panels to the control stand.
- (4) Do this task: Close the Fan Cowl Panels, AMM TASK 71-11-02-410-801-F00.

————— **END OF TASK** —————

804. Airplane Input Voltage For The Right Exciter (IGN 2) Is Always On - Fault Isolation**A. Description**

- (1) This task is for these maintenance message numbers:
 - (a) 74-11001, 74-11002, 74-21001, 74-21002, 74-31001, and 74-31002.
 - (b) For the maintenance message 74-X100Y; where X = EEC Channel (1=Channel A, 2=Channel B, 3=Dual Channel), and Y = Engine Position (1=Eng 1, 2=Eng 2), do the applicable Fault Isolation:
 - (c) If X=1 or 2, do the Fault Isolation Procedure - Single Channel Fault.
 - (d) If X=1 and 2 (two messages), or if X=3, do the Fault Isolation Procedure - Dual Channel Fault.
- (2) This message can be set by this condition:
 - (a) The EEC senses that the right igniter power (115 VAC) is 89 V or more with the start lever in the CUTOFF position.
- (3) This fault is reported when the EEC has electrical power.

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- (a) This fault should show as a dual channel message. If a single channel message shows there is an internal EEC problem.

B. Possible Causes

- (1) For the single channel maintenance message:

(a) EEC, M1818.

- (2) For the dual channel maintenance message:

(a) The wires, the connectors and the ignition switches between the ignition circuit breakers and the EEC

(b) EEC, M1818.

C. Circuit Breakers

- (1) For Engine 1:

(a) This is the primary circuit breaker related to the fault:

CAPT Electrical System Panel, P18-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	1	C00458	ENGINE 1 IGNITION RIGHT

- (2) For Engine 2:

(a) This is the primary circuit breaker related to the fault:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	4	C00459	ENGINE 2 IGNITION RIGHT

D. Related Data

- (1) Component Location (Figure 301)
- (2) Simplified Schematic (Figure 302)
- (3) (SSM 74-11-11)
- (4) (WDM 74-11-11)

E. Initial Evaluation

- (1) To find out if the fault is still active, do this task: EEC TEST, AMM TASK 73-21-00-700-804-F00
 - (a) If maintenance message number 74-11001, 74-11002, 74-21001, or 74-21002 shows, then do the Fault Isolation Procedure - Single Channel Fault.
 - (b) If maintenance message number 74-31001 or 74-31002 shows, then do the Fault Isolation Procedure - Dual Channel Fault.
 - (c) If the maintenance message does not show on the FMCS CDU, then the Initial Evaluation has shown that the fault is not active at this time and you have an intermittent fault.
 - 1) If you cannot find the fault at this time, then the Fault Isolation Procedure cannot isolate the fault.
 - 2) For an intermittent fault you must use your judgment, your airline policies, and the Possible Causes list to make the decision if you will try to correct the fault.
 - 3) If you will try to correct the fault, it is recommended that you do these steps:

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- a) Do the visual checks of the electrical connectors in the applicable fault isolation procedure below.
- b) Use the WDM references to identify intermediate electrical connections in the wire harness and do a visual check.
- c) If you find no problems, then replace components as listed in the Possible Causes list above.

(d) Monitor the airplane on the subsequent flight.

F. Fault Isolation Procedure - Single Channel Fault

- (1) If the fault was found by the Initial Evaluation, then replace the EEC, M1818.

These are the tasks:

EEC Removal, AMM TASK 73-21-60-000-801-F00,

EEC Installation, AMM TASK 73-21-60-400-801-F00.

- (a) Do the Repair Confirmation at the end of this task.

G. Fault Isolation Procedure - Dual Channel Fault

- (1) Do these steps to prepare for the procedure:

- (a) For Engine 1

- 1) Open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	1	C00458	ENGINE 1 IGNITION RIGHT
A	4	C01390	ENGINE 1 ALTN PWR CHAN B
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

- (b) For Engine 2

- 1) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	4	C00459	ENGINE 2 IGNITION RIGHT
D	7	C01391	ENGINE 2 ALTN PWR CHAN B
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

- (c) Make sure that the applicable start lever is in the CUTOFF position.

- (d) If not already done, do this task: Open the Fan Cowl Panels, AMM TASK 71-11-02-010-801-F00.

- (2) Examine the electrical connector DP0202 at the EEC:

NOTE: The electrical connector DP0202 is on the MW0302 wire harness at the J2 receptacle.

- (a) Make sure that the electrical connector DP0202 is correctly connected to the EEC.

- (b) Disconnect the electrical connector DP0202 from the EEC.

- (c) Visually examine the EEC J2 receptacle and wire harness connector.

- 1) If the EEC J2 receptacle is damaged, then replace the EEC, M1818.

These are the tasks:

EEC Removal, AMM TASK 73-21-60-000-801-F00,

EEC Installation, AMM TASK 73-21-60-400-801-F00.

FAULT ISOLATION MANUAL

- a) Do the Repair Confirmation at the end of this task.
- b) If the Repair Confirmation is not satisfactory, then continue.
- 2) If the harness connector is damaged, then replace the MW0302 wire harness.

These are the tasks:

Nacelle Wiring Harnesses Removal, AMM TASK 71-51-03-000-801-F00,
Nacelle Wiring Harnesses Installation, AMM TASK 71-51-03-400-801-F00.

- a) Do the Repair Confirmation at the end of this task.
- b) If the Repair Confirmation is not satisfactory, then continue.
- 3) If the connector was not correctly connected and no other problem was found, then do the Repair Confirmation at the end of this task.
 - a) If the Repair Confirmation is not satisfactory, then continue.
- (d) If you did not find a problem, then continue.
- (3) Do these steps to measure the input voltage at the electrical connector DP0202 at the EEC:
 - (a) For Engine 1
 - 1) Remove the safety tag and close this circuit breaker:

CAPT Electrical System Panel, P18-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	1	C00458	ENGINE 1 IGNITION RIGHT

- (b) For Engine 2
 - 1) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	4	C00459	ENGINE 2 IGNITION RIGHT

- (c) Do a check for 0 VAC from pin A to pin B (ground) of the DP0202 electrical connector.
 - (d) If the voltage is 0 VAC and the fault was found by the Initial Evaluation, then replace the EEC, M1818.
- These are the tasks:
- EEC Removal, AMM TASK 73-21-60-000-801-F00,
EEC Installation, AMM TASK 73-21-60-400-801-F00.
- 1) Do the Repair Confirmation at the end of this task.
 - (e) If the voltage is not 0 VAC, then continue.

- (4) Do this check of the applicable right ignition switch S89 (Engine 1) or S91 (Engine 2):

NOTE: The S89 switch is in the engine 1 start brake assembly M1824 in the control stand. The S91 switch is in the engine 2 start brake assembly M1825.

- (a) Remove the upper and side panels from the control stand.
- (b) Disconnect the electrical connector D11288P or D11292P from the control stand
- (c) Do a continuity check from the pin 11 to pin 13 of the connector.
- (d) If there is continuity, then replace the applicable S89 or S91 switch for a faulty ignition switch.

These are the tasks:

FAULT ISOLATION MANUAL

Engine Start Brake Assembly Switch Removal, AMM TASK 76-11-11-010-801-F00,
Engine Start Brake Switch Installation, AMM TASK 76-11-11-420-801-F00.

1) Do the Repair Confirmation at the end of this task.

- (e) If there is not continuity, then examine and repair the wires and connectors between the ignition switch and the EEC.

1) Do the Repair Confirmation at the end of this task.

H. Repair Confirmation

(1) Prepare for the procedure:

- (a) Make sure that the electrical connector DP0202 is correctly connected to the EEC.
(b) Make sure that the electrical connectors D11288P and D11292P are correctly connected to the control stand.
(c) For Engine 1
1) Make sure that these circuit breakers are closed:

CAPT Electrical System Panel, P18-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	1	C00458	ENGINE 1 IGNITION RIGHT
A	4	C01390	ENGINE 1 ALTN PWR CHAN B
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

(d) For Engine 2

1) Make sure that these circuit breakers are closed:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	4	C00459	ENGINE 2 IGNITION RIGHT
D	7	C01391	ENGINE 2 ALTN PWR CHAN B
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

(2) Do this task: EEC TEST, AMM TASK 73-21-00-700-804-F00.

(a) If the maintenance message does not show, you corrected the fault.

(3) Install the upper and side panels to the control stand.

(4) Do this task: Close the Fan Cowl Panels, AMM TASK 71-11-02-410-801-F00.

END OF TASK

805. DEU Igniter Data Is Incorrect - Fault Isolation**A. Description**

(1) This task is for these maintenance message numbers:

- (a) 74-11301, 74-11302, 74-21301, 74-21302, 74-31301, or 74-31302 and 74-11311, 74-11312, 74-21311, 74-21312, 74-31311, or 74-31312.
(b) The maintenance messages 74-X130Y or 74-X131Y where X = EEC Channel (1=Channel A, 2=Channel B, 3=Dual Channel), and Y = Engine Position (1=Eng 1, 2=Eng 2), do the applicable Fault Isolation Procedure:
(c) 74-X130Y is reported by the EEC for data from DEU1. 74-X131Y is reported by the EEC for data from DEU2.

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FAULT ISOLATION MANUAL

(2) This message can be set by this condition:

- (a) The EEC notes that DEU1 or DEU2 cannot sense the selection of the left igniter or the right igniter from the engine ignition switch S858.

(3) This fault is reported when the EEC has electrical power.

- (a) This fault should show as a dual channel message.

(4) You should do the Initial Evaluation to see if a dual channel maintenance message is set.

B. Possible Causes - One DEU Fault

- (1) The wires and the connectors between the engine ignition switch (P5 forward overhead panel) and the DEUs

(2) DEU, M1808 (DEU1), M1809 (DEU2)

(3) Engine Ignition Switch, S858.

C. Possible Causes - Two DEU Fault

- (1) Engine ignition switch, S858.

D. Circuit Breakers

- (1) These are the primary circuit breakers related to the fault:

CAPT Electrical System Panel, P18-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	5	C01359	DISPLAY DEU 1 PRI

F/O Electrical System Panel, P6-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	9	C01362	DISPLAY DEU 2 HOLDUP
D	10	C01361	DISPLAY DEU 1 HOLDUP
D	11	C01360	DISPLAY DEU 2 PRI

E. Related Data

(1) Component Location (Figure 301)

(2) Simplified Schematic (Figure 303)

(3) (SSM 74-31-11)

(4) (WDM 74-31-11)

F. Initial Evaluation

- (1) To find out if the fault is active, for each engine, do this task: EEC TEST, AMM TASK 73-21-00-700-804-F00

- (a) If one of these combinations of maintenance messages, 74-X1301 and 74-X1302, or 74-X1311 and 74-X1312 shows for one DEU, then do the Fault Isolation Procedure - One DEU Fault.
- (b) If all four maintenance messages 74-X1301, 74-X1302, 74-X1311 and 74-X1312 show for the two DEU's, then do the Fault Isolation Procedure - Two DEU Fault.
- (c) If the maintenance message does not show on the FMCS CDU, then the Initial Evaluation has shown that the fault is not active at this time and you have an intermittent fault.

FAULT ISOLATION MANUAL

- 1) If you cannot find the fault at this time, then the Fault Isolation Procedure cannot isolate the fault.
- 2) For an intermittent fault you must use your judgment, your airline policies, and the Possible Causes list to make the decision if you will try to correct the fault.
- 3) If you will try to correct the fault, it is recommended that you do these steps:
 - a) Do the visual checks of the electrical connectors in the applicable fault isolation procedure below.
 - b) Use the WDM references to identify intermediate electrical connections in the wire harness and do a visual check.
 - c) If you find no problems, then replace components as listed in the Possible Causes list above.
- 4) Monitor the airplane on the subsequent flight.

G. Fault Isolation Procedure - One DEU Fault

- (1) Do these steps to prepare for the procedure:

- (a) Make sure that these circuit breakers are open and have safety tags:

CAPT Electrical System Panel, P18-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	5	C01359	DISPLAY DEU 1 PRI

F/O Electrical System Panel, P6-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	9	C01362	DISPLAY DEU 2 HOLDUP
D	10	C01361	DISPLAY DEU 1 HOLDUP
D	11	C01360	DISPLAY DEU 2 PRI

- (b) Get access to the E3-1 shelf in the EE bay.

Open this access panel:

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door

- (2) Do this check of the wiring:

- (a) Remove the S858 switch.
 - (b) Remove the applicable DEU.

These are the tasks:

Display Electronic Unit Removal, AMM TASK 31-62-21-000-801,

Display Electronic Unit Installation, AMM TASK 31-62-21-400-801.

- (c) Do this resistance check between these pins to examine the wires from the engine ignition switch S858 in the P5 pilots overhead panel to the two DEUs or to ground:

FAULT ISOLATION MANUAL**Table 201**

SWITCH		DEU CONNECTOR		RESISTANCE
S858	PIN 2	DEU 1	D3973E PIN A7	LESS THAN 10 OHMS
	PIN 2	DEU 2	D3975E PIN A7	LESS THAN 10 OHMS
	PIN 8	DEU 1	D3973A PIN A7	LESS THAN 10 OHMS
	PIN 8	DEU 2	D3935A PIN A7	LESS THAN 10 OHMS
	PIN 3 TO THE AIRPLANE GROUND			GREATER THAN 1 MEGOHM
	PIN 7 TO THE AIRPLANE GROUND			GREATER THAN 1 MEGOHM

- (d) If the resistance is not in the specified range, then repair or replace the wires between the S858 switch, and the DEU connector or ground.

- 1) Do the Repair Confirmation at the end of this task.
- 2) If the Repair Confirmation is not satisfactory, then continue.

- (e) If resistance is in the specified range, then do these steps:

- 1) With the S858 switch in the BOTH position, do a check for continuity through the switch between pins 2 and 3 and between pins 8 and 7.
- 2) If there is continuity, then replace the S858 switch.
 - a) Do the Repair Confirmation at the end of this task.
- 3) If there is not continuity, then replace the applicable DEU.

These are the tasks:

Display Electronic Unit Removal, AMM TASK 31-62-21-000-801,

Display Electronic Unit Installation, AMM TASK 31-62-21-400-801.

- a) Do the Repair Confirmation at the end of this task.

H. Fault Isolation Procedure - Two DEU Fault

- (1) Replace the engine ignition switch, S858 on the P5 pilots overhead panel.

- (a) Do the Repair Confirmation at the end of this task.

I. Repair Confirmation

- (1) Prepare for the procedure:

- (a) Make sure that the DEUs are installed in the E3-1 shelf.
- (b) Make sure the S858 ignition switch and connector are correctly connected in the P5 overhead panel.
- (c) Make sure that these circuit breakers are closed:

CAPT Electrical System Panel, P18-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	5	C01359	DISPLAY DEU 1 PRI

F/O Electrical System Panel, P6-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	9	C01362	DISPLAY DEU 2 HOLDUP

FAULT ISOLATION MANUAL

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	10	C01361	DISPLAY DEU 1 HOLDUP
D	11	C01360	DISPLAY DEU 2 PRI

- (2) Do this task: EEC TEST, AMM TASK 73-21-00-700-804-F00.
- If the maintenance message does not show, then you corrected the fault.
 - Close this access panel:

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door

————— **END OF TASK** —————

806. IGN L (IGN 1) Is Failed - Fault Isolation**A. Description**

- This task is for these maintenance message numbers:
 - 74-10951, 74-10952, 74-20951, 74-20952, 74-30951, and 74-30952.
 - For the maintenance message 74-X095Y; where X = EEC Channel (1 = Channel A, 2 = Channel B, 3 = Dual Channel), and Y = Engine Position (1 = Eng 1, 2 = Eng 2), do the Fault Isolation Procedure.
- The EEC detects that there was no engine start (no increase in EGT) with these conditions:
 - The start lever is in the IDLE position.
 - The fuel metering valve (FMV) is in the correct position.
 - The input voltage to the EEC for the left exciter is correct.
 - The engine did not start when the left igniter was selected.
- This fault is reported when the EEC has electrical power.
 - This fault should show as a dual channel message.

B. Possible Causes

- For an Audible Igniters Test (Left Igniter) with one audible confirmation:
 - EEC, M1818.
- For an Audible Igniters Test (Left Igniter) with no audible confirmation:
 - Left igniter plug
 - Left ignition lead
 - Left ignition exciter
 - MW0301 wire harness.
- For an Audible Igniters Test (Left Igniter) with two audible confirmations:
 - Left igniter plug
 - Start brake assembly M1824 (Eng 1), M1825 (Eng 2), for left ignition switches S88, S90
 - left ignition lead
 - Left ignition exciter
 - EEC, M1818
 - MW0301 wire harness

FAULT ISOLATION MANUAL

(g) Upper 11 fuel nozzles if first start of the day or cold soaked engine.

C. Circuit Breakers

(1) For Engine 1:

(a) This is the primary circuit breaker related to the fault:

CAPT Electrical System Panel, P18-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C00153	ENGINE 1 IGNITION LEFT

(2) For Engine 2:

(a) This is the primary circuit breaker related to the fault:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	6	C00151	ENGINE 2 IGNITION LEFT

D. Related Data

(1) Component Location (Figure 301)

(2) Simplified Schematic (Figure 302)

(3) (SSM 74-11-11)

(4) (WDM 74-11-11)

E. Initial Evaluation

(1) Do this task: EEC BITE Procedure, 73-00 TASK 801.

(a) Look at the RECENT FAULTS for Flight Leg 0.

(b) If maintenance message number 74-X095Y shows, then do the Fault Isolation Procedure.

(c) If the maintenance message does not show on the FMCS CDU, then the Initial Evaluation has shown that the fault is not active at this time and you have an intermittent fault.

1) If you cannot find the fault at this time, then the Fault Isolation Procedure cannot isolate the fault.

2) For an intermittent fault you must use your judgment, your airline policies, and the Possible Causes list to make the decision if you will try to correct the fault.

3) If you will try to correct the fault, it is recommended that you do these steps:

a) Do the visual checks of the electrical connectors in the applicable fault isolation procedure below.

b) Use the WDM references to identify intermediate electrical connections in the wire harness and do a visual check.

c) If you find no problems, then replace components as listed in the Possible Causes list above.

4) Monitor the airplane on the subsequent flight.

F. Fault Isolation Procedure

(1) To see if the left igniter plug operates, do this task: Audible Test of the Ignition System - EEC BITE Igniters Test, AMM TASK 74-00-00-750-801-F00.

(a) The operation of the left igniter plug should be heard twice, for CH A and then for CH B.

FAULT ISOLATION MANUAL

- (b) If only one audible confirmation is heard, do the Fault Isolation Procedure - One Audible Confirmation.
- (c) If no audible confirmation is heard, do the Fault Isolation Procedure - No Audible Confirmation.
- (d) If the two audible confirmations are heard, do these steps:
 - 1) With the IGN L selected, do this task: Start the Engine Procedure (Selection), AMM TASK 71-00-00-800-807-F00.
 - 2) If the engine start is correct, then there was an intermittent fault.
 - 3) If the engine does not start, do the Fault Isolation Procedure - Two Audible Confirmations.

G. Fault Isolation Procedure - One Audible Confirmation

- (1) Replace the EEC, M1818, for a defective EEC internal igniter relay.

These are the tasks:

EEC Removal, AMM TASK 73-21-60-000-801-F00,

EEC Installation, AMM TASK 73-21-60-400-801-F00.

- (a) Do the Repair Confirmation at the end of this task.

H. Fault Isolation Procedure - No Audible Confirmation

- (1) If there are maintenance messages, do the fault isolation for those messages.

- (a) Do the Repair Confirmation at the end of this task.

- (b) If the Repair Confirmation is not satisfactory, then continue.

- (2) If there are no maintenance messages, then continue.

- (a) Examine the left igniter plug; do this task: Main Igniter Plug Inspection, AMM TASK 74-21-02-200-801-F00.

- 1) If the damage is more than the limits, replace the left igniter plug.

These are the tasks:

Main Igniter Plug Removal, AMM TASK 74-21-02-000-801-F00,

Main Igniter Plug Installation, AMM TASK 74-21-02-400-801-F00.

- 2) Do the Repair Confirmation at the end of this task.

- 3) If the Repair Confirmation is not satisfactory, then continue.

- (b) Examine the left ignition lead; do this task: Ignition Lead Inspection, AMM TASK 74-21-01-200-801-F00.

- 1) If the damage is more than the limits, replace the left ignition lead.

These are the tasks:

Ignition Lead Removal, AMM TASK 74-21-01-000-801-F00,

Ignition Lead Installation, AMM TASK 74-21-01-400-801-F00.

- 2) Do the Repair Confirmation at the end of this task.

- 3) If the Repair Confirmation is not satisfactory, then continue.

- (c) Examine the left ignition exciter; do this task: Ignition Exciter Inspection, AMM TASK 74-11-01-200-801-F00.

- 1) If the damage is more than the limits, replace the left ignition exciter.

These are the tasks:

FAULT ISOLATION MANUAL

Ignition Exciter Removal, AMM TASK 74-11-01-000-801-F00,
Ignition Exciter Installation, AMM TASK 74-11-01-400-801-F00.

- 2) Do the Repair Confirmation at the end of this task.
- 3) If the Repair Confirmation is not satisfactory, then continue.

- (3) Examine the electrical connector DP0101 at the EEC:

NOTE: The electrical connector DP0101 is on the MW0301 wire harness at the J1 receptacle.

- (a) Make sure that the electrical connector DP0101 is correctly connected to the EEC.
- (b) Disconnect the electrical connector DP0101 from the EEC.
- (c) Visually examine the EEC J1 receptacle and wire harness connector.
 - 1) If the EEC J1 receptacle is damaged, then replace the EEC, M1818.

These are the tasks:

EEC Removal, AMM TASK 73-21-60-000-801-F00,
EEC Installation, AMM TASK 73-21-60-400-801-F00.

- a) Do the Repair Confirmation at the end of this task.
- 2) If the harness connector is damaged, then replace the MW0301 wire harness.

These are the tasks:

Nacelle Wiring Harnesses Removal, AMM TASK 71-51-03-000-801-F00,
Nacelle Wiring Harnesses Installation, AMM TASK 71-51-03-400-801-F00.

- a) Do the Repair Confirmation at the end of this task.
- 3) If the connector was not correctly connected, and no other problem was found, then do the Repair Confirmation at the end of this task.

I. Fault Isolation Procedure - Two Audible Confirmation

- (1) For the left igniter plug, do this task: Main Igniter Plug Inspection, AMM TASK 74-21-02-200-801-F00.

- (a) If the damage to the igniter plug is more than the limits, then replace the left igniter plug (AMM TASK 74-21-02-400-801-F00).
 - 1) Do the Repair Confirmation at the end of this task.
 - 2) If the Repair Confirmation is not satisfactory, then continue.
- (b) If the damage is in the limits, then re-install the left igniter plug (AMM TASK 74-21-02-400-801-F00) and continue.

- (2) Replace the upper 11 fuel nozzles.

- (a) Fuel Nozzles Removal (AMM TASK 73-11-04-000-805-F01 or AMM TASK 73-11-04-000-804-F02).
- (b) Fuel Nozzles Installation (AMM TASK 73-11-04-400-805-F01 or AMM TASK 73-11-04-400-804-F02).

- (3) If the problem continues, then there was an intermittent fault.

- (a) For an intermittent fault you must use your judgment, your airline policies, and the Possible Causes list to make the decision if you will try to correct the fault.
 - 1) Replace components as listed in the Possible Causes list above and do the Repair Confirmation.

FAULT ISOLATION MANUAL

- 2) To examine the operation of the ignition switch in the engine start brake assembly, you can do the procedure that follows.
- (4) To examine the applicable left ignition switches, S88 (Eng 1) or S90 (Eng 2), in the engine start brake assembly, you can use input monitoring to see if the switch operation agrees with the selected start lever position.

NOTE: 737-SL-76-020 notes that some switches in the engine start brake assembly cause engine start problems.

- (a) Get access to the input monitoring screen on the CDU:

- 1) Push the INIT REF key two times.

NOTE: This causes the PERF INIT INDEX to show.

- 2) Push the INDEX line select key (LSK).
- 3) Push the MAINT LSK.
- 4) Push the ENGINE LSK.
- 5) Push the line select key for the applicable engine (ENGINE 1 or ENGINE 2).

NOTE: This causes the ENGINE X BITE TEST MAIN MENU to show.

- 6) Push the INPUT MONITORING LSK.

NOTE: An alert message will show to tell you that only data from one channel is available.

- 7) Push the CONTINUE LSK.

NOTE: This causes the INPUT MONITORING MENU to show. Push the NEXT PAGE key to go to page 2 of the menu

- 8) Push the DISCRETES LSK.

NOTE: This causes the INPUT MONITORING GMM DISCRETES screen to show.

- 9) Push the NEXT PAGE key twice to see page 3/3 and find the L IGNITER 115V line on the screen.
- (b) With the applicable start lever in the CUTOFF position, make sure the value is OFF.
- (c) Put the applicable start lever to the IDLE position and make sure the value is ON for each line.
- (d) Operate the start lever several times and see if the switch operates correctly.
 - 1) If the switch does not operate correctly, replace the switch, S88 or S90.

These are the tasks:

Engine Start Brake Assembly Switch Removal, AMM TASK 76-11-11-010-801-F00,

Engine Start Brake Switch Installation, AMM TASK 76-11-11-420-801-F00.

J. Repair Confirmation

- (1) Do these steps to prepare for the procedure:
 - (a) Make sure that the electrical connector DP0102 is correctly connected to the left ignition exciter.
 - (b) Make sure that the electrical connector DP0101 is correctly connected to the EEC at J1.
- (2) If the initial audible test of the ignition system failed, do these steps:
 - (a) For the left igniter plug, do this task: Audible Test of the Ignition System - EEC BITE Igniters Test, AMM TASK 74-00-00-750-801-F00.

FAULT ISOLATION MANUAL

- (b) If the left igniter test passes and two audible confirmations are heard then you corrected the fault.
- (3) If the initial audible test of the ignition system passed, do these steps:
 - (a) With the IGN I selected, do this task: Start the Engine Procedure (Selection), AMM TASK 71-00-00-800-807-F00.
 - (b) If the engine start is normal, then you corrected the fault.
- (4) Do this task: Close the Fan Cowl Panels, AMM TASK 71-11-02-410-801-F00.

END OF TASK**807. IGN R (IGN 2) Is Failed - Fault Isolation****A. Description**

- (1) This task is for these maintenance message numbers:
 - (a) 74-10961, 74-10962, 74-20961, 74-20962, 74-30961, and 74-30962.
 - (b) For the maintenance message 74-X096Y; where X = EEC Channel (1 = Channel A, 2 = Channel B, 3 = Dual Channel), and Y = Engine Position (1 = Eng 1, 2 = Eng 2), do the Fault Isolation Procedure.
- (2) The EEC detects that there was no engine start (no increase in EGT) with these conditions:
 - (a) The start lever is in the IDLE position.
 - (b) The fuel metering valve (FMV) is in the correct position.
 - (c) The input voltage to the EEC for the right exciter is correct.
 - (d) The engine did not start when the right igniter was selected.
- (3) This fault is reported when the EEC has electrical power.
 - (a) This fault should show as a dual channel message.

B. Possible Causes

- (1) For an Audible Igniters Test (Right Igniter) with one audible confirmation.
 - (a) EEC, M1818.
- (2) For an Audible Igniters Test (Right Igniter) with no audible confirmation:
 - (a) Right igniter plug
 - (b) Right ignition lead
 - (c) Right ignition exciter
 - (d) MW0302 wire harness.
- (3) For an Audible Igniters Test (Right Igniter) with two audible confirmations:
 - (a) Right igniter plug
 - (b) Start brake assembly M1824 (Eng 1), M1825 (Eng 2), for right ignition switches S89, S91
 - (c) Right ignition lead
 - (d) EEC, M1818
 - (e) MW0302 wire harness
 - (f) Upper 11 fuel nozzles if first start of the day or cold soaked engine

FAULT ISOLATION MANUAL**C. Circuit Breakers**

(1) For Engine 1:

- (a) This is the primary circuit breaker related to the fault:

CAPT Electrical System Panel, P18-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	1	C00458	ENGINE 1 IGNITION RIGHT

(2) For Engine 2:

- (a) This is the primary circuit breaker related to the fault:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	4	C00459	ENGINE 2 IGNITION RIGHT

D. Related Data

(1) Component Location (Figure 301)

(2) Simplified Schematic (Figure 302)

(3) (SSM 74-11-11)

(4) (WDM 74-11-11)

E. Initial Evaluation

(1) Do this task: EEC BITE Procedure, 73-00 TASK 801.

- (a) Look at the RECENT FAULTS for Flight Leg 0.
- (b) If maintenance message number 74-X096 is set, then do the Fault Isolation Procedure.
- (c) If the maintenance message does not show on the FMCS CDU, then the Initial Evaluation has shown that the fault is not active at this time and you have an intermittent fault.
 - 1) If you cannot find the fault at this time, then the Fault Isolation Procedure cannot isolate the fault.
 - 2) For an intermittent fault you must use your judgment, your airline policies, and the Possible Causes list to make the decision if you will try to correct the fault.
 - 3) If you will try to correct the fault, it is recommended that you do these steps:
 - a) Do the visual checks of the electrical connectors in the applicable fault isolation procedure below.
 - b) Use the WDM references to identify intermediate electrical connections in the wire harness and do a visual check.
 - c) If you find no problems, then replace components as listed in the Possible Causes list above.
 - 4) Monitor the airplane on the subsequent flight.

F. Fault Isolation Procedure

- (1) To see if the right igniter plug operates, do this task: Audible Test of the Ignition System - EEC BITE Igniters Test, AMM TASK 74-00-00-750-801-F00.
 - (a) The operation of the right igniter plug should be heard twice, for CH A and then for CH B.
 - (b) If only one audible confirmation is heard, do the Fault Isolation Procedure - One Audible Confirmation.

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- (c) If no audible confirmation is heard, do the Fault Isolation Procedure - No Audible Confirmation.
- (d) If the two audible confirmations are heard, do these steps:
 - 1) With the IGN R selected, do this task: Start the Engine Procedure (Selection), AMM TASK 71-00-00-800-807-F00.
 - 2) If the engine start is correct, then there was an intermittent fault.
 - 3) If the engine does not start, do the Fault Isolation Procedure - Two Audible Confirmations.
- G. Fault Isolation Procedure - One Audible Confirmation
 - (1) Replace the EEC, M1818, for a defective EEC internal igniter relay.
These are the tasks:
EEC Removal, AMM TASK 73-21-60-000-801-F00,
EEC Installation, AMM TASK 73-21-60-400-801-F00.
 - (a) Do the Repair Confirmation at the end of this task.
- H. Fault Isolation Procedure - No Audible Confirmation
 - (1) If there are maintenance messages, do the fault isolation for those messages.
 - (a) Do the Repair Confirmation at the end of this task.
 - (b) If the Repair Confirmation is not satisfactory, then continue.
 - (2) If there are no maintenance messages, then continue.
 - (a) Examine the right igniter plug; do this task: Main Igniter Plug Inspection, AMM TASK 74-21-02-200-801-F00.
 - 1) If the damage is more than the limits, replace the right igniter plug.
These are the tasks:
Main Igniter Plug Removal, AMM TASK 74-21-02-000-801-F00,
Main Igniter Plug Installation, AMM TASK 74-21-02-400-801-F00.
 - 2) Do the Repair Confirmation at the end of this task.
 - 3) If the Repair Confirmation is not satisfactory, then continue.
 - (b) Examine the right igniter lead. To examine it, do this task: Ignition Lead Inspection, AMM TASK 74-21-01-200-801-F00.
 - 1) If the damage is more than the limits, replace the right ignition lead.
These are the tasks:
Ignition Lead Removal, AMM TASK 74-21-01-000-801-F00,
Ignition Lead Installation, AMM TASK 74-21-01-400-801-F00.
 - 2) Do the Repair Confirmation at the end of this task.
 - 3) If the Repair Confirmation is not satisfactory, then continue.
 - (c) Examine the right ignition exciter. To examine it, do this task: Ignition Exciter Inspection, AMM TASK 74-11-01-200-801-F00.
 - 1) If the damage is more than the limits, replace the right ignition exciter.
These are the tasks:
Ignition Exciter Removal, AMM TASK 74-11-01-000-801-F00,
Ignition Exciter Installation, AMM TASK 74-11-01-400-801-F00.



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- 2) Do the Repair Confirmation at the end of this task.
 - 3) If the Repair Confirmation is not satisfactory, then continue.
- (3) Examine the electrical connector DP0202 at the EEC:
- NOTE:** The electrical connector DP0202 is on the MW0302 wire harness at the J2 receptacle.
- (a) Make sure that the electrical connector DP0202 is correctly connected to the EEC.
 - (b) Disconnect the electrical connector DP0202 from the EEC.
 - (c) Visually examine the EEC J2 receptacle and wire harness connector.
 - 1) If the EEC J2 receptacle is damaged, then replace the EEC, M1818.
 These are the tasks:
 EEC Removal, AMM TASK 73-21-60-000-801-F00,
 EEC Installation, AMM TASK 73-21-60-400-801-F00.
 - a) Do the Repair Confirmation at the end of this task.
 - 2) If the harness connector is damaged, then replace the MW0302 wire harness.
 These are the tasks:
 Nacelle Wiring Harnesses Removal, AMM TASK 71-51-03-000-801-F00,
 Nacelle Wiring Harnesses Installation, AMM TASK 71-51-03-400-801-F00.
 - a) Do the Repair Confirmation at the end of this task.
 - 3) If the connector was not correctly connected, and no other problem was found, then do the Repair Confirmation at the end of this task.

I. Fault Isolation Procedure - Two Audible Confirmation

- (1) For the right igniter plug, do this task: Main Igniter Plug Inspection, AMM TASK 74-21-02-200-801-F00.
 - (a) If the damage to the igniter plug is more than the limits, then replace the right igniter plug (AMM TASK 74-21-02-400-801-F00).
 - 1) Do the Repair Confirmation at the end of this task.
 - 2) If the Repair Confirmation is not satisfactory, then continue.
 - (b) If the damage is in the limits, then re-install the right igniter plug (AMM TASK 74-21-02-400-801-F00) and continue.
- (2) Replace the upper 11 fuel nozzles.
 - (a) Fuel Nozzles Removal (AMM TASK 73-11-04-000-805-F01 or AMM TASK 73-11-04-000-804-F02).
 - (b) Fuel Nozzles Installation (AMM TASK 73-11-04-400-805-F01 or AMM TASK 73-11-04-400-804-F02).
- (3) If the problem continues, then there was an intermittent fault.
 - (a) For an intermittent fault, you must use your judgment, your airline policies, and the Possible Causes list to make the decision if you will try to correct the fault.
 - 1) Replace components as listed in the Possible Causes list above and do the Repair Confirmation.
 - 2) To examine the operation of the ignition switch in the engine start brake assembly, you can do the procedure that follows.

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- (4) To examine the applicable right ignition switch, S89 (Eng 1) or S91 (Eng 2) in the engine start brake assembly, you can use input monitoring the see if the switch position agrees with the selected start lever position.

NOTE: 737-SL-76-020 notes some switches in the engine start brake assembly cause engine start problems.

- (a) Get access to the input monitoring screen on the CDU:

- 1) Push the INIT REF key two times.

NOTE: This causes the PERF INIT INDEX to show.

- 2) Push the INDEX line select key (LSK).

- 3) Push the MAINT LSK.

- 4) Push the ENGINE LSK.

- 5) Push the line select key for the applicable engine (ENGINE 1 or ENGINE 2).

NOTE: This causes the ENGINE X BITE TEST MAIN MENU to show.

- 6) Push the INPUT MONITORING LSK.

NOTE: An alert message will show to tell you that only data from one channel is available.

- 7) Push the CONTINUE LSK.

NOTE: This causes the INPUT MONITORING MENU to show. Push the NEXT PAGE key to go to page 2 of the menu

- 8) Push the DISCRETES LSK.

NOTE: This causes the INPUT MONITORING GMM DISCRETES screen to show.

- 9) Push the NEXT PAGE key twice to see page 3/3 and find the R IGNITER 115V line on the screen.

- (b) With the applicable start lever in the CUTOFF position, make sure the value is OFF.

- (c) Put the applicable start lever to the IDLE position and make sure the value is ON.

- (d) Operate the start lever several times to see if the switch operates correctly.

- 1) If the switch does not operate correctly, replace the switch, S89 or S91.

These are the tasks:

Engine Start Brake Assembly Switch Removal, AMM TASK 76-11-11-010-801-F00,

Engine Start Brake Switch Installation, AMM TASK 76-11-11-420-801-F00.

J. Repair Confirmation

- (1) Do these steps to prepare for the procedure:

- (a) Make sure that the electrical connector DP0201 is correctly connected to the right ignition exciter.

- (b) Make sure that the electrical connector DP0202 is correctly connected to the EEC at J2.

- (2) If the initial audible test of the ignition system failed, then do these steps:

- (a) For the right igniter plug, . do this task: Audible Test of the Ignition System - EEC BITE Igniters Test, AMM TASK 74-00-00-750-801-F00

- (b) If the right igniter test passes two audible confirmations are heard, then you corrected the fault.

- 1) Monitor the airplane on the subsequent flight.



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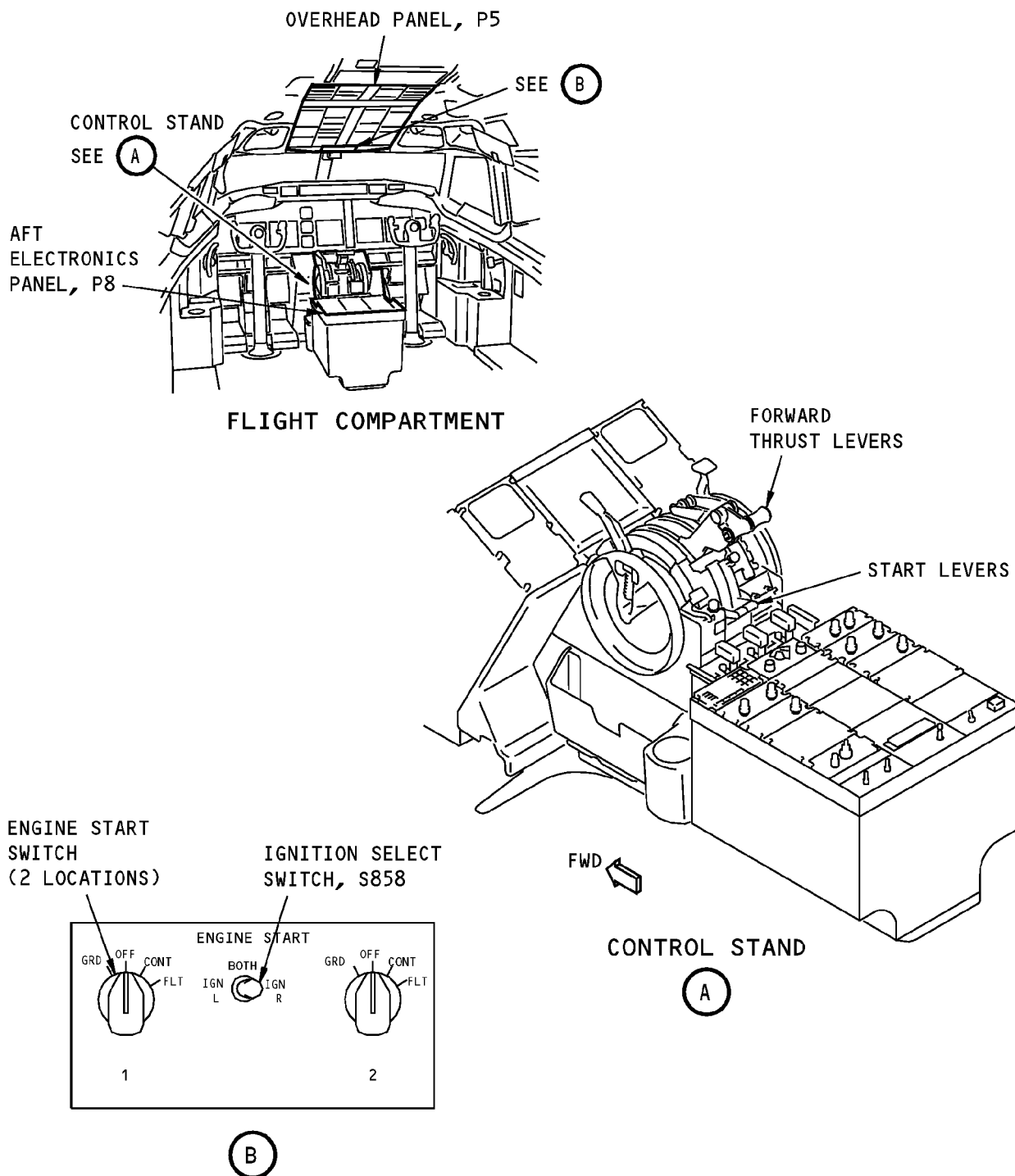
- (3) If the initial audible test of the ignition system passed, then do these steps:
- (a) With the IGN R selected, do this task: Start the Engine Procedure (Selection), AMM TASK 71-00-00-800-807-F00.
 - (b) If the engine start is normal, then you corrected the fault.

————— **END OF TASK** —————

EFFECTIVITY
HAP ALL

74-21 TASK 807

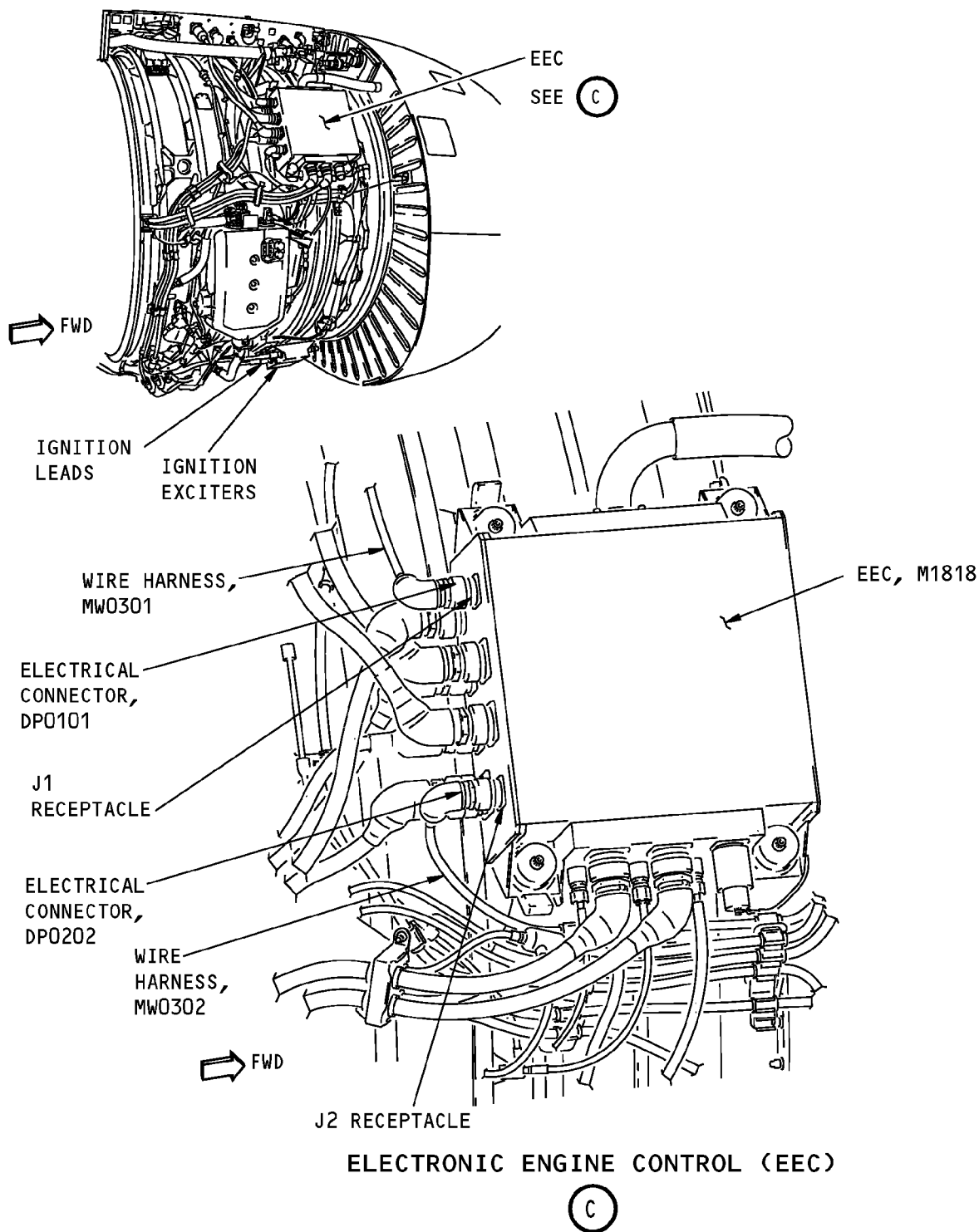
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Ignition System - Component Location
 Figure 301 (Sheet 1 of 2)/ 74-21-00-990-801-F00

EFFECTIVITY
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Ignition System - Component Location
Figure 301 (Sheet 2 of 2)/ 74-21-00-990-801-F00

EFFECTIVITY
HAP ALL

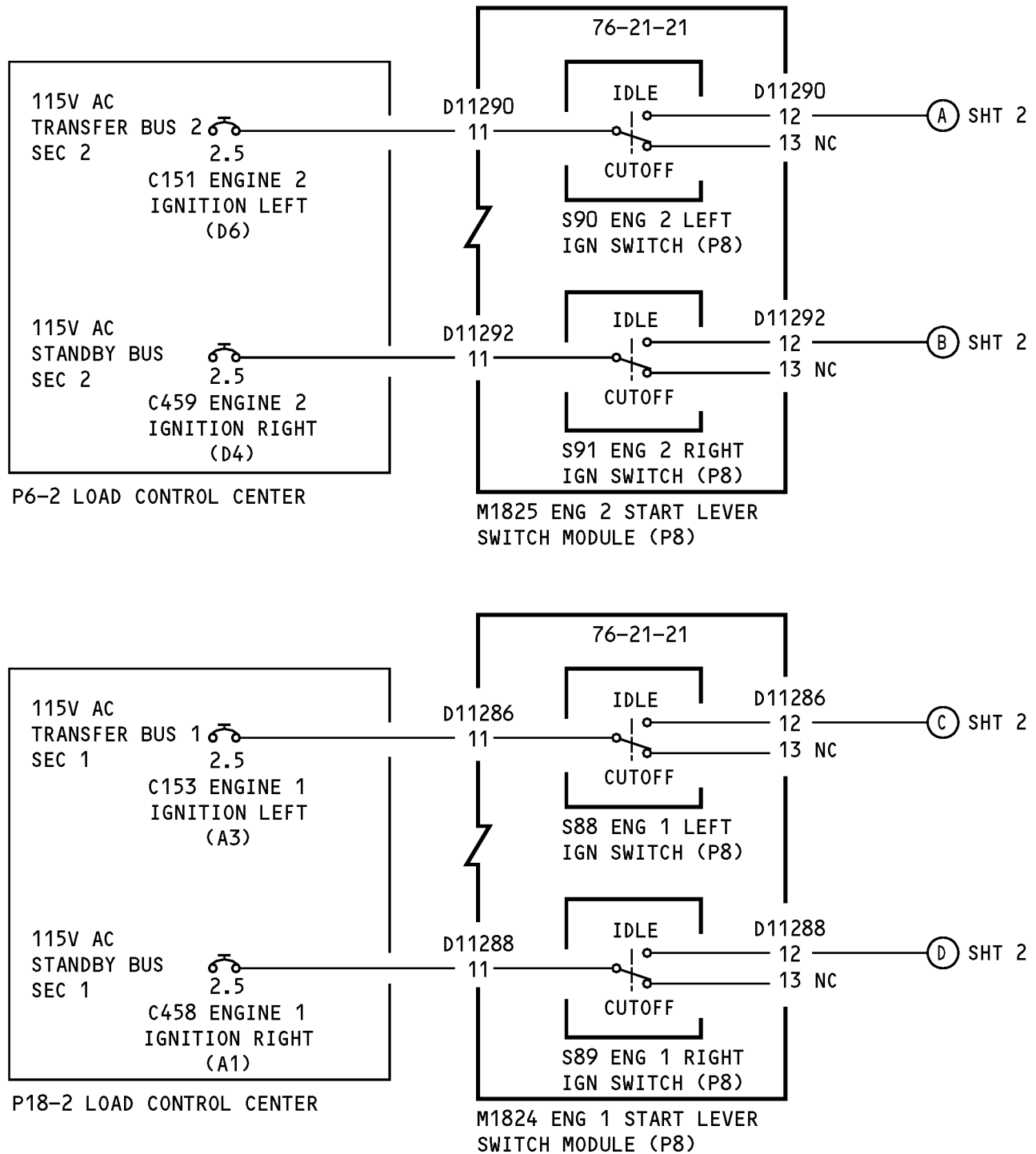
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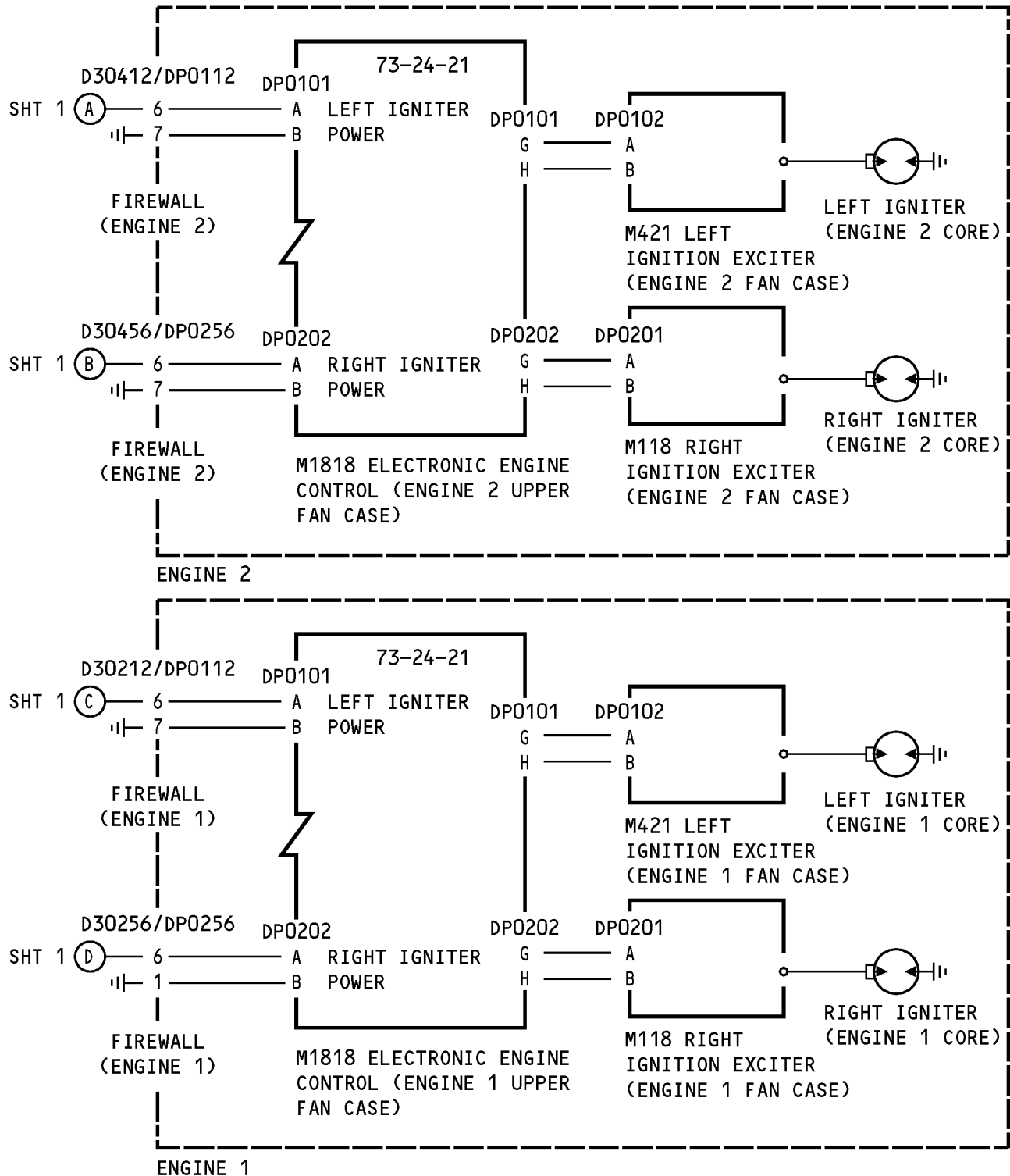


Ignition Power Simplified Schematic
Figure 302 (Sheet 1 of 2)/ 74-21-00-990-802-F00

EFFECTIVITY
HAP ALL

74-21 TASK SUPPORT

FAULT ISOLATION MANUAL

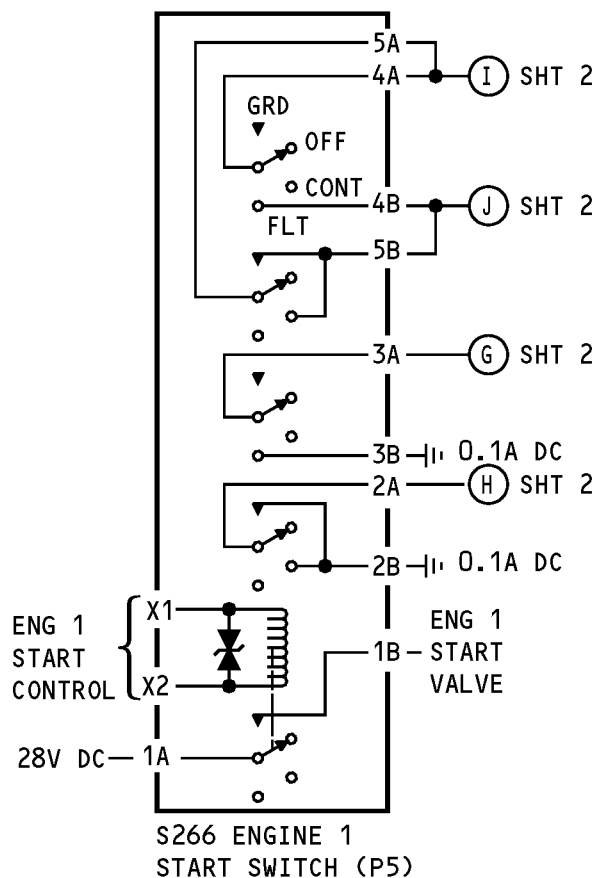
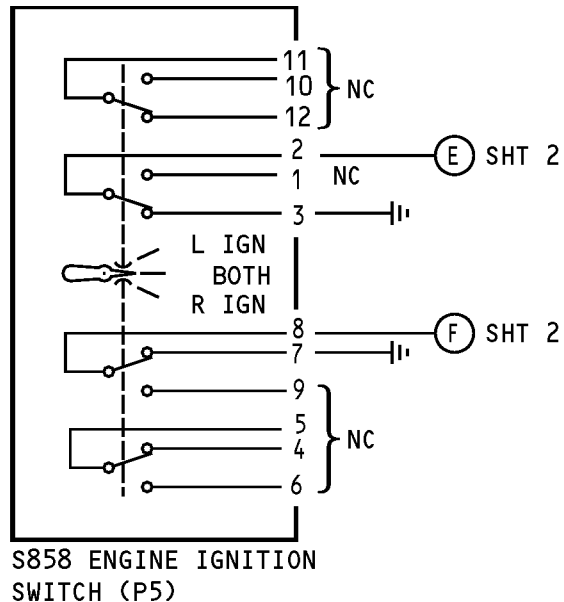
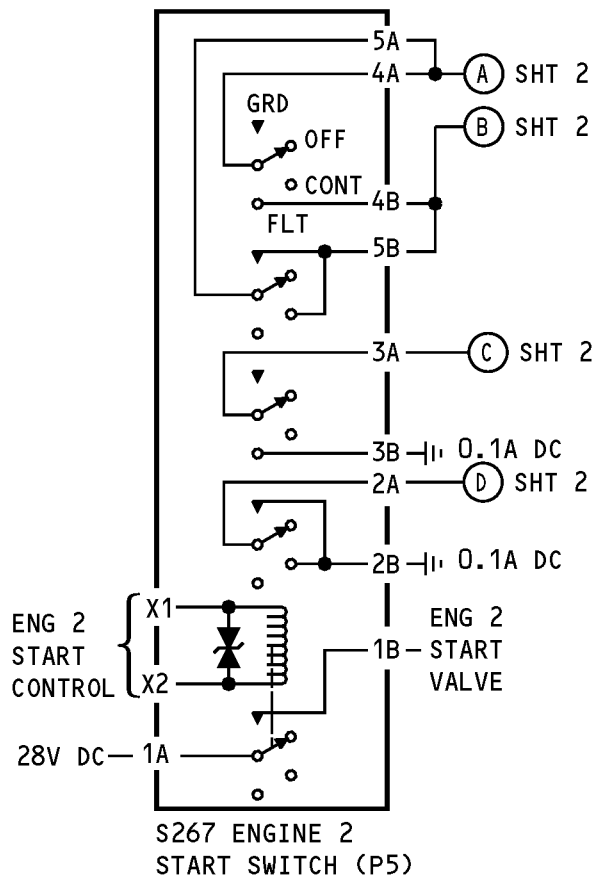


Ignition Power Simplified Schematic
 Figure 302 (Sheet 2 of 2)/ 74-21-00-990-802-F00

EFFECTIVITY
 HAP ALL

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FAULT ISOLATION MANUAL

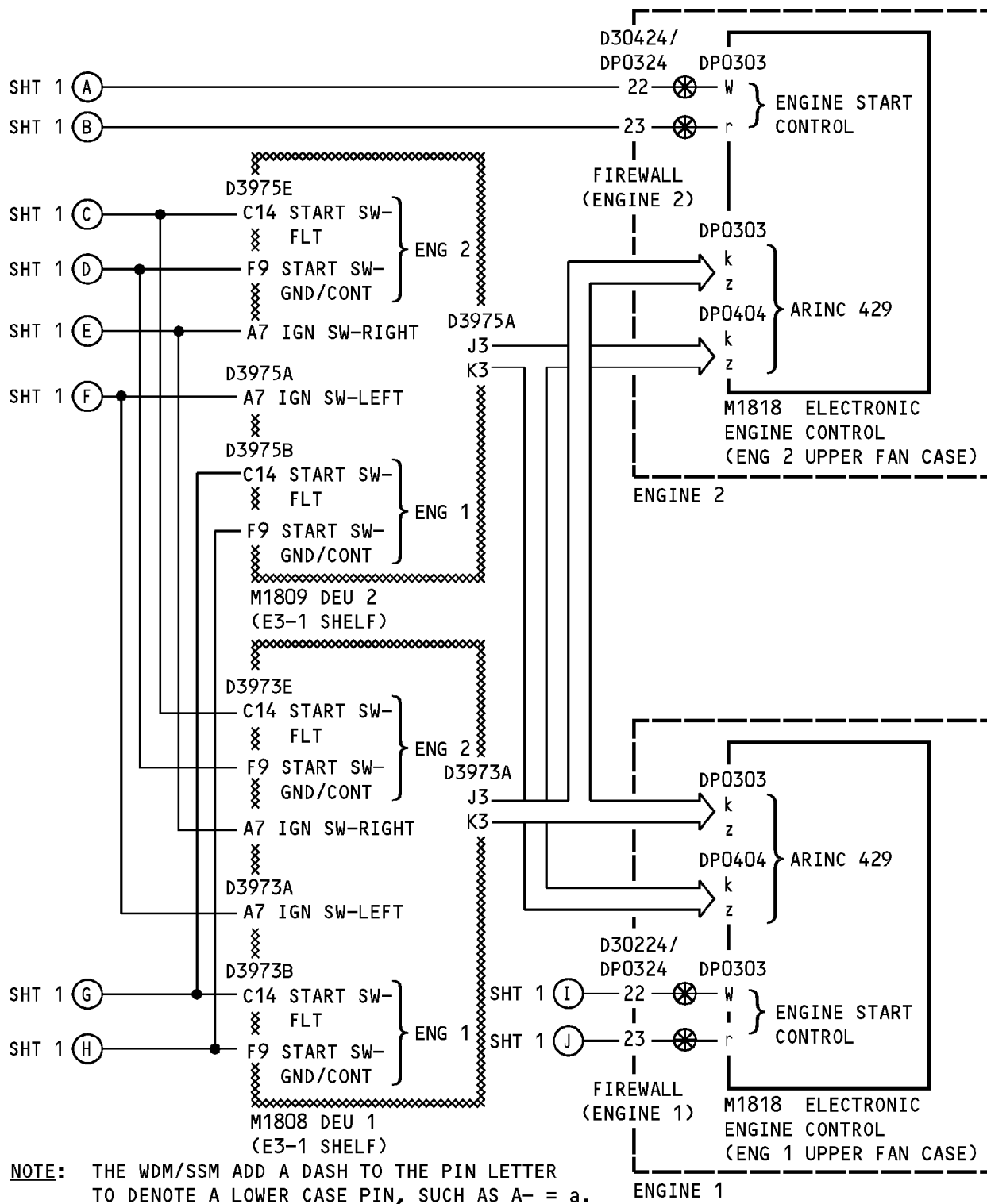


Engine Ignition Control Simplified Schematic
Figure 303 (Sheet 1 of 2)/ 74-21-00-990-803-F00

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Engine Ignition Control Simplified Schematic
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