

Scandinavian Airlines System

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CHAPTER 76 - ENGINE CONTROLS

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FAULT CODE	1. LOG BOOK REPORT 2. FAULT ISOLATION REFERENCE
76 03 XA --	1. (O1=L, O2=R) thrust lever movement symptoms or patterns problem was encountered by the flight crew which is not covered in the fault code diagrams (Ref Chapter 71 fault code diagram for flight crew actions). 2. SSM 76-11-01
76 03 XB --	1. (O1=L, O2=R) ENG VALVE light, or fuel control switch problem was encountered by the flight crew which is not covered in the fault code diagrams (Ref Chapter 71 fault code diagram for flight crew actions). 2. SSM 76-11-01
76 03 01 --	1. (O1=L, O2=R) eng thrust lever has dead band area. (Ref Chapter 71 for fault code diagram). 2. FIM 76-11-00/101, Fig. 107, Block 1
76 03 02 --	Not Used
76 03 03 --	Not Used
76 03 04 --	1. (O1=L, O2=R) eng thrust lever difficult to move in fwd and reverse thrust (Ref Chapter 71 for fault code diagram). 2. FIM 76-11-00/101, Fig. 103, Block 1
76 03 05 --	Not Used
76 03 06 --	1. (O1=L, O2=R) ENG VALVE and SPAR VALVE light illum with fuel control sw in (RUN, CUTOFF) (Ref Chapter 71 for fault code diagram). 2. Replace the L (R) Engine Fuel Control Switch YAZS1 (YAZS3) on the Engine Fuel Control Module M73 (WDM 76-11-11) or replace the Engine Fuel Control Module M73 (AMM 76-11-09/201).
76 03 07 --	1. EICAS msg (O1=L, O2=R) ENG SHUTDOWN did not display and aural warning and appropriate eng related msgs were not inhibited with eng shutdown (Ref Chapter 71 for fault code diagram). 2. FIM 76-11-00/101, Fig. 105, Block 1

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76-FAULT CODE INDEX

N04

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FAULT CODE	1. LOG BOOK REPORT 2. FAULT ISOLATION REFERENCE
76 03 08 --	1. (O1=L, O2=R) eng did not shutdown immediately with fuel control switch in CUTOFF pos. ENG VALVE light remained illuminated. EICAS msg (L, R) ENG FUEL VAL displayed (Ref Chapter 71 for fault code diagram). 2. FIM 76-11-00/101, Fig. 104, Block 1
76 03 09 --	1. (O1=L, O2=R) eng did not shutdown immediately with fuel control switch in CUTOFF pos. ENG VALVE light extinguished (Ref Chapter 71 for fault code diagram). 2. Replace the L (R) Engine Fuel Control Switch YAZS1 (YAZS3) on the Engine Fuel Control Module M73 (WDM 76-11-11) or replace the Engine Fuel Control Module M73 (AMM 76-11-09/201). If the problem continues, replace the L (R) Eng Fuel Metering Unit M3108 (AMM 73-21-01/401).
76 03 10 --	1. (O1=L, O2=R) ENG VALVE light slow to extinguish. Eng slow to start and shutdown (Ref Chapter 71 for fault code diagram). 2. Replace the L (R) Eng Fuel Metering Unit M3108 (AMM 73-21-01/401).
76 03 11 --	1. (O1=L, O2=R) ENG VALVE light remained illuminated with fuel control switch in RUN pos. EICAS msg (L, R) ENG FUEL VAL displayed (Ref Chapter 71 for fault code diagram). 2. FIM 76-11-00/101, Fig. 104, Block 1
76 03 12 --	1. (O1=L, O2=R) eng thrust lever has loss of friction. Walks back. (Ref Chapter 71 for fault code diagram). 2. FIM 76-11-00/101, Fig. 103, Block 1
76 03 13 --	1. (O1=L, O2=R) eng thrust lever has unwanted movement with auto-throttle OFF. (Ref Chapter 71 for fault code diagram). 2. FIM 76-11-00/101, Fig. 103, Block 1

EFFECTIVITY

ALL

76-FAULT CODE INDEX

N01

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ENGINE CONTROL SYSTEM

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	AMM REFERENCE
ACTUATORS - (FIM 78-36-00/101) L THRUST LEVER INTERLOCK, M01440 R THRUST LEVER INTERLOCK, M01441				
CIRCUIT BREAKERS- L ENG FUEL CONT VLV AND CHAN B RESET, C1419 R ENG FUEL CONT VLV AND CHAN B RESET, C1420	1	1	FLT COMPT, P11 11D25	*
COMPUTERS - (FIM 31-41-00/101) L EICAS, M10181 R EICAS, M10182		1	11D26	*
DIODE - (FIM 31-01-33/101) R45				
DIODE - (FIM 31-01-36/101) R297				
DIODES - (FIM 31-01-37/101) R43, R298				
LEVERS - THRUST, M985	2	1	FLT COMPT, P10	76-11-01
LIGHT - L ENG VLV, YAZL2	1	1	FLT COMPT, P10 FUEL CONT PANEL (MODULE), M73	*
LIGHT - R ENG VLV, YAZL4	1	1	FLT COMPT, P10 FUEL CONT PANEL (MODULE), M73	*
PANEL - FUEL CONT (MODULE), M73	1	1	FLT COMPT, P10	76-11-09
PACKS - (FIM 22-31-00/101) AUTOTHROTTLE BRAKE AUTOTHROTTLE MICROSWITCH				
RELAYS - (FIM 31-01-36/101) L FUEL/IGN CONT, K168 L ENG CH B EEC RESET, K1037				
RELAYS - (FIM 31-01-37/101) R FUEL/IGN CONT, K169 R ENG CH B EEC RESET, K1039				
RESOLVERS - (FIM 73-21-00/101) L ENG THROTTLE LEVER ANGLE, TS171 R ENG THROTTLE LEVER ANGLE, TS170				
SEALS - CONTROL STAND LEVERS COVERS, RAILS	1	1	FLT COMPT, P10	76-11-10
SWITCHES - (FIM 26-21-00/101) L ENGINE FIRE, S37 R ENGINE FIRE, S38				
SWITCH - L ENG FUEL CONT, YAZS1	1	1	FLT COMPT, P10, FUEL CONT PANEL (MODULE), M73	*
SWITCH - R ENG FUEL CONT, YAZS3	1	1	FLT COMPT, P10, FUEL CONT PANEL (MODULE), M73	*
UNIT - (FIM 22-32-00/101) AUTOTHROTTLE SERVO, M229				
UNITS - (FIM 73-21-00/101) L ENG FUEL METERING, M3108 R ENG FUEL METERING, M3108		1	416AR	
		1	426AR	

* SEE THE WDM EQUIPMENT LIST

Engine Control System - Component Index
Figure 101

EFFECTIVITY

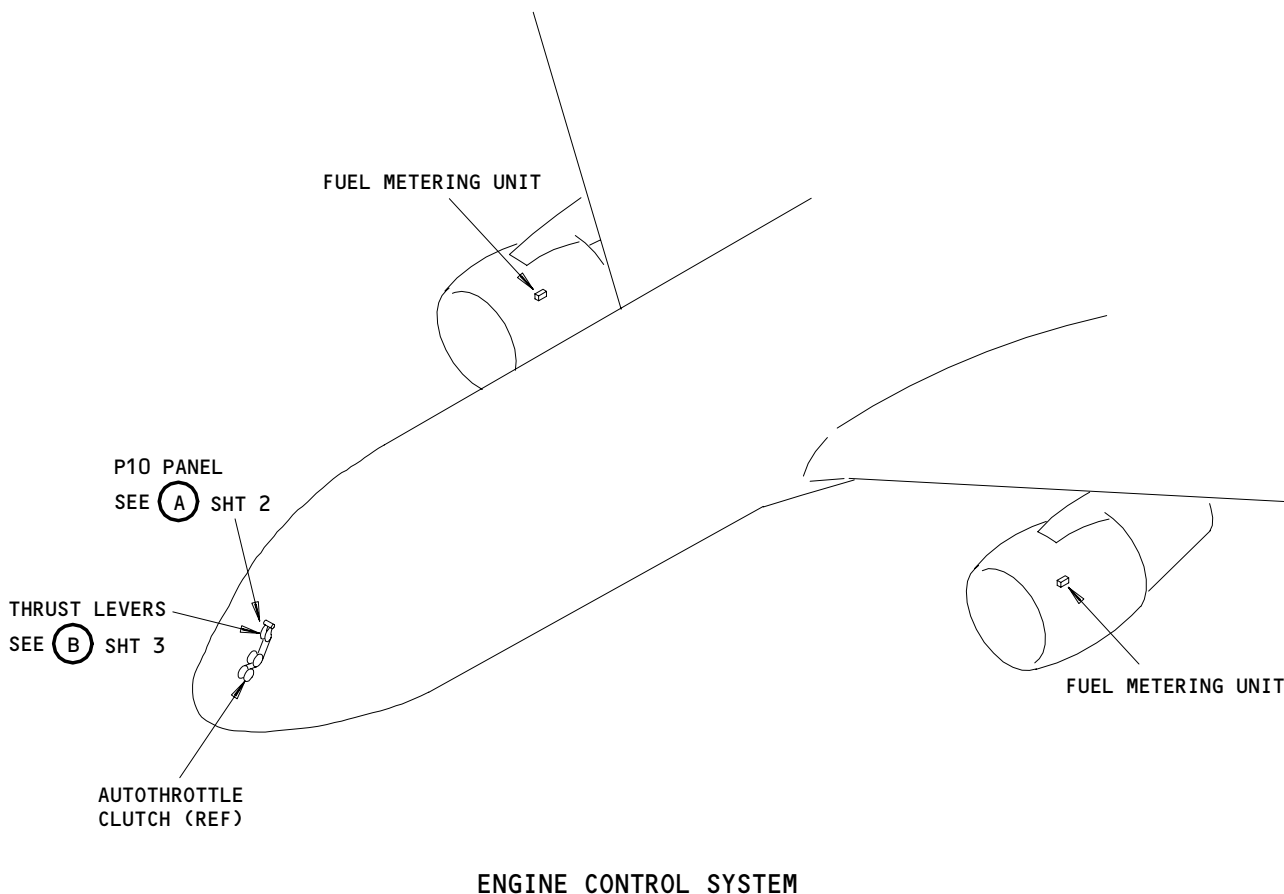
ALL

76-11-00

N01

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724222

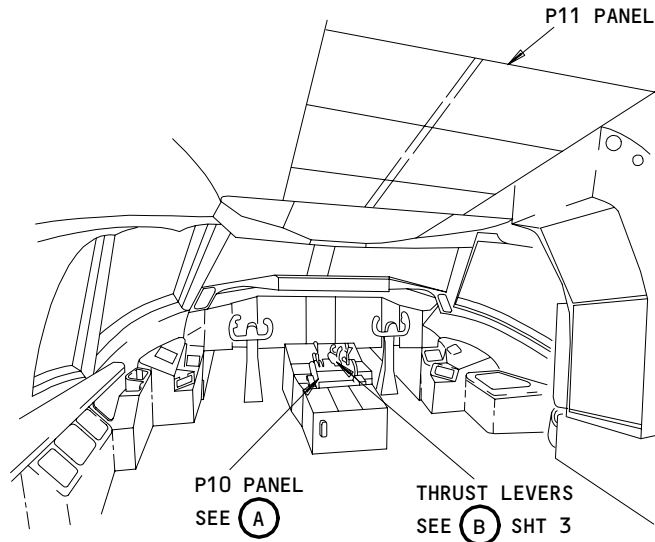


Engine Control System - Component Location
 Figure 102 (Sheet 1)

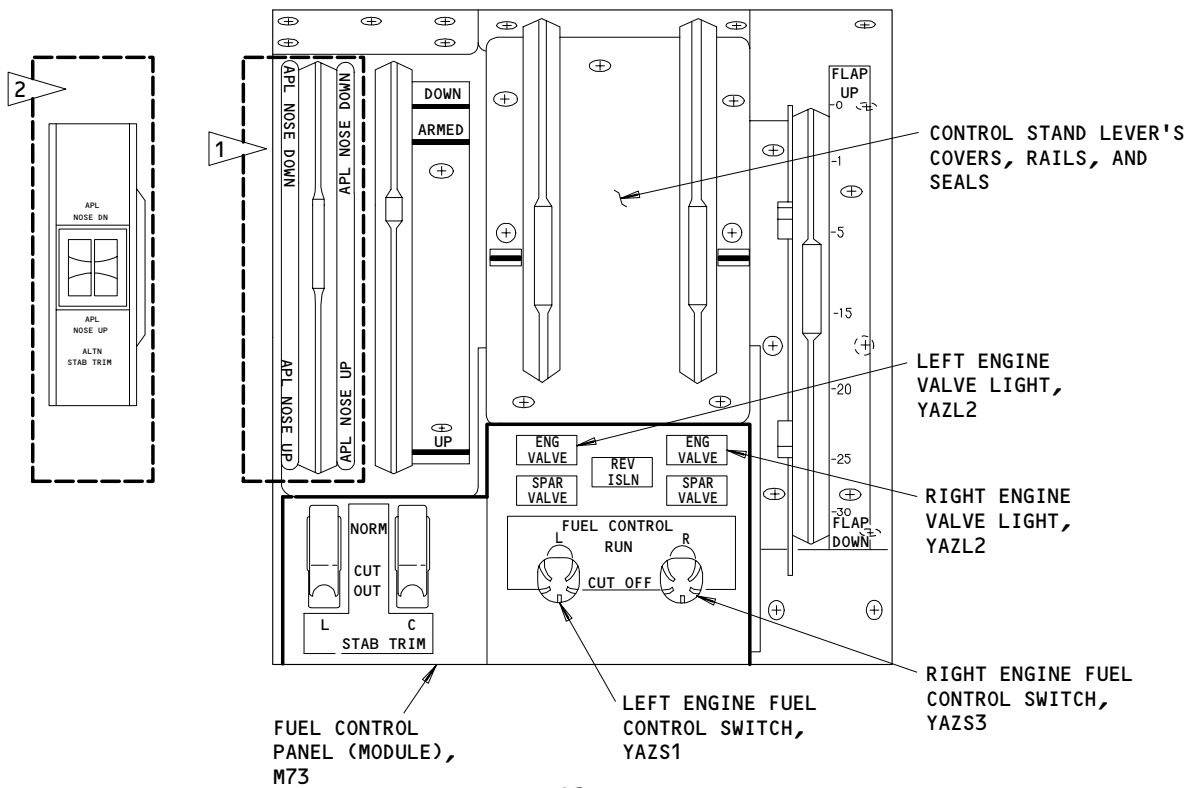
EFFECTIVITY	ALL
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76-11-00

723716



FLIGHT COMPARTMENT



P10 PANEL

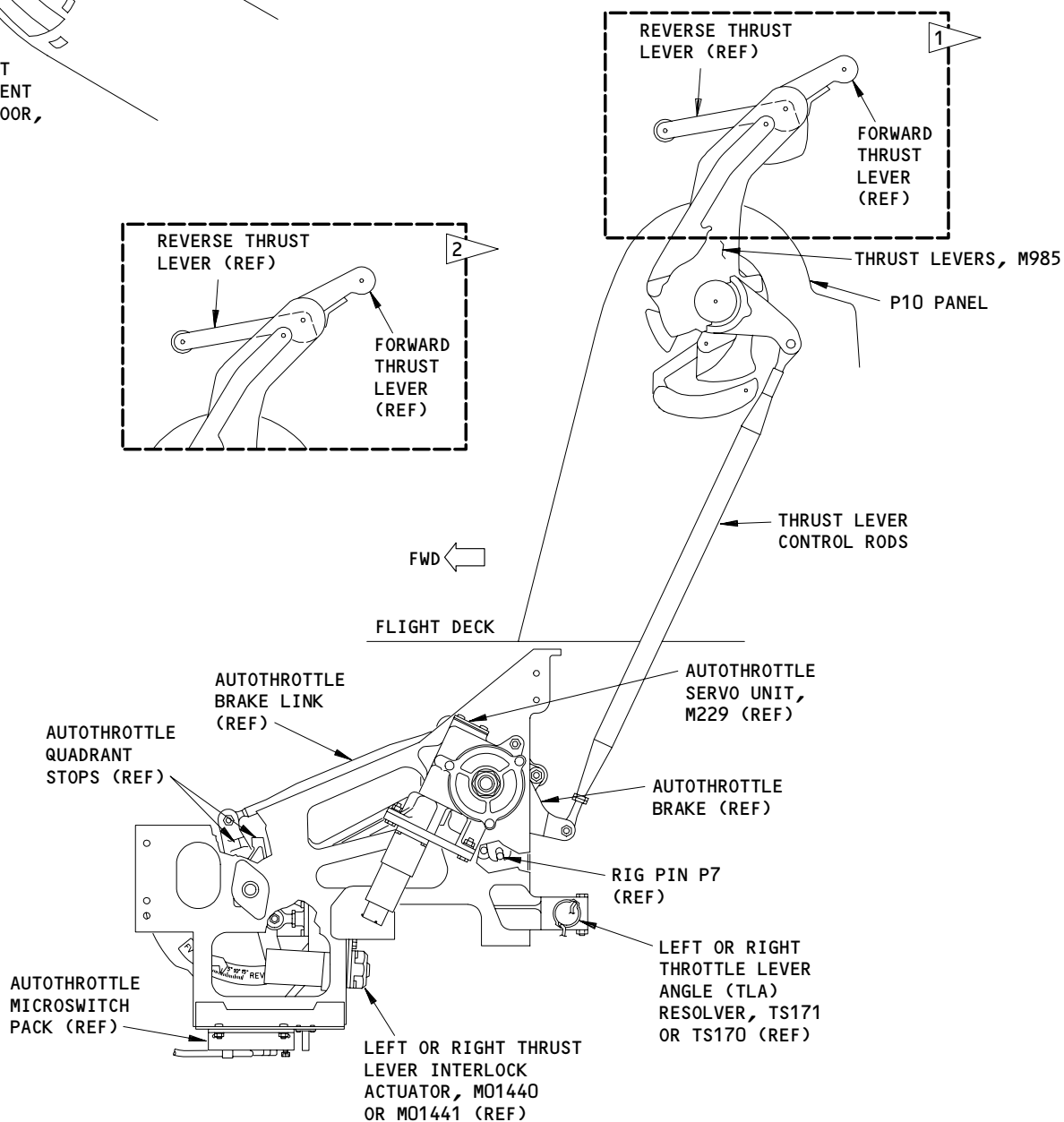
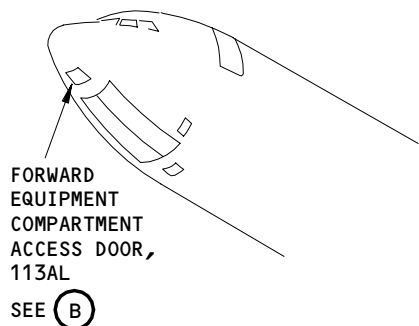
(A)

- 1 AIRPLANES WITH STABILIZER TRIM LEVERS
- 2 AIRPLANES WITH ALTERNATE STABILIZER TRIM SWITCHES

Engine Control System - Component Location
Figure 102 (Sheet 2)

EFFECTIVITY	ALL
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76-11-00



THRUST LEVERS

(B)

- 1 AIRPLANES WITH TITANIUM THRUST LEVERS
- 2 AIRPLANES WITH ALUMINUM THRUST LEVERS

Engine Control System - Component Location
Figure 102 (Sheet 3)

EFFECTIVITY	ALL
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76-11-00

**FORWARD/REVERSE
THRUST LEVER
PROBLEMS**

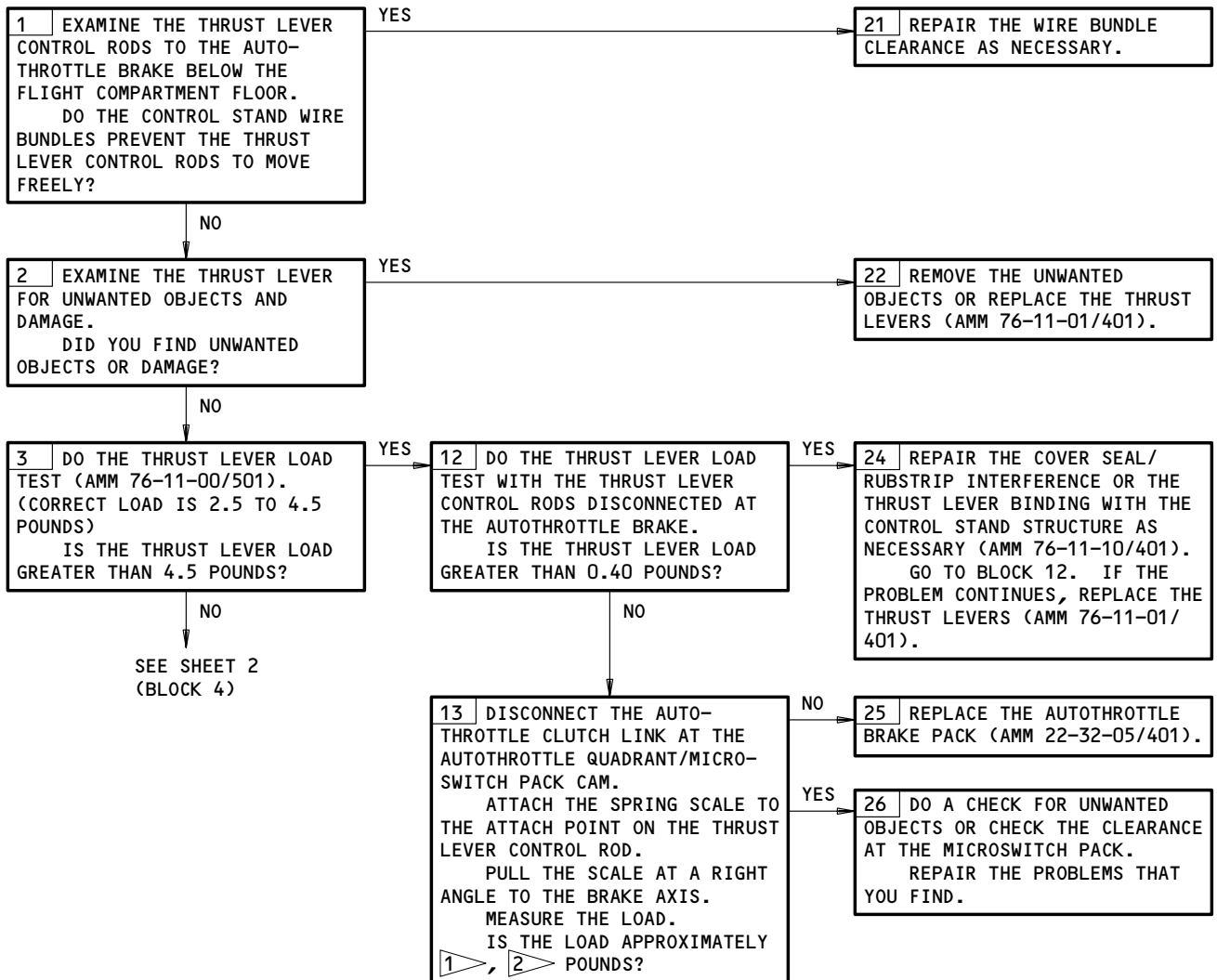
PREREQUISITES
NONE



POSSIBLE CAUSES:

1. INTERFERENCE FROM CONTROL STAND WIRE BUNDLES
2. DAMAGED THRUST LEVERS (AMM 76-11-01/401)
3. THRUST LEVERS BINDING WITH CONTROL STAND (AMM 76-11-10/401)
4. IMPROPER EXTENSION OF THRUST LEVERLOCK INTER ACTUATOR (FIM 78-36-00/101, FIG. 104)
5. BAD AUTOHROTTLE BRAKE PACK (AMM 22-32-05/401).

FAULT ISOLATION:



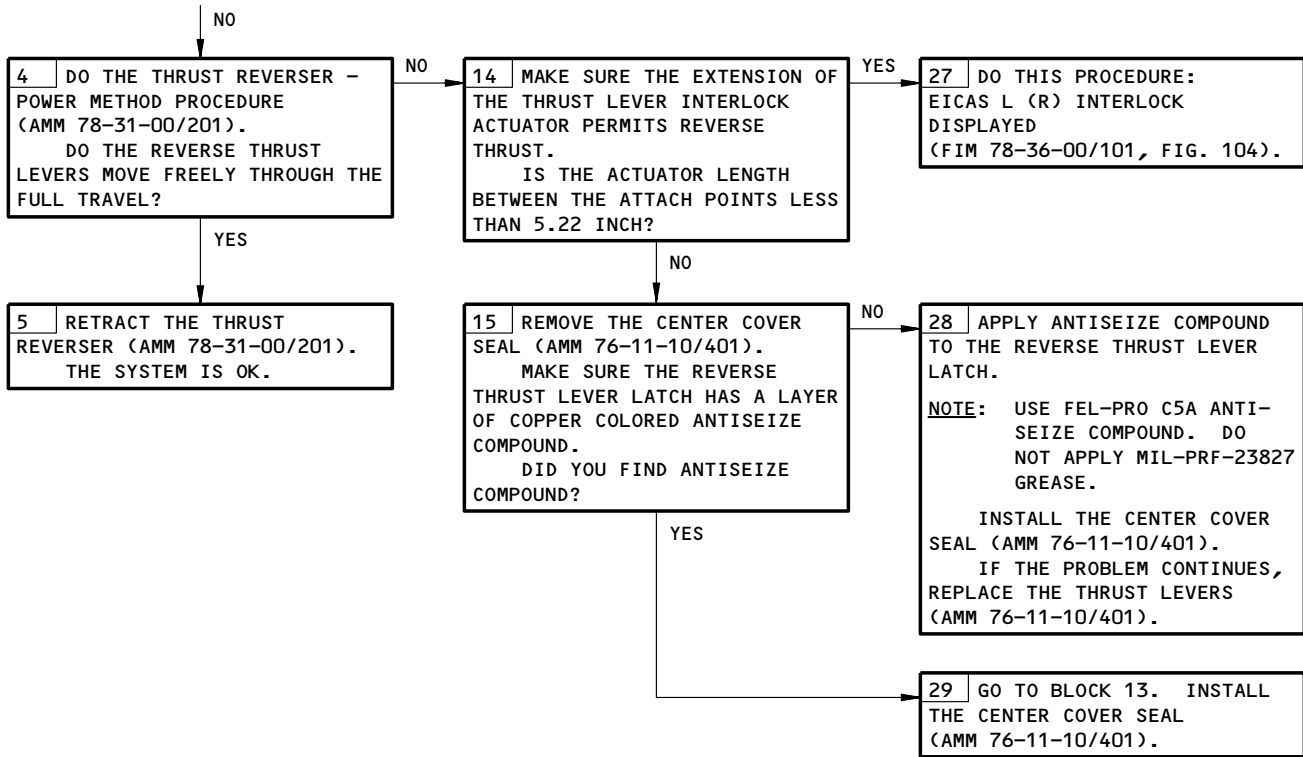
- 1 AIRPLANES WITHOUT THE THIRD AUTOHROTTLE BRAKE;
10-11 POUNDS
- 2 AIRPLANES WITH THE THIRD AUTOHROTTLE BRAKE;
7-8 POUNDS

Forward/Reverse Thrust Lever Problems
Figure 103 (Sheet 1)

EFFECTIVITY
AIRPLANES WITH TITANIUM
THRUST LEVERS

76-11-00

FROM SHEET 1
(BLOCK 3)



Forward/Reverse Thrust Lever Problems
Figure 103 (Sheet 2)

EFFECTIVITY
AIRPLANES WITH TITANIUM
THRUST LEVERS

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N01

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**FORWARD/REVERSE
THRUST LEVER
PROBLEMS**

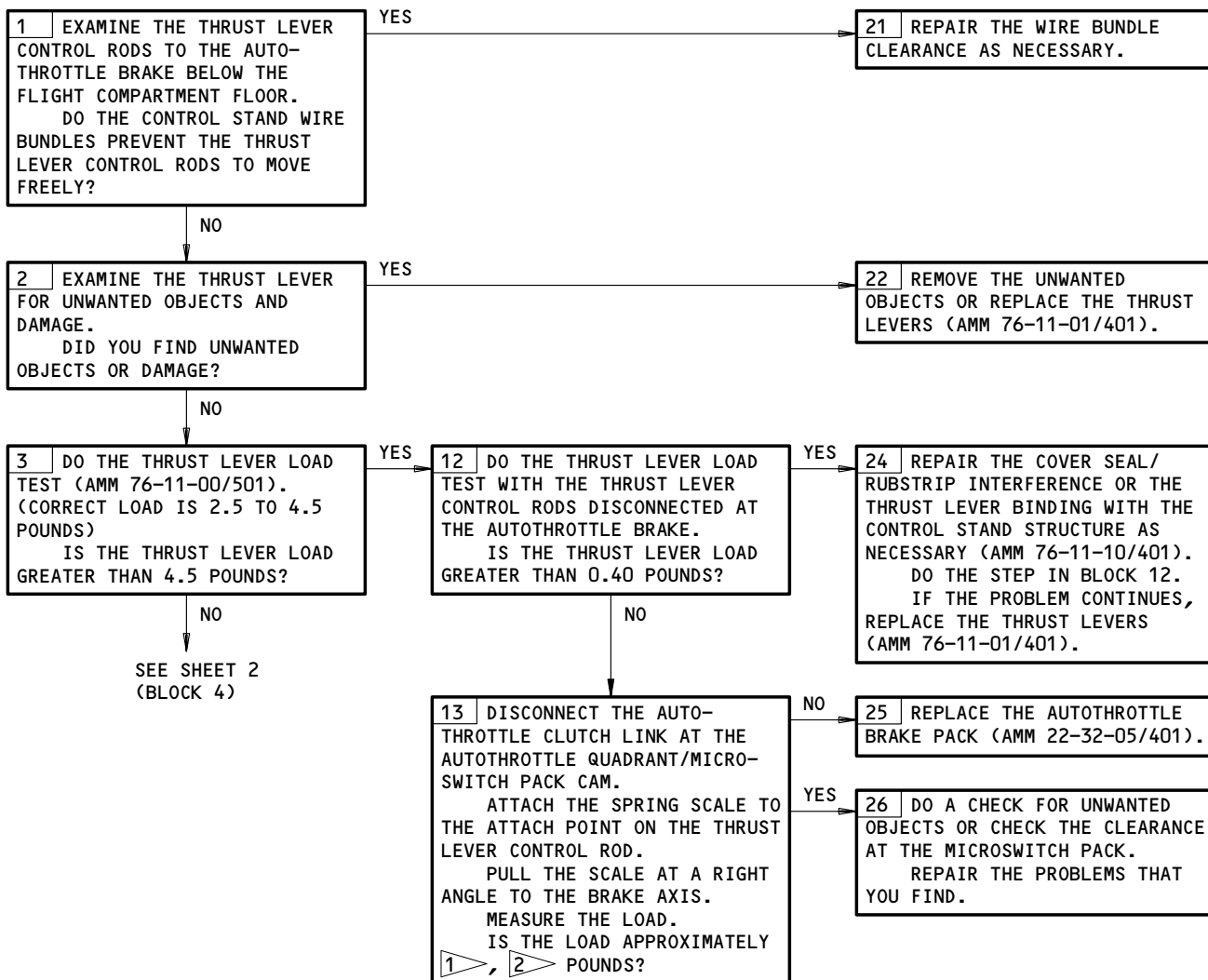
PREREQUISITES
NONE



POSSIBLE CAUSES:

1. INTERFERENCE FROM CONTROL STAND WIRE BUNDLES
2. DAMAGED THRUST LEVERS (AMM 76-11-01/401)
3. THRUST LEVERS BINDING WITH CONTROL STAND (AMM 76-11-10/401)
4. IMPROPER EXTENSION OF THRUST LEVERLOCK INTER ACTUATOR (FIM 78-36-00/101, FIG. 104)
5. BAD AUTOHOTTLE BRAKE PACK (AMM 22-32-05/401).

FAULT ISOLATION:

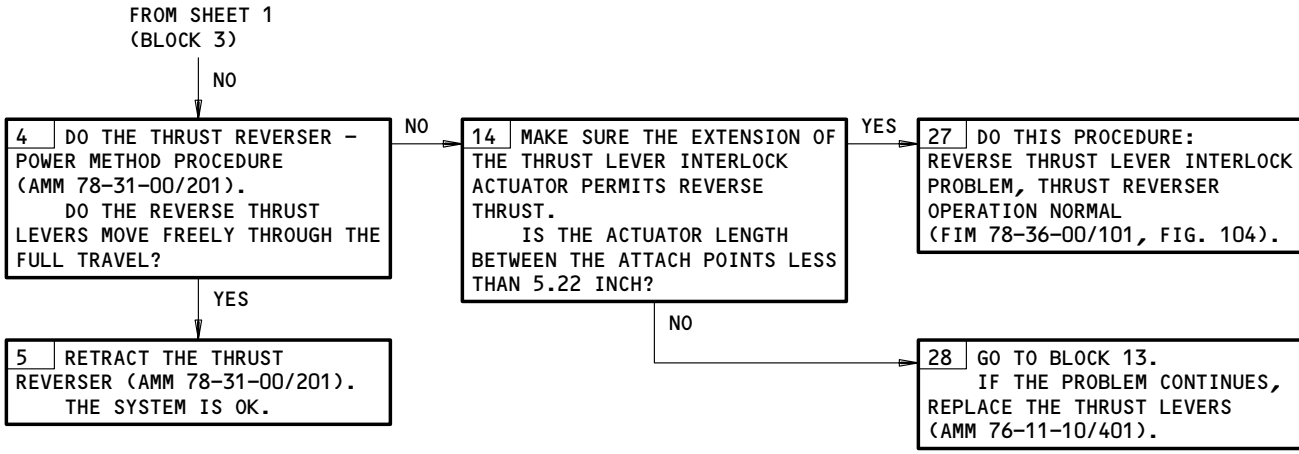


- 1 > AIRPLANES WITHOUT THE THIRD AUTOHOTTLE BRAKE;
10-11 POUNDS
- 2 > AIRPLANES WITH THE THIRD AUTOHOTTLE BRAKE;
7-8 POUNDS

Forward/Reverse Thrust Lever Problems
Figure 103A (Sheet 1)

EFFECTIVITY
AIRPLANES WITH ALUMINUM
THRUST LEVERS

76-11-00



Forward/Reverse Thrust Lever Problems
Figure 103A (Sheet 2)

EFFECTIVITY
AIRPLANES WITH ALUMINUM
THRUST LEVERS

76-11-00

E14269

ENGINE FUEL
CONDITIONING CONTROL
PROBLEM. "L (R)
ENG VALVE" LIGHT-
ON, "L (R) ENG FUEL
VAL" EICAS MSG
DISPLAYED



PREREQUISITES

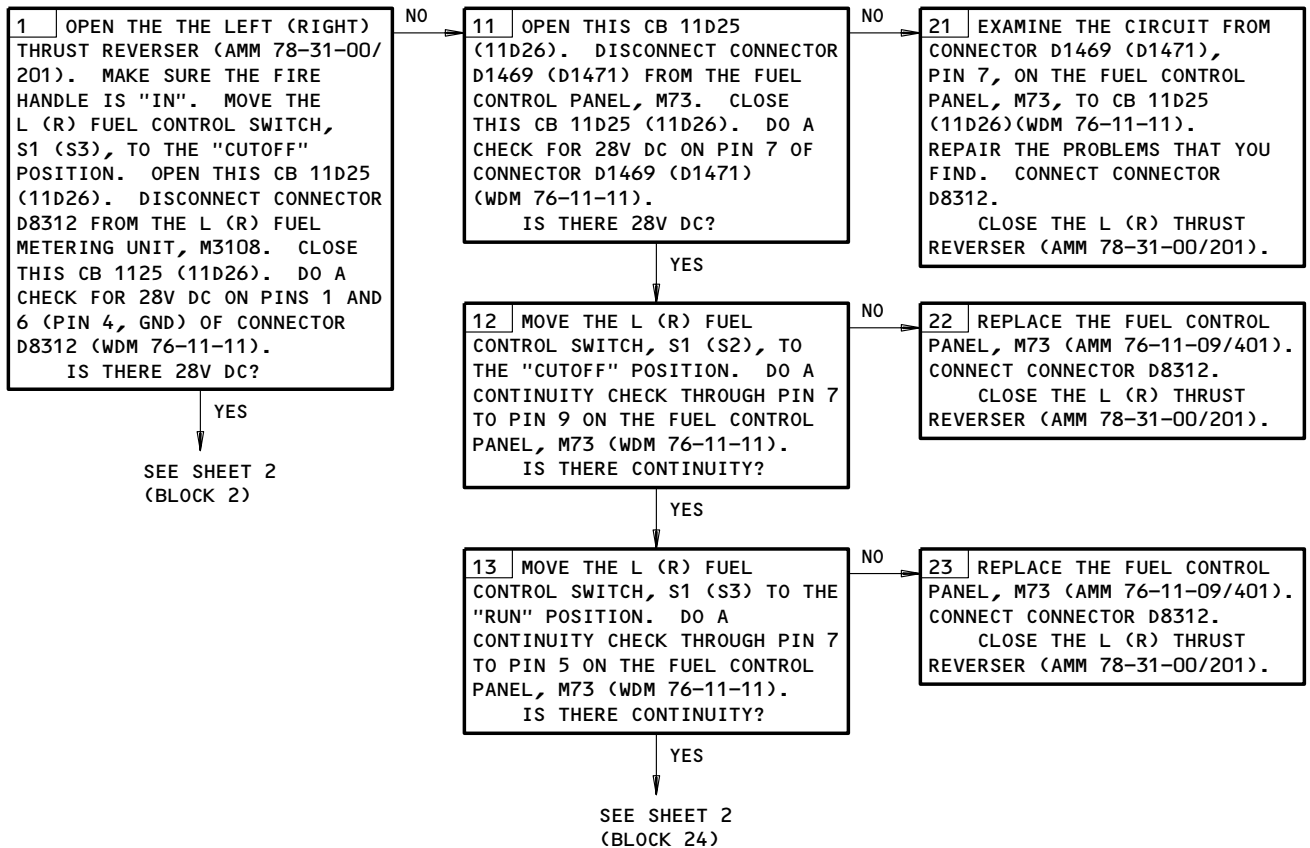
MAKE SURE THESE CIRCUIT BREAKERS ARE CLOSED:
11D25, 11D26

MAKE SURE THE AIRPLANE IS IN THIS CONFIGURATION:
ELECTRICAL POWER IS ON (AMM 24-22-00/201)
FIRE SWITCHES IN THE NORM POSITION

POSSIBLE CAUSES:

1. UNSATISFACTORY WIRE CONNECTIONS (WDM 76-11-11)
2. BAD FUEL CONTROL PANEL (AMM 76-11-09/401)
3. BAD FUEL METERING UNIT (AMM 73-21-01/401)
4. BAD FUEL/IGN CONTROL RELAY (WDM 76-11-11).

FAULT ISOLATION:



Engine Fuel Conditioning Control Problem. L (R) ENG VALVE Light-On,
L (R) ENG FUEL VAL EICAS Msg Displayed
Figure 104 (Sheet 1)

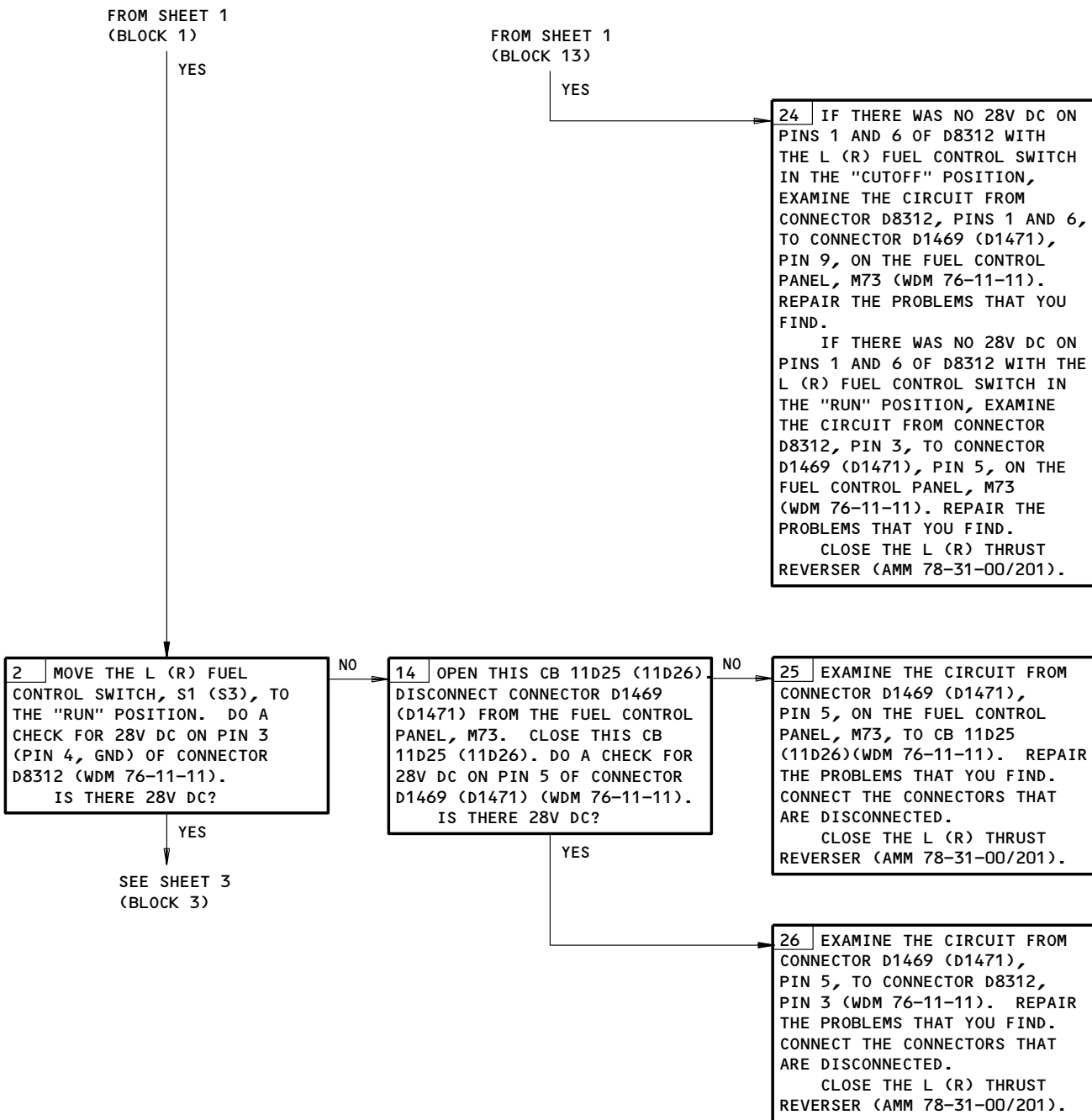
EFFECTIVITY

ALL

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N01

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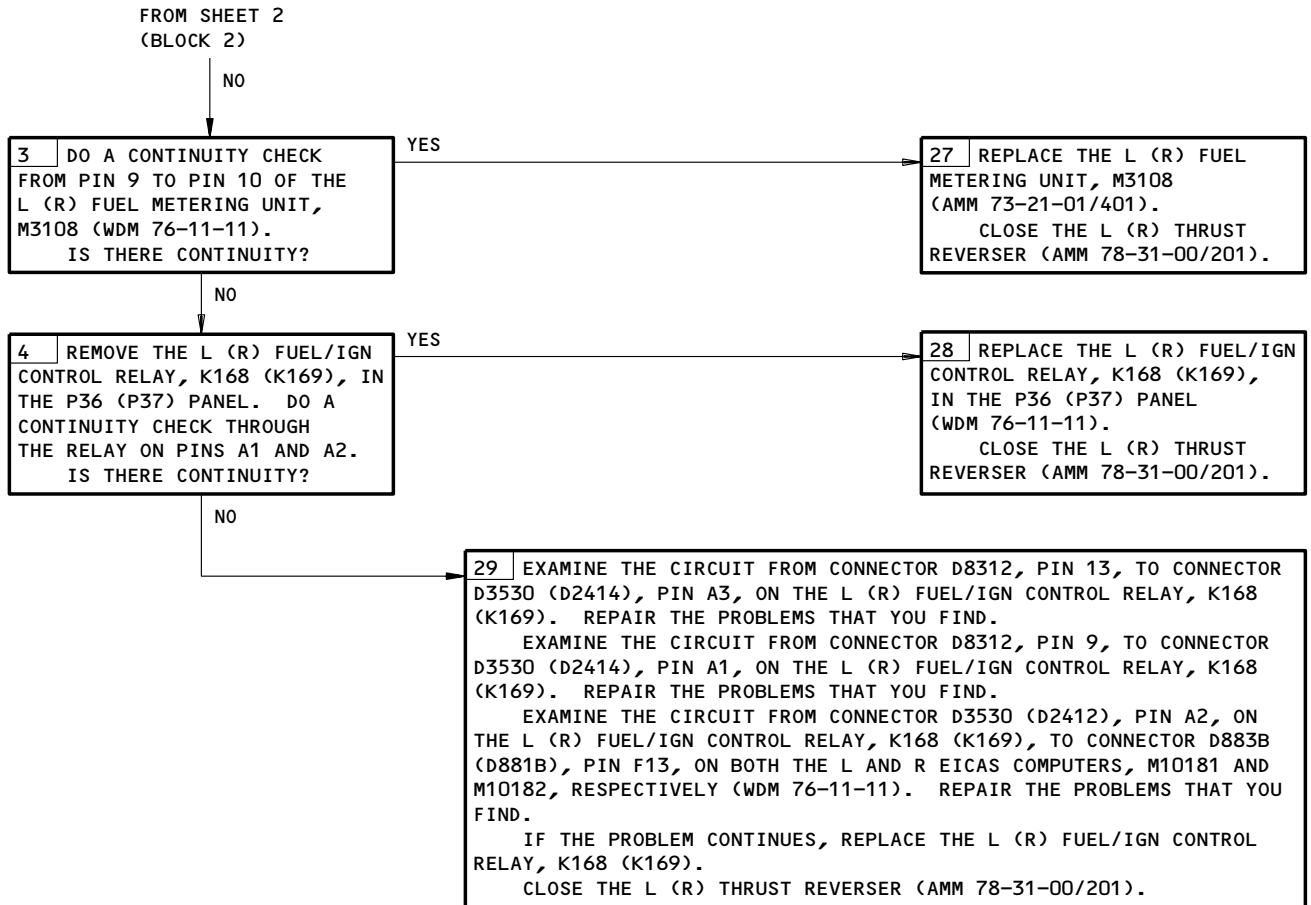


Engine Fuel Conditioning Control Problem. L (R) ENG VALVE Light-On,
 L (R) ENG FUEL VAL EICAS Msg Displayed
 Figure 104 (Sheet 2)

EFFECTIVITY

ALL

76-11-00



Engine Fuel Conditioning Control Problem. L (R) ENG VALVE Light-On,
L (R) ENG FUEL VAL EICAS Msg Displayed
Figure 104 (Sheet 3)

EFFECTIVITY	ALL
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N02

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"L (R) ENG SHUT-DOWN" EICAS MSG DID NOT DISPLAY. AURAL WARNING AND ENGINE RELATED MSGS WERE NOT INHIBITED. ENGINE SHUTDOWN.

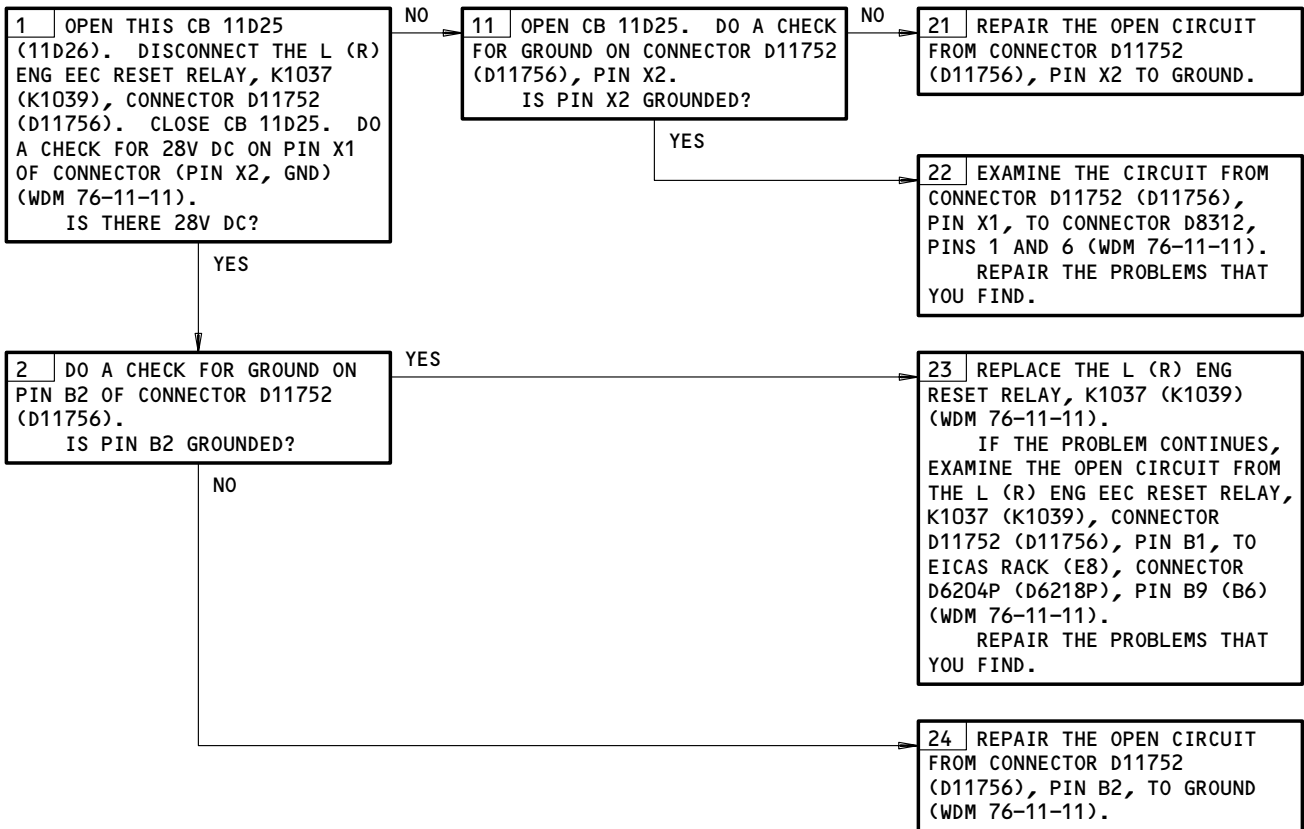
PREREQUISITES
MAKE SURE THESE CIRCUIT BREAKERS ARE OPEN AND ATTACH THE DO-NOT-CLOSE TAGS:
11D25,11D26



POSSIBLE CAUSES:

1. BAD WIRING TO FUEL METERING UNIT (WDM 76-11-11)
2. BAD EEC RESET RELAY (WDM 76-11-11).

FAULT ISOLATION:



L (R) ENG SHUTDOWN EICAS Msg Did Not Display. Aural Warning and Engine Related Msgs Were Not Inhibited. Engine Shutdown.

Figure 105

EFFECTIVITY	ALL
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76-11-00

724227

"L (R) ENG SHUT-
DOWN" EICAS MSG
DISPLAYED WITH
ENGINE RUNNING



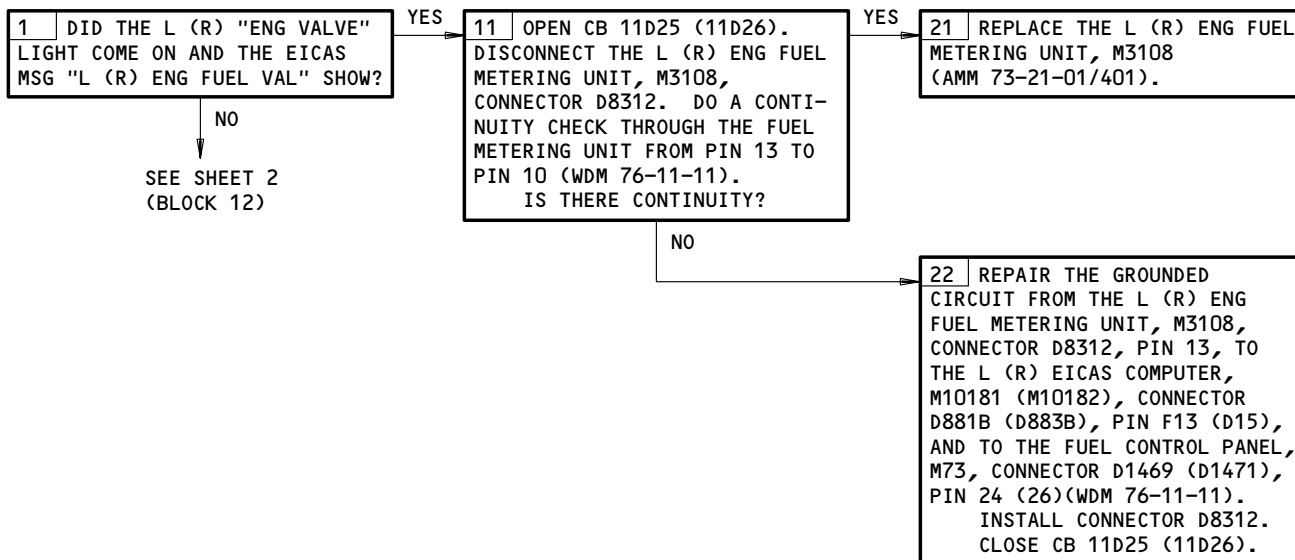
PREREQUISITES

MAKE SURE THESE SWITCHES ARE IN THESE POSITIONS:
FUEL CONTROL SWITCH - RUN
FIRE SWITCH - NORMAL

POSSIBLE CAUSES:

1. UNSATISFACTORY WIRE CONNECTIONS (WDM 76-11-11)
2. BAD FUEL METERING UNIT (AMM 73-21-01/401)
3. BAD EEC RESET RELAY (WDM 76-11-11).

FAULT ISOLATION:



L (R) ENG SHUTDOWN EICAS Msg Displayed with Engine Running
Figure 106 (Sheet 1)

EFFECTIVITY

ALL

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N01

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FROM SHEET 1
(BLOCK 1)

NO

12 OPEN CB 11D25 (11D26).
REMOVE THE L (R) ENG EEC RESET
RELAY, K1037 (K1039). DO A
CONTINUITY CHECK FROM PIN B1
TO PIN B2 OF THE RELAY
(WDM 76-11-11).
IS THERE CONTINUITY?

NO

23 REPAIR THE GROUNDED
CIRCUIT FROM TB196, DIODE R45,
ON THE P33 PANEL (TB274, DIODE
R43, ON THE P37 PANEL), TO THE
L (R) EICAS COMPUTER, M10181
(M10182), CONNECTOR D881B
(D883B), PIN D14 (J3)
(WDM 76-11-11).
IF THE PROBLEM CONTINUES,
EXAMINE THE GROUNDED CIRCUIT
FROM THE L (R) ENG FIRE
SWITCH, S37 (S38), CONNECTOR
D836 (D862), PIN 4
(WDM 31-51-33), TO THE L (R)
EICAS COMPUTER, M10181
(M10182), CONNECTOR D881B
(D883B), PINS J11 (K6)
(WDM 31-41-16).
REPAIR THE PROBLEMS THAT
YOU FIND.

YES

24 REPLACE THE L (R) ENG EEC
RESET RELAY (WDM 76-11-11).

L (R) ENG SHUTDOWN EICAS Msg Displayed with Engine Running
Figure 106 (Sheet 2)

EFFECTIVITY

ALL

76-11-00

NO1

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F16867

**THRUST LEVER HAS
LOST MOTION**

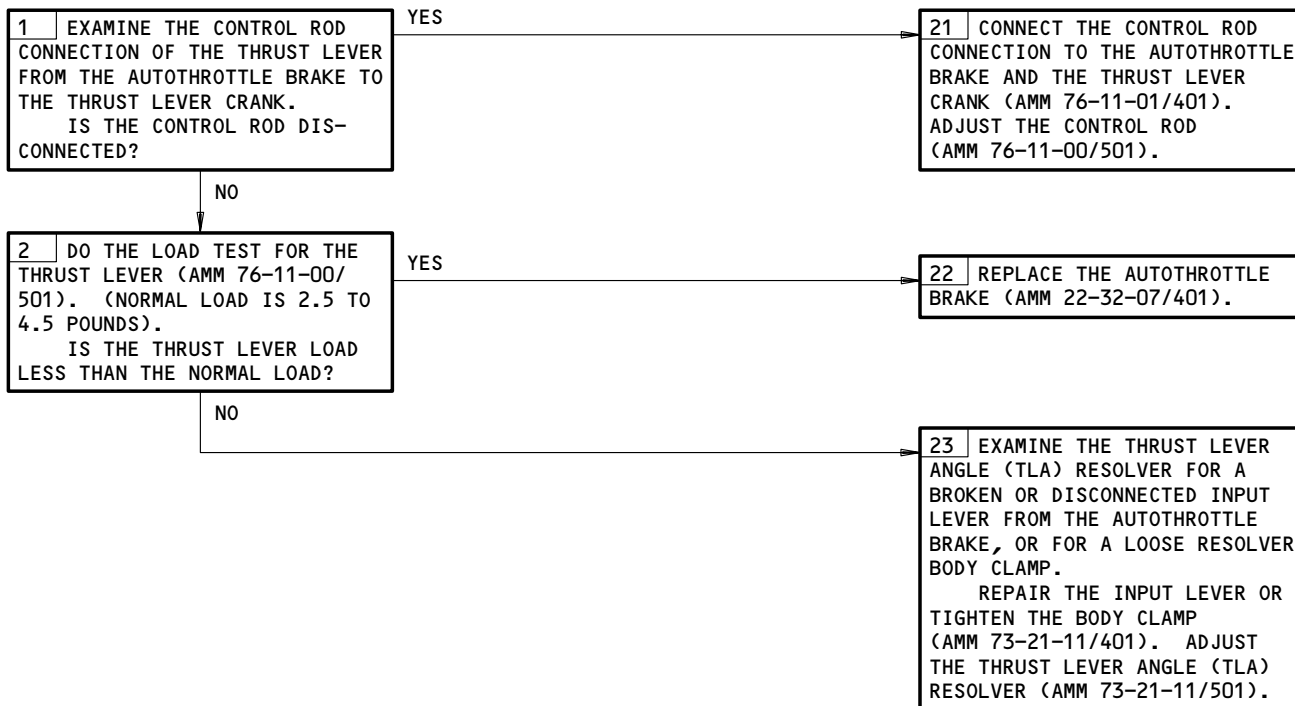
PREREQUISITES
NONE



POSSIBLE CAUSES:

1. DISCONNECTED CONTROL ROD (AMM 76-11-01/401)
2. BAD AUTOHROTTLE BRAKE (AMM 22-32-07/401)
3. IMPROPERLY ADJUSTED TLA RESOLVER (AMM 73-21-11/501)
4. LOOSE TLA RESOLVER BODY CLAMP (AMM 73-21-11/501).

FAULT ISOLATION:



Thrust Lever Has Lost Motion
Figure 107

EFFECTIVITY	ALL
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76-11-00