

Scandinavian Airlines System

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CHAPTER 80 - STARTING

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FAULT CODE	1. LOG BOOK REPORT 2. FAULT ISOLATION REFERENCE
80 03 XA --	1. A (O1=L, O2=R) Start VALVE lgt illum (eng operating) problem was encountered by the flight crew which is not covered in the fault code diagrams (Ref Chapter 71 for fault code diagram and flight crew actions). 2. SSM 80-11-01.
80 03 XB --	1. (O1=L, O2=R) A starting problem was encountered by the flight crew which is not covered in the fault code diagrams (Ref Chapter 71 for fault code diagram and flight crew actions). 2. SSM 80-11-01.
80 03 01 --	1. (O1=L, O2=R) Start VALVE lgt illum and EICAS msg (L,R) ENG STARTER displayed during eng operation (Ref Chapter 71 for fault code diagram). 2. Replace the Starter Control Valve V351 (AMM 80-11-02/401). Do the EICAS STATUS/MAINTENANCE message erase procedure (FIM 31-41-00/101, Fig. 109).
80 03 02 --	1. (O1=L, O2=R) Eng N2 failed to rotate with start selector in GND, start VALVE light was extin and duct press was norm. (Ref Chapter 71 for fault code diagram). 2. FIM 80-11-00/101, Fig. 105, Block 1
80 03 03 --	1. (O1=L, O2=R) eng N2 failed to rotate with start selector in GND, duct press was low with start vlv open. (Ref Chapter 71 for fault code diagram). 2. FIM 80-11-00/101, Fig. 104, Block 1
80 03 04 --	1. (O1=L, O2=R) eng low max N2 motoring speed during start, duct press was norm with start vlv open. (Ref Chapter 71 for fault code diagram). 2. Replace the starter (AMM 80-11-01/401). If the problem continues, replace the engine (AMM 71-00-02/401).
80 03 05 --	1. (O1=L, O2=R) eng low max N2 motoring speed during start, duct press was low with start vlv open. (Ref Chapter 71 for fault code diagram). 2. FIM 80-11-00/101, Fig. 104, Block 1

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N03

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FAULT CODE	1. LOG BOOK REPORT 2. FAULT ISOLATION REFERENCE
80 03 06 --	1. (01=L, 02=R) eng start VALVE light (failed to, remained) illum with start selector in GND, eng failed to rotate. (Ref Chapter 71 for fault code diagram). 2. FIM 80-11-00/101, Fig. 103, Block 1
80 03 07 --	1. (01=L, 02=R) eng start VALVE light (failed to, remained) illum with start selector in GND, eng rotation was norm. (Ref Chapter 71 for fault code diagram). 2. Replace the L(R) Engine Start Switch YAY S1(S2) on the Engine Ignition and Control Module M49 on P5 panel (WDM 80-11-11, WDM 80-11-21).
80 03 08 --	1. (01=L, 02=R) eng start selector sw failed to hold in GND during start, eng rotated norm when held in GND. (Ref Chapter 71 for fault code diagram). 2. Replace the L(R) Engine Start Switch YAY S1(S2) on the Engine Ignition and Control Module M49 on P5 panel (WDM 80-11-11, WDM 80-11-21).
80 03 09 --	1. (01=L, 02=R) eng start selector sw failed to hold in GND during start, eng failed to rotate when held in GND. (Ref Chapter 71 for fault code diagram). 2. Replace the Starter Control Valve V351 (AMM 80-11-02/401).
80 03 10 --	1. (01=L, 02=R) eng start VALVE light remained illum during start when start selector returned to AUTO. (Ref Chapter 71 for fault code diagram). 2. Replace the Starter Control Valve V351 (AMM 80-11-02/401).
80 03 11 --	1. (01=L, 02=R) eng start selector failed to return to AUTO at 50% N2 during start. (Ref Chapter 71 for fault code diagram). 2. Replace the L(R) Engine Speed Card M1093 (M1092) (AMM 77-12-01/401).
80 03 12 --	1. (01=L, 02=R) eng start selector returned to AUTO at _____% N2 during start. (Ref Chapter 71 for fault code diagram). 2. Replace the L(R) Engine Speed Card M1093 (M1092) (AMM 77-12-01/401).

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STARTING SYSTEM

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	REFERENCE
ADAPTER - QAD	2	1	415AL,416AR, THRUST REVERSER, L ENGINE, MAIN GEARBOX	80-11-03
ADAPTER - QAD	2	1	425AL,426AR, THRUST REVERSER, R ENGINE, MAIN GEARBOX	80-11-03
CIRCUIT BREAKERS	1		FLT COMPT, P11	*
START CONT LEFT, C1510		1	11D19	
START CONT RIGHT, C1511		1	11D20	
APU ENG START, C1512		1	11B36	
COMPUTER - (REF 31-41-00, FIG. 101)				
EICAS L, M10181				
EICAS R, M10182				
DIODES - (REF 31-01-06, FIG. 101)				
STARTER L, R225				
STARTER R, R226				
START IND L, R10119				
START IND R, R10120				
FILTER - STARTER CONTROL VALVE	2	1	417AL,418AR, CORE COWL, L ENGINE, MAIN GEARBOX	80-11-04
FILTER - STARTER CONTROL VALVE	2	1	427AL,428AR, CORE COWL, R ENGINE, MAIN GEARBOX	80-11-04
MODULE - (REF 49-61-00, FIG. 101)				
APU CONT UNIT, M206				
MODULE - ENG IGN AND START CONTROL, M49	1	1	FLT COMPT, P5	
MODULE - (REF 73-21-00, FIG. 101)				
L N2 ENG SPEEDCARD, M1093				
R N2 ENG SPEEDCARD, M1092				
MODULE (REF 31-01-06, FIG. 101)				
L START FAIL T/D, M10334				
R START FAIL T/D, M10335				
RELAY - (REF 31-01-06, FIG. 101)				
L ENG START 1, K665				
L ENG START 2, K10247				
R ENG START 1, K666				
R ENG START 2, K10250				
RELAY - (REF 31-01-36, FIG. 101)				
FLT RECORDER CONTROL, K163				
RELAY - (REF 31-01-37, FIG. 101)				
FLT RECORDER CONTROL, K164				
L ENG START SENSE, K680				
R ENG START SENSE, K681				
RELAY - (REF 76-11-00, FIG. 101)				
L FUEL/IGN CONTROL, K168				
R FUEL/IGN CONTROL, K169				
STARTER - PNEUMATIC	2	1	415AL,416AR, THRUST REVERSER, L ENGINE, MAIN GEARBOX	80-11-01
STARTER - PNEUMATIC	2	1	425AL,426AR, THRUST REVERSER, R ENGINE, MAIN GEARBOX	80-11-01
VALVE - STARTER CONTROL, V351	2	1	417AL,418AR, CORE COWL, L ENGINE, MAIN GEARBOX	80-11-02
VALVE - STARTER CONTROL, V351	2	1	427AL,428AR, CORE COWL, R ENGINE, MAIN GEARBOX	80-11-02

* SEE WM EQUIPMENT LIST

Component Index
Figure 101

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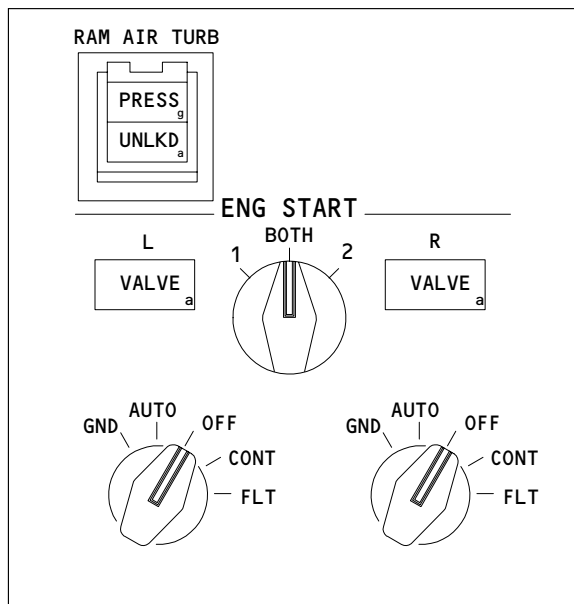
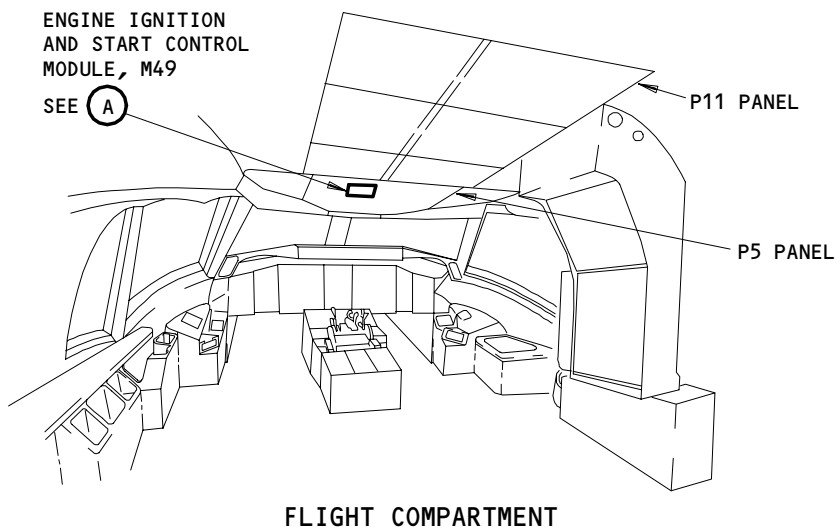
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ENGINE IGNITION AND START CONTROL MODULE, M49

(A)

Starting System - Component Location
Figure 102 (Sheet 1)

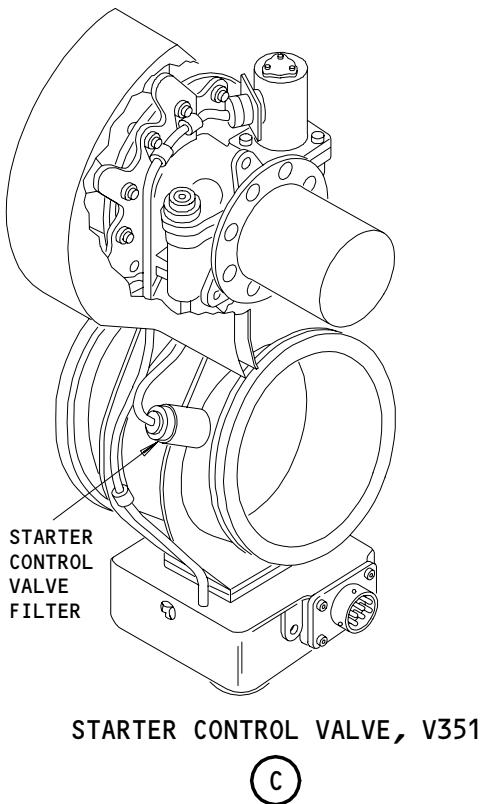
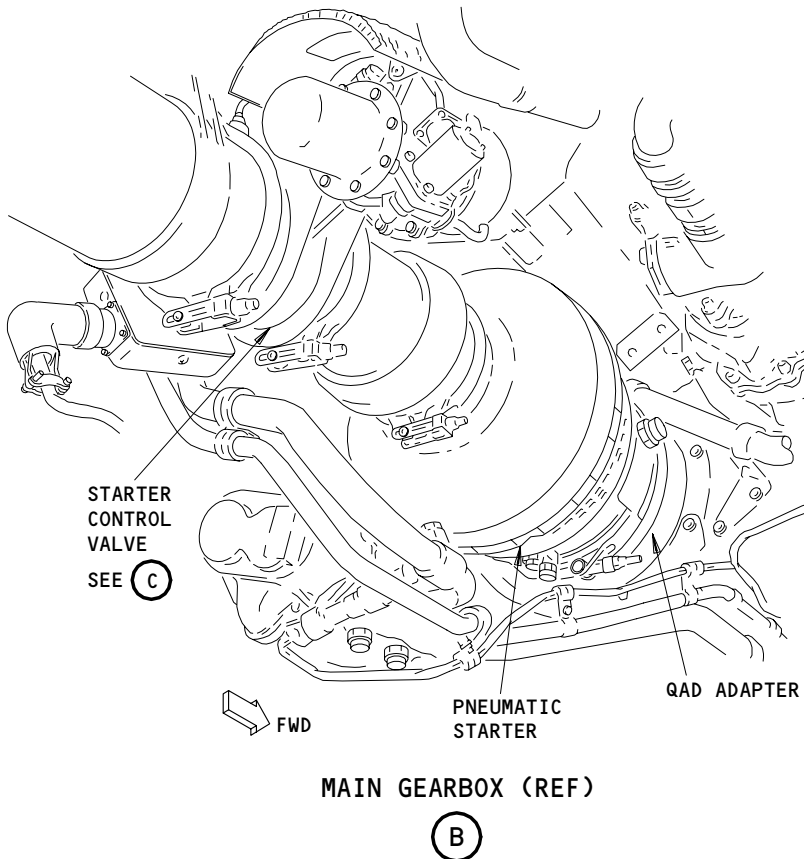
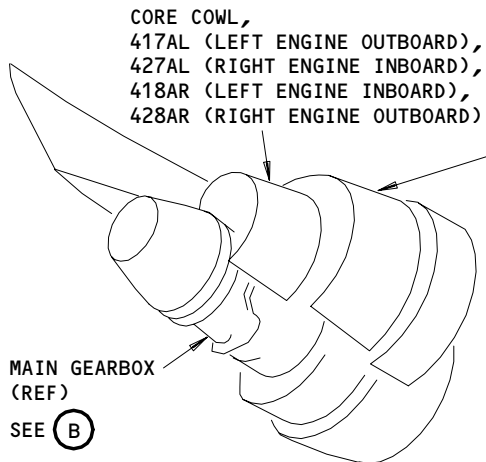
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Starting System - Component Location
Figure 102 (Sheet 2)

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80-11-00

START VALVE LIGHT
(FAILED TO, REMAINED)
ILLUMINATED. NO N2
ROTATION.



PREREQUISITES

MAKE SURE THESE CIRCUIT BREAKERS ARE CLOSED:
(LEFT ENGINE) 11D19
(RIGHT ENGINE) 11D20

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

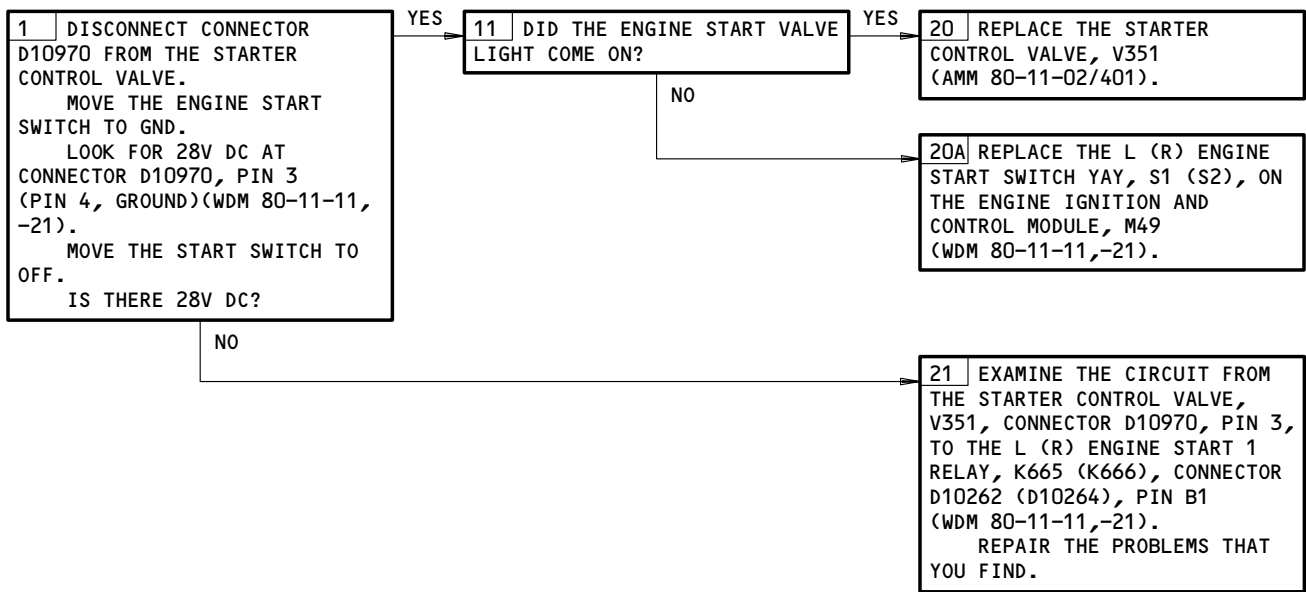
DESCRIPTION:

ENGINE START IS ATTEMPTED, BUT START VALVE LIGHT DID NOT ILLUMINATE OR CONTINUES TO ILLUMINATE, AND N2 DID NOT TURN.

POSSIBLE CAUSES:

1. STARTER CONTROL VALVE IS DAMAGED (AMM 80-11-02/401).
2. LEFT OR RIGHT ENGINE START SWITCH YAY ON THE ENGINE IGNITION AND CONTROL MODULE, M49, IS DEFECTIVE (WDM 80-11-11,-21).
3. CIRCUIT BETWEEN THE STARTER CONTROL VALVE AND THE LEFT OR RIGHT ENGINE START 1 RELAY IS DEFECTIVE (WDM 80-11-11,-21).

FAULT ISOLATION:



Start Valve Light (Failed to, Remained) Illuminated. No N2 Rotation.
Figure 103

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PREREQUISITES
 NONE

**SLOW OR NO N2
ROTATION WITH LOW
DUCT PRESSURE**



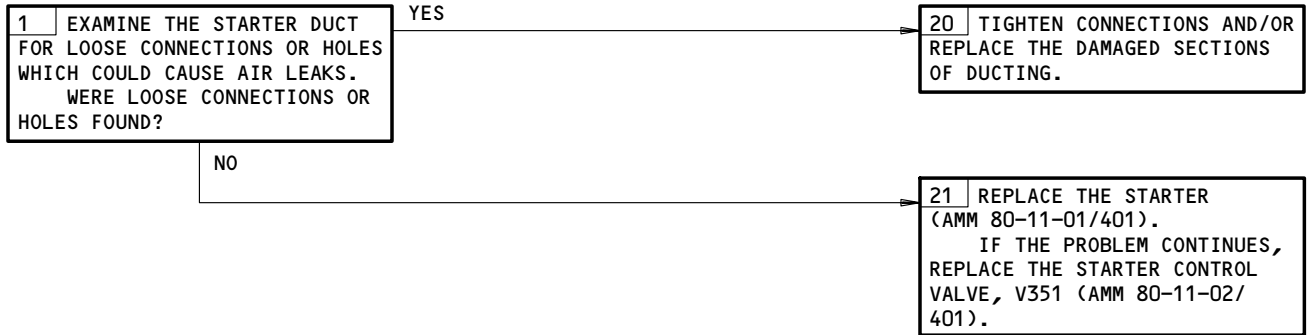
DESCRIPTION:

ENGINE START IS ATTEMPTED, BUT N2 DOES NOT TURN OR TURNS SLOWLY, AND THERE IS LOW DUCT PRESSURE.

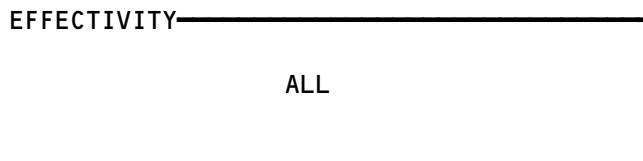
POSSIBLE CAUSES:

1. STARTER DUCT HAS LOOSE CONNECTIONS OR HAS HOLES.
2. STARTER IS DAMAGED (AMM 80-11-01/401).
3. STARTER CONTROL VALVE IS DAMAGED (AMM 80-11-02/401).

FAULT ISOLATION:



Slow or No N2 Rotation With Low Duct Pressure
Figure 104



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ENG N2 SHOWS ZERO
DURING START.
START VALVE
INDICATED OPEN.
NO OIL PRESS RISE.

PREREQUISITES

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



DESCRIPTION:

ENGINE START IS ATTEMPTED AND START VALVE IS INDICATED OPEN, BUT ENG N2 DOES NOT TURN, AND THE OIL PRESSURE DOES NOT INCREASE.

POSSIBLE CAUSES:

1. AIR PRESSURE IN THE STARTER CONTROL VALVE DUCT IS BELOW LIMITS (AMM 36-00-00/201)
2. FOREIGN OBJECT DAMAGE (FOD)(FIM 71-05-00/101)
3. N2 ROTOR IS CAUGHT (AMM 72-00-00/601)
4. STARTER CONTROL VALVE DOES NOT OPERATE (AMM 80-11-02/401)
5. STARTER DRIVE COUPLING IS DAMAGED (AMM 72-61-09/401)
6. STARTER DOES NOT OPERATE (AMM 80-11-01/401)

NOTE: IF IT IS NECESSARY, DO THIS PROCEDURE: ENGINE OVERTEMPERATURE INSPECTION REQUIREMENTS (GROUND AND IN-FLIGHT STARTING, AND ENGINE OPERATION BELOW IDLE SPEED (FIM 71-06-00/101, FIG. 104).

FAULT ISOLATION:

Eng N2 Shows Zero During Start.
Start Valve Indicated Open. No Oil Press Rise.
Figure 105 (Sheet 1)

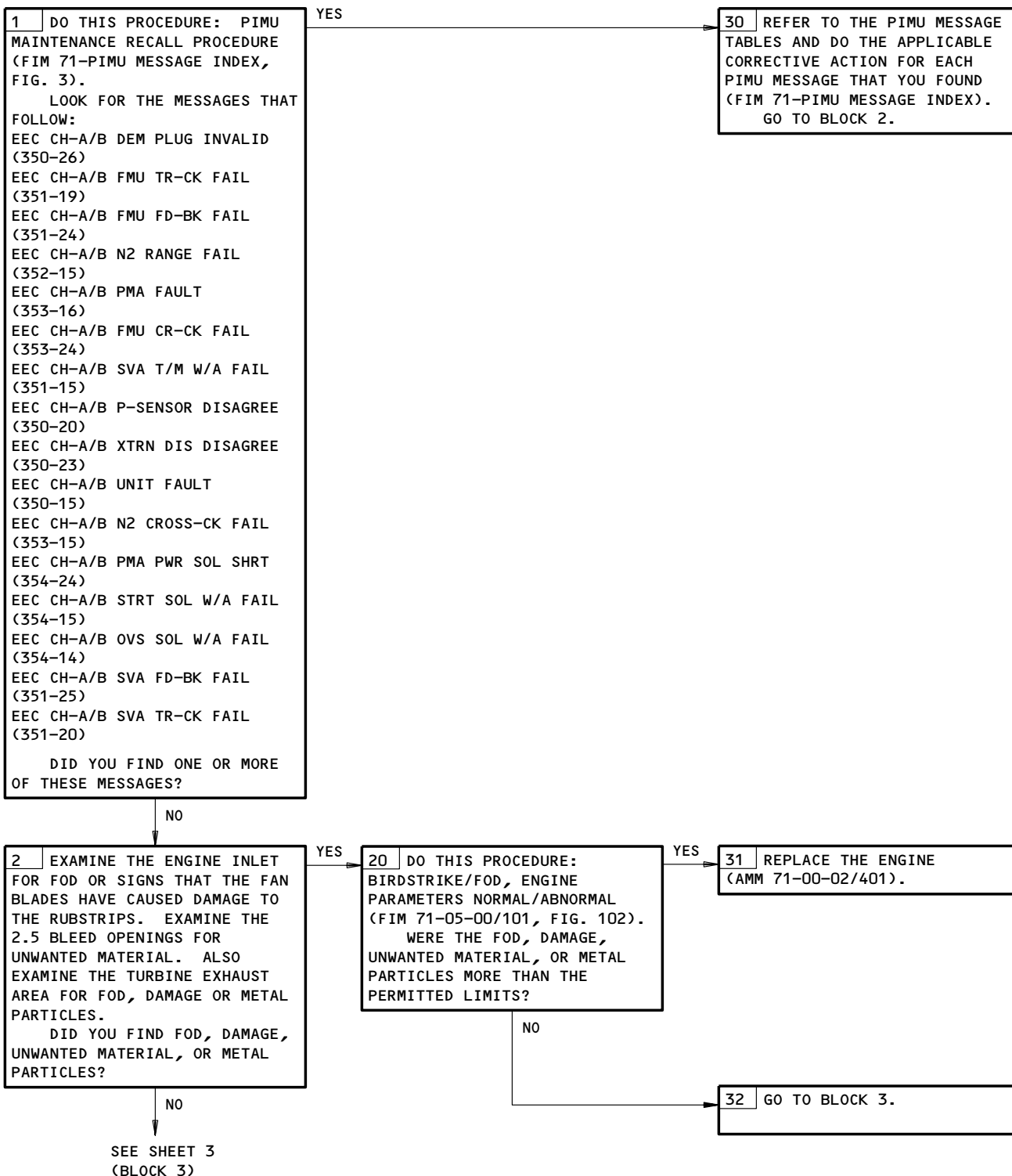
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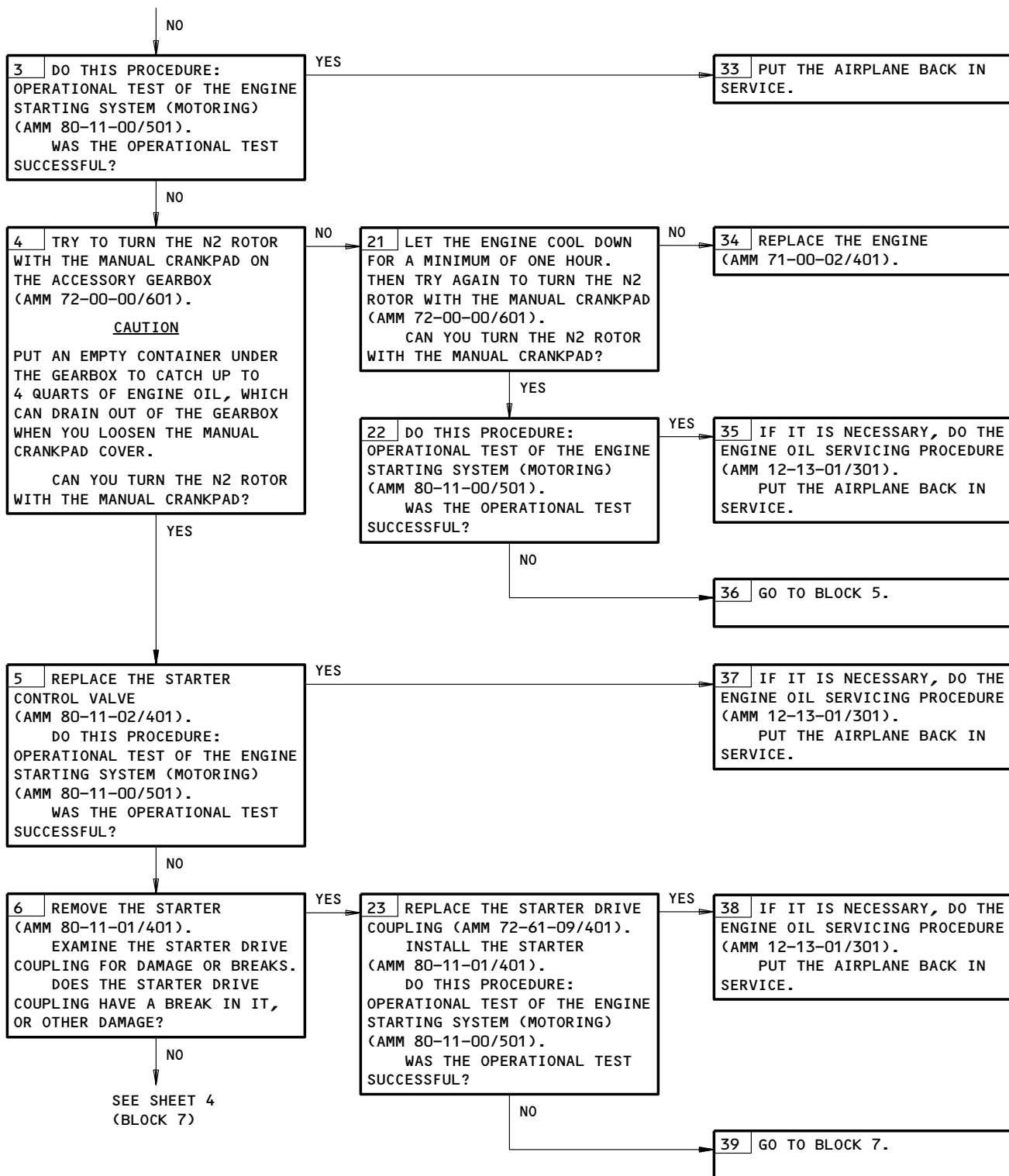


Eng N2 Shows Zero During Start.
Start Valve Indicated Open. No Oil Press Rise.
Figure 105 (Sheet 2)

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FROM SHEET 2
(BLOCK 3)



Eng N2 Shows Zero During Start.
Start Valve Indicated Open. No Oil Press Rise.
Figure 105 (Sheet 3)

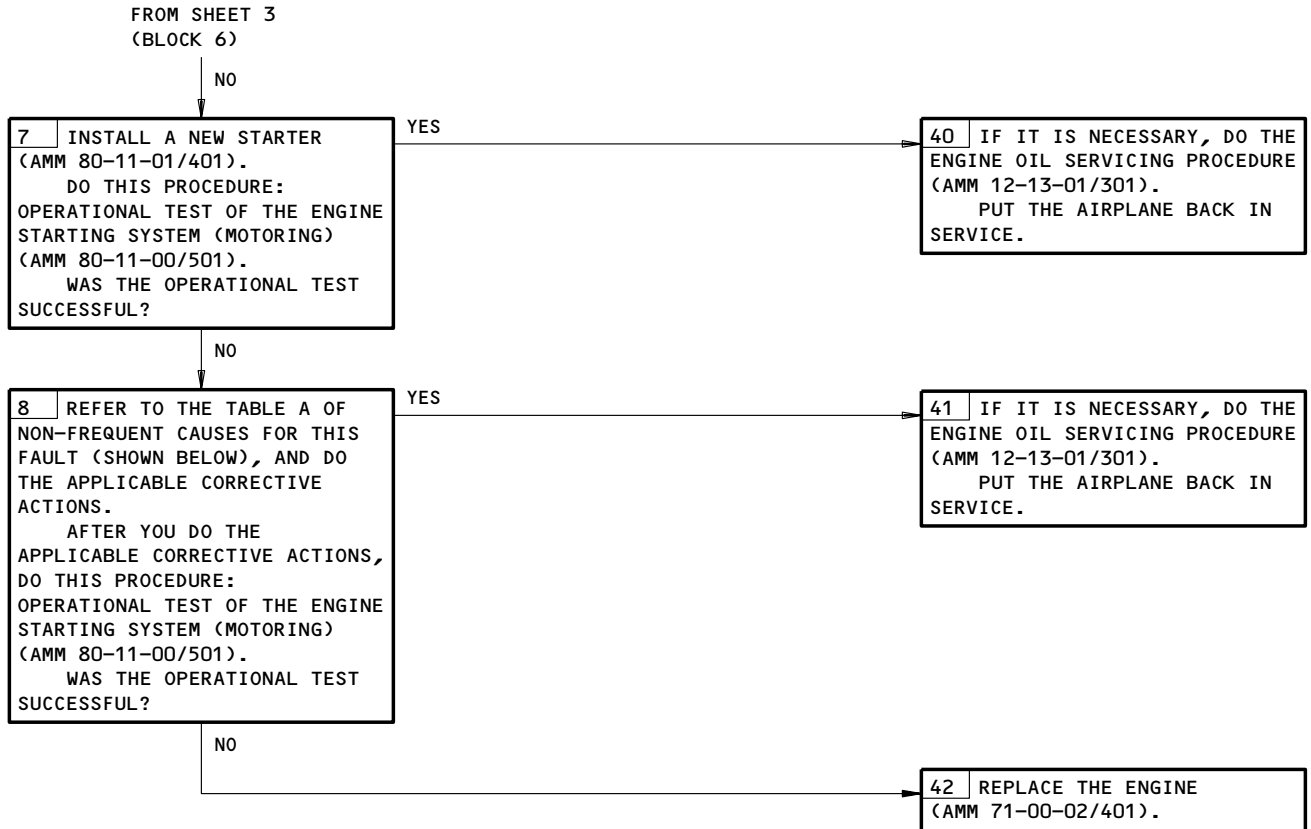
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NON-FREQUENT CAUSES OF THIS PROBLEM IN ALPHABETICAL ORDER	RECOMMENDED CORRECTIVE ACTION
GASPATH DAMAGE	DO THE APPLICABLE BORESCOPE TASKS IN THIS PROCEDURE: ENGINE GASPATH - INSPECTION/CHECK (AMM 72-00-00/601).
GEARBOX OR ANGLE GEARBOX WITH INTERNAL DAMAGE	DO A CHECK OF THE APPLICABLE GEARBOX CHIP DETECTORS (AMM 72-61-01/601).
MAINTENANCE HISTORY	EXAMINE THE MAINTENANCE HISTORY RECORD FOR THE ENGINE TO FIND PAST PROBLEM TRENDS, AND DO THE APPLICABLE CORRECTIVE ACTION(S).

TABLE A

Eng N2 Shows Zero During Start.
Start Valve Indicated Open. No Oil Press Rise.
Figure 105 (Sheet 4)

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