

KSSU Group

PAGE	DATE	CODE	PAGE	DATE	CODE	PAGE	DATE	CODE
CHAPTER 80 TAB			80-11-01		CONT.			
			408	BLANK				
STARTING (CF6-80C SERIES ENGINES)			80-11-01					
			601	OCT 10/95	J02			
			R 602	OCT 18/00	J02.1			
			603	JUN 10/97	J01			
			R 604	OCT 18/00	J02.1			
80-CONTENTS			80-11-02					
1 FEB 10/96 JKSS			401	OCT 10/95	J02			
R 2 OCT 18/00 JKSS.1			402	FEB 10/93	J02			
80-FAULT CODE INDEX			403	FEB 10/91	J02			
1 FEB 10/92 J01			404	FEB 15/98	J02			
2 FEB 15/99 J01			405	FEB 15/98	J02			
3 JUN 10/93 J01			406	FEB 15/99	J02			
4 FEB 10/95 J01			80-11-04					
5 FEB 10/95 J01			201	OCT 10/95	J02			
6 FEB 10/95 J01			202	JUN 10/88	J01			
7 FEB 10/95 J01			R 203	OCT 18/00	J02.1			
8 FEB 10/95 J01			R 204	OCT 18/00	J02.1			
80-00-00			R 205	OCT 18/00	J02.1			
101 OCT 10/95 J01			206	BLANK				
102 OCT 10/89 J01			80-11-05					
103 FEB 10/96 J01			401	OCT 10/95	J02			
104 OCT 10/95 J02			402	FEB 10/96	J02			
105 OCT 10/96 J01			R 403	OCT 18/00	J02.1			
106 JUN 10/91 J01			404	FEB 10/91	J02			
107 JUN 10/91 J01			405	FEB 10/91	J02			
108 OCT 10/95 J01			406	FEB 10/94	J02			
109 OCT 10/95 J01			407	OCT 10/95	J02			
110 BLANK			408	BLANK				
80-11-00			80-11-06					
1 OCT 10/95 J02			R 401	OCT 18/00	J02.1			
2 FEB 10/96 J01			402	OCT 10/95	J01			
3 JUN 10/88 J01			R 403	OCT 18/00	J10.1			
4 JUN 10/88 J01			R 404	OCT 18/00	J02.1			
5 JUN 10/88 J01			R 405	OCT 18/00	J10.1			
6 FEB 10/89 J01			R 406	OCT 18/00	J08.1			
F 7 APR 10/89 J01								
F 8 FEB 10/91 J01								
9 OCT 10/88 J01								
10 JUN 10/88 J01								
80-11-00								
501 OCT 10/96 J02								
502 OCT 10/96 J02								
503 OCT 10/96 J02								
504 BLANK								
80-11-01								
401 OCT 10/95 J02								
402 OCT 10/88 J01								
403 JUN 10/88 J01								
404 OCT 10/95 J02								
405 FEB 15/99 J02								
406 FEB 15/98 J02								
407 FEB 15/99 J02								

R = REVISED, A = ADDED OR D = DELETED
F = FOLDOUT PAGE
98
OCT 18/00

D633U101-98

CHAPTER 80
EFFECTIVE PAGES
J PAGE 1
LAST PAGE

CHAPTER 80 - STARTING

TABLE OF CONTENTS

<u>Subject</u>	<u>Chapter Section Subject</u>	<u>Page</u>	<u>Effectivity</u>
<u>FAULT CODE INDEX</u>	80-FAULT CODE INDEX	1	ALL
<u>STARTING</u>	80-00-00		
Component Location		101	ALL
Component Index			
Component Location			
Fault Isolation			
General		105	
Engine N2 Shows Zero or is Slow to Reach 20% During Start. Start Valve Indicated Open. Duct Pressure (Low or Fluctuates)_____ psi (Fig. 104).		107	
Engine N2 Shows Zero During Start. Start Valve Indicated Open. No Oil Pressure Rise. Duct Pressure Normal (Fig. 103).		106	
Engine Start Valve Light Did Not Illuminate. No N2 Rotation or Oil Pressure Indication (Fig. 105).		108	
Fault Isolation Procedures		105	
Fault Isolation Tips		105	
<u>CRANKING</u>	80-10-00		
ENGINE STARTING SYSTEM	80-11-00		
Description and Operation		1	ALL
General		1	
Control and Indication - Engine Starting		7	
Starter - Engine		1	
Valve - Start		1	
Operation		7	
Adjustment/Test		501	ALL
Operational Test - Engine Starting System		501	
DUCT - STARTER PNEUMATIC	80-11-05		
Removal/Installation		401	ALL

80-CONTENTS

JKSS

Page 1
Feb 10/96

CHAPTER 80 - STARTING

TABLE OF CONTENTS

<u>Subject</u>	<u>Chapter Section Subject</u>	<u>Page</u>	<u>Effectivity</u>
FILTER - START VALVE	80-11-04		
Maintenance Practices		201	ALL
Cleaning		203	
Examination		203	
Installation		205	
Removal		201	
MODULE - ENGINE IGNITION	80-11-06		
CONTROL/FUEL JETTISON			
Removal/Installation		401	ALL
STARTER	80-11-01		
Removal/Installation		401	ALL
Inspection/Check		601	ALL
VALVE - START	80-11-02		
Removal/Installation		401	ALL

FAULT CODE INDEX

1. General

- A. The Fault Code Index includes fault isolation or corrective action for each fault code in the Fault Reporting Manual (FRM). The fault codes for each chapter are in numerical order.
 - (1) The first paragraph given with each fault code is the log book report from the FRM. The log book report is a short description of the fault.
 - (2) The numbered paragraphs after the log book report contain the fault isolation or the corrective action.
- B. The fault isolation for most EICAS messages, engine exceedances, or PFD flags includes a list of one or more possible correlated CMCS messages.
 - (1) For each CMCS message in the list, there is the message number and an ATA number. The ATA number is the prompt under which you can find the message in Existing Faults or Fault History on the CDU.
 - (2) The corrective action refers to the procedure in Figure 1 of this section. Figure 1 shows how to use the Present Leg Faults, Existing Faults, and Fault History functions of the CMC to isolate the fault to a specific CMCS message.
- C. For those EICAS status messages which latch into EIU memory when they occur, this index includes the letters NVM, NVM-A, or NVM-G to the right of the log book report.
 - (1) NVM indicates that the message latches if it occurs in the air or on the ground.
 - (2) NVM-A indicates that the message latches only if it occurs in the air.
 - (3) NVM-G indicates that the message latches only if it occurs on the ground.
 - (4) To remove the latched message from the EICAS after you correct the fault, you must use the ERASE function of the CMC.

NOTE: Do not erase a latched EICAS message until you are sure that you have corrected the fault.

EFFECTIVITY

ALL

80-FAULT CODE INDEX

J01

Page 1

Feb 10/92

- D. When the CDU shows a large number of Flight Deck Effects (FDEs) or CMCS messages, it is possible that there is a bus failure. Do these steps to isolate the cause of the bus failure:
- (1) Look at the CMCS messages to determine which system or LRU is related to all the messages.
 - (2) Look at the wiring diagram for each system and determine if the suspect LRUs are on a common bus.
 - (3) Do a check of the wiring between each of the suspect LRUs and the common bus.
 - (4) Repair any problems that you find.
 - (5) If the problem continues, remove each LRU individually to determine which LRU is the cause of the fault.
 - (6) Replace the LRU which caused the fault.

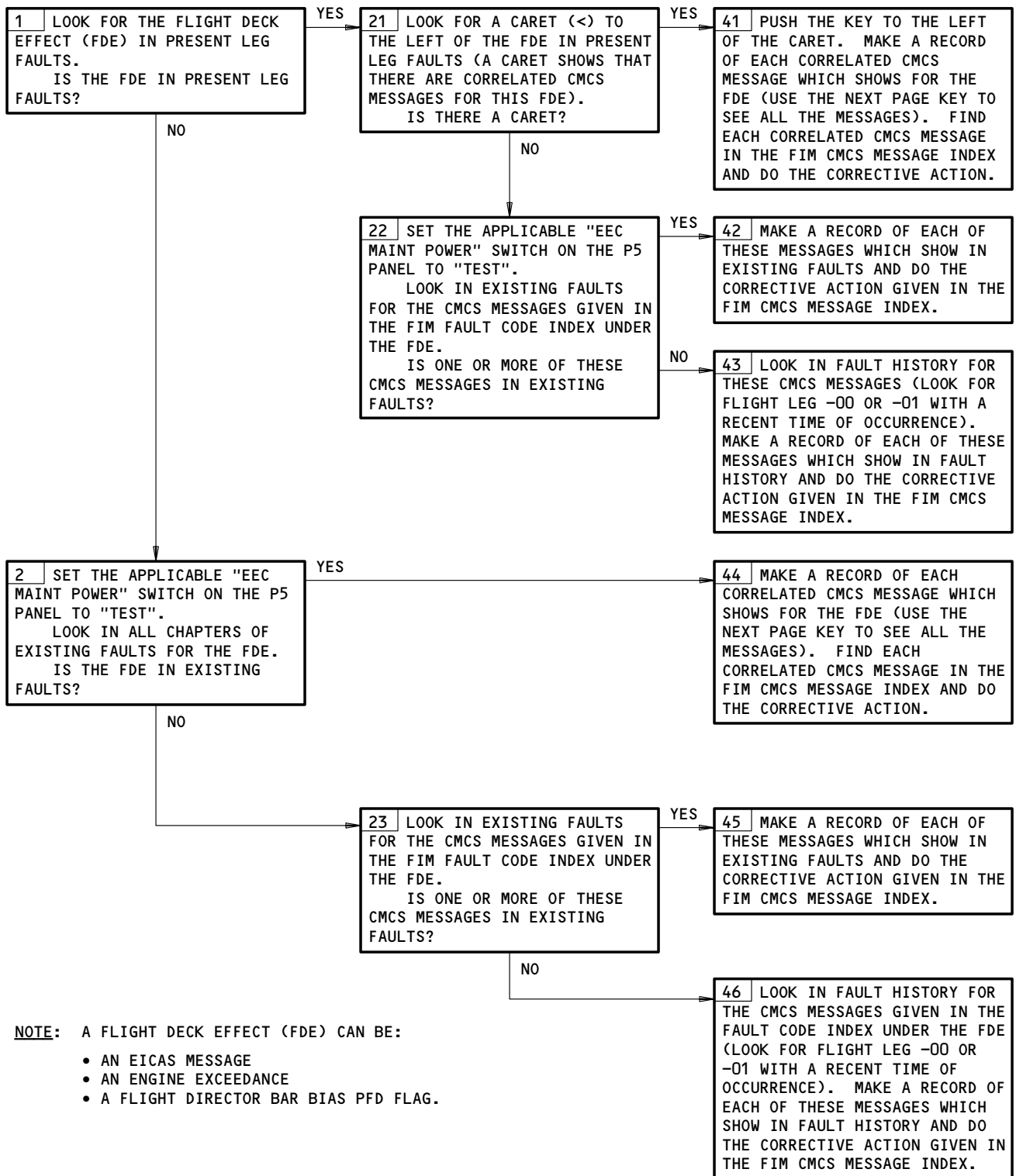
EFFECTIVITY

ALL

80-FAULT CODE INDEX

J01

Page 2
Feb 15/99


 Fault Isolation Procedure with the CMCS
 Figure 1

EFFECTIVITY

ALL

80-FAULT CODE INDEX

J01

 Page 3
 Jun 10/93

FAULT CODE	LOG BOOK REPORT/ CORRECTIVE ACTION
80 03 XA 00	<p>The flight crew found a starting problem that is not on the fault code diagram in the FRM. See the entry that the flight crew wrote in the log book.</p> <p>1. MM 80-11-00/501 and MM 36-11-00/501.</p>
80 03 01 00	<p>The EICAS message ENG 1 START VLV (ADVISORY) shows.</p> <p>1. Look for one or more of these CMCS messages (Fig. 1):</p> <p style="margin-left: 40px;">36029 (36-11) 36060 (36-21) 36274 (36-11) 71554 (71-00) 71587 (71-00)</p>
80 03 02 00	<p>The EICAS message ENG 1 START VLV (STATUS) shows. (NVM)</p> <p>1. Look for one or more of these CMCS messages (Fig. 1):</p> <p style="margin-left: 40px;">36029 (36-11) 36060 (36-21) 36274 (36-11) 71554 (71-00) 71587 (71-00)</p>
80 03 03 00	<p>The EICAS message ENG 2 START VLV (ADVISORY) shows.</p> <p>1. Look for one or more of these CMCS messages (Fig. 1):</p> <p style="margin-left: 40px;">36030 (36-11) 36060 (36-21) 36275 (36-11) 72554 (71-00) 72587 (71-00)</p>
80 03 04 00	<p>The EICAS message ENG 2 START VLV (STATUS) shows. (NVM)</p> <p>1. Look for one or more of these CMCS messages (Fig. 1):</p> <p style="margin-left: 40px;">36030 (36-11) 36060 (36-21) 36275 (36-11) 72554 (71-00) 72587 (71-00)</p>
80 03 05 00	<p>The EICAS message ENG 3 START VLV (ADVISORY) shows.</p> <p>1. Look for one or more of these CMCS messages (Fig. 1):</p>

EFFECTIVITY

ALL

80-FAULT CODE INDEX

J01

Page 4
Feb 10/95

FAULT CODE	LOG BOOK REPORT/ CORRECTIVE ACTION
	36031 (36-11) 36061 (36-21) 36276 (36-11) 73554 (71-00) 73587 (71-00)
80 03 06 00	The EICAS message ENG 3 START VLV (STATUS) shows. (NVM) 1. Look for one or more of these CMCS messages (Fig. 1): 36031 (36-11) 36061 (36-21) 36276 (36-11) 73554 (71-00) 73587 (71-00)
80 03 07 00	The EICAS message ENG 4 START VLV (ADVISORY) shows. 1. Look for one or more of these CMCS messages (Fig. 1): 36032 (36-11) 36061 (36-21) 36277 (36-11) 74554 (71-00) 74587 (71-00)
80 03 08 00	The EICAS message ENG 4 START VLV (STATUS) shows. (NVM) 1. Look for one or more of these CMCS messages (Fig. 1): 36032 (36-11) 36061 (36-21) 36277 (36-11) 74554 (71-00) 74587 (71-00)
80 03 09 00	The EICAS message STARTER CUTOFF 1 (CAUTION) shows. 1. Look for one or more of these CMCS messages (Fig. 1): 71325 (71-00) 71425 (71-00) 71566 (71-00) 71587 (71-00) 76009 (71-00)
80 03 10 00	The EICAS message STARTER CUTOFF 2 (CAUTION) shows. 1. Look for one or more of these CMCS messages (Fig. 1): 72325 (71-00) 72425 (71-00) 72566 (71-00) 72587 (71-00) 76010 (71-00)

EFFECTIVITY

ALL

80-FAULT CODE INDEX

J01

Page 5
Feb 10/95

FAULT CODE	LOG BOOK REPORT/ CORRECTIVE ACTION
80 03 11 00	<p>The EICAS message STARTER CUTOUT 3 (CAUTION) shows.</p> <p>1. Look for one or more of these CMCS messages (Fig. 1):</p> <p style="margin-left: 40px;">73325 (71-00) 73425 (71-00) 73566 (71-00) 73587 (71-00) 76010 (71-00)</p>
80 03 12 00	<p>The EICAS message STARTER CUTOUT 4 (CAUTION) shows.</p> <p>1. Look for one or more of these CMCS messages (Fig. 1):</p> <p style="margin-left: 40px;">74325 (71-00) 74425 (71-00) 74566 (71-00) 74587 (71-00) 76010 (71-00)</p>
80 03 13 ____	<p>No. (01=1, 02=2, 03=3, 04=4) engine shows zero during start. Start valve indicated open. No oil pressure rise. Duct pressure normal.</p> <p>1. Refer to FIM 80-00-00/101, Fig. 103 Block 1.</p>
80 03 14 ____	<p>No. (01=1, 02=2, 03=3, 04=4) engine shows zero during start. Start valve indicated open. No oil pressure rise. Duct pressure low.</p> <p>1. Refer to FIM 80-00-00/101, Fig. 104 Block 1.</p>
80 03 15 ____	<p>No. (01=1, 02=2, 03=3, 04=4) engine slow to reach 20% N2 during start. Duct pressure normal.</p> <p>1. Replace the start valve (MM 80-11-02/401). If the fault continues, replace the starter (AMM 80-00-01/401).</p>
80 03 16 ____	<p>No. (01=1, 02=2, 03=3, 04=4) engine slow to reach 20% N2 during start. Duct pressure (low/fluctuates) _____ psi.</p> <p>1. Refer to FIM 80-00-00/101, Fig. 104 Block 1.</p>

EFFECTIVITY	
	ALL

80-FAULT CODE INDEX



FAULT CODE	LOG BOOK REPORT/ CORRECTIVE ACTION
80 03 17 _	No. (01=1, 02=2, 03=3, 04=4) engine START light did not illuminate. No N2 rotation or oil pressure indication. 1. Refer to FIM 80-00-00/101, Fig. 105 Block 1.
80 03 18 _	No. (01=1, 02=2, 03=3, 04=4) engine START light illuminated. EICAS message ENG (1, 2, 3, 4) START VLV displayed. No N2 rotation or oil pressure indication. 1. Refer to the fault code which agrees with the EICAS message display as follows: ENG 1 START VLV 80 03 01 00 ENG 2 START VLV 80 03 03 00 ENG 3 START VLV 80 03 05 00 ENG 4 START VLV 80 03 07 00
80 03 19 _	No. (01=1, 02=2, 03=3, 04=4) engine START light remained illuminated at 50% N2. EICAS message STARTER CUTOUT (1, 2, 3, 4) displayed. Engine start switch did not return to OFF. Engine shutdown. 1. Refer to the fault code which agrees with the EICAS message display as follows: STARTER CUTOUT 1 80 03 09 00 STARTER CUTOUT 2 80 03 10 00 STARTER CUTOUT 3 80 03 11 00 STARTER CUTOUT 4 80 03 12 00
80 03 20 _	CMC S/W -008; No. (01=1, 02=2, 03=3, 04=4) engine START VALVE light illuminates. Engine start switch will not stay in pulled position at less than 50% N2 RPM. 1. Refer to FIM 80-00-00/101, Fig. 105 Block 3.

EFFECTIVITY	
	ALL

80-FAULT CODE INDEX

FAULT CODE	LOG BOOK REPORT/ CORRECTIVE ACTION
------------	---------------------------------------

80 03 20 00 CMC S/W -009;
The EICAS message >AUTOSTART OFF (ADVISORY) shows.
1. Refer to FIM 80-00-00/101, Fig. 105 Block 3.

EFFECTIVITY
ALL

80-FAULT CODE INDEX

STARTING

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	AMM REFERENCE
CARD - (FIM 77-00-00/101) ENGINE SPEED CARD, ENG. 1, YMLA001 ENGINE SPEED CARD, ENG. 2, YMLA003 ENGINE SPEED CARD, ENG. 3, YMLA005 ENGINE SPEEC CARD, ENG. 4, YMLA007				
CIRCUIT BREAKER - ENG START AIR CONT, C395 ENG 1 A/APU ENG START PERF SOL PWR, C10185 DUCT - STARTER PNEUMATIC ENGINE 1	1		FLT COMPT, P6 6J18 6F15	* * 80-11-05
ENGINE 2	1	1	417, LEFT CORE COWL PANEL, COMPRESSOR REAR FRAME, LEFT SIDE	
ENGINE 3	1	1	427, LEFT CORE COWL PANEL, COMPRESSOR REAR FRAME, LEFT SIDE	
ENGINE 4	1	1	437, LEFT CORE COWL PANEL, COMPRESSOR REAR FRAME, LEFT SIDE	
FILTER - START VALVE ENGINE 1	1	1	447, LEFT CORE COWL PANEL, COMPRESSOR REAR FRAME, LEFT SIDE	
ENGINE 2	2	1	415, LEFT THRUST REVERSER HALF, GEARBOX AFT FACE	80-11-04
ENGINE 3	2	1	425, LEFT THRUST REVERSER HALF, GEARBOX AFT FACE	
ENGINE 4	2	1	435, LEFT THRUST REVERSER HALF, GEARBOX AFT FACE	
MODULE - ENGINE IGNITION CONTROL/FUEL JETTISON, M7325	2	1	445, LEFT THRUST REVERSER HALF, GEARBOX AFT FACE	
RELAY - (FIM 31-01-06/101) ENGINE 1 AUTOSTART, R7804 ENGINE 1 FUEL CUTOFF, R7808 ENGINE 2 AUTOSTART, R7805 ENGINE 2 FUEL CUTOFF, R7809 ENGINE 3 AUTOSTART, R7806 ENGINE 3 FUEL CUTOFF, R7810 ENGINE 4 AUTOSTART, R7807 ENGINE 4 FUEL CUTOFF, R7811	1	1	PILOTS' OVERHEAD PANEL, P5	80-11-06

* SEE THE WDM EQUIPMENT LIST

Starting - Component Index
Figure 101 (Sheet 1)

EFFECTIVITY

ALL

80-00-00

J01

Page 101
Oct 10/95



//////////////////////////////////
 / CF6-80C SERIES /
 / ENGINES /
 //////////////////////////////////

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	REFERENCE
RELAY - (REF 31-01-36, FIG. 101) ENGINE 1 START 1, R7535 ENGINE 1 START 2, R7537 ENGINE 2 START 1, R7539 ENGINE 2 START 2, R7540				
RELAY - (REF 31-01-39, FIG. 101) ENGINE 3 START 1, R7541 ENGINE 3 START 2, R7542 ENGINE 4 START 1, R7543 ENGINE 4 START 2, R7544				
STARTER ENGINE 1	2	1	415 AND 416, THRUST REVERSER HALVES, GEARBOX AFT FACE	80-11-01
ENGINE 2	2	1	425 AND 426, THRUST REVERSER HALVES, GEARBOX AFT FACE	
ENGINE 3	2	1	435 AND 436, THRUST REVERSER HALVES, GEARBOX AFT FACE	
ENGINE 4	2	1	445 AND 446, THRUST REVERSER HALVES, GEARBOX AFT FACE	
UNIT - (REF 31-61-00, FIG. 101) EFIS/EICAS INTERFACE NO. 1, M7351 EFIS/EICAS INTERFACE NO. 2, M7352 EFIS/EICAS INTERFACE NO. 3, M7353				
UNIT - (REF 73-00-00, FIG. 101) ENGINE CONTROL, M7198				
VALVE - START, V351 ENGINE 1	2	1	415 AND 416, THRUST REVERSER HALVES, GEARBOX AFT FACE	80-11-02
ENGINE 2	2	1	425 AND 426, THRUST REVERSER HALVES, GEARBOX AFT FACE	
ENGINE 3	2	1	435 AND 436, THRUST REVERSER HALVES, GEARBOX AFT FACE	
ENGINE 4	2	1	445 AND 446, THRUST REVERSER HALVES, GEARBOX AFT FACE	

Starting - Component Index
Figure 101 (Sheet 2)

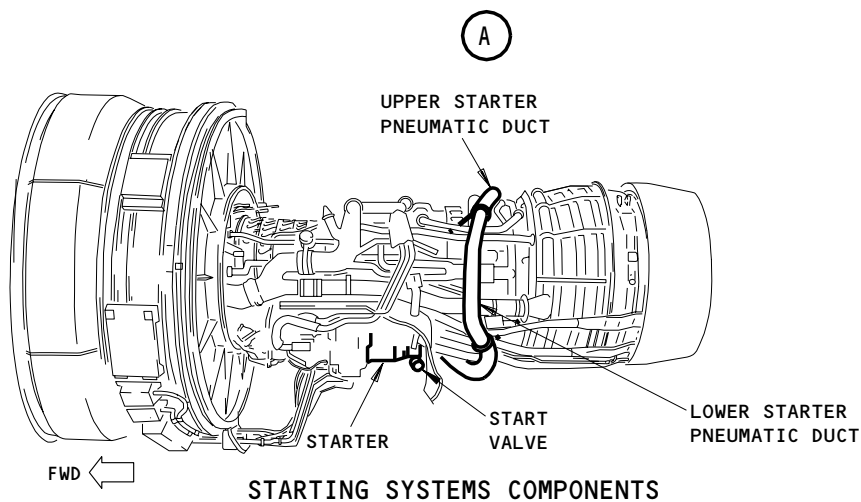
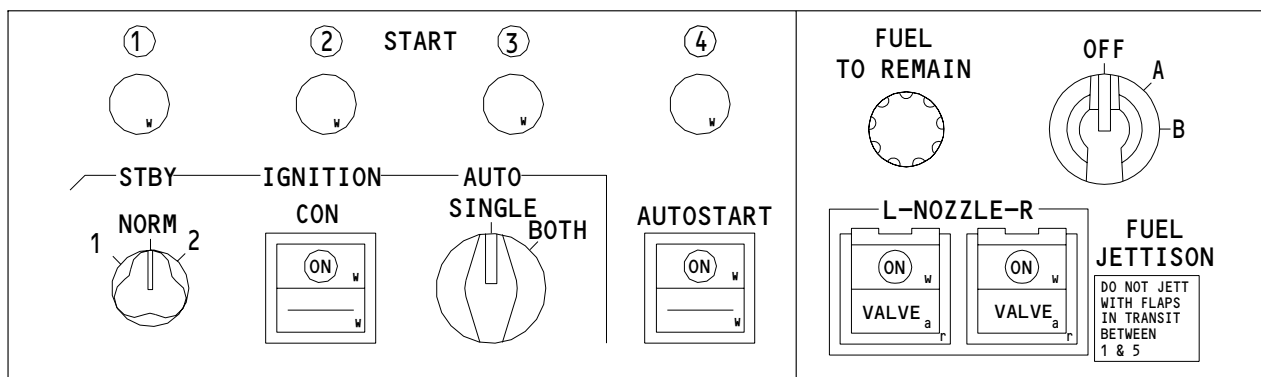
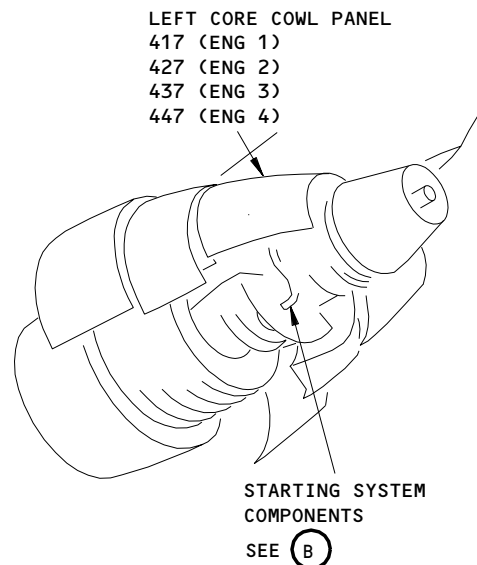
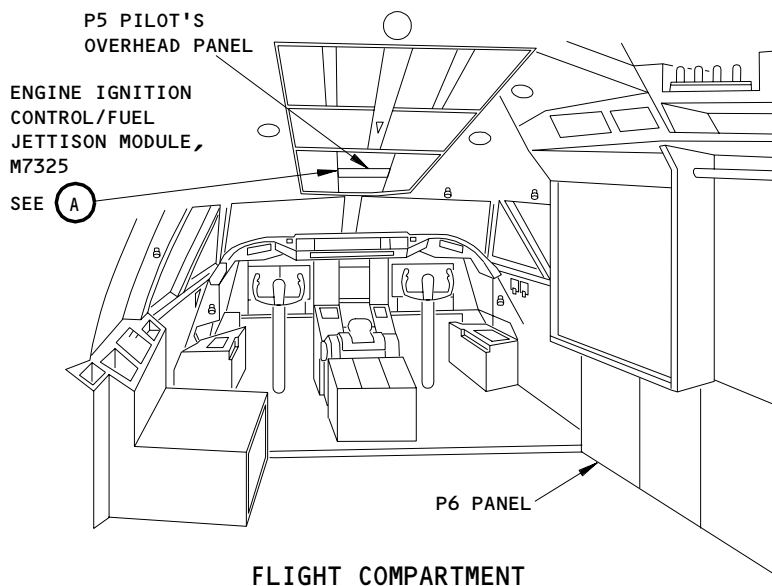
EFFECTIVITY:

ALL

80-00-00

J01

Page 102
Oct 10/89



(B)

Starting - Component Location
Figure 102 (Sheet 1)

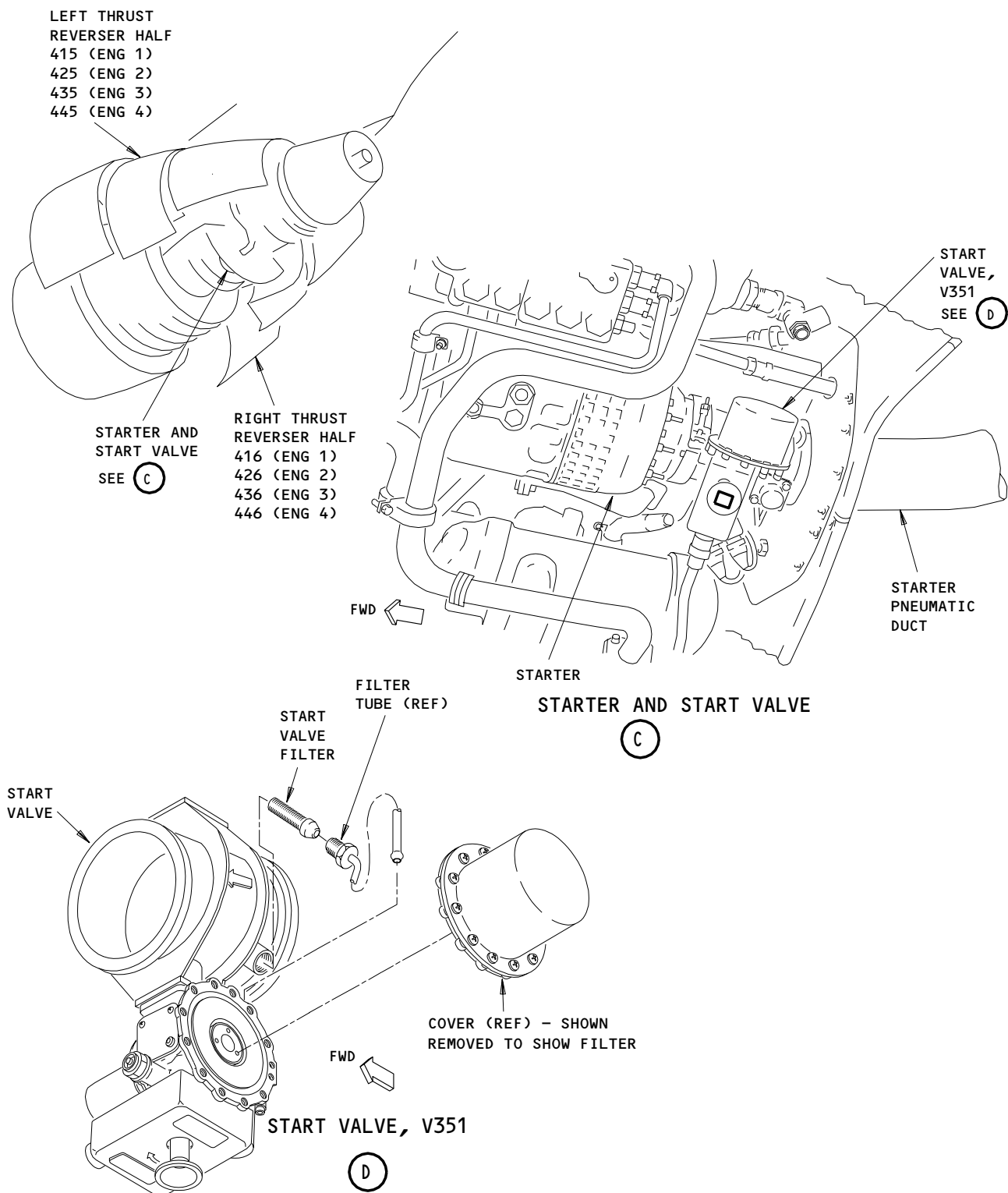
EFFECTIVITY

ALL

80-00-00

J01

Page 103
Feb 10/96



Starting - Component Location
Figure 102 (Sheet 2)

EFFECTIVITY

ALL

80-00-00

J02

Page 104
Oct 10/95

STARTING - FAULT ISOLATION

1. General

A. The fault isolation of the starting uses visual check of the component condition, the system test, the CMCS and the EICAS messages.

2. Fault Isolation Tips

A. Fault isolation procedures are used when the wiring is OK and the electrical power is available at the applicable bus. If the corrective action specified does not correct the fault, do a check of the wiring with the wiring diagrams.

3. Fault Isolation Procedures

Figure 103	Engine N2 Shows Zero During Start. Start Valve Indicated Open. No Oil Pressure Rise. Duct Pressure Normal.
Figure 104	Engine N2 Shows Zero or Is Slow To Reach 20% During Start. Start Valve Indicated Open. Duct Pressure (Low or Fluctuates) _____ psi.
Figure 105	Engine Start Valve Light Did Not Illuminate. No N2 Rotation or Oil Pressure Indication.

EFFECTIVITY

ALL

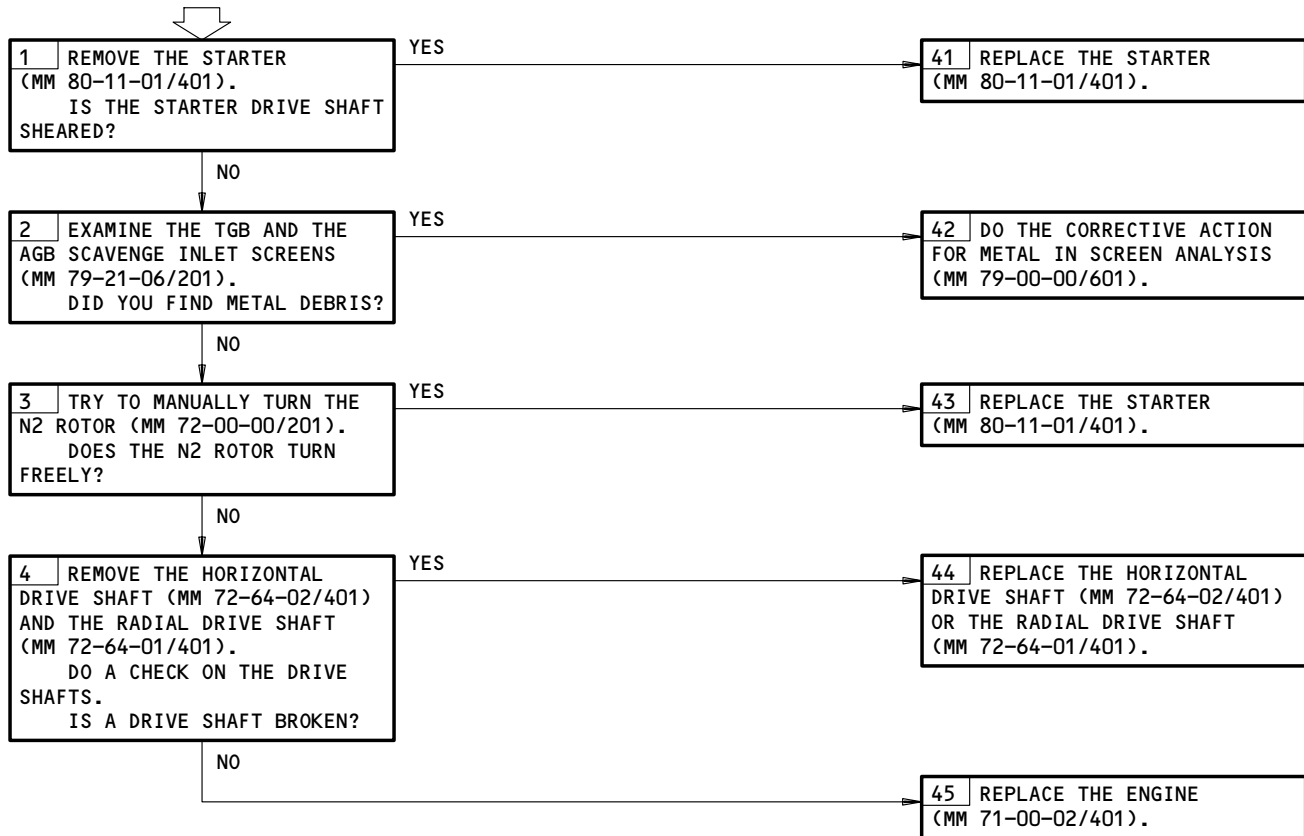
80-00-00

J01

Page 105
Oct 10/96

ENGINE N2 SHOWS ZERO
DURING START. START
VALVE INDICATED OPEN.
NO OIL PRESSURE RISE.
DUCT PRESSURE NORMAL.

PREREQUISITES
NONE



Engine N2 Shows Zero During Start. Start Valve Indicated Open. No Oil
Pressure Rise. Duct Pressure Normal.

Figure 103

EFFECTIVITY

ALL

80-00-00

J01

Page 106
Jun 10/91

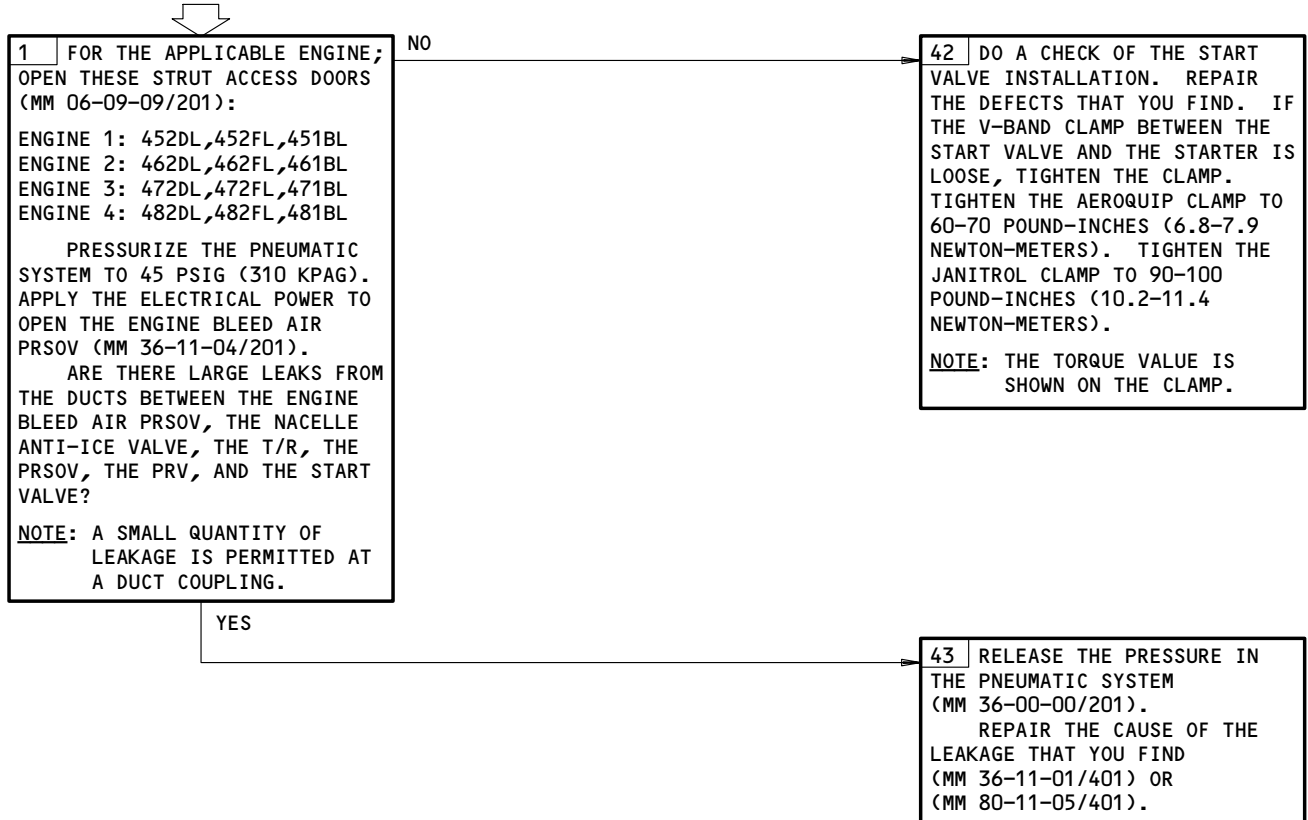
ENGINE N2 SHOWS
ZERO OR IS SLOW TO
REACH 20% DURING
START. START VALVE
INDICATED OPEN.
DUCT PRESSURE (LOW
OR FLUCTUATES)
_____ PSI.

PREREQUISITES

MAKE SURE THE AIRPLANE IS IN THE CONFIGURATION THAT
FOLLOWS:

ELECTRICAL POWER IS ON (MM 24-22-00/201)

PNEUMATIC POWER IS OFF (MM 36-00-00/201)



Engine N2 Shows Zero or is Slow to Reach 20% During Start. Start Valve
Indicated Open. Duct Pressure (Low or Fluctuates) _____ psi.

Figure 104

EFFECTIVITY

ALL

80-00-00

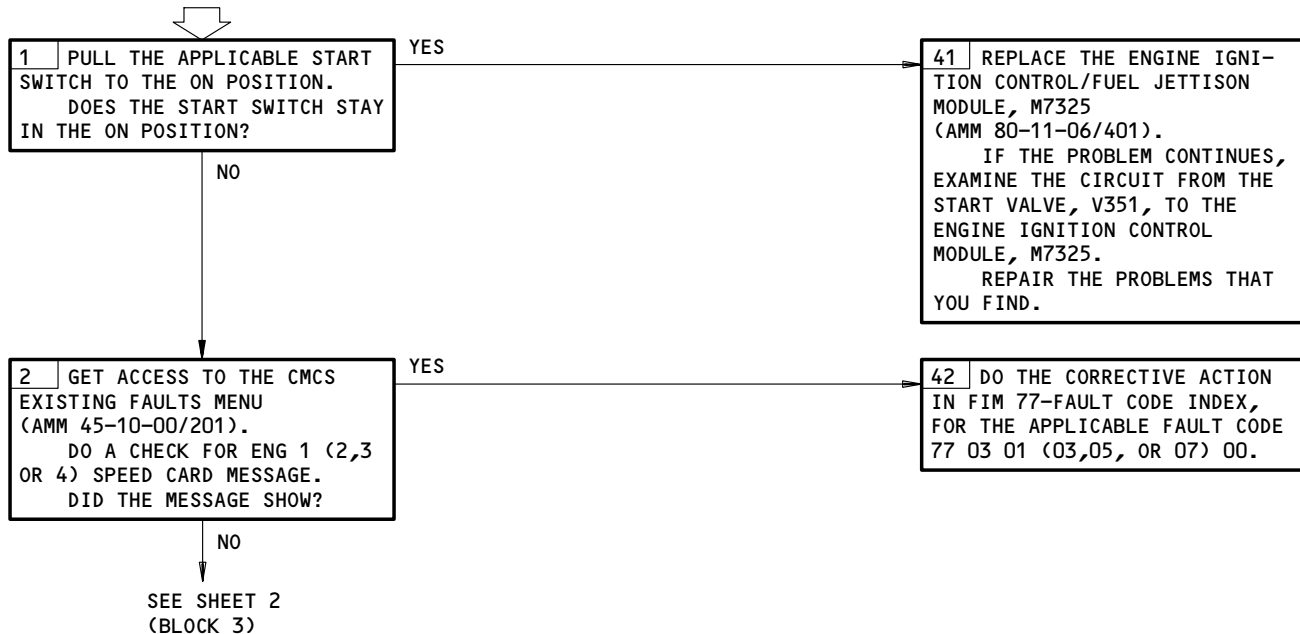
J01

Page 107
Jun 10/91

ENGINE START VALVE
LIGHT DID NOT
ILLUMINATE. NO N2
ROTATION OR OIL
PRESSURE INDICATION.

PREREQUISITES

MAKE SURE THE AIRPLANE IS IN THIS CONFIGURATION:
ELECTRICAL POWER IS ON (AMM 24-22-00/201)
PNEUMATIC POWER IS OFF (AMM 36-00-00/201)



Engine Start Valve Light Did Not Illuminate. No N2 Rotation or Oil Pressure Indication.
Figure 105 (Sheet 1)

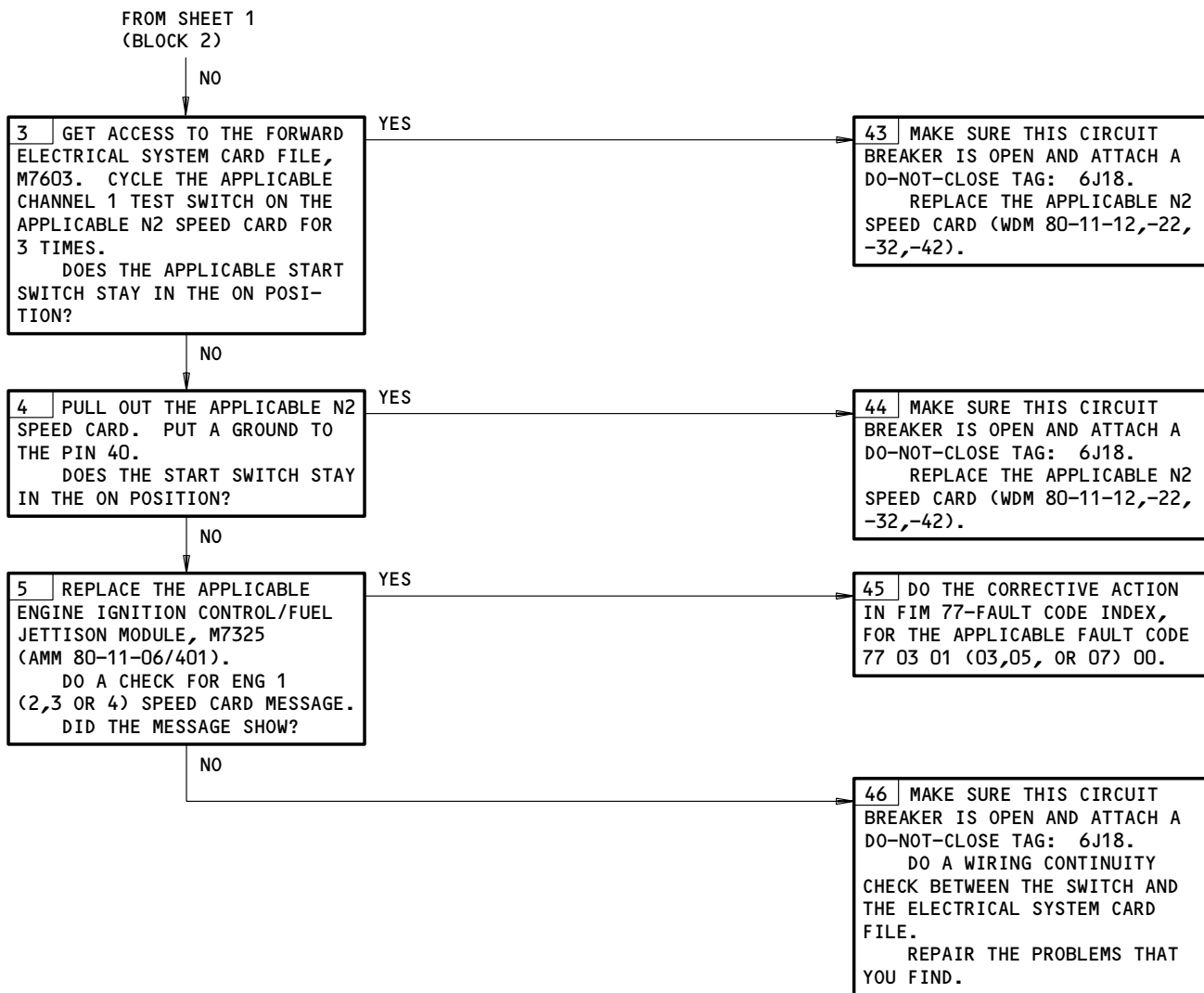
EFFECTIVITY

ALL

80-00-00

J01

Page 108
Oct 10/95



Engine Start Valve Light Did Not Illuminate. No N2 Rotation or Oil
Pressure Indication.
Figure 105 (Sheet 2)

EFFECTIVITY

ALL

80-00-00

J01

 Page 109
Oct 10/95

ENGINE STARTING SYSTEM - DESCRIPTION AND OPERATION

1. General

- A. The engine starting system provides the means of rotating the engine N2 compressor on the ground or in flight to an rpm range at which engine start can occur. For inflight start, the system can be energized to supplement a windmilling engine if required. System components for each engine include the engine starter, start valve, pneumatic ducting, and the necessary control and indication circuitry (Fig. 1 and 2). Four START switches and the AUTOSTART switch, located on the P5 overhead panel, control the engine starting system operation.
- B. Power for the starting system control circuitry is 28 volts dc supplied from the P6 main power distribution panel battery bus. Circuit breaker 6J18 ENG START AIR CONT supplies power to the system control circuitry for all four engines.
- C. For ground operation, pneumatic power can be obtained from three separate compressed air sources: the airplane auxiliary power unit (APU), ground carts through service connections, or cross-bleed air from an operating engine.

2. Engine Starter (Fig. 3)

- A. The engine starter converts high energy compressed air into starter shaft torque sufficient to accelerate the engine to starting speed. The starter is a lightweight, single stage, axial flow, turbine air motor. It consists of a nozzle, turbine wheel and shaft, reduction gear train, exhaust screen, housing assembly, clutch mechanism, and output drive shaft. Starter operation is controlled by the start valve which opens on demand to permit flow of air to the starter inlet.
- B. The starter is installed on an adapter on the aft face of the engine accessory gearbox at the 6 o'clock position. It is secured to an adapter pad by a V-band coupling and accurately located by two locator pins on the starter flange.
- C. The starter gears and bearings are splash-lubricated by a self-contained oil system. Fill and drain ports are provided in the housing for servicing. A magnetic drain plug assembly consists of an inner magnetic probe and an outer drain plug. The magnetic probe can be removed to check for metallic chips without draining the oil. A check valve in the drain plug prevents draining when the magnetic probe is removed.

3. Start Valve (Fig. 4 and 5)

- A. The start valve controls compressed air flow to the engine starter. The valve is a spring and pressure-loaded closed, pneumatically operated, electrically controlled shutoff valve. The valve incorporates a manual override and four electrical position indicating switches. A small pneumatic bleed flow is designed into the valve to provide heating for the solenoid control valve, eliminating moisture and preventing the possibility of malfunction due to freezing.

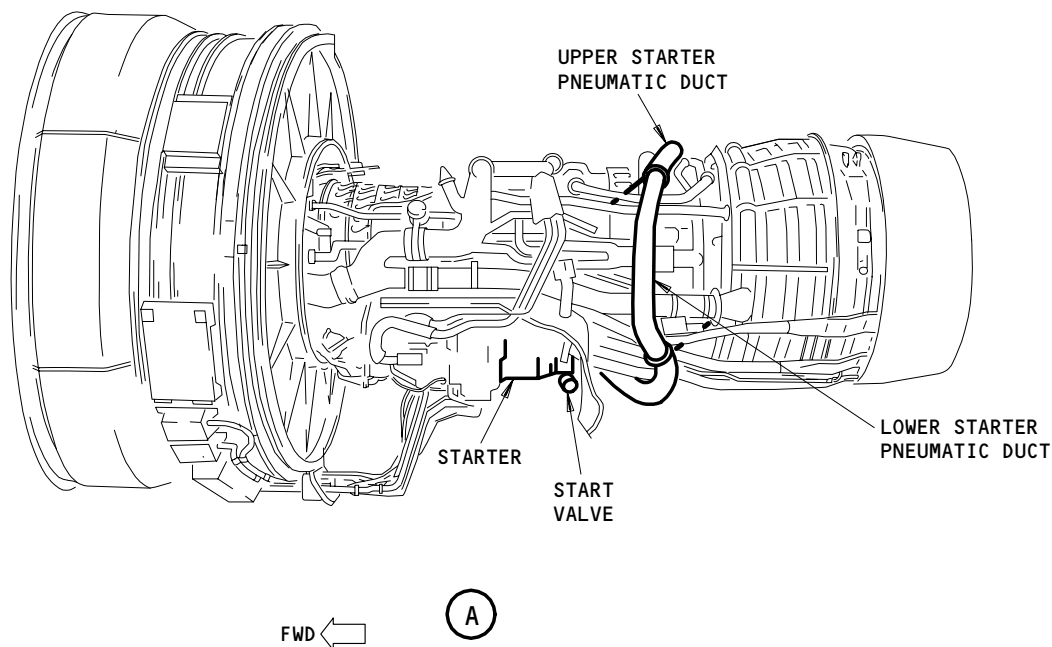
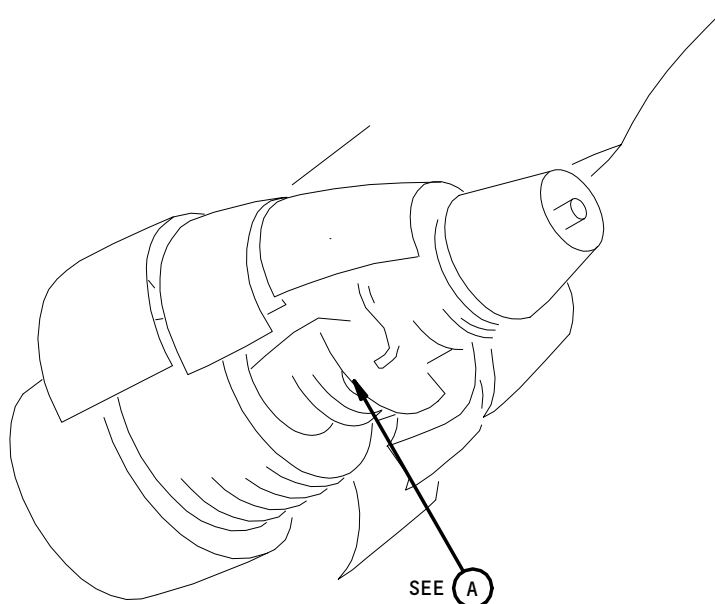
EFFECTIVITY

ALL

80-11-00

J02

Page 1
Oct 10/95



Starting System Component Location
Figure 1

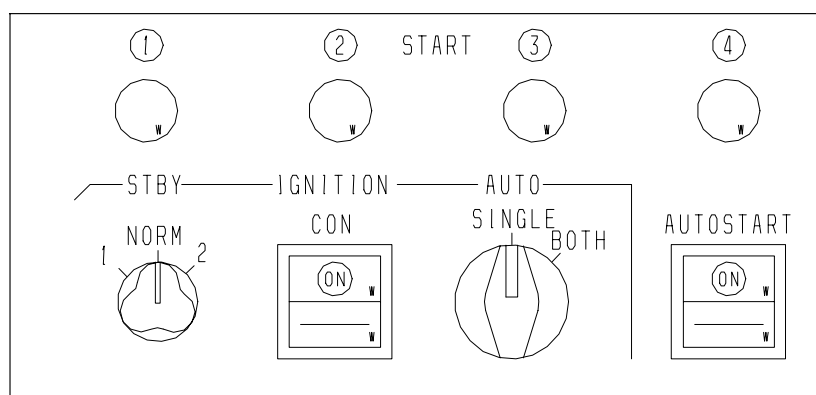
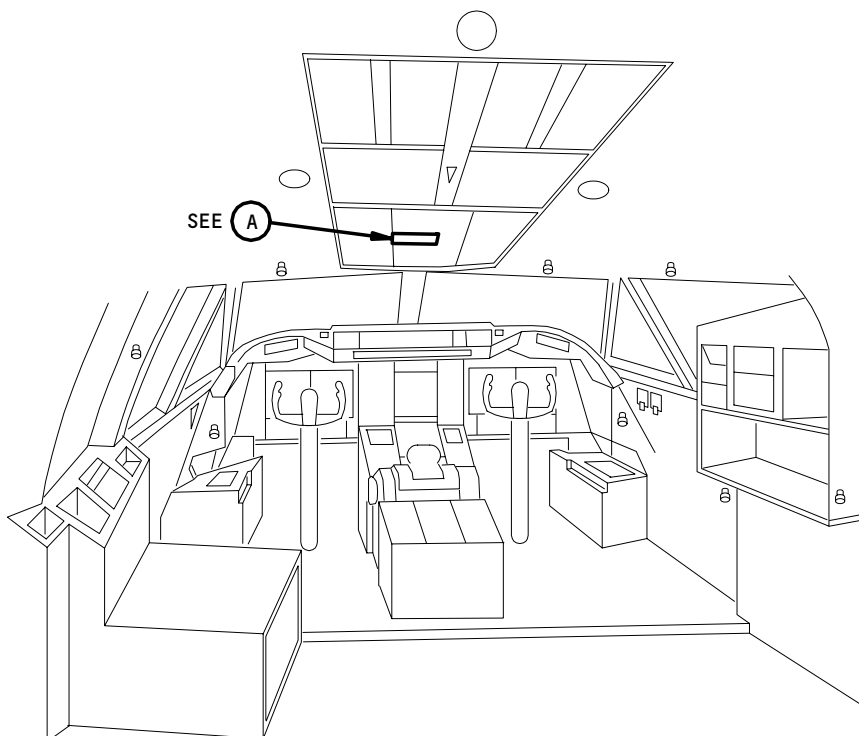
EFFECTIVITY

ALL

80-11-00

J01

Page 2
Feb 10/96



PILOTS' OVERHEAD PANEL

(A)

Engine Starting System Flight Deck Component Location
Figure 2

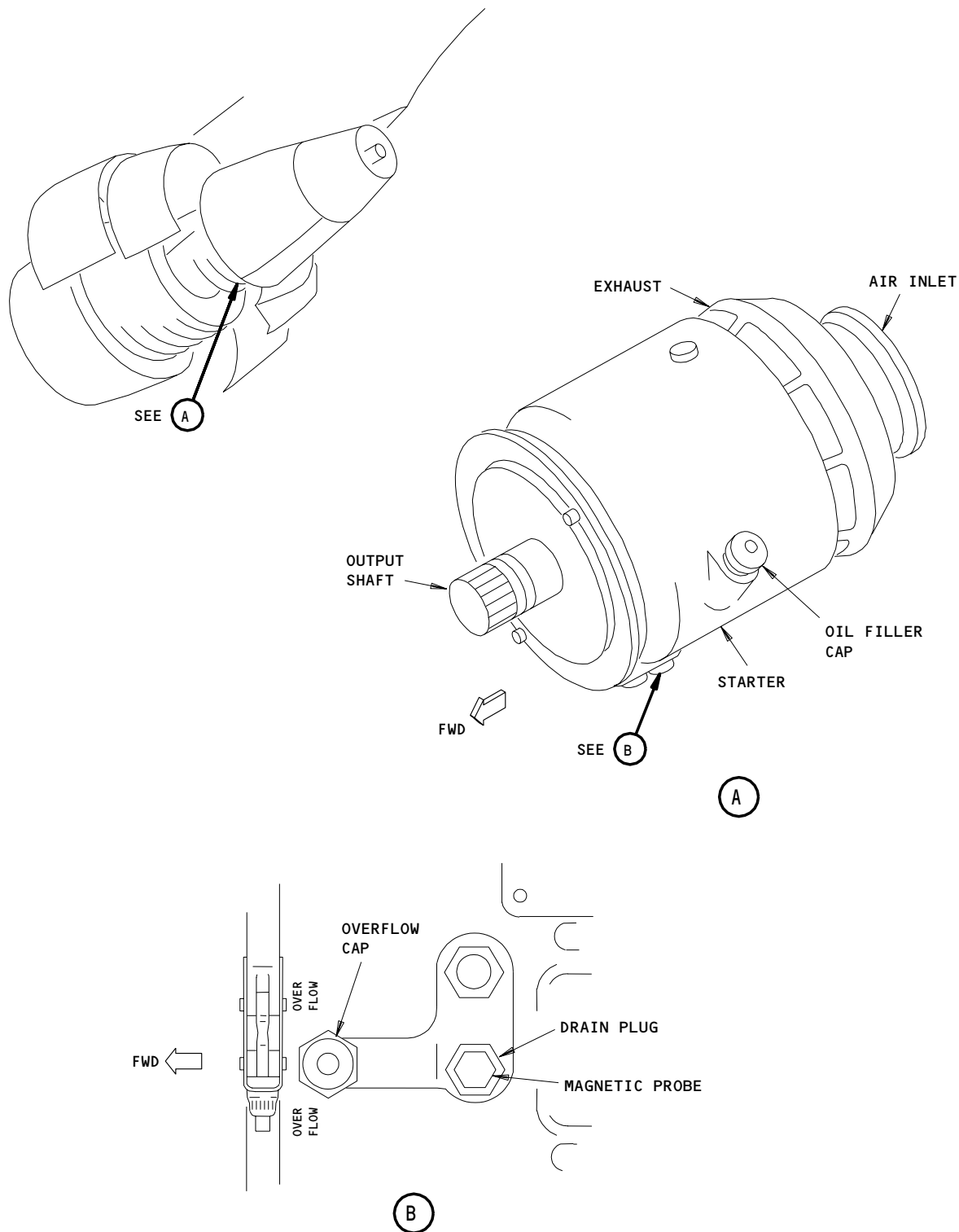
EFFECTIVITY

ALL

80-11-00

J01

Page 3
Jun 10/88



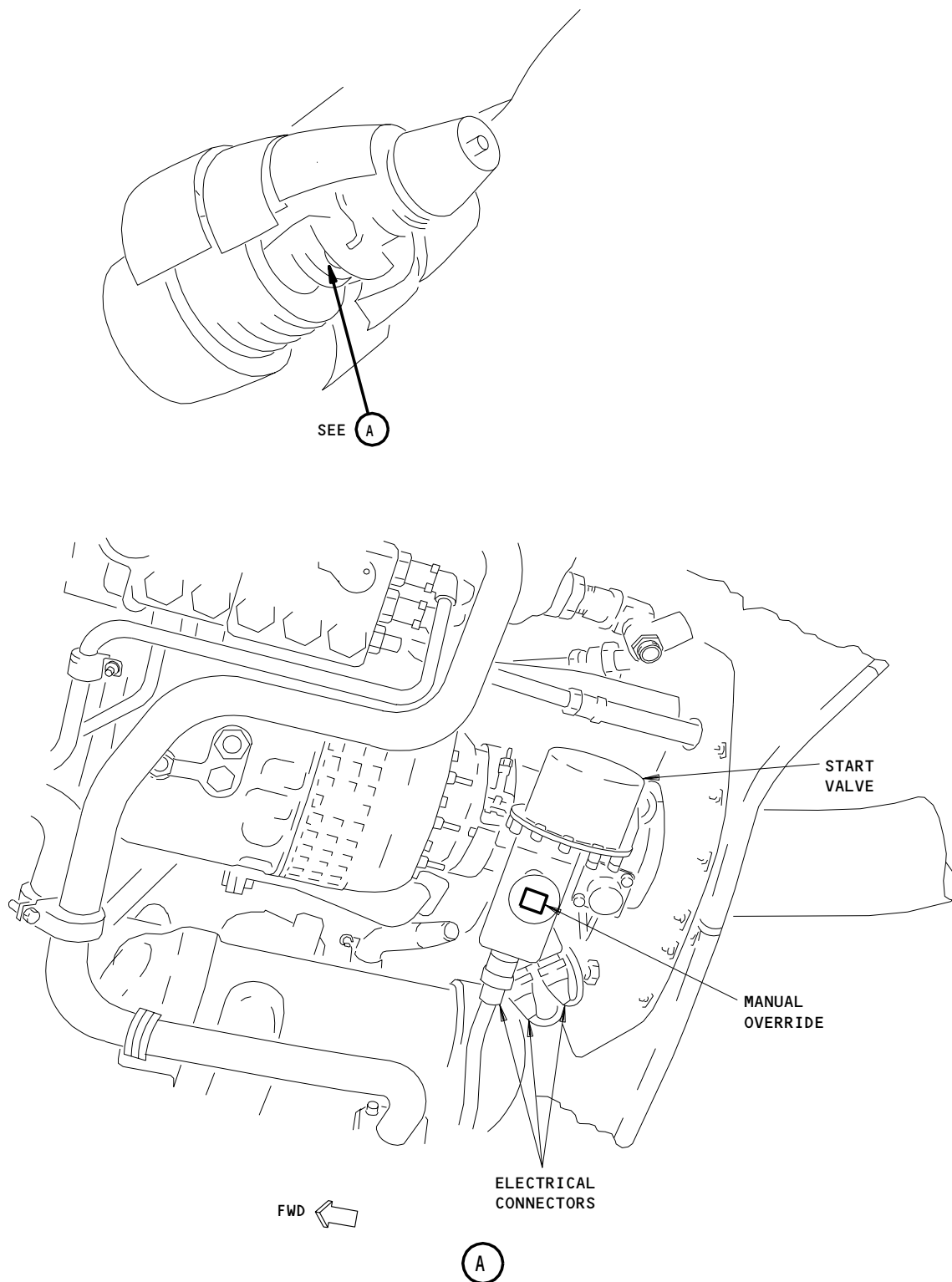
Engine Starter
Figure 3

EFFECTIVITY—
ALL

80-11-00

J01

Page 4
Jun 10/88



Start Valve
Figure 4

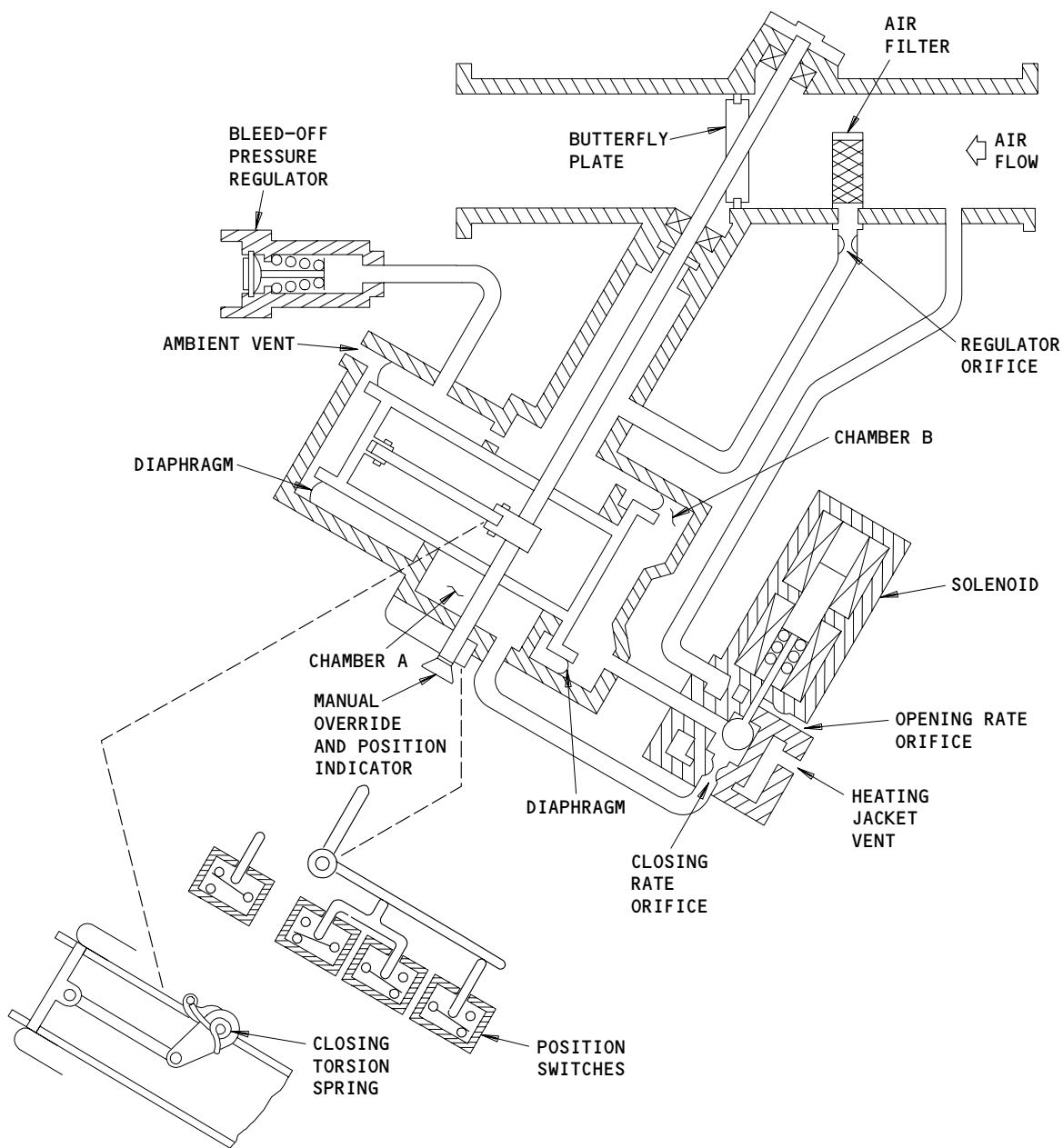
EFFECTIVITY

ALL

80-11-00

J01

Page 5
Jun 10/88



Start Valve Schematic
Figure 5

EFFECTIVITY

ALL

80-11-00

J01

Page 6
Feb 10/89

- B. The valve body is constructed with an integral butterfly-type closure and in-line flanged end connections, a diaphragm operated pneumatic actuator, and a solenoid actuated selector valve with manual override provisions for control of valve position. A regulator bleed orifice protected by a sintered wire mesh filter is incorporated in the inlet side of the valve to provide a controlled opening time. The lower end of the butterfly shaft is equipped with an override mechanism to allow manual opening of the valve in the event the solenoid fails to operate.
4. Engine Starting Control and Indication
- A. The four START switches on the P5 overhead panel control the operation of the corresponding start valves. The switches are pulled into the on position, and pushed into the off position. When the switches are on, the switch face is illuminated white.
- B. When the AUTOSTART switch is selected on, fuel flow and ignition operation are automatically initiated by the Electronic Control Unit (ECU) when the N2 speed reaches 17%. The ECU also automatically aborts engine start in the event of a failed lightup and will adjust N2 acceleration schedule during engine start. When the AUTOSTART switch is on, the switch is illuminated white.
- C. There are no EICAS messages associated with normal engine starting.
- D. If the position of the start valve disagrees with the position commanded by the corresponding START switch, the status message ENG X START VLV (where X is the applicable engine number) will appear on the EICAS screen after a five second delay.
- E. If the autostart system has failed to start the engine and has subsequently aborted further start attempts, the advisory message ENG X AUTOSTART (where X is the applicable engine number) will appear on the EICAS screen.
- F. If the start valve remains open above the engine speed at which starter cutout should occur (50% N2), the caution STARTER CUTOUT X (where X is the applicable engine number) will appear on the EICAS screen after a five second delay. This caution will inhibit all other existing EICAS cautions and advisories for 20 seconds during ground start attempts.
5. Operation (Fig. 6)
- A. The start system is armed when 28 volt dc power is supplied to the START switches on the engine ignition control module, located on the P5 overhead panel, by the 6J18 ENG START AIR CONT circuit breaker on the BATT BUS. For description of the ignition control system, refer to 74-31-00/001.
- B. For ground starting of an engine, pneumatic power must be provided to the start valve from the airplane pneumatic system. The pneumatic system control module is located on the P5 overhead panel. Pneumatic power can be supplied to the start valve from three separate compressed air sources:
- (1) Auxiliary Power Unit (APU) -
With the APU operating at governed speed, and the APU bleed air switch in the ON position, bleed air is supplied to pressurize the airplane pneumatic system. The applicable wing isolation valve switch must be in the valve open position, and the pack valve switches must be in the valve closed position.

EFFECTIVITY

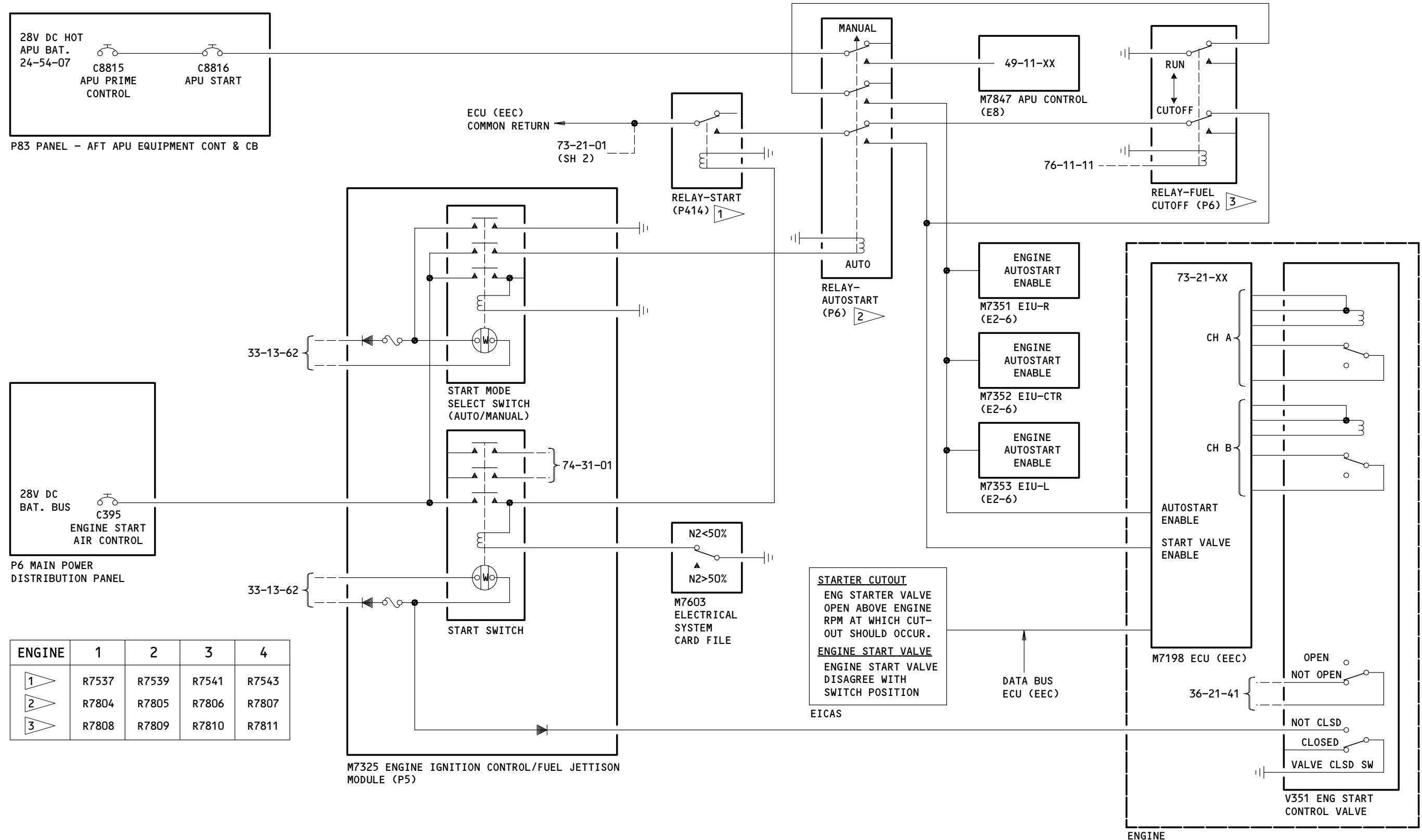
ALL

80-11-00

J01

Page 7

Apr 10/89



Engine Starting System Simplified Schematic
Figure 6

EFFECTIVITY

ALL

80-11-00

J01

Page 8
Feb 10/91

- (2) External air through service connections -
Air from an external source (ground carts) is used to pressurize the pneumatic system by connecting to ground service connections on the airplane. The pack valve switches must be in the valve closed position and the applicable wing isolation valve must be in the valve open position.
- (3) Cross bleed air from an operating engine -
By depressing the ENGINE BLEED switch for the operating engine, bleed air is supplied to the airplane pneumatic system. For cross bleed from one wing to the other, both isolation valves must be in the open position and the pack valve switches must be in the valve closed position.
- C. To initiate engine starter operation, the applicable START switch on the P5 overhead panel is pulled to the on position. The white light on the START switch is illuminated and electrical power is supplied to the corresponding engine bleed air Pressure Regulating and Shutoff Valve (PRSOV) and to the corresponding start valve. The PRSOV and the start valve solenoid valve open.
- D. The position of the start valve butterfly is controlled by the solenoid valve. Air immediately upstream of the start valve butterfly is filtered and routed through an orifice to the solenoid valve. When the solenoid is energized, the solenoid valve opens to bleed air from behind the larger diameter diaphragm out the ambient vent. Air pressure acts on the actuator large diameter diaphragm against the combined force of the actuating spring and the upstream pressure acting on the small diameter diaphragm. The resulting motion is translated through a mechanical linkage to rotate the valve butterfly toward the fully open position.
- E. When the start valve opens, compressed air is admitted to the starter air inlet. The air passes through the starter inlet nozzle and is directed axially through the turbine rotor, imparting high speed rotation to the rotor. Low energy exhaust air from the starter is discharged inside the engine cowling through holes perforated in the starter housing. The starter turbine rotation passes through a 2-stage reduction. The pinion gear, on the turbine rotor shaft, drives three cluster gears which mesh with the ring gear. The ring gear drives the inner race of the clutch. The outer race of the clutch is connected to the main gearbox starter drive by the starter output drive shaft.
- F. The starter rotation is transmitted through the accessory, transfer, and inlet gearboxes to the N2 compressor. The N2 compressor begins to rotate and establishes airflow through the engine. When the N2 compressor speed is 17 to 22% N2 rpm, fuel and ignition are applied, either automatically (when the AUTOSTART switch is on), or by manually advancing the FUEL CONTROL switch on the P8 control stand to RUN.

EFFECTIVITY

ALL

80-11-00

J01

Page 9

Oct 10/88

- G. The starter continues to assist the engine until the START switch is pushed to the off position or when N2 exceeds 50%, de-energizing a relay to open the START switch. When the START switch is opened, the start valve solenoid is de-energized and the white light on the START switch is extinguished. In the start valve, the solenoid ball valve closes the ambient vent and repressurizes the backside of the larger diameter diaphragm. Chamber A pressure and closing spring force moves the smaller diaphragm, rotating the butterfly valve closed. With the start valve closed, the starter speed begins to drop. When the N2 compressor speed exceeds the starter speed, the clutch disengages the starter and the starter coasts to a stop.
- H. In the event the electrical circuit for the start valve becomes inoperative, the valve can be operated by use of a manual override mechanism (Fig. 4). For manual start procedures, refer to 71-00-00/201.

EFFECTIVITY

ALL

80-11-00

J01

Page 10
Jun 10/88

ENGINE STARTING SYSTEM - ADJUSTMENT/TEST

1. General

- A. This procedure has one task, the operational test of the engine starting system. To do the operational test, you must open the thrust reverser halves for the applicable engine.
- B. This operational test does not include a test of the AUTOSTART system.

TASK 80-11-00-715-001-J00

2. Operational Test - Engine Starting System

A. General

CAUTION: DO NOT OPERATE THE ENGINE STARTER MORE THAN THE SPECIFIED LIMITS IN THE DUTY CYCLE. IF YOU OPERATE THE STARTER MORE THAN THE SPECIFIED LIMITS, YOU CAN CAUSE DAMAGE TO THE STARTER OR THE GEARBOX.

- (1) The operation limits of the engine starter are as follows:
 - (a) The normal duty cycle is one (1) minute on followed by one (1) minute off.
 - (b) The extended starter duty cycles and the times that are necessary to make it cool, with the fuel and ignition off, are as follows:
 - 1) If the starter was ON from 0 to 5 minutes, let the N2 decrease to zero before you motor the engine again.
 - 2) If the starter was on from 5 to 10 minutes, let the starter cool for 20 minutes before you motor the engine again.
 - 3) If the starter was on from 10 to 15 minutes, let the starter cool for 30 minutes before you motor the engine again.

CAUTION: DO NOT ENGAGE THE STARTER AGAIN AT MORE THAN 30% N2. IF YOU ENGAGE THE STARTER AGAIN AT MORE THAN 30% N2, YOU CAN CAUSE DAMAGE TO THE STARTER AND THE GEARBOX.

- (2) The limits to engage the starter again are as follows:
 - (a) 0% N2 - Recommended.

EFFECTIVITY

ALL

80-11-00

J02

Page 501
Oct 10/96

(b) 0-20% N2 - Usual.

NOTE: We recommend that you do not engage the starter again if the speed is more than 20% N2.

(c) 20-30% N2 - Permitted to remove a fire or purge fuel.

B. References

- (1) 12-13-06/301, Engine Starter - SRV (Oil Replenishing)
- (2) 71-00-00/201, Power Plant
- (3) 78-31-00/201, Thrust Reverser System

C. Access

(1) Location Zone

- 412 Engine 1 - Gearbox Aft Face 6 o'clock
- 422 Engine 2 - Gearbox Aft Face 6 o'clock
- 432 Engine 3 - Gearbox Aft Face 6 o'clock
- 442 Engine 4 - Gearbox Aft Face 6 o'clock

(2) Access Panel

- 415 and 416 Thrust Reverser Halves - Engine 1
- 425 and 426 Thrust Reverser Halves - Engine 2
- 435 and 436 Thrust Reverser Halves - Engine 3
- 445 and 446 Thrust Reverser Halves - Engine 4

D. Procedure

S 615-002-J00

- (1) Fill the starter with oil if it is necessary (Ref 12-13-06/301).

NOTE: Do not close the thrust reverser halves at this time.

S 865-014-J00

CAUTION: THE MAIN ENGINE FUEL PUMP IS FUEL LUBRICATED. DO NOT MOTOR THE ENGINE UNLESS A POSITIVE FUEL INLET PRESSURE IS INDICATED.

- (2) Do this task: "Engine Motoring - Dry (AMM 71-00-00/501, Test No. 2).

S 215-011-J00

- (3) During the dry motor procedure, do the checks as follows:
 - (a) Pull the applicable START switch to the ON position.
 - (b) Make sure the light on the switch comes on.
 - (c) Make sure that the N2 engine speed increases smoothly.

NOTE: The main EICAS screen does not show the correct N2 value until the N2 is approximately 8% rpm.

- (d) Do a check of the starter ducts for leakage or defective ducts.
- (e) Do a check of the starter for too much noise.

EFFECTIVITY

ALL

80-11-00

J02

Page 502
Oct 10/96

- (f) Push the START switch to the OFF position.
- (g) Make sure the light on the switch goes off.

S 415-012-J00

- (4) Close the thrust reverser halves (Ref 78-31-00/201).

EFFECTIVITY

ALL

80-11-00

J02

Page 503
Oct 10/96

STARTER - REMOVAL/INSTALLATION

1. General

- A. This procedure has two tasks:
 - (1) Remove the engine starter.
 - (2) Install the engine starter.
- B. To do the tasks, you must open the thrust reverser halves.
- C. Each engine has one starter. The starter is installed on the aft side of the accessory gearbox at the 6 o'clock position.
- D. The installation task includes the operational test for the engine starting system.

TASK 80-11-01-004-001-J00

2. Starter Removal (Fig. 401)

A. References

- (1) AMM 78-31-00/201, Thrust Reverser System
- (2) AMM 80-11-02/401, Start Valve
- (3) AIPC 80-11-01 Fig. 2

B. Access

(1) Location Zone

412	Engine 1 - Gearbox Aft Face 6 o'clock
422	Engine 2 - Gearbox Aft Face 6 o'clock
432	Engine 3 - Gearbox Aft Face 6 o'clock
442	Engine 4 - Gearbox Aft Face 6 o'clock

(2) Access Panel

415 and 416	Thrust Reverser Halves - Engine 1
425 and 426	Thrust Reverser Halves - Engine 2
435 and 436	Thrust Reverser Halves - Engine 3
445 and 446	Thrust Reverser Halves - Engine 4

C. Procedure

S 014-002-J00

- (1) Open the thrust reverser halves (AMM 78-31-00/201).

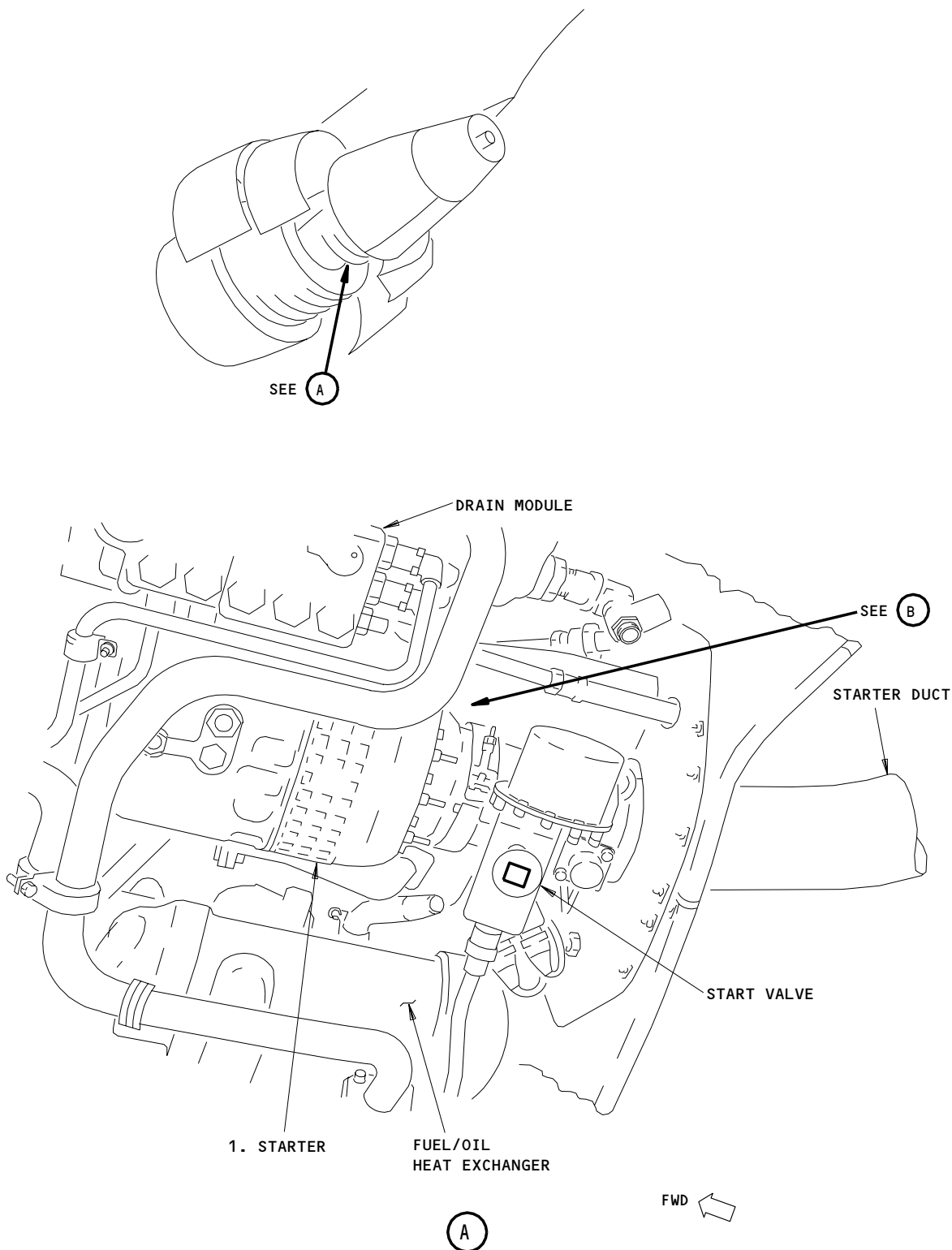
EFFECTIVITY

ALL

80-11-01

J02

Page 401
Oct 10/95



Engine Starter Installation
Figure 401 (Sheet 1)

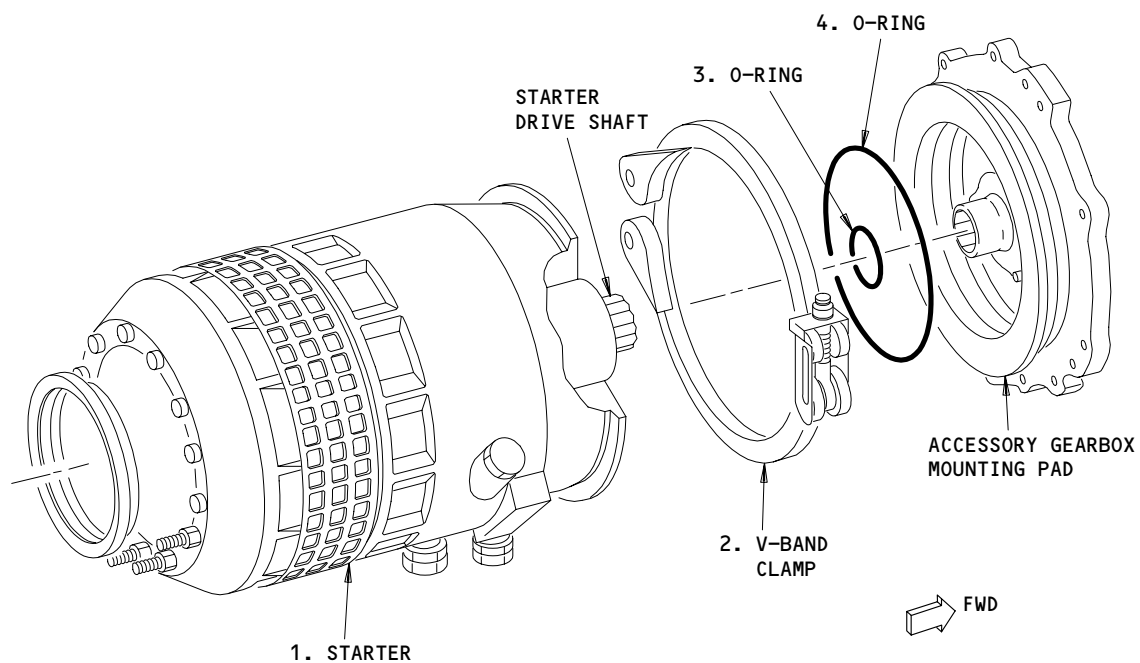
EFFECTIVITY

ALL

80-11-01

J01

Page 402
Oct 10/88



(B)

Engine Starter Installation
Figure 401 (Sheet 2)

EFFECTIVITY

ALL

80-11-01

J01

Page 403
Jun 10/88

S 864-013-J00

- (2) Open this circuit breaker and attach a DO-NOT-CLOSE tag:
(a) P6 Main Power Distribution Panel
1) 6J18 ENG START AIR CONT

S 014-003-J00

- (3) Remove the start valve (AMM 80-11-02/401).

S 034-019-J00

WARNING: MAKE SURE YOU HAVE SUFFICIENT SUPPORT FOR THE STARTER BEFORE YOU REMOVE THE STARTER FROM THE GEARBOX. THE STARTER IS HEAVY. IT CAN CAUSE INJURY TO PERSONS AND DAMAGE TO THE STARTER IF IT FALLS.

- (4) Remove the coupling V-band clamp (2) which attaches the starter (1) to the accessory gearbox mounting pad.

S 024-005-J00

- (5) Move the starter (1) aft from the gearbox until the drive shaft splines are free from the gearbox splines.

S 034-006-J00

- (6) Remove the O-ring (3) from the starter drive shaft.
(a) Discard the O-ring (3).

S 034-008-J00

- (7) Remove the O-ring (4) from the starter pad.
(a) Discard the O-ring (4).

S 434-024-J00

- (8) Install the protective caps on all starter openings and on the accessory gearbox pad.

TASK 80-11-01-404-008-J00

3. Starter Installation (Fig. 401)

A. Consumable Materials

- (1) D00389 Oil - Lubricating, GE Spec D50TF1 (GE C02-019)

EFFECTIVITY

ALL

80-11-01

J02

Page 404
Oct 10/95

B. Parts

AMM		NOMENCLATURE	AIPC		
FIG	ITEM		SUBJECT	FIG	ITEM
401	1	Starter	80-11-01	02	20
	2	Clamp			5
	3	O-Ring (Packing)			10
	4	O-Ring (Packing)			15

C. References

- (1) AMM 12-13-06/301, Engine Starter
- (2) AMM 71-00-00/201, Power Plant
- (3) AMM 71-00-00/501, Power Plant
- (4) AMM 78-31-00/201, Thrust Reverser System
- (5) AMM 80-11-00/501, Engine Starting System
- (6) AMM 80-11-02/401, Start Valve

D. Access

(1) Location Zone

- | | |
|-----|---------------------------------------|
| 412 | Engine 1 - Gearbox Aft Face 6 o'clock |
| 422 | Engine 2 - Gearbox Aft Face 6 o'clock |
| 432 | Engine 3 - Gearbox Aft Face 6 o'clock |
| 442 | Engine 4 - Gearbox Aft Face 6 o'clock |

(2) Access Panel

- | | |
|-------------|-----------------------------------|
| 415 and 416 | Thrust Reverser Halves - Engine 1 |
| 425 and 426 | Thrust Reverser Halves - Engine 2 |
| 435 and 436 | Thrust Reverser Halves - Engine 3 |
| 445 and 446 | Thrust Reverser Halves - Engine 4 |

E. Procedure

S 034-009-J00

- (1) Remove the protective caps from the starter openings and from the accessory gearbox pad.

EFFECTIVITY

ALL

80-11-01

J02

Page 405
Feb 15/99

S 644-010-J00

- (2) Lubricate the new O-rings (3 and 4) with engine oil.

S 434-018-J00

CAUTION: MAKE SURE YOU INSTALL THE O-RINGS FOR THE STARTER. IF YOU DO NOT INSTALL THE O-RING ON THE STARTER DRIVE SHAFT, AN OIL LOSS CAN OCCUR WHICH CAN CAUSE DAMAGE TO THE ENGINE.

- (3) Install the O-rings (3 and 4) on the starter drive shaft and the accessory gearbox mounting pad.

S 434-012-J00

- (4) Put the coupling V-band clamp (2) around the mounting pad flange.

S 424-015-J00

CAUTION: MAKE SURE YOU HAVE SUFFICIENT SUPPORT FOR THE STARTER WHEN YOU INSTALL THE STARTER. CAREFULLY ALIGN THE STARTER WITH THE GEARBOX TO PREVENT SPLINE DAMAGE.

- (5) Install the starter (1) on the gearbox mounting pad.
(a) Align the mating splines and the locator pins of the starter to the gearbox mounting pad.

S 434-019-J00

- (6) Install the coupling V-band clamp (2) around the starter (1) and the gearbox mounting pad flanges.
(a) Tighten the V-band clamp (2) to torque value shown on clamp.
(b) Hit the clamp lightly with a soft mallet to release the clamp tension.
(c) Do a check of the torque.
1) If the torque value is less than torque value shown on the clamp, do the steps above again.

EFFECTIVITY

ALL

80-11-01

J02

Page 406
Feb 15/98

- S 414-011-J00
(7) Install the start valve (AMM 80-11-02/401).
- S 614-012-J00
(8) Fill the starter with oil (AMM 12-13-06/301).
- S 414-013-J00
(9) Close the thrust reverser halves (AMM 78-31-00/201).
- S 864-015-J00
(10) Remove the DO-NOT-CLOSE tag and close this circuit breaker:
(a) P6 Main Power Distribution Panel
1) 6J18 ENG START AIR CONT
- S 714-010-J00
(11) Do the operational test of the engine starting system
(AMM 80-11-00/501).
- S 794-019-J00
(12) Operate engine at 80% N2 for 2-3 minutes.
(AMM 71-00-00/201).
(a) Do a check of the starter for oil leakage. Make sure there is
no leakage.

EFFECTIVITY

ALL

80-11-01

J02

Page 407
Feb 15/99

STARTER - INSPECTION/CHECK

1. General

- A. This procedure has one task, an inspection of the starter. The starter inspection includes:
 - (1) A visual check of the starter for oil leakage.
 - (2) An inspection of the magnetic probe for an indication of internal damage.
- B. To do a check on the starter, you must open the thrust reverser halves.
- C. The removal of the starter is not necessary unless the starter has damage.

TASK 80-11-01-206-001-J00

2. Starter Inspection Fig. (601)

- A. Standard Tools and Equipment
 - (1) Magnifying Lens - 10x Power
 - (2) Container - Suitable For Oil, Clean, 1 Gallon (4 Liters)
- B. Consumable Materials
 - (1) D00389 Oil - Lubricating, GE Spec D50TF1 (GE C02-019)
- C. References
 - (1) 12-13-06/301, Engine Starter - Servicing (Oil Replenishing)
 - (2) 78-31-00/201, Thrust Reverser System
 - (3) 80-11-01/401, Starter
 - (4) IPC 80-11-01 Fig. 2
- D. Access
 - (1) Location Zone
 - 412 Engine 1 - Gearbox Aft Face 6 o'clock
 - 422 Engine 2 - Gearbox Aft Face 6 o'clock
 - 432 Engine 3 - Gearbox Aft Face 6 o'clock
 - 442 Engine 4 - Gearbox Aft Face 6 o'clock
 - (2) Access Panel
 - 415 and 416 Thrust Reverser Halves
 - 425 and 426 Thrust Reverser Halves
 - 435 and 436 Thrust Reverser Halves
 - 445 and 446 Thrust Reverser Halves
- E. Procedure
 - S 866-002-J00
 - (1) Open this circuit breaker and attach a DO-NOT-CLOSE tag:
 - (a) P6 Main Power Distribution Panel
 - 1) 6J18 ENG START AIR CONT

EFFECTIVITY

ALL

80-11-01

J02

Page 601
Oct 10/95

S 016-003-J00

- (2) Open the thrust reverser halves (Ref 78-31-00/201).

S 216-004-J00

- (3) Examine the surface of the starter for the signs of the oil leakage.
(a) If you see an oil leak around the starter housing, replace the starter (Ref 80-11-01/401).

S 036-005-J00

- (4) Remove the magnetic probe from the drain plug of the starter.

NOTE: The drain plug has a check valve. You do not have to drain the oil from the starter, when you remove the probe.

- (a) Make sure you put the magnetic probe in a clean area.
(b) Discard the gasket.

S 216-006-J00

- (5) Do a check of the magnetic probe for the quantity and the type of the contamination.
(a) If the quantity of the contamination on the magnetic probe is small, install the magnetic probe into the drain plug.
1) Clean the magnetic probe.
2) Install a new gasket on the magnetic probe.
3) Install the magnetic probe into the drain plug on the starter.
4) Tighten the magnetic probe to 20-40 pound-inches (2.3-4.5 newton-meters).
(b) If the magnetic probe has too much contamination, clean the magnetic probe.
1) Keep the metal particles for analysis.
2) Examine the metal particles with a magnifying glass.
a) Small sharp slivers and small flat flakes in a small quantity are permitted.

NOTE: A small quantity of the slivers and the flakes is usual when the starter has worn parts.

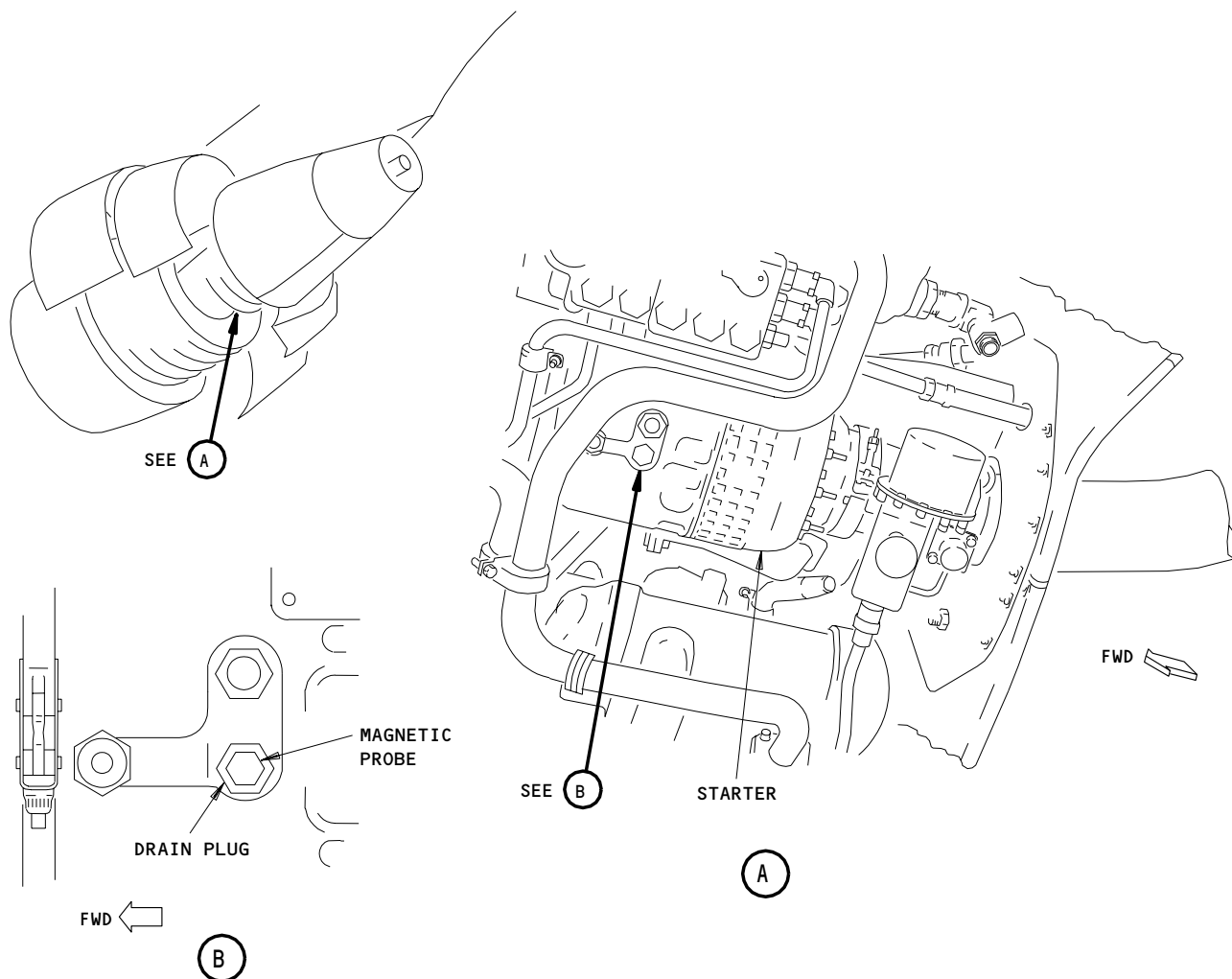
EFFECTIVITY

ALL

80-11-01

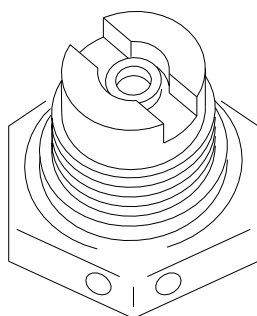
J02.1

Page 602
Oct 18/00

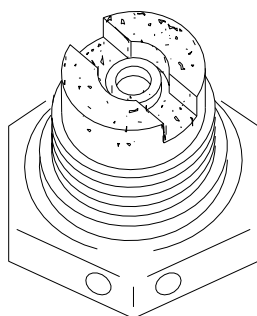


ACCEPTABLE

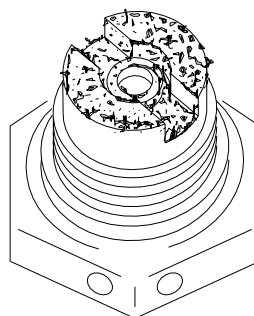
NOT ACCEPTABLE



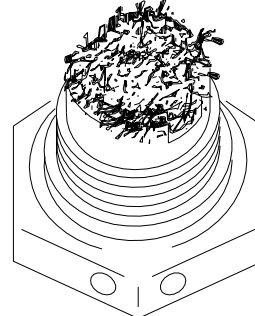
CLEAN



LIGHT FUZZ



MODERATE FUZZ



MAJOR METAL

CF8-6316-00-C

Magnetic Chip Detector Inspection
Figure 601

EFFECTIVITY

ALL

80-11-01

J01

Page 603
Jun 10/97

- b) A larger quantity of the metal particles shows the starter has possible internal damage.
- 3) Remove the drain plug from the starter.
 - a) Drain the oil from the starter through a fine mesh filter in the container below.
 - b) Discard the gasket.
- 4) Examine the oil for the amount of the contamination.
 - a) If the quantity of the metal contamination in the oil is too much, replace the starter (Ref 80-11-01/401).
 - b) If the quantity of the metal contamination in the oil is small, the starter is serviceable.
- 5) Install the drain plug on the starter.
 - a) Install a new gasket on the drain plug.
 - b) Tighten the drain plug to 70-80 pound-inches (7.9-9.0 N.m).
- 6) Install the magnetic probe into the drain plug.
 - a) Install a new gasket on the magnetic probe.
 - b) Install the magnetic probe into the drain plug.
 - c) Tighten the magnetic probe to 20-40 pound-inches (2.3-4.5 newton-meters).
- 7) Fill the starter with oil (Ref 12-13-06/301).

S 436-015-J00

- (6) Install the lockwire on the drain plug and the magnetic probe if it is necessary.

S 416-011-J00

- (7) Close the thrust reverser halves (Ref 78-31-00/201).

S 866-012-J00

- (8) Remove the DO-NOT-CLOSE tag and close this circuit breaker:
 - (a) P6 Main Power Distribution Panel
 - 1) 6J18 ENG START AIR CONT

EFFECTIVITY

ALL

80-11-01

J02.1

Page 604
Oct 18/00

START VALVE - REMOVAL/INSTALLATION

1. General

- A. This procedure has two tasks:
 - (1) The removal of the start valve (V351).
 - (2) The installation of the start valve (V351).
- B. To do the tasks, you must open the thrust reverser halves.
- C. Each engine has one start valve (V351). The start valve is installed on the air inlet (aft side) of the starter at the 6 o'clock position.
- D. The installation task includes the operational test of the starting system.

TASK 80-11-02-004-001-J00

2. Start Valve Removal (Fig. 401)

A. References

- (1) AMM 78-31-00/201, Thrust Reverser System
- (2) AIPC 80-11-01 Fig. 2
- (3) AIPC 80-11-02 Fig. 2

B. Access

(1) Location Zone

- | | |
|-----|---------------------------------------|
| 412 | Engine 1 - Gearbox Aft Face 6 o'clock |
| 422 | Engine 2 - Gearbox Aft Face 6 o'clock |
| 432 | Engine 3 - Gearbox Aft Face 6 o'clock |
| 442 | Engine 4 - Gearbox Aft Face 6 o'clock |

(2) Access Panel

- | | |
|-------------|-----------------------------------|
| 415 and 416 | Thrust Reverser Halves - Engine 1 |
| 425 and 426 | Thrust Reverser Halves - Engine 2 |
| 435 and 436 | Thrust Reverser Halves - Engine 3 |
| 445 and 446 | Thrust Reverser Halves - Engine 4 |

C. Procedure

S 864-002-J00

- (1) Open this circuit breaker and attach a DO-NOT-CLOSE tag:
 - (a) P6 Main Power Distribution Panel
 - 1) 6J18 ENG START AIR CONT

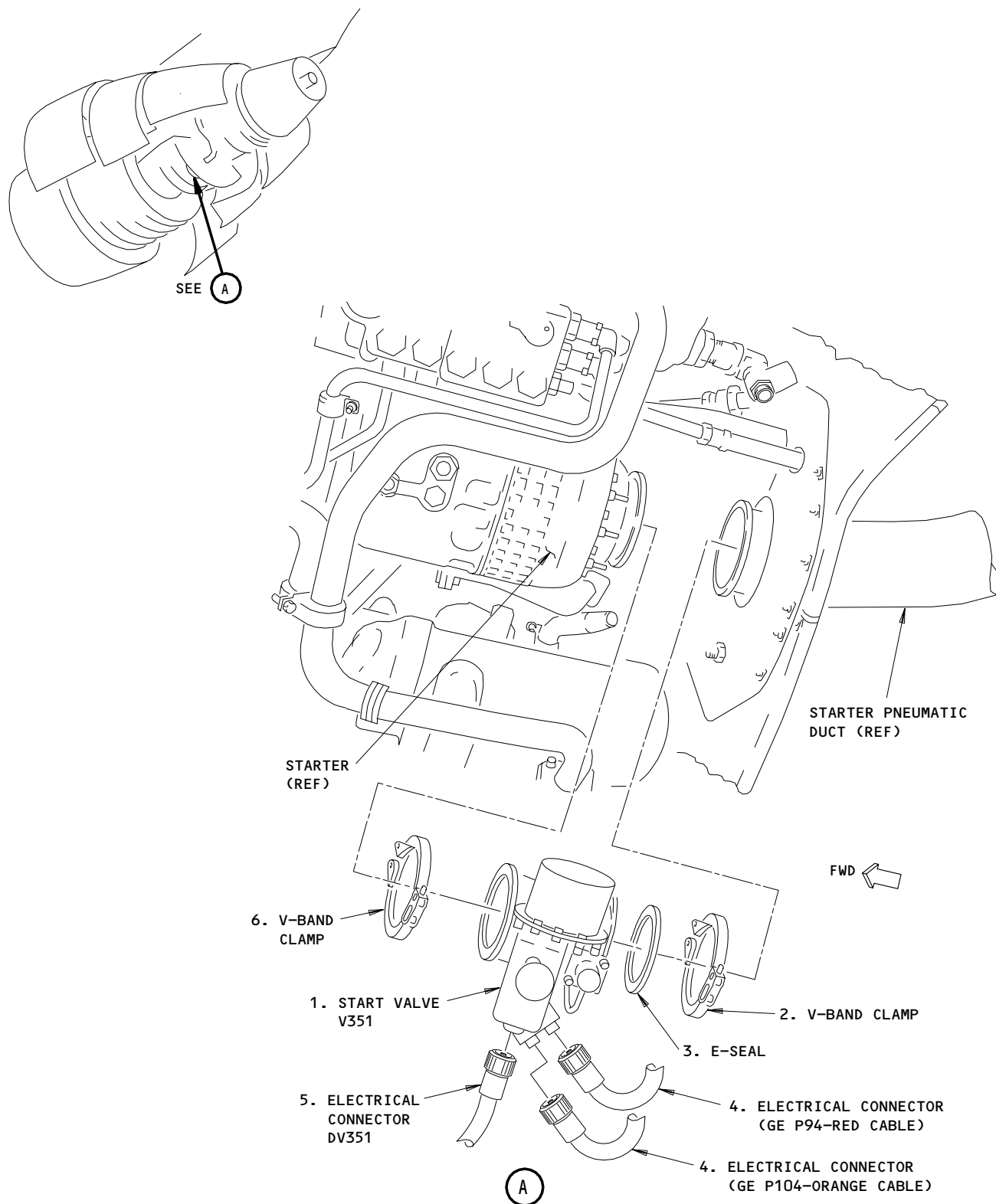
EFFECTIVITY

ALL

80-11-02

J02

Page 401
Oct 10/95



Start Valve Installation
Figure 401

EFFECTIVITY

ALL

80-11-02

J02

Page 402
Feb 10/93

S 014-003-J00

- (2) Open the thrust reverser halves (Ref 78-31-00/201).

S 034-029-J00

- (3) Disconnect the electrical connectors (DV351, P94, and P104) from the start valve.
- (a) Disconnect the electrical connector DV351 (5) from the start valve solenoid.
 - (b) Disconnect the electrical connector P94 (4) for channel A and the electrical connector P104 (4) for channel B from the start valve (1).

NOTE: Make a mark on the connectors for an easier installation.

- (c) Install the caps on all openings.

S 214-006-J00

- (4) Make sure the alignment stripe is painted on the starter and the start valve (1).

NOTE: The stripe aligns the start valve with the starter during installation.

- (a) If the alignment stripe is not shown, make a new alignment stripe.

S 034-007-J00

- (5) Remove the coupling V-band clamps (2 and 6) which attach the start valve (1) to the starter and the starter duct.

S 024-008-J00

- (6) Remove the start valve (1).
- (a) Remove the E-seal (3) between the start valve and the starter duct.

S 214-009-J00

- (7) Examine the E-seal (3) for damage.
- (a) Discard the E-seal (3) if the damage shows.

EFFECTIVITY

ALL

80-11-02

J02

Page 403
Feb 10/91

S 034-010-J00
(8) Install the caps on all openings.

TASK 80-11-02-404-011-J00

3. Start Valve Installation (Fig. 401)

A. Parts

AMM		NOMENCLATURE	AIPC		
FIG	ITEM		SUBJECT	FIG	ITEM
401	1	Start Valve	80-11-02	02	15
	2	Clamp			5
	3	E-seal			10
	6	Clamp	80-11-01	02	20

B. References

- (1) 78-31-00/201, Thrust Reverser System
- (2) 80-11-00/501, Engine Starting

C. Access

(1) Location Zone

- 412 Engine 1 - Gearbox Aft Face 6 o'clock
- 422 Engine 2 - Gearbox Aft Face 6 o'clock
- 432 Engine 3 - Gearbox Aft Face 6 o'clock
- 442 Engine 4 - Gearbox Aft Face 6 o'clock

(2) Access Panel

- 415 and 416 Thrust Reverser Halves - Engine 1
- 415D IDG Oil Thrust Reverser Access Door - Engine 1
- 425 and 426 Thrust Reverser Halves - Engine 2
- 425D IDG Oil Thrust Reverser Access Door - Engine 2
- 435 and 436 Thrust Reverser Halves - Engine 3
- 435D IDG Oil Thrust Reverser Access Door - Engine 3
- 445 and 446 Thrust Reverser Halves - Engine 4
- 445D IDG Oil Thrust Reverser Access Door - Engine 4

EFFECTIVITY

ALL

80-11-02

J02

Page 404
Feb 15/98

D. Procedure

S 434-012-J00

- (1) Remove the caps from the starter and the starter duct.

S 434-013-J00

- (2) Install the E-seal (3) in an open end of the starter duct.

S 424-014-J00

- (3) Install the start valve (1) between the starter and the starter duct.

(a) Align the stripe on the start valve with the stripe of the starter.

(b) Install the V-band clamps (2 and 6) on each side of the start valve (1).

NOTE: Turn the clamp nuts until they can be tightened through the IDG OIL SERVICE door.

(c) Tighten the V-band clamps with the hand at this time.

(d) Hit the clamps lightly with a soft mallet to make sure the valve is in the correct position.

S 434-031-J00

- (4) Connect the electrical connectors (DV351, P94, and P104):

(a) Remove the caps from the electrical connectors.

(b) Connect the electrical connector DV351 (5) to the start valve solenoid.

(c) Connect the electrical connector P94 (4) for channel A to the start valve (1) receptacle.

(d) Connect the electrical connector P104 (4) for channel B to the start valve (1) receptacle.

S 414-018-J00

- (5) Close the thrust reverser halves (Ref 78-31-00/201).

EFFECTIVITY

ALL

80-11-02

J02

Page 405
Feb 15/98

- S 014-019-J00
- (6) Open the IDG OIL SERVICE door on the left thrust reverser half.
- S 214-020-J00
- (7) Insert 3/8 inch square drive with a 36 inch (91 cm) extension through the start valve override access port in the right hand thrust reverser (6 o'clock position). Make sure the starter override receptacle is aligned properly with the guide tube access port by verifying that the tool engages into the start valve receptacle.
- (a) Adjust the position of the start valve if it is necessary.
- S 434-021-J00
- (8) Tighten the V-band clamp (6) between the starter and the start valve (1) to the value shown on the clamp.
- S 434-022-J00
- (9) Tighten the V-band clamp (2) between the start valve (1) and the starter duct to the torque value shown on clamp.
- S 414-023-J00
- (10) Close the IDG OIL SERVICE door on the left thrust reverser half.
- S 864-024-J00
- (11) Remove the DO-NOT-CLOSE tag and close this circuit breaker.
- (a) P6 Main Power Distribution Panel
- 1) 6J18 ENG START AIR CONT
- S 714-025-J00
- (12) Do the operational test of the engine starting system (Ref 80-11-00/501).

EFFECTIVITY

ALL

80-11-02

J02

Page 406
Feb 15/99

START VALVE FILTER - MAINTENANCE PRACTICES

1. General

- A. This procedure has four tasks:
(1) Remove the start valve filter.
(2) Examine the start valve filter.
(3) Clean the start valve filter.
(4) Install the start valve filter.
- B. To do the tasks, you must open the left thrust reverser half.

TASK 80-11-04-002-001-J00

2. Start Valve Filter Removal (Fig. 201)

- A. References
(1) 78-31-00/201, Thrust Reverser System
(2) IPC 80-11-02 Fig. 2
- B. Access
(1) Location Zone
412 Engine 1 - Gearbox Aft Face 6 O'clock
422 Engine 2 - Gearbox Aft Face 6 O'clock
432 Engine 3 - Gearbox Aft Face 6 O'clock
442 Engine 4 - Gearbox Aft Face 6 O'clock
- (2) Access Panel
415 Left Thrust Reverser Half - Engine 1
425 Left Thrust Reverser Half - Engine 2
435 Left Thrust Reverser Half - Engine 3
445 Left Thrust Reverser Half - Engine 4

C. Procedure

S 862-002-J00

- (1) For the applicable engine,
Open this circuit breaker and attach the DO-NOT-CLOSE tag:
(a) P6 Main Power Distribution Panel
1) 6J18 ENG START AIR CONT

S 012-003-J00

- (2) Open the left thrust reverser half (Ref 78-31-00/201).

S 032-004-J00

- (3) Remove the retainer and the filter tube.

S 022-005-J00

- (4) Remove the filter/plug and the packing from the start valve.
(a) Discard the packing.

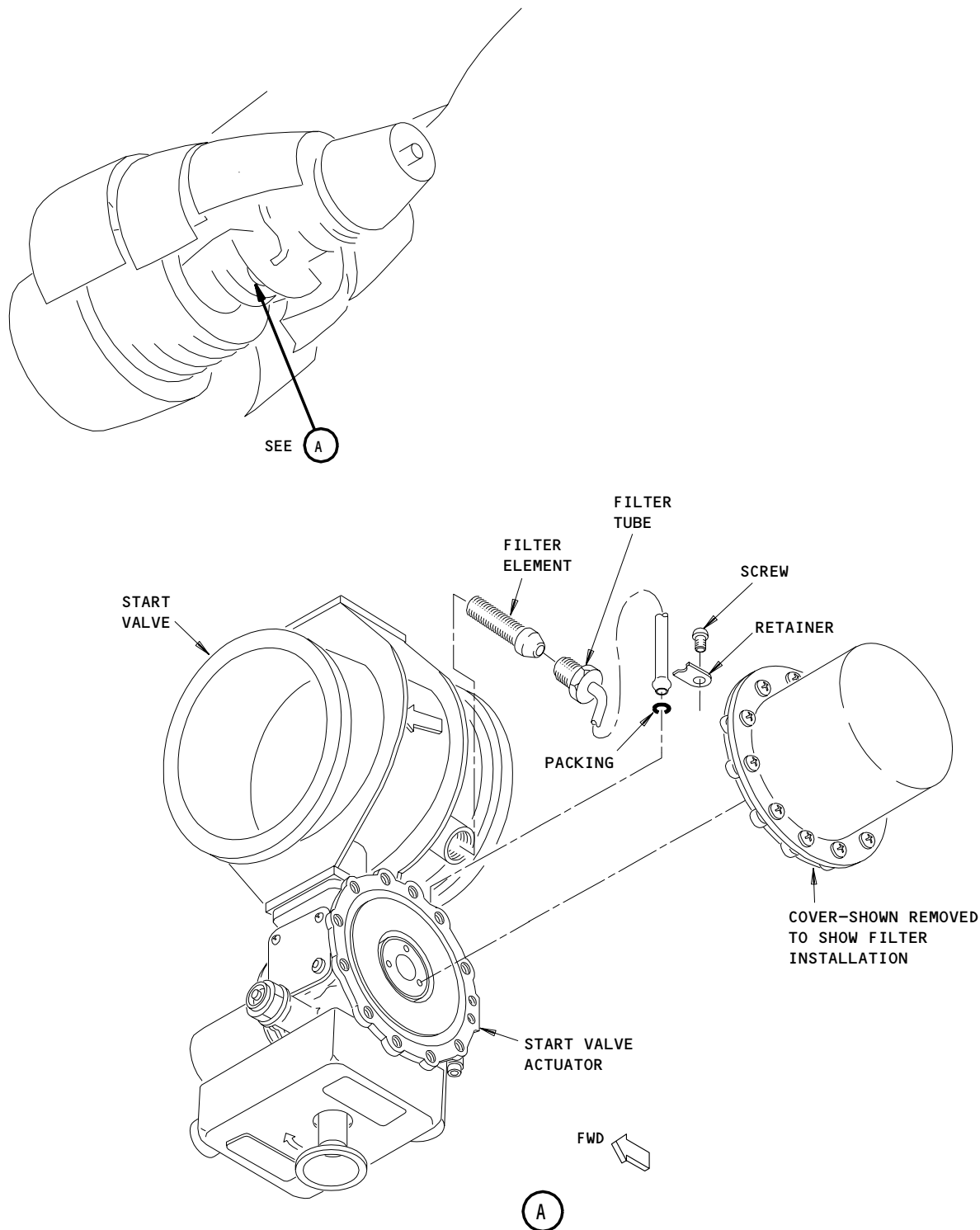
EFFECTIVITY

ALL

80-11-04

J02

Page 201
Oct 10/95



Start Valve Filter Installation
Figure 201

EFFECTIVITY

ALL

80-11-04

J01

Page 202
Jun 10/88

TASK 80-11-04-202-006-J00

3. Start Valve Filter Examination

A. References

- (1) IPC 80-11-02 Fig. 2

B. Access

(1) Location Zone

- | | |
|-----|---------------------------------------|
| 412 | Engine 1 - Gearbox Aft Face 6 O'clock |
| 422 | Engine 2 - Gearbox Aft Face 6 O'clock |
| 432 | Engine 3 - Gearbox Aft Face 6 O'clock |
| 442 | Engine 4 - Gearbox Aft Face 6 O'clock |

(2) Access Panel

- | | |
|-----|--------------------------------------|
| 415 | Left Thrust Reverser Half - Engine 1 |
| 425 | Left Thrust Reverser Half - Engine 2 |
| 435 | Left Thrust Reverser Half - Engine 3 |
| 445 | Left Thrust Reverser Half - Engine 4 |

C. Procedure

S 022-007-J00

- (1) Remove the start valve filter (procedure above).

S 212-008-J00

- (2) Examine the start valve filter for contamination.
(a) If the filter is dirty, clean the filter (procedure below).

S 212-009-J00

- (3) Examine the start valve filter for damage.
(a) Replace the filter if it has worn or broken wire.

S 422-010-J00

- (4) Install the start valve filter (procedure below).

TASK 80-11-04-102-011-J00

4. Start Valve Filter Cleaning

A. Standard Tools and Equipment

- (1) Air Source - Compressed, Clean, Filtered, Dry - 30 psi (200 kPa)
maximum

B. Consumable Materials

- (1) B00722 Solvent - Stoddard, P-D-680, Type I (C04-002)

C. References

- (1) IPC 80-11-02 Fig. 2

EFFECTIVITY

ALL

80-11-04

J02.1

Page 203
Oct 18/00

D. Access

(1) Location Zone

412 Engine 1 - Gearbox Aft Face 6 O'clock
422 Engine 2 - Gearbox Aft Face 6 O'clock
432 Engine 3 - Gearbox Aft Face 6 O'clock
442 Engine 4 - Gearbox Aft Face 6 O'clock

(2) Access Panel

415 Left Thrust Reverser Half - Engine 1
425 Left Thrust Reverser Half - Engine 2
435 Left Thrust Reverser Half - Engine 3
445 Left Thrust Reverser Half - Engine 4

E. Procedure

S 162-044-J00

(1) Do these steps to clean the start valve filter:

(a) Do the procedure to remove the start valve filter.

CAUTION: MAKE SURE THE AREA IS OPEN TO THE AIR WHEN YOU CLEAN THE FILTER. ALL PERSONS MUST FULLY KNOW THE SAFETY PRECAUTIONS. DO NOT BREATHE THE GAS. DO NOT GET THE SOLVENT ON YOUR SKIN FOR VERY LONG TIME. THE SOLVENT IS POISONOUS. IT CAN GO THROUGH YOUR SKIN AND INTO YOUR BODY.

(b) Clean the filter in the solvent.

WARNING: USE GOGGLES WHEN YOU USE COMPRESSED AIR. PARTICLES WHICH ARE BLOWN BY THE COMPRESSED AIR CAN CAUSE INJURY TO YOU.

CAUTION: BE CAREFUL WHEN YOU USE COMPRESSED AIR TO CLEAN THE MESH OF THE FILTER SCREEN. COMPRESSED AIR CAN CAUSE DAMAGE TO THE MESH OF THE FILTER SCREEN.

(c) Use the compressed air at not more than 30 psig to dry the filter.

EFFECTIVITY

ALL

80-11-04

J02.1

Page 204
Oct 18/00

- (d) Make sure there is no unwanted material in the filter.
 - 1) If you find unwanted material in the filter, clean the filter again.
- (e) Make sure the filter is not damaged.
- (f) Do the procedure to install the start valve filter.

TASK 80-11-04-402-016-J00

5. Start Valve Filter Installation (Fig. 201)

A. Consumable Materials

- (1) D00389 Oil - Lubricating, GE Spec D50TF1 (GE C02-019)

B. References

- (1) 78-31-00/201, Thrust Reverser System
- (2) IPC 80-11-02 Fig. 2

C. Access

(1) Location Zone

- | | |
|-----|---------------------------------------|
| 412 | Engine 1 - Gearbox Aft Face 6 O'clock |
| 422 | Engine 2 - Gearbox Aft Face 6 O'clock |
| 432 | Engine 3 - Gearbox Aft Face 6 O'clock |
| 442 | Engine 4 - Gearbox Aft Face 6 O'clock |

(2) Access Panel

- | | |
|-----|--------------------------------------|
| 415 | Left Thrust Reverser Half - Engine 1 |
| 425 | Left Thrust Reverser Half - Engine 2 |
| 435 | Left Thrust Reverser Half - Engine 3 |
| 445 | Left Thrust Reverser Half - Engine 4 |

D. Procedure

S 642-017-J00

- (1) Lubricate the packing with engine oil.

S 432-026-J00

- (2) Put the packing on the filter/plug.

S 422-033-J00

- (3) Install the filter/plug on the start valve.

S 432-018-J00

- (4) Install the filter tube and the retainer in the start valve.
 - (a) Tighten the retainer with the screw.

S 412-019-J00

- (5) Close the left thrust reverser half (Ref 78-31-00/201).

S 862-020-J00

- (6) For the applicable engine,
Remove the DO-NOT-CLOSE tag and close this circuit breaker:
 - (a) P6 Main Power Distribution Panel
 - 1) 6J18 ENG START AIR CONT

EFFECTIVITY

ALL

80-11-04

J02.1

Page 205
Oct 18/00

STARTER PNEUMATIC DUCT – REMOVAL/INSTALLATION

1. General

- A. This procedure has two tasks:
 - (1) The removal of the starter pneumatic ducts.
 - (2) The installation of the starter pneumatic ducts.
- B. Each engine has two starter pneumatic ducts. The upper duct is installed from the pneumatic interface duct (at the bottom of the strut) to the lower duct (on the left side of the engine). The lower duct is installed from the upper duct (on the left side of the engine) to the start valve at the 6 o'clock position.
- C. To do the tasks, you must open the left core cowl panel.
- D. The installation task includes the pneumatic leak test for the engine starter system.

TASK 80-11-05-004-001-J00

2. Starter Pneumatic Ducts Removal (Fig. 401-402)

- A. References
 - (1) 71-11-06/201, Core Cowl Panels
 - (2) IPC 80-11-05 Fig. 2
- B. Access
 - (1) Location Zone
 - 412 Engine 1 – Engine Compressor Rear Frame, Left Side
 - 422 Engine 2 – Engine Compressor Rear Frame, Left Side
 - 432 Engine 3 – Engine Compressor Rear Frame, Left Side
 - 442 Engine 4 – Engine Compressor Rear Frame, Left Side
 - (2) Access Panels
 - 417 Left Core Cowl Panel – Engine 1
 - 427 Left Core Cowl Panel – Engine 2
 - 437 Left Core Cowl Panel – Engine 3
 - 447 Left Core Cowl Panel – Engine 4
- C. Procedure
 - S 864-002-J00
 - (1) Open this circuit breaker and attach a DO-NOT-CLOSE tag:
 - (a) P6 Main Power Distribution Panel
 - 1) 6J18 ENG START AIR CONT

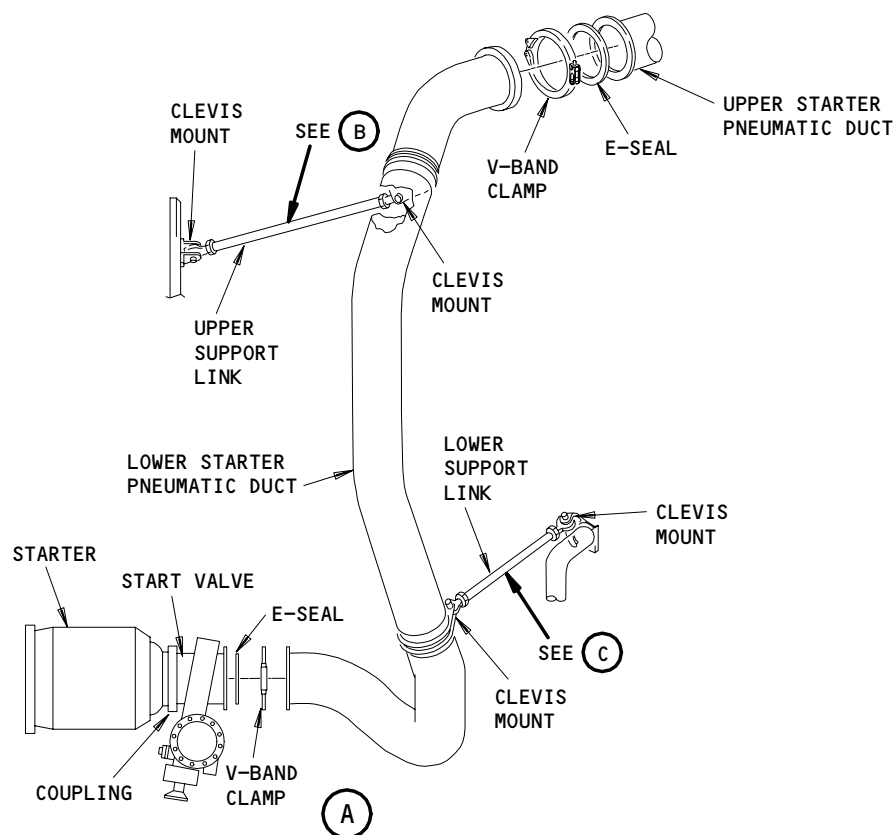
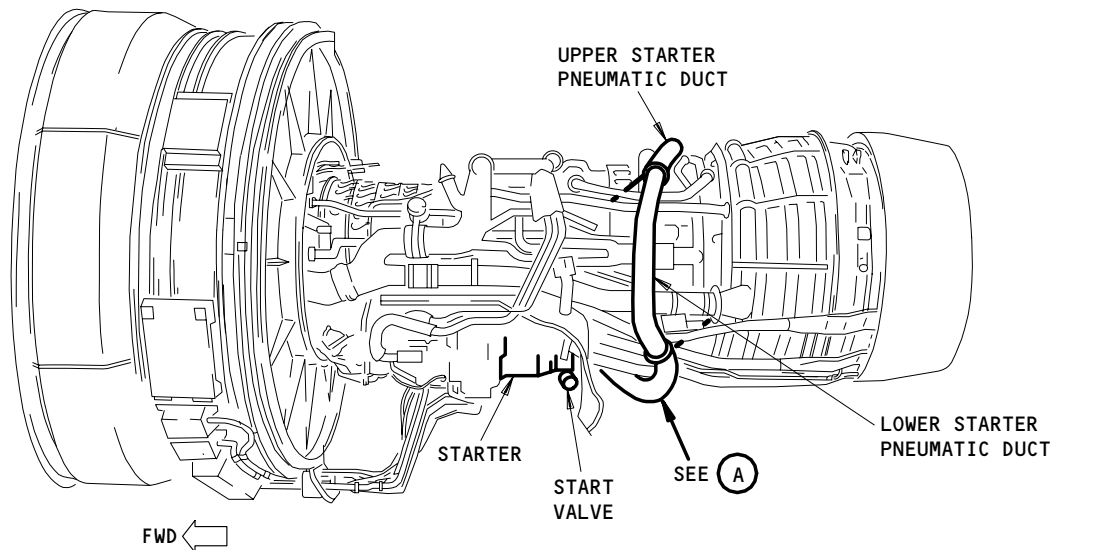
EFFECTIVITY

ALL

80-11-05

J02

Page 401
Oct 10/95



Lower Starter Pneumatic Duct Installation
Figure 401 (Sheet 1)

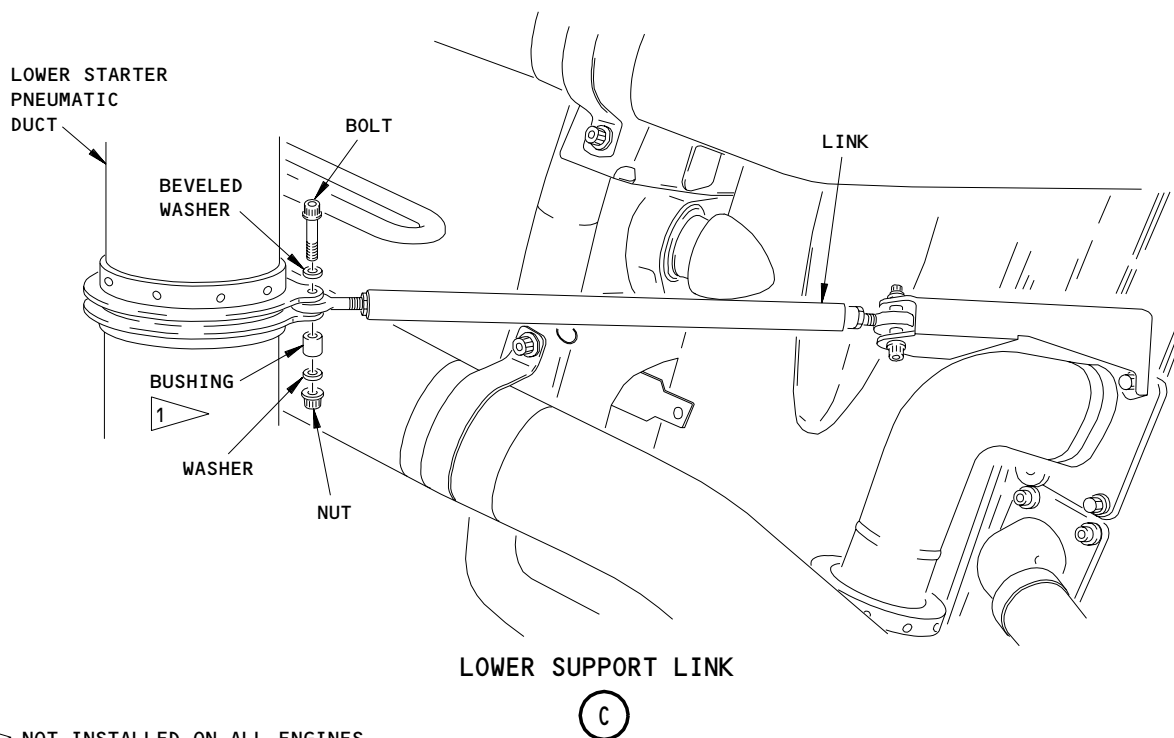
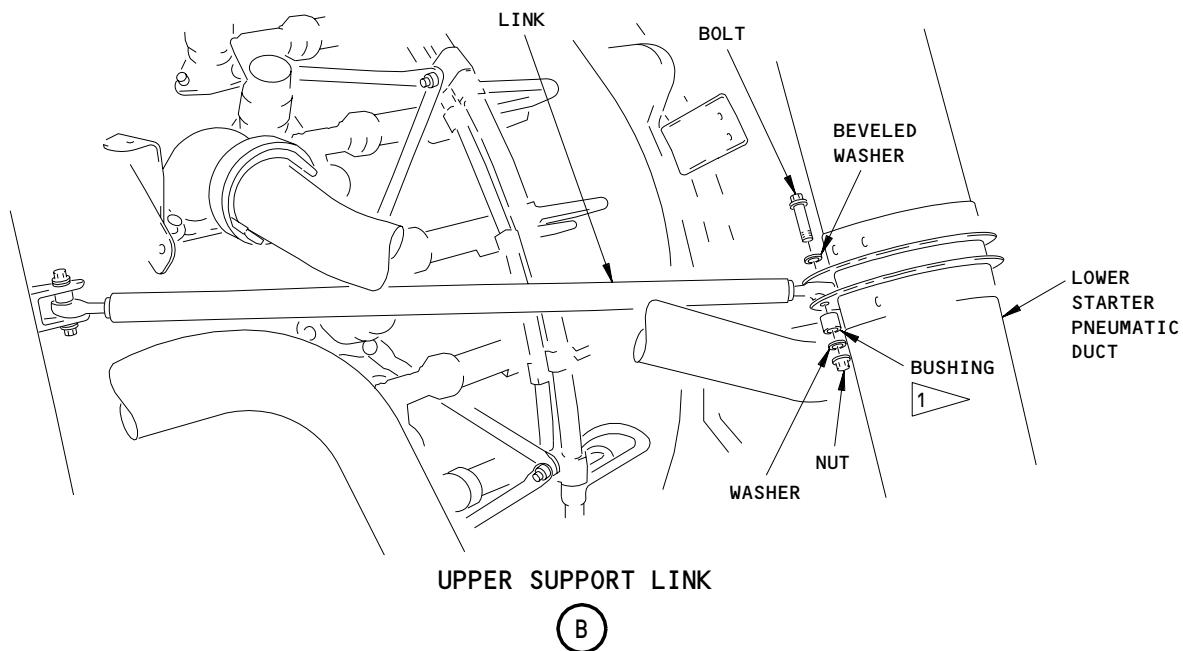
EFFECTIVITY

ALL

80-11-05

J02

Page 402
Feb 10/96



1 NOT INSTALLED ON ALL ENGINES

Lower Starter Pneumatic Duct Installation
Figure 401 (Sheet 2)

EFFECTIVITY

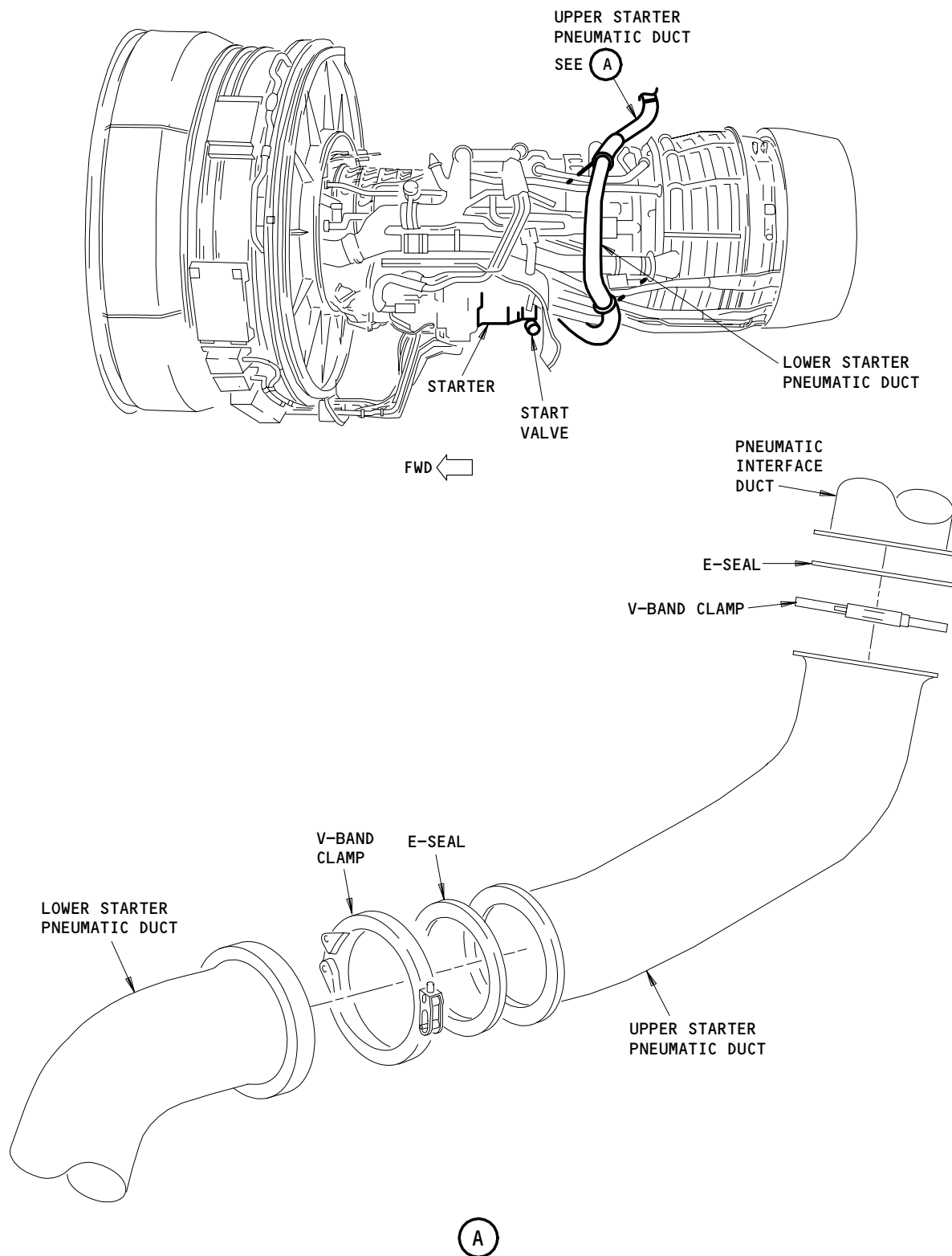
ALL

80-11-05

J02.1

Page 403
Oct 18/00

285718



Upper Starter Pneumatic Duct Installation
Figure 402

EFFECTIVITY

ALL

80-11-05

J02

Page 404
Feb 10/91

S 014-003-J00

- (2) Open the left core cowl panel (Ref 71-11-06/201).

S 024-030-J00

- (3) Remove the upper pneumatic duct:
- (a) Remove the V-band clamp and the E-seal which attach the upper pneumatic duct to the lower pneumatic duct.
 - (b) Remove the V-band clamp and the E-seal which attach the upper pneumatic duct to the pneumatic interface duct (Fig. 402).
 - (c) Remove the upper pneumatic duct.

S 024-029-J00

- (4) Remove the lower pneumatic duct:
- (a) Remove the bolt, the washers (beveled and flat), the bushing, and the nut which attach the upper support link to the duct (Fig. 401).
 - (b) Remove the bolt, the washers (beveled and flat), the bushing, and the nut which attach the lower support link to the duct (Fig. 401).
 - (c) Remove the V-band clamp and the E-seal which attach the lower starter pneumatic duct to the start valve.
 - (d) Remove the lower pneumatic duct.

S 214-009-J00

- (5) Examine the E-seals for damage.
- (a) Discard the E-seals if they are damaged.

TASK 80-11-05-404-010-J00

3. Starter Pneumatic Ducts Installation (Fig. 401-402)

A. References

- (1) 71-00-00/501, Power Plant
- (2) 71-11-06/201, Core Cowl Panels
- (3) IPC 80-11-05 Fig. 2

B. Access

(1) Location Zone

- 412 Engine 1 - Engine Compressor Rear Frame, Left Side
- 422 Engine 2 - Engine Compressor Rear Frame, Left Side
- 432 Engine 3 - Engine Compressor Rear Frame, Left Side
- 442 Engine 4 - Engine Compressor Rear Frame, Left Side

EFFECTIVITY

ALL

80-11-05

J02

Page 405
Feb 10/91

(2) Access Panels

- 417 Left Core Cowl Panel - Engine 1
- 427 Left Core Cowl Panel - Engine 2
- 437 Left Core Cowl Panel - Engine 3
- 447 Left Core Cowl Panel - Engine 4

C. Procedure

S 424-031-J00

- (1) Install the lower pneumatic duct:
- (a) Install the E-seal in the open end of the start valve.
 - (b) Attach the lower starter pneumatic duct to the start valve.
 - (c) Install the V-band clamp on the lower starter pneumatic duct and the start valve.

NOTE: Align the clamp nut to make sure it can be tightened through the IDG OIL SERVICE door.

- (d) Tighten the V-band clamp with your hand.
- (e) Hit the clamp lightly with a soft mallet to make sure the duct is in the correct position.
- (f) Attach the lower support link to the lower starter pneumatic duct.
 - 1) Make sure the bushings are installed in the duct flange.
 - 2) Adjust the support link, if necessary, to avoid pre-load on the bolt.
 - 3) Install the bolt, the beveled washer, the flat washer, and the nut.

NOTE: Do not tighten the nut at this time.

- 4) Install safety wire on the nut.
- (g) Attach the upper support link to the lower starter pneumatic duct.
 - 1) Make sure the bushings are installed in the duct flange.

EFFECTIVITY

ALL

80-11-05

J02

Page 406
Feb 10/94

- 2) Adjust the support link, if necessary, to avoid pre-load on the bolt.
- 3) Install the bolt, the beveled washer, the flat washer, and the nut.

NOTE: Do not tighten the nut at this time.

- 4) Install safety wire on the nut.

S 424-032-J00

- (2) Install the upper pneumatic duct:
 - (a) Install the E-seals in the ends of the upper starter pneumatic duct.
 - (b) Attach the upper starter pneumatic duct to the lower starter pneumatic duct and the pneumatic interface duct.
 - (c) Install the V-band clamps on the ends of the upper starter pneumatic duct.

NOTE: Align the clamps to make sure you can tighten the clamp nuts easily.

S 434-033-J00

- (3) Tighten the V-band clamps:
 - (a) Tighten three V-band clamps to the torque value shown on the clamps.
 - (b) Hit the clamp lightly with a soft mallet to make sure the duct is in the correct position.
 - (c) Do a check of the torque.
 - 1) If the torque value is less than the torque value shown on clamps, do the above steps again.

S 434-017-J00

- (4) Tighten the nuts on the upper and the lower support links.

S 414-018-J00

- (5) Close the left core cowl panel (Ref 71-11-06/201).

S 864-019-J00

- (6) Remove the DO-NOT-CLOSE tag and close this circuit breaker:
 - (a) P6 Main Power Distribution Panel
 - 1) 6J18 ENG START AIR CONT

S 794-020-J00

- (7) Do the engine pneumatic leak test (Ref 71-00-00/501).

EFFECTIVITY

ALL

80-11-05

J02

Page 407
Oct 10/95

ENGINE IGNITION CONTROL/FUEL JETTISON MODULE - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

- (1) Engine Ignition Control/Fuel Jettison Module Removal
- (2) Engine Ignition Control/Fuel Jettison Module Installation.

TASK 80-11-06-004-048-J00

2. Engine Ignition Control/Fuel Jettison Module Removal (Fig. 401)

A. References

- (1) AIPC 80-11-02, Fig. 10
- (2) SSM 28-31-02, 28-31-04
- (3) SSM 74-31-01, SSM 74-31-02, SSM 74-31-21, SSM 74-31-03, SSM 74-31-04
- (4) SSM 80-11-01, SSM 80-11-02
- (5) WDM 28-31-21, WDM 28-31-22, WDM 28-31-23, WDM 28-31-24,
WDM 28-31-25, WDM 28-31-26
- (6) WDM 74-31-11, WDM 74-31-12, WDM 74-31-21, WDM 74-31-22,
WDM 74-31-31, WDM 74-31-32, WDM 74-31-41, WDM 74-31-42
- (7) WDM 80-11-11, WDM 80-11-21, WDM 80-11-31, WDM 80-11-41

B. Access

(1) Location Zones

- 221 Control Cabin, Left
- 222 Control Cabin, Right

C. Procedure

S 864-042-J00

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

(a) On the main power distribution panel, P6:

- 1) 6J18, ENG START AIR CONT
- 2) 6L14, FUEL XFEED VALVE ENG 1
- 3) 6L15, FUEL XFEED VALVE ENG 2
- 4) 6L16, FUEL XFEED VALVE ENG 3
- 5) 6L17, FUEL XFEED VALVE ENG 4
- 6) 6C17, FUEL JTSN CONT B
- 7) 6C18, JTSN NOZZLE VLV CONT R
- 8) 6D17, FUEL JTSN CONT A
- 9) 6D18, JTSN NOZZLE VLV CONT L
- 10) 6E17, CTR R & MAIN 2 JTSN VLV
- 11) 6F5, FUEL SYS MGMT CARD A
- 12) 6F6, FUEL SYS MGMT CH1
- 13) 6F7, FUEL SYS MGMT CARD B
- 14) 6F8, FUEL SYS MGMT CH2
- 15) 6F17, CTR L & MAIN 3 JTSN VLV
- 16) 6F1, IGN 1 ENG 1
- 17) 6K19, IGN 2 ENG 1
- 18) 6G19, STBY IGN ENG 1

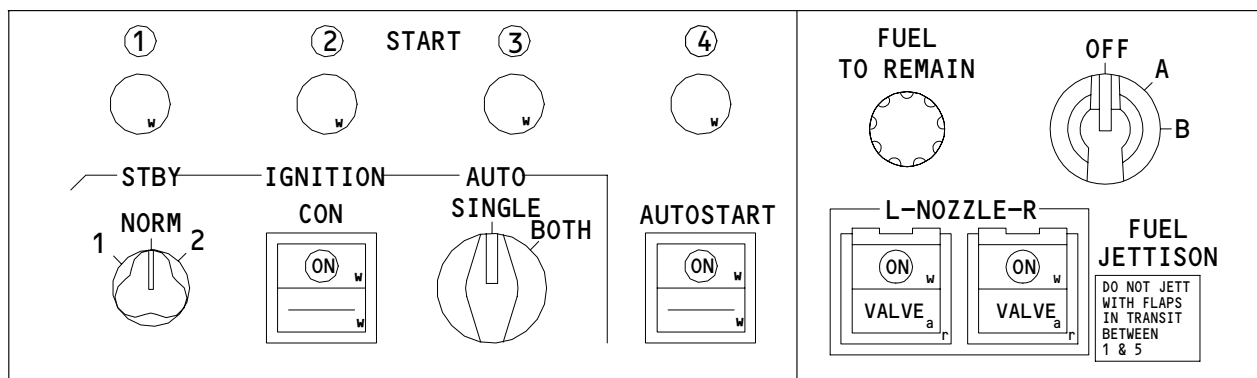
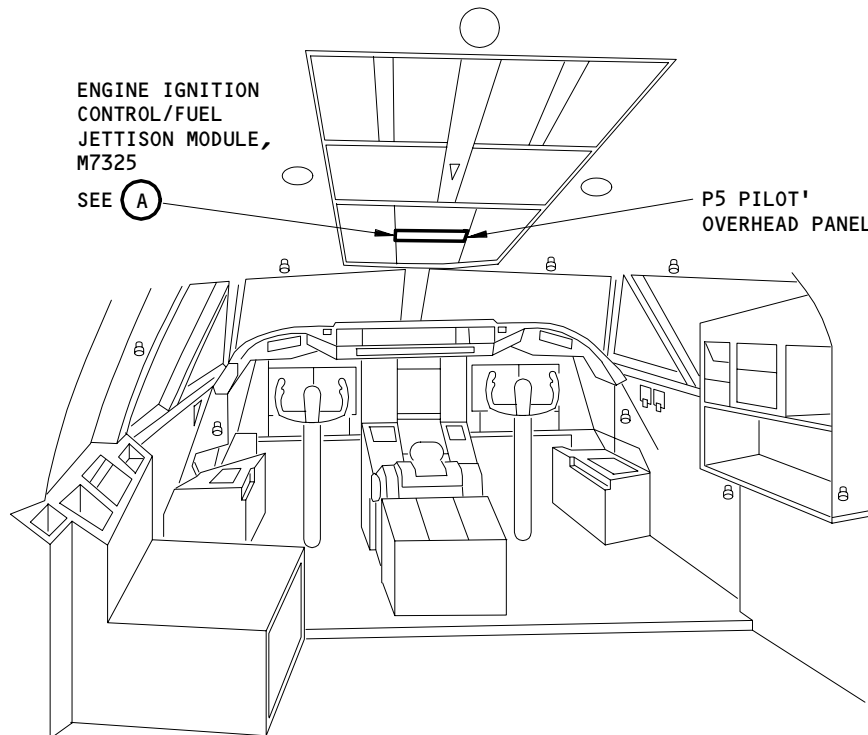
EFFECTIVITY

ALL

80-11-06

J02.1

Page 401
Oct 18/00



ENGINE IGNITION CONTROL/FUEL JETTISON MODULE, M7325

(A)

Engine Start/Jettison Module/Installation
Figure 401

EFFECTIVITY

ALL

80-11-06

J01

Page 402
Oct 10/95

- 19) 6F2, IGN 1 ENG 2
- 20) 6K20, IGN 2 ENG 2
- 21) 6G20, STBY IGN ENG 2
- 22) 6F3, IGN 1 ENG 3
- 23) 6K21, IGN 2 ENG 3
- 24) 6G21, STBY IGN ENG 3
- 25) 6F4, IGN 1 ENG 4
- 26) 6K22, IGN 2 ENG 4
- 27) 6G22, STBY IGN ENG 4
- (b) AIRPLANES WITH A HORIZONTAL STABILIZER TANK;
On the overhead circuit breaker panel, P7:
 - 1) 7H25, REFUEL & XFR STAB L
 - 2) 7H26, REFUEL & XFR STAB ROn the aft miscellaneous circuit breaker panel, P85:
 - 3) HORIZ STAB XFER/JETT PUMP-LEFT
 - 4) HORIZ STAB XFER/JETT PUMP-RIGHT
- (c) On the DC power distribution panel, P180:
 - 1) KLM 001-003, 025-029 WITHOUT SB 24-2139;
180B1, FUELING VALVE 2
180B2, FUELING LTS - HOT
 - 2) KLM 001-003, 025-029 POST SB 24-2139;
KLM 004-024, 030-999;
180M8, FUELING VALVE 2
180M9, FUELING LTS - HOT
or FUELING PWR - HOT BAT
 - 3) KLM 004-024, 032-999;
180C25, FUELING LTS PANEL
180C26, FUELING LTS RECP
 - 4) 180E2, FUEL OVRD/JTSN PMP CONT CTR L
 - 5) 180E3, FUEL OVRD/JTSN PMP CONT FWD 2&3
 - 6) 180E18, FUEL OVRD/JTSN PMP CONT AFT 2&3
 - 7) 180H17, FUEL SYS EICAS INTFC CONT
 - 8) 180H18, FUEL OVRD/JTSN PMP CONT CTR R
- (d) On the left power distribution center panel, P414:
 - 1) 414C5, FUEL OVRD/JTSN PUMP FWD 3
 - 2) 414C2, FUEL OVRD/JTSN PUMP FWD 2
 - 3) 414D2, OVRD/JTSN PUMP CTR-L
 - 4) 414F17, FUELING VALVE
 - 5) 414F22, LIGHT FUELING
or FUELING PWR
- (e) On the right power distribution center panel, P415:
 - 1) 415A38, FUEL OVRD/JTSN PUMP AFT 2
 - 2) 415B38, FUEL OVRD/JTSN PUMP AFT 3
 - 3) 415M32, OVRD/JTSN PUMP CTR-R

EFFECTIVITY

ALL

80-11-06

J10.1

Page 403
Oct 18/00

- S 014-043-J00
- (2) Loosen the quarter-turn-fasteners (4 locations) on the module, M7325.
- S 014-044-J00
- (3) Move the module until you can get to the electrical connectors.
- S 024-046-J00
- (4) Support the module and disconnect the electrical connectors.
(a) Attach identification tags to all electrical connectors.
- S 024-045-J00
- (5) Remove the engine ignition control/fuel jettison module, M7325.

TASK 80-11-06-204-047-J00

3. Engine Ignition Control/Fuel Jettison Module Installation (Fig. 401)

A. References

- (1) AMM 28-31-00/501, Fuel Jettison System
(2) AMM 71-00-00/201, Power Plant
(3) AMM 74-00-00/501, Ignition System
(4) AMM 80-11-00/501, Engine Starting System
(5) AIPC 80-11-02, Fig. 10
(6) SSM 28-31-02, SSM 28-31-04
(7) SSM 74-31-01, SSM 74-31-02, SSM 74-31-21, SSM 74-31-03, SSM 74-31-04
(8) SSM 80-11-01, SSM 80-11-02
(9) WDM 28-31-21, WDM 28-31-22, WDM 28-31-23, WDM 28-31-24,
WDM 28-31-25, WDM 28-31-26
(10) WDM 74-31-11, WDM 74-31-12, WDM 74-31-21, WDM 74-31-22,
WDM 74-31-31, WDM 74-31-32, WDM 74-31-41, WDM 74-31-42
(11) WDM 80-11-11, WDM 80-11-21, WDM 80-11-31, WDM 80-11-41

B. Access

- (1) Location Zones
221 Control Cabin, Left
222 Control Cabin, Right

C. Procedure

- S 824-040-J00
- (1) Support the Engine Ignition Control/Fuel Jettison Module, M7325, and connect the electrical connectors.
- S 434-049-J00
- (2) Attach the module with the quarter-turn-fasteners (4 locations).

EFFECTIVITY

ALL

80-11-06

J02.1

Page 404
Oct 18/00

S 864-057-J00

(3) Remove the DO-NOT-CLOSE tags and close these circuit breakers:

(a) On the main power distribution panel, P6:

- 1) 6J18, ENG START AIR CONT
- 2) 6L14, FUEL XFEED VALVE ENG 1
- 3) 6L15, FUEL XFEED VALVE ENG 2
- 4) 6L16, FUEL XFEED VALVE ENG 3
- 5) 6L17, FUEL XFEED VALVE ENG 4
- 6) 6C17, FUEL JTSN CONT B
- 7) 6C18, JTSN NOZZLE VLV CONT R
- 8) 6D17, FUEL JTSN CONT A
- 9) 6D18, JTSN NOZZLE VLV CONT L
- 10) 6E17, CTR R & MAIN 2 JTSN VLV
- 11) 6F5, FUEL SYS MGMT CARD A
- 12) 6F6, FUEL SYS MGMT CH1
- 13) 6F7, FUEL SYS MGMT CARD B
- 14) 6F8, FUEL SYS MGMT CH2
- 15) 6F17, CTR L & MAIN 3 JTSN VLV
- 16) 6F1, IGN 1 ENG 1
- 17) 6K19, IGN 2 ENG 1
- 18) 6G19, STBY IGN ENG 1
- 19) 6F2, IGN 1 ENG 2
- 20) 6K20, IGN 2 ENG 2
- 21) 6G20, STBY IGN ENG 2
- 22) 6F3, IGN 1 ENG 3
- 23) 6K21, IGN 2 ENG 3
- 24) 6G21, STBY IGN ENG 3
- 25) 6F4, IGN 1 ENG 4
- 26) 6K22, IGN 2 ENG 4
- 27) 6G22, STBY IGN ENG 4

(b) AIRPLANES WITH A HORIZONTAL STABILIZER TANK;

On the overhead circuit breaker panel, P7:

- 1) 7H25, REFUEL & XFR STAB L
- 2) 7H26, REFUEL & XFR STAB R

On the aft miscellaneous circuit breaker panel, P85:

- 3) HORIZ STAB XFER/JETT PUMP-LEFT
- 4) HORIZ STAB XFER/JETT PUMP-RIGHT

(c) On the DC power distribution panel, P180:

- 1) KLM 001-003, 025-029 WITHOUT SB 24-2139;
180B1, FUELING VALVE 2
180B2, FUELING LTS - HOT

EFFECTIVITY

ALL

80-11-06

J10.1

Page 405
Oct 18/00

- 2) KLM 001-003, 025-029 POST SB 24-2139;
KLM 004-024, 030-999;
180M8, FUELING VALVE 2
180M9, FUELING LTS - HOT
or FUELING PWR - HOT BAT
- 3) KLM 004-024, 032-999;
180C25, FUELING LTS PANEL
180C26, FUELING LTS RECP
- 4) 180E2, FUEL OVRD/JTSN PMP CONT CTR L
- 5) 180E3, FUEL OVRD/JTSN PMP CONT FWD 2&3
- 6) 180E18, FUEL OVRD/JTSN PMP CONT AFT 2&3
- 7) 180H17, FUEL SYS EICAS INTFC CONT
- 8) 180H18, FUEL OVRD/JTSN PMP CONT CTR R
- (d) On the left power distribution center panel, P414:
 - 1) 414C5, FUEL OVRD/JTSN PUMP FWD 3
 - 2) 414C2, FUEL OVRD/JTSN PUMP FWD 2
 - 3) 414D2, OVRD/JTSN PUMP CTR-L
 - 4) 414F17, FUELING VALVE
 - 5) 414F22, LIGHT FUELING
or FUELING PWR
- (e) On the right power distribution center panel, P415:
 - 1) 415A38, FUEL OVRD/JTSN PUMP AFT 2
 - 2) 415B38, FUEL OVRD/JTSN PUMP AFT 3
 - 3) 415M32, OVRD/JTSN PUMP CTR-R
- S 734-052-J00
- (4) Do these Fuel Jettison System tests (AMM 28-31-00/501):
 - (a) Fuel Jettison Control Card - Operational Test
 - (b) Fuel Jettison Transfer Valve - Ground Test
 - (c) Fuel Jettison Valve - Operational Test
 - (d) Jettison Pumps - Operational Test
- S 714-039-J00
- (5) Do the operational test of the engine starting system (AMM 80-11-00/501).
 - (a) Test all four start switches.
- S 734-051-J00
- (6) Do the System Test - Ignition System (AMM 74-00-00/501).
- S 864-050-J00
- (7) Do the Power Plant operation, normal with autostart (AMM 71-00-00/201).

EFFECTIVITY

ALL

80-11-06

J08.1

Page 406
Oct 18/00