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1	DEC 22/08	NSAS
2	AUG 22/99	NSAS
R 3	AUG 22/09	NSAS.1
4	APR 22/99	NSAS
5	AUG 10/98	NSAS
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405	AUG 22/00	N02
406	AUG 22/00	N02
407	DEC 10/98	N02
408	DEC 10/98	N02

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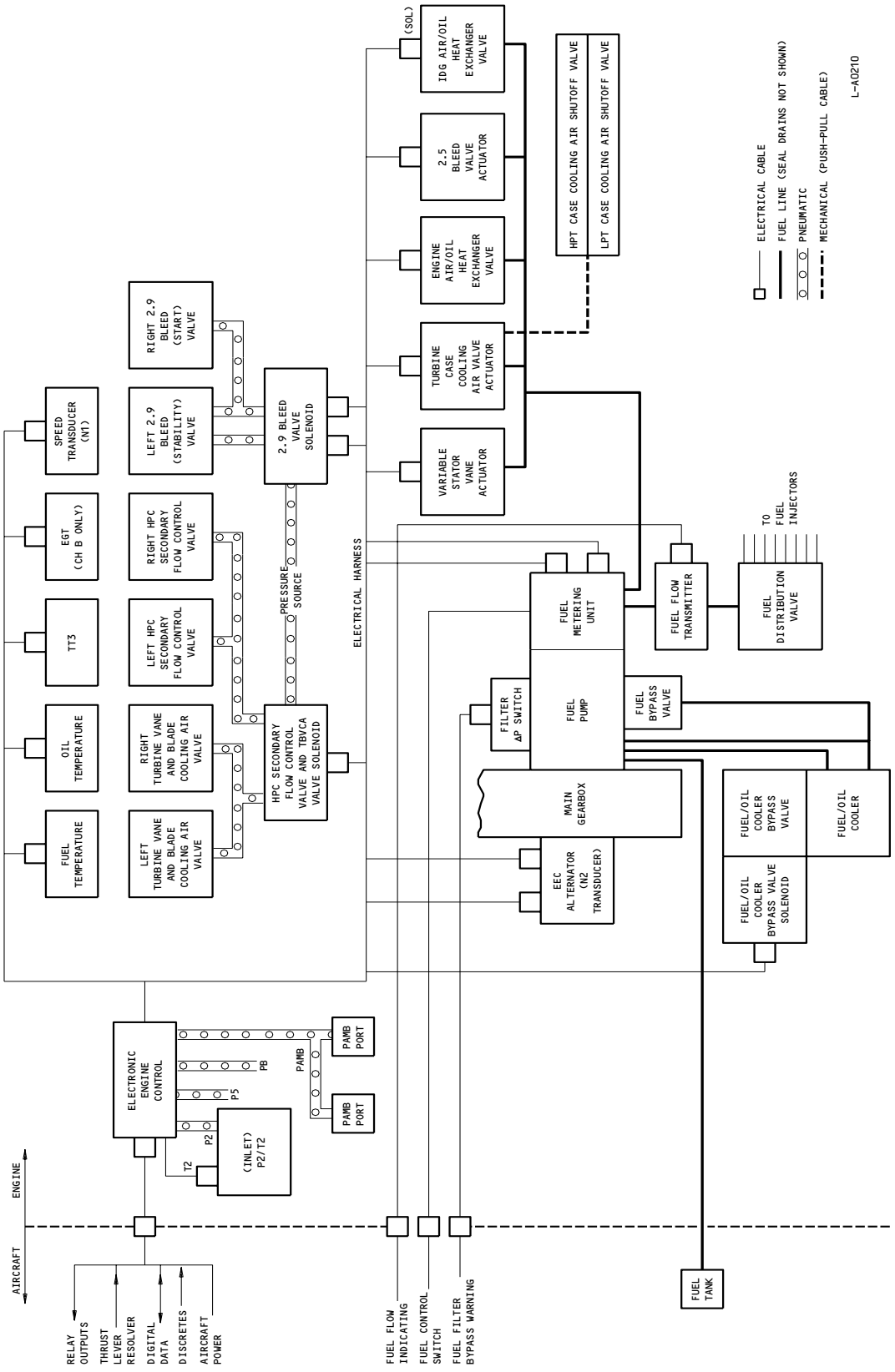
ENGINE FUEL AND CONTROL - DESCRIPTION AND OPERATION

1. General (Fig. 1)
   A. Thrust management is supplied by the electronic engine control system which includes a dual channel, full authority digital electronic engine control (EEC). The EEC interfaces with the aircraft and the engine control components and gives data for the engine indicating and crew alert system (EICAS).
   B. The EEC supplies the full range of control necessary to change engine fuel flow, high compressor stator vanes, low and high turbine case cooling, engine and IDGS air/oil cooling, and 2.5 compressor bleed flow. The electronic control also schedules discrete signals for solenoid operation to control the engine and IDGS fuel/oil cooler bypass valve.
   C. The fuel supply system for the aircraft uses position command signals of the EEC to operate the fuel metering valve. The fuel is supplied to the fuel distribution valve from the fuel metering valve. The fuel is then supplied to eight manifolds, each of which supplies three single-orifice fuel nozzles.
   D. The data supplied to the EEC by the aircraft includes throttle position, service bleed status, altitude, and total air pressure and total air temperature at the engine inlet. Engine mounted sensors supply the EEC with measurements of the engine temperatures, pressures, and speeds.



Engine Fuel and Control Schematic
Figure 1

801807

ENGINE FUEL AND CONTROL - MAINTENANCE PRACTICES

1. General
   A. This procedure includes a table which identifies specified areas and conditions for an inspection when the time to disassemble is permitted. Do not disassemble the item because of the data in the table that follows. Use this table when it is necessary to disassemble an item for other maintenance effects.
   B. Do not think that the conditions of the items in the table that follows includes all conditions. Data collected from other inspections and how you use this data are important parts in this inspection procedure.

TASK 73-00-00-212-001-N00

2. Engine Fuel and Control - Maintenance Practices
   A. References
      (1) AMM 73-11-01/401, Fuel Pump
      (2) AMM 73-11-02/401, Fuel Pump Filter
      (3) AMM 73-11-03/401, Fuel Distribution Valve
      (4) AMM 73-11-04/401, Fuel Distribution Valve Filter
      (5) AMM 73-21-01/401, Fuel Metering Unit
      (6) AMM 73-21-03/401, EEC Inlet Total Pressure/Temperature (PT2/TT2)/Probe
   B. Access
      (1) Location Zones
          412 L Power Plant Inlet Probe Access Panel
          416 L Power Plant Fan Reverser
          422 L Power Plant Inlet Probe Access Panel
          426 L Power Plant Fan Reverser

      (2) Access Panels
          412AR Inlet Probe Access Panel
          416AR Fan Reverser (Right)
          422AR Inlet Probe Access Panel
          426AR Fan Reverser (Right)

   C. Inspection of Engine Fuel and Control

      S 222-002-N00
      (1) Use this table to do an inspection of the engine fuel and control.

Inspection Reference Table		
ITEM	CHECK	CHAPTER/ SECTION REFERENCE
Fuel Pump	External Leakage	73-11-01
	Correct Installation	
Fuel Pump Filter Element (Cartridge)	Contamination of the Cartridge Look for bronze color particles. If you find bronze contamination, you must replace the fuel metering unit and the fuel pump. Note: The pump filter element must examine frequently in new aircarft and after fuel tanks repair.	73-11-02
Fuel Distribution Valve	External Fuel Leakage	73-11-03
	Correct Installtion	
Fuel Distribution Valve Filter	Inlet Screen Contamination or Damage	73-11-04
Fuel Metering Unit	External Fuel Leakage	73-21-01
	Correct Installation	
	Correct Installation of the Electrical Connectors	
EEC Inlet Total Pressure/ Temperature (PT2/ TT2) Probe	Correct Installation of the Electrical Connectors	73-21-03
	Correct Installation	

ENGINE FUEL AND CONTROL - INSPECTION/CHECK

TASK 73-00-00-226-001-N00

1. Engine Fuel and Control Fits and Clearances
   A. General
      (1) The numbers on the figures tell you the location of the parts for which the fits and clearances are found in the tables.
      (2) Unless specified differently, all the fits are measured by its diameter.
      (3) The numbers in all columns are in inches, and (millimeters).
      (4) The letter "T" which follows the limits tells you it is a tight fit.
      (5) The Description column gives you the name for the part or parts.
   B. Inspection Frequency Requirements (IFR)

      S 996-002-N00

      (1) The IFR column gives you the Inspection Frequency Requirements. The Letter Codes A, B, or C found in the IFR column show how and when it is recommended to examine the item identified by the adjacent reference number, as applicable to regular repairs. These IFR codes are in the table that follows:

IFR Code	Definition
A	The clearance or fit is calculated from the dimension of the part at each assembly of the parts. These dimensions written at the time of each part inspection are equally as correct as the dimensions written at the time of the part installation.
B	You must make an analysis of the clearance or fit at each installation of the parts. Use the trial assembly or the equivalent procedure to make an estimate of the clearance or fit. The dimension of the clearance or fit you calculated is only necessary if: The procedure you used to make an estimate shows that the clearance or fit is not in the specified limits, or One or two of the mating parts included is replaced or repaired in an area or in a procedure which changes the clearance or fit.
C	The fit is not made to change in the normal engine operation. The dimensions of the parts and the quantity you calculated of the fit is necessary if one of the mating parts inlcuded is replaced or repaired in the area or a procedure which would change the fit.

C. New Part Reference Dimensions

S 996-003-N00

(1) The dimensions are given in this column to refer to only.

S 996-004-N00

(2) The dimensions are the initial Minimum and Maximum values in inches (and millimeters) for each part found in the description column.

D. Limits

S 996-005-N00

(1) The Limits are applicable to all mixtures of new parts or parts which are used:

(a) This column gives the permitted (minimum - maximum) range of the fit or clearance in inches (and millimeters). You can use these limits with all mixtures of new parts or parts which are used.

(b) The limits are found from the minimum and maximum values which are specified in the New Part Reference Dimensions column. (See Example 1)

(c) Some limits are made larger to be more applicable than the new part conditions. These larger limits are identified with an asterisk (*) adjacent to the value. (See Example 2)

EXAMPLE 1

REF NO	IFR	DESCRIPTION	NEW PART REFERENCE			
			DIMENSIONS		LIMITS	
			MIN	MAX	MIN	MAX
1812		Bearing	0.508 (12.903)	0.512 (13.005)		
		Support	0.517 (13.131)	0.527 (13.385)	0.005 (0.126)	0.019 (0.482)

NOTE: In Example 1, compare the dimensions for the bearing and support to find the limits:

0.517 (13.131)	(-)	0.512 (13.005)	=	0.005 (0.126)
0.527 (13.385)	(-)	0.508 (12.903)	=	0.019 (0.482)

EXAMPLE 2						
			NEW PART REFERENCE			
			DIMENSIONS		LIMITS	
REF NO	I F R	DESCRIPTION	MIN	MAX	MIN	MAX
1812		Bearing	0.508 (12.903)	0.512 (13.005)		
		Support	0.517 (13.131)	0.527 (13.385)	0.005 (0.126)	0.020* (0.508)*

NOTE: In Example 2, the limits are larger than the usual limits as shown by the asterisk (*).

S 226-006-N00

(2) You can use one of the two applicable limits for engines which are scheduled for a repair which is not fully done.

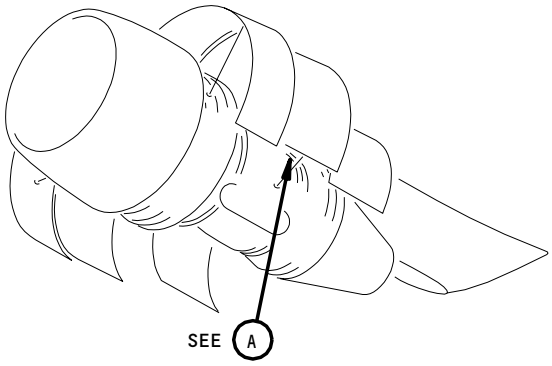
(a) You can also get a second set of limits which are contained by the lines (See Example 3). These limits, which are contained by the lines, are larger than the usual limits and are used with engines which are scheduled for a repair which is not fully done.

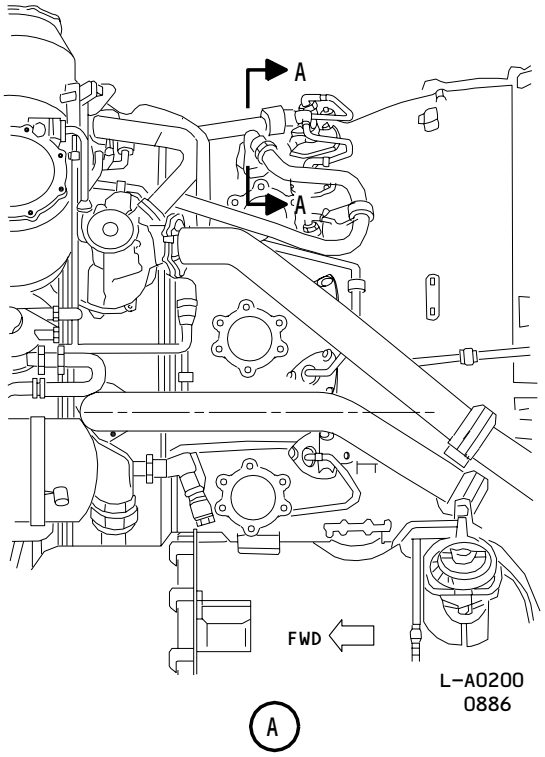
EXAMPLE 3						
			NEW PART REFERENCE			
			DIMENSIONS		LIMITS	
REF NO	I F R	DESCRIPTION	MIN	MAX	MIN	MAX
1812		Bearing	0.508 (12.903)	0.512 (13.005)		
		Support	0.517 (13.131)	0.527 (13.385)	0.005 (0.126)	0.019 (0.482)
					0.005 (0.13)	0.022 (0.56)

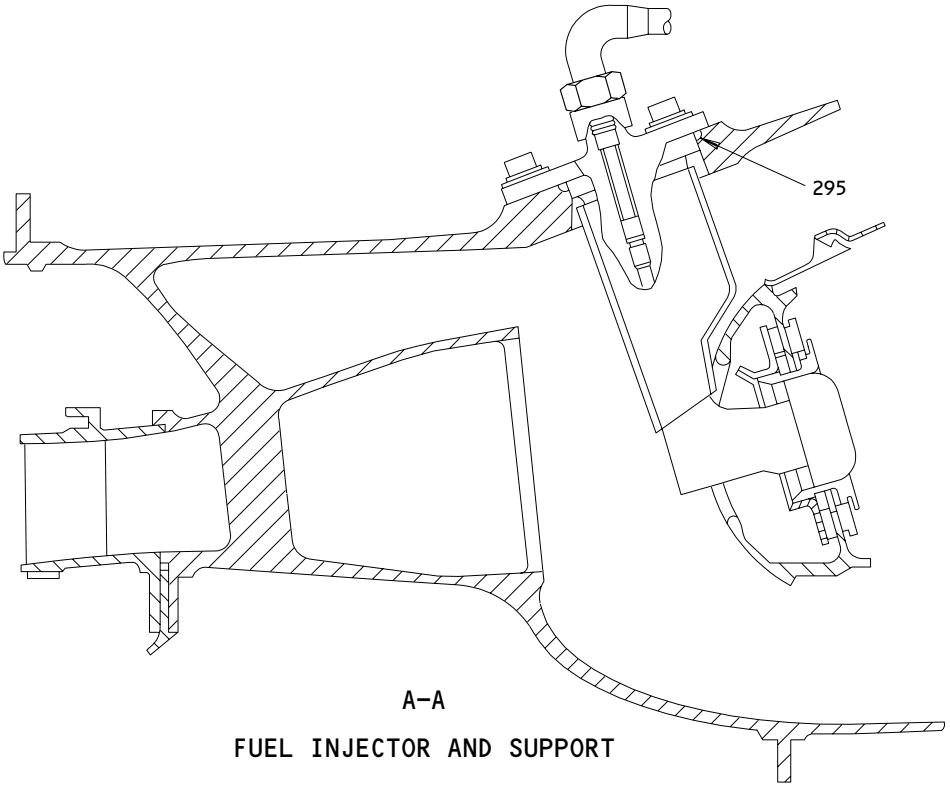
NOTE: In Example 3, the limits which are contained by the lines are used on engines which are scheduled for a repair which is not fully done.

REF NO	IFR	DESCRIPTION	NEW PART REFERENCE			
			DIMENSIONS		LIMITS	
			MIN	MAX	MIN	MAX
295 (Fig. 601)	B	Fuel Injector and Support Diffuser Case Assembly				
		Support	1.821 (46.254)	1.823 (46.304)		
		Case	1.824 (46.330)	1.826 (46.380)	0.001 (0.026)	0.005 (0.127)
541 (Fig. 602)	B	Gearbox (EEC Alternator Drive) Spur Gearshaft				
		EEC Alternator (N2 Transducer) Rotor				
		Gearshaft	0.7877 (20.0076)	0.7880 (20.0152)		
		Rotor	0.7882 (20.0203)	0.7886 (20.0304)	0.0002 (0.0051)	0.0009 (0.0228)
541 (Fig. 602)	B	Gearbox (EEC Alternator Drive) Spur Gearshaft				
		EEC Alternator (N2 Transducer) Rotor				
		Gearshaft	0.7877 (20.0076)	0.7880 (20.0152)		
		Rotor (ENGINES POST-PW-SB 72-375)	0.7872 (19.9949)	0.7877 (20.0075)	0.0000 (0.0000)	0.0008T (0.0203)
542 (Fig. 602)	B	EEC Stator				
		Gearbox EEC Alternator (N2 Transducer) Housing Assembly				
		Stator	3.180 (80.772)	3.181 (80.797)		
		Housing	3.1815 (80.811)	3.1825 (80.835)	0.0005 (0.013)	0.0025 (0.063)

REF NO	I F R	DESCRIPTION	NEW PART REFERENCE			
			DIMENSIONS		LIMITS	
			MIN	MAX	MIN	MAX
543 (Fig. 602)	B	Gearbox (EEC Alternator Drive) Spur Gearshaft				
		EEC Alternator (N2 Transducer) Rotor				
		Gearshaft (ENGINES POST-PW-SB 72-375)	0.7837 (19.9060)	0.7840 (19.9136)		
		Rotor (ENGINES POST-PW-SB 72-375)	0.7832 (19.8933)	0.7837 (19.9059)	0.0000 (0.0000)	0.0008T (0.0203)
1850 (Fig. 603)	B	Gearbox (EEC Alternator Drive) Spur Gearshaft				
		EEC Alternator (N2 Transducer) Rotor Lock Assembly				
		Gearshaft	0.672 (17.069)	0.673 (17.094)		
		Lock	0.674 (17.120)	0.675 (17.145)	0.001 (0.026)	0.003 (0.076)





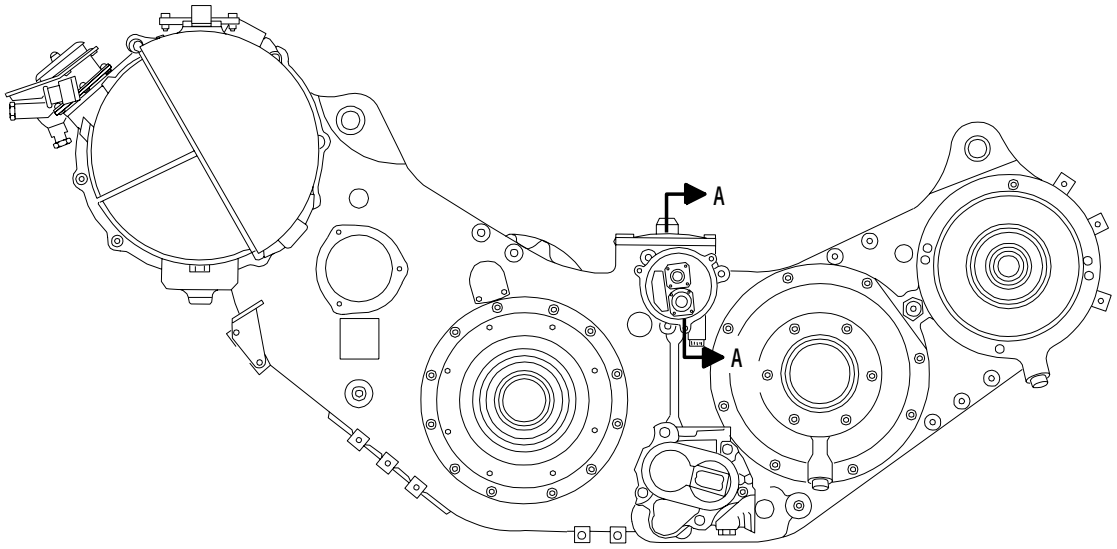


A-A

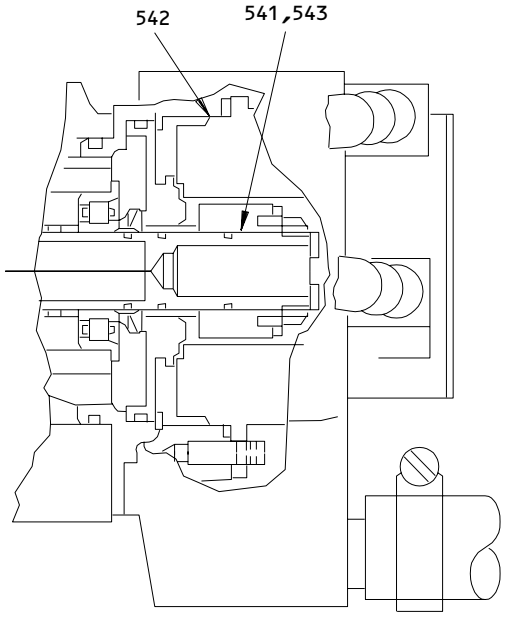
FUEL INJECTOR AND SUPPORT

L-A2734

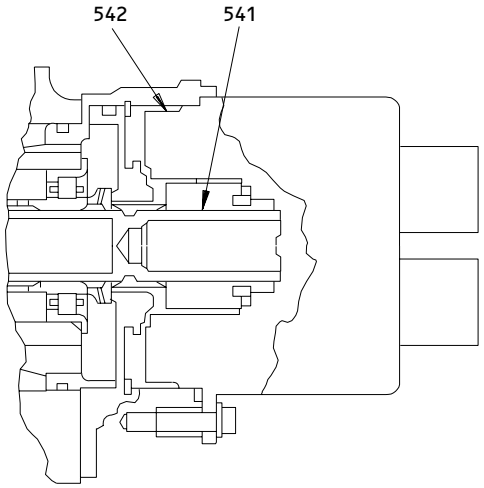
Fuel Injector and Support Fits and Clearances
Figure 601



MAIN GEAR BOX
REAR VIEW



A-A 1

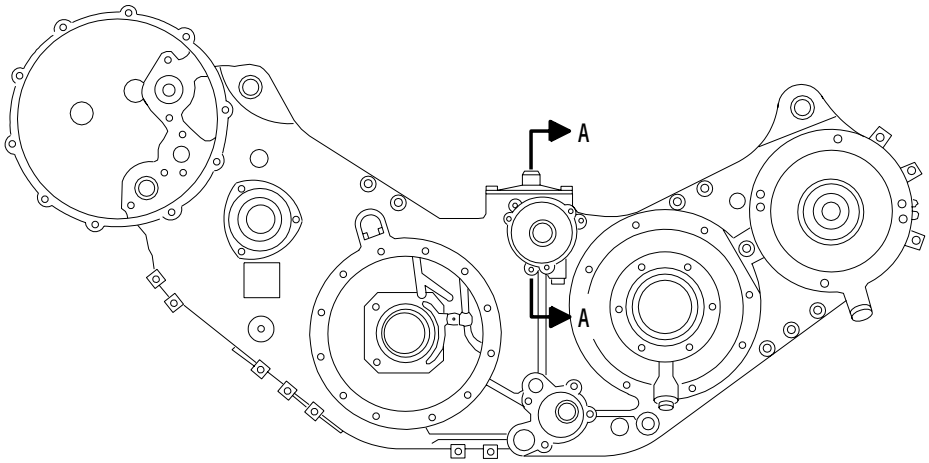


A-A 2

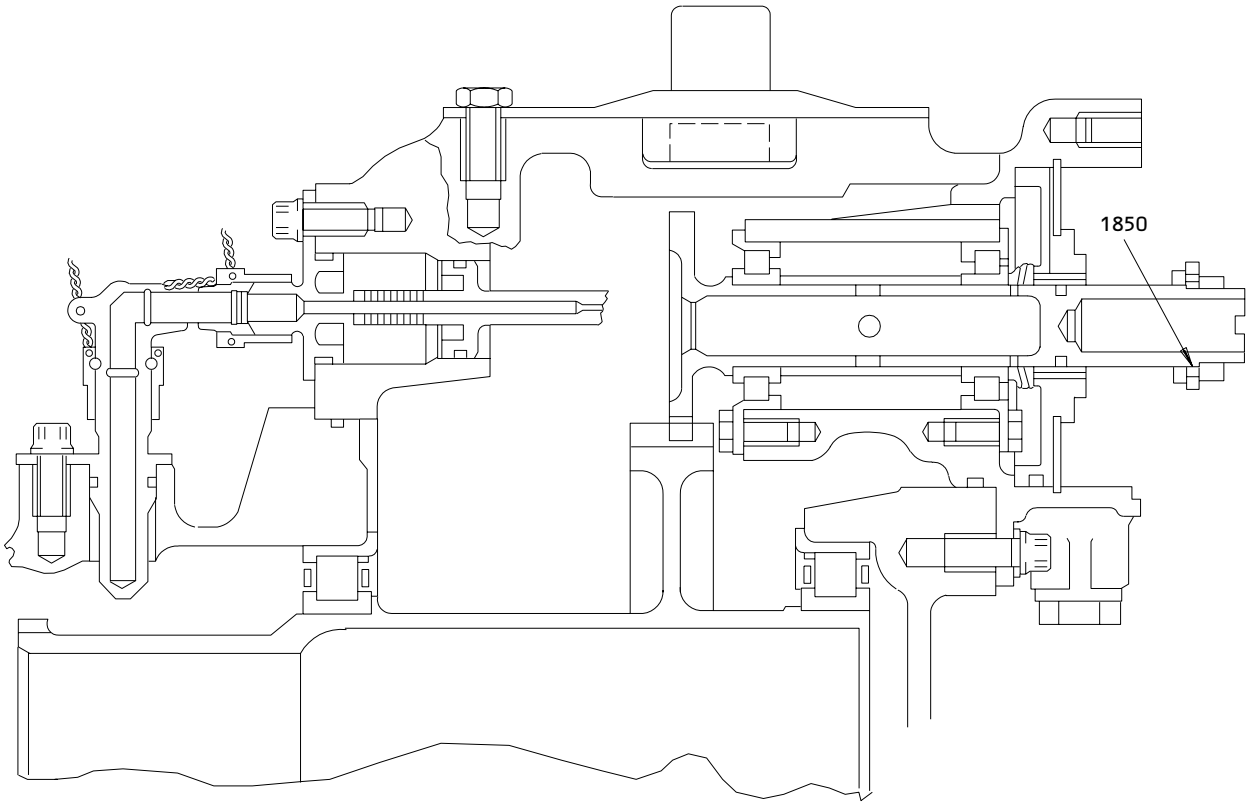
1 ENGINES POST-PW-SB 72-375
2 ENGINES PRE-PW-SB 72-375

L-A2719

EEC Alternator (N2 Transducer) Fits and Clearances
Figure 602



MAIN GEARBOX REAR VIEW



A–A

L–A2718

Gearbox Alternator Drive Fits and Clearances
Figure 603

OIL - CLEANING/PAINTING

1. General
   A. This procedure gives direction on how to clean the engine after chemical contact with oil.

TASK 73-00-00-107-001-N00

2. Clean the Engine Component
   A. References
      (1) AMM 70-11-10/201, Engine Contamination
   B. Procedure

S 117-002-N00

(1) If necessary, clean the engine to remove oil by SPOP 425 (AMM 70-11-10/201).

ENGINE FUEL AND CONTROL - DDG MAINTENANCE PROCEDURES

1. General
   A. This procedure includes these DDG maintenance procedures:
      (1) DDG 73-21-3 Preparation - Fuel Control ENG VALVE Lights Inoperative
      (2) DDG 73-21-3 Restoration - Fuel Control ENG VALVE Lights Inoperative

TASK 73-00-00-049-001-N00

2. DDG 73-21-3 Preparation - Fuel Control ENG VALVE Lights Inoperative
   A. Access
      (1) Location Zones
          211 Flight Compartment
          212 Flight Compartment

   B. Procedure

      S 869-002-N00
      (1) With the applicable engine in operation, open the applicable circuit breaker on the main power distribution panel, P6:
          (a) 6E1, SPAR FUEL VALVE L
          (b) 6E2, SPAR FUEL VALVE R

      S 869-003-N00
      (2) Put the FUEL CONTROL switch in the CUTOFF position.
          (a) If the engine stops, the valve operates correctly.

      S 869-004-N00
      (3) Close the applicable circuit breaker on the main power distribution panel, P6:
          (a) 6E1, SPAR FUEL VALVE L
          (b) 6E2, SPAR FUEL VALVE R

TASK 73-00-00-449-006-N00

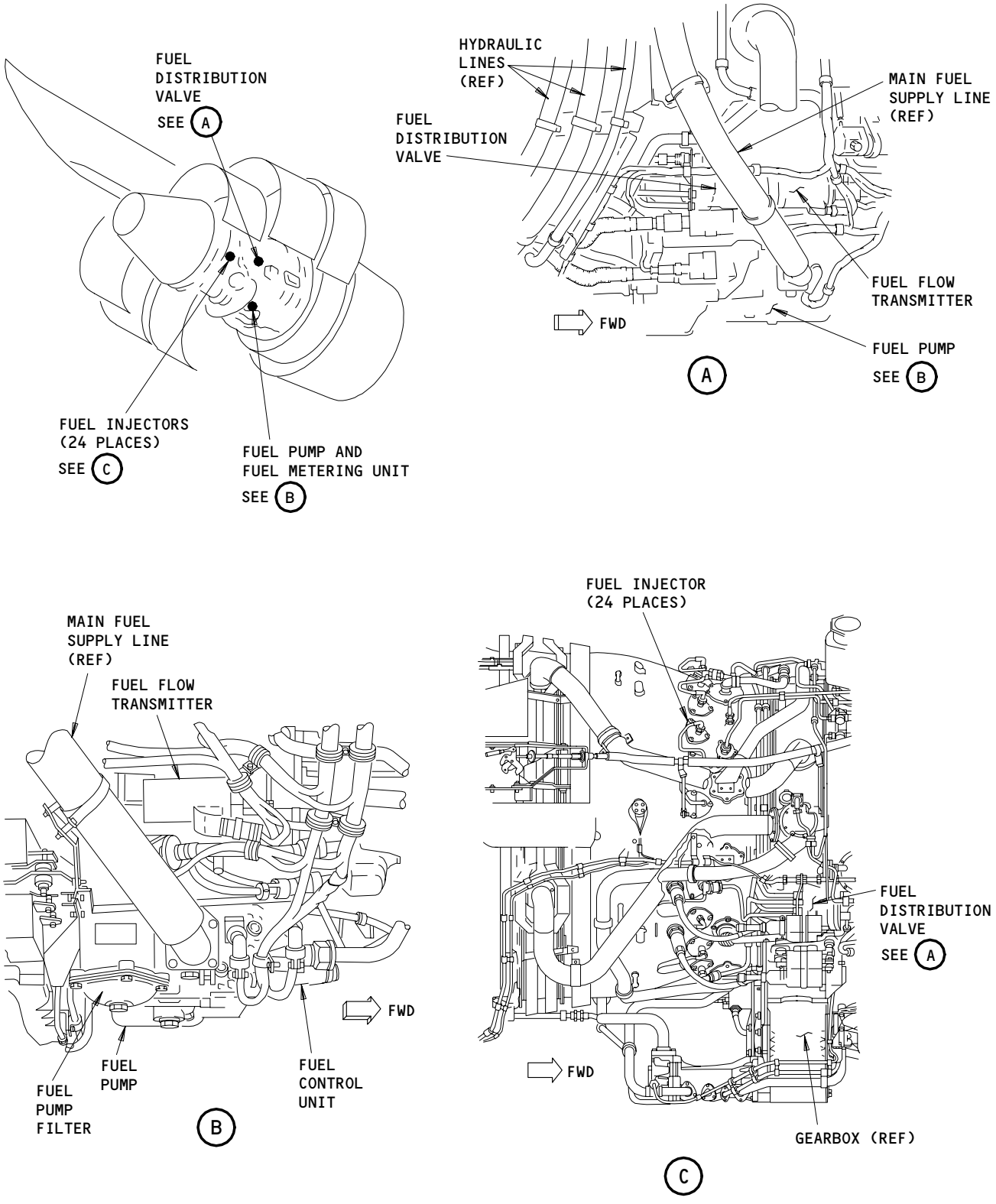
3. DDG 73-21-3 Restoration - Fuel Control ENG VALVE Lights Inoperative
   A. Access
      (1) Location Zones
          211 Flight Compartment
          212 Flight Compartment

   B. Procedure

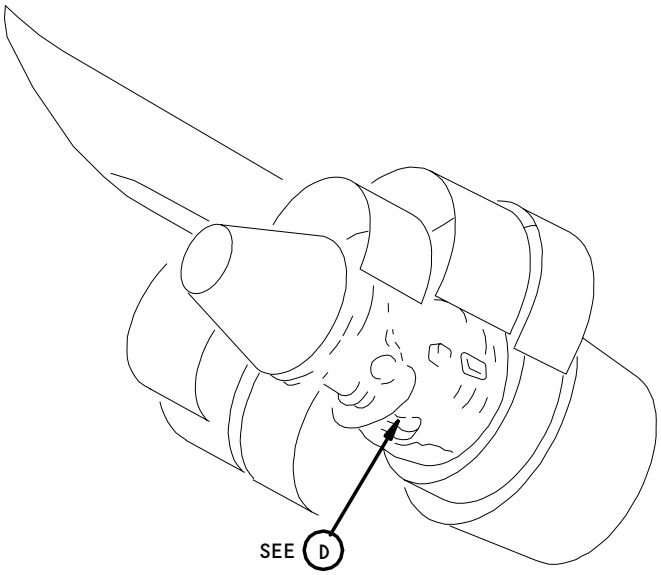
      S 909-005-N00
      (1) Replace the inoperative ENG VALVE light on the control stand, P10.

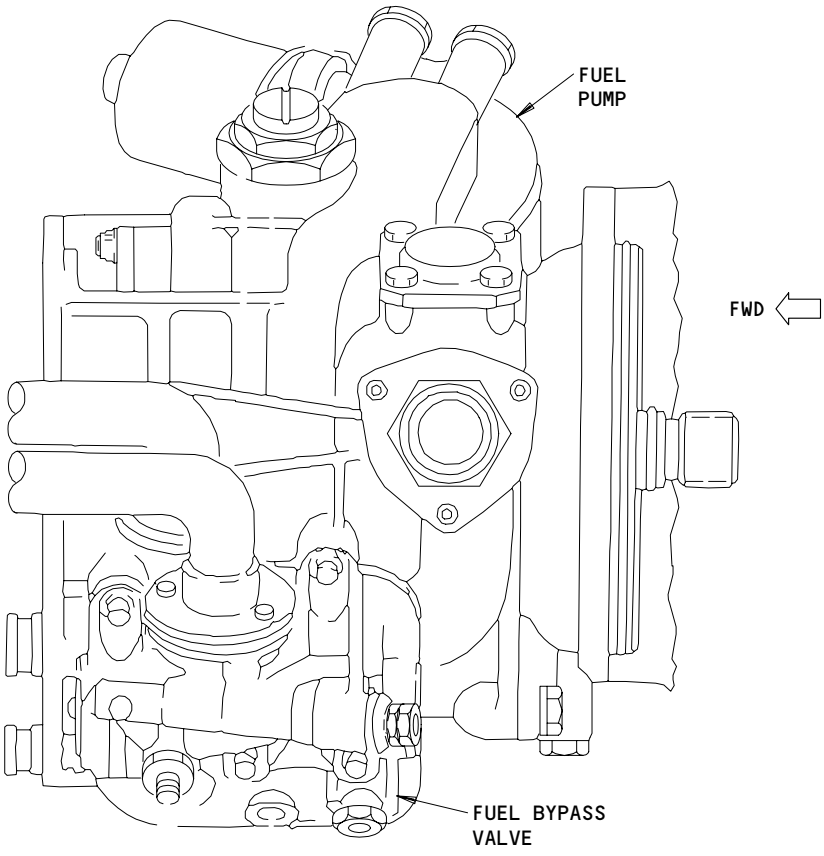
FUEL DISTRIBUTION SYSTEM DESCRIPTION AND OPERATION

1. General
   A. The fuel distribution system includes the fuel pump, fuel metering unit, fuel distribution valve, and fuel injectors. The system supplies fuel to the fuel injectors installed in the engine combustion chamber.
2. Component Details (Fig. 1)
   A. Fuel Pump
      (1) The fuel pump is installed on the right side, front face of the gearbox below the right thrust reverser.
      (2) The fuel pump includes a single gear stage supplied by a centrifugal boost stage and a 40 micron fuel filter, installed at the gear stage inlet.
      (3) The external splines of the fuel pump drive shaft are lubricated with oil. A pressure relief valve for the gear stage keeps a limit on pressure increases across the gear stage to approximately 1400 psi (9652.7 kPa). If contamination is accumulating in the filter, a fuel filter message will shows on the EICAS when a differential pressure switch is triggered at 5.50 psig (38.0 kPa). Eventually, a fuel filter bypass valve will open without any additional EICAS message at approximately 9 psig (62.1 kPa).
   B. Fuel Distribution Valve
      (1) The fuel distribution valve is installed on a bracket to the rear case assembly (flanges J and K) of the high pressure compressor at the four o'clock position.
      (2) The fuel distribution valve receives scheduled fuel flow from the fuel metering unit and supplies it to eight fuel manifolds, each of which supplies three fuel injectors.
      (3) Fuel is put through and cleaned by a self-relieving fuel strainer installed at the inlet passage of the fuel distribution valve.
   C. Fuel Injectors
      (1) There are twenty-four fuel injectors which are connected by manifolds in groups of three. The fuel injectors are externally installed through ports in the diffuser case. The fuel injectors are attached by bolts to the cast mounting pads on the external side of the case.
3. Operation
   A. Functional Description
      (1) The fuel is supplied to the fuel pump by the fuel tank boost pumps, through the engine fuel supply lines (AMM 28-22-00).
      (2) The fuel which goes in the fuel pump is supplied to the centrifugal boost stage to increase the fuel pressure. From the boost stage, the fuel goes to the fuel/oil heat exchanger to decrease the temperature of the oil and remove the ice in the fuel.
      (3) The fuel that goes out of the fuel/oil heat exchanger is put back into the fuel pump where it goes through a filter. The fuel which goes through the filter is put back into the high pressure stage of the fuel pump.



Fuel Distribution Components
Figure 1 (Sheet 1)





FUEL BYPASS VALVE

D

Fuel Distribution Components
Figure 1 (Sheet 2)

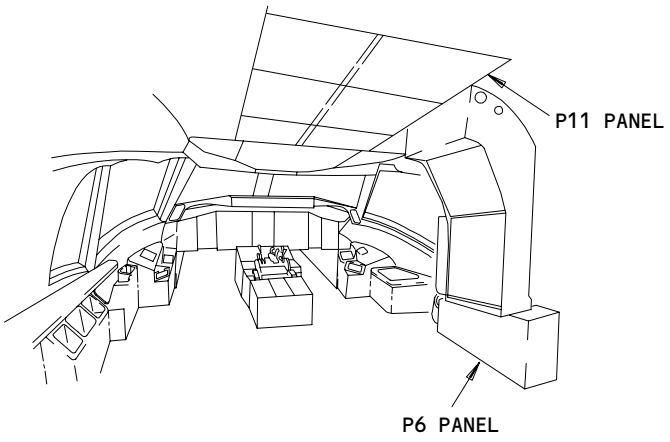
(4) The high pressure fuel is put back into the fuel metering unit where it is measured to make sure it is in the thrust and engine limits (AMM 73-21-00). The fuel which is measured goes into the fuel distribution valve where it is divided to each of the eight fuel manifolds. Each fuel manifold supplies fuel to three fuel injectors which supply fuel into the engine combustion chamber.

FUEL DISTRIBUTION SYSTEM

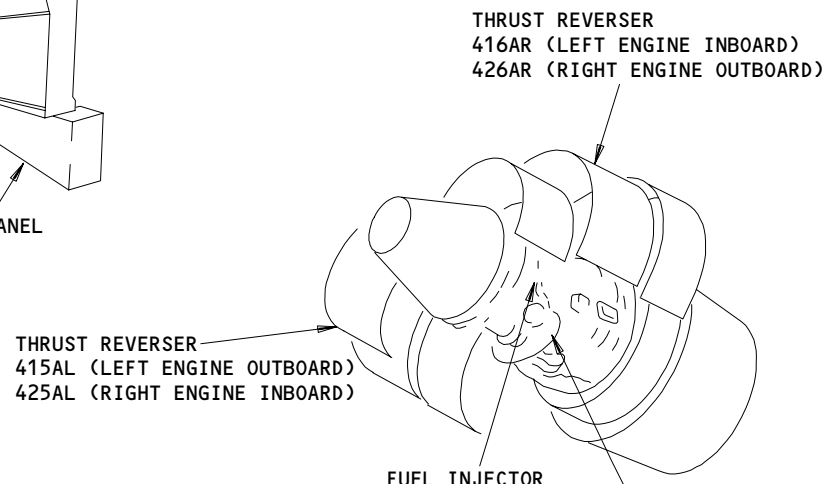
COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	AMM REFERENCE
CIRCUIT BREAKER –	1		FLT COMPT, P6,P11	
FUEL VALVE L SPAR, C1061		1	6E1	*
FUEL VALVE R SPAR, C1062		1	6E2	*
FUEL CONT VLV & EEC CHAN B RESET L, C1419		1	11D25	*
FUEL CONT VLV & EEC CHAN B RESET R, C1420		1	11D26	*
FILTER – LEFT ENGINE FUEL PUMP	2	1	416AR, THRUST REVERSER	73-11-02
FILTER – RIGHT ENGINE FUEL PUMP	2	1	426AR, THRUST REVERSER	73-11-02
INJECTORS AND SUPPORT – LEFT ENGINE FUEL	1	24	415AL,416AR THRUST REVERSER	73-11-05
INJECTORS AND SUPPORT – RIGHT ENGINE FUEL	1	24	425AL,426AR THRUST REVERSER	73-11-05
LINE – LEFT ENGINE MAIN FUEL SUPPLY	1	1	416AR, THRUST REVERSER	73-11-08
LINE – RIGHT ENGINE MAIN FUEL SUPPLY	1	1	426AR, THRUST REVERSER	73-11-08
PUMP – LEFT ENGINE FUEL	2	1	416AR, THRUST REVERSER	73-11-01
PUMP – RIGHT ENGINE FUEL	2	1	426AR, THRUST REVERSER	73-11-01
STRAINER – LEFT ENGINE FUEL DISTRIBUTION VALVE	2	1	416AR, THRUST REVERSER	73-11-04
STRAINER – RIGHT ENGINE FUEL DISTRIBUTION VALVE	2	1	426AR, THRUST REVERSER	73-11-04
VALVE – LEFT ENGINE FUEL BYPASS	2	1	416AR, THRUST REVERSER	73-11-07
VALVE – RIGHT ENGINE FUEL BYPASS	2	1	426AR, THRUST REVERSER	73-11-07
VALVE – LEFT ENGINE FUEL DISTRIBUTION	2	1	416AR, THRUST REVERSER	73-11-03
VALVE – RIGHT ENGINE FUEL DISTRIBUTION	2	1	426AR, THRUST REVERSER	73-11-03

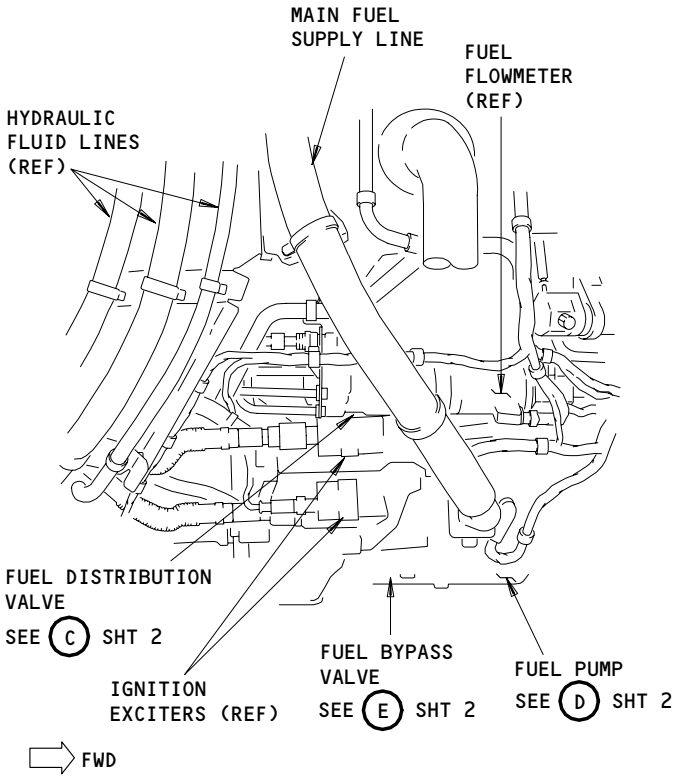
* SEE THE WDM EQUIPMENT LIST

Fuel Distribution System – Component Index
Figure 101



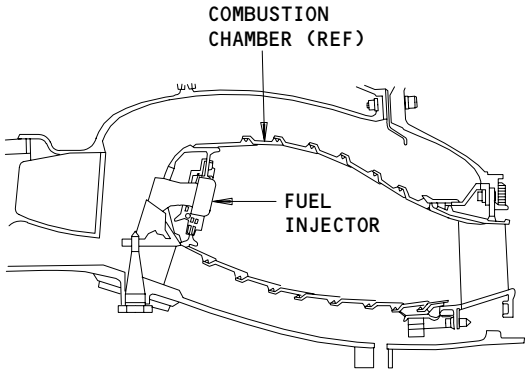
FLIGHT COMPARTMENT





RIGHT SIDE OF THE ENGINE

A

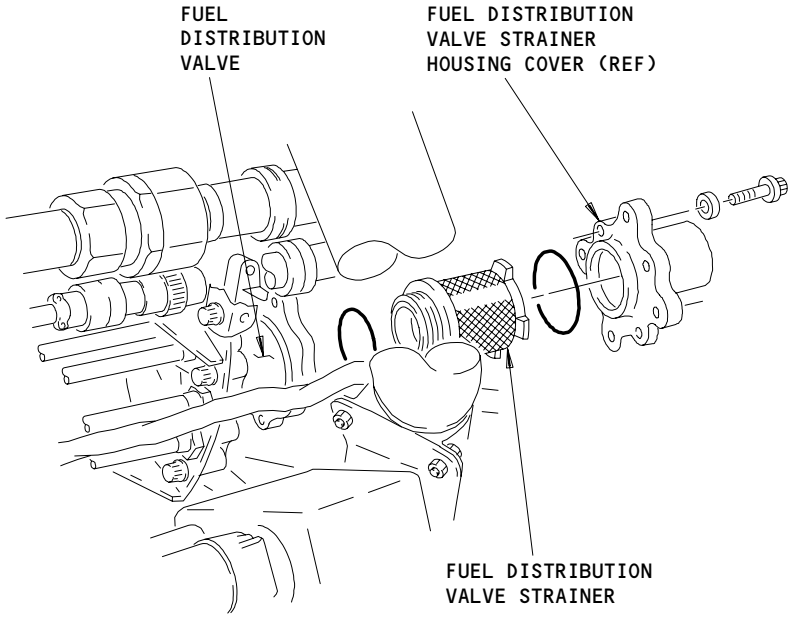


FUEL INJECTOR AND SUPPORT

B

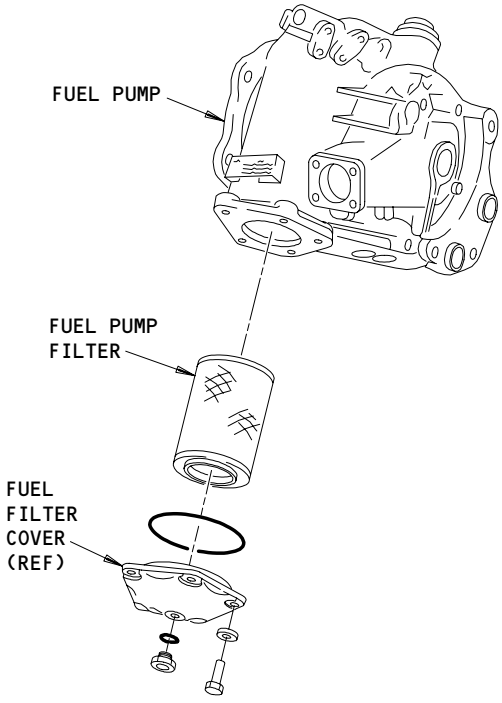
Fuel Distribution System – Component Location
Figure 102 (Sheet 1)

299343



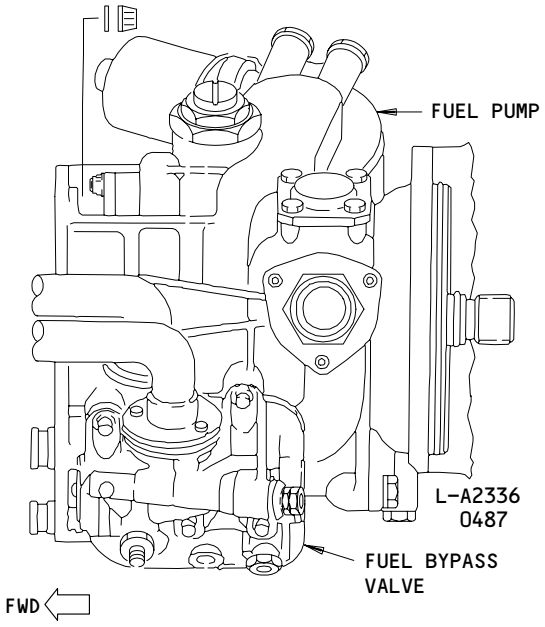
FUEL DISTRIBUTION VALVE

C



FUEL PUMP

D



FUEL BYPASS VALVE

E

Fuel Distribution System - Component Location (Details from Sht 1)
Figure 102 (Sheet 2)

ENGINE FUEL AND CONTROL - INSPECTION/CHECK

1. General
   A. This procedure gives the instructions to examine the fuel distribution system for clearance and damage of the fuel tubes. The instructions also include a leak check of the fuel distribution system.
   B. This procedure examines the system from the fuel distribution valve to the fuel injectors.

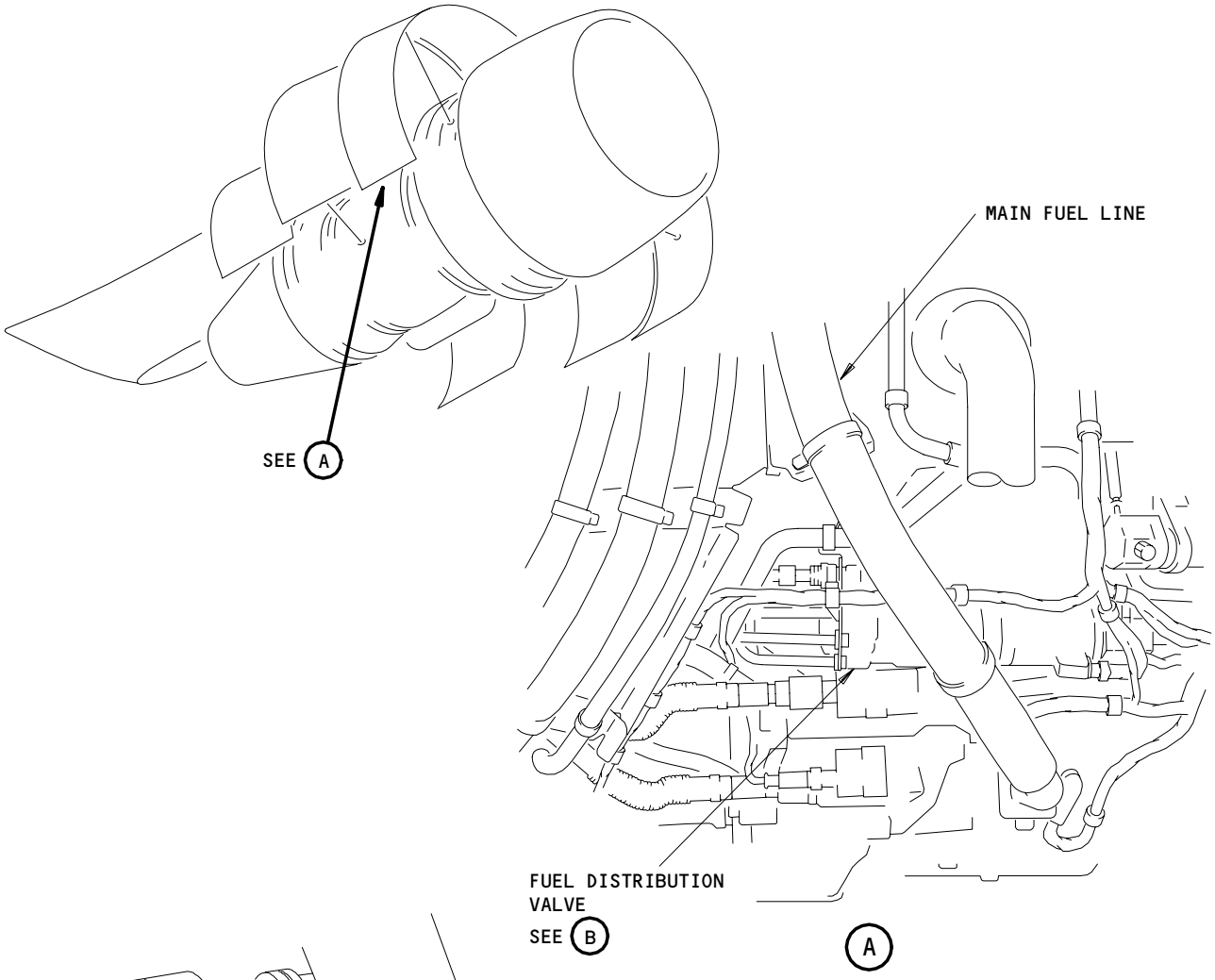
TASK 73-11-00-206-001-N00

2. Fuel Distribution System - Inspection
   A. Equipment
      (1) Adapter - PWA 85579
      (2) Air Supply - 95-105 psig (655.0 - 723.9 kPa) pressure controlled
   B. Consumable Materials
      (1) D00504 Petrolatum, PMC 9609
      (2) G02151 Fluid, Leak Check (PMC 9569)
      OR
      G50231 Fluid, Leak Check (PMC 2277)
   C. References
      (1) AMM 71-11-04/201, Fan Cowl Panels
      (2) AMM 71-11-06/201, Core Cowl Panels
      (3) AMM 73-11-04/401, Fuel Distribution-Valve Strainer
      (4) AMM 78-31-00/201, Thrust Reverser System
   D. Access
      (1) Location Zones
         416 L Power Plant Fan Reverser
         426 R Power Plant Fan Reverser

      (2) Access Panels
         416AR Fan Reverser (Right)
         426AR Fan Reverser (Right)

   E. Prepare for the Inspection of the Fuel Distribution System

      S 016-002-N00
      (1) Open the fan cowl panels (AMM 71-11-04/201).



ADAPTER INSTALLATION
B

Fuel Distribution System Inspection
Figure 601

S 046-003-N00

WARNING: DO THE THRUST REVERSER DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(2) Do this procedure: Thrust Reverser Deactivation for Ground Maintenance (AMM 78-31-00/201).

S 016-004-N00

(3) Open the core cowl panels (AMM 71-11-06/201).

S 016-005-N00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(4) Open the thrust reversers (AMM 78-31-00/201).

F. Procedure

S 226-013-N00

(1) Do the inspection of the fuel distribution system (Fig. 601):
   (a) Examine the clearance between the fuel distribution tubes and adjacent tubes, and between the fuel distribution tubes and engine parts.
      1) The minimum clearance is 0.125 inch (3.175 mm) unless specified differently.

         NOTE: The minimum clearance refers to the clearance around the fuel distribution tubes only. The minimum clearance does not refer to the fittings or attached components. The clearance can be less than the minimum clearance at locations where the fuel distribution tubes are attached together with clamps.

(b) Examine the fuel distribution tubes for damage. Make sure any damage is within the in-service limits that are given in the table below:

INSPECT FOR	IN-SERVICE LIMITS
Cracks	None permitted
Corrosion and Stains	Permitted if it can be removed by light polishing with crocus cloth
Loose Tube Nuts	None Permitted
Loose or Broken Lockwire	None Permitted
Nicks, Scratches, Chafing and Pitting	0.002 inch (0.051 mm) maximum depth permitted in all locations
Dents (without sharp edges or corners)	Permitted if the tube outer diameter is not decreased by more than 10 percent at each location. No dents permitted within 0.25 inch (6.25 mm) from the tube ferrule.
Dents (with sharp edges or corners)	None permitted

(c) Make sure the fuel distribution tubes are correctly attached at all support locations.
1) Replace all worn clamps.
2) Tighten all loose clamp and bracket attaching bolts.

(d) Examine all fuel-distribution-tube connections, manifold-to-component connections and tube-to-case-boss connections for leaks and or loose connections.
1) No leaks or loose connections are permitted.
2) Repair as necessary.

(e) Examine the fuel manifold nuts at all of the fuel injectors for signs of flaking coke build-up.
1) Flaking coke build-up is not permitted.
2) If signs of flaking coke build-up is found, replace the applicable fuel manifolds and the packings inside the connections in less than 50 cycles.

S 796-014-N00

(2) Do the leak check of the fuel distribution system.
  (a) Remove the strainer from the fuel distribution valve (AMM 73-11-04/401).
  (b) Lubricate the packing with petrolatum.
  (c) Install the packing into the groove in the end of the strainer.
  (d) Install the strainer into the housing of the fuel distribution valve.
  (e) Install the adapter to the four-hole pad on the fuel distribution valve with the detail bolts.
    1) Align the offset bolt hole.
  (f) Pressurize the fuel manifold and distribution valve with air at 95-105 psig (655.0-723.9 kPa).
  (g) Use the leak check fluid on the fuel distributon system to examine for leaks.
    1) Keep the pressure in the system for a minimum of five minutes.
  (h) Make sure you cannot see leakage from all surfaces, joints or connections.
  (i) If there is leakage, do the steps that follow:
    1) Repair or replace the component if it is necessary.
    2) Do the Leak Check again.
  (j) Disconnect the air supply from the fuel distribution valve.
  (k) Remove the adapter from the fuel distribution valve.
  (l) Install the work bolts in the storage holes on the adapter.
  (m) Install the strainer in the fuel distribution valve (AMM 73-11-04/401).

G. Return the Aircraft to Its Usual Condition

S 416-008-N00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Close the thrust reversers (AMM 78-31-00/201).

S 416-009-N00

(2) Close the core cowl panels (AMM 71-11-06/201).

S 416-010-N00

(3) Close the fan cowl panels (AMM 71-11-04/201).

S 446-011-N00

(4) Do the activation procedure for the thrust reversers (AMM 78-31-00/201).

FUEL PUMP - REMOVAL/INSTALLATION

1. General
   A. This procedure includes the data for the removal and installation of the fuel pump. You can use this procedure to remove and install the fuel pump with or without the fuel metering unit installed. If you install the fuel pump without the fuel metering unit, you must install the fuel metering unit after you install the fuel pump.

   TASK 73-11-01-004-001-N00

2. Remove the Fuel Pump
   A. Equipment
      (1) Container - 5 gallon (20 liters), to catch the fuel
      (2) PWA 85989 Handling Fixture (optional) - Pratt & Whitney
      (3) PWA 86461 Torque Adapter - Pratt & Whitney, East Hartford, CT
   B. Consumable Materials
      (1) D00137 Oil - PWA 521
      (2) D00504 Petrolatum - PMC-9609
      (3) G01505 Lockwire, Safety and Lock - NASM20995
   C. Parts

AMM		NOMENCLATURE	AIPC		
FIG	ITEM		SUBJECT	FIG	ITEM
401	38	Packing	73-11-02	10	10

   D. References
      (1) AMM 24-22-00/201, Electrical Power - Control
      (2) AMM 71-11-04/201, Fan Cowl Panels
      (3) AMM 71-11-06/201, Core Cowl Panels
      (4) AMM 73-11-07/401, Fuel Bypass Valve

(5) AMM 73-21-01/401, Fuel Metering Unit
(6) AMM 78-31-00/201, Thrust Reverser System

E. Access

(1) Location Zones

210	Control Cabin
411	Left Engine
421	Right Engine

(2) Access Panels

413AL/423AL	Fan Cowl Panel (Left)
414AR/424AR	Fan Cowl Panel (Right)
415AL/425AL	Thrust Reverser (Left)
416AR/426AR	Thrust Reverser (Right)
417AL/427AL	Core Cowl Panel (Left)
418AR/428AR	Core Cowl Panel (Right)

F. Prepare for the Removal of the Fuel Pump

S 864-002-N00
(1) Supply electrical power (AMM 24-22-00/201).

S 864-003-N00
(2) Do these steps to make sure the applicable engine and spar valves are closed:
(a) For the left engine, make sure this circuit breaker on the main power distribution panel, P6, is closed:
1) 6E1, FUEL VALVES L SPAR
(b) For the right engine, make sure this circuit breaker on the P6 panel is closed:
1) 6E2, FUEL VALVES R SPAR
(c) For the left engine, make sure this circuit breaker on the overhead circuit breaker panel, P11, is closed:
1) 11D25, FUEL CONT VLV & EEC CHAN B RESET L
(d) For the right engine, make sure this circuit breaker on the P11 panel is closed:
1) 11D26, FUEL CONT VLV & EEC CHAN B RESET R
(e) Make sure the applicable FUEL CONTROL switch is in the CUTOFF position.
(f) Make sure the panel lights on the control stand for the applicable ENG VALVE and SPAR VALVE are off.

S 864-004-N00
(3) For the left engine, open this circuit breaker on the P6 panel and attach a DO-NOT-CLOSE tag:
(a) 6E1, FUEL VALVES L SPAR

S 864-005-N00
(4) For the right engine, open this circuit breaker on the P6 panel and attach a DO-NOT-CLOSE tag:
(a) 6E2, FUEL VALVES R SPAR

S 864-006-N00

(5) For the left engine, open this circuit breaker on the P11 panel and attach a DO-NOT-CLOSE tag:
(a) 11D25, FUEL CONT VLV & EEC CHAN B RESET L

S 864-007-N00

(6) For the right engine, open this circuit breaker on the P11 panel and attach a DO-NOT-CLOSE tag:
(a) 11D26, FUEL CONT VLV & EEC CHAN B RESET R

S 014-011-N00

(7) Open the fan cowl panels (AMM 71-11-04/201).

S 044-012-N00

WARNING: DO THE THRUST REVERSER DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(8) Do this procedure: Thrust Reverser Deactivation for Ground Maintenance (AMM 78-31-00/201).

S 014-013-N00

(9) Open the core cowl panels (AMM 71-11-06/201).

S 014-014-N00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT COULD OCCUR.

(10) Open the thrust reversers (AMM 78-31-00/201).

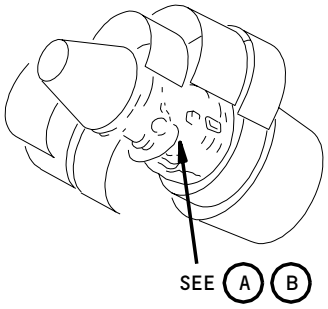
S 864-009-N00
(11) Remove electrical power (AMM 24-22-00/201).

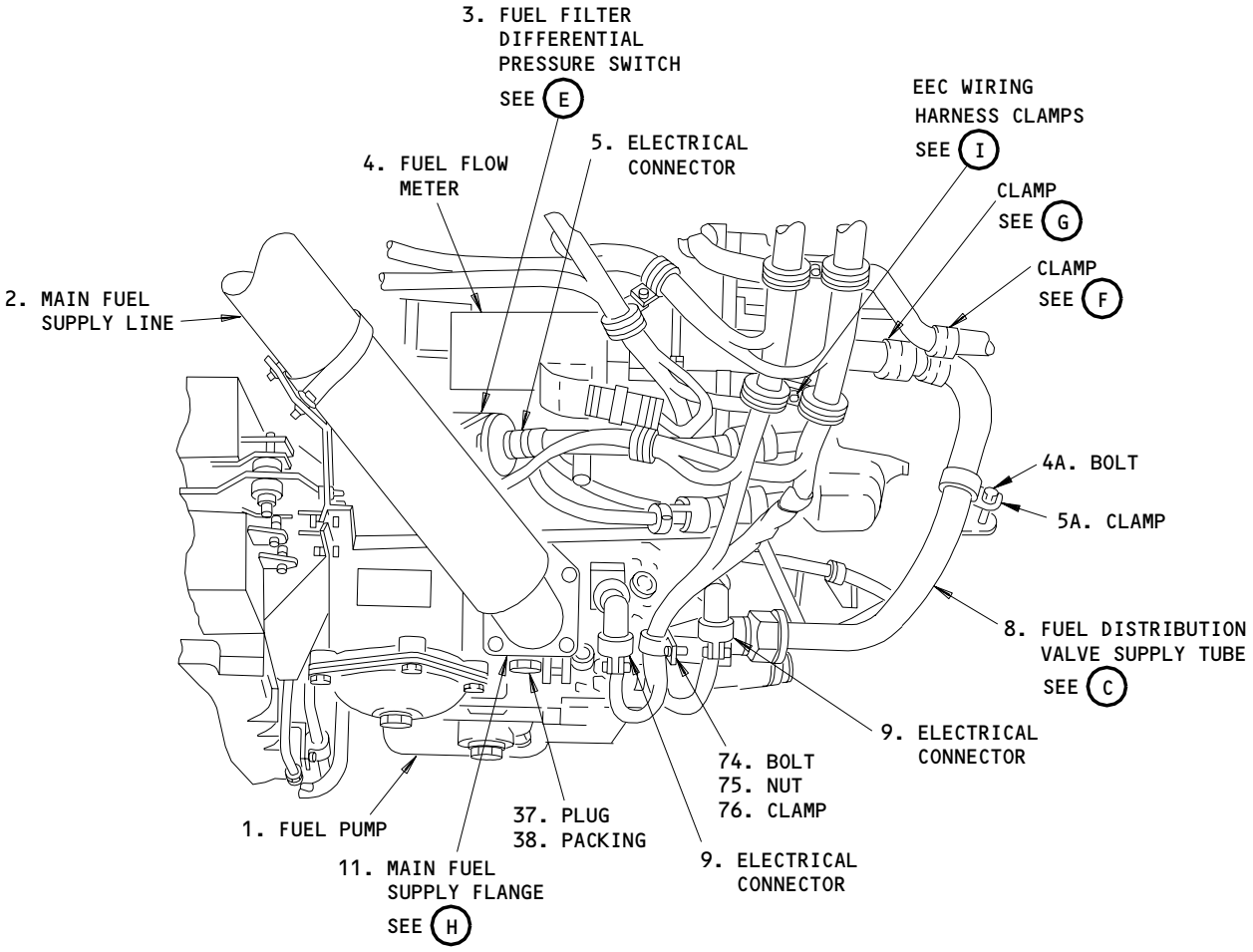
S 014-061-N00
(12) Remove the fuel bypass valve (AMM 73-11-07/401).

G. Procedure (Fig. 401, 402)

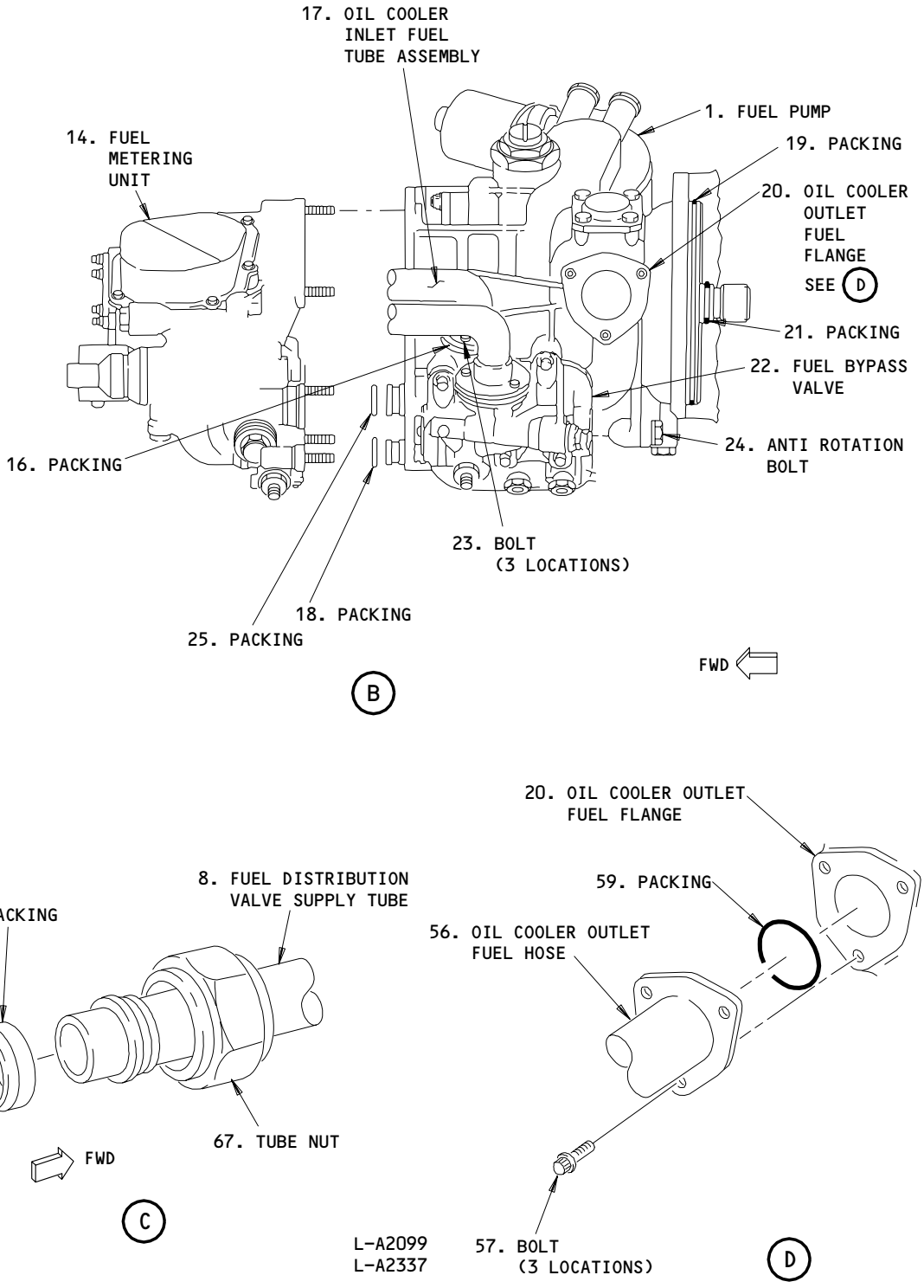
S 684-016-N00
(1) Do the steps that follow to drain the fuel from the fuel pump (1):
(a) Put the container below the fuel pump (1).
(b) Remove the drain plug (37) below the fuel supply line (2) to drain the fuel from the fuel pump (1).
1) Discard the packing (38).
(c) Lubricate the new packing (38) with the petrolatum.
(d) Install the new packing (38) on the drain plug (37).
(e) Lubricate the threads on the drain plug (37) with engine oil.
(f) Install the drain plug (37) in the fuel pump (1).
1) Tighten the drain plug (37) to 45-55 pound-inches (5.08-6.21 newton-meters).
2) Install the lockwire to the drain plug (38).

S 024-062-N00
(2) Remove the fuel pump.
(a) Remove the bolts (10) from the fuel supply flange (11) to disconnect the fuel supply line (2).
1) Discard the gasket (12).
(b) Disconnect the electrical connector from the differential pressure switch (3).
1) Install the protection cap on the electrical connector.
(c) ENGINES PRE-PW-SB 73-84 OR PRE-PW-SB 73-161;
Disconnect the electrical connector (35) from the fuel temperature probe (36).
1) Install the protection cap on the electrical connector.
(d) ENGINES POST-PW-SB 73-84 OR POST-PW-SB 73-161;
Disconnect the connectors from the alumel and chromel connections for the fuel temperature probe (86).

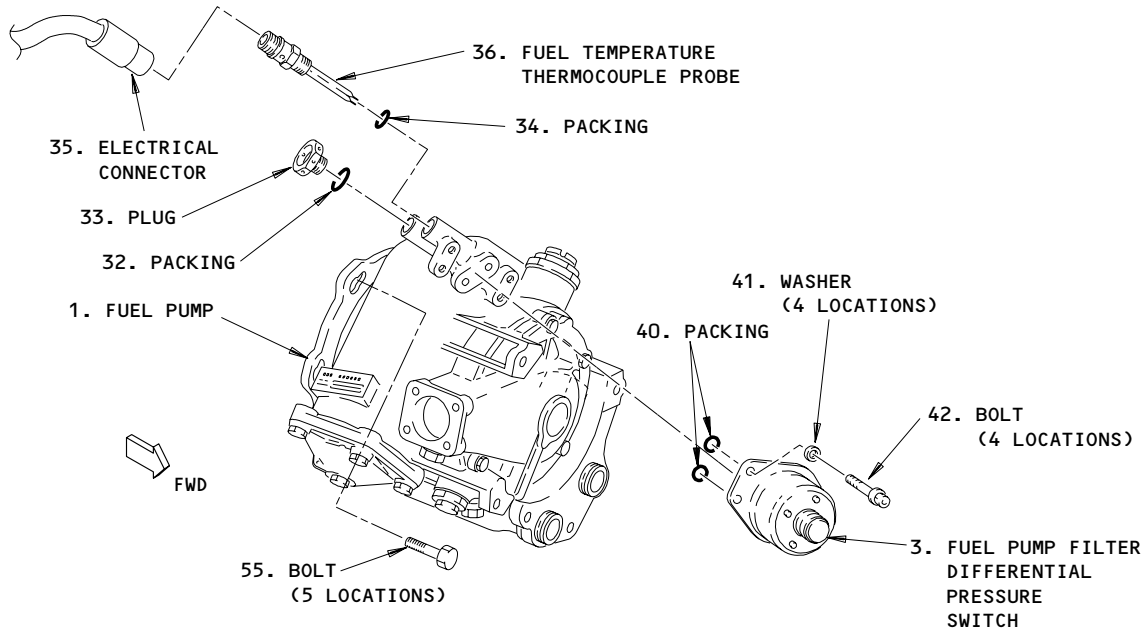




Fuel Pump Installation
Figure 401 (Sheet 1)

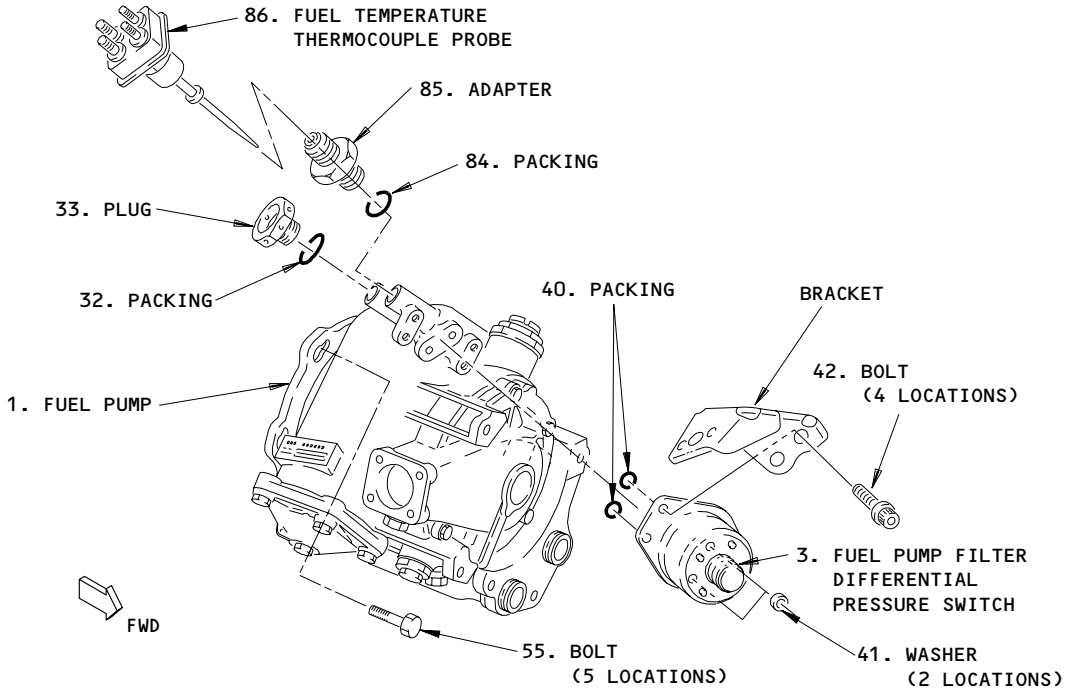


Fuel Pump Installation
Figure 401 (Sheet 2)



ENGINES PRE-PW-SB 73-84

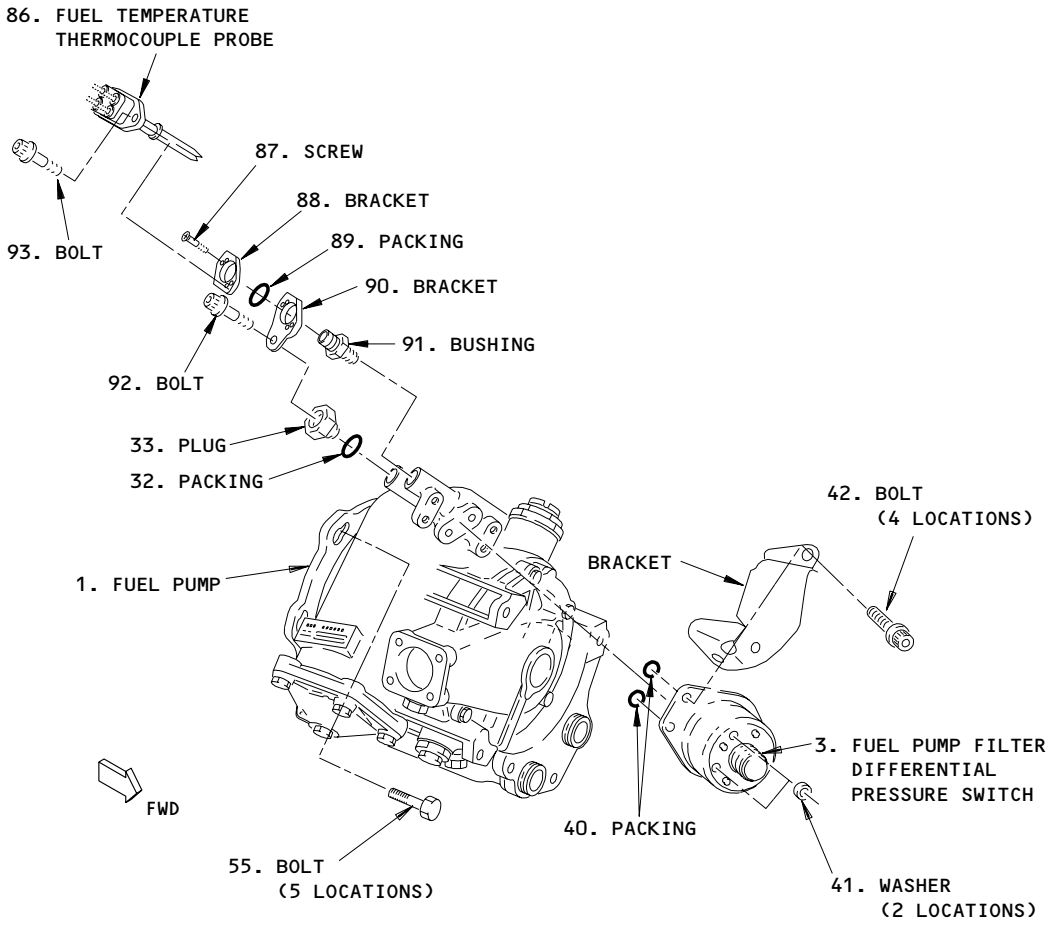
E



ENGINES POST-PW-SB 73-84 AND PRE-PW-SB 73-161

E

Fuel Pump Installation
Figure 401 (Sheet 3)

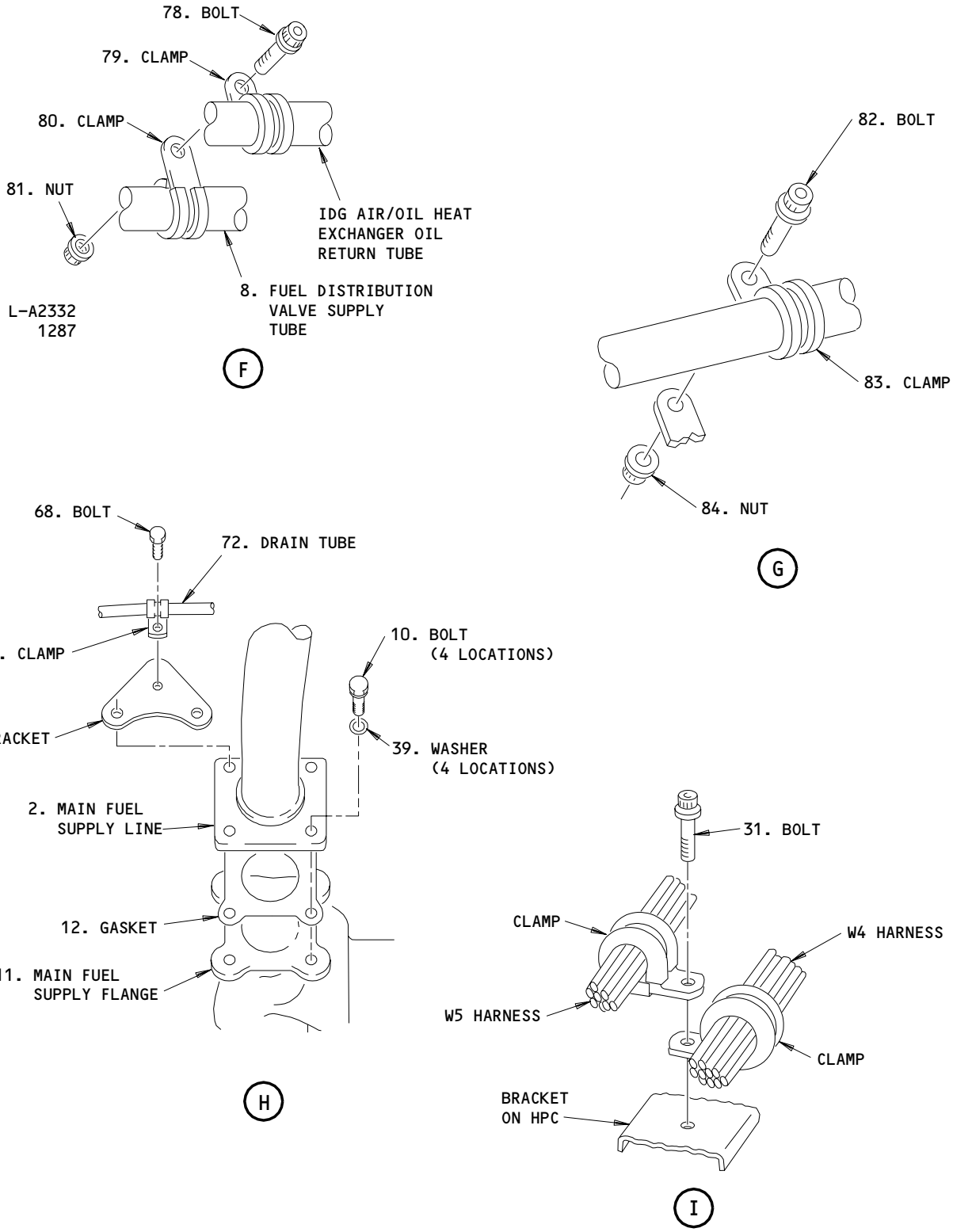


ENGINES POST-PW-SB 73-161

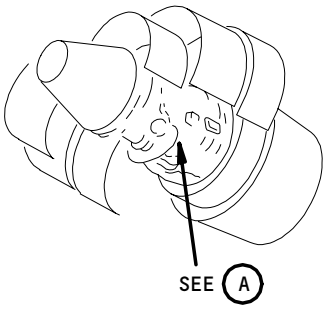
(E)

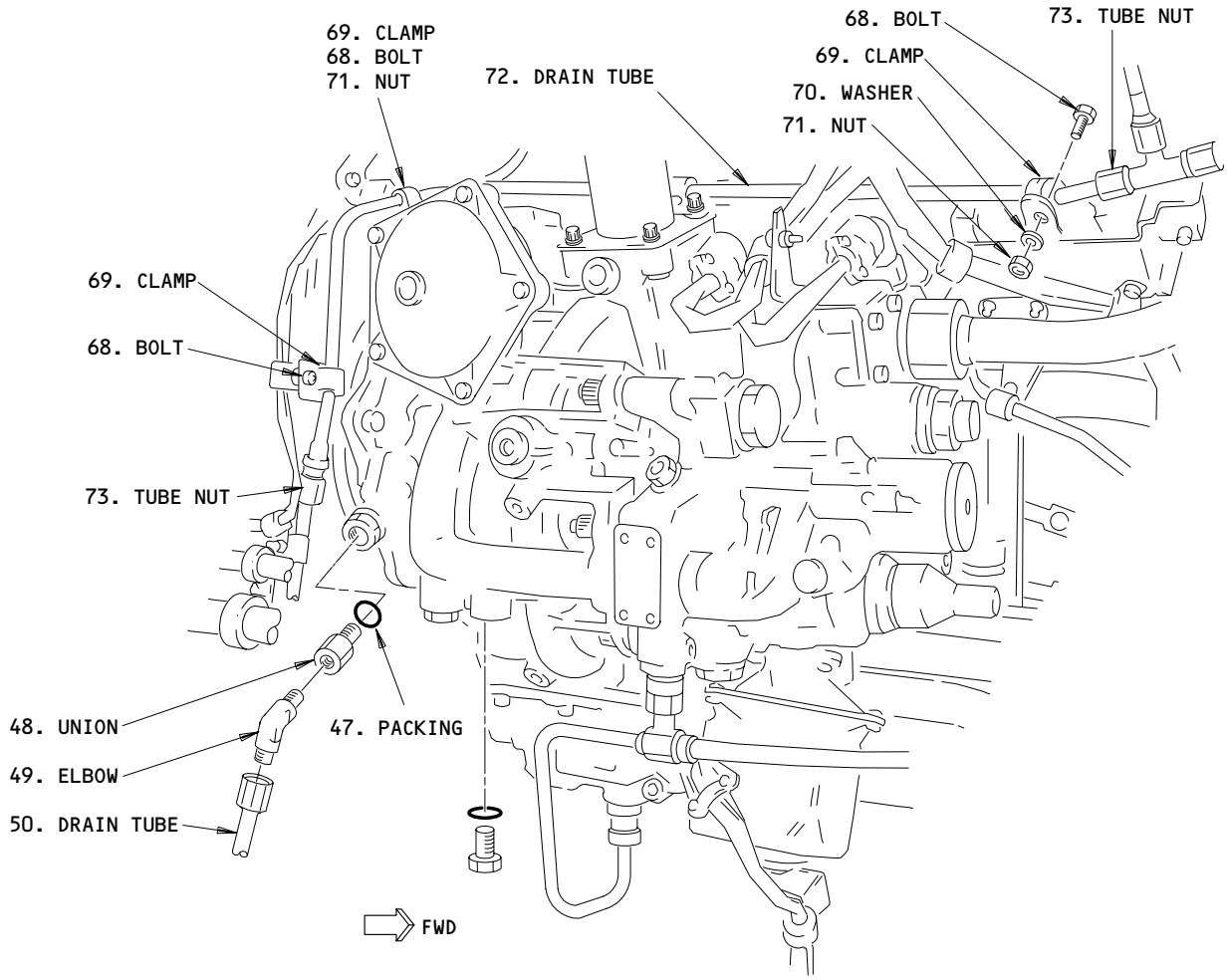
L-B2315 (0000)

Fuel Pump Installation
Figure 401 (Sheet 4)



Fuel Pump Installation
Figure 401 (Sheet 5)





FUEL PUMP AND FUEL METERING UNIT

A

Drain Tube Installation
Figure 402

1) Remove the nuts that attach the wire harness to the alumel and chromel connections on the fuel temperature probe (86).
2) Remove the clamp, bolt, and ground strap that are attached to the bracket on the housing of the fuel pump filter.
3) Remove the harness connectors from the studs on the fuel temperature probe (86).
4) Install the protection caps.

(e) Remove the bolts (57) which attach the oil-cooler-outlet fuel hose (56) to the fuel flange (20).
1) Discard the packing (59).

(f) Remove the bolts (23) which attach the oil-cooler-inlet fuel tube (17) to the fuel pump (1).
1) Discard the packing (17).

(g) Do the steps that follow to remove the drain tube (72) from the engine:
1) Remove the bolts (68), nuts (71), and washers (70) which attach the clamps (69) to the brackets.
2) Disconnect the tube nut (73) from the forward end of the drain tube (72).
3) Disconnect the tube nut (73) from the aft end of the drain tube (72).
4) Remove the drain tube (72) from the engine.

(h) Disconnect the drain tube (50) from the elbow (49) at the lower aft end of the fuel pump (1).

(i) Do the steps that follow if you will remove the fuel metering unit (14) and the fuel pump (1) together:
1) Disconnect the self-locking electrical connectors (9) from the fuel metering unit (14).
   a) Install the protection caps on the electrical connectors (9).
2) Remove the bolt (74) and the nut (75) that attach the harness clamp (76) to the fuel metering unit (14).
3) Remove the bolt (31) which attaches the wire harnesses (W4, W5) to the bracket on the high pressure compressor (HPC).
4) Remove the bolt (78) which attaches the clamp (80) to the clamp (79).
5) Remove the bolt (4A) that attaches the clamp (5A).
6) FOR ENGINES WITH THE SUPPLY TUBE (8) ATTACHED TO THE HPC BRACKET,
remove the bolt (82) and the nut (84) that attach the clamp (83).
7) Disconnect the tube nuts (67) and remove the supply tube for the fuel distribution valve (8).
   a) Discard the packings (65) and the retainers (64).

(j) If you will not remove the fuel pump (1) and fuel metering unit (14) as one unit, remove the fuel metering unit (14) (AMM 73-21-01/401).

(k) Do the steps that follow to remove the fuel pump from the gearbox:

1) Remove the anti-rotation bolt (24) on the fuel pump (1).

CAUTION: DO NOT LET THE PUMP SPLINES HOLD THE WEIGHT OF THE FUEL PUMP DURING THE REMOVAL. DAMAGE TO THE PUMP SPLINES CAN OCCUR.

2) Use the PWA 86461 torque adapter to loosen the bolt (55) at the 1 o'clock position which attaches the fuel pump (1).
3) Use the PWA 85862 torque adapter to loosen the remaining bolts (55) which attach the fuel pump (1) until the captured washers are clear of the flange.
4) Turn the fuel pump (1) clockwise (view from the front) until the flange holes disengage from the bolts (55).

NOTE: To make the removal easier, install the handling fixture to the fuel pump. Attach the handling fixture with the two detail bolts and the hand screw.

5) Move the fuel pump (1) and the fuel metering unit (14) (if installed) forward to disengage the pump spline, bolts (55) and oil-cooler-inlet fuel tube (17).
6) Lower the fuel pump (1) from the engine.
7) Remove and discard the packings (19, 21) from the groove on the drive spline and the base of the fuel pump (1).

S 024-063-N00

(3) Do the steps that follow if you will replace the fuel pump (1):

(a) Remove the bolts (42) which attach the differential pressure switch (3) to the fuel pump (1).
(b) Remove the differential pressure switch (3) from the fuel pump (1).
1) Discard the packing (40).
(c) ENGINES PRE-PW-SB 73-84 AND PRE-PW-SB 73-161;
Remove the fuel temperature probe (36) from the fuel pump (1).
1) Discard the packing (34).
(d) ENGINES POST-PW-SB 73-84 AND PRE-PW-SB 73-161;
Remove the fuel temperature probe (86) and the adapter (85) from the fuel pump (1).
1) Discard the packing (84).
(e) ENGINES POST-PW-SB 73-161;
Remove the fuel temperature probe (86) with the steps that follow:
1) Remove the bolts (93) that attach the fuel temperature thermocouple probe (86).

2) Carefully remove the fuel temperature thermocouple probe (86) from the fuel pump (1).
3) Remove the countersunk screws (87) that attach the bracket (88) to the bracket (90).
4) Remove the bracket (88).
5) Remove the bolt (92) that attaches the bracket (90) to the plug (33).
6) Remove the bracket (90).
7) Remove the bushing (91) from the fuel pump (1).
a) Discard the packing (89).

(f) Remove the plug (33) from the port on the fuel pump (1).
1) Discard the packing (32).

(g) Remove the elbow (49) and the union (48) from the fuel pump (1).
1) Install a protection cap on the fuel pump (1).
2) Discard the packing (47).

S 624-069-N00

(4) If applicable, do the preservation procedure of the fuel metering unit (14) if you will not install the same fuel metering unit again within 24 hours:
(a) Drain all remaining fuel from the FMU (14).
(b) Install caps on all ports but not on the transfer tube port for the fuel pump (1).
(c) Put the fuel metering unit (14) on a bench in a level position (as installed).
(d) Fill the fuel metering unit (14) with sufficient oil to apply a layer of oil on all areas which usually are open to the fuel.

NOTE: Fill the FMU with the oil through the transfer tube ports.

(e) Make sure all internal parts get a thick layer of the oil:
1) Turn the drive shaft by hand.
2) Turn the fuel metering unit (14).

3) Move the fuel metering unit (14) at an angle.
(f) Drain the oil from the fuel metering unit (14).
(g) Install caps on the transfer tube ports.

TASK 73-11-01-404-028-N00

3. Install the Fuel Pump

A. Equipment
(1) PWA 85989 Handling Fixture (optional), Pratt & Whitney
(2) PWA 85862 Torque Adapter, Pratt & Whitney
(3) PWA 86461 Torque Adapter, Pratt & Whitney

B. Consumable Materials
(1) D00137 Engine Oil - PWA 521
(2) D50124 Anti-seize Paste - PWA 36246
(3) D00504 Petrolatum - PMC-9609
(4) G01505 Lockwire, Safety and Lock - NASM20995
(5) G02332 Ferrule - P05-292 (Optional)
(6) G02335 Cable - Safety - P05-291 (Optional)

C. Parts

AMM		NOMENCLATURE	AIPC		
FIG	ITEM		SUBJECT	FIG	ITEM
401	1	Pump - Fuel	73-11-01	10	75
	12	Gasket	73-11-07	07	25
	16	Packing	73-11-06	20	27
	18	Packing	73-21-01	15	60
	19	Packing	73-11-01	10	65
	21	Packing			70
	25	Packing	73-21-01	15	55
	32	Packing	73-11-01	10	15
	34	Packing	73-21-09	01	40
	38	Packing	73-11-02	10	10
	40	Packing	73-34-01	10	20
402	47	Packing	71-71-01	17	405
401	59	Packing	73-11-06	20	41
	64	Retainer	73-11-06	35	35
	65	Packing			40
	84	Packing	73-21-09	01	40
	89	Packing			35

D. References

(1) AMM 70-24-05/201, Electrical Harnesses
(2) AMM 71-00-00/501, Power Plant
(3) AMM 71-11-04/201, Fan Cowl Panels
(4) AMM 71-11-06/201, Core Cowl Panels
(5) AMM 73-11-07/401, Fuel Bypass Valve
(6) AMM 73-21-01/401, Fuel Metering Unit
(7) AMM 78-31-00/201, Thrust Reverser System

E. Access

(1) Location Zones

210 Control Cabin
410/420 Power Plant

(2) Access Panels

413AL/423AL	Fan Cowl Panel (Left)
414AR/424AR	Fan Cowl Panel (Right)
415AL/425AL	Thrust Reverser (Left)
416AR/426AR	Thrust Reverser (Right)
417AL/427AL	Core Cowl Panel (Left)
418AR/428AR	Core Cowl Panel (Right)

F. Procedure (Fig. 401, 402)

S 944-065-N00

(1) Remove all of the caps installed for protection.

S 414-066-N00

(2) Do these steps when you install a new fuel pump (1):
  (a) Lubricate the packings (40) with the petrolatum.
  (b) Install the packings (40) to the pad on the fuel pump (1).
  (c) Lubricate the threads of the bolts (42), which attach the differential pressure switch (3), with engine oil.
  (d) Install the differential pressure switch (3) to the pad with the bolts (42) and washers (41).
    1) Tighten the bolts (42) to 85-95 pound-inches (9.60-10.73 newton-meters).
  (e) Lubricate the packing (32) with the petrolatum.
  (f) Install the packing (32) on the plug (33).
  (g) Lubricate the threads of the plug (33) with engine oil.
  (h) Install the plug (33) in the fuel pump (1).
    1) Tighten the plug (33) to 110-120 pound-inches (12.43-13.56 newton-meters).
    2) Install the lockwire to the plug (33).
  (i) ENGINES PRE-PW-SB 73-84 AND PRE-PW-SB 73-161;
    Do the steps that follow to install the fuel temperature probe (36):
    1) Lubricate the packing (34) with the petrolatum.
    2) Install the packing (34) to the fuel temperature probe (36).
    3) Lubricate the threads on the fuel temperature probe (36) with engine oil.
    4) Install the fuel temperature probe (36) in the fuel pump (1).
    5) Tighten the fuel temperature probe (36) to 110-120 pound-inches (12.43-13.56 newton-meters).
    6) Install the lockwire or safety cable and safety cable ferrule from the fuel temperature probe (36) to the housing.
  (j) ENGINES POST-PW-SB 73-84 AND PRE-PW-SB 73-161;
    Do the steps that follow to install the fuel temperature probe (86):
    1) Lubricate the packing (84) with the petrolatum.
    2) Install the packing (84) to the adapter (85).
    3) Lubricate the threads of the adapter (85) with engine oil.

4) Install the adapter (85) in the fuel pump (1).
   a) Tighten the adapter (85) to 95-100 pound-inches (10.73-11.30 newton-meters).
5) Install the lockwire or safety cable and safety cable ferrule from the adapter (85) to the housing.
6) Lubricate the threads of the fuel temperature probe (86) with engine oil.
7) Install the fuel temperature probe (86) to the adapter (85) and make sure the two larger studs are on the top and to the left.
8) Do not tighten the fuel temperature probe (86) at this time.

   NOTE: Do not install the clamp, bolt, and ground strap to the bracket on the housing at this time.

9) Lubricate the packing (89) with the petrolatum.
10) Install the packing (89) to the bushing (91).
11) Lubricate the threads of the bushing (91) with engine oil.
12) Install the bushing (91) in the fuel pump (1).
   a) Tighten the bushing (91) to 110-120 pound-inches (12.4-13.6 newton-meters).
13) Lubricate the threads of the bolt (92) with engine oil.
14) Install the bracket (90) to the plug (33) with the bolt (92).
   a) Tighten the bolt (92) to 85-95 pound-inches (9.6-10.7 newton-meters).
15) Lubricate the threads of the screws (87) with engine oil.
16) Align the boltholes and the contour of the bracket (88) with the bracket (90).
17) Install the bracket (88) with the screws (87).
   a) Tighten the screws (87) to 36-40 pound-inches (4.0-4.5 newton-meters).
18) Carefully install the fuel temperature probe (86) into the bracket assembly.
19) Lubricate the threads of the bolts (93) with engine oil.
20) Install the bolts (93) to connect the fuel temperature probe (86).

   NOTE: The boltholes in the bracket assembly and the fuel temperature probe-flange are offset. If necessary , turn the thermocouple to align the boltholes.
   a) Tighten the bolts (93) to 85-95 pound-inches (9.6-10.7 newton-meters).

(k) Lubricate the packing (47) with the petrolatum.
(l) Install the packing (47) to the union (48).
(m) Lubricate the threads of the union (48) with engine oil.
(n) Install the union (48) to the drain port on the fuel pump (1).
   1) Tighten the union (48).

(o) Lubricate the threads of the elbow (49) with engine oil.
(p) Install the elbow (49) to the union (48).
1) Tighten the elbow (49).

S 424-067-N00
(3) Do the steps that follow to install the fuel pump:
(a) Lubricate the bolts (55) on the main gearbox with the anti-seize paste.
(b) Lubricate the packing (16) with the petrolatum.
(c) Install the packing (16) to the inboard pad on the fuel pump (1).
(d) Lubricate the packing (59) with the petrolatum.
(e) Install the packing (59) to the fuel flange (20).
(f) Lubricate the packings (19, 21) with the petrolatum.
(g) Install the packings (19, 21) to the grooves in the spline drive and to the base of the fuel pump (1).

NOTE: To make the installation easier, install the PWA 85989 handling fixture to the fuel pump. Attach the handling fixture with the two detail bolts and the hand screw.

(h) Lift the fuel pump (1) to the correct position on the engine.

CAUTION: DO NOT LET THE PUMP SPLINES HOLD THE WEIGHT OF THE FUEL PUMP DURING THE INSTALLATION. DAMAGE TO THE PUMP SPLINES CAN OCCUR.

CAUTION: MAKE SURE THE OIL-COOLER-INLET FUEL TUBE ALIGNS WITH THE FUEL PUMP PORT AT THE TOP-INBOARD SIDE OF THE FUEL PUMP. IF NOT ALIGNED, DAMAGE TO THE PACKING AND FUEL PUMP PORT CAN OCCUR.

(i) Install the fuel pump (1) and the fuel metering unit (14) (if installed) on the bolt (55).
1) Make sure the drive shaft spline and the anti-rotation hole are correctly aligned and the oil-cooler-inlet fuel tube (17) aligns with the fuel pump port.
(j) Lubricate the threads of the anti-rotation bolt (24) with the anti-seize paste.
(k) Install the anti-rotation bolt (24).
(l) Use the PWA 86461 torque adapter to tighten the anti-rotation bolt at the 1 o'clock position to 225-250 pound-inches (25.43-28.25 newton-meters).
(m) Use the PWA 85862 torque adapter to tighten the anti-rotation bolt to 225-250 pound-inches (25.43-28.25 newton-meters).
(n) Lubricate the threads of the bolts (57), which attach the fuel hose (56), with engine oil.
(o) Install the oil-cooler-outlet fuel hose (56) to the fuel flange (20) with the bolts (57).
1) Tighten the bolts (57) to 85-95 pound-inches (9.60-10.73 newton-meters).

(p) Lubricate the threads of the bolts (23), which attach the fuel tube assembly (17), with engine oil.
(q) Install the oil-cooler-inlet fuel tube (17) to the pad on the fuel pump (1) with the bolts (23).
    1) Tighten the bolts (23) to 85-95 pound-inches (9.60-10.73 newton-meters).
(r) Connect the drain tube (50) to the elbow (49).
    1) Tighten the tube nut on the drain tube (50).
(s) If the fuel pump (1) was installed without the fuel metering unit (14), install the fuel metering unit (14) (AMM 73-21-01/401).
(t) Do the steps that follow to install the drain tube (72) on the engine (Fig. 402):
    1) Put the drain tube (72) in the correct position on the engine.
    2) Connect the tube nut (73) at the aft and forward ends of the drain tube (72).
        a) Tighten the tube nuts.
    3) Attach the drain tube (72) to the engine with the clamps (69), bolts (68), nuts (71), and washers (70).
(u) Lubricate the threads of the bolts (10), which attach the main fuel line (2), with engine oil.
(v) Install the main fuel line (2), bracket (77), and gasket (12) on the fuel pump (1) with the bolts (10) and washers (39).
    1) Tighten the bolts (10) to 180-200 pound-inches (20.338-22.597 newton-meters).
(w) Do the steps that follow if the fuel pump (1) and the fuel metering unit (14) are installed together:
    1) Lubricate the packings (65) with the petrolatum.
    2) Install the packings (65) and the retainers (64) on the supply tube assembly (8).
    3) Lubricate the adapters on the fuel metering unit (14) and the fuel flow transmitter (4) with engine oil.
    4) Install the supply tube assembly (8) between the two adapters.
        a) Tighten the tube nut (67) with your hand.
    5) Lubricate the threads of the bolt (78), which attaches the clamp (80), with engine oil.
    6) Install the clamp (80) to the clamp (79) with the bolt (78) and the nut (81).
        a) Tighten the nut (81) to 36-40 pound-inches (4.07-4.52 newton-meters).
    7) Lubricate the threads of the bolt (4A), which attaches the clamp (5A), with engine oil.
    8) Install the clamp (5A) with the bolt (4A).
        a) Tighten the bolt (4A) to 36-40 pound-inches (4.07-4.52 newton-meters).

9) FOR ENGINES WITH THE SUPPLY TUBE (8) ATTACHED TO THE HPC BRACKET,
do these steps:
a) Lubricate the threads of the bolt (82), which attaches the clamp (83), with engine oil.
b) Install the clamp (83) with the bolt (82) and the nut (84).
c) Tighten the nut (84) to 36-40 pound-inches (4.07-4.52 newton-meters).
10) Tighten the tube nuts (67) to 100-110 pound-inches (11.3-12.4 newton-meters).
11) Loosen the tube nuts (67).
12) Tighten the tube nuts (67) to 100-110 pound-inches (11.3-12.4 newton-meters) again.
a) Safety the tube nuts (67) with lockwire or safety cable and safety cable ferrule.
13) Install the clamps and bolt (31) which attach the wire harnesses (W4, W5) to the bracket on HPC.

CAUTION: USE THE CORRECT ASSEMBLY PROCEDURE, AND TOOLS, FOR THE HARNESS CONNECTOR INSTALLATION (AMM 70-24-05/201). IF YOU USE THE INCORRECT ASSEMBLY PROCEDURE, OR TOOLS, A DAMAGED OR LOOSE CONNECTOR CAN OCCUR. A LOOSE CONNECTOR PERMITS VIBRATION, WHICH CAUSES THE CONTACTS TO WEAR AND DECREASES THE LIGHTNING PROTECTION.

14) Connect the electrical connectors (9) to the fuel metering unit (14) (AMM 70-24-05/201).
15) Install the harness clamp (76) to the fuel metering unit (14) with the bolt (74) and the nut (75).
a) Tighten the nut (75) to 36-40 pound-inches (4.07-4.52 newton-meters).

CAUTION: USE THE CORRECT ASSEMBLY PROCEDURE, AND TOOLS, FOR THE HARNESS CONNECTOR INSTALLATION (AMM 70-24-05/201). IF YOU USE THE INCORRECT ASSEMBLY PROCEDURE, OR TOOLS, A DAMAGED OR LOOSE CONNECTOR CAN OCCUR. A LOOSE CONNECTOR PERMITS VIBRATION, WHICH CAUSES THE CONTACTS TO WEAR AND DECREASES THE LIGHTNING PROTECTION.

(x) ENGINES PRE-PW-SB 73-84 AND PRE-PW-SB 73-161;
Connect the electrical connector (35) to the fuel temperature probe (36) (AMM 70-24-05/201).
(y) ENGINES POST-PW-SB 73-84 AND PRE-PW-SB 73-161;
Connect the fuel temperature probe (86) with the steps that follow:
1) Connect the harness connectors to the alumel studs (larger studs) and the chromel studs (smaller stud) on the fuel temperature probe (86) with the nuts.
a) Loosely install the nuts.

2) Install the clamp, bolt and ground strap loosely to the bracket on the housing.

CAUTION: MAKE SURE THE THERMOCOUPLE STUD BOX DOES NOT TURN WHEN THE COUPLING NUT IS TIGHTENED. IF IT TURNS, DAMAGE TO THE WIRE HARNESS CAN OCCUR.

3) While you hold the thermocouple stud box, tighten the coupling nut of the fuel temperature probe (86) to 95-100 pound-inches (10.734-11.298 newton-meters).

CAUTION: DO NOT ALIGN THE THERMOCOUPLE STUD BOX AFTER THE COUPLING NUT IS TIGHTENED. HOLD THE THERMOCOUPLE STUD BOX AND LOOSEN THE COUPLING NUT AND ALIGN THE THERMOCOUPLE STUD BOX AGAIN.

4) Make sure the thermocouple stud box is aligned.
   a) Do not put too much force on the harness connectors.

CAUTION: DO NOT TIGHTEN THE NUTS TOO MUCH. TOO MUCH TORQUE (MORE THAN THE MAXIMUM TORQUE) ON THE NUTS CAN LOOSEN OR DAMAGE THE STUDS ON THE FUEL TEMPERATURE PROBE.

5) Tighten the nuts on the alumel studs to 18-22 pound-inches (2.03-2.49 newton-meters).
6) Tighten the nuts on the chromel studs to 15-18 pound-inches (1.70-2.03 newton-meters).
7) Install the lockwire or safety cable and safety cable ferrule from the coupling nut on the fuel temperature probe (86) to the adapter (85).
8) Tighten the bolt which attaches the clamp and the ground strap to the bracket on the housing to 36-40 pound-inches (4.067-4.519 newton-meters).

(z) ENGINES POST-PW-SB 73-161;
Connect the fuel temperature probe (86) with the steps that follow:
1) Connect the harness connectors to the alumel studs (larger studs) and the chromel studs (smaller studs) on the fuel temperature probe (86) with the nuts.
   a) Loosely install the nuts.
2) Install the clamp, bolt and ground strap loosely to the bracket on the housing.

CAUTION: DO NOT TIGHTEN THE NUTS TOO MUCH. TOO MUCH TORQUE (MORE THAN THE MAXIMUM TORQUE) ON THE NUTS CAN LOOSEN OR DAMAGE THE STUDS ON THE FUEL TEMPERATURE PROBE.

3) Tighten the nuts on the alumel studs to 18-22 pound-inches (2.0-2.5 newton-meters).
4) Tighten the nuts on the chromel studs to 15-18 pound-inches (1.7-2.0 newton-meters).

5) Tighten the bolt which attaches the clamp and the ground strap to the bracket on the housing to 36-40 pound-inches (4.067-4.519 newton-meters).

(aa) Remove the cap and connect the electrical connector (5) to the differential pressure switch (3).

(ab) Tighten the electrical connector (5) with your hand until it locks.

G. Put the Aircraft Back to its Usual Condition.

S 414-068-N00

(1) Install the fuel bypass valve (AMM 73-11-07/401).

S 414-041-N00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT COULD OCCUR.

(2) Close the thrust reversers (AMM 78-31-00/201).

S 414-042-N00

(3) Close the core cowl panels (AMM 71-11-06/201).

S 414-057-N00

(4) Close the fan cowl panels (AMM 71-11-04/201).

S 444-043-N00

(5) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

S 864-045-N00

(6) For the left engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P6 panel:
(a) 6E1, FUEL VALVES L SPAR

S 864-046-N00

(7) For the right engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P6 panel:
(a) 6E2, FUEL VALVES R SPAR

S 864-047-N00

(8) For the left engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P11 panel:
(a) 11D25, FUEL CONT VLV & EEC CHAN B RESET L

S 864-048-N00

(9) For the right engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P11 panel:
(a) 11D26, FUEL CONT VLV & EEC CHAN B RESET R

S 714-049-N00

(10) Do the test for the fuel pump which is shown in the Power-Plant Test-Reference Table (AMM 71-00-00/501).

FUEL PUMP FILTER - REMOVAL/INSTALLATION

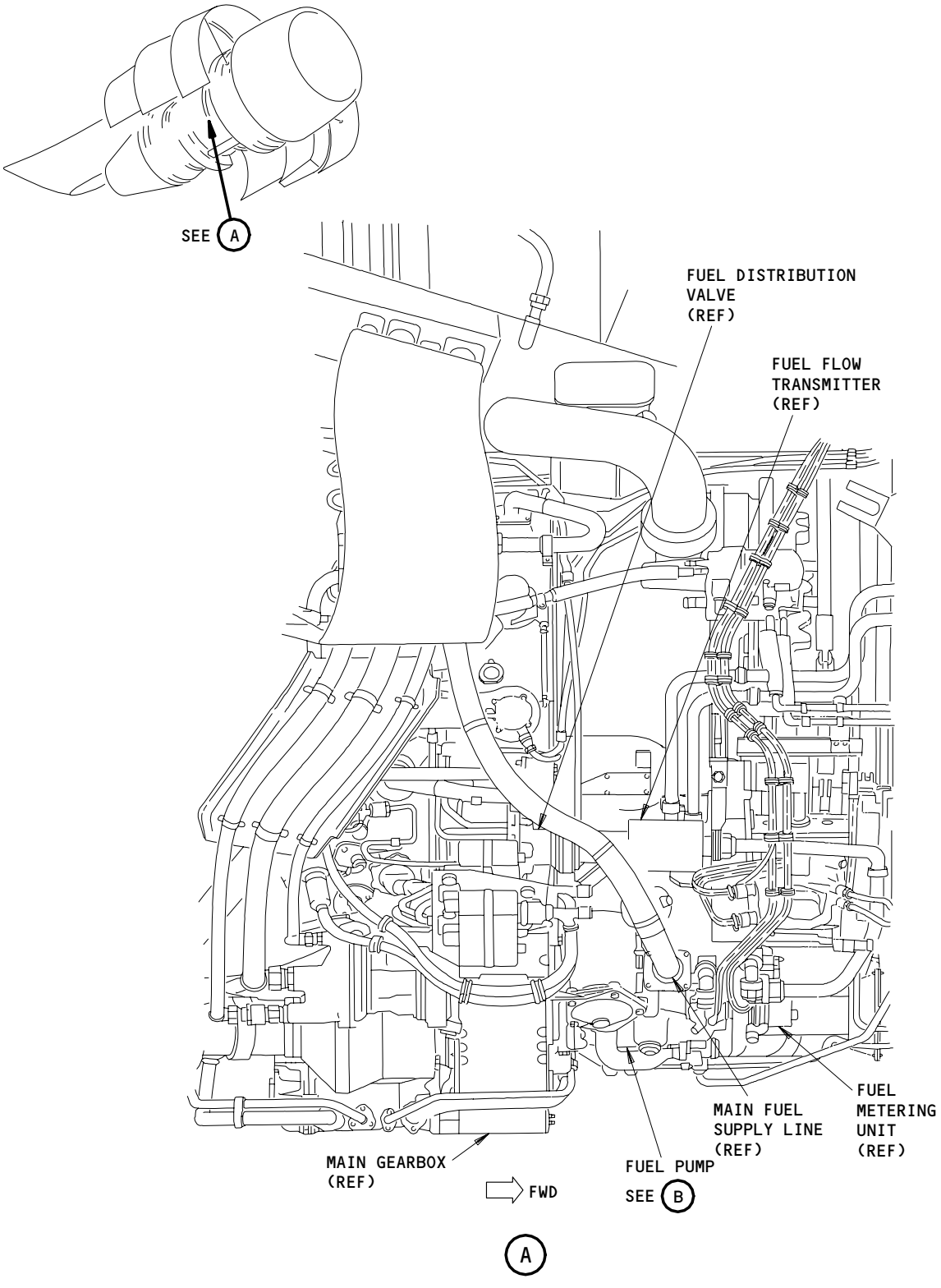
1. General
   A. The fuel pump filter is attached to the bottom of the fuel pump. You can get access through the right thrust reverser.

TASK 73-11-02-004-001-N00

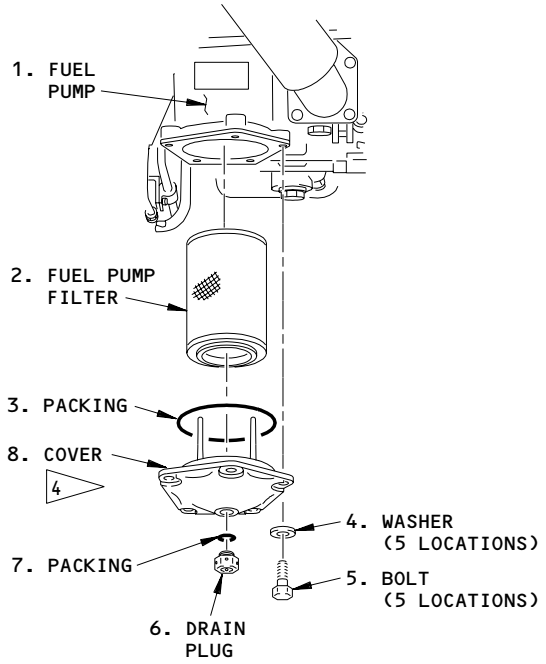
2. Remove the Fuel Pump Filter (Fig. 401)
   A. Equipment
      (1) Container - 5 gallon (20 liters), to catch the fuel
   B. References
      (1) AMM 24-22-00/201, Electrical Power - Control
      (2) AMM 28-10-00/201, Microbial Growth
      (3) AMM 71-11-04/201, Fan Cowl Panels
      (4) AMM 71-11-06/201, Core Cowl Panels
      (5) AMM 73-11-01/401, Fuel Pump
      (6) AMM 73-11-02/601, Fuel Pump Filter
      (7) AMM 78-31-00/201, Thrust Reverser System
   C. Access
      (1) Location Zone
          411 Left Engine
          421 Right Engine
      (2) Access Panel
          414AR Fan cowl panel (Right), Left Engine
          416AR Fan reverser (Right), Left Engine
          418AR Core cowl (Right), Left Engine
          424AR Fan cowl panel (Right), Right Engine
          426AR Fan reverser (Right), Right Engine
          428AR Core cowl (Right), Right Engine
   D. Prepare to Remove the Fuel Pump Filter

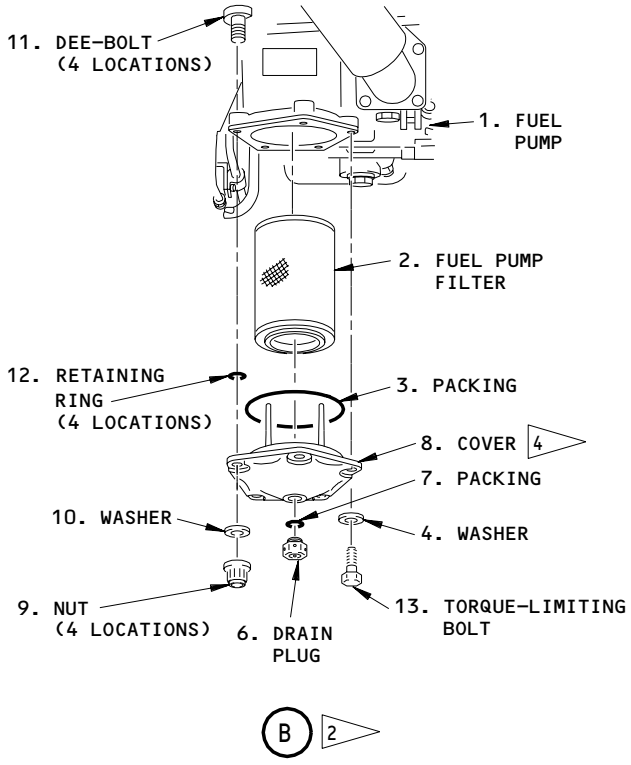
      S 864-002-N00
      (1) Supply electrical power (AMM 24-22-00/201).

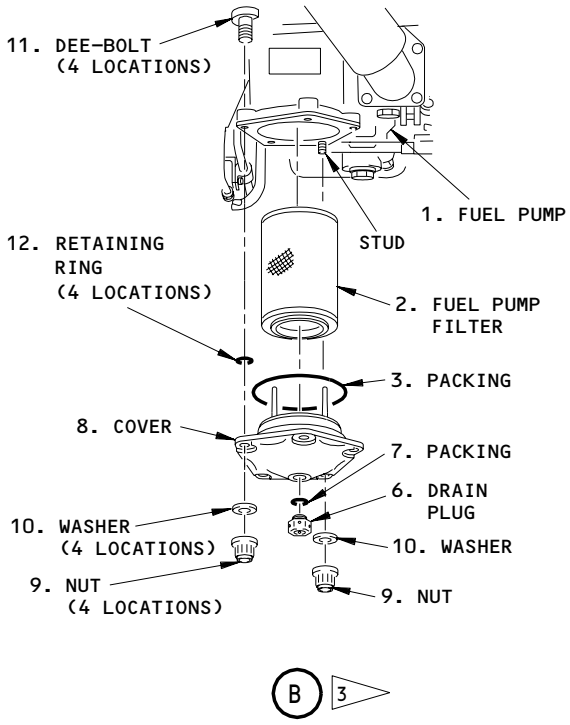
      S 864-003-N00
      (2) Make sure that applicable engine and spar valves are closed as follows:
          (a) For the left engine, make sure this circuit breaker on the main power distribution panel, P6, is closed:
              1) 6E1, FUEL VALVES L SPAR
          (b) For the right engine, make sure this circuit breaker on the main power distribution panel, P6, is closed:
              1) 6E2, FUEL VALVES R SPAR
          (c) For the left engine, make sure this circuit breaker on the overhead panel, P11, is closed:
              1) 11D25, FUEL CONT VLV & EEC CHAN B RESET L



Fuel Pump Filter Installation
Figure 401 (Sheet 1)







1 FUEL PUMP WITHOUT THE DEE-BOLTS (PRE-PW-SB 73-75).

2 FUEL PUMP WITH THE DEE-BOLTS AND THE TORQUE-LIMITING BOLT (POST-PW-SB 73-75).

3 FUEL PUMP WITH THE DEE-BOLTS AND THE STUD (POST-PW-SB 73-104)

4 COVER WITH THE TAPERED PINS POST-PW-SB 73-85).

Fuel Pump Filter Installation
Figure 401 (Sheet 2)

(d) For the right engine, make sure this circuit breaker on the overhead panel, P11, is closed:
1) 11D26, FUEL CONT VLV & EEC CHAN B RESET R

(e) Make sure that the applicable FUEL CONTROL switch is in the cutoff position.

S 864-004-N00

(3) Make sure that the applicable ENG VALVE and SPAR VALVE panel lights on the control stand are off.

S 864-005-N00

(4) For the left engine, open this circuit breaker on the main power distribution panel, P6, and attach the DO-NOT-CLOSE tag:
(a) 6E1, FUEL VALVES L SPAR

S 864-006-N00

(5) For the right engine, open this circuit breaker on the main power distribution panel, P6, and attach the DO-NOT-CLOSE tag:
(a) 6E2, FUEL VALVES R SPAR

S 864-007-N00

(6) For the left engine, open this circuit breaker on the overhead panel, P11, and attach the DO-NOT-CLOSE tag:
(a) 11D25, FUEL CONT VLV & EEC CHAN B RESET L

S 864-008-N00

(7) For the right engine, open this circuit breaker on the overhead panel, P11, and attach the DO-NOT-CLOSE tag:
(a) 11D26, FUEL CONT VLV & EEC CHAN B RESET R

S 864-009-N00

(8) Remove electrical power (AMM 24-22-00/201).

S 014-010-N00

(9) Open the right fan cowl panel (AMM 71-11-04/201).

S 044-056-N00

WARNING: DO THE THRUST REVERSER DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(10) Do this procedure: Thrust Reverser Deactivation for Ground Maintenance (AMM 78-31-00/201).

S 014-012-N00

(11) Open the right core cowl panel (AMM 71-11-06/201).

S 014-013-N00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(12) Open the right thrust reverser (AMM 78-31-00/201).

E. Procedure

S 684-014-N00

(1) Drain the fuel from the fuel pump filter with the steps that follow:
(a) Put the container below the fuel filter cover (8).

WARNING: DO NOT LET THE FUEL STAY ON YOUR SKIN FOR A LONG PERIOD OF TIME. THE FUEL IS POISONOUS AND CAN BE ABSORBED THROUGH YOUR SKIN.

(b) Remove the drain plug (6) from the center of the fuel pump filter cover (8).
1) Let the fuel fully drain.
2) Discard the packing (7).

S 024-057-N00

(2) Remove the fuel pump filter:
(a) ENGINES PRE-PW-SB 73-75 AND PRE-PW-SB 73-104;
Remove the fuel filter cover (8) with the steps that follow:
1) Remove the bolts (5) and washers (4) from the fuel filter cover (8).
2) Monitor the torque necessary to turn the bolts (5) out of the helicoil inserts in the fuel pump.
a) If the necessary torque is less than 6.5 pound-inches (0.73 Newton-meters), replace the fuel pump (AMM 73-11-01/401).

NOTE: If a replacement fuel pump is not available, you can use different bolts as specified in the Argo-Tech Component Maintenance Manual 73-11-04.

3) Remove the fuel filter cover (8) and the fuel pump filter (2).

(b) ENGINES POST-PW-SB 73-75 AND PRE-PW-SB 73-104;
Remove the fuel filter cover (8) with the steps that follow:

CAUTION: DO NOT PUT UNWANTED FORCE ON THE HEAD OF THE TORQUE-LIMITING BOLT. KEEP THE WRENCH STRAIGHT AND AT 90 DEGREES TO THE HEAD AND LOOSEN IT SLOWLY. IF YOU DO NOT OBEY THESE INSTRUCTIONS, YOU CAN CAUSE DAMAGE TO THE TORQUE-LIMITING BOLT.

1) Keep the wrench straight and at 90 degrees to the head of the torque-limiting bolt (13) and slowly loosen and remove the torque-limiting bolt (13) and washer (4).
2) Monitor the torque necessary to remove the torque-limiting bolt (13) from the helicoil self-locking quality.
   a) If the torque is less than 6.5 pound-inches (0.73 newton-meters), replace the fuel pump (AMM 73-11-01/401).

      NOTE: If a replacement fuel pump is not available, you can use different bolts as specified in the Argo-Tech Component Maintenance Manual 73-11-04.

3) Remove the nuts (9) and washers (10) from the dee-bolts (11).
4) Remove the fuel filter cover (8) and the fuel pump filter (2).

(c) ENGINES POST-PW-SB 73-104;
Remove the fuel filter cover (8) with the steps that follow:
1) Remove the nuts (9) and washers (10) from the dee-bolts (11) and the stud.
2) Remove the fuel filter cover (8) and the fuel pump filter (2) from the fuel pump (1).

   NOTE: Some fuel filter covers have machined slot in the split surface. These machined slots will help you remove the fuel filter cover.

(d) Remove the packing (3) from the fuel filter cover (8).
1) Discard the packing (3).
(e) Examine the housing for the fuel pump filter and the fuel filter cover (8) to make sure the old gaskets from the fuel pump filter (2) are removed.
(f) Install a cover on the fuel pump to prevent contamination.

S 214-018-N00
(3) Do the Inspection of the Fuel Pump Filter (AMM 73-11-02/601).
(a) Examine the fuel filter element for signs of microbial contamination.

NOTE: Microbial contamination may be evident in the filter as a dark colored sludge or slime but does not always have these characteristics. Microbial contamination can cause a blocked fuel filter and result in a fuel filter bypass condition.

1) If the fuel filter element has trapped fine debris of unknown origin, it is recommended you do the inspection of the fuel tanks for microbial contamination (AMM 28-10-00/201).
(b) Examine the fuel pump filter for bronze color particles (AMM 73-11-02/601).

TASK 73-11-02-404-019-N00
3. Install the Fuel Pump Filter (Fig. 401)
A. Consumable Materials
(1) D00137, Oil - PWA 521
(2) D00504, Petrolatum - PMC 9609
(3) G01505 Lockwire, Safety and Lock - NASM20995
(4) G02332 Ferrule - P05-292 (Optional)
(5) G02335 Cable - Safety - P05-291 (Optional)
(6) G01025 Solvent - Cleaning - P11-004
B. Parts

AMM		NOMENCLATURE	AIPC		
FIG	ITEM		SUBJECT	FIG	ITEM
401	2	Filter	73-11-02	10	35, 38
	3	Packing			30
	7	Packing			10

C. References
(1) AMM 71-00-00/501, Power Plant
(2) AMM 71-11-04/201, Fan Cowl Panels
(3) AMM 71-11-06/201, Core Cowl Panels
(4) AMM 73-11-01/401, Fuel Pump

(5) AMM 78-31-00/201, Thrust Reverser System

D. Access

(1) Location Zone

411 Left Engine
421 Right Engine

(2) Access Panel

414AR Fan cowl panel (Right), Left Engine
416AR Fan reverser (Right), Left Engine
418AR Core cowl (Right), Left Engine
424AR Fan cowl panel (Right), Right Engine
426AR Fan reverser (Right), Right Engine
428AR Core cowl (Right), Right Engine

E. Procedure

S 424-058-N00

(1) Prepare to install the fuel pump filter:

(a) Remove the covers from the fuel pump.

(b) Clean the fuel filter cover (8) and the inner space of the fuel filter housing.

(c) Examine the helicoil insert(s) to make sure they are correctly installed in the recesses of the fuel pump filter housing.

(d) If the helicoil insert(s) are not in the fuel pump filter housing recesses, replace the fuel pump (1) (AMM 73-11-01/401).

CAUTION: MAKE SURE THE OLD GASKETS OF THE FUEL PUMP FILTER DO NOT STAY IN THE HOUSING FOR THE FUEL PUMP FILTER OR THE FUEL FILTER COVER. IF YOU DO NOT REMOVE THE OLD GASKETS, DAMAGE TO THE ENGINE CAN OCCUR.

(e) Examine the housing for the fuel pump filter and the fuel filter cover (8) to make sure the old gaskets from the fuel pump filter (2) are removed.

1) If necessary, remove the old gaskets.

S 424-059-N00

CAUTION: DO NOT CLEAN THE FUEL FILTER OR USE THE SAME FUEL FILTER AGAIN. IF YOU DO NOT USE A NEW, CLEAN AND UNDAMAGED FUEL FILTER, DAMAGE TO THE ENGINE CAN OCCUR.

CAUTION: INSTALL THE CORRECT FUEL PUMP FILTER FOR THE ENGINE MODEL. LOOK AT THE FUEL PUMP FILTER TO FIND THE PART NUMBER AND ENGINE MODEL MARKS. IF THE FUEL PUMP FILTER IS INCORRECT FOR THE ENGINE MODEL, IT CAN CAUSE CONTAMINATION OF THE FUEL SYSTEM AND UNSATISFACTORY ENGINE OPERATION.

(2) Install the fuel pump filter:

(a) Lubricate the packing (3) with petrolatum.

(b) Install the packing (3) into the groove in the fuel filter cover (8).

(c) ENGINES PRE-PW-SB 73-75 AND PRE-PW-SB 73-104;
Install the fuel pump filter (2) with the steps that follow:
1) Clean the bolt (5) threads with solvent (P11-004) and dry the bolt (5) threads before installation.
2) ENGINES PRE-PW-SB 73-85;
Install a new fuel pump filter (2) on the fuel filter cover (8).
3) ENGINES POST-PW-SB 73-85;
Install a new fuel pump filter (2) onto the tapered pins of the fuel filter cover (8).

CAUTION: USE THE TIGHTENING PROCEDURE THAT FOLLOWS. THIS WILL PREVENT DAMAGE TO THE PACKING AND HELICOIL INSERTS, AND MAKE SURE THAT THE FUEL FILTER COVER IS CORRECTLY ALIGNED.

4) Install the fuel pump filter (2) and the fuel filter cover (8) to the fuel pump (1) with the bolts (5) and washers (4).
5) Monitor the torque necessary to turn the bolts (5) into the helicoil inserts.
a) Make a note of the torque value (Ta= _____).
6) Symmetrically tighten the bolts (5) to the value Tb where Tb = (150-170 pound-inches (16.9-19.2 newton-meters) + Ta).
7) Safety the bolts (5) with lockwire or safety cable and safety cable ferrule.

(d) ENGINES POST-PW-SB 73-75 AND PRE-PW-SB 73-104;
Install the fuel pump filter (8) with the steps that follow:
1) Clean the threads of the torque-limiting bolt (13) and the dee-bolts (11) with the solvent (P11-004).
a) Make sure the threads are dry before you install the bolts.
2) ENGINES PRE-PW-SB 73-85;
Install the fuel pump filter (2) on the fuel filter cover (8).
3) ENGINES POST-PW-SB 73-85;
Install the fuel pump filter (2) onto the tapered pins of the fuel filter cover (8).

4) Verify that the retaining rings (12) are properly placed on the Dee-bolts.
5) Attach the fuel pump filter (2) and the fuel filter cover (8) to the fuel pump (1) with the dee-bolts (11), washers (10), and nuts (9).
6) Install the torque-limiting bolt (13) and washer (4).

CAUTION: DO NOT TIGHTEN THE TORQUE-LIMITING BOLT BEFORE THE FUEL FILTER COVER IS FULLY ENGAGED INTO THE FUEL FILTER HOUSING. IF YOU TIGHTEN THE TORQUE-LIMITING BOLT BEFORE THE FUEL FILTER COVER IS FULLY ENGAGED, DAMAGE TO THE PACKING AND HELICOIL INSERT CAN OCCUR.

7) After the cover is completely engaged, loosen, and then symmetrically tighten the nuts (9) to 150-170 pound-inches (16.9-19.2 newton-meters) plus the torque to turn the nuts (9) through the self-locking quality.
8) After all nuts (9) are tightened, tighten the torque-limiting bolt (13) to 150-170 pound-inches (16.9-19.2 newton-meters) plus the torque necessary to turn the torque-limitng bolt (5) into the helicoil insert.

(e) ENGINES POST-PW-SB 73-104;
Install the fuel filter cover (8) with the steps that follow:

CAUTION: MAKE SURE YOU SYMMETRICALLY TIGHTEN THE NUTS TO ENGAGE THE FUEL FILTER COVER TO THE HOUSING. MONITOR THE INSTALLATION OF THE FUEL FILTER COVER AND MAKE SURE THE FUEL FILTER COVER ENGAGES THE HOUSING SYMMETRICALLY AND FREELY. IF YOU TIGHTEN THE NUTS TOO MUCH, DAMAGE TO THE PACKING CAN OCCUR.

1) Clean the threads of the dee-bolts (11) with the solvent (P11-004) .
   a) Make sure the threads of the dee-bolts (11) are dry before you install them.
2) Install the fuel pump filter (2) onto the tapered pins of the fuel filter cover (8).
3) Verify that the retaining rings (12) are properly placed on the dee-bolts (11).
4) Attach the fuel pump filter (2) and the fuel filter cover (8) to the fuel pump (1) with the dee-bolts (11), washers (10), and nuts (9).
5) Equally tighten the nuts (9) to symmetrically engage the fuel filter cover (8).
   a) Monitor the torque necessary to turn the nuts (9) through the self-locking quality.

6) After all nuts (9) are tightened, loosen and tighten the nuts (9) (one at a time) to 150-170 pound-inches (16.9-19.2 newton-meters) plus the torque necessary to turn the nuts (9) through the self-locking quality.

(f) Install the drain plug (6) as follows:
1) Lubricate the packing (7) with oil.
2) Install the packing (7) to the drain plug (6).
3) Lubricate the threads of the drain plug (6) with oil.
4) Install the drain plug (6) into the fuel filter cover (8).
a) Tighten the drain plug (6) to 45-55 pound-inches (5.1-6.2 newton-meters).
5) Safety the drain plug (6) with lockwire or safety cable and safety cable ferrule.

F. Return the Aircraft to its Usual Condition

S 414-026-N00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Close the right thrust reverser (AMM 78-31-00/201).

S 414-027-N00
(2) Close the right core cowl panel (AMM 71-11-06/201).

S 414-029-N00
(3) Close the right fan cowl panel (AMM 71-11-04/201).

S 444-060-N00
(4) Do the activation procedure for the thrust reversers (AMM 78-31-00/201).

S 864-030-N00
(5) For the left engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P6 panel:
(a) 6E1, FUEL VALVES L SPAR

S 864-031-N00
(6) For the right engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P6 panel:
(a) 6E2, FUEL VALVES R SPAR

S 864-032-N00
(7) For the left engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P11 panel:
(a) 11D25, FUEL CONT VLV & EEC CHAN B RESET L

S 864-033-N00

(8) For the right engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P11 panel:
(a) 11D26, FUEL CONT VLV & EEC CHAN B RESET R

S 714-061-N00

(9) Do the test for the Fuel Pump Filter that is shown in the Power Plant Test Reference Table (AMM 71-00-00/501).

FUEL PUMP FILTER - INSPECTION/CHECK

1. General
   A. This procedure examines the fuel pump filter for signs of damage or quantities of contamination.

TASK 73-11-02-206-001-N00

2. Fuel Pump Filter - Inspection
   A. References
      (1) AMM 73-11-02/401, Fuel Pump Filter

   B. Access
      (1) Location Zones
          416 L Power Plant Fan Reverser
          426 R Power Plant Fan Reverser

      (2) Access Panels
          416AR Fan Reverser (Right)
          426AR Fan Reverser (Right)

   C. Procedure

S 216-009-N00

      (1) Do the inspection of the fuel pump filter.
          (a) Remove the fuel pump filter (AMM 73-11-02/401).
          (b) If the fuel pump filter has a paper outer wrap, remove the paper outer wrap from around the fuel pump filter.
          (c) Examine the fuel filter element for signs of damage or contamination.
              1) Look for bronze color particles. If you find bronze particles (contamination), you must replace the fuel metering unit and fuel pump.

                 NOTE: Bronze particles are very small and can collect into larger particles. It is possible for bronze particles to collect at the bottom of the filter crease. An inspector can think that the bronze particles are synthetic bronze brazes, or welds. The fuel pump filter must get a full inspection. Look carefully at the crease bottom for bronze particles or an indication of bronze discoloration.

              2) If there is contamination, find the source of the contamination upstream of the fuel pump and repair as necessary.
          (d) Replace the fuel pump filter with a new fuel pump filter.

              NOTE: You cannot clean the fuel pump filter.

(e) Install the fuel pump filter (AMM 73-11-02/401).

FUEL DISTRIBUTION VALVE - REMOVAL/INSTALLATION

1. General
   A. This procedure contains the data to remove and install the fuel distribution valve. The fuel distribution valve is found at the 4 o'clock position on the rear case assembly (flanges J and K) of the high pressure compressor (HPC). The fuel distribution valve is installed on a bracket which is attached to the HPC.

   TASK 73-11-03-004-001-N00

2. Remove the Fuel Distribution Valve
   A. Equipment
      (1) Container - 1 gallon (4 liters), to catch the fuel
      (2) Jackscrew, 0.190-32 (2 necessary)
   B. References
      (1) AMM 24-22-00/201, Electrical Power - Control
      (2) AMM 71-11-04/201, Fan Cowl Panels
      (3) AMM 71-11-06/201, Core Cowl Panels
      (4) AMM 78-31-00/201, Thrust Reverser System
   C. Access
      (1) Location Zones
          210 Control Cabin
          411 Left Engine
          421 Right Engine

      (2) Access Panels
          414AR Fan Cowl Panel (Right), Left Engine
          416AR Thrust Reverser (Right), Left Engine
          418AR Core Cowl Panel (Right), Left Engine
          424AR Fan Cowl Panel (Right), Right Engine
          426AR Thrust Reverser (Right), Right Engine
          428AR Core Cowl Panel (Right), Right Engine

   D. Prepare to Remove the Fuel Distribution Valve

      S 864-003-N00
      (1) Supply electrical power (AMM 24-22-00/201).

      S 864-004-N00
      (2) Do these steps to make sure the applicable engine and spar valves are closed:
          (a) For the left engine, make sure this circuit breaker on the main power distribution panel, P6, is closed:
              1) 6E1, FUEL VALVES L SPAR
          (b) For the right engine, make sure this circuit breaker on the P6 panel is closed:
              1) 6E2, FUEL VALVES R SPAR
          (c) For the left engine, make sure this circuit breaker on the overhead panel, P11, is closed:
              1) 11D25, FUEL CONT VLV & EEC CHAN B RESET L

(d) For the right engine, make sure this circuit breaker on the P11 panel is closed:
1) 11D26, FUEL CONT VLV & EEC CHAN B RESET R
(e) Make sure the applicable FUEL CONTROL switch is in the CUTOFF position.
(f) Make sure the applicable ENG VALVE and SPAR VALVE panel lights on the control stand are off.

S 864-005-N00
(3) For the left engine, open this circuit breaker on the P6 panel and attach a DO-NOT-CLOSE tag:
(a) 6E1, FUEL VALVES L SPAR

S 864-006-N00
(4) For the right engine, open this circuit breaker on the P6 panel and attach a DO-NOT-CLOSE tag:
(a) 6E2, FUEL VALVES R SPAR

S 864-007-N00
(5) For the left engine, open this circuit breaker on the P11 panel and attach a DO-NOT-CLOSE tag:
(a) 11D25, FUEL CONT VLV & EEC CHAN B RESET L

S 864-008-N00
(6) For the right engine, open this circuit breaker on the P11 panel and attach a DO-NOT-CLOSE tag:
(a) 11D26, FUEL CONT VLV & EEC CHAN B RESET R

S 864-009-N00
(7) Remove electrical power (AMM 24-22-00/201).

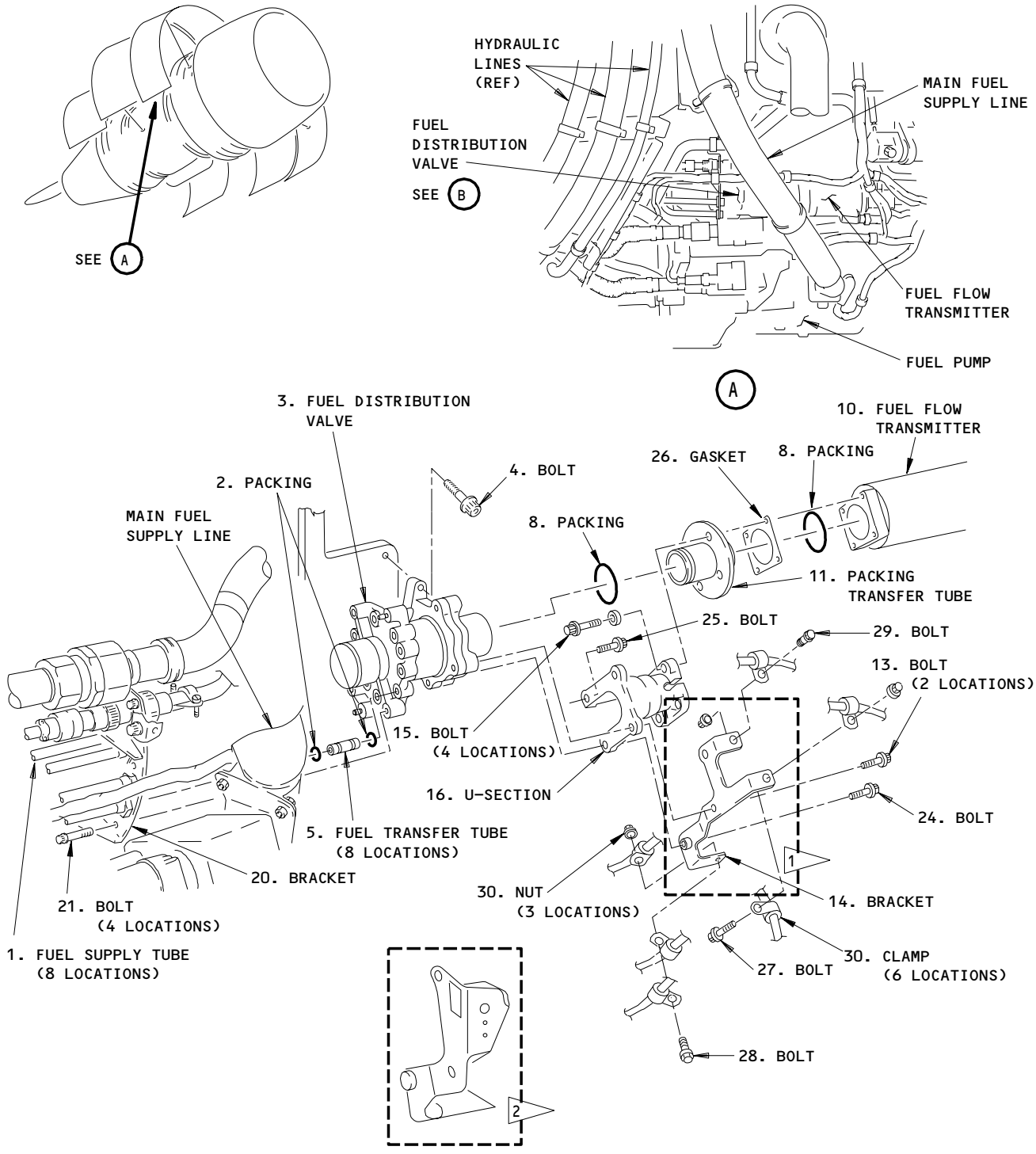
S 014-010-N00
(8) Open the right fan cowl panel (AMM 71-11-04/201).

S 044-011-N00

WARNING: DO THE THRUST REVERSER DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(9) Do this procedure : Thrust Reverser Deactivation for Ground Maintenance (AMM 78-31-00/201).

S 014-012-N00
(10) Open the right core cowl panel (AMM 71-11-06/201).



Fuel Distribution Valve Installation
Figure 401

S 014-013-N00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT COULD OCCUR.

(11) Open the right thrust reverser (AMM 78-31-00/201).

E. Procedure

S 024-039-N00

(1) Remove the fuel distribution valve (Fig. 401):
  (a) Remove the bolts (27, 28, 29) and nuts (30) which attach the clamps (30) for the wire harnesses to the bracket (14).
  (b) Put the container below the fuel distribution valve (3).
  (c) Do these steps to remove the U-section (16) from the engine:
    1) Remove the bolt (25) which attaches the U-section (16) to the fuel distribution valve (3).
    2) Remove the bolts (15) which attach the U-section (16) to the flange of the packing transfer tube (11).
    3) Remove the bolts (13, 24) which attach the U-section (16) and bracket (14) to the fuel distribution valve (3).
    4) Remove the U-section (16) and the bracket (14) from the engine.
  (d) Do these steps to remove the fuel distribution valve (3) from the engine:
    1) Move the packing transfer tube (11) aft until it touches the fuel distribution valve (3).
    2) Remove the bolt (4) which attaches the forward end of the fuel distribution valve (3) to the bracket on Flange J.
    3) Remove the bolts (21) which attach the fuel distribution valve (3) to the bracket (20) on flange K.
    4) Remove the fuel distribution valve (3) from the engine with two jackscrews.
    5) Remove the jackscrews.
  (e) Remove the fuel transfer tubes (5) from the adapter on each fuel supply tube (1). Discard the packings (2).
  (f) Remove the packing transfer tube (11) from the fuel distribution valve (3). Discard the packings (8).
  (g) Install caps on the openings of the supply tubes (1), the fuel distribution valve (3) and the fuel flow transmitter (10).

TASK 73-11-03-404-002-N00

3. Install the Fuel Distribution Valve

A. Consumable Materials

(1) D00137 Oil, PWA-521B
(2) D00250 Petroleum Jelly (P06-007)
(3) D00504 Petrolatum, White, PMC 9609
(4) G01505 Lockwire, Safety and Lock - NASM20995
(5) G02332 Ferrule - P05-292 (Optional)
(6) G02335 Cable, Safety - P05-291 (Optional)

B. Parts

AMM			AIPC		
FIG	ITEM	NOMENCLATURE	SUBJECT	FIG	ITEM
401	2	Packing	73-11-06	30	65
	3	Valve - Fuel Distribution	73-11-03	10	55
	8	Packing			35

C. References

(1) AMM 71-00-00/501, Power Plant
(2) AMM 71-11-04/201, Fan Cowl Panels
(3) AMM 71-11-06/201, Core Cowl Panels
(4) AMM 78-31-00/201, Thrust Reverser System

D. Access

(1) Location Zones

210 Control Cabin
411 Left Engine
421 Right Engine

(2) Access Panels

414AR Fan Cowl Panel (Right), Left Engine
416AR Thrust Reverser (Right), Left Engine
418AR Core Cowl Panel (Right), Left Engine
424AR Fan Cowl Panel (Right), Right Engine
426AR Thrust Reverser (Right), Right Engine
428AR Core Cowl Panel (Right), Right Engine

E. Procedure

S 424-040-N00

(1) Install the fuel distribution valve (Fig. 401):
  (a) Remove the caps from all openings.
  (b) Install two packings (2) lubricated with petroleum jelly to each fuel transfer tube (5).
  (c) Install the fuel transfer tubes (5) to each adapter on the fuel supply tubes (1) on the bracket (20) at flange K.
  (d) Install packings (8) lubricated with petrolatum to the packing transfer tube (11).
  (e) Install the longer end of the packing transfer tube (11) in the fuel distribution valve (3).
  (f) Do these steps to install the fuel distribtuion valve (3):
    1) Put the fuel distribution valve (3) in the correct position on the fuel transfer tubes (5).

      NOTE: Make sure the pins on the fuel distribution valve (3) align with the holes in the bracket (20) and the front mount aligns with the hole in the bracket on flange J.

    2) ENGINES PRE-PW-SB 73-170;
      Do the steps that follow:
      a) Lubricate the bolts (21) with engine oil.
      b) Attach the fuel distribution valve (3) to the bracket (20) on flange K with the bolts (21).

        NOTE: Engines PRE-PW-SB 73-170 have bolts (21) that are too short to reliably engage the helicoil locking feature. The threads of the bolts (21) are not coated with anti-gallant material.

      c) Tighten the bolts (21) to 85-95 pound-inches (9.6-10.7 newton-meters).

3) ENGINES POST-PW-SB 73-170;
Do the steps that follow:
a) Attach the fuel distribution valve (3) to the bracket (20) on flange K with the bolts (21).

NOTE: Engines POST-PW-SB 73-170 have bolts (21) of sufficient length to reliably engage the helicoil locking feature. The threads of the bolts (21) are coated with anti-gallant material. Do not apply engine oil to the threads of the four bolts (21).

b) Tighten the four bolts (21) to 62-72 pound-inches (7.0-8.1 newton-meters).
4) Lubricate the bolts (4) with engine oil.
5) Attach the fuel distribution valve (3) to the bracket at flange J with the bolts (4).
a) Tighten the bolts (4) to 85-95 pound-inches (9.6-10.7 newton-meters).

(g) Do these steps to install the U-section (16) on the packing transfer tube (11):
1) Move the packing transfer tube (11) forward until the flange touches the fuel flow transmitter (10).

NOTE: Make sure the alignment pin engages the seal plate (26) and the recess in the packing transfer tube (11).

2) Lubricate the bolts (13, 24) with engine oil.
3) Attach the bracket (14) and the U-section (16) to the fuel distribution valve (3) with the bolts (13, 24).
a) Tighten the bolts (13, 24) to 85-95 pound-inches (9.6-10.7 newton-meters).
4) Lubricate the bolt (25) with engine oil.
5) Attach the U-section (16) to the fuel distribution valve (3) with the bolt (25).
a) Tighten the bolt (25) to 85-95 pound-inches (9.6-10.7 newton-meters).
6) Lubricate the bolts (15) with engine oil.
7) Attach the U-section (16) to the packing transfer tube (11) with the bolts (15).
a) Tighten the bolts (15) to 85-95 pound-inches (9.6-10.7 newton-meters).
8) Safety the bolts (15) with lockwire or safety cable and safety cable ferrule.

(h) Attach the clamps of the wire harnesses to the bracket (14) with the bolts (27, 28, 29) and nuts (30).
1) Tighten the nuts (30) to 36-40 pound-inches (4.0-4.5 newton-meters).

F. Return the Aircraft to Its Usual Condition

S 414-029-N00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT COULD OCCUR.

(1) Close the right thrust reverser (AMM 78-31-00/201).

S 414-030-N00
(2) Close the right core cowl panel (AMM 71-11-06/201).

S 414-032-N00
(3) Close the right fan cowl panel (AMM 71-11-04/201).

S 444-031-N00
(4) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

S 864-033-N00
(5) For the left engine, remove the DO-NOT-CLOSE tag and close the this circuit breaker on the P6 panel:
(a) 6E1, FUEL VALVES L SPAR

S 864-034-N00
(6) For the right engine, remove the DO-NOT-CLOSE tag and close the this circuit breaker on the P6 panel:
(a) 6E2, FUEL VALVES R SPAR

S 864-035-N00
(7) For the left engine, remove the DO-NOT-CLOSE tag and close the this circuit breaker on the P11 panel:
(a) 11D25, FUEL CONT VLV & EEC CHAN B RESET L

S 864-036-N00
(8) For the right engine, remove the DO-NOT-CLOSE tag and close the this circuit breaker on the P11 panel:
(a) 11D26, FUEL CONT VLV & EEC CHAN B RESET R

S 714-037-N00
(9) Do the test for the fuel distribution valve which is shown in the Power-Plant Test-Reference Table (AMM 71-00-00/501).

FUEL DISTRIBUTION VALVE STRAINER - REMOVAL/INSTALLATION

1. General
   A. The strainer for the fuel distribution valve is installed forward of the fuel distribution valve, which is found below the right half thrust reverser.

TASK 73-11-04-004-001-N00

2. Remove the Fuel Distribution Valve Strainer (Fig. 401)
   A. Equipment
      (1) Container - 1 gallon (4 liters), to collect fuel
      (2) PWA 86459 Puller
   B. References
      (1) AMM 24-22-00/201, Electrical Power - Control
      (2) AMM 71-11-04/201, Fan Cowl Panels
      (3) AMM 71-11-06/201, Core Cowl Panels
      (4) AMM 73-11-04/601, Fuel Distribution Valve Strainer
      (5) AMM 73-11-04/701, Fuel Distribution Valve Strainer
      (6) AMM 78-31-00/201, Thrust Reverser System
   C. Access
      (1) Location Zones
          411 Left Engine
          421 Right Engine

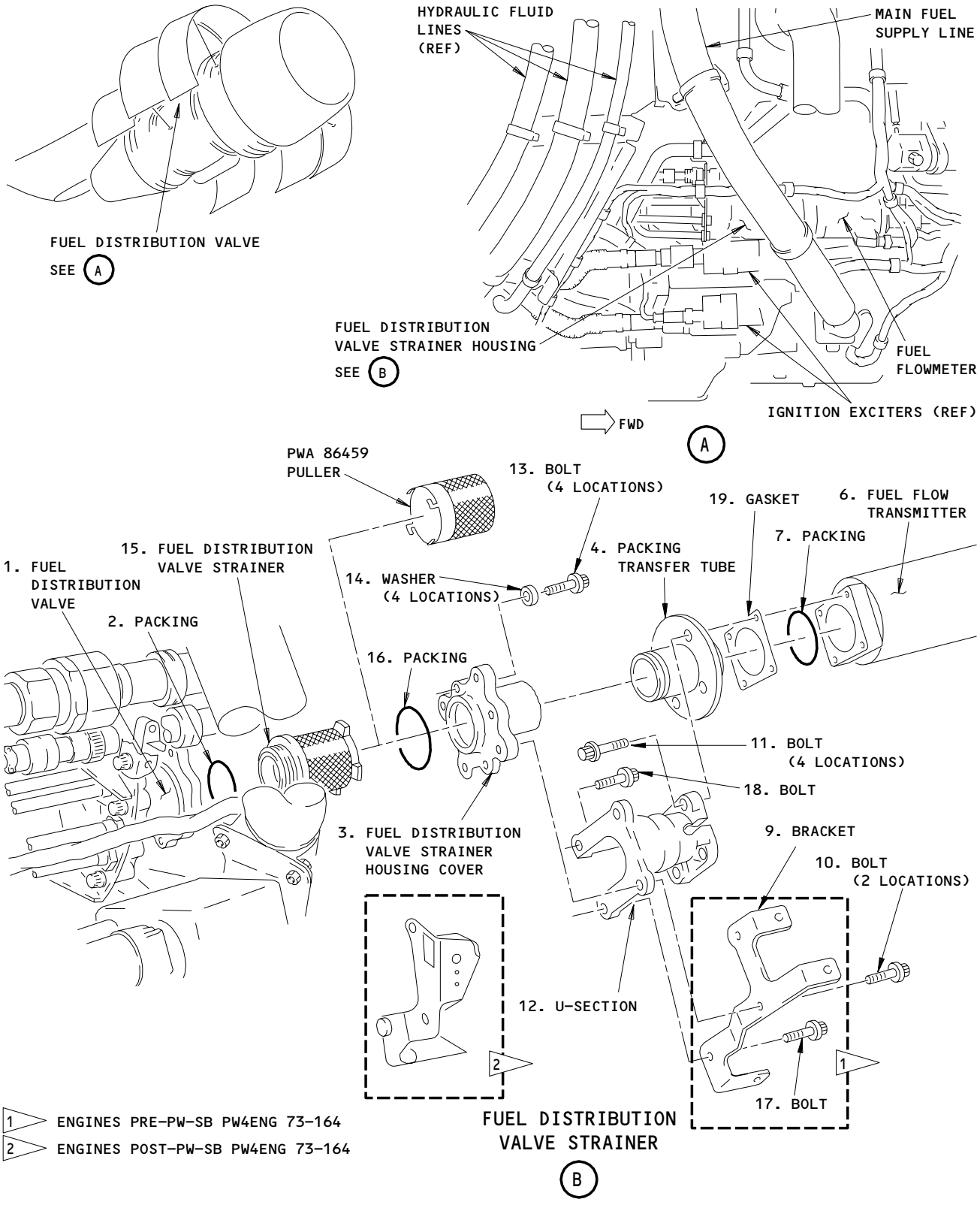
      (2) Access Panels
          414AR Fan Cowl Panel (Right), Left Engine
          416AR Fan Reverser (Right), Left Engine
          418AR Core Cowl Panel (Right), Left Engine
          424AR Fan Cowl Panel (Right), Right Engine
          426AR Fan Reverser (Right), Right Engine
          428AR Core Cowl Panel (Right), Right Engine

   D. Prepare to Remove the Fuel Distribution Valve Strainer

      S 864-002-N00
      (1) Supply electrical power (AMM 24-22-00/201).

      S 864-003-N00
      (2) For the left engine, make sure this circuit breaker on the main power distribution panel, P6, is closed:
          (a) 6E1, FUEL VALVES L SPAR

      S 864-004-N00
      (3) For the right engine, make sure this circuit breaker on the main power distribution panel, P6, is closed:
          (a) 6E2, FUEL VALVES R SPAR



Fuel Distribution Valve Strainer Installation
Figure 401

S 864-005-N00
(4) For the left engine, make sure this circuit breaker on the main power distribution panel, P6, is closed:
(a) 11D25, FUEL CONT VLV & EEC CHAN B RESET L

S 864-006-N00
(5) For the right engine, make sure this circuit breaker on the main power distribution panel, P6, is closed:
(a) 11D26, FUEL CONT VLV & EEC CHAN B RESET R

S 864-007-N00
(6) Make sure the applicable FUEL CONTROL switch is in the cutoff position.

S 864-008-N00
(7) Make sure the applicable ENG VALVE and SPAR VALVE panel lights on the control stand are off.

S 864-009-N00
(8) For the left engine, open this circuit breaker on the main power distribution panel, P6, and attach the DO-NOT-CLOSE tag:
(a) 6E1, FUEL VALVES L SPAR

S 864-010-N00
(9) For the right engine, open this circuit breaker on the main power distribution panel, P6, and attach the DO-NOT-CLOSE tag:
(a) 6E2, FUEL VALVES R SPAR

S 864-011-N00
(10) For the left engine, open this circuit breaker on the main power distribution panel, P6, and attach the DO-NOT-CLOSE tag:
(a) 11D25, FUEL CONT VLV & EEC CHAN B RESET L

S 864-012-N00
(11) For the right engine, open this circuit breaker on the main power distribution panel, P6, and attach the DO-NOT-CLOSE tag:
(a) 11D26, FUEL CONT VLV & EEC CHAN B RESET R

S 864-013-N00
(12) Remove the electrical power (AMM 24-22-00/201).

S 014-014-N00
(13) Open the right fan cowl panel (AMM 71-11-04/201).

S 044-015-N00

WARNING: DO THE THRUST REVERSER DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(14) Do this procedure: Thrust Reverser Deactivation for Ground Maintenance (AMM 78-31-00/201).

S 014-016-N00

(15) Open the right core cowl panel (AMM 71-11-06/201).

S 014-017-N00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(16) Open the right thrust reverser (AMM 78-31-00/201).

E. Procedure

S 024-059-N00

(1) Remove the strainer from the fuel distribution valve:
  (a) Put the container below the fuel distribution valve (1).
  (b) Remove the bolts (10, 11, 17, 18) which attach the U-section (12) and bracket (9) to the front and rear flanges of the packing transfer tube (4).
  (c) Remove the U-section (12) from the engine.
  (d) Move the packing transfer tube (4) aft until it touches the fuel distribution valve (1).
  (e) Remove the remaining bolts (13) that attach the housing cover (3) to the fuel distribution valve (1).
  (f) Remove the packing transfer tube (4) and the housing cover (3) from the engine.
    1) Discard the packings (7, 16).

CAUTION: YOU MUST USE THE PWA 86459 PULLER TO REMOVE THE STRAINER. IF YOU DO NOT USE THE PWA 86459 PULLER, YOU CAN CAUSE DAMAGE TO THE STRAINER.

(g) Remove the strainer (15) from the fuel distribution valve (1) with the steps that follow:
1) Engage the PWA 86459 puller to the strainer (15).
2) Pull the strainer (15) from the fuel distribution valve (1).
3) Disengage the PWA 86459 puller from the strainer (15).
4) Remove the PWA 86459 puller and the strainer (15) from the engine one at a time.
a) Discard the packing (2).

(h) Install the protection caps.

S 214-026-N00

(2) Do the inspection of the fuel distribution-valve strainer (15) (AMM 73-11-04/601).

S 114-027-N00

(3) If necessary, clean the strainer (15) (AMM 73-11-04/701).

TASK 73-11-04-404-028-N00

3. Install the Fuel Distribution Valve Strainer (Fig. 401)

A. Consumable Materials
(1) D00137 Engine Oil - PWA-521
(2) D00504 Petrolatum - PMC 9609
(3) G01505 Lockwire, Safety and Lock - NASM20995
(4) G02332 Ferrule - P05-292 (Optional)
(5) G02335 Cable - Safety - P05-291 (Optional)

B. Parts

AMM		NOMENCLATURE	AIPC		
FIG	ITEM		SUBJECT	FIG	ITEM
401	2	Packing	73-11-04	01	30
	7	Packing	73-11-03	10	35
	15	Strainer	73-11-04	01	25
	16	Packing			20

C. References
(1) AMM 71-00-00/501, Power Plant
(2) AMM 71-11-04/201, Fan Cowl Panels
(3) AMM 71-11-06/201, Core Cowl Panels
(4) AMM 78-31-00/201, Thrust Reverser System

D. Access
(1) Location Zones
411 Left Engine
421 Right Engine

(2) Access Panels
414AR Fan Cowl Panel (Right), Left Engine
416AR Fan Reverser (Right), Left Engine
418AR Core Cowl Panel (Right), Left Engine
424AR Fan Cowl Panel (Right), Right Engine
426AR Fan Reverser (Right), Right Engine
428AR Core Cowl Panel (Right), Right Engine

E. Procedure

S 424-060-N00
(1) Install the strainer in the fuel distribution valve:
(a) Remove the protection caps.
(b) Lubricate the packing (2) with petrolatum.
(c) Install the packing (2) into the groove on the end of the strainer (15).
(d) Install the strainer (15) to the ID of the fuel distribution valve (1).
(e) Lubricate the packings (7) with petrolatum.
(f) Install the packing (7) to the packing transfer tube (4).
(g) Install the packing transfer tube (4) to the housing cover (3) for the fuel distribution valve (1).
(h) Lubricate the packing (16) with petrolatum.
(i) Install the packing into the housing cover (3).
(j) Lubricate the threads of the bolts (13) with engine oil.

(k) Install the housing cover (3) to the fuel distribution valve (1) with the bolts (13).

NOTE: The retaining bolts for the housing cover are found on the four sides of the housing cover. You must install the retaining bolts at the four corners after you put the packing transfer tube in its position.

1) Tighten the bolts (13) to 30-33 pound-inches (3.4-3.7 newton-meters).

(l) Extend the packing transfer tube (4) forward until the forward flange is against the fuel flow transmitter (6).

NOTE: Make sure the gasket (19) is in the correct position against the fuel flow transmitter and the bolt holes and dowel pin are aligned.

(m) Lubricate the threads of the bolts (10, 11, 17, 18) with engine oil.

(n) Hold the U-section (12) and bracket (9) in position against the packing transfer tube (4) and the housing cover (3).

(o) Install the bolts (10, 11, 17, 18) to attach the housing cover (3) and the packing transfer tube (4).
1) Tighten the bolts (10, 11, 17, 18) to 85-95 pound-inches (9.6-10.7 newton-meters).

(p) Safety the bolts with lockwire or safety cable and safety cable ferrule.

F. Return the Aircraft to Its Usual Condition

S 864-044-N00

(1) For the left engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P6 panel:
(a) 6E1, FUEL VALVES L SPAR

S 864-045-N00

(2) For the right engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P6 panel:
(a) 6E2, FUEL VALVES R SPAR

S 864-046-N00
(3) For the left engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P11 panel:
(a) 11D25, FUEL CONT VLV & EEC CHAN B RESET L

S 864-047-N00
(4) For the right engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P11 panel:
(a) 11D26, FUEL CONT VLV & EEC CHAN B RESET R

S 414-048-N00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(5) Close the right thrust reverser (AMM 78-31-00/201).

S 414-049-N00
(6) Close the right core cowl panel (AMM 71-11-06/201).

S 414-050-N00
(7) Close the right fan cowl panel (AMM 71-11-04/201).

S 444-051-N00
(8) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

S 714-052-N00
(9) Do the test of the fuel distribution valve strainer that is shown in the Power Plant Test Reference Table (AMM 71-00-00/501).

FUEL DISTRIBUTION VALVE STRAINER - INSPECTION/CHECK

1. General
   A. This procedure examines the strainer for the fuel distribution valve for signs of damage and contamination which has collected.

TASK 73-11-04-206-001-N00

2. Do the Inspection of the Fuel Distribution Valve Strainer
   A. References
      (1) AMM 73-11-02/601, Fuel Pump Filter
      (2) AMM 73-11-04/401, Fuel Distribution Valve Strainer
      (3) AMM 73-11-04/701, Fuel Distribution Valve Strainer
   B. Access
      (1) Location Zones
          416 L Power Plant Fan Reverser
          426 R Power Plant Fan Reverser

      (2) Access Panels
          416AR Fan Reverser (Right)
          426AR Fan Reverser (Right)

   C. Examine the Strainer for the Fuel Distribution Valve

      S 026-002-N00
      (1) Remove the strainer for the fuel distribution valve (AMM 73-11-04/401).

      S 226-003-N00
      (2) Examine the strainer for signs of damage or contamination which has collected.

      S 116-004-N00
      (3) Clean the strainer (AMM 73-11-04/701).

      S 966-005-N00
      (4) If there are signs of damage, replace with a new strainer.

      S 226-006-N00
      (5) If there is a large quantity of contamination, examine the fuel pump filter (AMM 73-11-02/601) which is upstream.

      S 426-007-N00
      (6) Install the strainer (AMM 73-11-04/401).

FUEL DISTRIBUTION VALVE STRAINER - CLEANING/PAINTING

1. General
   A. This procedure has two tasks:
      (1) A cleaning procedure for strainers that have small quantities of contamination.
      (2) A cleaning procedure for strainers that have large quantities of contamination.

TASK 73-11-04-107-001-N00

2. Clean Fuel Distribution Valve Strainer (Small Quantities of Contamination)
   A. Standard Tools and Equipment
      (1) Container - 1 gallon (4 liter) volume (for petroleum solvent)
      (2) Air Source - Compressed Dry Filtered
   B. Consumable Materials
      (1) B00074 Solvent, Petroleum - PMC 9001
   C. References
      (1) AMM 73-11-04/401, Fuel Distribution Valve Strainer
      (2) AMM 73-11-04/601, Fuel Distribution Valve Strainer
   D. Access
      (1) Location Zones
          411 Left Engine
          421 Right Engine

      (2) Access Panels
          414AR Fan Cowl Panel (Right), Left Engine
          416AR Thrust Reverser (Right), Left Engine
          418AR Core Cowl (Right), Left Engine
          424AR Fan Cowl Panel (Right), Right Engine
          426AR Thrust Reverser (Right), Right Engine
          428AR Core Cowl (Right), Right Engine

   E. Prepare to Clean the Fuel Distribution-Valve Strainer

      S 027-014-N00
      (1) Do this task: "Fuel Distribution-Valve Strainer Removal" (AMM 73-11-04/401).

S 217-015-N00
(2) Do this task: "Fuel Distribution-Valve Strainer Inspection" (AMM 73-11-04/601).

F. Procedure

S 167-017-N00

CAUTION: DO NOT USE A WIRE BRUSH, PROBE OR OTHER DEVICE TO CLEAN THE STRAINER. THESE DEVICES CAN CAUSE DAMAGE TO THE WIRE MESH SCREEN OF THE STRAINER.

CAUTION: DO NOT USE PAPER TO CLEAN OR DRY THE PARTS. LINT OR PIECES FROM THE PAPER CAN CAUSE CONTAMINATION OF THE FUEL SYSTEM.

(1) Clean the fuel distribution-valve strainer (small quantity of contamination)
(a) Put the strainer in a container filled with petroleum solvent and move the strainer around quickly.

WARNING: MAKE SURE YOU WEAR PROTECTIVE GOGGLES OR A FACE SHIELD WHEN YOU USE COMPRESSED AIR. THE AIR PRESSURE MUST BE LESS THAN 30 PSI (200 KPA). COMPRESSED AIR CAN CAUSE INJURY TO PERSONS.

(b) Clean all remaining particles from the strainer with dry compressed air with a maximum pressure of 30 psi (200 kPa).
(c) Examine the strainer for contamination with the steps that follow:
1) Hold a light in or behind the strainer to make sure the strainer is clean.
2) If the strainer is not clean, do the cleaning procedure of the strainer again.
3) Replace the strainer if the inspection shows that the contamination stays on more than approximately 10 percent of the strainer.

G. Return the Aircraft to Its Usual Condition

S 427-016-N00
(1) Do this task: "Fuel Distribution Valve Strainer Installation" (AMM 73-11-04/401).

TASK 73-11-04-117-007-N00

3. Clean Fuel Distribution Valve Strainer (Large Quantities of Contamination)

A. Standard Tools and Equipment
(1) Container - 1 gallon (4 liter) volume (for petroleum solvent)
(2) Air Source - Compressed Dry Filtered

B. Consumable Materials
(1) B00074 Solvent, Petroleum - PMC 9001
(2) G00371 Brush - Soft Bristle

C. References
(1) AMM 73-11-04/401, Fuel Distribution Valve Strainer
(2) AMM 73-11-04/601, Fuel Distribution Valve Strainer

D. Access
(1) Location Zones
411 Left Engine
421 Right Engine

(2) Access Panels
414AR Fan Cowl Panel (Right), Left Engine
416AR Thrust Reverser (Right), Left Engine
418AR Core Cowl (Right), Left Engine
424AR Fan Cowl Panel (Right), Right Engine
426AR Thrust Reverser (Right), Right Engine
428AR Core Cowl (Right), Right Engine

E. Prepare to Clean the Fuel Distribution-Valve Strainer

S 027-018-N00
(1) Do this task: "Fuel Distribution-Valve Strainer Removal" (AMM 73-11-04/401).

S 217-019-N00
(2) Do this task: "Fuel Distribution-Valve Strainer Inspection" (AMM 73-11-04/601).

F. Procedure

S 167-020-N00

CAUTION: DO NOT USE A WIRE BRUSH, PROBE OR OTHER DEVICE TO CLEAN THE STRAINER. THESE DEVICES CAN CAUSE DAMAGE TO THE WIRE MESH SCREEN OF THE STRAINER.

CAUTION: DO NOT USE PAPER TO CLEAN OR DRY THE PARTS. LINT OR PIECES FROM THE PAPER CAN CAUSE CONTAMINATION OF THE FUEL SYSTEM.

(1) Clean the fuel distribution-valve strainer (large quantity of contamination)
(a) Put the strainer in a container filled with Petroleum Solvent and let the strainer soak for ten minutes.

(b) Remove the strainer from the container.
(c) Remove the contamination from the wire mesh screen with a soft bristle brush.
(d) Put the strainer back in the container with petroleum solvent and move the strainer around quickly.

WARNING: MAKE SURE YOU WEAR PROTECTIVE GOGGLES OR A FACE SHIELD WHEN YOU USE COMPRESSED AIR. THE AIR PRESSURE MUST BE LESS THAN 30 PSI (200 KPA). COMPRESSED AIR CAN CAUSE INJURY TO PERSONS.

(e) Clean all remaining particles from the strainer with dry compressed air with a maximum pressure of 30 psi (200 kPa).
(f) Examine the strainer for contamination with the steps that follow:
1) Hold a light in or behind the strainer to make sure the strainer is clean.
2) If the strainer is not clean, do the cleaning procedure of the strainer again.
3) Replace the strainer if the inspection shows that the contamination stays on more than approximately 10 percent of the strainer.

G. Return the Aircraft to Its Usual Condition

S 427-021-N00
(1) Do this task: "Fuel Distribution Valve Strainer Installation" (AMM 73-11-04/401).

FUEL INJECTOR AND SUPPORT - REMOVAL/INSTALLATION

1. General
   A. The eight fuel supply manifolds give fuel to eight groups of three fuel injectors. You can get access to the fuel injectors through the thrust reversers.

   TASK 73-11-05-004-001-N00

2. Remove the Fuel Injector and Support
   A. References
      (1) AMM 24-11-01/401, Integrated Drive Generator
      (2) AMM 24-22-00/201, Electrical Power - Control
      (3) AMM 29-11-05/401, Engine-Driven Pump
      (4) AMM 71-11-04/201, Fan Cowl Panels
      (5) AMM 71-11-06/201, Core Cowl Panels
      (6) AMM 73-11-00/601, Fuel Distribution System
      (7) AMM 75-24-02/401, Turbine-Vane and Blade Cooling Air-Duct
      (8) AMM 78-31-00/201, Thrust Reverser System
      (9) AMM 79-11-01/401, Oil Tank
      (10) AMM 80-11-01/401, Starter
   B. Access
      (1) Location Zones
          415 L Power Plant Fan Reverser
          416 L Power Plant Fan Reverser
          425 R Power Plant Fan Reverser
          426 R Power Plant Fan Reverser

      (2) Access Panels
          415AL Fan Reverser (Left)
          416AR Fan Reverser (Right)
          425AL Fan Reverser (Left)
          426AR Fan Reverser (Right)

   C. Procedure

      S 864-090-N00
      (1) Do these steps to prepare the engine for the removal of the fuel injector and support:
          (a) Supply electrical power (AMM 24-22-00/201).

(b) For the left engine, make sure this circuit breaker on the main power distribution panel, P6, is closed:
1) 6E1, FUEL VALVES L SPAR
(c) For the right engine, make sure this circuit breaker on the main power distribution panel, P6, is closed:
1) 6E2, FUEL VALVES R SPAR
(d) For the left engine, make sure this circuit breaker on the overhead circuit breaker panel, P11, is closed:
1) 11D25, FUEL CONT VLV & EEC CHAN B RESET L
(e) For the right engine, make sure this circuit breaker on the overhead circuit breaker panel, P11, is closed:
1) 11D26, FUEL CONT VLV & EEC CHAN B RESET R
(f) Make sure the applicable FUEL CONTROL switch is in the CUTOFF position.
(g) Make sure the applicable ENG VALVE and SPAR VALVE panel lights on the control stand are off.
(h) For the left engine, open this circuit breaker on the main power distribution panel, P6, and attach the DO-NOT-CLOSE tag:
1) 6E1, FUEL VALVES L SPAR
(i) For the right engine, open this circuit breaker on the main power distribution panel, P6, and attach the DO-NOT-CLOSE tag:
1) 6E2, FUEL VALVES R SPAR
(j) For the left engine, open this circuit breaker on the overhead circuit breaker panel, P11, and attach the DO-NOT-CLOSE tag:
1) 11D25, FUEL CONT VLV & EEC CHAN B RESET L
(k) For the right engine, open this circuit breaker on the overhead circuit breaker panel, P11, and attach the DO-NOT-CLOSE tag:
1) 11D26, FUEL CONT VLV & EEC CHAN B RESET R
(l) Remove electrical power (AMM 24-22-00/201).

S 014-014-N00

(2) Open the fan cowl panels (AMM 71-11-04/201).

S 044-015-N00

WARNING: DO THE THRUST REVERSER DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(3) Do this procedure: Thrust Reverser Deactivation for Ground Maintenance (AMM 78-31-00/201).

S 014-016-N00

(4) Open the core cowl panels (AMM 71-11-06/201).

S 014-017-N00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(5) Open the thrust reversers (AMM 78-31-00/201).

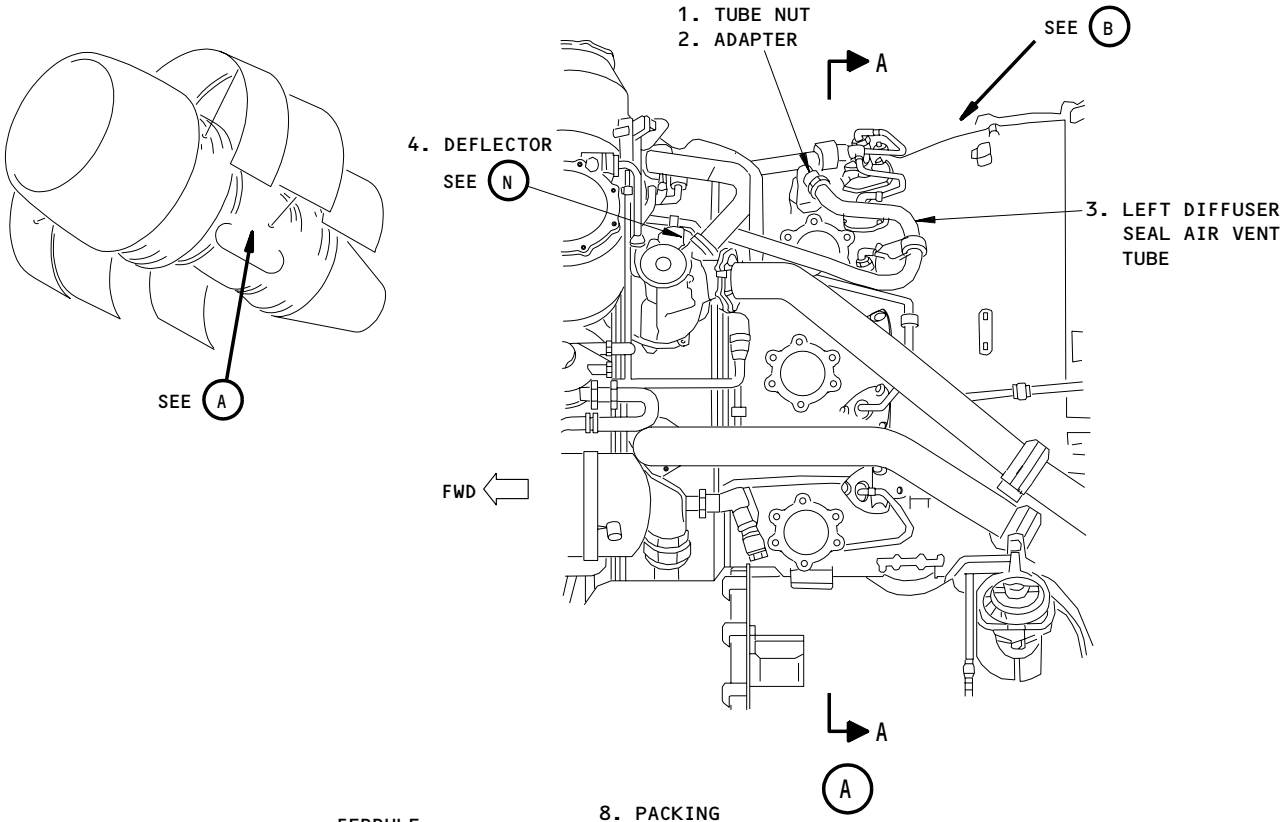
D. Remove the Fuel Injector and Support (Fig. 401)

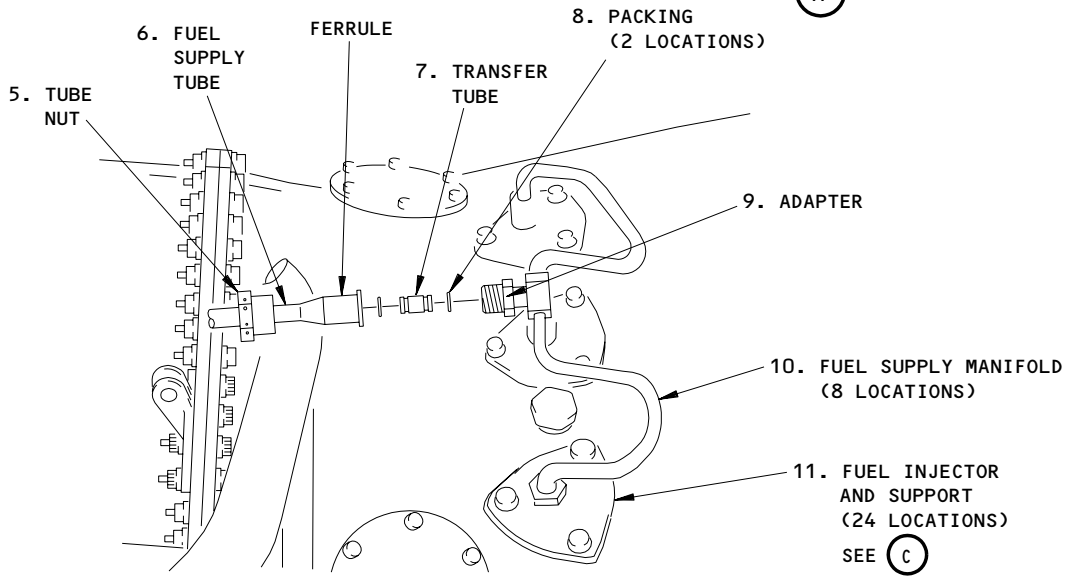
S 014-091-N00

(1) To get access to the fuel injector 2, do the steps that follow (View D, Fig. 401):
   (a) Remove the bolt (30) and nut (32) from the clamp (31) and the bracket (2).
   (b) Remove the bolts (17) which attach the bracket (12) to the fuel injector (11).
   (c) Remove the bracket (12) from the engine.

S 014-092-N00

(2) To get access to the fuel injector 4 or 5, do the steps that follow (View E, Fig. 401):
   (a) Remove the bolts (38) from the triangle support (36).
   (b) Remove the triangle support (36) from the engine.
   (c) For the fuel injector 4, remove the bracket (23) with the steps that follow:
      1) Remove the bolts (17) which attach the bracket (23) and the fuel injector (11) to the engine.
      2) Remove the bracket (23) from the engine.
   (d) For the fuel injector 5, remove the brackets (22, 24) with the steps that follow:
      1) Remove the bolt (35) which attaches the turnbuckle (33) to the bracket (22).

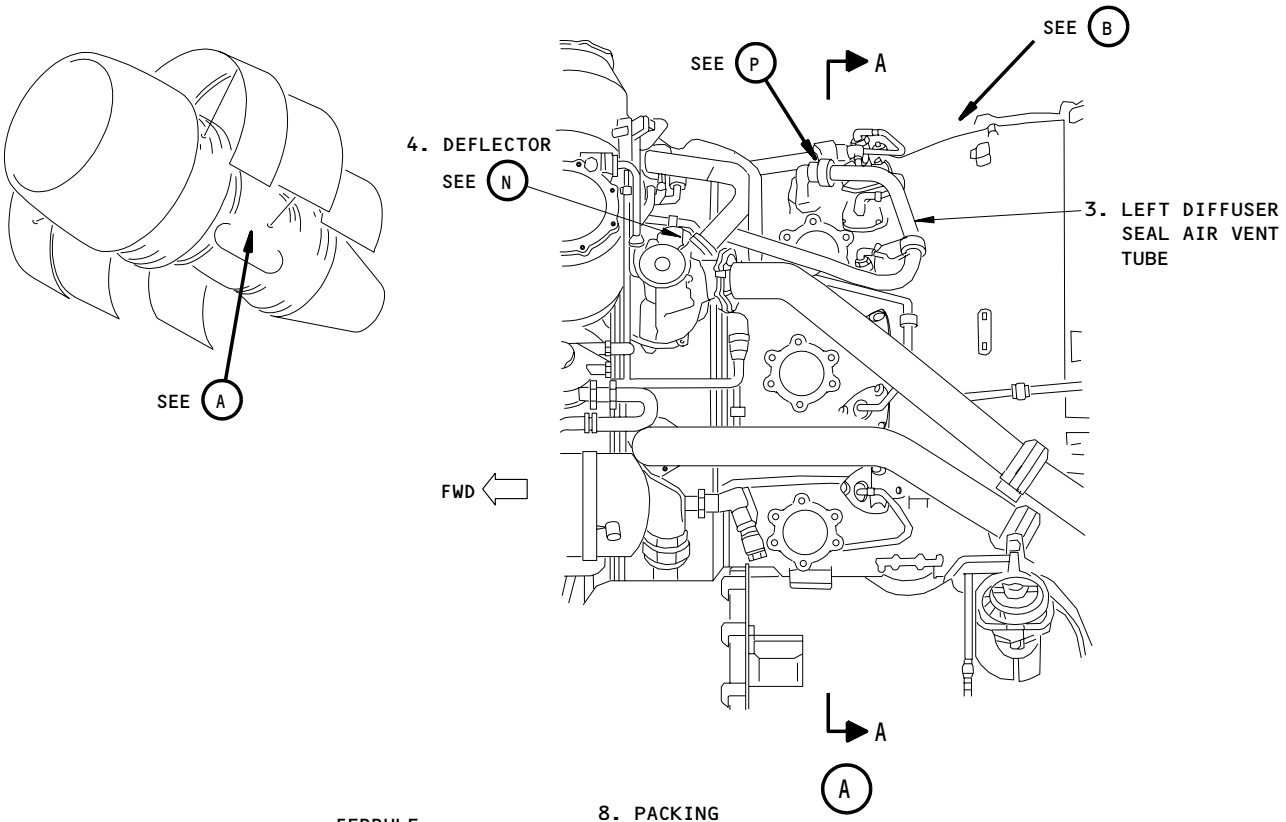


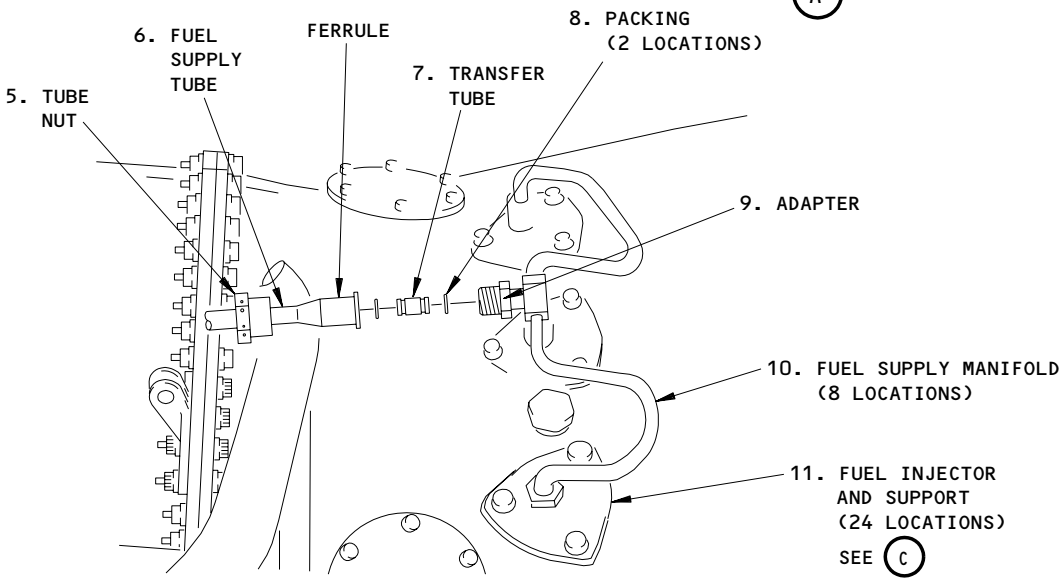


(EXAMPLE, 8 LOCATIONS)
B

ENGINES PRE-PW SB 72-567

Fuel Injector and Support Installation
Figure 401 (Sheet 1)



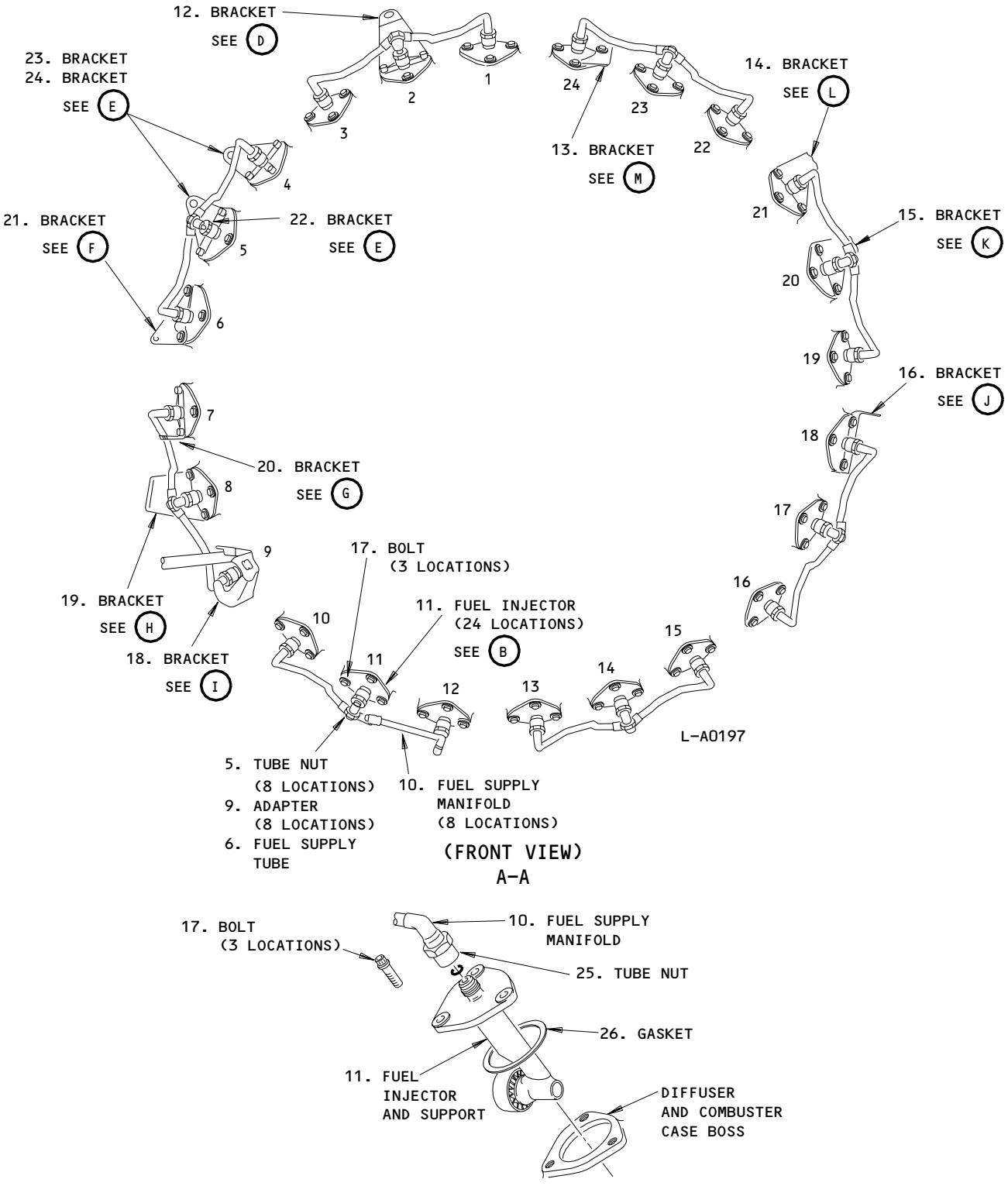


(EXAMPLE, 8 LOCATIONS)

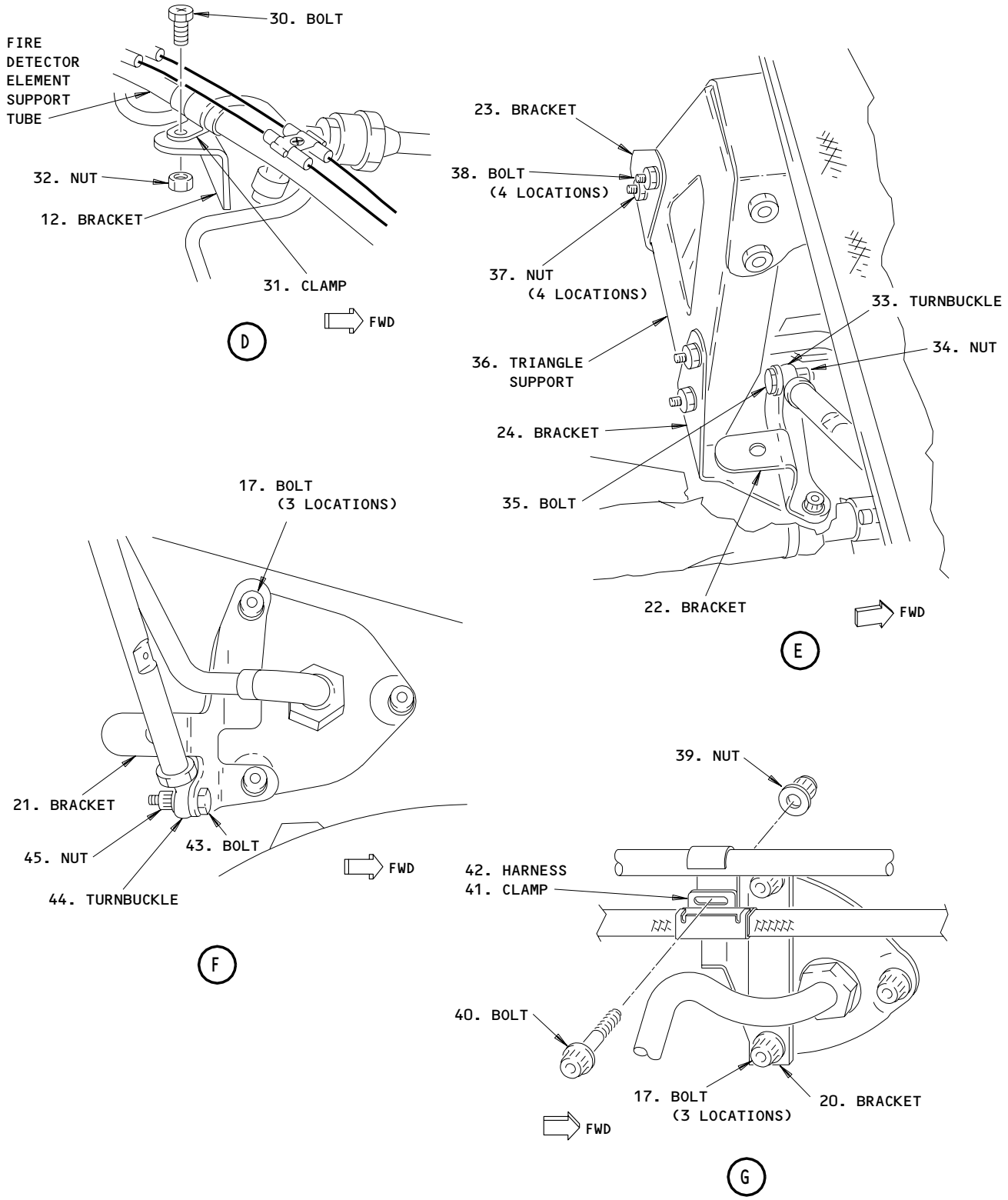
B

ENGINES POST-PW SB 72-567

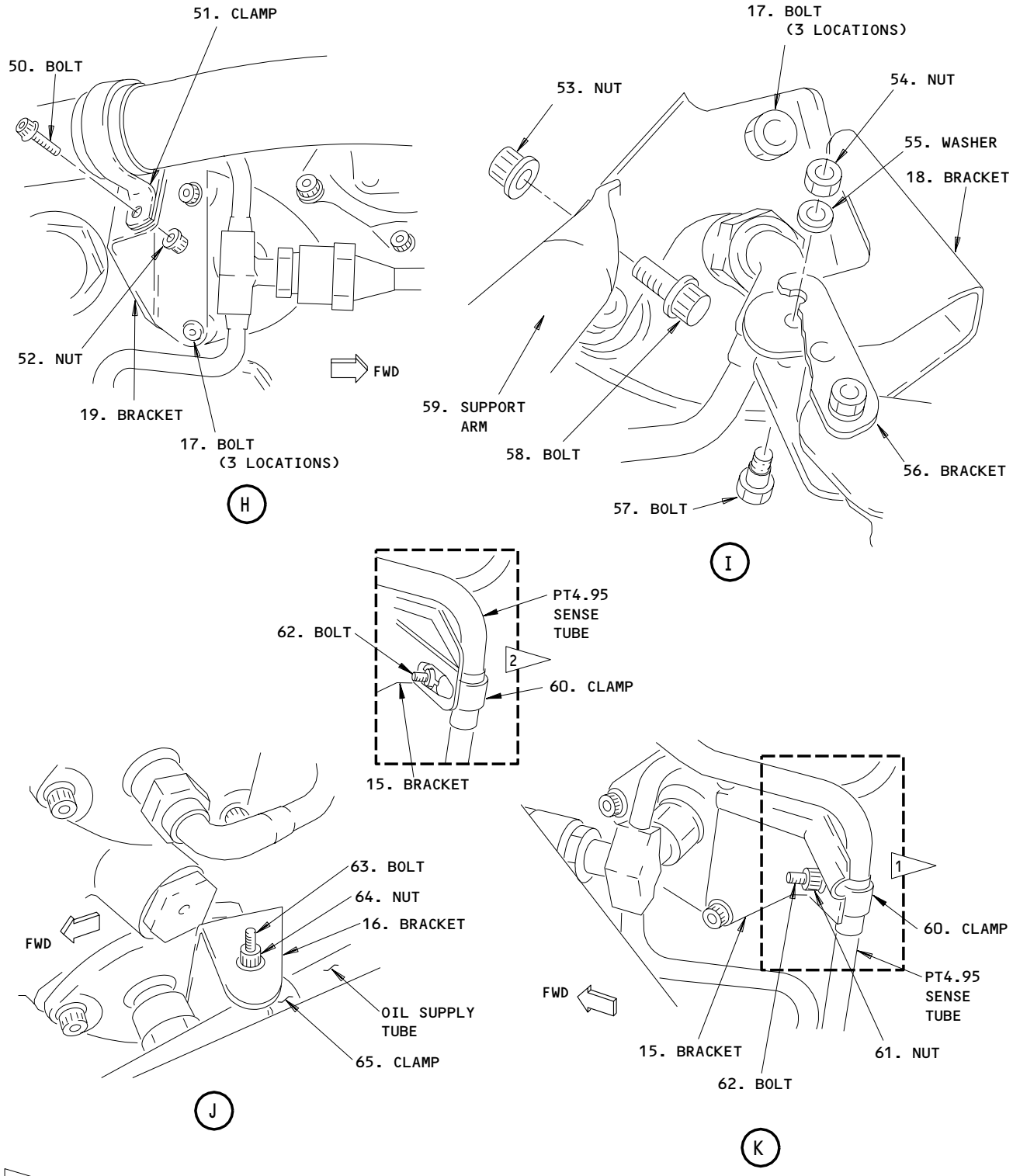
Fuel Injector and Support Installation
Figure 401 (Sheet 2)



Fuel Injector and Support Installation
Figure 401 (Sheet 3)

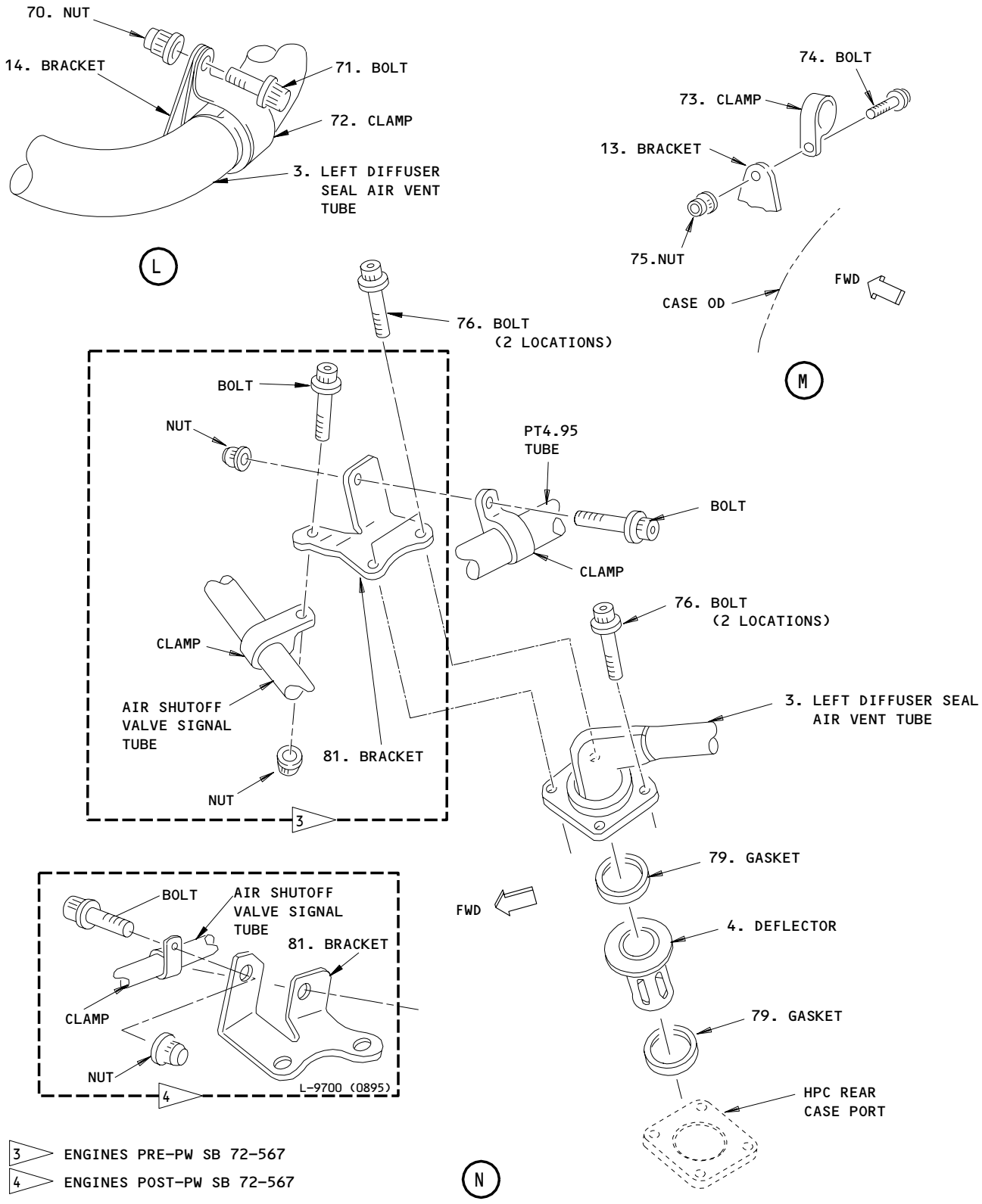


Fuel Injector and Support Installation
Figure 401 (Sheet 4)

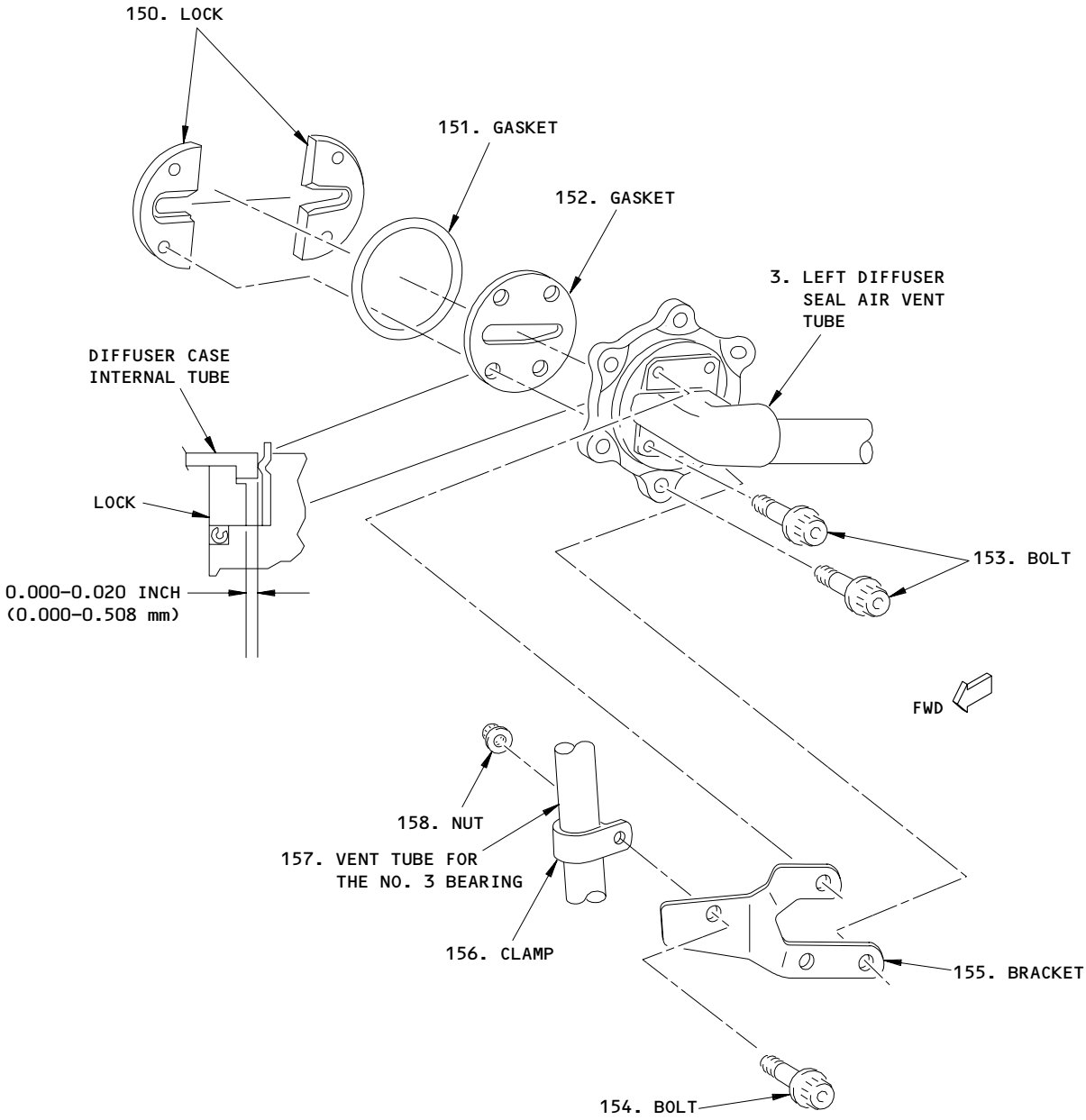


Fuel Injector and Support Installation
Figure 401 (Sheet 5)

A17082



Fuel Injector and Support Installation
Figure 401 (Sheet 6)



ENGINES POST-PW SB 72-567

L-A8782 (0895)

Left Diffuser Seal Air Vent Tube Installation
Figure 401 (Sheet 7)

2) Remove the bolts (17) which attach the brackets (22, 24) and the fuel injector (11) to the engine.
3) Remove the brackets (22, 24) from the engine.

S 014-093-N00

(3) To get access to the fuel injector 6, remove the bracket (21) with the steps that follow (View F, Fig. 401):
(a) Remove the bolt (43) which attaches the turnbuckle (44) to the bracket (21).
(b) Remove the bolts (17) which attach the bracket (21) and the fuel injector (11) to the engine.
(c) Remove the bracket (21) from the engine.

S 014-094-N00

(4) To get access to the fuel injector 7, remove the bracket (20) with the steps that follow (View G, Fig. 401):
(a) Remove the lower right air duct (85) for the turbine-vane and blade cooling (AMM 75-24-02/401).
(b) Remove the bolt (40) which attaches the clamp (41) and the harness (42) to the bracket (20).
(c) Remove the bolts (17) which attach the bracket (20) and the fuel injector (11) to the engine.
(d) Remove the bracket (20) from the engine.

S 014-095-N00

(5) To get access to the fuel injector 8, remove the bracket (19) with the steps that follow (View H, Fig. 401):
(a) Remove the bolt (50) which attaches the clamp (51) to the bracket (19).
(b) Remove the bolts (17) which attach the bracket (19) and the fuel injector (11) to the engine.
(c) Remove the bracket (19) from the engine.

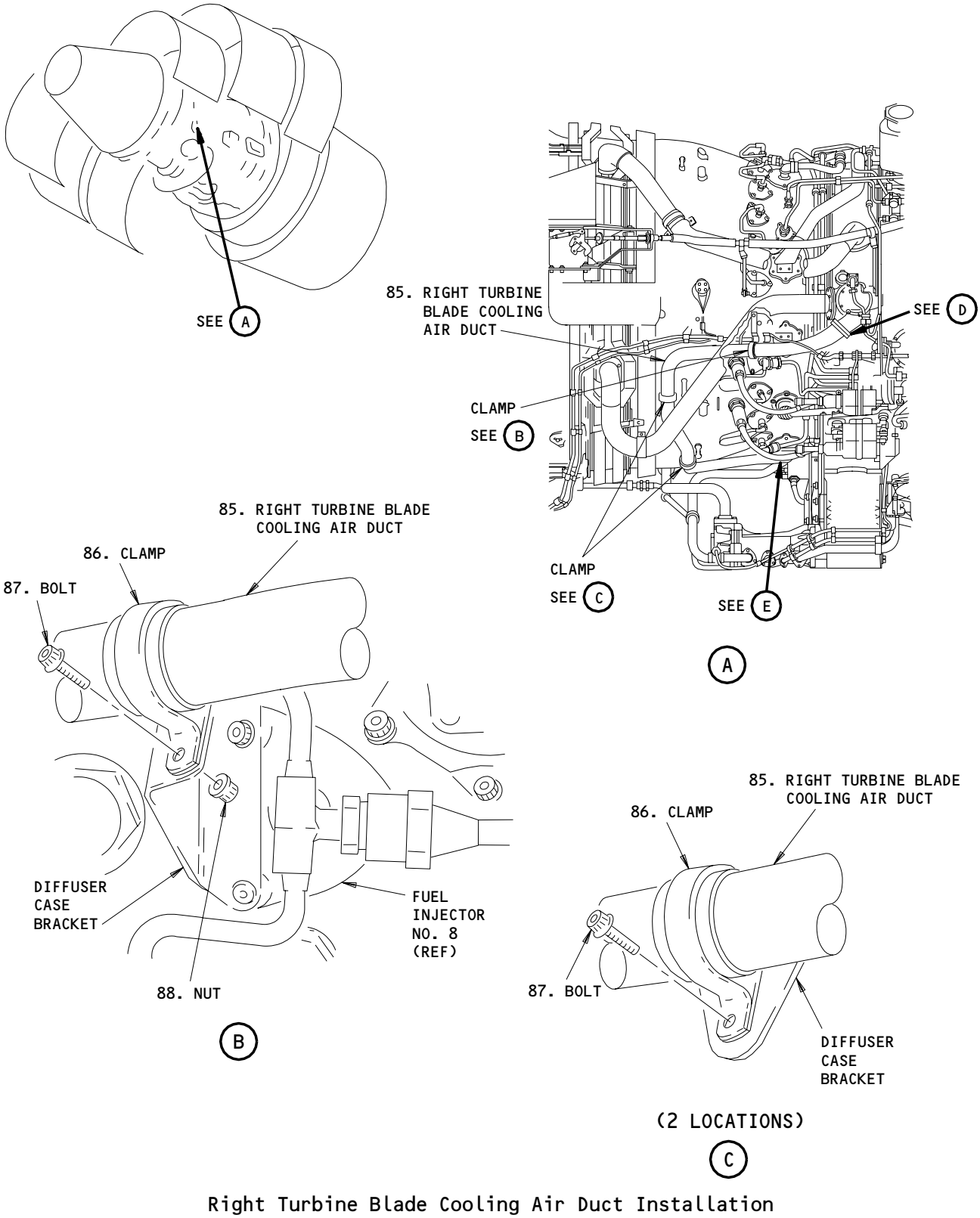
S 014-096-N00

(6) To get access to the fuel injector 9, remove the bracket (18) with the steps that follow (View I, Fig. 401):
(a) Remove the bolt (58) from the support arm (59).

(b) Remove the bolt (57) which attaches the brackets (18, 56).
(c) Remove the bolts (17) which attach the bracket (18) and the fuel injector (11) to the engine.
(d) Remove the bracket (18) from the engine.

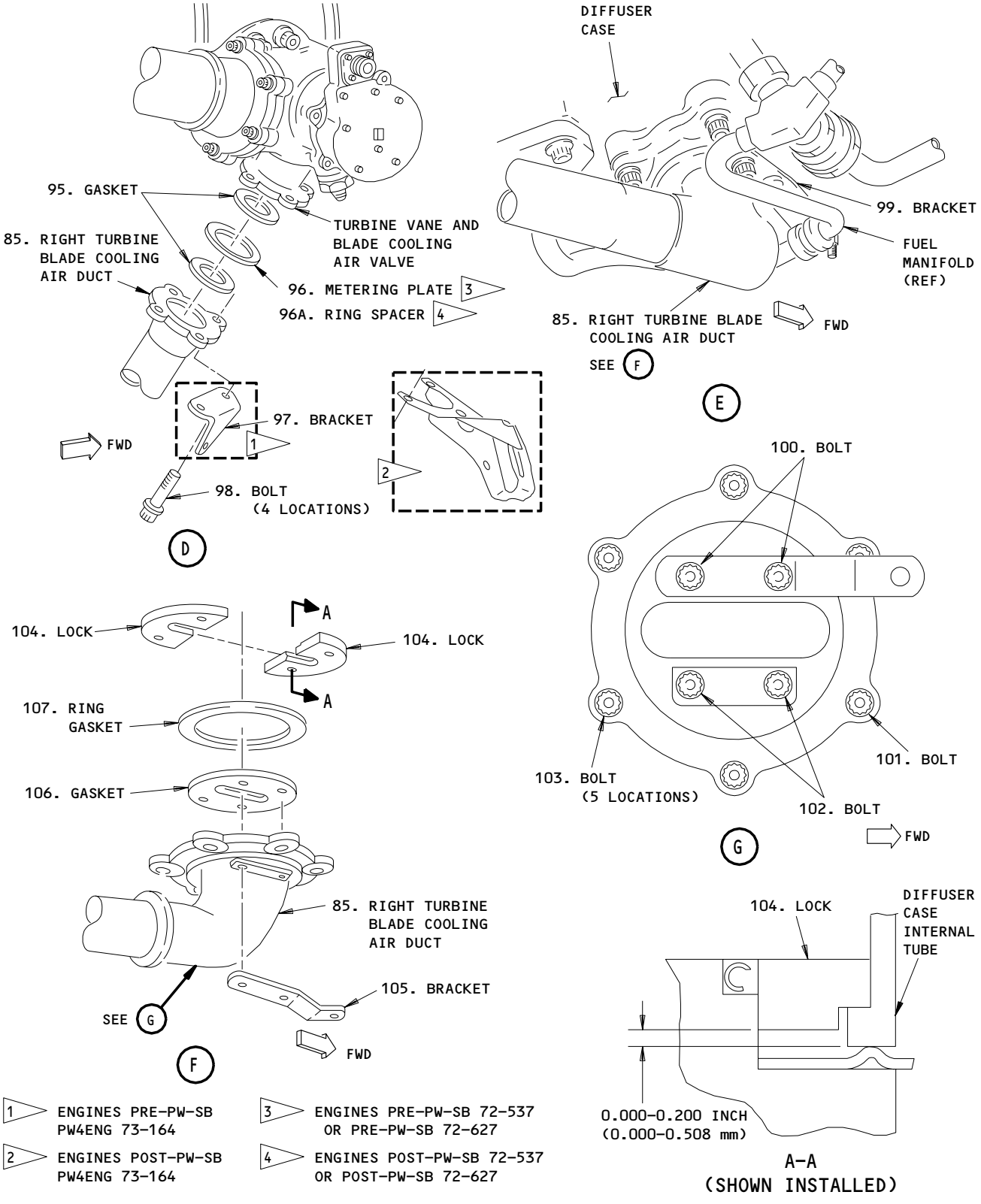
S 014-097-N00

(7) To get access to the fuel injector 10, 11 or 12, do the steps that follow:
(a) For the fuel injector 12, remove the lower right cooling-air duct (85) for the turbine vane and blade.
1) Remove the bolts (101, 103) and bracket (99) which attach the flange on the cooling air duct (85) to the diffuser case at approximately the 5 o'clock position (View G, Fig. 402).
2) Remove the bolt, nut, and clamp which attach the fuel supply manifold to the bracket (99).
3) Remove the bracket (99).
4) Remove the bolts (98) and bracket (97) which attach the flange of the lower right cooling air duct (85) to the cooling-air valve for the turbine-vane and blade on the HPC case (View D, Fig. 402).
5) Remove the bolts (88), nuts (90), and clamps (89) which attach the lower right cooling air duct (85) to the diffuser case brackets.
6) Remove the lower right cooling air duct (85) from the engine.
7) ENGINES PRE-PW-SB 72-537 OR POST-PW-SB 72-627; Remove the gaskets (95, 106, 107), locks (104), and metering plate (96).
8) ENGINES POST-PW-SB 72-537 OR PRE-PW-SB 72-627; Remove the gaskets (95, 106, 107), locks (104), and ring spacer (96A).
a) Discard the gaskets (95, 106, 107).
b) Install the protection covers.
(b) Remove the starter (AMM 80-11-01/401).



Right Turbine Blade Cooling Air Duct Installation
Figure 402 (Sheet 1)

A17054



Right Turbine Blade Cooling Air Duct Installation
Figure 402 (Sheet 2)

(c) Remove the engine-driven pump (AMM 29-11-05/401).
(d) Remove the bolts (116, 120) from the heat shield (119) (Fig. 403).
(e) Remove the heat shield (119) from the engine.

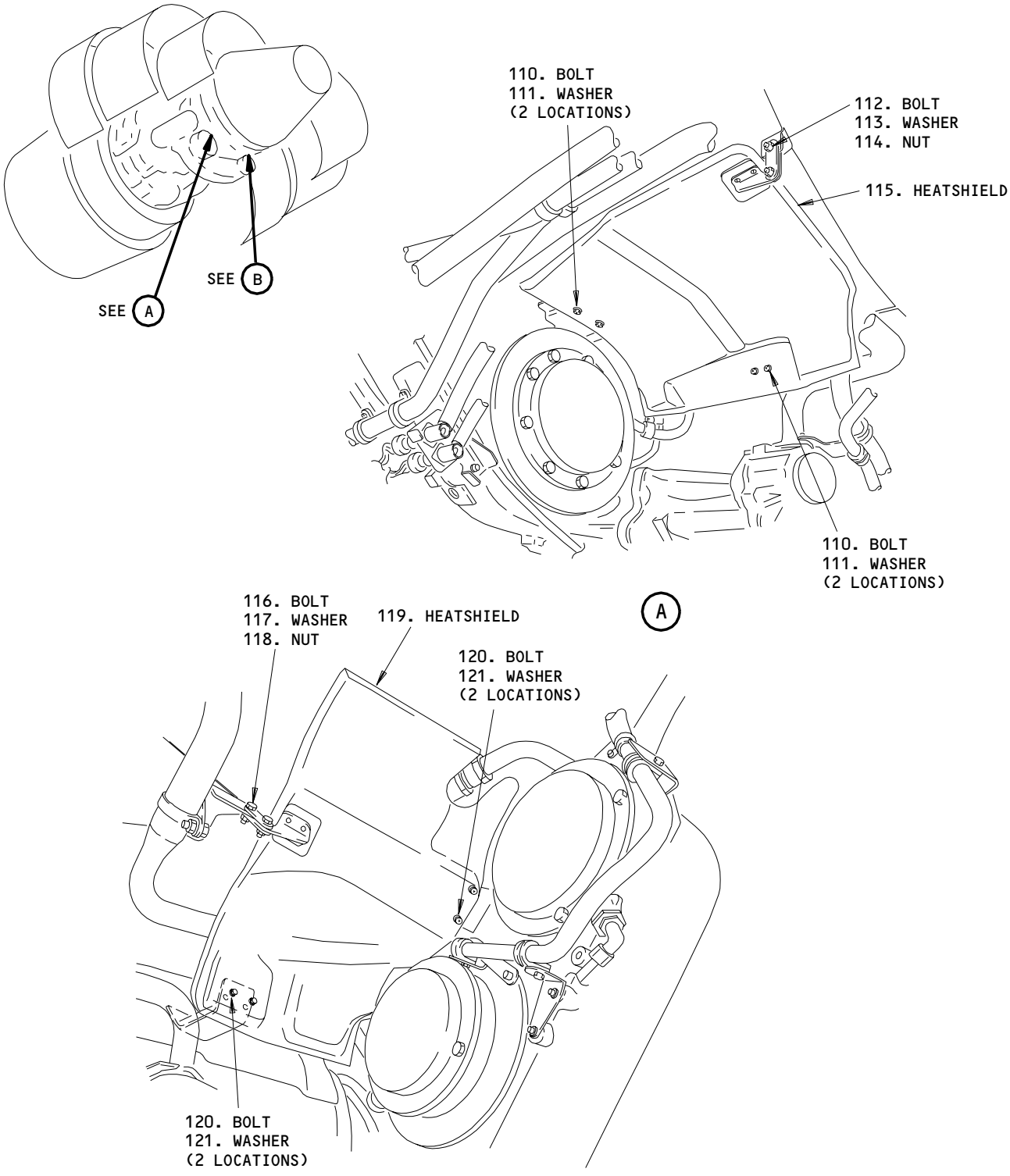
S 014-098-N00

(8) To get access to the fuel injector 13, 14 or 15, do the steps that follow:
(a) ENGINES PRE-PW-SB 73-84 AND PRE-PW-SB 79-46 OR PRE-PW-SB 79-75;
For the fuel injector 13, remove the oil scavenge manifold (125) for the No. 3 bearing with the steps that follow (Fig. 404):
1) Disconnect the electrical connector (130), W5P13, from the oil temperature sensor for the No. 3 bearing at the 5 o'clock position.
2) Install the protection covers on the electrical connectors.
3) Remove the bolt (131), nut (134), and clamp (133) which attach the oil scavenge manifold (125) to the oil pump bracket.
4) Disconnect the tube nut (126) for the internal tube on the diffuser case from the elbow on the oil scavenge manifold (125) at the 6 o'clock position.
5) Remove the bolts (129) which attach the oil scavenge manifold (125) and the bracket (128) to the lubrication and scavenge oil pump.
6) Remove the oil scavenge manifold (125) from the engine.

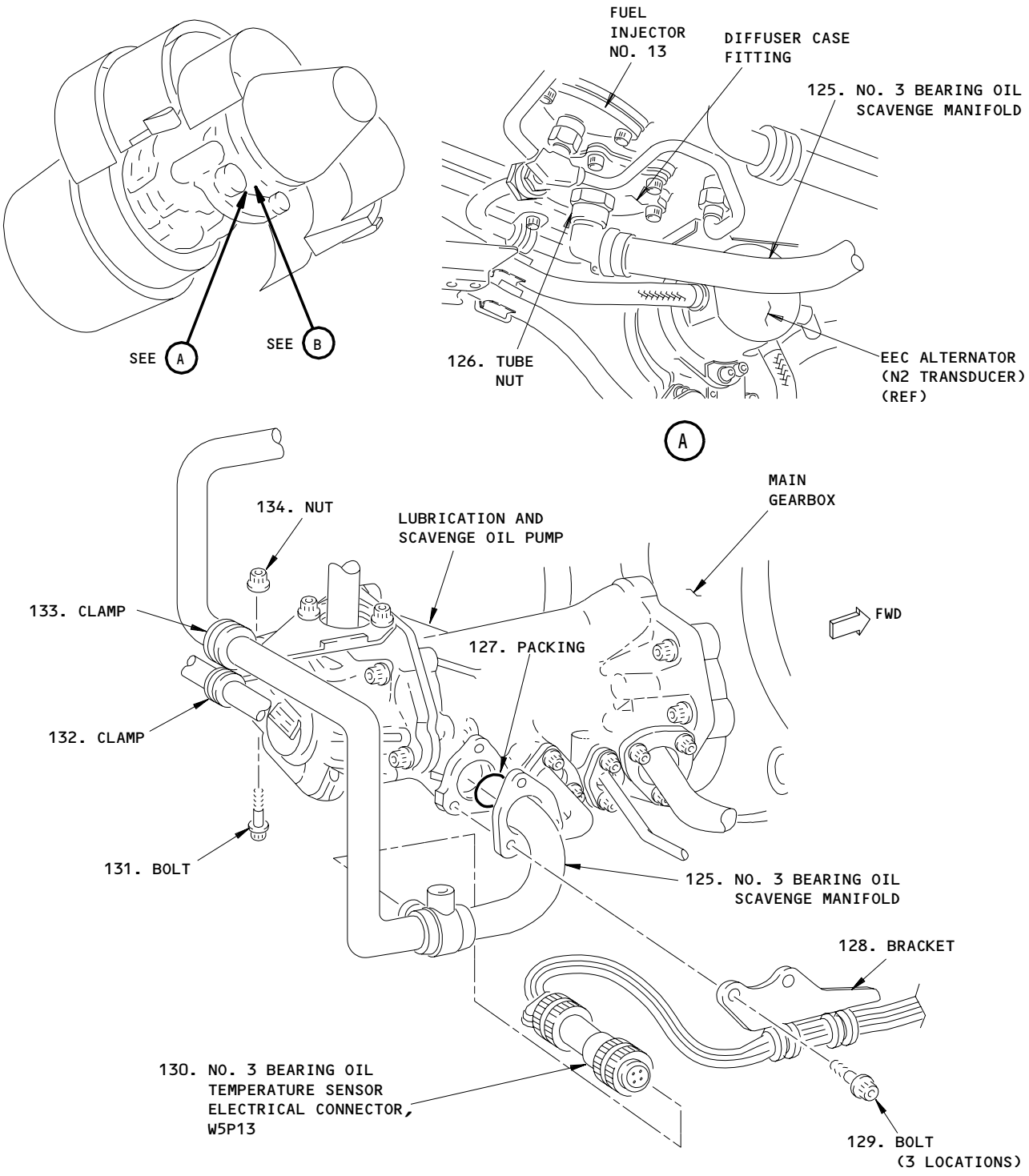
NOTE: Catch the oil in the container with a capacity of approximately 5 U.S. gallons (19 liters).

a) Discard the packing (127).
b) Install the protection covers.

(b) ENGINES POST-PW-SB 73-84 AND PRE-PW-SB 79-46 OR PRE-PW-SB 79-75;
For the fuel injector 13, remove the oil scavenge manifold (125) for the No. 3 bearing with the steps that follow (Fig. 404):
1) Remove the nuts which attach the harness connector (130), W5P13, to the studs of the oil temperature sensor for the No. 3 bearing at the 5 o'clock position.



Heat Shield Installation
Figure 403

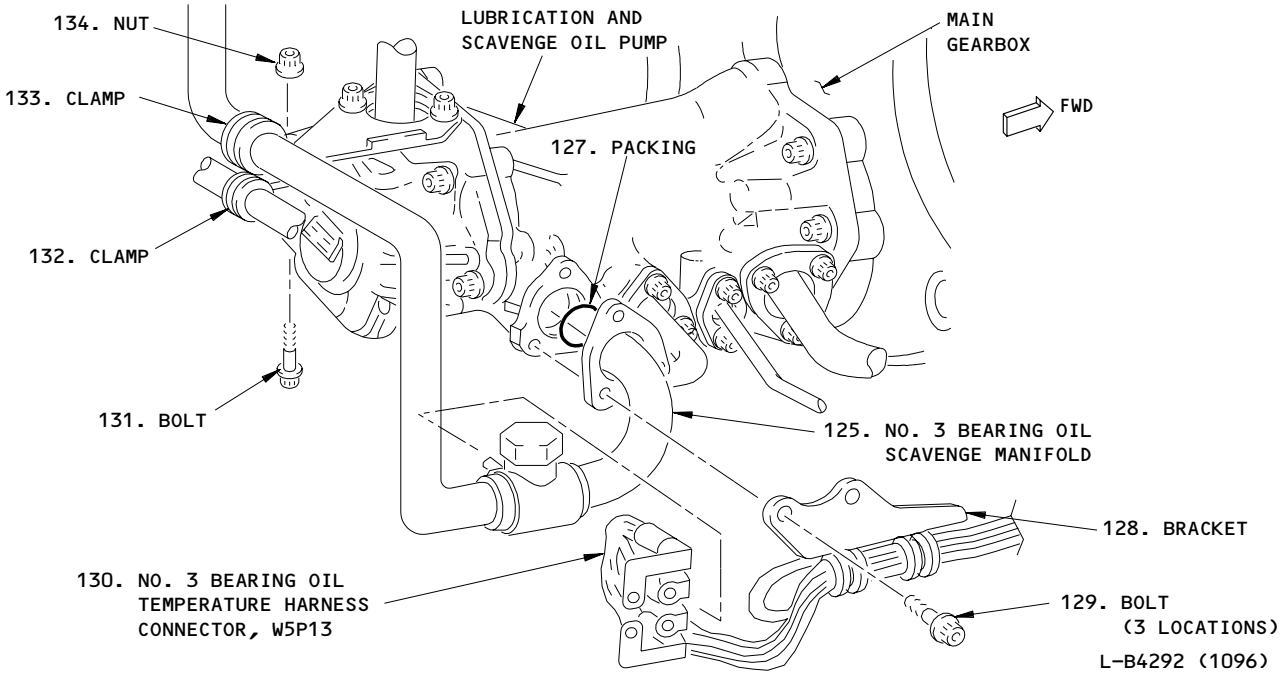


ENGINES PRE-PW-SB 73-84, AND PRE-PW-SB 79-46 OR PRE-PW-SB 79-75

B

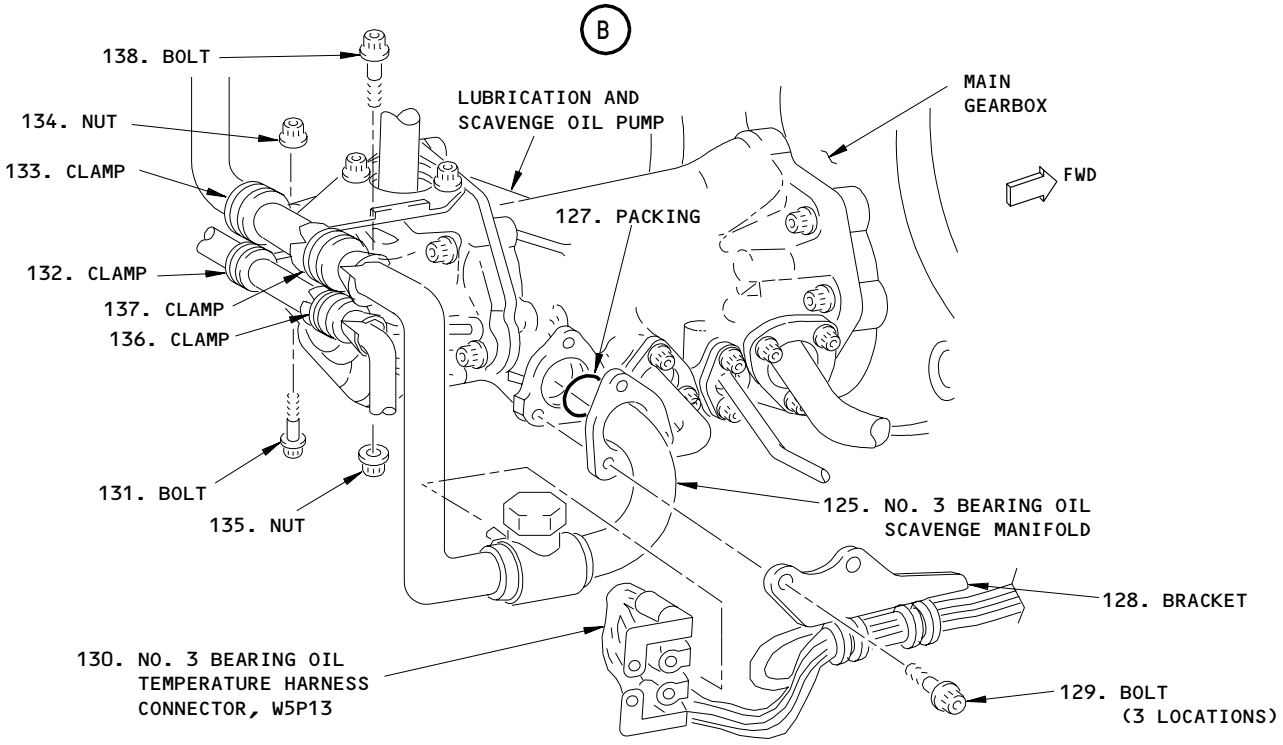
L-A4709 (1096)

No. 3 Bearing Oil Scavenge Manifold Installation
Figure 404 (Sheet 1)



ENGINES POST-PW-SB 73-84 AND PRE-PW-SB 79-46 OR PRE-PW-SB 79-75

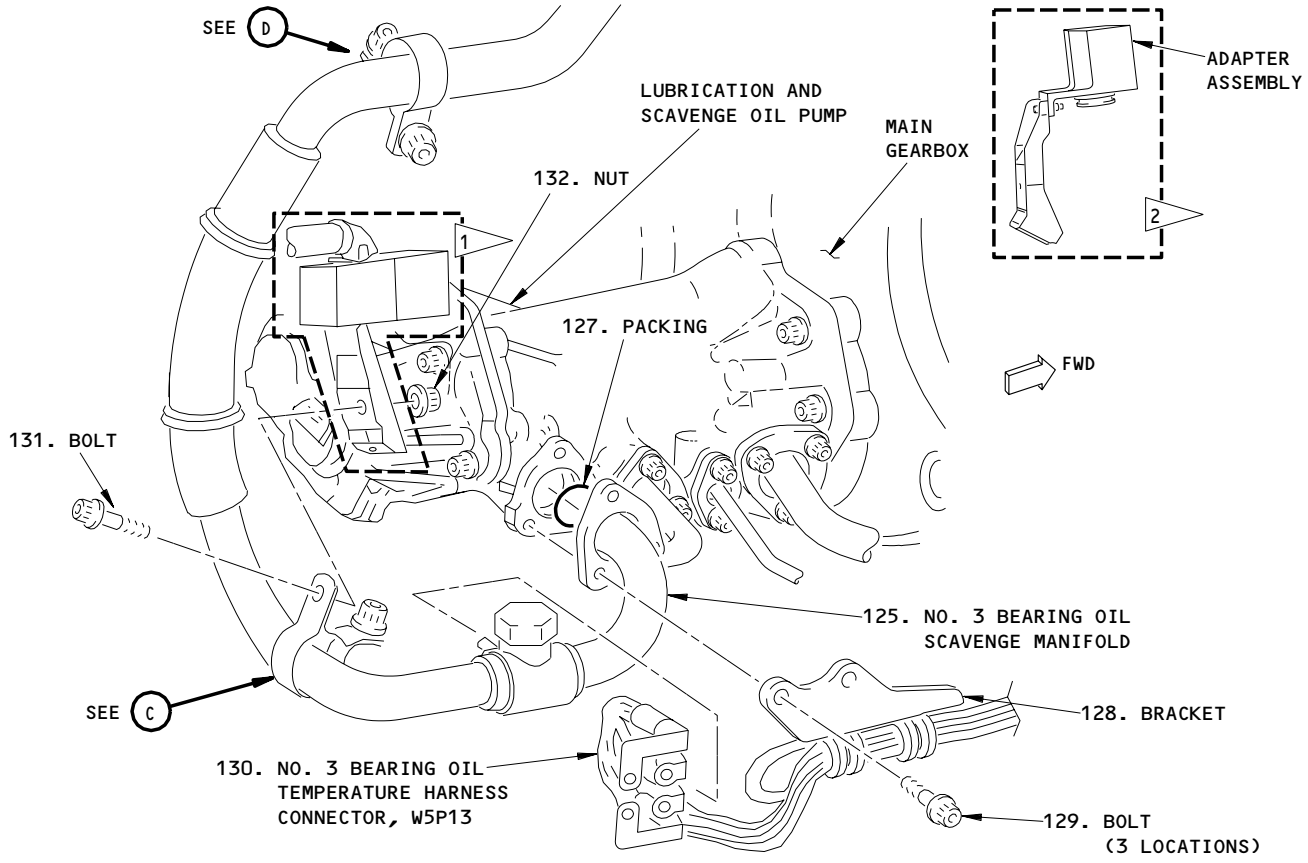
B



ENGINES POST-PW-SB 73-84 AND POST-PW-SB 79-46

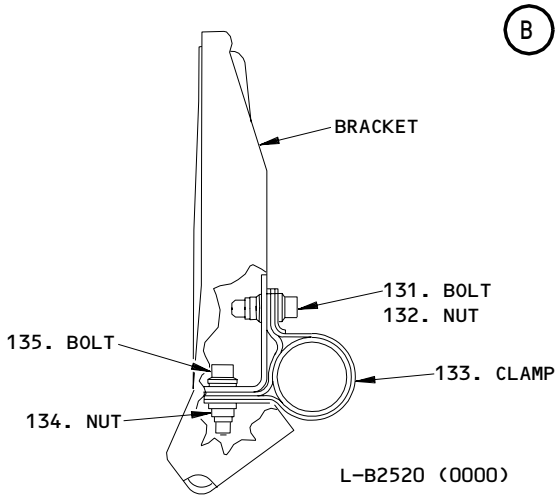
B

No. 3 Bearing Oil Scavenge Manifold Installation
Figure 404 (Sheet 2)

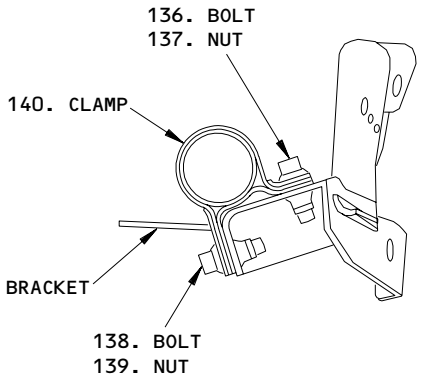


ENGINES POST-PW-SB 73-84 AND POST-PW-SB 79-75

B



C



D

1 ENGINES PRE-PW-SB 79-86
2 ENGINES POST-PW-SB 79-86

L-B2518 (0000)

No. 3 Bearing Oil Scavenge Manifold Installation
Figure 404 (Sheet 3)

2) Remove the bolt (131), nut (134), and clamp (133) which attach the oil scavenge manifold (125) to the oil pump bracket.
3) Disconnect the tube nut (126) for the internal tube on the diffuser case from the elbow on the oil scavenge manifold (125) at the 6 o'clock position.
4) Remove the bolts (129) which attach the oil scavenge manifold (125) and the bracket (128) to the lubrication and scavenge oil pump.
5) Remove the oil scavenge manifold (125) from the engine.

NOTE: Catch the oil in the container with a capacity of approximately 5 U.S. gallons (19 liters).

a) Discard the packing (127).
b) Install the protection covers.

(c) ENGINES POST-PW-SB 73-84 AND POST-PW-SB 79-46;
For the fuel injector 13, remove the oil scavenge manifold (125) for the No. 3 bearing with the steps that follow (Fig. 404):
1) Remove the nuts which attach the harness connector (130), W5P13, to the studs of the oil temperature sensor for the No. 3 bearing at the 5 o'clock position.
2) Remove the bolts (131, 138), nuts (135, 134) and clamps (133, 137) which attach the oil scavenge manifold (125) to the oil pump bracket.
3) Disconnect the tube nut (126) for the internal tube on the diffuser case from the elbow on the oil scavenge manifold (125) at the 6 o'clock position.
4) Remove the bolts (129) which attach the oil scavenge manifold (125) and the bracket (128) to the lubrication and scavenge oil pump.
5) Remove the oil scavenge manifold (125) from the engine.

NOTE: Catch the oil in the container with a capacity of approximately 5 U.S. gallons (19 liters).

a) Discard the packing (127).
b) Install the protection covers.

(d) ENGINES POST-PW-SB 73-84 AND POST-PW-SB 79-75;
For the fuel injector 13, remove the oil scavenge hose and manifold assembly (125) for the No. 3 bearing with the steps that follow (Fig. 404):
1) Remove the nuts which attach the harness connector (130), W5P13, to the studs of the oil temperature sensor for the No. 3 bearing at the 5 o'clock position.
2) Remove the bolts (131, 135), nuts (132, 134), and clamp (133) which attach the oil scavenge hose and manifold assembly (125) to the oil pump bracket.

3) Remove the bolts (136, 138), nuts (137, 139), and clamp (140) which attach the oil scavenge hose and manifold assembly (125) to the bracket between the fuel injector 12 and 13.
4) Disconnect the tube nut (126) for the internal tube on the diffuser case from the elbow on the oil scavenge hose and manifold assembly (125) at the 6 o'clock position.
5) Remove the bolts (129) which attach the oil scavenge hose and manifold assembly (125) and the bracket (128) to the fluid pressure dampener (ENGINES PRE-PW-SB 79-86) or to the adapter assembly (ENGINES POST-PW-SB 79-86), which is mounted on the top of the lubrication and scavenge oil pump.
6) Remove the oil scavenge hose and manifold assembly (125) from the engine.

NOTE: Catch the oil in the container with a capacity of approximately 5 U.S. gallons (19 liters).

a) Discard the packing (127).
b) Install the protection covers.

(e) Remove the integrated drive generator (AMM 24-11-01/401).
(f) Remove the bolts (110, 112) from the heat shield (115) (Fig. 403).
(g) Remove the heat shield (115) from the engine.

S 034-020-N00

(9) To get access to the fuel injector 16 or 17, remove the engine oil tank (AMM 79-11-01/401).

S 014-087-N00

(10) To get access to the fuel injector 18, do the steps that follow:
(a) Remove the engine oil tank (AMM 79-11-01/401).
(b) Remove the bolt (63) which attaches the clamp (65) to the bracket (16) (View J, Fig. 401).
(c) Remove the bolts (17) which attach the bracket (16) and the fuel injector (11) to the engine.
(d) Remove the bracket (16) from the engine.

S 014-109-N00

(11) To get access to the fuel injector 19, 20 or 21, do the steps that follow:
(a) For the fuel injector 20, remove the upper left cooling-air duct for the turbine-vane and blade (AMM 75-24-02/401).
(b) ENGINES PRE-PW-SB 72-567;
Remove the diffuser-seal air-vent tube (3):
1) Disconnect the higher tube nut (1) on the air vent tube (3) for the diffuser seal from the adapter on the diffuser case (View A, Fig. 401).

2) Remove the bolts and nuts which attach the clamps of the PT4.95 tube and the air shutoff-valve signal tube to the bracket (81) (Fig. 401, View N).
3) Remove the bolts (76) and the bracket (81) which attach the lower, forward end of the air vent tube (3) to the boss on the compressor case (View N, Fig. 401).
4) Remove the deflector (4) and the gaskets (79) from the same HPC case boss.
5) Discard the gaskets (79).
6) Install the protection covers.
7) Remove the bolt (71), nut (70) and clamp (72) which attach the air vent tube (3) to the bracket (14) on the fuel injector (11) (View L, Fig. 401).
8) Remove the assembly of the air vent tube (3) from the engine.

(c) ENGINES POST-PW-SB 72-567;
Remove the diffuser-seal air-vent tube (3):
1) Remove the bolt (154) and nut (158) that attach the clamp clamp (156) of the vent tube for the No.3 bearing (157) (View P).
2) Remove the four bolts (153) that attach the bracket (155) to the flange of the diffuser-seal air-vent tube (3).
   a) Remove the bracket (155).
3) Remove the bolt (71) and nut (70) that attach the clamp (72) of the diffuser-seal air-vent tube (3) (View L).
4) Remove the bolt and nut that attach the clamp of the PT4.95 pressure tube (View N).
5) Remove the bolt and nut that attach the clamp of the air shutoff valve signal tube.
6) Remove the four bolts (76) which attach the flange of the diffuser-seal air-vent tube (3) and the bracket (81) to the HPC rear case.
7) Remove the six bolts (153) which attach the flange of the diffuser-seal air-vent tube (203) to the diffuser case.
8) Carefully remove the diffuser-seal air-vent tube (3) from the engine.

CAUTION: ATTACH A TEMPORARY SAFETY WIRE AROUND THE DIFFUSER CASE INTERNAL TUBE BEFORE YOU REMOVE THE LOCKS. IF YOU DO NOT ATTACH A SAFETY WIRE, THE DIFFUSER CASE INTERNAL TUBE CAN FALL INTO THE DIFFUSER CASE.

9) Install a temporary safety wire around the diffuser case internal tube.
10) Remove the gaskets (151, 152) and the locks (150) from the engine.
   a) Discard the gaskets (151, 152).
11) Remove the deflector (4) and the gaskets (79) from the HPC rear case.
   a) Discard the gaskets (79).

12) Install protection caps to the openings in the diffuser case, the HPC rear case and the open ends of the diffuser-seal air-vent tube.

(d) For the fuel injector 20, remove the bracket (15) with the steps that follow (View K, Fig. 401):
1) ENGINES PRE-PW-SB 73-106;
Remove the bolt (62) and the nut (61) which attach the clamp (60) to the bracket (15).
2) ENGINES POST-PW-SB 73-106;
Remove the bolt (62) which attaches the clamp (60) to the bracket (15).
3) Remove the bolts (17) which attach the bracket (15) and the fuel injector (11) to the engine.
4) Remove the bracket (15) from the engine.

(e) For the fuel injector 21, remove the bracket (14) with the steps that follow (View L, Fig. 401):
1) Remove the bolts (17) which attach the bracket (14) and the fuel injector (11) to the engine.
2) Remove the bracket (14) from the engine.

S 034-033-N00

(12) To get access to the fuel injector 24, remove the bracket (13) with the steps that follow (View M, Fig. 401):
(a) Remove the bolt (74) which attaches the clamp (73) to the bracket (13).
(b) Remove the bolts (17) which attach the bracket (13) and the fuel injector (11) to the engine.
(c) Remove the bracket (13) from the engine.
(d) ENGINES PRE-PW-SB 72-567;
If access to fuel injector No. 22 is required, remove the left diffuser-seal air-vent tube (3):
1) Remove the lockwire or safety cable and disconnect the tube nut from the diffuser case internal tube at approximately 11 o'clock position.

S 024-089-N00

(13) Remove the applicable fuel injector.
(a) Put the container below the fuel injector (11) which you are to remove.
(b) Disconnect the tube nuts (25) on the fuel supply manifold from the fuel injector (11) and the two adjacent fuel injectors which are supplied by the same fuel supply manifold (View B, Fig. 401).

(c) Disconnect the fuel supply manifold (10) of the fuel injector from the fuel supply tube (6) (View B, Fig. 401).
1) Remove the fuel supply manifold (10) and the transfer tubes (7).
2) Discard the packings (8).
(d) Remove the remaining bolts (17) (if it is applicable) which attach the fuel injector (11), which is being removed.
(e) Remove the fuel injector (11) and the gasket (26) (View C, Fig. 401).

NOTE: Lift, and if necessary turn the fuel injector at an angle, to disengage the fuel injector from the diffuser case.

1) Discard the gaskets (26).
(f) Install the protection covers.

TASK 73-11-05-404-040-N00

3. Install the Fuel Injectors and Supports

A. Equipment
(1) PWA 85579 Adapter
(2) M303, M305, or M307 Bergen Mechanical Crimper
Bergen Cable Technologies Inc
170 Gregg St
P.O. Box 1300
Lodi, NJ 07644-9982

B. Consumable Materials
(1) D00137 Engine Oil - PWA 521
(2) D00420 Beeswax
(3) D00504 Petrolatum - PMC 9609
(4) G02151 Leak Check - Bubble type, PMC 9569
OR
G50231 Leak Check - Bubble type, PMC 2277
(5) G01505 Lockwire - MS20995
(6) G02030 Wax - Paraffin - PMC 9552
(7) G02332 Ferrule - P05-292 (Optional)
(8) G02335 Cable - Safety - P05-291 (Optional)

(9) D50124 Anti-seize Paste PWA 36246

C. Parts

AMM		NOMENCLATURE	AIPC		
FIG	ITEM		SUBJECT	FIG	ITEM
401	8	Packing	73-11-06	30	67
	11	Injector - Fuel	73-11-05	05	10
	26	Gasket			20
	79	Gasket	75-37-00	01	38
	151	Gasket			41
	152	Gasket			46
402	95	Gasket	75-26-00	01	50
	106	Gasket			65
	107	Gasket-Ring			80
404	127	Packing	79-22-00	10	30

D. References

(1) AMM 24-11-01/401, Integrated Drive Generator
(2) AMM 24-22-00/201, Electrical Power - Control
(3) AMM 29-11-05/401, Engine-Driven Pump
(4) AMM 70-24-05/201, Electrical Harnesses
(5) AMM 71-00-00/501, Power Plant
(6) AMM 71-11-04/201, Fan Cowl Panels
(7) AMM 71-11-06/201, Core Cowl Panels
(8) AMM 73-11-00/601, Fuel Distribution System
(9) AMM 73-31-01/401, Fuel Flow Transmitter
(10) AMM 75-24-02/401, Turbine Vane and Blade Air Duct
(11) AMM 78-31-00/201, Thrust Reverser System
(12) AMM 79-11-01/401, Engine Oil Tank
(13) AMM 80-11-01/401, Starter

E. Access

(1) Location Zones

415 L Power Plant Fan Reverser
416 L Power Plant Fan Reverser
425 R Power Plant Fan Reverser
426 R Power Plant Fan Reverser

(2) Access Panels

415AL Fan Reverser (Left)
416AR Fan Reverser (Right)
425AL Fan Reverser (Left)
426AR Fan Reverser (Right)

F. Install the Fuel Injectors and Supports (Fig. 401)

S 424-090-N00

(1) Remove the protection covers.

S 644-079-N00
(2) Lubricate the gasket (26) with the beeswax.

S 424-042-N00
(3) Install the gasket (26) and the fuel injector (11) to the boss on the diffuser case (View C, Fig. 401).
  (a) Move the fuel injector (11) into its position.
  (b) Turn the fuel injector (11) at an angle to engage the burner.

S 424-091-N00
(4) For the fuel injector 2, do the steps that follow (View D, Fig. 401):
  (a) Lubricate the threads of the bolts (17) with engine oil.
  (b) Install the bracket (12) to the fuel injector (11) with the bolts (17).
    1) Tighten the bolts (17) to 65-85 pound-inches (7.3-9.6 newton-meters).
    2) Safety the bolts (17) with lockwire or safety cable and safety cable ferrule.
  (c) Lubricate the threads of the bolt (30) with oil.
  (d) Install the bolt (30), clamp (31) and nut (32) to the bracket (12).

S 424-092-N00
(5) For the fuel injector 4 or 5, do the steps that follow (View E, Fig. 401):
  (a) For the fuel injector 4, do the steps that follow:
    1) Lubricate the threads of the bolts (17) with engine oil.
    2) Install the bracket (23) to the fuel injector (11) with the bolts (17).
      a) Tighten the bolts (17) to 65-85 pound-inches (7.3-9.6 newton-meters).
      b) Safety the bolts (17) with lockwire or safety cable and safety cable ferrule.
  (b) For the fuel injector 5, do the steps that follow:
    1) Lubricate the threads of the bolts (17) with engine oil.
    2) Install the brackets (24, 22) to the fuel injector (11) with the bolts (17).
      a) Tighten the bolts (17) to 65-85 pound-inches (7.3-9.6 newton-meters).
      b) Safety the bolts (17) with lockwire or safety cable and safety cable ferrule.
    3) Lubricate the threads of the bolt (35) with engine oil.
    4) Install the turnbuckle (33) to the bracket (22) with the bolt (35) and nut (34).
  (c) Lubricate the threads of the bolts (38) with engine oil.
  (d) Install the triangular support (36) to the brackets (23, 24) with the bolts (38) and nuts (37).

S 424-093-N00

(6) For the fuel injector 6, do the steps that follow (View F, Fig. 401):
   (a) Lubricate the threads of the bolts (17) with engine oil.
   (b) Install the bracket (21) to the fuel injector (11) with the bolts (17).
      1) Tighten the bolts (17) to 65-85 pound-inches (7.3-9.6 newton-meters).
      2) Safety the bolts (17) with lockwire or safety cable and safety cable ferrule.
   (c) Lubricate the threads of the bolt (43) with engine oil.
   (d) Install the turnbuckle (44) to the bracket (21) with the bolt (43) and nut (45).

S 424-094-N00

(7) For the fuel injector 7, do the steps that follow (View G, Fig. 401):
   (a) Lubricate the threads of the bolts (17) with engine oil.
   (b) Install the bracket (20) to the fuel injector (11) with the bolts (17).
      1) Tighten the bolts (17) to 65-85 pound-inches (7.3-9.6 newton-meters).
      2) Safety the bolts (17) with lockwire or safety cable and safety cable ferrule.
   (c) Lubricate the threads of the bolt (40) with engine oil.
   (d) Install the bolt (40), clamp (41) and nut (39) to the bracket (20).

S 424-095-N00

(8) For the fuel injector 8, do the steps that follow (View H, Fig. 401):
   (a) Lubricate the threads of the bolts (17) with engine oil.
   (b) Install the bracket (19) to the fuel injector (11) with the bolts (17).
      1) Tighten the bolts (17) to 65-85 pound-inches (7.3-9.6 newton-meters).
      2) Safety the bolts (17) with lockwire or safety cable and safety cable ferrule.
   (c) Lubricate the threads of the bolt (50) with engine oil.
   (d) Install the bolt (50), clamp (51) and nut (52) to the bracket (19).

S 424-096-N00

(9) For the fuel injector 9, do the steps that follow (View I, Fig. 401):
   (a) Lubricate the threads of the bolts (17) with engine oil.

(b) Install the bracket (18) to the fuel injector (11) with the bolts (17).
1) Tighten the bolts (17) to 65-85 pound-inches (7.3-9.6 newton-meters).
2) Safety the bolts (17) with lockwire or safety cable and safety cable ferrule.
(c) Lubricate the threads of the bolts (57, 58) with engine oil.
(d) Install the support arm (59) and the bracket (56) to the bracket (18) with the bolts (57, 58), washer (55) and nuts (54, 53).

S 424-097-N00

(10) For the fuel injector 18, do the steps that follow (View J, Fig. 401):
(a) Lubricate the threads of the bolts (17) with engine oil.
(b) Install the bracket (16) to the fuel injector (11) with the bolts (17).
1) Tighten the bolts (17) to 65-85 pound-inches (7.3-9.6 newton-meters).
2) Safety the bolts (17) with lockwire or safety cable and safety cable ferrule.
(c) Lubricate the threads of the bolt (63) with engine oil.
(d) Install the bolt (63), nut (64) and clamp (65) to the bracket (16).

S 424-098-N00

(11) For the fuel injector 20, do the steps that follow (View K, Fig. 401):
(a) Lubricate the threads of the bolts (17) with engine oil.
(b) Install the bracket (15) to the fuel injector (11) with the bolts (17).
1) Tighten the bolts (17) to 65-85 pound-inches (7.3-9.6 newton-meters).
2) Safety the bolts (17) with lockwire or safety cable and safety cable ferrule.
(c) Lubricate the threads of the bolt (62) with engine oil.
(d) ENGINES PRE-PW-SB 73-106;
Install the bolt (62), nut (61) and clamp (60) to the bracket (15).

(e) ENGINES POST-PW-SB 73-106;
Install the bolt (62) and clamp (60) to the bracket (15).

S 424-099-N00

(12) For the fuel injector 21, do the steps that follow (View L, Fig. 401):
(a) Lubricate the threads of the bolts (17) with engine oil.
(b) Install the bracket (14) to the fuel injector (11) with the bolts (17).
1) Tighten the bolts (17) to 65-85 pound-inches (7.3-9.6 newton-meters).
2) Safety the bolts (17) with lockwire or safety cable and safety cable ferrule.
(c) Lubricate the threads of the bolt (71) with engine oil.
(d) Install the bolt (71), nut (70) and clamp (72) to the bracket (14).

S 424-100-N00

(13) For the fuel injector 24, do the steps that follow (View M, Fig. 401):
(a) Lubricate the threads of the bolts (17) with engine oil.
(b) Install the bracket (13) to the fuel injector (11) with the bolts (17).
1) Tighten the bolts (17) to 65-85 pound-inches (7.3-9.6 newton-meters).
2) Safety the bolts (17) with lockwire or safety cable and safety cable ferrule.
(c) Lubricate the threads of the bolt (74) with engine oil.
(d) Install the bolt (74), clamp (73) and nut (75) to the bracket (13).

S 644-055-N00

(14) Lubricate the threads of the bolts (17) with engine oil.

S 424-056-N00

(15) Install the bolts (17) into the remaining fuel injectors (11).
(a) Tighten the bolts (17) to 65-85 pound-inches (7.3-9.6 newton-meters).

NOTE: To make sure you have the correct torque values, continue to tighten the bolts to the necessary torque until the bolt does not loosen.

S 434-057-N00

(16) Safety the bolts (17) with lockwire or safety cable and safety cable ferrule.

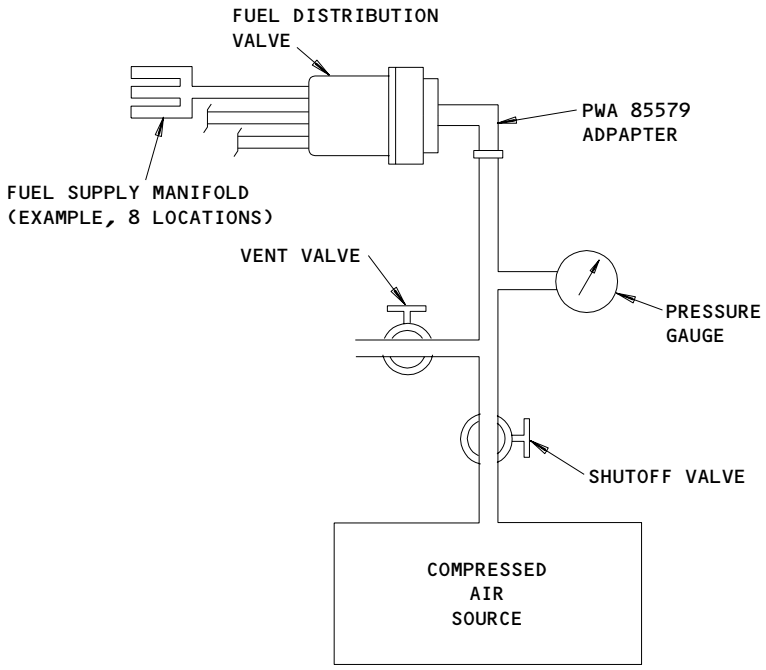
S 424-101-N00

(17) Install the fuel supply manifolds (10).
(a) Lubricate the packings (8) with the petroleum jelly.

(b) Install the two packings (8) on each transfer tube (7) (View B, Fig. 401).
(c) Install the transfer tubes (7) to the adapters (9) on the fuel manifolds (10).
(d) Lubricate the threads of the adapters (9) with engine oil.
(e) Connect the fuel supply tubes (6) to the fuel manifolds (10).
1) Tighten the tube nuts (5) with your hand.
(f) Lubricate the threads of the adapter on the fuel injectors (11) with engine oil.
(g) Connect the fuel supply manifolds (10) to the fuel injectors (11).
1) Tighten the tube nuts (25) with your hand.

S 794-080-N00

(18) Do a test of the connections for the fuel tubes and fuel manifolds for leaks with the steps that follow (Fig. 405):



Fuel Manifold Leak Check
Figure 405

(a) Remove the fuel flow transmitter (AMM 73-31-01/401).
(b) Connect the PWA 85579 Adapter to the fuel distribution valve with the bolts and packing.
(c) Supply clean air through the PWA 85579 Adapter at a pressure of 95-105 psig (655.0-723.9 KPa).

NOTE: Make sure there are loose tube nuts for the fuel tubes and fuel manifolds that were disconnected to find a leak in the transfer tube packings.

(d) Apply the leak check to the connections.
(e) Examine the connections for signs of leaks for a minimum of five minutes.
(f) If there are leaks found, repair or replace the parts as it is necessary.
1) If it was necessary to repair or replace a part, do the test for leaks again.
2) If no leaks are found, remove the PWA 85579 Adapter from the fuel distribution valve.
(g) Install the fuel flow transmitter (AMM 73-31-01/401).

S 424-102-N00
(19) Tighten the tube nuts of the fuel supply manifolds with the steps that follow:
(a) Tighten the tube nuts (25) to 185-200 pound-inches (20.9-22.6 newton-meters).
1) Tighten the tube nuts until the necessary torque is kept.

NOTE: If the torque of the tube nut decreases after the fourth time you try to tighten it, replace the fuel manifold, fuel tubes or seals as necessary.

(b) Tighten the tube nuts (5) to 275-325 pound-inches (31.1-36.7 newton-meters).
1) Tighten the tube nuts until the necessary torque is kept.

NOTE: If the torque of the tube nut decreases after the fourth time you try to tighten it, replace the fuel manifold, fuel tubes or seals as necessary.

(c) Safety the tube nuts (5, 25) with lockwire or safety cable and safety cable ferrule.

S 414-103-N00

(20) For the fuel injector 7, install the lower right cooling air-duct for the turbine-vane and blade (AMM 75-24-02/401).

S 414-104-N00

(21) For the fuel injector 10, 11 or 12, do the steps that follow:

(a) For the fuel injector 12, install the lower right cooling-air tube for the turbine-vane and blade with the steps that follow (View F, Fig. 402):

1) Remove the protection covers.
2) Install the gasket (106), with the higher seal surface where you can see it, to the elbow end of the cooling-air duct (85).
   a) Align the slot in the cooling-air duct (85) and the four bolt holes.
3) Attach the gasket (106) in this position with the paraffin wax.
4) Install the ring gasket (107) to the elbow groove with the paraffin wax.
5) Install the locks (104) to engage the internal tube of the diffuser case.
   a) Make sure to install the locks (104) with the slot groove out.
   b) Make sure the locks (104) engage the flange on the internal tube lip.
6) Attach the locks (104) with the paraffin wax.
7) Hold the locks (104) out against the internal tube lip.
8) Measure to make sure the end of the internal tube is 0.000-0.020 inch (0.000-0.508 mm) above the locks (104) (View A-A, Fig. 402).
9) If the dimension is not in this limit, install the locks (104) again.
   a) Make sure the internal tube lip is engaged correctly.
10) ENGINES PRE-PW-SB 72-537 OR POST-PW-SB 72-627;
    Install the gasket (95) and the metering plate (96) to the flanged end of the cooling air duct (85) at the end for the cooling-air valve of the turbine-vane and blade.

11) ENGINES POST-PW-SB 72-537 OR PRE-PW-SB 72-627;
Install the gasket (95) and the ring spacer (96A) to the flanged end of the cooling air duct (85) at the end for the cooling-air valve of the turbine-vane and blade.
12) ENGINES PRE-PW-SB 72-537 OR POST-PW-SB 72-627;
Attach the gasket (95) and the metering plate (96) with the paraffin wax.
13) ENGINES POST-PW-SB 72-537 OR PRE-PW-SB 72-627;
Attach the gasket (95) and the ring spacer (96A) with the paraffin wax.
14) Install the gasket (95) to the lower flanged opening of the cooling air valve.
15) Attach the gasket (95) with the paraffin wax.
16) Lubricate the threads of the bolts (98), which attach the cooling air tube, with engine oil.
17) ENGINES PRE-PW-SB 72-537 OR POST-PW-SB 72-627;
Attach the opposite end, with the gasket (95) and metering plate (96) in position, to the cooling air valve with the bolts (98).
18) ENGINES POST-PW-SB 72-537 OR PRE-PW-SB 72-627;
Attach the opposite end, with the gasket (95) and ring spacer (96A) in position, to the cooling air valve with the bolts (98).
a) Tighten the bolts (98) with your hand.
19) Lubricate the threads of the bolts (87), which attach the clamps (86) for the cooling air duct (85), with engine oil.
20) Attach the cooling air duct (85) to the three brackets on the diffuser case with the bolts (87), clamps (86), and nut (88).
a) Tighten the bolts (87) to 36-40 pound-inches (4.0-4.5 newton-meters).
21) Tighten all bolts (98, 101, 103) at each end of the cooling air duct (1) to 85-95 pound-inches(9.6-10.7 newton-meters).
a) Tighten the bolts (98, 101, 103) until the necessary torque is kept.
b) Install the lockwire or safety cable and safety cable ferrule to the bolts (98, 101, 103) after the necessary torque is kept.
22) Lubricate the threads of the bolt, which attaches the clamp to the bracket at the diffuser case, with engine oil.
23) Attach the fuel supply manifold to the bracket attached to the flange of the cooling air tube at the diffuser case with the bolt, clamp, and nut.
a) Tighten the bolt to 36-40 pound-inches (4.0-4.5 newton-meters).

(b) Install the heat shield (119) to the engine with the bolts (116, 120), washers (117, 121) and nut (118) (Fig. 403).

(c) Install the starter (AMM 80-11-01/401).
(d) Install the engine-driven pump (AMM 29-11-05/401).

S 424-105-N00
(22) For the fuel injector 13, 14 or 15, do the steps that follow (Fig. 404):
(a) ENGINES PRE-PW-SB 73-84 AND PRE-PW-SB 79-46 OR PRE-PW-SB 79-75; For the fuel injector 13, install the oil scavenge manifold (125) for the No.3 bearing with the steps that follow:
1) Remove the protection covers.
2) Lubricate the packing (127) with engine oil.
3) Install the packing (127) into the groove at the flanged end of the oil scavenge manifold (125).
4) Lubricate the threads of the elbow for the oil scavenge manifold (125) with engine oil.
5) Install the oil scavenge manifold (125) to the engine.
a) Lubricate the threads of the bolts (129), which attach oil scavenge manifold (125), with the anti-seize paste.
b) Install the oil scavenge manifold (125) to the tube nut (126) on the internal tube for the diffuser case at approximately the 6 o'clock position.
c) Install the other end of the oil scavenge manifold (125) to the port on the lubrication and scavenge oil pump with the bolts (129) and bracket (128).
d) Tighten the bolts (129) with your hand.
e) Lubricate the threads of the bolt (131), which attaches the clamp (133) to the oil pump bracket, with engine oil.
f) Attach the oil scavenge manifold (125) to the oil pump bracket with the bolt (131), clamp (133), and nut (134).
g) Tighten the bolt (131) to 36-40 pound-inches (4.0-4.5 newton-meters).
h) Tighten the bolts (129), which attach the oil scavenge manifold (125) to the lubrication and scavenge oil pump, to 62-72 pound-inches (7.0-8.1 newton-meters).
i) While you hold the elbow, tighten the tube nut (126) for the internal tube to 650-700 pound-inches (73.4-79.1 newton-meters).

j) Safety the tube nut (126) with lockwire or safety cable and safety cable ferrule.

CAUTION: USE THE CORRECT ASSEMBLY PROCEDURE, AND TOOLS, FOR THE HARNESS CONNECTOR INSTALLATION (AMM 70-24-05/201). IF YOU USE THE INCORRECT ASSEMBLY PROCEDURE, OR TOOLS, A DAMAGED OR LOOSE CONNECTOR CAN OCCUR. A LOOSE CONNECTOR PERMITS VIBRATION, WHICH CAUSES THE CONTACTS TO WEAR AND DECREASES THE LIGHTNING PROTECTION.

6) Connect the electrical connector (130), W5P13, to the oil temperature sensor for the No. 3 bearing (AMM 70-24-05/201).

(b) ENGINES POST-PW-SB 73-84 AND PRE-PW-SB 79-46 OR PRE-PW-SB 79-75;
For the fuel injector 13, install the oil scavenge manifold (125) for the No.3 bearing with the steps that follow:

1) Remove the protection covers.
2) Lubricate the packing (127) with engine oil.
3) Install the packing (127) into the groove at the flanged end of the oil scavenge manifold (125).
4) Lubricate the threads of the elbow for the oil scavenge manifold (125) with engine oil.
5) Install the oil scavenge manifold (125) to the engine.
   a) Lubricate the threads of the bolts (129), which attach oil scavenge manifold (125), with the anti-seize paste.
   b) Install the oil scavenge manifold (125) to the tube nut (126) on the internal tube for the diffuser case at approximately the 6 o'clock position.
   c) Install the other end of the oil scavenge manifold (125) to the port on the lubrication and scavenge oil pump with the bolts (129) and bracket (128).
   d) Tighten the bolts (129) with your hand.
   e) Lubricate the threads of the bolt (131), which attaches the clamp (133) to the oil pump bracket, with engine oil.
   f) Attach the oil scavenge manifold (125) to the oil pump bracket with the bolt (131), clamp (133), and nut (134).
   g) Tighten the bolt (131) to 36-40 pound-inches (4.0-4.5 newton-meters).

h) Tighten the bolts (129), which attach the oil scavenge manifold (125) to the lubrication and scavenge oil pump, to 62-72 pound-inches (7.0-8.1 newton-meters).
i) While you hold the elbow, tighten the tube nut (126) for the internal tube to 650-700 pound-inches (73.4-79.1 newton-meters).
j) Safety the tube nut (126) with lockwire or safety cable and safety cable ferrule.

6) Connect the harness connector (130), W5P13, to the oil temperature sensor for the No. 3 bearing.
a) Connect the lugs of the harness connector (130), W5P13, to the studs on the oil temperature sensor and loosely install the nuts.

CAUTION: DO NOT TIGHTEN THE NUTS OF THE HARNESS CONNECTOR TO MORE THAN THE MAXIMUM TORQUE. TOO MUCH TORQUE ON THE STUDS OF THE OIL TEMPERATURE SENSOR CAN LOOSEN OR DAMAGE THE STUDS.

b) Tighten the nuts on the alumel studs (larger studs) to 18-22 pound-inches (2.0-2.5 newton-meters).
c) Tighten the nuts on the chromel studs (larger studs) to 15-18 pound-inches (1.7-2.0 newton-meters).

(c) ENGINES POST-PW-SB 73-84 AND POST-PW-SB 79-46;
For the fuel injector 13, install the oil scavenge manifold (125) for the No.3 bearing with the steps that follow:
1) Remove the protection covers.
2) Lubricate the packing (127) with engine oil.
3) Install the packing (127) into the groove at the flanged end of the oil scavenge manifold (125).
4) Lubricate the threads of the elbow for the oil scavenge manifold (125) with engine oil.
5) Install the oil scavenge manifold (125) to the engine.
a) Lubricate the threads of the bolts (129), which attach oil scavenge manifold (125), with the anti-seize paste.
b) Install the oil scavenge manifold (125) to the tube nut (126) on the internal tube for the diffuser case at approximately the 6 o'clock position.
c) Install the other end of the oil scavenge manifold (125) to the port on the lubrication and scavenge oil pump with the bolts (129) and bracket (128).
d) Tighten the bolts (129) with your hand.
e) Lubricate the threads of the bolts (131, 138), which attach the clamps (133, 137) to the oil pump bracket, with engine oil.
f) Attach the oil scavenge manifold (125) to the oil pump bracket with the bolts (131, 138), clamps (133, 137), and nuts (134, 135).

g) Tighten the bolts (131, 138) to 36-40 pound-inches (4.0-4.5 newton-meters).
h) Tighten the bolts (129), which attach the oil scavenge manifold (125) to the lubrication and scavenge oil pump, to 62-72 pound-inches (7.0-8.1 newton-meters).
i) While you hold the elbow, tighten the tube nut (126) for the internal tube to 650-700 pound-inches (73.4-79.1 newton-meters).
j) Safety the tube nut (126) with lockwire or safety cable and safety cable ferrule.

6) Connect the harness connector (130), W5P13, to the oil temperature sensor for the No. 3 bearing.
a) Connect the lugs of the harness connector (130), W5P13, to the studs on the oil temperature sensor and loosely install the nuts.

CAUTION: DO NOT TIGHTEN THE NUTS OF THE HARNESS CONNECTOR TO MORE THAN THE MAXIMUM TORQUE. TOO MUCH TORQUE ON THE STUDS OF THE OIL TEMPERATURE SENSOR CAN LOOSEN OR DAMAGE THE STUDS.

b) Tighten the nuts on the alumel studs (larger studs) to 18-22 pound-inches (2.0-2.5 newton-meters).
c) Tighten the nuts on the chromel studs (larger studs) to 15-18 pound-inches (1.7-2.0 newton-meters).

(d) ENGINES POST-PW-SB 73-84 AND POST-PW-SB 79-75;
For the fuel injector 13, install the oil scavenge hose and manifold assembly (125) for the No.3 bearing with the steps that follow:
1) Remove the protection covers.
2) Lubricate the packing (127) with engine oil.
3) Install the packing (127) into the groove at the flanged end of the oil scavenge hose and manifold assembly (125).
4) Lubricate the threads of the elbow for the oil scavenge hose and manifold assembly (125) with engine oil.
5) Install the oil scavenge hose and manifold assembly (125) to the engine.
a) Lubricate the threads of the bolts (129), which attach oil scavenge hose and manifold assembly (125), with the anti-seize paste.
b) Install the oil scavenge hose and manifold assembly (125) to the tube nut (126) on the internal tube for the diffuser case at approximately the 6 o'clock position.
c) Install the other end of the oil scavenge hose and manifold assembly (125) with the bolts (129) and bracket (128) to the bracket bolted on the fluid pressure dampener (ENGINES PRE-PW-SB 79-86) or to the adapter assembly (ENGINES POST-PW-SB 79-86), which is mounted on the top of the lubrication and scavenge oil pump.

d) Tighten the bolts (129) with your hand.
e) Lubricate the threads of the bolts (131, 135, 136, 138), which attach the clamps (133, 140), with engine oil.
f) Attach the oil scavenge hose and manifold assembly (125) to the oil pump bracket with the bolts (131, 135), clamp (133) and nuts (132, 134).
g) Attach the oil scavenge hose and manifold assembly (125) to the bracket between the fuel injectors 12 and 13, with the bolts (136, 138), clamp (140) and nuts (137, 139).
h) Tighten the bolts (131, 135, 136, 138) to 36-40 pound-inches (4.0-4.5 newton-meters).
i) Tighten the bolts (129), which attach the oil scavenge manifold (125) to the lubrication and scavenge oil pump, to 62-72 pound-inches (7.0-8.1 newton-meters).
j) While you hold the elbow, tighten the tube nut (126) for the internal tube to 650-700 pound-inches (73.4-79.1 newton-meters).
k) Safety the tube nut (126) with lockwire or safety cable and safety cable ferrule.

6) Connect the harness connector (130), W5P13, to the oil temperature sensor for the No. 3 bearing.
a) Connect the lugs of the harness connector (130), W5P13, to the studs on the oil temperature sensor and loosely install the nuts.

CAUTION: DO NOT TIGHTEN THE NUTS OF THE HARNESS CONNECTOR TO MORE THAN THE MAXIMUM TORQUE. TOO MUCH TORQUE ON THE STUDS OF THE OIL TEMPERATURE SENSOR CAN LOOSEN OR DAMAGE THE STUDS.

b) Tighten the nuts on the alumel studs (larger studs) to 18-22 pound-inches (2.0-2.5 newton-meters).
c) Tighten the nuts on the chromel studs (larger studs) to 15-18 pound-inches (1.7-2.0 newton-meters).

(e) Install the heat shield (115) to the engine with the bolts (110, 112), washers (111, 113) and nut (114) (Fig. 403).
(f) Install the integrated drive generator (AMM 24-11-01/401).

S 424-106-N00
(23) For the fuel injector 16, 17 or 18, install the oil tank (AMM 79-11-01/401).

S 424-107-N00
(24) For the fuel injector 19, 20 or 21, do the steps that follow:
(a) ENGINES PRE-PW-SB 72-567;
Install the diffuser-seal air-vent tube (3) with the steps that follow:
1) Attach the gasket (79) to the boss on the HPC case with the paraffin wax.
2) Align the deflector dowel pin with the dowel pin hole in the HPC boss.
3) Install the deflector (4).
4) Attach the gasket (79) to the flanged end of the air vent tube (3) with the paraffin wax.
5) Lubricate the threads of the bolts (76) with engine oil.
6) Install the bracket (81) and the air vent tube (3) to the HPC boss above the deflector (4) with the bolts (76).
a) Tighten the bolts (76) with your hand.
7) Connect the tube nut (1) to the adapter (2) (View A, Fig. 401).
a) Tighten the tube nut (1) with your hand.
8) Lubricate the threads of the bolt (71) with engine oil.
(b) For the fuel injector 20, install the upper left cooling-air duct for the turbine-vane and blade (AMM 75-24-02/401).
1) Attach the air vent tube (3) to the bracket (14) at the fuel injector 21 with the bolt (71), clamp (72) and nut (70).
2) Tighten the tube nut (1) to 825-900 pound-inches (93.2-101.7 newton-meters).
a) Safety the tube nut (1) with lockwire or safety cable and safety cable and ferrule.

3) Tighten the bolts (76) to 85-95 pound-inches (9.6-10.7 newton-meters).
   a) Without loosening, tighten the bolts (76) again until the necessary torque is kept.
   b) Safety the bolts (76) with lockwire or safety cable and safety cable ferrule.
4) Lubricate the threads of the bolt, which attaches the clamp for the PT4.95 tube, with engine oil.
5) Attach the clamp for the PT4.95 tube to the bracket (81) at the end of the air vent tube (3) with the bolt and nut.
   a) Tighten the bolt to 36-40 pound-inches (4.1-4.5 newton-meters).
6) Lubricate the threads of the bolt, which attaches the clamp for the signal tube of the air shutoff valve, with engine oil.
7) Attach the clamp for the signal tube to the bracket (81) with the bolt and nut.
   a) Tighten the bolt to 36-40 pound-inches (4.1-4.5 newton-meters).

(c) ENGINES POST-PW-SB 72-567;
Install the left diffuser-seal air-vent tube (3) with the steps that follow:
1) Remove the protection caps from the openings in the diffuser case, the HPC rear case and the open ends of the diffuser-seal air-vent tube.
2) Install the gasket (79) in the groove in the port on the HPC rear case.
3) Install the deflector (4) in the port on the HPC rear case.
   a) Align the pin on the deflector (4) with the alignment hole in the HPC rear case.

CAUTION: HOLD THE DIFFUSER CASE INTERNAL TUBE WHEN YOU REMOVE THE SAFETY WIRE AND INSTALL THE LOCKS. IF YOU DO NOT HOLD THE DIFFUSER CASE INTERNAL TUBE, IT CAN FALL INTO THE DIFFUSER CASE.

4) Remove the temporary safety wire around the diffuser case internal tube.

5) Attach the locks (150) that hold the diffuser case internal tube with paraffin wax.
6) Attach the new gasket (152) to the rear flange of the diffuser-seal air-vent tube (3) with paraffin wax.
   a) Make sure the raised surface of the gasket (152) points outside of the diffuser-seal air-vent tube (3).
   b) Make sure the boltholes and the opening in the gasket (152) align with the boltholes and the opening in the rear flange of the diffuser-seal air-vent tube (3).
7) Attach the new gasket (79) to the groove in the rear flange of the diffuser-seal air-vent tube (3) with paraffin wax.
8) Attach the new gasket (151) to the forward flange of the diffuser-seal air-vent tube (3) with paraffin wax.
9) Lubricate the threads of the attaching bolts of the diffuser-seal air-vent tube (3) with engine oil.
10) Put the diffuser-seal air-vent tube (3) in position on the engine.
11) Attach the rear flange and the bracket (155) to the diffuser case with the ten bolts (153).
   a) Tighten the bolts (153) with your hand.
12) Attach the forward flange and the bracket (81) to the HPC rear case with the four bolts (76).
   a) Tighten the bolts (76) with your hand.
13) Lubricate the threads of the bolt (71) with engine oil.
14) Attach the clamp (72) of the diffuser-seal air-vent tube (3) to the fuel injector bracket with the bolt (71) and nut (70).
   a) Tighten the bolt (71) with your hand.
15) Tighten the bolts (153) that attach the diffuser-seal air-vent tube (3) and the bracket (155) to the diffuser case to 65-85 pound-inches (7.3-9.6 newton-meters).
   a) Without loosening, tighten the bolts (153) again until the necessary torque is kept.
16) Tighten the bolts (76) that attach the diffuser-seal air-vent tube (3) and the bracket (81) to the HPC rear case to 85-95 pound-inches (9.6-10.7 newton-meters).
   a) Without loosening, tighten the bolts (76) again until the necessary torque is kept.

17) Safety the bolts (76 and 153) with lockwire or safety cable and safety cable ferrule.
18) Tighten the bolt (71) that attaches the clamp (72) of the diffuser-seal air-vent tube (3) to the fuel injector bracket to 36-40 pound-inches (4.1-4.5 newton-meters).
19) Lubricate the threads of the attaching bolt (154) of the vent tube for the No.3 bearing (157) with engine oil.
20) Attach the clamp (156) of the vent tube for the No.3 bearing (157) to the bracket (155) with the bolt (154) and nut (158).
    a) Tighten the nut (158) to 36-40 pound-inches (4.1-4.5 newton-meters).
21) Lubricate the threads of the attaching bolt of the PT4.95 tube with engine oil.
22) Attach the clamp of the PT4.95 tube to the bracket (81) with the bolt and nut.
    a) Tighten the nut to 36-40 pound-inches (4.1-4.5 newton-meters).
23) Lubricate the threads of the attaching bolt of the air shutoff valve signal-tube with engine oil.
24) Attach the clamp of the air shutoff valve signal-tube to the bracket (81) with the bolt and nut.
    a) Tighten the nut (225) to 36-40 pound-inches (4.1-4.5 newton-meters).

G. Put the Airplane Back to Its Usual Condition

S 864-068-N00

(1) For the left engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P6 panel:
(a) 6E1, FUEL VALVES L SPAR

S 864-069-N00

(2) For the right engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P6 panel:
(a) 6E2, FUEL VALVES R SPAR

S 864-070-N00
(3) For the left engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P11 panel:
(a) 11D25, FUEL CONT VLV & EEC CHAN B RESET L

S 864-071-N00
(4) For the right engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P11 panel:
(a) 11D26, FUEL CONT VLV & EEC CHAN B RESET R

S 214-072-N00
(5) Examine the fuel distribution system for leaks (AMM 73-11-00/601).

S 714-073-N00
(6) Do a test of the fuel injector and support that is shown in the Power Plant Test Reference Table (AMM 71-00-00/501).

S 414-074-N00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(7) Close the thrust reversers (AMM 78-31-00/201).

S 414-075-N00
(8) Close the core cowl panels (AMM 71-11-06/201).

S 414-076-N00
(9) Close the fan cowl panels (AMM 71-11-04/201).

S 444-077-N00
(10) Do the activation procedure for the thrust reversers (AMM 78-31-00/201).

FUEL TUBES - REMOVAL/INSTALLATION

1. General
   A. This procedure gives the tasks for the removal and the installation of the tubes in the fuel system.
   B. It is not necessary to remove the fuel tubes for the usual maintenance. If one or more of these conditions show, you can remove the fuel tubes:
      (1) The fuel tubes are damaged
      (2) The fuel tubes have leaks
      (3) The fuel tubes prevent the removal of the engine component.
   C. When you remove the fuel tubes, you must use this procedure.
   D. You can get access to the fuel tubes when you open the left or the right thrust reversers.

TASK 73-11-06-004-021-N00

2. Fuel Tube Removal
   A. References
      (1) AMM 71-11-04/201, Fan Cowl Panels
      (2) AMM 71-11-06/201, Core Cowl Panels
      (3) AMM 78-31-00/201, Thrust Reverser System
   B. Access
      (1) Location Zones
          411 Engine, Left - High Pressure Compressor (HPC) Case, Diffuser, and Combustor Case
          421 Engine, Right - High Pressure Compressor (HPC) Case, Diffuser, and Combustor Case

      (2) Access Panels
          415AL Left Thrust Reverser Half, Left Engine
          416AR Right Thrust Reverser Half, Left Engine
          425AL Left Thrust Reverser Half, Right Engine
          426AR Right Thrust Reverser Half, Right Engine

   C. Procedure

      S 014-022-N00
      (1) Open the fan cowl panel (AMM 71-11-04/201).

S 044-023-N00

WARNING: DO THE THRUST REVERSER DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(2) Do this procedure: Thrust Reverser Deactivation for Ground Maintenance (AMM 78-31-00/201).

S 014-024-N00

(3) Open the core cowl panels (AMM 71-11-06/201).

S 014-025-N00

WARNING: OBEY THE INSTRUCTIONS IN THE PROCEDURE TO OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

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

S 024-026-N00

(5) Remove the fuel tube:
  (a) Disconnect the coupling nuts or the flexible fittings.
  (b) Remove the fuel tube from the engine.

S 934-027-N00

(6) Attach a tag with the name and the location to each fuel tube that you disconnected or removed.

NOTE: If you remove the tubes from different systems, you must be careful to not connect the tubes at the incorrect location.

S 934-028-N00

(7) Attach a tag or put a note on the location of all clips, support clamps, and brackets to make sure they are installed correctly.

S 034-029-N00

(8) Install caps for protection of the fuel tubes and openings:
  (a) Install the caps on the disconnected or removed fuel tube.
  (b) Install the caps on the openings on the engine where you removed the fuel tube.

TASK 73-11-06-404-030-N00

3. Fuel Tube Installation

A. References

(1) AMM 70-11-04/201, Fittings
(2) AMM 71-00-00/501, Power Plant
(3) AMM 71-11-04/201, Fan Cowl Panels
(4) AMM 71-11-06/201, Core Cowl Panels
(5) AMM 78-31-00/201, Thrust Reverser System

B. Access

(1) Location Zones

411 Engine, Left - High Pressure Compressor (HPC) Case, Diffuser, and Combustor Case
421 Engine, Right - High Pressure Compressor (HPC) Case, Diffuser, and Combustor Case

(2) Access Panels

415AL Left Thrust Reverser Half, Left Engine
416AR Right Thrust Reverser Half, Left Engine
425AL Left Thrust Reverser Half, Right Engine
426AR Right Thrust Reverser Half, Right Engine

C. Procedure

S 424-031-N00

(1) Install the fuel tube:
(a) Put the fuel tube on the engine.
(b) Connect the coupling nuts or the flexible fittings (AMM 70-11-04/201).

S 434-032-N00

(2) Connect all clips, support clamps, and brackets.

S 414-033-N00

WARNING: OBEY THE INSTRUCTIONS IN THE PROCEDURE TO CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(3) Close the thrust reverser (AMM 78-31-00/201).

S 414-034-N00

(4) Close the core cowl panel (AMM 71-11-06/201).

S 414-037-N00

(5) Close the fan cowl panel (AMM 71-11-06/201).

S 444-035-N00

(6) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

S 794-036-N00

(7) Do the test for the Fuel Tubes which is shown in the Power Plant Test Reference Table (AMM 71-00-00/501).

FUEL BYPASS VALVE - REMOVAL/INSTALLATION

1. General
   A. The fuel bypass valve is installed on the fuel pump, below the right thrust reverser.

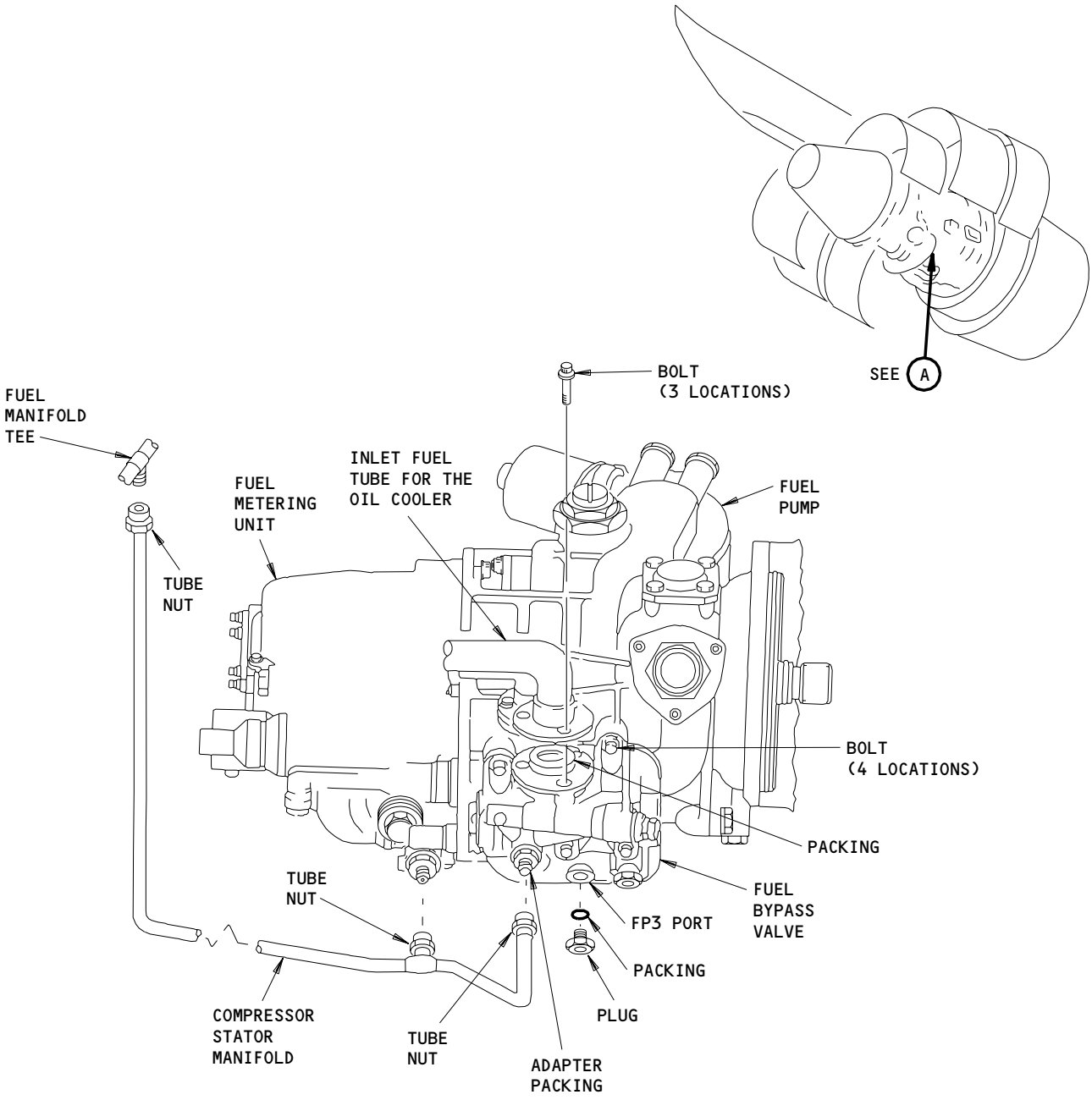
TASK 73-11-07-004-001-N00

2. Remove the Fuel Bypass Valve (Fig. 401)
   A. Equipment
      (1) Container - 5 gallon (20 liters), to catch the fuel
   B. Consumable Materials
      (1) D00504 Petrolatum - PMC 9609
      (2) G01505 Lockwire. Safety and Lock - NASM20995
   C. References
      (1) AMM 24-22-00/201, Electrical Power - Control
      (2) AMM 71-11-04/201, Fan Cowl Panels
      (3) AMM 71-11-06/201, Core Cowl Panels

      (4) AMM 78-31-00/201, Thrust Reverser System
   D. Access
      (1) Location Zone
          411 Left Engine
          421 Right Engine
      (2) Access Panel
          414AR Fan cowl panel (Right), Left Engine
          416AR Fan reverser (Right), Left Engine
          418AR Core cowl (Right), Left Engine
          424AR Fan cowl panel (Right), Right Engine
          426AR Fan reverser (Right), Right Engine
          428AR Core cowl (Right), Right Engine
   E. Prepare to Remove the Fuel Bypass Valve

      S 864-002-N00
      (1) Supply electrical power (AMM 24-22-00/201).

      S 864-003-N00
      (2) Make sure the applicable engine and spar valves are closed as follows:
          (a) Make sure this circuit breaker on the main power distribution panel, P6, is closed:
              1) For the left engine:
                 a) 6E1, FUEL VALVES L SPAR



Fuel Bypass Valve Installation
Figure 401

2) For the right engine:
a) 6E2, FUEL VALVES R SPAR

(b) Make sure this circuit breaker on the overhead circuit breaker panel, P11, is closed:
1) For the left engine:
a) 11D25, FUEL CONT VLV & EEC CHAN B RESET L
2) For the right engine:
a) 11D26, FUEL CONT VLV & EEC CHAN B RESET R

(c) Make sure that the applicable FUEL CONTROL switch is in the CUTOFF position.

(d) Make sure that the applicable ENG VALVE and SPAR VALVE panel lights on the control stand are off.

S 864-004-N00

(3) Open this circuit breaker on the main power distribution panel, P6, and attach the DO-NOT-CLOSE tag:
(a) For the left engine:
1) 6E1, FUEL VALVES L SPAR
(b) For the right engine:
1) 6E2, FUEL VALVES R SPAR

S 864-005-N00

(4) Open this circuit breaker on the overhead circuit breaker panel, P11, and attach the DO-NOT-CLOSE tag:
(a) For the left engine:
1) 11D25, FUEL CONT VLV & EEC CHAN B RESET L
(b) For the right engine:
1) 11D26, FUEL CONT VLV & EEC CHAN B RESET R

S 864-006-N00

(5) Remove electrical power (AMM 24-22-00/201).

S 014-007-N00

(6) Open the right fan cowl panel (AMM 71-11-04/201).

S 044-038-N00

WARNING: DO THE THRUST REVERSER DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(7) Do this procedure: Thurust Reverser Deactivation for Ground Maintenance (AMM 78-31-00/201).

S 014-009-N00

(8) Open the right core cowl panel (AMM 71-11-06/201).

S 014-010-N00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(9) Open the right thrust reverser (AMM 78-31-00/201).

F. Procedure

S 024-039-N00

(1) Remove the Fuel Bypass Valve
  (a) Drain the fuel from the fuel pump as follows:
    1) Put the container below the fuel pump.
    2) Remove the drain plug from the fuel pump.
    3) Let the fuel drain from the fuel pump.
    4) Remove and discard the packing from the drain plug.
  (b) Install the drain plug in the fuel pump as follows:
    1) Lubricate a new packing with the petrolatum.
    2) Install the packing on the drain plug.
    3) Install the drain plug in the fuel pump.
    4) Tighten the drain plug to 45-55 pound-inches (5.1-6.2 newton-meters).
    5) Install lockwire on the drain plug.
  (c) Disconnect the compressor stator manifold as follows:
    1) Disconnect the compressor stator manifold from the fuel bypass valve.
    2) Disconnect the compressor stator manifold from the fuel metering unit.
    3) Disconnect the compressor stator manifold from the fuel manifold tee.

4) Remove the compressor stator manifold from the enigne.

(d) Remove the bolts that attach the inlet fuel tube for the oil cooler to the top of the fuel bypass valve.

(e) Remove the fuel bypass valve from the fuel pump as follows:

1) Remove the bolts that attach the fuel bypass valve to the fuel pump.

2) Remove the fuel bypass valve from the fuel pump.

3) Discard the packings.

(f) Remove the packing from the flange of the inlet fuel tube for the oil cooler.

(g) Install the covers on the fuel pump and the inlet fuel tube for the oil cooler.

S 024-019-N00

(2) If it is necessary to replace the fuel bypass valve, do the steps that follow:

(a) Remove the adapter from the fuel bypass valve.

(b) Remove and discard the packing from the adapter.

TASK 73-11-07-404-021-N00

3. Install the Fuel Bypass Valve (Fig. 401)

A. Consumable Materials

(1) D00137 Engine Oil - PWA 521

(2) D00504 Petrolatum - PMC 9609

(3) G01505 Lockwire, Safety and Lock - NASM20995

(4) G02332 Ferrule - P05-292 (Optional)

(5) G02335 Cable - Safety - P05-291 (Optional)

B. References

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

(2) AMM 71-00-00/501, Power Plant

(3) AMM 71-11-04/201, Fan Cowl Panels

(4) AMM 71-11-06/201, Core Cowl Panels

(5) AMM 78-31-00/201, Thrust Reverser System

C. Access

(1) Location Zone

411 Left Engine

421 Right Engine

(2) Access Panel

414AR	Fan cowl panel (Right), Left Engine
416AR	Fan reverser (Right), Left Engine
418AR	Core cowl (Right), Left Engine
424AR	Fan cowl panel (Right), Right Engine
426AR	Fan reverser (Right), Right Engine
428AR	Core cowl (Right), Right Engine

D. Procedure

S 424-023-N00

(1) If it is necessary to install a new fuel bypass valve, do the steps that follow:
   (a) Lubricate the packing for the adapter with the petrolatum.
   (b) Install the packing on the adapter.
   (c) Lubricate the threads of the adapter with oil.
   (d) Install the adapter on the fuel bypass valve.
      1) Tighten the adapter to 110-120 pound-inches (12.4-13.6 newton-meters).

S 424-024-N00

(2) Install the fuel bypass valve:
   (a) Remove the covers from the fuel pump and the inlet fuel tube for the oil cooler.
   (b) Lubricate the packing for the inlet fuel tube for the oil cooler with the petrolatum.
   (c) Install the packing on the flange of the inlet fuel tube for the oil cooler.
   (d) Lubricate the packings for the fuel bypass valve with the petrolatum.
   (e) Install the packings in the grooves on the machined surface on the inboard side of the fuel pump.
   (f) Lubricate the bolt threads with oil.
   (g) Align the flange of the inlet fuel tube for the oil cooler on the large opening in the fuel bypass valve.
   (h) Attach the fuel bypass valve to the fuel pump with the bolts.
      1) Tighten the bolts to 85-95 pound-inches (9.6-10.7 newton-meters).

(i) Attach the inlet fuel tube for the oil cooler to the fuel bypass valve as follows:
1) Lubricate the bolt threads with oil.
2) Attach the inlet fuel tube for the oil cooler to the fuel bypass valve with the bolts.
3) Tighten the bolts to 85-95 pound-inches (9.6-10.7 newton-meters).

(j) Install the compressor stator manifold to the engine as follows:
1) Lubricate the threads of the tube nuts on the compressor stator manifold with oil.
2) Attach the compressor stator manifold to the fuel manifold tee.
3) Attach the compressor stator manifold to the fuel metering unit.
4) Attach the compressor stator manifold to the fuel bypass valve.
5) Tighten the tube nut at the fuel manifold tee to 340-375 pound-inches (38.4-42.4 newton-meters).
6) Tighten the tube nut at the fuel metering unit to 400-500 pound-inches (50.8-56.5 newton-meters).
7) Tighten the tube nut at the fuel bypass valve to 200-225 pound-inches (22.6-25.4 newton-meters).
8) Safety the tube nuts with lockwire or safety cable and safety cable ferrule.

E. Return the Aircraft to its Usual Condition

S 414-029-N00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 TO CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Close the right thrust reverser (AMM 78-31-00/201).

S 414-030-N00
(2) Close the right core cowl panel (AMM 71-11-06/201).

S 414-032-N00
(3) Close the right fan cowl panel (AMM 71-11-04/201).

S 444-036-N00
(4) Do the activation procedure for the thrust reversers (AMM 78-31-00/201).

S 864-033-N00
(5) Remove the DO-NOT-CLOSE tag and close this circuit breaker on the main power distribution panel, P6:
  (a) For the left engine:
    1) 6E1, FUEL VALVES L SPAR
  (b) For the right engine:
    1) 6E2, FUEL VALVES R SPAR

S 864-034-N00
(6) Remove the DO-NOT-CLOSE tag and close this circuit breaker on the overhead circuit breaker panel, P11:
  (a) For the left engine:
    1) 11D25, FUEL CONT VLV & EEC CHAN B RESET L
  (b) For the right engine:
    1) 11D26, FUEL CONT VLV & EEC CHAN B RESET R

S 714-035-N00
(7) Do the test of the Fuel Bypass Valve that is shown in the Power Plant Test Reference Table (AMM 71-00-00/501).

ENGINE MAIN FUEL SUPPLY LINE - REMOVAL/INSTALLATION

1. General
   A. This procedure has two tasks. The first task removes the fuel supply line for the engine main fuel. The second task installs the fuel supply line.
   B. You can get access to the fuel supply line when you open the right thrust reverser.

TASK 73-11-08-004-001-N00

2. Remove the Engine Main Fuel Supply Line
   A. Equipment
      (1) Five-gallon container for the fuel
   B. Consumable Materials
      (1) D00137 Engine Oil - PWA 521
      (2) D00504 Petrolatum - PMC 9609
   C. References
      (1) AMM 24-22-00/201, Electrical Power Control
      (2) AMM 71-11-04/201, Fan Cowl Panels
      (3) AMM 71-11-06/201, Core Cowl Panels
      (4) AMM 78-31-00/201, Thrust Reverser System
   D. Access
      (1) Location Zones
          416 L Power Plant Fan Reverser
          426 R Power Plant Fan Reverser

      (2) Access Panels
          416AR Fan Reverser (Right)
          426AR Fan Reverser (Right)

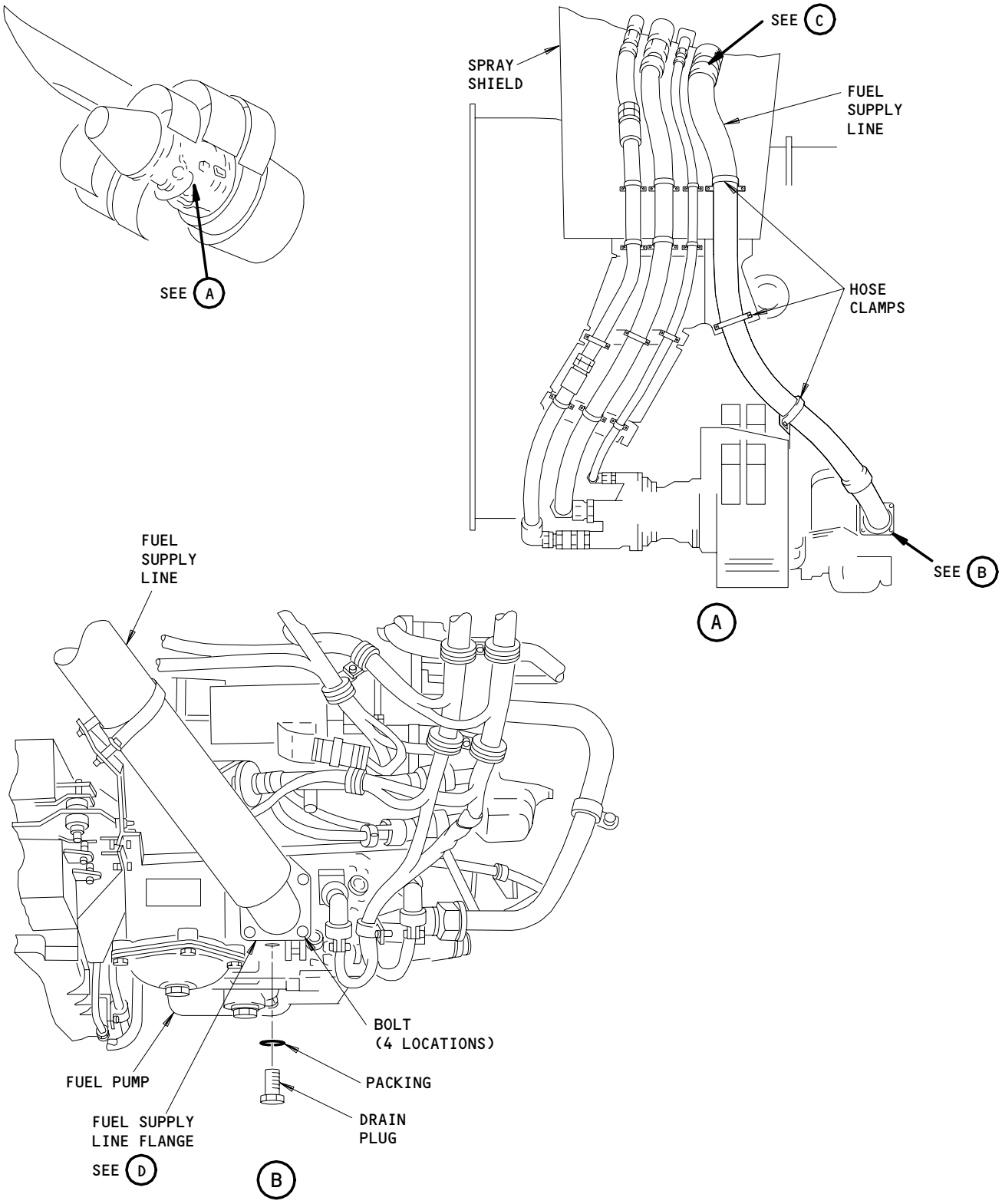
   E. Prepare to Remove the Fuel Supply Line

      S 864-002-N00
      (1) Supply electrical power (AMM 24-22-00/201).

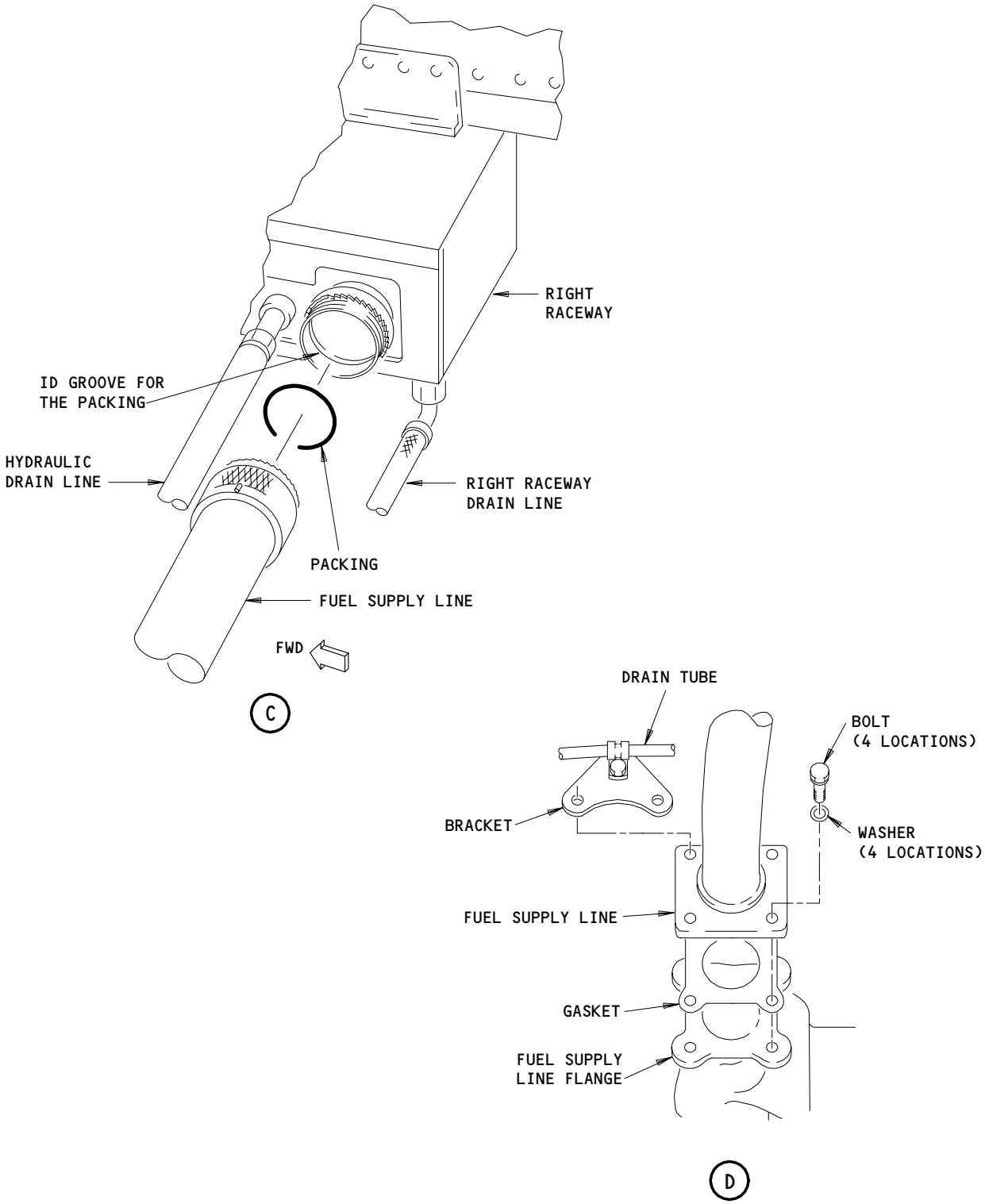
      S 864-003-N00
      (2) For the left engine, make sure this circuit breaker on the main power distribution panel, P6, is closed:
      (a) 6E1, FUEL VALVE L SPAR

      S 864-004-N00
      (3) For the right engine, make sure this circuit breaker on the main power distribution panel, P6, is closed:
      (a) 6E2, FUEL VALVE R SPAR

      S 864-005-N00
      (4) For the left engine, make sure this circuit breaker on the overhead circuit breaker panel, P11, is closed:
      (a) 11D25, FUEL CONT VLV & EEC CHAN B RESET L



Main Fuel Supply Line Installation
Figure 401 (Sheet 1)



Main Fuel Supply Line Installation
Figure 401 (Sheet 2)

316744

S 864-006-N00
(5) For the right engine, make sure this circuit breaker on the overhead circuit breaker panel, P11, is closed:
(a) 11D26, FUEL CONT VLV & EEC CHAN B RESET R

S 864-007-N00
(6) Make sure the applicable FUEL CONTROL switch is in the CUTOFF position.

S 864-008-N00
(7) Make sure the applicable ENG VALVE and SPAR VALVE panel lights on the control stand are off.

S 864-009-N00
(8) For the left engine, open this circuit breaker on the main power distribution panel, P6, and attach the DO-NOT-CLOSE tag:
(a) 6E1, FUEL VALVE L SPAR

S 864-010-N00
(9) For the right engine, open this circuit breaker on the main power distribution panel, P6, and attach the DO-NOT-CLOSE tag:
(a) 6E2, FUEL VALVE R SPAR

S 864-011-N00
(10) For the left engine, open this circuit breaker on the overhead circuit breaker panel, P11, and attach the DO-NOT-CLOSE tag:
(a) 11D25, FUEL CONT VLV & EEC CHAN B RESET L

S 864-012-N00
(11) For the right engine, open this circuit breaker on the overhead circuit breaker panel, P11, and attach the DO-NOT-CLOSE tag:
(a) 11D26, FUEL CONT VLV & EEC CHAN B RESET R

S 014-013-N00
(12) Open the right fan cowl panel (AMM 71-11-04/201).

S 044-014-N00

WARNING: DO THE THRUST REVERSER DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(13) Do this procedure: Thrust Reverser Deactivation for Ground Maintenance (AMM 78-31-00/201).

S 014-015-N00

(14) Open the right core cowl panel (AMM 71-11-06/201).

S 014-016-N00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00 WHEN YOU OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(15) Open the right thrust reverser (AMM 78-31-00/201).

F. Remove the Fuel Supply Line for the Engine Main Fuel

S 684-017-N00

(1) Put the container below the fuel pump.

S 684-018-N00

(2) Remove the drain plug from below the flange of the fuel supply line.
(a) Let the fuel drain.

S 034-019-N00

(3) Remove the packing from the drain plug.
(a) Discard the packing.

S 644-020-N00

(4) Lubricate the new packing with petrolatum.

S 434-021-N00

(5) Install the new packing to the drain plug.

S 644-022-N00

(6) Lubricate the threads of the drain plug with engine oil.

S 434-023-N00
(7) Install the drain plug to the fuel pump.
(a) Tighten the drain plug to 45-55 pound-inches (5.084-6.214 newton-meters).
(b) Install the lockwire to the drain plug.

S 034-024-N00
(8) Remove the bolts from the flange of the fuel supply line on the fuel pump.

S 034-025-N00
(9) Move the spray shield away from the strut mounted coupling.

S 034-026-N00
(10) Remove the bolts and nuts from the hose clamps which attach the fuel supply line to the engine core case.

S 024-027-N00
(11) Pull rearward and turn the coupling of the fuel supply line counterclockwise to remove the fuel supply line from the strut connector.
(a) Discard the packing from the ID groove on the strut connector.

TASK 73-11-08-404-028-N00

3. Install the Engine Main Fuel Supply Line

A. Consumable Materials
(1) D00504 Petrolatum - PMC 9609

B. References
(1) AMM 24-22-00/201, Electrical Power Control
(2) AMM 71-00-00/501, Power Plant
(3) AMM 71-11-04/201, Fan Cowl Panels
(4) AMM 71-11-06/201, Core Cowl Panels
(5) AMM 78-31-00/201, Thrust Reverser System

C. Access
(1) Location Zones
416 L Power Plant Fan Reverser
426 R Power Plant Fan Reverser

(2) Access Panels
416AR Fan Reverser (Right)
426AR Fan Reverser (Right)

D. Install the Fuel Supply Line for the Engine Main Fuel (Fig. 401)

S 434-029-N00
(1) Install the gasket on the flange of the fuel supply line.

S 424-030-N00
(2) Loosely attach the fuel supply line and the bracket to the flange with the bolts and washers.

S 644-031-N00
(3) Lubricate the new packing for the strut connector with petrolatum.

S 434-032-N00
(4) Install the packing in the ID groove of the strut connector.

S 424-033-N00

CAUTION: DO NOT USE THE TOOLS TO TIGHTEN THE COUPLING. IF YOU DO USE THE TOOLS, YOU CAN CAUSE DAMAGE TO THE COUPLING IF IT IS TIGHTENED TOO MUCH.

(5) Attach the fuel supply line to the strut connector.
(a) Tighten the coupling with your hand.
(b) Make sure the teeth on the coupling lock with the teeth on the strut connector.

S 434-034-N00
(6) Tighten the bolts on the flange to 180-200 pound-inches (20.338-22.597 newton-meters).

S 434-035-N00
(7) Install the bolts and nuts to the hose clamps which attach the fuel supply line to the engine core case.

S 434-036-N00
(8) Put the spray shield above the fuel hoses.

S 434-037-N00
(9) Connect the adhesive ends with a minimum overlap of 0.5 inch.
(a) Install the lockwire on the adhesive ends.

E. Put the Airplane Back to Its Usual Condition

S 414-038-N00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00 WHEN YOU CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Close the right thrust reverser (AMM 78-31-00/201).

S 414-039-N00
(2) Close the right core cowl panel (AMM 71-11-06/201).

S 414-040-N00
(3) Close the right fan cowl panel (AMM 71-11-04/201).

S 444-041-N00
(4) Do the activation procedure for the thrust reversers (AMM 78-31-00/201).

S 864-042-N00
(5) For the left engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P6 panel:
(a) 6E1, FUEL VALVE L SPAR

S 864-043-N00
(6) For the right engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P6 panel:
(a) 6E2, FUEL VALVE R SPAR

S 864-044-N00
(7) For the left engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P11 panel:
(a) 11D25, FUEL CONT VLV & EEC CHAN B RESET L

S 864-045-N00

(8) For the right engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P11 panel:
(a) 11D26, FUEL CONT VLV & EEC CHAN B RESET R

S 714-046-N00

(9) Do the test of the Fuel Manifold and External Tubes that is shown in the Power Plant Test Reference Table (AMM 71-00-00/501).

S 864-047-N00

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

FUEL PUMP INLET TUBE - REMOVAL/INSTALLATION

1. General
   A. This procedure includes the data for the removal and installation of the fuel pump inlet tube. As indicated below, you have to remove/install the fuel pump and fuel metering unit as well as the No. 3 bearing breather and restrictor valve before/after you work on the fuel pump inlet tube.

   TASK 73-11-59-004-001-N00

2. Remove the Fuel Pump Inlet Tube (FM11)
   A. Equipment
      (1) Container - 5 gallon (20 liters), to catch the fuel
   B. References
      (1) AMM 73-11-01/401, Fuel Pump
      (2) AMM 79-21-11/401, No. 3 Bearing Breather and Restrictor Valve
   C. Access
      (1) Location Zones

210	Control Cabin
411	Left Engine
421	Right Engine

      (2) Access Panels

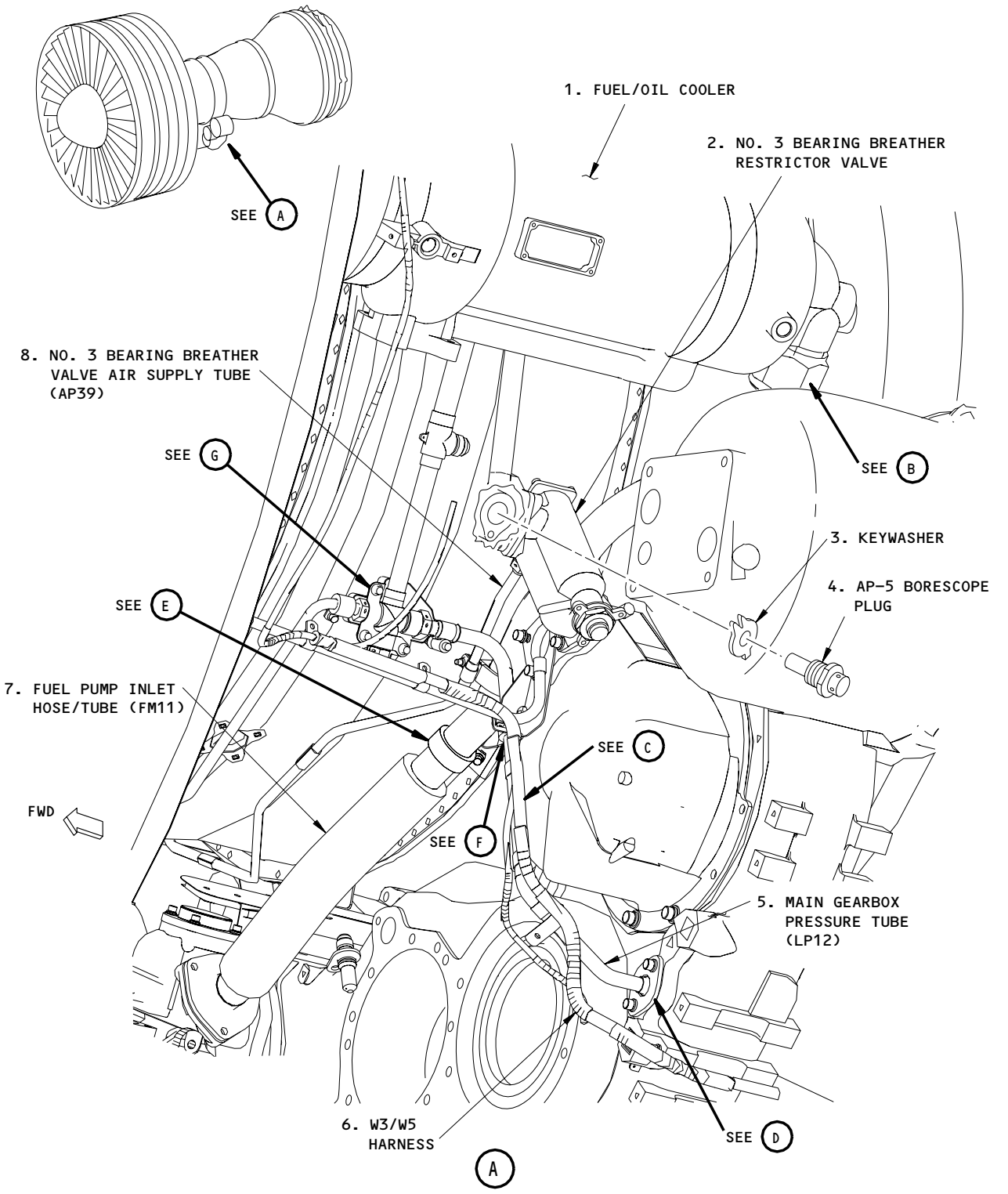
413AL/423AL	Fan Cowl Panel (Left)
414AR/424AR	Fan Cowl Panel (Right)
415AL/425AL	Thrust Reverser (Left)
416AR/426AR	Thrust Reverser (Right)
417AL/427AL	Core Cowl Panel (Left)
418AR/428AR	Core Cowl Panel (Right)

   D. Prepare for the Removal of the Fuel Pump Inlet Tube

      S 024-002-N00
      (1) Remove both the fuel pump and the fuel metering unit (AMM 73-11-01/401).

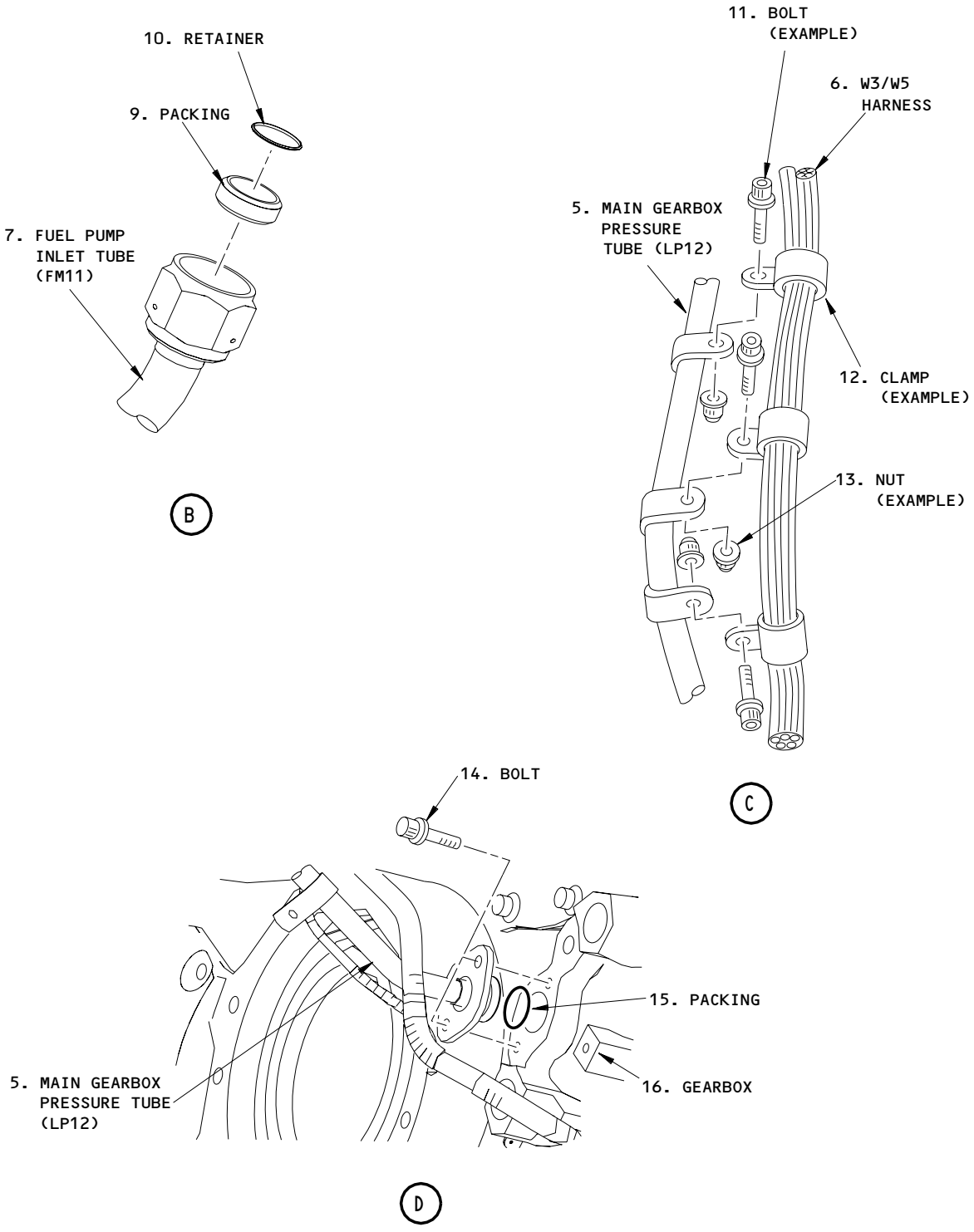
      NOTE: Make sure you follow the entire removal procedure.

      S 024-003-N00
      (2) Remove the No. 3 Bearing Breather and Restrictor Valve (AMM 79-21-11/401)
   E. Procedure



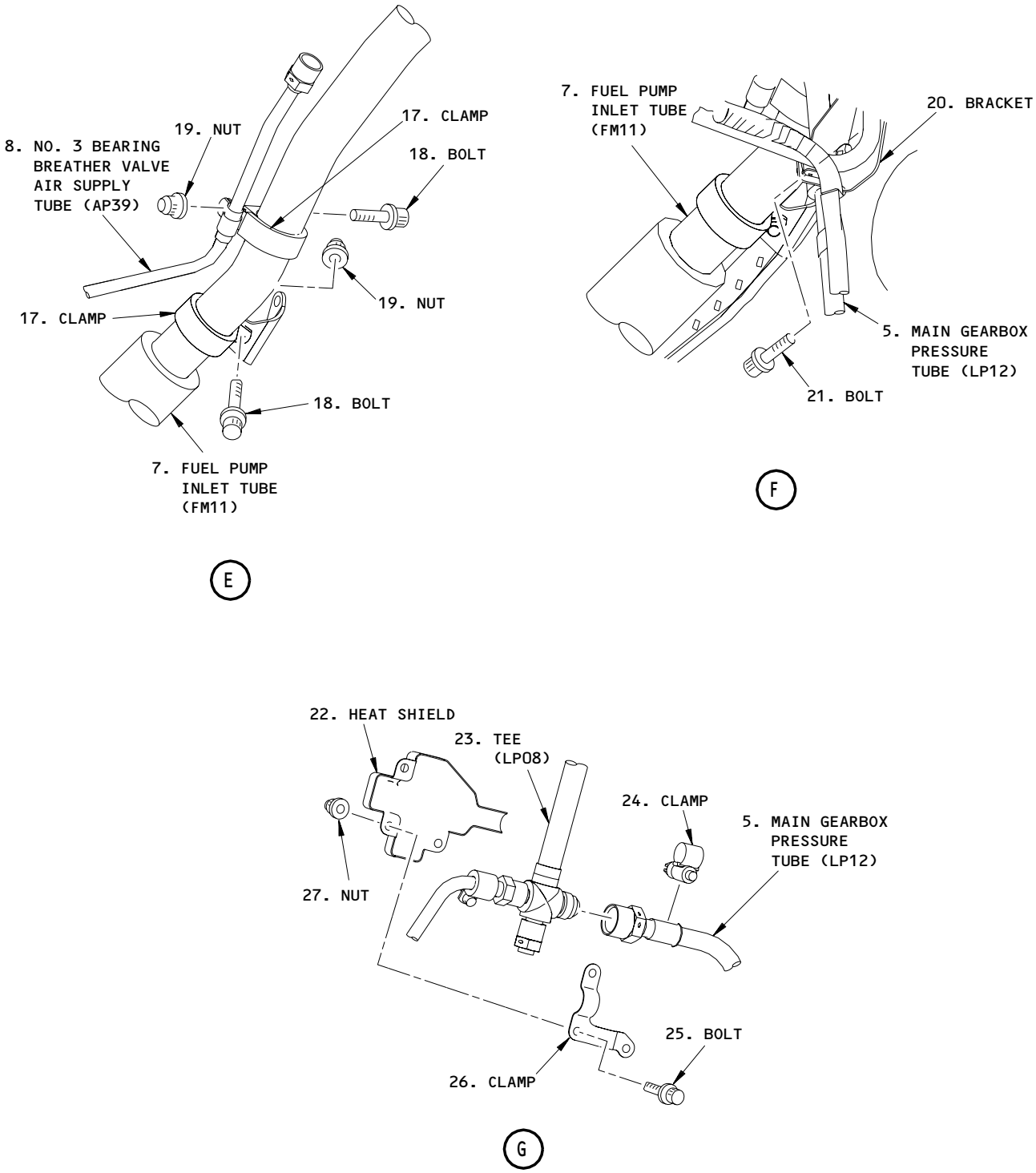
L-B7028 (1098)
PW V

Fuel Pump Inlet Tube Installation
Figure 401 (Sheet 1)

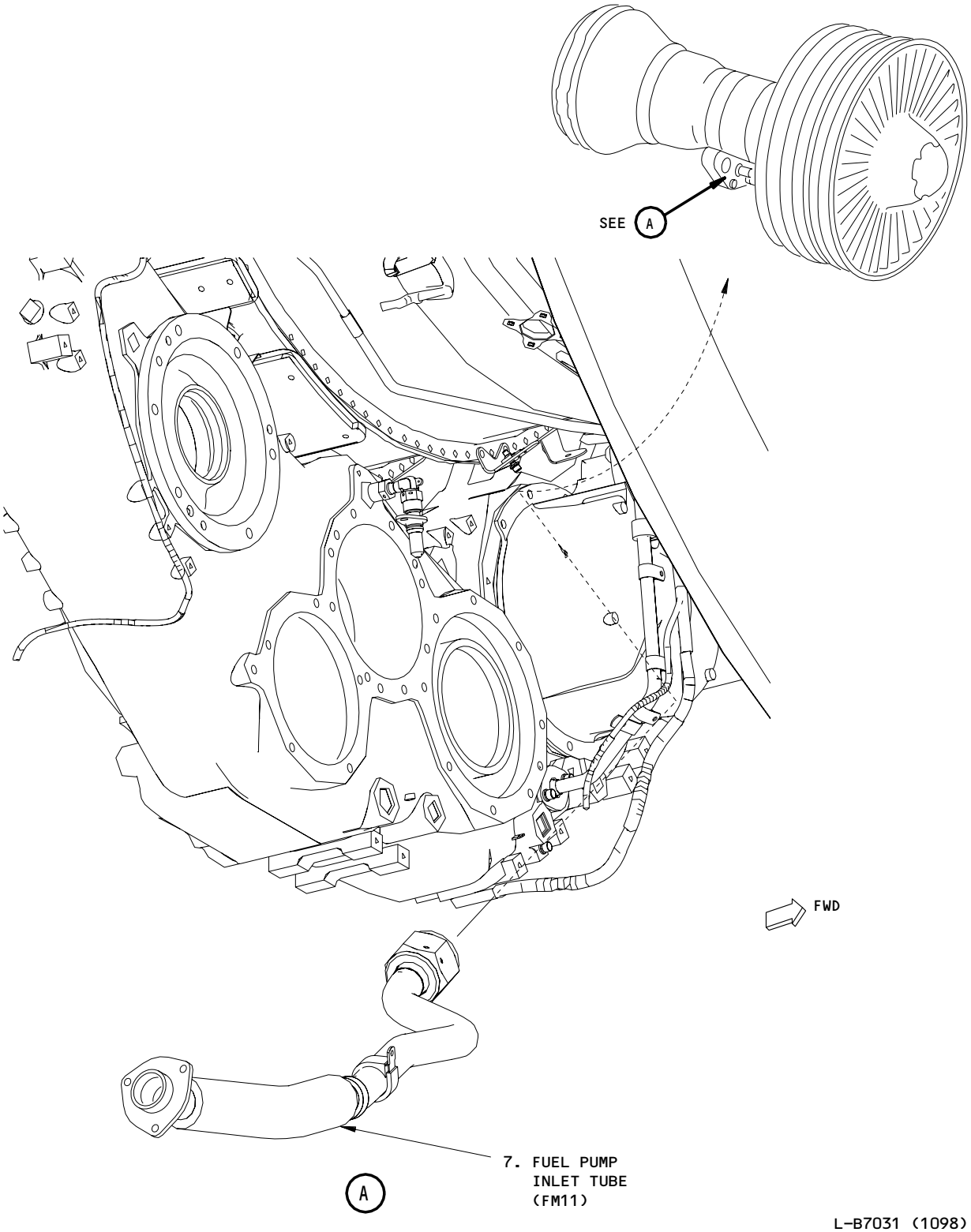


L-B7029 (1098)
PW V

Fuel Pump Inlet Tube Installation
Figure 401 (Sheet 2)



Fuel Pump Inlet Tube Installation
Figure 401 (Sheet 3)



L-B7031 (1098)
PW V

Fuel Pump Inlet Tube Installation From The right Side
Figure 402

S 024-004-N00
(1) Disconnect the fuel pump inlet tube (FM11) (7) from the aft end of the fuel/oil cooler (1).

S 024-005-N00
(2) Remove the AP-5 borescope plug (4).
  (a) Find the AP-5 borescope plug (4) on the HPC case at approximately the 7 o'clock position.
  (b) Remove the AP-5 plug (4) and key washer (3) from the HPC case.

S 024-006-N00
(3) Remove the heatshield (22) and clamp (26) from the (LP08) tee (23).
  (a) Remove the three bolts (25) and nuts (27), which attach the heatshield (22) and clamp (26) to the (LP08) tee (23).
  (b) Remove the clamp (24), which attaches the heatshield (22) to the main gearbox pressure tube (LP12) (5).
  (c) Remove the heatshield (22) and clamp (26) from the engine.

S 024-007-N00
(4) Remove the main gearbox pressure tube (LP12) (5).
  (a) Disconnect the main gearbox pressure tube (LP12) (5) from the (LP08) tee (23).
  (b) Remove the two bolts (14), which attach the main gearbox pressure tube (LP12) (5) flange to the gearbox (16).
  (c) Remove the clamp bolts (11) and nuts (13), which attach the main gearbox pressure tube (LP12) (5) to the W3 and W5 harness clamps (12).
  (d) Remove the clamp bolt (21), which attaches the main gearbox pressure tube (LP12) (5) to the bracket (20) below the fuel pump inlet tube (FM11) (7).
  (e) Remove the main gearbox pressure tube (LP12) (5) from the engine.

S 024-008-N00
(5) Disconnect the clamps (17) on the fuel pump inlet tube (FM11) (7).
  (a) Remove the bolts (18) and nuts (19), which attach the clamps (17) to the No. 3 bearing breather valve air supply tube (AP39) (8) and the bracket (20).

S 024-009-N00
(6) Remove the fuel pump inlet tube (FM11) (7) from the engine.
  (a) With the fuel pump and the FMU removed, hold the flanged end of the fuel pump inlet tube (FM11) (7) and carefully remove it from the right side of the engine.

(b) Remove the packing (9) and retainer (10) from the fuel/oil cooler end (1) on the fuel pump inlet tube (FM11) (7).

S 424-010-N00

(7) Install protection covers to all openings.

TASK 73-11-59-404-011-N00

3. Install the Fuel Pump Inlet Tube (FM11)

A. Equipment

(1) M303, M305, or M307 Bergen Mechanical Crimper
Bergen Cable Technologies Inc
170 Gregg St
Lodi, NJ 07644-9982

B. Consumable Materials

(1) D00137 Engine Oil - PWA-521
(2) G02334 Lockwire - AS3214-02
(3) G02335 Cable - Safety - P05-291 (Optional)
(4) G02332 Ferrule - P05-292 (Optional)
(5) D50124 Anti-seize paste - P06-054
(6) A00456 Antigalling Compound - PWA 550

C. Parts

AMM			AIPC		
FIG	ITEM	NOMENCLATURE	SUBJECT	FIG	ITEM
401	7	Fuel Pump Inlet Hose/Tube (FM11)	73-11-06	20	65, 68
	9	Packing			42
	15	Packing	79-21-51	05	135

D. References

(1) AMM 71-00-00/501, Power Plant
(2) AMM 73-11-01/401, Fuel Pump
(3) AMM 79-21-11/401, No. 3 Bearing Breather and Restrictor Valve

E. Procedure

S 024-012-N00

(1) Remove the protection covers from the openings.

S 424-013-N00

(2) Install the fuel pump inlet tube (FM11) (7).

(a) Put the fuel pump inlet tube (FM11) (7) in position below the HPC from the right side of the engine.

(b) Move the fuel pump inlet tube (FM11) (7) around the HPC on the left side of the engine until the top end of the tube is in position on the aft port of the fuel/oil cooler (1).
(c) Lubricate the retainer (10) and packing (9) with engine oil (PWA 521).
(d) Lubricate the adapter on the fuel/oil cooler aft port with Antigalling Compound (PWA 550).
(e) Attach the fuel pump inlet tube (FM11) (7) to the aft port of the fuel/oil cooler (1), hand tight only.
(f) Attach the two clamps (17) on the fuel pump inlet tube (FM11) (7).
1) Lubricate the two clamp bolts (18) with Engine Oil (PWA 521).
2) Install the bolt (18) and nut (19) to the fuel pump inlet tube (FM11) (7) and the No. 3 bearing breather valve air supply tube (AP39) clamp (17), hand tight only.
3) Install the bolt (18) and nut (19) to the fuel pump inlet tube (FM11) clamp (17) and bracket (20), hand tight only.

S 424-014-N00

(3) Install the fuel pump and the fuel metering unit (AMM 73-11-01/401).

NOTE: The lower end of the fuel pump inlet tube (FM11) is connected when you install the fuel pump and fuel metering unit.

Do not do the steps to Put the Aircraft Back to its Usual Condition (AMM 73-11-01/401).

S 424-015-N00

(4) Complete the installation of the fuel pump inlet tube (FM11) (7).
(a) Torque the two clamp bolts (18) to 36-40 pound-inches (4.0-4.5 newton-meters).
(b) Torque the fuel pump inlet tube (FM11) (7) to 150-160 pound-inches (16.9-18.1 newton-meters), then loosen and torque again to the same value.
(c) Safety the tube nut with Lockwire (G02334) or Safety Cable (G02335) and Safety Cable Ferrule (G02332).

S 424-016-N00

(5) Install the main gearbox pressure tube (LP12) (5).
(a) Lubricate the clamp bolt (11) and harness clamp bolts with Engine Oil (PWA 521).
(b) Lubricate the nut threads of the main gearbox pressure tube (LP12) (5) with Antigalling Compound (PWA 550).

(c) Install the clamp (24) on the upper end of the main gearbox pressure tube (LP12) (5).
(d) Lubricate the packing (15) for the groove end of the main gearbox pressure tube (LP12) (5) with Engine Oil (PWA 521).
(e) Install the packing (15) to the groove on the main gearbox pressure tube (LP12) (5).
(f) Attach the main gearbox pressure tube (LP12) to the (LP08) tee (23), hand tight only.
(g) Install the clamp bolt (21) to the clamp and the bracket (20), hand tight only.
(h) Install the two bolts (14) to the main gearbox pressure tube flange.
(i) Torque the two flange bolts (14) to 85-95 pound-inches (9.6-10.7 newton-meters).
(j) Attach the W3 and W5 harness clamp bolts (11) and nuts (13) to the main gearbox pressure tube (LP12) (5).
(k) Torque the clamp (24) bolt to 36-40 pound-inches (4.1-4.5 newton-meters).
(l) Torque all the harness clamp bolts (11) to 36-40 pound-inches (4.1-4.5 newton-meters).
(m) Torque the main gearbox pressure tube (LP12) (5) to the (LP08) tee (23) to 340-375 pound-inches (38.4-42.4 newton-meters).
(n) Safety the main gearbox pressure tube nut with Lockwire (GO2334) or Safety Cable (GO2335) and Safety Cable Ferrule (GO2332).

S 424-017-N00

(6) Install the heatshield (22) to the (LP08) tee (23).
(a) Lubricate the three heat shield bolts (25) with Engine Oil (PO3-001).
(b) Install the heatshield (22) and clamp (26) to the (LP08) tee (23) with the three bolts (25) and nuts (27).
(c) Torque the three bolts (25) to 36-40 pound-inches (4.1-4.5 newton-meters).
(d) Torque the clamp (26) on the main gearbox pressure tube (LP12) (5) to the heatshield (22) to 18-23 pound-inches (2.0-2.6 newton-meters).
(e) Safety the three heatshield bolts (25) with Lockwire (PO5-289) or Safety Cable (PO5-291) and Safety Cable Ferrule (PO5-292).

S 424-018-N00

(7) Install the AP-5 borescope plug (4) to the HPC.
(a) Lubricate the threads of the AP-5 (4) with anti-seize paste (PO6-054).
(b) Install the new key washer (3) and the plug (4) to the AP-5 port.

(c) Torque the AP-5 borescope plug (4) to 175-190 pound-inches (19.8-21.5 newton-meters).

S 424-019-N00

(8) Install the No. 3 Bearing Breather and Restrictor Valve (AMM 79-21-11/401).

F. Put the Aircraft Back to its Usual Condition.

S 864-020-N00

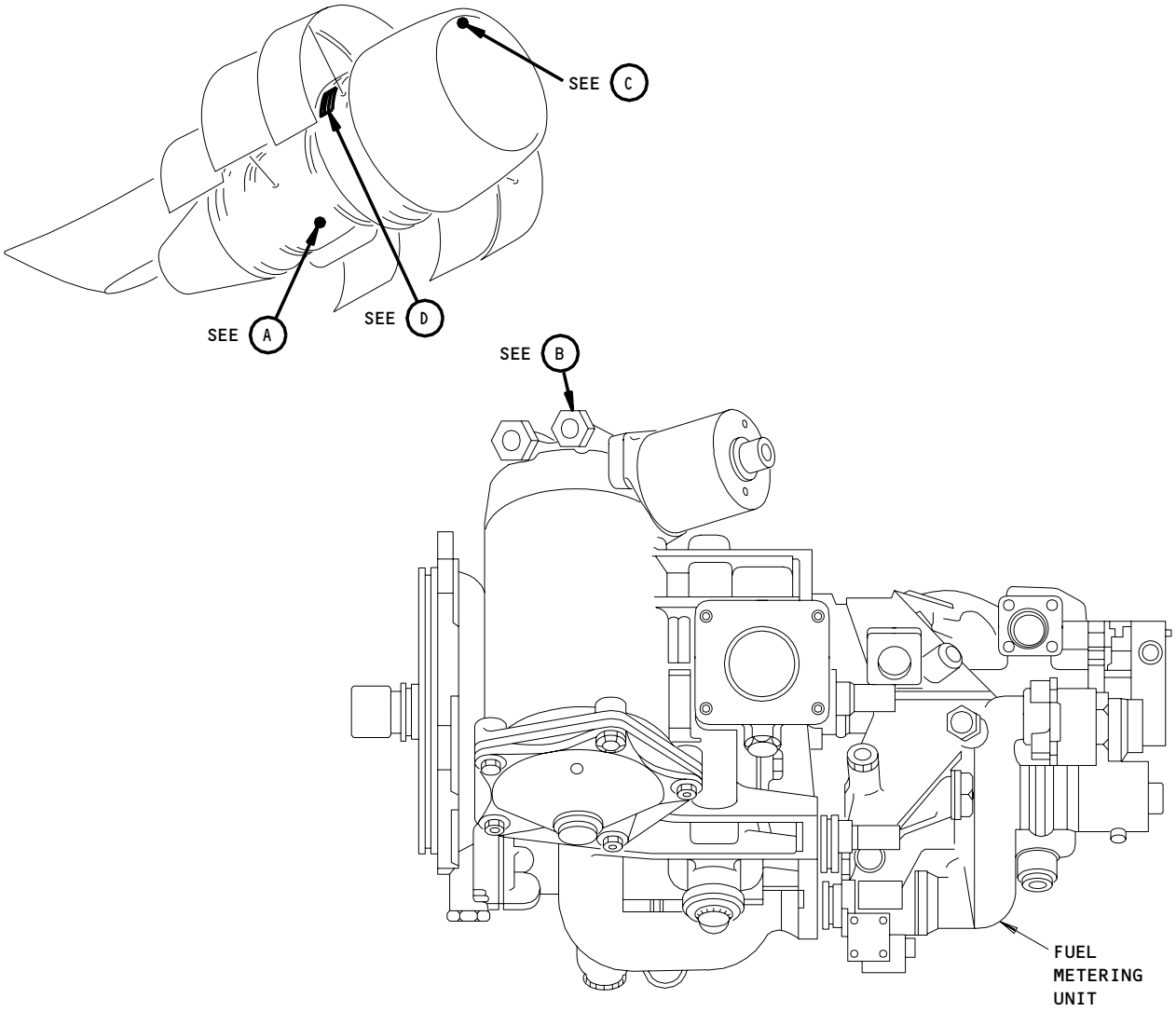
(1) Do the steps in the fuel pump procedure to Put the Aircraft Back to Its Usual Condition (AMM 73-11-01/401).

S 714-021-N00

(2) Do the test for the fuel pump which is shown in the Power Plant Test Reference Table (AMM 71-00-00/501).

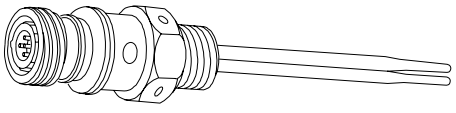
FUEL CONTROL SYSTEM - DESCRIPTION AND OPERATION

1. General
   A. Engine fuel control is provided by the electonic engine control (EEC), and the fuel metering unit as described in this section. Other fuel and control functions are described in the Fuel Distribution System (AMM 73-11-00/001).
   B. System components include EEC, fuel metering unit, EEC alternator (N2 transducer), EEC speed transducer (N1), and EEC probe for the inlet total pressure/temperature (PT2/TT2). Other components are the EEC thermocouple probe for the fuel temperature, the EEC thermocouple probe for the oil temperature, the resolver for the thrust lever angle (TLA) and the supplemental control unit (SCU).
   system components include EEC, fuel metering unit, EEC alternator (N2 transducer), EEC speed transducer (N1), and EEC probe for the inlet total pressure/temperature (PT2/TT2). Other components are the EEC thermocouple probe for the fuel temperature, the EEC thermocouple probe for the oil temperature, the resolver for the thrust lever angle (TLA) and the supplemental control unit (SCU).
2. Component Details (Fig. 1)
   A. Electronic Engine Control (EEC)
      (1) The EEC is mounted on the engine fan case with vibration-isolation hardware. The EEC is a dual channel unit that automatically switches to the opposite channel when the main channel is faulty.
      (2) The EEC is linked to the airplane Air Data Computer (ADC) and Thrust Management Computer (TMC) by digital data links. The ADC provides the EEC with total air pressure and temperature readings and pressure altitude data. The TMC receives engine performance and rating data from the EEC.
      (3) The EEC also receives rotor speed, pressure, and temperature signals from the engine. These parameters are combined with signals from the ADC and the resolvers for the thrust lever angle (TLA) to command outputs to engine actuators.
      (4) The EEC controls the following engine functions: acceleration/deceleration limiting, engine pressure ratio (EPR), idle speed, burner pressure limiting, angle scheduling of the variable stator vanes, intercompressor bleed control, turbine case cooling, turbine blade and vane cooling, start/stability bleed, and fuel/oil temperature management.
      (5) The EEC alternator provides power to the EEC as well as a separate N2 speed signal to each EEC channel.
      (6) A data entry plug is connected to the EEC to provide thrust rating and thrust-versus-engine pressure ratio data to the EEC. The Plug remains connected to the engine when removing the EEC.
      (7) Extensive self-test and fault isolation logic is built into the EEC and operates continuously.
   B. Fuel Metering Unit (FMU)
      (1) The fuel metering unit is mounted on the engine fuel pump, located on the gearbox.



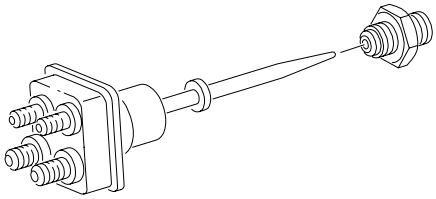
FUEL METERING UNIT

A



EEC FUEL TEMPERATURE THERMOCOUPLE PROBE

B 1



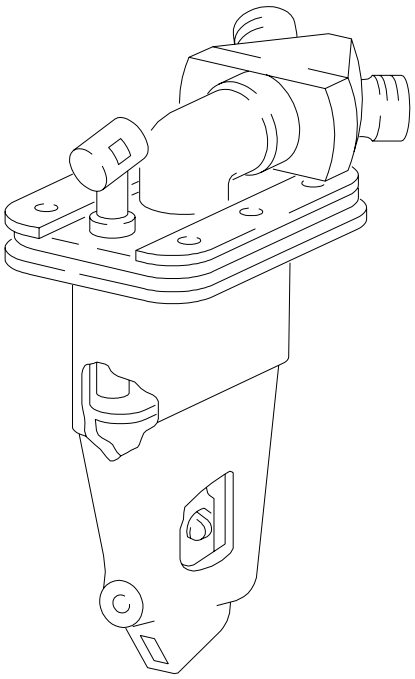
EEC FUEL TEMPERATURE THERMOCOUPLE PROBE

B 2

1 ENGINES PRE-PW-SB 73-84

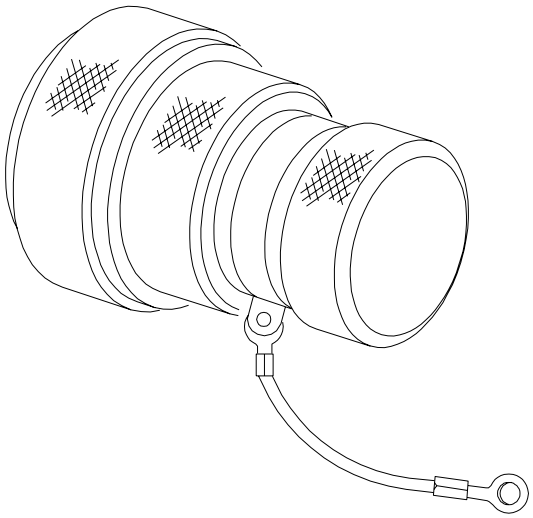
2 ENGINES POST-PW-SB 73-84

Fuel Control System Components
Figure 1 (Sheet 1)



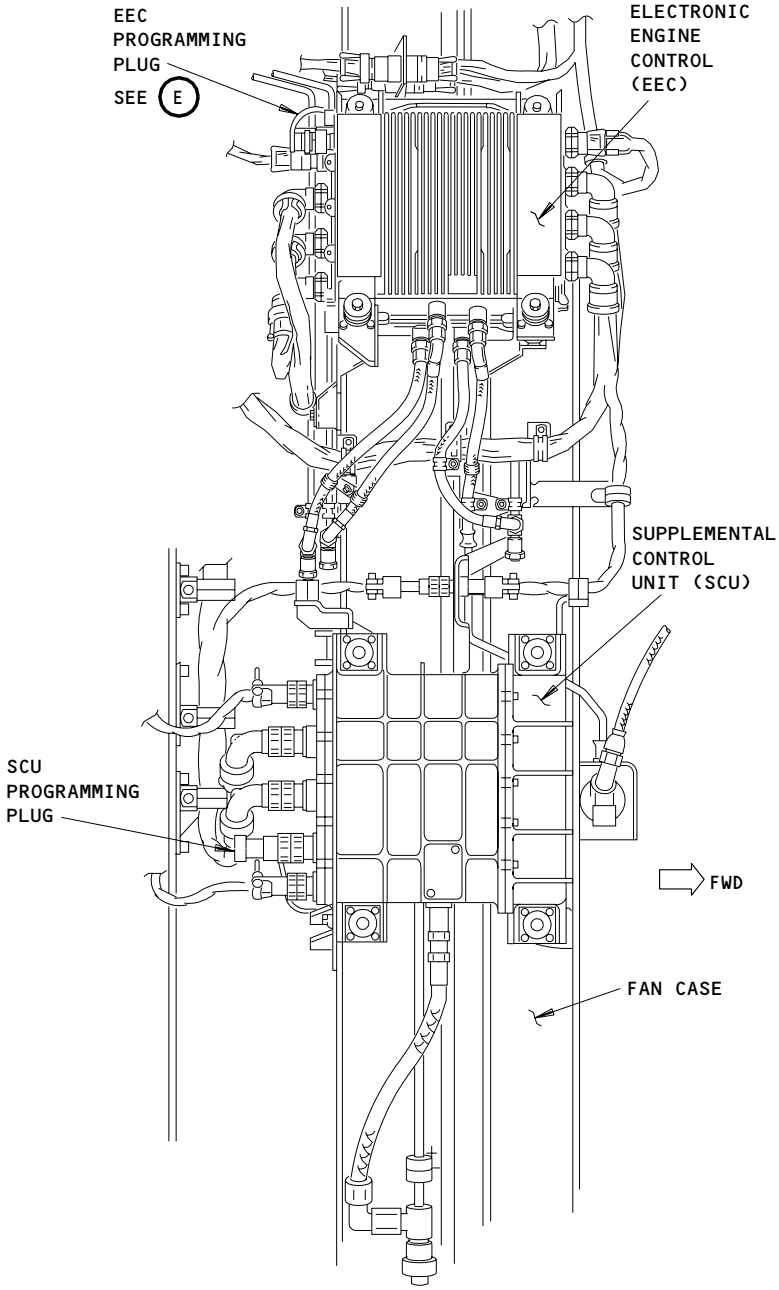
EEC INLET
TOTAL PRESSURE/TEMPERATURE
(PT2/TT2) PROBE

C



EEC PROGRAMMING PLUG

E

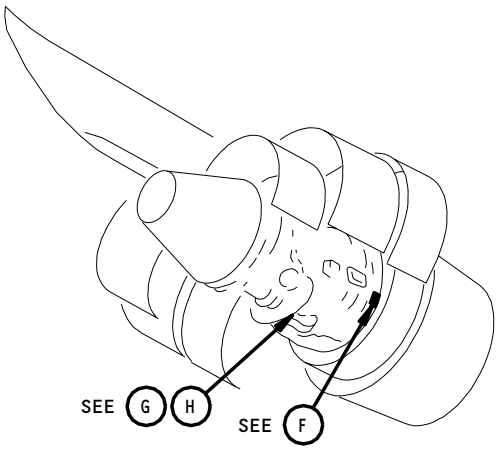


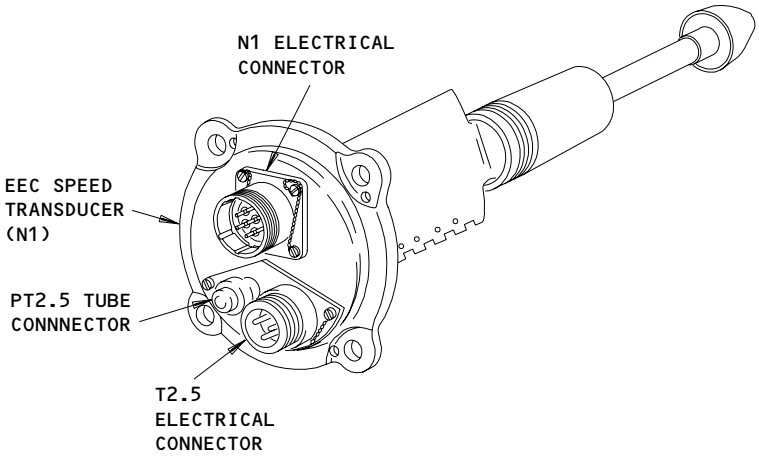
ELECTRONIC ENGINE CONTROL (EEC) AND
SUPPLEMENTAL CONTROL UNIT (SCU)

D

L-A0221
L-A0455
L-A0223

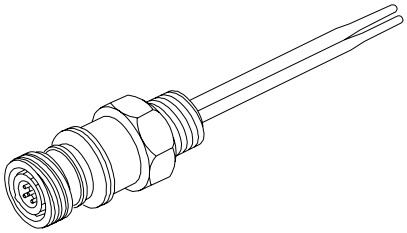
Fuel Control System Components
Figure 1 (Sheet 2)





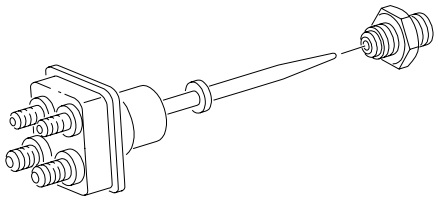
EEC SPEED TRANSDUCER (N1)

F



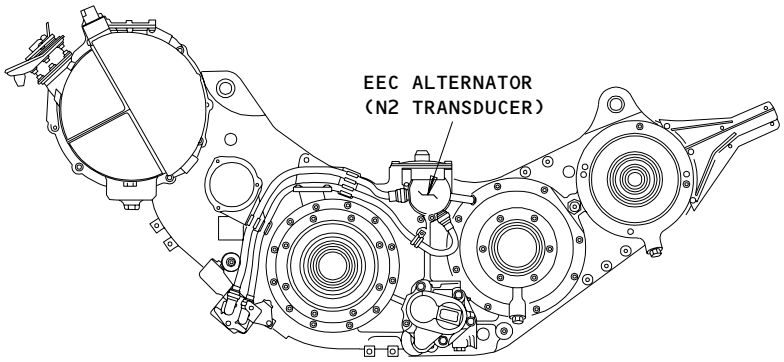
EEC OIL TEMPERATURE THERMOCOUPLE PROBE

G 1



EEC OIL TEMPERATURE THERMOCOUPLE PROBE

G 2



EEC ALTERNATOR (N2 TRANSDUCER)

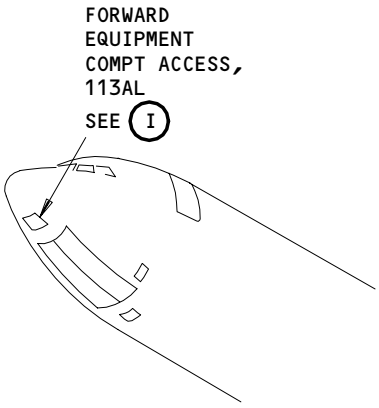
H

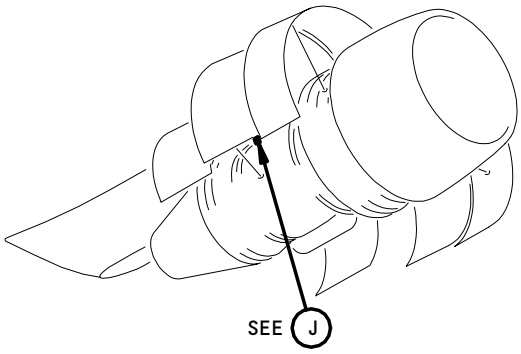
1 ENGINES PRE-PW-SB 73-84

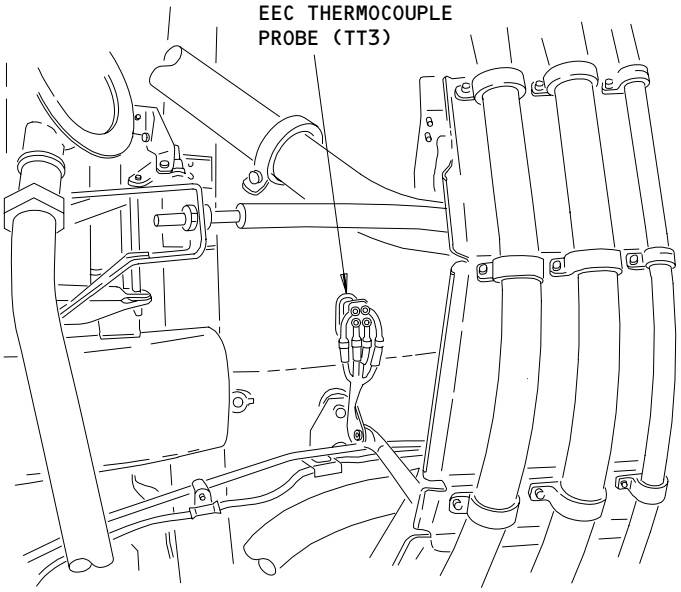
2 ENGINES POST-PW-SB 73-84

L-A0222
L-A2339

Fuel Control System Components
Figure 1 (Sheet 3)

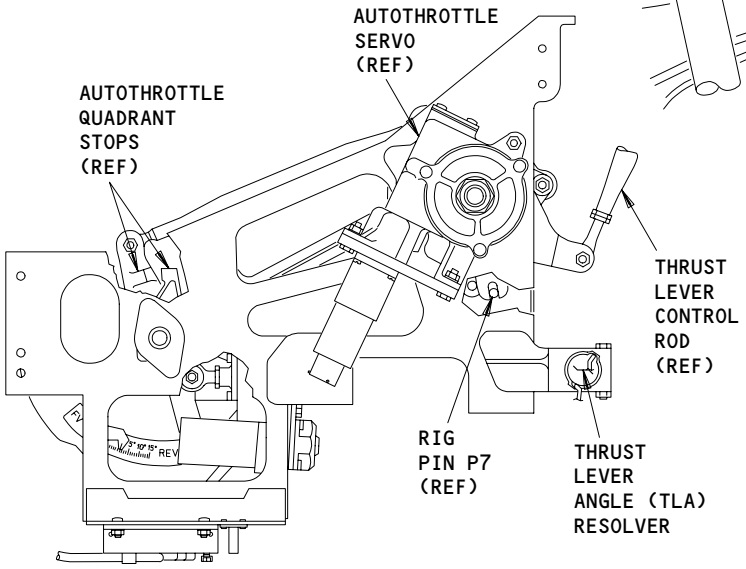






EEC THERMOCOUPLE PROBE (TT3)

J



THRUST LEVER ANGLE (TLA) RESOLVER

I

Fuel Control System Components
Figure 1 (Sheet 4)

299696

(2) The FMU contains the following major components: a wash-flow serve filter, metering valve, pressure regulating valve (PRV), servo pressure regulator, overspeed solenoid, windmill bypass valve (WMBPV), minimum pressure and shut-off valve (MPSOV), sequence valve, torque motor and dual coil resolver.

(3) The FMU provides the following functions: metered fuel flow to the engine as scheduled by the EEC, engine maximum and minimum fuel flow settings, fuel shutoff, windmill bypass, and filtered supply pressure for the hydraulic actuators of the engine control system.

(4) Overspeed protection is provided by the overspeed cutback solenoid.

C. EEC Alternator (N2 Transducer)

(1) The EEC alternator (N2 transducer), is mounted on the gearbox and is composed of a rotor and a stator. The rotor is mounted to a stub shaft, and the stator fits over the rotor and mounts to the gearbox.

(2) The stator consists of two 3-phase windings and a single phase winding. Each 3-phase winding provides power and a signal for the N2 rotor speed to a channel of the EEC. The single phase winding provides a signal for the N2 rotor speed to the engine indicating and crew alerting system (EICAS), standby engine indicator (SEI), and the system for the airborne vibration monitor (AVM).

(3) A shaft seal, seals the alternator from the gearbox. The alternator will still operate when filled with oil, in case of shaft seal failure.

D. EEC Speed Transducer (N1)

(1) The EEC speed transducer (N1) is mounted on a dipstick arrangement, that inserts through the intermediate case wall. The transducer pickup unit is mounted in close proximity to 60 teeth machined on the shaft for the low pressure compressure. The transducer provides two identical, independent outputs - one for each channel of the EEC.

(2) The assembly for the EEC speed transducer (N1) measures three different conditions: low rotor speed (N1), station 2.5 total pressure and station 2.5 total temperature.

(a) Motional Pickup (EEC Speed Transducer (N1))

1) The speed transducer section of the probe is at the end of the assembly farthest from the mounting flange. The EEC speed transducer has a permanent magnet, two electrically independent pickup coils and two ferromagnetic coil cores. All of these items are in a non-magnetic steel case. The output signals are carried by two pairs of shielded insulated wires which connect to the electrical connector on the mounting flange.

(b) Total Temperature (TT2.5)

1) The total temperature section of the assembly is in an open space in the instrumentation sleeve. The air temperature is measured by four thermocouples in four ports on the leading edge of the instrumentation sleeve. Sampled air goes out the assembly through the eight exhaust holes on each side of the airfoil. The average of the thermocouple temperature is calculated in the internal wiring that connects to the electrical connector on the mounting flange.

(c) Total Pressure (PT2.5)

1) The total pressure section is on the instrumentation sleeve. The air goes into the pressure sensing section through the five ports on the leading edge of the instrumentation sleeve. Station 2.5 total pressure is transmitted to the Propulsion Multiplexer through a tube connector on the mounting flange.

E. EEC Probe for the Inlet Total Pressure/Temperature (PT2/TT2)

(1) The PT2/TT2 probe is located near the 12 o'clock position in the inlet cowl. The probe measures the total pressure and total temperature of the air mass entering the engine.

(2) Total temperature is measured by two platinum resistance elements. Each channel monitors one element and converts the resistance to a temperature signal.

(3) Total pressure is routed to one of the pressure transducers in the main channel of the EEC.

(4) The probe has an internal heater to protect the probe from icing conditions (AMM 30-34-00).

F. EEC Thermocouple Probe for the Fuel Temperature

(1) A thermocouple probe for the fuel temperature is installed in the fuel out end of the fuel/oil heat exchanger. The probe consists of two alumel-chromel thermocouples, which provide independent signals to each channel of the EEC.

G. EEC Thermocouple Probe for the Oil Temperature

(1) A thermocouple probe for the oil temperature is installed at the left forward side of the main gearbox. Two alumel-chromel thermocouples provide independent oil temperature signals to each channel of the EEC.

H. Resolver for the Thrust Lever Angle (TLA)
   (1) The resolvers for the thrust lever angle (TLA) are dual precision resolvers which supply electrically isolated thrust command signals to both channels of the electronic engine control (EEC).
   (2) The resolvers for the thrust lever angle (TLA) are located on the autothrottle assembly.

I. Data Entry Plug for the EEC
   (1) The data entry plug for the EEC consists of a 26-contact connector plug and a connector backshell. A lanyard provides a means of permanently attaching the data entry plug to the engine. The plug identification is inscribed on the connector backshell. Pins (insulating) are installed in all unused contacts not occupied by electrical lead assemblies (jumper wires).

J. Supplemental Control Unit (SCU)
   (1) The SCU supplies the EEC with a second source of conditioned electrical power.
   (2) The SCU monitors engine temperature (T2.5) and pressure (P2.5) for engine condition monitoring purposes. The SCU receives the temperature and pressure data from a probe that sense temperature (T2.5), pressure (P2.5), and N1 speed. The SCU sends the temperature and pressure data to the system for the aircraft condition monitoring.
   (3) The SCU is mounted, with vibration isolating mounts, on the fan case at the 3 o'clock position.
   (4) If the EEC Alternator (N2 transducer) fails, the SCU will supply the EEC with 28 volt dc electrical power from the airplane.
   (5) The SCU contains the electronic modules that follow:
      (a) Module Assembly for the Analog Input
      (b) Memory Assembly for the Central Processing Unit (CPU)
      (c) Module Assembly for the Power Converter
      (d) Mark IIIA Module for the Pressure Transducer
      (e) Module Assembly for the Storage Bank
      (f) Module Assembly for the Conditioned Aircraft Power

K. SCU Programming Plug
   (1) The SCU programming plug supplies the engine serial number to the the SCU.

(2) The SCU programming plug consists of an electrical connector and a backshell. It is attached to the engine by a lanyard.

NOTE: The programming plug must remain with the engine if the SCU is replaced.

L. Each of the following components are controlled and monitored by the EEC. If one of these components fails to work properly, the EEC will set a fault bit to indicate that the control loop has failed.
(1) Actuator for the Variable Stator Vanes (AMM 75-31-00)
(2) 2.5 Bleed Valve Actuator (AMM 75-32-00)
(3) Air Valve Actuator for Turbine Case Cooling (TCC) (AMM 75-24-00)
(4) Air/Oil Heat Exchanger and Valve (AMM 79-21-00)
(5) Reverser Interlock Relay
(6) Mode Indicator Light

M. Each of the following components receive command signals from the EEC. The EEC will set a fault bit if it detects a failure in the command loop to any of these components.
(1) Bypass Valve Solenoid for the Fuel/Oil Cooler (AMM 79-21-00)
(2) Air Shutoff Valve of the Heat Exchanger for the IDG Air/Oil (AMM 24-11-00)
(3) 2.9 Bleed Valve Solenoid (AMM 75-32-00)
(4) Control Valve for the HPC Secondary Flow, Valve Solenoid for the Turbine Blade and Vane Cooling Air (AMM 75-33-00)
(5) Control Valve for the HPC Secondary Flow, Valve Override Solenoid of the Heat Exchanger for the IDG Air/Oil (AMM 75-33-00)

N. The EEC receives input from the following components. If one of these components fails to work properly, the EEC will set a fault bit to indicate that the input loop has failed.
(1) EGT (TT4.95) Thermocouple Probe (AMM 77-21-00)
(2) PT4.95 Probe for the Engine Pressure Ratio (EPR) (AMM 77-11-00)
(3) EEC Thermocouple Probe (TT3) (AMM 73-21-00)
(4) Oil Temperature Sensor for the No. 3 Bearing (AMM 79-34-00)
(5) Hydraulic Actuator for the Thrust Reverser (AMM 78-31-00)
(6) Position Switch of the Air Valve for Turbine Vane and Blade Cooling (AMM 75-24-00)

(7) Control Valve for the HPC Secondary Flow (AMM 75-33-00)
(8) Burner Pressure

3. Operation

A. Electronic Engine Control (EEC)

(1) The EEC receives power from a dual, engine-gearbox driven permanent magnet alternator. This redundency provides high operational reliability. When the airplane is on the ground and the engines are not running, the EEC can be powered using the EEC POWER switch located on the maintenance panel P61.

(2) The EEC has digital data links to various aircraft systems. Each channel has a data link which receives aircraft supplied data including total air pressure, total air temperature, and pressure altitude, which are used to calculate appropriate engine ratings for the flight conditions. The EEC transmits engine performance and rating data on a data link to the engine indicating and crew alerting system (EICAS) and thrust management computer (TMC).

(3) The EEC receives N1 and N2 rotor speed, pressure, and temperature signals from the engine. These parameters along with the position of the thrust lever angle and information from digital air data computers for the aircraft are used to send outputs to engine actuators.

(4) The EEC has 2 channels, channel A and channel B. Either channel is able to control the engine. The channel in control will change between channel A and channel B each time the Fuel Control Switch is put in the CUTOFF position and the N2 rotor speed is less than 20%. One channel will control the engine unless it is not capable. Redundant data is available to this channel via a serial crosstalk data link. If the channel in control is determined to be less healthy than the opposite channel, the fault logic switches control to the opposite channel, which will operate at its highest and safest level of control complexity.

(5) The EEC uses a list of defects to control the EEC's function to make a decision to change channels or not. If there is a more important defect to the EEC, the EEC will not change channels. The defects are in the list that follows, with the most important defect first:

(a) The EEC cannot control the fuel valve, which includes the two TRA's
(b) The EEC cannot control the stator vane actuator
(c) The EEC cannot make sure there is a correct data entry modifier

(d) The EEC cannot control the 2.5 bleed valve actuator
(e) The EEC cannot control the start bleed
(f) The EEC cannot control the tandem/surge bleed
(g) The EEC cannot control the air/oil cooler valve
(h) The EEC cannot control the bypass valve solenoid for the fuel/oil cooler
(i) The 28 volts for the performance power is out for more than 10 seconds
(j) The EEC cannot control the TCC air valve
(k) The EEC cannot lower the temperature of the engine oil.
(l) The EEC cannot control in EPR mode
(m) The EEC cannot control the function to change channels each time the power is supplied to the EEC.

(6) The EEC will normally operate the engine in the EPR mode. The engine can also be operated in the alternate (N1) mode. Reversion to N1 mode can be automatic or manual. Alternate (N1) mode is selected when the EEC cannot set power in the EPR mode. Also, a switch on the flight deck can manually select alternate (N1) mode.

(7) Self-test routines enhance troubleshooting and maintenance proceedures by detecting and isolating faults within the EEC and its input and output devices. Fault messages are diplayed on the engine indicating and crew alerting system (EICAS).

B. Fuel Metering Unit

(1) Engine start or shutdown is accomplished by energizing a solenoid that is built into the FMU. A spring-loaded sequence valve, positioned by the shut-off solenoid, controls operation of the minimum pressure and shut-off valve (MPSOV) and windmill by-pass valve (WMBPV). During engine shutdown or windmilling, the MPSOV is closed and the WMBPV by-passes flow to pump interstage and maintains minimum pressure for control of engine variable geometry and valve actuators.

(2) The EEC sends a command to the dual-wound torque motor to set the metering valve position. Metering valve position is measured for the EEC by a dual resolver. Each EEC channel commands one torque motor coil and receives feedback from one resolver coil. If the torque motor does not receive a position command signal from the EEC it will drive the fuel metering valve to a minimum flow position.

(3) The pressure regulating valve maintains a constant pressure differential across the metering valve by returning excess fuel flow to the fuel pump interstage.
(4) The minimum pressurizing and shut-off valve (MPSOV) is designed to provide a minimum inlet pressure to the FMU above pump interstage pressure and shut off of engine fuel flow at shutdown.
(5) Inlet fuel pressure to the FMU is used for positioning engine stator vanes, intercompressor bleed, control air valves for turbine case cooling and the actuators controlling cooling air to the engine and the heat exchangers for the IDGS air/oil.
(6) When the EEC detects an overspeed condition the overspeed cut back solenoid is energized, which drives the metering valve to minimum flow.

C. EEC Alternator
(1) The rotor contains twelve individual permanent magnets to generate the electrical power in an eighteen slot, three-phase, Y-connected stator. The alternator is driven at 3.52 times N2 speed.
(2) The alternator provides two identical and independent power outputs, one for each channel of the EEC.

D. Resolver for the Thrust Lever Angle (TLA)
(1) Dual precision resolvers sense thrust lever position and provide electrically isolated inputs for the thrust command to each channel of the EEC. Electrical excitation power for each resolver element is provided by the corresponding EEC channel. The resolver provides a single phase ac signal, to each EEC channel, representative of the position of the thrust lever angle.

E. Data Entry Plug for the EEC
(1) The data entry plug is configured to establish a discrete data code to be read by the EEC to which it is connected. This is accomplished by jumper wires installed on the rear of the plug assembly between selected contact pairs. The EEC uses this discrete data and other inputs to schedule the engine rating.
(2) The location of jumper wires between contact pairs determines the digital logic pattern and appropriate assembly part number. Each plug has a separate part number, serial number and data plate.

(3) The data entry plug is attached to the J6 connector on the EEC. The plug furnishes the EEC with information identifying engine basic thrust rating, and normalizes the thrust-versus-engine pressure ratio (ERP) relationship. It also indicates to the EEC which of two power setting schedules should be selected and can modify the synthesized inlet temperature of the high pressure compressor to the EEC with four fixed multipliers. If for any reason the EEC is removed from the engine the plug must remain attached to the engine.

F. EEC Speed Transducer (N1)

(1) The EEC speed transducer is installed near and is energized by the ferromagnetic teeth on the low rotor shaft. The signal is received by two ferromagnetic coil cores which are the pole pieces. Two identical and independent output frequency signals are supplied. The output voltage of each coil is a minimum of 1.0 volt, peak to peak, at a speed range of 200-4400 rpm. Each output is used by its dedicated channel of the EEC.

(a) An open or short circuit in one coil will not prevent the other coil operation, which produces the specified output voltage in all speed and environmental conditions.

G. Total Temperature (TT2.5) and Total Pressure (PT2.5)

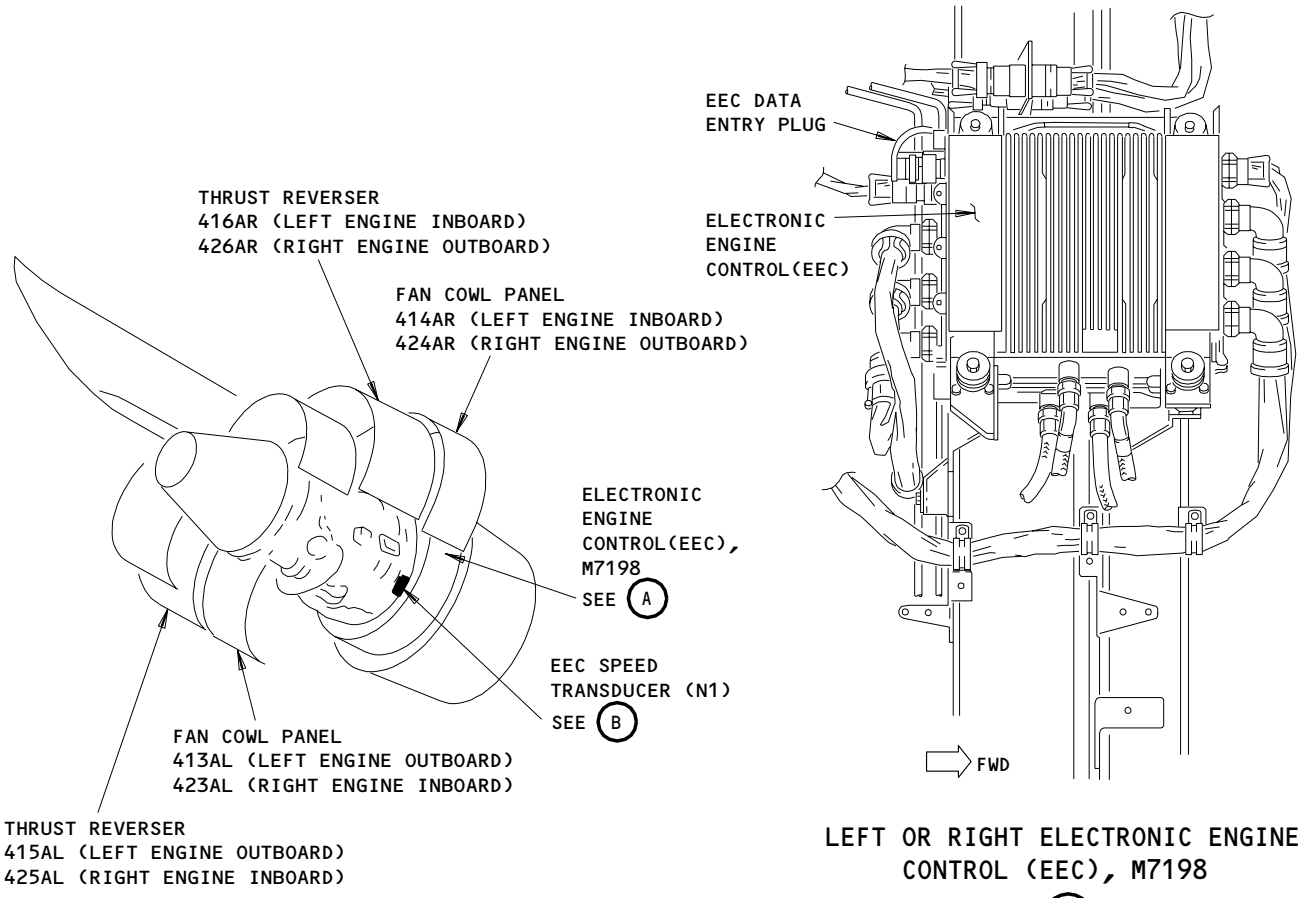
(1) The outputs of the temperature and pressure probes are used by the Propulsion Multiplexer.

FUEL CONTROL SYSTEM

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	AMM REFERENCE
ALTERNATOR - LEFT EEC, T686	6	1	415AL,416AR, THRUST REVERSERS	73-21-05
ALTERNATOR - RIGHT EEC, T686	6	1	425AL,426AR, THRUST REVERSERS	73-21-05
CIRCUIT BREAKER -	3		FLIGHT COMPT, P6,P11	
AIR DATA CMPTR LEFT, C625		1	11A10	*
AIR DATA CMPTR RIGHT, C626		1	11F30	*
APU ENG START/ECS DISCRETES, C1512		1	11B36	*
FUEL CONT VLV & EEC CHAN B RESET L, C1419		1	11D25	*
FUEL CONT VLV & EEC CHAN B RESET R, C1420		1	11D26	*
FUEL VALVE LEFT SPAR, C1061		1	6E1	*
FUEL VALVE RIGHT SPAR, C1062		1	6E2	*
L ENGINE PERF SOL CHAN A, C1465		1	11L3	*
L ENGINE PERF SOL CHAN B, C1466		1	11L4	*
LEFT ENGINE EEC DISCRETES, C1404		1	11M5	*
LEFT ENGINE PROBE HEAT, C1122		1	6L25	*
R ENGINE PERF SOL CHAN A, C1467		1	11L30	*
R ENGINE PERF SOL CHAN B, C1468		1	11L31	*
RIGHT ENGINE EEC DISCRETES, C1405		1	11M32	*
RIGHT ENGINE PROBE HEAT, C1123		1	6K25	*
CONTROL - LEFT ELECTRONIC ENGINE, M7198	1	1	414AR, FAN COWL PANEL	73-21-04
CONTROL - RIGHT ELECTRONIC ENGINE, M7198	1	1	424AR, FAN COWL PANEL	73-21-04
HARNESS - LEFT ENGINE EEC WIRING	1	1	416AR, THRUST REVERSER	73-21-07
HARNESS - RIGHT ENGINE EEC WIRING	1	1	426AR, THRUST REVERSER	73-21-07
PLUG - LEFT ENGINE EEC DATA ENTRY	1	1	414AR, FAN COWL PANEL	73-21-08
PLUG - RIGHT ENGINE EEC DATA ENTRY	1	1	424AR, FAN COWL PANEL	73-21-08
PROBE - LEFT ENGINE EEC FUEL TEMPERATURE THERMOCOUPLE	6	1	416AR, THRUST REVERSER	73-21-09
PROBE - LEFT ENGINE EEC INLET TOTAL PRESSURE/ TEMPERATURE (PT2/TT2), T867	4	1	412AR, INLET PROBE ACCESS PANEL	73-21-03
PROBE - LEFT ENGINE EEC OIL TEMPERATURE THERMOCOUPLE	2	1	415AL,416AR, THRUST REVERSERS	73-21-10
PROBE - LEFT ENGINE EEC THERMOCOUPLE (TT3)	5	1	416AR, THRUST REVERSER	73-21-14
PROBE - RIGHT ENGINE EEC FUEL TEMPERATURE THERMOCOUPLE	6	1	426AR, THRUST REVERSER	73-21-09
PROBE - RIGHT ENGINE EEC INLET TOTAL PRESSURE TEMPERATURE (PT2/TT2), T867	4	1	422AR, INLET PROBE ACCESS PANEL	73-21-03
PROBE - RIGHT ENGINE EEC OIL TEMPERATURE THERMOCOUPLE	2	1	425AL,426AR, THRUST REVERSERS	73-21-10
PROBE - RIGHT ENGINE EEC THERMOCOUPLE (TT3)	5	1	426AR, THRUST REVERSER	73-21-14
RESOLVER - LEFT THRUST LEVER ANGLE (TLA), TS171	3	1	113AL, FORWARD EQUIPMENT COMPT ACCESS	
RESOLVER - RIGHT THRUST LEVER ANGLE (TLA), TS170	3	1	113AL, FORWARD EQUIPMENT COMPT ACCESS	
TRANSDUCER - LEFT ENGINE EEC SPEED (N1)	1	1	415AL,416AR, THRUST REVERSERS	73-21-06
TRANSDUCER - RIGHT ENGINE EEC SPEED (N1)	1	1	425AL,426AR, THRUST REVERSERS	73-21-06
UNIT - LEFT ENGINE FUEL METERING	6	1	415AL,416AR, THRUST REVERSERS	73-21-01
UNIT - RIGHT ENGINE FUEL METERING	6	1	425AL,426AR, THRUST REVERSERS	73-21-01

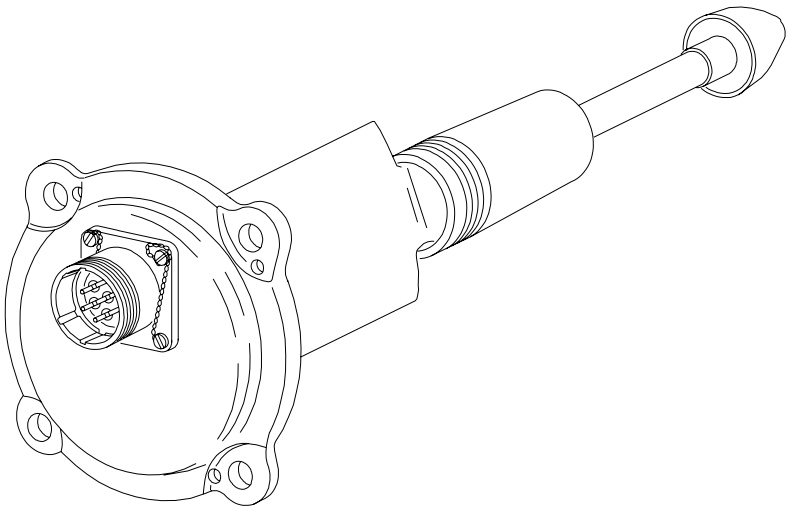
* SEE THE WDM EQUIPMENT LIST

Fuel Control System - Component Index
Figure 101



LEFT OR RIGHT ELECTRONIC ENGINE CONTROL (EEC), M7198

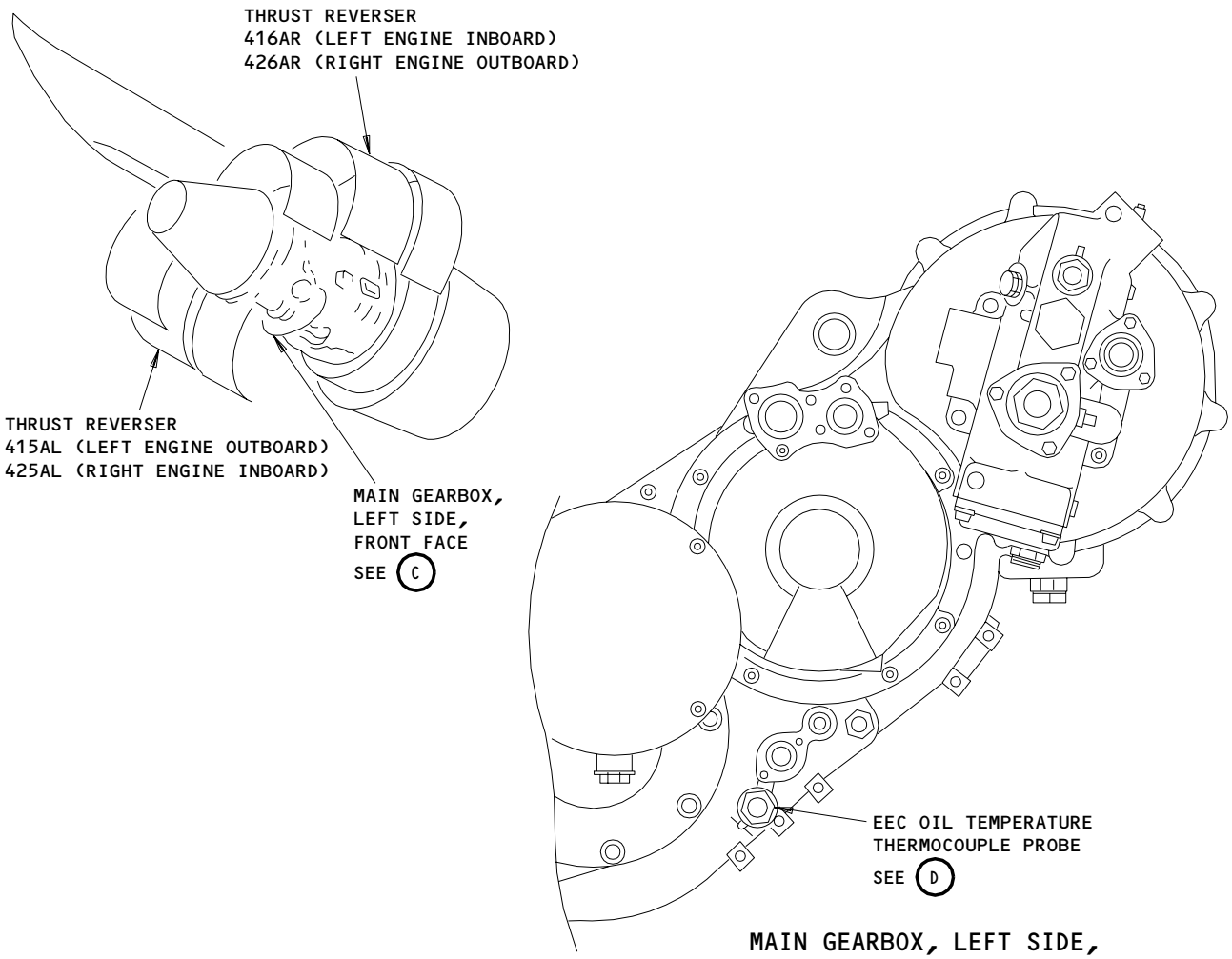
A

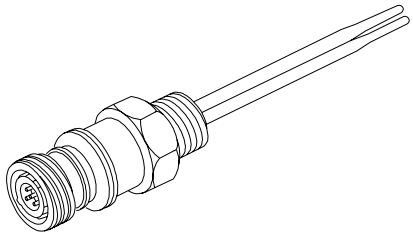


LEFT OR RIGHT EEC SPEED TRANSDUCER (N1)

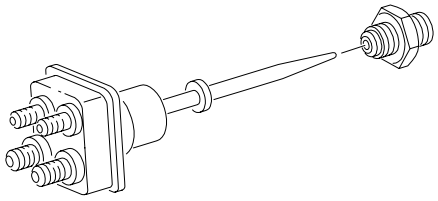
B

Fuel Control System – Component Location
Figure 102 (Sheet 1)





LEFT OR RIGHT EEC OIL TEMPERATURE
THERMOCOUPLE PROBE
D 1

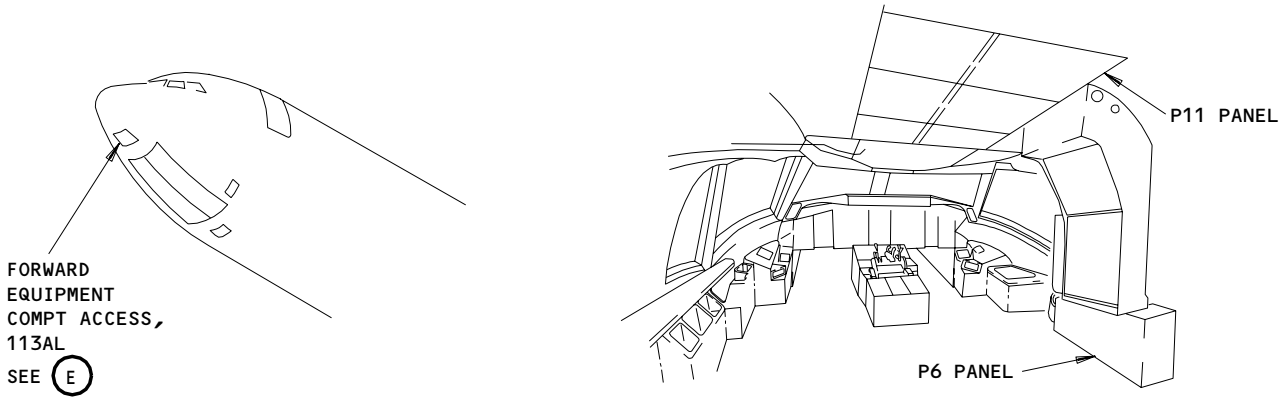


LEFT OR RIGHT EEC OIL TEMPERATURE
THERMOCOUPLE PROBE
D 2

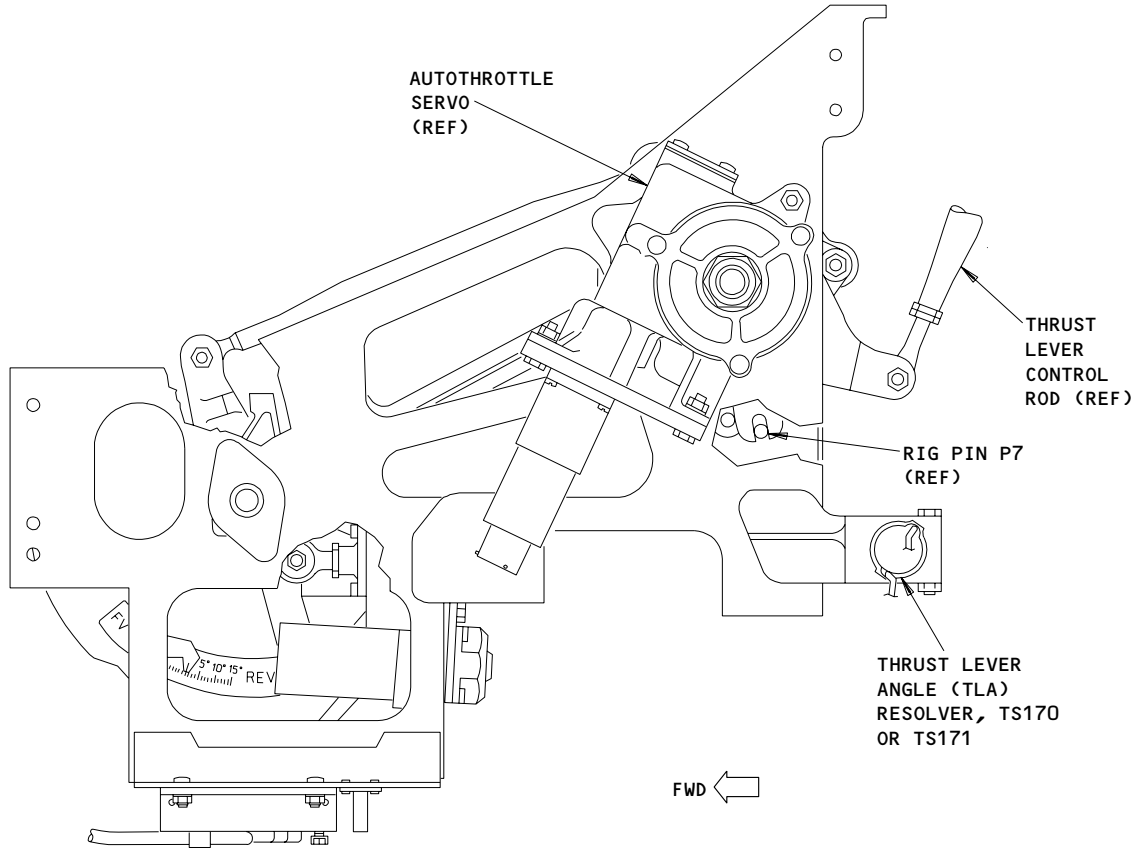
1 ENGINES PRE-PW-SB 73-84

2 ENGINES POST-PW-SB 73-84

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



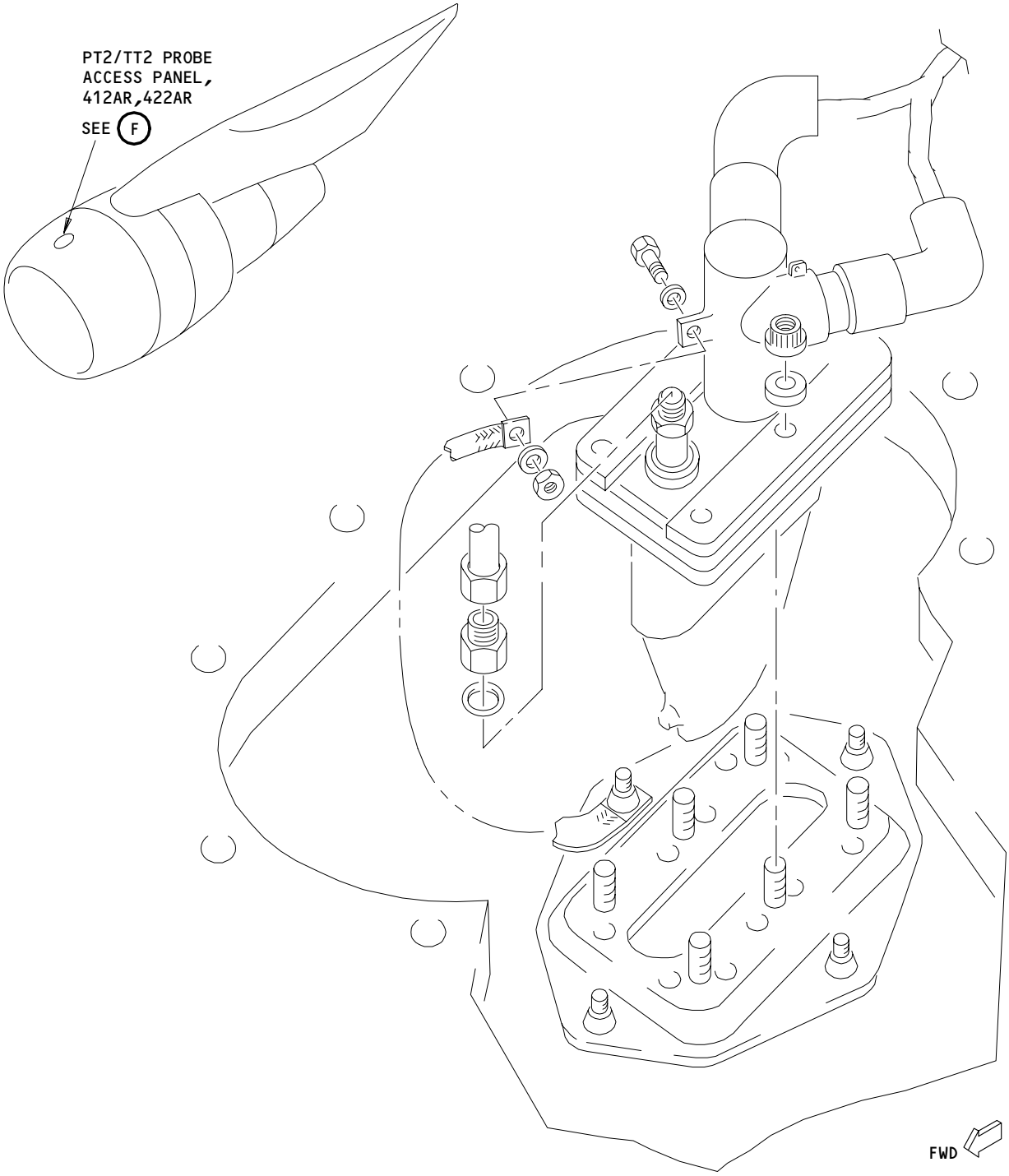
FLIGHT COMPARTMENT



LEFT OR RIGHT THRUST LEVER ANGLE (TLA) RESOLVER, TS170 OR TS171

E

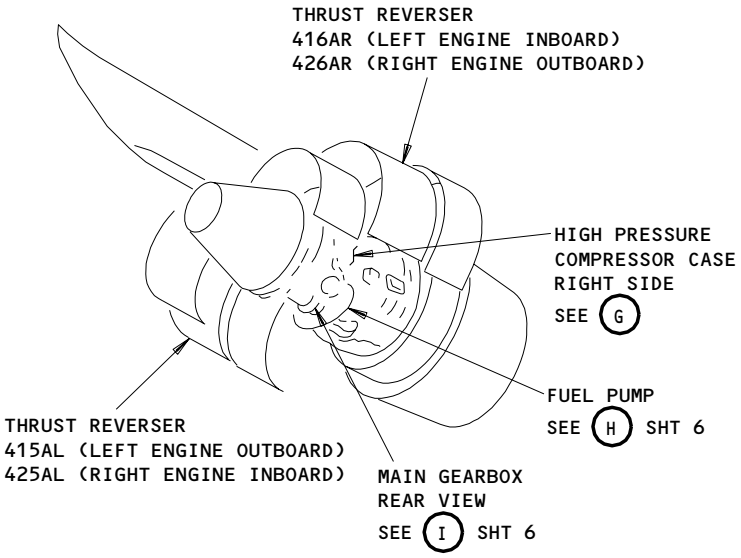
Fuel Control System – Component Location
Figure 102 (Sheet 3)

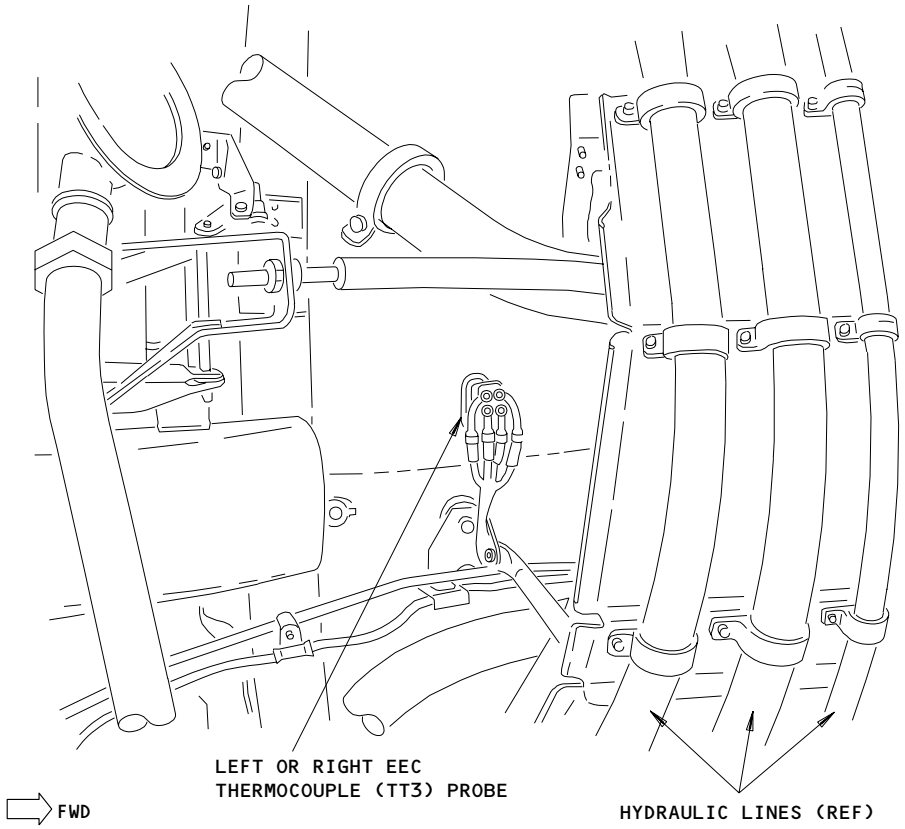


LEFT OR RIGHT EEC INLET TOTAL PRESSURE/TEMPERATURE
(PT2/TT2) PROBE, T867

(F)

Fuel Control System - Component Location
Figure 102 (Sheet 4)

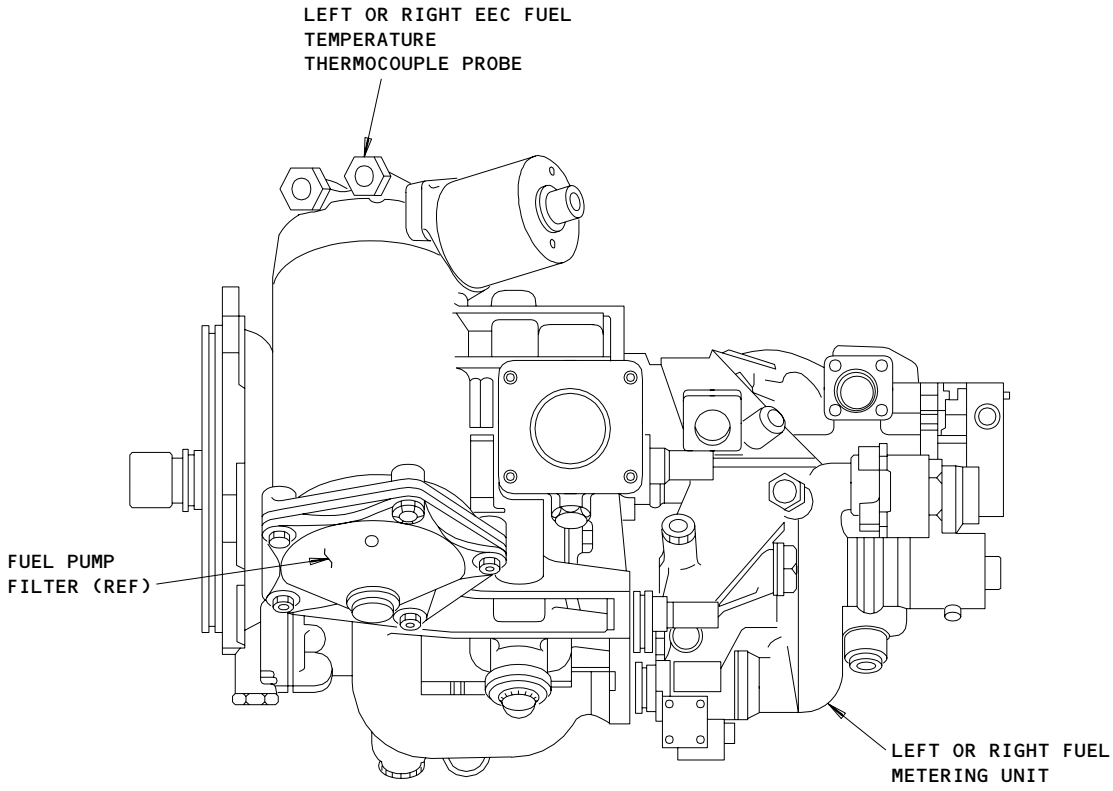




HIGH PRESSURE COMPRESSOR CASE, RIGHT SIDE

G

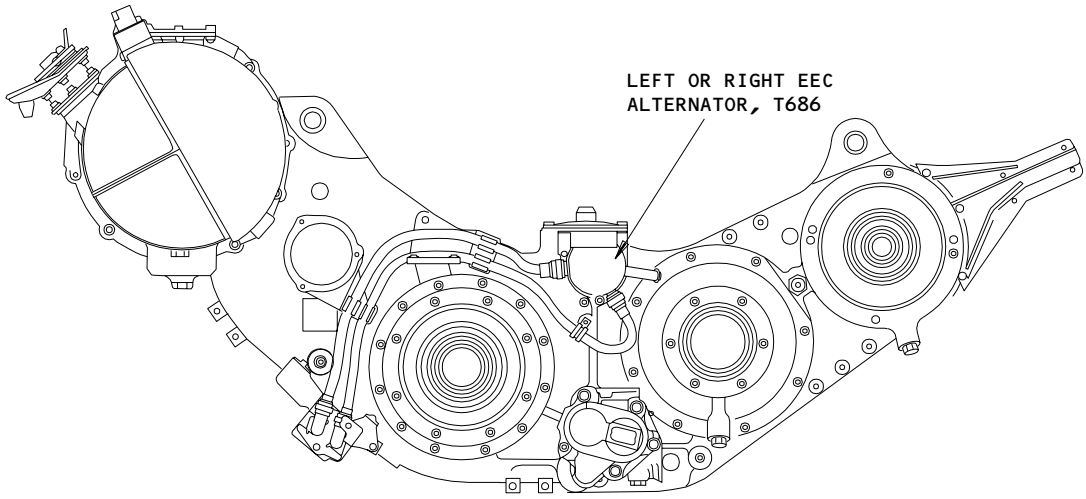
Fuel Control System – Component Location
Figure 102 (Sheet 5)



FUEL PUMP

H

L-A0224



MAIN GEARBOX REAR VIEW

I

L-A2339

Fuel Control System - Component Location (Details from Sht 5)
Figure 102 (Sheet 6)

FUEL METERING UNIT - REMOVAL/INSTALLATION

1. General
   A. This procedure contains the data to remove and install the fuel metering unit (FMU) from the engine. The fuel metering unit is attached to the fuel pump at approximately the 5 o'clock position (view from the front) on the engine.

   TASK 73-21-01-004-002-N00

2. Remove the Fuel Metering Unit
   A. Equipment
      (1) 5 gallon container (for the fuel)
   B. Consumable Materials
      (1) D00504 Petrolatum, PMC 9609
      (2) D00124 Oil, Slushing, PMC 9852
      (3) G02334 Lockwire - AS3214-02
   C. Parts

AMM		NOMENCLATURE	AIPC		
FIG	ITEM		SUBJECT	FIG	ITEM
401	7	Packing	73-11-02	10	10

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

      (2) AMM 71-11-04/201, Fan Cowl Panels
      (3) AMM 71-11-06/201, Core Cowl Panels
      (4) AMM 73-11-01/401, Fuel Pump
      (5) AMM 78-31-00/201, Thrust Reverser
   E. Access
      (1) Location Zones
          210 Control Cabin
          411 Left Engine
          421 Right Engine

(2) Access Panels

413AL/423AL	Fan Cowl Panel (Left)
414AR/424AR	Fan Cowl Panel (Right)
415AL/425AL	Thrust Reverser (Left)
416AR/426AR	Thrust Reverser (Right)
417AL/427AL	Core Cowl Panel (Left)
418AR/428AR	Core Cowl Panel (Right)

F. Prepare to Remove the Fuel Metering Unit

S 864-003-N00
(1) Supply electrical power (AMM 24-22-00/201).

S 864-004-N00
(2) Do these steps to make sure the applicable engine and spar valves are closed:
(a) For the left engine, make sure this circuit breaker on the main distribution panel, P6, is closed:
1) 6E1, FUEL VALVES L SPAR
(b) For the right engine, make sure this circuit breaker on the P6 panel is closed:
1) 6E2, FUEL VALVES R SPAR
(c) For the left engine, make sure this circuit breaker on the overhead circuit breaker panel, P11, is closed:
1) 11D25, FUEL CONT VLV & EEC CHAN B RESET L
(d) For the right engine, make sure this circuit breaker on the P11 panel is closed:
1) 11D26, FUEL CONT VLV & EEC CHAN B RESET R
(e) Make sure the applicable FUEL CONTROL switch is in the CUTOFF position.
(f) Make sure the applicable ENG VALVE panel lights on the control stand are off.

S 864-005-N00
(3) For the left engine, open this circuit breaker on the P6 panel and attach the DO-NOT-CLOSE tag:
(a) 6E1, FUEL VALVES L SPAR

S 864-006-N00
(4) For the right engine, open this circuit breaker on the P6 panel and attach the DO-NOT-CLOSE tag:
(a) 6E2, FUEL VALVES R SPAR

S 864-007-N00

(5) For the left engine, open this circuit breaker on the P11 panel and attach the DO-NOT-CLOSE tag:
(a) 11D25, FUEL CONT VLV & EEC CHAN B RESET L

S 864-008-N00

(6) For the right engine, open this circuit breaker on the P11 panel and attach the DO-NOT-CLOSE tag:
(a) 11D26, FUEL CONT VLV & EEC CHAN B RESET R

S 864-010-N00

(7) Remove electrical power (AMM 24-22-00/201).

S 014-012-N00

(8) Open the fan cowl panels (AMM 71-11-04/201).

S 044-013-N00

WARNING: DO THE THRUST REVERSER DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(9) Do this procedure: Thrust Reverser Deactivation for Ground Maintenance (AMM 78-31-00/201).

S 014-014-N00

(10) Open the core cowl panels (AMM 71-11-06/201).

S 014-015-N00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT COULD OCCUR.

(11) Open the thrust reversers (AMM 78-31-00/201).

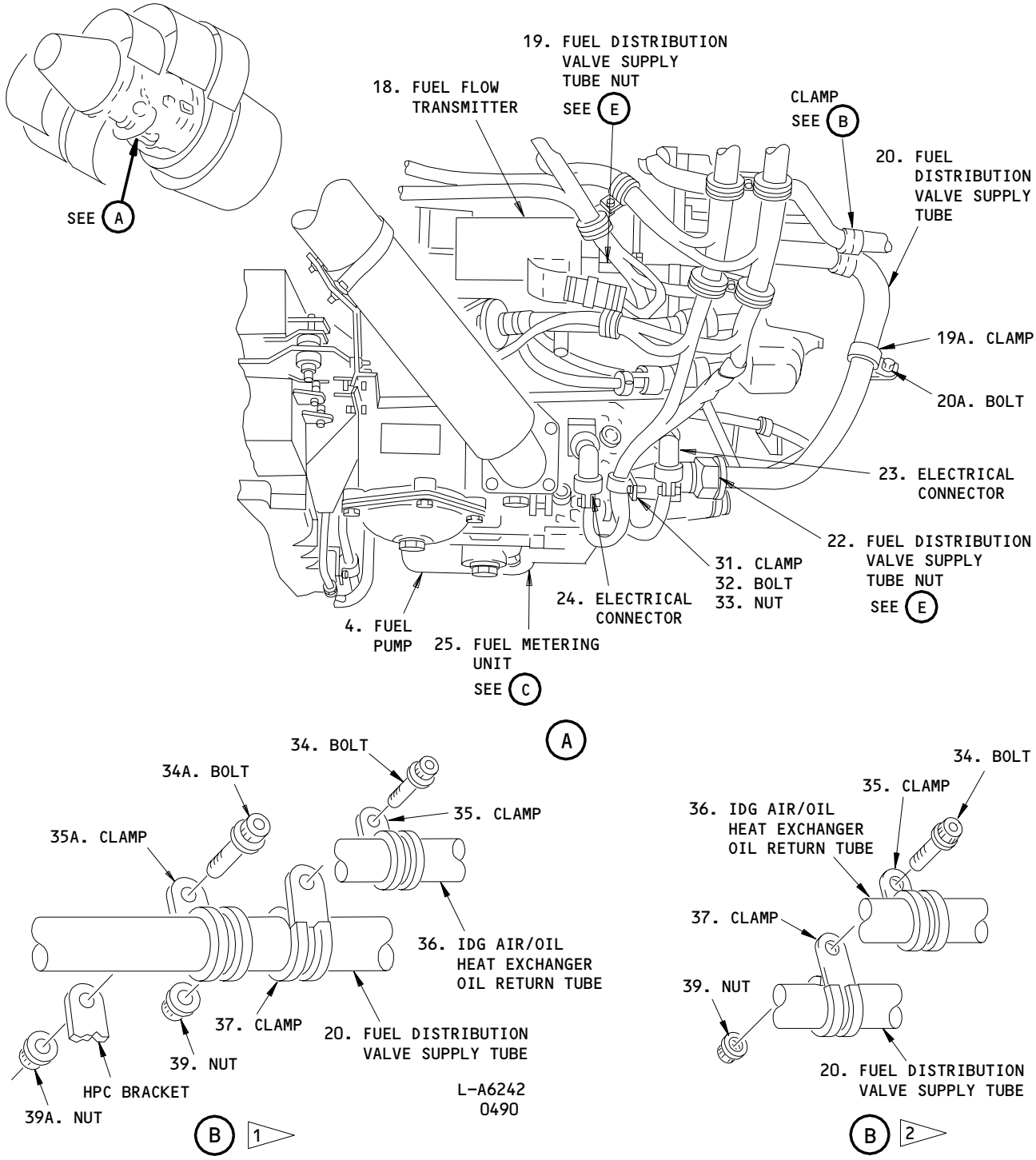
G. Procedure

S 684-018-N00

(1) Do these steps to drain the fuel from the fuel pump:
  (a) Put a container below the fuel pump (4).
  (b) Remove the drain plug (8) to drain the fuel from the fuel pump (4).
    1) Discard the packing (7).
  (c) Lubricate the new packing (7) with the petrolatum.
  (d) Install the packing (7) on the drain plug (8).
  (e) Lubricate the threads of the drain plug (8).
  (f) Install the drain plug (8) in the fuel pump (4).
    1) Tighten the drain plug (8) to 45-55 pound-inch (5.1-6.2 newton-meters).
    2) Safety the drain plug (8) with lockwire.

S 024-052-N00

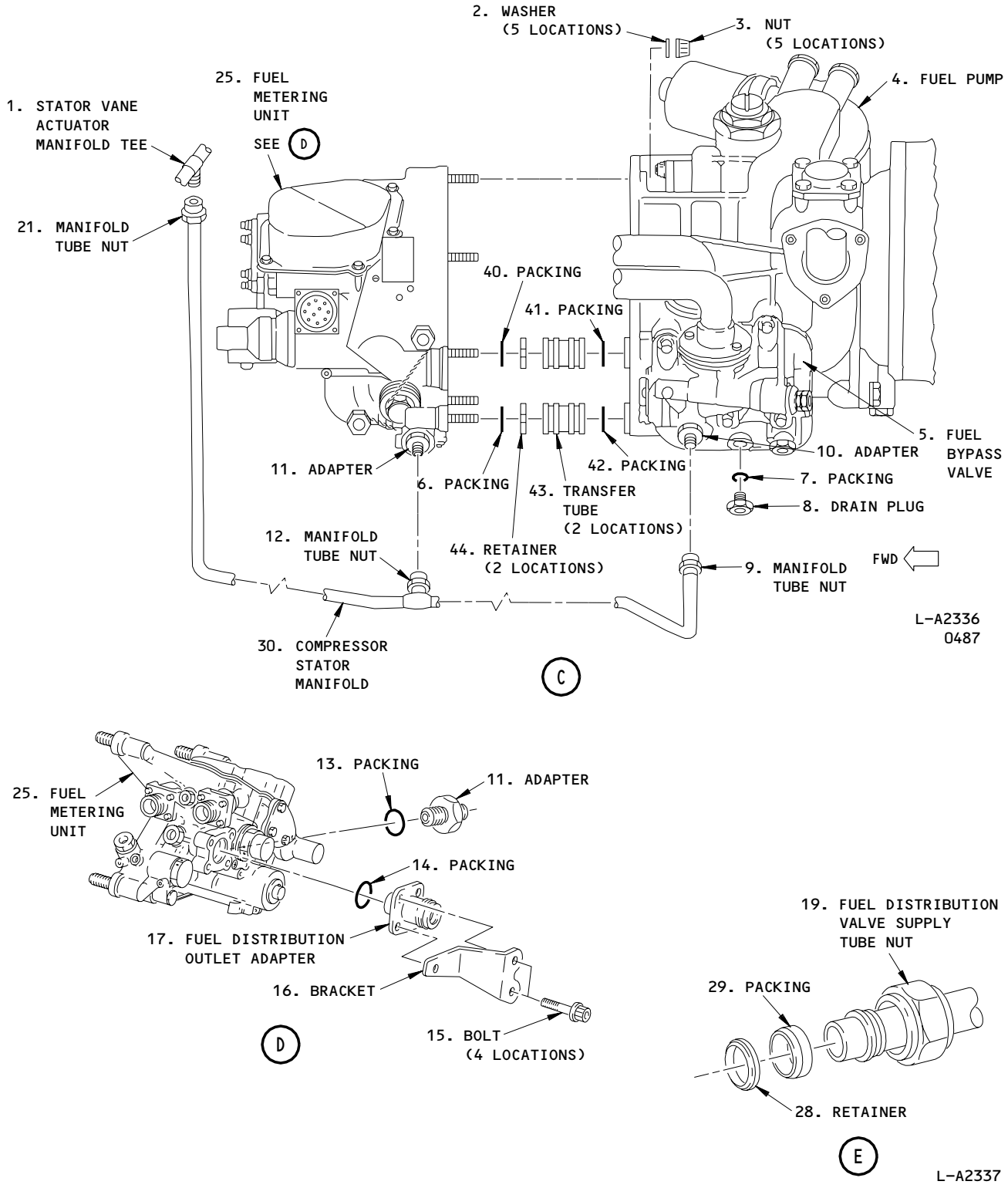
(2) Remove the fuel metering unit:
  (a) Disconnect the self-locking electrical connectors (23, 24) from the fuel metering unit (25).
    1) Install the protection caps on the electrical connectors.
  (b) Remove the bolt (32) which attaches the harness clamp (31) to the bracket on the fuel metering unit (25).
  (c) Disconnect the compressor stator manifold (30) from the adapter (11) on the fuel metering unit (25), the stator vane actuator manifold tee (1), and the fuel bypass valve (5).
  (d) Remove the compressor stator manifold (30) from the engine.
  (e) Remove the bolt (34) which attaches the clamp (37) to the clamp (35).
  (f) Remove the bolt (20A) that attaches the clamp (19A).
  (g) ENGINES WITH THE SUPPLY TUBE (20) ATTACHED ON THE HPC BRACKET; Remove the bolt (34A) and the nut (39A) that attach the clamp (35A) to the HPC bracket.
  (h) Disconnect the tube nuts (19) and remove the supply tube (8) from between the fuel metering unit (25) and the fuel flow transmitter (18).
    1) Discard the packings (29) and the retainers (28).



1 ON ENGINES WITH THE SUPPLY TUBE (20) ATTACHED ON THE HPC BRACKET

2 ON ENGINES WITHOUT THE SUPPLY TUBE (20) ATTACHED ON THE HPC BRACKET

Fuel Metering Unit Installation
Figure 401 (Sheet 1)



Fuel Metering Unit Installation
Figure 401 (Sheet 2)

(i) Do these steps to remove the fuel metering unit (25) from the fuel pump (4) when they are installed on the engine:
1) Remove the nuts (3) which attach the fuel metering unit (25) to the fuel pump (4).
2) Remove the fuel metering unit (25) from the fuel pump (4).
3) Remove the two transfer tubes (43) from the fuel pump (4) as follows:
a) In the following steps, look for bronze or bronze color particles on the transfer tubes and the servo wash filter when you disconnect the fuel metering unit from the fuel pump.
- If you find bronze (contamination), you must replace the fuel metering unit and the fuel pump. You must monitor the servo fuel driven components for dual "Track Check" faults. Refer to the FIM/TSM. If dual "Track Check" faults occur, you must take the necessary maintenance procedure to find the cause.
b) Discard the packings (6, 40) from the transfer tubes (43) on the fuel pump (4).
c) Remove the retainers (44) that hold the transfer tubes (43) in the fuel pump (4).
d) Remove the transfer tubes (43) from the fuel pump (4) and remove the packings (41, 42) from the inner grooves of the transfer tubes.
4) Install the protection caps on the fuel metering unit (25) and fuel pump (4).

(j) Do these steps to remove the fuel metering unit (25) from the fuel pump (4) when they are not installed on the engine:
1) Remove the fuel pump (4) together with the fuel metering unit (25) from the engine (AMM 73-11-01/401).
2) Remove the nuts (3) which attach the fuel metering unit (25) to the fuel pump (4).
3) Remove the fuel metering unit (25) from the fuel pump (4).
4) Discard the packings (6, 40) from the transfer tubes on the fuel pump (4).
5) Install the protection caps on the fuel metering unit (25) and fuel pump (4).

S 024-027-N00

(3) Do these steps if you will replace the fuel metering unit (25):
(a) Remove the adapter (11) from the fuel metering unit (25).
1) Discard the packing (13).
(b) Remove the bolts (15) which attach the bracket (16) and the outlet adapter (17) to the fuel metering unit (25).
(c) Remove the outlet adapter (17) from the fuel metering unit (25).
1) Discard the packing (14).

S 624-028-N00

CAUTION: YOU MUST DO THE PRESERVATION STEPS THAT FOLLOW IF THE FUEL METERING UNIT WILL NOT BE INSTALLED ON THE ENGINE IN LESS THAN 24 HOURS AFTER REMOVAL. INTERNAL CORROSION CAN CAUSE DAMAGE TO THE FUEL METERING UNIT.

(4) If the fuel metering unit (25) will not be installed in less than 24 hours after the removal, do these steps:
   (a) Remove the caps to drain all remaining fuel from the fuel metering unit (25).
   (b) Install caps to all openings that are not on the mating surface of the fuel metering unit (25) and the fuel pump (4).
   (c) Put the fuel metering unit (25) in a level position.
   (d) Fill the mating parts on the fuel metering unit (25) with sufficient slushing oil to apply a layer of oil to all surfaces which touch the fuel.
   (e) Make sure all internal parts get a thick layer of oil.
      1) Turn the FMU (25).
   (f) Drain the slushing oil from the fuel metering unit (25).
      1) Install the protection caps on all openings.

TASK 73-21-01-404-001-N00

3. Install the Fuel Metering Unit

A. Consumable Materials
   (1) D00137 Oil, PWA 521
   (2) D00504 Petrolatum - PMC 9609
   (3) G02334 Lockwire - AS3214-02

B. Parts

AMM			AIPC		
FIG	ITEM	NOMENCLATURE	SUBJECT	FIG	ITEM
401	6	Packing	73-21-01	15	60
	13	Packing			35
	14	Packing			25
	25	Unit-Fuel Metering			40
	29	Packing	73-11-06	35	40
	40	Packing	73-21-01	15	55
	41	Packing	73-11-02	10	50
	42	Packing			55

C. References
   (1) AMM 70-24-05/201, Electrical Harnesses

(2) AMM 71-00-00/501, Power Plant - General
(3) AMM 71-11-04/201, Fan Cowl Panels
(4) AMM 71-11-06/201, Core Cowl Panels
(5) AMM 73-11-01/401, Fuel Pump
(6) AMM 78-31-00/201, Thrust Reverser

D. Access

(1) Location Zones

210	Control Cabin
411	Left Engine
421	Right Engine

(2) Access Panels

413AL/423AL	Fan Cowl Panel (Left)
414AR/424AR	Fan Cowl Panel (Right)
415AL/425AL	Thrust Reverser (Left)
416AR/426AR	Thrust Reverser (Right)
417AL/427AL	Core Cowl Panel (Left)
418AR/428AR	Core Cowl Panel (Right)

E. Prepare to Install the Fuel Metering Unit (Fig. 401)

S 424-029-N00

(1) Do these steps when you install a new fuel metering unit (25):
   (a) Lubricate the new packing (14) with the petrolatum.
   (b) Install the packing (14) on the outlet adapter (17).
   (c) Lubricate the threads of the bolts (15) with engine oil.
   (d) Install the outlet adapter (17) and the bracket (16) to the fuel metering unit (25) with the bolts (15).
      1) Make sure the bolt (15) with the lockwire holes is in the bottom, left position (look from the front) on the outlet adapter (17).
      2) Tighten the bolts (15) to 65-85 pound-inches (7.3-9.6 newton-meters).
   (e) Lubricate the new packing (13) with the petrolatum.
   (f) Install the packing (13) on the adapter (11).

(g) Lubricate the threads of the adapter (11) with engine oil.
(h) Install the adapter (11) to the port on the fuel metering unit (25).
1) Tighten the adapter (11) to 200-225 pound-inches (22.6-25.4 newton-meters).

S 424-030-N00
(2) Do these steps to install the fuel metering unit (25) to the fuel pump (4) when they are not installed on the airplane:
(a) Remove the caps from the transfer tubes on the fuel pump (4) and the mating ports on the fuel metering unit (25).
(b) Install the transfer tubes (43) to the fuel pump as follows:
1) Lubricate the packings (6, 40, 41, 42) with the petrolatum.
2) Install one packing (41, 42) to both of the transfer tubes (43).
3) Install the transfer tubes (43), packing side inward, to the fuel pump ports.
4) Install the retainers (44) to hold the transfer tubes (43) in position in the fuel pump (4).
5) Install the remaining packings (6, 40) to the transfer tubes (43) on the fuel pump (4).
(c) Lubricate the threads of the studs on the fuel metering unit (25) with oil.
(d) Align the transfer tubes on the fuel pump (4) with the ports on the fuel metering unit (25).
(e) Install the fuel metering unit (25) to the fuel pump (4) with the washers (2) and the nuts (3).
1) Tighten the nuts (3) to 275-300 pound-inches (31.1-33.9 newton-meters).

F. Install the Fuel Metering Unit

S 424-053-N00
(1) Do this step when you install the fuel metering unit (25) together with the fuel pump:
(a) Install the fuel pump (4) together with the fuel metering unit (25) on the engine (AMM 73-11-01/401).

S 424-031-N00
(2) Do these steps to install the fuel metering unit (25) to the fuel pump (4) when the fuel pump is installed on the engine:
(a) Lubricate the packings (6, 40) with the petrolatum.
(b) Install the packings (6, 40) to each transfer tube on the fuel pump (4).

(c) Lubricate the threads of the studs on the fuel metering unit (25) with oil.
(d) Align the transfer tubes on the fuel pump (4) with the ports on the fuel metering unit (25).
(e) Install the fuel metering unit (25) to the fuel pump (4) with the washers (2) and the nuts (3).
    1) Tighten the nuts (3) to 275-300 pound-inches (31.1-33.9 newton-meters).
(f) Lubricate the packings (29) with the petrolatum.
(g) Install the packings (29) and the retainers (28) to the supply tube (20).
(h) Lubricate the threads on the adapters for the fuel metering unit (25) and the fuel flow transmitter (18) with oil.
(i) Install the supply tube (20) between the two adapters on the fuel metering unit (25) and the fuel flow transmitter (18).
    1) Tighten the tube nuts (19, 22) to 100-110 pound-inches (11.3-12.4 newton-meters).
(j) Loosen the tube nuts (19, 22).
(k) Tighten the tube nuts (19, 22) again to 100-110 pound-inches (11.3-12.4 newton-meters).
(l) Safety the tube nuts (19, 22) with lockwire or safety cable and safety cable ferrule.

    NOTE: Safety the tube nut (22) to the bottom, left bolt (15) (look from the front) on the outlet adapter (17).

(m) Lubricate the threads of the bolt (34) with engine oil.
(n) Install the clamp (35) to the clamp (37) with the bolt (34) and nut (39).
    1) Tighten the nut (39) to 36-40 pound-inches (4.1-4.5 newton-meters).
(o) ENGINES WITH THE SUPPLY TUBE (20) ATTACHED ON THE HPC BRACKET; Do the steps that follow:
    1) Lubricate the threads of the bolt (34A) with engine oil.
    2) Install the clamp (35A) to the HPC bracket with the bolt (34A) and nut (39A).
        a) Tighten the nut (39A) to 36-40 pound-inches (4.1-4.5 newton-meters).
(p) Lubricate the threads of the bolt (20A) with engine oil.

(q) Install the clamp (19A) with the bolt (20A).
1) Tighten the bolt (20A) to 36-40 pound-inches (4.1-4.5 newton-meters).

(r) Do these steps to install the compressor stator manifold (30) on the engine:
1) Lubricate the threads of the adapters (10, 11) with oil.
2) Install the compressor stator manifold (30) to the adapters (10, 11) on the fuel metering unit (25) and the fuel bypass valve (5).
a) Tighten the tube nut (9) to 200-225 pound-inches (22.6-25.4 newton-meters).
b) Tighten the tube nut (12) to 450-500 pound-inches (50.8-56.5 newton-meters).
c) Safety the tube nuts (9, 12) with lockwire or safety cable and safety cable ferrule.
3) Install the compressor stator manifold (30) to the actuator manifold tee (1).
a) Tighten the tube nut (21) to 340-375 pound-inches (38.4-42.4 newton-meters).
b) Safety the tube nut (21) with lockwire or safety cable and safety cable ferrule.

(s) Lubricate the threads of the bolt (32) with engine oil.

(t) Attach the clamp (31) for the wire harness to the bracket on the fuel metering unit (25) with the bolt (32) and nut (33).

(u) Remove the caps from the electrical connectors (23, 24).

CAUTION: USE THE CORRECT ASSEMBLY PROCEDURE, AND TOOLS, FOR THE HARNESS CONNECTOR INSTALLATION (AMM 70-24-05/201). IF YOU USE THE INCORRECT ASSEMBLY PROCEDURE, OR TOOLS, A DAMAGED OR LOOSE CONNECTOR CAN OCCUR. A LOOSE CONNECTOR PERMITS VIBRATION, WHICH CAUSES THE CONTACTS TO WEAR AND DECREASES THE LIGHTNING PROTECTION.

(v) Connect the electrical connectors (23, 24) to the fuel metering unit (25) (AMM 70-24-05/201).

G. Return the Aircraft to Its Usual Condition

S 414-038-N00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT COULD OCCUR.

(1) Close the thrust reversers (AMM 78-31-00/201).

S 414-039-N00

(2) Close the core cowl panels (AMM 71-11-06/201).

S 414-049-N00

(3) Close the fan cowl panels (AMM 71-11-04/201).

S 444-040-N00
(4) Do the activation procedure for the thrust reversers (AMM 78-31-00/201).

S 864-042-N00
(5) For the left engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P6 panel:
(a) 6E1, FUEL VALVES L SPAR

S 864-043-N00
(6) For the right engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P6 panel:
(a) 6E2, FUEL VALVES R SPAR

S 864-044-N00
(7) For the left engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P11 panel:
(a) 11D25, FUEL CONT VLV & EEC CHAN B RESET L

S 864-045-N00
(8) For the right engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P11 panel:
(a) 11D26, FUEL CONT VLV & EEC CHAN B RESET R

S 714-046-N00
(9) Do the test for the fuel metering unit which is shown in the Power Plant Test Reference Table (AMM 71-00-00/501).

EEC INLET TOTAL PRESSURE/TEMPERATURE (PT2/TT2) PROBE - REMOVAL/INSTALLATION

1. General
   A. This procedure contains the data to remove and install the PT2/TT2 probe.
   B. The EEC PT2/TT2 probe is installed in the top, left acoustical panel (view from the front) of the inlet cowl.

TASK 73-21-03-004-002-N00

2. Remove the EEC Inlet Total Pressure/Temperature (PT2/TT2) Probe
   A. References
      (1) AMM 06-43-00/201, Engine and Nacelle Strut Access Doors and Panels
   B. Access
      (1) Location Zones
          210 Control Cabin
          412/422 Nose Cowl

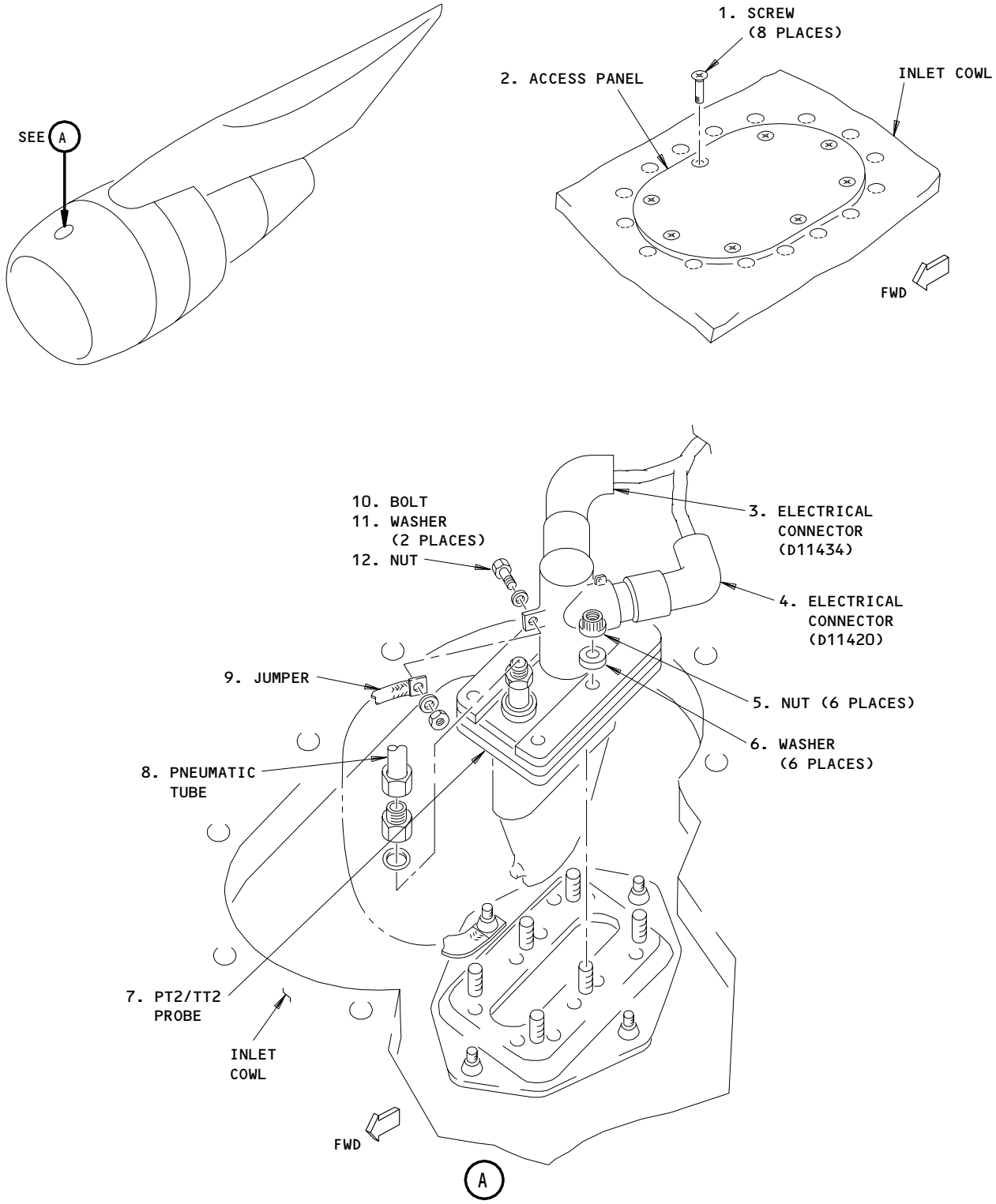
      (2) Access Panels
          412AR/422AR PT2 Probe

   C. Prepare to Remove the PT2/TT2 Probe

      S 864-003-N00
      (1) For the left engine, open this circuit breaker on the main power distribution panel, P6, and attach a DO-NOT-CLOSE tag:
          (a) 6L19, L ENG PROBE HT

      S 864-004-N00
      (2) For the right engine, open this circuit breaker on the P6 panel and attach a DO-NOT-CLOSE tag:
          (a) 6K25, R ENG PROBE HT

      S 414-005-N00
      (3) Remove the screws (1) which attach the access panel (2), 412AR/422AR, to the inlet cowl (AMM 06-43-00/201).



EEC PT2/TT2 Probe Installation
Figure 401

S 414-006-N00

(4) Remove the access panel (2) from the engine.

D. Remove the PT2/TT2 Probe (Fig. 401)

S 034-007-N00

(1) Disconnect the pneumatic tube (8) from the PT2/TT2 probe (7).

S 034-008-N00

(2) Disconnect the electrical connectors (3, 4) from the PT2/TT2 probe (7).

S 034-009-N00

(3) Remove the bolt (10) to disconnect the jumper (9) from the PT2/TT2 probe (7).

S 024-010-N00

(4) Remove the nuts (5) and the washers (6) which attach the PT2/TT2 probe (7).

S 024-011-N00

CAUTION: DO NOT MOVE THE PNEUMATIC TUBES TOO MUCH IN ONE DIRECTION. TOO MUCH MOVEMENT CAN CAUSE A STRUCTURAL FAILURE OF THE TUBE.

(5) Move the pneumatic tube (8) horizontally until it is clear of the PT2/TT2 probe (7).

S 024-012-N00

(6) Remove the PT2/TT2 probe (7) from the engine.

TASK 73-21-03-404-001-N00

3. Install the EEC Inlet Total Pressure/Temperature (PT2/TT2) Probe

A. Consumable Materials

(1) A00247 Sealant - BMS 5-95

(2) A00144 Sealant - PRO SEAL 860 (optional to BMS 5-79) (AMM 20-30-01)

B. Parts

AMM		NOMENCLATURE	AIPC		
FIG	ITEM		SUBJECT	FIG	ITEM
401	7	Probe - PT2/TT2	71-11-01	10	25

C. References
(1) AMM 06-43-00/201, Engine and Nacelle Strut Access Doors and Panels
(2) AMM 51-31-01/201, Seals and Sealing
(3) AMM 71-00-00/501, Power Plant

D. Access
(1) Location Zones
210 Control Cabin
412/422 Nose Cowl

(2) Access Panels
412AR/422AR PT2 Probe

E. Install the PT2/TT2 Probe (Fig. 401)

S 164-013-N00
(1) Clean all sealant from the PT2/TT2 probe fitting in the acoustic panel (AMM 51-31-01/201).

S 424-014-N00

CAUTION: DO NOT MOVE THE PNEUMATIC TUBES TOO MUCH IN ONE DIRECTION. TOO MUCH MOVEMENT CAN CAUSE A STRUCTURAL FAILURE OF THE TUBE.

(2) Move the pneumatic tube (8) horizontally until you have sufficient space to install the PT2/TT2 probe (7).

S 424-015-N00
(3) Install the PT2/TT2 probe (7) in the fitting on the acoustic panel of the inlet cowl.

S 424-016-N00
(4) Attach the PT2/TT2 probe (7) with the nuts (5) and the washers (6).

S 394-017-N00
(5) Put the sealant between the PT2/TT2 probe (7) and the acoustic panel (AMM 51-31-01/201).

S 434-018-N00
(6) Install the jumper (9) to the PT2/TT2 probe (7) with a bolt (10), washers (11), and nut (12).

S 434-019-N00
(7) Connect the electrical connectors (3, 4) to the PT2/TT2 probe (7).

S 434-020-N00
(8) Connect the pneumatic tube (8) to the PT2/TT2 probe (7).

F. Put the Airplane Back to Its Usual Condition

S 394-021-N00
(1) Install a seal to the mating surfaces between the inlet cowl and the access panel (2) (AMM 51-31-01/201).

S 414-022-N00
(2) Install the access panel (2), 412AR/422AR, with screws (1) (AMM 06-43-00/201).

S 864-023-N00
(3) For the left engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P6 panel:
(a) 6L19, L ENG PROBE HT

S 864-024-N00
(4) For the right engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P6 panel:
(a) 6K25, R ENG PROBE HT

S 714-025-N00
(5) Do the test for the PT2/TT2 probe which is shown in the Power-Plant Test-Reference Table (AMM 71-00-00/501).

ELECTRONIC ENGINE CONTROL (EEC) - REMOVAL/INSTALLATION

1. General
   A. The Electronic Engine Control (EEC) is located under the fan cowl on the right side of the engine.

TASK 73-21-04-004-001-N00

2. Remove the Electronic Engine Control (EEC) (Fig. 401)
   A. References
      (1) AMM 71-11-04/201, Fan Cowl Panels
   B. Access
      (1) Location Zone
          411 Left Engine
          421 Right Engine

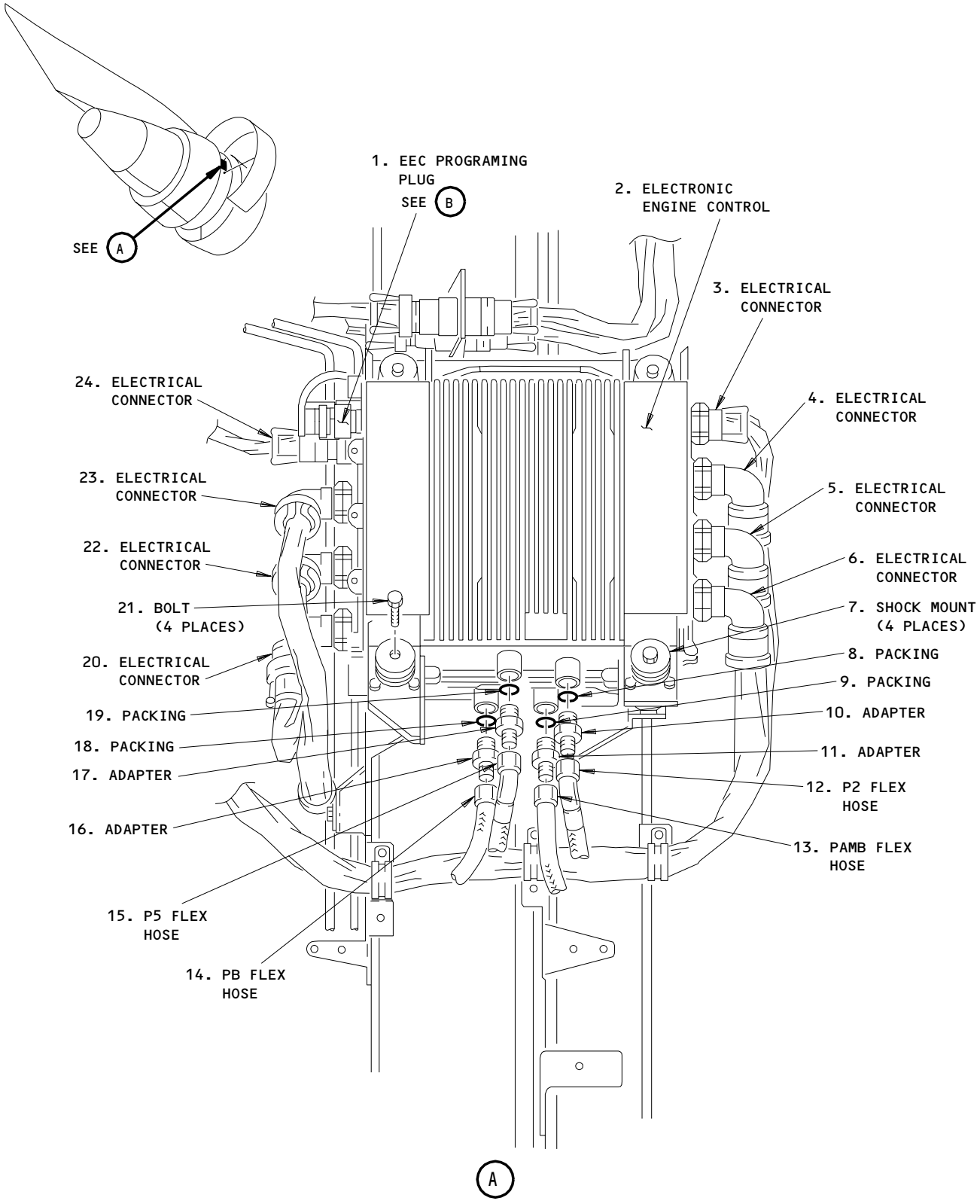
      (2) Access Panel
          414AR Fan Cowl Panel (Right), Left Engine
          424AR Fan Cowl panel (Right), Right Engine

   C. Prepare to Remove the Electronic Engine Control (EEC)

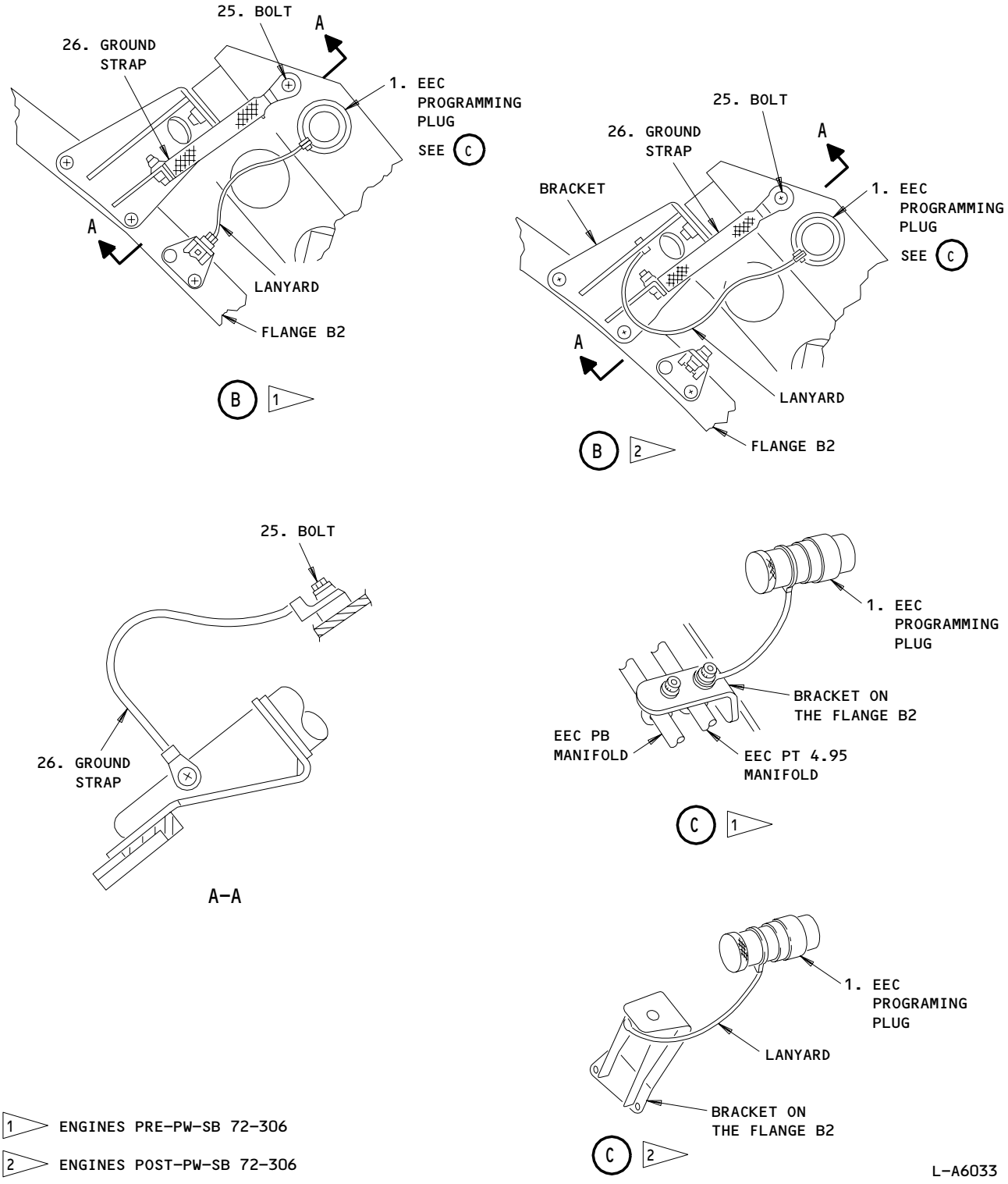
      S 864-002-N00
      (1) For the left engine, open this circuit breaker on the main power distribution panel P6 and attach a DO-NOT-CLOSE tag:
          (a) 6L19, PROBE HEAT L ENG

      S 864-003-N00
      (2) For the right engine, open this circuit breaker on the main power distribution panel P6 and attach a DO-NOT-CLOSE tag:
          (a) 6K25, PROBE HEAT R ENG

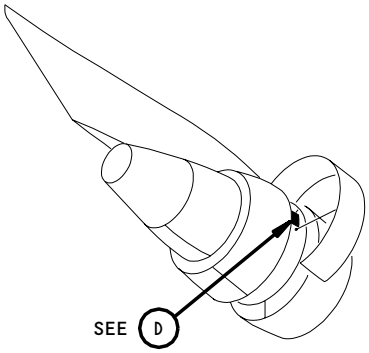
      S 864-004-N00
      (3) For the left engine, open these circuit breakers on the overhead panel P11 and attach DO-NOT-CLOSE tags:
          (a) 11A10, AIR DATA CMPTR L

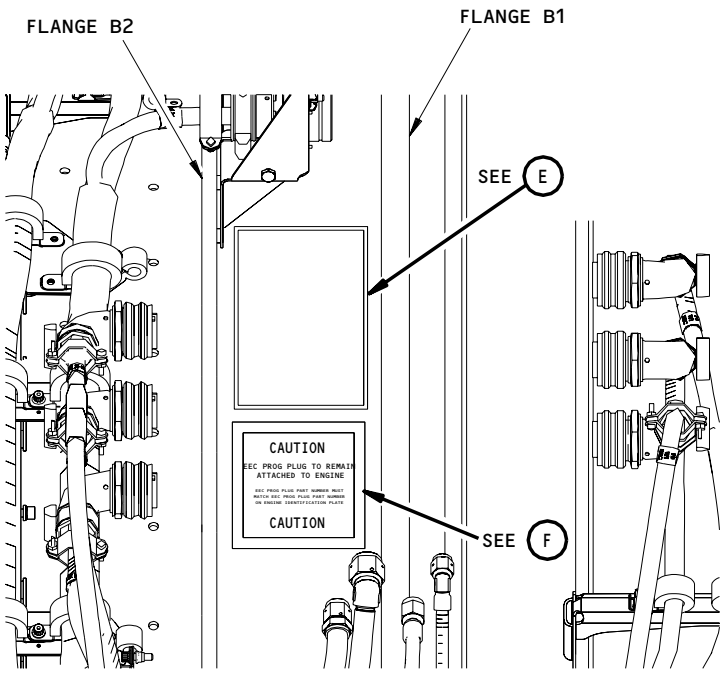


Electronic Engine Control Installation
Figure 401 (Sheet 1)



Electronic Engine Control Installation
Figure 401 (Sheet 2)





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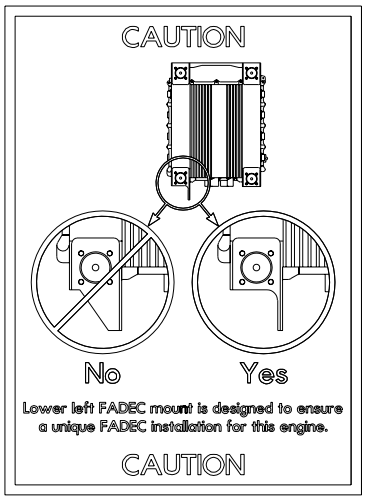

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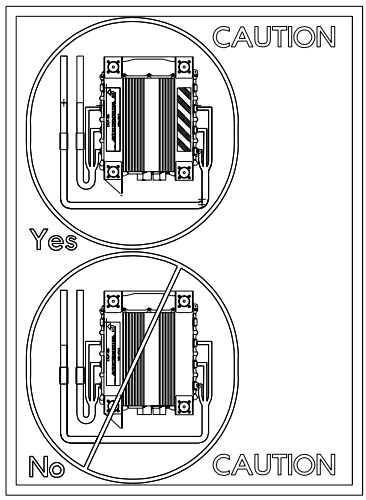
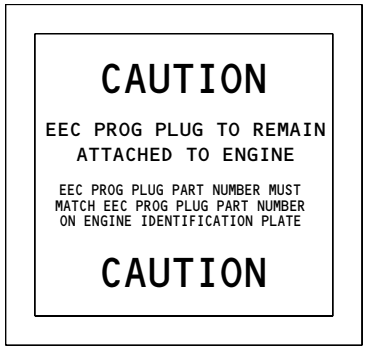


E 5



F

3 FAN CASE WITH EEC REMOVED. ENGINES THAT DO NOT HAVE SEGMENTED OR RING CASE HPC WILL NOT HAVE A LABEL

4 ENGINES WITH SEGMENTED CASE HPC

5 ENGINES WITH RING CASE HPC

L-D0815 (0103)

Electronic Engine Control Installation
Figure 401 (Sheet 3)

(b) 11L3, L ENGINE PERF SOL CHAN A
(c) 11L4, L ENGINE PERF SOL CHAN B
(d) 11D17, LEFT ENGINE EEC DISCRETES

S 864-005-N00
(4) For the right engine, open these circuit breakers on the overhead panel P11 and attach DO-NOT-CLOSE tags:
(a) 11F30, AIR DATA CMPTR R
(b) 11L30, R ENGINE PERF SOL CHAN A
(c) 11L31, R ENGINE PERF SOL CHAN B
(d) 11M32, RIGHT ENGINE EEC DISCRETES

S 864-038-N00
(5) Set the applicable EEC Maint Power switch to the OFF/NORM position.

S 864-039-N00
(6) Set the applicable fuel control switch to the CUTOFF position.

S 864-040-N00
(7) Set the applicable start control switch to the OFF position.

S 864-050-N00
(8) Open these circuit breakers with the steps that follow:
(a) For the left engine, open this circuit breaker on the overhead circuit breaker panel, P11, and attach the DO-NOT-CLOSE tag:
1) 11L7, L ENG EEC/SCU PWR
(b) For the right engine, open this circuit breaker on the overhead circuit breaker panel, P11, and attach the DO-NOT-CLOSE tag:
1) 11K28, R ENG EEC/SCU PWR

S 864-006-N00
(9) Open this circuit breaker on the overhead panel P11 and attach a DO-NOT-CLOSE tag:
(a) 11B36, APU ENG START/ECS DISCRETES

S 014-008-N00
(10) Open the right fan cowl panel (AMM 71-11-04/201).

D. Procedure

S 024-054-N00
(1) Remove the Electronic Engine Control (EEC):

CAUTION: DO NOT REMOVE THE EEC PROGRAMMING PLUG FROM THE ENGINE WHEN YOU REMOVE THE EEC. THE PROGRAMMING PLUG MUST STAY ON THE ENGINE TO KEEP THE CORRECT THRUST RATING.

(a) Disconnect the EEC programming plug (1) from the EEC (2) but do not remove the EEC programming plug from the engine.
1) Install covers on the EEC programming plug (1) and on the EEC (2).

(b) Disconnect the electrical connectors (3, 4, 5, 6, 20, 22, 23 and 24) from the EEC (2).
1) Install covers on all the electrical connectors and on the EEC (2).
(c) Disconnect the flex hoses (12, 13, 14 and 15) from the bottom of the EEC (2).
(d) Remove the bolt (25) to disconnect the ground strap (26) from the EEC (2).
(e) Remove the bolts (21) and shock mounts (7) that attach the EEC (2) to the engine.
1) Remove the EEC (2) from the engine.

S 024-055-N00

(2) If it is necessary to replace the EEC, do the steps that follow:
(a) Remove the adapters (10, 11, 16 and 18) from the flex hose connections on the EEC (2).
(b) Remove the packings (8, 9, 17 and 19) from the adapters (10, 11, 16 and 18).
1) Discard the packings (8, 9, 17 and 19).

S 024-056-N00

(3) Install covers over the flex hose connections on the EEC (2).

TASK 73-21-04-404-016-N00

3. Install the Electronic Engine Control (EEC) (Fig. 401)
A. Equipment
(1) M303, M305, or M307 Bergen Mechanical Crimper
Bergen Cable Technologies Inc
170 Gregg St
P.O. Box 1300
Lodi, NJ 07644-9982
B. Consumable Materials
(1) D00137 Engine Oil - PWA 521
(2) G02334 Lockwire, (P05-289) 0.032 inch (0.813 mm) - AS3214-02
(3) G02335 Cable, Safety (P05-291)
(4) G02332 Ferrule, Safety Cable (P05-292)
C. Parts

AMM			AIPC		
FIG	ITEM	NOMENCLATURE	SUBJECT	FIG	ITEM
401	2	Electronic Engine Control	73-21-04	05	80
	8	Packing			10
	9	Packing			20
	18	Packing			30
	19	Packing			40

D. References
(1) AMM 70-24-05/201, Electrical Harnesses
(2) AMM 71-00-00/501, Power Plant
(3) AMM 71-11-04/201, Fan Cowl Panels

E. Access
(1) Location Zone
411 Left Engine
421 Right Engine

(2) Access Panel
414AR Fan cowl Panel (right), Left Engine
424AR Fan cowl panel (right), Right Engine

F. Procedure

S 404-063-N00

WARNING: INSTALLATION OF A P/N 791100-14-102 EEC IS NOT ALLOWED ON AN AIRPLANE THAT HAS RING CASE CONFIGURATION ENGINES INSTALLED. IF YOU DO YOU CAN CAUSE INJURY TO PERSONNEL OR DAMAGE TO THE AIRPLANE.

(1) Make sure you have the correct EEC part number for the engine model number shown on the engine data plate.

NOTE: Engines with the Phase 3 engine changes or Phase 3 fan blade changes must use the correct EEC part number. Engine models PW40XX(-3), PW40XX(-1C), or PW40XX(-3B) must have EEC part numbers 52D335 or subsequent. A hung start will occur if you use the incorrect EEC part number.

NOTE: Installation of a P/N 791100-14-102 (P&W P/N 54D043) EEC (EEC software version SCN 11B/AM - CUTBACK STATOR SOFTWARE) is not allowed on an airplane that has ring case configuration engines (Post SB PW4ENG 72-755 or production equivalent) installed.

S 424-057-N00
(2) Remove the covers from the EEC (2) and the electrical connectors (3, 4, 5, 6, 20, 22, 23 and 24).

S 424-060-N00

CAUTION: DO NOT LUBRICATE THE HOSE ADAPTERS OR PACKINGS. IF YOU LUBRICATE THE ADAPTERS OR PACKINGS, THE LUBRICANT CAN CAUSE CONTAMINATION OF THE EEC.

CAUTION: EXAMINE THE ENGINE FAN CASE AT APPROXIMATELY THE ONE O'CLOCK POSITION FOR A FADEC CAUTION LABEL. THIS LABEL SHOWS THAT A UNIQUE MOUNTING EEC IS NECESSARY BECAUSE CUTBACK HPC STATORS (POST-PW-SB 72-706) ARE INSTALLED IN THE ENGINE. MAKE SURE THE CORRECT EEC IS INSTALLED.

(3) If it is necessary to replace the EEC (2), do the steps that follow:
  (a) Install the packings (8, 9, 18 and 19) on the adapters (10, 11, 16 and 17).
  (b) Install the adapters (10, 11, 16 and 17) in the ports marked P2, PAMB, PB, and P5.
  (c) Tighten the adapters (10, 11, 16 and 17):
    1) Tighten the adapter (10) in the P2 port to 65-75 pound-inches (7.3-8.5 newton-meters).
    2) Tighten the adapter (11) in the PAMB port to 90-100 pound-inches (10.2-11.3 newton-meters).
    3) Tighten the adapter (16) in the PB port to 110-120 pound-inches (12.4-13.6 newton-meters).
    4) Tighten the adapter (17) in the P5 port to 150-170 pound-inches (16.9-19.2 newton-meters).

S 424-019-N00

(4) Install the Electronic Engine Control (EEC):
  (a) Put the EEC (2) on the mounting bracket on the fan case at the 2 o'clock position with the pressure ports pointed down.
  (b) Lubricate the threads of the bolts (21) with engine oil.
  (c) Attach the EEC (2) to the engine with the bolts (21) and shock mounts (7).
    1) Tighten the bolts (21) to 150-170 pound-inches (16.9-19.2 newton-meters).

  CAUTION: DO NOT USE LUBRICANTS ON THE FLEX HOSES, ADAPTERS, OR PACKINGS. THE USE OF LUBRICANTS IN THESE LOCATIONS CAN CAUSE CONTAMINATION OF THE EEC.

  CAUTION: HOLD THE WRENCH FLATS FOR THE EEC ADAPTERS WHEN YOU TORQUE THE HOSE NUTS. THIS WILL PREVENT DAMAGE TO THE THREADS IN THE EEC.

  (d) Install the flex hoses (12, 13, 14 and 15) on the EEC (2):
    1) Install the PB flex hose nut (14) to the adapter (16).
      a) Tighten the PB flex hose nut (14) to 270-300 pound-inches (30.5-33.9 newton-meters).

b) Install the Lockwire or Safety Cable and Safety Cable Ferrule to the tube nuts.

2) Install the P5 flex hose nut (15) to the adapter (17).
   a) Tighten the P5 flex hose nut (15) to 450-500 pound-inches (50.8-56.5 newton-meters).
   b) Install the Lockwire or Safety Cable and Safety Cable Ferrule to the tube nuts.
3) Install the PAMB flex hose nut (13) to the adapter (11).
   a) Tighten the PAMB flex hose nut (13) to 135-150 pound-inches (15.2-16.9 newton-meters).
   b) Install the Lockwire or Safety Cable and Safety Cable Ferrule to the Tube nuts.
4) Install the P2 flex hose nut (12) to the adapter (10).
   a) Tighten the P2 flex hose nut (12) to 90-100 pound-inches (10.2-11.3 newton-meters).
   b) Install the Lockwire or Safety Cable and Safety Cable and Ferrule to the tube nuts.

CAUTION: MAKE SURE THAT THE LUGS ON THE GROUND CABLE ARE TIGHTLY ATTACHED TO THE GROUND CABLE. MAKE SURE THAT THE CABLE IS NOT MORE THAN 25 PERCENT BROKEN. IF THE LUGS ARE LOOSE OR THE CABLE IS BADLY BROKEN, LIGHTNING PROTECTION WILL NOT BE SUFFICIENT.

(e) Install the ground cable:
1) Put the lug for the ground cable (26) on the upper aft side of the EEC (2).
2) Lubricate the bolt (25) with engine oil.
3) Attach the ground cable (26) to the EEC (2) with the bolt (25).
   a) Tighten the bolt (25) to 75-85 pound-inches (8.5-9.6 newton-meters).

CAUTION: USE THE CORRECT ASSEMBLY PROCEDURE, AND TOOLS, FOR THE HARNESS CONNECTOR INSTALLATION (AMM 70-24-05/201). IF YOU USE THE INCORRECT ASSEMBLY PROCEDURE, OR TOOLS, A DAMAGED OR LOOSE CONNECTOR CAN OCCUR. A LOOSE CONNECTOR PERMITS VIBRATION, WHICH CAUSES THE CONTACTS TO WEAR AND DECREASES THE LIGHTNING PROTECTION.

(f) Connect the electrical connectors (3, 4, 5, 6, 20, 22, 23 and 24) to the applicable connectors on the EEC (2) (AMM 70-24-05/201).

CAUTION: MAKE SURE THE WIRE HARNESSES AT THE FORWARD AND AFT END OF THE EEC DO NOT EXTEND OUT OF THE OUTER SURFACE OF THE EEC. IF THE WIRE HARNESSES EXTEND OUT OF THE OUTER SURFACE OF THE EEC, THEY CAN TOUCH THE FAN COWL PANEL AND GET DAMAGED.

(g) Make sure the wire harnesses do not extend out of the outer surfaces of the EEC (2).

CAUTION: USE THE CORRECT ASSEMBLY PROCEDURE, AND TOOLS, FOR THE PROGRAMMING PLUG INSTALLATION (AMM 70-24-05/201). IF YOU USE THE INCORRECT ASSEMBLY PROCEDURE, OR TOOLS, A DAMAGED OR LOOSE PROGRAMMING PLUG CAN OCCUR. A LOOSE PROGRAMMING PLUG PERMITS VIBRATION, WHICH CAUSES THE CONTACTS TO WEAR AND DECREASES THE LIGHTNING PROTECTION.

(h) Install the programming plug (1) to the connector on the upper left side of the EEC (2) (AMM 70-24-05/201).

G. Return the Aircraft to its Usual Condition

S 414-025-N00
(1) Close the right fan cowl panel (AMM 71-11-04/201).

S 864-026-N00
(2) For the left engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the main power disribution panel P6:
(a) 6L19, PROBE HEAT L ENG

S 864-027-N00
(3) For the right engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the main power disribution panel P6:
(a) 6K25, PROBE HEAT R ENG

S 864-028-N00
(4) Remove the DO-NOT-CLOSE tag and close this circuit breaker on the overhead panel P11:
(a) 11B36, APU ENG START/ECS DISCRETES

S 864-052-N00
(5) Close these circuit breakers with the steps that follow:
(a) For the left engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P11 panel:
1) 11L7, L ENG EEC/SCU PWR
(b) For the right engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P11 panel:
1) 11K28, R ENG EEC/SCU PWR

S 864-029-N00
(6) For the left engine, remove the DO-NOT-CLOSE tags and close these circuit breakers on the overhead panel P11:
(a) 11A10, AIR DATA CMPTR L
(b) 11L3, L ENGINE PERF SOL CHAN A
(c) 11L4, L ENGINE PERF SOL CHAN B
(d) 11D17, LEFT ENGINE EEC DISCRETES

S 864-030-N00
(7) For the right engine, remove the DO-NOT-CLOSE tags and close these circuit breakers on the overhead panel P11:
(a) 11F30, AIR DATA CMPTR R
(b) 11L30, R ENGINE PERF SOL CHAN A
(c) 11L31, R ENGINE PERF SOL CHAN B
(d) 11M32, RIGHT ENGINE EEC DISCRETES

S 864-031-N00
(8) Move the EEC MAINT L(R) ENG POWER switch on the right side panel P61 to the TEST position.

S 864-032-N00
(9) Wait for five seconds.

S 864-033-N00
(10) Move the EEC MAINT L (R) ENG POWER switch to the NORM position.

S 714-034-N00
(11) Do the test of the Electronic Engine Control (EEC) that is shown in the Power Plant Test Reference Table (AMM 71-00-00/501).

ELECTRONIC ENGINE CONTROL - INSPECTION/CHECK

1. General
   A. This procedure contains the instructions to remove the water from the water traps on the EEC pressure manifolds.

TASK 73-21-04-686-001-N00

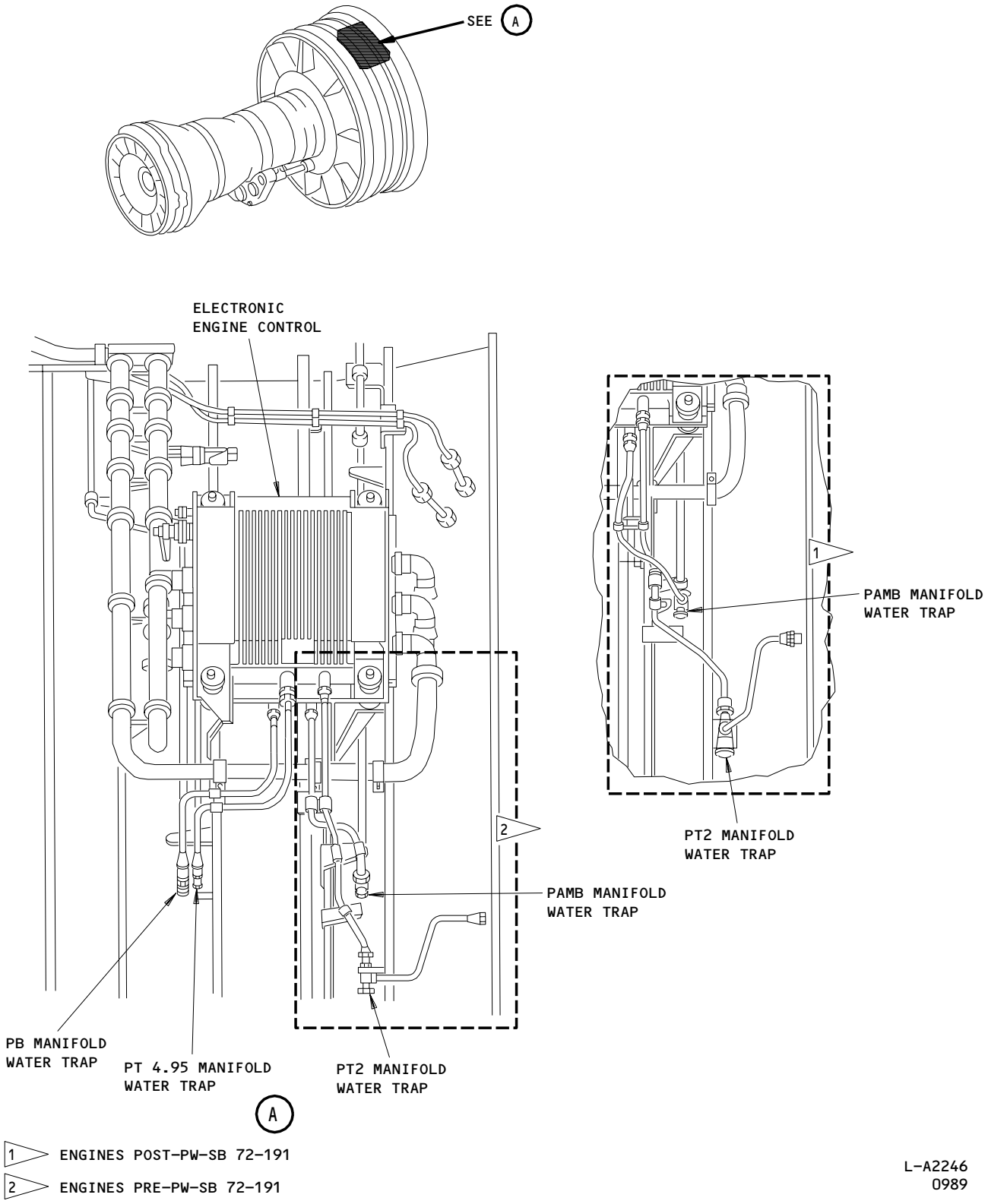
2. Remove the Water from the Water Traps on the EEC Manifolds
   A. Equipment
      (1) M303, M305, or M307 Bergen Mechanical Crimper
          Bergen Cable Technologies Inc
          170 Gregg St
          P.O. Box 1300
          Lodi, NJ 07644-9982
   B. Consumable Materials
      (1) G02334 Lockwire - AS3214-02
      (2) G02332 Ferrule - P05-292 (Optional)
      (3) G02335 Cable - Safety - P05-291 (Optional)
      (4) B00130 Alcohol - Isopropyl (PMC 9094) - P11-014
   C. References
      (1) AMM 71-11-04/201, Fan Cowl Panels
   D. Access
      (1) Location Zones
          411 Left Engine
          421 Right Engine

      (2) Access Panels
          414AL Fan Cowl Panel (Right), Left Engine
          424AL Fan Cowl Panel (Right), Right Engine

   E. Prepare to Remove the Water from the EEC Water Traps

      S 016-002-N00
      (1) Open the fan cowl panel on the right side of the engine (AMM 71-11-04/201).
   F. Procedure

      S 216-003-N00
      (1) Remove the water from the water trap of the EEC PB manifold.
          (a) Remove lockwire and water trap.



EEC Pressure Manifold Water Trap Check
Figure 601

(b) Make an inspection of the water trap as follows:
1) Remove any water from the water trap.
2) Clean the water trap.
3) Clean the vent hole in the condensation trap of any obstruction.
a) Use a 0.010 - 0.015 inch diameter steel wire.
b) Clean the side walls of the trap with a rough cylindrical bristle brush (with strong fibers such as natural, nylon, polyester or tampico) that will not scratch the trap interior.

NOTE: Do not use ferrous material type brushes. Use a stainless steel brush only.

c) Clean the bottom of the trap with a stainless steel brush (such as Dremmwl #532) and Isopropyl Alcohol or equivalent.
d) Check the inside of the trap and the bleed hole to make sure it is free of loose material, fluid, soot, or scale deposites. A 0.010 - 0.015 inch (0.254 - 0.381 mm) diameter steel wire or drill bit must be able to easily pass through the bleed hole without collecting or dislodging debris. Do this procedure again, as necessary.
e) Rinse the trap with water and blow compressed air through the trap and the vent hole to remove any unwanted material.

NOTE: Use clean, dry, low pressure shop air.
f) Do a visual inspection of the trap to make sure there are no obstructions or blockages. A 10X magnifying glass with a light can be used to help in the inspection. If you can see through the hole, the trap can be considered clean and can be re-installed.
g) If cleaning does not remove the unwanted material or blockage, replace the condensation trap.

CAUTION: DO NOT USE LUBRICANTS WHEN YOU INSTALL THE CAP ON THE EEC MANIFOLD. DAMAGE TO THE EEC BY CONTAMINATION CAN OCCUR.

(c) Install the water trap to the tee on the manifold.
1) Tighten the water trap nut to 270-300 pound-inches (30.5-33.9 newton-meters).
2) Safety the nut with lockwire or safety cable and safety cable ferrule.

S 216-004-N00
(2) Remove the water from the water trap of the PT 4.95 manifold.
(a) Remove lockwire and cap.
(b) Make an inspection of the water trap as follows:
1) Remove any water from the water trap.

2) Clean the water trap.
3) Clean the vent hole in the condensation trap of any obstruction.
   a) Use a 0.010 - 0.015 inch diameter steel wire.
   b) Clean the side walls of the trap with a rough cylindrical bristle brush (with strong fibers such as natural, nylon, polyester or tampico) that will not scratch the trap interior.

      NOTE: Do not use ferrous material type brushes. Use a stainless steel brush only.

   c) Clean the bottom of the trap with a stainless steel brush (such as Dremmwl #532) and Isopropyl Alcohol or equivalent.
   d) Check the inside of the trap and the bleed hole to make sure it is free of loose material, fluid, soot, or scale deposites. A 0.010 - 0.015 inch (0.254 - 0.381 mm) diameter steel wire or drill bit must be able to easily pass through the bleed hole without collecting or dislodging debris. Do this procedure again, as necessary.
   e) Do a visual inspection of the trap to make sure there are no obstructions or blockages. A 10X magnifying glass with a light can be used to help in the inspection. If you can see through the hole, the trap can be considered clean and can be re-installed.
   f) If cleaning does not remove the unwanted material or blockage, replace the condensation trap.

CAUTION: DO NOT USE LUBRICANTS WHEN YOU INSTALL THE CAP ON THE EEC MANIFOLD. DAMAGE TO THE EEC BY CONTAMINATION COULD OCCUR.

(c) Install the cap to the tee on the manifold.
   1) Tighten the cap to 270-300 pound-inches (30.5-33.9 newton-meters).
   2) Safety the cap with lockwire or safety cable and safety cable ferrule.

S 216-005-N00

(3) Remove the water from the water trap of the PAMB Manifold.
   (a) Remove lockwire and cap.
   (b) Make an inspection of the water trap as follows:
      1) Remove any water from the water trap.
      2) Clean the water trap.

3) Clean the vent hole in the condensation trap of any obstruction.
   a) Use a 0.010 - 0.015 inch diameter steel wire.
   b) Clean the side walls of the trap with a rough cylindrical bristle brush (with strong fibers such as natural, nylon, polyester or tampico) that will not scratch the trap interior.

      NOTE: Do not use ferrous material type brushes. Use a stainless steel brush only.

   c) Clean the bottom of the trap with a stainless steel brush (such as Dremmwl #532) and Isopropyl Alcohol or equivalent.
   d) Check the inside of the trap and the bleed hole to make sure it is free of loose material, fluid, soot, or scale deposites. A 0.010 - 0.015 inch (0.254 - 0.381 mm) diameter steel wire or drill bit must be able to easily pass through the bleed hole without collecting or dislodging debris. Do this procedure again, as necessary.
   e) Do a visual inspection of the trap to make sure there are no obstructions or blockages. A 10X magnifying glass with a light can be used to help in the inspection. If you can see through the hole, the trap can be considered clean and can be re-installed.
   f) If cleaning does not remove the unwanted material or blockage, replace the condensation trap.

CAUTION: DO NOT USE LUBRICANTS WHEN YOU INSTALL THE CAP ON THE EEC MANIFOLD. DAMAGE TO THE EEC BY CONTAMINATION COULD OCCUR.

(c) Install the cap to the tee on the manifold.
   1) Tighten the cap to 270-300 pound-inches (30.5-33.9 newton-meters).

2) Safety the cap with lockwire or safety cable and safety cable ferrule.

S 216-006-N00

(4) Remove the water from the water trap of the PT2 manifold.
(a) Remove lockwire and cap.
(b) Make an inspection of the water trap as follows:
1) Remove any water from the water trap.
2) Clean the water trap.
3) Clean the vent hole in the condensation trap of any obstruction.
a) Use a 0.010 - 0.015 inch diameter steel wire.
b) Clean the side walls of the trap with a rough cylindrical bristle brush (with strong fibers such as natural, nylon, polyester or tampico) that will not scratch the trap interior.

NOTE: Do not use ferrous material type brushes. Use a stainless steel brush only.

c) Clean the bottom of the trap with a stainless steel brush (such as Dremmwl #532) and Isopropyl Alcohol or equivalent.
d) Check the inside of the trap and the bleed hole to make sure it is free of loose material, fluid, soot, or scale deposites. A 0.010 - 0.015 inch (0.254 - 0.381 mm) diameter steel wire or drill bit must be able to easily pass through the bleed hole without collecting or dislodging debris. Do this procedure again, as necessary.
e) Do a visual inspection of the trap to make sure there are no obstructions or blockages. A 10X magnifying glass with a light can be used to help in the inspection. If you can see through the hole, the trap can be considered clean and can be re-installed.

f) If cleaning does not remove the unwanted material or blockage, replace the condensation trap.

CAUTION: DO NOT USE LUBRICANTS WHEN YOU INSTALL THE CAP ON THE EEC MANIFOLD. DAMAGE TO THE EEC BY CONTAMINATION COULD OCCUR.

(c) Install the cap to the tee on the manifold.
1) Tighten the cap to 270-300 pound-inches (30.5-33.9 newton-meters).
2) Safety the cap with lockwire or safety cable and safety cable ferrule.

G. Return the Aircraft to Its Usual Condition

S 416-007-N00

(1) Close the fan cowl panel on the right side of the engine (AMM 71-11-04/201).

EEC ALTERNATOR - REMOVAL/INSTALLATION

1. General
   A. This procedure removes and installs the EEC alternator (N2 Transducer) stator and rotor.
   B. The EEC alternator rotor and stator have different removal/installation procedures. You must remove the starter to get access to the EEC alternator. You must remove the stator to get access to the rotor.
   C. The EEC alternator is installed on the aft face of the main gearbox at the 6 o'clock position.
   D. You can get access to the EEC alternator through the thrust reverser halves.

TASK 73-21-05-004-001-N00

2. Remove the EEC Alternator Stator
   A. Equipment
      (1) Torque Adapter PWA 85749 (Optional)
   B. References
      (1) AMM 71-11-04/201, Fan Cowl Panels
      (2) AMM 71-11-06/201, Core Cowl Panels
      (3) AMM 78-31-00/201, Thrust Reverser System
      (4) AMM 80-11-01/401, Pneumatic Starter
   C. Access
      (1) Location Zones
          415 L Power Plant Fan Reverser
          416 L Power Plant Fan Reverser
          425 R Power Plant Fan Reverser
          426 R Power Plant Fan Reverser

      (2) Access Panels
          415AL Fan Reverser (Left)
          416AR Fan Reverser (Right)
          425AL Fan Reverser (Left)
          426AR Fan Reverser (Right)

   D. Prepare to Remove the EEC Alternator Stator

      S 864-002-N00
      (1) Open these circuit breakers on the overhead circuit breaker panel, P11, and attach the DO-NOT-CLOSE tags:
          (a) 11D7, ENGINE STBY IGN 1

(b) 11D8, ENGINE STBY IGN 2

S 864-003-N00

(2) For the left engine, open these circuit breakers on the overhead circuit breaker panel, P11, and attach the DO-NOT-CLOSE tags:
(a) 11M1, L IGN 1
(b) 11M9, LEFT ENGINES BUS PWR SENSE
(c) 11M28, L IGN 2

S 864-004-N00

(3) For the right engine, open these circuit breakers on the overhead circuit breaker panel, P11, and attach the DO-NOT-CLOSE tags:
(a) 11M2, R IGN 1
(b) 11M29, R IGN 2
(c) 11M36, RIGHT ENGINE BUS PWR SENSE

S 044-006-N00

WARNING: DO THE THRUST REVERSER DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(4) Do the deactivation procedure for the thrust reverser for ground maintenance (AMM 71-11-04/201).

S 014-086-N00

(5) Open the fan cowl panels (AMM 71-11-04/201).

S 014-007-N00

(6) Open the core cowl panels (AMM 71-11-06/201).

S 014-008-N00

WARNING: OBEY THE INSTRUCTIONS IN THE PROCEDURE TO OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(7) Open the thrust reversers (AMM 78-31-00/201).

SAS E. Remove the EEC Alternator Stator (Fig. 401 and 402)
SAS
SAS NOTE: For EEC Alternator Rotor Replacement on-wing, the preferred
SAS method is to replace the complete EEC Alternator Drive Gearshaft
SAS and Bearing Assembly according to 72-61- 14. The instructions
SAS below may be used as an alternate method.
SAS

S 034-009-N00

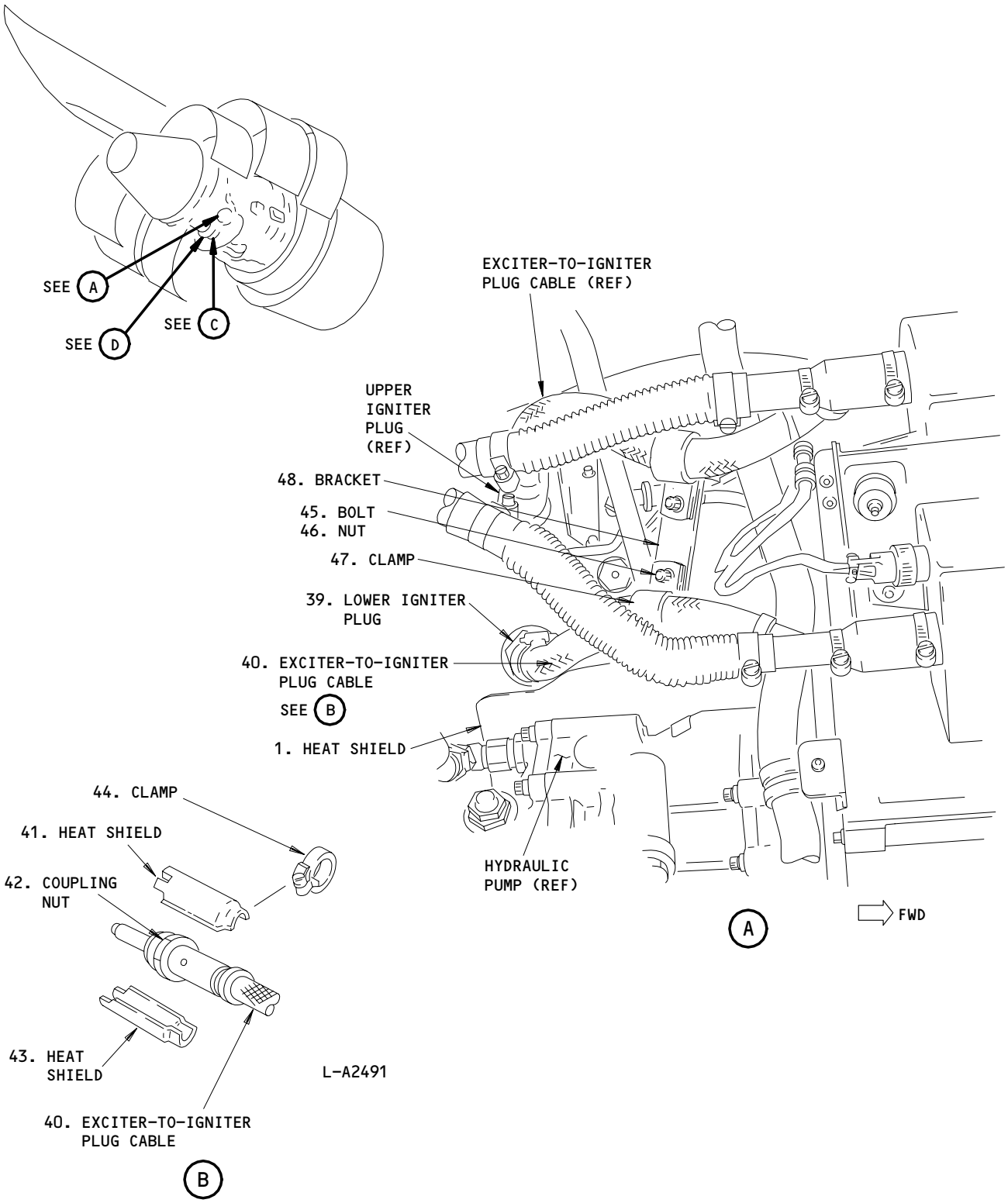
(1) Remove the Pneumatic Starter (AMM 80-11-01/401).

S 014-083-N00

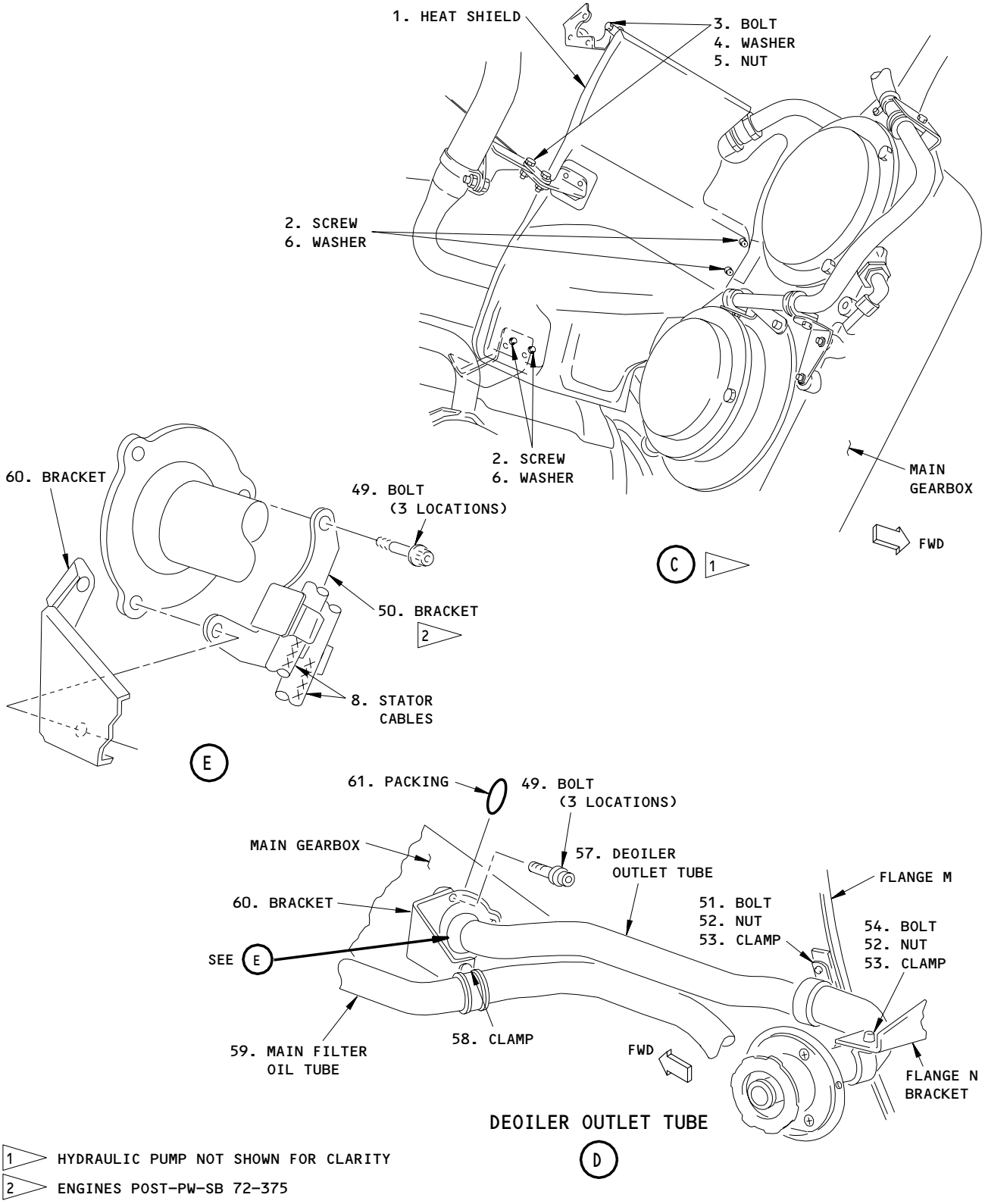
(2) If necessary, to get easier access to the EEC alternator stator (12), remove the deoiler outlet tube (57) as follows:
   (a) Remove the three bolts (49) which attach the deoiler outlet tube (57) to the rear of the main gearbox.
   (b) ENGINES POST-PW-SB 72-375;
   Do the steps that follow:
      1) Disconnect the stator cables (8) from the clips in the bracket (50) that is attached to the flange of the deoiler outlet tube (57).
      2) Remove the bracket (50) from the flange of the tube (57).
   (c) Remove the bolts (51, 54), nuts (52), and clamps (53) which attach the deoiler outlet tube (57) to the M and N flanges.
   (d) Loosen the clamp (58) which attaches the main filter oil tube (59) to the front flange of the deoiler outlet tube (57).
   (e) Move the bracket (60) away from the flange of the deoiler outlet tube (57).
   (f) Remove the deoiler outlet tube (57).
   (g) Remove and discard the packing (61).
   (h) Install protection caps on the ends of the deoiler outlet tubes (57).

S 034-010-N00

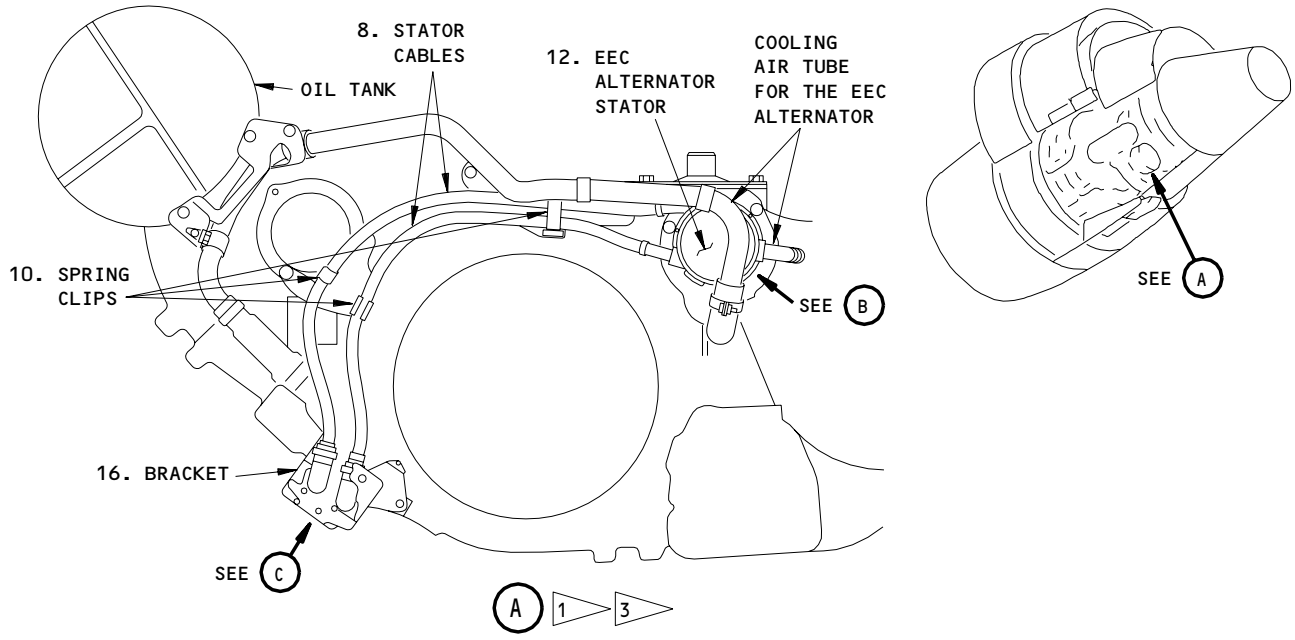
(3) If it is necessary, to get easier access to the EEC alternator stator (12), remove the exciter-to-igniter as follows:
   (a) Remove the nut (46) that attaches to the bolt (45).

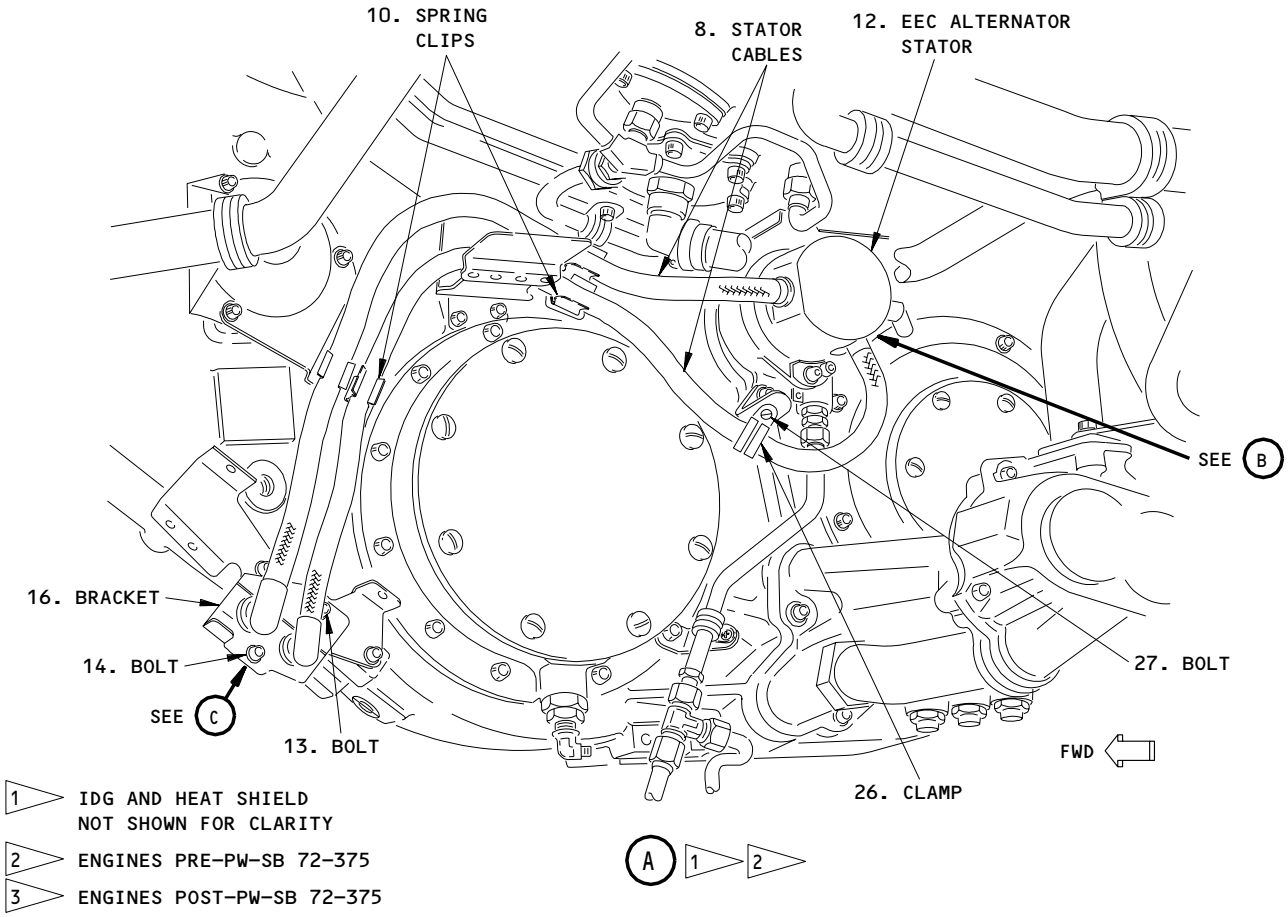


EEC Igniter Plug and Heat Shield Installation
Figure 401 (Sheet 1)

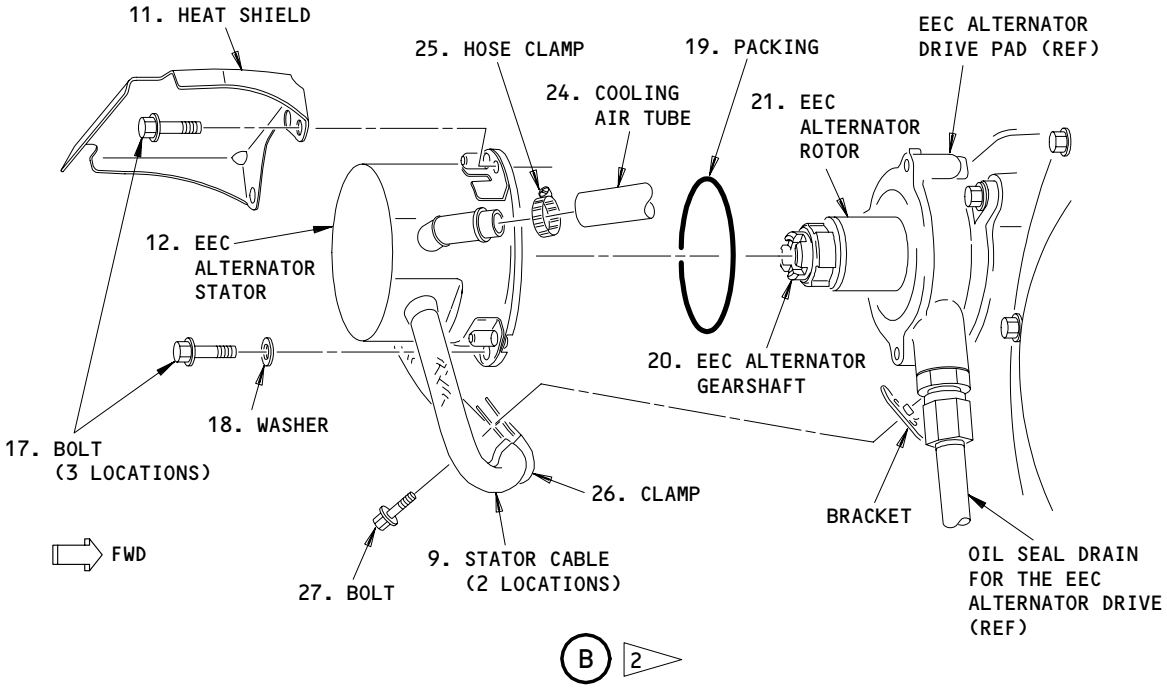


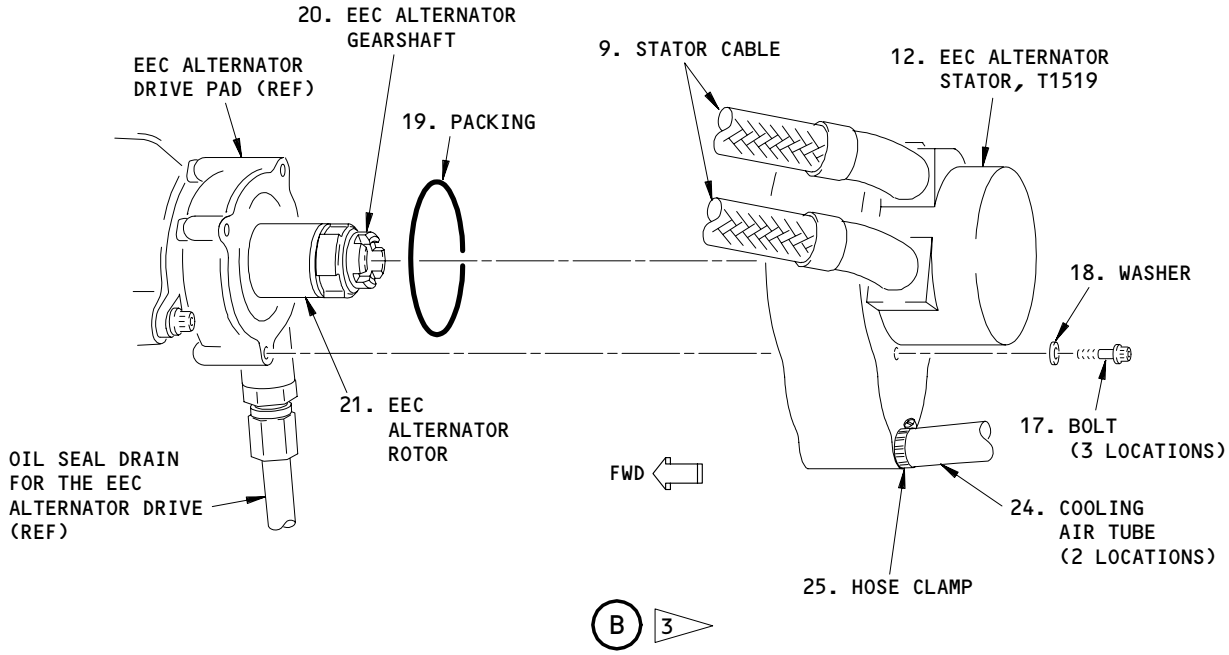
EEC Igniter Plug and Heat Shield Installation
Figure 401 (Sheet 2)



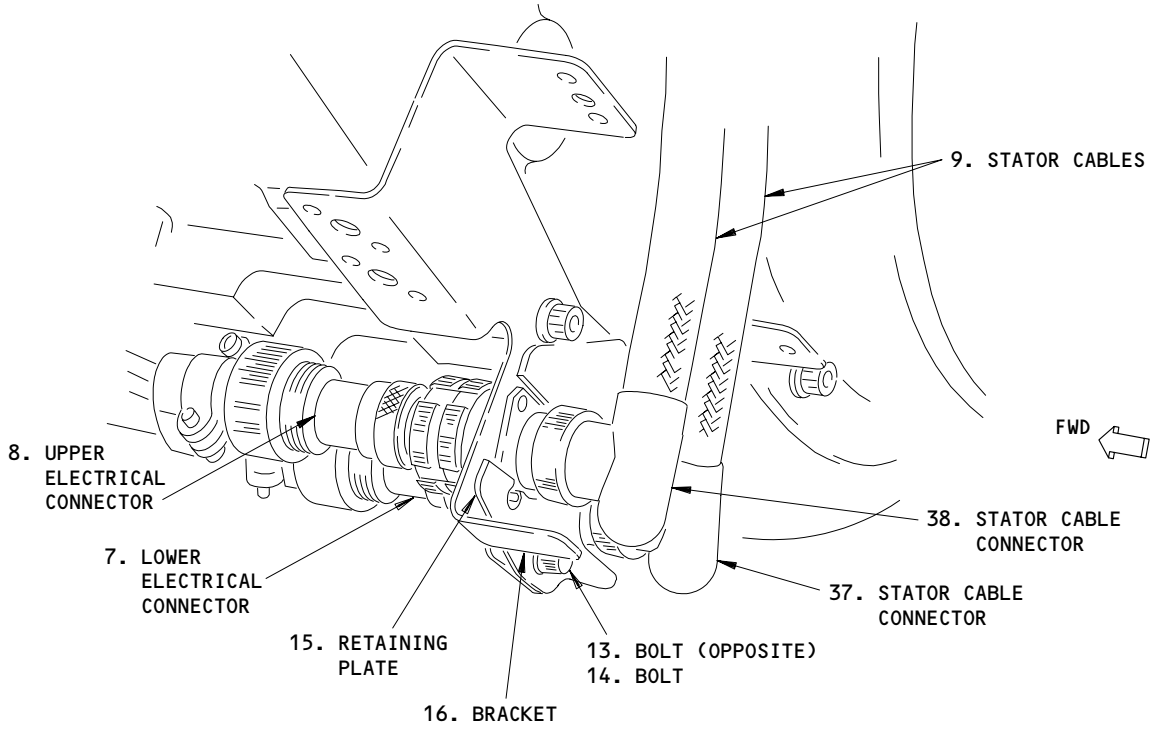


EEC Alternator (N2 Transducer) Stator Installation
Figure 402 (Sheet 1)





EEC Alternator (N2 Transducer) Stator Installation
Figure 402 (Sheet 2)



C

EEC Alternator (N2 Transducer) Stator Installation
Figure 402 (Sheet 3)

(b) Remove the bolt (45) that attaches to the cable (40).
(c) Remove the clamp (47) that attaches to the bracket (48).

S 034-011-N00

WARNING: MAKE SURE THE ELECTRICAL POWER IS REMOVED FROM THE SYSTEM FOR 3 MINUTES BEFORE YOU REMOVE THE CABLE. GROUND THE CABLE TERMINALS AGAINST THE IGNITER PLUG HOUSING AFTER YOU DISCONNECT THE CABLE. MAKE SURE THAT THE IGNITION EXCITER IS FREE FROM ELECTRICAL POWER BEFORE YOU REMOVE THE CABLE. ELECTRICAL POWER TO THE IGNITION SYSTEM IS AT A VERY HIGH VOLTAGE AND CAN CAUSE BAD INJURY TO PERSONS.

(4) Disconnect the cable (40) from the lower igniter plug (39).
(a) Loosen the clamp (44) which attaches the heat shields (41, 43) on the cable (40).
(b) Remove the heat shields (41, 43).
(c) Disconnect the coupling nut (42) which attaches the cable (40) to the igniter plug (39).
(d) Ground the cable (40) against the igniter plug boss.
(e) Attach the end of the cable (40) away from the igniter plug (39).

S 034-012-N00
(5) Remove the screws (2, 6) and bolt (3) from the heat shield (1).

S 034-013-N00
(6) Remove the heat shield (1) from the engine.

S 034-014-N00
(7) Disconnect the electrical connectors (7, 8) from the cables (9) of the EEC alternator stator at the bracket (16) on the lower left side of the gearbox.

NOTE: You can use the PWA 85749 torque adapter to disconnect the electrical connectors.

(a) Install the protection caps to the electrical connectors.

S 034-015-N00
(8) Remove the bolts (13, 14) which attach the stator cable connectors (37, 38) and the retaining plate (15) to the bracket (16).

S 034-016-N00
(9) Remove the retaining plate (15).

S 034-070-N00
(10) Remove the cables (9) from the spring clips (10) on the rear face of the gearbox.

S 034-017-N00

(11) Loosen the hose clamp (25) for the cooling air tube (24) located on the right side of the stator (12).

S 034-018-N00

(12) Disconnect this cooling air tube (24) from the EEC alternator stator (12).

S 034-071-N00

(13) ENGINES POST-PW-SB 72-375;
Do these steps:
(a) Loosen the hose clamp (25) for the cooling air tube (24) located at the bottom of the stator (12).
(b) Remove the bolts and/or nuts from the clamps that attach the cooling air tube to the brackets on the gearbox, oil tank, and diffuser case.
(c) Move the tube away from the EEC alternator.

NOTE: The clamps can stay with the tube.

(d) Remove the bolts (17) and washers (18) which attach the stator (12) to the EEC alternator drive pad.
(e) Remove the stator (12) from the gearbox.
1) Discard the packing (19).

S 034-072-N00

(14) ENGINES PRE-PW-SB 72-375;
Do these steps:
(a) Remove the clamp (26) and bolt (27) from the cable (9).
(b) Remove the bolts (17) which attach the EEC alternator stator (12) and the heat shield (11) to the gearbox.
(c) Remove the EEC alternator stator (12) and the heat shield (11) from the gearbox.
1) Discard the packing (19).

S 034-073-N00

(15) Install the protection caps on the EEC alternator drive pad and the open end of the stator.

TASK 73-21-05-004-023-N00

3. Remove the EEC Alternator Rotor

A. Equipment
(1) PWA 85238 - Wrench holder (engines PRE-PW-SB 72-375), Pratt & Whitney
(2) PWA 86603 - Adapter, Wrench (engines POST-PW-SB 72-375), Pratt & Whitney
(3) PWA 85931 - Puller (engines PRE-PW-SB 72-375), Pratt & Whitney
(4) PWA 86551 - Puller (engines POST-PW-SB 72-375), Pratt & Whitney

B. Access

(1) Location Zones

415 L Power Plant Fan Reverser
416 L Power Plant Fan Reverser
425 R Power Plant Fan Reverser
426 R Power Plant Fan Reverser

(2) Access Panels

415AL Fan Reverser (Left)
416AR Fan Reverser (Right)
425AL Fan Reverser (Left)
426AR Fan Reverser (Right)

C. Remove the EEC Alternator Rotor (Fig. 403)

S 034-024-N00

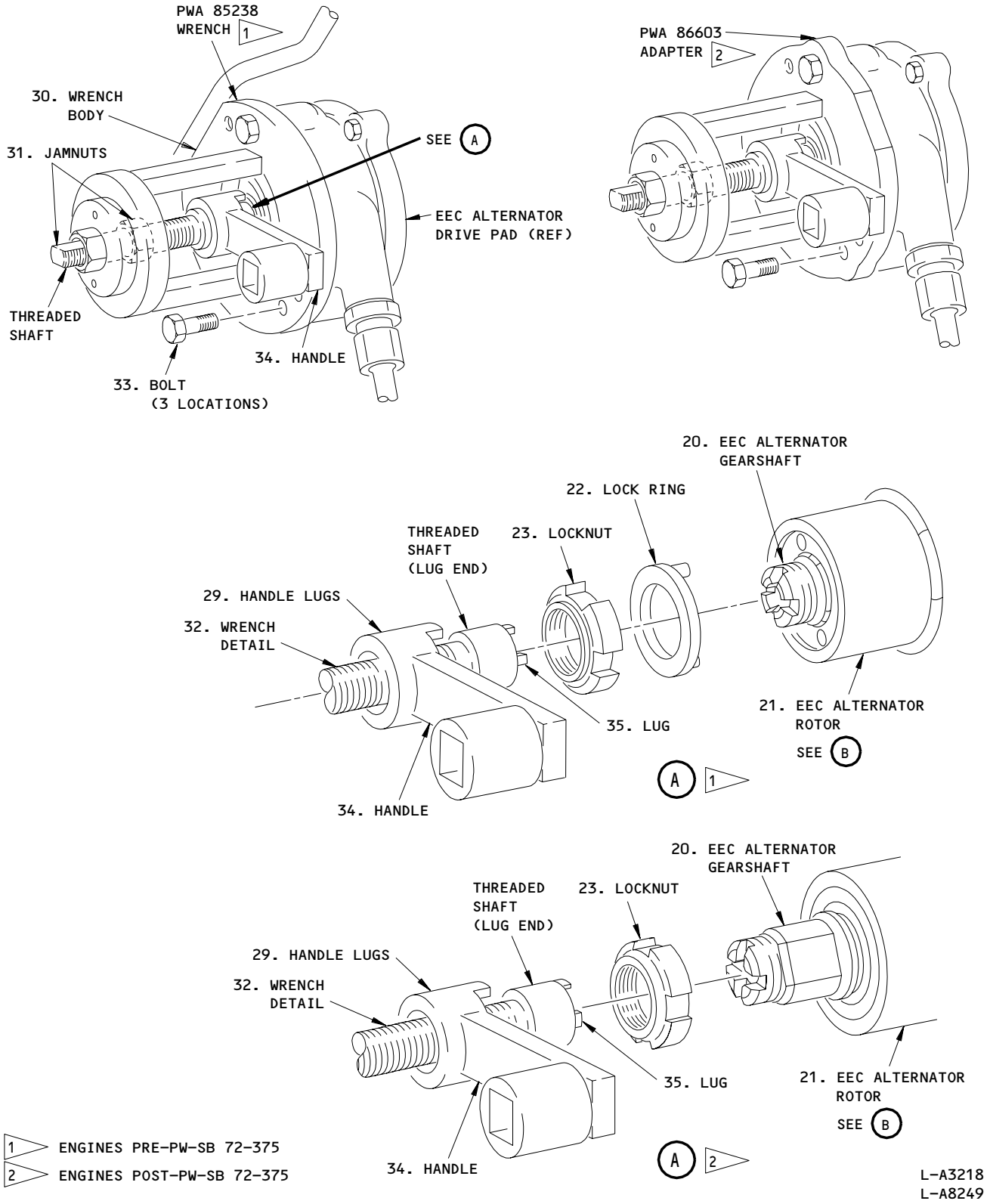
(1) Do the task to remove the EEC Alternator Stator.

S 034-025-N00

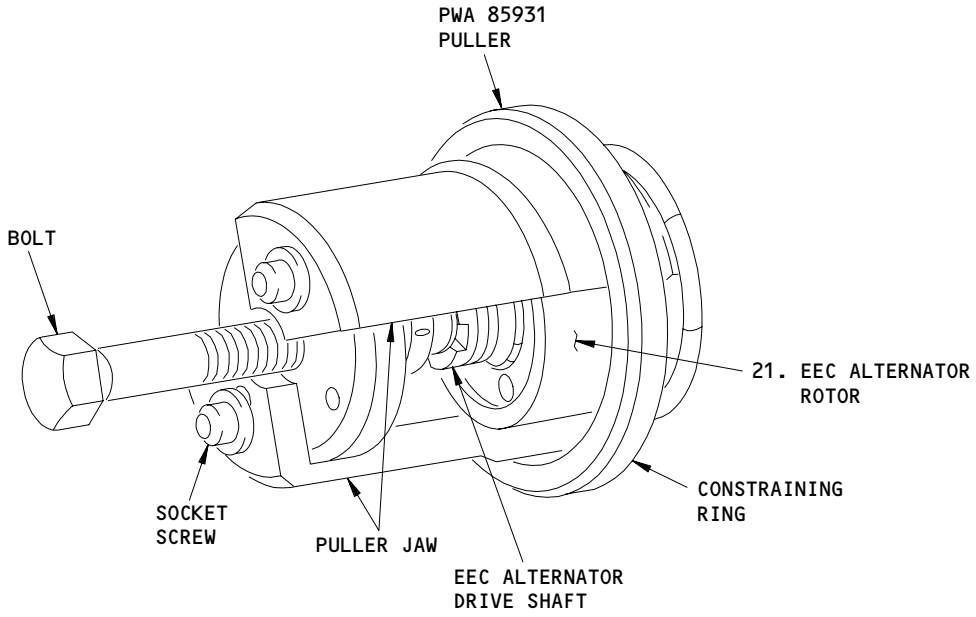
(2) Use the PWA 85238 wrench holder or PWA 86603 wrench adapter (30) to loosen the rotor locknut (23) with the steps that follow:

NOTE: The following steps refer to the PWA 85238 wrench holder or the PWA 86603 wrench adapter. The wrench holder is for engines without PW SB 72-375 and the wrench adapter is for engines with PW SB 72-375. "PWA wrench" is used to describe both types in this procedure.

(a) Loosen the jamnuts (31).
(b) Retract the wrench detail (32) from the body of the wrench (30).
(c) Install the handle (34) above the mating lug of the wrench detail (32).
1) Make sure the lug end of the handle (34) points out.
(d) Put the body of the wrench (30) above the gear shaft (20) and on the housing pad of the gear shaft.
1) Align the bolt holes.

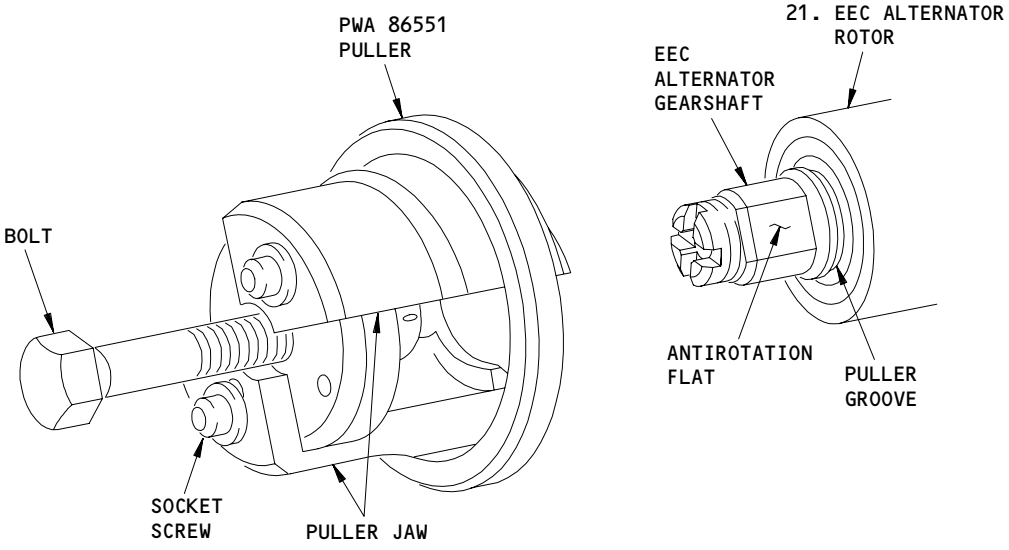


EEC Alternator (N2 Transducer) Rotor Installation
Figure 403 (Sheet 1)



PWA 85931 PULLER

B 1



PWA 86551 PULLER

B 2

L-A3218
L-A8250

EEC Alternator (N2 Transducer) Rotor Installation
Figure 403 (Sheet 2)

(e) Engage the lugs (35) of the wrench detail (32) with the mating slots in the gear shaft (20).
(f) Attach the body of the wrench (30) with the bolts (33) which are included with the PWA wrench.
(g) Install the wrench detail (32) tightly on the gear shaft (20) with the jamnuts (31).
(h) Engage the lugs (29) of the handle with the mating lugs on the nut (23).
(i) Turn the handle (34) to loosen the nut (23).

NOTE: You must do this in many steps because you cannot move the handle too much. You must remove the handle and install it on the nut again.

(j) Remove the bolts (33) which attach the wrench (30) to the gearbox.
(k) Remove the wrench (30).

S 024-026-N00

(3) Remove the locknut (23) which attaches the EEC alternator rotor (21) to the gear shaft (20).

S 034-027-N00

(4) ENGINES PRE-PW-SB 72-375;
Remove the lock ring (22) from the gear shaft (20).

S 494-074-N00

(5) Install the PWA puller with the steps that follow:
(a) Retract the hexagon head bolt on the rotor puller.
(b) Loosen the two socket head screws.
(c) ENGINES PRE-PW-SB 72-375;
Put the two puller jaws on the rotor (3).
(d) ENGINES POST-PW-SB 72-375;
Put the two puller jaws in the puller groove on the rotor (3).
(e) Push the constraining ring on and against the puller jaws shoulder.
(f) Tighten the two socket head screws.

S 024-075-N00

(6) Tighten the hexagon head bolt until the rotor comes away from the drive shaft.

NOTE: The puller and rotor can turn when you tighten the hexagon head bolt. If you hold a rod or a punch in one of the holes in the puller jaws while the bolt is tightened, the rotor will not turn.

S 024-076-N00

(7) Remove the rotor (3) and puller from the drive shaft.

S 024-077-N00

(8) Remove the rotor (3) from the puller with the steps that follow:
(a) Loosen the hexagon head bolt.
(b) Loosen the two socket head screws.
(c) Pull the constraining ring from the puller jaws shoulder.
(d) Remove the rotor (3) from the puller.

S 034-029-N00

(9) Install the protection cover on the EEC alternator drive pad.

TASK 73-21-05-404-030-N00

4. Install the EEC Alternator Rotor

A. Equipment
(1) PWA 85238 - Wrench holder (engines without PW SB 72-375)
(2) PWA 86603 - Adapter, wrench (engines with PW SB 72-375)

B. Consumable Materials
(1) D00137 Engine Oil - PWA 521

C. Parts

AMM		NOMENCLATURE	AIPC		
FIG	ITEM		SUBJECT	FIG	ITEM
403	21	Rotor - Permanent Magnet Altntr (EEC Alternator Rotor)	73-21-05	15	35

D. References
(1) AMM 70-50-00/201, Standard Torque Values

E. Access
(1) Location Zones
415 L Power Plant Fan Reverser
416 L Power Plant Fan Reverser
425 R Power Plant Fan Reverser
426 R Power Plant Fan Reverser

(2) Access Panels
415AL Fan Reverser (Left)
416AR Fan Reverser (Right)
425AL Fan Reverser (Left)
426AR Fan Reverser (Right)

F. Install the EEC Alternator Rotor (Fig. 403)

S 434-031-N00

(1) Remove the protection covers.

S 424-085-N00

CAUTION: DO NOT USE INDUCTION HEATING TO ASSEMBLE THE ROTOR ASSEMBLY FOR THE EEC ALTERNATOR. INDUCTION HEATING CAN DAMAGE THE MAGNETIC MATERIAL IN THE ROTOR.

(2) Install the EEC alternator rotor (21) on the gear shaft (20).
  (a) Make sure the EEC alternator rotor (21) is fully against the gear shaft (20).

S 434-033-N00
(3) ENGINES PRE-PW-SB 72-375;
Install the lock ring (22) on the gear shaft (20) as follows:
  (a) Align the ID flats on the lock ring (22) with the flats on the gear shaft (20).
  (b) Engage the pins on the lock ring (22) with the holes in the EEC alternator rotor (21).

S 644-035-N00
(4) Lubricate the threads of the locknut with engine oil.

S 434-078-N00
(5) Install the nut (23) on the drive shaft.

S 484-087-N00
(6) Install the PWA 85238 wrench holder or PWA 86603 wrench adapter.

NOTE: The following steps refer to the PWA 85238 wrench holder or the PWA 86603 wrench adapter. The wrench is for engines PRE-PW-SB 72-375 and the adapter is for engines POST-PW-SB 72-375. "PWA wrench" is used to describe both types in this procedure.

S 434-036-N00
(7) Use the PWA wrench to tighten the locknut (23) with the steps that follow:

NOTE: When you use the PWA wrench, the torque wrench value is less than the torque which is necessary (AMM 70-50-00/201).

  (a) Loosen the jamnuts (31).
  (b) Retract the wrench detail (32) from the body of the PWA wrench (30).
  (c) Install the handle (34) above the mating lug (35) of the wrench detail (32).
    1) Make sure the lug end of the handle (34) points out.

(d) Put the body of the PWA wrench (30) above the gear shaft (20) and on the housing pad for the gear shaft.
1) Make sure you align the bolt holes.
(e) Engage the lugs (35) of the wrench detail (32) with the mating slots in the gear shaft (20).
(f) Attach the body of the wrench (30) with the bolts (33) which are included with the PWA wrench assembly.
(g) Install the wrench detail (32) tightly on the gear shaft (20).
(h) Attach the wrench detail (32) with the jamnuts (31).
(i) Engage the lugs of the handle for the PWA wrench with the mating lugs on the locknut to tighten the nut.

CAUTION: WHEN YOU USE THE PWA WRENCH, YOU MUST ADJUST THE TORQUE WRENCH VALUE. IF YOU DO NOT ADJUST THE TORQUE WRENCH VALUE, YOU WILL USE AN INCORRECT TORQUE WHICH CAN CAUSE DAMAGE TO THE THREADS OF THE NUT.

(j) Adjust the torque wrench value as necessary (AMM 70-50-00/201).
(k) Tighten the locknut (23) to 675-800 pound-inches (76.265-90.388 newton-meters).

NOTE: You must do this in many steps because the handle cannot move too much. You must remove the handle from the nut and install it to the nut again.

(l) Loosen the locknut (23) to 0 torque.
(m) Tighten the locknut (23) to 675-800 pound-inch (76.3-90.4 newton-meters).

S 094-067-N00
(8) Remove the bolts which attach the PWA wrench to the drive pad.

S 094-066-N00
(9) Remove the PWA wrench.

S 434-037-N00
(10) Do the task which follows to install the EEC alternator stator.

TASK 73-21-05-404-038-N00

5. Install the EEC Alternator Stator

A. Equipment
(1) Torque Adapter PWA 85749 (Optional)
B. Consumable Materials
(1) D00137 Engine Oil - PWA 521
(2) D00504 Petrolatum - PMC-9609
(3) D50124 Anti-seize paste - PWA 36246
(4) D00333 Antiseize Compound - PMC 9523, Molykote, Type Z
C. Parts

AMM		NOMENCLATURE	AIPC		
FIG	ITEM		SUBJECT	FIG	ITEM
401	61	Packing	79-23-00	20	35
402	12	Stator	73-21-05	15	25
	19	Packing			30

D. References
(1) AMM 70-24-05/201, Electrical Harnesses
(2) AMM 71-00-00/501, Power Plant
(3) AMM 71-11-04/201, Fan Cowl Panels
(4) AMM 71-11-06/201, Core Cowl Panels
(5) AMM 78-31-00/201, Thrust Reverser System
(6) AMM 80-11-01/401, Pneumatic Starter

E. Access
(1) Location Zones
415 L Power Plant Fan Reverser
416 L Power Plant Fan Reverser
425 R Power Plant Fan Reverser
426 R Power Plant Fan Reverser

(2) Access Panels
415AL Fan Reverser (Left)
416AR Fan Reverser (Right)
425AL Fan Reverser (Left)
426AR Fan Reverser (Right)

F. Install the EEC Alternator Stator (Fig. 401 and 402)

S 434-039-N00
(1) Remove the protection covers.

S 644-040-N00
(2) Lubricate the new packing (19) with petrolatum.

S 434-041-N00
(3) Install the packing (19) on the EEC alternator stator (12).

S 824-042-N00
(4) Align the bolt holes in the EEC alternator stator (12) with the bolt holes on the gearbox.

S 424-043-N00
(5) Carefully install the EEC alternator stator (12) on the EEC alternator rotor (21).

S 644-044-N00
(6) Lubricate the threads of the bolts (17) with the anti-seize paste.

S 424-079-N00
(7) ENGINES PRE-PW-SB 72-375;
Do these steps:
(a) Put the heat shield (11) above the stator (12).
(b) Attach the stator (12) and the heat shield (11) to the EEC alternator drive pad with the bolts (17) and washers (18).
(c) Tighten the bolts (17) to 62-72 pound-inch (7.0-8.1 newton-meters).

S 424-080-N00
(8) ENGINES POST-PW-SB 72-375;
Do these steps:
(a) Attach the stator (12) to the EEC alternator drive pad with the bolts (17) and washers (18).
(b) Tighten the bolts (17) to 62-72 pound-inch (7.0-8.1 newton-meters).
(c) Use a 0.003 inch (0.076 mm) feeler guage to make sure the clearance between the EEC alternator (12) and the EEC Alternator Drive Pad is satisfactory.
1) If the feeler guage can go in the clearance, you must do a check of the torque of the bolts (17).
2) If the bolts are at the maximum torque and the EEC alternator stator (12) is not installed correctly, remove and install the stator (12) again.
3) Use the feeler guage again to make sure the clearance is satisfactory.

S 434-046-N00
(9) Install the cable connectors (37, 38) to the bracket (16) on the lower left side of the gearbox.
(a) While you make sure the spacers point to the bracket (16), install the retaining plate (15) on the flanges of the cable connectors (37, 38).

S 644-047-N00
(10) Lubricate the bolt (13) with the anti-seize paste and the bolt (14) with oil.

S 434-048-N00
(11) Attach the retaining plate (15) to the bracket (16) with the bolts (13, 14).
(a) Tighten the bolt (13) to 62-72 pound-inches (7.005-8.135 newton-meters).
(b) Tighten the bolt (14) to 36-40 pound-inches (4.067-4.519 newton-meters).

S 434-049-N00
(12) Attach the cables (9) to the spring clips (10).

S 434-068-N00
(13) Connect the air cooling tube (24) and the clamp (25) on the right side of the EEC alternator stator (12).

S 434-081-N00
(14) ENGINES PRE-PW-SB 72-375;
Do these steps:
(a) Lubricate the threads of the bolt (27) with oil.
(b) Install the clamp (26) to the lower cable.
(c) Attach the clamp (26) to the bracket below the EEC alternator stator (12) with the bolt (27).
(d) Tighten the bolt (27) to 36-40 pound-inches (4.067-4.519 newton-meters).

S 434-082-N00
(15) ENGINES POST-PW-SB 72-375;
Do these steps:
(a) Install the cooling air tube for the bottom of the EEC alternator to brackets on the gearbox, oil tank, and diffuser case.

(b) Lubricate the threads of the bolt with engine oil.
(c) Use the clamps that stayed with the tube and attach the tube to the brackets with the clamps, bolts, and/or nuts.
(d) Tighten the bolts to 36 to 40 pound-inch (4.1-4.5 newton-meters).

S 434-065-N00

CAUTION: USE THE CORRECT ASSEMBLY PROCEDURE, AND TOOLS, FOR THE HARNESS CONNECTOR INSTALLATION (AMM 70-24-05/201). IF YOU USE THE INCORRECT ASSEMBLY PROCEDURE, OR TOOLS, A DAMAGED OR LOOSE CONNECTOR CAN OCCUR. A LOOSE CONNECTOR PERMITS VIBRATION, WHICH CAUSES THE CONTACTS TO WEAR AND DECREASES THE LIGHTNING PROTECTION.

(16) Connect the harness connectors (7, 8) to the stator cable connectors (37, 38) (AMM 70-24-05/201).

NOTE: You can tighten the electrical connectors (7, 8) with the PWA 85749 torque adapter.

S 434-055-N00
(17) Connect the cable (40) for the exciter-to-igniter plug to the lower igniter plug (39).
(a) Tighten the nut to 140-160 pound-inches (15.8-18.1 newton-meters).

NOTE: If you do not sufficiently tighten the coupling nut, it can cause ignition noise which can cause an effect on the airplane radio equipment.

(b) Install the heat shield (41, 43) on the cable (40).
(c) Bend the tabs of the heat shields (41, 43) into the groove in the igniter plug boss of the heat shield, which is attached, with the clamp (44).
1) Tighten the clamp screw to 40-45 pound-inches (4.5-5.1 newton-meters).
(d) Attach the cable (40) of the exciter-to-igniter plug and clamp (47) to the bracket (48) with the bolt (45) and nut (46).
1) Tighten the bolt (45) to 36-40 pound-inches (4.067-4.519 newton-meters).

S 414-084-N00

(18) Install the deoiler outlet tube (57) as follows:

(a) Remove the protection caps from the ends of the deoiler outlet tube (57).

(b) Install a new packing (61), lubricated with engine oil, on the forward flange groove on the deoiler outlet tube (57).

(c) Put the deoiler outlet tube (57) on the doiler outlet port on the rear of the main gearbox.

(d) Put the brackets (50, 60) on the flange of the deoiler outlet tube (57).

(e) Install the three bolts (49), threads lubricated with engine oil, which attach the deoiler outlet tube (57) to the rear of the main gearbox.

1) Tighten the three bolts (49) with your hand.

(f) Install the bolts (51, 54), nuts (52), and clamps (53) which attach the deoiler outlet tube (57) to the M and N flanges.

1) Tighten the clamp bolts (51, 54) to 36-40 pound-inches (4.067-4.519 newton-meters).

(g) Tighten the three bolts (49), which attach the deoiler outlet tube (57) to the main gearbox, to 62-72 pound-inches (7.005-8.135 newton-meters).

(h) Tighten the clamp (58) which attaches the main filter oil tube (59) to the front flange of the deoiler outlet tube (57) to 36-40 pound-inches (4.067-4.519 newton-meters).

(i) Connect the stator cables (8) to the clips on the bracket (50) that is attached to the flange of the deoiler outlet tube (57).

S 434-056-N00

(19) Install the Pneumatic Starter (AMM 80-11-01/401).

G. Put the Airplane Back to Its Usual Condition

S 414-057-N00

WARNING: OBEY THE INSTRUCTIONS IN THE PROCEDURE TO CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Close the thrust reversers (AMM 78-31-00/201).

S 414-058-N00

(2) Close the core cowl panels (AMM 71-11-06/201).

S 414-059-N00

(3) Close the fan cowl panels (AMM 71-11-04/201).

S 414-060-N00

(4) Do the activation procedure for the thrust reversers (AMM 78-31-00/201).

S 864-061-N00
(5) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P11:
(a) 11D7, ENGINE STBY IGN 1
(b) 11D8, ENGINE STBY IGN 2

S 864-062-N00
(6) For the left engine, remove the DO-NOT-CLOSE tags and close these circuit breakers on the P11 panel:
(a) 11M1, L IGN 1
(b) 11M9, LEFT ENGINES BUS PWR SENSE
(c) 11M28, L IGN 2

S 864-063-N00
(7) For the right engine, remove the DO-NOT-CLOSE tags and close these circuit breakers on the P11 panel:
(a) 11M2, R IGN 1
(b) 11M29, R IGN 2
(c) 11M36, RIGHT ENGINE BUS PWR SENSE

S 714-064-N00
(8) Do the test of the EEC alternator that is shown in the Power Plant Test Reference Table (AMM 71-00-00/501).

EEC N1 SPEED TRANSDUCER - REMOVAL/INSTALLATION

1. General
   A. This procedure contains the data to remove and install the EEC N1 speed transducer. The EEC N1 speed transducer will be referred to as the speed transducer.
   B. For correct installation, the speed transducer must be installed two times. The first time is necessary to measure the distance between the installed speed transducer and the fan rotor. After this measurement is found, the speed transducer can be installed with the correct shim for the fan rotor distance.
   C. The speed transducer is found on the intermediate case of the engine below the right half of the thrust reverser.
   D. ALL SAS AIRCRAFT;
      The speed transducer supplies a N1 signal to the EEC. It also supplies the propulsion multiplexer with the station 2.5 temperature and pressure.

TASK 73-21-06-004-001-N00

2. Remove the EEC N1 Speed Transducer
   A. Equipment
      (1) ENGINES PRE-PW-SB 73-88;
          Puller (PWA 101359)
   B. References
      (1) AMM 71-00-00/501, Power Plant - General
      (2) AMM 71-11-04/201, Fan Cowl Panels
      (3) AMM 71-11-06/201, Core Cowl Panels
      (4) AMM 72-34-03/401, Fan Exit Liner Segments
      (5) AMM 78-31-00/201, Thrust Reverser System
   C. Access
      (1) Location Zones
          411 Left Engine
          421 Right Engine

      (2) Access Panels
          414AR Fan Cowl Panel (Right), Left Engine
          416AR Thrust Reverser (Right), Left Engine
          418AR Core Cowl Panel (Right), Left Engine
          424AR Fan Cowl Panel (Right), Right Engine
          426AR Thrust Reverser (Right), Right Engine
          428AR Core Cowl Panel (Right), Right Engine

   D. Prepare to Remove the Speed Transducer

      S 014-003-N00
      (1) Open the right fan cowl panel (AMM 71-11-04/201).

S 044-004-N00

WARNING: DO THE THRUST REVERSER DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(2) Do this procedure: Thrust Reverser Deactivation for Ground Maintenance (AMM 78-31-00/201).

S 014-005-N00

(3) Open the right core cowl panel (AMM 71-11-06/201).

S 014-006-N00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT COULD OCCUR.

(4) Open the right thrust reverser (AMM 78-31-00/201).

E. Procedure

S 014-007-N00

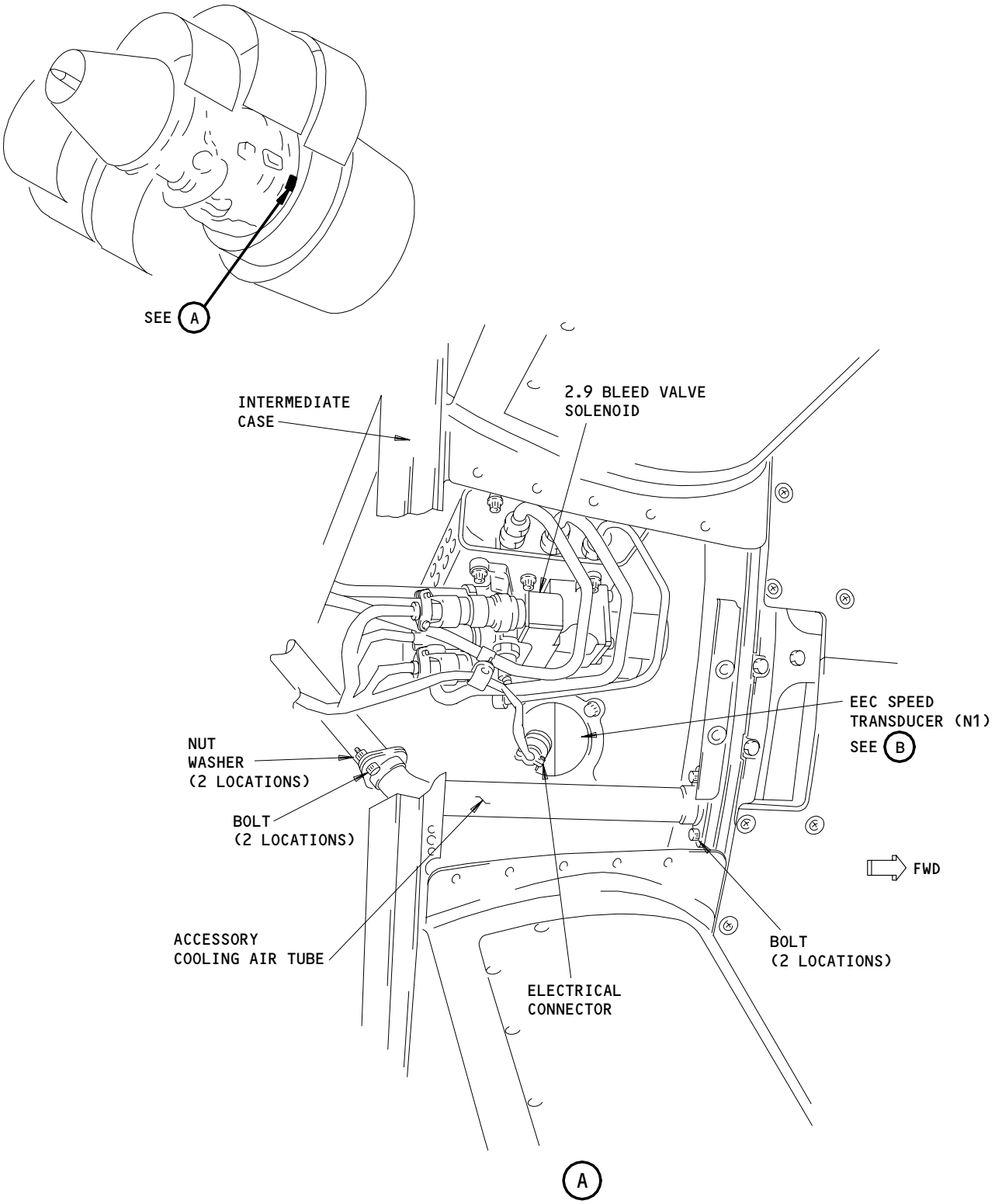
(1) Remove the inner liner from the fan exit case at approximately the 5 o'clock position (AMM 72-34-03/401).

S 014-062-N00

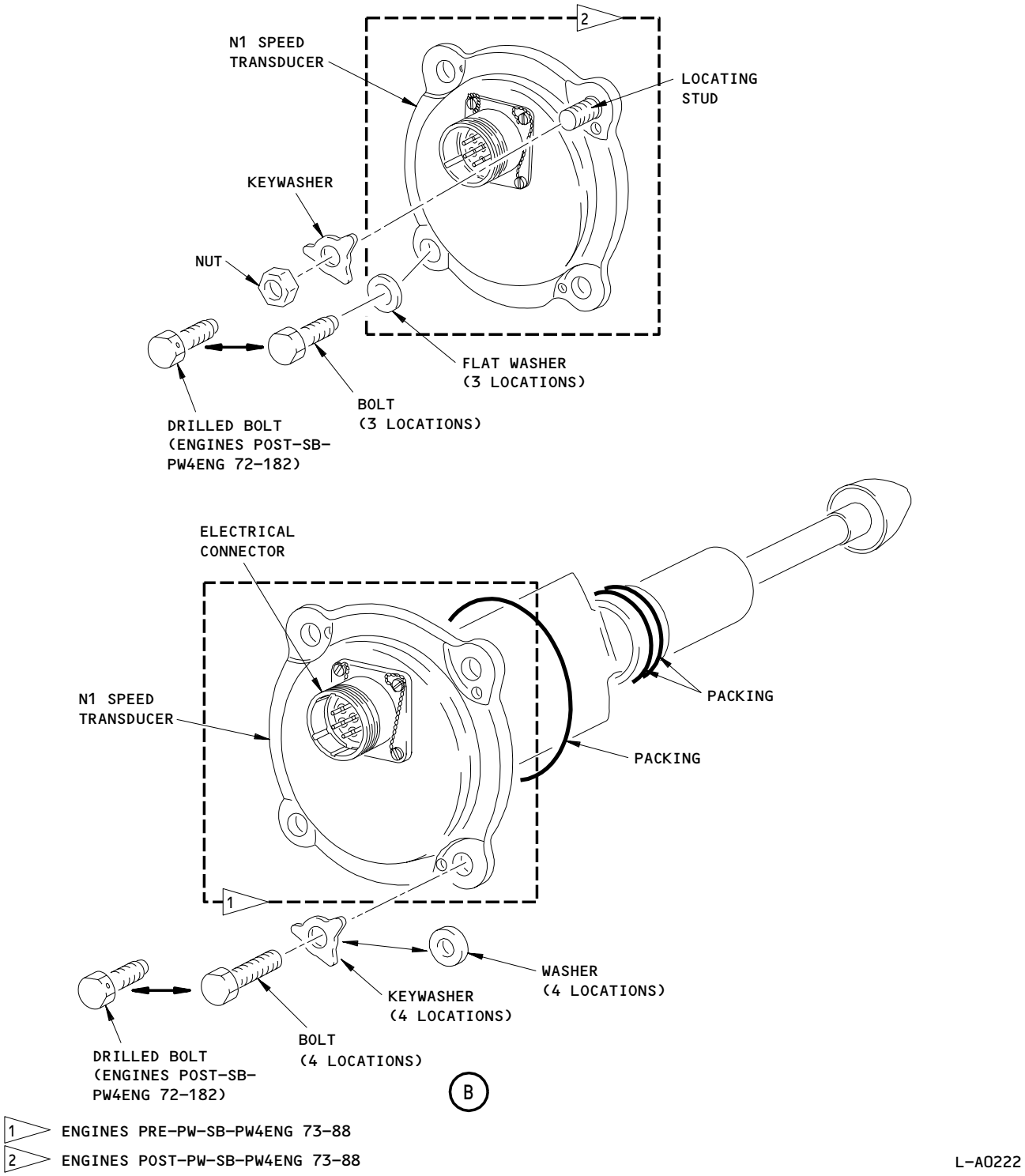
(2) Do these steps to remove the accessory cooling tube:
   (a) Remove the bolts which attach the tube flanges to the manifold flange and case boss.
   (b) Remove the accessory cooling tube from the engine.
   (c) Install caps on the openings.

S 024-063-N00

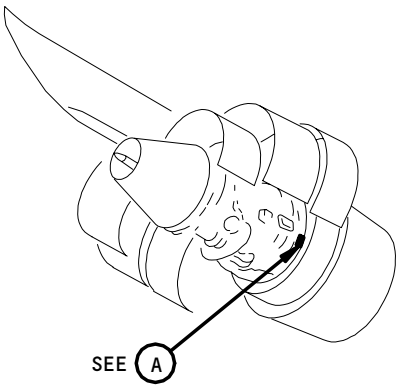
(3) Remove the speed transducer (Fig. 401):
   (a) ALL MTH AIRCRAFT;
   Disconnect the electrical connector on the speed transducer.
   (b) ALL SAS AIRCRAFT;
   Do these steps to disconnect the components attached to the speed transducer:
      1) Disconnect the electrical connectors from the speed transducer probe.
      2) Disconnect and remove the PT2.5 sensing manifold from between the speed transducer probe and the PT2.5 sensing tube.
   (c) Bend the tabs of the key washers until you can loosen the bolts which attach the transducer flange to the intermediate case.

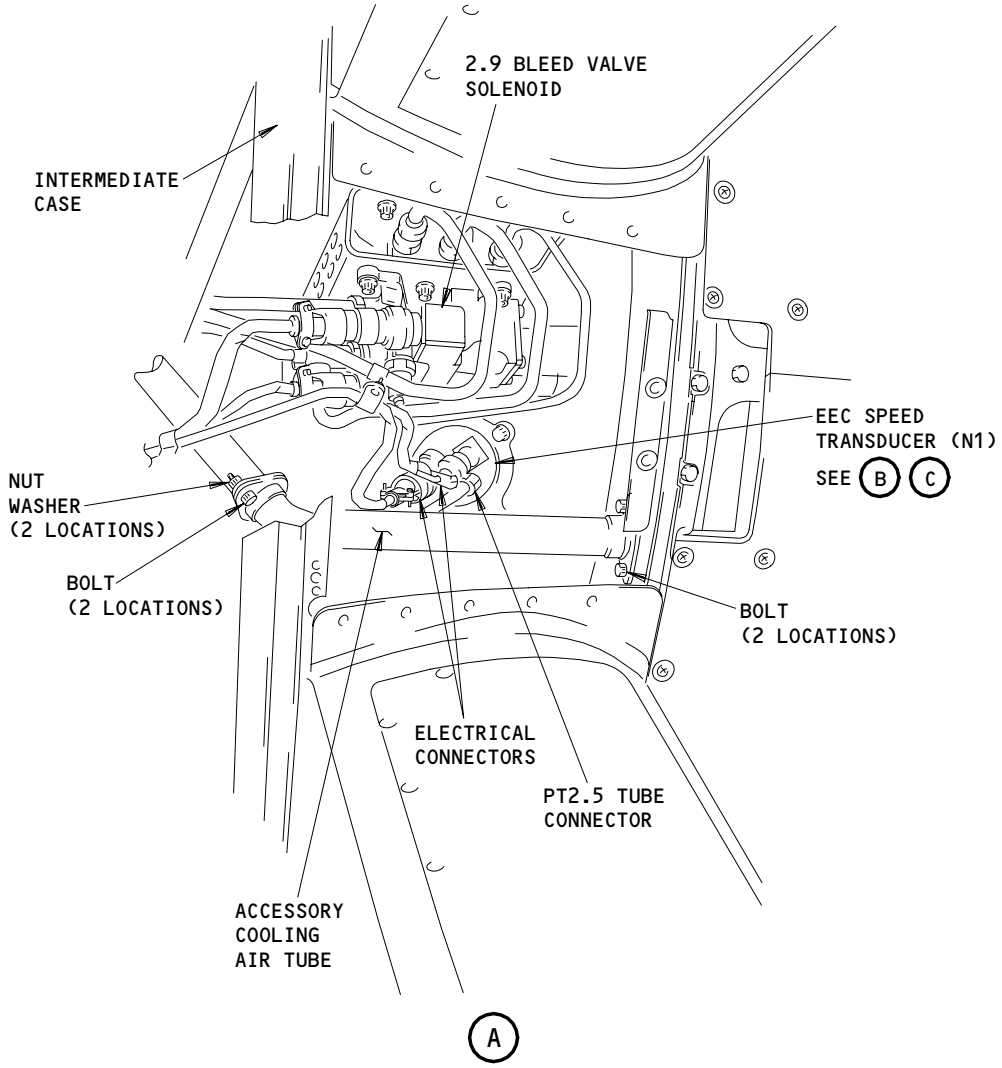


EEC Speed Transducer (N1) Installation
Figure 401 (Sheet 1)



EEC Speed Transducer (N1) Installation
Figure 401 (Sheet 2)





EEC Speed Transducer (N1) Installation
Figure 401 (Sheet 3)

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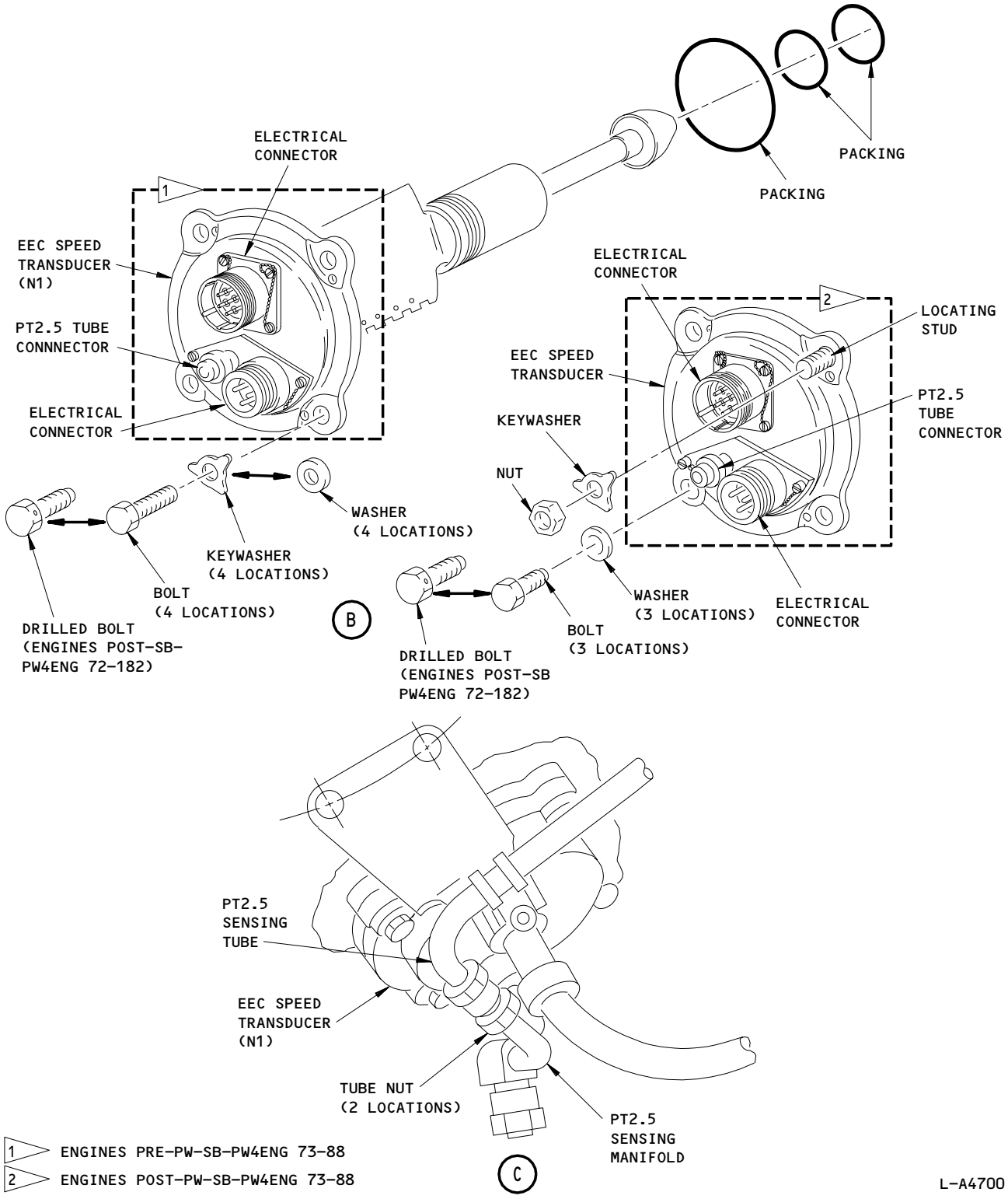


EEC Speed Transducer (N1) Installation
Figure 401 (Sheet 4)

(d) ENGINES PRE-PW-SB 73-88;
Equally remove the bolts and washers which attach the speed transducer.

NOTE: The speed transducer has a spring in it. Loosen the bolts equally (not one at a time).

(e) ENGINES POST-PW-SB 73-88;
Equally remove the bolts, nut, and cable clamp bracket which attach the speed transducer to the intermediate case.

NOTE: The speed transducer has a spring in it. Loosen the bolts and nut equally (not one at a time).

(f) ALL SAS AIRCRAFT;
Move the PT2.5 tube until you can remove the speed transducer.

CAUTION: DO NOT TURN THE SPEED TRANSDUCER UNTIL YOU DISENGAGE IT FROM THE INNER BRACKET. IF YOU TURN THE SPEED TRANSDUCER, YOU CAN CAUSE DAMAGE TO THE SPEED TRANSDUCER OR THE ENGINE.

(g) ENGINES PRE-PW-SB 73-88;
Use the puller (PWA 101359) to break the interface between the flange of the speed transducer and the intermediate case and remove the speed transducer from the engine.

(h) ENGINES POST-PW-SB 73-88;
Use three jackscrews to break the interface between the flange of the speed transducer and the intermediate case and remove the speed transducer from the engine.

NOTE: The jackscrew holes are 0.190-32 UNJF thread.

(i) Remove the three packings from the speed transducer.
1) Discard the packings.

(j) Install caps on the openings.

TASK 73-21-06-404-002-N00

3. Install the EEC N1 Speed Transducer (Speed Transducer)

A. Equipment
(1) M303, M305, or M307 Bergen Mechanical Crimper
Bergen Cable Technologies Inc
170 Gregg St
P.O. Box 1300
Lodi, NJ 07644-9982

B. Consumable Materials
(1) D00045 Beeswax
(2) D00137 Engine Oil - PWA 521
(3) D00504 Petrolatum, PMC 9609

(4) GO2334 Lockwire - AS3214-02
(5) GO2332 Ferrule - PO5-292 (Optional)
(6) GO2335 Cable - Safety - PO5-291 (Optional)

C. References
(1) AMM 70-24-05/201, Electrical Harnesses
(2) AMM 71-00-00/501, Power Plant - General
(3) AMM 71-11-04/201, Fan Cowl Panels
(4) AMM 71-11-06/201, Core Cowl Panels
(5) AMM 72-34-03/401, Fan Exit Liner Segments
(6) AMM 78-31-00/201, Thrust Reverser system

D. Access
(1) Location Zones
411 Left Engine
421 Right Engine

(2) Access Panels
414AR Fan Cowl Panel (Right), Left Engine
416AR Thrust Reverser (Right), Left Engine
418AR Core Cowl Panel (Right), Left Engine
424AR Fan Cowl Panel (Right), Right Engine
426AR Thrust Reverser (Right), Right Engine
428AR Core Cowl Panel (Right), Right Engine

E. Procedure

S 424-065-N00
(1) Remove the caps from the openings.

S 424-066-N00
(2) Apply approximately 0.070 inch (1.778 mm) of beeswax to the flat surface on the small end of the speed transducer.

S 424-067-N00
(3) Install a Class 1 shim in the machined recess on the lower shoulder of the speed transducer.

NOTE: Do not install the three packings to the speed transducer at this time.

S 424-064-N00
(4) Do the initial installation of the speed transducer (Fig. 401):

CAUTION: DO NOT TURN THE SPEED TRANSDUCER DURING THE INSTALLATION. INSTALL THE SPEED TRANSDUCER WITH THE ELECTRICAL CONNECTOR TO THE REAR. IF YOU TURN THE SPEED TRANSDUCER, YOU CAN CAUSE DAMAGE TO THE ENGINE OR THE SPEED TRANSDUCER.

(a) ALL MTH AIRCRAFT;
Carefully install the speed transducer in the opening on the intermediate case at approximately the 5 o'clock position.

1) Make sure the electrical connector points to the rear.

CAUTION: DO NOT TURN THE SPEED TRANSDUCER DURING THE INSTALLATION. INSTALL THE SPEED TRANSDUCER WITH THE LARGER ELECTRICAL CONNECTOR TO THE REAR. IF YOU TURN THE SPEED TRANSDUCER, YOU CAN CAUSE DAMAGE TO THE ENGINE OR THE SPEED TRANSDUCER.

(b) ALL SAS AIRCRAFT;
Carefully install the speed transducer in the opening on the intermediate case at approximately the 5 o'clock position.
1) Make sure the larger electrical connector points to the rear.

(c) ENGINES WITHOUT THE SELF-LOCKING INSERTS;
Attach the speed transducer with the steps that follow:
1) ALL MTH AIRPLANES PRE-PW-SB 73-88;
Do the steps that follow:
a) Lubricate the threads of the bolts, which attach the speed transducer, with engine oil.
b) Attach the speed transducer with the bolts and key washers.

NOTE: Engine with POST PW SB PW4ENG 72-182, install the drilled bolt into the mounting hole next to the PT2.5 connection on the transducer.

c) Tighten the bolts equally to 65-85 pound-inches (7.3-9.6 newton-meters).

2) ALL SAS AIRCRAFT PRE-PW-SB 73-88;
Do the steps that follow:
a) Lubricate the threads of the bolts, which attach the speed transducer, with engine oil.
b) Attach the speed transducer with the bolts and key washers.

NOTE: If this is the second installation, make sure the bolt with the wire hole is adjacent to the PT2.5 tube connctor.

NOTE: Engine with POST PW SB PW4ENG 72-182, install the drilled bolt into the mounting hole next to the PT2.5 connection on the transducer.

c) Tighten the bolts equally to 65-85 pound-inches (7.3-9.6 newton-meters).

3) ALL MTH AIRPLANES POST-PW-SB 73-88;
Do the steps that follow:
a) Lubricate the threads of the bolts and nut, which attach the speed transducer, with engine oil.
b) Attach the speed transducer with the bolts, nut, and key washers.

NOTE: Engine with POST PW SB PW4ENG 72-182, install the drilled bolt into the mounting hole next to the PT2.5 connection on the transducer.

c) Equally tighten the bolts to 65-85 pound-inches (7.3-9.6 newton-meters) and nut to 150-170 pound-inches (16.9-19.2 newton-meters).

4) ALL SAS AIRCRAFT POST-PW-SB 73-88;
Do the steps that follow:
a) Lubricate the threads of the bolts and nut, which attach the speed transducer, with engine oil.
b) Attach the speed transducer with the bolts, nut, and key washers.

NOTE: If this is the second installation, make sure the bolt with the wire hole is adjacent to the PT2.5 tube connector.

NOTE: Engine with POST PW SB PW4ENG 72-182, install the drilled bolt into the mounting hole next to the PT2.5 connection on the transducer.

c) Equally tighten the bolt to 65-85 pound-inches (7.3-9.6 newton-meters) and nut to 150-170 pound-inches (16.9-19.2 newton-meters).

5) If this is the second installation, bend the key washers against the heads of the bolts.

NOTE: Do not bend the key washers after the first installation.

(d) ENGINES WITH THE SELF-LOCKING INSERTS;
Attach the speed transducer with the steps that follow:
1) ALL MTH AIRCRAFT PRE-PW-SB 73-88;
Do the steps that follow:
a) Lubricate the threads of the bolts, which attach the speed transducer, with engine oil.
b) Attach the speed transducer with the bolts and flat washers.
c) Tighten the bolts equally to 85-95 pound-inches (9.6-10.7 newton-meters).

2) ALL SAS AIRCRAFT PRE-PW-SB 73-88;
do the steps that follow:
   a) Lubricate the threads of the bolts, which attach the speed transducer, with engine oil.
   b) Attach the speed transducer with the bolts and flat washers.

      NOTE: If this is the second installation, make sure the bolt with the wire hole is adjacent to the PT2.5 tube connector.

   c) Tighten the bolts to 85-95 pound-inches (9.6-10.7 newton-meters).
3) ALL MTH AIRCRAFT POST-PW-SB 73-88;
Do the steps that follow:
   a) Lubricate the threads of the bolts and nut, which attach the speed transducer, with engine oil.
   b) Attach the speed transducer with the bolts, nut, and flat washers.
   c) Equally tighten the bolts to 85-95 pound-inches (9.6-10.7 newton-meters) and nut to 150-170 pound-inches (16.9-19.2 newton-meters).
4) ALL SAS AIRCRAFT POST-PW-SB 73-88;
Do the steps that follow:
   a) Lubricate the threads of the bolts and nut, which attach the speed transducer, with engine oil.
   b) Attach the speed transducer with the bolts, nut, and flat washers.

      NOTE: If this is the second installation, make sure the bolt with the wire hole is adjacent to the PT2.5 tube connector.

   c) Equally tighten the bolts to 85-95 pound-inches (9.6-10.7 newton-meters) and the nut to 150-170 pound-inches (16.9-19.2 newton-meters).

S 824-033-N00

(5) Do these steps to make sure the speed transducer is in the correct position:
   (a) Slowly turn the fan rotor counterclockwise (view from the front) approximately 15 degrees.
   (b) Loosen the four bolts and remove the speed transducer from the engine.
   (c) Carefully cut the wax away from the flat surface at the end of the speed transducer.
   (d) Measure the thickness of the wax in the area where the wax is the thinnest.
   (e) If the depth of the wax is between 0.020-0.050 inch (0.508-1.270 mm), the correct shim is installed.
   (f) If the depth of the wax is less than 0.020 inch (0.508 mm), replace the Class 1 shim with a Class 2 shim.
   (g) If the depth of the wax is more than 0.050 inch (1.270 mm), remove the Class 1 shim.
   (h) Remove all wax from the end of the speed transducer.

S 424-068-N00

(6) Do the final installation of the speed transducer:
   (a) Lubricate the two packings, which are installed on the shaft of the speed transducer, with engine oil.
   (b) Install the packings to the grooves in the shaft of the speed transducer.
   (c) Lubricate the packing, which is installed on the speed transducer flange, with the petrolatum.
   (d) Install the packing to the groove in the speed transducer flange.
   (e) Do the steps of the initial installation of the speed transducer again.
   (f) ALL SAS AIRCRAFT;
   do these steps to install the PT2.5 sensing manifold and the electrical connectors to the speed transducer:

      CAUTION: DO NOT USE OF LUBRICANTS WHEN YOU INSTALL EEC SENSING TUBES, ADAPTERS, OR PACKINGS. DAMAGE TO THE EEC FROM CONTAMINATION CAN OCCUR.

      1) Install the PT2.5 sensing manifold between the speed transducer probe and PT2.5 sensing tube.
      2) Tighten the tube nuts to 135-150 pound-inches (15.2-16.9 newton-meters).

3) Safety the tube nuts with lockwire or safety cable and safety cable ferrule.

NOTE: Engine with POST PW SB PW4ENG 72-182, safety the tube nut to the drilled transducer mount bolt.

4) Remove the caps from the electrical connectors.

CAUTION: USE THE CORRECT ASSEMBLY PROCEDURE, AND TOOLS, FOR THE HARNESS CONNECTOR INSTALLATION (AMM 70-24-05/201). IF YOU USE THE INCORRECT ASSEMBLY PROCEDURE, OR TOOLS, A DAMAGED OR LOOSE CONNECTOR CAN OCCUR. A LOOSE CONNECTOR PERMITS VIBRATION, WHICH CAUSES THE CONTACTS TO WEAR AND DECREASES THE LIGHTNING PROTECTION.

5) Install the electrical connectors on the speed transducer (AMM 70-24-05/201).

(g) ALL MTH AIRCRAFT;
Do these steps to install the electrical connector to the speed transducer:

1) Remove the cap from the electrical connector.

CAUTION: USE THE CORRECT ASSEMBLY PROCEDURE, AND TOOLS, FOR THE HARNESS CONNECTOR INSTALLATION (AMM 70-24-05/201). IF YOU USE THE INCORRECT ASSEMBLY PROCEDURE, OR TOOLS, A DAMAGED OR LOOSE CONNECTOR CAN OCCUR. A LOOSE CONNECTOR PERMITS VIBRATION, WHICH CAUSES THE CONTACTS TO WEAR AND DECREASES THE LIGHTNING PROTECTION.

2) Install the electrical connector on the speed transducer (AMM 70-24-05/201).

S 414-069-N00

(7) Do these steps to install the accessory cooling air tube:

(a) Remove the caps and install the cooling air tube tube between the manifold flange and the case boss.

(b) Install the cooling air tube to the manifold flange with bolts lubricated with oil, washers, nuts.

1) Tighten the bolts to 85-95 pound-inches (9.6-10.7 newton-meters).

(c) Install the cooling air tube to the case boss with bolts lubricated with oil.

1) Tighten the bolts to 85-95 pound-inches (9.6-10.7 newton-meters).

S 414-045-N00

(8) Install the inner liner to the fan case (AMM 72-34-03/401).

F. Return the Aircraft to Its Usual Condition

S 414-046-N00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT COULD OCCUR.

(1) Close the right thrust reverser (AMM 78-31-00/201).

S 414-047-N00

(2) Close the right core cowl panel (AMM 71-11-06/201).

S 444-048-N00

(3) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

S 414-049-N00

(4) Close the right fan cowl panel (AMM 71-11-04/201).

S 714-070-N00

(5) Do the test for the EEC speed transducer (N1) which is shown in the Power-Plant Test-Reference Table (AMM 71-00-00/501).

EEC WIRING HARNESS - REMOVAL/INSTALLATION

1. General
   A. This procedure supplies instructions for the removal and installation of the W3, W4, W5, and the W6 EEC wiring harnesses for the phase 3 engines.

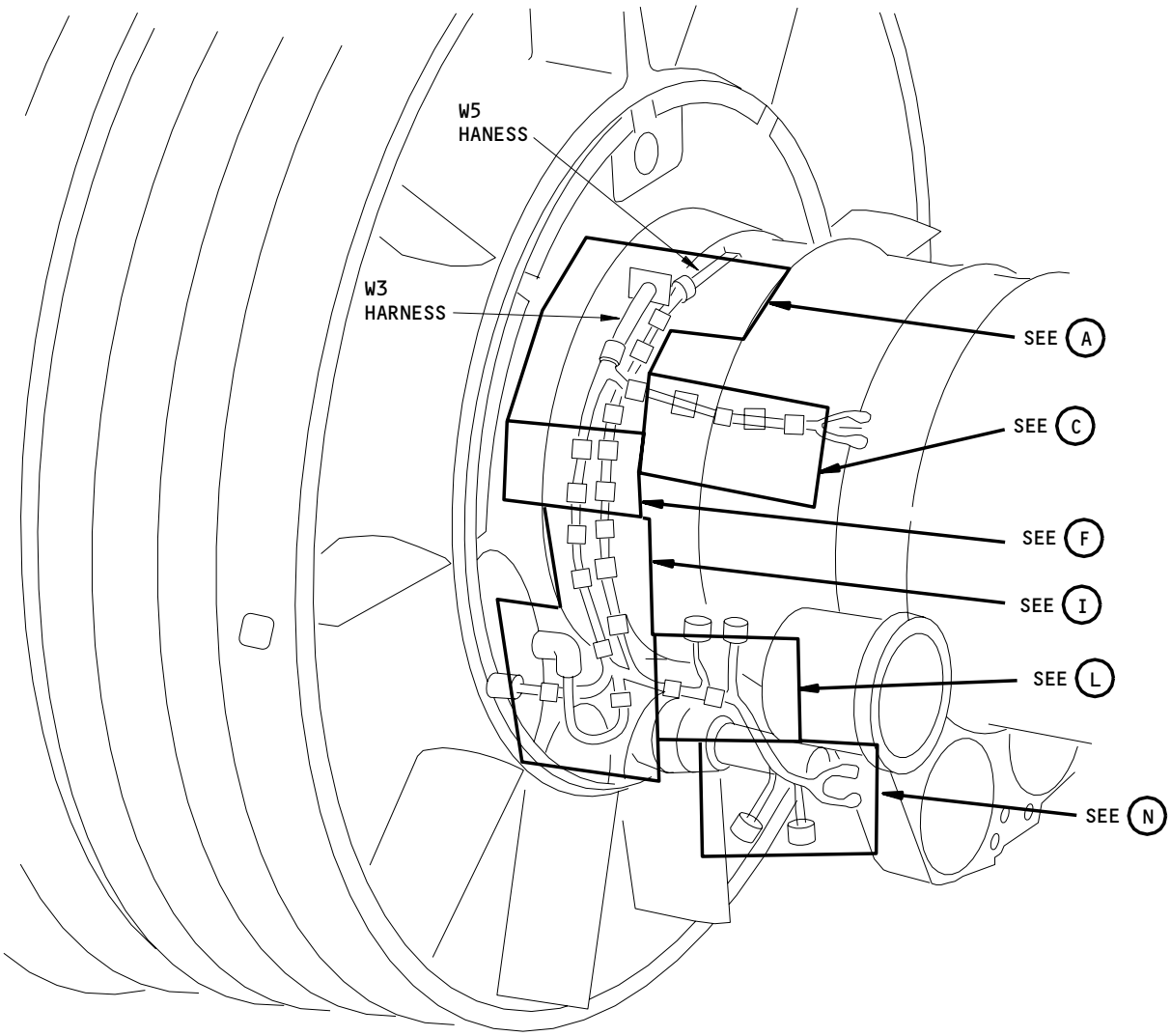
TASK 73-21-07-004-181-N01

2. Remove the EEC Wiring Harness W3 (Fig. 401)
   A. Equipment
      (1) Wrench - Strap, Model TG-70, Glenair, Inc., 1211 Air Way, Glendale. CA 91201; or Model BT-BS-601, Daniels Mfg. Corp., 6103 Anno Ave., Orlando, FL 32809
      (2) PWA 85749 Adapter - Electrical Harness Connector, Pratt & Whitney, Commercial Products Division, 400 Main Street, East Hartford, CT 06108 (optional)

HARNESS CONNECTORS WHERE THE TORQUE ADAPTER (PWA 85749) CAN BE USED	
CONNECTOR	COMPONENT
W3P1	EEC Alternator (N2 Transducer)
W3P15	2.5 Bleed Valve Actuator

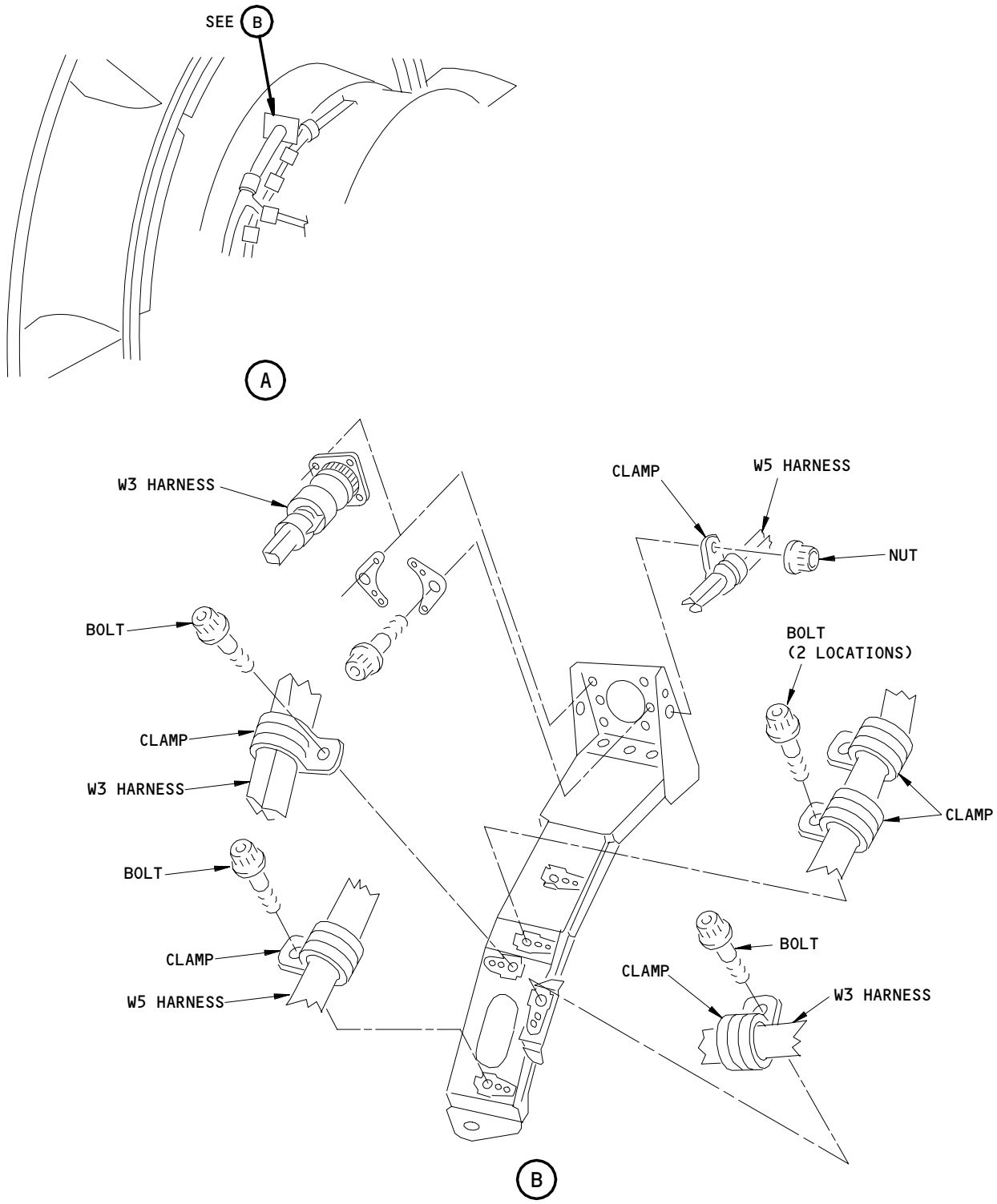
   B. References
      (1) AMM 71-11-04/201, Fan Cowl Panels
      (2) AMM 71-11-06/201, Core Cowl Panels
      (3) AMM 78-31-00/201, Thrust Reverser System
   C. Access
      (1) Location Zones
          410 No. 1 Power Plant
          420 No. 2 Power Plant

      (2) Access Panels
          413 Fan Cowl Panel (LH)
          414 Fan Cowl Panel (RH)
          415 Fan Reverser (LH)
          416 Fan Reverser (RH)
          417 Core Cowl (LH)
          418 Core Cowl (RH)
          423 Fan Cowl Panel (LH)
          424 Fan Cowl Panel (RH)
          425 Fan Reverser (LH)
          426 Fan Reverser (RH)
          427 Core Cowl (LH)
          428 Core Cowl (RH)



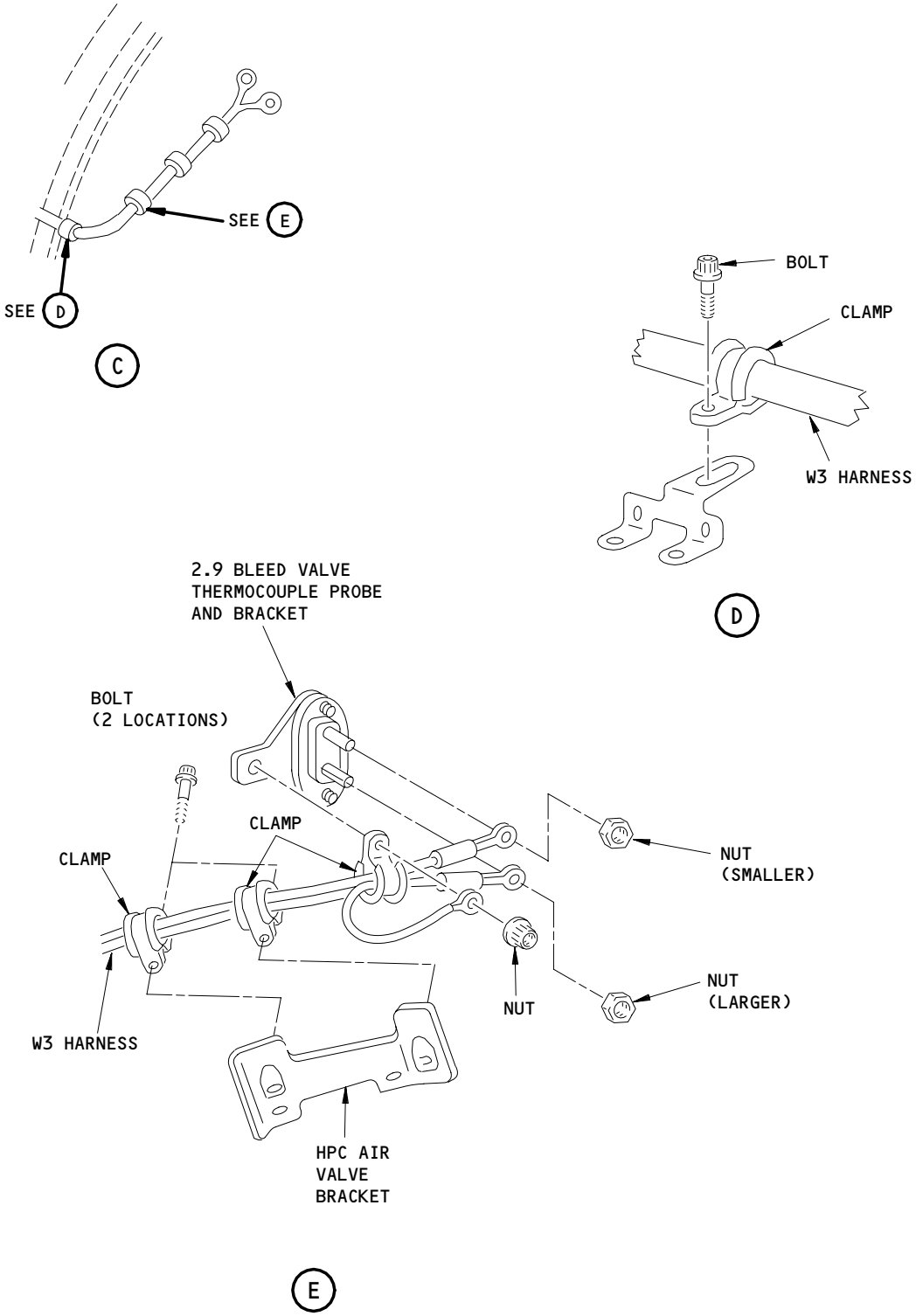
L-B2021 (0000)

EEC Wiring Harness W3 Installation
Figure 401 (Sheet 1)



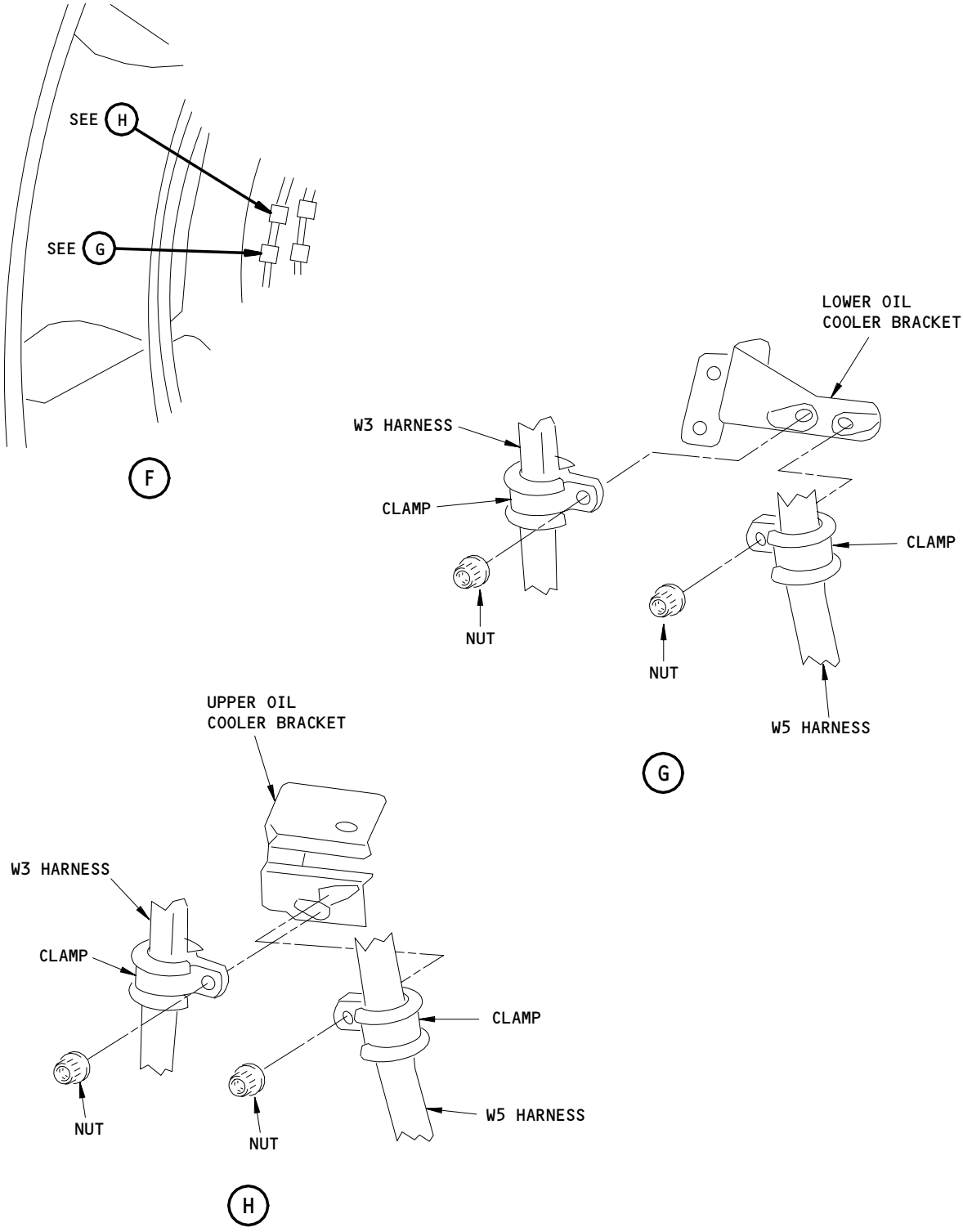
LA9294 (0000)

EEC Wiring Harness W3 Installation
Figure 401 (Sheet 2)



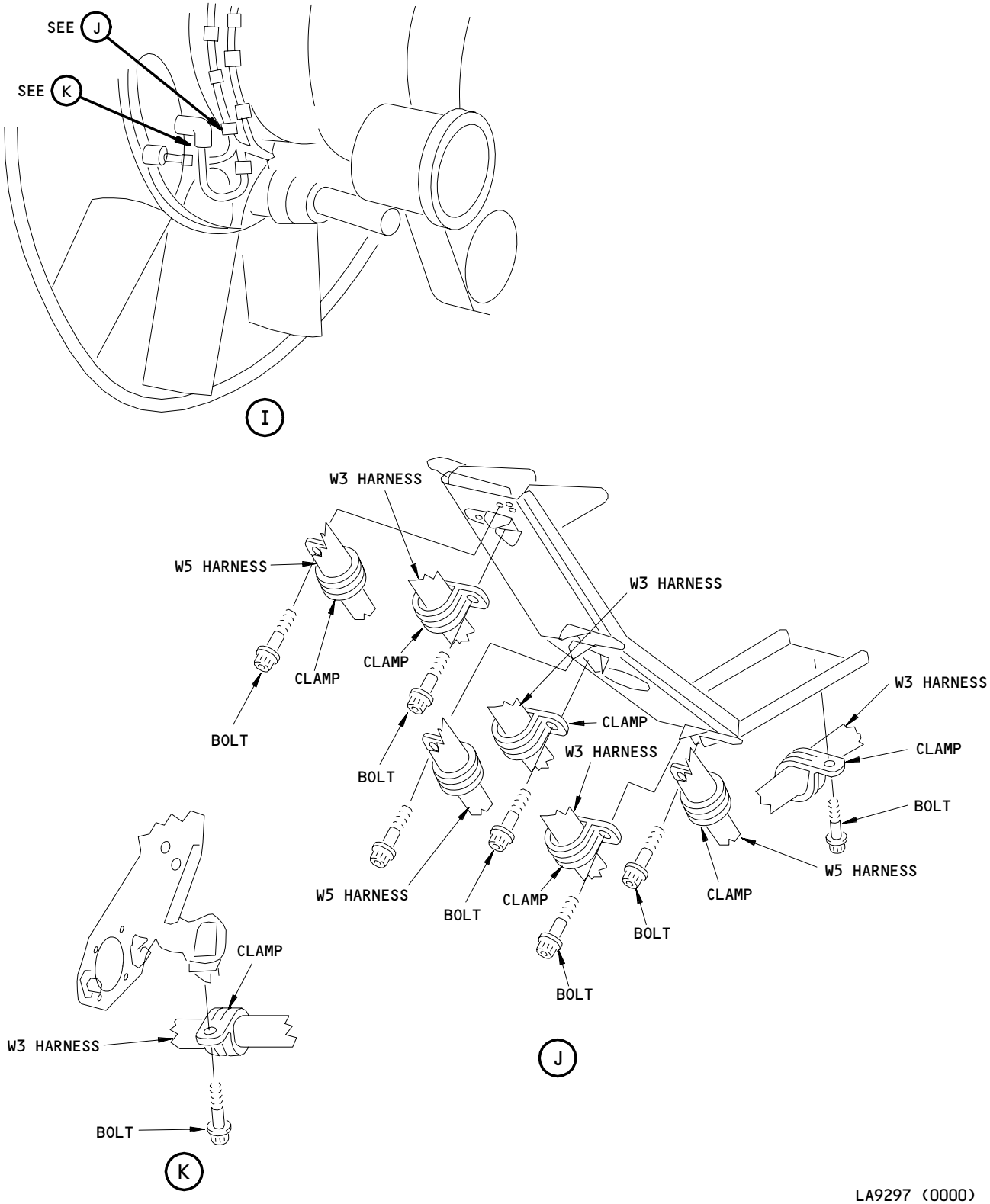
LA9295 (0000)

EEC Wiring Harness W3 Installation
Figure 401 (Sheet 3)

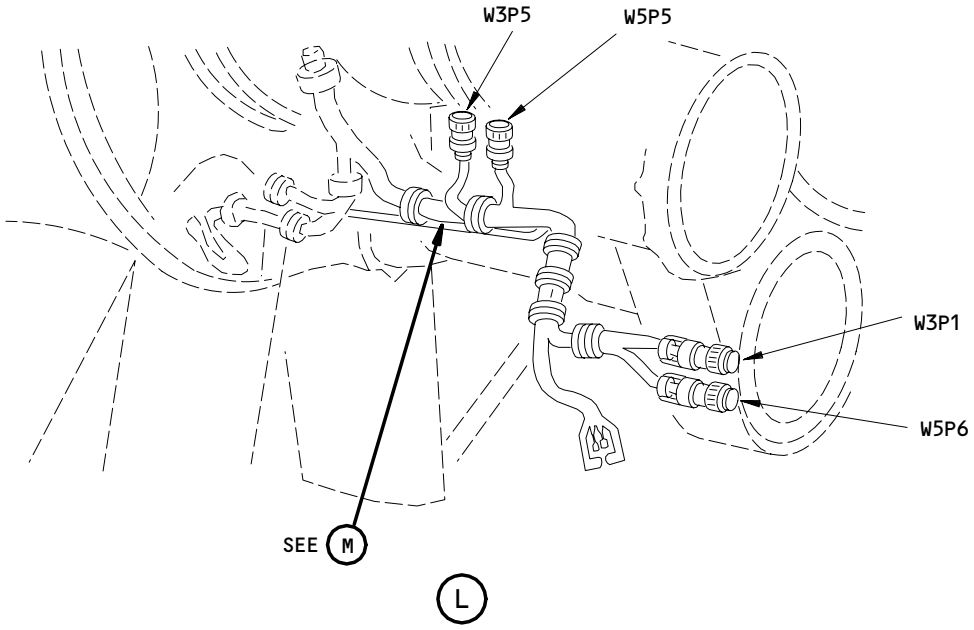


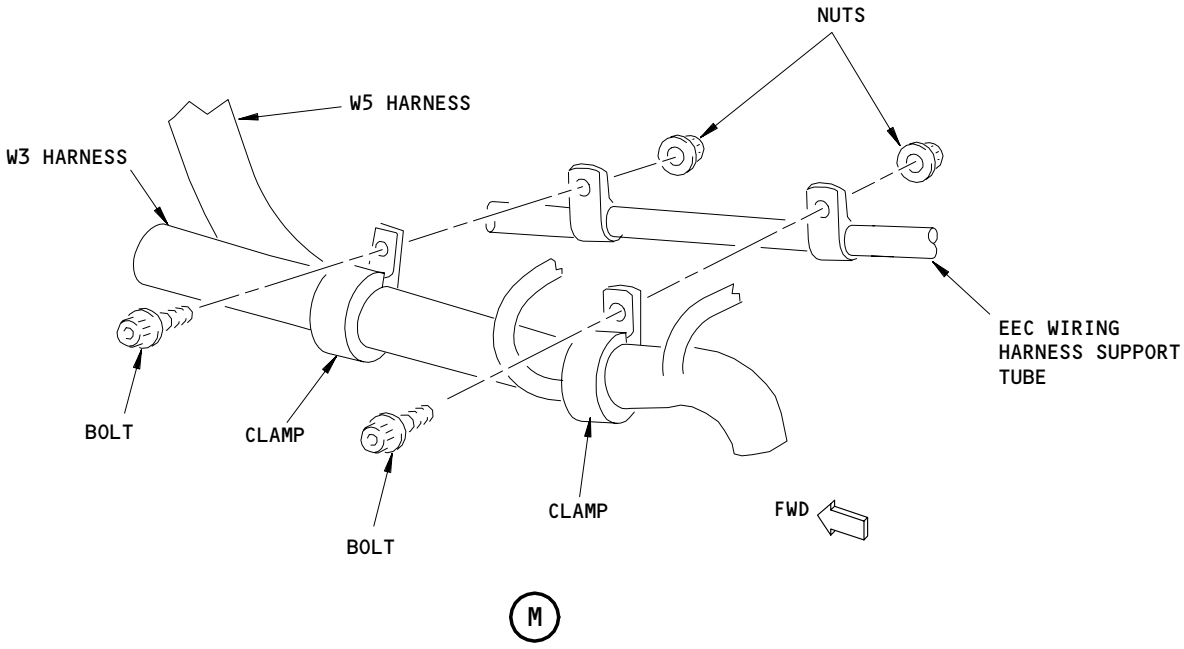
LA9296 (0000)

EEC Wiring Harness W3 Installation
Figure 401 (Sheet 4)



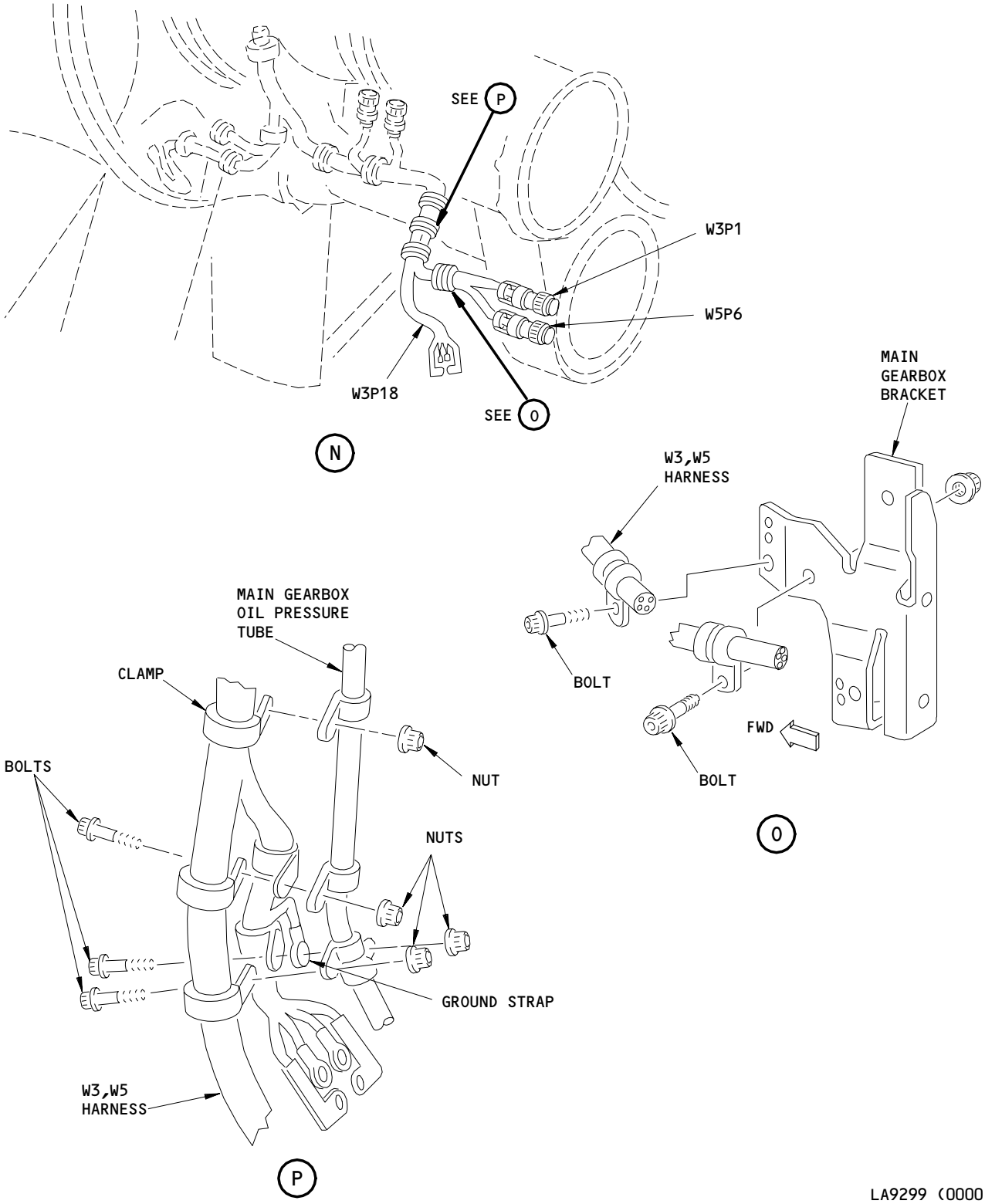
EEC Wiring Harness W3 Installation
Figure 401 (Sheet 5)





LA9298 (0000)

EEC Wiring Harness W3 Installation
Figure 401 (Sheet 6)



EEC Wiring Harness W3 Installation
Figure 401 (Sheet 7)

D. Prepare For Wiring Harness Removal

S 864-001-N01

(1) For the left engine, open this circuit breaker on the main power distribution panel P6 and attach DO-NOT-CLOSE tag:
(a) 6L19, PROBE HEAT L ENG

S 864-002-N01

(2) For the right engine, open this circuit breaker on the main power distribution panel P6 and attach DO-NOT-CLOSE tag:
(a) 6K25, PROBE HEAT R ENG

S 864-003-N01

(3) For the left engine, open these circuit breakers on the overhead panel P11 and attach DO-NOT-CLOSE tags:
(a) 11A10, AIR DATA CMPTR L
(b) 11L3, L ENGINE PERF SOL CHAN A
(c) 11L4, L ENGINE PERF SOL CHAN B
(d) 11M5, LEFT ENGINE EEC DISCRETES

S 864-004-N01

(4) For the right engine, open these circuit breakers on the overhead panel P11 and attach DO-NOT-CLOSE tags:
(a) 11F30, AIR DATA CMPTR R
(b) 11L30, R ENGINE PERF SOL CHAN A
(c) 11L31, R ENGINE PERF SOL CHAN B
(d) 11M32, RIGHT ENGINE EEC DISCRETES

S 864-005-N01

(5) Open this circuit breaker on the overhead panel P11 and attach DO-NOT-CLOSE tag:
(a) 11B36, APU ENG START/ECS DISCRETES

S 014-006-N01

(6) Open the fan cowl panels (AMM 71-11-04/201).

S 044-007-N01

WARNING: DO THE THRUST REVERSER DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(7) Do this procedure: Thrust Reverser Deactivation for Ground Maintenance (AMM 78-31-00/201).

S 014-008-N01

(8) Open the core cowl panels (AMM 71-11-06/201).

S 014-009-N01

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(9) Open the thrust reversers (AMM 78-31-00/201).

E. Remove EEC Wiring Harness W3

S 024-010-N01

CAUTION: DO NOT TWIST OR BEND THE HARNESS BADLY DURING REMOVAL. IF THE HARNESS IS TWISTED OR BENT BADLY, THE HARNESS CAN BE DAMAGED.

(1) Disconnect the W3J24 connector from the W1P24 connector as follows:
   (a) Find the W1P24 connector at the 10 o'clock position on the High Pressure Compressor (HPC) case.
   (b) Disconnect the W3J24 connector from the W1P24 connector.
   (c) Remove the two bolts and retainers that attach the W3J24 connector to the bracket on the HPC case.
   (d) Remove the W3J24 connector from the bracket.
   (e) Install protective covers on the electrical connectors.

S 024-095-N01

(2) Disconnect the W3P5 connector from the bypass valve solenoid for the fuel/oil cooler as follows:
   (a) Find the W3P5 connector attached to the bypass valve solenoid for the fuel/oil cooler at the 8 o'clock position.
   (b) Disconnect the W3P5 connector.
   (c) Install protective covers on the electrical connectors.

S 024-096-N01

(3) Disconnect the W3P17 connector from the air/oil heat exchanger as follows:
   (a) Find the W3P13 connector attached to the air oil heat exchanger located at the 8 o'clock position.
   (b) Disconnect the W3P17 connector from the air/oil heat exchanger.
   (c) Install protective covers on the electrical connectors.

S 024-097-N01

(4) Disconnect the W3P15 connector from the 2.5 bleed valve actuator as follows:
   (a) Find the W3P15 connector attached to the 2.5 bleed valve actuator on the intermediate case located at the 7:30 o'clock position.

(b) Disconnect the W3P15 connector from the 2.5 bleed valve actuator.

NOTE: You may use the torque adapter (PWA 85749) to disconnect the W3P15 connector.

(c) Install protective covers on the electrical connectors.

S 024-098-N01

(5) Disconnect the W3P1 connector from the EEC alternator as follows:
(a) Find the W3P1 connector on the left side of the gearbox located at the 7 o'clock position.
(b) Disconnect the W3P1 connector from the EEC alternator connector.

NOTE: You can use the torque adapter (PWA 85749) to remove the W3P1 connector.

(c) Install protective covers on the electrical connectors.

S 024-099-N01

(6) Disconnect the W3P18 connector from the EEC oil temperature thermocouple probe as follows:
(a) Find the W3P18 connector on the front side of the gearbox located at the 7 o'clock position.
(b) Disconnect the W3P18 connector from the EEC oil temperature thermocouple probe.
(c) Install protective covers on the electrical connectors.

S 024-100-N01

(7) Disconnect the T2.95 connector from the 2.9 bleed valve thermocouple probe as follows:
(a) Find the T2.95 connector on the left bleed valve located at the 10 o'clock position.
(b) Disconnect the T2.95 connector from the 2.9 bleed valve thermocouple probe.
(c) Install protective covers on the electrical connectors.

S 024-102-N01

(8) Remove the bolts, nuts, and clamps that attach the W3 harness to the brackets and support tubes on the HPC case and the gearbox.

S 024-101-N01

(9) Remove the applicable harness ties.

S 024-103-N01

(10) Remove the W3 harness from the engine.

TASK 73-21-07-404-011-N01

3. Install the EEC Wiring Harness W3 (Fig. 401)

A. Equipment

(1) Strap Wrench TG-70

(2) Torque Adapter PWA 85749 (optional)

HARNESS CONNECTORS WHERE THE TORQUE ADAPTER (PWA 85749) CAN BE USED	
CONNECTOR	COMPONENT
W3P1	EEC Alternator (N2 Transducer)
W3P15	2.5 Bleed Valve Actuator

B. Consumable Materials

(1) D00137 Engine Oil - PWA 521

C. References

(1) AMM 70-24-05/201, Electrical Harnesses

(2) AMM 71-11-04/201, Fan Cowl Panels

(3) AMM 71-11-06/201, Core Cowl Panels

(4) AMM 78-31-00/201, Thrust Reverser System

D. Access

(1) Location Zones

410 No. 1 Power Plant

420 No. 2 Power Plant

(2) Access Panels

413 Fan Cowl Panel (LH)

414 Fan Cowl Panel (RH)

415 Fan Reverser (LH)

416 Fan Reverser (RH)

417 Core Cowl (LH)

418 Core Cowl (RH)

423 Fan Cowl Panel (LH)

424 Fan Cowl Panel (RH)

425 Fan Reverser (LH)

426 Fan Reverser (RH)

427 Core Cowl (LH)

428 Core Cowl (RH)

E. Install the EEC Wiring Harness W3

S 424-182-NO1

CAUTION: DO NOT TWIST OR BEND THE HARNESS BADLY DURING INSTALLATION. IF THE HARNESS IS TWISTED OR BENT BADLY, THE HARNESS CAN BE DAMAGED.

(1) Install the W3 harness on the left side of the engine.
  (a) Put the W3 harness on the engine.
    1) Make sure the tracer cord is pointed outboard and the ends are at the first breakout.
    2) Make sure the master keyway is pointed inboard.

S 424-105-NO1

(2) Attach the W3J24 connector to the bracket on the High Pressure Compressor (HPC) as follows:
  (a) Remove the protective covers from the W3J24 connector.
  (b) Find the bracket for the W3J24 connector at 10 o'clock position on the HPC.
  (c) Install the two retainers that attach the connector flange to the bracket.
  (d) Lubricate bolt threads with engine oil.
  (e) Align the boltholes and install the bolts.
  (f) Tighten the bolts to 36-40 pound-inches (4.067-4.519 newton-meters).

F. ENGINES PRE-PW-SB 73-84;
Connect the thermocouples:

S 424-183-NO1

CAUTION: USE THE CORRECT ASSEMBLY PROCEDURE, AND TOOLS, FOR THE HARNESS CONNECTOR INSTALLATION (AMM 70-24-05/201). IF YOU USE THE INCORRECT ASSEMBLY PROCEDURE, OR TOOLS, A DAMAGED OR LOOSE CONNECTOR CAN OCCUR. A LOOSE CONNECTOR PERMITS VIBRATION, WHICH CAUSES THE CONTACTS TO WEAR AND DECREASES THE LIGHTNING PROTECTION.

(1) Connect the T2.95 connector to the 2.9 bleed valve thermocouple probe as follows:
  (a) Find the T2.95 connector on the left bleed valve located at the 10 o'clock position.
  (b) Remove the protective covers from the connectors.
  (c) Connect the T2.95 connector to the 2.9 bleed valve thermocouple probe.

S 424-107-NO1

(2) Connect the W3P18 connector to the thermocouple probe for the EEC oil temperature as follows (AMM 70-24-05/201):
  (a) Find the thermocouple probe on the front of the gearbox located at the 7 o'clock position.
  (b) Remove the protective covers from the connectors.

(c) Connect the W3P18 connector to the thermocouple probe.

S 424-108-NO1

(3) Connect the W3P1 connector to the connector for the EEC alternator as follows (AMM 70-24-05/201):
   (a) Find the connectors for the EEC alternator on the bottom side of gearbox located at the 7 o'clock position.
   (b) Remove the protective covers from the connectors.
   (c) Connect the W3P1 connector to the higher of the two connectors for the EEC alternator.

       NOTE: You can use the torque adapter (PWA 85749) to tighten the W3P1 connector.

S 424-109-NO1

(4) Connect the W3P15 connector to the 2.5 bleed valve actuator as follows (AMM 70-24-05/201):
   (a) Find the 2.5 bleed valve actuator on the intermediate cae at the 7:30 o'clock position.
   (b) Remove the protective covers from the connectors.
   (c) Connect the W3P15 connector to the 2.5 bleed valve actuator.

       NOTE: You can use the torque adapter (PWA 85749) to tighten the W3P15 connector.

S 424-110-NO1

(5) Connect the W3P17 connector to the air/oil heat exchanger as follows (AMM 70-24-05/201):
   (a) Find the air/oil heat exchanger on the HPC case at the 8 o'clock position.
   (b) Remove the protective covers from the connectors.
   (c) Connect the W3P17 connector to the air/oil heat exchanger.

S 424-111-NO1

(6) Connect the W13P5 connector to the bypass valve solenoid for the fuel/oil cooler as follows (AMM 70-24-05/201):
   (a) Find the bypass valve solenoid for the fuel/oil cooler on the bottom side of the fuel/oil cooler located at the 8 o'clock position.
   (b) Remove the protective covers from the connectors.
   (c) Connect the W3P5 connector to the forward connector on the bypass valve solenoid for the fuel/oil cooler.

G. ENGINES POST-PW-SB 73-84;
Connect the thermocouples:

S 424-193-NO1

(1) Install the wire harness to the EEC Oil Temperature thermocouple probe:
   (a) Install the wiring harness terminals to the thermocouple studs and loosely install the nuts to the thermocouple studs.
   (b) Loosely install the clamp, ground strap, and nut to the bracket on the housing.

CAUTION: MAKE SURE THE THERMOCOUPLE STUD BOX DOES NOT TURN WHEN THE COUPLING NUT IS TIGHTENED. IF THE THERMOCOUPLE STUD BOX TURNS, DAMAGE TO THE WIRING HARNESS CAN OCCUR.

   (c) If it is necessary to align the thermocouple stud box, loosen the coupling nut.
   (d) Align the thermocouple stud box with the wiring harness connector.
   (e) Hold the thermocouple stud box and tighten the coupling nut for the thermocouple probe to 95-100 pound-inches (10.734-11.298 newton-meters).
      1) Do not let the thermocouple stud turn.

CAUTION: DO NOT ALIGN THE THERMOCOUPLE STUD BOX AFTER THE COUPLING NUT IS TIGHTENED. HOLD THE THERMOCOUPLE STUD BOX AND LOOSEN THE COUPLING NUT TO ALIGN THE THERMOCOUPLE STUD BOX AGAIN. DAMAGE TO THE THERMOCOUPLE STUD BOX CAN OCCUR.

   (f) Make sure the thermocouple stud box is aligned.

CAUTION: TOO MUCH TORQUE (MORE THAN THE MAXIMUM TORQUE) ON THE THERMOCOUPLE PROBE NUTS CAN LOOSEN THEM. IF TOO MUCH TORQUE IS APPLIED, DAMAGE TO THE THERMOCOUPLE STUDS CAN OCCUR.

   (g) Tighten the alumel nuts (larger terminal studs) to 18-22 pound-inches (2.034-2.486 newton-meters).
   (h) Tighten the chromel nuts (smaller terminal studs) to 15-18 pound-inches (1.695-2.034 netwon-meters).
   (i) Install the lockwire from the coupling nut to the adapter.
   (j) Tighten the nut that attaches the clamp and ground strap to the bracket on the housing to 36-40 pound-inches (4.067-4.519 newton-meters).

S 424-112-NO1

(2) Install the wire harness to 2.9 thermocouple probe:
   (a) Attach the harness with the two nuts.
   (b) Tighten the larger nut to 18-22 pound-inches (2.0-2.5 newton-meters).

(c) Tighten the smaller nut to 15-18 pound-inches (1.7-2.0 newton-meters).

S 824-113-NO1

(3) Adjust the W3 harness to get the necessary clearances.

S 424-114-NO1

(4) Install the clamps at all clamp locations.

S 644-115-NO1

(5) Lubricate threads for the nuts and bolts with engine oil.

S 424-116-NO1

(6) Loosely install the bolts and nuts to the clamps for the W3 wiring harness.

S 824-117-NO1

(7) Make sure the W3 wiring harness is not pulled too tightly between any two clamps.

S 824-118-NO1

(8) Make sure the W3 wiring harness does not touch any engine parts.

S 824-119-NO1

(9) Make sure the W3 wiring harness is not pulled too tightly where the wiring harness attaches to the connector.

S 424-120-NO1

(10) Tighten the nuts and bolts for the harness to 36-40 pound-inches (4.067-4.519 newton-meters).

NOTE: Make sure there is clearance between the W3 and W5 harnesses and the hardware near the lower left of the front side of the gearbox.

H. Put the Airplane Back to its Usual Condition

S 414-013-NO1

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Close the thrust reversers (AMM 78-31-00/201).

S 414-014-NO1

(2) Close the core cowl panels (AMM 71-11-06/201).

S 444-015-NO1

(3) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

S 414-016-NO1
(4) Close the fan cowl panels (AMM 71-11-04/201).

S 864-017-NO1
(5) For the left engine, remove DO-NOT-CLOSE tag and close this circuit breaker on the main power disribution panel P6:
(a) 6L19, PROBE HEAT L ENG

S 864-018-NO1
(6) For the right engine, remove DO-NOT-CLOSE tag and close this circuit breaker on the main power disribution panel P6:
(a) 6K25, PROBE HEAT R ENG

S 864-019-NO1
(7) For the left engine, remove DO-NOT-CLOSE tags and close these circuit breakers on the overhead panel P11:
(a) 11A10, AIR DATA CMPTR L
(b) 11L3, L ENGINE PERF SOL CHAN A
(c) 11L4, L ENGINE PERF SOL CHAN B
(d) 11M5, LEFT ENGINE EEC DISCRETES

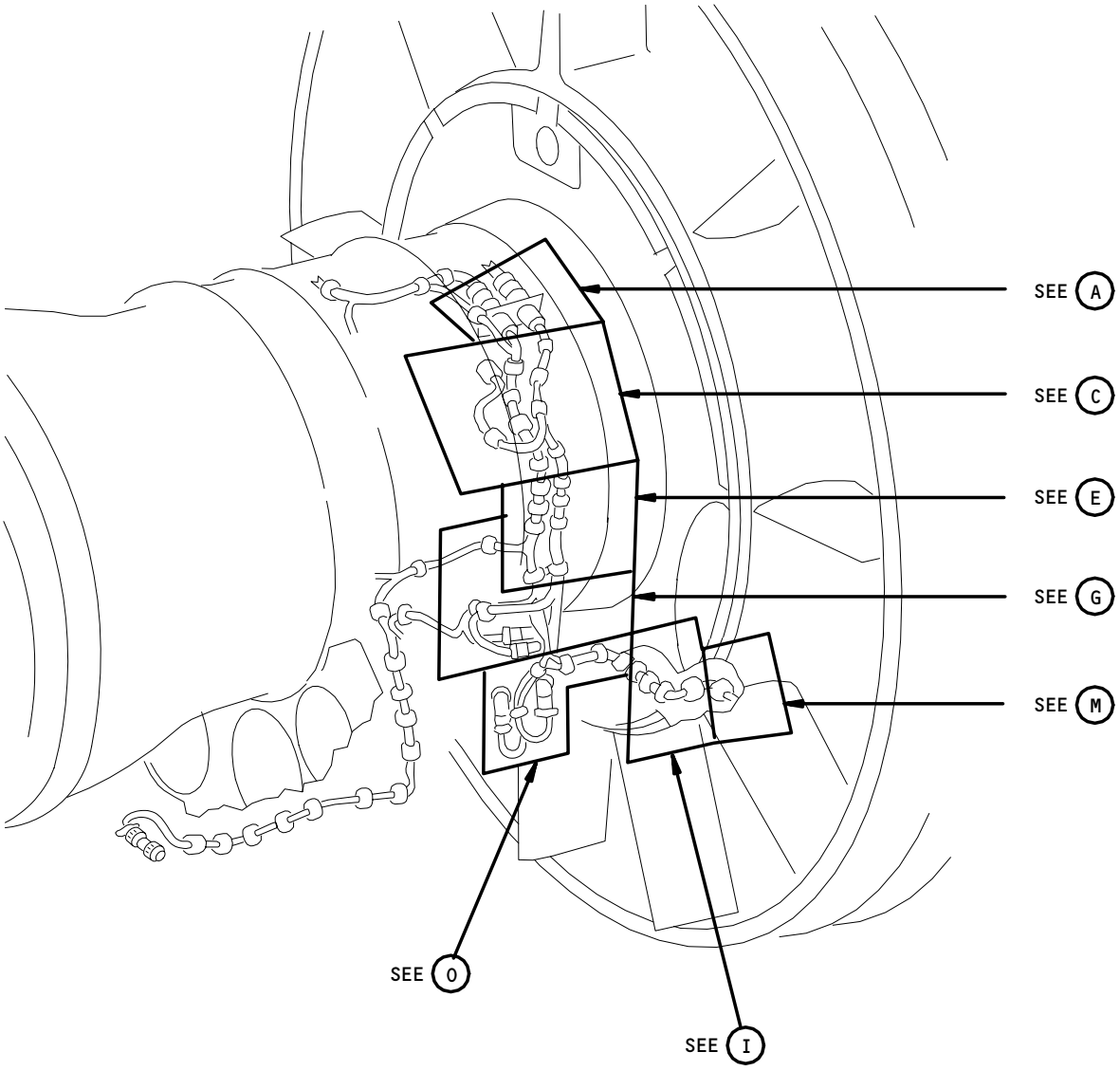
S 864-020-NO1
(8) For the right engine, remove DO-NOT-CLOSE tags and close these circuit breakers on the overhead panel P11:
(a) 11F30, AIR DATA CMPTR R
(b) 11L30, R ENGINE PERF SOL CHAN A
(c) 11L31, R ENGINE PERF SOL CHAN B
(d) 11M32, RIGHT ENGINE EEC DISCRETES

S 864-021-NO1
(9) Remove DO-NOT-CLOSE tag and close this circuit breaker on the overhead panel P11:
(a) 11B36, APU ENG START/ECS DISCRETES

S 714-022-NO1
(10) Do the test of the EEC wiring harness that is shown in the Power Plant Test Reference Table (AMM 71-00-00/501).

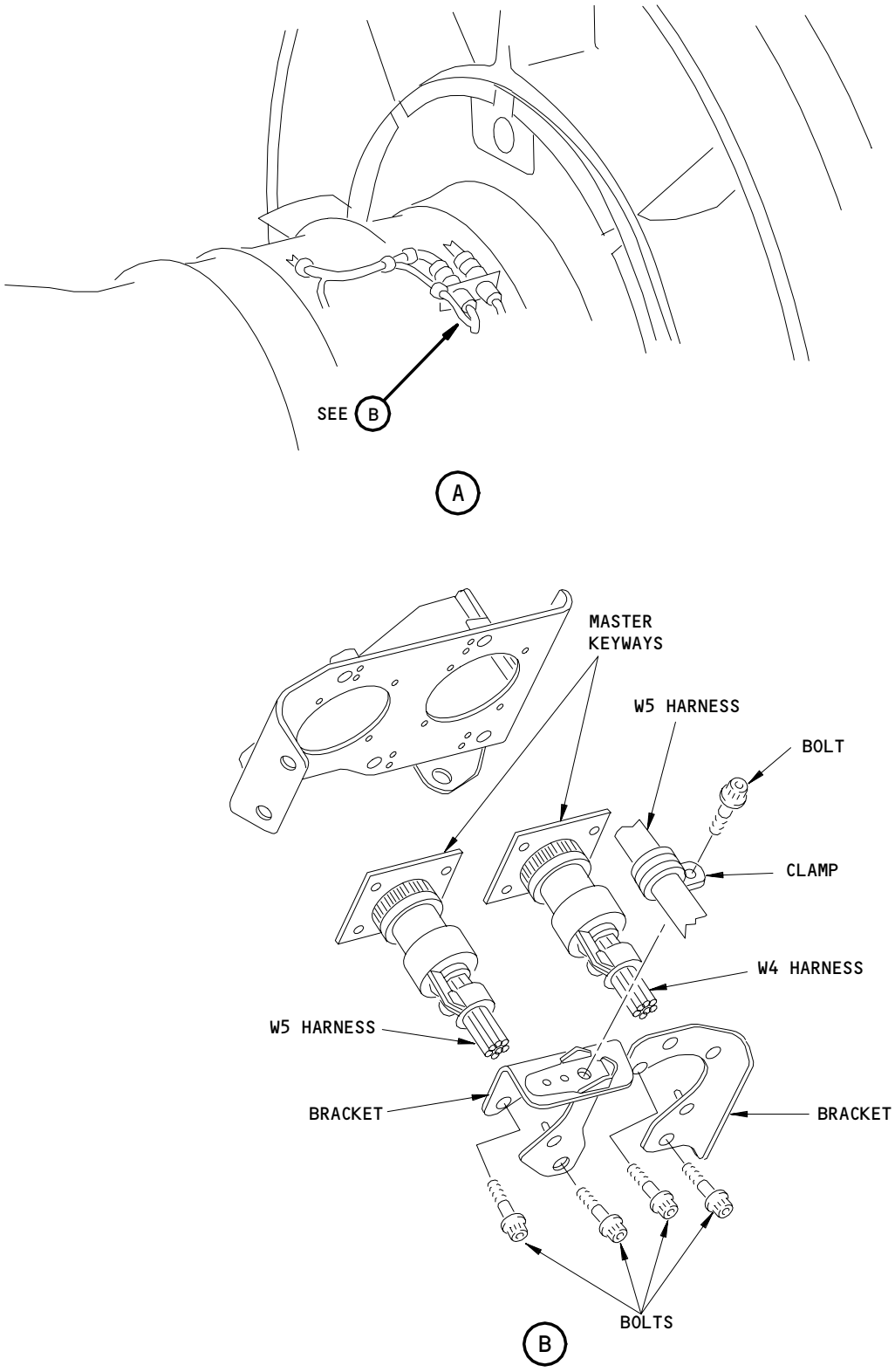
TASK 73-21-07-024-121-NO1

4. Remove the EEC Wiring Harness W4 (Fig. 402)
A. Equipment
(1) Strap Wrench TG-70
(2) Torque Adapter PWA 85749 (optional)

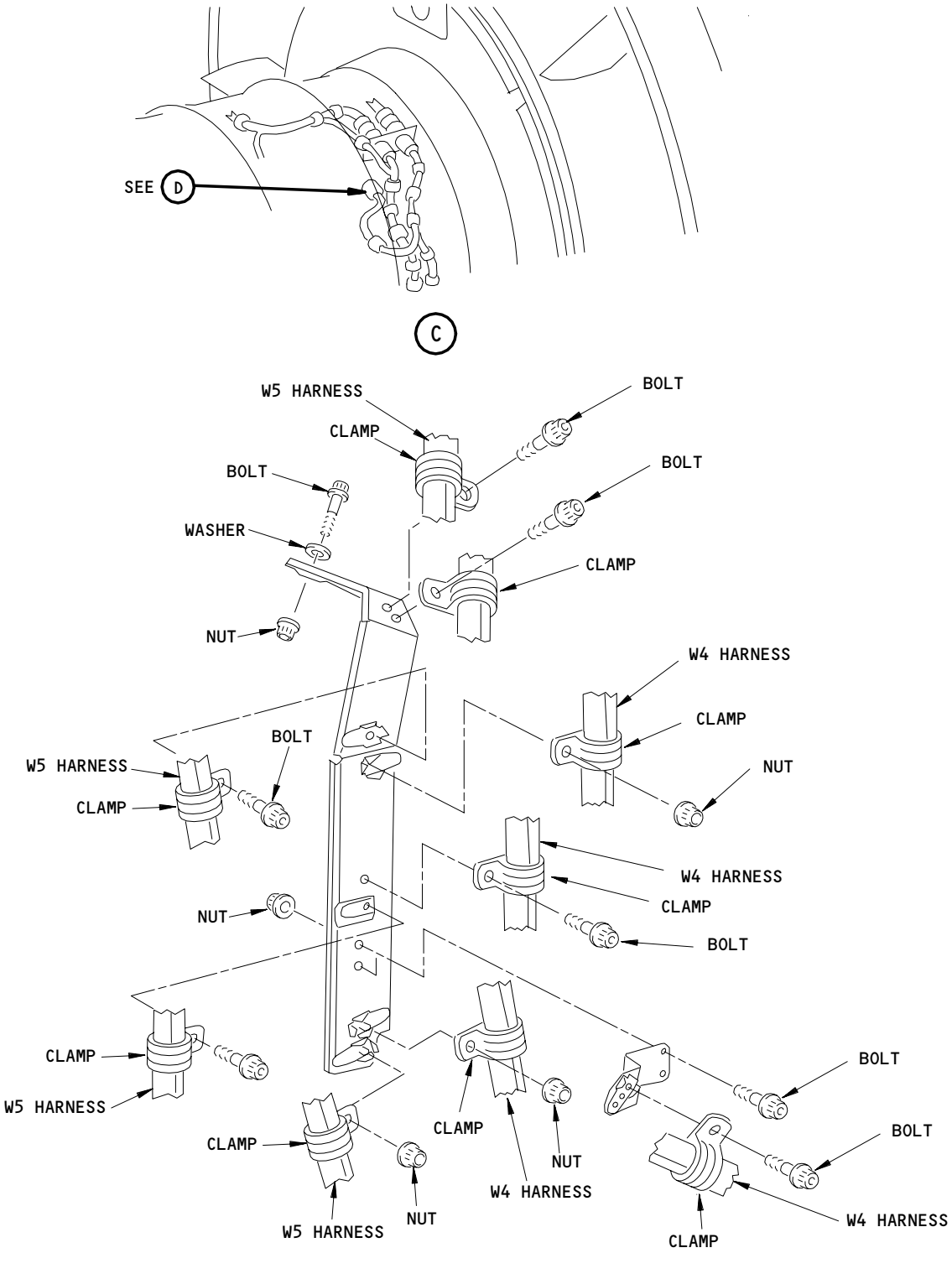


LA9300 (0000)

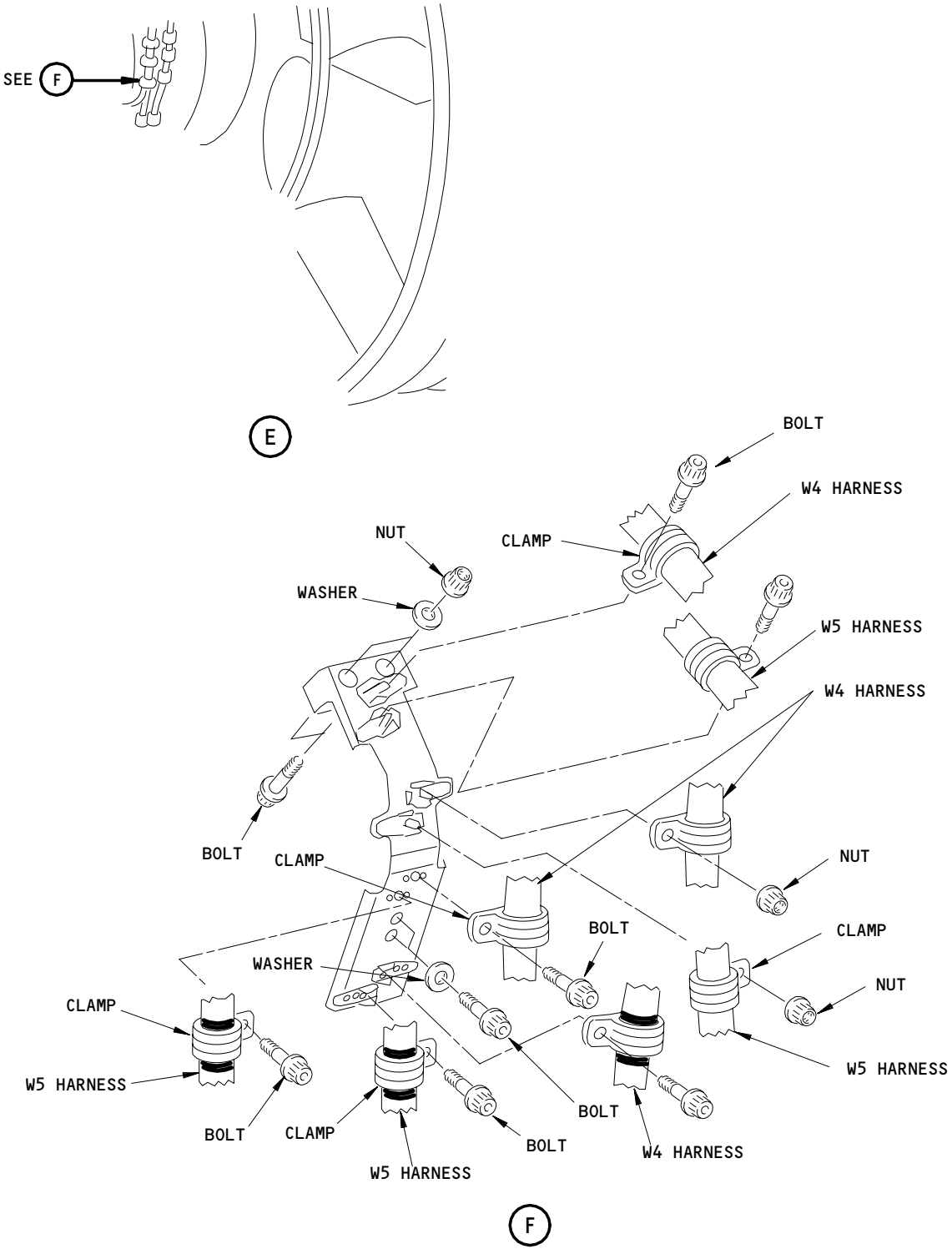
EEC Wiring Harness W4 Installation
Figure 402 (Sheet 1)



EEC Wiring Harness W4 Installation
Figure 402 (Sheet 2)



EEC Wiring Harness W4 Installation
Figure 402 (Sheet 3)

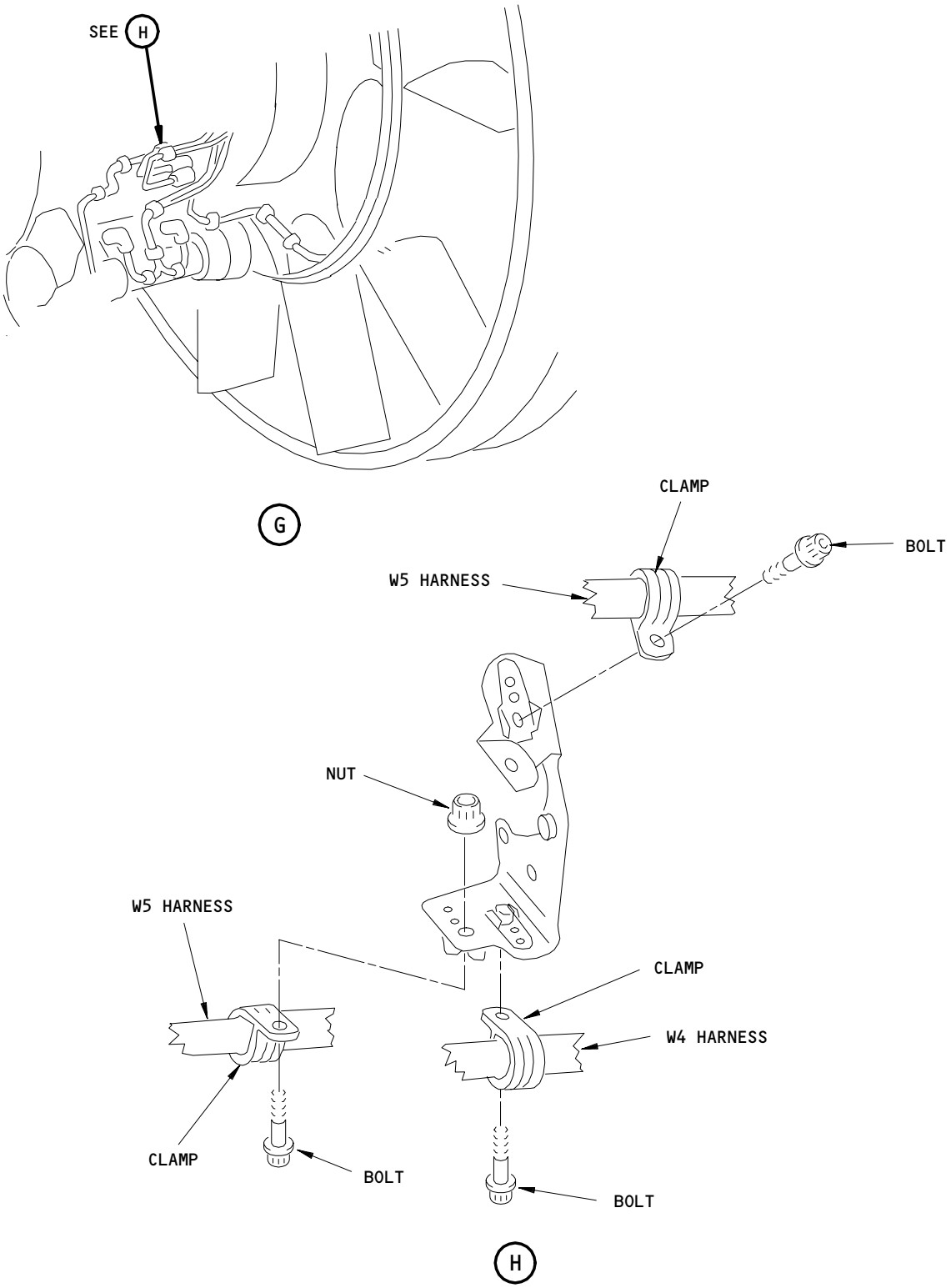


LA9302 (0000)

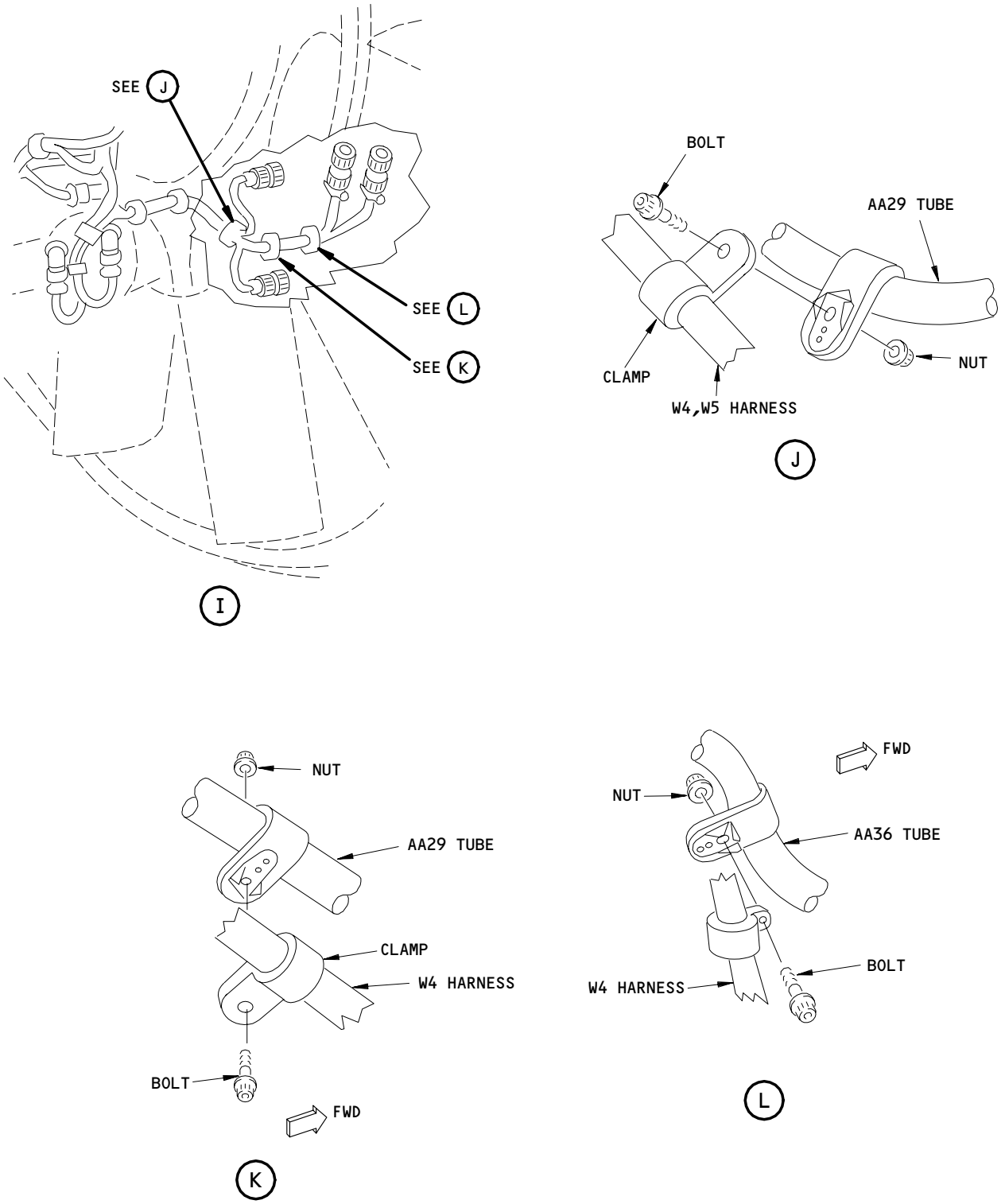
EEC Wiring Harness W4 Installation
Figure 402 (Sheet 4)

EFFECTIVITY
ENGINES WITH PHASE 3

E43276

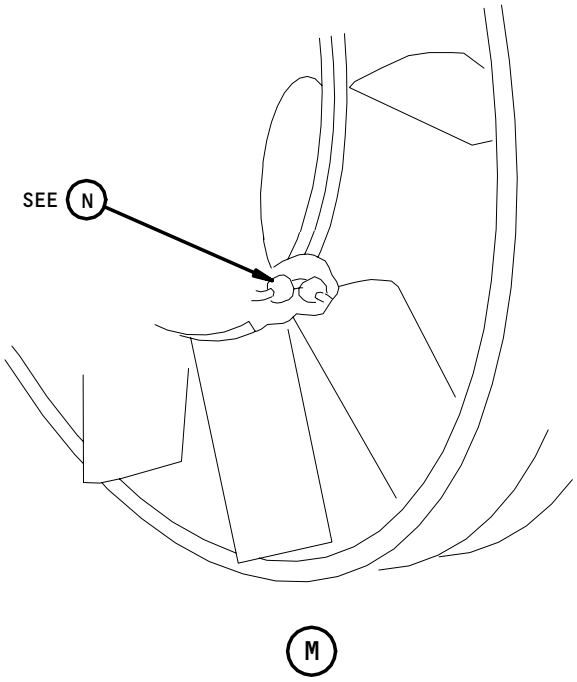


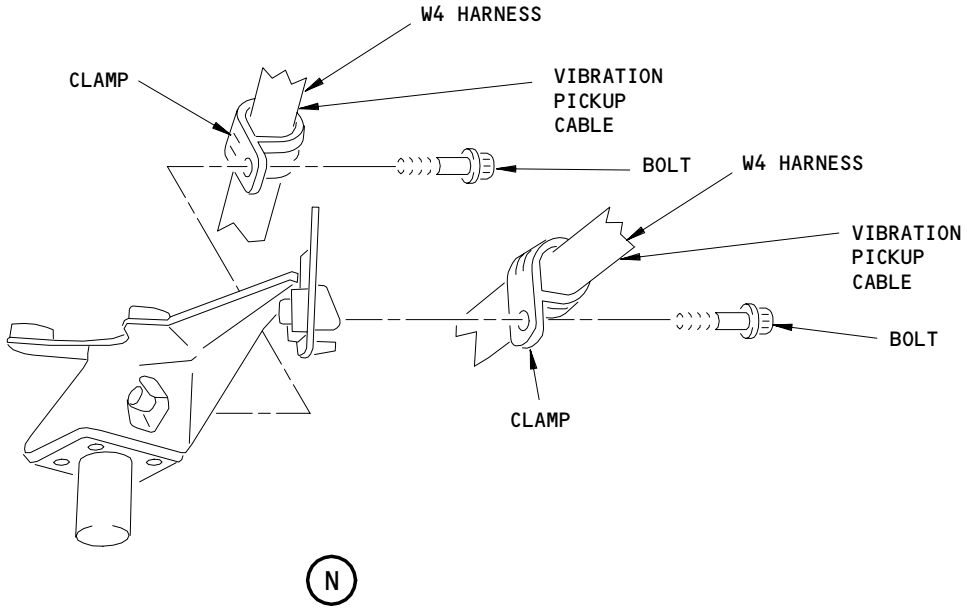
EEC Wiring Harness W4 Installation
Figure 402 (Sheet 5)



LA9306 (0000)

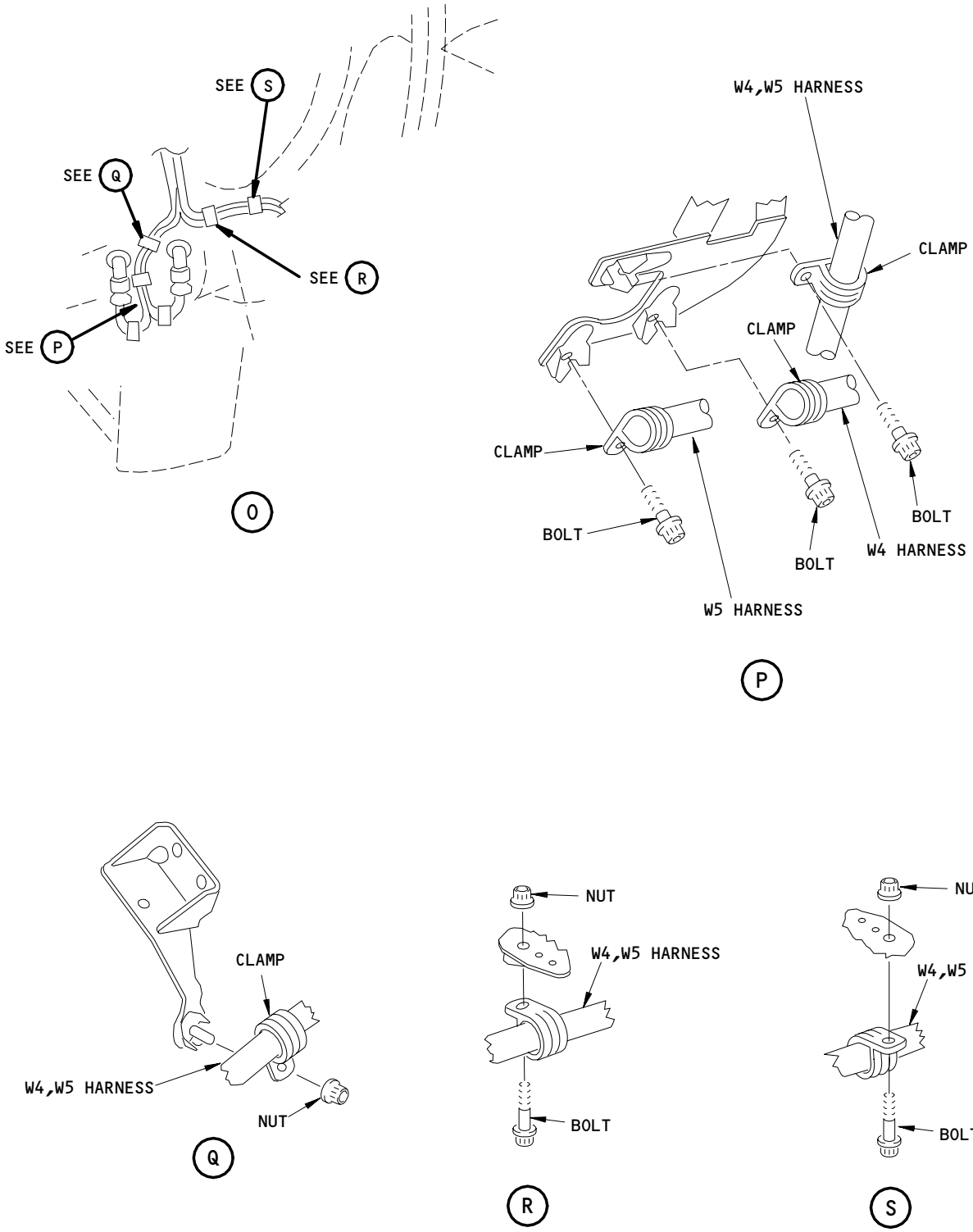
EEC Wiring Harness W4 Installation
Figure 402 (Sheet 6)





LA9307 (0000)

ECC Wiring Harness W4 Installation
Figure 402 (Sheet 7)



LA9305 (0000)

EEC Wiring Harness W4 Installation
Figure 402 (Sheet 8)

HARNESS CONNECTORS WHERE THE TORQUE ADAPTER (PWA 85749) CAN BE USED	
CONNECTOR	COMPONENT
W4P4	2.9 Bleed Valve Soleniod

B. References
(1) AMM 71-11-04/201, Fan Cowl Panels
(2) AMM 71-11-06/201, Core Cowl Panels
(3) AMM 78-31-00/201, Thrust Reverser System

C. Access
(1) Location Zones
410 No. 1 Power Plant
420 No. 2 Power Plant

(2) Access Panels
413 Fan Cowl Panel (LH)
414 Fan Cowl Panel (RH)
415 Fan Reverser (LH)
416 Fan Reverser (RH)
417 Core Cowl (LH)
418 Core Cowl (RH)
423 Fan Cowl Panel (LH)
424 Fan Cowl Panel (RH)
425 Fan Reverser (LH)
426 Fan Reverser (RH)
427 Core Cowl (LH)
428 Core Cowl (RH)

D. Prepare For Wiring Harness Removal

S 864-023-N01
(1) For the left engine, open this circuit breaker on the main power distribution panel P6 and attach DO-NOT-CLOSE tag:
(a) 6L19, PROBE HEAT L ENG

S 864-024-N01
(2) For the right engine, open this circuit breaker on the main power distribution panel P6 and attach DO-NOT-CLOSE tag:
(a) 6K25, PROBE HEAT R ENG

S 864-025-N01
(3) For the left engine, open these circuit breakers on the overhead panel P11 and attach DO-NOT-CLOSE tags:
(a) 11A10, AIR DATA CMPTR L
(b) 11L3, L ENGINE PERF SOL CHAN A
(c) 11L4, L ENGINE PERF SOL CHAN B
(d) 11M5, LEFT ENGINE EEC DISCRETES

S 864-026-N01

(4) For the right engine, open these circuit breakers on the overhead panel P11 and attach DO-NOT-CLOSE tags:
  (a) 11F30, AIR DATA CMPTR R
  (b) 11L30, R ENGINE PERF SOL CHAN A
  (c) 11L31, R ENGINE PERF SOL CHAN B
  (d) 11M32, RIGHT ENGINE EEC DISCRETES

S 864-027-N01

(5) Open this circuit breaker on the overhead panel P11 and attach DO-NOT-CLOSE tag:
  (a) 11B36, APU ENG START/ECS DISCRETES

S 014-028-N01

(6) Open the fan cowl panels (AMM 71-11-04).

S 044-029-N01

WARNING: DO THE THRUST REVERSER DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(7) Do this procedure: Thrust Reverser Deactivation for Ground Maintenance (AMM 78-31-00/201).

S 014-030-N01

(8) Open the core cowl panels (AMM 71-11-06/201).

S 014-031-N01

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(9) Open the thrust reversers (AMM 78-31-00/201).

E. Remove EEC Wiring Harness W4

S 024-184-N01

CAUTION: DO NOT TWIST OR BEND THIS HARNESS BADLY DURING REMOVAL. IF THE HARNESS IS TWISTED OR BENT BADLY, THE HARNESS CAN BE DAMAGED.

(1) Disconnect the W4J25 connector from the W1P25 connector as follows:
  (a) Find the W4J25 connector at the 1 o'clock position on the High Pressure Compressor (HPC) case.
  (b) Disconnect the W4J25 connector from the W1P25 connector.
  (c) Remove the bolts and nuts that attach the W4J25 connector to the bracket on the HPC case.
  (d) Remove the W4J25 connector from the bracket.

(e) Install protective covers on the electrical connector.

S 024-123-NO1

(2) Disconnect the W4P16 connector attached to the air valve actuator for the Turbine Case Cooling (TCC) as follows:
   (a) Find the W4P16 connector attached to the air valve actuator for the TCC.
   (b) Disconnect the W4P16 connector from the air valve actuator for the TCC.
   (c) Install protective covers on the electrical connector.

S 024-124-NO1

(3) Disconnect the W4P3 connector from the actuator for the variable stator vanes as follows:
   (a) Find the W4P3 connector at the actuator for the variable stator vanes.
   (b) Disconnect the W4P3 connector from the actuator for the variable stator vanes.
   (c) Install protective covers on the electrical connectors.

S 024-125-NO1

(4) ENGINES WITHOUT SCU's;
   Disconnect the W4P19 connector from the EEC speed transducer (N1):
   (a) Find the W4P19 connector at the EEC speed transducer (N1) on the intermediate case at the 4:30 o'clock position.
   (b) Disconnect the W4P19 connector from the EEC speed transducer (N1).
   (c) Install protective covers on the electrical connectors.

S 024-127-NO1

(5) Disconnect the W4P23 connector from the EEC speed transducer (N1).
   (a) Install protective covers on the electrical connectors.

S 024-128-NO1

(6) Disconnect the W4P2 connector from the fuel metering unit as follows:
   (a) Find the W4P2 connector on the fuel metering unit (forward connector) on the front side of fuel pump at the 5 o'clock position.
   (b) Disconnect the W4P2 connector from the fuel metering unit.
   (c) Install protective covers on the electrical connectors.

S 024-129-NO1

(7) Disconnect the W4P4 connector from the solenoid for the 2.9 bleed valve as follows:
   (a) Find the W4P4 connector on the solenoid for the 2.9 bleed valve on the intermediate case at the 5 o'clock position.

(b) Disconnect the W4P4 connector from the solenoid for the 2.9 bleed valve.

NOTE: You can use the torque adapter (PWA 85749) to disconnect the W4P4 connector.

(c) Install protective covers on the electrical connectors.

S 024-130-N01

(8) Remove the bolts, nuts, and clamps that attach the W4 harness to the brackets and tubes on the HPC case.

S 024-131-N01

(9) Remove the W4 harness from the engine.

TASK 73-21-07-404-132-N01

5. Install the EEC Wiring Harness W4 (Fig. 402)

A. Equipment

(1) Strap Wrench TG-70

(2) Torque Adapter PWA 85749 (optional)

HARNESS CONNECTORS WHERE THE TORQUE ADAPTER (PWA 85749) CAN BE USED	
CONNECTOR	COMPONENT
W4P4	2.9 Bleed Valve Soleniod

B. Consumable Materials

(1) D00137 Engine Oil - PWA 521

C. References

(1) AMM 70-24-05/201, Electrical Harnesses

(2) AMM 71-11-04/201, Fan Cowl Panels

(3) AMM 71-11-06/201, Core Cowl Panels

(4) AMM 78-31-00/201, Thrust Reverser System

D. Access

(1) Location Zones

410 No. 1 Power Plant

420 No. 2 Power Plant

(2) Access Panels

413	Fan Cowl Panel (LH)
414	Fan Cowl Panel (RH)
415	Fan Reverser (LH)
416	Fan Reverser (RH)
417	Core Cowl (LH)
418	Core Cowl (RH)
423	Fan Cowl Panel (LH)
424	Fan Cowl Panel (RH)
425	Fan Reverser (LH)
426	Fan Reverser (RH)
427	Core Cowl (LH)
428	Core Cowl (RH)

E. Install the EEC Wiring Harness W4

S 424-185-NO1

CAUTION: DO NOT TWIST OR BEND THE HARNESS BADLY DURING INSTALLATION. IF THE HARNESS IS TWISTED OR BENT BADLY, THE HARNESS CAN BE DAMAGED.

(1) Install the W4J25 connector to the bracket on the High Pressure Compressor (HPC) as follows:
   (a) Put the W4 harness on the right side of the engine.
   (b) Make sure the tracer cord is pointed outboard.
   (c) Make sure the master keyway is pointed inboard.
   (d) Remove the protective covers from the electrical connector.
   (e) Find the bracket for the W4J25 connector at the 1 o'clock position on HPC case.
   (f) Attach the W4J25 connector to the bracket.
      1) Make sure the cutout is pointed rearward.
   (g) Lubricate the bolt threads with engine oil.
   (h) Align the boltholes and install the bolts.
   (i) Tighten the bolts to 36-40 pound-inches (4.067-4.519 newton-meters).

S 424-186-NO1

CAUTION: EXAMINE THE HARNESS CONNECTORS AND THE RECEPTACLES THAT THEY CONNECT TO FOR BENT PINS AND CONTAMINATION. BENT PINS AND CONNECTOR CONTAMINATION CAN CAUSE THE HARNESS TO FAIL.

USE THE CORRECT ASSEMBLY PROCEDURE, AND TOOLS, FOR THE HARNESS CONNECTOR INSTALLATION (AMM 70-24-05/201). IF YOU USE THE INCORRECT ASSEMBLY PROCEDURE, OR TOOLS, A DAMAGED OR LOOSE CONNECTOR CAN OCCUR. A LOOSE CONNECTOR PERMITS VIBRATION, WHICH CAUSES THE CONTACTS TO WEAR AND DECREASES THE LIGHTNING PROTECTION.

(2) Connect the W4P4 connector to the solenoid for the 2.9 bleed valve as follows (AMM 70-24-05/201):
  (a) Remove the protective covers from the electrical connectors.
  (b) Find the solenoid for the 2.9 bleed valve on the intermediate case at the 5 o'clock position.
  (c) Connect the W4P4 connector to the connector on the outboard connector of the solenoid for the 2.9 bleed valve.

NOTE: You can use the torque adapter (PWA 85749) to tighten the W4P4 connector.

S 424-135-NO1

(3) Connect the W4P2 connector to the fuel metering unit as follows (AMM 70-24-05/201).
  (a) Remove the protective covers from the electrical connectors.
  (b) Find the fuel metering unit on the front side of the fuel pump at the 5 o'clock position.
  (c) Connect the W4P2 connector to the forward connector on the fuel metering unit.

S 424-137-NO1

(4) Connect the W4P23 connector to the EEC speed transducer (N1) (AMM 70-24-05/201).

S 424-138-NO1

(5) Connect the W4P19 connector to the EEC speed transducer (N1) as follows (AMM 70-24-05/201):
  (a) Remove the protective covers from the electrical connectors.
  (b) Find the EEC speed transducer (N1) on the intermediate ase at the 4:30 o'clock position.
  (c) Connect the W4P19 connector to the EEC speed transducer.

S 424-139-NO1

(6) Connect the W4P3 connector to the actuator for the variable stator vanes as follows (AMM 70-24-05/201):
  (a) Remove the protective covers from the electrical connectors.

(b) Find the actuator for the variable stator vanes at the 4 o'clock position.
(c) Connect the W4P3 connector to the lower connector on the actuator for the variable stator vanes.

S 424-140-NO1
(7) Connect the W4P16 connector to the air valve actuator for the Turbine Case Cooling (TCC) as follows (AMM 70-24-05/201):
(a) Remove the protective covers from the electrical connectors.
(b) Find the air valve actuator for the TCC at the 2 o'clock position.
(c) Connect the W4P16 connector to the air valve actuator for the TCC.

S 424-141-NO1
(8) Adjust the W4 harness to get the necessary clearances.

S 424-142-NO1
(9) Install the clamps on the harness at the tape marker locations.
(a) Make sure you can see the tape marker on both sides of the clamp.
(b) Make sure the tracer cord is pointed outboard.

S 424-143-NO1
(10) Install the clamps at all the clamp locations.

S 644-144-NO1
(11) Lubricate threads for the nuts and bolts with engine oil.

S 424-145-NO1
(12) Loosely install the bolts and nuts to the clamps for the W4 wiring harness.

S 824-146-NO1
(13) Make sure the wiring harnesses are not pulled too tightely between any two clamps.

S 824-147-NO1
(14) Make sure the wiring harness does not touch any engine parts.

S 824-148-NO1
(15) Make sure the wiring harness is not pulled too tightly where the wiring harness attaches to the connectors.

S 424-149-NO1
(16) Tighten all the nuts and bolts for the clamps on the harness to 36-40 pound-inches (4.067-4.519 newton-meters).

F. Put the Airplane Back to its Usual Condition

S 414-033-N01

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00 WHEN YOU CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Close the thrust reversers (AMM 78-31-00/201).

S 414-034-N01

(2) Close the core cowl panels (AMM 71-11-06/201).

S 444-035-N01

(3) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

S 414-036-N01

(4) Close the fan cowl panels (AMM 71-11-04/201).

S 864-037-N01

(5) For the left engine, remove DO-NOT-CLOSE tag and close this circuit breaker on the main power distribution panel P6:
(a) 6L19, PROBE HEAT L ENG

S 864-038-N01

(6) For the right engine, remove DO-NOT-CLOSE tag and close this circuit breaker on the main power distribution panel P6:
(a) 6K25, PROBE HEAT R ENG

S 864-039-N01

(7) For the left engine, remove DO-NOT-CLOSE tags and close these circuit breakers on the overhead panel P11:
(a) 11A10, AIR DATA CMPTR L
(b) 11L3, L ENGINE PERF SOL CHAN A
(c) 11L4, L ENGINE PERF SOL CHAN B
(d) 11M5, LEFT ENGINE EEC DISCRETES

S 864-040-N01

(8) For the right engine, remove DO-NOT-CLOSE tags and close these circuit breakers on the overhead panel P11:
(a) 11F30, AIR DATA CMPTR R
(b) 11L30, R ENGINE PERF SOL CHAN A
(c) 11L31, R ENGINE PERF SOL CHAN B
(d) 11M32, RIGHT ENGINE EEC DISCRETES

S 864-041-N01

(9) Remove DO-NOT-CLOSE tag and close this circuit breaker on the overhead panel P11:
(a) 11B36, APU ENG START/ECS DISCRETES

S 714-042-N01

(10) Do the test of the EEC wiring harness that is shown in the Power Plant Test Reference Table (AMM 71-00-00/501).

TASK 73-21-07-004-012-N01

6. Remove the EEC Wiring Harness W5 (Fig. 403, 404)

A. Equipment

(1) Strap Wrench TG-70

(2) Torque Adapter PWA 85749 (optional)

HARNESS CONNECTORS WHERE THE TORQUE ADAPTER (PWA 85749) CAN BE USED	
CONNECTOR	COMPONENT
W5P6	EEC Alternator (N2 Transducer)
W5P11	2.9 Bleed Valve Solenoid

B. References

(1) AMM 71-11-04/201, Fan Cowl Panels

(2) AMM 71-11-06/201, Core Cowl Panels

(3) AMM 78-31-00/201, Thrust Reverser System

C. Access

(1) Location Zones

410 No. 1 Power Plant

420 No. 2 Power Plant

(2) Access Panels

413 Fan Cowl Panel (LH)

414 Fan Cowl Panel (RH)

415 Fan Reverser (LH)

416 Fan Reverser (RH)

417 Core Cowl (LH)

418 Core Cowl (RH)

423 Fan Cowl Panel (LH)

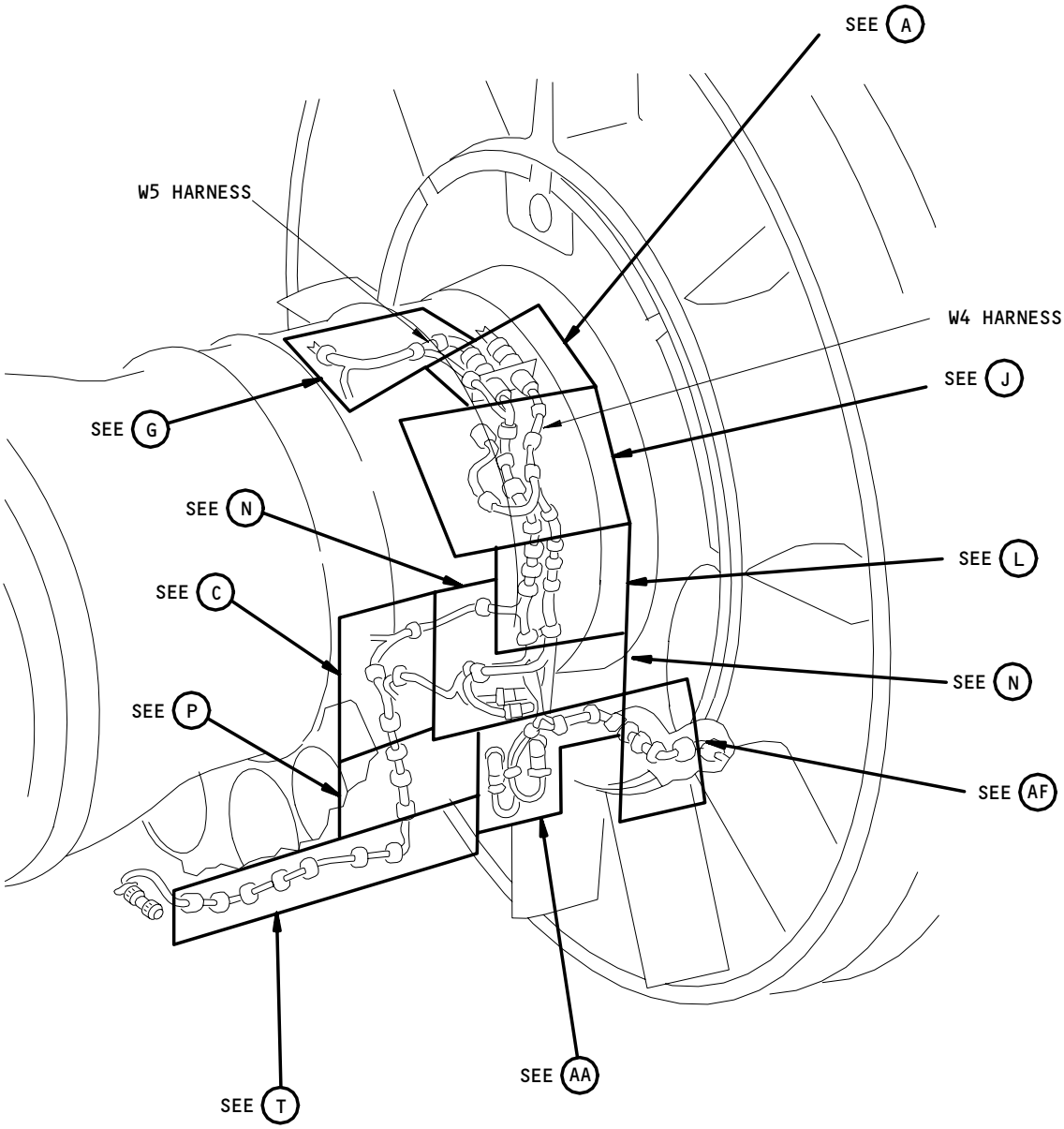
424 Fan Cowl Panel (RH)

425 Fan Reverser (LH)

426 Fan Reverser (RH)

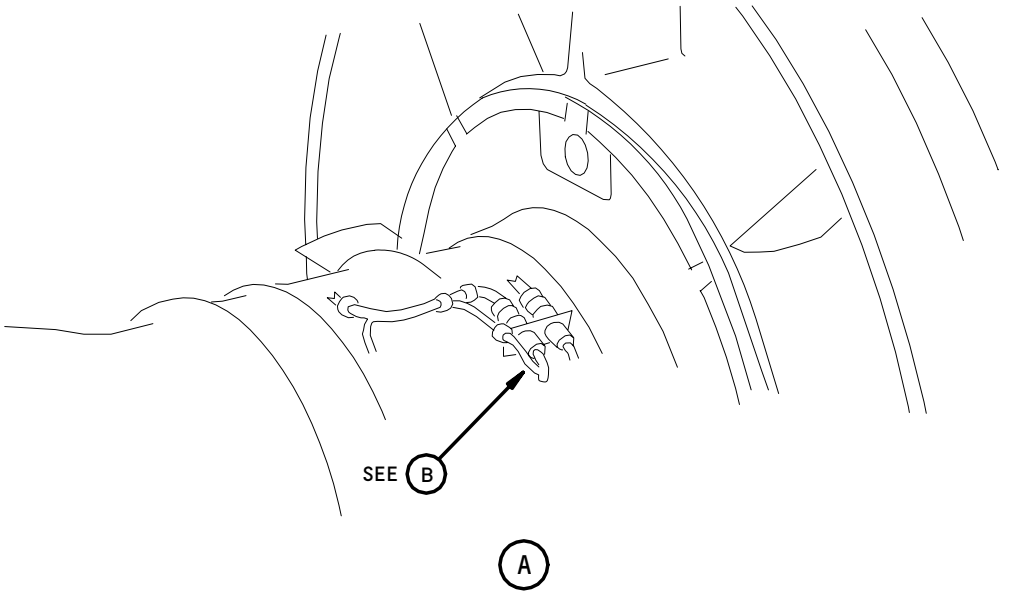
427 Core Cowl (LH)

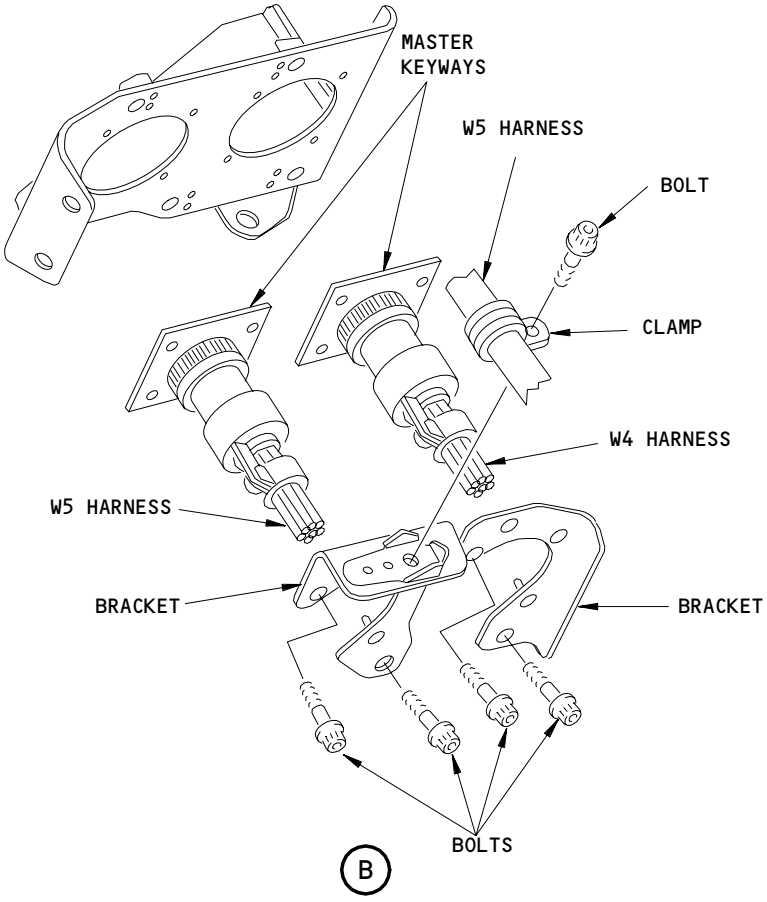
428 Core Cowl (RH)



LA9308 (0000)

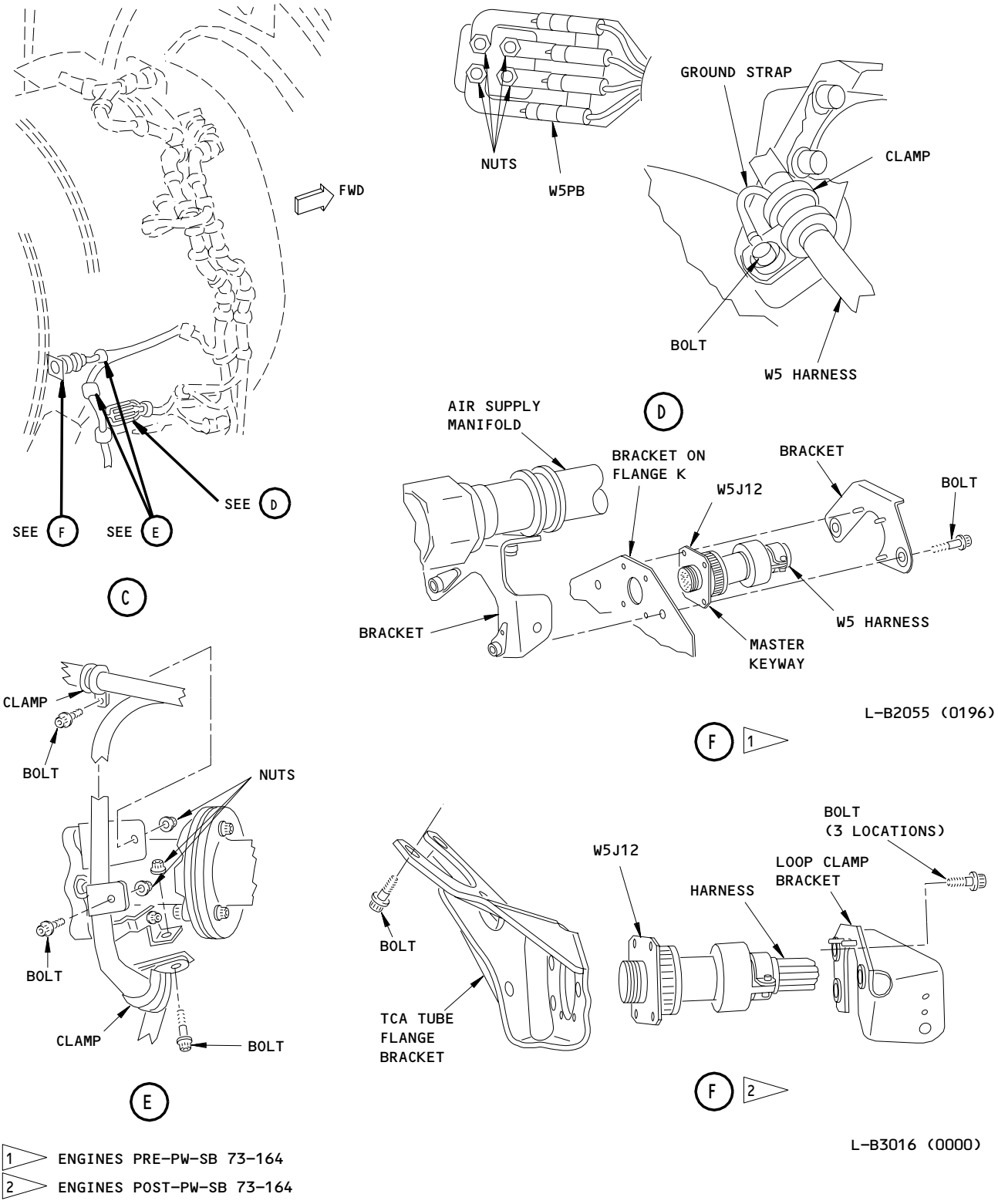
EEC Wiring Harness W5 Installation (Right Side)
Figure 403 (Sheet 1)





LA9301 (0000)

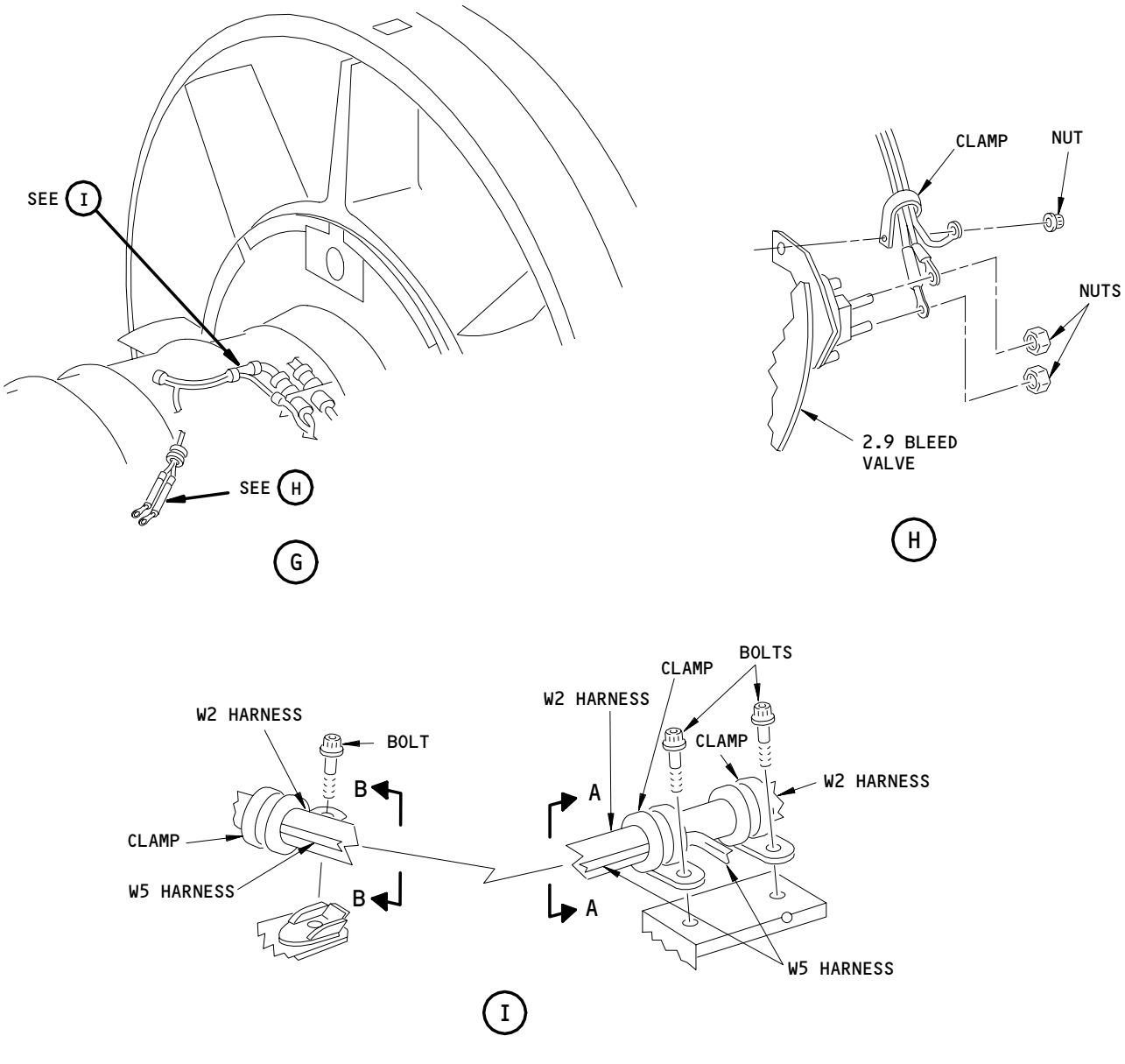
EEC Wiring Harness W5 Installation (Right Side)
Figure 403 (Sheet 2)



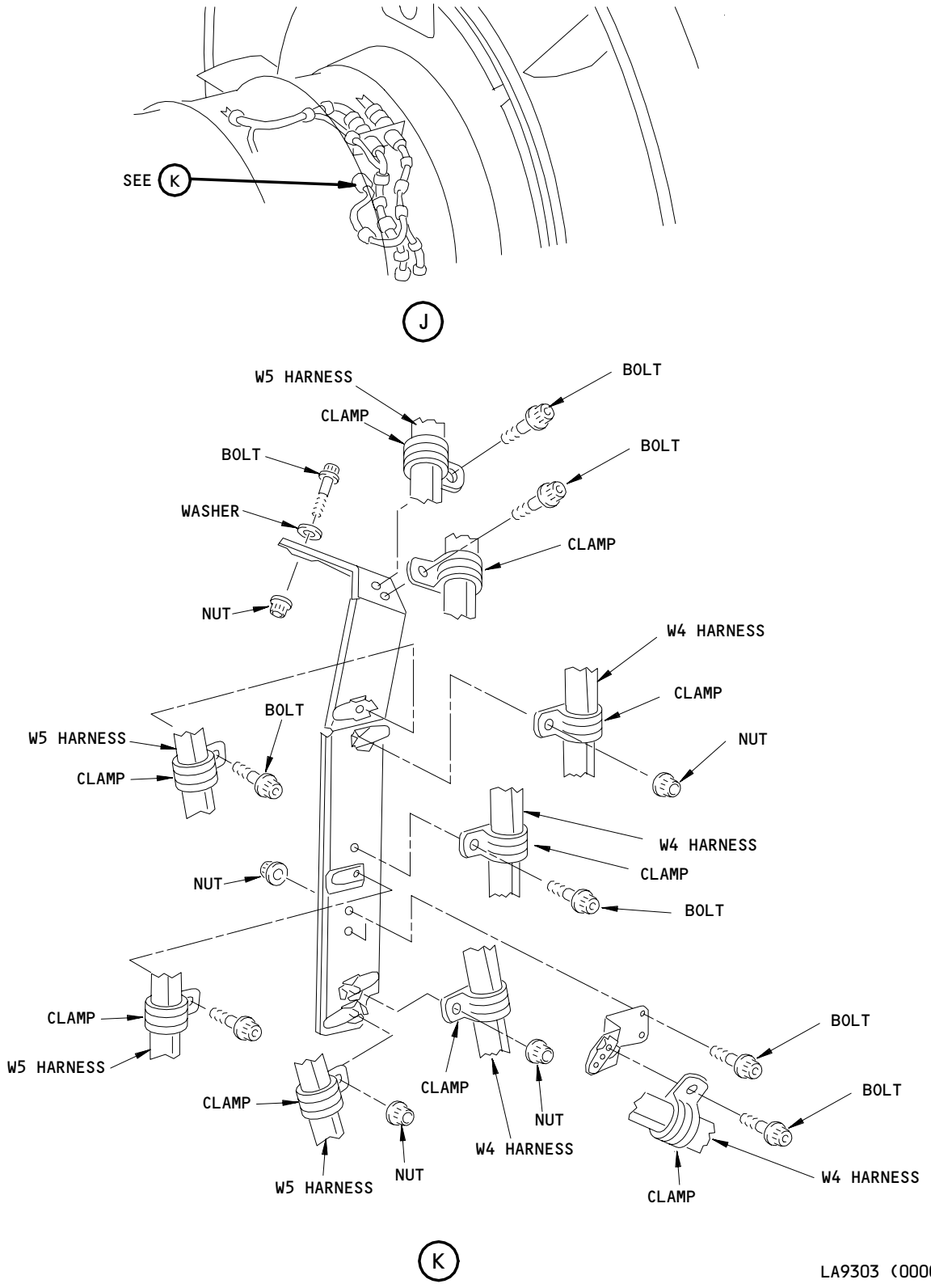
EEC Wiring Harness W5 Installation (Right Side)
Figure 403 (Sheet 3)

EFFECTIVITY
ENGINES WITH PHASE 3

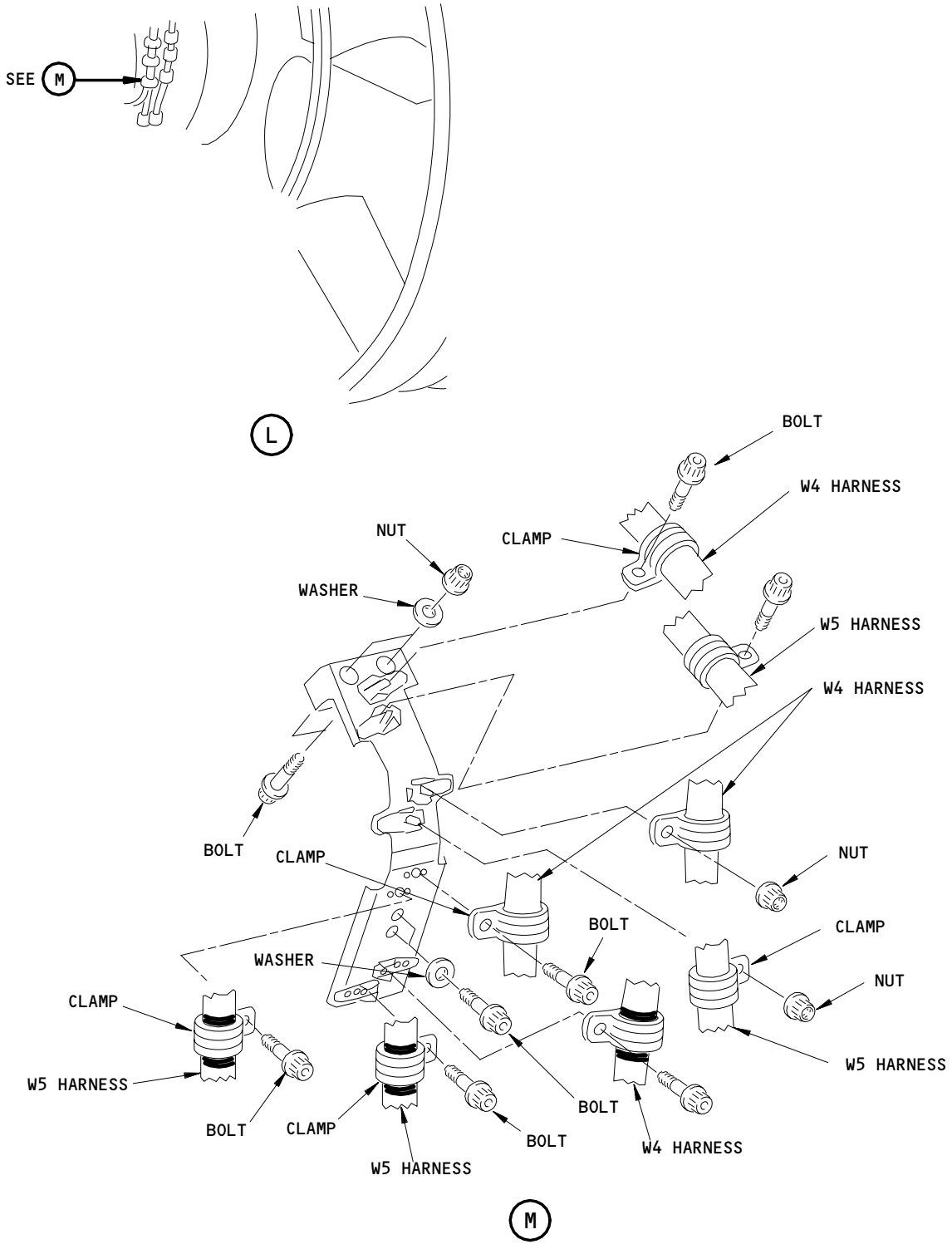
E43423



EEC Wiring Harness W5 Installation (Right Side)
Figure 403 (Sheet 4)

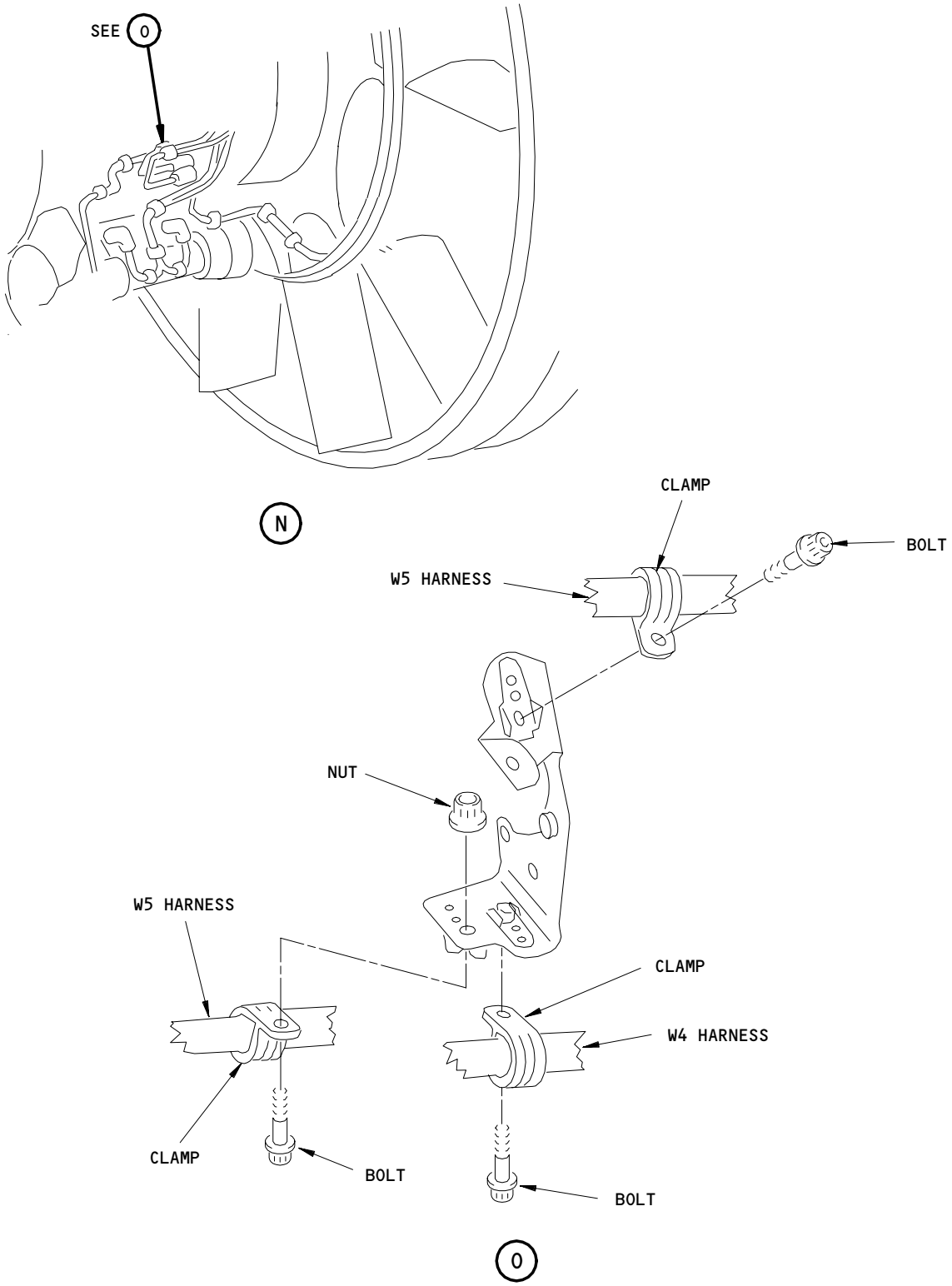


EEC Wiring Harness W5 Installation (Right Side)
Figure 403 (Sheet 5)



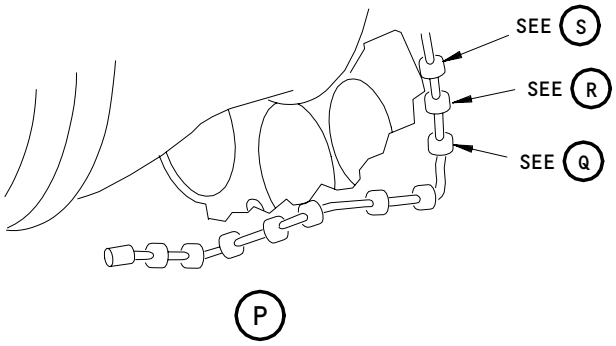
LA9302 (0000)

EEC Wiring Harness W5 Installation (Right Side)
Figure 403 (Sheet 6)

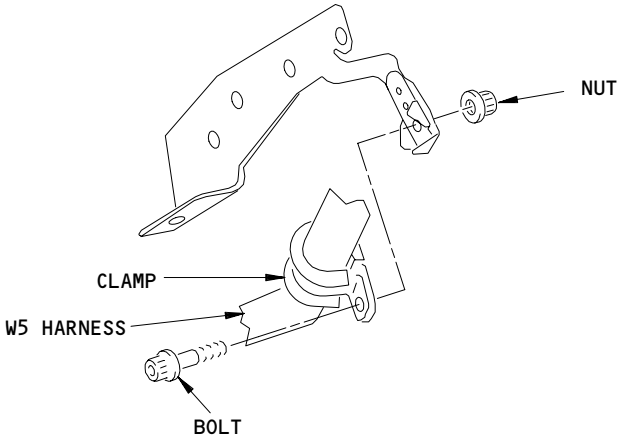


LA9304 (0000)

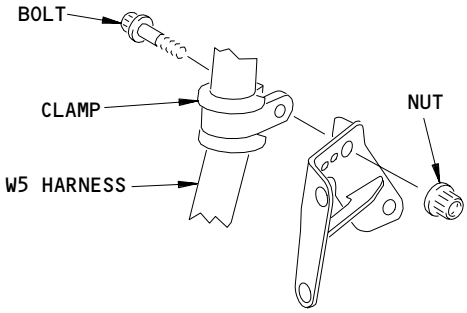
EEC Wiring Harness W5 Installation (Right Side)
Figure 403 (Sheet 7)



P



Q



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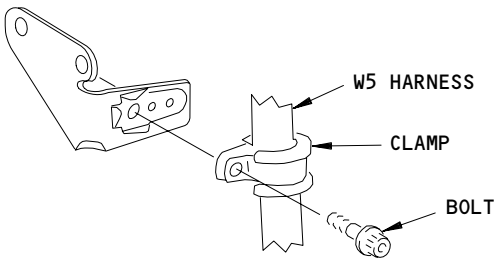


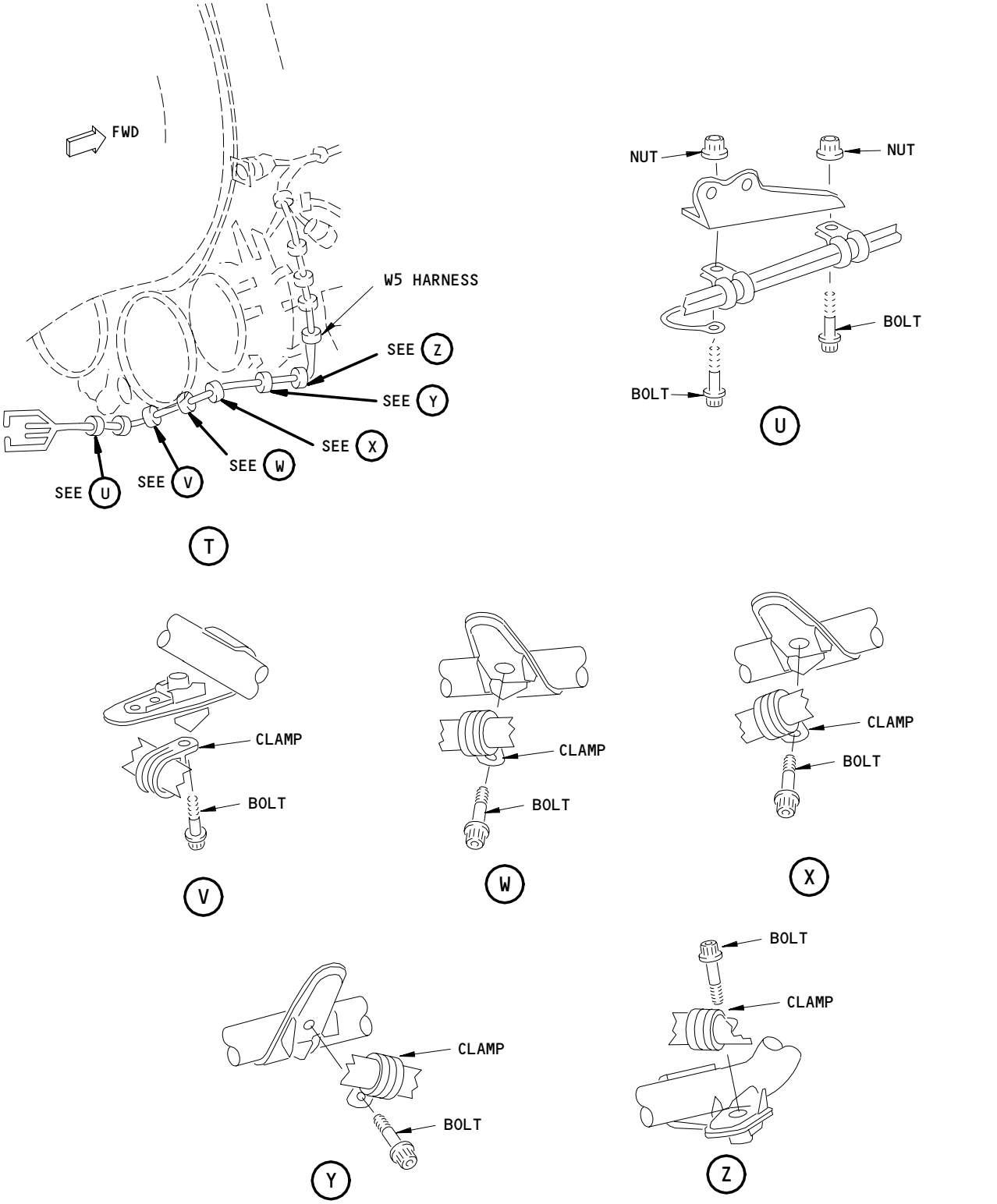
S

LA9312

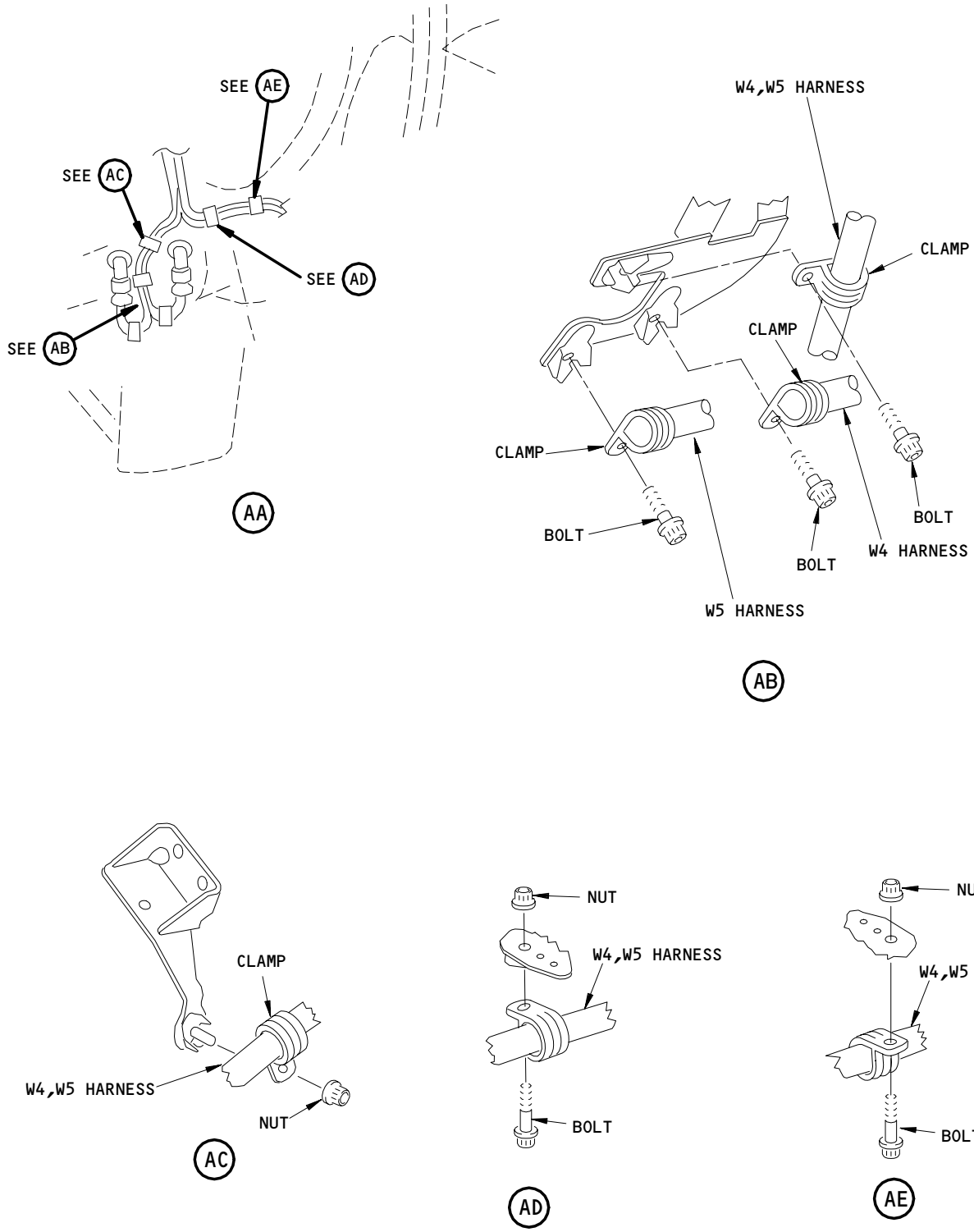
EEC Wiring Harness W5 Installation (Right Side)
Figure 403 (Sheet 8)

EFFECTIVITY
ENGINES WITH PHASE 3

E43491

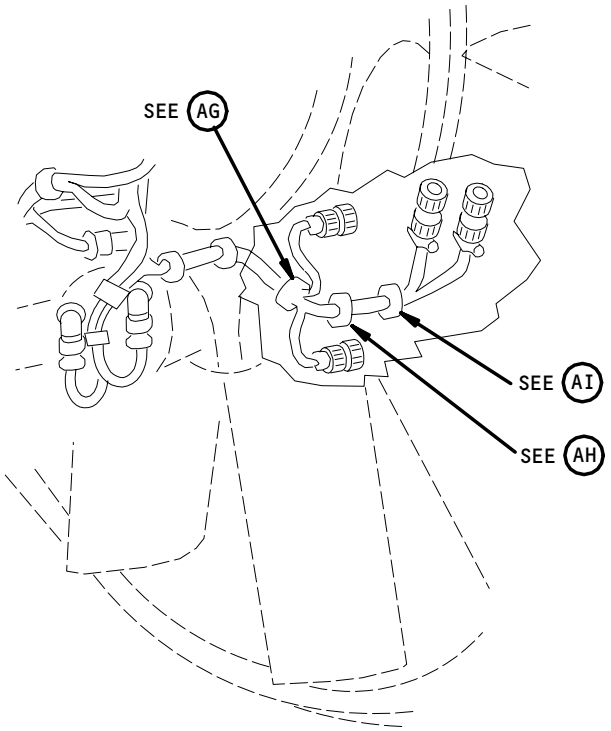


EEC Wiring Harness W5 Installation (Right Side)
Figure 403 (Sheet 9)



LA9305 (0000)

EEC Wiring Harness W5 Installation
Figure 403 (Sheet 10)



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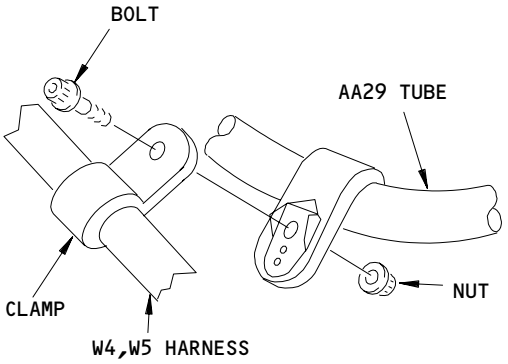

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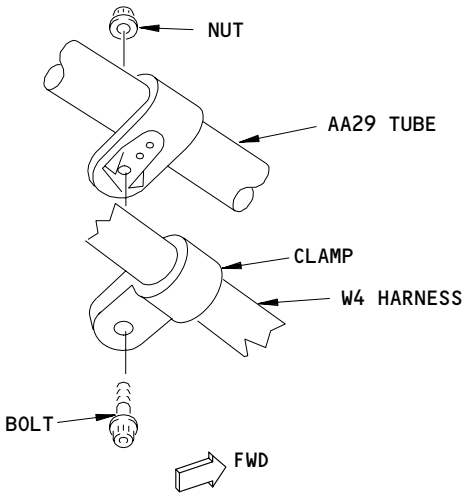

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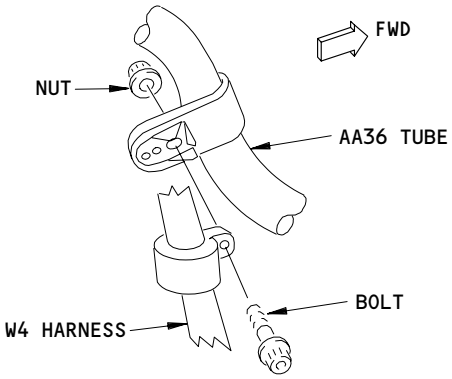
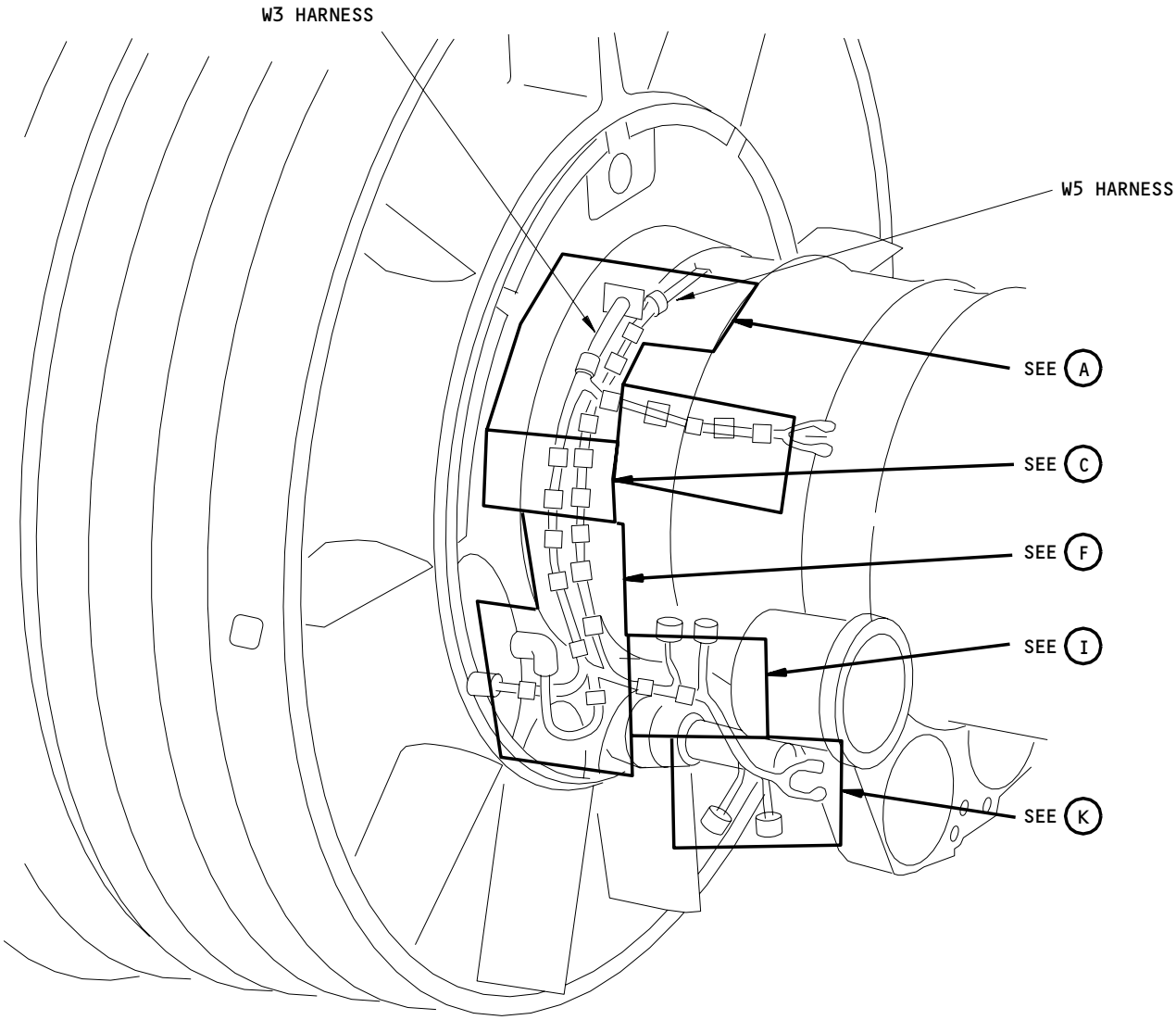


AI

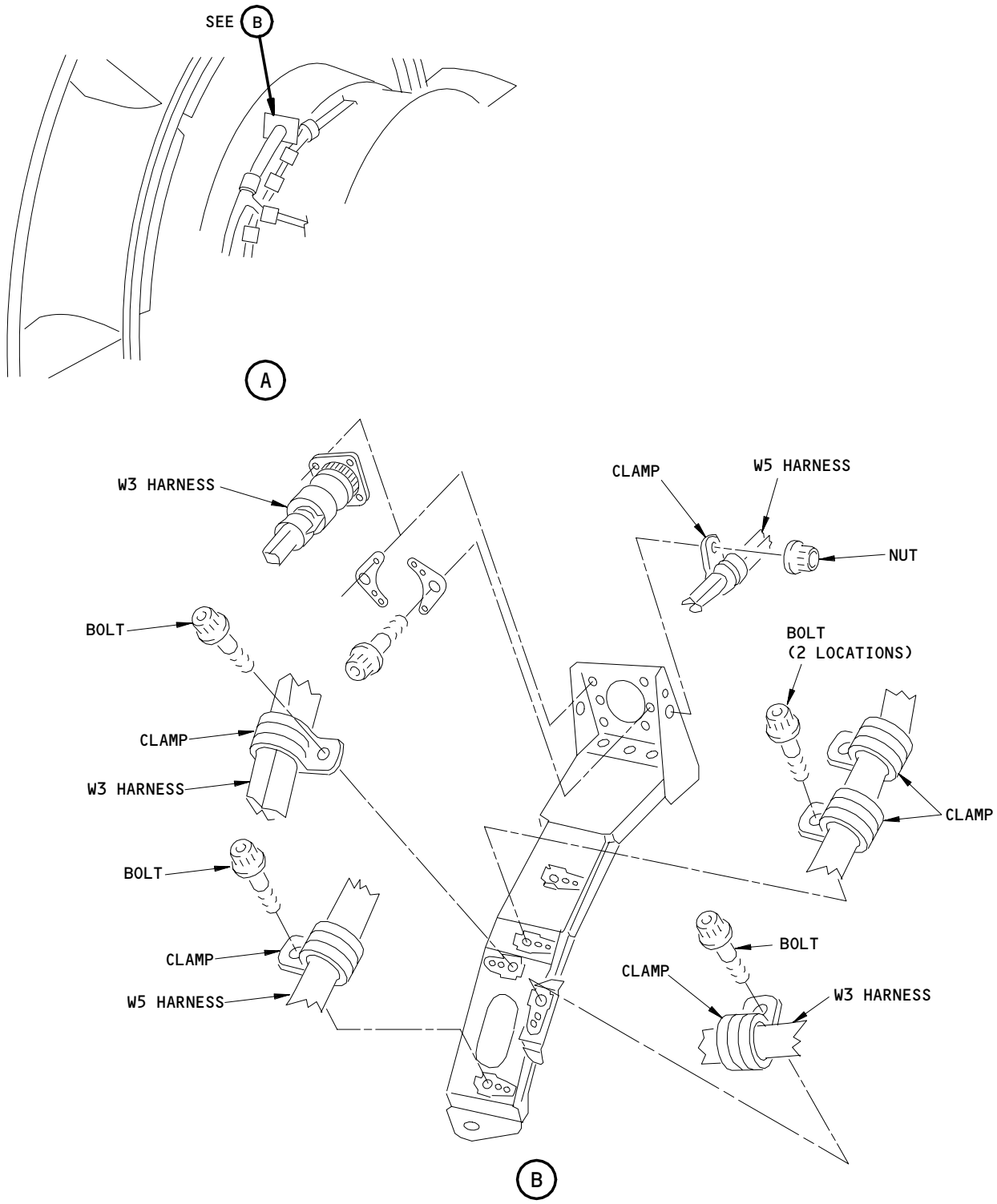
LA9306 (0000)

EEC Wiring Harness W5 Installation (Right Side)
Figure 403 (Sheet 11)



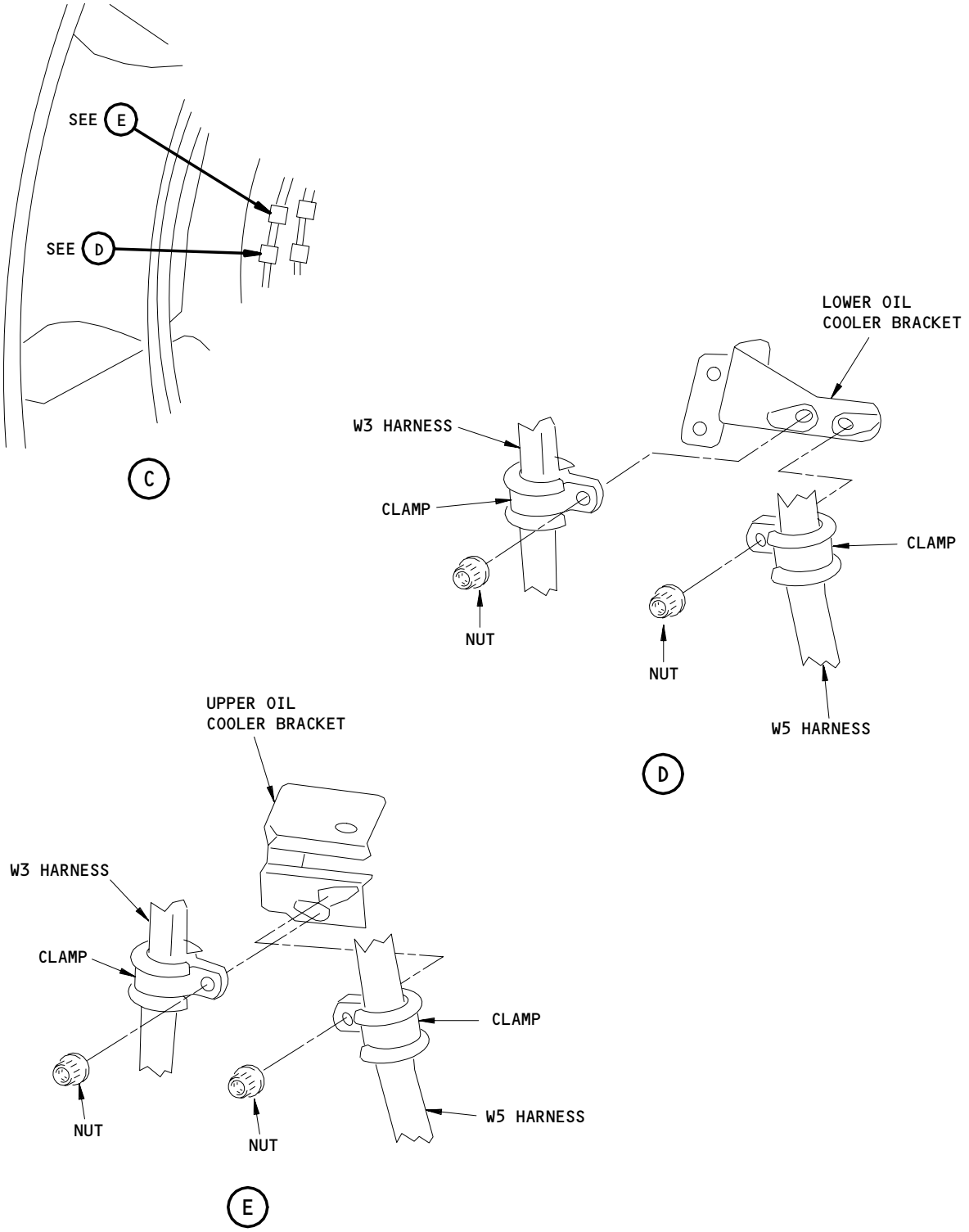
L-B2021 (0000)

EEC Wiring Harness W5 Installation (Left Side)
Figure 404 (Sheet 1)



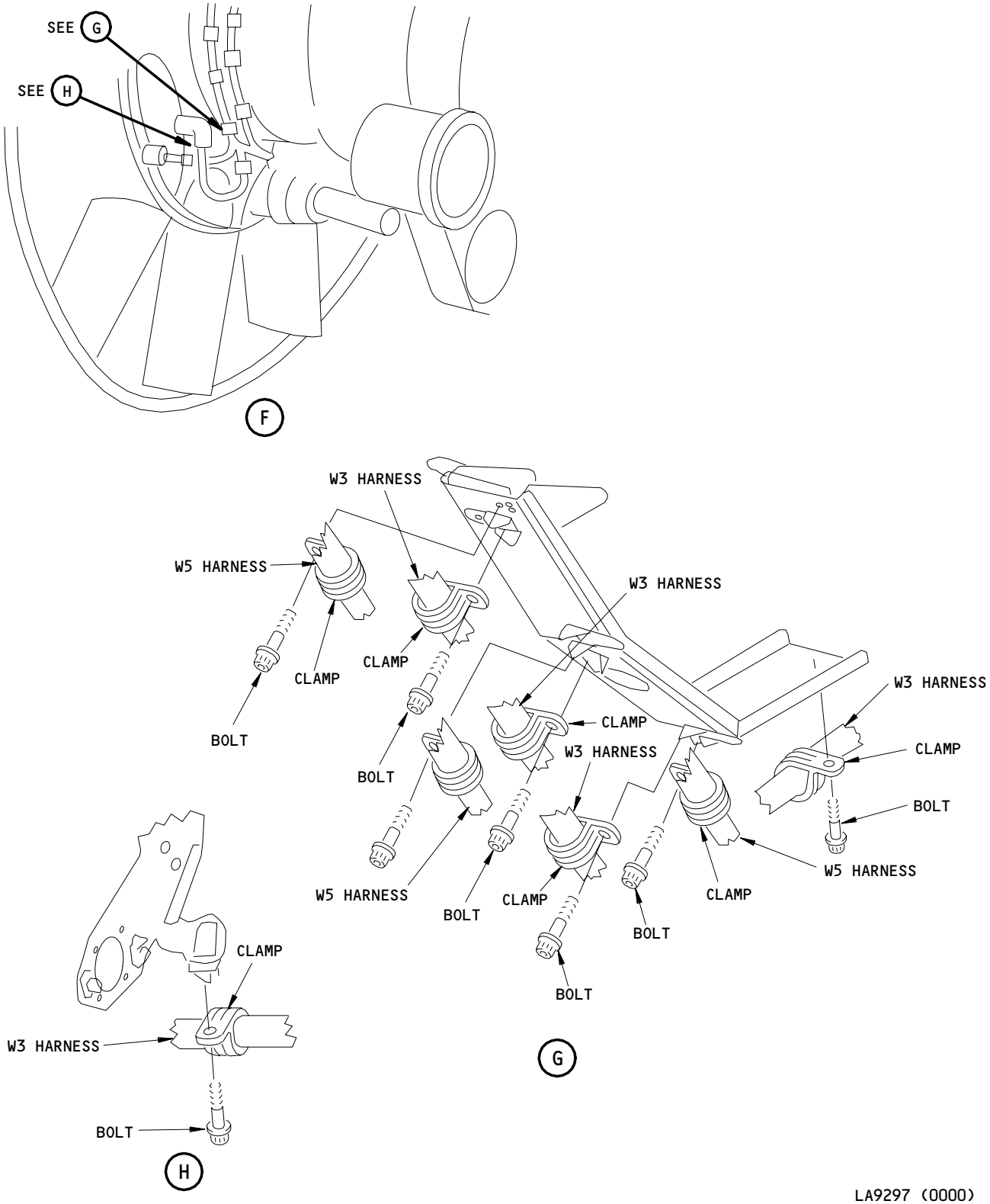
LA9294 (0000)

EEC Wiring Harness W5 Installation (Left Side)
Figure 404 (Sheet 2)



LA9296 (0000)

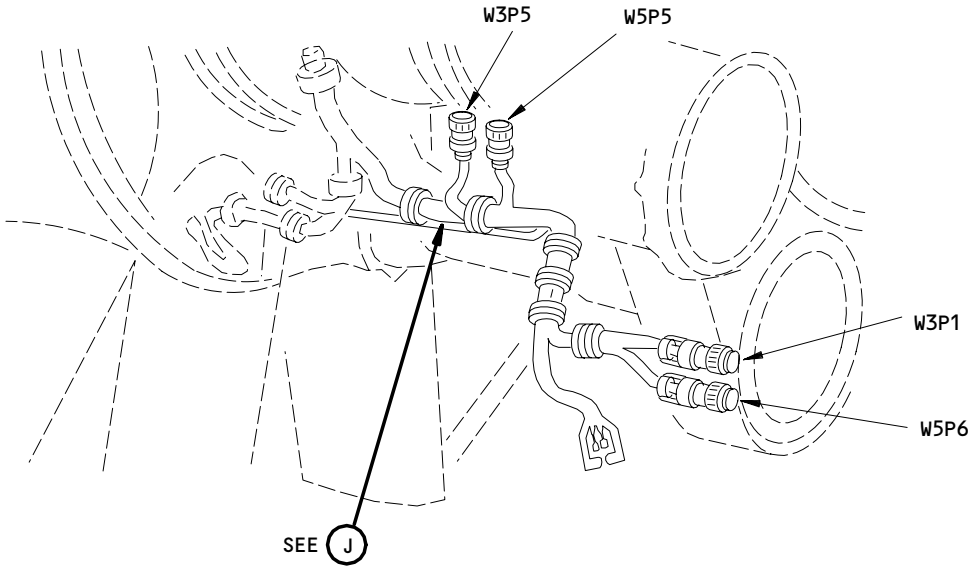
EEC Wiring Harness W5 Installation (Left Side)
Figure 404 (Sheet 3)



EEC Wiring Harness W5 Installation (Left Side)
Figure 404 (Sheet 4)

EFFECTIVITY
ENGINES WITH PHASE 3

E43172



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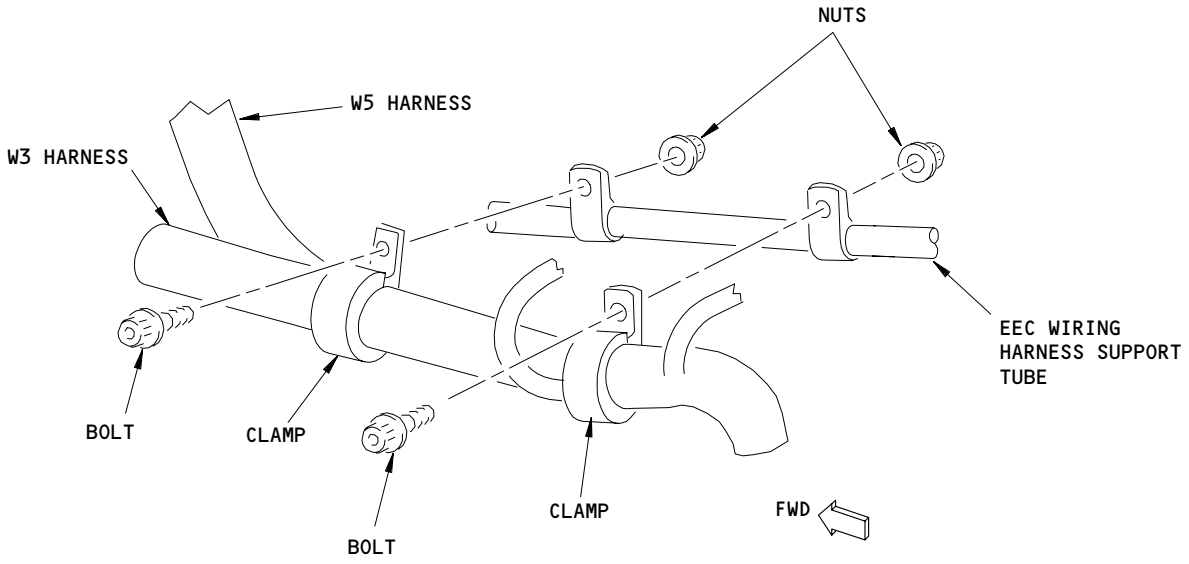
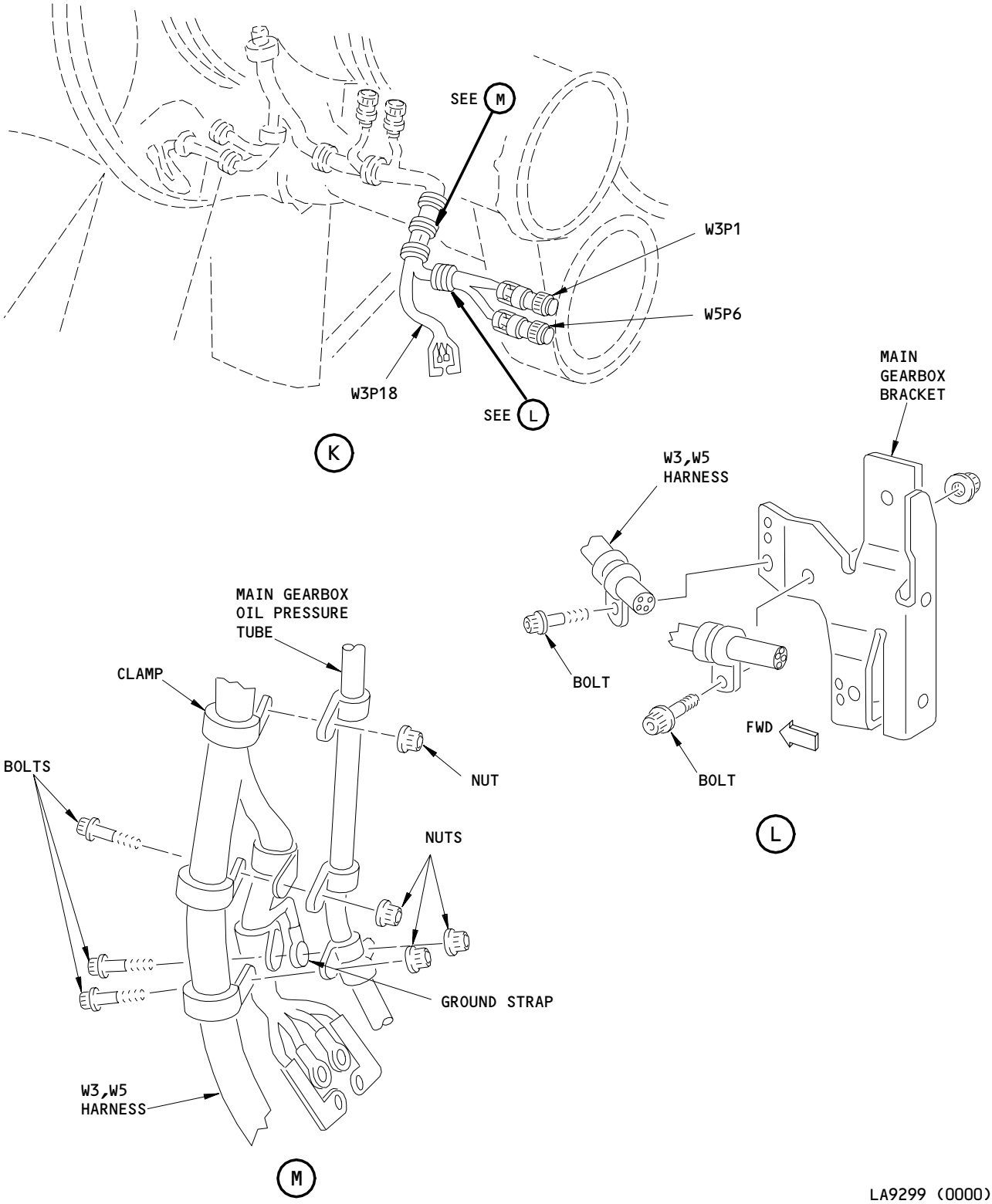


J

LA9298 (0000)

EEC Wiring Harness W5 Installation (Left Side)
Figure 404 (Sheet 5)



LA9299 (0000)

EEC Wiring Harness W5 Installation (Left Side)
Figure 404 (Sheet 6)

D. Prepare For Wiring Harness Removal

S 864-043-NO1

(1) For the left engine, open this circuit breaker on the main power distribution panel P6 and attach DO-NOT-CLOSE tag:
(a) 6L19, PROBE HEAT L ENG

S 864-044-NO1

(2) For the right engine, open this circuit breaker on the main power distribution panel P6 and attach DO-NOT-CLOSE tag:
(a) 6K25, PROBE HEAT R ENG

S 864-045-NO1

(3) For the left engine, open these circuit breakers on the overhead panel P11 and attach DO-NOT-CLOSE tags:
(a) 11A10, AIR DATA CMPTR L
(b) 11L3, L ENGINE PERF SOL CHAN A
(c) 11L4, L ENGINE PERF SOL CHAN B
(d) 11M5, LEFT ENGINE EEC DISCRETES

S 864-046-NO1

(4) For the right engine, open these circuit breakers on the overhead panel P11 and attach DO-NOT-CLOSE tags:
(a) 11F30, AIR DATA CMPTR R
(b) 11L30, R ENGINE PERF SOL CHAN A
(c) 11L31, R ENGINE PERF SOL CHAN B
(d) 11M32, RIGHT ENGINE EEC DISCRETES

S 864-047-NO1

(5) Open this circuit breaker on the overhead panel P11 and attach DO-NOT-CLOSE tag:
(a) 11B36, APU ENG START/ECS DISCRETES

S 014-048-NO1

(6) Open the fan cowl panels (AMM 71-11-04/201).

S 044-049-NO1

WARNING: DO THE THRUST REVERSER DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(7) Do this procedure: Thrust Reverser Deactivation for Ground Maintenance (AMM 78-31-00/201).

S 014-050-NO1

(8) Open the core cowl panels (AMM 71-11-06/201).

S 014-051-N01

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(9) Open the thrust reversers (AMM 78-31-00/201).

E. Remove the EEC Wiring Harness W5

S 024-152-N01

CAUTION: DO NOT TWIST OR BEND THE HARNESS BADLY DURING REMOVAL. IF THE HARNESS IS TWISTED OR BENT BADLY, THE HARNESS CAN BE DAMAGED.

(1) Disconnect the W5J26 connector from the W2P26 connector as follows:
   (a) Find the W5J26 connector located at the 1:00 o'clock position on the High Pressure Compressor (HPC) case.
   (b) Disconnect the W5J26 connector from the W2P26 connector.
   (c) Remove the bolts and nuts that attach the W5J26 connector to the bracket.
   (d) Disconnect the W6P12 harness connector from the W5J12 harness connector located on Flange K at the 3:30 o'clock position.
   (e) Remove the W5J26 connector from the bracket.
   (f) Install protective covers on the electrical connectors.

S 024-151-N01

(2) Disconnect the W5P5 connector from the bypass valve solenoid for the fuel/oil cooler as follows:
   (a) Find the W5P5 connector on the bypass valve solenoid for the fuel/oil cooler at the 8 o'clock position.
   (b) Disconnect the W5P5 connector from the bypass valve solenoid for the fuel/oil cooler.
   (c) Install protective covers on the electrical connectors.

S 024-187-N01

(3) Disconnect the W5P6 connector from the EEC alternator as follows:
   (a) Find the W5P6 connector on the bottom side of the gearbox at the 7 o'clock position.
   (b) Disconnect the W5P6 connector from the EEC alternator connector.

      NOTE: You can use the torque adapter (PWA 85749) to disconnect the W5P6 connector.

   (c) Install protective covers on the electrical connectors.

S 024-153-NO1

(4) Disconnect the W5P7 connector from the actuator for the variable stator vanes as follows:
   (a) Find the W5P7 connector on the actuator for the variable stator vanes at the 4 o'clock position.
   (b) Disconnect the W5P7 connector from the actuator for the variable stator vanes.
   (c) Install protective covers on the electrical connectors.

S 024-154-NO1

(5) Disconnect the W5P11 connector from the solenoid for the 2.9 bleed valves as follows:
   (a) Find the W5P11 connector at the solenoid for the 2.9 bleed valve on the intermediate case at the 5 o'clock position.
   (b) Disconnect the W5P11 connector from the solenoid for the 2.9 bleed valve.

      NOTE: You can use the torque adapter (PWA 85749) to disconnect the W5P11 connector.

   (c) Install protective covers on the electrical connectors.

S 024-188-NO1

(6) Disconnect the W5P1 connector from the fuel metering unit as follows:
   (a) Find the W5P1 connector at the fuel metering unit on the front side of the fuel pump at the 5 o'clock position.
   (b) Disconnect the W5P1 connector from the fuel metering unit.
   (c) Install protective covers on the electrical connectors.

S 024-189-NO1

(7) Disconnect the W5P8 connector from the thermocouple probe for the EEC fuel temperature a follows:
   (a) Find the W5P8 connector at the thermocouple probe for the EEC fuel temperature on the fuel pump housing at the 4:30 o'clock position.
   (b) Disconnect the W5P8 connector from the thermocouple probe for the EEC fuel temperature.
   (c) Install protective covers on the electrical connectors.

S 024-155-NO1

(8) Disconnect the W5P13 connector from the temperature sensor for the No. 3 bearing oil as follows:
   (a) Find the W5P13 connector at the temperature sensor on the No. 3 bearing oil scavenge manifold at the 5:30 o'clock position.
   (b) Disconnect the W5P13 connector from the temperature sensor.
   (c) Install protective covers on the electrical connectors.

S 024-156-N01

(9) Disconnect the T2.95 connector from the thermocouple probe for the 2.9 bleed valve.
  (a) Find the T2.95 connector at the thermocouple probe for the 2.9 bleed valve on the right bleed valve at the 1:00 o'clock position.
  (b) Disconnect the T2.95 connector from the thermocouple probe.
  (c) Install protective covers on the electrical connectors.

S 024-157-N01

(10) Remove the bolts, nuts, and clamps that attach the W5 harness to the brackets and tubes on the HPC case and gearbox.

S 024-158-N01

(11) Remove the W5 harness from the engine.

TASK 73-21-07-404-159-N01

7. Install the EEC Wiring Harness W5 (Fig. 403, 404)

A. Equipment
  (1) Strap Wrench TG-70
  (2) Torque Adapter PWA 85749 (optional)

HARNESS CONNECTORS WHERE THE TORQUE ADAPTER (PWA 85749) CAN BE USED	
CONNECTOR	COMPONENT
W5P6	EEC Alternator (N2 Transducer)
W5P11	2.9 Bleed Valve Solenoid

B. Consumable Materials
  (1) D00137 Engine Oil - PWA 521
  (2) G01505 Lockwire, AS3214-01

C. References
  (1) AMM 70-24-05/201, Electrical Harnesses
  (2) AMM 71-11-04/201, Fan Cowl Panels
  (3) AMM 71-11-06/201, Core Cowl Panels
  (4) AMM 78-31-00/201, Thrust Reverser System

D. Access
  (1) Location Zones
    410 No. 1 Power Plant
    420 No. 2 Power Plant

(2) Access Panels

413	Fan Cowl Panel (LH)
414	Fan Cowl Panel (RH)
415	Fan Reverser (LH)
416	Fan Reverser (RH)
417	Core Cowl (LH)
418	Core Cowl (RH)
423	Fan Cowl Panel (LH)
424	Fan Cowl Panel (RH)
425	Fan Reverser (LH)
426	Fan Reverser (RH)
427	Core Cowl (LH)
428	Core Cowl (RH)

E. Install the EEC Wiring Harness W5

S 424-190-NO1

CAUTION: DO NOT TWIST OR BEND THE HARNESS BADLY DURING REMOVAL. IF THE HARNESS IS TWISTED BADLY, THE HARNESS CAN BE DAMAGED.

(1) Install the W5 harness on the left and right side of the engine.
   (a) Find the bracket for the W5J26 connector at the 1:00 o'clock position on the HPC case.
   (b) Remove the protective covers from the electrical connector.
   (c) Temporarily attach the W5J26 connector flange to the bracket with a lockwire.
   (d) Install protective cover on the W5J26 connector.
   (e) Find the sections of the W5 harness that are attached to the connectors that follow: W5P1, W5P7, W5P8, W5P11, and W5J12.
   (f) Put these sections of the W5 harness over the top and let them hang down the right side of the engine.
   (g) Remove the protective cover from W5J26 connector.
   (h) Remove the lockwire that attaches the W5J26 connector flange to the bracket.
   (i) Attach the W5J26 connector to the bracket.
      1) Make sure the angle points forward and cutout points inboard.
      2) Make sure the tracer cord is pointed outboard.
   (j) Lubricate bolt threads with engine oil.
   (k) Align the bolthole and install bolts.
   (l) Tighten the bolts to 36-40 pound-inches (4.067-4.519 newton-meters).

S 424-161-NO1

(2) Attach the W5J12 connector to the bracket on the HPC case as follows:
   (a) Remove protective covers from the connectors.
   (b) Find the bracket at 3:30 o'clock position on flange K.

(c) Attach the W5J12 connector to the bracket.
1) Make sure the angle points forward and cutout points inboard.
2) Make sure the master keyway is pointed inboard.
(d) Lubricate bolts with engine oil.
(e) Align the bolt holes and install the bolts.
(f) Tighten the bolts to 36-40 pound-inches (4.067-4.519 newton-meters).

F. ENGINES PRE-PW-SB 73-84;
Connect the thermocouples:

S 424-191-NO1

CAUTION: USE THE CORRECT ASSEMBLY PROCEDURE AND TOOLS FOR THE HARNESS CONNECTOR INSTALLATION (AMM 70-24-05/201). IF YOU USE THE INCORRECT ASSEMBLY PROCEDURE, OR TOOLS, A DAMAGE OR LOOSE CONNECTOR CAN OCCUR. A LOOSE CONNECTOR PERMITS VIBRATION, WHICH CAUSES THE CONTACTS TO WEAR AND DECREASES THE LIGHTNING PROTECTION.

(1) Connect the T2.95 connector to the thermocouple probe for the 2.9 bleed valve as follows (AMM 70-24-05/201):
(a) Find the T2.95 connector on the right bleed valve located at 1 o'clock position.
(b) Remove the protective covers from the electrical connector.
(c) Connect the T2.95 connector to the thermocouple probe for the 2.9 bleed valve.

S 424-163-NO1
(2) Connect the W5P13 connector to the temperature sensor for the No. 3 bearing oil as follows (AMM 70-24-05/201):
(a) Find the W5P13 connector on the No. 3 bearing oil scavenge manifold at the 5:30 o'clock position.
(b) Remove the protective covers from the electrical connector.
(c) Connect the W5P13 connector to the temperature sensor for the No. 3 bearing oil.

S 424-164-NO1
(3) Connect the W5P8 connector to the thermocouple probe for the EEC fuel temperature as follows (AMM 70-24-05/201).
(a) Find the thermocouple probe for the EEC fuel temperature on the fuel pump housing at the 4:30 o'clock position.
(b) Remove the protective covers from the electrical connector.
(c) Connect the W5P8 connector to the thermocouple probe for the EEC fuel temperature.

S 424-165-NO1
(4) Connect the W5P1 connector to the fuel metering unit as follows (AMM 70-24-05/201):
(a) Find the fuel metering unit on the front side of the fuel pump at the 5 o'clock position.

(b) Remove the protective covers for the electrical connector.
(c) Connect the W5P1 connector to the aft connector on the fuel metering unit.

S 424-166-NO1
(5) Connect the W5P11 connector to the solenoid for the 2.9 bleed valve as follows (AMM 70-24-05/201):
(a) Find the solenoid for the 2.9 bleed valve at the 5 o'clock position on the intermediate case.
(b) Remove the protective covers for the electrical connector.
(c) Connect the W5P11 connector to the solenoid for the 2.9 bleed valve.

NOTE: You can use the torque adapter (PWA 85749) to tighten the W5P11 connector.

S 424-167-NO1
(6) Connect the W5P7 connector to the actuator for the variable stator vanes as follows (AMM 70-24-05/201):
(a) Find the actuator for the variable stator vanes at the 4 o'clock position.
(b) Remove the protective covers from the electrical connector.
(c) Connect the W5P7 connector to the top connector on the actuator for the variable stator vanes.

S 424-168-NO1
(7) Connect the W5P6 connector to the EEC alternator as follows (AMM 70-24-05/201):
(a) Find the EEC alternator on the bottom side of the gearbox at the 7 o'clock position.
(b) Remove the protective covers from the electrical connector.
(c) Connect the W5P6 connector to the lower connector of the EEC alternator.

NOTE: You can use the torque adapter (PWA 85749) to tighten the W5P6 connector.

S 424-169-NO1
(8) Connect the W5P5 connector to the bypass valve solenoid for the fuel/oil cooler as follows (AMM 70-24-05/201):
(a) Find the bypass valve solenoid for the fuel/oil cooler at the 8 o'clock position.
(b) Remove the protective covers for the electrical connectors.
(c) Connect the W5P5 connector to the aft connector on the bypass valve solenoid for the fuel/oil cooler.

G. ENGINES POST-PW-SB 73-84;
Connect the thermocouples:

S 424-170-N01

(1) Install the wire harness to the T2.95 thermocouple probe as follows:
(a) Attach the harmness with the two nuts.
(b) Tighten the larger nut to 18-22 pound-inches (2.034-2.486 newton-meters).
(c) Tighten the smaller nut to 15-18 pound-inches (1.695-2.034 newtonmeters).

S 424-194-N01

(2) Install the wire harness to the thermocouple probes W5P8 and W5P13:
(a) Attach the harness with the two nuts.
(b) Tighten the larger nut to 18-22 pound-inches (2.034-2.486 newton-meters).
(c) Tighten the smaller nut to 15-18 pound-inches (1.695-2.034 newton-meters).

S 424-171-N01

(3) Install the wire harness to the thermocouple probes W5P8 and W5P13 as follows:
(a) Install the wiring harness terminals to the thermocouple studs and loosely install the nuts to the thermocouple studs.
(b) Loosely install the clamp, ground strap, and bolt to the bracket on the housing.

CAUTION: MAKE SURE THE THERMOCOUPLE STUD BOX DOES NOT TURN WHEN THE COUPLING NUT IS TIGHTENED. IF THE THERMOCOUPLE STUD BOX TURNS, DAMAGE TO THE WIRING HARNESS CAN OCCUR.

(c) If it is necessary to align the thermocouple stud box, loosen the coupling nut.
(d) Align the thermocouple stud box with the wiring harness connector.
(e) Hold the thermocouple stud box and tighten the coupling nut for the thermocouple probe to 95-100 pound-inches (10.734-11.298 newton-meters).
(f) Do not let the thermocouple stud turn.

CAUTION: DO NOT ALIGN THE THERMOCOUPLE STUD BOX AFTER THE COUPLING NUT IS TIGHTENED. HOLD THE THERMOCOUPLE STUD BOX AND LOOSEN THE COUPLING NUT TO ALIGN THE THERMOCOUPLE STUD BOX AGAIN. DAMAGE TO THE THERMOCOUPLE STUD BOX CAN OCCUR.

(g) Make sure the thermocouple stud box is aligned.

CAUTION: TOO MUCH TORQUE (MORE THAN THE MAXIMUM TORQUE) ON THE THERMOCOUPLE PROBE NUTS CAN LOOSEN. IF TOO MUCH TORQUE IS APPLIED, DAMAGE TO THE THERMOCOUPLE STUDS CAN OCCUR.

(h) Tighten the alumel nuts (larger terminal studs) to 18-22 pound-inches (2.034-2.486 newton-meters).
(i) Tighten the chromel nuts (smaller terminal studs) to 15-18 pound-inches (1.695-2.034 newton-meters).
(j) Install the lockwire from the coupling nut to the adapter.
(k) Tighten the bolt that attaches the clamp and ground strap to the bracket on the housing to 36-40 pound-inches (4.067-4.519 newton-meters).

S 824-172-NO1

(4) Adjust the W5 harness to get the necessary clearances.

S 424-173-NO1

(5) Install the clamps on the harness at the tape marker locations.
(a) Make sure you can see the tape marker on both sides of the clamp.

S 424-174-NO1

(6) Install the clamps at all the clamp locations.

S 644-175-NO1

(7) Lubricate the threads of the nuts and bolts with engine oil.

S 424-176-NO1

(8) Loosely install the bolts and nuts to the clamps for the W5 wiring harness.

S 824-177-NO1

(9) Make sure the wiring harnesses are not pulled too tightly between any two clamps.

S 824-178-NO1

(10) Make sure the wiring harness does not touch any engine parts.

S 824-179-NO1

(11) Make sure the wiring harness is not pulled too tightly where the wiring harness attaches to the connectors.

S 424-180-NO1

(12) Tighten all the nuts and bolts for the clamps on the W5 harness to 36-40 pound-inches (4.067-4.519 newton-meters).

NOTE: Make sure there is clearance between the W3 and W5 wiring harnesses and hardware near the lower left of the front side of the gearbox.

H. Put the Airplane Back to its Usual Condition

S 414-053-N01

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00 WHEN YOU CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Close the thrust reversers (AMM 78-31-00/201).

S 414-054-N01

(2) Close the core cowl panels (AMM 71-11-06/201).

S 444-055-N01

(3) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

S 414-056-N01

(4) Close the fan cowl panels (AMM 71-11-04/201).

S 864-057-N01

(5) For the left engine, remove DO-NOT-CLOSE tag and close this circuit breaker on the main power distribution panel P6:
(a) 6L19, PROBE HEAT L ENG

S 864-058-N01

(6) For the right engine, remove DO-NOT-CLOSE tag and close this circuit breaker on the main power distribution panel P6:
(a) 6K25, PROBE HEAT R ENG

S 864-059-N01

(7) For the left engine, remove DO-NOT-CLOSE tags and close these circuit breakers on the overhead panel P11:
(a) 11A10, AIR DATA CMPTR L
(b) 11L3, L ENGINE PERF SOL CHAN A
(c) 11L4, L ENGINE PERF SOL CHAN B
(d) 11M5, LEFT ENGINE EEC DISCRETES

S 864-060-N01

(8) For the right engine, remove DO-NOT-CLOSE tags and close these circuit breakers on the overhead panel P11:
(a) 11F30, AIR DATA CMPTR R
(b) 11L30, R ENGINE PERF SOL CHAN A
(c) 11L31, R ENGINE PERF SOL CHAN B
(d) 11M32, RIGHT ENGINE EEC DISCRETES

S 864-061-N01

(9) Remove DO-NOT-CLOSE tag and close this circuit breaker on the overhead panel P11:
(a) 11B36, APU ENG START/ECS DISCRETES

S 714-062-N01

(10) Do the test of the EEC wiring harness that is shown in the Power Plant Test Reference Table (AMM 71-00-00/501).

TASK 73-21-07-004-063-N01

8. Remove the EEC Wiring Harness W6 (Fig. 405)

A. References

(1) AMM 71-11-04/201, Fan Cowl Panels
(2) AMM 71-11-06/201, Core Cowl Panels
(3) AMM 78-31-00/201, Thrust Reverser System

B. Access

(1) Location Zones

410 No. 1 Power Plant
420 No. 2 Power Plant

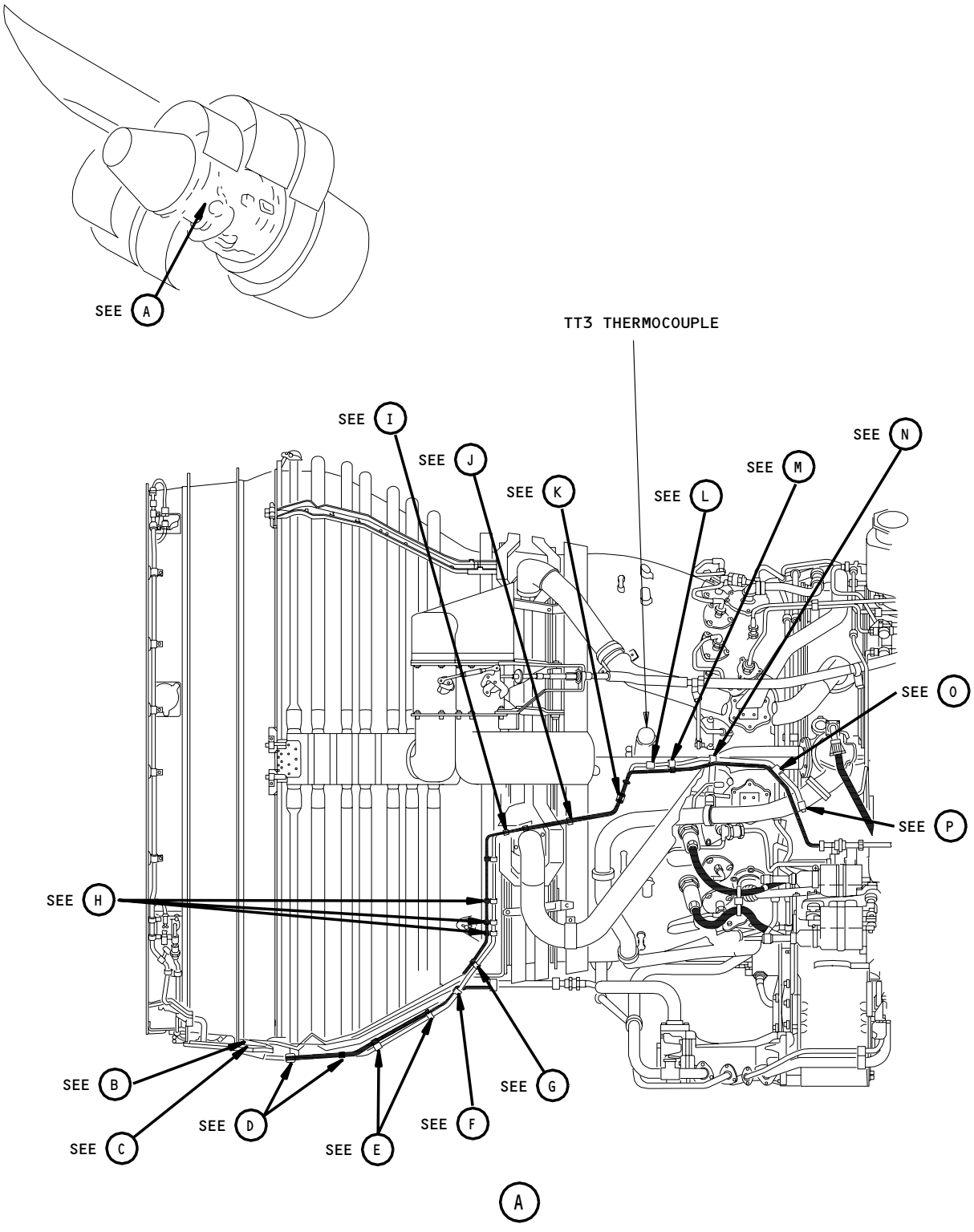
(2) Access Panels

413 Fan Cowl Panel (LH)
414 Fan Cowl Panel (RH)
415 Fan Reverser (LH)
416 Fan Reverser (RH)
417 Core Cowl (LH)
418 Core Cowl (RH)
423 Fan Cowl Panel (LH)
424 Fan Cowl Panel (RH)
425 Fan Reverser (LH)
426 Fan Reverser (RH)
427 Core Cowl (LH)
428 Core Cowl (RH)

C. Prepare For Wiring Harness Removal

S 864-064-N01

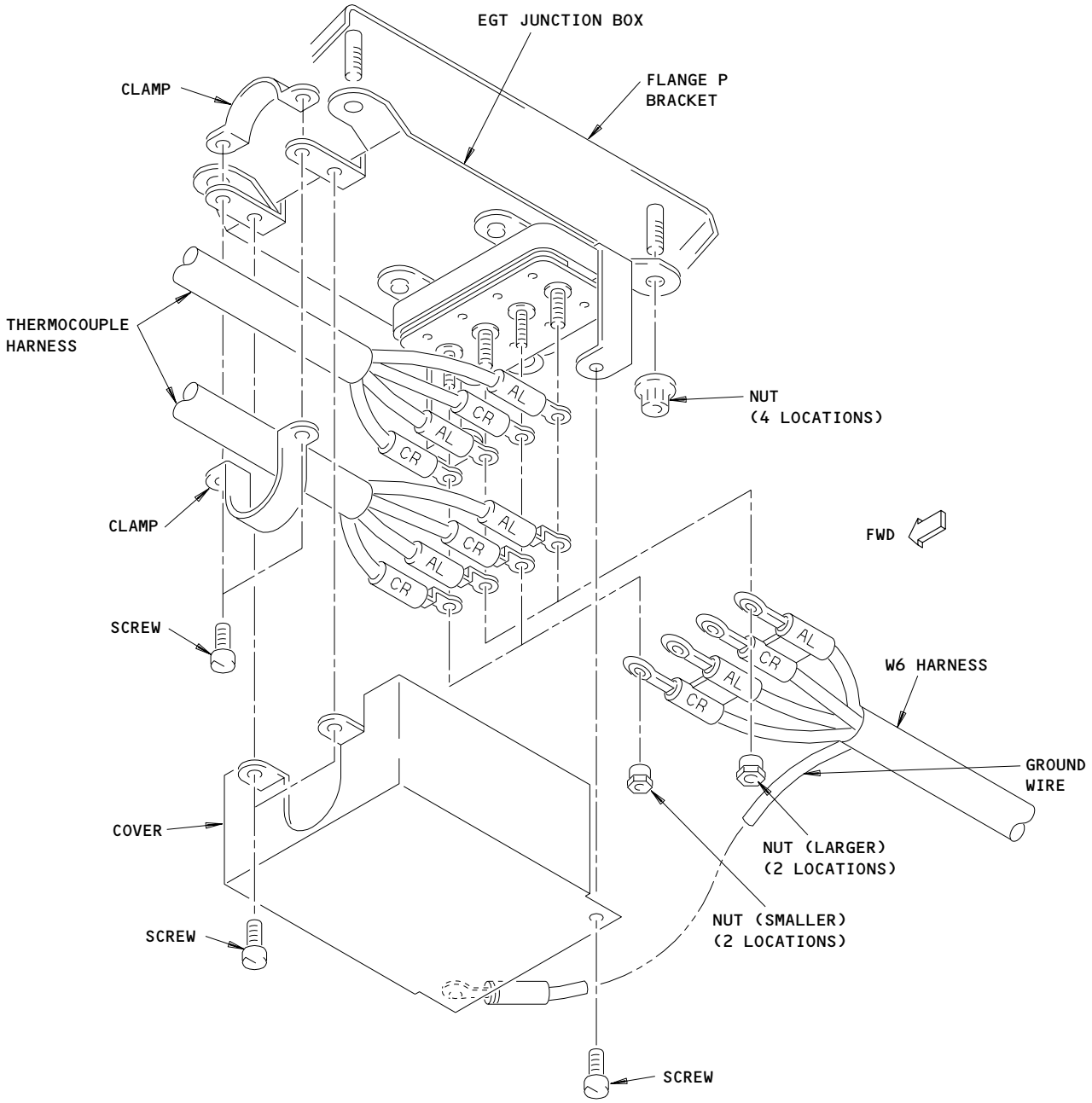
(1) For the left engine, open this circuit breaker on the main power distribution panel P6 and attach DO-NOT-CLOSE tag:
(a) 6L19, PROBE HEAT L ENG



EEC Wiring Harness W6 Installation
Figure 405 (Sheet 1)

EFFECTIVITY
ENGINES WITH PHASE 3

E42814

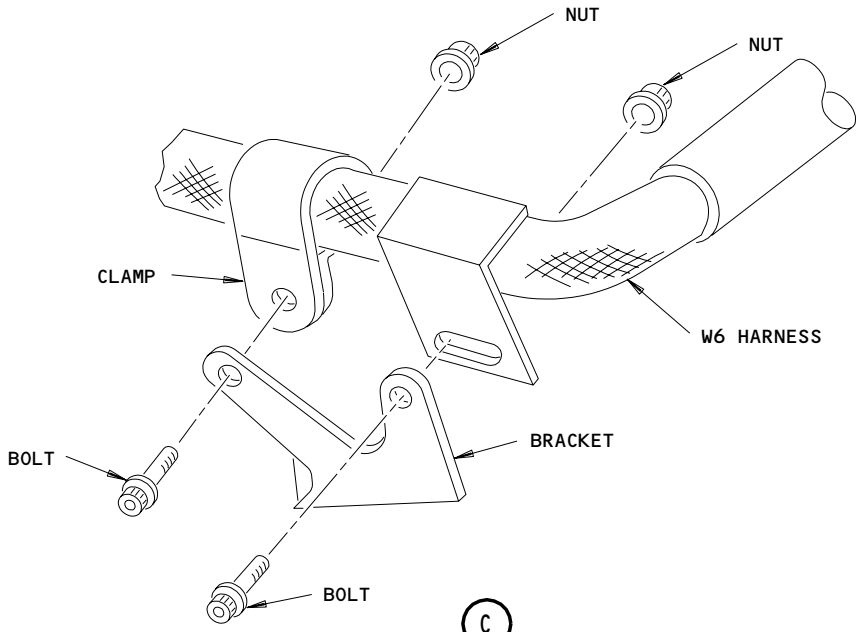


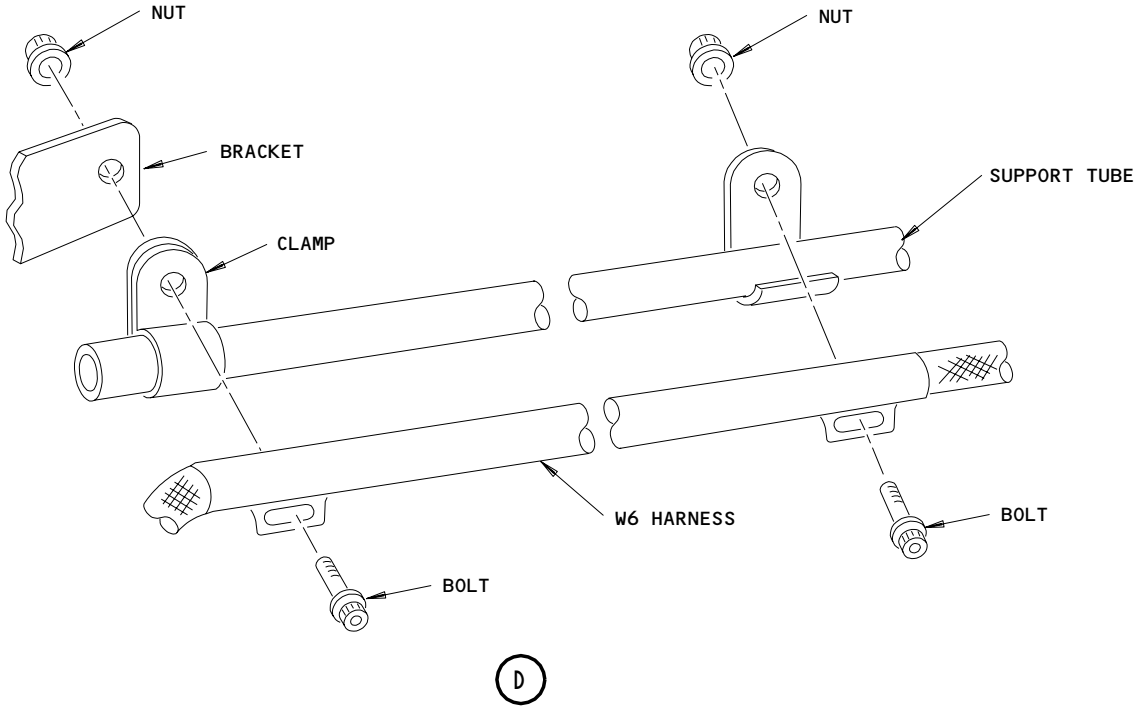
EGT JUNCTION BOX

(B)

L-A3849

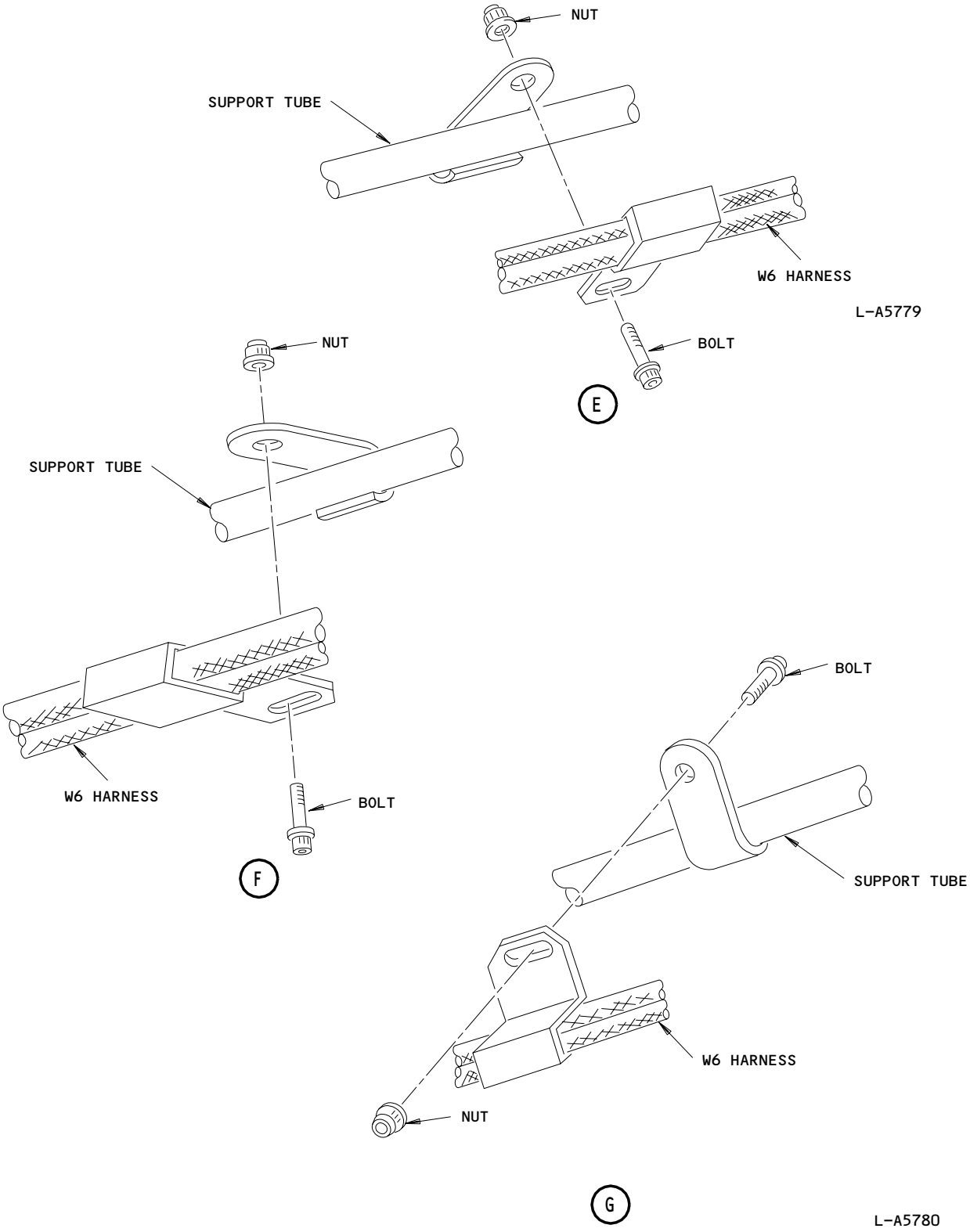
EEC Wiring Harness W6 Installation
Figure 405 (Sheet 2)



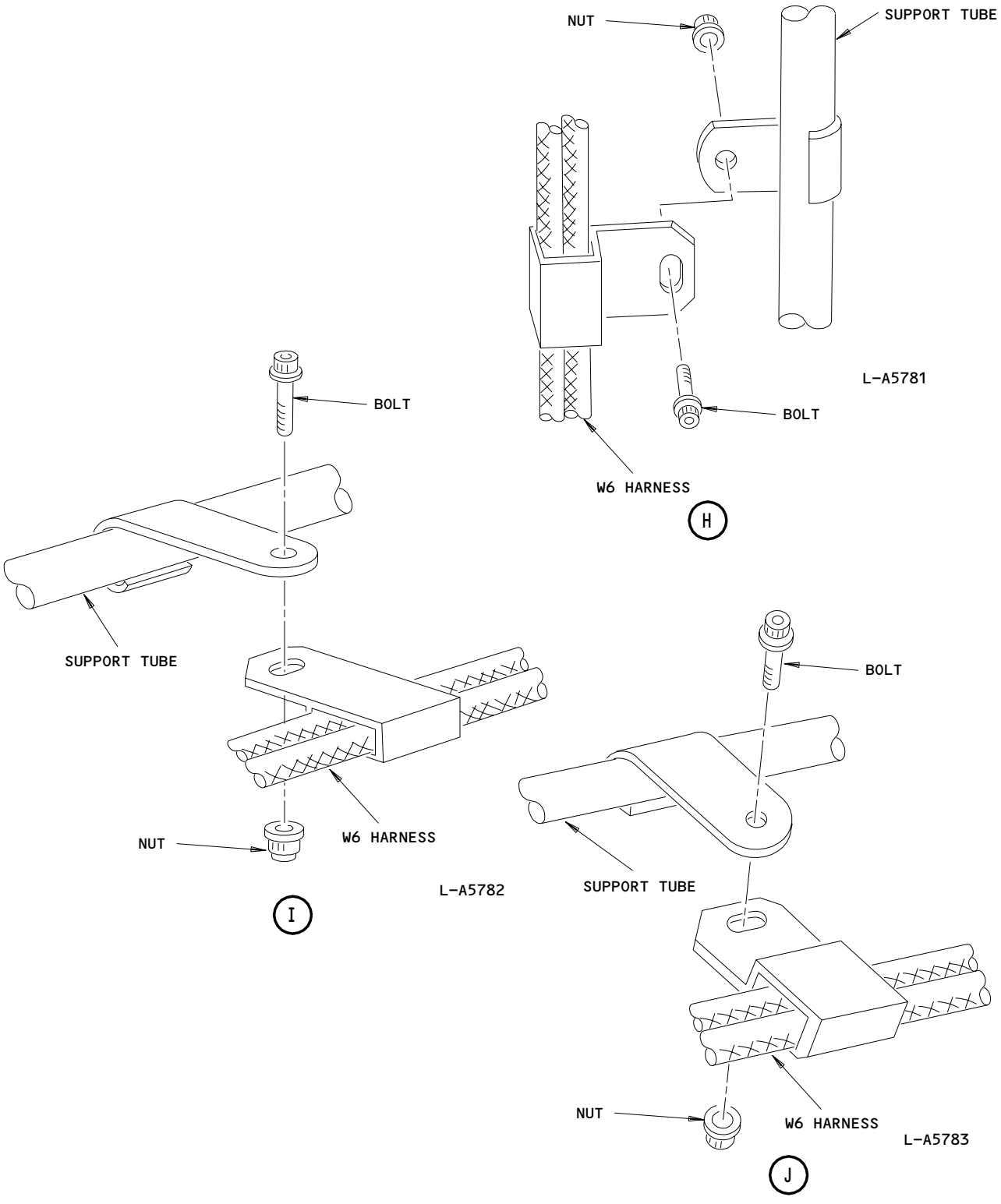


L-A5778

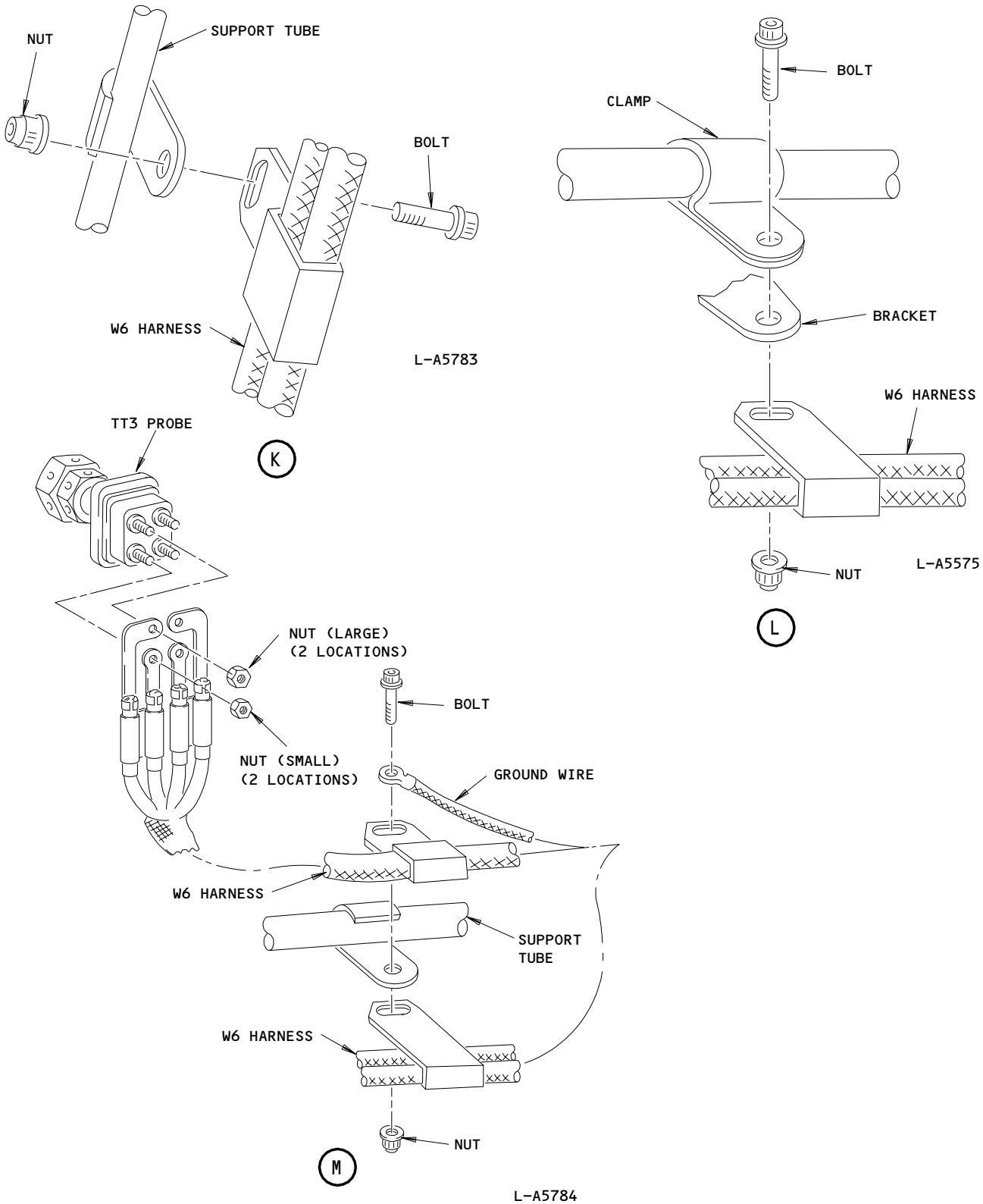
EEC Wiring Harness W6 Installation
Figure 405 (Sheet 3)



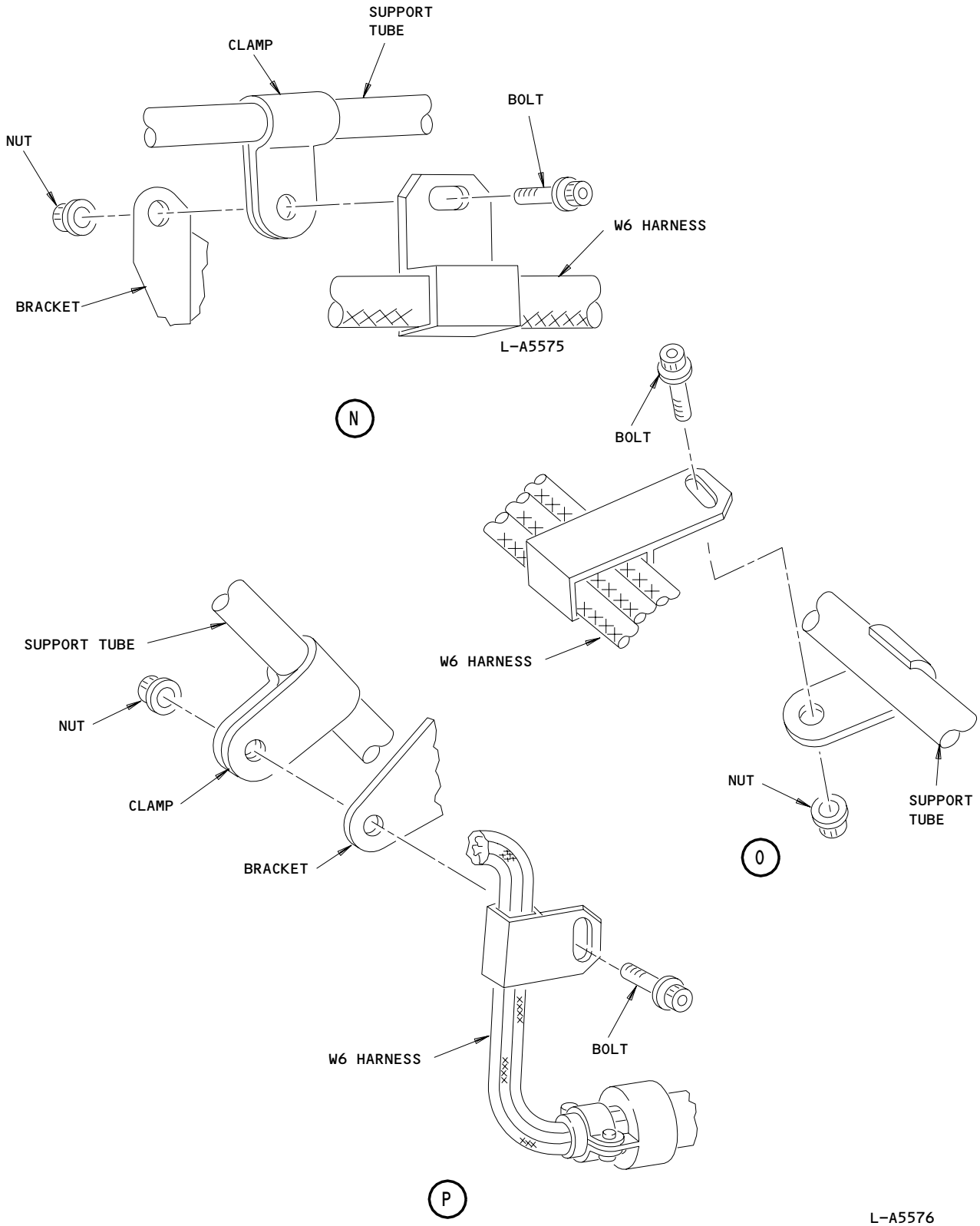
EEC Wiring Harness W6 Installation
Figure 405 (Sheet 4)



EEC Wiring Harness W6 Installation
Figure 405 (Sheet 5)



EEC Wiring Harness W6 Installation
Figure 405 (Sheet 6)



EEC Wiring Harness W6 Installation
Figure 405 (Sheet 7)

EFFECTIVITY
ENGINES WITH PHASE 3

E42829

S 864-065-NO1

(2) For the right engine, open this circuit breaker on the main power distribution panel P6 and attach DO-NOT-CLOSE tag:
(a) 6K25, PROBE HEAT R ENG

S 864-066-NO1

(3) For the left engine, open these circuit breakers on the overhead panel P11 and attach DO-NOT-CLOSE tags:
(a) 11A10, AIR DATA CMPTR L
(b) 11L3, L ENGINE PERF SOL CHAN A
(c) 11L4, L ENGINE PERF SOL CHAN B
(d) 11M5, LEFT ENGINE EEC DISCRETES

S 864-067-NO1

(4) For the right engine, open these circuit breakers on the overhead panel P11 and attach DO-NOT-CLOSE tags:
(a) 11F30, AIR DATA CMPTR R
(b) 11L30, R ENGINE PERF SOL CHAN A
(c) 11L31, R ENGINE PERF SOL CHAN B
(d) 11M32, RIGHT ENGINE EEC DISCRETES

S 864-068-NO1

(5) Open this circuit breaker on the overhead panel P11 and attach DO-NOT-CLOSE tag:
(a) 11B36, APU ENG START/ECS DISCRETES

S 014-069-NO1

(6) Open the fan cowl panels (AMM 71-11-04/201).

S 044-070-NO1

WARNING: DO THE THRUST REVERSER DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(7) Do this procedure: Thrust Reverser Deactivation for Ground Maintenance (AMM 78-31-00/201).

S 014-071-NO1

(8) Open the core cowl panels (AMM 71-11-06/201).

S 014-072-NO1

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(9) Open the thrust reversers (AMM 78-31-00/201).

D. Remove the EEC Wiring Harness W6

S 934-073-N01

(1) Before you disconnect the W6 harness, put tags on all W6 harness connections.

S 024-074-N01

CAUTION: DO NOT TWIST OR BEND THE HARNESS BADLY DURING REMOVAL. IF THE HARNESS IS TWISTED OR BENT BADLY, THE HARNESS CAN BE DAMAGED.

(2) Disconnect the EGT thermocouple cable from the EGT junction box as follows:
   (a) Find the EGT junction box at the 5:30 o'clock position on the turbine exhaust case.
   (b) Remove the screws that attach the EGT junction box cover to the EGT junction box.
   (c) Remove the EGT junction box cover from the engine.
   (d) Remove the four nuts that attach the W6 harness to the terminal studs on the EGT junction box.
   (e) Install the four nuts back on to the terminal studs on the EGT junction box.

      NOTE: The diameter of the chromel nuts and terminal studs is smaller than the diameter of the alumel nuts and terminal studs.

S 024-075-N01

(3) Disconnect the W6 harness from the TT3 probe as follows:
   (a) Find the TT3 probe at the 3 o'clock position on the diffuser case.
   (b) Remove the nuts that attach the W6 harness to the terminal studs on the TT3 probe.
   (c) Install the four nuts back on the terminal studs on the TT3 probe.

      NOTE: The diameter of the chromel nuts and terminal studs is smaller than the diameter of the alumel nuts and terminal studs.

S 024-076-N01

(4) Disconnect the W6P12 connector from the W5J12 connector as follows:
   (a) Find the W6P12 and W5J12 connectors at the 3:30 o'clock position above the ignition exciters.
   (b) Disconnect the W6P12 connector form the W5J12 connector.
   (c) Install covers on the W6P12 and W5J12 connectors.

S 024-077-N01

(5) Remove the nuts, bolts, and clamps that attach the W6 harness to the brackets at flange P.

S 024-078-N01

(6) Remove the nuts, bolts, and clamps that attach the W6 harness to the brackets on the engine.

S 024-079-N01

(7) Remove the nuts, bolts, and clamps that attach the W6 harness to the clamps on the support tube.

S 024-080-N01

(8) Remove the W6 harness from the engine.

S 034-081-N01

(9) Remove the support tube from the engine as follows:
   (a) Find the clamp that attaches the support tube to the bracket on the turbine cooling air support.
   (b) Remove the nut, bolt, and clamp that attach the support tube to the bracket on the turbine cooling air support.
   (c) Find the clamp that attaches the support tube to the lower right turbine cooling air tube.
   (d) Remove the nut, bolt, and clamp that attach the support tube to the bracket on the lower right turbine cooling air tube.
   (e) Remove the support tube from the engine.

TASK 73-21-07-404-082-N01

9. Install the EEC Wiring Harness W6 (Fig. 405)
   A. Consumable Materials
      (1) D00137 Engine Oil - PWA 521
   B. References
      (1) AMM 70-24-05/201, Electrical Harnesses
      (2) AMM 71-11-04/201, Fan Cowl Panels
      (3) AMM 71-11-06/201, Core Cowl Panels
      (4) AMM 78-31-00/201, Thrust Reverser System
   C. Access
      (1) Location Zones
          410 No. 1 Power Plant
          420 No. 2 Power Plant

(2) Access Panels

413	Fan Cowl Panel (LH)
414	Fan Cowl Panel (RH)
415	Fan Reverser (LH)
416	Fan Reverser (RH)
417	Core Cowl (LH)
418	Core Cowl (RH)
423	Fan Cowl Panel (LH)
424	Fan Cowl Panel (RH)
425	Fan Reverser (LH)
426	Fan Reverser (RH)
427	Core Cowl (LH)
428	Core Cowl (RH)

D. Install the EEC Wiring Harness W6

S 434-083-N01

(1) Install the support tube as follows:

(a) Put the long straight end of the support tube on the bottom side of the bracket on flange P.

(b) Put the other end of the support tube on the bracket attached to the cooling air tube for the turbine blades.

(c) Attach the support tube to the bracket on the cooling air tube for the turbine vanes as follows:

1) Find the bracket on the aft end of the cooling air tube for the turbine vanes.
2) Lubricate the bolt threads with oil.
3) Attach the support tube to the bracket with the clamp, bolt, and nut.
4) Tighten the nut with your hand.

(d) Attach the support tube to the bracket on the support for the HPT cooling air manifold as follows:

1) Find the bracket on the support for the HPT cooling air manifold at the 4:30 o'clock position.
2) Lubricate the bolt threads with oil.
3) Attach the support tube to the bracket with the clamp, bolt, and nut.
4) Tighten the nut with your hand.

(e) Attach the support tube to the bracket on the support for the LPT cooing air manifold as follows:

1) Find the bracket on the support for the LPT cooling air manifold at the 5 o'clock position.
2) Lubricate the bolt threads with oil.
3) Attach the support tube to the bracket with the clamp, bolt, and nut.
4) Tighten the nut with your hand.

NOTE: Do not use a wrench to tighten the nuts that attach the support tube to the engine at this time.

S 424-084-N01

(2) Install the EEC wiring harness W6 as follows:

CAUTION: DO NOT TWIST OR BEND THE HARNESS BADLY DURING INSTALLATION. IF THE HARNESS IS TWISTED OR BENT BADLY, THE HARNESS CAN BE DAMAGED.

EXAMINE THE HARNESS CONNECTORS AND THE RECEPTACLES THAT THEY CONNECT TO FOR BENT PINS AND CONTAMINATION. BENT PINS AND CONNECTOR CONTAMINATION CAN CAUSE THE HARNESS TO FAIL.

(a) Examine the harness connectors and the receptacles that they attach to as follows:
  1) Remove the covers from the harness connectors.
  2) Examine the harness connectors for bent pins.
    a) If bent pins are found, make the pins straight.
  3) Examine the connectors and the receptacles that they attach to for contamination.
    a) If contamination is found, clean the connectors and receptacles as necessary.
  4) Examine the EGT terminal lugs and ground lead for damage.

NOTE: If the ground lead on the W6 cable at the EGT Thermocouple Terminal Box is damaged or missing, you must repair the cable per Unison SB 420081-73-46 or replace it.

CAUTION: USE THE CORRECT ASSEMBLY PROCEDURE, AND TOOLS, FOR THE HARNESS CONNECTOR INSTALLATION (AMM 70-24-05/201). IF YOU USE THE INCORRECT ASSEMBLY PROCEDURE, OR TOOLS, A DAMAGED OR LOOSE CONNECTOR CAN OCCUR. A LOOSE CONNECTOR PERMITS VIBRATION, WHICH CAUSES THE CONTACTS TO WEAR AND DECREASES THE LIGHTNING PROTECTION.

(b) Connect the W6P12 connector to the W5J12 connector as follows (AMM 70-24-05/201):
  1) Find the W5J12 connector above the ignition exciters at the 3:30 o'clock position.
  2) Connect the W6P12 connector to the W5J12 connector.

(c) Put the wiring harness on the support tube as follows:
  1) Put the wiring harness along the forward end of the support tube.
  2) Put the wiring harness on the inboard side of the forward end of the cooling air tube for the turbine vanes.

(d) Attach the wiring harness to the support tube along the burner and diffuser case as follows:
  1) Find the bracket on the forward end of the cooling air tube for the turbine blades.

2) Put the clamp for the support tube on the inboard side of the bracket.
3) Put the clamp for the wiring harness on the outboard side of the bracket.
4) Lubricate the bolt threads with oil.
5) Attach the wiring harness and the support tube to the bracket with the bolt and nut.
6) Tighten the nut with your hand.
7) Find the first clamp from the forward end of the support tube that is brazed on the support tube.
8) Lubricate the bolt threads with oil.
9) Attach the wiring harness to the clamp on the support tube with the clamp, bolt, and nut.
10) Tighten the nut with your hand.
11) Find the bracket at the No. 7 fuel injector.
12) Put the clamp for the support tube on the outboard side of the bracket.
13) Put the clamp for the wiring harness over the clamp for the support tube.
14) Lubricate the bolt threads with oil.
15) Attach the wiring harness and the support tube to the bracket with the bolt and nut.
16) Tighten the nut with your hand.
17) Find the second clamp from the forward end of the support tube that is brazed on the support tube.
18) Put the wiring harness that goes to the TT3 probe on top of the clamp on the support tube.
19) Put the wiring harness that goes to the EGT junction box on the bottom of the clamp on the support tube.
20) Lubricate the bolt threads with oil.
21) Attach the ground wire and the two wiring harness leads to the clamp on the support tube with the bolt and nut.
22) Tighten the nut with your hand.

(e) Connect the wiring harness connector to the TT3 probe as follows:
1) Remove the nuts from the terminal studs on the TT3 probe.
2) Put the wiring harness connections on the TT3 probe.
3) Install the nuts on the terminal studs with the round side of the nut to the TT3 probe.
4) Align the wires to the TT3 probe so they are parallel.

CAUTION: DO NOT TIGHTEN THE NUTS ON THE TERMINAL STUDS OF THE TT3 PROBE TOO MUCH. TOO MUCH TORQUE ON THE NUTS CAN LOOSEN OR DAMAGE THE TERMINAL STUDS ON THE TT3 PROBE.

5) Tighten the nuts on the terminal studs of the TT3 probe as follows:
a) Tighten the alumal nuts (larger diameter nuts) to 10-15 pound-inches (1.130-1.695 newton meters).
b) Tighten the chromel nuts (smaller diameter nuts) to 8-10 pound-inches (0.906-1.356 newton meters).

(f) Attach the wiring harness to the support tube along the burner and diffuser case as follows:
1) Find the bracket on the diffuser case below the TT3 probe.
2) Put the clamp for the support tube on top of the bracket.
3) Put the clamp for the wieing harness on the bottom of the bracket.
4) Lubricate the bolt threads with oil.
5) Attach the support tube and the wiring harness to the bracket with the bolt and nut.
6) Tighten the nut with your hand.
7) Find the third clamp from the forward end of the support tube that is brazed on the support tube.
8) Put the clamp for the wiring harness below the clamp that is brazed on the support tube.
9) Lubricate the bolt threads with oil.
10) Attach the wiring harness to the clamp on the support tube with the bolt and nut.
11) Tighten the nut with your hand.

(g) Attach the wiring harness to the support tube along the High Pressure Compressor (HPC) as follows:
1) Find the fourth clamp from the forward end of the support tube that is brazed on the support tube.
2) Put the clamp for the wiring harness below the clamp that is brazed on the support tube.
3) Lubricate the bolt threads with oil.
4) Attach the wiring harness to the clamp on the support tube with the bolt and nut.
5) Tighten the nut with your hand.
6) Find the fifth clamp from the forward end of the support tube that is brazed on the support tube.
7) Put the clamp for the wiring harness below the clamp that is brazed on the support tube.
8) Lubricate the bolt threads with oil.
9) Attach the wiring harness to the clamp on the support tube with the bolt and nut.
10) Tighten the nut with your hand.
11) Find the 6th, 7th, and 8th clamp from the forward end of the support tube that are brazed on the support tube.
12) Put the clamps for the wiring harness on the outboard side of the clamps on the support tube.
13) Lubricate the bolt threads with oil.
14) Attach the wiring harness on the three clamps on the support tube with bolts and nuts.
15) Tighten the nuts with your hand.
16) Find the 9th clamp from the forward end of the support tube that is brazed on the support tube.
17) Put the clamp for the wiring harness on the aft side of the clamp on the support tube.
18) Lubricate the bolt threads with oil.
19) Attach the wiring harness to the clamp on the support tube with the bolt and nut.

20) Tighten the nut with your hand.

(h) Attach the wiring harness on the support tube along the Low Pressure Turbine (LPT) as follows:
1) Find the 10th clamp from the forward end of the support tube that is brazed on the support tube.
2) Put the clamp for the wiring harness on the bottom side of the clamp on the support tube.
3) Lubricate the bolt threads with oil.
4) Attach the wiring harness to the clamp on the support tube with the bolt and nut.
5) Tighten the nut with your hand.
6) Find the 11th and 12th clamps from the forward end of the support tube that are brazed on the support tube.
7) Put the clamps for the wiring haresses on the bottom side of the clamps on the support tube.
8) Lubricate the bolt threads with oil.
9) Attach the wiring harness to the clamps on the wiring harness tube with the bolts and nuts.
10) Tighten the nuts with your hand.
11) Find the 13th clamp from the forward end of the support tube that is brazed on the support tube.
12) Put the clamp for the wiring harness on the outboard side of the clamp on the support tube.
13) Lubricate the bolt threads with oil.
14) Attach the wiring harness to the clamp on the support tube with the bolt and nut.
15) Tighten the nut with your hand.
16) Find the bracket on flange P at the 5:30 o'clock position on the low pressure turbine.
17) Put the clamp for the support tube on the outboard side of the bracket.
18) Put the clamp for the wiring harness on the outboard side of the clamp for the support tube.
19) Lubricate the bolt threads with oil.
20) Attach the support tube and the wiring harness to the bracket with the bolt and nut.
21) Tighten the nut with your hand.
22) Find the bracket on flange P at the 6:00 o'clock position on the low pressure turbine.
23) Put the clamp for the wiring harness on the top side of the bracket.
24) Lubricate the threads of two bolts with oil.
25) Attach the wiring harness to the bracket with a bolt and nut.
26) Install a clamp on the wiring harness and put the clamp on the top side of the same bracket.
27) Attach the clamp to the bracket with a bolt and nut.
28) Tighten the nuts with your hand.

(i) Tighten the nuts and bolts for the harness clamps and support tube to 36-40 pound-inches (4.067-4.519 newton-meters).

(j) Connect the wiring harness to the EGT junction box as follows:
1) Remove the nuts for the terminal studs on the EGT junction box.
2) Put the wiring harness connectors on the terminal studs of the EGT junction box.

NOTE: Do not attach the ground wire to the terminal studs.

3) Install the nuts on the terminal studs with the round side of the nut to the EGT junction box.
4) Align the wires to the EGT junction box so they are parallel.

CAUTION: DO NOT TIGHTEN THE NUTS ON THE TERMINAL STUDS OF THE EGT JUNCTION BOX TOO MUCH. TOO MUCH TORQUE ON THE NUTS CAN LOOSEN OR DAMAGE THE TERMINAL STUDS ON THE EGT JUNCTION BOX.

(k) Tighten the nuts on the terminal studs of the EGT junction box as follows:
1) Tighten the alumel nuts (larger diameter nuts) to 18-22 pound-inches (2.034-2.486 newton-meters).
2) Tighten the chromel nuts (smaller diameter nuts) to 15-18 pound-inches (1.695-2.034 newton-meters).

(l) Install the cover on the EGT junction box as follows:
1) Put the cover on the EGT junction box.
2) Install two screws on the left side of the cover for the EGT junction box.
3) Install one screw on the right forward side of the EGT junction box.
4) Put the connector for the ground wire under the aft right corner of the cover.
5) Attach the cover and the ground wire to the EGT junction box with a screw.
6) Tighten the screws to 16-22 pound-inches (.808-2.486 newton- meters).
7) Install lockwire on the screws.

E. Put the Airplane Back to its Usual Condition

S 414-085-N01

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00 WHEN YOU CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Close the thrust reversers (AMM 78-31-00/201).

S 414-086-N01

(2) Close the core cowl panels (AMM 71-11-06/201).

S 444-087-N01
(3) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

S 414-088-N01
(4) Close the fan cowl panels (AMM 71-11-04/201).

S 864-089-N01
(5) For the left engine, remove DO-NOT-CLOSE tag and close this circuit breaker on the main power disribution panel P6:
(a) 6L19, PROBE HEAT L ENG

S 864-090-N01
(6) For the right engine, remove DO-NOT-CLOSE tag and close this circuit breaker on the main power disribution panel P6:
(a) 6K25, PROBE HEAT R ENG

S 864-091-N01
(7) For the left engine, remove DO-NOT-CLOSE tags and close these circuit breakers on the overhead panel P11:
(a) 11A10, AIR DATA CMPTR L
(b) 11L3, L ENGINE PERF SOL CHAN A
(c) 11L4, L ENGINE PERF SOL CHAN B
(d) 11M5, LEFT ENGINE EEC DISCRETES

S 864-092-N01
(8) For the right engine, remove DO-NOT-CLOSE tags and close these circuit breakers on the overhead panel P11:
(a) 11F30, AIR DATA CMPTR R
(b) 11L30, R ENGINE PERF SOL CHAN A
(c) 11L31, R ENGINE PERF SOL CHAN B
(d) 11M32, RIGHT ENGINE EEC DISCRETES

S 864-093-N01
(9) Remove DO-NOT-CLOSE tag and close this circuit breaker on the overhead panel P11:
(a) 11B36, APU ENG START/ECS DISCRETES

S 714-094-N01
(10) Do the test of the EEC wiring harness that is shown in the Power Plant Test Reference Table (AMM 71-00-00/501).

EEC WIRING HARNESS - REMOVAL/INSTALLATION

1. General
   A. This procedure supplies instructions for the removal and installation of the W3, W4, W5, and the W6 EEC wiring harnesses.

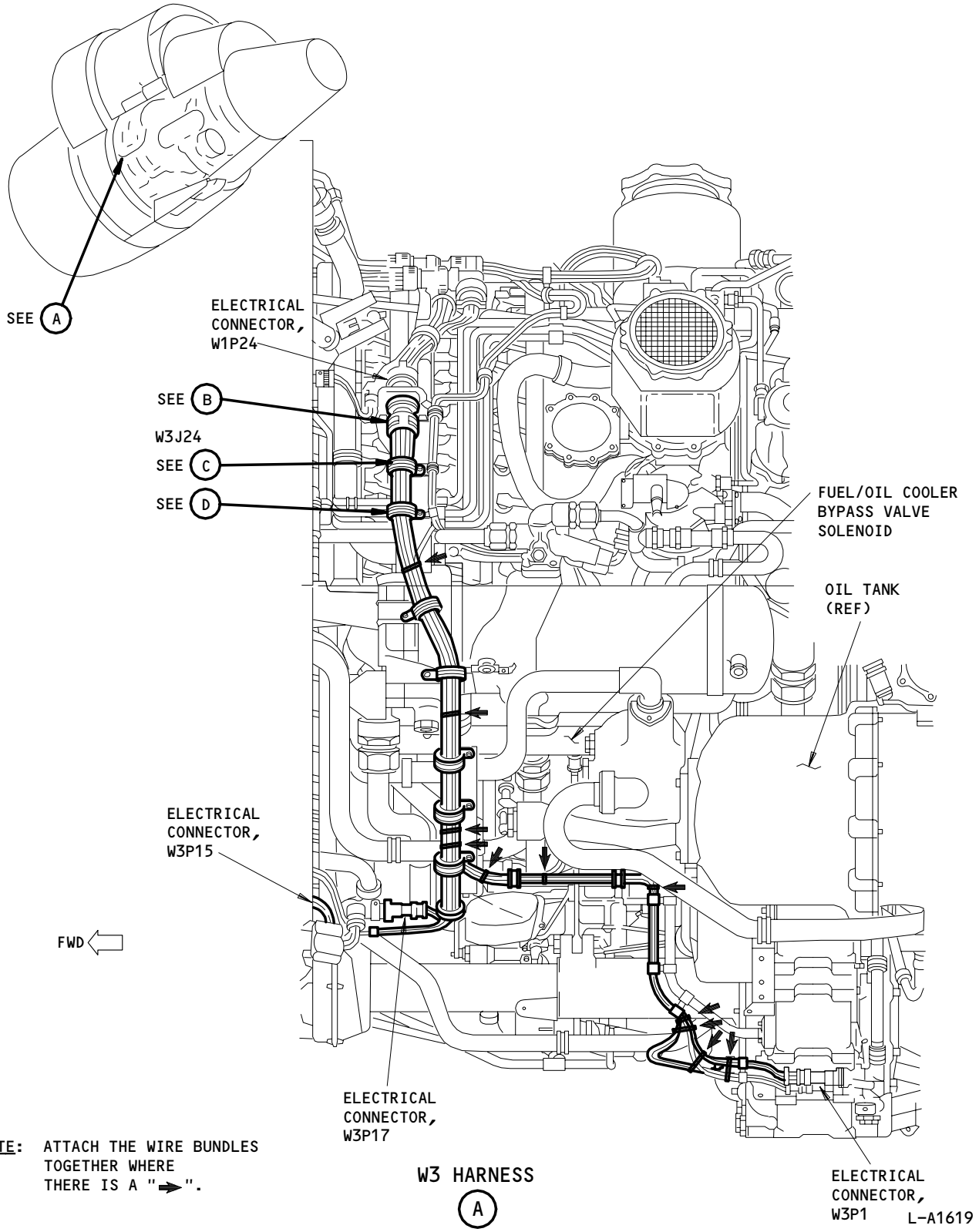
TASK 73-21-07-004-001-N02

2. Remove the EEC Wiring Harness W3 (Fig. 401, 401A, 401B)
   A. Equipment
      (1) Torque Adapter PWA 85749 (optional)

HARNESS CONNECTORS WHERE THE TORQUE ADAPTER (PWA 85749) CAN BE USED	
CONNECTOR	COMPONENT
W3P1	EEC Alternator (N2 Transducer)
W3P15	2.5 Bleed Valve Actuator

   B. References
      (1) AMM 71-11-04/201, Fan Cowl Panels
      (2) AMM 71-11-06/201, Core Cowl Panels
      (3) AMM 78-31-00/201, Thrust Reverser System
   C. Access
      (1) Location Zone
          410 No. 1 Power Plant
          420 No. 2 Power Plant

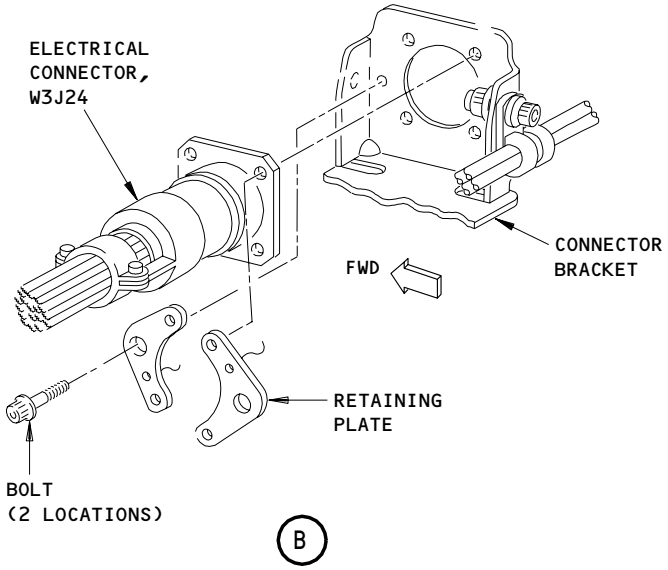
      (2) Access Panel
          413 Fan Cowl Panel (LH)
          414 Fan Cowl Panel (RH)
          415 Fan Reverser (LH)
          416 Fan Reverser (RH)
          417 Core Cowl (LH)
          418 Core Cowl (RH)
          423 Fan Cowl Panel (LH)
          424 Fan Cowl Panel (RH)
          425 Fan Reverser (LH)
          426 Fan Reverser (RH)
          427 Core Cowl (LH)
          428 Core Cowl (RH)

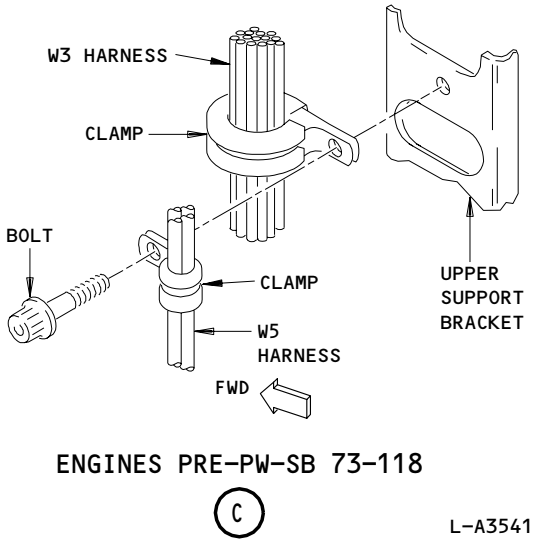


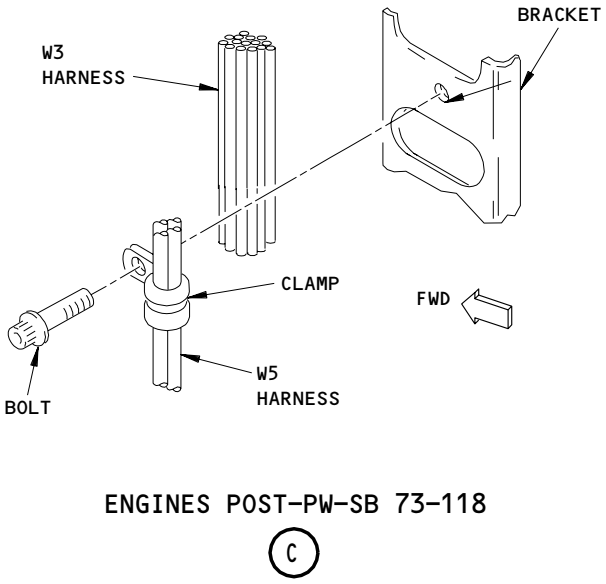
NOTE: ATTACH THE WIRE BUNDLES TOGETHER WHERE THERE IS A "➔".

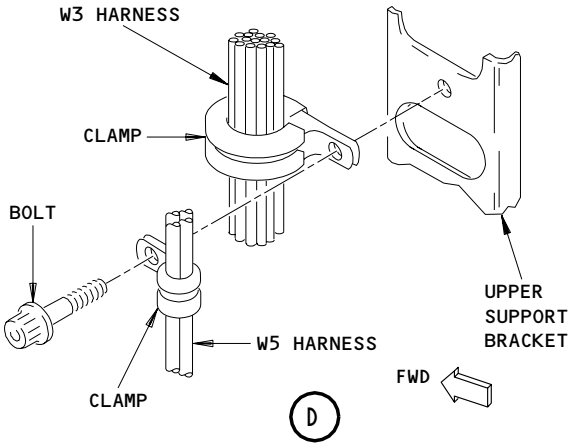
W3 HARNESS
(A)

EEC Wiring Harness W3 Installation (Top Half)
Figure 401 (Sheet 1)









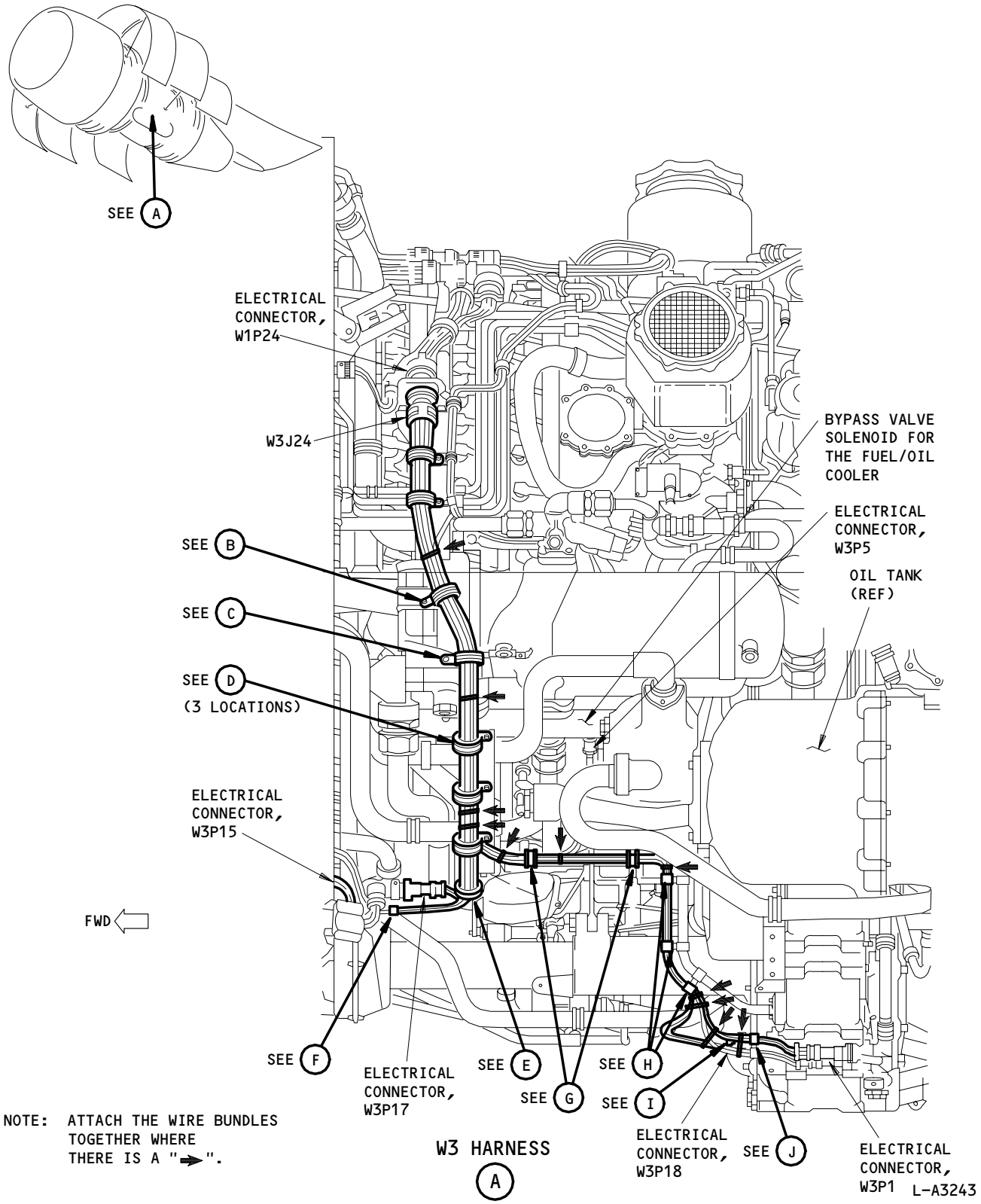
L-A3541

L-A3542

EEC Wiring Harness W3 Installation (Top Half)
Figure 401 (Sheet 2)

EFFECTIVITY
ENGINES WITHOUT PHASE 3

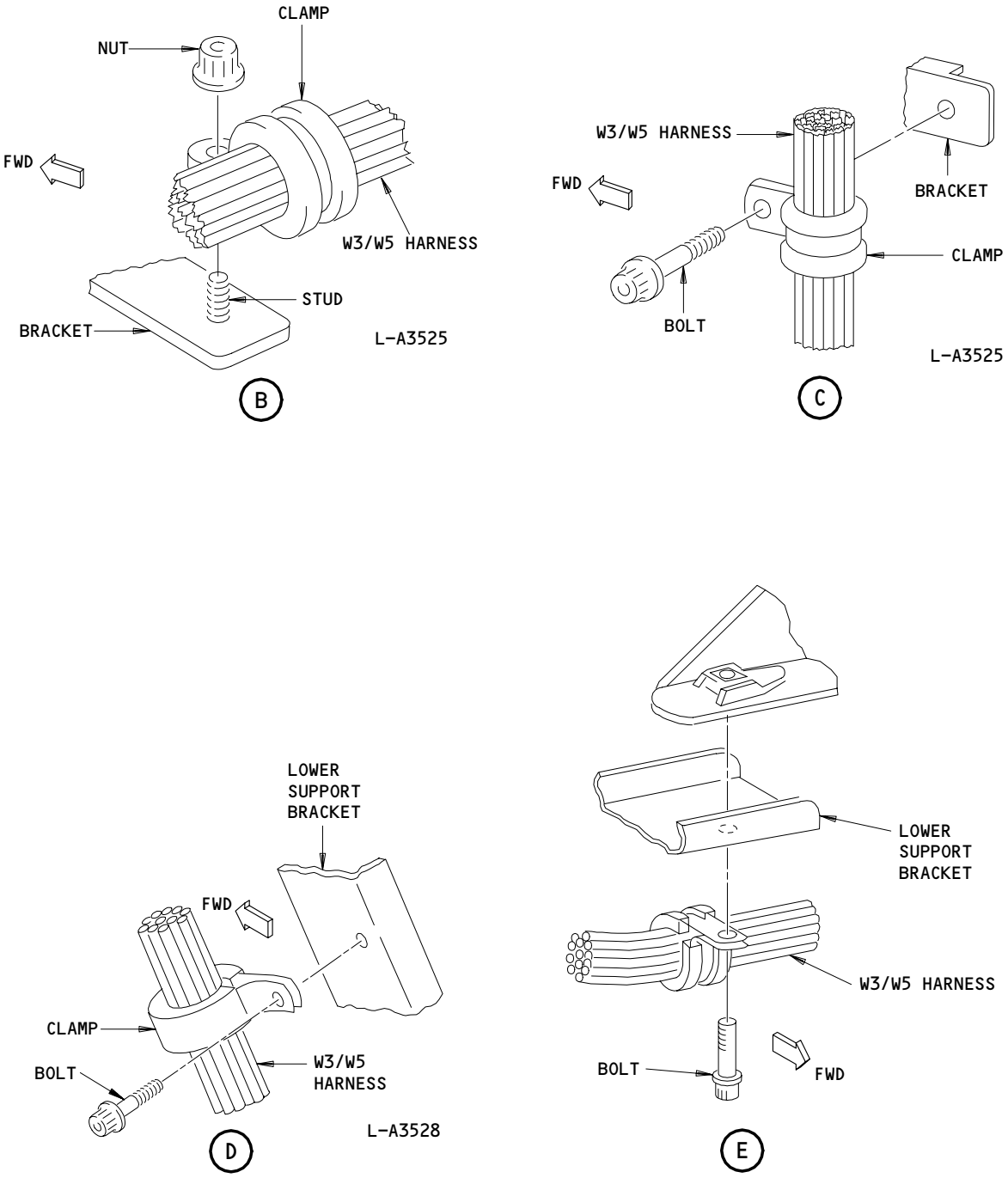
753123



EEC Wiring Harness W3 Installation (Bottom Half)
Figure 401A (Sheet 1)

EFFECTIVITY
ENGINES WITHOUT PHASE 3

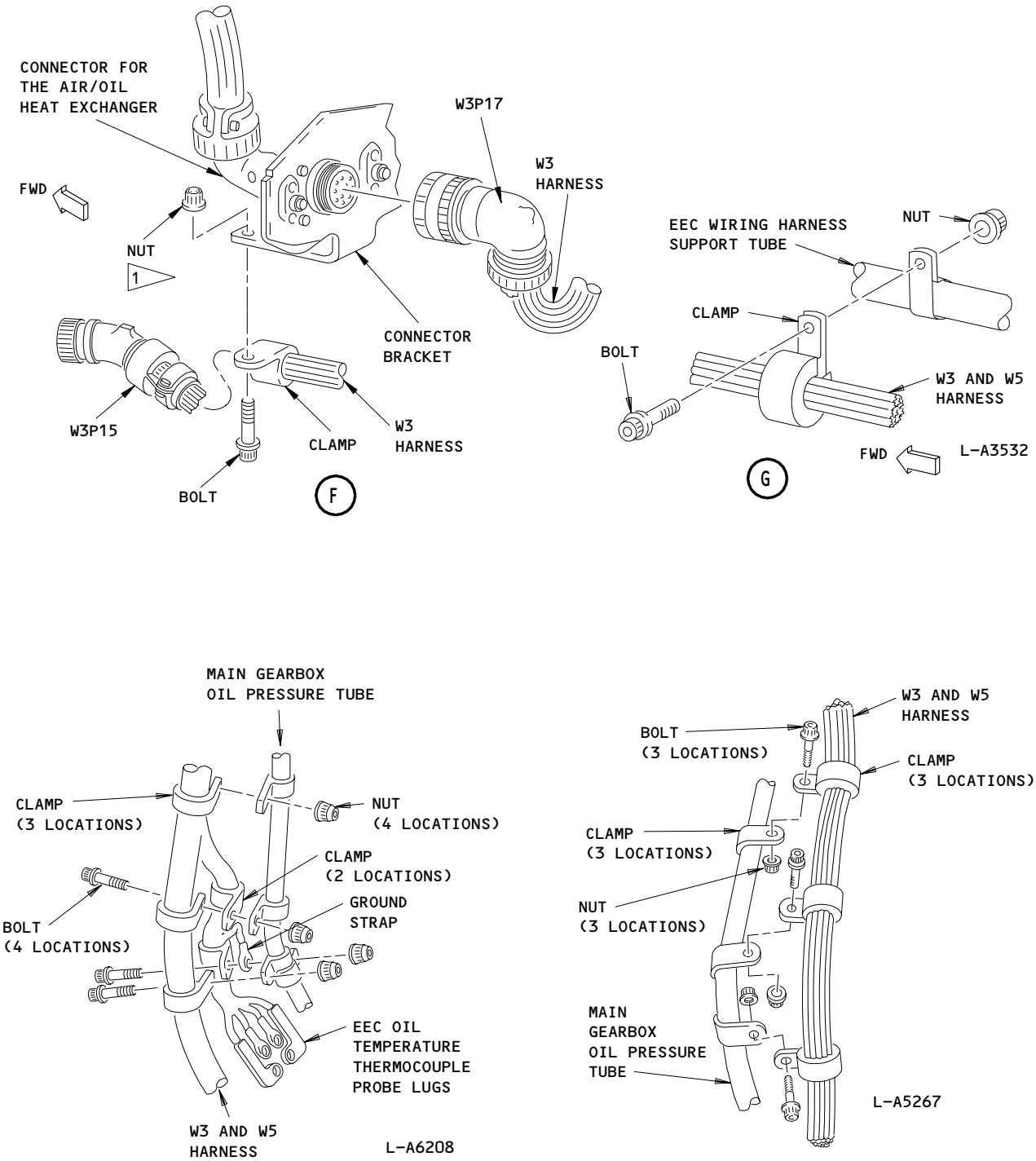
753258



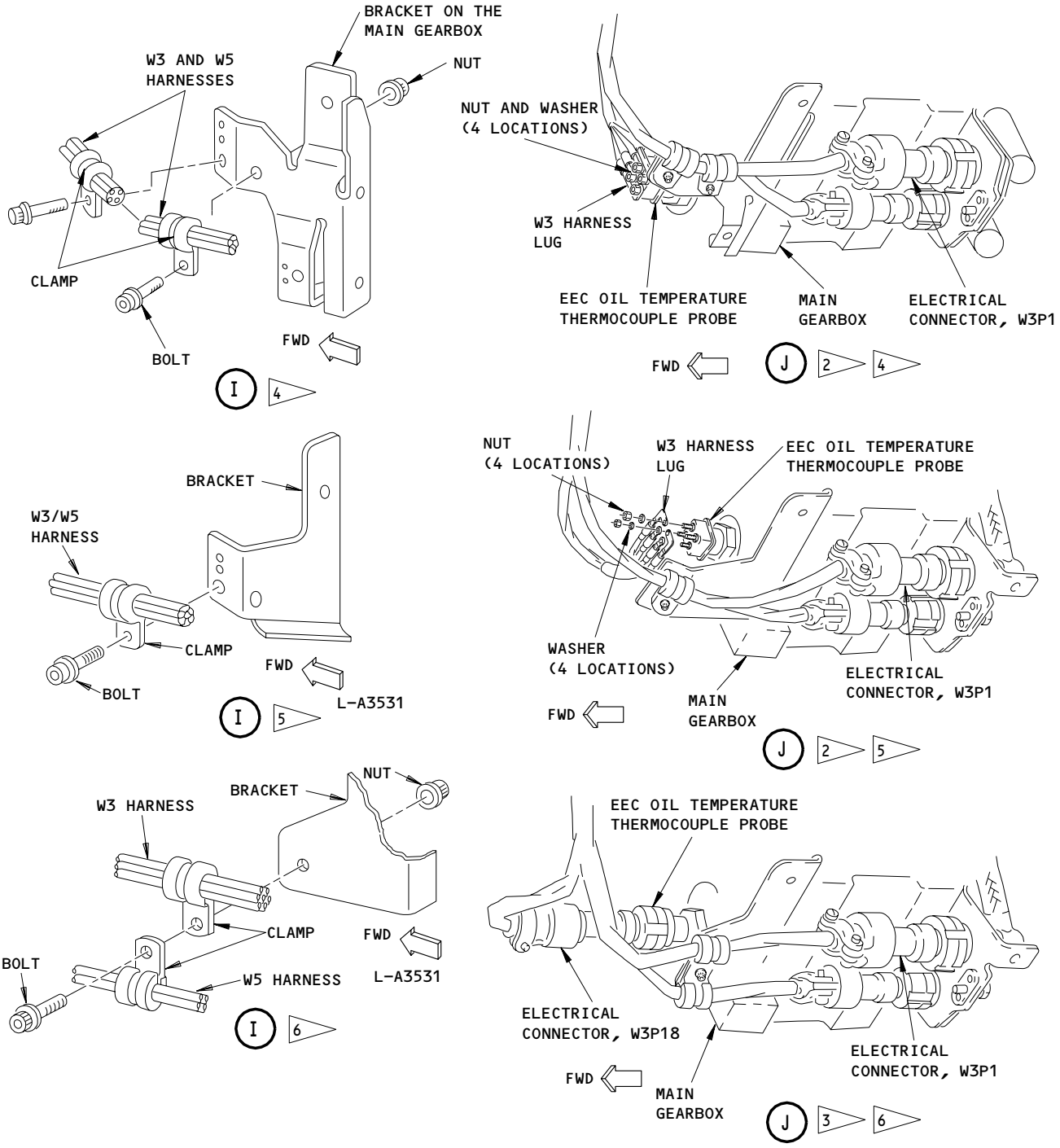
EEC Wiring Harness W3 Installation (Bottom Half)
Figure 401A (Sheet 2)

EFFECTIVITY
ENGINES WITHOUT PHASE 3

753309



EEC Wiring Harness W3 Installation (Bottom Half)
Figure 401A (Sheet 3)

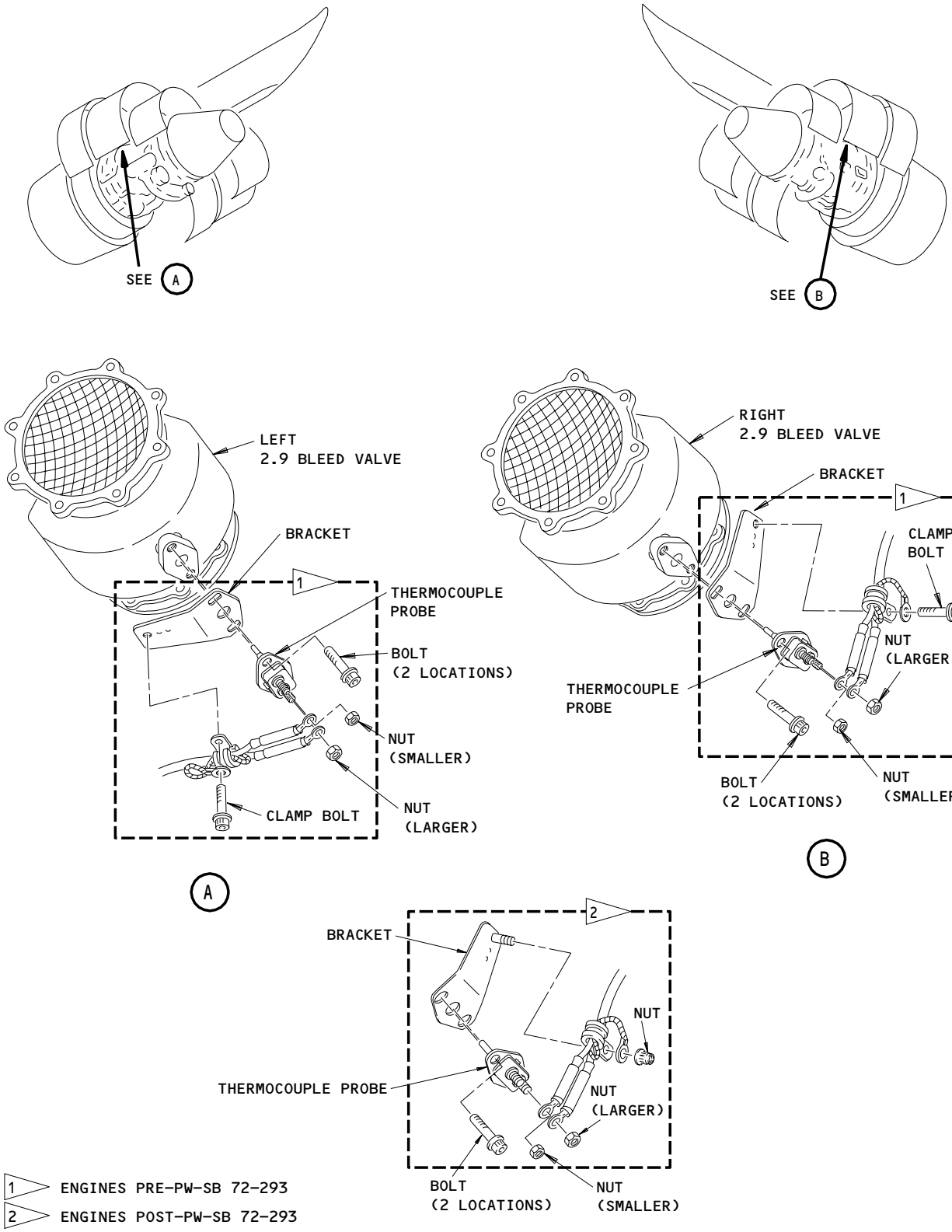


2 ENGINES POST-PW-SB 73-84 (STUD AND LUG CONNECTOR)
3 ENGINES PRE-PW-SB 73-84 (PIN AND SOCKET CONNECTOR)
4 ENGINES POST-PW-SB 72-375 (TWO CLAMP LOCATIONS)
5 ENGINES PRE-PW-SB 72-375 AND POST PW-SB 73-76 (ONE CLAMP)
6 ENGINES PRE-PW-SB 73-76 (TWO CLAMPS/ONE LOCATION)

EEC Wiring Harness W3 Installation (Bottom Half)
Figure 401A (Sheet 4)

EFFECTIVITY
ENGINES WITHOUT PHASE 3

839154



EEC Wiring Harness W3 Installation (2.9 Bleed Valve Thermocouple Probe)
Figure 401B

D. Prepare For Wiring Harness Removal

S 864-002-N02

(1) For the left engine, open this circuit breaker on the main power distribution panel P6 and attach DO-NOT-CLOSE tag:
(a) 6L19, PROBE HEAT L ENG

S 864-003-N02

(2) For the right engine, open this circuit breaker on the main power distribution panel P6 and attach DO-NOT-CLOSE tag:
(a) 6K25, PROBE HEAT R ENG

S 864-004-N02

(3) For the left engine, open these circuit breakers on the overhead panel P11 and attach DO-NOT-CLOSE tags:
(a) 11A10, AIR DATA CMPTR L
(b) 11L3, L ENGINE PERF SOL CHAN A
(c) 11L4, L ENGINE PERF SOL CHAN B
(d) 11M5, LEFT ENGINE EEC DISCRETES

S 864-005-N02

(4) For the right engine, open these circuit breakers on the overhead panel P11 and attach DO-NOT-CLOSE tags:
(a) 11F30, AIR DATA CMPTR R
(b) 11L30, R ENGINE PERF SOL CHAN A
(c) 11L31, R ENGINE PERF SOL CHAN B
(d) 11M32, RIGHT ENGINE EEC DISCRETES

S 864-006-N02

(5) Open this circuit breaker on the overhead panel P11 and attach DO-NOT-CLOSE tag:
(a) 11B36, APU ENG START/ECS DISCRETES

S 014-007-N02

(6) Open the fan cowl panels (AMM 71-11-04/201).

S 044-008-N02

WARNING: DO THE THRUST REVERSER DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(7) Do this procedure: Thrust Reverser Deactivation for Ground Maintenance (AMM 78-31-00/201).

S 014-009-N02

(8) Open the core cowl panels (AMM 71-11-06/201).

S 014-010-N02

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(9) Open the thrust reversers (AMM 78-31-00/201).

E. Remove EEC Wiring Harness W3.

S 024-020-N02

CAUTION: DO NOT TWIST OR BEND THE HARNESS BADLY DURING REMOVAL. IF THE HARNESS IS TWISTED OR BENT BADLY, THE HARNESS CAN BE DAMAGED.

(1) Disconnect the W1P24 connector from the W3J24 connector as follows (Fig. 401):
   (a) Find the W3J24 connector at the 10 o'clock position on the High Pressure Compressor (HPC) case.
   (b) Disconnect the W1P24 connector from the W3J24 connector.
   (c) Remove the screws that attach the W3J24 connector to the bracket on the HPC case.
   (d) Remove the W3J24 connector from the bracket.
   (e) Install covers on the electrical connectors.

S 024-013-N02

(2) Disconnect the W3P15 connector from the 2.5 bleed valve actuator as follows (Fig. 401A):
   (a) Find the W3P15 connector attached to the 2.5 bleed valve actuator.
   (b) Disconnect the W3P15 connector from the 2.5 bleed valve actuator. You may use the torque adapter (PWA 85749) to disconnect the W3P15 connector.
   (c) Install covers on the electrical connectors.

S 024-014-N02

(3) Disconnect the W3P17 connector from the air/oil heat exchanger as follows:
   (a) Find the W3P17 connector at the air/oil heat exchanger on the intermediate case.
   (b) Disconnect the W3P17 connector from the air/oil heat exchanger.

(c) Install covers on the electrical connectors.

S 024-015-NO2

(4) Disconnect the W3P5 connector from the bypass valve solenoid for the fuel/oil cooler as follows:
(a) Find the W3P5 connector attached to the bypass valve solenoid for the fuel/oil cooler.
(b) Disconnect the W3P5 connector.
(c) Install covers on the electrical connectors.

S 024-016-NO2

(5) Disconnect the W3P1 connector from the EEC alternator as follows:
(a) Find the W3P1 connector on the left side of the gearbox.
(b) Disconnect the W3P1 connector from the EEC alternator connector. You can use the torque adapter (PWA 85749) to remove the W3P1 connector.
(c) Install covers on the electrical connectors.

S 024-017-NO2

(6) ENGINES PRE-PW-SB 73-84;
Disconnect the W3P18 connector from the EEC oil temperature probe as follows:
(a) Find the W3P18 connector on the front of the gearbox.
(b) Disconnect the W3P18 connector from the EEC oil temperature probe.
(c) Install covers on the electrical connectors.

S 024-018-NO2

(7) ENGINES POST-PW-SB 73-84;
Disconnect the W3P18 connector from the EEC oil temperature probe as follows:
(a) Find the W3P18 connector on the front of the gearbox.
(b) Remove the nuts to disconnect the W3P18 connector from the EEC oil temperature probe.
(c) Install the covers on the electrical connectors.

S 024-030-NO2

(8) ENGINES WITH THE THERMOCOUPLE PROBE FOR THE LEFT 2.9 BLEED VALVE AND PRE-PW-SB 72-293;
Disconnect the W3 harness from the thermocouple probe with the steps that follow (Fig. 401B):
(a) Remove the clamp bolt which attaches the clamp and the ground cable to the bracket.
(b) Remove the nuts which attach the W3 harness from the thermocouple probe.

S 024-023-N02

(9) ENGINES WITH THE THERMOCOUPLE PROBE FOR THE LEFT 2.9 BLEED VALVE AND POST-PW-SB 72-293;
Disconnect the W3 harness from the thermocouple probe with the steps that follow (Fig. 401B):
(a) Remove the nut which attaches the clamp and the ground cable to the bracket.
(b) Remove the nuts which attach the W3 harness to the thermocouple probe.

S 024-022-N02

(10) Remove the bolts, nuts, and clamps that attach the W3 harness to the brackets and support tube on the HPC case.

S 024-028-N02

(11) Remove the W3 harness from the engine.

TASK 73-21-07-404-024-N02

3. Install the EEC Wiring Harness W3 (Fig. 401, 401A, 401B)

A. Equipment
(1) Torque Adapter PWA 85749 (optional)

HARNESS CONNECTORS WHERE THE TORQUE ADAPTER (PWA 85749) CAN BE USED	
CONNECTOR	COMPONENT
W3P1	EEC Alternator (N2 Transducer)
W3P15	2.5 Bleed Valve Actuator

B. Consumable Materials
(1) D00137 Engine Oil - PWA 521

C. References
(1) AMM 70-24-05/201, Electrical Harnesses
(2) AMM 71-11-04/201, Fan Cowl Panels
(3) AMM 71-11-06/201, Core Cowl Panels
(4) AMM 78-31-00/201, Thrust Reverser System

D. Access
(1) Location Zone
410 No. 1 Power Plant
420 No. 2 Power Plant

(2) Access Panel

413	Fan Cowl Panel (LH)
414	Fan Cowl Panel (RH)
415	Fan Reverser (LH)
416	Fan Reverser (RH)
417	Core Cowl (LH)
418	Core Cowl (RH)
423	Fan Cowl Panel (LH)
424	Fan Cowl Panel (RH)
425	Fan Reverser (LH)
426	Fan Reverser (RH)
427	Core Cowl (LH)
428	Core Cowl (RH)

E. Install the EEC Wiring Harness W3

S 424-025-NO2

(1) Attach the W3J24 connector to the bracket on the High Pressure Compressor (HPC) as follows (Fig. 401):
   (a) Remove the cover from the W3J24 connector.
   (b) Find the bracket for the W3J24 connector at the 10 o'clock position on the HPC.
   (c) Attach the W3J24 connector flange to the bracket with screws and nuts.
   (d) Tighten the nuts to 5-6 pound inches (0.565-0.678 newton meters).

S 424-026-NO2

CAUTION: USE THE CORRECT ASSEMBLY PROCEDURE, AND TOOLS, FOR THE HARNESS CONNECTOR INSTALLATION (AMM 70-24-05/201). IF YOU USE THE INCORRECT ASSEMBLY PROCEDURE, OR TOOLS, A DAMAGED OR LOOSE CONNECTOR CAN OCCUR. A LOOSE CONNECTOR PERMITS VIBRATION, WHICH CAUSES THE CONTACTS TO WEAR AND DECREASES THE LIGHTNING PROTECTION.

(2) Connect the W1P24 connector to the W3J24 connector as follows (AMM 70-24-05/201):
   (a) Remove the cover from the W1P24 connector.
   (b) Connect the W1P24 connector to the W3J24 connector.

S 824-021-NO2

(3) Let the W3 harness hang down the left side of the HPC case.

S 424-292-NO2

CAUTION: USE THE CORRECT ASSEMBLY PROCEDURE, AND TOOLS, FOR THE HARNESS CONNECTOR INSTALLATION (AMM 70-24-05/201). IF YOU USE THE INCORRECT ASSEMBLY PROCEDURE, OR TOOLS, A DAMAGED OR LOOSE CONNECTOR CAN OCCUR. A LOOSE CONNECTOR PERMITS VIBRATION, WHICH CAUSES THE CONTACTS TO WEAR AND DECREASES THE LIGHTNING PROTECTION.

(4) Connect the W3P15 connector to the 2.5 bleed valve actuator as follows (AMM 70-24-05/201):
   (a) Find the 2.5 bleed valve actuator on the intermediate case (Fig. 401A).
   (b) Remove the covers from the connectors.
   (c) Connect the W3P15 connector to the 2.5 bleed valve actuator. You can use the torque adapter (PWA 85749) to tighten the W3P15 connector.

S 424-028-NO2

CAUTION: USE THE CORRECT ASSEMBLY PROCEDURE, AND TOOLS, FOR THE HARNESS CONNECTOR INSTALLATION (AMM 70-24-05/201). IF YOU USE THE INCORRECT ASSEMBLY PROCEDURE, OR TOOLS, A DAMAGED OR LOOSE CONNECTOR CAN OCCUR. A LOOSE CONNECTOR PERMITS VIBRATION, WHICH CAUSES THE CONTACTS TO WEAR AND DECREASES THE LIGHTNING PROTECTION.

(5) Connect the W3P17 connector to the air/oil heat exchanger as follows (AMM 70-24-05/201):
   (a) Find the air/oil heat exchanger at the 8 o'clock position on the HPC case (Fig. 401A).
   (b) Remove the covers from the connectors.
   (c) Connect the W3P17 connector to the air/oil heat exchanger.

S 424-291-NO2

CAUTION: USE THE CORRECT ASSEMBLY PROCEDURE, AND TOOLS, FOR THE HARNESS CONNECTOR INSTALLATION (AMM 70-24-05/201). IF YOU USE THE INCORRECT ASSEMBLY PROCEDURE, OR TOOLS, A DAMAGED OR LOOSE CONNECTOR CAN OCCUR. A LOOSE CONNECTOR PERMITS VIBRATION, WHICH CAUSES THE CONTACTS TO WEAR AND DECREASES THE LIGHTNING PROTECTION.

(6) Connect the W3P5 connector to the bypass valve solenoid for the fuel/oil cooler as follows (AMM 70-24-05/201):
   (a) Find the bypass valve solenoid for the fuel/oil cooler on the bottom side of the fuel/oil cooler.

(b) Remove the covers from the connectors.
(c) Connect the W3P5 connector to the forward connector on the bypass valve solenoid for the fuel/oil cooler.

S 424-030-N02

CAUTION: USE THE CORRECT ASSEMBLY PROCEDURE, AND TOOLS, FOR THE HARNESS CONNECTOR INSTALLATION (AMM 70-24-05/201). IF YOU USE THE INCORRECT ASSEMBLY PROCEDURE, OR TOOLS, A DAMAGED OR LOOSE CONNECTOR CAN OCCUR. A LOOSE CONNECTOR PERMITS VIBRATION, WHICH CAUSES THE CONTACTS TO WEAR AND DECREASES THE LIGHTNING PROTECTION.

(7) Connect the W3P1 connector to the connector for the EEC alternator as follows (AMM 70-24-05/201):
(a) Find the connectors for the EEC alternator on the left side of the gearbox.
(b) Remove the covers from the connectors.
(c) Connect the W3P1 connector to the higher of the two connectors for the EEC alternator. You can use the torque adapter (PWA 85749) to tighten the W3P1 connector.

S 424-290-N02

CAUTION: USE THE CORRECT ASSEMBLY PROCEDURE, AND TOOLS, FOR THE HARNESS CONNECTOR INSTALLATION (AMM 70-24-05/201). IF YOU USE THE INCORRECT ASSEMBLY PROCEDURE, OR TOOLS, A DAMAGED OR LOOSE CONNECTOR CAN OCCUR. A LOOSE CONNECTOR PERMITS VIBRATION, WHICH CAUSES THE CONTACTS TO WEAR AND DECREASES THE LIGHTNING PROTECTION.

(8) ENGINES PRE-PW-SB 73-84;
Connect the W3P18 connector to the thermocouple probe for the EEC oil temperature as follows (AMM 70-24-05/201):
(a) Find the thermocouple probe on the front of the gearbox.

(b) Remove the covers from the connectors.
(c) Connect the W3P18 connector to the thermocouple probe.

S 424-288-NO2
(9) ENGINES POST-PW-SB 73-84;
Connect the W3P18 connector to the thermocouple probe for the EEC oil temperature as follows:
(a) Install the wiring harness terminals to the thermocouple studs and loosely install the nuts to the thermocouple studs.
(b) Loosley install the clamp, ground strap, and bolt to the bracket on the housing.

CAUTION: MAKE SURE THE THERMOCOUPLE STUD BOX DOES NOT TURN WHEN THE COUPLING NUT IS TIGHTENED. IF THE THERMOCOUPLE STUD BOX TURNS, DAMAGE TO THE WIRING HARNESS CAN OCCUR.

(c) If it is necessary to align the thermocouple stud box, loosen the coupling nut.
(d) Align the thermocouple stud box with the wiring harness connector.
(e) Hold the thermocouple stud box and tighten the coupling nut for the thermocouple probe to 95-100 pound-inches (10.734-11.298 newton-meters).
1) Do not let the thermocouple studs turn.

CAUTION: DO NOT ALIGN THE THERMOCOUPLE STUD BOX AFTER THE COUPLING NUT IS TIGHTENED. HOLD THE THERMOCOUPLE STUD BOX AND LOOSEN THE COUPLING NUT TO ALIGN THE THERMOCOUPLE STUD BOX AGAIN. DAMAGE TO THE THERMOCOUPLE STUD BOX CAN OCCUR.

(f) Make sure the thermocouple stud box is aligned.

CAUTION: TOO MUCH TORQUE (MORE THAN THE MAXIMUM TORQUE) ON THE THERMOCOUPLE PROBE NUTS CAN LOOSEN. IF TOO MUCH TORQUE IS APPLIED, DAMAGE TO THE THERMOCOUPLE STUDS CAN OCCUR.

(g) Tighten the alumel nuts (larger terminal studs) to 18-22 pound-inches (2.034-2.486 newton-meters).

(h) Tighten the chromel nuts (smaller terminal studs) to 15-18 pound-inches (1.695-2.034 newton-meters).
(i) Install the lockwire from the coupling nut to the adapter.

S 424-296-NO2

(10) ENGINES WITH THE THERMOCOUPLE PROBE FOR THE LEFT 2.9 BLEED VALVE; Install the thermocouple probe with the steps that follow (Fig. 401B):
(a) Attach the W3 harness with the two nuts.
(b) Tighten the larger nut to 18-22 pound-inches (2.034 - 2.486 newton-meters).
(c) Tighten the smaller nut to 15-18 pound-inches (1.695 - 2.034 newton-meters).
(d) Put the clamps on the W3 and W5 harnesses on the brackets above the fuel/oil cooler and adjacent to the thermocouple probe.
(e) ENGINES PRE-PW-SB 72-293;
Connect the W3 harness to the bracket with the steps that follow:
1) Lubricate the threads of the clamp bolt with oil.
2) Attach the clamps to the brackets with the clamp bolt.

NOTE: Install the end of the ground cable for the W3 and W5 harness with the clamp bolt adjacent to the thermocouple probe.

3) Tighten the clamp bolt with your hand.
(f) ENGINES POST-PW-SB 72-293;
Connect the W3 harness to the bracket with the steps that follow:
1) Lubricate the threads of the bolt, which is attached to the bracket, with engine oil.
2) Attach the clamp and the ground cable to the bracket with the nut.
3) Tighten the nut with your hand.

S 424-036-NO2

(11) Attach the harness lead for the 2.5 bleed valve actuator to the engine as follows:
(a) Find the bracket that holds the electrical connector for the air/oil heat exchanger at the 7:30 o'clock position on the HPC case (VIEW F, Fig. 401A).

(b) Put the clamps for the wiring harness below the bracket.
(c) Lubricate the bolt threads with oil.
(d) Attach the wiring harness to the bracket with the bolt and nut.
(e) Tighten the nut with your hand.

S 424-037-NO2

(12) Attach the W3 and W5 harness to the support bracket at the 10 o'clock position on the HPC case as follows:
(a) Install the two clamps on the W3 and W5 harnesses at the upper support bracket (View C and D, Fig. 401).
(b) Lubricate the bolt threads with oil.
(c) Attach the two clamps and the airframe bracket to the support bracket with the bolt and nut.
(d) Tighten the nut with your hand.

S 424-038-NO2

(13) Attach the W3 and W5 harness to the brackets on the front of the fuel oil cooler as follows:
(a) Put the clamps for the W3 and W5 harnesses on the two brackets on the fuel/oil cooler (VIEW B and C, Fig. 401A).
(b) Lubricate the threads of the bolt and nut with oil.
(c) Attach the wiring harness to the brackets with the bolt and nut.
(d) Tighten the bolt and nut with your hand.

S 424-285-NO2

(14) Attach the W3 and W5 harnesses to the support bracket as follows:
(a) Put the clamps for the W3 and W5 harnesses on the outboard side of the support bracket (VIEW D, and E, Fig. 401A).
(b) Lubricate the bolt threads with oil.
(c) Attach the wiring harness to the brackets with the bolts and nut.
(d) Tighten the bolts with your hand.

S 424-295-NO2

(15) ENGINES PRE-PW-SB 72-248;
Attach the wiring harness to the bracket on the HPC case at the 8 o'clock position:

(a) Put the clamp for the wiring harness on the bracket on the HPC case (View F, Fig. 401A).
(b) Lubricate the bolt threads with oil.
(c) Attach the wiring harness to the bracket with the bolt and nut.
(d) Tighten the nut with your hand.

S 424-294-N02

(16) ENGINES POST-PW-SB 72-248;
Attach the wiring harness to the bracket on the HPC case at the 8 o'clock position:
(a) Put the clamp for the wiring harness on the bracket on the HPC case (View F, Fig. 401A).
(b) Lubricate the bolt threads with oil.
(c) Attach the wiring harness to the bracket with the bolt.
(d) Tighten the bolt with your hand.

S 424-286-N02

(17) Attach the W3 and W5 harnesses to the support tube in two locations as follows:
(a) Put the clamps for the wiring harness on the support tube clamps (VIEW G, Fig. 401A).
(b) Lubricate the bolt threads with oil.
(c) Attach the wiring harness to the support tube with the bolts and nuts.
(d) Tighten the nuts with your hand.

S 424-287-N02

(18) Attach the wiring harness to the oil pressure tube for the gearbox in three locations as follows:
(a) Put the clamps for the wiring harness on the clamps for the oil pressure tube (VIEW H, Fig. 401A).
(b) Lubricate the bolt threads with oil.
(c) Attach the wiring harness to the oil pressure tube with bolts and nuts.
(d) Tighten the nuts with your hand.

S 864-044-N02

(19) ENGINES WITH TWO CLAMPS FOR THE W3 AND W5 HARNESS ATTACHED TO THE BRACKET ON THE MAIN GEARBOX AT TWO LOCATIONS;
Install the two clamps on the W3 and W5 harnesses at the bracket on the lower left corner of the main gearbox (VIEW I and J, Fig. 401A).

(a) Lubricate the threads of the bolts with engine oil.
(b) Attach the clamps to the bracket on the lower left corner of the main gearbox with the bolts.
1) Tighten the bolts with your hand.

S 864-045-NO2

(20) ENGINES WITH ONE CLAMP FOR THE W3 AND W5 HARNESS ATTACHED TO THE BRACKET ON THE MAIN GEARBOX;
Install the clamp on the W3 and W5 harnesses.
(a) Lubricate the threads of the bolt with engine oil.
(b) Attach the clamp to the bracket with the bolt (VIEW I and J, Fig. 401A).
1) Tighten the bolt with your hand.

S 864-046-NO2

(21) ENGINES WITH TWO CLAMPS FOR THE W3 AND W5 HARNESS ATTACHED TO THE BRACKET ON THE MAIN GEARBOX AT THE SAME BOLTHOLE;
Install the clamp on the W3 harness.
(a) Lubricate the threads of the bolt with engine oil.
(b) Attach the clamps for the W3 and W5 harnesses to the bracket with the bolt and nut (VIEW I and J, Fig. 401A).
1) Tighten the nut with your hand.

S 214-044-NO2

(22) Make sure the wiring harness is not pulled too tightly between any two clamps.

S 214-045-NO2

(23) Make sure the wiring harness does not touch any engine parts.

S 214-046-NO2

(24) Make sure the wiring harness is not pulled too tightly where the wiring harness attaches to the connectors.

S 424-284-NO2

(25) Tighten the nuts and bolts for the clamps on the W3 harness to 36-40 pound-inches (4.067-4.519 newton-meters).

NOTE: Make sure there is clearance between the W3 and W5 harnesses and the hardware near the lower left of the forward side of the gearbox.

F. Put the Airplane Back to its Usual Condition

S 414-048-NO2

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Close the thrust reversers (AMM 78-31-00/201).

S 414-049-NO2

(2) Close the core cowl panels (AMM 71-11-06/201).

S 444-050-NO2

(3) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

S 414-051-NO2

(4) Close the fan cowl panels (AMM 71-11-04/201).

S 864-052-NO2

(5) For the left engine, remove DO-NOT-CLOSE tag and close this circuit breaker on the main power distribution panel P6:
(a) 6L19, PROBE HEAT L ENG

S 864-053-NO2

(6) For the right engine, remove DO-NOT-CLOSE tag and close this circuit breaker on the main power distribution panel P6:
(a) 6K25, PROBE HEAT R ENG

S 864-054-NO2

(7) For the left engine, remove DO-NOT-CLOSE tags and close these circuit breakers on the overhead panel P11:
(a) 11A10, AIR DATA CMPTR L
(b) 11L3, L ENGINE PERF SOL CHAN A
(c) 11L4, L ENGINE PERF SOL CHAN B
(d) 11M5, LEFT ENGINE EEC DISCRETES

S 864-055-NO2

(8) For the right engine, remove DO-NOT-CLOSE tags and close these circuit breakers on the overhead panel P11:
(a) 11F30, AIR DATA CMPTR R
(b) 11L30, R ENGINE PERF SOL CHAN A
(c) 11L31, R ENGINE PERF SOL CHAN B
(d) 11M32, RIGHT ENGINE EEC DISCRETES

S 864-056-NO2

(9) Remove DO-NOT-CLOSE tag and close this circuit breaker on the overhead panel P11:
(a) 11B36, APU ENG START/ECS DISCRETES

S 714-057-NO2

(10) Do the test of the EEC wiring harness that is shown in the Power Plant Test Reference Table (AMM 71-00-00/501).

TASK 73-21-07-004-058-NO2

4. Remove the EEC Wiring Harness W4 (Fig. 402, 402A)

A. Equipment

(1) Torque Adapter PWA 85749 (optional)

HARNESS CONNECTORS WHERE THE TORQUE ADAPTER (PWA 85749) CAN BE USED	
CONNECTOR	COMPONENT
W4P4	2.9 Bleed Valve Soleniod

B. References

(1) AMM 71-11-04/201, Fan Cowl Panels
(2) AMM 71-11-06/201, Core Cowl Panels
(3) AMM 78-31-00/201, Thrust Reverser System

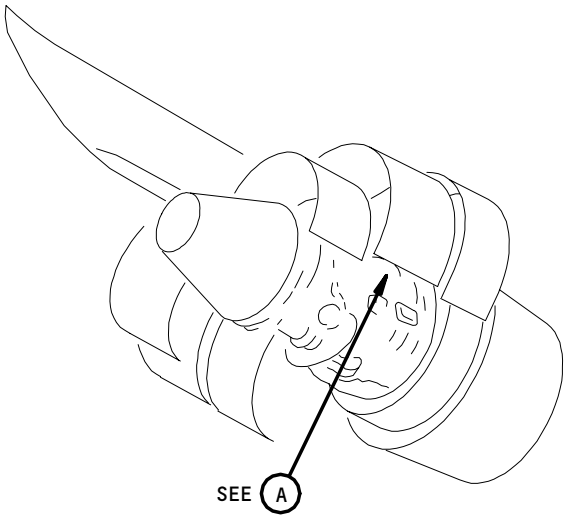
C. Access

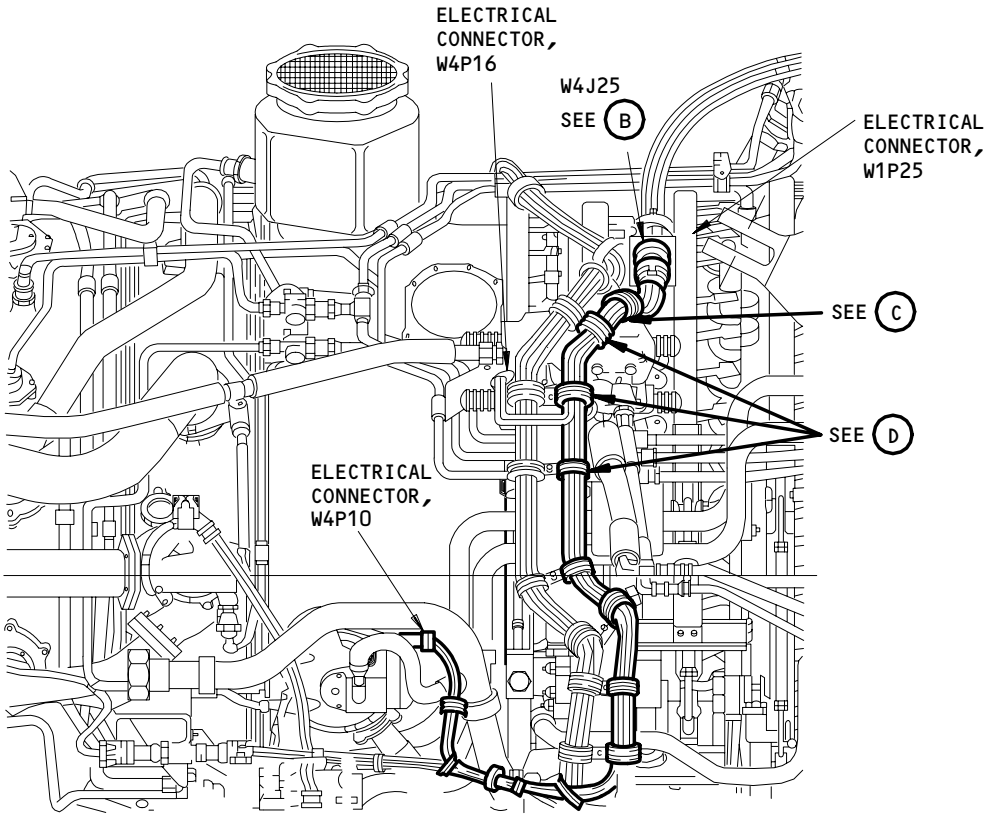
(1) Location Zone

410 No. 1 Power Plant
420 No. 2 Power Plant

(2) Access Panel

413 Fan Cowl Panel (LH)
414 Fan Cowl Panel (RH)
415 Fan Reverser (LH)
416 Fan Reverser (RH)
417 Core Cowl (LH)
418 Core Cowl (RH)
423 Fan Cowl Panel (LH)
424 Fan Cowl Panel (RH)
425 Fan Reverser (LH)
426 Fan Reverser (RH)
427 Core Cowl (LH)
428 Core Cowl (RH)



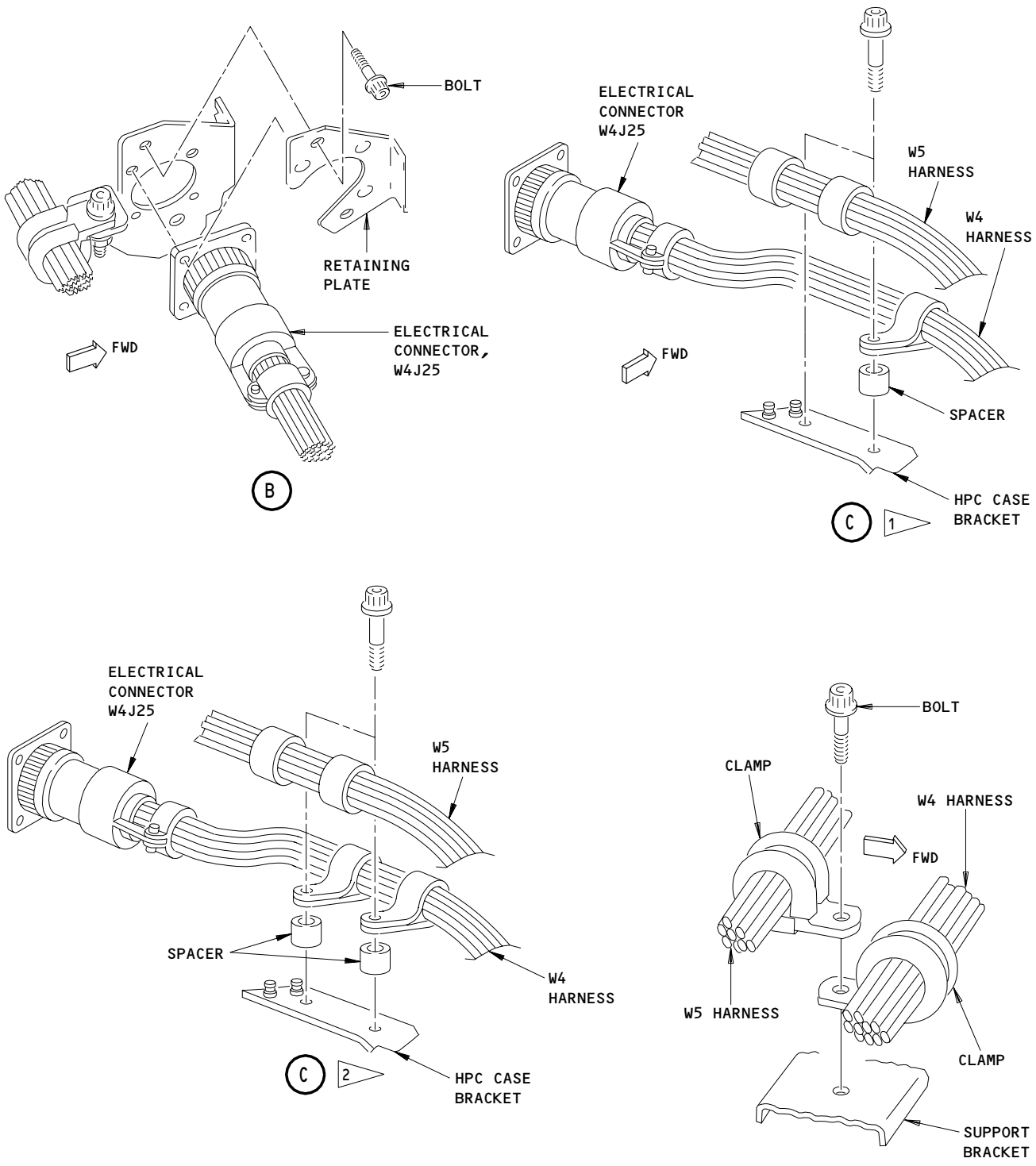


W4 HARNESS

A

NOTE: ATTACH THE WIRE BUNDLES TOGETHER WHERE THERE IS A "⇒".

EEC Wiring Harness W4 Installation (Top Half)
Figure 402 (Sheet 1)



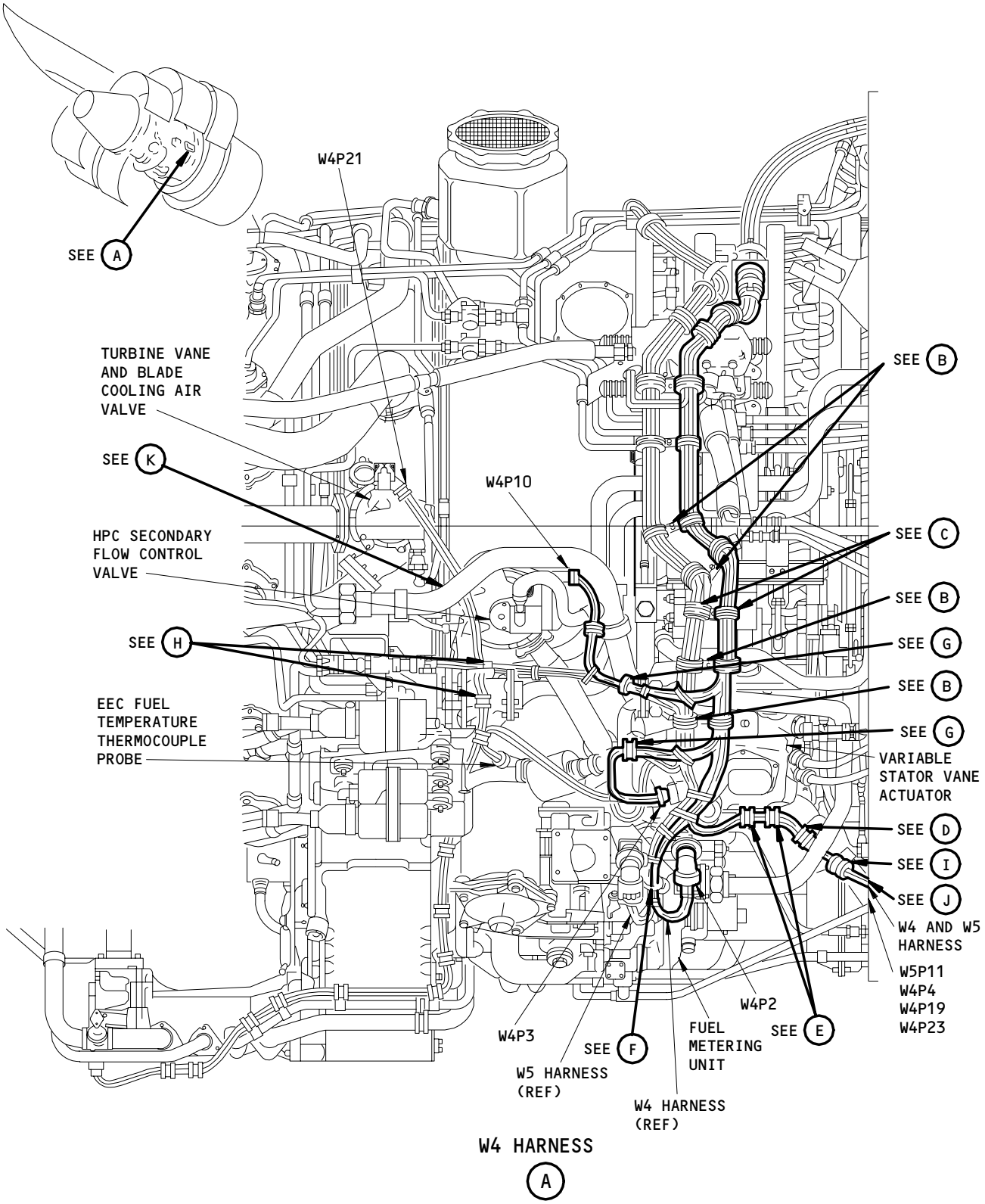
1 ENGINES WITH ONE SPACER (POST-PW-SB 73-118)

2 ENGINES WITH TWO SPACERS (PRE-PW-SB 73-118)

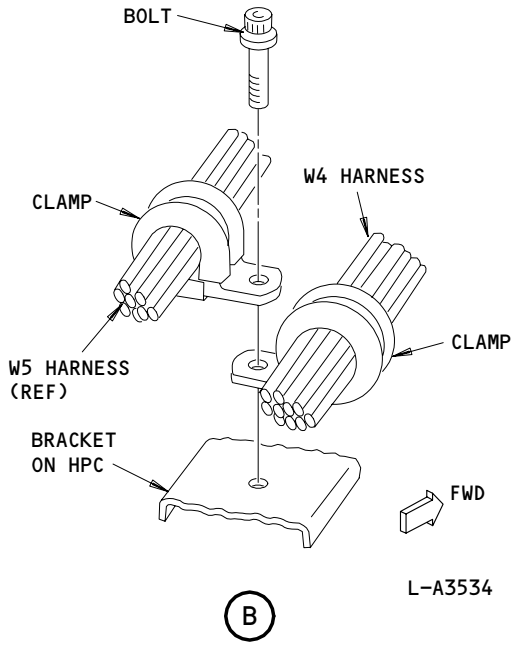
EEC Wiring Harness W4 Installation (Top Half)
Figure 402 (Sheet 2)

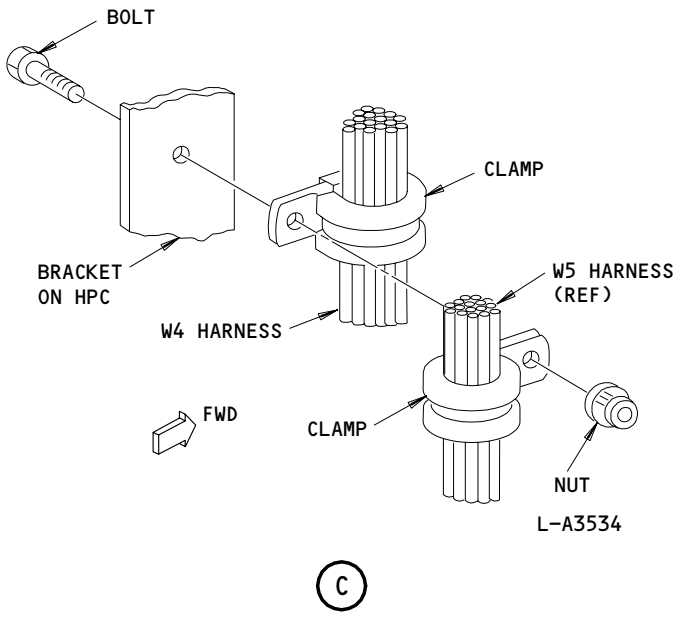
EFFECTIVITY
ENGINES WITHOUT PHASE 3

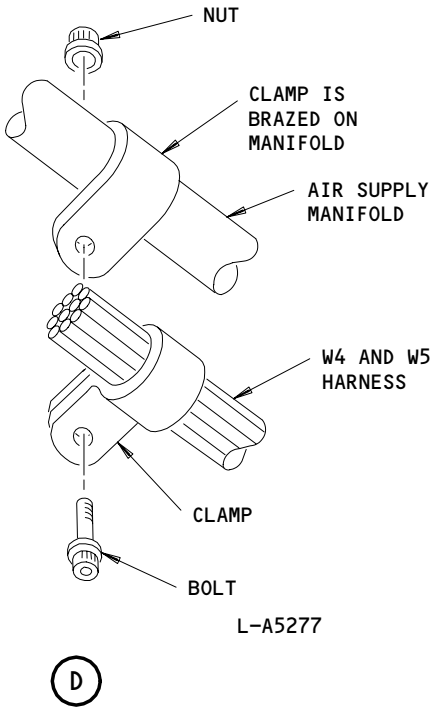
753669

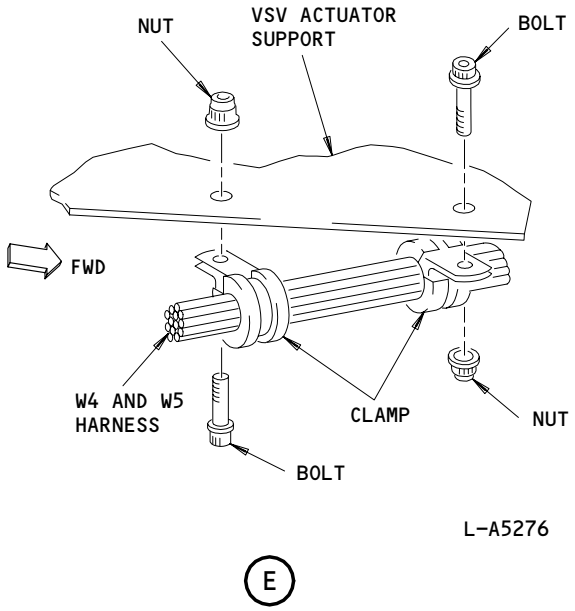


EEC Wiring Harness W4 Installation (Bottom Half)
Figure 402A (Sheet 1)





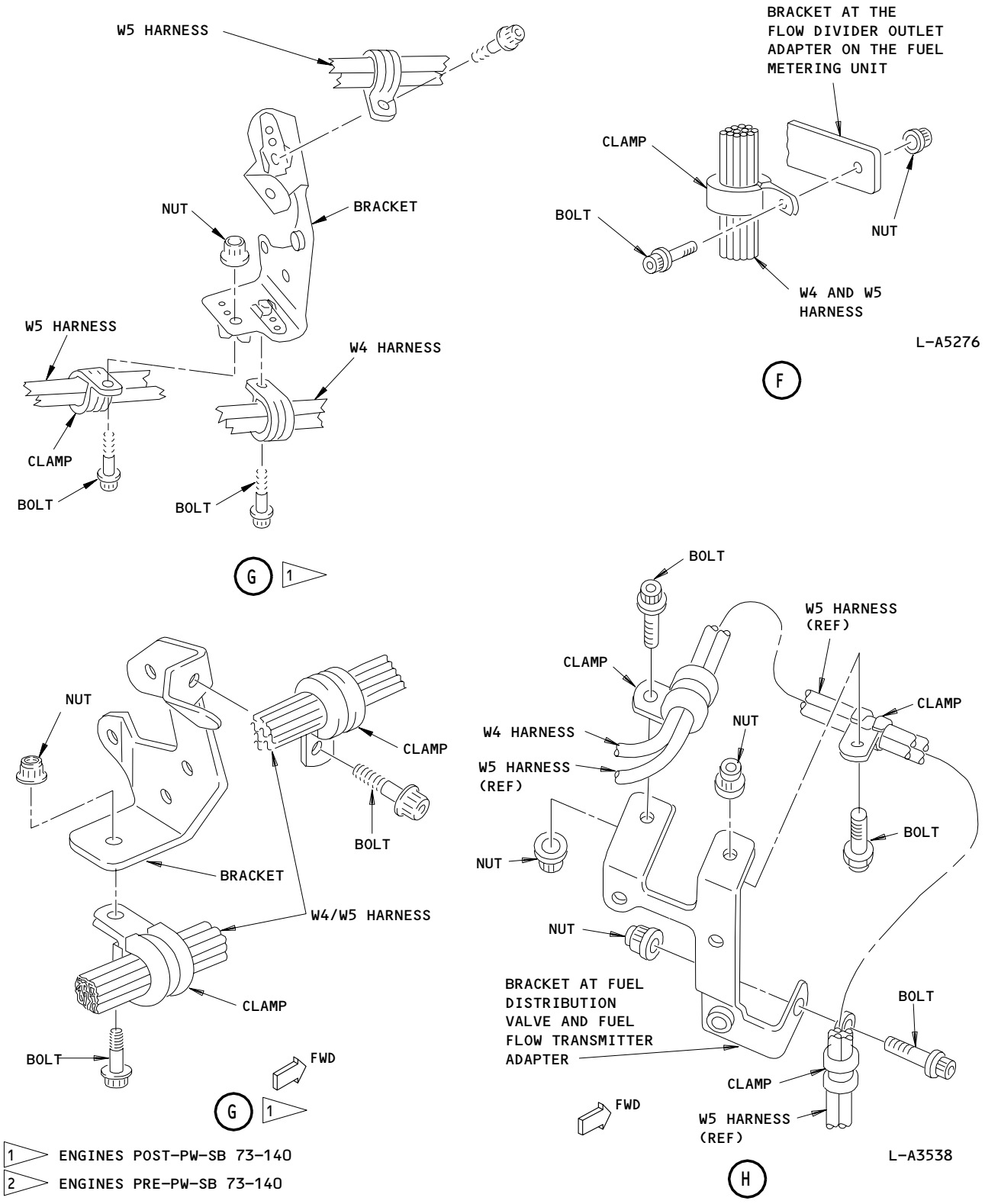




EEC Wiring Harness W4 Installation (Bottom Half)
Figure 402A (Sheet 2)

EFFECTIVITY
ENGINES WITHOUT PHASE 3

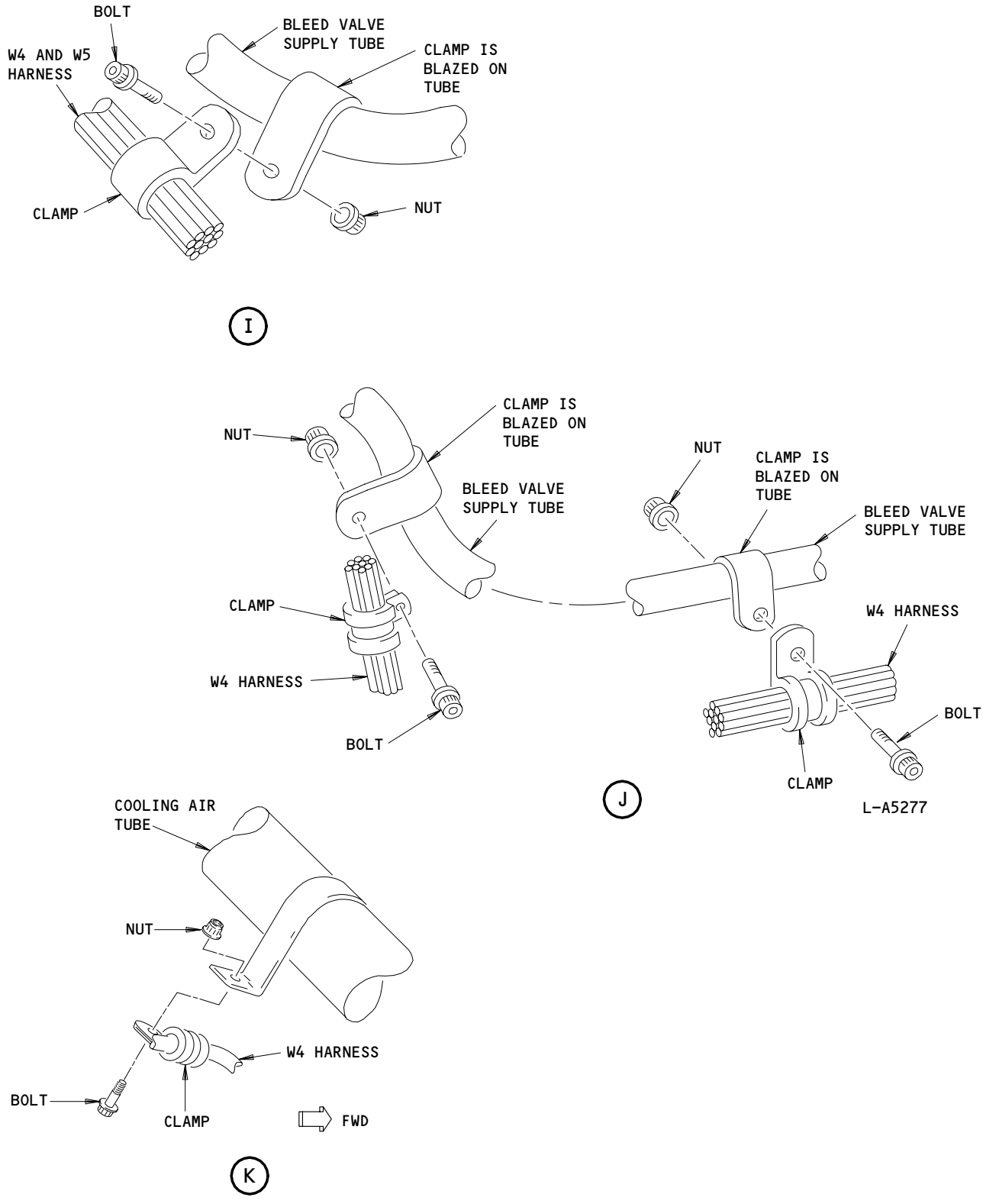
753676



EEC Wiring Harness W4 Installation (Bottom Half)
Figure 402A (Sheet 3)

EFFECTIVITY
ENGINES WITHOUT PHASE 3

753678



EEC Wiring Harness W4 Installation (Bottom Half)
Figure 402A (Sheet 4)

D. Prepare For Wiring Harness Removal

S 864-059-NO2

(1) For the left engine, open this circuit breaker on the main power distribution panel P6 and attach DO-NOT-CLOSE tag:
(a) 6L19, PROBE HEAT L ENG

S 864-060-NO2

(2) For the right engine, open this circuit breaker on the main power distribution panel P6 and attach DO-NOT-CLOSE tag:
(a) 6K25, PROBE HEAT R ENG

S 864-061-NO2

(3) For the left engine, open these circuit breakers on the overhead panel P11 and attach DO-NOT-CLOSE tags:
(a) 11A10, AIR DATA CMPTR L
(b) 11L3, L ENGINE PERF SOL CHAN A
(c) 11L4, L ENGINE PERF SOL CHAN B
(d) 11M5, LEFT ENGINE EEC DISCRETES

S 864-062-NO2

(4) For the right engine, open these circuit breakers on the overhead panel P11 and attach DO-NOT-CLOSE tags:
(a) 11F30, AIR DATA CMPTR R
(b) 11L30, R ENGINE PERF SOL CHAN A
(c) 11L31, R ENGINE PERF SOL CHAN B
(d) 11M32, RIGHT ENGINE EEC DISCRETES

S 864-063-NO2

(5) Open this circuit breaker on the overhead panel P11 and attach DO-NOT-CLOSE tag:
(a) 11B36, APU ENG START/ECS DISCRETES

S 014-064-NO2

(6) Open the fan cowl panels (Ref 71-11-04/201).

S 044-065-NO2

WARNING: DO THE THRUST REVERSER DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(7) Do this procedure: Thrust Reverser Deactivation for Ground Maintenance (AMM 78-31-00/201).

S 014-066-NO2

(8) Open the core cowl panels (AMM 71-11-06/201).

S 014-067-N02

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00 WHEN YOU OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(9) Open the thrust reversers (AMM 78-31-00/201).

E. Remove EEC Wiring Harness W4.

S 024-068-N02

CAUTION: DO NOT TWIST OR BEND THE HARNESS BADLY DURING REMOVAL. IF THE HARNESS IS TWISTED OR BENT BADLY, THE HARNESS CAN BE DAMAGED.

(1) Disconnect the W1P25 connector from the W4J25 connector as follows (Fig. 402):
   (a) Find the W4J25 connector at the 1:30 o'clock position on the High Pressure Compressor (HPC) case.
   (b) Disconnect the W1P24 connector from the W4J25 connector.
   (c) Remove the screws and nuts that attach the W4J25 connector to the bracket on the HPC case.
   (d) Remove the W4J25 connector from the bracket.
   (e) Install covers on the electrical connectors.

S 024-069-N02

(2) Disconnect the W4P16 connector from the air valve actuator for the Turbine Case Cooling (TCC) as follows:
   (a) Find the W4P16 connector attached to the air valve actuator for the TCC.
   (b) Disconnect the W4P16 connector from the air valve actuator for the TCC.
   (c) Install covers on the electrical connectors.

S 024-070-N02

(3) Disconnect the W4P21 connector from the valve for the turbine vane and blade cooling air as follows (Fig. 402A):
   (a) Find the W4P21 connector attached to the valve for the turbine vane and blade cooling air.
   (b) Disconnect the W4P21 connector.
   (c) Install covers on the electrical connectors.

S 024-071-N02

(4) Disconnect the W4P10 connector from the control valve for the HPC secondary flow as follows:
   (a) Find the W4P10 connector at the control valve for the HPC secondary flow.
   (b) Disconnect the W4P10 connector from the control valve for the HPC secondary flow.
   (c) Install protective covers on the electrical connectors.

S 024-072-NO2

(5) Disconnect the W4P3 connector from the actuator for the variable stator vanes as follows:
   (a) Find the W4P3 connector at the actuator for the variable stator vanes.
   (b) Disconnect the W4P3 connector from the actuator for the variable stator vanes.
   (c) Install covers on the electrical connectors.

S 024-073-NO2

(6) Disconnect the W4P4 connector from the solenoid for the 2.9 bleed valve as follows:
   (a) Find the W4P4 connector on the solenoid for the 2.9 bleed valve (VIEW A, Fig. 402A).
   (b) Disconnect the W4P4 connector from the solenoid for the 2.9 bleed valve.

      NOTE: You can use the torque adapter (PWA 85749) to disconnect the W4P4 connector.

   (c) Install covers on the electrical connectors.

S 024-074-NO2

(7) Disconnect the W4P19 electrical connector from the EEC speed transducer (N1) as follows:
   (a) Find the W4P19 connector at the EEC speed transducer (N1) on the intermediate case as follows:
   (b) Find the W4P19 connector attached to the EEC speed transducer.
   (c) Disconnect the W4P19 connector from the EEC speed transducer (N1).
   (d) Install covers on the electrical connectors.

S 024-078-NO2

(8) Disconnect the W4P23 connector from the EEC speed transducer (N1).
   (a) Find the W4P23 connector on the EEC speed transducer (N1).
   (b) Disconnect the W4P23 connector from the EEC speed transducer (N1).
   (c) Install the covers on the electrical connectors.

S 024-079-NO2

(9) Disconnect the W4P2 connector from the fuel metering unit as follows:
   (a) Find the W4P2 connector on the fuel metering unit.
   (b) Disconnect the W4P2 connector from the fuel metering unit.

(c) Install covers on the electrical connectors.

S 024-080-N02

(10) Remove the bolts, nuts, and clamps that attach the W4 harness to the brackets on the HPC case.

S 024-081-N02

(11) Remove the W4 harness from the engine.

TASK 73-21-07-404-082-N02

5. Install the EEC Wiring Harness W4 (Fig. 402, 402A)

A. Equipment

(1) Wrench - Strap, Model TG-70, Glenair, Inc., 1211 Air Way, Glendale. CA 91201; or Model BT-BS-601, Daniels Mfg. Corp., 6103 Anno Ave., Orlando, FL 32809

(2) Torque Adapter PWA 85749 (optional)

HARNESS CONNECTORS WHERE THE TORQUE ADAPTER (PWA 85749) CAN BE USED	
CONNECTOR	COMPONENT
W4P4	2.9 Bleed Valve Soleniod

B. Consumable Materials

(1) D00137 Engine Oil - PWA 521

C. References

(1) AMM 70-24-05/201, Electrical Harnesses
(2) AMM 71-11-04/201, Fan Cowl Panels
(3) AMM 71-11-06/201, Core Cowl Panels
(4) AMM 78-31-00/201, Thrust Reverser System

D. Access

(1) Location Zone
410 No. 1 Power Plant
420 No. 2 Power Plant

(2) Access Panel

413	Fan Cowl Panel (LH)
414	Fan Cowl Panel (RH)
415	Fan Reverser (LH)
416	Fan Reverser (RH)
417	Core Cowl (LH)
418	Core Cowl (RH)
423	Fan Cowl Panel (LH)
424	Fan Cowl Panel (RH)
425	Fan Reverser (LH)
426	Fan Reverser (RH)
427	Core Cowl (LH)
428	Core Cowl (RH)

E. Install the EEC Wiring Harness W4

S 424-083-NO2

CAUTION: DO NOT TWIST OR BEND THE HARNESS BADLY DURING INSTALLATION. IF THE HARNESS IS TWISTED OR BENT BADLY, THE HARNESS CAN BE DAMAGED.

(1) Temporarily attach the W4J25 connector to the bracket on the High Pressure Compressor (HPC) as follows (Fig. 402):
(a) Remove the covers from the electrical connectors.
(b) Find the bracket for the W4J25 connector at the 1:30 o'clock position on the HPC (VIEW B, Fig. 402).
(c) Attach the W4J25 connector to the bracket with lockwire.
(d) Install the cover on the W4J25 connector.

S 424-084-NO2

(2) Let the W4 harness hang down on the brackets on the right side of the HPC case.

S 424-085-NO2

CAUTION: USE THE CORRECT ASSEMBLY PROCEDURE, AND TOOLS, FOR THE HARNESS CONNECTOR INSTALLATION (AMM 70-24-05/201). IF YOU USE THE INCORRECT ASSEMBLY PROCEDURE, OR TOOLS, A DAMAGED OR LOOSE CONNECTOR CAN OCCUR. A LOOSE CONNECTOR PERMITS VIBRATION, WHICH CAUSES THE CONTACTS TO WEAR AND DECREASES THE LIGHTNING PROTECTION.

(3) Connect the W4P16 connector to the air valve actuator for the turbine case cooling (TCC) as follows (AMM 70-24-05/201):
(a) Remove the covers from the electrical connectors.

(b) Find the air valve actuator for the TCC under the harness bracket (VIEW A, Fig. 402).
(c) Put the W4P16 connector under the main harness and bracket.
(d) Attach the W4P16 connector to the air valve actuator for the TCC.

S 424-086-NO2

(4) Connect the W4P10 connector to the control valve for the HPC secondary flow as follows:
(a) Remove the covers from the electrical connectors.
(b) Find the control valve for the HPC secondary flow at the 3:30 o'clock position on the HPC case (VIEW A Fig. 402A).
(c) Connect the W4P10 connector to the control valve for the HPC secondary flow.

CAUTION: WHEN YOU USE THE STRAP WRENCH, YOU MUST ADJUST THE TORQUE WRENCH VALUE TO GET THE CORRECT TORQUE (AMM 70-24-05/201). AN INCORRECT TORQUE CAN CAUSE DAMAGE TO THE ELECTRICAL CONNECTOR AND UNSATISFACTORY LIGHTENING PROTECTION.

(d) Use the strap wrench to tighten the W4P10 connector to 21-26 pound-inches (2.373-2.938 newton-meters).
(e) Install the lockwire (AS3214-01) on the W4P10 connector.

S 424-087-NO2

(5) Connect the W4P21 connector to the cooling air valve for the turbine vanes and blades as follows:
(a) Remove the covers from the connectors.
(b) Find the cooling air valve for the turbine vanes and blades at the 3:00 o'clock position on the HPC case (VIEW A, Fig.402A).
(c) Connect the W4P21 connector to the cooling air valve for the turbine vanes and blades.

CAUTION: WHEN YOU USE THE STRAP WRENCH, YOU MUST ADJUST THE TORQUE WRENCH VALUE TO GET THE CORRECT TORQUE (AMM 70-24-05/201). AN INCORRECT TORQUE CAN CAUSE DAMAGE TO THE ELECTRICAL CONNECTOR AND UNSATISFACTORY LIGHTENING PROTECTION.

(d) Use the strap wrench to tighten the W4P21 electrical connector to 30-35 pound-inches (3.4-4.0 newton-meters).
(e) Install the lockwire (AS3214-01) on the W4P21 connector.

S 424-088-NO2

(6) Temporarily attach the W4 harness to the bracket at the fuel flow transmitter as follows:
   (a) Find the bracket on the adapter for the fuel flow transmitter (VIEW H, Fig. 402A).
   (b) Lubricate the bolt threads with oil.
   (c) Attach the W4 harness to the bracket with the bolts and nuts.
   (d) Tighten the nuts with your hand.

S 424-089-NO2

CAUTION: USE THE CORRECT ASSEMBLY PROCEDURE, AND TOOLS, FOR THE HARNESS CONNECTOR INSTALLATION (AMM 70-24-05/201). IF YOU USE THE INCORRECT ASSEMBLY PROCEDURE, OR TOOLS, A DAMAGED OR LOOSE CONNECTOR CAN OCCUR. A LOOSE CONNECTOR PERMITS VIBRATION, WHICH CAUSES THE CONTACTS TO WEAR AND DECREASES THE LIGHTNING PROTECTION.

(7) Connect the W4P3 connector to the actuator for the variable stator vanes as follows (AMM 70-24-05/201):
   (a) Remove the covers from the connectors.
   (b) Find the actuator for the variable stator vanes (VIEW A, Fig. 402A).
   (c) Put the W4P3 connector on the inboard side of the main harness.
   (d) Pull the W4P3 connector toward the actuator for the variable stator vanes.
   (e) Connect the W4P3 connector to the lower connector on the actuator for the variable stator vanes.

S 424-090-NO2

CAUTION: USE THE CORRECT ASSEMBLY PROCEDURE, AND TOOLS, FOR THE HARNESS CONNECTOR INSTALLATION (AMM 70-24-05/201). IF YOU USE THE INCORRECT ASSEMBLY PROCEDURE, OR TOOLS, A DAMAGED OR LOOSE CONNECTOR CAN OCCUR. A LOOSE CONNECTOR PERMITS VIBRATION, WHICH CAUSES THE CONTACTS TO WEAR AND DECREASES THE LIGHTNING PROTECTION.

(8) Connect the W4P4 connector to the solenoid for the 2.9 bleed valve as follows (AMM 70-24-05/201):
   (a) Remove the covers from the electrical connectors.
   (b) Find the solenoid for the 2.9 bleed valve on the intermediate case (VIEW A, Fig. 402A).

(c) Connect the W4P4 connector to the connector on the outboard side of the solenoid for the 2.9 bleed valve.

NOTE: You can use the torque adapter (PWA 85749) to tighten the W4P4 connector.

S 424-091-N02

CAUTION: USE THE CORRECT ASSEMBLY PROCEDURE, AND TOOLS, FOR THE HARNESS CONNECTOR INSTALLATION (AMM 70-24-05/201). IF YOU USE THE INCORRECT ASSEMBLY PROCEDURE, OR TOOLS, A DAMAGED OR LOOSE CONNECTOR CAN OCCUR. A LOOSE CONNECTOR PERMITS VIBRATION, WHICH CAUSES THE CONTACTS TO WEAR AND DECREASES THE LIGHTNING PROTECTION.

(9) Connect the W4P19 connector to the EEC speed transducer (N1) as follows (AMM 70-24-05/201):
(a) Remove the covers from the electrical connectors.
(b) Find the EEC speed transducer (N1) on the intermediate case (VIEW A, Fig. 402A).
(c) Connect the W4P19 connector to the EEC speed transducer.

S 424-092-N02

CAUTION: USE THE CORRECT ASSEMBLY PROCEDURE, AND TOOLS, FOR THE HARNESS CONNECTOR INSTALLATION (AMM 70-24-05/201). IF YOU USE THE INCORRECT ASSEMBLY PROCEDURE, OR TOOLS, A DAMAGED OR LOOSE CONNECTOR CAN OCCUR. A LOOSE CONNECTOR PERMITS VIBRATION, WHICH CAUSES THE CONTACTS TO WEAR AND DECREASES THE LIGHTNING PROTECTION.

(10) Connect the W4P23 connector to the EEC speed transducer (N1) (AMM 70-24-05/201).
(a) Remove the covers from the electrical connectors.
(b) Find the EEC speed transducer (N1) on the intermediate case (View A, Fig. 402A).
(c) Connect the W4P23 connector to the EEC speed transducer (N1).

S 424-093-N02

CAUTION: USE THE CORRECT ASSEMBLY PROCEDURE, AND TOOLS, FOR THE HARNESS CONNECTOR INSTALLATION (AMM 70-24-05/201). IF YOU USE THE INCORRECT ASSEMBLY PROCEDURE, OR TOOLS, A DAMAGED OR LOOSE CONNECTOR CAN OCCUR. A LOOSE CONNECTOR PERMITS VIBRATION, WHICH CAUSES THE CONTACTS TO WEAR AND DECREASES THE LIGHTNING PROTECTION.

(11) Connect the W4P2 connector to the fuel metering unit as follows (AMM 70-24-05/201):
  (a) Remove the covers from the electrical connectors.
  (b) Find the fuel metering unit (VIEW A, Fig 402A).
  (c) Connect the W4P2 connector to the forward connector on the fuel metering unit.

S 424-094-N02

(12) Connect the W4J25 connector to the bracket on the HPC case as follows:
  (a) Remove the covers from the electrical connectors.
  (b) Find the W4J25 connector at the 1:30 o'clock position on the HPC case (VIEW B, Fig. 402).
  (c) Remove the lockwire that attaches the W4J25 connector to the bracket.
  (d) Attach the W4J25 connector to the bracket with the screws and nuts.
  (e) Tighten the nuts to 5-6 pound-inches (0.565-0.678 newton-meters).

S 424-095-N02

CAUTION: USE THE CORRECT ASSEMBLY PROCEDURE, AND TOOLS, FOR THE HARNESS CONNECTOR INSTALLATION (AMM 70-24-05/201). IF YOU USE THE INCORRECT ASSEMBLY PROCEDURE, OR TOOLS, A DAMAGED OR LOOSE CONNECTOR CAN OCCUR. A LOOSE CONNECTOR PERMITS VIBRATION, WHICH CAUSES THE CONTACTS TO WEAR AND DECREASES THE LIGHTNING PROTECTION.

(13) Connect the W1P25 connector to the W4J25 connector (AMM 70-24-05/201).

S 424-096-NO2

(14) Attach the W4 and W5 harness at nine locations between the W4J25 connector and the fuel metering unit as follows:
  (a) Put the clamps for the W4 and W5 harnesses on the outboard side of the bracket on the HPC (VIEW C and D, Fig. 402; VIEW B and C, Fig. 402A).
  (b) Lubricate the threads of the bolts and nuts with oil.
  (c) Attach the W4 and W5 harness to the bracket in eight locations with the bolts.
  (d) Attach the W4 and W5 harnesses to the bracket in one location with the bolt and nut.
  (e) Tighten the bolts and nuts with your hand.

S 424-097-NO2

(15) Attach the W4 and W5 harness to the bracket at the forward end of the fuel flow transmitter as follows:
  (a) Find the bracket at the forward end of the fuel flow transmitter (VIEW H, Fig. 402A).
  (b) Attach the clamp for the W4 and W5 harness at the top of the bracket as follows:
    1) Put the clamp for the W4 and W5 harness on the outboard side of the bracket.
  (c) Attach the clamps for the W4 and W5 harnesses on the bottom of the bracket as follows:
    1) Put the clamps for the W4 and W5 harnesses on the bottom of the bracket.
  (d) Lubricate the bolt threads with oil.
  (e) Attach the clamps for the W4 and W5 harness to the bracket with the bolts and nuts.
  (f) Tighten the nuts with your hand.

S 424-098-NO2

(16) Attach the W4 and W5 harness to the bracket at the aft end of the fuel flow transmitter as follows:
  (a) Put the clamp for the W4 and W5 harnesses on the bottom side of the bracket (VIEW I, Fig. 402A).
  (b) Lubricate the bolt threads with oil.
  (c) Attach the clamps for the W4 and W5 harnesses to the bracket with the bolt and nut.
  (d) Tighten the nut with your hand.

S 424-099-N02

(17) Attach the W4 harness to the cooling air tube at the 9 o'clock position:
  (a) Put the clamp for the W4 harness on the clamp which is brazed on the cooling air tube (View L, Fig. 402A).
  (b) Lubricate the bolt threads with oil.
  (c) Attach the clamp for the W4 harness to the clamp on the cooling air tube with the bolt and nut.
  (d) Tighten the nut with your hand.

S 424-100-N02

(18) Attach the W4 and W5 harnesses to the fuel metering unit as follows:
  (a) Put the clamp for the W4 and W5 harness on the bracket at the fuel metering unit (VIEW G, Fig. 402A).
  (b) Lubricate the bolt threads with oil.
  (c) Attach the W4 and W5 harness to the bracket with the bolt.
  (d) Tighten the nut with your hand.

S 424-101-N02

(19) Attach the W4 and W5 harness to the actuator support for the variable stator vanes as follows:
  (a) Put the clamps for the W4 and W5 harness on the bottom side of the actuator support (VIEW E, Fig. 402A).
  (b) Lubricate the bolt threads with oil.
  (c) Attach the W4 and W5 harness to the actuator support with the bolts and nuts.
  (d) Tighten the nuts with your hand.

S 424-102-N02

(20) Attach the W4 and W5 harness to the supply tube for the fuel distribution valve as follows:
  (a) Put the clamp for the W4 and W5 harness on the clamp at the supply tube for the fuel distribution valve (VIEW D, Fig. 402A).
  (b) Lubricate the bolt threads with oil.
  (c) Attach the W4 and W5 harness to the supply tube for the fuel distribution valve with the bolt and nut.
  (d) Tighten the nut with your hand.

S 424-103-N02

(21) Attach the W4 and W5 harness to the supply tube for the supply tube as follows:
  (a) Put the clamps for the W4 and W5 harness on the clamps at the supply tube (Views J and K, Fig. 402A).
  (b) Lubricate the bolt threads with oil.

(c) Attach the W4 and W5 harness to the supply tube with the bolts and nuts.
(d) Tighten the nuts with your hand.

S 214-104-NO2
(22) Make sure the wiring harnesses are not pulled too tightly between any two clamps.

S 214-105-NO2
(23) Make sure the wiring harness does not touch any engine parts.

S 214-106-NO2
(24) Make sure the wiring harness is not pulled to tightly where the wiring harness attaches to the connectors.

S 424-107-NO2
(25) Tighten the nuts and bolts for the clamps on the W4 and W5 harness to 36-40 pound-inches (4.067-4.519 newton-meters).

F. Put the Airplane Back to its Usual Condition

S 414-108-NO2

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Close the thrust reversers (AMM 78-31-00/201).

S 414-109-NO2
(2) Close the core cowl panels (AMM 71-11-06/201).

S 444-110-NO2
(3) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

S 414-111-NO2
(4) Close the fan cowl panels (AMM 71-11-04/201).

S 864-112-NO2
(5) For the left engine, remove DO-NOT-CLOSE tag and close this circuit breaker on the main power disribution panel P6:
(a) 6L19, PROBE HEAT L ENG

S 864-113-NO2
(6) For the right engine, remove DO-NOT-CLOSE tag and close this circuit breaker on the main power disribution panel P6:
(a) 6K25, PROBE HEAT R ENG

S 864-114-NO2

(7) For the left engine, remove DO-NOT-CLOSE tags and close these circuit breakers on the overhead panel P11:
(a) 11A10, AIR DATA CMPTR L
(b) 11L3, L ENGINE PERF SOL CHAN A
(c) 11L4, L ENGINE PERF SOL CHAN B
(d) 11M5, LEFT ENGINE EEC DISCRETES

S 864-115-NO2

(8) For the right engine, remove DO-NOT-CLOSE tags and close these circuit breakers on the overhead panel P11:
(a) 11F30, AIR DATA CMPTR R
(b) 11L30, R ENGINE PERF SOL CHAN A
(c) 11L31, R ENGINE PERF SOL CHAN B
(d) 11M32, RIGHT ENGINE EEC DISCRETES

S 864-116-NO2

(9) Remove DO-NOT-CLOSE tag and close this circuit breaker on the overhead panel P11:
(a) 11B36, APU ENG START/ECS DISCRETES

S 714-117-NO2

(10) Do the test of the EEC wiring harness that is shown in the Power Plant Test Reference Table (AMM 71-00-00/501).

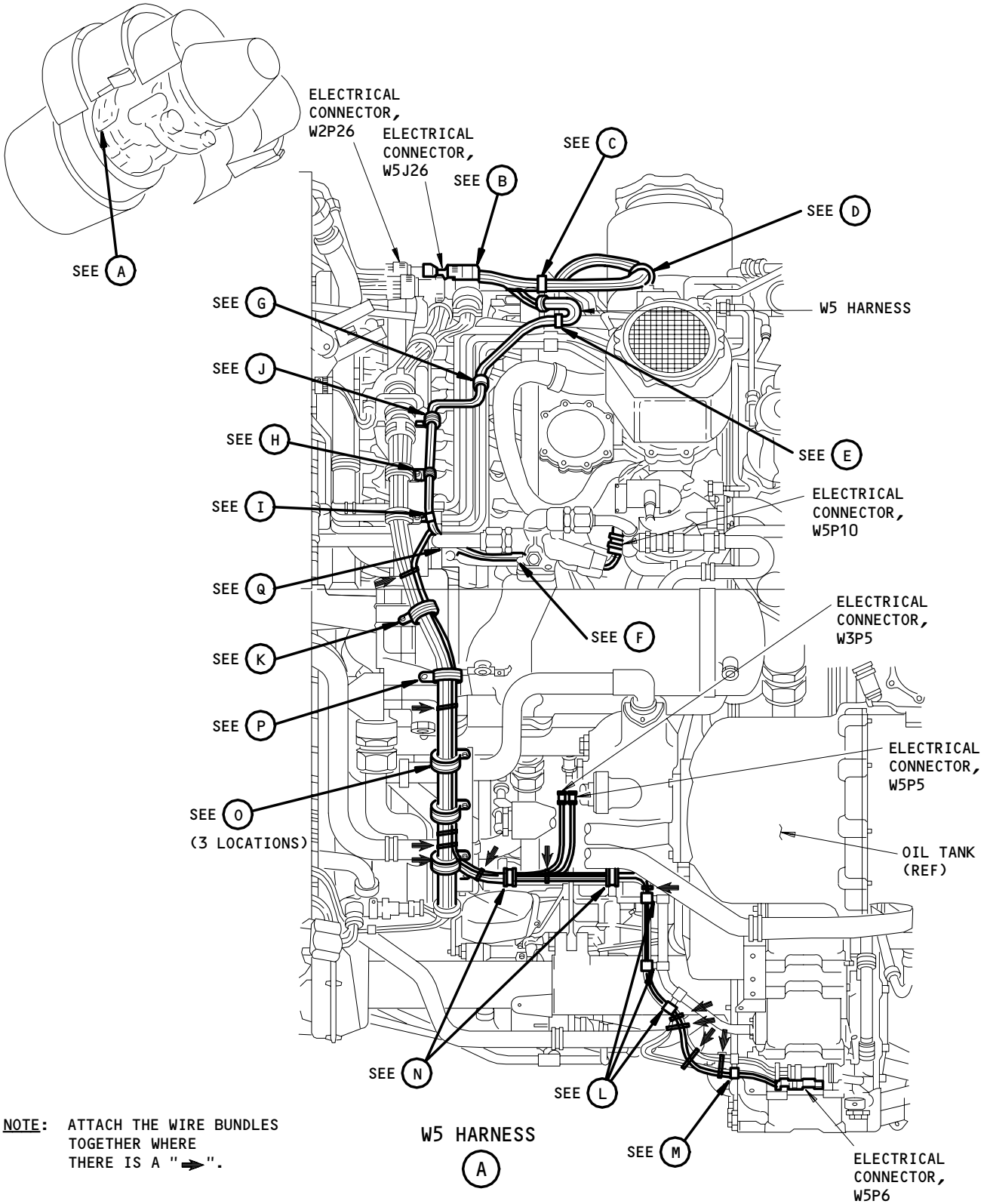
TASK 73-21-07-004-118-NO2

6. Remove the EEC Wiring Harness W5 (Fig. 403, 403A)

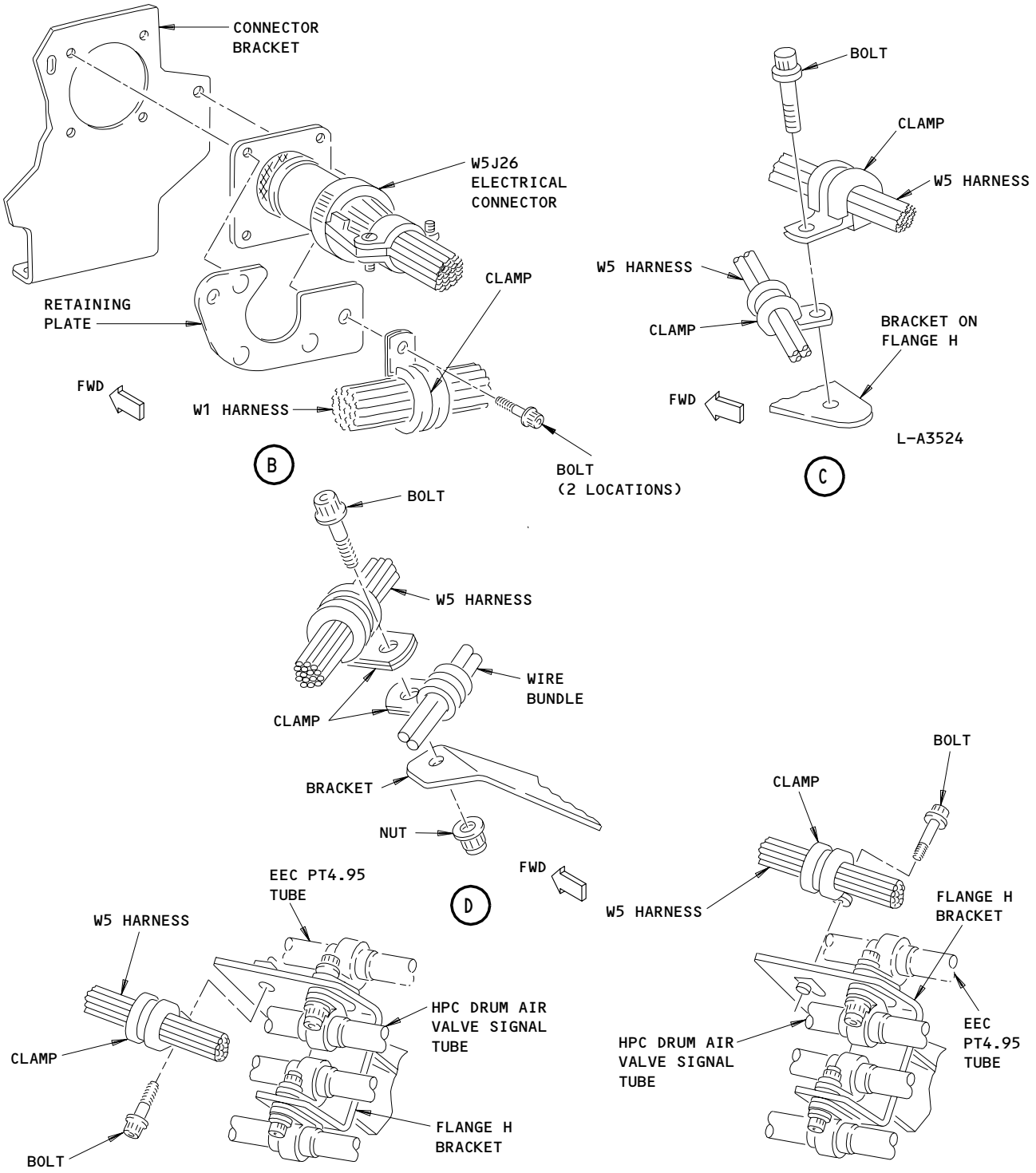
A. Equipment
(1) Torque Adapter PWA 85749 (optional)

HARNESS CONNECTORS WHERE THE TORQUE ADAPTER (PWA 85749) CAN BE USED	
CONNECTOR	COMPONENT
W5P6	EEC Alternator (N2 Transducer)
W5P11	2.9 Bleed Valve Solenoid

B. References
(1) AMM 71-11-04/201, Fan Cowl Panels
(2) AMM 71-11-06/201, Core Cowl Panels
(3) AMM 78-31-00/201, Thrust Reverser System



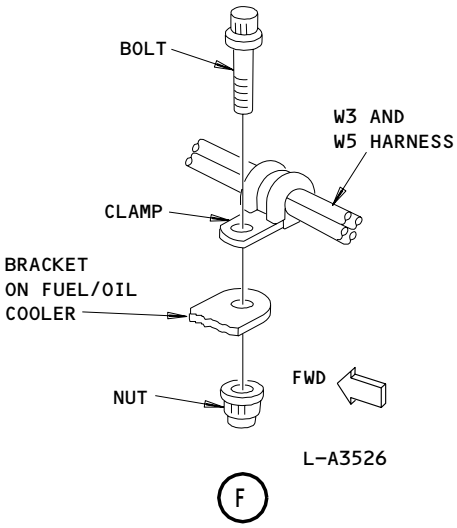
EEC Wiring Harness W5 Installation (Left Side)
Figure 403 (Sheet 1)



EEC Wiring Harness W5 Installation (Left Side)
Figure 403 (Sheet 2)

EFFECTIVITY
ENGINES WITHOUT PHASE 3

753712



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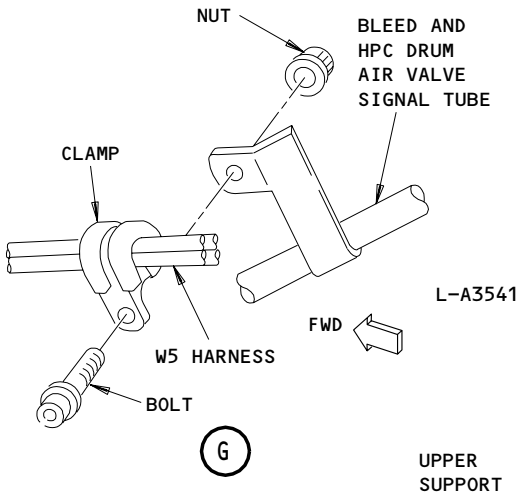

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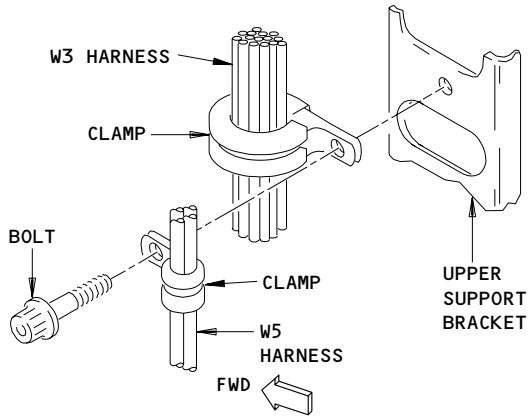
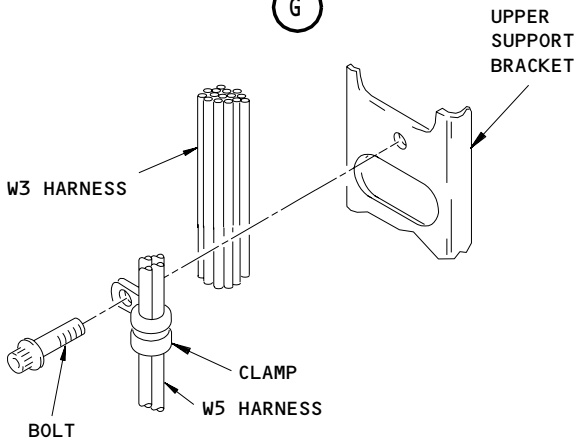


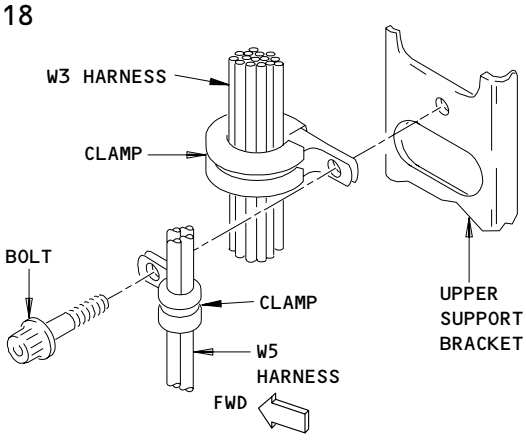
ENGINES PRE-PW-SB 73-118

H



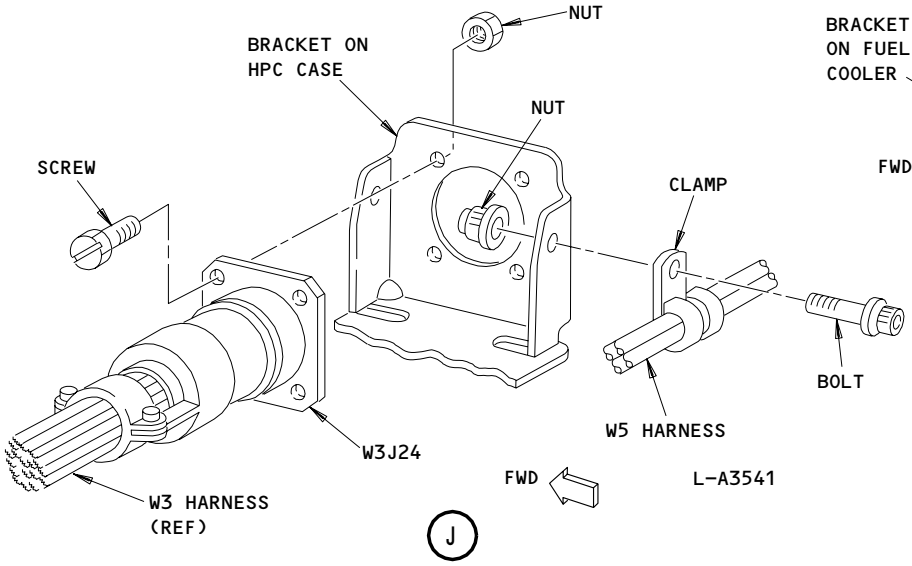
ENGINES POST-PW-SB 73-118

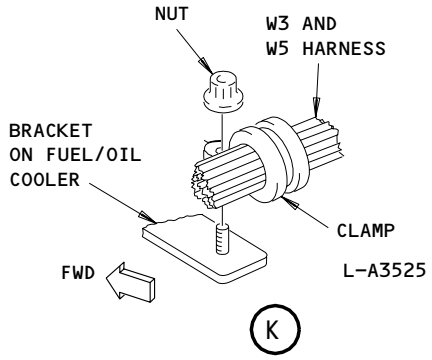
H

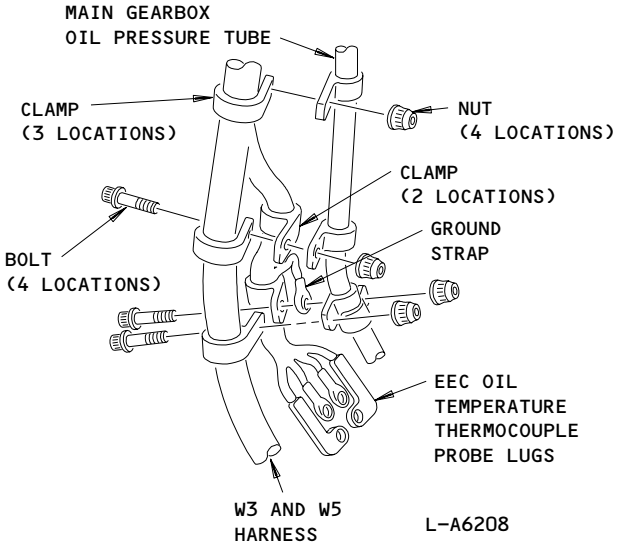


I

EEC Wiring Harness W5 Installation (Left Side)
Figure 403 (Sheet 3)

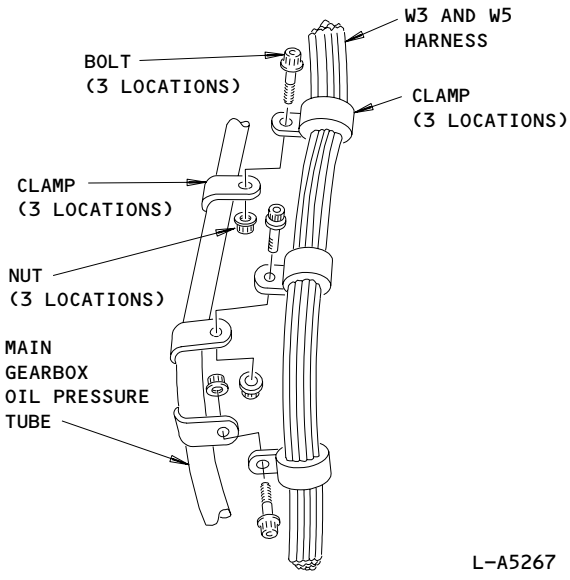






ENGINES POST-PW-SB 73-84

L



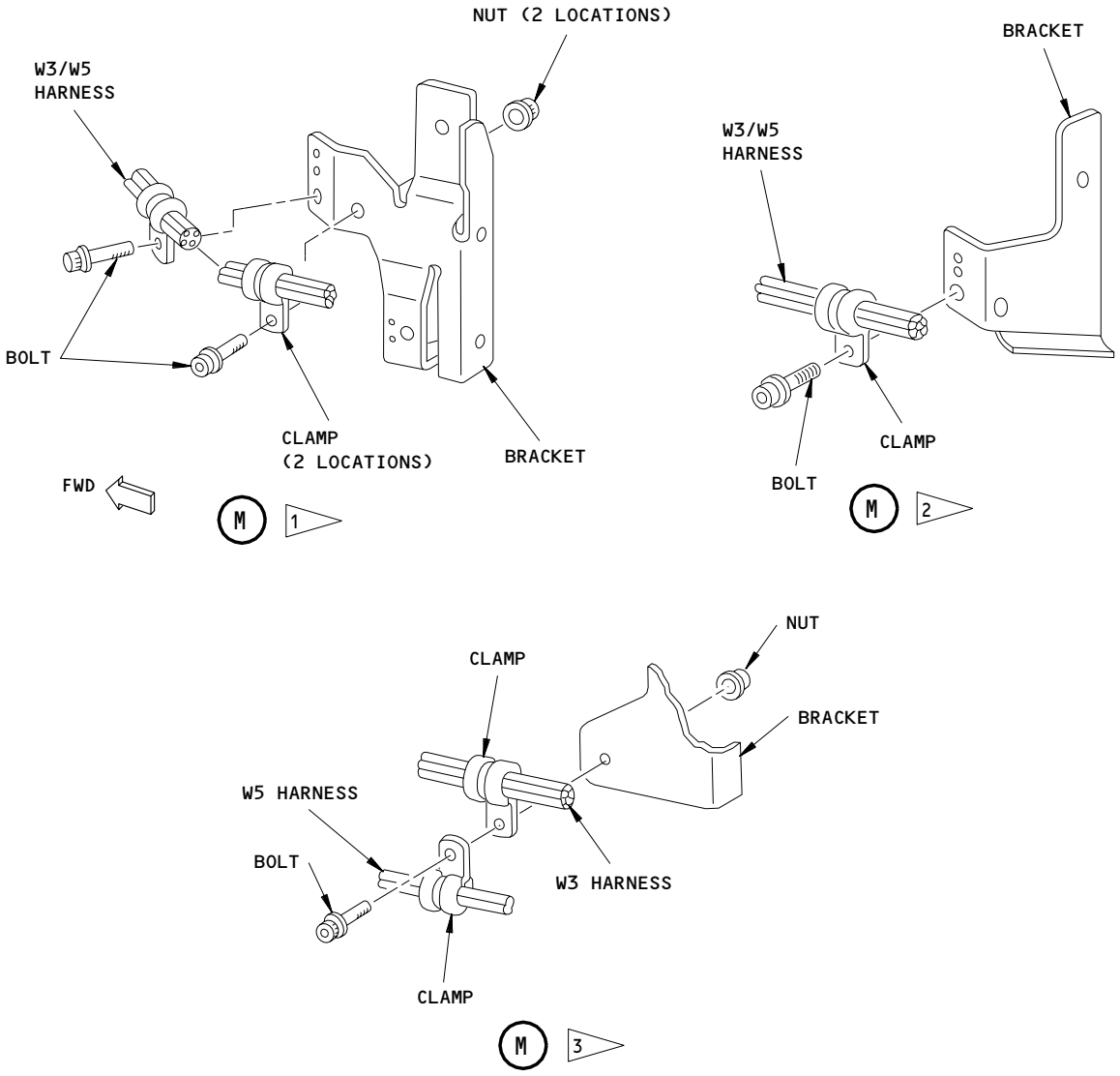
ENGINES PRE-PW-SB 73-84

L

EEC Wiring Harness W5 Installation (Left Side)
Figure 403 (Sheet 4)

EFFECTIVITY
ENGINES WITHOUT PHASE 3

753746



1 ENGINES POST-PW-SB 72-375 (TWO CLAMP LOCATIONS)

2 ENGINES PRE-PW-SB 72-375 AND POST-PW-SB 73-76 (ONE CLAMP)

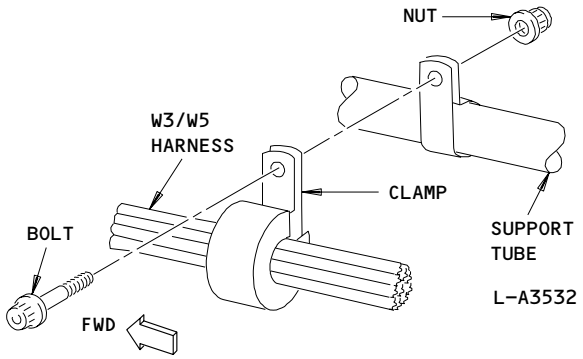
3 ENGINES PRE-PW-SB 73-76 (TWO CLAMPS/ONE LOCATION)

L-A3534

EEC Wiring Harness W5 Installation (Left Side)
Figure 403 (Sheet 5)

EFFECTIVITY
ENGINES WITHOUT PHASE 3

D10654



(EXAMPLE, 2 LOCATIONS)

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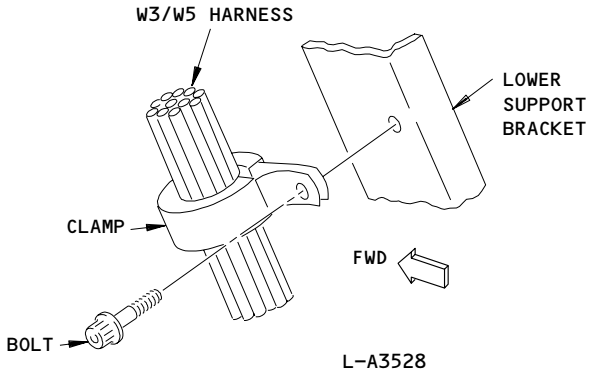
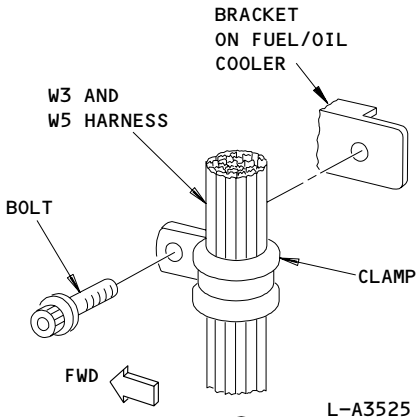


(EXAMPLE, 3 LOCATIONS)

O



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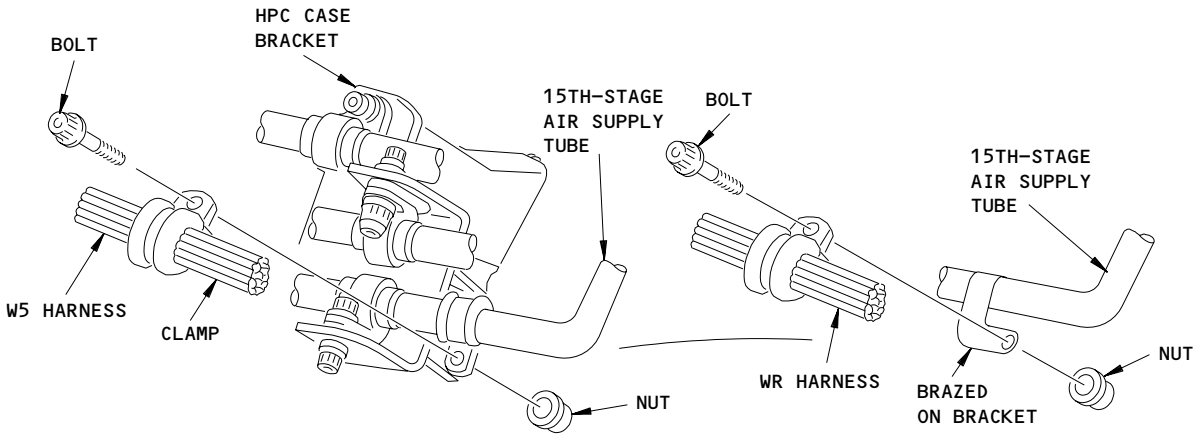


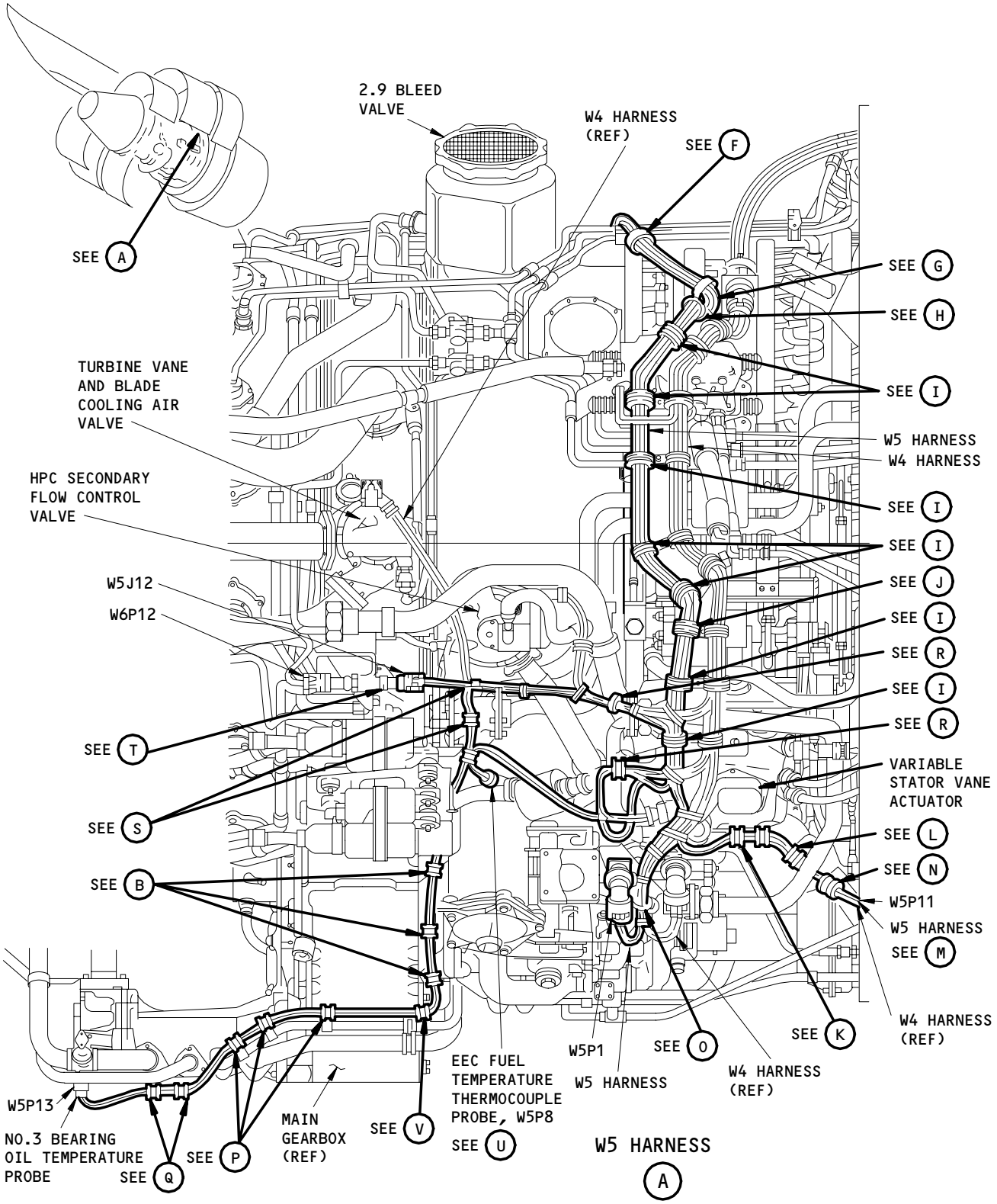
ENGINES PRE-PW-SB 73-54

Q

ENGINES POST-PW-SB 73-54

Q

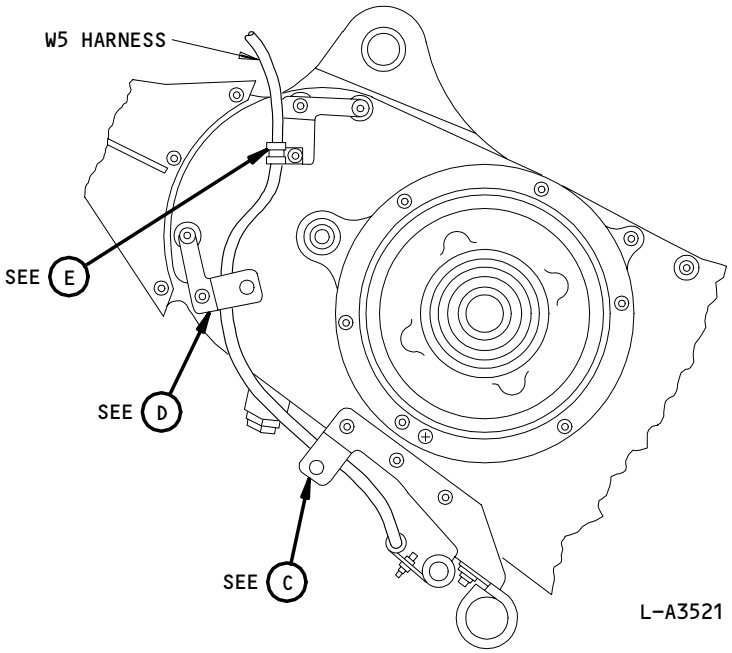
EEC Wiring Harness W5 Installation (Left Side)
Figure 403 (Sheet 6)



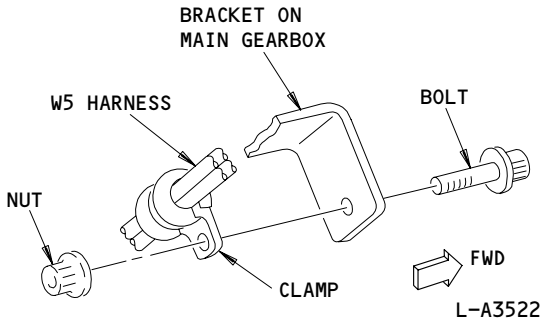
EEC Wiring Harness W5 Installation (Right Side)
Figure 403A (Sheet 1)

EFFECTIVITY
ENGINES WITHOUT PHASE 3

753773



B



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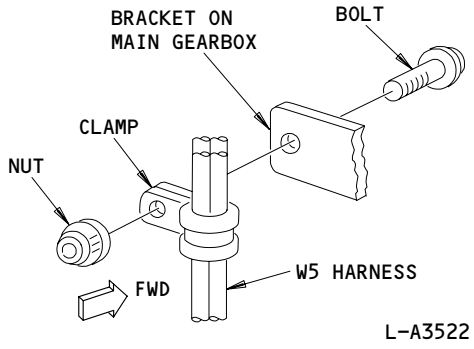
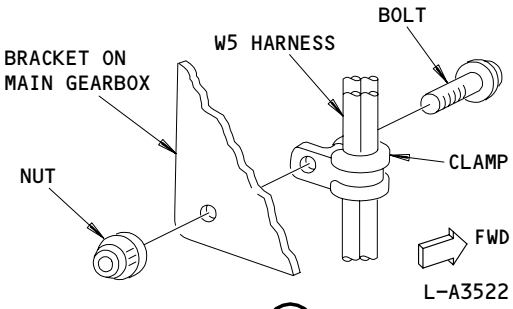


D

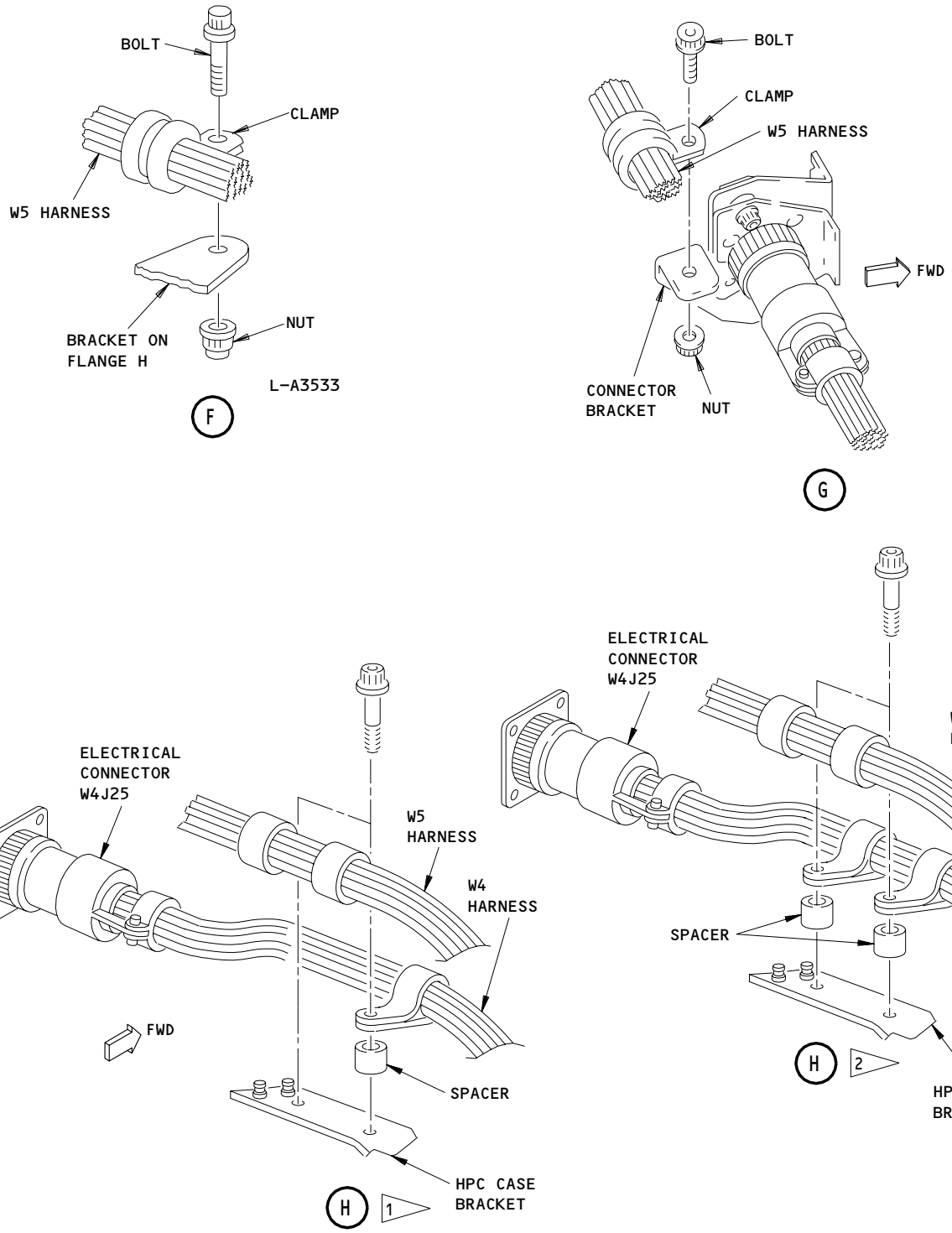


E

EEC Wiring Harness W5 Installation (Right Side)
Figure 403A (Sheet 2)

EFFECTIVITY
ENGINES WITHOUT PHASE 3

753780



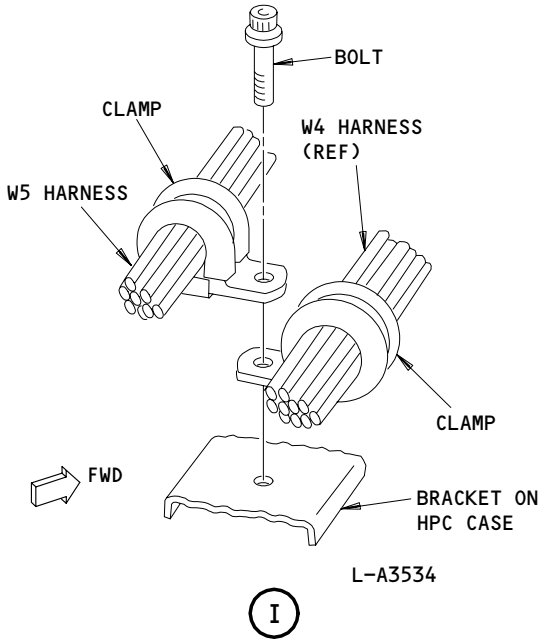
1 ENGINES WITH ONE SPACER (POST-PW-SB 73-118)

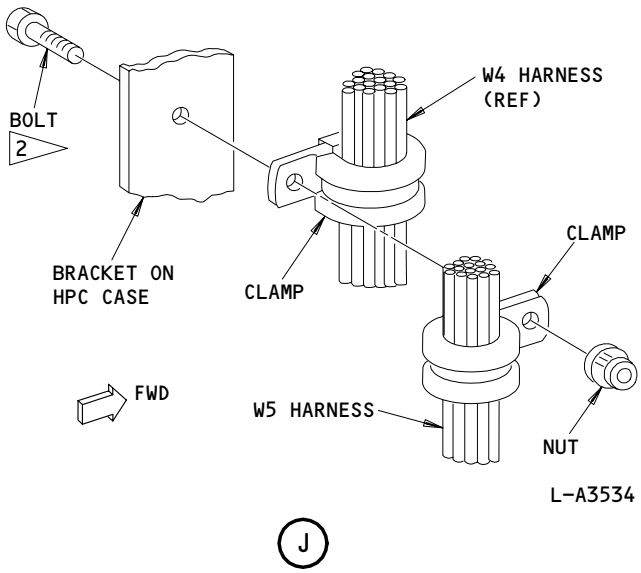
2 ENGINES WITH TWO SPACERS (PRE-PW-SB 73-118)

EEC Wiring Harness W5 Installation (Right Side)
Figure 403A (Sheet 3)

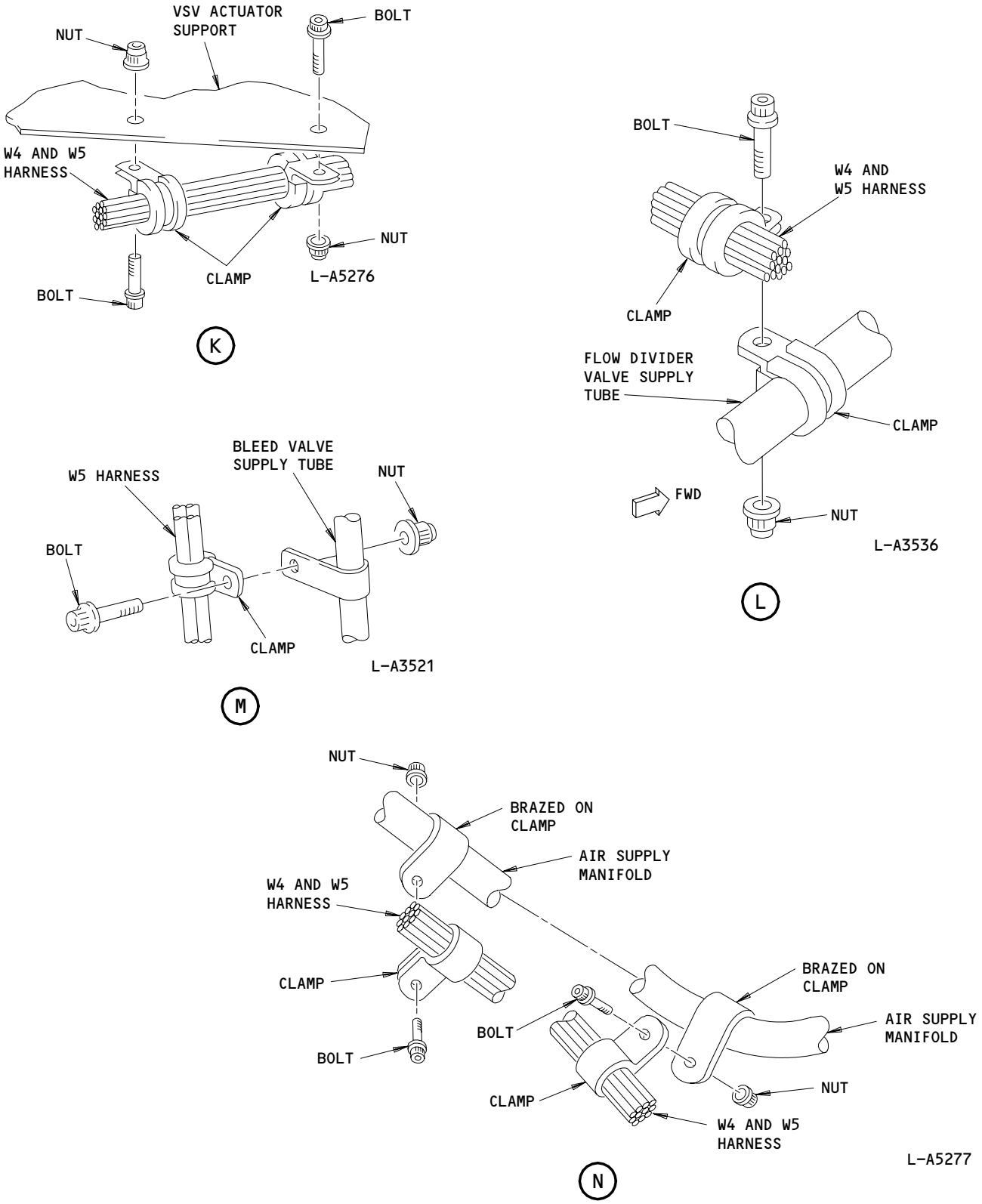
EFFECTIVITY
ENGINES WITHOUT PHASE 3

753782





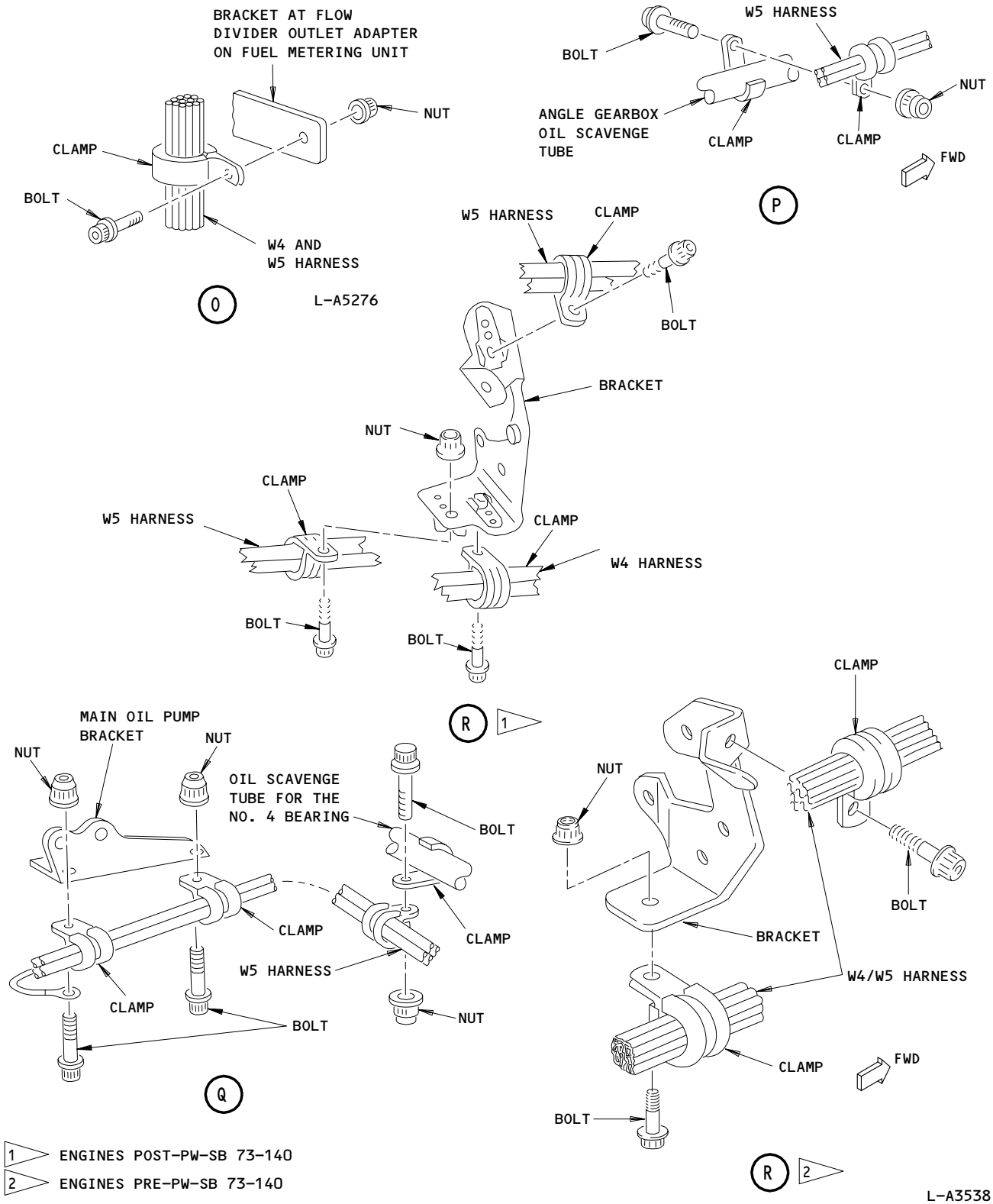
EEC Wiring Harness W5 Installation (Right Side)
Figure 403A (Sheet 4)



EEC Wiring Harness W5 Installation (Right Side)
Figure 403A (Sheet 5)

EFFECTIVITY
ENGINES WITHOUT PHASE 3

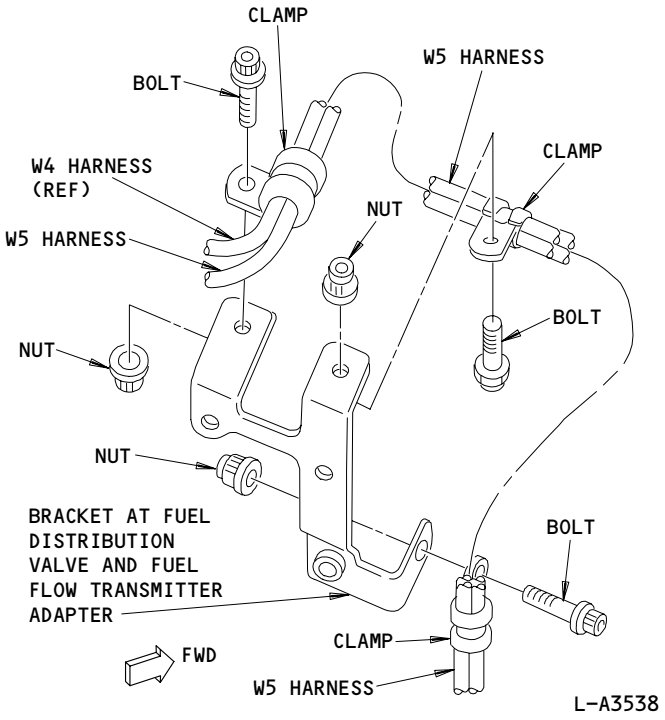
753785



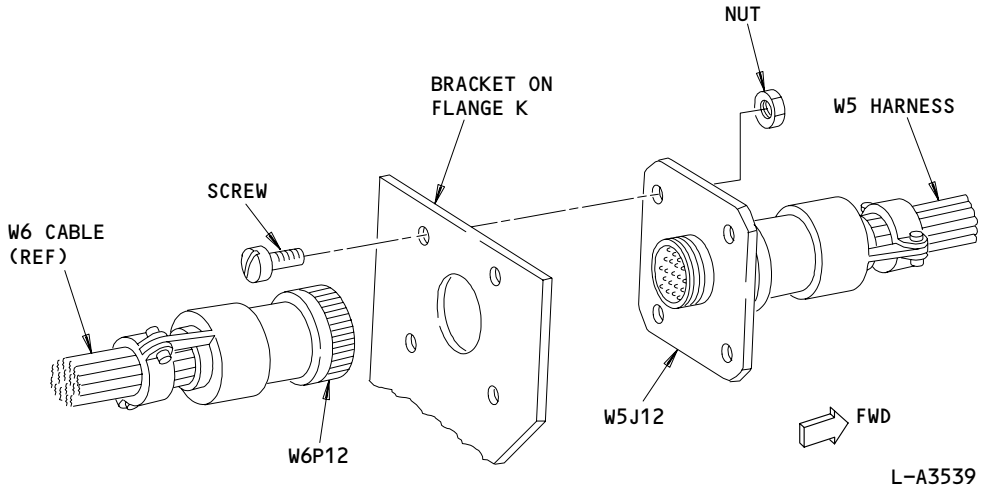
EEC Wiring Harness W5 Installation (Right Side)
Figure 403A (Sheet 6)

EFFECTIVITY
ENGINES WITHOUT PHASE 3

753805

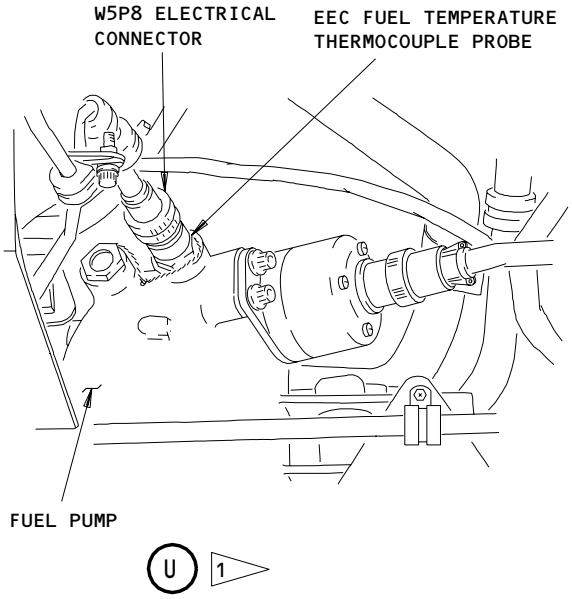


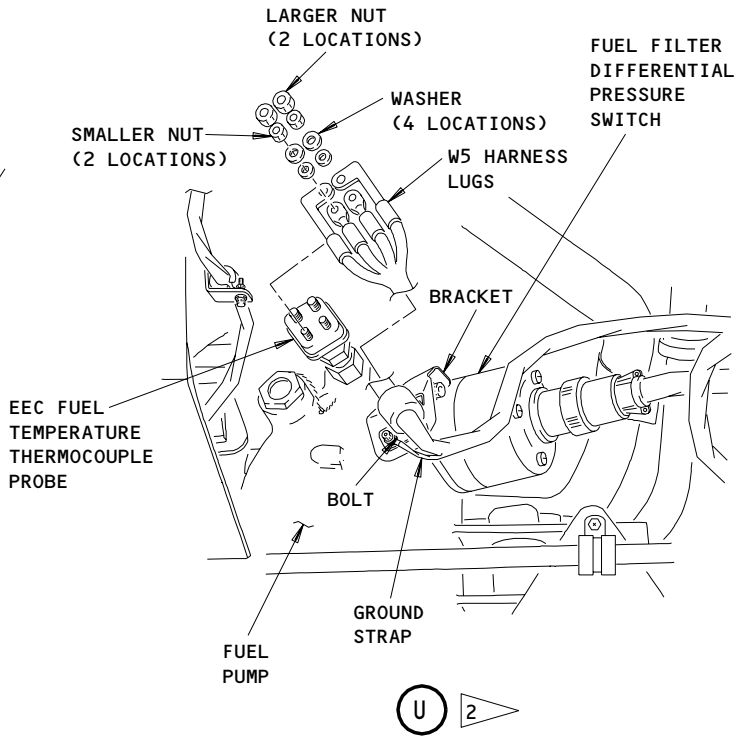
(S)

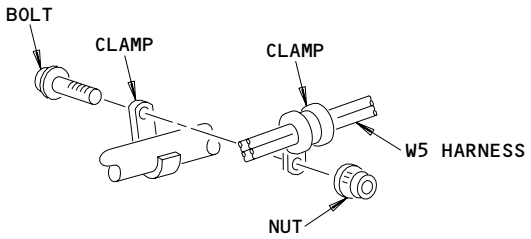


(T)

EEC Wiring Harness W5 Installation (Right Side)
Figure 403A (Sheet 7)

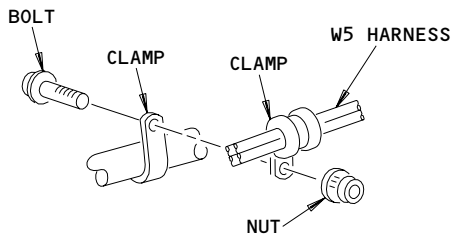






ENGINES PRE-PW-SB 73-92

V



ENGINES POST-PW-SB 73-92

V

1 ENGINES WITH THERMOCOUPLE PROBES THAT HAVE PIN AND SOCKET CONNECTORS

2 ENGINES WITH THERMOCOUPLE PROBES THAT HAVE STUD AND LUG CONNECTORS

EEC Wiring Harness W5 Installation (Right Side)
Figure 403A (Sheet 8)

EFFECTIVITY
ENGINES WITHOUT PHASE 3

839671

C. Access

(1) Location Zone

410	No. 1 Power Plant
420	No. 2 Power Plant

(2) Access Panel

413	Fan Cowl Panel (LH)
414	Fan Cowl Panel (RH)
415	Fan Reverser (LH)
416	Fan Reverser (RH)
417	Core Cowl (LH)
418	Core Cowl (RH)
423	Fan Cowl Panel (LH)
424	Fan Cowl Panel (RH)
425	Fan Reverser (LH)
426	Fan Reverser (RH)
427	Core Cowl (LH)
428	Core Cowl (RH)

D. Prepare For Wiring Harness Removal

S 864-119-NO2

(1) For the left engine, open this circuit breaker on the main power distribution panel P6 and attach DO-NOT-CLOSE tag:
(a) 6L19, PROBE HEAT L ENG

S 864-120-NO2

(2) For the right engine, open this circuit breaker on the main power distribution panel P6 and attach DO-NOT-CLOSE tag:
(a) 6K25, PROBE HEAT R ENG

S 864-121-NO2

(3) For the left engine, open these circuit breakers on the overhead panel P11 and attach DO-NOT-CLOSE tags:
(a) 11A10, AIR DATA CMPTR L
(b) 11L3, L ENGINE PERF SOL CHAN A
(c) 11L4, L ENGINE PERF SOL CHAN B
(d) 11M5, LEFT ENGINE EEC DISCRETES

S 864-122-NO2

(4) For the right engine, open these circuit breakers on the overhead panel P11 and attach DO-NOT-CLOSE tags:
(a) 11F30, AIR DATA CMPTR R
(b) 11L30, R ENGINE PERF SOL CHAN A
(c) 11L31, R ENGINE PERF SOL CHAN B
(d) 11M32, RIGHT ENGINE EEC DISCRETES

S 864-123-NO2

(5) Open this circuit breaker on the overhead panel P11 and attach DO-NOT-CLOSE tag:
(a) 11B36, APU ENG START/ECS DISCRETES

S 014-124-NO2

(6) Open the fan cowl panels (AMM 71-11-04/201).

S 044-125-NO2

WARNING: DO THE THRUST REVERSER DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(7) Do this procedure: Thrust Reverser Deactivation for Ground Maintenance (AMM 78-31-00/201).

S 014-126-NO2

(8) Open the core cowl panels (AMM 71-11-06/201).

S 014-127-NO2

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(9) Open the thrust reversers (AMM 78-31-00/201).

E. Remove EEC Wiring Harness W5.

S 024-128-NO2

CAUTION: DO NOT TWIST OR BEND THE HARNESS BADLY DURING REMOVAL. IF THE HARNESS IS TWISTED OR BENT BADLY, THE HARNESS CAN BE DAMAGED.

(1) Disconnect the W2P26 connector from the W5J26 connector as follows:
(a) Find the W5J26 connector at the 11:30 o'clock position on the High Pressure Compressor (HPC) case (VIEW A, Fig. 403).
(b) Disconnect the W2P26 connector from the W5J26 connector.
(c) Remove the screws and nuts that attach the W5J26 connector to the bracket.
(d) Remove the W5J26 connector from the bracket.
(e) Install covers on the connectors.

S 024-129-NO2

(2) Disconnect the W5P10 connector from the control valve for the HPC secondary flow as follows:
   (a) Find the W5P10 connector on the control valve for the HPC secondary flow at the 9:30 o'clock position on the HPC (VIEW A, Fig. 403).
   (b) Disconnect the W5P10 connector from the control valve for the HPC secondary flow.
   (c) Install covers on the connectors.

S 024-130-NO2

(3) Disconnect the W5P5 connector from the bypass valve solenoid for the fuel/oil cooler as follows:
   (a) Find the W5P5 connector on the bypass valve solenoid for the fuel/oil cooler (VIEW B, Fig. 403).
   (b) Disconnect the W5P5 connector from the bypass valve solenoid for the fuel/oil cooler.
   (c) Install covers on the connectors.

S 024-131-NO2

(4) Disconnect the W5P6 connector from the EEC alternator as follows:
   (a) Find the W5P6 connector on the left side of the gearbox (VIEW A, Fig. 403).
   (b) Disconnect the W5P6 connector from the EEC alternator connector.
   (c) Install covers on the connectors.

S 024-132-NO2

(5) Disconnect the W5P7 connector from the actuator for the variable stator vanes as follows:
   (a) Find the W5P7 connector on the actuator for the variable stator vanes (VIEW A, Fig.403A).
   (b) Disconnect the W5P7 connector from the actuator for the variable stator vanes.
   (c) Install covers on the connectors.

S 024-133-NO2

(6) Disconnector the W6P12 connector from the W5J12 connector as follows:
   (a) Find the W5J12 connector at the 3:30 o'clock position on flange K (VIEW T, Fig. 403A).
   (b) Disconnect the W1P12 connector from the W5J12 connector.
   (c) Remove the screws and nuts that attach the W5J12 connector to the bracket at flange K.
   (d) Remove the W5J12 connector from the bracket.

(e) Install covers on the connectors.

S 024-134-NO2

(7) Disconnect the W5P11 connector from the solenoid for the 2.9 bleed valve as follows:
(a) Find the W5P11 connector at the solenoid for the 2.9 bleed valve on the intermediate case (VIEW A, Fig. 403A).
(b) Disconnect the W5P11 connector from the solenoid for the 2.9 bleed valve.

NOTE: You can use the torque adapter (PWA 85749) to disconnect the W5P11 connector.

(c) Install covers on the connectors.

S 024-135-NO2

(8) Disconnect the W5P1 connector from the fuel metering unit as follows:
(a) Find the W5P1 connector at the fuel metering unit (VIEW A, Fig. 403A).
(b) Disconnect the W5P1 connector from the fuel metering unit.
(c) Install covers on the connectors.

S 024-136-NO2

(9) ENGINES PRE-PW-SB 73-84;
Disconnect the W5P8 connector from the thermocouple probe for the EEC fuel temperature as follows:
(a) Find the W5P8 connector at the thermocouple probe for the EEC fuel temperature on the fuel pump (VIEW A, Fig. 403A).
(b) Disconnect the W5P8 connector from the thermocouple probe for the EEC fuel temperature.
(c) Install covers on the connectors.

S 024-137-NO2

(10) ENGINES POST-PW-SB 73-84;
Disconnect the W5P8 connector from the thermocouple probe for the EEC fuel temperature.
(a) Find the W5P8 connector at the thermocouple probe on the fuel pump (VIEW A, Fig. 403A).
(b) Remove the nuts to disconnect the W5P8 connector from the thermocouple probe.

S 024-139-NO2

(11) ENGINES PRE-PW-SB 73-84;
Disconnect the W5P13 connector from the temperature probe for the No. 3 bearing oil as follows:
(a) Find the W5P13 connector at the temperature probe (VIEW A, Fig. 403A).
(b) Disconnect the W5P13 connector from the temperature probe.
(c) Install covers on the connectors.

S 024-141-NO2

(12) ENGINES POST-PW-SB 73-84;
Disconnect the W3P18 connector from the EEC oil temperature probe as follows:
(a) Find the W3P18 connector on the front of the gearbox (VIEW A, Fig. 401A).
(b) Remove the nuts to disconnect the W3P18 connector from the EEC oil temperature probe.
(c) Install the covers on the electrical connectors.

S 024-143-NO2

(13) ENGINES WITH THE THERMOCOUPLE PROBE FOR THE RIGHT 2.9 BLEED VALVE AND PRE-PW-SB 72-293;
Disconnect the W3 harness from the thermocouple probe with the steps that follow:
(a) Remove the bolts, nuts and clamps that attach the W5 harness to the bracket and support tubes on the HPC and gearbox.
(b) Remove the W5 harness from the engine.

S 024-024-NO2

(14) ENGINES WITH THE THERMOCOUPLE PROBE FOR THE RIGHT 2.9 BLEED VALVE AND POST-PW-SB 72-293;
Disconnect the W3 harness for the thermocouple probe with the steps that follow:
(a) Remove the nut which attaches the clamp and ground cable to the bracket.
(b) Remove the nuts which attach the W3 harness to the thermocouple probe.

TASK 73-21-07-404-145-NO2

7. Install the EEC Wiring Harness W5 (Fig. 403, 403A)
A. Equipment
(1) Wrench - Strap, Model TG-70, Glenair, Inc., 1211 Air Way, Glendale, CA 91201; or Model BT-BS-601, Daniels Mfg. Corp., 6103 Anno Ave., Orlando, FL 32809

(2) Torque Adapter PWA 85749 (optional)

HARNESS CONNECTORS WHERE THE TORQUE ADAPTER (PWA 85749) CAN BE USED	
CONNECTOR	COMPONENT
W5P6	EEC Alternator (N2 Transducer)
W5P11	2.9 Bleed Valve Solenoid

B. Consumable Materials
(1) D00137 Engine Oil - PWA 521
(2) G01505 Lockwire, AS3214-01

C. References
(1) AMM 70-24-05/201, Electrical Harnesses
(2) AMM 71-11-04/201, Fan Cowl Panels
(3) AMM 71-11-06/201, Core Cowl Panels
(4) AMM 78-31-00/201, Thrust Reverser System

D. Access
(1) Location Zone
410 No. 1 Power Plant
420 No. 2 Power Plant

(2) Access Panel
413 Fan Cowl Panel (LH)
414 Fan Cowl Panel (RH)
415 Fan Reverser (LH)
416 Fan Reverser (RH)
417 Core Cowl (LH)
418 Core Cowl (RH)
423 Fan Cowl Panel (LH)
424 Fan Cowl Panel (RH)
425 Fan Reverser (LH)
426 Fan Reverser (RH)
427 Core Cowl (LH)
428 Core Cowl (RH)

E. Install the EEC Wiring Harness W5

S 424-146-N02
(1) Temporarily attach the W5J26 connector to the bracket on the High Pressure Compressor (HPC) as follows:
(a) Remove the covers from the connectors.

(b) Find the bracket for the W5J26 connector at the 11:30 o'clock position on the HPC case (VIEW B, Fig./403).
(c) Attach the W5J26 connector to the bracket with lockwire.
(d) Install the cover on the W5J26 connector.

S 424-147-NO2

(2) Find the sections of the W5 harness that are attached to the connectors that follow: W5P1, W5P7, W5P8, W5P11, W5J12, and W5J13.

S 424-148-NO2

(3) Put these sections of the W5 harness over the top and let them hang down the right side of the engine.

S 424-149-NO2

(4) Attach the W5J12 connector to the bracket on the HPC case as follows:
(a) Remove the covers from the connectors.
(b) Find the W5J26 connector at the 11:30 o'clock position on the HPC case (VIEW B, Fig. 403).
(c) Remove the lockwire that attaches the W5J26 connector to the bracket.
(d) Attach the W5J26 connector to the bracket with the screws and nuts.
(e) Tighten the nuts to 5-6 pound-inches (0.565-0.678 newton-meters).

S 424-150-NO2

CAUTION: USE THE CORRECT ASSEMBLY PROCEDURE, AND TOOLS, FOR THE HARNESS CONNECTOR INSTALLATION (AMM 70-24-05/201). IF YOU USE THE INCORRECT ASSEMBLY PROCEDURE, OR TOOLS, A DAMAGED OR LOOSE CONNECTOR CAN OCCUR. A LOOSE CONNECTOR PERMITS VIBRATION, WHICH CAUSES THE CONTACTS TO WEAR AND DECREASES THE LIGHTNING PROTECTION.

(5) Connect the W2P26 connector to the W5J26 connector (AMM 70-24-05/201).

S 424-151-NO2

(6) Attach the W5 harness to the bracket on flange H as follows:
(a) Put the clamps for the W5 harness on the bracket at the 11:30 o'clock position on the HPC case (VIEW C, Fig. 403).
(b) Lubricate the bolt threads with oil.
(c) Attach the W5 harness to the bracket with the bolt.
(d) Tighten the bolt with your hand.

S 424-152-N02

(7) Connect the W5P10 connector to the control valve for the HPC secondary flow as follows:
  (a) Remove the covers from the connectors.
  (b) Find the control valve for the HPC secondary flow (VIEW A, Fig. 403).
  (c) Connect the W5P10 connector to the control valve for the HPC secondary flow.

CAUTION: WHEN YOU USE THE STRAP WRENCH, YOU MUST ADJUST THE TORQUE WRENCH VALUE TO GET THE CORRECT TORQUE (AMM 70-24-05/201). AN INCORRECT TORQUE CAN CAUSE DAMAGE TO THE ELECTRICAL CONNECTOR AND UNSATISFACTORY LIGHTENING PROTECTION.

  (d) Use the strap wrench to tighten the W5P10 connector to 21-26 pound-inches (2.373-2.938 newton-meters).
  (e) Install the lockwire (AS3214-01) on the W5P10 connector.

S 424-153-N02

CAUTION: USE THE CORRECT ASSEMBLY PROCEDURE, AND TOOLS, FOR THE HARNESS CONNECTOR INSTALLATION (AMM 70-24-05/201). IF YOU USE THE INCORRECT ASSEMBLY PROCEDURE, OR TOOLS, A DAMAGED OR LOOSE CONNECTOR CAN OCCUR. A LOOSE CONNECTOR PERMITS VIBRATION, WHICH CAUSES THE CONTACTS TO WEAR AND DECREASES THE LIGHTNING PROTECTION.

(8) Connect the W5P5 connector to the bypass valve solenoid for the fuel/oil cooler as follows (AMM 70-24-05/201):
  (a) Remove the covers from the connectors.
  (b) Find the bypass valve solenoid for the fuel/oil cooler (VIEW A, Fig. 403).
  (c) Connect the W5P5 connector to the aft connector on the bypass valve solenoid for the fuel oil cooler.

S 424-154-NO2

CAUTION: USE THE CORRECT ASSEMBLY PROCEDURE, AND TOOLS, FOR THE HARNESS CONNECTOR INSTALLATION (AMM 70-24-05/201). IF YOU USE THE INCORRECT ASSEMBLY PROCEDURE, OR TOOLS, A DAMAGED OR LOOSE CONNECTOR CAN OCCUR. A LOOSE CONNECTOR PERMITS VIBRATION, WHICH CAUSES THE CONTACTS TO WEAR AND DECREASES THE LIGHTNING PROTECTION.

(9) Connect the W5P6 connector to the EEC alternator as follows (AMM 70-24-05/201):
   (a) Remove the covers from the connectors.
   (b) Find the connectors for the EEC alternator on the left side of gearbox (VIEW A, Fig. 403).
   (c) Connect the W5P6 connector to the connector for the EEC alternator.

      NOTE: You can use the torque adapter (PWA 85749) to tighten the W5P6 connector.

S 424-155-NO2

(10) ENGINES WITH THE THERMOCOUPLE PROBE FOR THE RIGHT 2.9 BLEED VALVE; Install the thermocouple probe with the steps that follow:
   (a) Attach the W3 harness with the two nuts.
   (b) Tighten the larger nut to 18-22 pound-inches (2.034 - 2.486 newton-meters).
   (c) Tighten the smaller nut to 15-18 pound-inches (1.695 - 2.034 newton-meters).
   (d) Put the clamps on the W3 and W5 harnesses on the brackets above the fuel/oil cooler and adjacent to the thermocouple probe.
   (e) ENGINES PRE-PW-SB 72-293;
      Attach the W3 harness to the bracket with the steps that follow:
      1) Lubricate the bolt threads with oil.
      2) Attach the clamps to the brackets with the clamp bolt.

         NOTE: Install the end of the ground cable for the W3 and W5 harnesses with the clamp bolt adjacent to the thermocouple probe.

      3) Tighten the clamp bolt with your hand.
   (f) ENGINES POST-PW-SB 72-293;

Attach the W3 harness to the bracket with the steps that follow:

1) Lubricate the threads of the bolt, which is attached to the bracket, with engine oil.
2) Attach the clamp and the ground cable to the bolt on the bracket with the nut.
3) Tighten the nut with your hand.

S 424-157-NO2

CAUTION: USE THE CORRECT ASSEMBLY PROCEDURE, AND TOOLS, FOR THE HARNESS CONNECTOR INSTALLATION (AMM 70-24-05/201). IF YOU USE THE INCORRECT ASSEMBLY PROCEDURE, OR TOOLS, A DAMAGED OR LOOSE CONNECTOR CAN OCCUR. A LOOSE CONNECTOR PERMITS VIBRATION, WHICH CAUSES THE CONTACTS TO WEAR AND DECREASES THE LIGHTNING PROTECTION.

(11) Connect the W5P7 connector to the actuator for the variable stator vanes as follows (AMM 70-24-05/201):
   (a) Remove the covers from the connectors.
   (b) Find the acuator for the variable stator vanes (VIEW A, Fig. 403A).
   (c) Connect the W5P7 connector to the top connector on the actuator for the variable stator vanes.

S 424-158-NO2

CAUTION: USE THE CORRECT ASSEMBLY PROCEDURE, AND TOOLS, FOR THE HARNESS CONNECTOR INSTALLATION (AMM 70-24-05/201). IF YOU USE THE INCORRECT ASSEMBLY PROCEDURE, OR TOOLS, A DAMAGED OR LOOSE CONNECTOR CAN OCCUR. A LOOSE CONNECTOR PERMITS VIBRATION, WHICH CAUSES THE CONTACTS TO WEAR AND DECREASES THE LIGHTNING PROTECTION.

(12) Connect the W5P11 connector to the solenoid for the 2.9 bleed valve as follows (AMM 70-24-05/201):
   (a) Remove the covers from the connectors.
   (b) Find the solenoid for the 2.9 bleed valve at the 5:00 o'clock position on the intermediate case (VIEW A, Fig. 403A).
   (c) Connect the W5P11 connector to the solenoid for the 2.9 bleed valve.

NOTE: You can use the torque adapter (PWA 85749) to tighten the W5P11 connector.

S 424-159-NO2

(13) Attach connector W5J12 to the bracket on the HPC case as follows:
  (a) Find the bracket at the 3:30 o'clock position on flange K (VIEW T, Fig. 403A).
  (b) Attach the W5J12 connector to the bracket with the screws and nuts.
  (c) Tighten the nuts to 5-6 pound-inches (0.565-0.678 newton meters).

S 424-160-NO2

CAUTION: USE THE CORRECT ASSEMBLY PROCEDURE, AND TOOLS, FOR THE HARNESS CONNECTOR INSTALLATION (AMM 70-24-05/201). IF YOU USE THE INCORRECT ASSEMBLY PROCEDURE, OR TOOLS, A DAMAGED OR LOOSE CONNECTOR CAN OCCUR. A LOOSE CONNECTOR PERMITS VIBRATION, WHICH CAUSES THE CONTACTS TO WEAR AND DECREASES THE LIGHTNING PROTECTION.

(14) Connect the W6P12 connector to the W5J12 connector (AMM 70-24-05/201).

S 424-161-NO2

CAUTION: USE THE CORRECT ASSEMBLY PROCEDURE, AND TOOLS, FOR THE HARNESS CONNECTOR INSTALLATION (AMM 70-24-05/201). IF YOU USE THE INCORRECT ASSEMBLY PROCEDURE, OR TOOLS, A DAMAGED OR LOOSE CONNECTOR CAN OCCUR. A LOOSE CONNECTOR PERMITS VIBRATION, WHICH CAUSES THE CONTACTS TO WEAR AND DECREASES THE LIGHTNING PROTECTION.

(15) ENGINES PRE-PW-SB 73-84;
Connect the W5P8 connector to the thermocouple probe for the EEC fuel temperature as follows (AMM 70-24-05/201):
  (a) Remove the covers from the connectors.
  (b) Find the thermocouple probe for the EEC fuel temperature on the fuel pump (VIEW A, Fig. 403A).
  (c) Connect the W5P8 connector to the thermocouple probe for the EEC fuel temperature.

S 424-293-NO2

(16) ENGINES POST-PW-SB 73-84;
Connect the W5P8 connector to the thermocouple probe for the EEC fuel temperature as follows:
  (a) Install the wiring harness terminals to the thermocouple studs and loosely install the nuts to the thermocouple studs.

(b) Loosley install the clamp, ground strap, and bolt to the bracket on the housing.

CAUTION: MAKE SURE THE THERMOCOUPLE STUD BOX DOES NOT TURN WHEN THE COUPLING NUT IS TIGHTENED. IF THE THERMOCOUPLE STUD BOX TURNS, DAMAGE TO THE WIRING HARNESS CAN OCCUR.

(c) If it is necessary to align the thermocouple stud box, loosen the coupling nut.
(d) Align the thermocouple stud box with the wiring harness connector.
(e) Hold the thermocouple stud box and tighten the coupling nut for the thermocouple probe to 95-100 pound-inches (10.734-11.298 newton-meters).
1) Do not let the thermocouple studs turn.

CAUTION: DO NOT ALIGN THE THERMOCOUPLE STUD BOX AFTER THE COUPLING NUT IS TIGHTENED. HOLD THE THERMOCOUPLE STUD BOX AND LOOSEN THE COUPLING NUT TO ALIGN THE THERMOCOUPLE STUD BOX AGAIN. DAMAGE TO THE THERMOCOUPLE STUD BOX CAN OCCUR.

(f) Make sure the thermocouple stud box is aligned.

CAUTION: TOO MUCH TORQUE (MORE THAN THE MAXIMUM TORQUE) ON THE THERMOCOUPLE PROBE NUTS CAN LOOSEN. IF TOO MUCH TORQUE IS APPLIED, DAMAGE TO THE THERMOCOUPLE STUDS CAN OCCUR.

(g) Tighten the alumel nuts (larger terminal studs) to 18-22 pound-inches (2.034-2.486 newton-meters).
(h) Tighten the chromel nuts (smaller terminal studs) to 15-18 pound-inches (1.695-2.034 newton-meters).
(i) Install the lockwire from the coupling nut to the adapter.

S 424-163-N02

CAUTION: USE THE CORRECT ASSEMBLY PROCEDURE, AND TOOLS, FOR THE HARNESS CONNECTOR INSTALLATION (AMM 70-24-05/201). IF YOU USE THE INCORRECT ASSEMBLY PROCEDURE, OR TOOLS, A DAMAGED OR LOOSE CONNECTOR CAN OCCUR. A LOOSE CONNECTOR PERMITS VIBRATION, WHICH CAUSES THE CONTACTS TO WEAR AND DECREASES THE LIGHTNING PROTECTION.

(17) Connect the W5P1 connector to the fuel metering unit as follows (AMM 70-24-05/201):
(a) Find the fuel metering unit (VIEW A, Fig. 403A).

(b) Connect the W5P1 connector to the aft connector on the fuel metering unit.

S 424-164-NO2

CAUTION: USE THE CORRECT ASSEMBLY PROCEDURE, AND TOOLS, FOR THE HARNESS CONNECTOR INSTALLATION (AMM 70-24-05/201). IF YOU USE THE INCORRECT ASSEMBLY PROCEDURE, OR TOOLS, A DAMAGED OR LOOSE CONNECTOR CAN OCCUR. A LOOSE CONNECTOR PERMITS VIBRATION, WHICH CAUSES THE CONTACTS TO WEAR AND DECREASES THE LIGHTNING PROTECTION.

(18) Connect the W5P13 connector to the temperature probe for the No. 3 bearing oil as follows (AMM 70-24-05/201):
(a) Remove the covers from the connectors.
(b) Find the temperature probe for the No. 3 bearing oil at the 5:30 o'clock position (VIEW B, Fig. 403A).
(c) Connect the W5P13 connector to the temperature probe for the No. 3 bearing oil.

S 424-165-NO2

(19) Attach the W5 harness to the bracket at the bottom of the 2.9 bleed valve as follows:
(a) Put the clamp for the W5 harness on the bracket at the bottom of the 2.9 bleed valve (VIEW D, Fig. 403).
(b) Lubricate the bolt threads with oil.
(c) Attach the W5 harness to the bracket with the bolt and nut.
(d) Tighten the nut with your hand.

S 424-166-NO2

(20) Attach the W5 harness to the bracket at flange H as follows:
(a) Find the bracket at the 11:00 o'clock position on flange H (VIEW E, Fig. 403).
(b) Put the clamp for the W5 harness on the top side of the clamp for the EEC PT4.95 tube.
(c) Lubricate the bolt threads with oil.
(d) Attach the clamps for the components that follow to the bracket with the bolt and nut.
1) The EEC PT4.95 tube.
2) The signal tube for the HPC drum air valve.
3) The W5 harness.
(e) Tighten the nut with your hand.

S 424-167-NO2

(21) Attach the W5 harness to the signal tube for the bleed and HPC drum air valve as follows:
  (a) Find the bracket on the signal tube for the bleed and HPC drum air valve (VIEW G, Fig. 403).
  (b) Put the clamp for the W5 harness on the bottom side of the bracket.
  (c) Lubricate the bolt threads with oil.
  (d) Attach the W5 harness to the bracket with the bolt and nut.
  (e) Tighten the nut with your hand.

S 424-168-NO2

(22) Attach the W5 harness to the bracket at the 10:00 o'clock position on the HPC case as follows:
  (a) Put the clamp for the W5 harness on the aft side of the bracket (VIEW J, Fig. 403).
  (b) Lubricate the bolt threads with oil.
  (c) Attach the W5 harness to the bracket with the bolt and nut.
  (d) Tighten the nut with your hand.

S 424-169-NO2

(23) Attach the W5 harness to the support bracket in two locations at the 10:00 o'clock position on the HPC as follows:
  (a) Install the two clamps on the W5 harness at the upper support bracket (VIEW I and J, Fig. 403).
  (b) Lubricate the bolt threads with oil.
  (c) Attach the components that follow to the support bracket in two locations with the bolts and nuts.
    1) The W3 harness.
    2) The W5 harness.
  (d) Tighten the nuts with your hand.

S 424-170-NO2

(24) ENGINES PRE-PW-SB 73-54;
Attach the W5 harness to the air supply tube for the 15th-stage with the steps that follow:
  (a) Find the clamp at the 10:00 o'clock position on the air supply tube (VIEW T, Fig. 403).
  (b) Put the clamp on the W5 harness at the clamp on the air supply tube.
  (c) Lubricate the threads of the bolt, which attaches the clamps, with engine oil.
  (d) Attach the W5 harness to the clamp on the air supply tube with the bolt and nut.
  (e) Tighten the nut with your hand.

S 424-171-NO2

(25) ENGINES POST-PW-SB 73-54;
Attach the W5 harness to the air supply tube for the 15th-stage with the steps that follow:
(a) Find the bracket, which is brazed to the air supply tube, at the 10:00 o'clock position on the HPC case bracket (VIEW T, Fig. 403).
(b) Put the clamp for the W5 harness at the bracket which is brazed on the air supply tube.
(c) Lubricate the threads of the bolt, which attaches the clamp to the bracket, with engine oil.
(d) Attach the W5 harness to the bracket with the bolt and nut.
(e) Tighten the nut with your hand.

S 424-173-NO2

(26) Attach the W5 harness to the front of the fuel/oil cooler as follows:
(a) Put the clamps for the W5 harness on the brackets at the front of the fuel/oil cooler (VIEW K and P, Fig. 403).
(b) Lubricate the bolt threads with oil.
(c) Attach the W5 harness to the brackets with the bolts and nuts.
(d) Tighten the bolts and nuts with your hand.

S 424-174-NO2

(27) Attach W3 and W5 harnesses to the support bracket in three locations as follows:
(a) Put the clamps for the W3 and W5 harness on the outside of the support bracket in three locations (VIEW O, Fig. 403).
(b) Lubricate the bolt threads with oil.
(c) Attach the W3 and W5 harness to the support bracket in three locations with the bolts.
(d) Tighten the bolts with your hand.

S 424-175-NO2

(28) Attach the W3 and W5 harness and the support bracket to the bracket on the HPC case as follows:
(a) Put the clamp for the W3 and W5 harness on the outside of the support bracket (VIEW O, Fig. 403).
(b) Lubricate the bolt threads with oil.
(c) Attach the W3 and W5 harnesses and the support bracket to the bracket on the HPC case with the bolt and nut.
(d) Tighten the nut with your hand.

S 424-176-NO2

(29) Attach the W3 and W5 harness to the support tube in two locations as follows:
   (a) Put the clamps for the W3 and W5 harness on the outboard side of the clamp on the support tube (VIEW N, Fig. 403).
   (b) Lubricate the bolt threads with oil.
   (c) Attach the W3 and W5 harness to the support tube in two locations with the bolts and nuts.
   (d) Tighten the nuts with your hand.

S 424-177-NO2

(30) ENGINES PRE-PW-SB 73-84;
Attach the W3 and W5 harness to the oil pressure tube for the main gearbox in two locations as follows:
   (a) Find the clamps on the oil pressure tube for the main gearbox at the 7:30 o'clock position on the HPC case (VIEW L, Fig. 403).
   (b) Put the clamps for the W3 and W5 harness on the front side of the clamps on the oil pressure tube.
   (c) Lubricate the bolt threads with oil.
   (d) Attach the W3 and W5 harness to the oil pressure tube in three locations with the bolts and nuts.
   (e) Tighten the nuts with your hand.

S 424-179-NO2

(31) ENGINES POST-PW-SB 73-84;
Connect the W3P18 connector to the EEC oil temperature probe as follows:
   (a) Install the wiring harness terminals to the thermocouple studs and loosely install the nuts to the thermocouple studs.
   (b) Loosley install the clamp, ground strap, and bolt to the bracket on the housing.

   CAUTION: MAKE SURE THE THERMOCOUPLE STUD BOX DOES NOT TURN WHEN THE COUPLING NUT IS TIGHTENED. IF THE THERMOCOUPLE STUD BOX TURNS, DAMAGE TO THE WIRING HARNESS CAN OCCUR.

   (c) If it is necessary to align the thermocouple stud box, loosen the coupling nut.
   (d) Align the thermocouple stud box with the wiring harness connector.

(e) Hold the thermocouple stud box and tighten the coupling nut for the thermocouple probe to 95-100 pound-inches (10.734-11.298 newton-meters).
1) Do not let the thermocouple studs turn.

CAUTION: DO NOT ALIGN THE THERMOCOUPLE STUD BOX AFTER THE COUPLING NUT IS TIGHTENED. HOLD THE THERMOCOUPLE STUD BOX AND LOOSEN THE COUPLING NUT TO ALIGN THE THERMOCOUPLE STUD BOX AGAIN. DAMAGE TO THE THERMOCOUPLE STUD BOX CAN OCCUR.

(f) Make sure the thermocouple stud box is aligned.

CAUTION: TOO MUCH TORQUE (MORE THAN THE MAXIMUM TORQUE) ON THE THERMOCOUPLE PROBE NUTS CAN LOOSEN. IF TOO MUCH TORQUE IS APPLIED, DAMAGE TO THE THERMOCOUPLE STUDS CAN OCCUR.

(g) Tighten the alumel nuts (larger terminal studs) to 18-22 pound-inches (2.034-2.486 newton-meters).
(h) Tighten the chromel nuts (smaller terminal studs) to 15-18 pound-inches (1.695-2.034 newton-meters).
(i) Install the lockwire from the coupling nut to the adapter.
(j) Tighten the bolt that attaches the clamp and ground strap to the bracket on the housing to 36-40 pound-inches (4.067-4.519 newton-meters).
(k) ENGINES WITH TWO CLAMPS FOR THE W3 AND W5 HARNESS ATTACHED TO THE BRACKET ON THE MAIN GEARBOX AT TWO LOCATIONS;
Install the two clamps on the W3 and W5 harnesses at the bracket on the lower left corner of the main gearbox (VIEW M, Fig. 403).
(l) Lubricate the threads of the bolts with engine oil.
(m) Attach the clamps to the bracket on the lower left corner of the main gearbox with the bolts.
1) Tighten the bolts with your hand.

S 424-289-NO2
(32) ENGINES WITH ONE CLAMP FOR THE W3 AND W5 HARNESS ATTACHED TO THE BRACKET ON THE MAIN GEARBOX;
Install the clamp on the W3 and W5 harnesses.
(a) Lubricate the threads of the bolt with engine oil.
(b) Attach the clamp to the bracket with the bolt (VIEW M, Fig. 401A).
1) Tighten the bolt with your hand.

S 424-048-NO2
(33) ENGINES WITH TWO CLAMPS FOR THE W3 AND W5 HARNESS ATTACHED TO THE BRACKET ON THE MAIN GEARBOX AT THE SAME BOLTHOLE;
Install the clamp on the W3 harness.
(a) Lubricate the threads of the bolt with engine oil.

(b) Attach the clamps for the W3 and W5 harnesses to the bracket with the bolt and nut (VIEW M, Fig. 403).
1) Tighten the nut with your hand.

S 424-181-NO2

(34) Attach the W3 and W5 harness to the bracket on the fuel/oil cooler as follows:
(a) Put the clamp for the W3 and W5 harness on the top side of the bracket on the fuel/oil cooler (VIEW F, Fig. 403).
(b) Lubricate the bolt threads with oil.
(c) Attach the W3 and W5 harness to the bracket woth the bolt and nut.
(d) Tighten the nut with your hand.

S 424-182-NO2

(35) Attach the W5 harness to flange H at the 1:00 o'clock position on the HPC case as follows:
(a) Put the clamp for the W5 harness on the top side of the bracket on flange H (VIEW F, Fig. 403A).
(b) Lubricate the bolt threads with oil.
(c) Attach the W5 harness to the bracket woth the bolt and nut.
(d) Tighten the nut with your hand.

S 424-183-NO2

(36) Attach the W5 harness to the bracket at the 1:30 o'clock position on the HPC case as follows:
(a) Put the clamp for the W5 harness on the bottom side of the bracket on the HPC case (VIEW G, Fig. 403A).
(b) Lubricate the bolt threads with oil.
(c) Attach the W5 harness to the bracket with the bolt and nut.
(d) Tighten the nut with your hand.

S 424-184-NO2

(37) Attach the W4 and W5 harness at nine locations between the W4J25 connector and the fuel metering unit as follows:
(a) Put the clamps for the W4 and W5 harnesses on the outboard side of the bracket on the HPC case (VIEW H, I AND J, Fig. 403A).
(b) Lubricate the threads of the bolts and nuts with oil.
(c) Attach the W4 and W5 harnesses to the bracket in eight locations with the bolts.
(d) Attach the W4 and W5 harnesses to the bracket in one location with the bolt and nut.
(e) Tighten the bolts and nuts with your hand.

S 424-185-NO2

(38) Attach the clamps for the W5 harness to the supply tube for the bleed valve as follows:
  (a) Put the clamp for the W5 harness on the clamp that is attached to the supply tube for the bleed valve (VIEW M, Fig. 403A).
  (b) Lubricate the bolt threads with oil.
  (c) Attach the W5 harness to the supply tube for the bleed valve with the bolt and nut.
  (d) Tighten the nut with your hand.

S 424-186-NO2

(39) Attach the clamps for the W4 and W5 harnesses to the supply tube for the fuel distribution valve as follows:
  (a) Put the clamp for the W4 and W5 harness on the inboard side of the of the supply tube (VIEW L, Fig. 403A).
  (b) Lubricate the bolt threads with oil.
  (c) Attach the W4 and W5 harness to the supply tube for the fuel distribution valve with the bolt and nut.
  (d) Tighten the nut with your hand.

S 424-187-NO2

(40) Attach the clamps for the W4 and W5 harness to the support for the stator vane actuator as follows:
  (a) Put the clamps for the W4 and W5 harness on the bottom side of the support for the stator vane actuator (VIEW N, Fig. 403A).
  (b) Lubricate the bolt threads with oil.
  (c) Attach the W4 and W5 harness to the support with the bolt and nut.
  (d) Tighten the nut with your hand.

S 424-188-NO2

(41) Attach the W4 and W5 harness to the fuel metering unit as follows:
  (a) Put the clamp for the W4 and W5 harness on the aft side of the bracket on the fuel metering unit (VIEW O, Fig 403A).
  (b) Lubricate the bolt threads with oil.
  (c) Attach the W4 and W5 harness to the bracket with the bolt and nut.
  (d) Tighten the nut with your hand.

S 424-189-NO2

(42) Attach the W4 and W5 harness to the bracket at the forward end of the fuel flow transmitter as follows:
  (a) Find the bracket at the forward end of the fuel flow transmitter (VIEW R, Fig. 403A).

(b) Attach the clamp for the W4 and W5 harness at the top of the bracket as follows:
1) Put the clamp for the W4 and W5 harness on the outboard side of the bracket.
(c) Attach the clamps for the W4 and W5 harnesses on the bottom of the bracket as follows:
1) Put the clamps for the W4 and W5 harnesses on the bottom side of the bracket.
(d) Lubricate the bolt threads with oil.
(e) Attach the clamps for the W4 and W5 harnesses to the bracket with the bolts and nuts.

S 424-190-NO2

(43) Attach the the W4 and W5 harnesses on the bracket at the aft end of the fuel fuel flow transmitter as follows:
(a) Find the bracket at the aft end of the fuel flow transmitter (VIEW S, Fig. 403A).
(b) Attach the clamps for the W4 and W5 harnesses at the top of the backet as follows:
1) Put the clamp for the W4 and W5 harness on the top side of the bracket.
2) Put the clamp for the W5 harness on the bottom side of the bracket.
(c) Attach the clamp for the W5 harness at the bottom of the bracket as follows:
1) Put the clamp for the W5 harness on the outboard side of the bracket.
(d) Lubricate the bolt threads with oil.
(e) Attach the clamps for the W4 and W5 harnesses to the bracket with the bolts and nuts.
(f) Tighten the nuts with your hand.

S 424-191-NO2

(44) Attach the W5 harness to the forward face of the main gearbox in three locations as follows:
(a) Put the clamps for the W5 harness on the brackets at the forward side of the main gearbox (VIEW B, Fig. 403A).
(b) Lubricate the bolt threads with oil.
(c) Attach the W5 harness to the brackets in three locations with the bolts and nuts.
(d) Tighten the nuts with your hand.

S 424-192-NO2

(45) Attach the W5 harness to the oil scavange tube for the angle gearbox in four locations as follows:
  (a) Put the clamps for the W5 harness on the top side of the clamps on the oil scavange tube for the angle gearbox (VIEW P, Fig. 403A).
  (b) Lubricate the bolt threads with oil.
  (c) Attach the W5 harness to the oil scavange tube for the angle gearbox with the bolts and nuts.
  (d) Tighten the nuts with your hand.

S 424-193-NO2

(46) Attach the W5 harness to the oil scavange tube for the No. 4 bearing as follows:
  (a) Put the clamp for the W5 harness on the bottom side of the clamp on the oil scavenge tube for the No. 4 bearing (VIEW Q, Fig. 403A).
  (b) Lubricate the bolt threads with oil.
  (c) Attach the clamp for the W5 harness to the clamp on the oil scavenge tube for the No. 4 bearing with the bolt and nut.
  (d) Tighten the nut with your hand.

S 214-194-NO2

(47) Make sure the wiring harness is not pulled too tightly between any two clamps.

S 214-195-NO2

(48) Make sure the wiring harness does not touch any engine parts.

S 214-196-NO2

(49) Make sure the wiring harness is not pulled too tightly where the wiring harness attaches to the connectors.

S 424-197-NO2

(50) Tighten the nuts and bolts for the clamps on the W5 harness to 36-40 pound-inches (4.067-4.519 newton-meters).

NOTE: Make sure there is clearance between the W3 and W5 harnesses and the hardware near the lower left of the forward side of the gearbox.

F. Put the Airplane Back to its Usual Condition

S 414-198-NO2

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Close the thrust reversers (AMM 78-31-00/201).

S 414-199-NO2

(2) Close the core cowl panels (AMM 71-11-06/201).

S 444-200-NO2

(3) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

S 414-201-NO2

(4) Close the fan cowl panels (AMM 71-11-04/201).

S 864-202-NO2

(5) For the left engine, remove DO-NOT-CLOSE tag and close this circuit breaker on the main power disribution panel P6:
(a) 6L19, PROBE HEAT L ENG

S 864-203-NO2

(6) For the right engine, remove DO-NOT-CLOSE tag and close this circuit breaker on the main power disribution panel P6:
(a) 6K25, PROBE HEAT R ENG

S 864-204-NO2

(7) For the left engine, remove DO-NOT-CLOSE tags and close these circuit breakers on the overhead panel P11:
(a) 11A10, AIR DATA CMPTR L
(b) 11L3, L ENGINE PERF SOL CHAN A
(c) 11L4, L ENGINE PERF SOL CHAN B
(d) 11M5, LEFT ENGINE EEC DISCRETES

S 864-205-NO2

(8) For the right engine, remove DO-NOT-CLOSE tags and close these circuit breakers on the overhead panel P11:
(a) 11F30, AIR DATA CMPTR R
(b) 11L30, R ENGINE PERF SOL CHAN A
(c) 11L31, R ENGINE PERF SOL CHAN B
(d) 11M32, RIGHT ENGINE EEC DISCRETES

S 864-206-NO2

(9) Remove DO-NOT-CLOSE tag and close this circuit breaker on the overhead panel P11:
(a) 11B36, APU ENG START/ECS DISCRETES

S 714-207-NO2

(10) Do the test of the EEC wiring harness that is shown in the Power Plant Test Reference Table (AMM 71-00-00/501).

TASK 73-21-07-004-208-NO2

8. Remove the EEC Wiring Harness W6 (Fig. 404)

A. References
(1) AMM 71-11-04/201, Fan Cowl Panels
(2) AMM 71-11-06/201, Core Cowl Panels
(3) AMM 78-31-00/201, Thrust Reverser System

B. Access
(1) Location Zone
410 No. 1 Power Plant
420 No. 2 Power Plant

(2) Access Panel
413 Fan Cowl Panel (LH)
414 Fan Cowl Panel (RH)
415 Fan Reverser (LH)
416 Fan Reverser (RH)
417 Core Cowl (LH)
418 Core Cowl (RH)
423 Fan Cowl Panel (LH)
424 Fan Cowl Panel (RH)
425 Fan Reverser (LH)
426 Fan Reverser (RH)
427 Core Cowl (LH)
428 Core Cowl (RH)

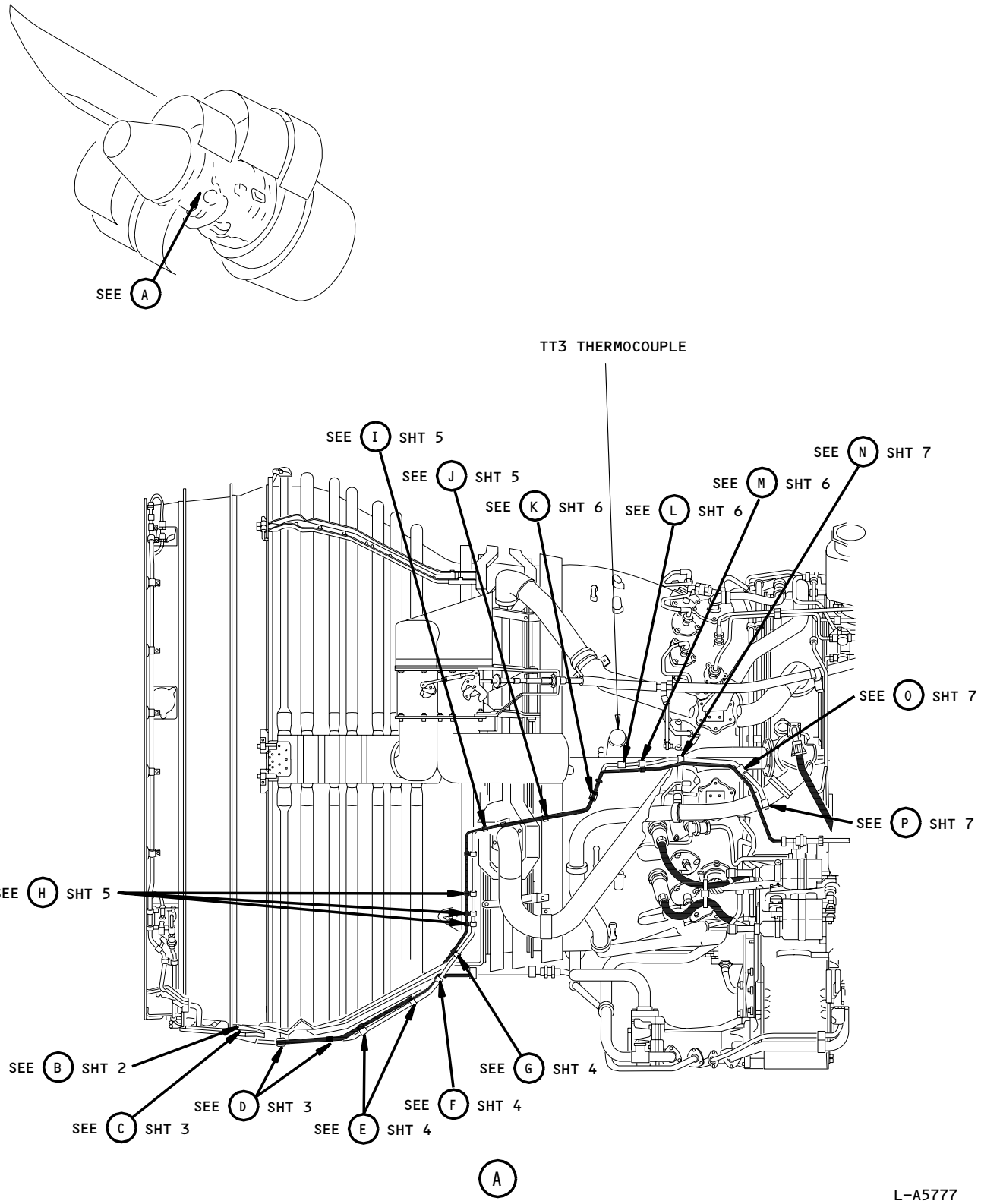
C. Prepare For Wiring Harness Removal

S 864-209-NO2

(1) For the left engine, open this circuit breaker on the main power distribution panel P6 and attach DO-NOT-CLOSE tag:
(a) 6L19, PROBE HEAT L ENG

S 864-210-NO2

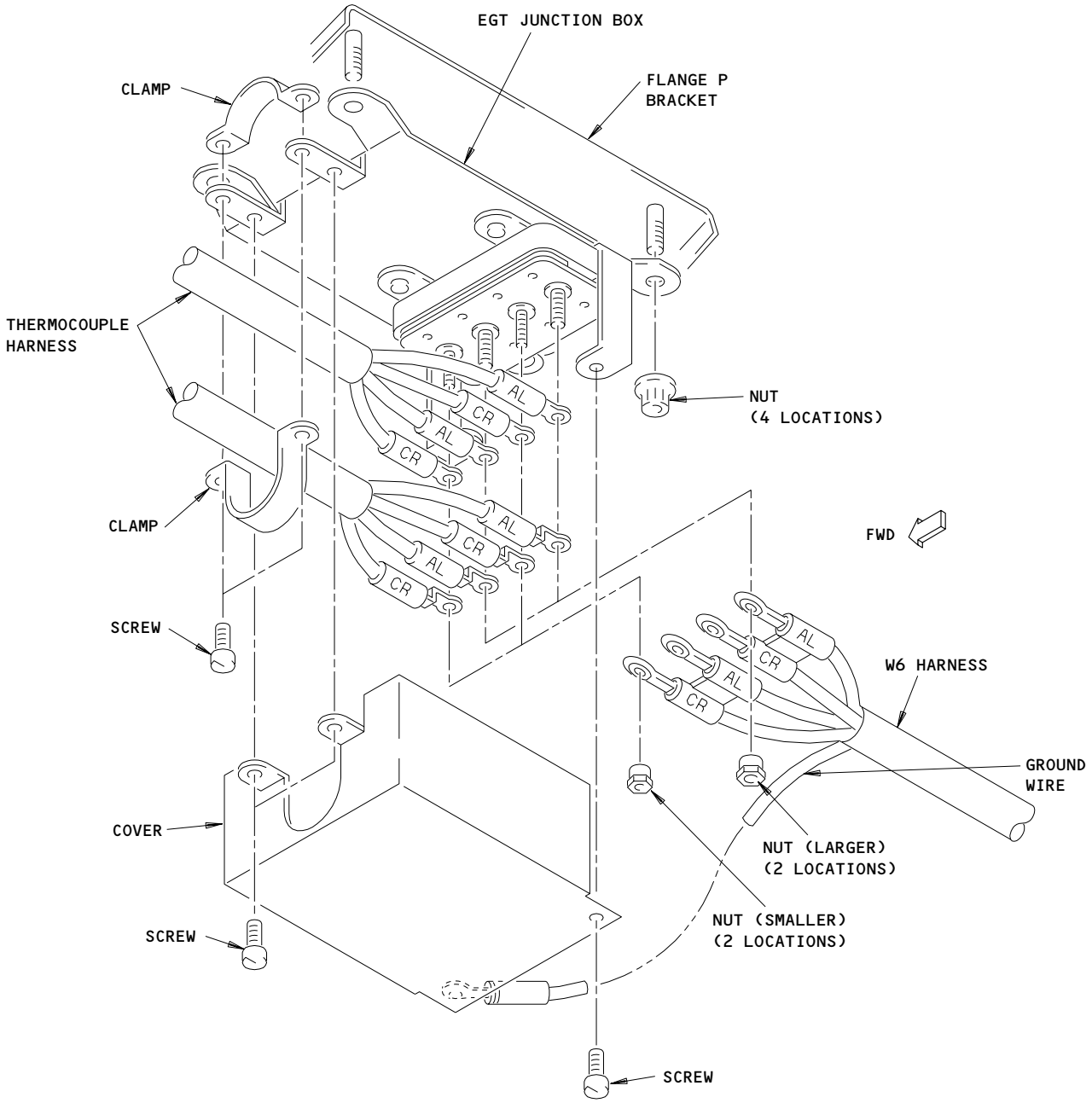
(2) For the right engine, open this circuit breaker on the main power distribution panel P6 and attach DO-NOT-CLOSE tag:
(a) 6K25, PROBE HEAT R ENG



EEC Wiring Harness W6 Installation
Figure 404 (Sheet 1)

EFFECTIVITY
ENGINES WITHOUT PHASE 3

753545

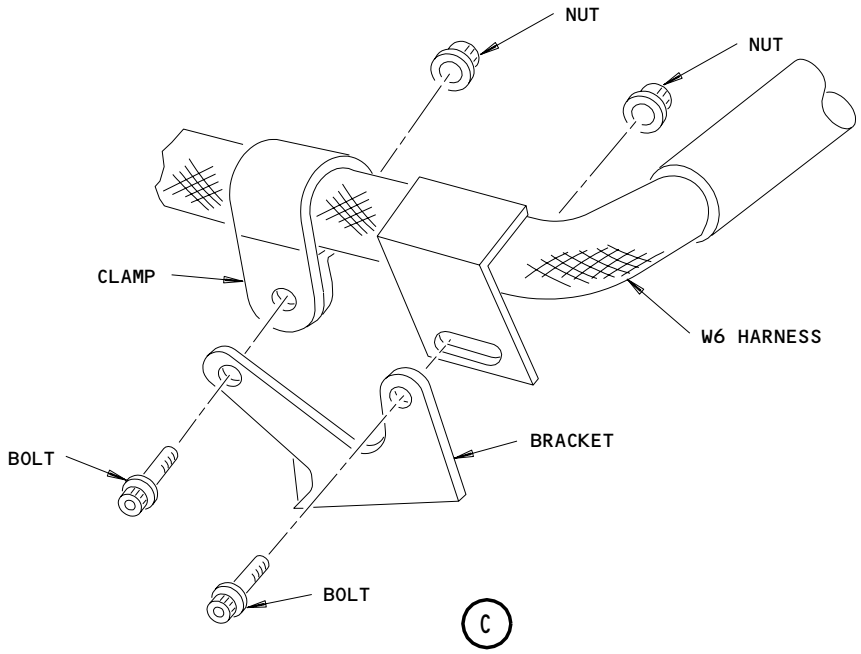


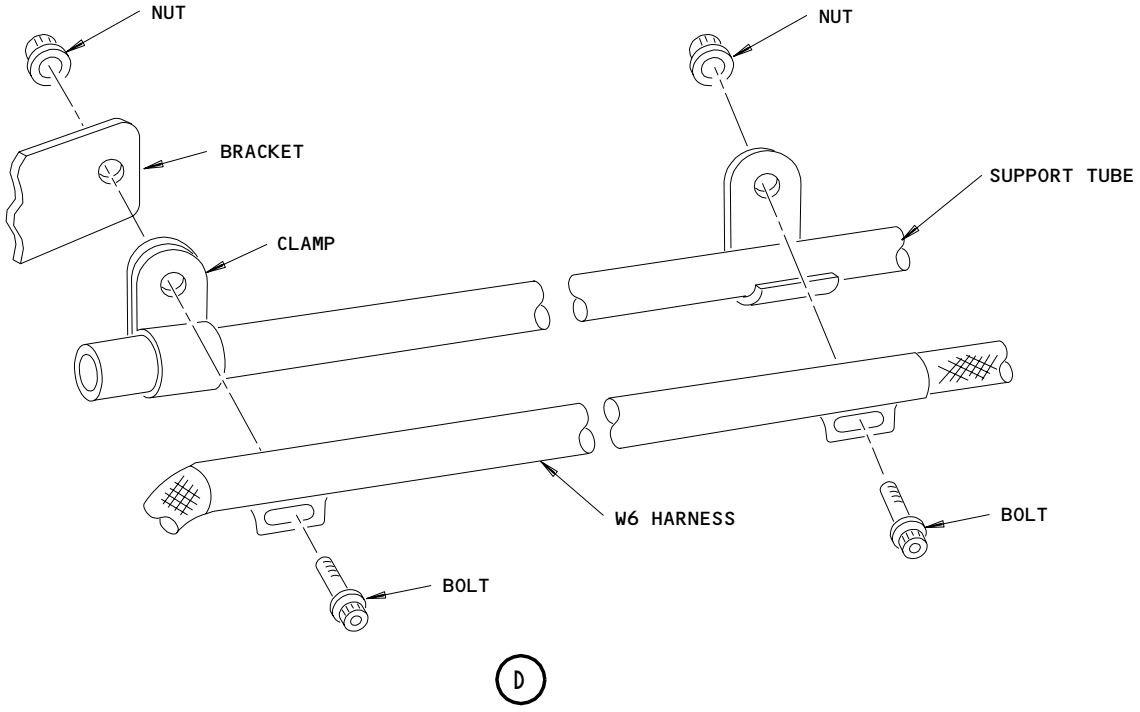
EGT JUNCTION BOX

(B)

L-A3849

EEC Wiring Harness W6 Installation
Figure 404 (Sheet 2)



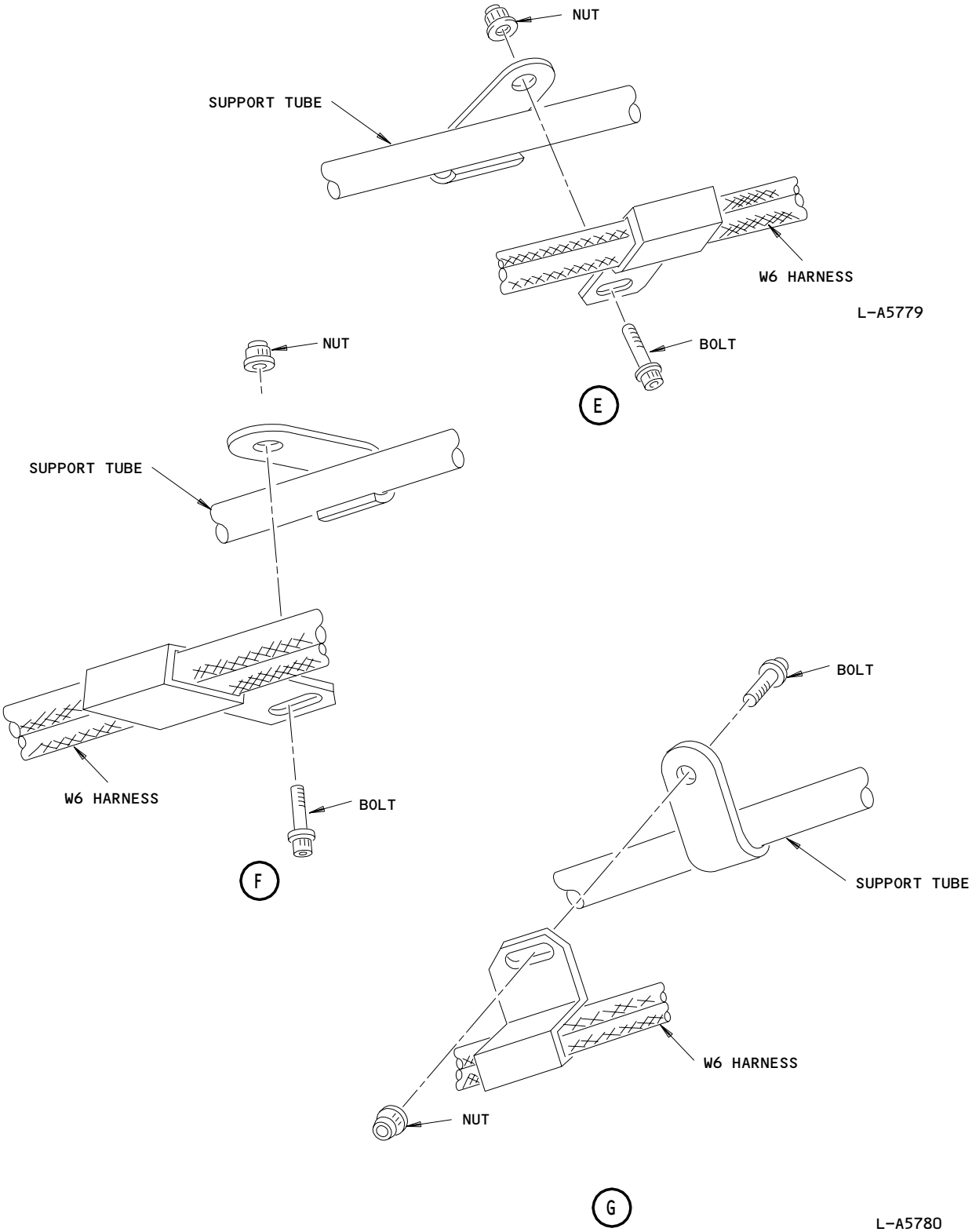


L-A5778

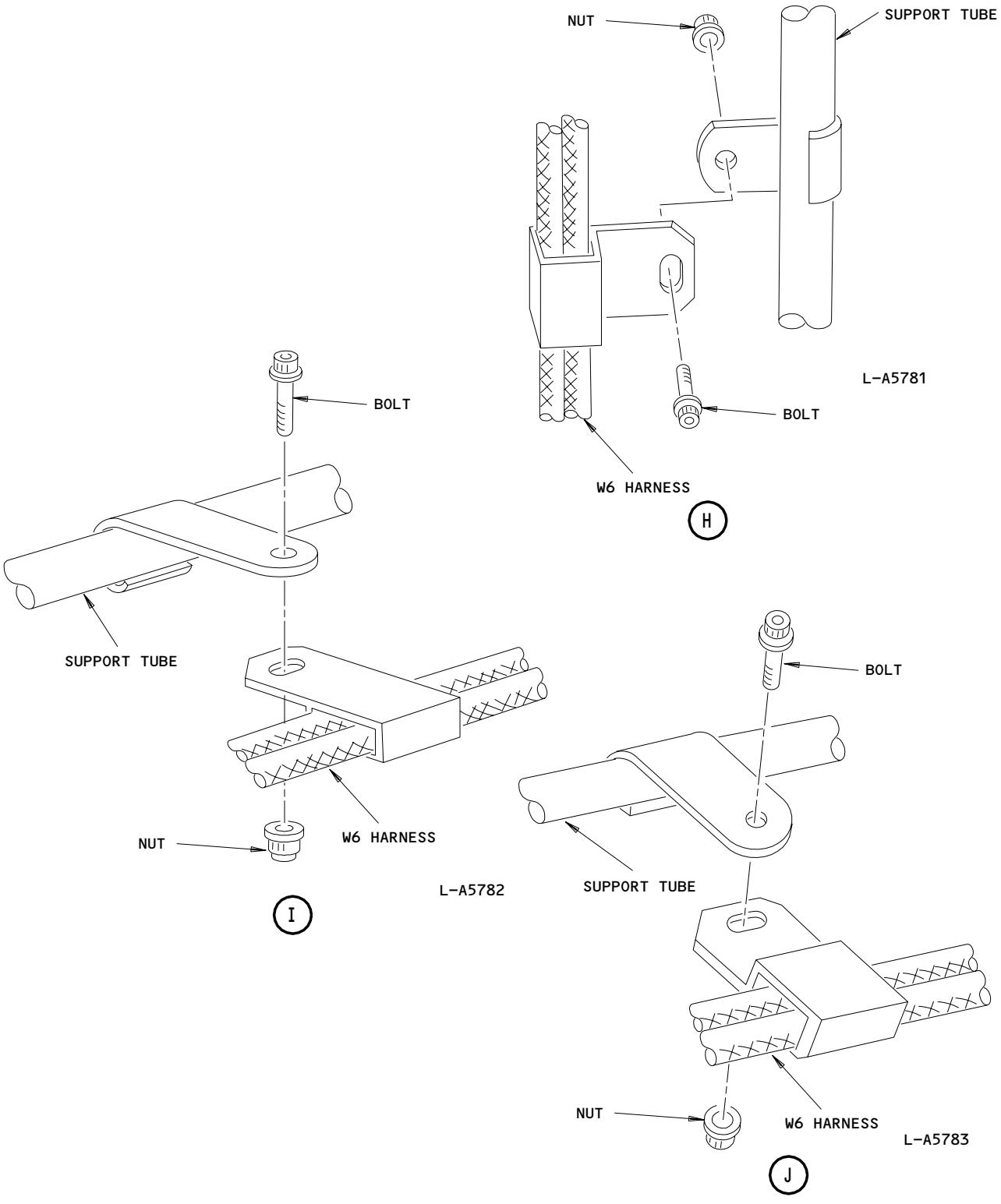
EEC Wiring Harness W6 Installation
Figure 404 (Sheet 3)

EFFECTIVITY
ENGINES WITHOUT PHASE 3

753547



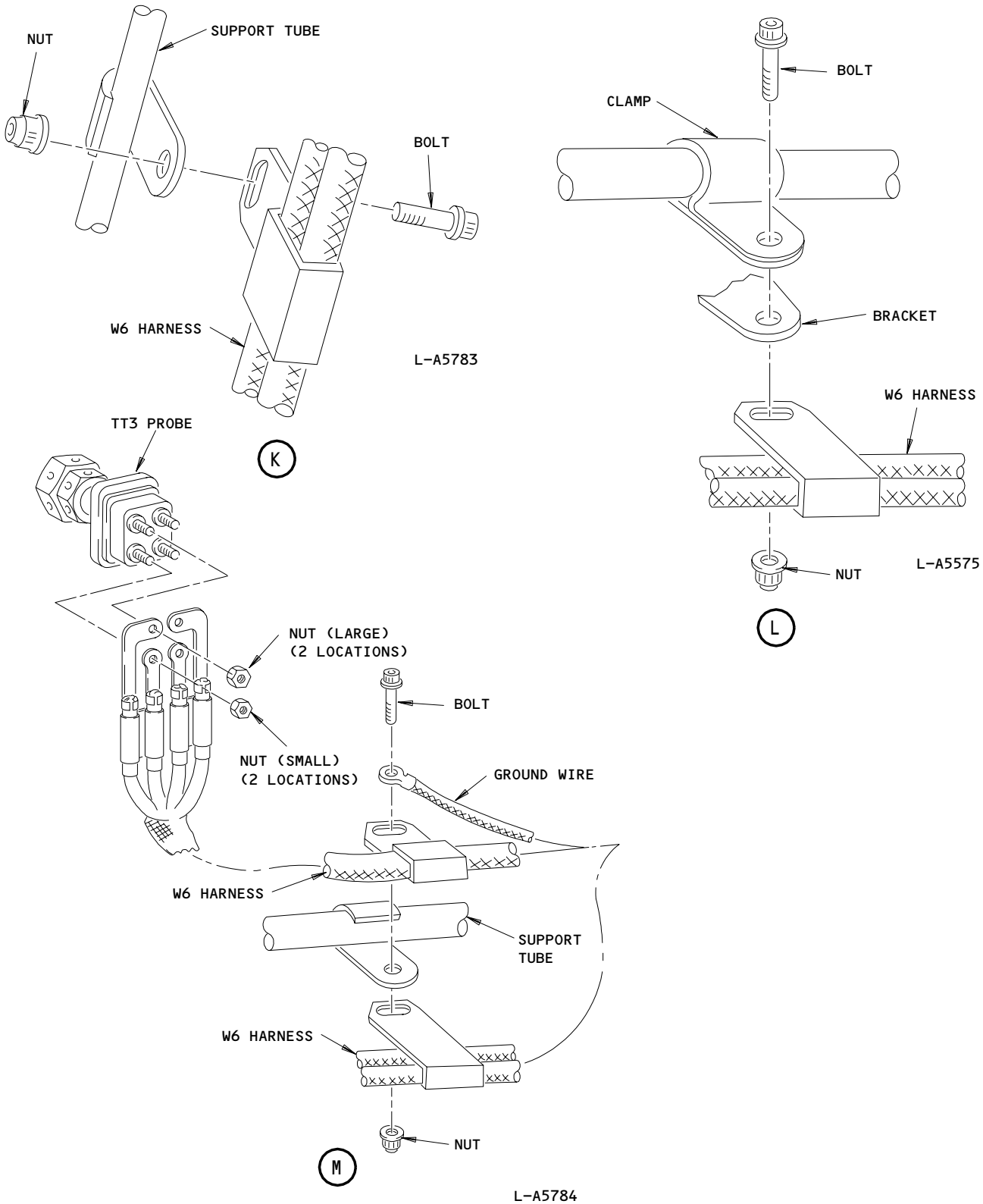
EEC Wiring Harness W6 Installation
Figure 404 (Sheet 4)



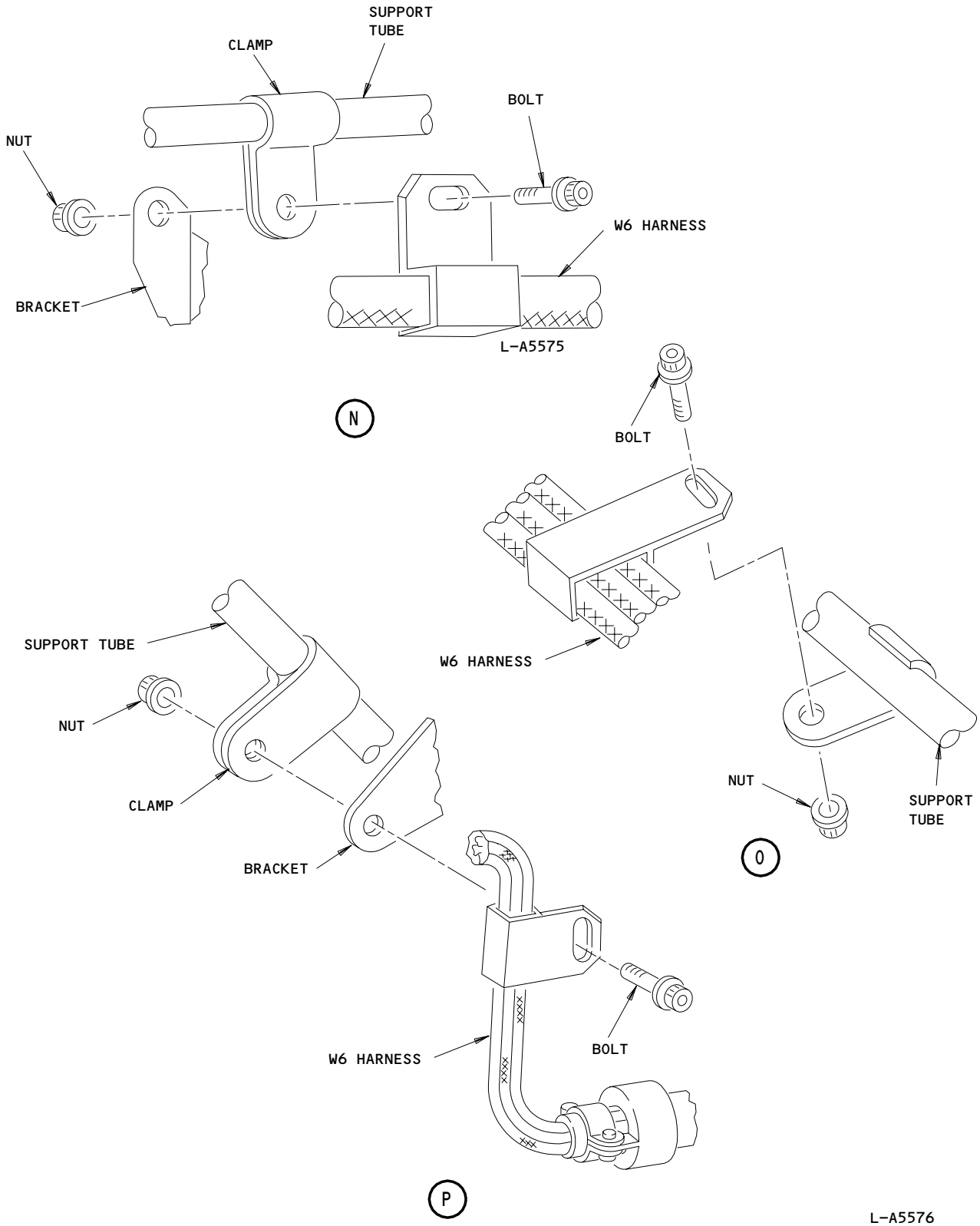
EEC Wiring Harness W6 Installation
Figure 404 (Sheet 5)

EFFECTIVITY
ENGINES WITHOUT PHASE 3

753549



EEC Wiring Harness W6 Installation
Figure 404 (Sheet 6)



EEC Wiring Harness W6 Installation
Figure 404 (Sheet 7)

EFFECTIVITY
ENGINES WITHOUT PHASE 3

753551

S 864-211-NO2

(3) For the left engine, open these circuit breakers on the overhead panel P11 and attach DO-NOT-CLOSE tags:
(a) 11A10, AIR DATA CMPTR L
(b) 11L3, L ENGINE PERF SOL CHAN A
(c) 11L4, L ENGINE PERF SOL CHAN B
(d) 11M5, LEFT ENGINE EEC DISCRETES

S 864-212-NO2

(4) For the right engine, open these circuit breakers on the overhead panel P11 and attach DO-NOT-CLOSE tags:
(a) 11F30, AIR DATA CMPTR R
(b) 11L30, R ENGINE PERF SOL CHAN A
(c) 11L31, R ENGINE PERF SOL CHAN B
(d) 11M32, RIGHT ENGINE EEC DISCRETES

S 864-213-NO2

(5) Open this circuit breaker on the overhead panel P11 and attach DO-NOT-CLOSE tag:
(a) 11B36, APU ENG START/ECS DISCRETES

S 014-214-NO2

(6) Open the fan cowl panels (AMM 71-11-04/201).

S 044-215-NO2

WARNING: DO THE THRUST REVERSER DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(7) Do this procedure: Thrust Reverser Deactivation for Ground Maintenance (AMM 78-31-00/201).

S 014-216-NO2

(8) Open the core cowl panels (AMM 71-11-06/201).

S 014-217-NO2

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(9) Open the thrust reversers (AMM 78-31-00/201).

D. Remove the EEC Wiring Harness W6.

S 934-218-NO2

(1) Before you disconnect the W6 harness, put tags on all W6 harness connections.

S 024-219-NO2

CAUTION: DO NOT TWIST OR BEND THE HARNESS BADLY DURING REMOVAL. IF THE HARNESS IS TWISTED OR BENT BADLY, THE HARNESS CAN BE DAMAGED.

(2) Disconnect the EGT thermocouple cable from the EGT junction box as follows:
   (a) Find the EGT junction box at the 5:30 o'clock position on the turbine exhaust case (VIEW B, Fig. 404).
   (b) Remove the screws that attach the EGT junction box cover to the EGT junction box.
   (c) Remove the EGT junction box cover from the engine.
   (d) Remove the four nuts that attach the W6 harness to the terminal studs on the EGT junction box.
   (e) Install the four nuts bock on to the terminal studs on the EGT junction box.

      NOTE: The diameter of the chromel nuts and terminal studs is smaller than the diameter of the alumel nuts and terminal studs.

S 024-220-NO2

(3) Disconnect the W6 harness from the TT3 probe as follows:
   (a) Find the TT3 probe at the 3 o'clock position on the diffuser case (VIEW M, Fig. 404).
   (b) Remove the nuts that attach the W6 harness to the terminal studs on the TT3 probe.
   (c) Install the four nuts back on the terminal studs on the TT3 probe.

      NOTE: The diameter of the chromel nuts and terminal studs is smaller than the diameter of the alumel nuts and terminal studs.

S 024-221-NO2

(4) Disconnect the W6P12 connector from the W5J12 connector as follows:
   (a) Find the W6P12 and W5J12 connectors at the 3:30 o'clock position above the ignition exciters.

(b) Disconnect the W6P12 connector form the W5J12 connector.
(c) Install covers on the W6P12 and W5J12 connectors.

S 024-222-NO2
(5) Remove the nuts, bolts, and clamps that attach the W6 harness to the brackets at flange P.

S 024-223-NO2
(6) Remove the nuts, bolts, and clamps that attach the W6 harness to the brackets on the engine.

S 024-224-NO2
(7) Remove the nuts, bolts, and clamps that attach the W6 harness to the clamps on the support tube.

S 024-225-NO2
(8) Remove the W6 harness from the engine.

S 034-226-NO2
(9) Remove the support tube from the engine as follows:
(a) Find the clamp that attaches the support tube to the bracket on the turbine cooling air support.
(b) Remove the nut, bolt, and clamp that attach the support tube to the bracket on the turbine cooling air support.
(c) Find the clamp that attaches the support tube to the lower right turbine cooling air tube.
(d) Remove the nut, bolt, and clamp that attach the support tube to the bracket on the lower right turbine cooling air tube.
(e) Remove the support tube from the engine.

TASK 73-21-07-404-227-NO2

9. Install the EEC Wiring Harness W6 (Fig. 404)
A. Consumable Materials
(1) D00137 Engine Oil - PWA 521
B. References
(1) AMM 70-24-05/201, Electrical Harnesses
(2) AMM 71-11-04/201, Fan Cowl Panels
(3) AMM 71-11-06/201, Core Cowl Panels
(4) AMM 78-31-00/201, Thrust Reverser System
C. Access
(1) Location Zone
410 No. 1 Power Plant
420 No. 2 Power Plant

(2) Access Panel

413	Fan Cowl Panel (LH)
414	Fan Cowl Panel (RH)
415	Fan Reverser (LH)
416	Fan Reverser (RH)
417	Core Cowl (LH)
418	Core Cowl (RH)
423	Fan Cowl Panel (LH)
424	Fan Cowl Panel (RH)
425	Fan Reverser (LH)
426	Fan Reverser (RH)
427	Core Cowl (LH)
428	Core Cowl (RH)

D. Install the EEC Wiring Harness W6.

S 434-228-NO2

(1) Install the support tube as follows:

(a) Put the long straight end of the support tube on the bottom side of the bracket on flange P.

(b) Put the other end of the support tube on the bracket attached to the cooling air tube for the turbine blades.

(c) Attach the support tube to the bracket on the cooling air tube for the turbine vanes as follows:

1) Find the bracket on the aft end of the cooling air tube for the turbine vanes.
2) Lubricate the bolt threads with oil.
3) Attach the support tube to the bracket with the clamp, bolt, and nut.
4) Tighten the nut with your hand.

(d) Attach the support tube to the bracket on the support for the HPT cooling air manifold as follows:

1) Find the bracket on the support for the HPT cooling air manifold at the 4:30 o'clock position.
2) Lubricate the bolt threads with oil.
3) Attach the support tube to the bracket with the clamp, bolt, and nut.
4) Tighten the nut with your hand.

(e) Attach the support tube to the bracket on the support for the LPT cooing air manifold as follows:

1) Find the bracket on the support for the LPT cooling air manifold at the 5 o'clock position.
2) Lubricate the bolt threads with oil.
3) Attach the support tube to the bracket with the clamp, bolt, and nut.

4) Tighten the nut with your hand.

NOTE: Do not use a wrench to tighten the nuts that attach the support tube to the engine at this time.

S 424-229-NO2

(2) Install the the EEC wiring harness W6 as follows:

CAUTION: DO NOT TWIST OR BEND THE HARNESS BADLY DURING INSTALLATION. IF THE HARNESS IS TWISTED OR BENT BADLY, THE HARNESS CAN BE DAMAGED.

EXAMINE THE HARNESS CONNECTORS AND THE RECEPTACLES THAT THEY CONNECT TO FOR BENT PINS AND CONTAMINATION. BENT PINS AND CONNECTOR CONTAMINATION CAN CUSE THE HARNESS TO FAIL.

(a) Examine the harness connectors and the receptacles that they attach to as follows:
1) Remove the covers from the harness connectors.
2) Examine the harness connectors for bent pins.
a) If bent pins are found, make the pins straight.
3) Examine the connectors and the receptacles that they attach to for contamination.
a) If contamination is found, clean the connectors and receptacles as necessary.
4) Examine the EGT terminal lugs and ground lead for damage.

NOTE: If the ground lead on the W6 cable at the EGT Thermocouple Terminal Box is damaged or missing, you must repair the cable per Unison SB 420081-73-46 or replace it.

CAUTION: USE THE CORRECT ASSEMBLY PROCEDURE, AND TOOLS, FOR THE HARNESS CONNECTOR INSTALLATION (AMM 70-24-05/201). IF YOU USE THE INCORRECT ASSEMBLY PROCEDURE, OR TOOLS, A DAMAGED OR LOOSE CONNECTOR CAN OCCUR. A LOOSE CONNECTOR PERMITS VIBRATION, WHICH CAUSES THE CONTACTS TO WEAR AND DECREASES THE LIGHTNING PROTECTION.

(b) Connect the W6P12 connector to the W5J12 connector as follows (AMM 70-24-05/201):
1) Find the W5J12 connector above the ignition exciters at the 3:30 o'clock position.
2) Connect the W6P12 connector to the W5J12 connector.
(c) Put the wiring harness on the support tube as follows:
1) Put the wiring harness along the forward end of the support tube.

2) Put the wiring harness on the inboard side of the forward end of the cooling air tube for the turbine vanes.

(d) Attach the wiring harness to the support tube along the burner and diffuser case as follows:

1) Find the bracket on the forward end of the cooling air tube for the turbine blades.
2) Put the clamp for the support tube on the inboard side of the bracket.
3) Put the clamp for the wiring harness on the outboard side of the bracket.
4) Lubricate the bolt threads with oil.
5) Attach the wiring harness and the support tube to the bracket with the bolt and nut.
6) Tighten the nut with your hand.
7) Find the first clamp from the forward end of the support tube that is brazed on the support tube.
8) Lubricate the bolt threads with oil.
9) Attach the wiring harness to the clamp on the support tube with the clamp, bolt, and nut.
10) Tighten the nut with your hand.
11) Find the bracket at the No. 7 fuel injector.
12) Put the clamp for the support tube on the outboard side of the bracket.
13) Put the clamp for the wiring harness over the clamp for the support tube.
14) Lubricate the bolt threads with oil.
15) Attach the wiring harness and the support tube to the bracket with the bolt and nut.
16) Tighten the nut with your hand.
17) Find the second clamp from the forward end of the support tube that is brazed on the support tube.
18) Put the wiring harness that goes to the TT3 probe on top of the clamp on the support tube.
19) Put the wiring harness that goes to the EGT junction box on the bottom of the clamp on the support tube.
20) Lubricate the bolt threads with oil.
21) Attach the ground wire and the two wiring harness leads to the clamp on the support tube with the bolt and nut.
22) Tighten the nut with your hand.

(e) Connect the wiring harness connector to the TT3 probe as follows:

1) Remove the nuts from the terminal studs on the TT3 probe.
2) Put the wiring harness connections on the TT3 probe.
3) Install the nuts on the terminal studs with the round side of the nut to the TT3 probe.
4) Align the wires to the TT3 probe so they are parallel.

CAUTION: DO NOT TIGHTEN THE NUTS ON THE TERMINAL STUDS OF THE TT3 PROBE TOO MUCH. TOO MUCH TORQUE ON THE NUTS CAN LOOSEN OR DAMAGE THE TERMINAL STUDS ON THE TT3 PROBE.

5) Tighten the nuts on the terminal studs of the TT3 probe as follows:
   a) Tighten the alumal nuts (larger diameter nuts) to 10-15 pound-inches (1.130-1.695 newton-meters).
   b) Tighten the chromel nuts (smaller diameter nuts) to 8-10 pound-inches (0.906-1.356 newton meters).

(f) Attach the wiring harness to the support tube along the burner and diffuser case as follows:
1) Find the bracket on the diffuser case below the TT3 probe.
2) Put the clamp for the support tube on top of the bracket.
3) Put the clamp for the wieing harness on the bottom of the bracket.
4) Lubricate the bolt threads with oil.
5) Attach the support tube and the wiring harness to the bracket with the bolt and nut.
6) Tighten the nut with your hand.
7) Find the third clamp from the forward end of the support tube that is brazed on the support tube.
8) Put the clamp for the wiring harness below the clamp that is brazed on the support tube.
9) Lubricate the bolt threads with oil.
10) Attach the wiring harness to the clamp on the support tube with the bolt and nut.
11) Tighten the nut with your hand.

(g) Attach the wiring harness to the support tube along the High Pressure Compressor (HPC) as follows:
1) Find the fourth clamp from the forward end of the support tube that is brazed on the support tube.
2) Put the clamp for the wiring harness below the clamp that is brazed on the support tube.
3) Lubricate the bolt threads with oil.
4) Attach the wiring harness to the clamp on the support tube with the bolt and nut.
5) Tighten the nut with your hand.
6) Find the fifth clamp from the forward end of the support tube that is brazed on the support tube.
7) Put the clamp for the wiring harness below the clamp that is brazed on the support tube.
8) Lubricate the bolt threads with oil.
9) Attach the wiring harness to the clamp on the support tube with the bolt and nut.

10) Tighten the nut with your hand.
11) Find the 6th, 7th, and 8th clamp from the forward end of the support tube that are brazed on the support tube.
12) Put the clamps for the wiring harness on the outboard side of the clamps on the support tube.
13) Lubricate the bolt threads with oil.
14) Attach the wiring harness on the three clamps on the support tube with bolts and nuts.
15) Tighten the nuts with your hand.
16) Find the 9th clamp from the forward end of the support tube that is brazed on the support tube.
17) Put the clamp for the wiring harness on the aft side of the clamp on the support tube.
18) Lubricate the bolt threads with oil.
19) Attach the wiring harness to the clamp on the support tube with the bolt and nut.
20) Tighten the nut with your hand.

(h) Attach the wiring harness on the support tube along the Low Pressure Turbine (LPT) as follows:
1) Find the 10th clamp from the forward end of the support tube that is brazed on the support tube.
2) Put the clamp for the wiring harness on the bottom side of the clamp on the support tube.
3) Lubricate the bolt threads with oil.
4) Attach the wiring harness to the clamp on the support tube with the bolt and nut.
5) Tighten the nut with your hand.
6) Find the 11th and 12th clamps from the forward end of the support tube that are brazed on the support tube.
7) Put the clamps for the wiring haresses on the bottom side of the clamps on the support tube.
8) Lubricate the bolt threads with oil.
9) Attach the wiring harness to the clamps on the wiring harness tube with the bolts and nuts.
10) Tighten the nuts with your hand.
11) Find the 13th clamp from the forward end of the support tube that is brazed on the support tube.
12) Put the clamp for the wiring harness on the outboard side of the clamp on the support tube.
13) Lubricate the bolt threads with oil.
14) Attach the wiring harness to the clamp on the support tube with the bolt and nut.
15) Tighten the nut with your hand.
16) Find the bracket on flange P at the 5:30 o'clock position on the low pressure turbine.

17) Put the clamp for the support tube on the outboard side of the bracket.
18) Put the clamp for the wiring harness on the outboard side of the clamp for the support tube.
19) Lubricate the bolt threads with oil.
20) Attach the support tube and the wiring harness to the bracket with the bolt and nut.
21) Tighten the nut with your hand.
22) Find the bracket on flange P at the 6:00 o'clock position on the low pressure turbine.
23) Put the clamp for the wiring harness on the top side of the bracket.
24) Lubricate the threads of two bolts with oil.
25) Attach the wiring harness to the bracket with a bolt and nut.
26) Install a clamp on the wiring harness and put the clamp on the top side of the same bracket.
27) Attach the clamp to the bracket with a bolt and nut.
28) Tighten the nuts with your hand.

(i) Tighten the nuts and bolts for the harness clamps and support tube to 36-40 pound-inches (4.067-4.519 newton-meters).

(j) Connect the wiring harness to the EGT junction box as follows:
1) Remove the nuts for the terminal studs on the EGT junction box.
2) Put the wiring harness connectors on the terminal studs of the EGT junction box.

NOTE: Do not attach the ground wire to the terminal studs.

3) Install the nuts on the terminal studs with the round side of the nut to the EGT junction box.
4) Align the wires to the EGT junction box so they are parallel.

CAUTION: DO NOT TIGHTEN THE NUTS ON THE TERMINAL STUDS OF THE EGT JUNCTION BOX TOO MUCH. TOO MUCH TORQUE ON THE NUTS CAN LOOSEN OR DAMAGE THE TERMINAL STUDS ON THE EGT JUNCTION BOX.

(k) Tighten the nuts on the terminal studs of the EGT junction box as follows:
1) Tighten the alumel nuts (larger diameter nuts) to 18-22 pound-inches (2.034-2.486 newton-meters).
2) Tighten the chromel nuts (smaller diameter nuts) to 15-18 pound-inches (1.695-2.034 newton-meters).

(l) Install the cover on the EGT junction box as follows:
1) Put the cover on the EGT junction box.
2) Install two screws on the left side of the cover for the EGT junction box.
3) Install one screw on the right forward side of the EGT junction box.
4) Put the connector for the ground wire under the aft right corner of the cover.
5) Attach the cover and the ground wire to the EGT junction box with a screw.
6) Tighten the screws to 16-22 pound-inches (1.808-2.486 newton-meters).
7) Install lockwire on the screws.

E. Put the Airplane Back to its Usual Condition

S 414-230-N02

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Close the thrust reversers (AMM 78-31-00/201).

S 414-231-N02
(2) Close the core cowl panels (AMM 71-11-06/201).

S 444-232-N02
(3) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

S 414-233-N02
(4) Close the fan cowl panels (AMM 71-11-04/201).

S 864-234-N02
(5) For the left engine, remove DO-NOT-CLOSE tag and close this circuit breaker on the main power disribution panel P6:
(a) 6L19, PROBE HEAT L ENG

S 864-235-N02
(6) For the right engine, remove DO-NOT-CLOSE tag and close this circuit breaker on the main power disribution panel P6:
(a) 6K25, PROBE HEAT R ENG

S 864-236-N02
(7) For the left engine, remove DO-NOT-CLOSE tags and close these circuit breakers on the overhead panel P11:
(a) 11A10, AIR DATA CMPTR L

(b) 11L3, L ENGINE PERF SOL CHAN A
(c) 11L4, L ENGINE PERF SOL CHAN B
(d) 11M5, LEFT ENGINE EEC DISCRETES

S 864-237-NO2
(8) For the right engine, remove DO-NOT-CLOSE tags and close these circuit breakers on the overhead panel P11:
(a) 11F30, AIR DATA CMPTR R
(b) 11L30, R ENGINE PERF SOL CHAN A
(c) 11L31, R ENGINE PERF SOL CHAN B
(d) 11M32, RIGHT ENGINE EEC DISCRETES

S 864-238-NO2
(9) Remove DO-NOT-CLOSE tag and close this circuit breaker on the overhead panel P11:
(a) 11B36, APU ENG START/ECS DISCRETES

S 714-239-NO2
(10) Do the test of the EEC wiring harness that is shown in the Power Plant Test Reference Table (AMM 71-00-00/501).

EEC WIRING HARNESS - INSPECTION/CHECK

1. General
   A. This procedure does a check for loose electrical connectors, the lockwire on the connector backshells, and a visual inspection of the EEC wire harnesses.

   TASK 73-21-07-206-001-N00

2. Do a Check of the EEC Wiring Harnesses
   A. References
      (1) AMM 71-11-04/201, Fan Cowl Panels
      (2) AMM 71-11-06/201, Core Cowl Panels
      (3) AMM 73-21-07/401, EEC Wiring Harness
      (4) AMM 78-31-00/201, Thrust Reverser System
   B. Access
      (1) Location Zones
          410 No. 1 Power Plant
          420 No. 2 Power Plant

      (2) Access Panels
          413 Fan Cowl Panel (LH)
          414 Fan Cowl Panel (RH)
          415 Fan Reverser (LH)
          416 Fan Reverser (RH)
          417 Core Cowl (LH)
          418 Core Cowl (RH)
          423 Fan Cowl Panel (LH)
          424 Fan Cowl Panel (RH)
          425 Fan Reverser (LH)
          426 Fan Reverser (RH)
          427 Core Cowl (LH)
          428 Core Cowl (RH)

   C. Prepare to Examine the EEC Wire Harnesses

      S 016-002-N00
      (1) Open the fan cowl panels (AMM 71-11-04/201).

S 046-003-N00

WARNING: DO THE THRUST REVERSER DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(2) Do this procedure: Thrust Deactivation for Ground Maintenance (AMM 78-31-00/201).

S 016-004-N00

(3) Open the core cowl panels (AMM 71-11-06/201).

S 016-005-N00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(4) Open the thrust reversers (AMM 78-31-00/201).

D. Examine the EEC Wire Harnesses

S 216-015-N00

(1) Visually examine the EEC wire harnesses for all types of damage.

NOTE: If the ground lead on the W6 cable at the EGT Thermocouple Terminal Box is damaged or missing, you must repair the cable per Unison SB 420081-73-46 or replace it.

(a) Replace the applicable EEC wire harness if it is necessary (AMM 73-21-07/401).

S 286-007-N00

(2) Examine the EEC wire harnesses for loose electrical connectors, backshells, and coupling nuts.
(a) If it is necessary, tighten the loose electrical connectors, backshells, and coupling nuts.
(b) If it is necessary, replace the applicable EEC wire harness (AMM 73-21-07/401).

S 216-008-N00

(3) Make sure the backshells are correctly installed with the lockwire.
(a) If it is necessary, replace the lockwire.

E. Put the Airplane Back to Its Usual Condition.

S 416-009-N00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Close the thrust reversers (AMM 78-31-00/201).

S 416-010-N00

(2) Close the core cowl panels (AMM 71-11-06/201).

S 416-011-N00

(3) Close the fan cowl panels (AMM 71-11-04/201).

S 446-014-N00

(4) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

EEC PROGRAMMING PLUG - REMOVAL/INSTALLATION

1. General
   A. This procedure has two tasks. The first task removes the programming plug for the EEC. The second task installs the programming plug.

TASK 73-21-08-004-001-N00

2. Remove the EEC Programming Plug
   A. References
      (1) AMM 71-11-04/201, Fan Cowl Panels
   B. Access
      (1) Location Zones
          414 L Power Plant Fan Cowl Panel
          424 R Power Plant Fan Cowl Panel

      (2) Access Panels
          414AR Fan Cowl Panel (Right)
          424AR Fan Cowl Panel (Right)

   C. Prepare to Remove the Programming Plug

      S 014-002-N00
      (1) Open the right fan cowl panel (AMM 71-11-04/201).

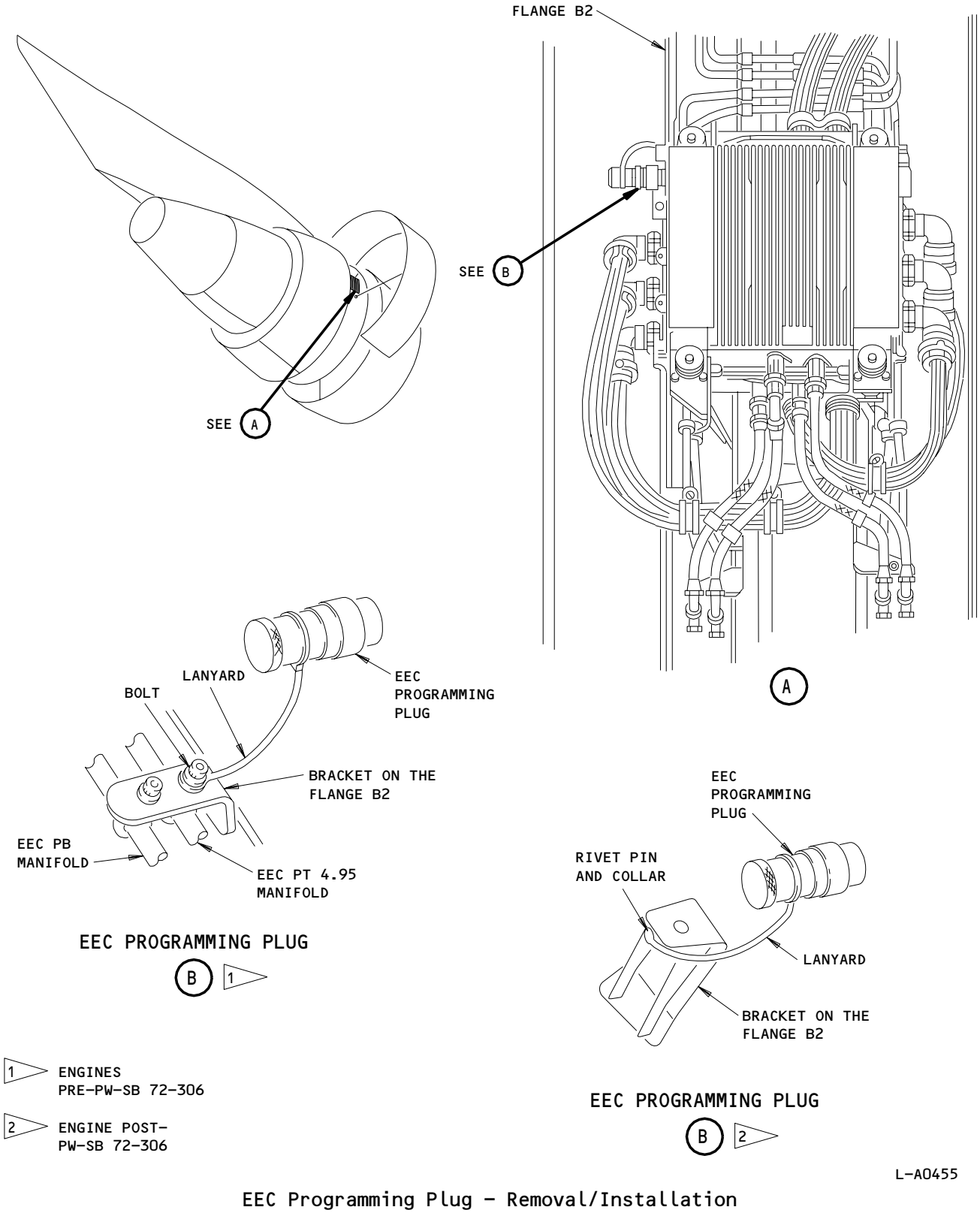
      S 034-019-N00
      (2) ENGINES PRE-PW-SB 72-306;
      Remove the bolt and nut which attach the lanyard and the EEC PT4.95 manifold to the bracket on the Flange B2.

      S 034-017-N00
      (3) ENGINES POST-PW-SB 72-306;
      Remove the rivet pin and collar which attach the lanyard to the bracket on the Flange B2.

      S 024-004-N00
      (4) Loosen and remove the programming plug from the EEC.
          (a) Install the protection caps on the EEC and on the programming plug.

TASK 73-21-08-404-005-N00

3. Install the EEC Programming Plug
   A. Consumable Materials
      (1) D00137 Engine Oil - PWA 521



EEC Programming Plug - Removal/Installation
Figure 401

B. References
(1) AMM 70-24-05/201, Electrical Harnesses
(2) AMM 71-00-00/501, Power Plant - General
(3) AMM 71-11-04/201, Fan Cowl Panels

C. Access
(1) Location Zones
414 L Power Plant Fan Cowl Panel
424 R Power Plant Fan Cowl Panel

(2) Access Panels
414AR Fan Cowl Panel (Right)
424AR Fan Cowl Panel (Right)

D. Install the Programming Plug

S 434-006-N00
(1) Remove the protection caps from the programming plug and the EEC.

S 214-007-N00
(2) Examine the programming plug and the receptacle for pins which are bent and for contamination.
(a) If there are pins which are bent, carefully make the pins straight.
(b) Clean the connector of all of the contamination.

S 424-013-N00

CAUTION: WHEN YOU REPLACE THE EEC PROGRAMMING PLUG, MAKE SURE THE REPLACEMENT HAS THE SAME PART NUMBER AND CLASS NUMBER AS IDENTIFIED ON THE ENGINE NAMEPLATE. IF THE REPLACEMENT DOES NOT HAVE THE SAME CLASS NUMBER, THE EEC WILL NOT OPERATE CORRECTLY.

CAUTION: USE THE CORRECT ASSEMBLY PROCEDURE, AND TOOLS, FOR THE INSTALLATION OF THE PROGRAMMING PLUG (AMM 70-24-05/201). IF YOU USE THE INCORRECT ASSEMBLY PROCEDURE, OR TOOLS, A DAMAGED OR LOOSE PROGRAMMING PLUG CAN OCCUR. A LOOSE PROGRAMMING PLUG PERMITS VIBRATION, WHICH CAUSES THE CONTACTS TO WEAR AND DECREASES THE LIGHTNING PROTECTION.

(3) Install the programming plug on the EEC (AMM 70-24-05/201).

NOTE: The programming plug is correctly installed when you cannot see the color band which is nearest to the threads.

(a) Align the keyway of the connector.
(b) Push the programming plug into the receptacle.
1) While you push in on the programming plug, tighten the coupling ring with your hand.

S 644-020-N00

(4) ENGINES PRE-PW-SB 72-306;
Attach the lanyard with the steps that follow:
(a) Lubricate the threads of the bolt, which attaches the lanyard, with engine oil.
(b) Attach the lanyard to the inlet case Flange B2 with the bolt, washers (below the head of the bolt and the nut) and nut.
(c) Tighten the bolt to 36-40 pound-inches (4.067-4.519 newton meters).

S 434-016-N00

(5) ENGINES POST-PW-SB 72-306;
Install the rivet pin and collar to attach the lanyard to the bracket at the Flange B2.

E. Put the Airplane Back to Its Usual Condition

S 414-011-N00

(1) Close the right fan cowl panel (AMM 71-11-04/201).

S 714-012-N00

(2) Do the test of the EEC programming plug that is shown in the Power Plant Test Reference Table (AMM 71-00-00/501).

EEC FUEL TEMPERATURE THERMOCOUPLE PROBE - REMOVAL/INSTALLATION

1. General
   A. This procedure gives the instructions to remove and install the EEC fuel temperature thermocouple probe. The EEC fuel temperature thermocouple probe will be referred to as the fuel temperature probe. The fuel temperature probe is installed on the top of the fuel pump filter housing.

TASK 73-21-09-004-001-N00

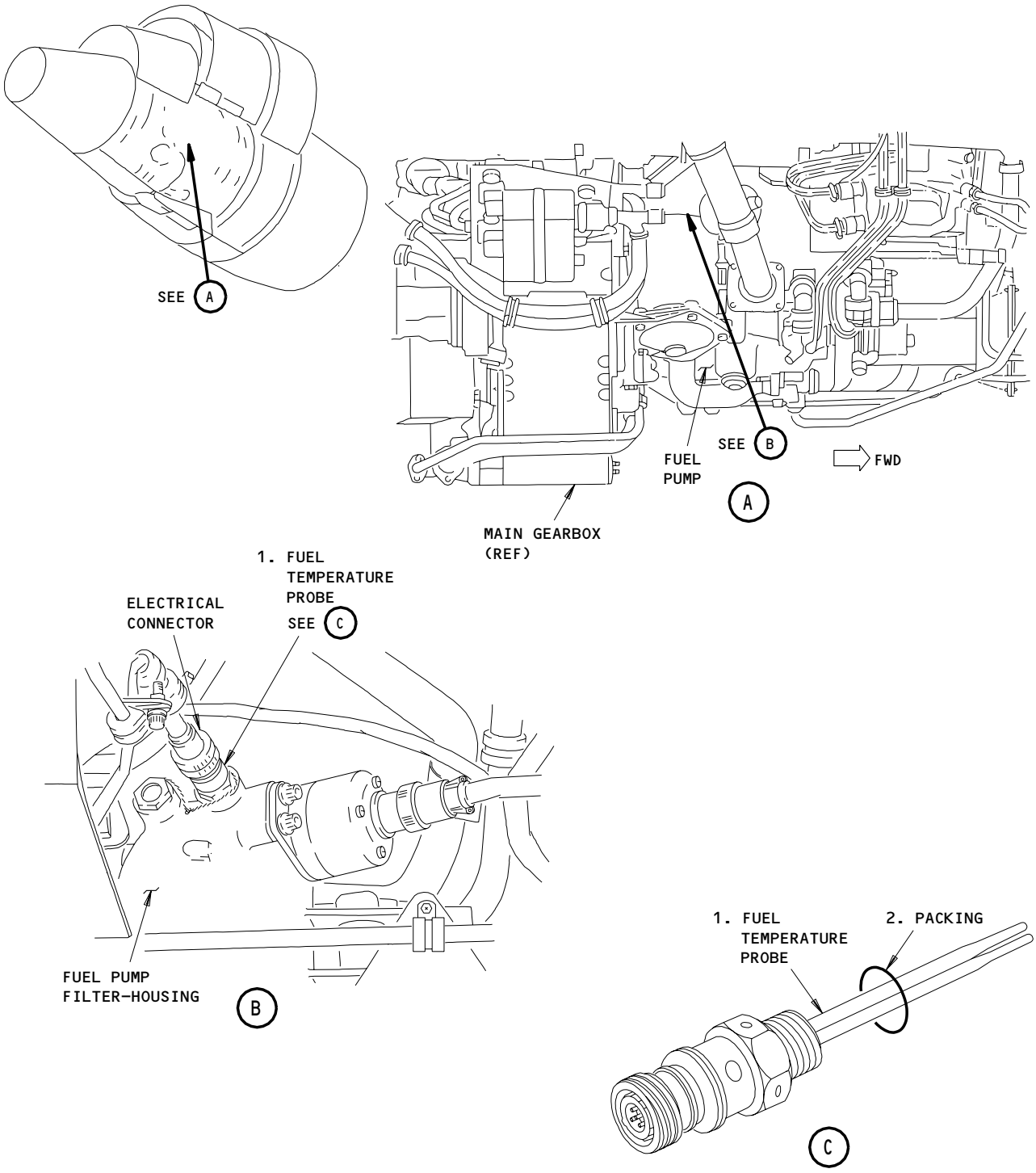
2. Remove the EEC Fuel Temperature Thermocouple Probe (Fuel Temperature Probe)
   A. Equipment
      (1) Container - 5 US gallons (19 liters), to catch the fuel
   B. References
      (1) AMM 24-22-00/201, Electrical Power - Control
      (2) AMM 71-11-04/201, Fan Cowl Panels
      (3) AMM 71-11-06/201, Core Cowl Panels
      (4) AMM 78-31-00/201, Thrust Reverser System
   C. Access
      (1) Location Zones
          210 Control Cabin
          411 Left Engine
          421 Right Engine

      (2) Access Panels
          414AR Fan Cowl Panel (Right), Left Engine
          416AR Thrust Reverser (Right), Left Engine
          418AR Core Cowl Panel (Right), Left Engine
          424AR Fan Cowl Panel (Right), Right Engine
          426AR Thrust Reverser (Right), Right Engine
          428AR Core Cowl Panel (Right), Right Engine

   D. Prepare to Remove the Fuel Temperature Probe

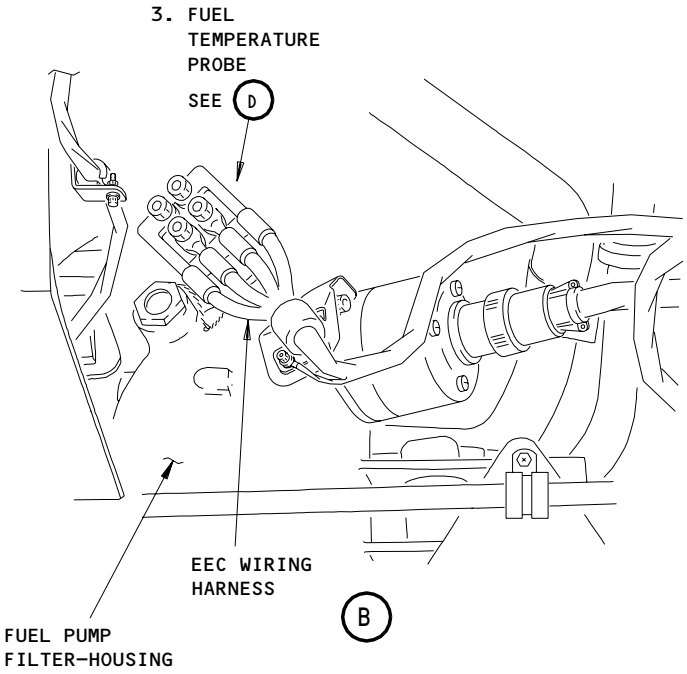
      S 864-002-N00
      (1) Supply electrical power (AMM 24-22-00/201).

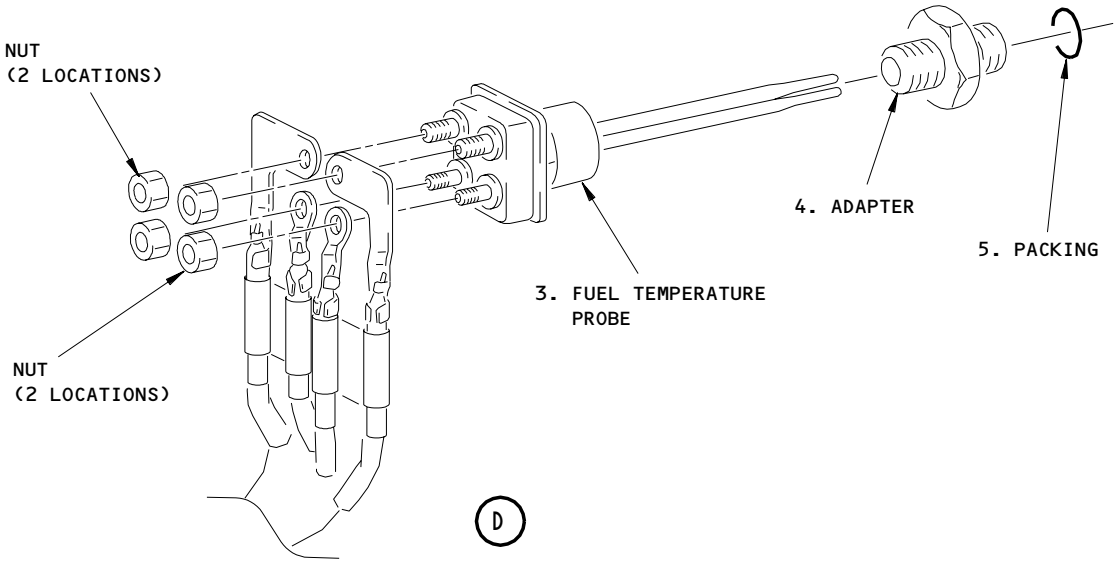
      S 864-003-N00
      (2) Do these steps to make sure the applicable engine and spar valves are closed:
          (a) For the left engine, make sure this circuit breaker on the main power distribution panel, P6, is closed:
              1) 6E1, FUEL VALVE L SPAR
          (b) For the right engine, make sure this circuit breaker on the P6 panel is closed:
              1) 6E2, FUEL VALVE R SPAR
          (c) For the left engine, make sure this circuit breaker on the overhead circuit breaker panel, P11, is closed:
              1) 11D25, ENGINE FUEL CONTROL VALVE L



ENGINES PRE-PW-SB 73-84 OR PRE-PW-SB 73-161

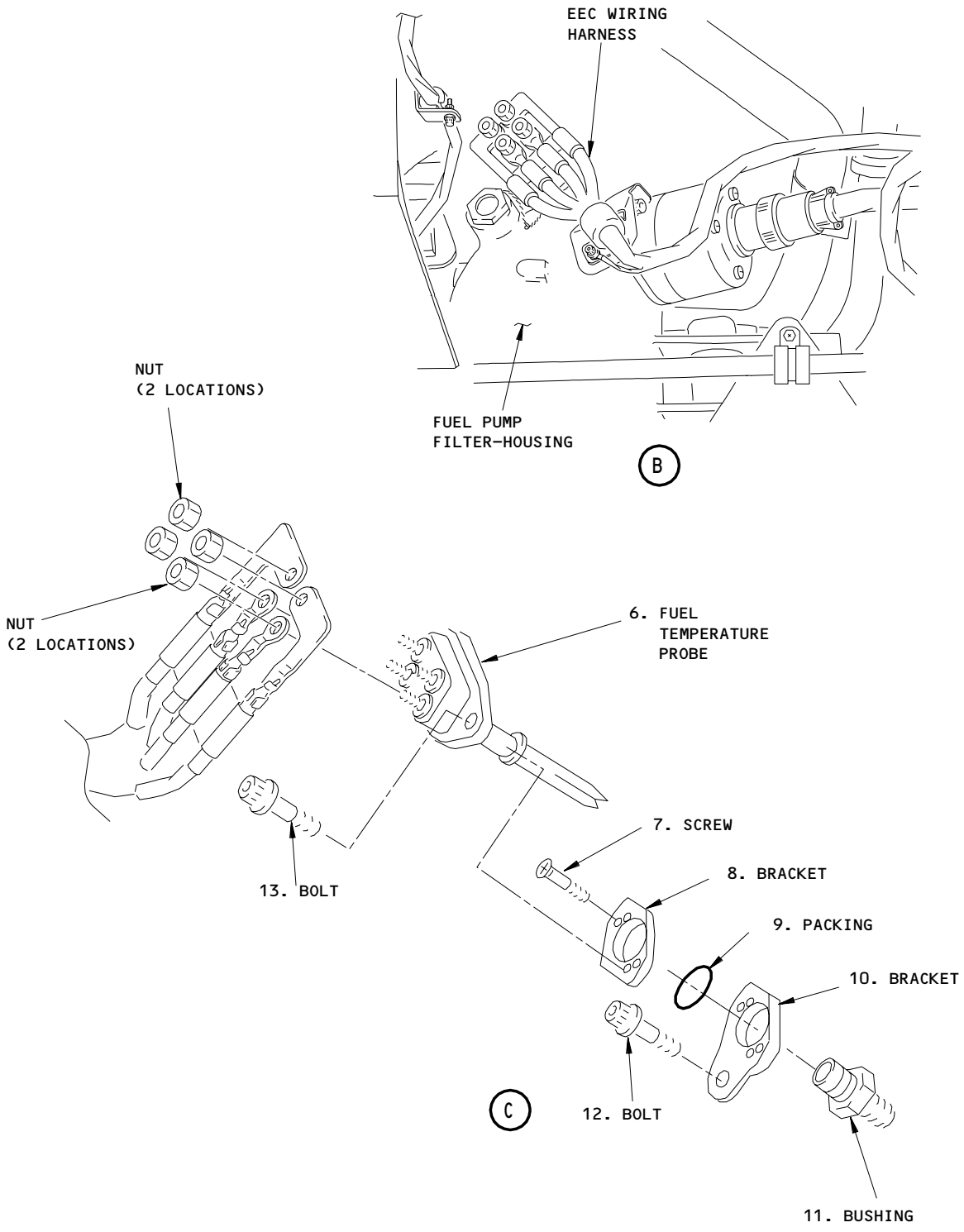
EEC Fuel Temperature Thermocouple Probe Installation
Figure 401 (Sheet 1)





ENGINES POST-PW-SB 73-84 AND PRE-PW-SB 73-161

EEC Fuel Temperature Thermocouple Probe Installation
Figure 401 (Sheet 2)



ENGINES POST-PW-SB 73-161

EEC Fuel Temperature Thermocouple Probe Installation
Figure 401 (Sheet 3)

(d) For the right engine, make sure this circuit breaker on the P11 panel is closed:
1) 11D26, ENGINE FUEL CONTROL VALVE R
(e) Make sure the applicable FUEL CONTROL switch is in the CUTOFF position.
(f) Make sure the applicable ENG VALVE and SPAR VALVE panel lights on the control stand are off.

S 864-004-N00
(3) For the left engine, open this circuit breaker on the P6 panel and attach a DO-NOT-CLOSE tag:
(a) 6E1, FUEL VALVE L SPAR

S 864-005-N00
(4) For the right engine, open this circuit breaker on the P6 panel and attach a DO-NOT-CLOSE tag:
(a) 6E2, FUEL VALVE R SPAR

S 864-006-N00
(5) For the left engine, open this circuit breaker on the P11 panel and attach a DO-NOT-CLOSE tag:
(a) 11D25, ENGINE FUEL CONTROL VALVE L

S 864-007-N00
(6) For the right engine, open this circuit breaker on the P11 panel and attach a DO-NOT-CLOSE tag:
(a) 11D26, ENGINE FUEL CONTROL VALVE R

S 864-008-N00
(7) Remove electrical power (AMM 24-22-00/201).

S 014-009-N00
(8) Open the right fan cowl panel (AMM 71-11-04/201).

S 044-010-N00

WARNING: DO THE THRUST REVERSER DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(9) Do this procedure: Thrust Reverser Deactivation for Ground Maintenance (AMM 78-31-00/201).

S 014-011-N00
(10) Open the right core cowl panel (AMM 71-11-06/201).

S 014-012-N00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT COULD OCCUR.

(11) Open the right thrust reverser (AMM 78-31-00/201).

E. Procedure (Fig. 401)

S 024-013-N00

(1) ENGINES PRE-PW-SB 73-84 OR PRE-PW-SB 73-161;
Remove the fuel temperature probe:
(a) Disconnect the electrical connector from the fuel temperature probe (1).
1) Install a protection cap on the electrical connector.
(b) Remove the fuel temperature probe (1) from the fuel pump filter-housing.

NOTE: Be prepared to catch fuel in a container with a minimum capacity of 5 U.S. gallons (19 liters).

1) Discard the packing (2).
(c) Install a protection cap on the opening in the fuel pump filter-housing.

S 024-014-N00

(2) ENGINES POST-PW-SB 73-84 AND PRE-PW-SB 73-161;
Remove the fuel temperature probe:
(a) Remove the nuts that attach the W5 wire harness to the studs on the fuel temperature probe (3).
(b) Remove the bolt, clamp and ground strap that are attached to the bracket on the fuel pump filter-housing.
(c) Remove the terminals of the W5 wire harness from the studs on the fuel temperature probe (3).
(d) Remove the fuel temperature probe (3) from the fuel pump filter-housing.

NOTE: Be prepared to catch fuel in a container with a minimum capacity of 5 U.S. gallons (19 liters).

(e) If necessary, remove the adapter (4) from the fuel pump filter-housing.
1) Discard the packing (5).

(f) Install a protection cap on the opening in the fuel pump filter-housing.

S 024-030-N00

(3) ENGINES POST-PW-SB 73-161;
Remove the fuel temperature probe:

(a) Remove the nuts that attach the W5 wire harness to the studs on the fuel temperature probe (6).

(b) Remove the bolt, clamp and ground strap that are attached to the bracket on the fuel pump filter-housing.

(c) Remove the terminals of the W5 wire harness from the studs on the fuel temperature probe (6).

(d) Remove the bolts (13) that attach the fuel temperature probe (6).

(e) Carefully remove the fuel temperature probe (6) from the fuel pump filter-housing.

NOTE: Be prepared to catch fuel in a container with a minimum capacity of 5 U.S. gallons (19 liters).

(f) If necessary, do the steps that follow to remove the bracket assembly and bushing from the fuel pump filter-housing:

1) Remove the countersunk screws (7) that attach the bracket (8) to the bracket (10).
2) Remove the bracket (8).
3) Remove the bolt (12) that attaches the bracket (10) to the plug in the fuel pump filter-housing.
4) Remove the bracket (10).
5) Remove the bushing (11) from the fuel pump filter-housing.
a) Discard the packing (9).

(g) Install a protection cap on the opening in the fuel pump filter-housing.

TASK 73-21-09-404-016-N00

3. Install the EEC Fuel Temperature Thermocouple Probe (Fuel Temperature Probe)

A. Equipment

(1) M303, M305, or M307 Bergen Mechanical Crimper
Bergen Cable Technologies Inc
170 Gregg St
P.O. Box 1300
Lodi, NJ 07644-9982

B. Consumable Materials

(1) D00137 Engine Oil - PWA 521

(2) D00504 Petrolatum, White - PMC 9609
(3) G02334 Lockwire - AS3214-02
(4) G02332 Ferrule - P05-292 (Optional)
(5) G02335 Cable - Safety - P05-291 (Optional)

C. Parts

AMM		NOMENCLATURE	AIPC		
FIG	ITEM		SUBJECT	FIG	ITEM
401	1	Probe - Fuel Temp Thermocouple	73-21-09	01	60
	2	Packing			40
	3	Probe - Fuel Temp Thermocouple			70
	5	Packing			35
	6	Probe - Fuel Temp Thermocouple			75
	9	Packing			35

D. References
(1) AMM 70-24-05/201, Electrical Harnesses
(2) AMM 71-00-00/501, Power Plant
(3) AMM 71-11-04/201, Fan Cowl Panels
(4) AMM 71-11-06/201, Core Cowl Panels
(5) AMM 78-31-00/201, Thrust Reverser System

E. Access
(1) Location Zones
210 Control Cabin
411 Left Engine
421 Right Engine

(2) Access Panels
414AR Fan Cowl Panel (Right), Left Engine
416AR Thrust Reverser (Right), Left Engine
418AR Core Cowl Panel (Right), Left Engine
424AR Fan Cowl Panel (Right), Right Engine
426AR Thrust Reverser (Right), Right Engine
428AR Core Cowl Panel (Right), Right Engine

F. Procedure (Fig. 401)

S 424-018-N00
(1) ENGINES PRE-PW-SB 73-84 OR PRE-PW-SB 73-161;
Install the fuel temperature probe:
(a) Remove the protection caps from the fuel pump filter-housing and the electrical connector.

(b) Lubricate the packing (2) with petrolatum.
(c) Install the packing (2) to the fuel temperature probe (1).
(d) Lubricate the threads of the fuel temperature probe (1) with engine oil.
(e) Install the fuel temperature probe (1) to the boss at the top of the fuel pump filter-housing.
1) Tighten the fuel temperature probe (1) to 110-120 pound-inches (12.4-13.6 newton-meters).
2) Safety the fuel temperature probe (1) with lockwire or safety cable and safety cable ferrule.

CAUTION: USE THE CORRECT ASSEMBLY PROCEDURE, AND TOOLS, FOR THE HARNESS CONNECTOR INSTALLATION (AMM 70-24-05/201). IF YOU USE THE INCORRECT ASSEMBLY PROCEDURE, OR TOOLS, A DAMAGED OR LOOSE CONNECTOR CAN OCCUR. A LOOSE CONNECTOR PERMITS VIBRATION, WHICH CAUSES THE CONTACTS TO WEAR AND DECREASES THE LIGHTNING PROTECTION.

(f) Connect the electrical connector to the fuel temperature probe (1) (AMM 70-24-05/201).

S 424-019-N00
(2) ENGINES POST-PW-SB 73-84 AND PRE-PW-SB 73-161;
Install the fuel temperature probe:
(a) Remove the protection cap from the fuel pump filter-housing.
(b) If applicable, do the steps that follow to install the adapter (4):
1) Lubricate the packing (5) with petrolatum.
2) Install the packing (5) to the adapter (4).
3) Lubricate the threads of the adapter (4) with engine oil.
4) Install the concave end of the adapter (4) into the port on the fuel pump filter-housing.
a) Tighten the adapter (4) to 95-100 pound-inches (10.7-11.3 newton-meters).
b) Safety the adapter (4) to the housing with lockwire or safety cable and safety cable ferrule.
(c) Lubricate the threads of the fuel temperature probe (3) with engine oil.
(d) Install the fuel temperature probe (3) into the adapter (4).
(e) Turn the fuel temperature probe (3) to align the studs with the W5 wire harness terminals.

(f) Connect the W5 wire harness terminals to the studs on the fuel temperature probe (3) and loosely install the nuts.
(g) Loosely install the clamp, bolt and ground strap to the bracket on the fuel pump filter-housing.

CAUTION: MAKE SURE THE STUD BOX OF THE FUEL TEMPERATURE PROBE DOES NOT TURN WHEN THE COUPLING NUT IS TIGHTENED. IF THE STUD BOX OF THE FUEL TEMPERATURE PROBE TURNS, DAMAGE TO THE W5 WIRE HARNESS CAN OCCUR.

CAUTION: DO NOT ALIGN THE STUD BOX OF THE FUEL TEMPERATURE PROBE AFTER THE COUPLING NUT IS TIGHTENED. HOLD THE STUD BOX AND LOOSEN THE COUPLING NUT BEFORE YOU ALIGN THE STUD BOX AGAIN. IF YOU DO NOT DO THIS, DAMAGE TO THE STUD BOX CAN OCCUR.

(h) Hold the stud box aligned with the W5 wire harness and tighten the coupling nut of the fuel temperature probe (3) to 95-100 pound-inches (10.7-11.3 newton-meters).

CAUTION: DO NOT TIGHTEN THE NUTS TOO MUCH. TOO MUCH TORQUE (MORE THAN THE MAXIMUM TORQUE) ON THE NUTS CAN LOOSEN OR DAMAGE THE STUDS ON THE FUEL TEMPERATURE PROBE.

(i) Tighten the alumel nuts (larger terminal studs) to 18-22 pound-inches (2.0-2.5 newton-meters).
(j) Tighten the chromel nuts (smaller terminal studs) to 15-18 pound-inches (1.7-2.0 newton-meters).
(k) Safety the coupling nut to the adapter (4) with lockwire or safety cable and safety cable ferrule.
(l) Tighten the bolt that attaches the clamp and ground strap to the bracket on the fuel pump filter-housing, to 36-40 pound-inches (4.1-4.5 newton-meters).

S 424-033-N00
(3) ENGINES POST-PW-SB 73-161;
Install the fuel temperature probe:
(a) Remove the protection cap from the fuel pump filter-housing.
(b) If applicable, do the steps that follow to install the bracket assembly and bushing to the fuel pump filter-housing:
1) Lubricate the packing (9) with petrolatum.

2) Install the packing (9) to the bushing (11).
3) Lubricate the threads of the bushing (11) with engine oil.
4) Install the bushing (11) in the fuel pump filter-housing.
   a) Tighten the bushing (11) to 110-120 pound-inches (12.4-13.6 newton-meters).
5) Lubricate the threads of the bolt (12) with engine oil.
6) Install the bracket (10) to the plug in the fuel pump filter-housing with the bolt (12).
   a) Tighten the bolt (12) to 85-95 pound-inches (9.6-10.7 newton-meters).
7) Lubricate the threads of the screws (7) with engine oil.
8) Align the boltholes and the contour of the bracket (8) with the bracket (10).
9) Install the bracket (8) with the screws (7).
   a) Tighten the screws (7) to 36-40 pound-inches (4.0-4.5 newton-meters).

(c) Carefully install the fuel temperature probe (6) into the bracket assembly and the fuel pump filter-housing.
(d) Lubricate the threads of the bolts (13) with engine oil.
(e) Install the fuel temperature probe (6) with the bolts (13).

NOTE: The boltholes in the bracket assembly and the fuel temperature probe-flange are offset. If necessary, turn the fuel temperature probe to align the boltholes.

1) Tighten the bolts (13) to 85-95 pound-inches (9.6-10.7 newton-meters).

(f) Connect the terminals of the W5 wire harness to the alumel studs (larger studs) and the chromel studs (smaller studs) on the fuel temperature probe (6).
1) Loosely install the nuts.

(g) Install the clamp, bolt and ground strap loosely to the bracket on the fuel pump filter-housing.

CAUTION: DO NOT TIGHTEN THE NUTS TOO MUCH. TOO MUCH TORQUE (MORE THAN THE MAXIMUM TORQUE) ON THE NUTS CAN LOOSEN OR DAMAGE THE STUDS ON THE FUEL TEMPERATURE PROBE.

(h) Tighten the nuts on the alumel studs to 18-22 pound-inches (2.0-2.5 newton-meters).
(i) Tighten the nuts on the chromel studs to 15-18 pound-inches (1.7-2.0 newton-meters).
(j) Tighten the bolt which attaches the clamp and the ground strap to the bracket on the fuel pump filter-housing to 36-40 pound-inches (4.1-4.5 newton-meters).

G. Return the Aircraft to Its Usual Condition

S 414-020-N00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT COULD OCCUR.

(1) Close the right thrust reverser (AMM 78-31-00/201).

S 414-021-N00

(2) Close the right core cowl panel (AMM 71-11-06/201).

S 444-022-N00

(3) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

S 414-023-N00

(4) Close the right fan cowl panel (AMM 71-11-04/201).

S 864-024-N00

(5) For the left engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P6 panel:
(a) 6E1, FUEL VALVE L SPAR

S 864-025-N00

(6) For the right engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P6 panel:
(a) 6E2, FUEL VALVE R SPAR

S 864-026-N00

(7) For the left engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P11 panel:
(a) 11D25, ENGINE FUEL CONTROL VALVE L

S 864-027-N00

(8) For the right engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P11 panel:
(a) 11D26, ENGINE FUEL CONTROL VALVE R

S 714-028-N00

(9) Do the test for the EEC fuel temperature thermocouple probe which is shown in the Power Plant Test Reference Table (AMM 71-00-00/501).

EEC OIL TEMPERATURE THERMOCOUPLE PROBE - REMOVAL/INSTALLATION

1. General
   A. This procedure gives the instructions to remove and install the EEC oil temperature thermocouple probe. The EEC oil temperature thermocouple probe will be referred to as the oil temperature probe. The oil temperature probe is installed on the lower, left, front of the main gearbox.

TASK 73-21-10-004-001-N00

2. Remove the EEC Oil Temperature Thermocouple Probe (Oil Temperature Probe)
   A. Equipment
      (1) Container - 5 US gallons (19 liters), to catch the oil
   B. References
      (1) AMM 71-11-04/201, Fan Cowl Panels
      (2) AMM 71-11-06/201, Core Cowl Panels
      (3) AMM 78-31-00/201, Thrust Reverser System
   C. Access
      (1) Location Zones
          411 Left Engine
          421 Right Engine

      (2) Access Panels
          413AL Fan Cowl Panel (Left), Left Engine
          415AL Thrust Reverser (Left), Left Engine
          417AL Core Cowl Panel (Left), Left Engine
          423AL Fan Cowl Panel (Left), Right Engine
          425AL Thrust Reverser (Left), Right Engine
          427AL Core Cowl Panel (Left), Right Engine

   D. Prepare to Remove the Oil Temperature Probe

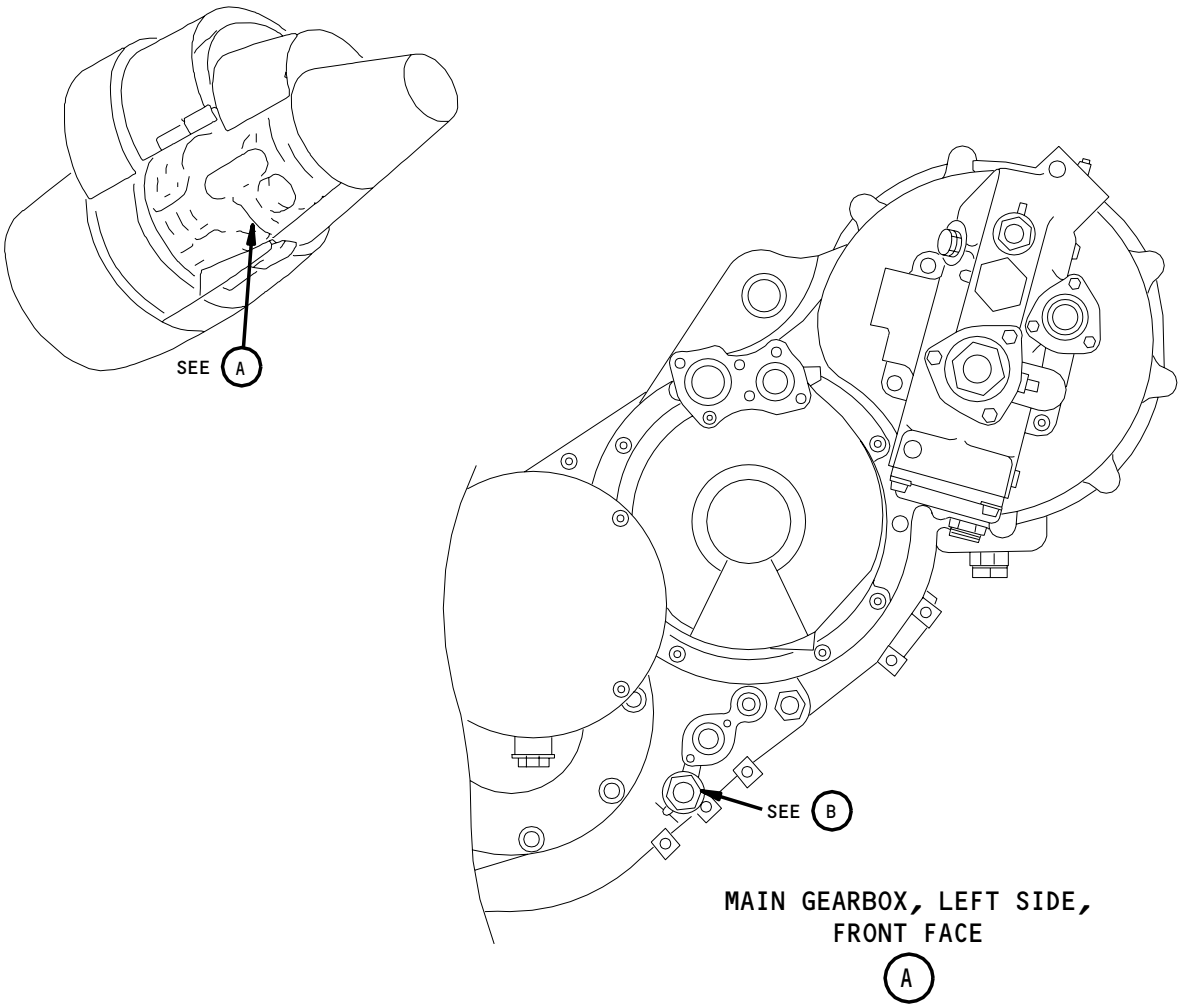
      S 014-002-N00
      (1) Open the left fan cowl panel (AMM 71-11-04/201).

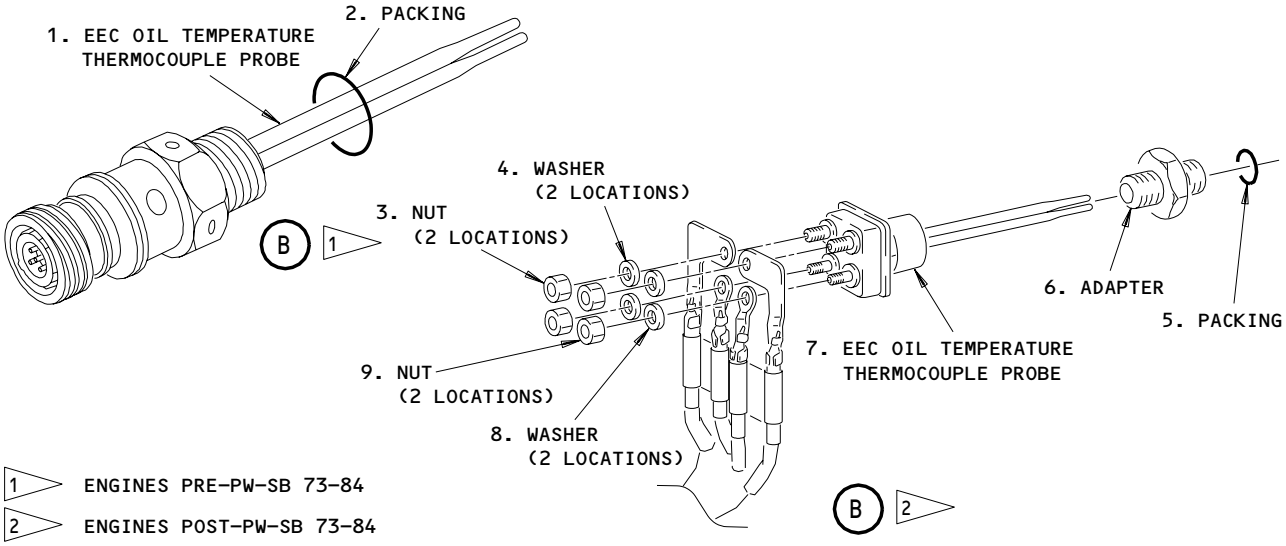
      S 044-003-N00

      WARNING: DO THE THRUST REVERSER DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

      (2) Do this procedure: Thrust Reverser Deactivation for Ground Maintenance (AMM 78-31-00/201).

      S 014-004-N00
      (3) Open the left core cowl panel (AMM 71-11-06/201).





EEC Oil Temperature Thermocouple Probe Installation
Figure 401

S 014-005-N00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT COULD OCCUR.

(4) Open the left thrust reverser (AMM 78-31-00/201).

E. Procedure (Fig. 401)

S 024-006-N00

(1) ENGINES PRE-PW-SB 73-84;
Remove the oil temperature probe:
(a) Disconnect the electrical connector from the oil temperature probe (1).
1) Install a protection cap on the electrical connector.
(b) Put a container below the main gearbox to catch the oil.
(c) Remove the oil temperature probe (1) from the main gearbox.
1) Discard the packing (2).
(d) Install a protection cap on the opening in the main gearbox.

S 024-007-N00

(2) ENGINES POST-PW-SB 73-84;
Remove the oil temperature probe:
(a) Remove the nuts (3, 9) and washers (4, 8) that attach the W3 wire harness to the studs on the oil temperature probe (7).
(b) Remove the bolt, clamp, and ground strap that are attached to the pressure tube for the main gearbox.
(c) Remove the W3 wire harness terminals from the studs on the oil temperature probe (7).
(d) Remove the oil temperature probe (7) from the main gearbox housing.

NOTE: Be prepared to catch the oil in a container with a minimum capacity of 5 U.S. gallons (19 liters).

(e) If necessary, remove the adapter (6) from the main gearbox housing.
1) Discard the packing (5).

(f) Install a protection cap on the opening in the main gearbox.

TASK 73-21-10-404-009-N00

3. Install the EEC Oil Temperature Thermocouple Probe (Oil Temperature Probe)

A. Equipment

(1) M303, M305, or M307 Bergen Mechanical Crimper
Bergen Cable Technologies Inc
170 Gregg St
P.O. Box 1300
Lodi, NJ 07644-9982

B. Consumable Materials

(1) D00137 Engine Oil - PWA 521
(2) D00504 Petrolatum, White - PMC 9609
(3) G02334 Lockwire - AS3214-02
(4) G02332 Ferrule - P05-292 (Optional)
(5) G02335 Cable - Safety - P05-291 (Optional)

C. Parts

AMM		NOMENCLATURE	AIPC		
FIG	ITEM		SUBJECT	FIG	ITEM
401	1	Probe - Oil Temp Thermocouple	73-21-10	05	5
	2	Packing			10
	5	Packing			10
	7	Probe - Oil Temp Thermocouple			6

D. References

(1) AMM 12-13-01/301, Engine - Servicing (Oil Replenishing)
(2) AMM 70-24-05/201, Electrical Harnesses
(3) AMM 71-00-00/501, Power Plant
(4) AMM 71-11-04/201, Fan Cowl Panels
(5) AMM 71-11-06/201, Core Cowl Panels
(6) AMM 78-31-00/201, Thrust Reverser System

E. Access

(1) Location Zones
411 Left Engine
421 Right Engine

(2) Access Panels
413AL Fan Cowl Panel (Left), Left Engine
415AL Thrust Reverser (Left), Left Engine
417AL Core Cowl Panel (Left), Left Engine
423AL Fan Cowl Panel (Left), Right Engine
425AL Thrust Reverser (Left), Right Engine
427AL Core Cowl Panel (Left), Right Engine

F. Procedure (Fig. 401)

S 424-011-N00

(1) ENGINES PRE-PW-SB 73-84;
Install the oil temperature probe:
(a) Remove the protection cap from the opening in the main gearbox.
(b) Lubricate the new packing (2) with petrolatum.
(c) Install the packing (2) to the oil temperature probe (1).
(d) Lubricate the threads of the oil temperature probe (1) with engine oil.
(e) Install the oil temperature probe (1) into the main gearbox housing.
1) Tighten the oil temperature probe (1) to 110-120 pound-inches (12.4-13.6 newton-meters).
2) Safety the oil temperature probe (1) with lockwire or safety cable and safety cable ferrule.
(f) Remove the protection cap from the electrical connector.

CAUTION: USE THE CORRECT ASSEMBLY PROCEDURE, AND TOOLS, FOR THE HARNESS CONNECTOR INSTALLATION (AMM 70-24-05/201). IF YOU USE THE INCORRECT ASSEMBLY PROCEDURE, OR TOOLS, A DAMAGED OR LOOSE CONNECTOR CAN OCCUR. A LOOSE CONNECTOR PERMITS VIBRATION, WHICH CAUSES THE CONTACTS TO WEAR AND DECREASES THE LIGHTNING PROTECTION.

(g) Connect the electrical connector to the oil temperature probe (1) (AMM 70-24-05/201).

S 424-012-N00

(2) ENGINES POST-PW-SB 73-84;
Install the oil temperature probe:
(a) Remove the protection cap from the opening in the main gearbox.
(b) Lubricate the new packing (5) with petrolatum.
(c) Install the packing (5) to the adapter (6).
(d) Install the concave end of the adapter (6) into the main gearbox housing.
1) Tighten the adapter (6) to 95-100 pound-inches (10.7-11.3 newton-meters).
2) Safety the adapter (6) to the main gearbox housing with lockwire or safety cable and safety cable ferrule.
(e) Lubricate the threads of the oil temperature probe (7) with engine oil.
(f) Install the oil temperature probe (7) into the adapter (6) in the main gearbox housing.
(g) Turn the oil temperature probe (7) to align the studs with the W3 wire harness terminals.

NOTE: Do not install the clamp, ground strap, and bolt to the pressure tube for the main gearbox at this time.

(h) Install the W3 wire harness terminals to the studs on the oil temperature probe (7) and loosely install the nuts (3, 9) and washers (4, 8).
(i) Loosely install the clamp, ground strap and bolt to the pressure tube for the main gearbox.

CAUTION: MAKE SURE THE STUD BOX OF THE OIL TEMPERATURE PROBE DOES NOT TURN WHEN THE COUPLING NUT IS TIGHTENED. IF THE STUD BOX TURNS, DAMAGE TO THE W3 WIRE HARNESS CAN OCCUR.

CAUTION: DO NOT ALIGN THE STUD BOX OF THE OIL TEMPERATURE PROBE AFTER THE COUPLING NUT IS TIGHTENED. HOLD THE STUD BOX AND LOOSEN THE COUPLING NUT BEFORE YOU ALIGN THE STUD BOX AGAIN. IF YOU DO NOT DO THIS, DAMAGE TO THE STUD BOX CAN OCCUR.

(j) Hold the stud box aligned with the W3 wire harness and tighten the coupling nut of the oil temperature probe (7) to 95-100 pound-inches (10.7-11.3 newton-meters).

CAUTION: TOO MUCH TORQUE (MORE THAN THE MAXIMUM TORQUE) ON THE NUTS THAT CONNECT THE W3 WIRE HARNESS TO THE OIL TEMPERATURE PROBE, CAN LOOSEN OR DAMAGE THE STUDS OF THE OIL TEMPERATURE PROBE.

(k) Tighten the alumel nuts (3) (larger terminal studs) to 18-22 pound-inches (2.0-2.5 newton-meters).
(l) Tighten the chromel nuts (9) (smaller terminal studs) to 15-18 pound-inches (1.7-2.0 newton-meters).
(m) Safety the coupling nut of the oil temperature probe (7) to the adapter (6) with lockwire or safety cable and safety cable ferrule.
(n) Tighten the bolt, that attaches the clamp and the ground strap to the pressure tube for the main gearbox, to 36-40 pound-inches (4.1-4.5 newton-meters).

G. Return the Aircraft to Its Usual Condition

S 614-013-N00
(1) Fill the oil tank (AMM 12-13-01/301).

S 414-014-N00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT COULD OCCUR.

(2) Close the left thrust reverser (AMM 78-31-00/201).

S 414-015-N00

(3) Close the left core cowl panel (AMM 71-11-06/201).

S 444-016-N00

(4) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

S 414-017-N00

(5) Close the left fan cowl panel (AMM 71-11-04/201).

S 714-018-N00

(6) Do the test for the EEC oil temperature thermocouple probe which is shown in the Power Plant Test Reference Table (AMM 71-00-00/501).

THRUST LEVER ANGLE (TLA) RESOLVER - REMOVAL/INSTALLATION

1. General
   A. The two thrust lever angle (TLA) resolvers, one for the left engine and one for the right engine, are found below the pilot's control stand. You can get access to the TLA resolvers through the forward equipment bay. You must adjust the TLA resolver after the removal/installation.

   TASK 73-21-11-004-001-N00

2. Remove the Thrust Lever Angle (TLA) Resolver
   A. References
      (1) AMM 06-41-00/201, Fuselage Access Doors and Panels
      (2) AMM 73-21-11/501, Thrust Lever Angle (TLA) Resolver
   B. Access
      (1) Location Zones
          113 Area Forward of the NLG Wheel Well

      (2) Access Panels
          113AL Forward Equipment Bay Access Door

   C. Prepare to Remove the Thrust Lever Angle (TLA) Resolver

      S 864-002-N00
      (1) Make sure the thrust levers are in the idle position.
          (a) Attach the DO-NOT-OPERATE tag.

      S 864-003-N00
      (2) Make sure the reverse thrust levers are in the stow position.
          (a) Attach the DO-NOT-OPERATE tag.

      S 864-004-N00
      (3) Open these circuit breakers on the overhead circuit breaker panel, P11, and attach the DO-NOT-CLOSE tags:
          (a) 11F14, TMC AC
          (b) 11F16, TMC SERVO

      S 864-005-N00
      (4) For the left engine, open this circuit breaker on the APU external power panel, P34, and attach the DO-NOT-CLOSE tag:
          (a) 34P2, EEC GRD TEST - L ENG

      S 864-006-N00
      (5) For the right engine, open this circuit breaker on the APU external power panel, P34, and attach the DO-NOT-CLOSE tag:
          (a) 34P3, EEC GRD TEST - R ENG

      S 014-007-N00
      (6) Open the access door for the forward equipment bay, 113AL (AMM 06-41-00/201).

D. Remove the TLA Resolver (Fig. 401)

S 034-008-N00
(1) Disconnect the electrical connectors (two for each TLA resolver).

S 034-009-N00
(2) Loosen the bolts (5) to let the clamp assembly (6) turn.

S 034-010-N00
(3) Loosen the nuts (4) to let the TLA resolver (1) turn.

S 024-011-N00
(4) Move the TLA resolver (1) outboard to remove it from the resolver body clamp (7).

TASK 73-21-11-404-012-N00

3. Install the Thrust Lever Angle (TLA) Resolver

A. Parts

AMM		NOMENCLATURE	AIPC		
FIG	ITEM		SUBJECT	FIG	ITEM
401	1	Resolver	22-32-01	02	600 605

B. References
(1) AMM 06-41-00/201, Fuselage Access Doors and Panels
(2) AMM 73-21-11/501, Thrust Lever Angle (TLA) Resolver

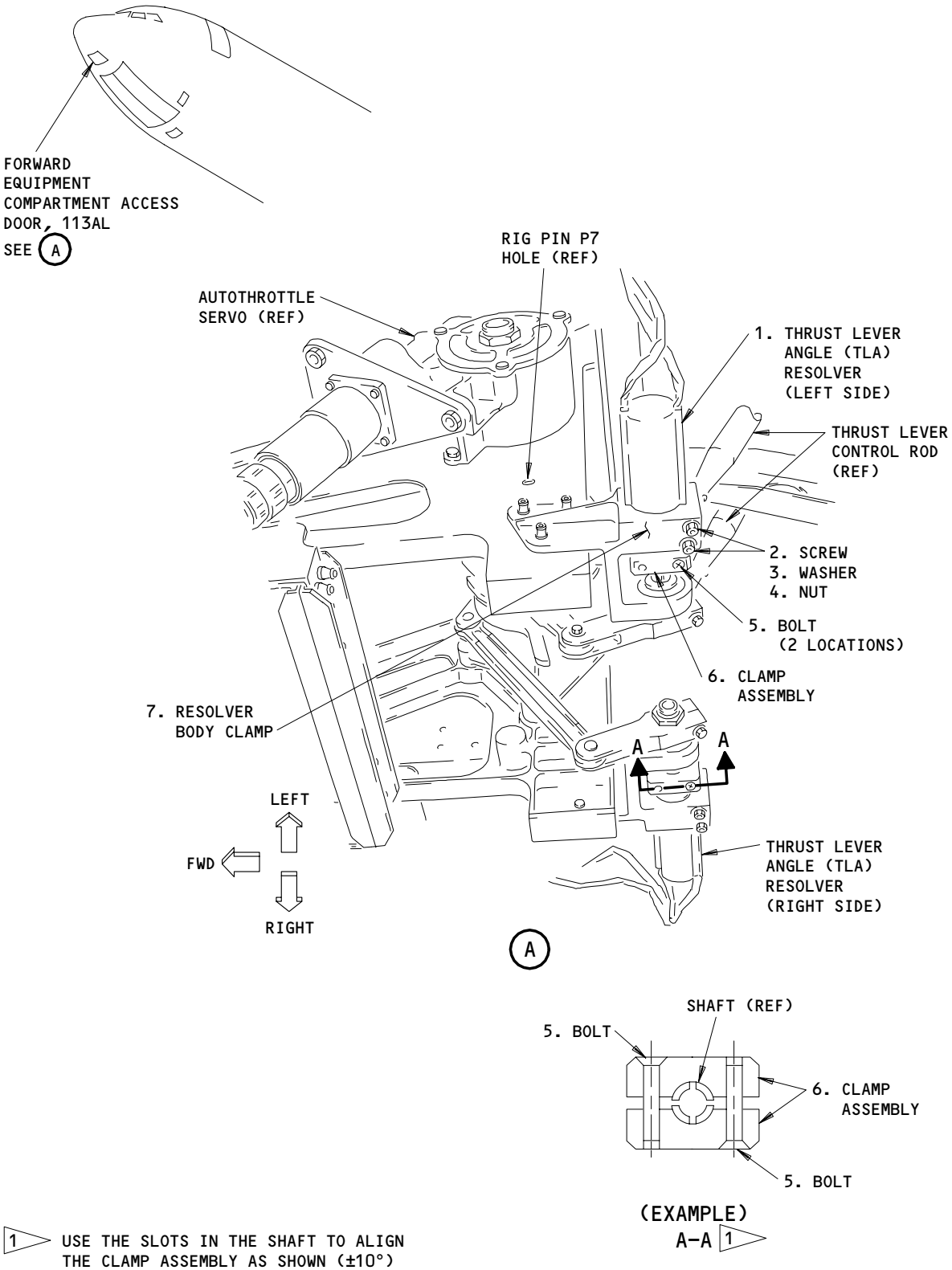
C. Access
(1) Location Zones
113 Area Forward of the NLG Wheel Well

(2) Access Panels
113AL Forward Equipment Bay Access Door

D. Install the TLA Resolver (Fig. 401)

S 424-013-N00
(1) Move the TLA resolver (1) into the resolver body clamp (7) and the clamp assembly (6).

S 824-014-N00
(2) Align the clamp assembly (6) with the slots in the shaft as shown on Fig. 401.



Thrust Lever Angle (TLA) Resolver Installation
Figure 401

S 434-015-N00
(3) Tighten the clamp assembly (6) with the bolts (5).

S 434-016-N00
(4) Tighten the resolver body clamp (7) with the screws (2), washers (3) and nuts (4).

S 434-017-N00
(5) Connect the electrical connectors (two for each TLA resolver).

E. Put the Airplane Back to Its Usual Condition

S 414-018-N00
(1) Close the access door for the forward equipment bay, 113AL (AMM 06-41-00/201).

S 864-019-N00
(2) For the right engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P34 panel:
(a) 34P3, EEC GRD TEST - R ENG

S 864-020-N00
(3) For the left engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P34 panel:
(a) 34P2, EEC GRD TEST - L ENG

S 864-021-N00
(4) Remove the DO-NOT-CLOSE tags and close this circuit breaker on the P11 panel:
(a) 11F14, TMC AC
(b) 11F16, TMC SERVO

S 864-023-N00
(5) Remove the DO-NOT-OPERATE tags from the thrust levers.

S 824-022-N00
(6) Adjust the TLA resolver (AMM 73-21-11/501).

THRUST LEVER ANGLE (TLA) RESOLVER - ADJUSTMENT/TEST

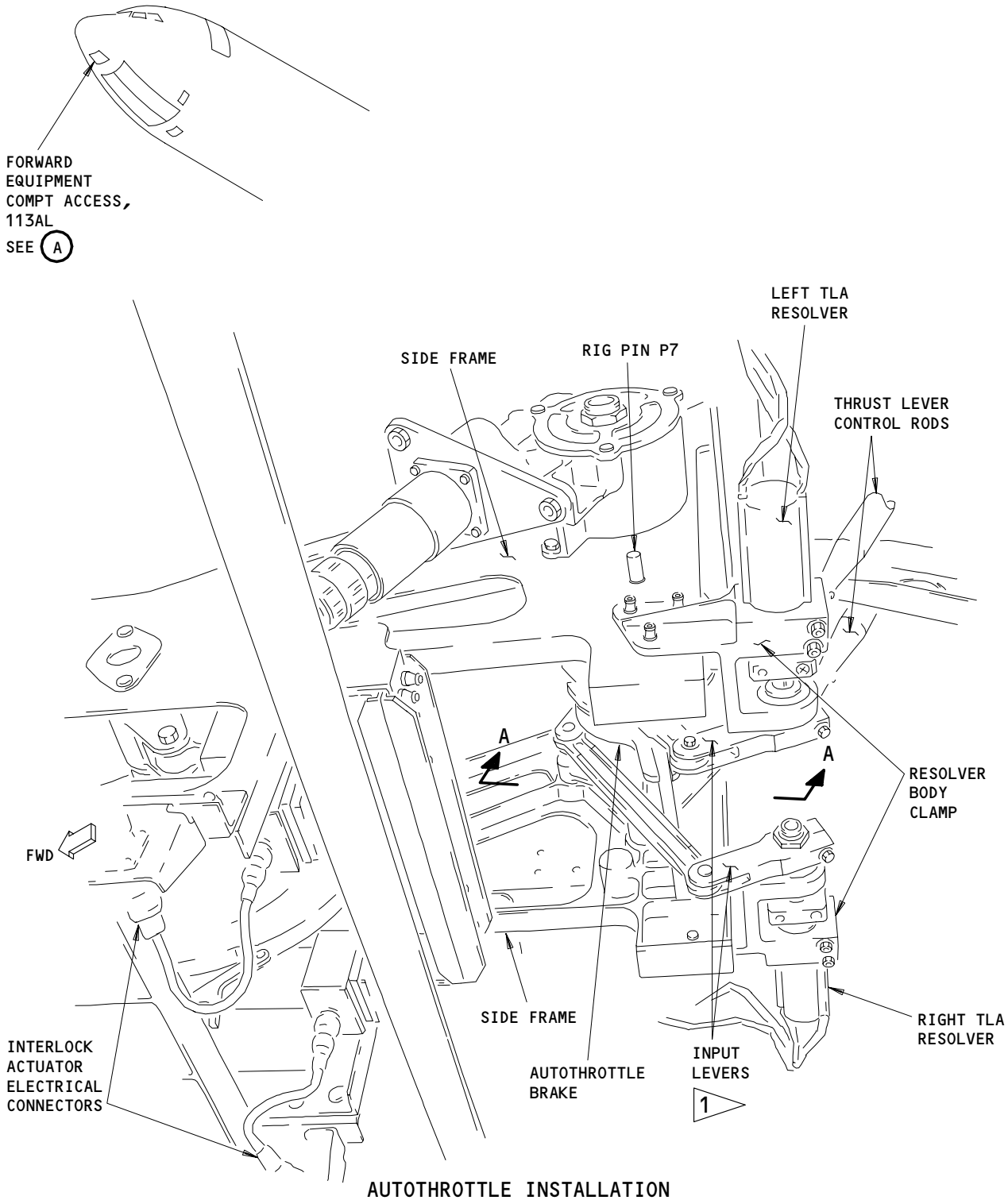
1. General
   A. This procedure supplies two Thrust Lever Angle (TLA) adjustment procedures as follows:
      (1) TLA adjustment with external test equipment (Recommended Procedure)
      (2) TLA adjustment with no external test equipment (Optional Procedure)
   B. When you close the PERF SOL circuit breakers to change the channels of the EEC, it is possible that the EEC will not change channels because of a defect. The EEC uses a list of defects which control the EEC's function to make a decision to change channels or not. If there is a more important defect of the EEC, the EEC will not change channels. The defects are in the list that follows, with the most important defect first:

      (1) The EEC cannot control the fuel valve, which includes the two TRA's
      (2) The EEC cannot control the stator vane actuator
      (3) The EEC cannot make sure there is a correct data entry modifier
      (4) The EEC cannot control the 2.5 bleed valve actuator
      (5) The EEC cannot control the start bleed
      (6) The EEC cannot control the tandem/surge bleed
      (7) The EEC cannot control the air/oil cooler valve
      (8) The EEC cannot control the bypass valve solenoid for the fuel/oil cooler
      (9) The 28 volts for the performance power is out for more than 10 seconds
      (10) The EEC cannot control the TCC air valve
      (11) The EEC cannot lower the temperature of the engine oil.
      (12) The EEC cannot control in EPR mode
      (13) The EEC cannot control the function to change channels each time the power is supplied to the EEC.

   TASK 73-21-11-825-002-N00

2. Adjustment - Thrust Lever Angle (TLA) Resolvers (Fig. 501 and 502)
   A. Equipment

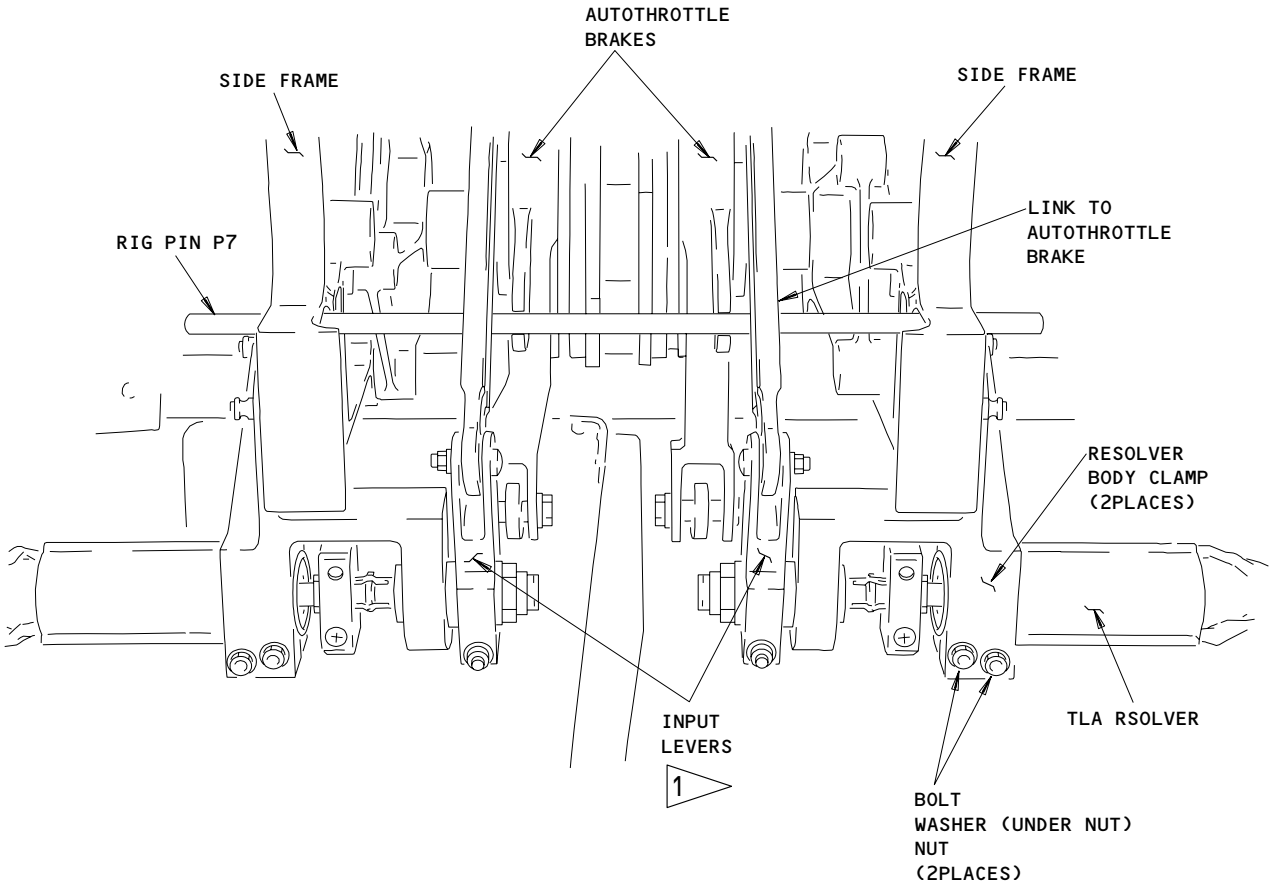
      (1) Rig Pin P7 - P/N A20004-23,
      part of set A20004-XX (AMM 20-10-24/201)
      (2) The equipment that follows is the external test equipment:
         (a) Sinewave Oscillator - Hewlett Packard
         Model 200CD, 204B, 3325B (recommended),
         Wavetek, Model 188 (recommended), or
         equivalent
         (b) Breakout Box - A27063-2 Position
         Sensors, Flight Control Rigging
         (c) Digital Multimeter - Commercially Available
         (d) Frequency Counter - Commercially Available



AUTOTHROTTLE INSTALLATION

(A)

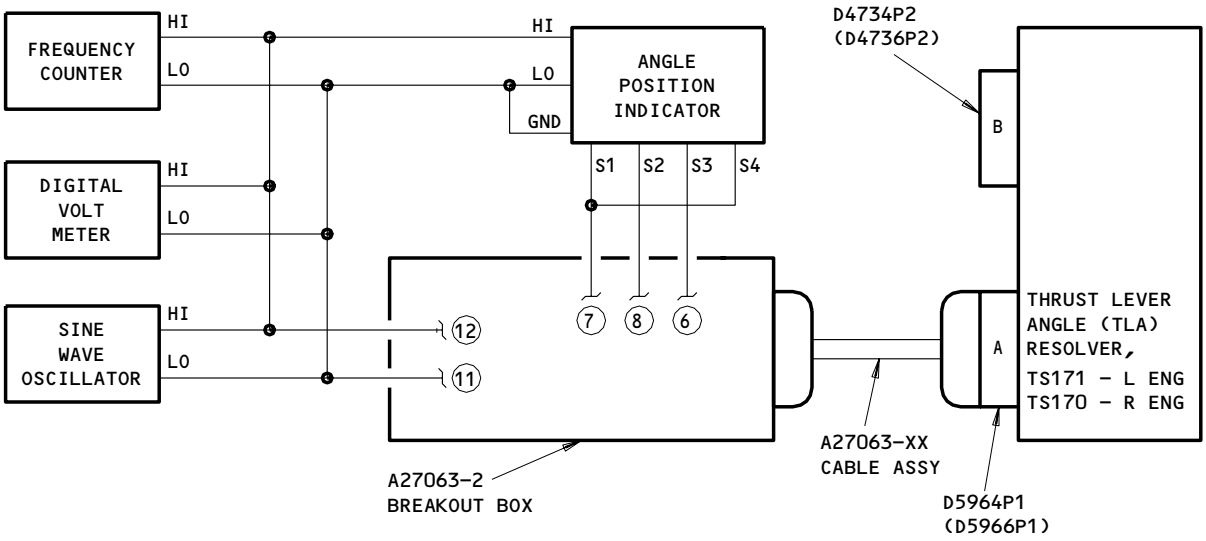
Thrust Lever Angle (TLA) Resolver Adjustment
Figure 501 (Sheet 1)



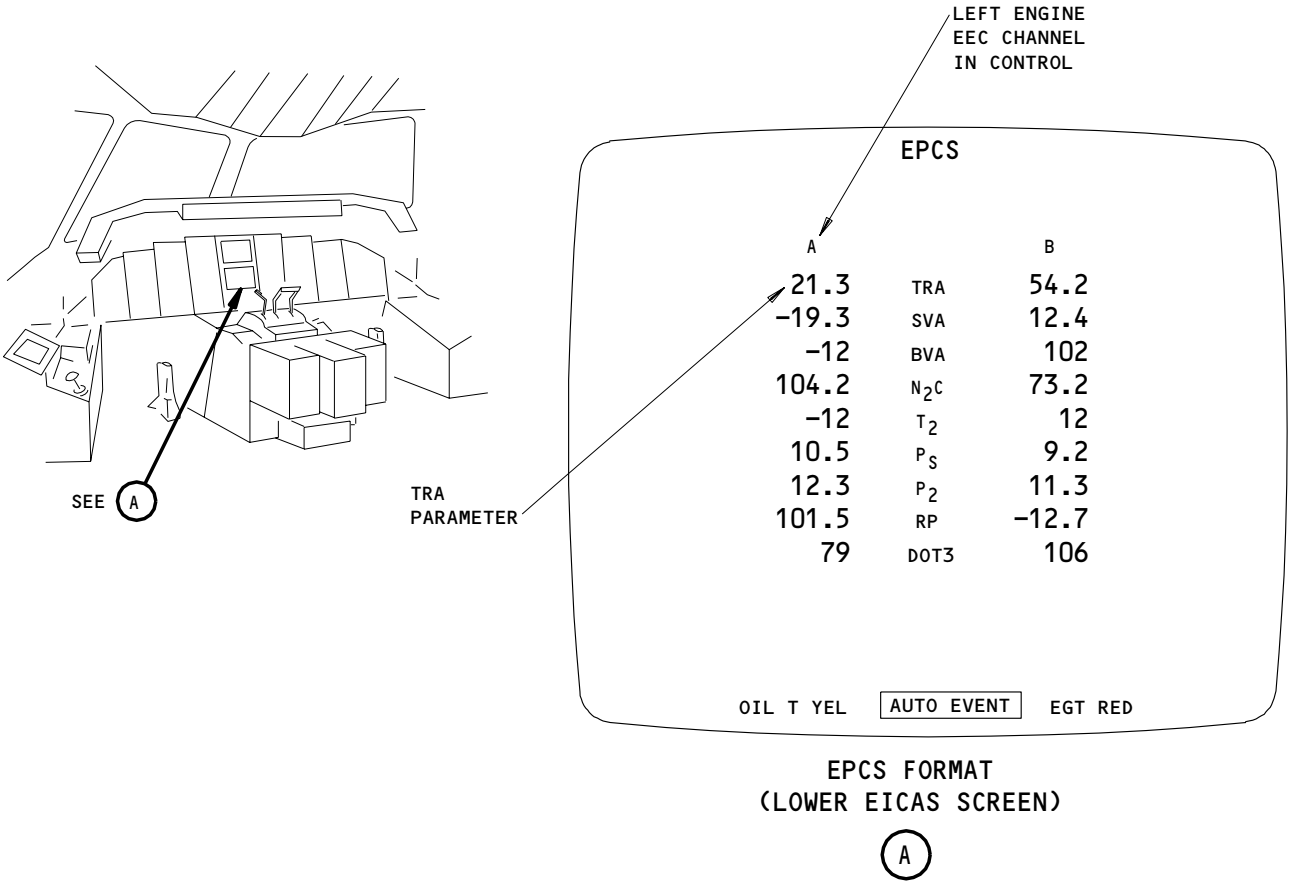
A-A

1 SUSPEND 10 POUND WEIGHT FROM INPUT LEVER TO REMOVE BACKLASH

Thrust Lever Angle (TLA) Resolver Adjustment
Figure 501 (Sheet 2)



EXTERNAL EQUIPMENT METHOD



EPCS FORMAT
(LOWER EICAS SCREEN)

A

ONBOARD AIRPLANE EQUIPMENT METHOD

Thrust Lever Angle (TLA) Resolver Adjustment Methods
Figure 502

(e) Angle Position Indicator (API) -
North Atlantic Model 8810-09-12-S3128
(f) Power Source - 28 volts dc

B. References
(1) AMM 20-10-24/201, Rig Pins
(2) AMM 24-22-00/201, Electrical Power - Control
(3) AMM 27-61-00/201, Spoiler/Speedbrake Control System
(4) AMM 78-31-00/201, Thrust Reverser System
(5) AMM 78-31-00/501, Thrust Reverser System

C. Access
(1) Location Zones
113 Area Forward of NLG Wheel Well
114 Area Forward of NLG Wheel Well

(2) Access Panels
113AL Forward Equipment Bay

D. Prepare For Adjustment

S 015-010-N00
(1) Open the forward equipment bay access door.

S 865-003-N00
(2) Open these circuit breakers and attach the DO-NOT-CLOSE identifiers:
(a) P11 Overhead Panel
1) 11C35, L ENG T/L INTERLOCK
2) 11C36, R ENG T/L INTERLOCK ALTN
3) 11D04, L ENG T/R CONT
4) 11D33, R ENG T/R CONT ALTN
5) 11F14, TMC AC
6) 11F16, TMC SERVO
7) 11L29, R ENG T/L INTERLOCK
8) 11L33, R ENG T/R CONT
(b) P34 APU External Power Panel
1) 34L1, ENG IDLE CONT
2) 34P2, EEC GRD TEST - L ENGINE

3) 34P3, EEC GRD TEST - R ENGINE

S 045-074-N00

WARNING: THE SPOILERS SHOULD BE DEACTIVATED. THE SPOILERS CAN RETRACT AND INJURE THE PEOPLE OR DAMAGE THE EQUIPMENT.

(3) Deactivate the spoilers (AMM 27-61-00/201).

S 845-059-N00

(4) Move both of the forward thrust levers to the idle position.
   (a) Keep both of the forward thrust levers in the idle position for a few seconds.
   (b) Slowly release both of the forward thrust levers.

S 825-060-N00

(5) Adjust the rod assemblies so that the rig pin P7 can be inserted through the autothrottle side frames and the autothrottle brakes.

S 835-060-N00

(6) Insert the rig pin P7 through the autothrottle side frames and the autothrottle brakes.

S 845-002-N00

(7) Apply the electrical power to the airplane (AMM 24-22-00/201).

E. Adjust The Thrust Lever Angle (TLA) Resolvers With The External Test Equipment

S 825-015-N00

(1) Adjust the resolvers as follows:
   (a) Disconnect the connector D5964P1 from the Channel A of the left resolver (TS171).
   (b) Connect the external test equipment components to each other.
   (c) Connect the external test equipment to the Channel A of the left resolver.
   (d) Set the output voltage and the output frequency for the oscillator as follows:
      1) Output Voltage = 6.00 +/- 1.00% VRMS
      2) Output Frequency = 2.95 +/- 1.00% KHZ
   (e) Loosen the clamp around the left resolver until it can be rotated.

(f) Rotate the left resolver until the angle position indicator (API) displays an angle of 56.10 +/- 0.167 degrees.
(g) Tighten the clamp around the left resolver.
(h) Make sure that the API displays 56.10 +/- 0.167 degrees.
    1) Record the value displayed on the API for the LEFT ENGINE CHANNEL A _____.
(i) Disconnect the external test equipment from the Channel A of the left resolver.
(j) Connect the connector D5964P1 to the Channel A of the left resolver.
(k) Disconnect the connector D5966P1 from the Channel A of the right resolver (TS170).
(l) Connect the external test equipment to the Channel A of the right resolver.
(m) Loosen the clamp around the right resolver until it can be rotated.
(n) Rotate the right resolver until the API displays 33.90 +/- 0.167 degrees.
(o) Tighten the clamp around the right resolver.
(p) Make sure that the API displays 33.90 +/- 0.167 degrees.
    1) Record the value displayed on the API for the RIGHT ENGINE CHANNEL A _____.
(q) Disconnect the external test equipment from the Channel A of the right resolver.
(r) Connect the connector D5966P1 to the Channel A of the right resolver.
(s) Subtract the value for the LEFT ENGINE CHANNEL A from the value of 90 degrees.
(t) Subtract the value obtained above from the value for the RIGHT ENGINE CHANNEL A.
(u) Make sure that the absolute value of the result is less than the value of 0.30 degrees.
(v) Disconnect the connector D4734P2 from the Channel B of the left resolver.
(w) Connect the external test equipment to the Channel B of the left resolver.
    1) Record the value displayed on the API for the LEFT ENGINE CHANNEL B _____.

(x) Disconnect the external test equipment from the Channel B of the left resolver.
(y) Connect the connector D4734P2 to the Channel B of the left resolver.
(z) Disconnect the connector D4736P2 from the Channel B of the right resolver.
(aa) Connect the external test equipment to the Channel B of the right resolver.
    1) Record the value displayed on the API for the RIGHT ENGINE CHANNEL B _____.
(ab) Disconnect the external test equipment from the Channel B of the right resolver.
(ac) Connect the connector D4736P2 to the Channel B of the right resolver.
(ad) Subtract the value of the LEFT ENGINE CHANNEL A from the value of the LEFT ENGINE CHANNEL B.
(ae) Make sure that the absolute value of the result is not greater than the value of 0.25 degrees.
(af) Subtract the value of the RIGHT ENGINE CHANNEL A from the value of the RIGHT ENGINE CHANNEL B.
(ag) Make sure that the absolute value of the result is not greater than the value of 0.25 degrees.
(ah) Disconnect the connector D5964P1 from the Channel A of the left resolver.
(ai) Connect the external test equipment to the Channel A of the left resolver.
(aj) Remove the rig pin P7 from the autothrottle side frames and the autothrottle brakes.
(ak) Move both of the forward thrust levers to the full power position.
(al) Make sure that the API displays a value that is greater than the value of 3.5 degrees and less than the value of 6.5 degrees.
(am) Disconnect the external test equipment from the Channel A of the left resolver.
(an) Connect the connector D5964P1 to the Channel A of the left resolver.
(ao) Disconnect the connector D5966P1 from the Channel A of the right resolver.
(ap) Connect the external test equipment to the Channel A of the right resolver.
(aq) Make sure that both of the forward thrust levers are in the full power position.
(ar) Make sure that the API displays a value that is greater than the value of 83.5 degrees and is less than the value of 86.5 degrees.
(as) Disconnect the connector D11830 from the left thrust lever interlock actuator.

(at) Ground the pin 6 and the pin 10 of the the connector D11830.
(au) Apply 28 VDC to the pin 8 of the connector D11830.
(av) Disconnect the connector D11832 from the right thrust lever interlock actuator.
(aw) Ground the pin 6 and the pin 10 of the connector D11832.
(ax) Apply 28 VDC to the pin 8 of the connector D11832.
(ay) Move both of the reverse thrust levers to the full power position.
(az) Remove the 28 VDC from the pin 8 of the connector D11830.
(ba) Remove the ground from the pin 6 and the pin 10 of the connector D11830.
(bb) Remove the 28 VDC from the pin 8 of the connector D11832.
(bc) Remove the ground from the pin 6 and the pin 10 of the connector D11832.
(bd) Make sure that the API displays a value that is greater than the value of 3.5 degrees and is less than the value of 6.5 degrees.
(be) Disconnect the external test equipment from the Channel A of the right resolver.
(bf) Connect the connector D5966P1 to the Channel A of the right resolver.
(bg) Disconnect the connector D5964P1 from the Channel A of the left resolver.
(bh) Connect the external test equipment to the Channel A of the left resolver.
(bi) Make sure that both of the reverse thrust levers are in the full power position.
(bj) Make sure that the API displays a value that is greater than the value of 82.0 degrees and is less than the value of 86.5 degrees.
(bk) Disconnect the external test equipment from the Channel A of the left resolver.
(bl) Connect the connector D5964P1 to the Channel A of the left resolver.

S 845-067-N00

(2) Move both of the reverse thrust levers to the stowed position.

S 845-068-N00
(3) Ground the pin 8 and the pin 10 of the connector D11830.

S 845-069-N00
(4) Apply 28 VDC to the pin 6 of the connector D11830 to retract the thrust lever interlock actuator.

S 845-077-N00
(5) Remove the 28 VDC from the pin 6 of the connector D11830.

S 845-070-N00
(6) Remove the ground from the pin 8 and the pin 10 of the connector D11830.

S 435-003-N00
(7) Connect the connector D11830 to the left thrust lever interlock actuator.

S 845-076-N00
(8) Ground the pin 8 and the pin 10 of the connector D11832.

S 845-073-N00
(9) Apply 28 VDC to the pin 6 of the connector D11832 to retract the thrust lever interlock actuator.

S 845-071-N00
(10) Remove the 28 VDC from the pin 6 of the connector D11832.

S 845-072-N00
(11) Remove the ground from the pin 8 and the pin 10 of the connector D11832.

S 435-072-N00
(12) Connect the connector D11832 to the right thrust lever interlock actuator.

S 085-068-N00
(13) Remove the external test equipment from the airplane.

F. Adjust The Thrust Lever Angle (TLA) Resolvers With No External Test Equipment

S 865-027-N00
(1) Make sure that the 6 EICAS circuit breakers are closed.

S 865-028-N00
(2) Push the EPCS button on the EICAS MAINT panel on the right side panel, P61.

S 865-029-N00
(3) Move the EEC MAINT L(R) ENG POWER switch on the right side panel P61 to the TEST position.

S 825-030-N00
(4) Adjust the TLA resolver as follows:
(a) Loosen the left (right) resolver body clamp screws until the TLA resolver can be turned.
(b) Turn the left (right) TLA resolver until the EICAS EPCS page shows a TRA angular value in the range that follows:

NOTE: If you turn the TLA resolver outside of its normal range, the TLA data on EICAS will be blank.

1) Left engine: 33.7-34.1 degrees
2) Right engine: 33.7-34.1 degrees
(c) Tighten the left (right) TLA resolver body clamp screws.
(d) Make sure that the EICAS EPCS page still shows a TRA angular value in the range of the above step.
(e) Write the TRA angular values from the EICAS EPCS page for the left (_____ degrees) and (_____ degrees) right engine.
(f) Write the channel of the EEC that is in control for the left engine (channel ____) and right engine (channel ____).

S 865-031-N00
(5) If channel A is in control, change to channel B as follows:
(a) For the left engine, open this circuit breaker on the overhead panel P11 and attach DO-NOT-CLOSE identifiers:
1) 11L3, LEFT ENGINE PERF SOL CHAN A
(b) For the right engine, open this circuit breaker on the overhead panel P11 and attach DO-NOT-CLOSE identifier:
1) 11L30, RIGHT ENGINE PERF SOL CHAN A

S 865-032-N00
(6) If channel B is in control, change to channel A as follows:
(a) For the left engine, open the circuit breaker on the overhead panel P11 and attach DO-NOT-CLOSE identifier:
1) 11L4, LEFT ENGINE PERF SOL CHAN B
(b) For the right engine, open this circuit breaker on the overhead panel P11 and attach DO-NOT-CLOSE identifier:
1) 11L31, RIGHT ENGINE PERF SOL CHAN B

S 865-033-N00
(7) Make sure that the left (right) EEC channel in control has changed.

NOTE: If the EEC does not change channels, the EEC could have a more important defect which will not let the EEC change channels. A list of the items which control the EEC's function is included in this procedure. The performance power is the ninth most important defect.

S 825-034-N00
(8) Make sure that the EICAS EPCS page shows a TRA angular value that is near (± 0.3 degrees) the value written in the above step.

S 085-035-N00
(9) To remove the rig pin, do the steps that follow:
(a) Remove the rig pin P7.

S 825-036-N00
(10) Examine the TLA resolver adjustment with the thrust levers in the full forward position as follows:
(a) Move the left (right) forward thrust levers from idle to the full forward thrust position.
(b) Make sure that the EICAS EPCS page shows a TRA angular value that is in the range that follows:
1) Left engine: between 82.5 and 87.5 degrees
2) Right engine: between 82.5 and 87.5 degrees

S 825-037-N00
(11) Examine the TLA resolver adjustment with the reverse thrust levers in the full reverse thrust position as follows:
(a) Extend the left (right) thrust lever interlock actuator as follows:
1) Disconnect the left (right) interlock actuator electrical connector.
2) Supply 28v dc to the left (right) interlock actuator electrical connector pin 8 (pin 10 gnd).

(b) Move the left (right) forward thrust levers to the idle position.
(c) Move the left (right) reverse thrust levers from forward idle to the full reverse thrust position.
(d) Make sure that the TRA angular value is in the range that follows:
1) Left engine: between 3.0 and 8.0 degrees
2) Right engine: between 3.0 and 8.0 degrees

S 865-038-N00

(12) Return the reverse thrust levers to the idle position and retract the thrust lever interlock actuator as follows:
(a) Move the left (right) reverse thrust levers to the forward idle position.
(b) Retract the left (right) thrust lever interlock actuator as follows:
1) Supply 28v dc to the left (right) interlock actuator electrical connector pin 6 (pin 10 gnd).
2) Connect the left (right) interlock actuator electrical connector.

S 865-039-N00

(13) Move the EEC MAINT L(R) ENG POWER switch on the right side panel P61 to the NORM position.

S 865-040-N00

(14) Push the EPCS button on the EICAS MAINT panel on the right side panel, P61.

S 865-041-N00

(15) For the left engine, remove DO-NOT-CLOSE identifiers and close these circuit breakers on the overhead panel P11:
(a) 11L3, LEFT ENGINE PERF SOL CHAN A
(b) 11L4, LEFT ENGINE PERF SOL CHAN B

S 865-042-N00

(16) For the right engine, remove DO-NOT-CLOSE identifiers and close these circuit breakers on the overhead panel P11:
(a) 11L30, RIGHT ENGINE PERF SOL CHAN A
(b) 11L31, RIGHT ENGINE PERF SOL CHAN B

G. Restore The Airplane To The Normal Condition

S 845-075-N00

(1) Remove the DO-NOT-CLOSE identifiers and close these circuit breakers:
(a) P11 Overhead Panel
1) 11C35, L ENG T/L INTERLOCK

2) 11C36, R ENG T/L INTERLOCK ALTN
3) 11D04, L ENG T/R CONT
4) 11D33, R ENG T/R CONT ALTN
5) 11F14, TMC AC
6) 11F16, TMC SERVO
7) 11L29, R ENG T/L INTERLOCK
8) 11L33, R ENG T/R CONT

(b) P34 APU External Power Panel
1) 34L1, ENG IDLE CONT
2) 34P2, EEC GRD TEST - L ENGINE
3) 34P3, EEC GRD TEST - R ENGINE

S 445-071-N00
(2) Activate the spoilers (AMM 27-61-00/201).

S 715-073-N00
(3) Do an operational test of the thrust reverser system (AMM 78-31-00/501).

S 845-000-N00
(4) Remove the electrical power if it is no longer required (AMM 24-22-00/201).

S 415-072-N00
(5) Close the forward equipment bay access door.

EEC DISCRETE PRINTED CIRCUIT CARD - REMOVAL/INSTALLATION

1. General
   A. This procedure has two tasks. The first task removes the printed circuit card for the EEC discrete. The second task install the printed circuit card.
   B. The printed circuit cards are found in the electrical systems cardfile, P50 panel, in the main equipment center.

TASK 73-21-12-004-001-N00

2. Remove the EEC Discrete Printed Circuit Card
   A. References
      (1) AMM 06-41-00/201, Fuselage Access Doors and Panels
      (2) AMM 20-10-01/401, E/E Rack Mounted Components
      (3) AMM 20-41-01/201, Electrostatic Discharge Sensitive Devices
   B. Access
      (1) Location Zones
          119 Main Equipment Center

      (2) Access Panels
          119AL Main Equipment Center Access Door

   C. Prepare to Remove the Printed Circuit Card

      S 864-002-N00
      (1) For the left engine, open this circuit breaker on the overhead circuit breaker panel, P11, and attach the DO-NOT-CLOSE tag:
          (a) 11D17, LEFT ENGINE EEC DISCRETES

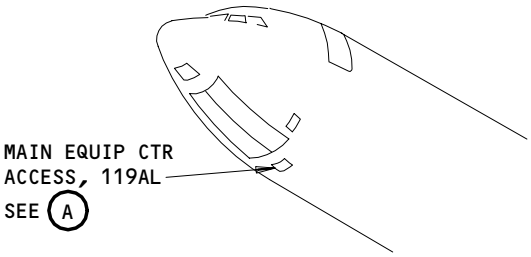
      S 864-003-N00
      (2) For the right engine, open this circuit breaker on the overhead circuit breaker panel, P11, and attach the DO-NOT-CLOSE tag:
          (a) 11M32, RIGHT ENGINE EEC DISCRETES

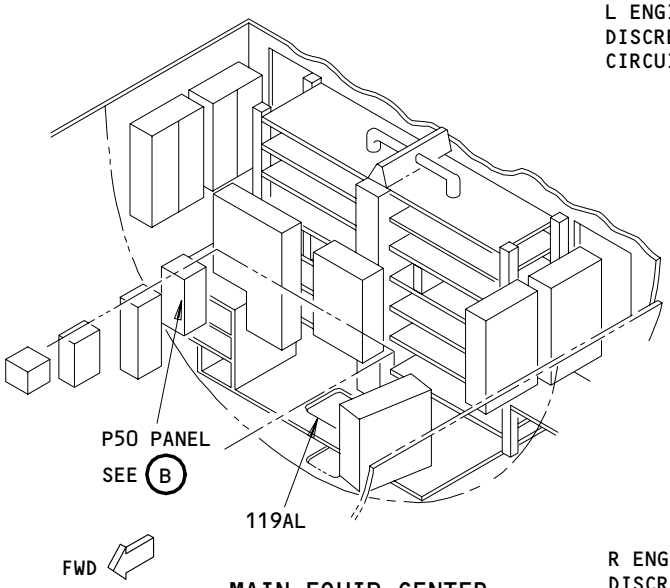
      S 014-004-N00
      (3) Go into the main equipment center through the access hatch (AMM 06-41-00/201).

      S 024-005-N00

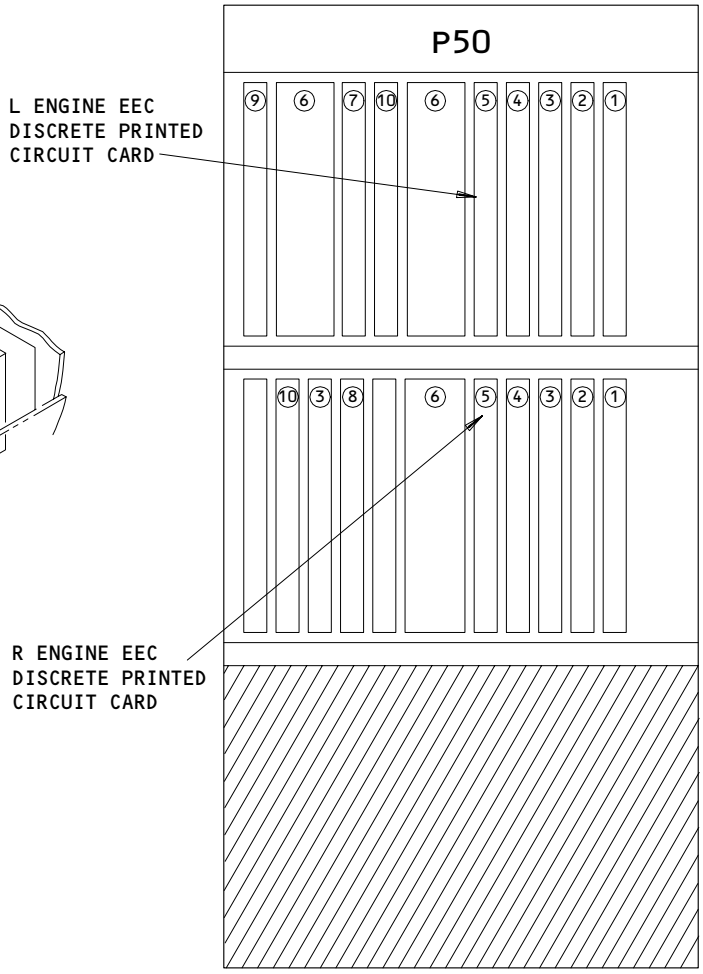
      CAUTION: DO NOT REMOVE THE PRINTED CIRCUIT CARD UNTIL YOU READ THE PROCEDURE ON HOW TO TOUCH THE ELECTROSTATIC DISCHARGE SENSITIVE DEVICES (AMM 20-41-01/201). IF YOU DO NOT OBEY THESE INSTRUCTIONS, YOU CAN CAUSE DAMAGE TO THE PRINTED CIRCUIT CARD.

      (4) Remove the printed circuit card from the electrical systems cardfile, P50 panel (AMM 20-10-01/401).





MAIN EQUIP CENTER
A



B

EEC Discrete Printed Circuit Card Installation
Figure 401

TASK 73-21-12-404-006-N00

3. Install the EEC Discrete Printed Circuit Card

A. References

(1) AMM 20-10-01/401, E/E Rack Mounted Components

B. Access

(1) Location Zones

119 Main Equipment Center

(2) Access Panels

119AL Main Equipment Center Access Door

C. Install the Printed Circuit Card (Fig. 401)

S 424-007-N00

CAUTION: DO NOT REMOVE THE PRINTED CIRCUIT CARD UNTIL YOU READ THE PROCEDURE ON HOW TO TOUCH THE ELECTROSTATIC DISCHARGE SENSITIVE DEVICES (AMM 20-41-01/201). IF YOU DO NOT OBEY THESE INSTRUCTIONS, YOU CAN CAUSE DAMAGE TO THE PRINTED CIRCUIT CARD.

(1) Install the printed circuit card in the electrical systems cardfile, P50 panel (AMM 20-10-01/401).

D. Put the Airplane Back to Its Usual Condition

S 864-008-N00

(1) For the left engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P11 panel:
(a) 11D17, LEFT ENGINE EEC DISCRETES

S 864-009-N00

(2) For the right engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P11 panel:
(a) 11M32, RIGHT ENGINE EEC DISCRETES

EEC THERMOCOUPLE PROBE (TT3) - REMOVAL/INSTALLATION

1. General
   A. This procedure contains the data to remove and install the EEC thermocouple probe (TT3). The EEC thermocouple probe is on the diffuser case at the 2:30 o'clock position (viewed from the rear).

TASK 73-21-14-004-001-N00

2. Remove the EEC Thermocouple (TT3) Probe
   A. References
      (1) AMM 71-11-04/201, Fan Cowl Panels
      (2) AMM 71-11-06/201, Core Cowl Panels
      (3) AMM 78-31-00/201, Thrust Reverser system
   B. Access
      (1) Location Zones
          411 Left Engine
          421 Right Engine

      (2) Access Panels
          414AR Fan Cowl Panel (Right), Left Engine
          416AR Thrust Reverser (Right), Left Engine
          418AR Core Cowl Panel (Right), Left Engine
          424AR Fan Cowl Panel (Right), Right Engine
          426AR Thrust Reverser (Right), Right Engine
          428AR Core Cowl Panel (Right), Right Engine

   C. Prepare to Remove the TT3 Probe

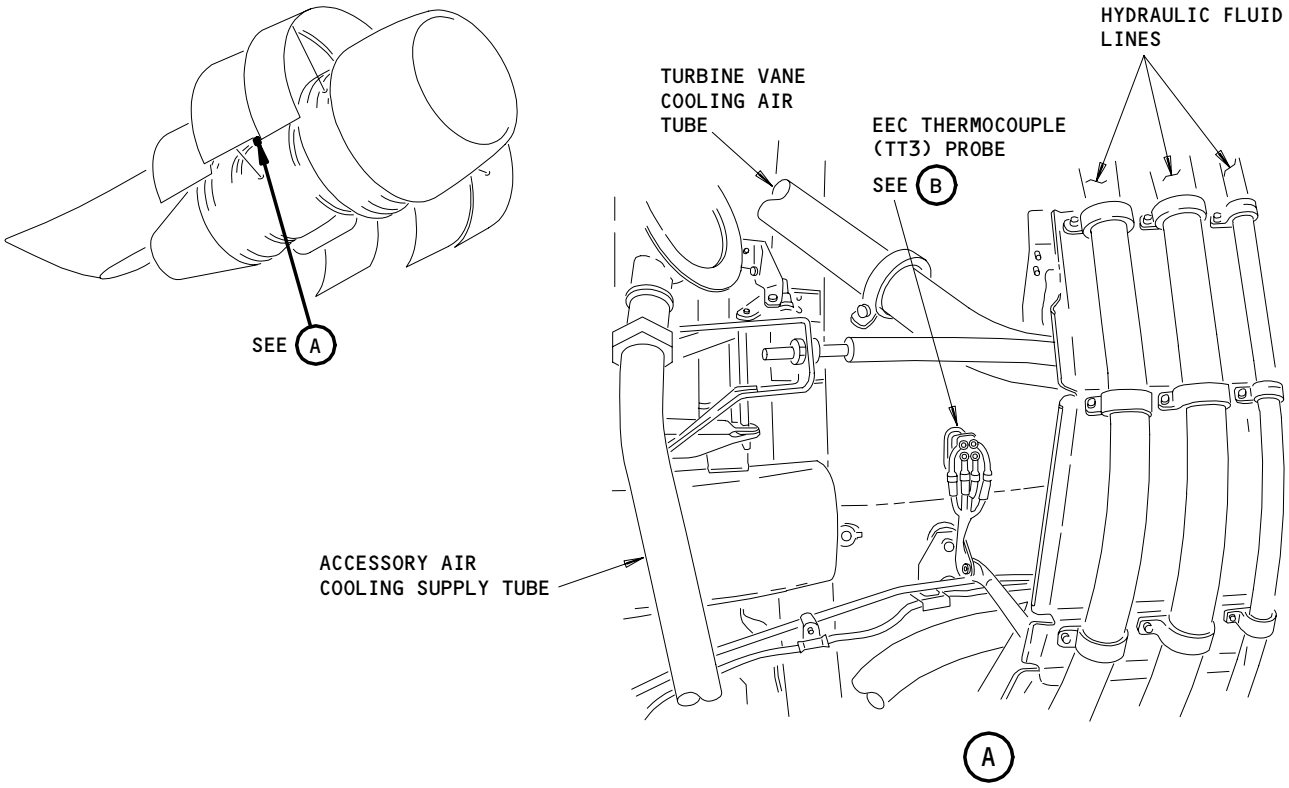
      S 014-002-N00
      (1) Open the right fan cowl panel (AMM 71-11-04/201).

      S 044-003-N00

      WARNING: DO THE THRUST REVERSER DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

      (2) Do this procedure: Thrust Reverser Deactivation for Ground Maintenance (AMM 78-31-00/201).

      S 014-004-N00
      (3) Open the right core cowl panel (AMM 71-11-06/201).



EEC THERMOCOUPLE (TT3) PROBE

B

EEC Thermocouple (TT3) Probe
Figure 401

S 014-005-N00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT COULD OCCUR.

(4) Open the right thrust reverser (AMM 78-31-00/201).

D. Procedure

S 024-029-N00

(1) Remove the TT3 Probe (Fig. 401):
  (a) Remove the nuts and washers that attach the wire harness to the studs on the TT3 probe.
  (b) Remove the wire harness from the studs on the TT3 probe.
  (c) Remove the TT3 probe from the boss on the diffuser/combustor case.

NOTE: Do not remove the lockwire between the coupling nut and the body nut. Also, do not remove the body nut from the TT3 probe when the probe is removed from the engine.

1) Discard the gasket.

  (d) Install a protection cap to the boss on the diffuser/combustor case.

TASK 73-21-14-404-011-N00

3. Install the EEC Thermocouple (TT3) Probe

A. Equipment
(1) M303, M305, or M307 Bergen Mechanical Crimper
Bergen Cable Technologies Inc
170 Gregg St
P.O. Box 1300
Lodi, NJ 07644-9982
(2) PWA 87649 - Angle Gage Pratt & Whitney, Commercial Products Division, 400 Main Street, East Hartford, CT 06108

B. Consumable Materials
(1) D00137 Oil, PWA-521

(2) GO2334 Lockwire - AS3214-02
(3) GO2332 Ferrule - PO5-292 (Optional)
(4) GO2335 Cable - Safety - PO5-291 (Optional)

C. References
(1) AMM 71-00-00/501, Power Plant - General
(2) AMM 71-11-04/201, Fan Cowl Panels
(3) AMM 71-11-06/201, Core Cowl Panels
(4) AMM 78-31-00/201, Thrust Reverser system

D. Access
(1) Location Zones
411 Left Engine
421 Right Engine

(2) Access Panels
414AR Fan Cowl Panel (Right), Left Engine
416AR Thrust Reverser (Right), Left Engine
418AR Core Cowl Panel (Right), Left Engine
424AR Fan Cowl Panel (Right), Right Engine
426AR Thrust Reverser (Right), Right Engine
428AR Core Cowl Panel (Right), Right Engine

E. Procedure

S 424-030-N00
(1) Install the TT3 Probe (Fig. 401):
(a) Remove the protection cap from the boss on the diffuser/combustor case.
(b) Install a new gasket to the TT3 probe.
(c) Lubricate the threads of the TT3 probe with engine oil.
(d) Install the TT3 probe in the diffuser/combuster case boss.
(e) If installed, remove the lockwire or safety cable between the body nut and the coupling nut.
(f) Tighten the body nut to 95-100 pound-inches (10.7-11.3 newton-meters).
(g) Safety the body nut to the diffuser/combuster case with lockwire or safety cable and safety cable ferrule.
(h) Attach the PWA 87649 Angle Gage to the two bolt hole boss on the diffuser/combuster case.
1) Move the gage guide into position.
(i) Turn the TT3 probe until the two larger studs align with the top of engine and hold the TT3 probe in position.
(j) Touch the side of the TT3 probe with the guide to align the TT3 probe for installation of the wire harness.
1) Tighten the hand knob to hold the guide assembly in position.

(k) Tighten the coupling nut to 95-100 pound-inches (10.7-11.3 newton-meters).
(l) Safety the coupling nut to the body nut with lockwire or safety cable and safety cable ferrule.
(m) Remove the PWA 87649 Angle Gage from the diffuser/combuster case.

CAUTION: DO NOT APPLY TOO MUCH TORQUE (MORE THAN MAXIMUM TORQUE) TO THE NUTS ON THE TT3 PROBE STUDS. TOO MUCH TORQUE CAN LOOSEN OR DAMAGE THE TT3 PROBE STUDS.

(n) Connect the terminals of the wire harness to the studs on the TT3 probe with the washers and the nuts.

NOTE: Make sure you connect the alumel terminals to the larger studs and the chromel terminals to the smaller studs.

1) Tighten the nuts on the alumel terminals to 18-22 pound-inches (2.0-2.5 newton-meters).
2) Tighten the nuts on the chromel terminals to 15-18 pound-inches (1.7-2.0 newton-meters).

F. Return the Aircraft to Its Usual Condition

S 414-025-N00
(1) Close the right half of the thrust reverser (AMM 78-31-00/201).

S 414-020-N00
(2) Close the core cowl panel on the right side of the engine (AMM 71-11-06/201).

S 444-021-N00
(3) Do the activation procedure for the thrust reversers (AMM 78-31-00/201).

S 414-022-N00
(4) Close the fan cowl panel on the right side of the engine (AMM 71-11-04/201).

S 714-023-N00
(5) Do the test for the EEC thermocouple probe (TT3) which is shown in the Power-Plant Test-Reference Table (AMM 71-00-00/501).

SUPPLEMENTAL CONTROL UNIT (SCU) - MAINTENANCE PRACTICES

1. General

A. This procedure includes two tasks. The first task gives the instructions for the removal and installation of the supplemental control unit (SCU) from the temporary shipment position on the left side of the fan case to the flight position on the right side of the fan case. The second task gives the instructions for the removal and installation of the SCU from the flight position on the right side of the fan case to the temporary shipment position on the left side of the fan case.

TASK 73-21-15-802-022-N00

2. Remove and Install the Supplemental Control Unit (SCU) from the Storage Position to the Flight Position on the Fan Case

A. Equipment

(1) M303, M305, or M307 Bergen Mechanical Crimper
Bergen Cable Technologies Inc.
170 Gregg St.
P.O. Box 1300
Lodi, NJ 07644-9982

(2) Pliers, soft-jawed - TG-69, Glenair

(3) Wrench, Strap - TG-70, Glenair

B. Consumable Materials

(1) D00137 Engine Oil, PWA 521

(2) G02334 Lockwire, AS3214-02 (P05-289) 0.032 inch (0.813 mm)

(3) G02332 Ferrule, Safety (P05-292) (Optional)

(4) G02335 Cable, Safety (P05-291) (Optional)

(5) Consumable Material

(6) Alcohol, Denatured Ethyl (AMS 3002) (P11-009)

C. References

(1) AMM 71-00-00/501, Power Plant

(2) AMM 71-11-04/201, Fan Cowl Panels

D. Access

(1) Location Zones

411 Left Engine
421 Right Engine

(2) Access Panels

413AL Fan Cowl Panel (Left)
414AR Fan Cowl Panel (Right)
423AL Fan Cowl Panel (Left)
424AR Fan Cowl Panel (Right)

E. Procedure

NOTE: It is necessary to have two persons to do this procedure.

S 012-033-N00

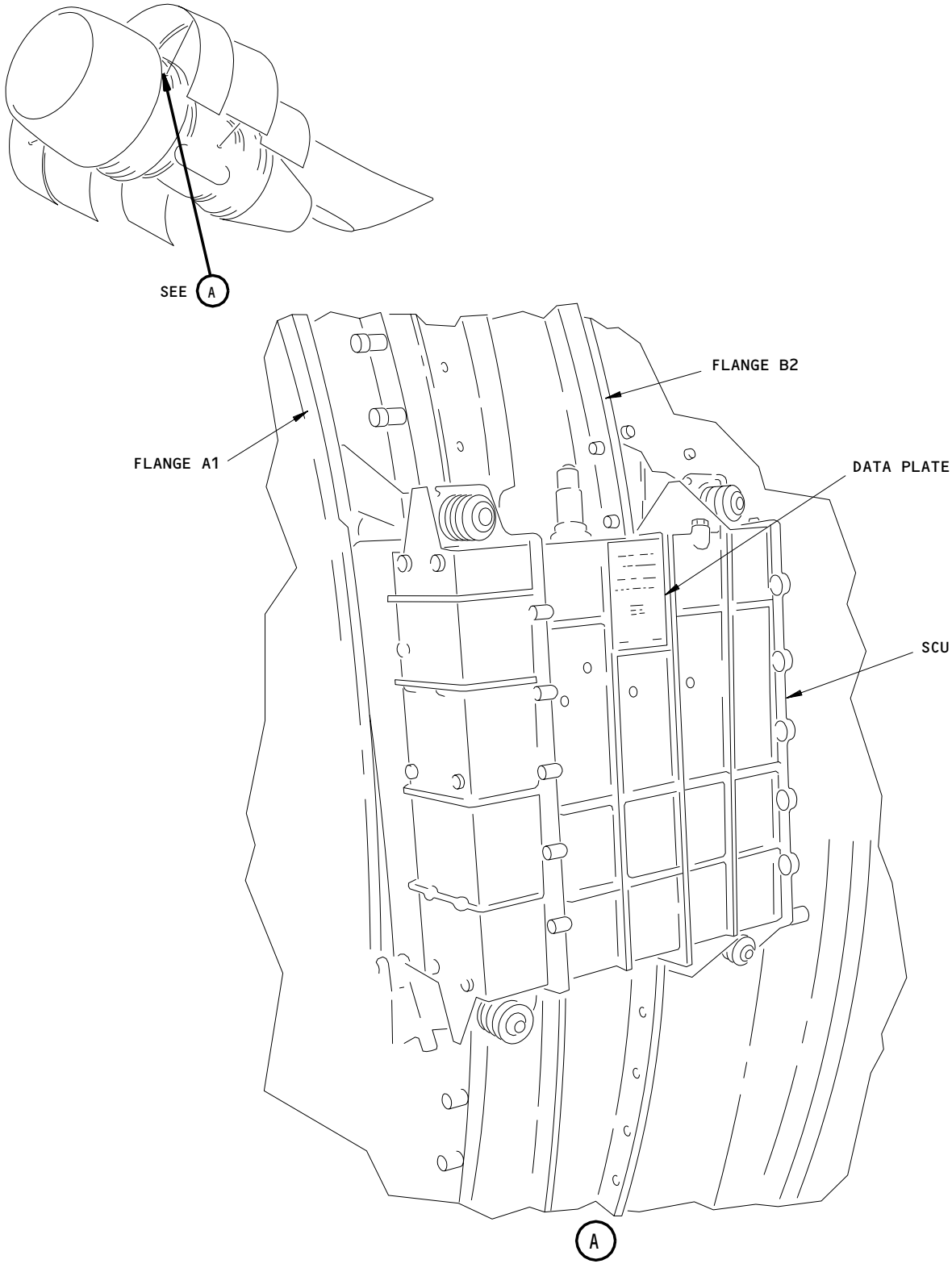
(1) Open the fan cowl panels (AMM 71-11-04/201).

S 022-036-N00

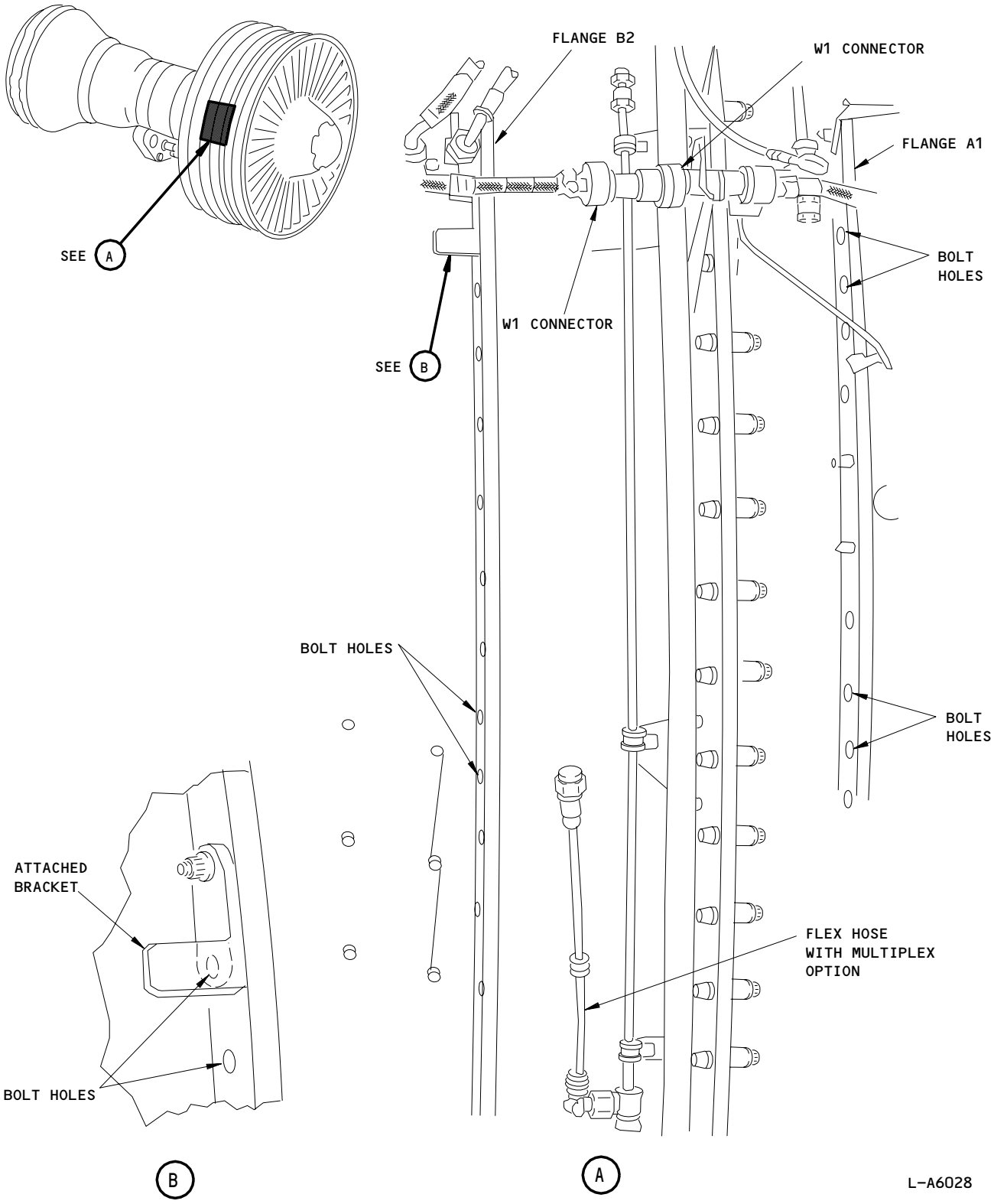
(2) Remove the SCU from the storage position on the left side of the engine:
   (a) Remove the two bolts, washers and nuts from the lower mount bracket for the supplemental control unit (SCU) on Flange A1.
   (b) Remove the two bolts, washers and nuts from the lower mount bracket for the SCU on Flange B2.
   (c) Remove the two bolts, washers and nuts from the upper mount bracket for the SCU on Flange B2.
   (d) Have another person very carefully hold the SCU, and remove the two bolts, washers and nuts from the upper mount bracket on Flange A1.
   (e) Remove the SCU with the mount brackets from the fan case.

S 422-035-N00

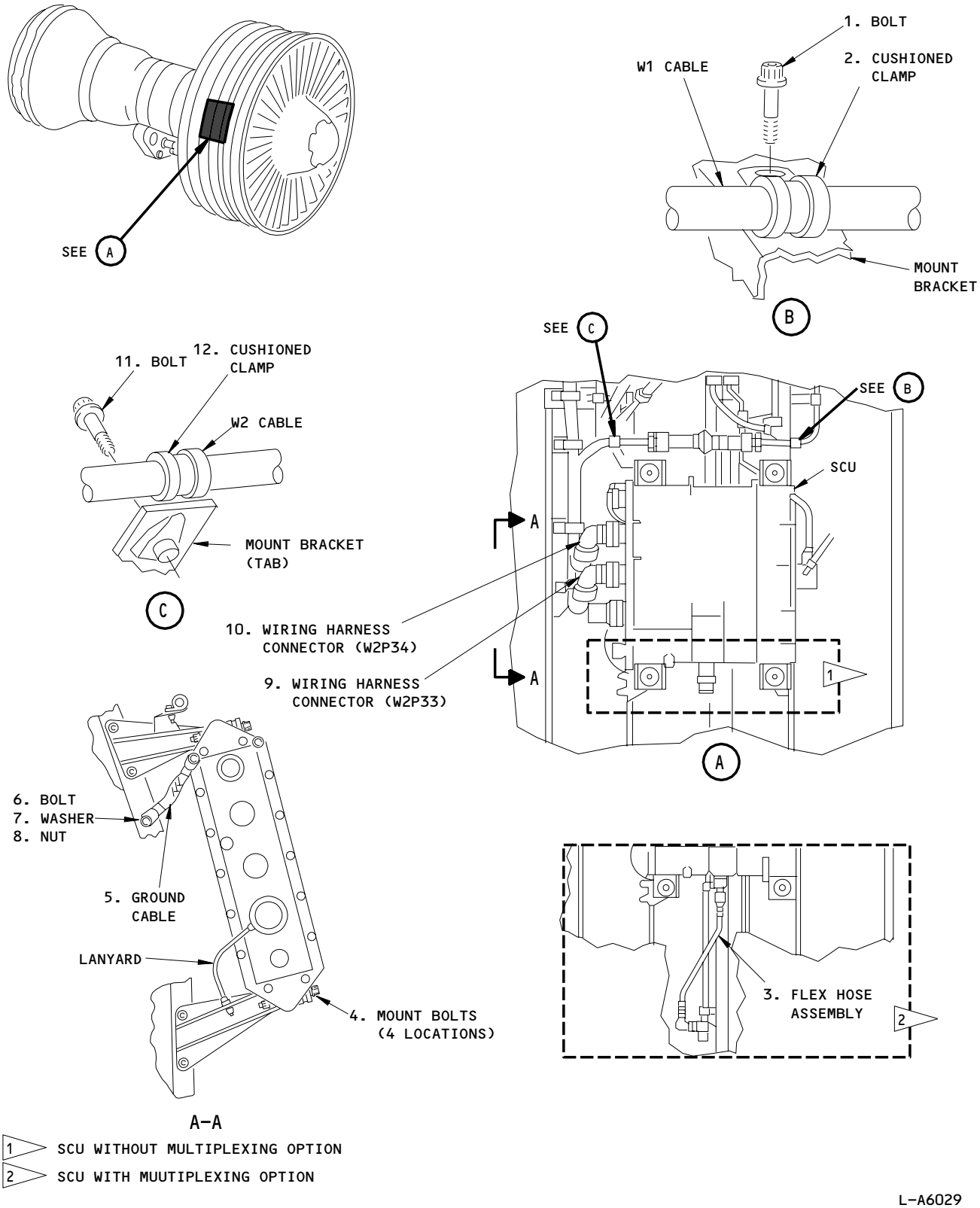
(3) Install the SCU to the flight position on the right side of the engine:
   (a) Remove the protection covers from the electrical connectors on the SCU.
   (b) If the SCU has the multiplexing option, remove the protection cover from the adapter which is located near the data plate.
   (c) With the electrical connectors on the SCU positioned rearward, install the SCU to the right side of the fan case at a location below the smaller connectors of the W1 and W2 harnesses located across Flanges A1 and B2 at the 2:30 o'clock position.
      1) Put the forward mount brackets to the rear of Flange A1 and the rear mount brackets to the rear of Flange B2.
      2) Align the top bolt hole of the upper rear mount bracket with the lower bolt hole of the attached bracket and the bolt hole in the flange.
   (d) Align the bolt holes in the mount brackets with the bolt holes in the flanges and attach the brackets to the flanges with the bolts, threads lubricated with engine oil, washers and nuts.
      1) Tighten the bolts to 85-95 pound-inches (9.6-10.7 newton-meters).



Supplemental Control Unit (SCU) at Storage Location
Figure 201



Flight Location on the Fan Case for Supplemental Control Unit (SCU)
Figure 202



L-A6029

Supplemental Control Unit (SCU) at Flight Location
Figure 203

(e) Loosen the four mount bolts (4) that attach the SCU to the four mount brackets.
1) Re-tighten the four mount bolts (4) to 85-95 pound-inches (9.6-10.7 newton-meters).

S 432-042-N00

CAUTION: BEFORE YOU CONNECT THE GROUND CABLE TO THE SCU, EXAMINE THE CABLE MOUNTING LUGS TO MAKE SURE THE LUGS ARE SECURED TO THE CABLE AND THE CABLE WIRES (STRANDS) ARE A MINIMUM OF 75 PERCENT NOT BROKEN. LOOSE LUGS OR TOO MANY BROKEN WIRES (STRANDS) CAN NOT GIVE SUFFICIENT PROTECTION FROM A LIGHTNING STRIKE.

(4) Attach the ground cable (5) from the SCU to Flange B2:
(a) Remove the bolt (6), washer (7) and nut (8) that are temporarily attached to Flange B2.
(b) Put the ground cable (5) to the bolt hole in Flange B2.
(c) Attach the ground cable (5) to Flange B2 with the bolt (6), threads lubricated with engine oil, washer (7) and nut (8).
(d) Tighten the bolt (6) to 85-95 pound-inches (9.6-10.7 newton-meters).

S 432-043-N00

CAUTION: DO NOT USE LUBRICANTS ON THE SENSING HOSE, CAP ASSEMBLY, OR GASKET UNLESS SPECIFIED DIFFERENTLY. LUBRICANT CAN CAUSE CONTAMINATION OF THE SCU.

(5) If the SCU has the multiplexing option, install the connector nut on the top of the flex hose (3) to the adapter at the bottom side of the SCU.
(a) Tighten the connector nut to 270-300 pound-inches (30.5-33.9 newton-meters).
(b) Install the lockwire or safety cable and safety cable ferrule.

S 432-044-N00

CAUTION: EXAMINE THE HARNESS CONNECTORS AND THE MATING RECEPTACLES FOR BENT PINS AND CONTAMINATION. CAREFULLY MAKE STRAIGHT ANY BENT PINS AND CLEAN AS NECESSARY.

(6) Connect the connectors for wiring harness (W2P34) (10) and wiring harness (W2P33) (9) to the SCU harness receptacles:
(a) Remove the protection covers.

(b) Examine the harness connector and the mating receptacle for bent pins and contamination.
1) If necessary, carefully make straight any bent pins.
2) If necessary, clean the connector and receptacle with Denatured Ethyl Alcohol.
a) Let the alcohol become dry.

(c) Align the connector keyways and engage the connector to the mating receptacle.

(d) Tighten the connector coupling nut with your hand until you cover the witness (color) band and the connector coupling nut is handtight.

NOTE: The witness (color) band is the first band on the receptacle that you cover when you tighten the connector coupling nut.

CAUTION: USE THE CORRECT ASSEMBLY TOOLS. USE OF THE WRONG ASSEMBLY TOOLS CAN RESULT IN CONNECTOR DAMAGE OR A LOOSE CONNECTOR. A LOOSE CONNECTOR PERMITS VIBRATION AND CAN RESULT IN CONTACT WEAR AND POOR LIGHTNING PROTECTION.

(e) Use the TG-70 strap wrench or the TG-69 soft-jawed pliers and tighten the connector coupling nut.
1) Use sufficient force to make sure these conditions occur:

NOTE: This procedure will make sure the contacts are sufficiently engaged and the connector is tight.

If you use too much force, the strap wrench and pliers will turn around on the connector coupling nut. This will prevent too much torque.

See the instructions given with the strap wrench for correct use.

a) The connector coupling nut is fully tight
b) The connector fits tightly against the receptacle (metal to metal).

S 432-021-N00

(7) Attach the W2 cable to the mount bracket:
(a) Remove the bolt (11) from the tab of the upper rear mount bracket.
(b) Put the attached cushioned clamp (12) that is on the W2 cable to the tab of the mount bracket.

(c) Attach the cushioned clamp (12) with the bolt (11), threads lubricated with engine oil.
(d) Tighten the bolt (11) to 36-40 pound-inches (4.1-4.5 newton-meters).

S 432-020-N00
(8) Attach the W1 cable to the mount bracket:
(a) Remove the bolt (1) from the tab of the upper front mount bracket.
(b) Put the cushioned clamp (2) that is on the W1 cable to the tab of the mount bracket.
(c) Attach the cushioned clamp (2) with the bolt (1), threads lubricated with engine oil.
(d) Tighten the bolt to 36-40 pound-inches (4.1-4.5 newton-meters).

S 412-032-N00
(9) Close the fan cowl panels (AMM 71-11-04/201).

S 862-039-N00
(10) For the left engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P11 panel:
(a) 11L7, EEC/SCU PWR L ENG

S 862-040-N00
(11) For the right engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P11 panel:
(a) 11K28, EEC/SCU PWR R ENG

S 712-041-N00
(12) Do the test for the supplemental control unit (SCU) which is shown in the Power Plant Test Reference Table (AMM 71-00-00/501).

TASK 73-21-15-802-023-N00

3. Remove and Install the Supplemental Control Unit (SCU) from the Flight Position to the Storage Position on the Fan Case

A. Consumable Materials
(1) D00137 Engine Oil, PWA 521

B. References
(1) AMM 71-11-04/201, Fan Cowl Panels

C. Access
(1) Location Zones
411 Left Engine
421 Right Engine

(2) Access Panels

413AL	Fan Cowl Panel (Left)
414AR	Fan Cowl Panel (Right)
423AL	Fan Cowl Panel (Left)
424AR	Fan Cowl Panel (Right)

D. Procedure

S 862-037-N00

(1) For the left engine, open this circuit breaker on the overhead panel, P11, and attach the DO-NOT-CLOSE tag:
(a) 11L7, EEC/SCU PWR L ENG

S 862-038-N00

(2) For the right engine, open this circuit breaker on the overhead panel, P11, and attach the DO-NOT-CLOSE tag:
(a) 11K28, EEC/SCU PWR R ENG

S 012-031-N00

(3) Open the fan cowl panels (AMM 71-11-04/201).

S 032-024-N00

(4) Disconnect the W2P34 wiring harness connector (10) and the W2P33 wiring harness connector (9) from the rear side of the SCU.
(a) Install protection covers on the electrical connectors on the SCU and the wiring harness.

S 032-025-N00

(5) Disconnect the W2 cable from the mount bracket:
(a) Remove the bolt (11) from the cushioned clamp (12) that attaches the W2 cable to the tab on the upper rear mount bracket of the SCU.
(b) Loosen the cushioned clamp (12) from the mount bracket, install the bolt (11) into the same hole in the tab of the mount bracket and tighten sufficiently to engage the self-locking threads of the nut plate.

S 032-026-N00

(6) Disconnect the W1 cable from the mount bracket:
(a) Remove the bolt (1) from the cushioned clamp (2) that attaches the W1 cable to the tab on the upper front mount bracket of the SCU.
(b) Loosen the cushioned clamp (2) from the mount bracket, install the bolt (1) into the same hole in the tab of the mount bracket and tighten sufficiently to engage the self-locking threads of the nut plate.

S 032-027-N00

(7) If the SCU has the flex hose assembly (3) for the multiplexing option, remove the top connector of the flex hose assembly (3) from the bottom side of the SCU.
   (a) Install a protection cover to the flex hose opening.

S 032-028-N00

(8) Disconnect the ground cable (5) for the SCU:
   (a) Remove the bolt (6), washer (7) and nut (8) from the ground cable (5) that is attached to a bolt hole in Flange B2.
   (b) Install the bolt (6), washer (7) and nut (8) into the same bolt hole in Flange B2 and tighten the bolt (6) sufficiently to engage the self-locking threads of the nut (8).

S 032-029-N00

(9) Remove the SCU from the flight position on the fan case:

   NOTE: It is necessary to have two persons do this procedure.

   (a) Remove the two bolts, washers and nuts from the lower SCU mount bracket on Flange A1.
   (b) Remove the two bolts, washers and nuts from the lower SCU mount bracket on Flange B2.
   (c) Remove the two bolts, washers and nuts from the upper SCU mount bracket on Flange B2.
   (d) Have another person very carefully hold the SCU, and remove the two bolts, washers and nuts from the upper mount bracket on Flange A1.
   (e) Remove the SCU with the mount brackets from the fan case.

S 422-030-N00

(10) Install the SCU in the storage position on the left side of fan case:
   (a) With the electrical connectors on the SCU pointing rearward, install the SCU to the upper left side of the fan case at the 10:30 o'clock position.
   (b) Put the forward mount brackets to the rear of Flange A1 and the rear mount brackets to the rear of Flange B2.
   (c) Align the bolt holes in the mount brackets with the bolt holes in the flanges with the bolts, threads lubricated with engine oil, washers and nuts.
   (d) Tighten the bolts to 85-95 pound-inches (9.6-10.7 newton-meters).

(e) Attach (to temporarily store) the cable clamps, ground cable, harness connectors and flex hose assembly (if necessary) for shipment and transportation.
(f) Close the fan cowl panels (AMM 71-11-04/201).

SUPPLEMENTAL CONTROL UNIT (SCU) - REMOVAL/INSTALLATION

1. General
   A. This procedure gives the instructions for the removal and installation of the Supplemental Control Unit (SCU).
   B. The SCU is installed on the fan case at the 3 o'clock position.
   C. Open the right fan cowl panel to get access to the SCU.

TASK 73-21-15-004-001-N00

2. Remove the Supplemental Control Unit (SCU) (Fig. 401)
   A. References
      (1) AMM 71-11-04/201, Fan Cowl Panels
   B. Access
      (1) Location Zone

          411 Left Engine
          421 Right Engine

      (2) Access Panels

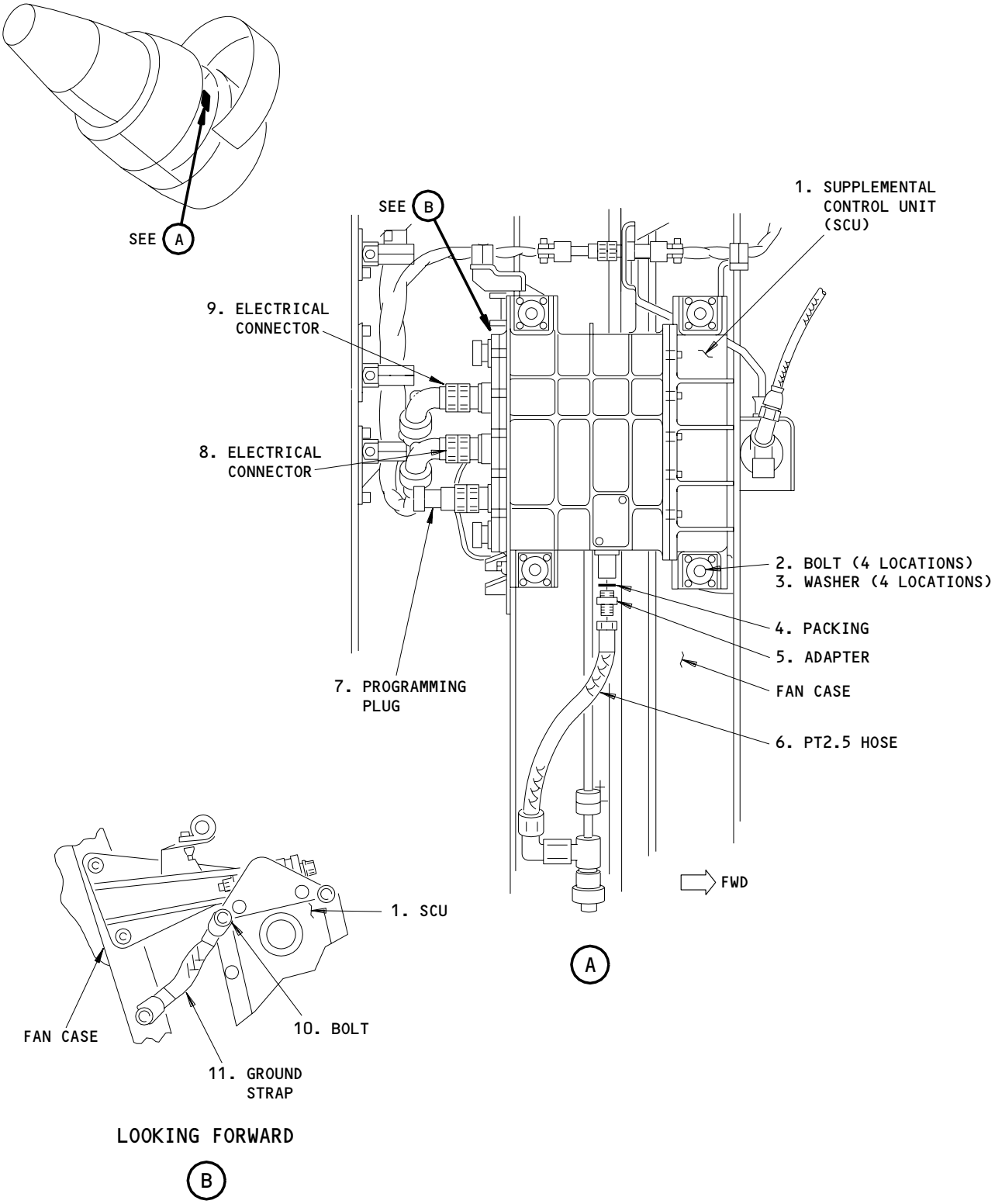
          414AR Fan Cowl Panel (Right), Left Engine
          424AR Fan Cowl Panel (Right), Right Engine

   C. Prepare to Remove the Supplemental Control Unit (SCU)

          S 864-002-N00
      (1) For the left engine, open this circuit breaker on the overhead panel P11 and attach the DO-NOT-CLOSE tag:
          (a) 11L7, EEC/SCU PWR L ENG

          S 864-003-N00
      (2) For the right engine, open this circuit breaker on the overhead panel P11 and attach the DO-NOT-CLOSE tag:
          (a) 11K28, EEC/SCU PWR R ENG

          S 014-004-N00
      (3) Open the right fan cowl panel (AMM 71-11-04/201).



Supplemental Control Unit (SCU) Installation
Figure 401

D. Procedure

S 024-025-N00

(1) Remove the Supplemental Control Unit (SCU):

CAUTION: DO NOT REMOVE THE PROGRAMMING PLUG FROM THE ENGINE. THE PROGRAMMING PLUG MUST STAY WITH THE ENGINE DURING THE SCU REPLACEMENT TO MAKE SURE THE ENGINE SERIAL NUMBER IS CORRECT.

(a) Disconnect the programming plug (7) from its receptacle on the SCU (1).

NOTE: Keep the plug attached to the engine by its lanyard.

1) Install a protection cap on the programming plug (7).

(b) Disconnect the electrical connectors (8, 9) from their receptacles on the SCU (1).
1) Install protection caps on the electrical connectors (8, 9).

(c) Disconnect the PT2.5 hose (6) from the PT2.5 port at the bottom of the SCU (1).
1) Install a protection cap on the open end of the PT2.5 hose (6).

(d) Remove the bolt (10) which attaches the ground strap (11) to the top, aft end of the SCU (1).

(e) Remove the bolts (2) and washers (3) that attach the SCU (1) to its mounting brackets.

(f) Remove the SCU (1) from the engine.

S 024-026-N00

(2) If it is necessary to replace the SCU, do the steps that follow:
(a) Remove the adapter (5) and packing (4) from the PT2.5 port on the SCU (1).
1) Keep the adapter (5) for installation on the new SCU (1).
2) Discard the packing (4).

(b) Remove the two protection caps from the receptacles that are not used on the SCU (1).
1) Keep the two protection caps for installation on the new SCU (1).

S 024-027-N00

(3) Install protection caps to the openings and receptacles on the SCU (1).

TASK 73-21-15-404-011-N00

3. Install the Supplemental Control Unit (SCU) (Fig. 401)

A. Equipment

(1) M303, M305, or M307 Bergen Mechanical Crimper
Bergen Cable Technologies Inc
170 Gregg St
P.O. Box 1300
Lodi, NJ 07644-9982

B. Consumable Materials

(1) D00137 Engine Oil - PWA 521
(2) Fluid - Lubricating PWA 36511
(3) G02334 Lockwire - AS3214-02
(4) G02332 Ferrule - P05-292 (Optional)
(5) G02335 Cable - Safety - P05-291 (Optional)

C. References

(1) AMM 70-24-05/201, Electrical Harnesses
(2) AMM 71-00-00/501, Power Plant
(3) AMM 71-11-04/201, Fan Cowl Panels

D. Access

(1) Location Zone
411 Left Engine
421 Right Engine

(2) Access Panels
414AR Fan Cowl Panel (Right), Left Engine
424AR Fan Cowl Panel (Right), Right Engine

E. Prepare to Install the Supplemental Control Unit (SCU)

S 424-028-N00

(1) Remove the protection caps from the SCU.

S 424-029-N00

(2) If you install a new SCU, do the steps that follow:
(a) Lubricate a new PT2.5 packing (4) with the lubricating fluid.
(b) Install the packing (4) to the adapter (5).
(c) Install the adapter (5) to the PT2.5 port on the SCU (1).
1) Tighten the adapter (5) to 65-75 pound-inches (7.3-8.5 newton-meters).

(d) Do the steps that follow to install the protection caps to the receptacles on the SCU (1) that are not used:
1) Carefully push the protection caps into the receptacles.
a) Tighten the protection caps with your hand.
2) Safety the protection caps with lockwire or safety cable and safety cable ferrule.

F. Procedure

S 424-014-N00

(1) Install the Supplemental Control Unit (SCU):
(a) Lubricate the threads of the bolts (2) with engine oil.
(b) Put the SCU (1) on its mounting brackets with the receptacles to the rear.
(c) Attach the SCU (1) to the mounting brackets with the bolts (2) and washers (3).
1) Tighten the bolts (2) to 85-95 pound-inches (9.6-10.7 newton-meters).

CAUTION: DO NOT CONNECT THE GROUND STRAP TO THE SCU IF:
- THE GROUND STRAP HAS LOOSE MOUNTING LUGS
- MORE THAN 25 PERCENT OF THE STRAP STRANDS ARE BROKEN.
A GROUND STRAP WITH LOOSE MOUNTING LUGS OR BROKEN STRANDS CAN CAUSE UNSATISFACTORY LIGHTNING PROTECTION.

(d) Examine the ground strap (11) and its mountings for damage and wear.
1) Replace the ground strap (11) if the mounting lugs are loose or more than 25 percent of the strands are broken.
(e) Do these steps to attach the ground strap (11) to the SCU (1):
1) Lubricate the threads of the bolt (10) with engine oil.
2) Attach the ground strap (11) to the SCU (1) with the bolt (10).
a) Tighten the bolt (10) to 85-95 pound-inches (9.6-10.7 newton-meters).
(f) Remove the protection caps from the electrical connectors (8, 9) and the programming plug (7).

CAUTION: USE THE CORRECT ASSEMBLY PROCEDURE, AND TOOLS, FOR THE INSTALLATION OF THE HARNESS CONNECTORS AND THE PROGRAMMING PLUG (AMM 70-24-05/201). IF YOU USE THE INCORRECT ASSEMBLY PROCEDURE, OR TOOLS, A DAMAGED OR LOOSE CONNECTOR CAN OCCUR. A LOOSE CONNECTOR PERMITS VIBRATION, WHICH CAUSES THE CONTACTS TO WEAR AND DECREASES THE LIGHTNING PROTECTION.

(g) Connect the electrical connectors (8, 9) and the programming plug (7) to their applicable receptacles on the SCU (1) (AMM 70-24-05/201).
1) Connect the programming plug (7) to the receptacle identified as J4.
2) Connect the electrical connector (8) to the receptacle identified as J3.
3) Connect the electrical connector (9) to the receptacle identified as J2.

CAUTION: DO NOT LUBRICATE THE PT2.5 HOSE CONNECTOR. A LUBRICANT ON THE PT2.5 HOSE CONNECTOR CAN CAUSE CONTAMINATION OF THE SCU.

(h) Connect the PT2.5 hose (6) to the PT2.5 port on the SCU (1).
1) Use a wrench to hold the adapter and tighten the hose connector to 270-300 pound-inches (30.5-33.9 newton-meters).

G. Return the Aircraft to Its Usual Condition.

S 414-020-N00
(1) Close the right fan cowl panel (AMM 71-11-04/201).

S 864-021-N00
(2) For the left engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P11 panel:
(a) 11L7, EEC/SCU PWR L ENG

S 864-022-N00
(3) For the left engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P11 panel:
(a) 11K28, EEC/SCU PWR R ENG

S 714-030-N00

(4) Do the test for the supplemental control unit which is shown in the Power Plant Test Reference Table (AMM 71-00-00/501).

SUPPLEMENTAL CONTROL UNIT (SCU) 28 VDC POWER CIRCUIT - ADJUSTMENT/TEST

1. General
   A. This test is necessary for airplanes that have the system wire changes to use the SCU back-up power function. Not all airplanes with SCU's have this function. The engine intermix procedure lets you install an engine on an airplane which may not have the wire installation necessary to provide the back-up power function. Thus, this test is not required for all airplanes with SCU's.
   B. This procedure makes a check of the airplane electrical circuit used to supply 28 VDC power to the SCU.
   C. This procedure makes a check of the Power Source Discrete from the SCU to the EEC.
   D. Ground test power will be needed to do this test. You will also take EPR readings at the EICAS.

TASK 73-21-15-705-001-N00

2. SCU 28 VDC Power Circuit Test
   A. Special Tools and Equipment
      (1) Proximity Sensor, Actuator/Deactuator
          A32102-25 (Recommended)
          A32102-1 (Alternative)
   B. References
      (1) AMM 24-22-00/201, Electrical Power
      (2) AMM 32-09-02/201, Air/Ground Relays
      (3) AMM 71-11-04/201, Fan Cowl Panels
   C. Access
      (1) Location Zones

211	Control Cabin
212	Control Cabin
414	Fan Cowl Panel (RH)
424	Fan Cowl Panel (RH)
731	Main Landing Gear (L)
741	Main Landing Gear (R)

      (2) Access Panels

414AR	Fan Cowl Panel (RH)
424AR	Fan Cowl Panel (RH)

   D. Do the SCU Power Test

      S 865-002-N00
      (1) Supply electrical power (AMM 24-22-00/201).

      S 865-005-N00
      (2) Open these circuit breakers on the overhead circuit breaker panel, P11:
          (a) 11L7, L ENG EEC/SCU PWR
          (b) 11K28, R ENG EEC/SCU PWR.

S 865-006-N00
(3) Make sure the applicable EEC MAINT L(R) ENG POWER switch is in the NORM position.

S 715-007-N00
(4) Make sure the EPR display on the EICAS is blank.

S 865-008-N00
(5) Put the applicable EEC MAINT L(R) ENG POWER switch to the TEST position.

S 715-009-N00
(6) Make sure the EPR display on the EICAS is blank.

S 865-010-N00
(7) Close these circuit breakers on the overhead circuit breaker panel, P11:
(a) 11L7, L ENG EEC/SCU PWR
(b) 11K28, R ENG EEC/SCU PWR.

S 715-011-N00
(8) Make sure the EPR display on the EICAS reads approximately 1.00.

NOTE: The precision of the EPR indication for this step is not very important. It is used to show that the EEC has power and can send data.

S 865-035-N00
(9) Push the EPCS switch on the EICAS MAINT panel two times to show the EPCS Status Page on EICAS.

S 715-036-N00
(10) Make sure the first digit of label 272 is either 8, 9, A, B, C, D, E, or F.
(a) If the first digit of label 272 is 0, 1, 2, 3, 4, 5, 6, or 7, do a continuity test of the circuit from the SCU to the EEC, as follows:

NOTE: If necessary, open the fan cowl panel (AMM 71-11-04/201).

1) Do a check between pin N on W2P33 (on the SCU) and pin p on D11114 (on the EEC)

2) Do a check between pin N on W2P33 and pin p on D11686 (on the EEC)
3) Do a check between pin C on W2P33 and pin S on D11114
4) Do a check between pin C on W2P33 and pin S on D11686.

S 865-012-N00

(11) Put the applicable EEC MAINT L(R) ENG POWER switch to the NORM position.

S 715-013-N00

(12) Make sure the EPR display on the EICAS is blank.

S 865-014-N00

(13) Make sure these circuit breakers on the overhead circuit breaker panel, P11, are closed:
(a) 11C30, LANDING GEAR POSITION AIR/GND SYS 1
(b) 11U15, AIR/GND SYSTEM 1
(c) 11U24, LANDING GEAR POS AIR/GND SYSTEM 2.

S 865-032-N00

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

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

S 485-016-N00

(15) Connect the target simulator devices to these sensors on the L(R) main gear strut:
(a) S245 L GEAR TILTED SYS 1
(b) S246 R GEAR TILTED SYS 1
(c) S267 L GEAR TILTED SYS 2
(d) S268 R GEAR TILTED SYS 2.

S 715-017-N00

(16) Make sure the EPR display on the EICAS reads approximately 1.00.

S 085-018-N00

(17) Disconnect the target simulator devices in this order:
(a) S245 and S267

NOTE: This pair must be disconnected at the same time and in less than 0.5 seconds.

(b) S246 and S268.

S 865-019-N00
(18) Put the L(R) fuel control switch to the RUN position.

S 715-033-N00
(19) Make sure the EPR display on EICAS is blank.

S 865-021-N00
(20) Put the L(R) N2 SPEED CARD-CHAN 1 test switch on the electrical systems cardfile, P50, to the TEST position.

S 715-022-N00
(21) Make sure the EPR display on the EICAS reads approximately 1.00.

S 865-023-N00
(22) Put the L(R) N2 SPEED CARD-CHAN 1 test switch on the electrical systems cardfile, P50, to the NORM position.

S 715-024-N00
(23) Make sure the EPR display on the EICAS reads approximately 1.00.

S 865-025-N00
(24) Put the L(R) fuel control switch to the CUTOFF position.

S 715-034-N00
(25) Make sure the EPR display on EICAS is blank.

E. Put the Airplane to its Usual Condition

S 865-038-N00
(1) Put the safety-sensitive systems back to their initial conditions (AMM 32-09-02/201)

S 865-031-N00
(2) Remove electrical power (AMM 24-22-00/201).

S 415-027-N00
(3) If necessary, close the right fan cowl (AMM 71-11-04/201).

SCU PROGRAMMING PLUG - REMOVAL/INSTALLATION

1. General
   A. This procedure gives the instructions for the removal and installation of the SCU programming plug.
   B. The SCU programming plug is installed on the aft end of the Supplemental Control Unit (SCU). The SCU is installed on the fan case at the 3 o'clock position.
   C. Open the right fan cowl panel to get access to the SCU programming plug.

TASK 73-21-16-004-001-N00

2. Remove the SCU Programming Plug (Fig. 401)
   A. References
      (1) AMM 71-11-04/201, Fan Cowl Panels
   B. Access
      (1) Location Zone

          414 Fan Cowl Panel (RH)
          424 Fan Cowl Panel (RH)

      (2) Access Panels

          414AR Fan Cowl Panel (RH)
          424AR Fan Cowl Panel (RH)

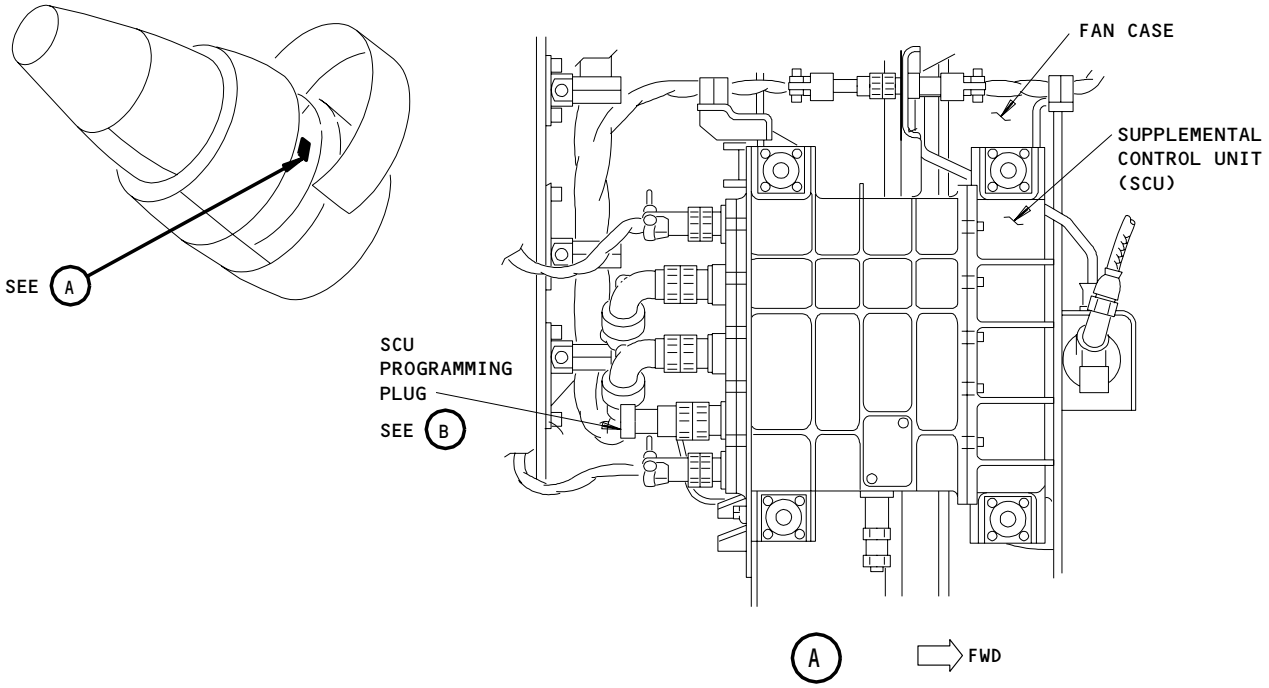
   C. Remove the SCU programming plug

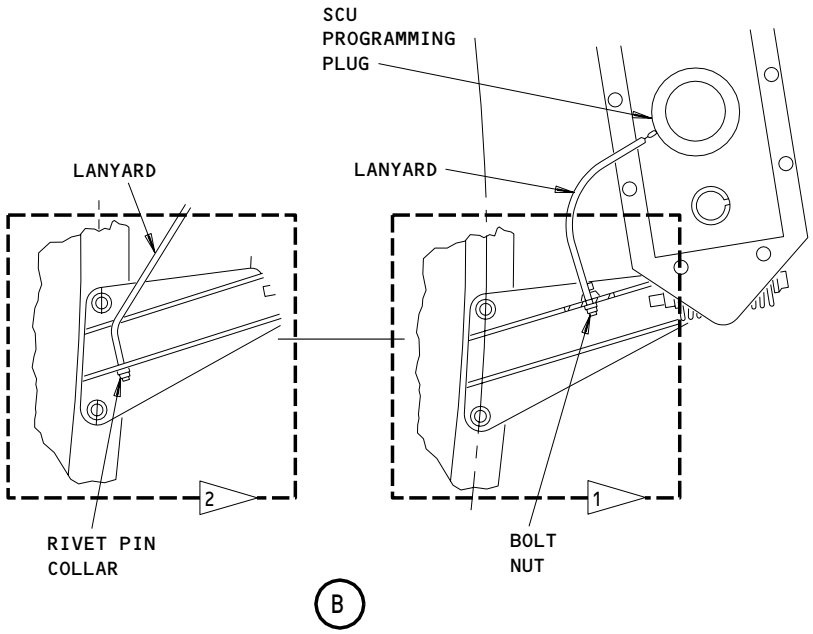
          S 864-002-N00
      (1) For the left engine, open this circuit breaker on the overhead panel, P11, and attach the DO-NOT-CLOSE tag:
          (a) 11L7, EEC/SCU PWR L ENG

          S 864-003-N00
      (2) For the right engine, open this circuit breaker on the overhead panel, P11, and attach the DO-NOT-CLOSE tag:
          (a) 11K28, EEC/SCU PWR R ENG

          S 014-004-N00
      (3) Open the right fan cowl panel (AMM 71-11-04/201).

          S 024-006-N00
      (4) Disconnect the SCU programming plug from the SCU.





1 ENGINES PRE-PW-SB 72-306
2 ENGINES POST-PW-SB 72-306

SCU Programming Plug Installation
Figure 401

S 034-015-N00

(5) ENGINES PRE-PW-SB 72-306;
Remove the bolt and nut which attaches the lanyard to the bracket at the Flange B2.

S 034-016-N00

(6) ENGINES POST-PW-SB 72-306;
Remove the rivet pin and collar which attaches the lanyard to the bracket at the Flange B2.

S 024-007-N00

(7) Remove the SCU programming plug from the engine.

S 034-008-N00

(8) Install the protection caps to the SCU programming plug and to the receptacle on the SCU.

TASK 73-21-16-404-009-N00

3. Install the SCU Programming Plug (Fig. 401)

A. Consumable Materials

(1) D00137 Engine Oil - PWA 521

B. References

(1) AMM 70-24-05/201, Electrical Harnesses

(2) AMM 71-11-04/201, Fan Cowl Panels

C. Access

(1) Location Zone

414 Fan Cowl Panel (RH)
424 Fan Cowl Panel (RH)

(2) Access Panels

414AR Fan Cowl Panel (RH)
424AR Fan Cowl Panel (RH)

D. Install the SCU programming plug.

NOTE: The programming plugs are not interchangeable. If a different programming plug is installed, it must be made to the same engine serial number.

S 434-010-N00

(1) Remove the protection cap from the SCU programming plug.

S 424-011-N00

CAUTION: USE THE CORRECT ASSEMBLY PROCEDURE, AND TOOLS, FOR THE PROGRAMMING PLUG INSTALLATION (AMM 70-24-05/201). IF YOU USE THE INCORRECT ASSEMBLY PROCEDURE, OR TOOLS, A DAMAGED OR LOOSE PROGRAMMING PLUG CAN OCCUR. A LOOSE PROGRAMMING PLUG PERMITS VIBRATION, WHICH CAUSES THE CONTACTS TO WEAR AND DECREASES THE LIGHTNING PROTECTION.

(2) Connect the SCU programming plug to the applicable receptacle on the SCU as follows (AMM 70-24-05/201):
   (a) Examine the receptacle for bent pins.
      1) If there are bent pins, carefully make the pins straight.
   (b) Examine the SCU programming plug and receptacle for contamination.
      1) If it is necessary, clean the SCU programming plug and receptacle.
   (c) Align the keyway and push the SCU programming plug into the receptacle.
   (d) Tighten the SCU programming plug with your hand while you push in the SCU programming plug.

      NOTE: The SCU programming plug is correctly installed when you cannot see the color band (nearest to the threads).

S 434-017-N00

(3) ENGINES PRE-PW-SB 72-306;
Attach the lanyard for the SCU programming plug with the bolt and nut.

S 434-018-N00

(4) ENGINES POST-PW-SB 72-306;
Attach the lanyard for the SCU programming plug with the rivet pin and collar.

E. Put the Airplane Back to Its Usual Condition.

S 414-012-N00

(1) Close the right fan cowl panel (AMM 71-11-04/201).

S 864-013-N00

(2) For the left engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P11 panel:
   (a) 11L7, EEC/SCU PWR L ENG

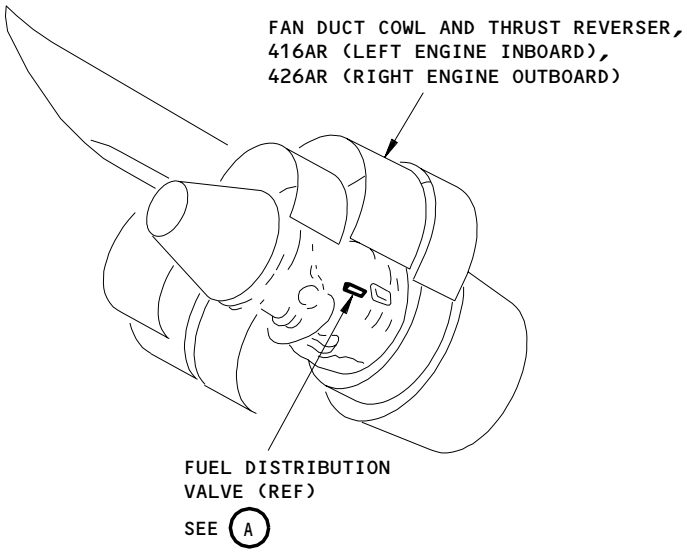
S 864-014-N00

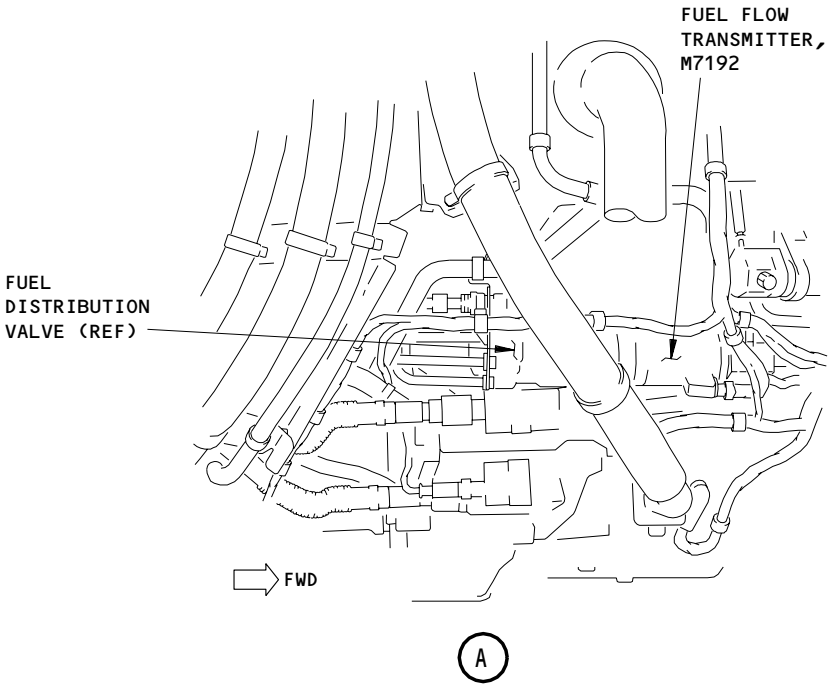
(3) For the right engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P11 panel:
   (a) 11K28, EEC/SCU PWR R ENG

FUEL FLOW INDICATING SYSTEM

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	AMM REFERENCE
COMPUTER - (FIM 31-41-00/101) L EICAS, M10181				
COMPUTER - (FIM 31-41-00/101) R ECIAS, M10182				
TRANSMITTER - L ENG FUEL FLOW, M7192	--	1	416AR, FAN DUCT COWL AND THRUST REVERSER, FUEL DISTRIBUTION VALVE (REF)	73-31-01
TRANSMITTER - R ENG FUEL FLOW, M7192	--	1	426AR, FAN DUCT COWL AND THRUST REVERSER, FUEL DISTRIBUTION VALVE (REF)	73-31-01

Fuel Flow Indicating System - Component Index
Figure 101





Fuel Flow Indicating System – Component Location
Figure 102

FUEL FLOW INDICATING SYSTEM - ADJUSTMENT/TEST

1. General
   A. This test has the instructions to make sure the system which monitors the fuel flow operates correctly.

TASK 73-31-00-715-001-N00

2. Operational Test - Fuel Flow Indicating
   A. References
      (1) AMM 71-00-00/201, Power Plant
   B. Access
      (1) Location Zones
          211/212 Flight Compartment

   C. Do a Test of the Indication System for the Fuel Flow

S 865-002-N00

WARNING: USE AMM 71-00-00/201 TO OPERATE THE POWER PLANT. IF YOU DO NOT USE THIS PROCEDURE, YOU CAN CAUSE DAMAGE TO EQUIPMENT OR INJURY TO PERSONS.

(1) Use the Power Plant Operation (Normal) procedure to start the two engines (AMM 71-00-00/201).

S 215-003-N00

(2) Monitor the fuel flow indication on the bottom EICAS display.
    (a) Make sure the fuel flow indication reads approximately the same for the two engines.

S 865-004-N00

(3) Use the Power Plant Operation (Normal) procedure to do the engine shutdown (AMM 71-00-00/201).

FUEL FLOW TRANSMITTER - REMOVAL/INSTALLATION

1. General
   A. The fuel flow transmitter is installed at approximately the 4 o'clock position. The fuel flow transmitter is found in the fuel line between the fuel metering unit and the fuel distribution valve.
   B. You can get access to the fuel flow transmitter through the right thrust reverser.

TASK 73-31-01-004-001-N00

2. Remove the Fuel Flow Transmitter
   A. References
      (1) AMM 24-22-00/201, Electrical Power - Control
      (2) AMM 71-11-04/201, Fan Cowl Panels
      (3) AMM 71-11-06/201, Core Cowl Panels
      (4) AMM 78-31-00/201, Thrust Reverser System
   B. Access
      (1) Location Zones
          416 L Power Plant Fan Reverser
          426 R Power Plant Fan Reverser

      (2) Access Panels
          416AR Fan Reverser (Right)
          426AR Fan Reverser (Right)

   C. Equipment
      (1) 5-gallon container for the fuel
   D. Consumables
      (1) D00137 Engine Oil - PWA 521
   E. Prepare to Remove the Fuel Flow Transmitter

      S 864-002-N00
      (1) Supply electrical power (AMM 24-22-00/201).

      S 864-003-N00
      (2) For the left engine, make sure this circuit breaker on the main power distribution panel, P6, is closed:
          (a) 6E1, FUEL VALVE L SPAR

S 864-004-N00
(3) For the right engine, make sure this circuit breaker on the main power distribution panel, P6, is closed:
(a) 6E2, FUEL VALVE R SPAR

S 864-005-N00
(4) For the left engine, make sure this circuit breaker on the overhead circuit breaker panel, P11, is closed:
(a) 11D25, FUEL CONT VLV & EEC CHAN B RESET L

S 864-006-N00
(5) For the right engine, make sure this circuit breaker on the overhead circuit breaker panel, P11, is closed:
(a) 11D26, FUEL CONT VLV & EEC CHAN B RESET R

S 864-007-N00
(6) Make sure the applicable FUEL METERING switch on the control stand is in the CUTOFF position.

S 214-008-N00
(7) Make sure the applicable ENG VALVE and SPAR VALVE lights on the control stand are off.

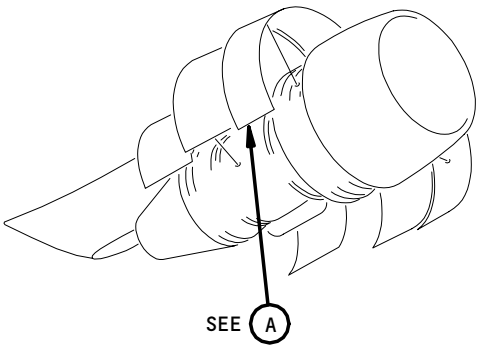
S 864-009-N00
(8) For the left engine, open this circuit breaker on the main power distribution panel, P6, and attach the DO-NOT-CLOSE tag:
(a) 6E1, FUEL VALVE L SPAR

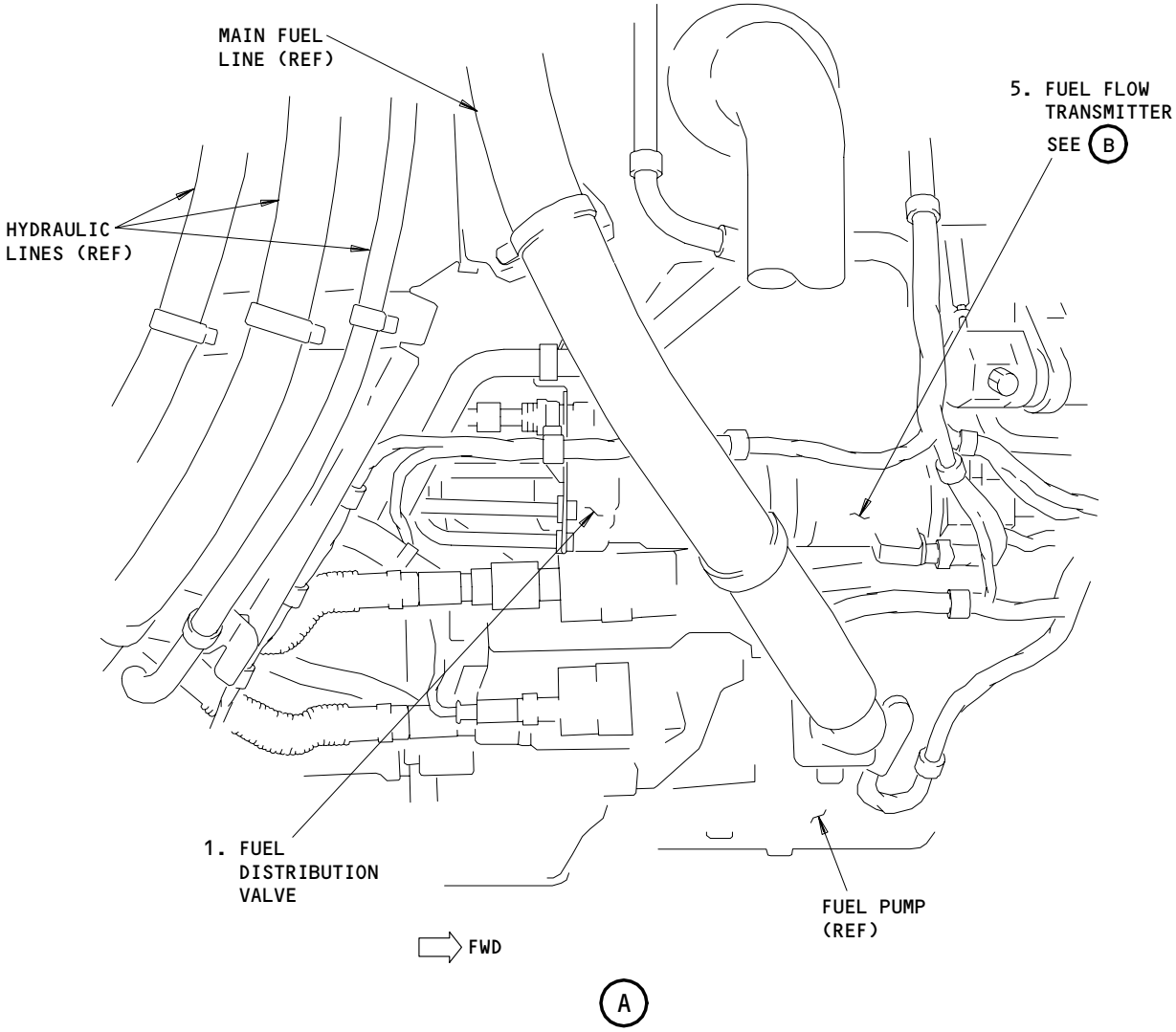
S 864-010-N00
(9) For the right engine, open this circuit breaker on the main power distribution panel, P6, and attach the DO-NOT-CLOSE tag:
(a) 6E2, FUEL VALVE R SPAR

S 864-011-N00
(10) For the left engine, open this circuit breaker on the overhead circuit breaker panel, P11, and attach the DO-NOT-CLOSE tag:
(a) 11D25, FUEL CONT VLV & EEC CHAN B RESET L

S 864-012-N00
(11) For the right engine, open this circuit breaker on the overhead circuit breaker panel, P11, and attach the DO-NOT-CLOSE tag:
(a) 11D26, FUEL CONT VLV & EEC CHAN B RESET R

S 864-013-N00
(12) Remove electrical power (AMM 24-22-00/201).





Fuel Flow Transmitter Installation
Figure 401 (Sheet 1)

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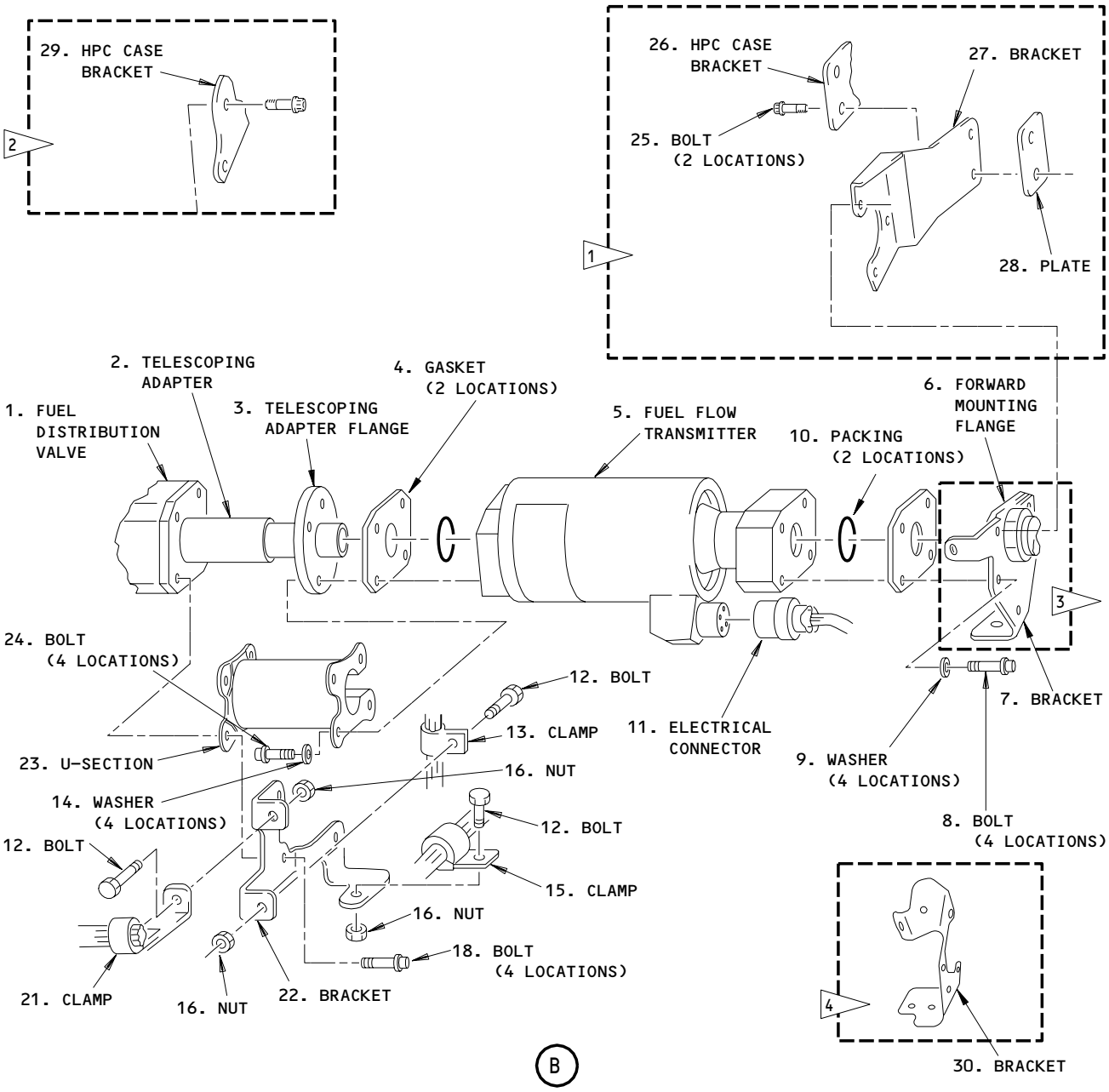

1 ENGINES POST-PW-SB 73-63
2 ENGINES PRE-PW-SB 73-63
3 ENGINES POST-PW-SB 73-140
4 ENGINES PRE-PW-SB 73-140 OR 73-146

Fuel Flow Transmitter Installation
Figure 401 (Sheet 2)

S 014-014-N00
(13) Open the right fan cowl panel (AMM 71-11-04/201).

S 044-015-N00

WARNING: DO THE THRUST REVERSER DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(14) Do this procedure: Thrust Reverser Deactivation for Ground Maintenance (AMM 78-31-00/201).

S 014-016-N00
(15) Open the right core cowl panel (AMM 71-11-06/201).

S 014-017-N00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(16) Open the right thrust reverser (AMM 78-31-00/201).

F. Remove the Fuel Flow Transmitter (Fig. 401)

S 034-018-N00
(1) Disconnect the electrical connector (11) from the fuel flow transmitter (5).
(a) Install the protection caps.

S 034-019-N00
(2) Put a container below the fuel flow transmitter (5) to catch the remaining fuel.

S 034-020-N00
(3) Remove the bolts (12) which attach the clamps (13, 15, 21) to the bracket (22).

S 034-021-N00
(4) Remove the bolts (18) which attach the bracket (22) to the U-section (23) and the fuel distribution valve (1).

S 034-022-N00
(5) Remove the bracket (22) from the engine.

S 024-023-N00
(6) Remove the remaining bolts (18, 24) which attach the U-section (23) to the fuel distribution valve (1) and the fuel flow transmitter (5).

S 034-024-N00

(7) Remove the U-section (23) from the engine.

S 024-025-N00

(8) ENGINES PRE-PW-SB 73-63;
Remove the bolts (8) which attach the HPC case bracket (29) and the forward end of the fuel flow transmitter (5).

S 024-059-N00

(9) ENGINES POST-PW-SB 73-63;
Disconnect the forward end of the fuel flow transmitter (5) with the steps that follow:
(a) Remove the bolts (25) which attach the bracket (27) and plate (28) to the HPC case bracket (26).
(b) Remove the bolts (8) which attach the brackets (7 and 27) to the forward end of the fuel flow transmitter (5).

S 034-026-N00

(10) Move the telescoping adapter (2) aft until the adapter (2) is against the fuel distribution valve (1).

S 024-027-N00

(11) Remove the fuel flow transmitter (5) and the telescoping adapter (2) from the engine.
(a) Discard the gasket (4) and the packings (10).

S 624-068-N00

CAUTION: YOU MUST PRESERVE THE FUEL FLOW TRANSMITTER IF YOU DO NOT INSTALL IT WITHIN 24 HOURS. IF THIS IS NOT DONE, THE INTERNAL PARTS OF THE TRANSMITTER WILL CORRODE.

(12) Preserve the transmitter (5) for these conditions:
- You will not install the same transmitter that you removed
- You will wait 24 hours or more before you install the transmitter.

(a) Fill the transmitter with oil.

(b) Drain the oil from the transmitter.

NOTE: Make sure there is a thin layer of oil on the internal parts of the transmitter.

S 034-028-N00

(13) Install the protection covers.

TASK 73-31-01-404-029-N00

3. Install the Fuel Flow Transmitter

A. Consumable Materials

(1) D00137 Engine Oil - PWA 521

(2) D00504 Petrolatum - PMC 9609

B. Parts

AMM			AIPC		
FIG	ITEM	NOMENCLATURE	SUBJECT	FIG	ITEM
401	4	Gasket	73-31-01	01	25
				07	20
				08	20
	5	Transmitter - Fuel Flow	73-31-01	01	35
				07	30
				08	30
	10	Packing	73-31-01	01	30
				07	25
				08	25

C. References

(1) AMM 71-00-00/501, Power Plant

(2) AMM 71-11-04/201, Fan Cowl Panels

(3) AMM 71-11-06/201, Core Cowl Panels

(4) AMM 78-31-00/201, Thrust Reverser System

D. Access

(1) Location Zones

416 L Power Plant Fan Reverser

426 R Power Plant Fan Reverser

(2) Access Panels
416AR Fan Reverser (Right)
426AR Fan Reverser (Right)

E. Install the Fuel Flow Transmitter (Fig. 401)

S 434-030-N00
(1) Remove the protection covers.

S 644-031-N00
(2) Lubricate the packings (10) with petrolatum.

S 434-032-N00
(3) Install the packings (10) into the grooves in the forward mounting flange (6) and the telescoping adapter flange (3).

S 644-033-N00
(4) Lubricate the two sides of the gasket (4) with engine oil.

S 424-034-N00
(5) Put the gasket (4) and the fuel flow transmitter (5) to the forward mounting flange (6).
(a) Make sure to align the indexing pin.

S 424-062-N00
(6) ENGINES PRE-PW-SB 73-63;
Attach the forward end of the fuel flow transmitter (5) with the steps that follow:
(a) Lubricate the threads of the bolts (8) with engine oil.
(b) Attach the forward end of the fuel flow transmitter (5) to the forward mounting flange (6), bracket (7) and the HPC case bracket (29) with the bolts (8) and washers (9).
(c) Tighten the bolts (8) to 90-110 pound-inches (10.168-12.427 newton-meters).

S 424-063-N00
(7) ENGINES POST-PW-SB 73-63;
Attach the forward end of the fuel flow transmitter (5) with the steps that follow:
(a) Lubricate the threads of the bolts (8) with engine oil.
(b) Attach the forward end of the fuel flow transmitter (5) to the forward mounting flange (6) and the brackets (7 and 27) with the bolts (8) and washers (9).
(c) Tighten the bolts (8) to 90-110 pound-inches (10.168-12.427 newton-meters).
(d) Lubricate the threads of the bolts (25) with engine oil.
(e) Attach the bracket (27) and plate (28) to the HPC case bracket (26) with the bolts (25).
1) Tighten the bolts (25) with your hand.

S 644-037-N00
(8) Lubricate the two sides of the gasket (4) with engine oil.

S 434-038-N00
(9) Install the gasket (4) into the aft end of the fuel flow transmitter (5).

S 434-039-N00
(10) Install the telescoping adapter (2) to the fuel distribution valve (1).
(a) Extend the telescoping adapter (2) forward until the flange of the telescoping adapter is against the gasket (4).

S 434-040-N00
(11) Install the U-section (23) to the telescoping adapter (2).

S 644-041-N00
(12) Lubricate the threads of the bolts (24) with engine oil.

S 434-042-N00
(13) Install the bolts (24) and washers (25) to the forward end of the U-section (23), the telescoping adapter flange (3) and the aft end of the fuel flow transmitter (5).
(a) Tighten the bolts (24) to 90-110 pound-inches (10.168-12.427 newton meters).

S 434-043-N00
(14) Install the bracket (22) to the aft end of the U-section (23).

S 644-044-N00
(15) Lubricate the threads of the bolts (18) with engine oil.

S 434-045-N00
(16) Install the bolts (18) to the bracket (22), U-section (23) and the fuel distribution valve (1).
(a) Tighten the bolts (18) to 85-95 pound-inches (9.603-10.732 newton meters).

S 434-065-N00
(17) ENGINES POST-PW-SB 73-63;
Tighten the bolts (25) which attach the bracket (27) and plate (28) to the HPC case bracket (26) to 85-95 pound-inches (9.6-10.7 newton-meters).

S 644-046-N00
(18) Lubricate the threads of the bolts (12) with engine oil.

S 434-047-N00
(19) Install the clamps (13, 15, 21) to the bracket (22) with the bolts (12) and nuts (16).
(a) Tighten the bolts (12) to 36-40 pound-inches (4.067-4.519 newton meters).

S 434-048-N00
(20) Connect the electrical connector (11) to the fuel flow transmitter (5).

F. Put the Airplane Back to Its Usual Condition

S 414-049-N00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Close the right thrust reverser (AMM 78-31-00/201).

S 414-050-N00
(2) Close the right core cowl panel (AMM 71-11-06/201).

S 434-051-N00
(3) Close the fan cowl panel (AMM 71-11-04/201).

S 444-052-N00
(4) Do the activation procedure for the thrust reversers (AMM 78-31-00/201).

S 864-053-N00
(5) For the left engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P6 panel:
(a) 6E1, FUEL VALVE L SPAR

S 864-054-N00
(6) For the right engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P6 panel:
(a) 6E2, FUEL VALVE R SPAR

S 864-055-N00
(7) For the left engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P11 panel:
(a) 11D25, FUEL CONT VLV & EEC CHAN B RESET L

S 864-056-N00

(8) For the right engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P11 panel:
(a) 11D26, FUEL CONT VLV & EEC CHAN B RESET R

S 704-069-N00

(9) Do a test of the fuel flow transmitter that is shown in the Power Plant Test Reference Table (AMM 71-00-00/501).

FUEL PRESSURE INDICATING SYSTEM - DESCRIPTION AND OPERATION

1. General
   A. The engine fuel pressure is monitored by a pressure transmitter installed at the output of the first stage of the fuel pump. Fuel pressure indication is shown on the bottom EICAS display in the PERF/APU mode. The main system component is the engine fuel pump interstage pressure transmitter.
2. Component Details
   A. Engine Fuel Pump Interstage Pressure Transmitter (EFPIPT)
      (1) The EFPIPT is a two port differential pressure sensor with one port which is open to ambient conditions through a plug with vents.
      (2) The fuel pressure transmitter is an inductor, with a tap, energized by 28v ac. The core of the inductor is on a diaphragm, and moves as the fuel pressure changes. The motion of the core causes a change in the output voltage at the tap.
3. Operation
   A. Functional Description
      (1) The interstage fuel pressure applies a force on one side of the movable diaphragm, while the ambient pressure is on the other side. Thus, the fuel pressure shown is pressure - altitude compensated.
      (2) The diaphragm changes position as the differential pressure changes. The diaphragm position changes the quantity of the core material in the inductor, which changes the total inductance. The change in the inductance causes a change in the voltage at the tap. The EICAS computers changes the ac signal to a related fuel pressure indication.
   B. Fuel Pressure (FP) Indication
      (1) The fuel pressure data is shown on the bottom display of the EICAS in the PERF/APU mode.
      (2) The fuel pressure data is below the fuel flow (FF) indications in the lower right corner of the display. A cyan-colored label (FP) identifies the fuel pressure data. FP data is white in color and is in units of pounds/square inch.

FUEL PRESSURE INDICATING SYSTEM

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	AMM REFERENCE
CIRCUIT BREAKER –			FLIGHT COMPT, P11	
L ENG FUEL PRESS, C1415		1	11M7	*
R ENG FUEL PRESS, C1416		1	11M34	*
COMPUTER – (FIM 31-41-00/101)				
L EICAS, M10181				
R EICAS, M10182				
TRANSMITTER –				
L ENG FUEL PUMP INTERSTAGE PRESSURE, M7193	2	1	416AR, THRUST REVERSER	73-33-01
R ENG FUEL PUMP INTERSTAGE PRESSURE, M7193	2	1	426AR, THRUST REVERSER	73-33-01

* SEE THE WDM EQUIPMENT LIST

Fuel Pressure Indicating System – Component Index
Figure 101

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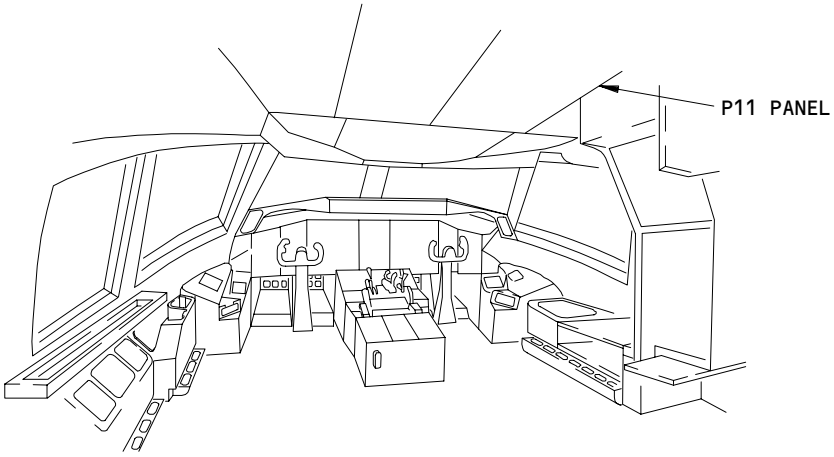
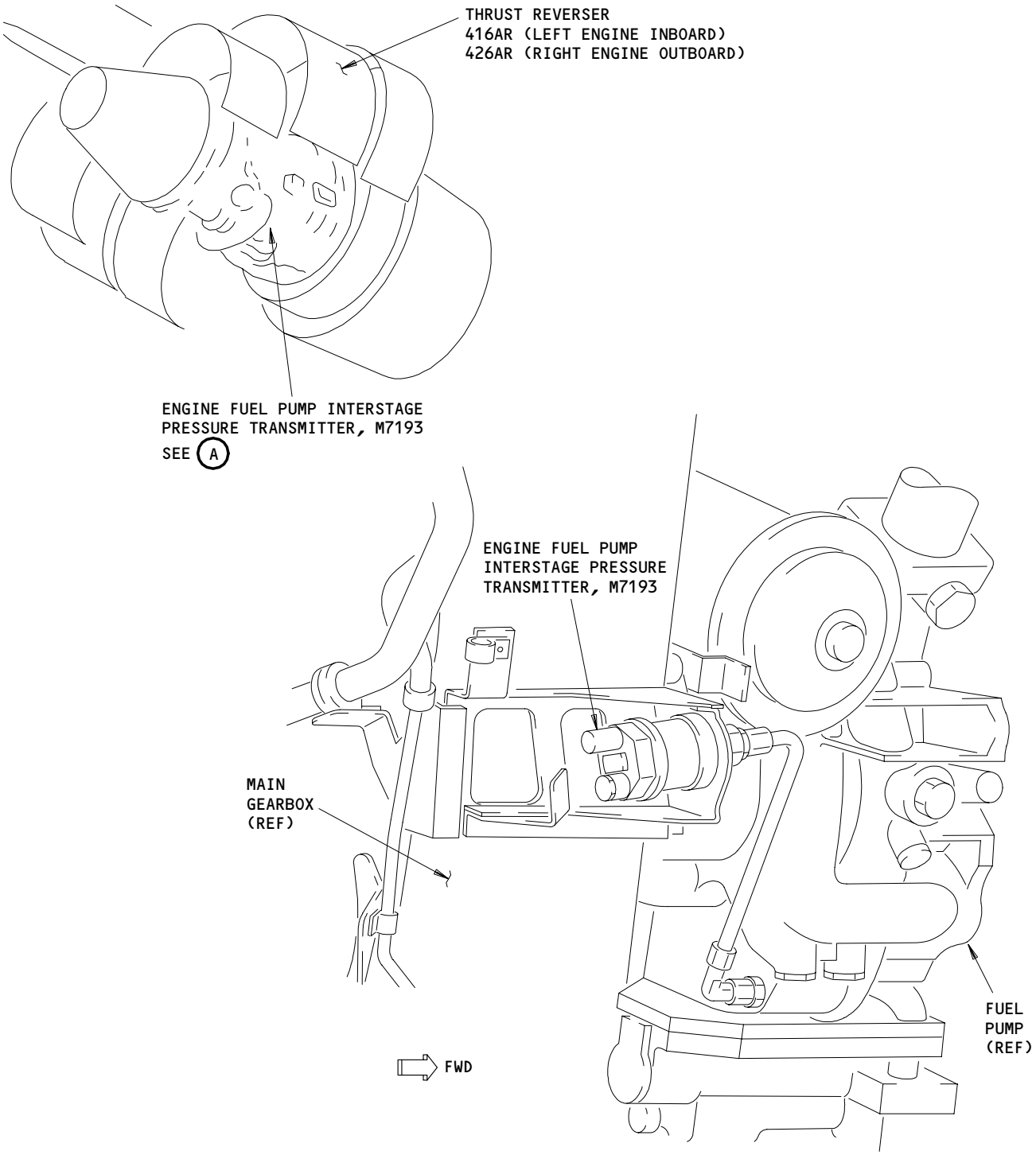


FLIGHT COMPARTMENT

Fuel Pressure Indicating System - Component Location
Figure 102 (Sheet 1)



ENGINE FUEL PUMP INTERSTAGE PRESSURE
TRANSMITTER, M7193

(A)

Fuel Pressure Indicating System – Component Location
Figure 102 (Sheet 2)

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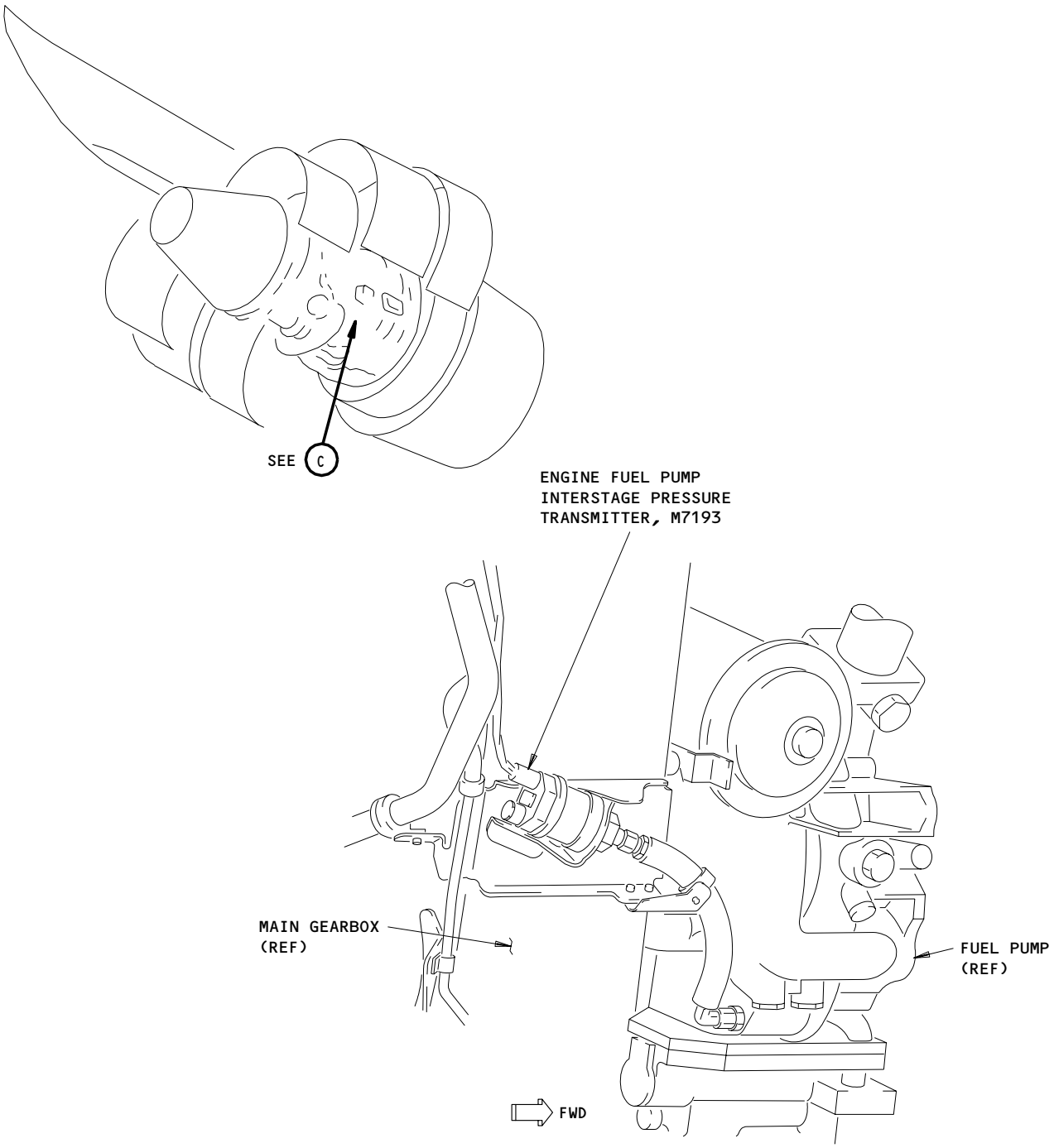


ENGINE FUEL PUMP INTERSTAGE PRESSURE
TRANSMITTER, M7193

C

Fuel Pressure Indicating System – Component Location
Figure 102 (Sheet 3)

ENGINE FUEL PUMP INTERSTAGE PRESSURE TRANSMITTER - REMOVAL/INSTALLATION

1. General
   A. The interstage pressure transmitter for the fuel pump is attached to the lower right side of the main gearbox. You can get access to the interstage pressure transmitter through the right thrust reverser.

TASK 73-33-01-004-001-N00

2. Remove the Engine Fuel Pump Interstage Pressure Transmitter
   A. Equipment
      (1) 5-gallon container for the fuel
   B. Consumable Materials
      (1) D00137 Engine Oil - PWA 521
      (2) D00504 Petrolatum - PMC-9609
   C. References
      (1) AMM 24-22-00/201, Electrical Power - Control
      (2) AMM 71-11-04/201, Fan Cowl Panels
      (3) AMM 71-11-06/201, Core Cowl Panels
      (4) AMM 78-31-00/201, Thrust Reverser
   D. Access
      (1) Location Zones
          416 L Power Plant Fan Reverser
          426 R Power Plant Fan Reverser

      (2) Access Panels
          416AR Fan Reverser (Right)
          426AR Fan Reverser

   E. Prepare to Remove the Interstage Pressure Transmitter for the Fuel Pump

      S 864-002-N00
      (1) Supply electrical power (AMM 24-22-00/201).

      S 864-003-N00
      (2) Do a check to make sure the applicable engine and spar valves are closed as follows:
          (a) For the left engine, make sure this circuit breaker on the main power distribution panel, P6, is closed:
              1) 6E1, FUEL VALVES L SPAR
          (b) For the right engine, make sure this circuit breaker on the main power distribution panel, P6, is closed:
              1) 6E2, FUEL VALVES R SPAR
          (c) For the left engine, make sure this circuit breaker on the overhead circuit breaker panel, P11, is closed:
              1) 11D25, FUEL CONT VLV & EEC CHAN B RESET L
          (d) For the right engine, make sure this circuit breaker on the overhead circuit breaker panel, P11, is closed:
              1) 11D26, FUEL CONT VLV & EEC CHAN B RESET R
          (e) Make sure that the applicable FUEL CONTROL switch is in the CUTOFF position.

(f) Make sure that the applicable ENG VALVE and SPAR VALVE panel lights on the control stand are not on.

S 864-004-N00

(3) For the left engine, open this circuit breaker on the main power distribution panel, P6, and attach the DO-NOT-CLOSE tag:
(a) 6E1, FUEL VALVES L SPAR

S 864-005-N00

(4) For the right engine, open this circuit breaker on the main power distribution panel, P6, and attach the DO-NOT-CLOSE tag:
(a) 6E2, FUEL VALVES R SPAR

S 864-006-N00

(5) For the left engine, open this circuit breaker on the overhead circuit breaker panel, P11, and attach the DO-NOT-CLOSE tag:
(a) 11D25, FUEL CONT VLV & EEC CHAN B RESET L

S 864-007-N00

(6) For the right engine, open this circuit breaker on the overhead circuit breaker panel, P11, and attach the DO-NOT-CLOSE tag:
(a) 11D26, FUEL CONT VLV & EEC CHAN B RESET R

S 864-008-N00

(7) Remove electrical power (AMM 24-22-00/201).

S 014-009-N00

(8) Open the right fan cowl panel (AMM 71-11-04/201).

S 044-010-N00

WARNING: DO THE THRUST REVERSER DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(9) Do this procedure: Thrust Reverser Deactivation for Ground Maintenance (AMM 78-31-00/201).

S 014-011-N00
(10) Open the right core cowl panel (AMM 71-11-06/201).

S 014-012-N00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(11) Open the right thrust reverser (AMM 78-31-00/201).

S 034-013-N00
(12) Disconnect the electrical connector (1) from the interstage pressure transmitter (2).

S 034-014-N00
(13) Install the protection covers on the electrical connectors (1).

F. Remove the Interstage Pressure Transmitter for the Fuel Pump (Fig. 401)

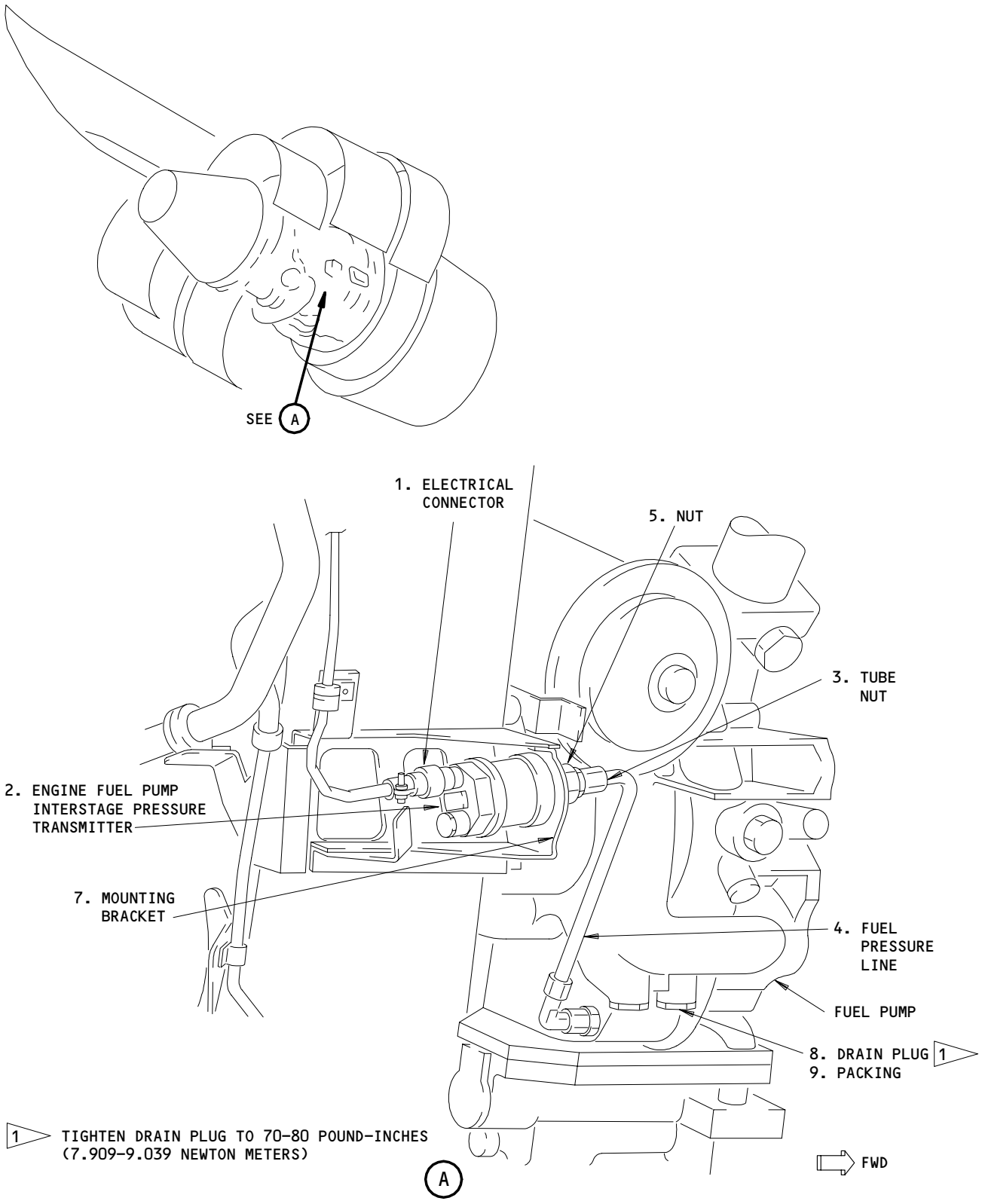
S 684-015-N00
(1) Put the container below the fuel pump.

S 034-016-N00
(2) Remove the drain plug (8) from the fuel pump.
(a) Let the fuel fully drain.
(b) Discard the packing (9) from the drain plug (8).

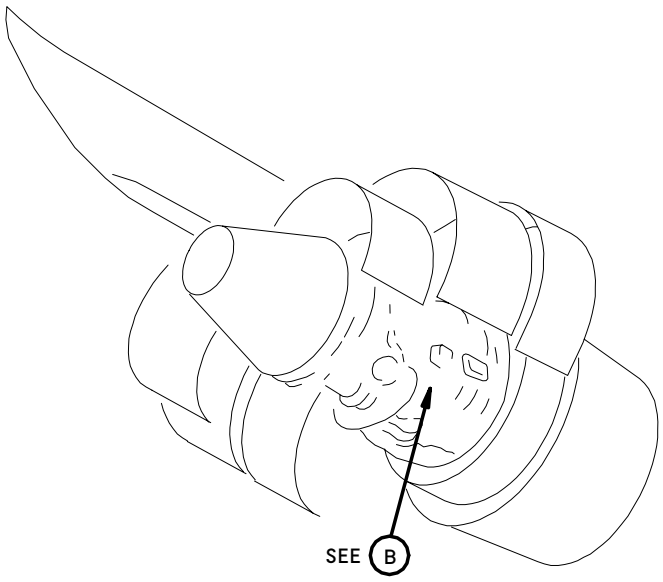
S 644-017-N00
(3) Lubricate the packing (9) with the petrolatum.

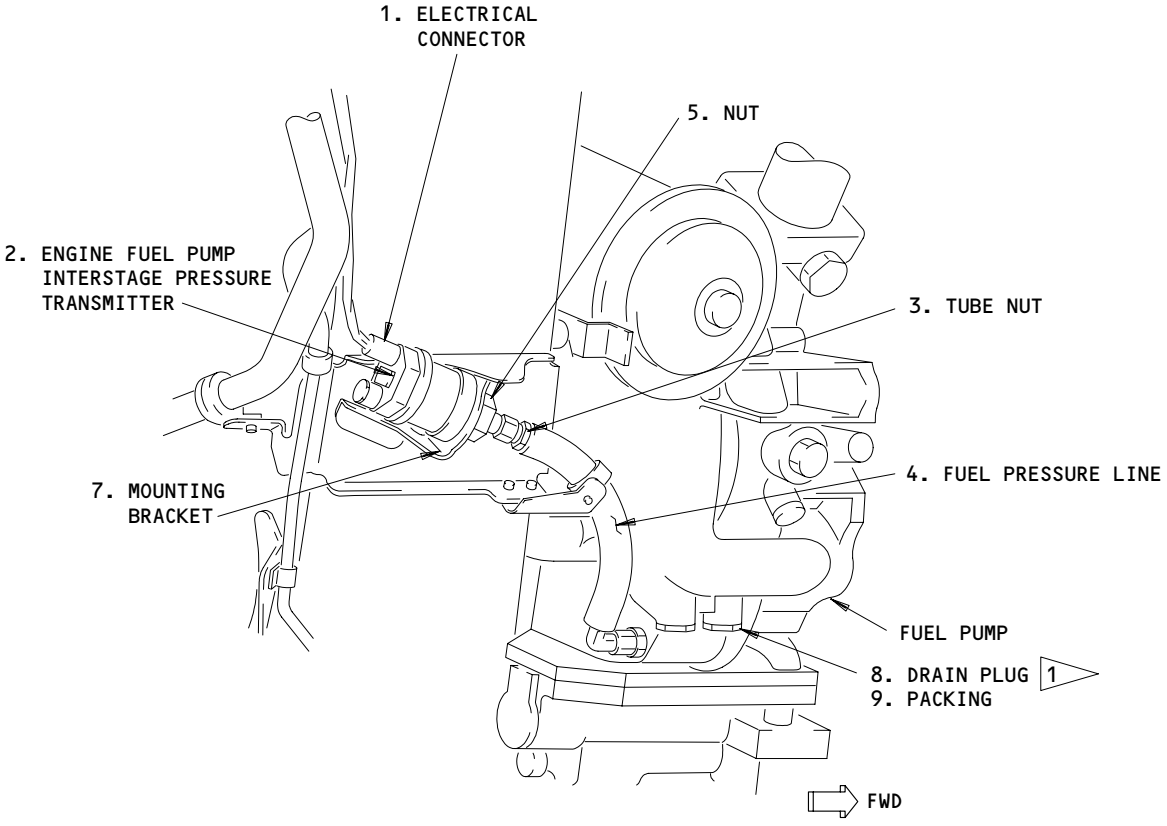
S 434-018-N00
(4) Install the packing (9) on the drain plug (8).

S 644-019-N00
(5) Lubricate the threads of the drain plug (8) with engine oil.



Engine Fuel Pump Interstage Pressure Transmitter
Figure 401 (Sheet 1)





Engine Fuel Pump Interstage Pressure Transmitter
Figure 401 (Sheet 2)

S 434-020-N00

(6) Install the drain plug (8) to the fuel pump.
  (a) Tighten the drain plug (8) to 70-80 pound-inches (7.909-9.039 newton-meters).
  (b) Install the lockwire to the drain plug (8).

S 024-036-N00

(7) ENGINES WITHOUT THE BRACKET WHICH ATTACHES THE FUEL PRESSURE LINE; Disconnect the interstage pressure transmitter (2) with the steps that follow:
  (a) Disconnect the tube nut (3) for the fuel pressure line (4) from the interstage pressure transmitter (2).
  (b) Remove the nut (5) which attaches the interstage pressure transmitter (2) to the mounting bracket (7).
  (c) Remove the interstage pressure transmitter (2) from the engine.

S 024-037-N00

(8) ENGINES WITH THE BRACKET WHICH ATTACHES THE FUEL PRESSURE LINE; Disconnect the interstage pressure transmitter (2) with the steps that follow:
  (a) Remove the bolt, clamp and nut which attach the flex hose to the bracket.
  (b) Disconnect the tube nut for the fuel pressure line from the interstage pressure transmitter (2).
  (c) Remove the nut which attaches the interstage pressure transmitter (2) to the mounting bracket.
  (d) Remove the interstage pressure transmitter (2) from the engine.

TASK 73-33-01-404-023-N00

3. Install the Engine Fuel Pump Interstage Pressure Transmitter

A. References
  (1) AMM 71-00-00/501, Power Plant
  (2) AMM 71-11-04/201, Fan Cowl Panels
  (3) AMM 71-11-06/201, Core Cowl Panels
  (4) AMM 78-31-00/201, Thrust Reverser

B. Access
  (1) Location Zones
    416 L Power Plant Fan Reverser
    426 R Power Plant Fan Reverser

  (2) Access Panels
    416AR Fan Reverser (Right)
    426AR Fan Reverser

C. Install the Interstage Pressure Transmitter for the Fuel Pump

S 424-024-N00

(1) Attach the interstage pressure transmitter (2) to the bracket (7) with the nut (5).

NOTE: Install the interstage pressure transmitter where the electrical connector is turned to the right side of the engine. This will make it easier to install the electrical connector around the mounting bracket for the interstage pressure transmitter.

(a) Install the lockwire to the nut (5).

S 434-039-N00

(2) ENGINES WITHOUT THE BRACKET WHICH ATTACHES THE FUEL PRESSURE LINE; Connect the fuel pressure line (4) with the steps that follow:
(a) Connect the fuel pressure line (4) to the interstage pressure transmitter (2).
1) Tighten the tube nut (3).

S 434-038-N00

(3) ENGINES WITH THE BRACKET WHICH ATTACHES THE FUEL PRESSURE LINE; Connect the fuel pressure line with the steps that follow:

CAUTION: DO NOT LET THE FUEL PRESSURE LINE TWIST WHEN YOU TIGHTEN THE END FITTINGS. YOU CAN CAUSE DAMAGE TO THE HOSE IF IT IS TWISTED.

(a) Connect the tube nut on the fuel pressure line to the interstage pressure transmitter (2).
1) Tighten the tube nut.
(b) Install the clamp to the fuel pressure line.
(c) Attach the clamp on the fuel pressure line to the bracket with the bolt and nut.
1) Tighten the bolt.

S 434-026-N00

(4) Connect the electrical connector (1) to the interstage pressure transmitter (2).
(a) Tighten the electrical connector (1) with your hand.

D. Put the Airplane Back to Its Usual Condition.

S 414-027-N00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT CAN occur.

(1) Close the right thrust reverser (AMM 78-31-00/201).

S 414-028-N00
(2) Close the right core cowl panel (AMM 71-11-06/201).

S 414-029-N00
(3) Close the fan cowl panels (AMM 71-11-04/201).

S 444-030-N00
(4) Do the activation procedure for the thrust reversers (AMM 78-31-00/201).

S 864-031-N00
(5) For the left engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P6 panel:
(a) 6E1, FUEL VALVES L SPAR

S 864-032-N00
(6) For the right engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P6 panel:
(a) 6E2, FUEL VALVES R SPAR

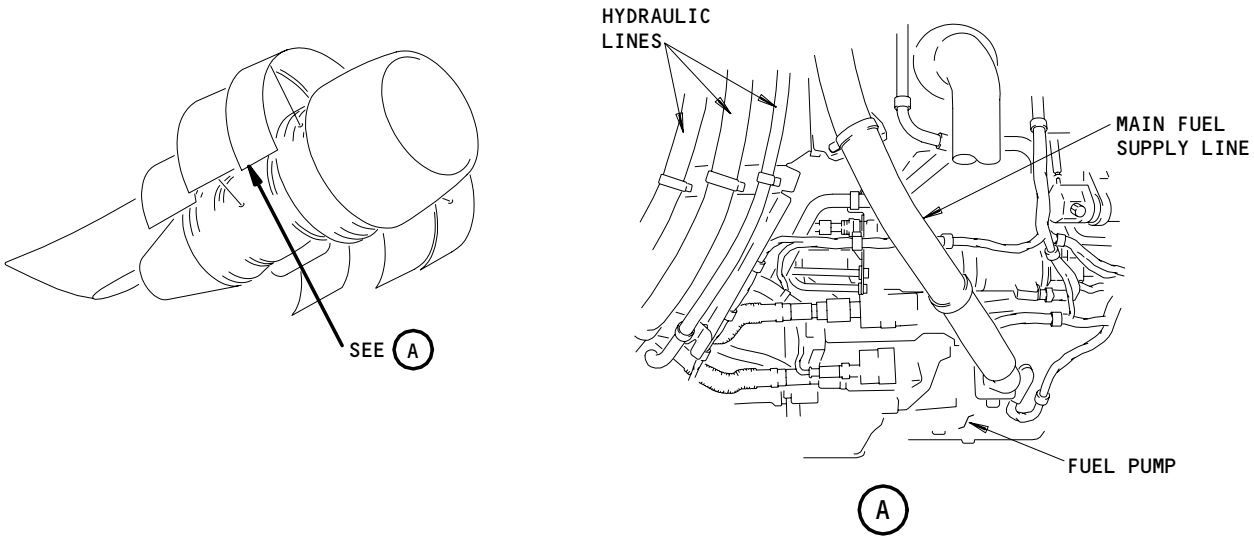
S 864-033-N00
(7) For the left engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P11 panel:
(a) 11D25, FUEL CONT VLV & EEC CHAN B RESET L

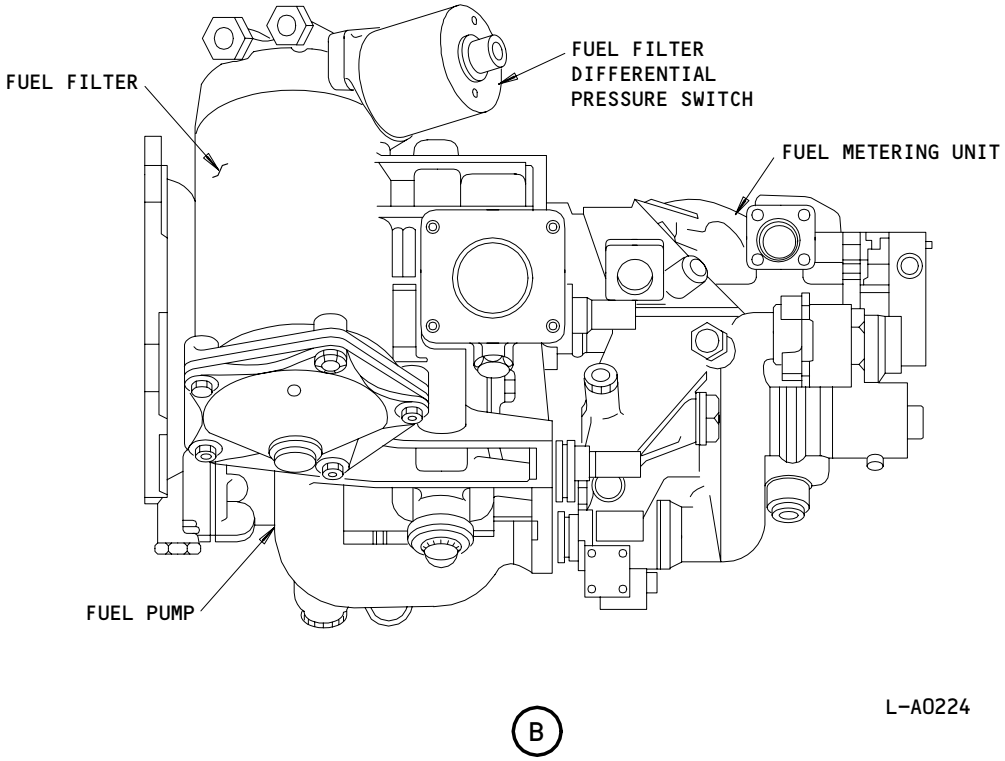
S 864-034-N00
(8) For the right engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P11 panel:
(a) 11D26, FUEL CONT VLV & EEC CHAN B RESET R

S 714-035-N00
(9) Do the test for the interstage pressure transmitter for the fuel pump that is shown in the Power Plant Test Reference Table (AMM 71-00-00/501).

FUEL FILTER BYPASS WARNING SYSTEM - DESCRIPTION AND OPERATION

1. General
   A. The bypass warning system for the fuel filter shows an impending fuel bypass of the fuel pump filter. The main system component is the differential pressure switch for the fuel pump filter.
2. Component Details (Fig. 1)
   A. Fuel Pump Filter Differential Pressure Switch (FPFDPS)
      (1) The FPFDPS is installed on the outboard side of the fuel pump. The differential pressure switch closes at an increasing differential pressure of 5.0-6.0 psid (34.5-41.4 kPad) and opens at a decreasing differential pressure of 3.0-4.0 psid (20.7-27.6 kPad).
3. Operation
   A. When the pressure decreases across the fuel pump filter is more than 19.5 psid, the FPFDS closes the circuit to ground. The ground signal lets an EICAS status/maintenance message, L (R) ENG FUEL FILT, and keeps the fault in the non-volatile memory.



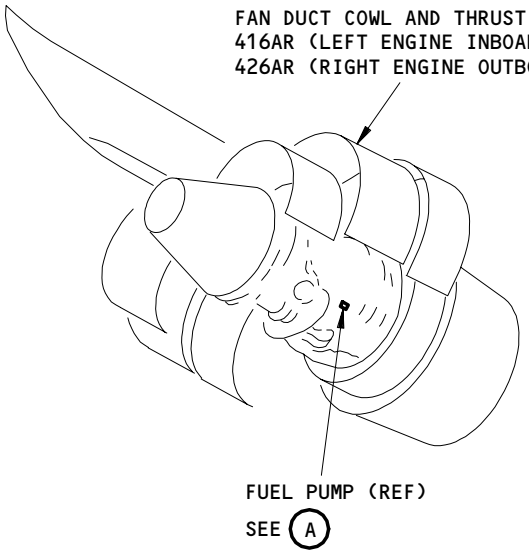


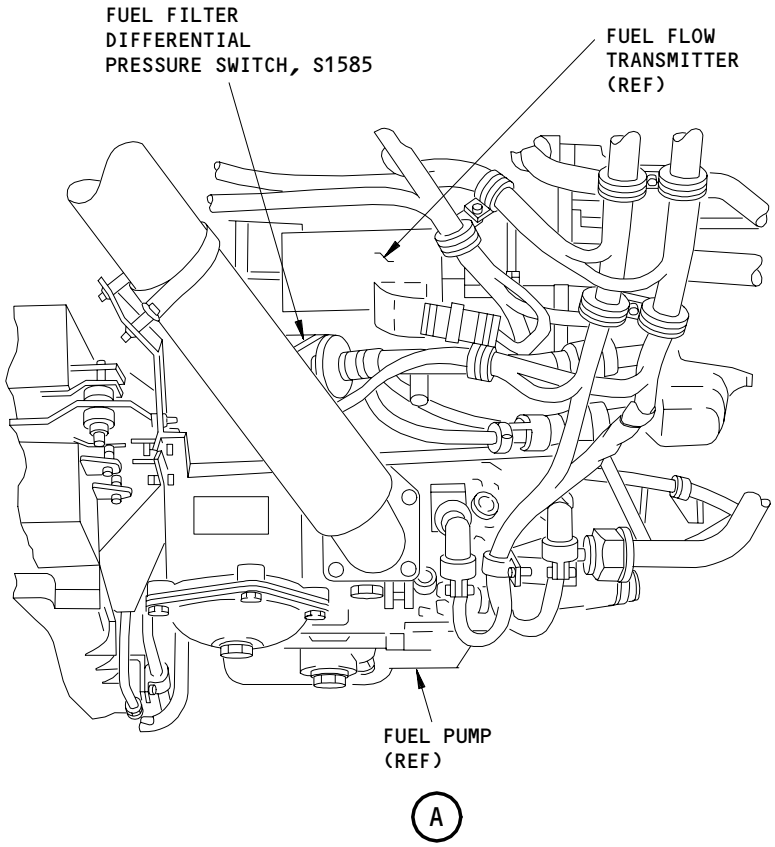
Fuel Filter Bypass Warning System
Figure 1

FUEL FILTER BYPASS WARNING SYSTEM

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	AMM REFERENCE
COMPUTER - (FIM 31-41-00/101) LEFT EICAS, M10181 COMPUTER - (FIM 31-41-00/101) RIGHT EICAS, M1082 SWITCH - FUEL FILTER DIFFERENTIAL PRESSURE, S1585	--	2	416AR, 426AR FAN DUCT COWL AND THRUST REVERSER, FUEL PUMP	73-34-01

Fuel Filter Bypass Warning System - Component Index
Figure 101





Fuel Filter Bypass Warning System - Component Location
Figure 102

FUEL FILTER BYPASS WARNING SYSTEM - ADJUSTMENT/TEST

1. General
   A. This test is to make sure the bypass warning system for the fuel filter operates correctly.

TASK 73-34-00-735-001-N00

2. System Test - Fuel Filter Bypass Warning System
   A. Equipment
      (1) Jumper wire
   B. References
      (1) AMM 24-22-00/201, Electrical Power - Control
      (2) AMM 71-11-04/201, Fan Cowl Panels
      (3) AMM 71-11-06/201, Core Cowl Panels
      (4) AMM 78-31-00/201, Thrust Reverser System
   C. Access
      (1) Location Zones
          416 L Power Plant Fan Reverser
          426 R Power Plant Fan Reverser

      (2) Access Panels
          416AR Fan Reverser (Right)
          426AR Fan Reverser (Right)

   D. Prepare to Do the System Test

      S 865-002-N00
      (1) Remove electrical power (AMM 24-22-00/201).

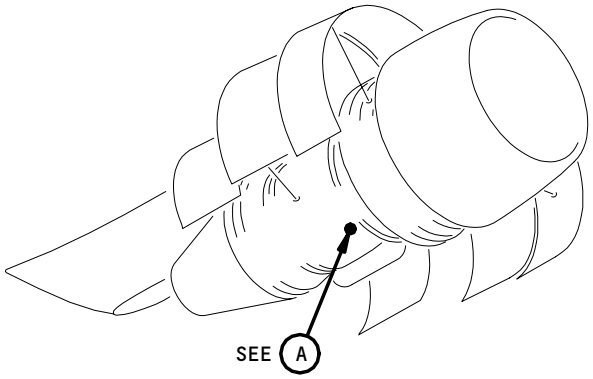
      S 015-003-N00
      (2) Open the right fan cowl panel (AMM 71-11-04/201).

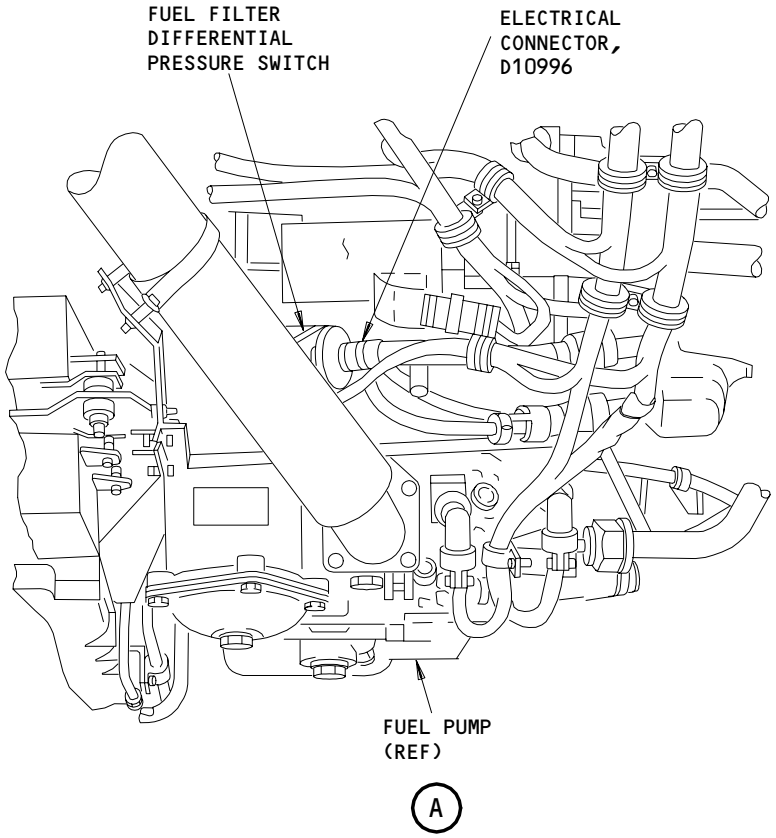
      S 045-004-N00

      WARNING: DO THE THRUST REVERSER DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

      (3) Do this procedure: Thrust Reverser Deactivation for Ground Maintenance (AMM 78-31-00/201).

      S 015-005-N00
      (4) Open the right core cowl panel (AMM 71-11-06/201).





Fuel Pump Filter Differential Pressure Switch Test
Figure 501

S 015-006-N00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(5) Open the right thrust reverser (AMM 78-31-00/201).

E. Do the System Test (Fig. 501)

S 035-007-N00

(1) Disconnect the electrical connector, D10996, from the differential pressure switch of the fuel filter.

S 495-008-N00

(2) Install the jumper wire from the pin A to the pin C of the harness connector.

S 865-009-N00

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

S 215-010-N00

(4) Make sure STATUS shows on the bottom EICAS display in the top, left corner.

S 865-011-N00

(5) Push the STATUS button on the select panel of the EICAS display to make sure this EICAS messsage, L(R) ENG FUEL FILT, shows on the bottom display.

S 095-012-N00

(6) Remove the jumper wire.

S 865-013-N00

(7) Push the STATUS button.

S 865-014-N00
(8) Push the ECS/MSG switch on the EICAS MAINT panel to make sure this EICAS message, L(R) ENG FUEL FILT, shows on the bottom display.

S 865-015-N00
(9) If the EICAS messages on the maintenance pages are not necessary, push and hold the ERASE button on the EICAS MAINT panel until the EICAS messages do not show.

S 865-016-N00
(10) Remove electrical power (AMM 24-22-00/201).

S 435-017-N00
(11) Install the electrical connector, D10996.
(a) Tighten the electrical connector with your hand.

F. Put the Airplane Back to Its Usual Condition

S 415-018-N00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Close the right thrust reverser (AMM 78-31-00/201).

S 415-019-N00
(2) Close the right core cowl panel (AMM 71-11-06/201).

S 415-020-N00
(3) Close the right fan cowl panel (AMM 71-11-04/201).

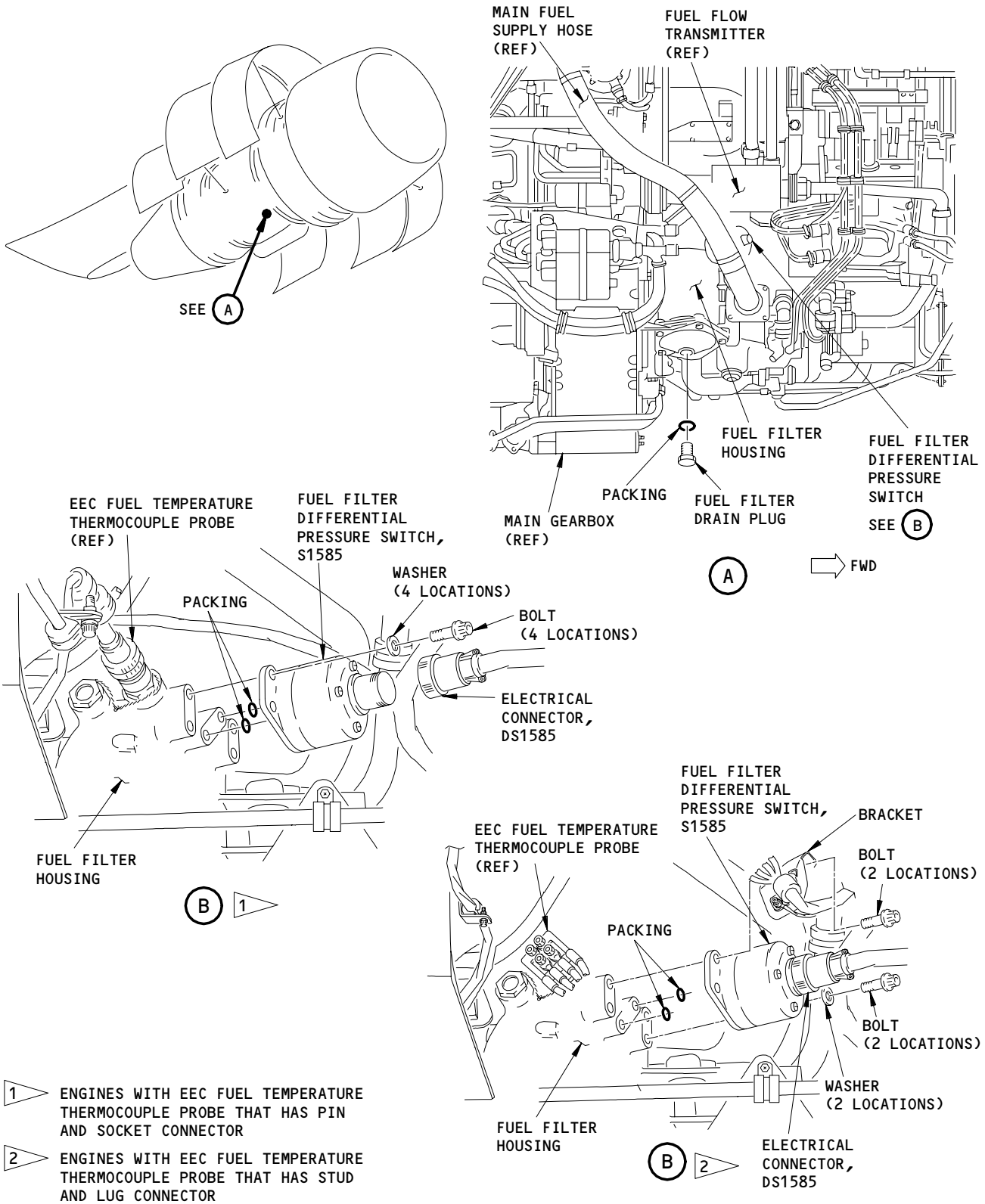
S 445-021-N00
(4) Do the activation procedure for the thrust reversers (AMM 78-31-00/201).

FUEL PUMP FILTER DIFFERENTIAL PRESSURE SWITCH - REMOVAL/INSTALLATION

1. General
   A. The differential pressure switch for the fuel pump is installed on the fuel pump.

TASK 73-34-01-004-001-N00

2. Remove the Fuel Pump Filter Differential Pressure Switch (Fig. 401)
   A. Equipment
      (1) Five gallon (20 liter) container for the fuel.
      (2) M303, M305, or M307 Bergen Mechanical Crimper (Optional)
          Bergen Cable Technologies Inc
          170 Gregg St
          P.O. Box 1300
          Lodi, NJ 07644-9982
   B. Consumable Materials
      (1) D00137 Oil, PWA-521
      (2) G02334 Lockwire - AS3214-02
      (3) G02332 Ferrule - P05-292 (Optional)
      (4) G02335 Cable - Safety - P05-291 (Optional)
      (5) D00504, Petrolatum - PMC 9609
   C. References
      (1) AMM 71-00-00/501, Power Plant
      (2) AMM 71-11-04/201, Fan Cowl Panels
      (3) AMM 71-11-06/201, Core Cowl Panels
      (4) AMM 78-31-00/201, Thrust Reverser System
   D. Access
      (1) Location Zone
          413 Fan cowl panel (Left)
          414 Fan cowl panel (Right)
          415 Fan reverser (Left)
          416 Fan reverser (Right)
          417 Core cowl (Left)
          418 Core cowl (Right)
          423 Fan cowl panel (Left)
          424 Fan cowl panel (Right)
          425 Fan reverser (Left)
          426 Fan reverser (Right)
          427 Core cowl (Left)
          428 Core cowl (Right)



1 ENGINES WITH EEC FUEL TEMPERATURE THERMOCOUPLE PROBE THAT HAS PIN AND SOCKET CONNECTOR

2 ENGINES WITH EEC FUEL TEMPERATURE THERMOCOUPLE PROBE THAT HAS STUD AND LUG CONNECTOR

Fuel Filter Differential Pressure Switch Installation
Figure 401

(2) Access Panel
413 Fan cowl panel (Left)
414 Fan cowl panel (Right)
415 Fan reverser (Left)
416 Fan reverser (Right)
417 Core cowl (Left)
418 Core cowl (Right)
423 Fan cowl panel (Left)
424 Fan cowl panel (Right)
425 Fan reverser (Left)
426 Fan reverser (Right)
427 Core cowl (Left)
428 Core cowl (Right)

E. Prepare for Removal

S 864-002-N00
(1) Supply electrical power (AMM 24-22-00/201).

S 864-003-N00
(2) Make sure that applicable engine and spar valves are closed as follows:
(a) Make sure this circuit breaker on the main power distribution panel P6 is closed:
1) For the left engine:
a) 6E1, FUEL VALVES L SPAR
2) For the right engine:
a) 6E2, FUEL VALVES R SPAR
(b) Make sure this circuit breaker on the overhead panel P11 is closed:
1) For the left engine:
a) 11D25, FUEL CONT VLV & EEC CHAN B RESET L
2) For the right engine:
a) 11D26, FUEL CONT VLV & EEC CHAN B RESET R
(c) Make sure that the applicable FUEL CONTROL switch is in the CUTOFF position.
(d) Make sure that the applicable ENG VALVE and SPAR VALVE panel lights on the control stand are off.

S 864-004-N00
(3) Open this circuit breaker on the main power distribution panel P6 and attach a DO-NOT-CLOSE tag:
(a) For the left engine:
1) 6E1, FUEL VALVES L SPAR
(b) For the right engine:
1) 6E2, FUEL VALVES R SPAR

S 864-005-N00
(4) Open this circuit breaker on the overhead panel P11 and attach a DO-NOT-CLOSE tag:
(a) For the left engine:
1) 11D25, FUEL CONT VLV & EEC CHAN B RESET L

(b) For the right engine:
1) 11D26, FUEL CONT VLV & EEC CHAN B RESET R

S 864-006-N00

(5) Remove electrical power (AMM 24-22-00/201).

S 014-007-N00

(6) Open the right fan cowl panel (AMM 71-11-04/201).

S 864-008-N00

WARNING: DO THE THRUST REVERSER DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(7) Do this procedure: Thurust Reverser Deactivation for Ground Maintenance (AMM 78-31-00/201).

S 014-009-N00

(8) Open the right core cowl panel (AMM 71-11-06/201).

S 014-010-N00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(9) Open the right thrust reverser (AMM 78-31-00/201).

F. Remove the Fuel Pump Filter Differential Presure Switch

S 684-041-N00

WARNING: DO NOT LET ENGINE FUEL STAY ON YOUR SKIN FOR A LONG TIME. THE FUEL IS POISONOUS AND CAN GO THROUGH YOUR SKIN.

(1) Drain the fuel from the fuel filter housing.
(a) Put the container below the drain plug for the fuel filter.
(b) Remove the lockwire or safety cable from the drain plug.
(c) Remove the drain plug from the center of the fuel pump filter cover.
1) Let the fuel drain into the container.
2) Discard the packing on the drain plug.
(d) Lubricate the new packing with the petrolatum.
(e) Install the new packing on the drain plug.
(f) Lubricate the threads of the drain plug with engine oil.
(g) Install the drain plug in the center opening on the fuel filter cover.
1) Tighten the drain plug to 45-55 pound-inches (5.1-6.2 newton-meters).

2) Install the lockwire or the safety cable and safety cable ferrule to the drain plug.

S 034-011-N00

(2) Remove the electrical connector from the differential pressure switch.
(a) Install the protection cap on the electrical connector.

S 034-029-N00

(3) ENGINES WITHOUT THE THERMOCOUPLE PROBE FOR THE EEC FUEL TEMEPRATURE; Remove the four bolts and washers which attach the differential pressure switch to the fuel pump.

S 034-030-N00

(4) ENGINES WITH THE THERMOCOUPLE PROBE FOR THE EEC FUEL TEMPERATURE; Remove the four bolts and two washers which attach the differential pressure switch and bracket to the fuel pump.

S 024-014-N00

(5) Remove the differential pressure switch from the fuel pump.
(a) Discard the packings.

S 034-015-N00

(6) Install a protection cap on the fuel pump.

TASK 73-34-01-404-016-N00

3. Install the Fuel Pump Filter Differential Pressure Switch (Fig. 401)

A. Consumable Materials
(1) D00137 Engine Oil - PWA 521
(2) D00504, Petrolatum - PMC 9609

B. References
(1) AMM 71-00-00/501, Power Plant
(2) AMM 71-11-04/201, Fan Cowl Panels
(3) AMM 71-11-06/201, Core Cowl Panels
(4) AMM 78-31-00/201, Thrust Reverser System

C. Access
(1) Location Zone

413	Fan cowl panel (Left)
414	Fan cowl panel (Right)
415	Fan reverser (Left)
416	Fan reverser (Right)
417	Core cowl (Left)
418	Core cowl (Right)
423	Fan cowl panel (Left)
424	Fan cowl panel (Right)
425	Fan reverser (Left)
426	Fan reverser (Right)
427	Core cowl (Left)
428	Core cowl (Right)

(2) Access Panel
413 Fan cowl panel (Left)
414 Fan cowl panel (Right)
415 Fan reverser (Left)
416 Fan reverser (Right)
417 Core cowl (Left)
418 Core cowl (Right)
423 Fan cowl panel (Left)
424 Fan cowl panel (Right)
425 Fan reverser (Left)
426 Fan reverser (Right)
427 Core cowl (Left)
428 Core cowl (Right)

D. Install the Fuel Pump Filter Differential Pressure Switch

S 434-017-N00
(1) Remove the cover from the fuel pump.

S 644-031-N00
(2) Lubricate the packings for the fuel pump ports with the petrolatum.

S 434-032-N00
(3) Install the packings in the recesses of the fuel pump ports.

S 424-034-N00
(4) ENGINES WITHOUT THE THERMOCOUPLE PROBE FOR THE EEC FUEL TEMPERATURE; Install the differential pressure switch with the steps that follow:
(a) Lubricate the threads of the bolts, which attach the differential pressure switch, with engine oil.
(b) Install the differentail pressure switch on the fuel pump with the bolts and washers.
(c) Tighten the bolts to 85-95 pound-inches (9.6-10.7 newton-meters).

S 424-036-N00
(5) ENGINES WITH THE THERMOCOUPLE PROBE FOR THE EEC FUEL TEMPERATURE; Install the differential pressure switch with the steps that follow:

(a) Lubricate the threads of the bolts, which attach the differential pressure switch, with engine oil.
(b) Install the differential pressure switch with the bracket on the fuel pump with the bolts and two washers.

NOTE: Install the washers below the bolt heads that do not attach the bracket to the fuel pump.

(c) Tighten the bolts to 85-95 pound-inches (9.6-10.7 newton-meters).

S 434-038-N00
(6) Remove the protection cap from the electrical connector.

S 434-020-N00
(7) Install the electrical connector on the differential pressure switch.
(a) Tighten the electrical conector with your hand.

E. Put the Airplane Back to its Usual Condition

S 414-021-N00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 TO CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Close the right thrust reverser (AMM 78-31-00/201).

S 414-022-N00
(2) Close the right core cowl panel (AMM 71-11-06/201).

S 444-037-N00
(3) Do the activation procedure for the thrust reversers (AMM 78-31-00/201).

S 414-024-N00
(4) Close the right fan cowl panel (AMM 71-11-04/201).

S 864-025-N00

(5) Remove the DO-NOT-CLOSE tag and close this circuit breaker on the main power distribution panel P6:
   (a) For the left engine:
      1) 6E1, FUEL VALVES L SPAR
   (b) For the right engine:
      1) 6E2, FUEL VALVES R SPAR

S 864-026-N00

(6) Remove the DO-NOT-CLOSE tag and close this circuit breaker on the overhead panel P11:
   (a) For the left engine:
      1) 11D25, FUEL CONT VLV & EEC CHAN B RESET L
   (b) For the right engine:
      1) 11D26, FUEL CONT VLV & EEC CHAN B RESET R

S 794-027-N00

(7) Do the test of the Fuel Pump Filter Differential Pressure Switch that is shown in the Power Plant Test Reference Table (AMM 71-00-00/501).