CHAPTER

79

OIL

MD-80
AIRCRAFT MAINTENANCE MANUAL

CHAPTER 79
OIL

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

79-EFFECTIVE PAGES

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AIRCRAFT MAINTENANCE MANUAL

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CHAPTER 79
OIL

OIL - DESCRIPTION AND OPERATION

1. General

A. The engine oil system is of a self-contained high-pressure design which supplies lubrication to the main engine bearings and accessory drives. A scavenge system removes oil from the bearing compartments and accessories and returns the oil to the tank. A breather system interconnects the individual bearing compartments to the oil tank. Oil system pressure and temperature are regulated within specified limits.

B. The oil system consists of a supply tank, pressure, scavenge, and breather system, and provisions for filtering and cooling the oil. System operating conditions are displayed in the flight compartment by oil quantity, pressure, and temperature indicators located on the center instrument panel. In addition, a low-pressure caution switch and a filter differential pressure (strainer clogging) switch are provided to actuate annunciator caution indications.

2. Storage

A. The engine oil tank is used to store and supply deaerated oil to the engine oil pump and lubricating system. The tank is provided with a scupper drain sump and drain line connection, self-locking filler cap and dipstick, internal baffle, internal deaerator, two sight gauges, drain valve, filler strainer, and outlet strainer. In addition, three external mounting flanges are provided. Two of the flanges are capped, the third, at the bottom of the tank, provides a mounting for the oil quantity transmitter. For a complete description of storage system, refer to STORAGE - DESCRIPTION AND OPERATION, PAGEBLOCK 79-10-00/001.

3. Distribution

A. The engine is equipped with a high-pressure oil system to lubricate and cool the engine bearings and accessory drives.

B. The system consists of the main oil pump, oil pressure relief valves, main oil filter, fuel/oil filter, fuel/oil cooler, oil scavenge pumps and external tubes. For a complete description and operation of the distribution system, refer to DISTRIBUTION, SUBJECT 79-20-00.

4. Indicating

A. Engine oil indicating systems are provided to monitor oil pressure, oil quantity, oil temperature, low oil pressure and oil strainer clogging. The information is indicated on a cockpit warning display in the flight compartment. For a complete description of the indicating system, refer to INDICATING, SUBJECT 79-30-00.

5. Operation

A. Oil is gravity fed from the tank to the main oil pump where the pressure pump forces the oil through an internal passage of the accessory drive case to the main oil filter where it is filtered through a filter element. Oil flows through the filter and another internal passage of the accessory drive case to the pressure relief valve. If filter clogging occurs, a bypass valve incorporated in the center of the element opens allowing continuous oil flow. When the pressure drop across the filter exceeds 35(±2) psig, the filter differential pressure switch actuates, completes a circuit, creating a cockpit warning indication. Oil from the filter leaves the accessory drive case and flows into the fuel/oil cooler where it is cooled by circulating around the core of the fuel coolant tubes. If obstruction occurs in the fuel/oil cooler, a bypass valve opens allowing continuous oil flow. As the oil flows out of the fuel/oil cooler, the oil temperature sensor senses the temperature of the oil. The flow continues through an external tube to the inlet case. At this point, the oil pressure transmitter and the low-pressure warning switch sense the system pressure before oil enters the engine. If the system pressure drops below 35(±1) psig, the low-pressure warning switch actuates, completes a circuit, creating a cockpit warning indication. From the inlet case, oil is conducted through internal tubes and screens, metering orifices and clearances, to the engine bearings and drives. As the bearings and drives are lubricated, cavities collect the excess oil. The scavenge pumps force this oil through the scavenge tubes to the accessory drive case sump. Oil is pumped from the sump to the oil tank through the internal deaerator which removes the major part of the air collected from the system. Proper oil flow and scavenge pump operation is maintained by the breather system which balances the internal oil cavity pressure. The breather tubes conduct this pressure to the accessory drive case where the oil-laden air passes through rotary breather impellers mounted on the starter drive gearshaft, to remove the oil. The relatively oil-free air reaching the center of the gearshaft is vented overboard.

LUBRICATION SYSTEM -- TROUBLESHOOTING

1. General

A. For engine lubrication system and subsystem troubleshooting procedures, refer to ENGINE GENERAL - TROUBLESHOOTING -02 (LUBRICATION SYSTEM), PAGEBLOCK 72-00-02/101.

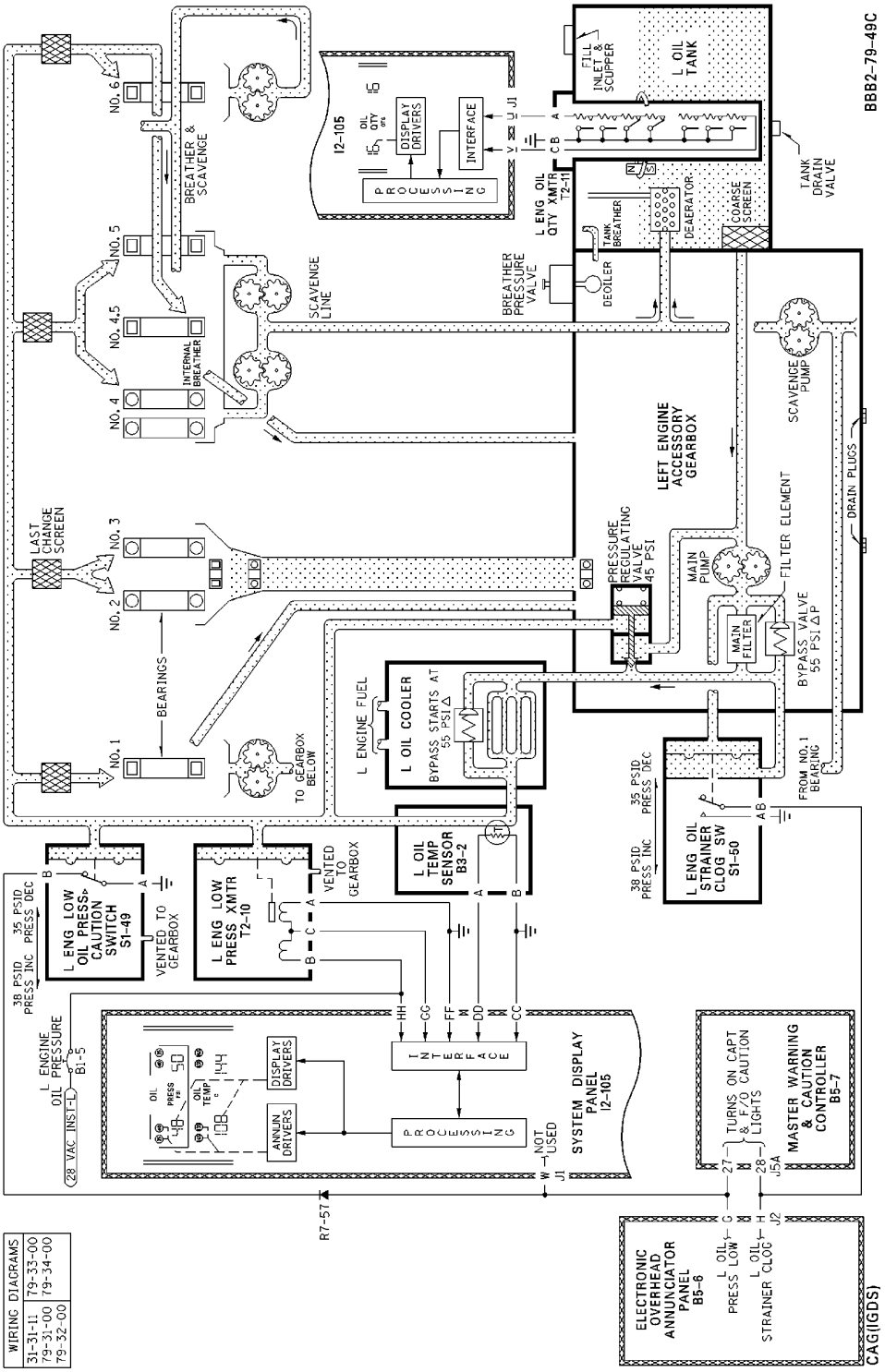
WJE 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893

B. For engine lubrication system indicating troubleshooting procedures, refer to INDICATING - TROUBLE SHOOTING, PAGEBLOCK 79-30-00/101 Config 1.

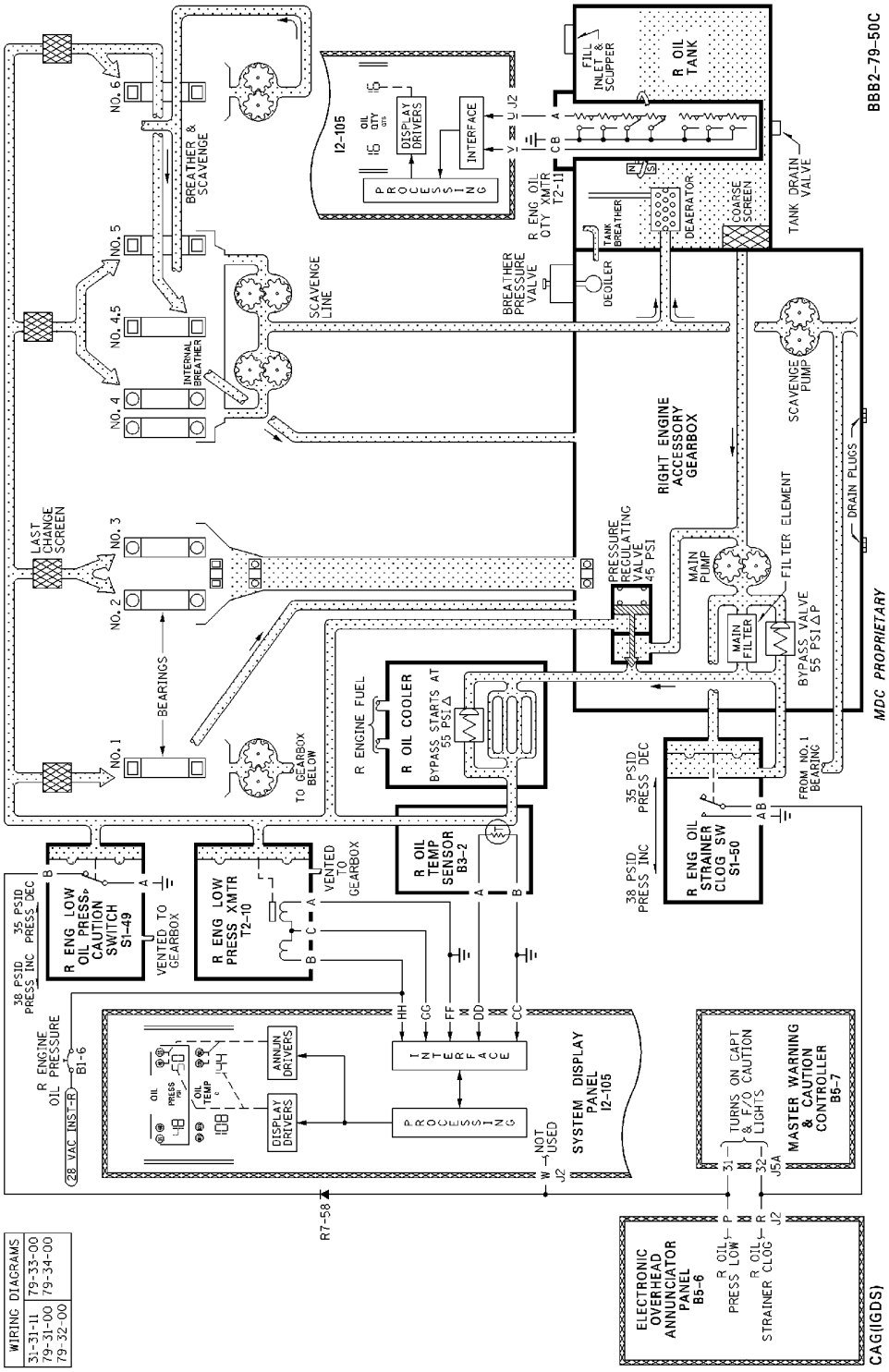
WJE 401-406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887

C. For engine lubrication system indicating troubleshooting procedures, refer to INDICATING - TROUBLE SHOOTING, PAGEBLOCK 79-30-00/101 Config 2.

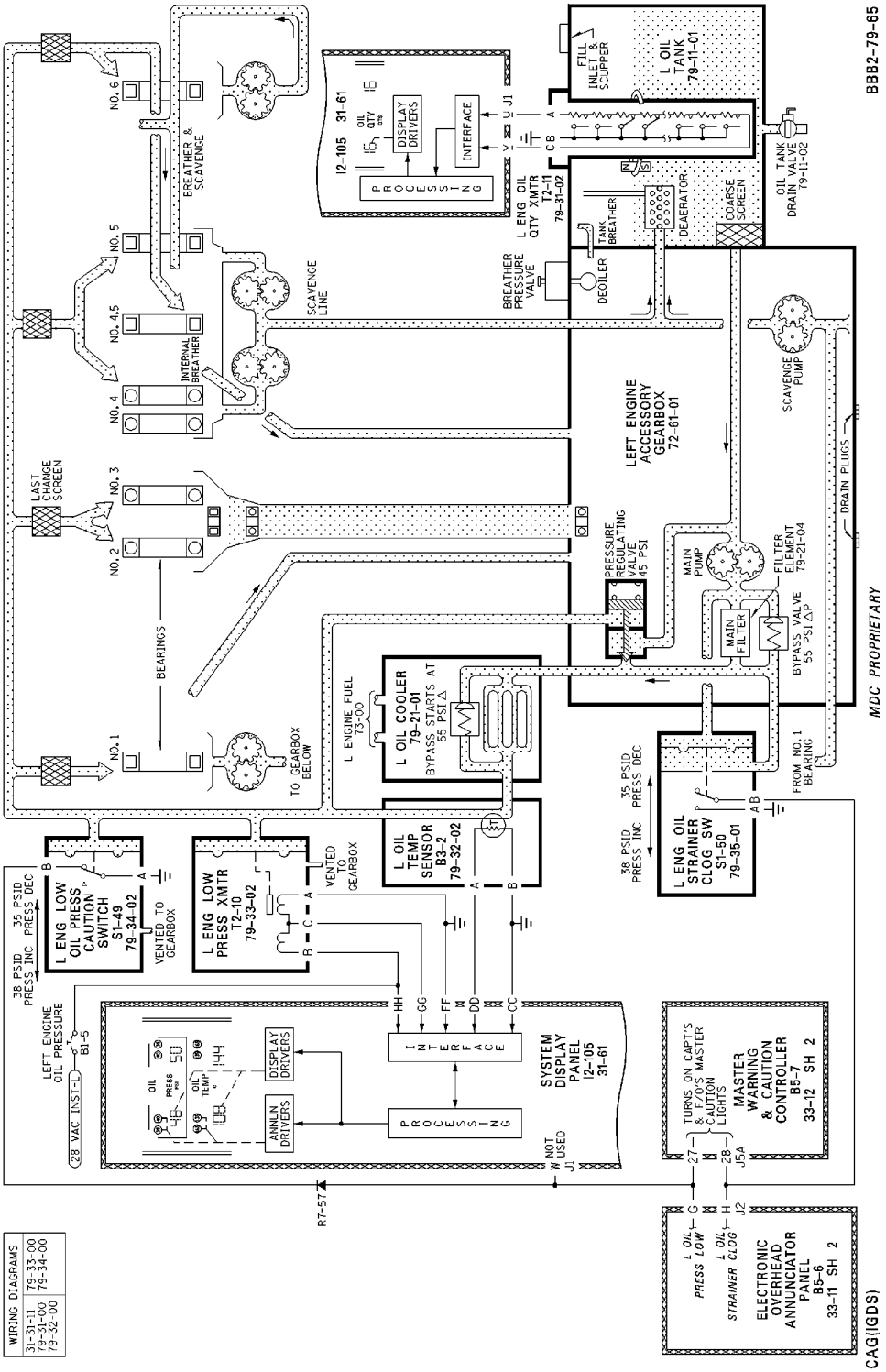
WJE ALL



Engine Lubrication System -- Trouble Shooting
Figure 101/79-00-00-990-811 (Sheet 1 of 12)



Engine Lubrication System -- Trouble Shooting
Figure 101/79-00-00-990-811 (Sheet 2 of 12)



Engine Lubrication System -- Trouble Shooting
Figure 101/79-00-00-990-811 (Sheet 3 of 12)

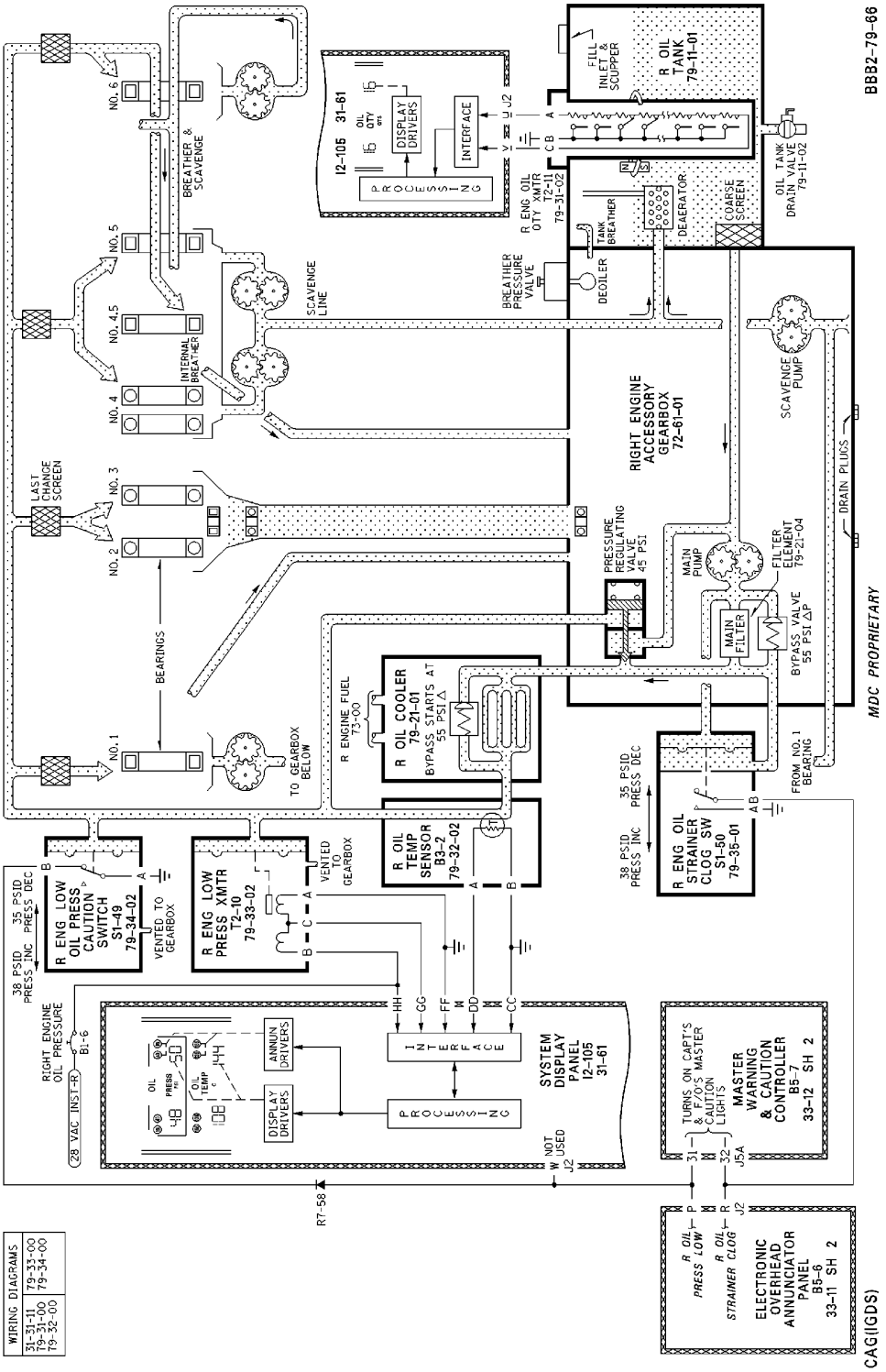


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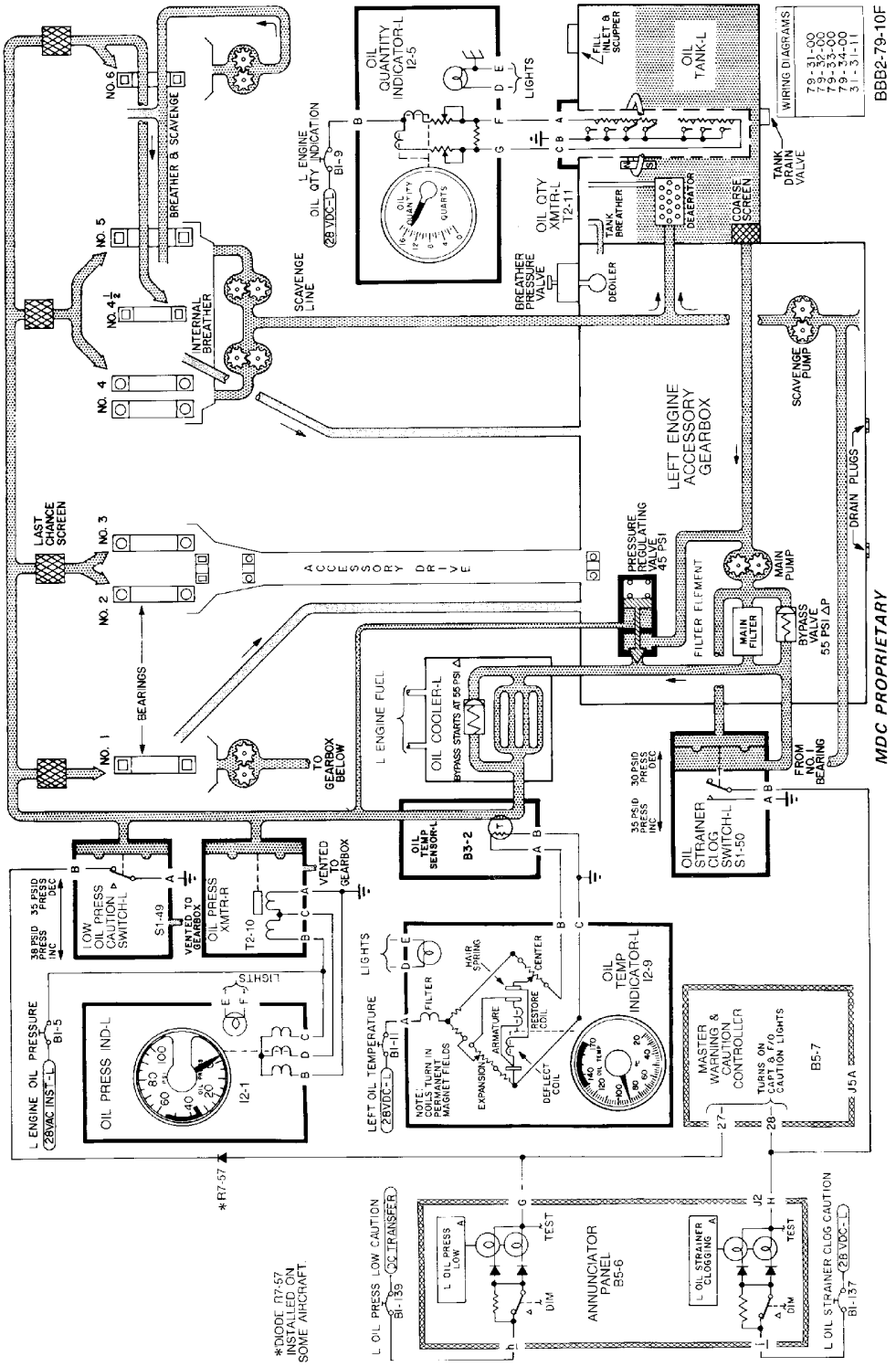
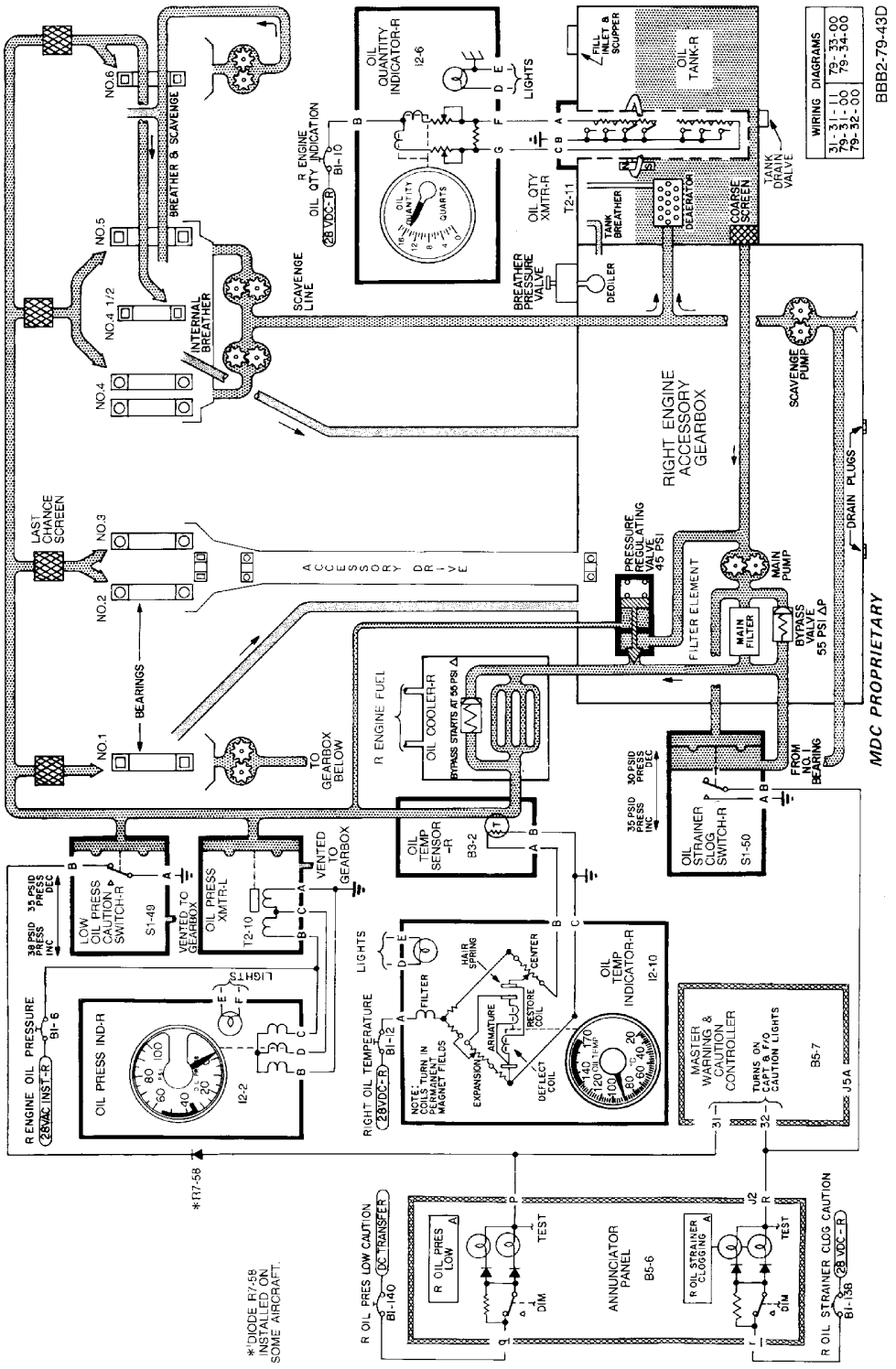
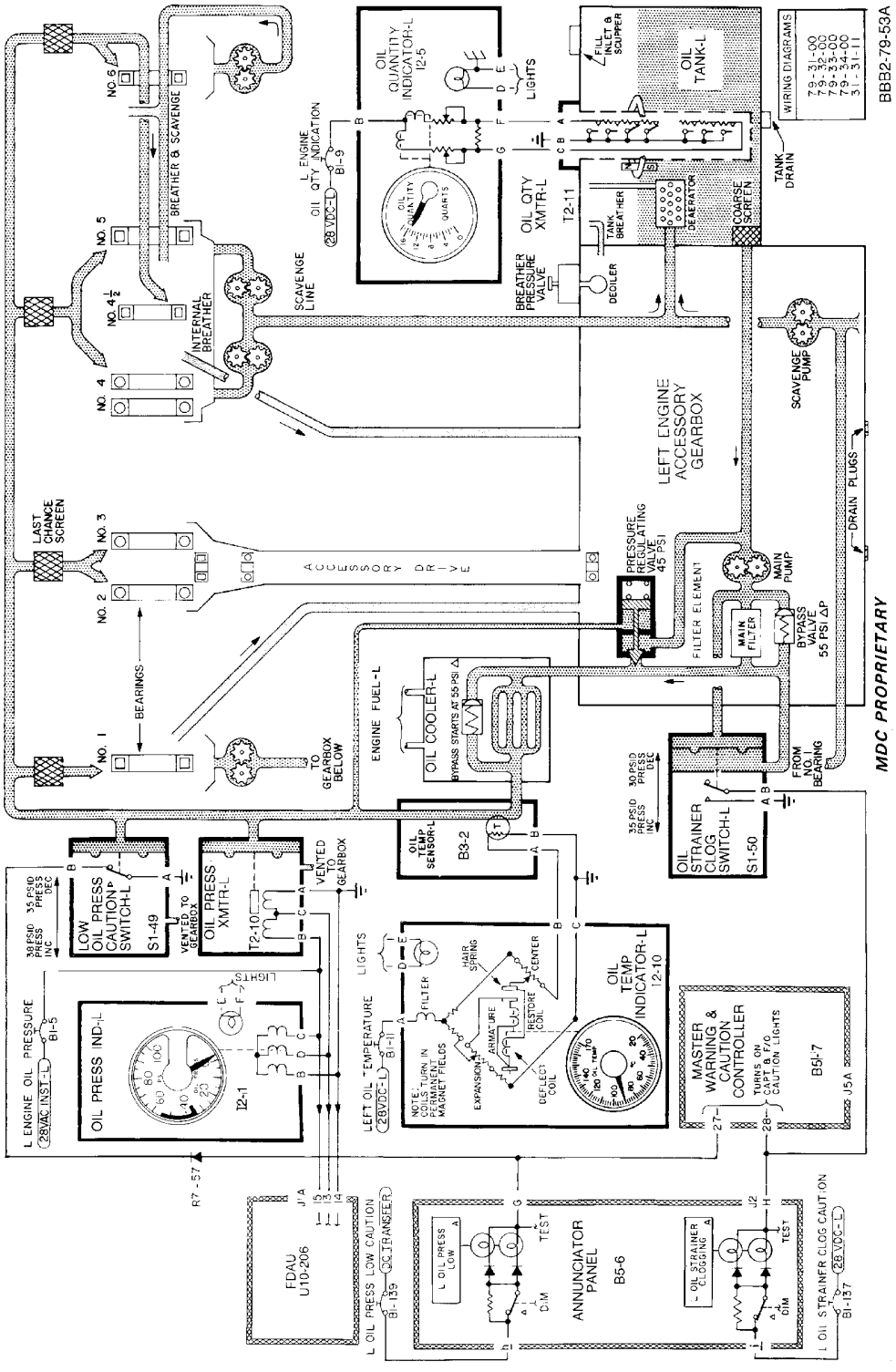
Figure 101/79-00-00-990-811 (Sheet 4 of 12)



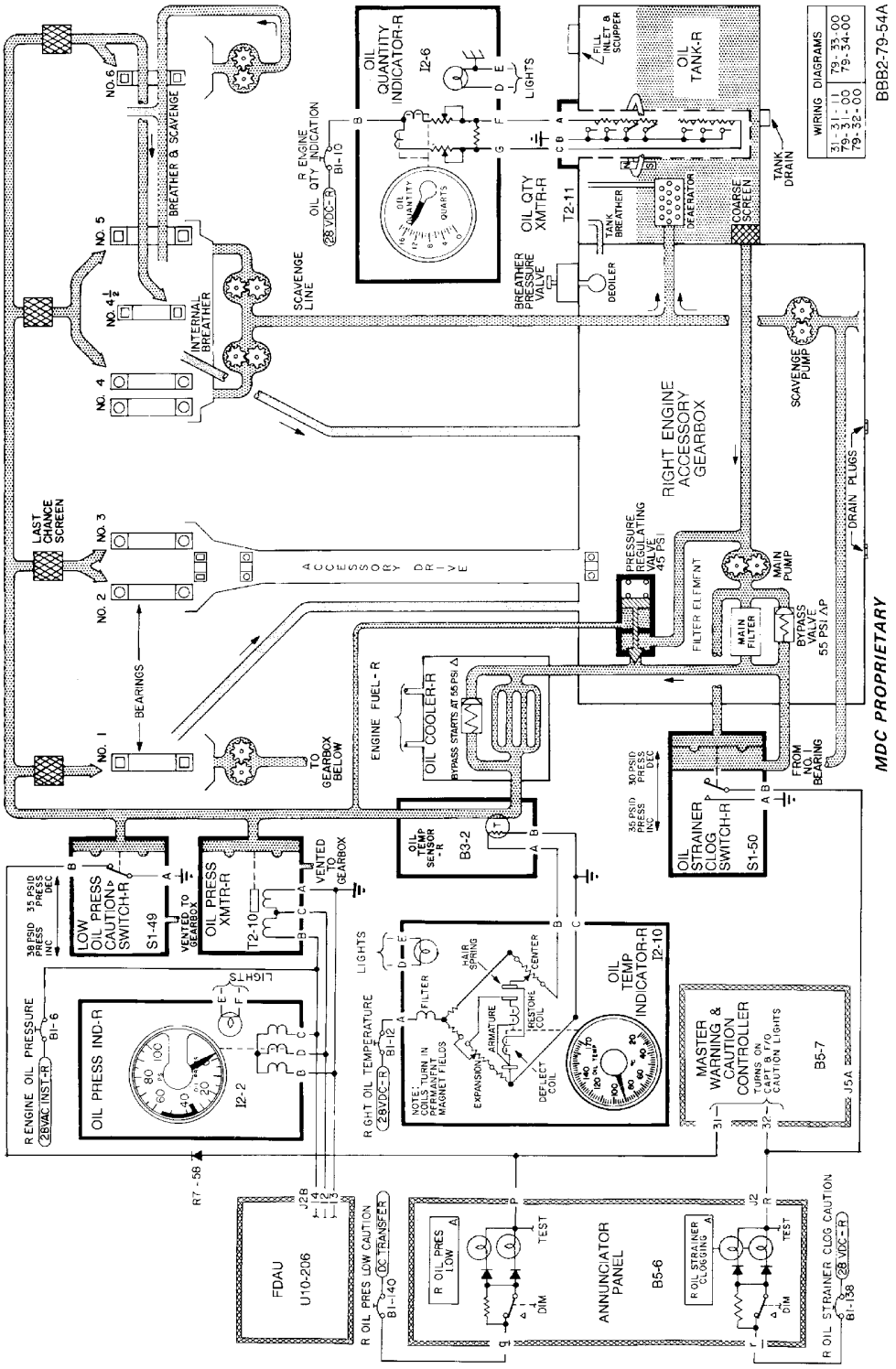
Engine Lubrication System -- Trouble Shooting
Figure 101/79-00-00-990-811 (Sheet 5 of 12)



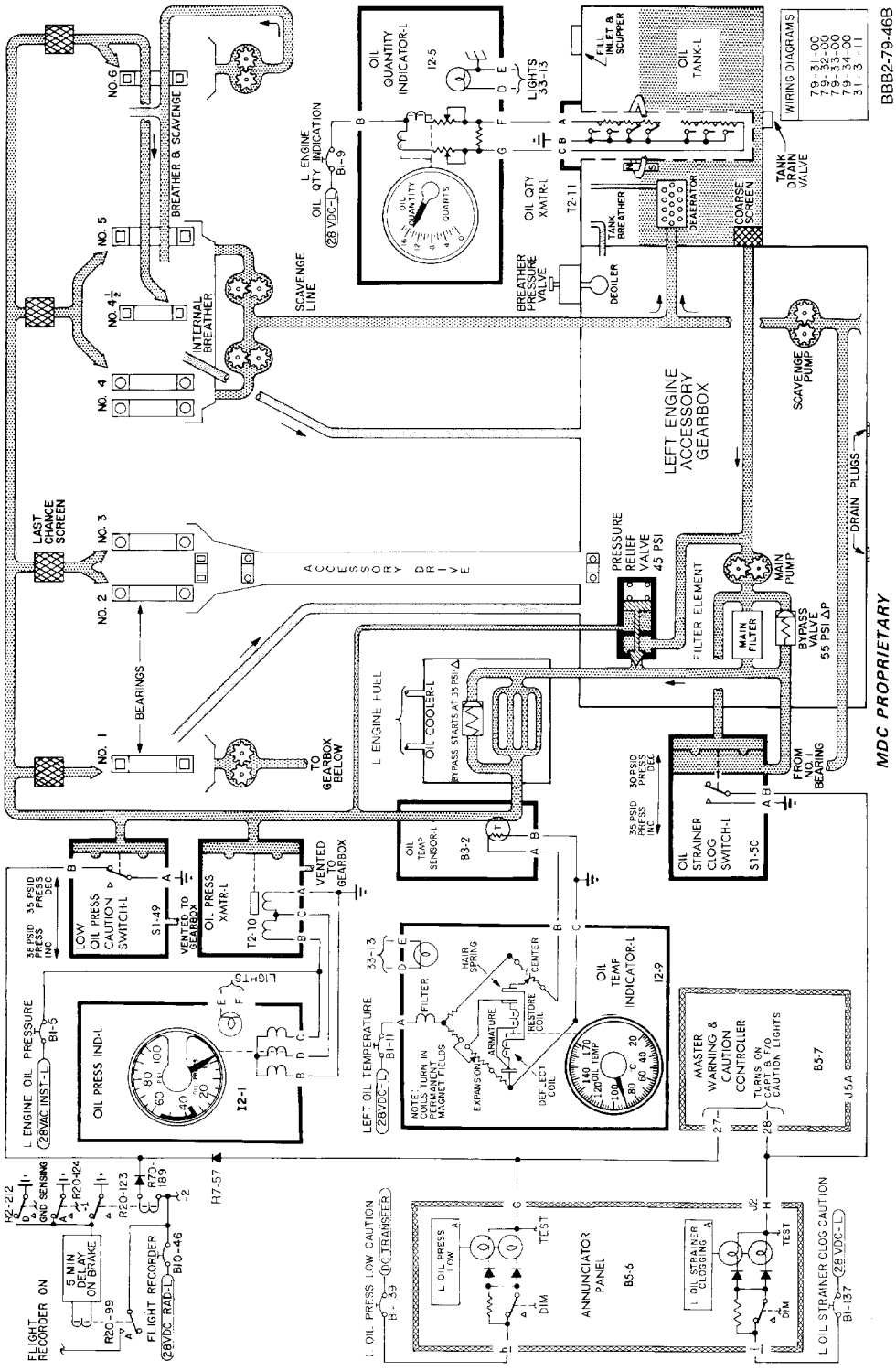
Engine Lubrication System -- Trouble Shooting
Figure 101/79-00-00-990-811 (Sheet 6 of 12)



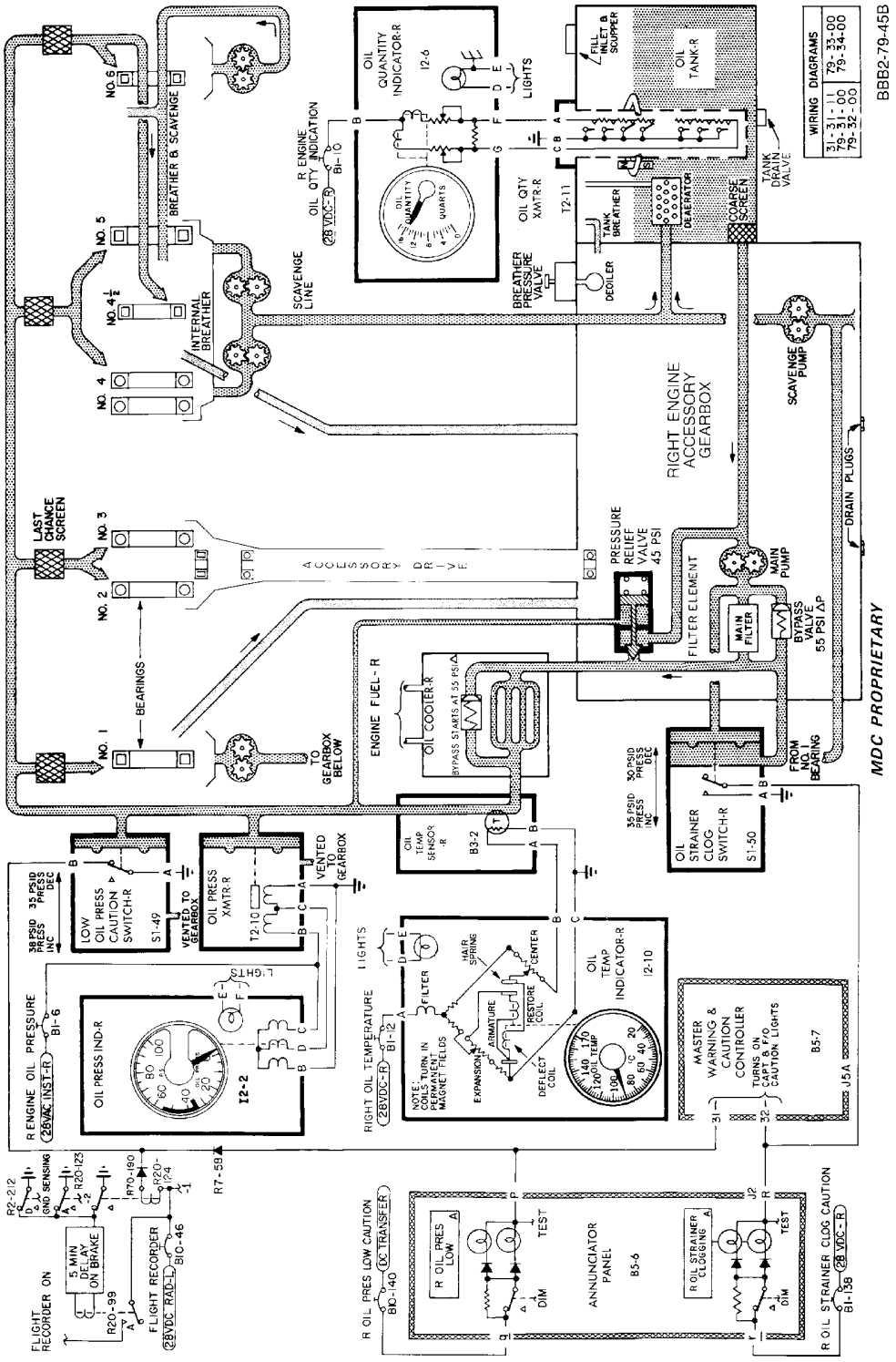
Engine Lubrication System -- Trouble Shooting
Figure 101/79-00-00-990-811 (Sheet 7 of 12)



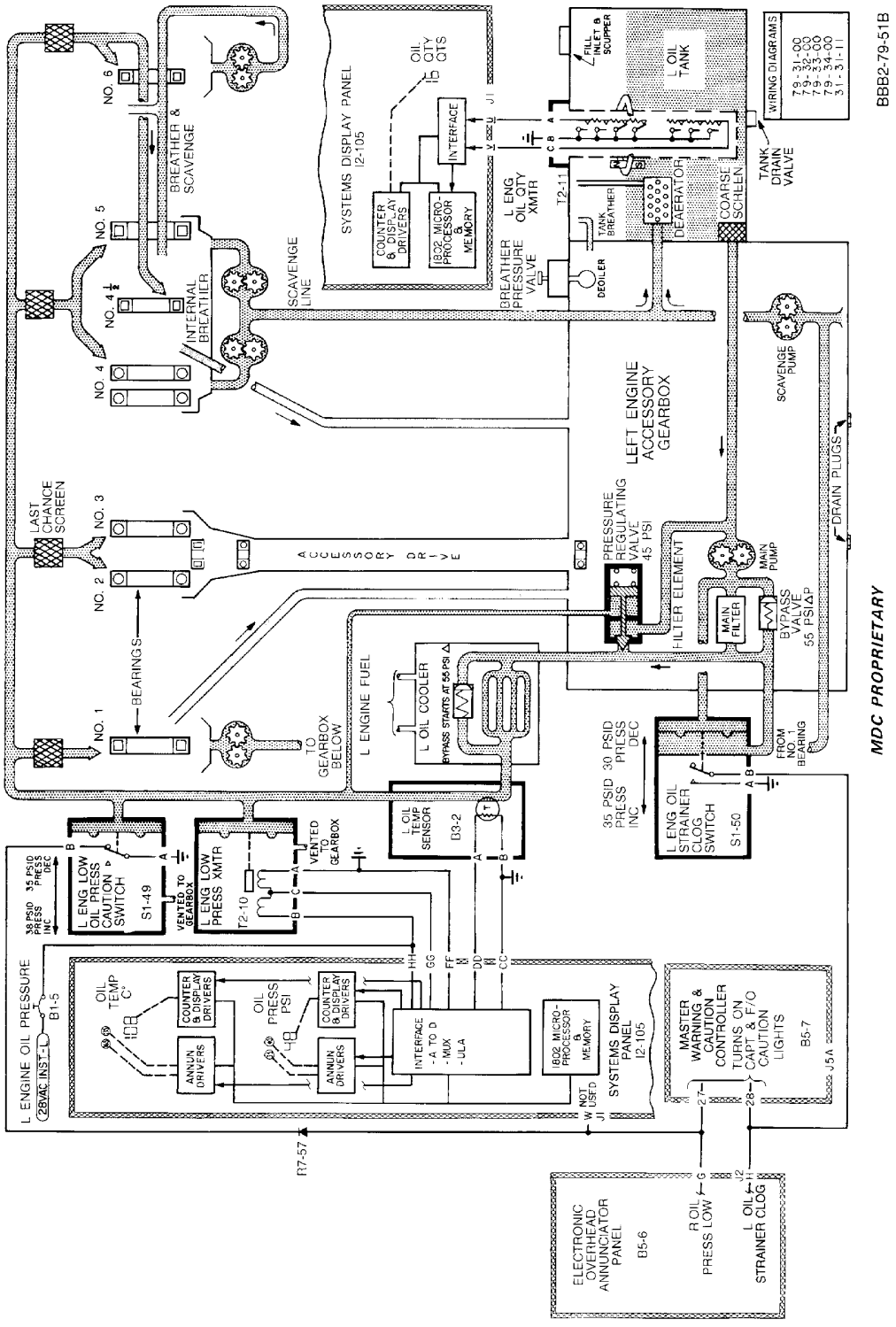
Engine Lubrication System -- Trouble Shooting
Figure 101/79-00-00-990-811 (Sheet 8 of 12)



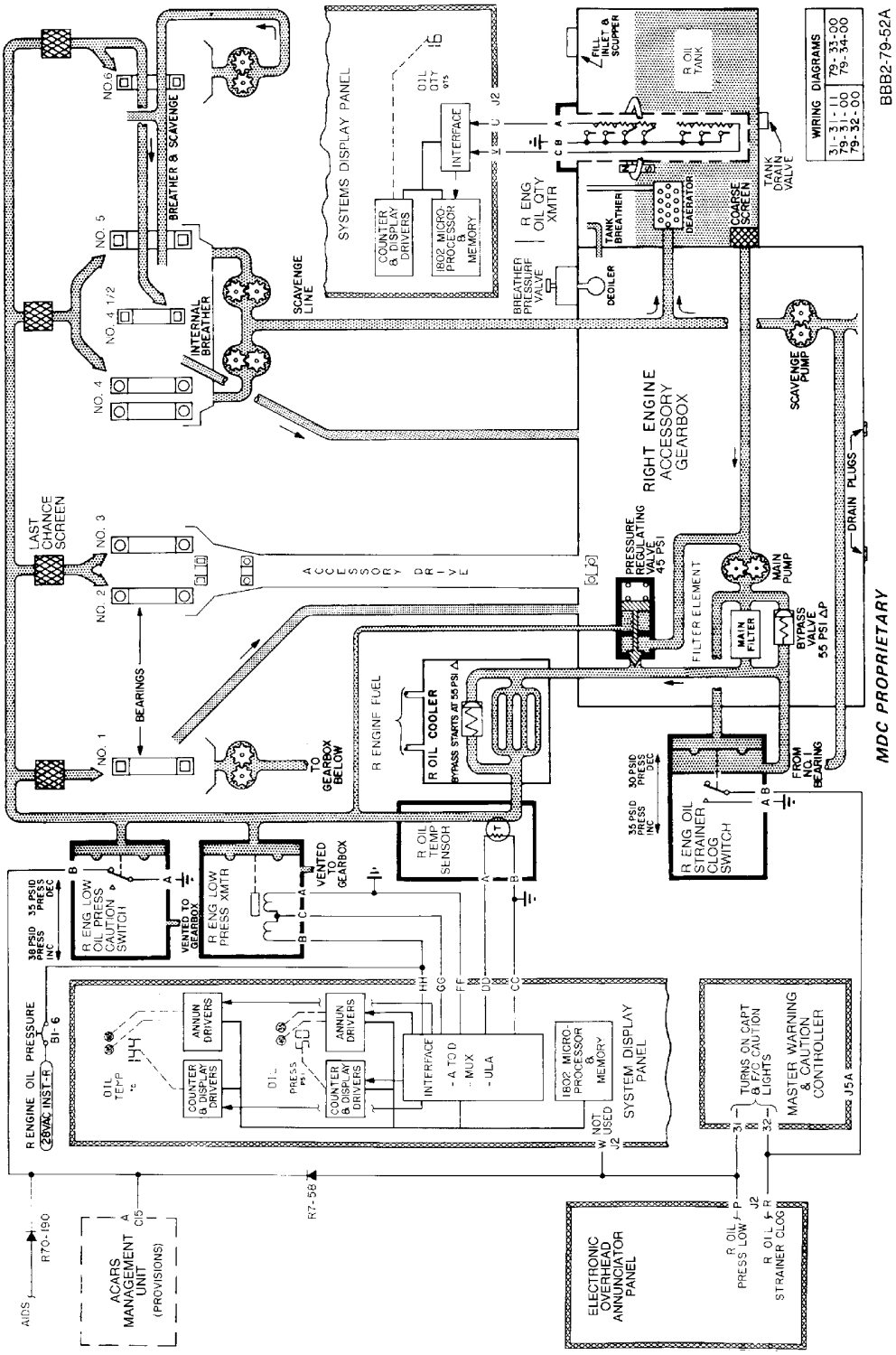
Engine Lubrication System -- Trouble Shooting
Figure 101/79-00-00-990-811 (Sheet 9 of 12)



Engine Lubrication System -- Trouble Shooting
Figure 101/79-00-00-990-811 (Sheet 10 of 12)



Engine Lubrication System -- Trouble Shooting
Figure 101/79-00-00-990-811 (Sheet 11 of 12)



Engine Lubrication System -- Trouble Shooting
Figure 101/79-00-00-990-811 (Sheet 12 of 12)

GENERAL - MAINTENANCE PRACTICES

1. General Maintenance Features

A. Maintenance Interphone System

(1) Communication between the flight compartment and the engine location where maintenance is being performed is provided through the maintenance interphone system. A switch on the overhead switch panel is utilized to connect the maintenance jack outlets to the aircraft service interphone system.

(2) An interphone jack for each engine is located on the fuselage adjacent to access doors 5901C and 5902C.

B. Engine Accessibility

(1) Accessibility is provided to all systems and components within the engine installation and nacelle. Cowl doors provide access to all parts of the engine and accessories that require checking, maintenance, or servicing. (GENERAL, SUBJECT 71-00-00, Page 201)

C. Component Interchangeability

(1) Identical accessories are installed on both engines.

2. Safety and Operating Precautions

A. Circuit Breakers

(1) All circuit breakers opened during maintenance should be tagged to prevent inadvertent operation of affected system.

B. High Voltage System and Components

(1) Prior to performing maintenance on high voltage system or components, make certain power to system or components has been shut off and all affected circuit breakers are open and tagged.

WARNING: INADVERTENT OPERATION OF AN AIRCRAFT SYSTEM COULD RESULT IN DEATH OR SERIOUS INJURY TO PERSONNEL.

WARNING: BEFORE ACTIVATING ANY FUEL, ELECTRICAL, HYDRAULIC, OR PNEUMATIC SYSTEM FOR MAINTENANCE PURPOSES, MAKE CERTAIN THAT ALL PERSONNEL AND EQUIPMENT ARE CLEAR OF OPERATING PORTIONS OF AIRCRAFT.

C. Application of External Power and Pressurization of Fluid Systems

D. Open Fluid Lines and Pneumatic Ducts

(1) Cap all fluid lines and pneumatic ducts opened for maintenance purposes to prevent damage to lines and ducts and to prevent contaminants from entering system.

WARNING: CLEANING OPERATIONS USING SOLVENTS SHOULD BE PERFORMED IN A WELL-VENTILATED ATMOSPHERE. EXERCISE NORMAL SAFETY PRECAUTIONS DURING USE.

E. Use of Cleaning Solvents

F. Spilled Fluids

WARNING: SYNTHETIC TURBINE LUBRICANTS CONTAIN ADDITIVES THAT ARE READILY ABSORBED THROUGH SKIN AND ARE CONSIDERED HIGHLY TOXIC. EXCESSIVE OR PROLONGED EXPOSURE OF SKIN TO THESE LUBRICANTS SHOULD BE AVOIDED.

WARNING: A MINIMUM OF 5 MINUTES SHOULD ELAPSE AFTER ENGINE SHUTDOWN BEFORE REMOVING OIL TANK FILLER CAP TO ALLOW TANK PRESSURE TO BLEED OFF. HOT OIL GUSHING FROM TANK COULD CAUSE SEVERE BURNS.

(1) Clean up spilled fluids immediately to prevent damage to and contamination of engine components, accessories, and compartments.

CAUTION: FUEL PUMP AND FUEL CONTROL ARE FUEL-LUBRICATED. DO NOT MOTOR ENGINE UNLESS A POSITIVE FUEL INLET PRESSURE IS INDICATED.

G. Engine Motoring

CAUTION: MAKE CERTAIN RIGHT ENGINE UPPER COWL DOOR IS CLOSED BEFORE OPERATING APU, OR APU EXHAUST WILL IMPINGE DIRECTLY ON COWL DOOR CAUSING EXTENSIVE DAMAGE.

H. Cowl Doors

3. **General Maintenance Practices**

A. Engine Access

WARNING: TO PREVENT INJURY TO PERSONNEL, EXERCISE CARE TO AVOID STRAKES WHEN WORKING IN ENGINE AREA WITH COWL DOORS OPEN.

(1) To open cowl doors for both engines, refer to COWL DOORS, SUBJECT 71-10-03, Page 201.

B. Check position and angle of all fittings removed from components to ensure proper alignment with mating lines on installation of components.

C. O-Rings and Gaskets

(1) Discard all used O-rings.

D. Preservation of Accessories

(1) Accessories removed from engine for storage or return to overhaul must be preserved as follows:

(a) Pour engine oil into component to coat internal parts. Rotate drive shaft of engine-driven components to ensure thorough coating of oil.

NOTE: Component that has been subjected to engine oil, as in engine operation or testing, is considered to be sufficiently coated internally.

(b) Drain excess fluid.

(c) Cap all openings and install protective covers over drive shafts.

E. External Electrical Power

(1) For procedures to connect external electrical power to aircraft, refer to EXTERNAL POWER - DESCRIPTION AND OPERATION, PAGEBLOCK 24-40-00/001.

F. External Pneumatic Power

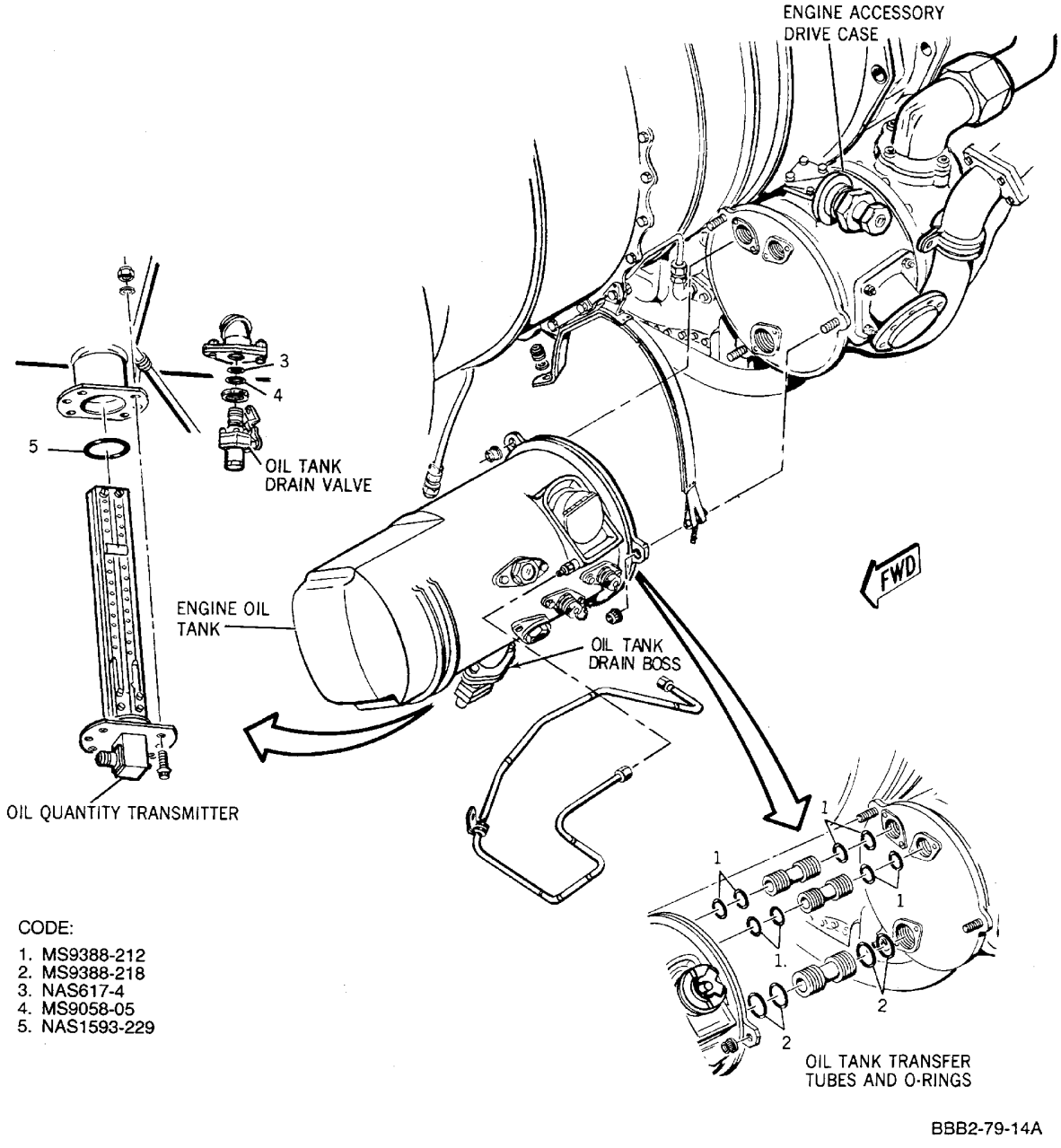
(1) For procedures to connect external pneumatic power to aircraft, refer to GENERAL - MAINTENANCE PRACTICES, PAGEBLOCK 36-00-00/201.

G. Oil Leak Detection

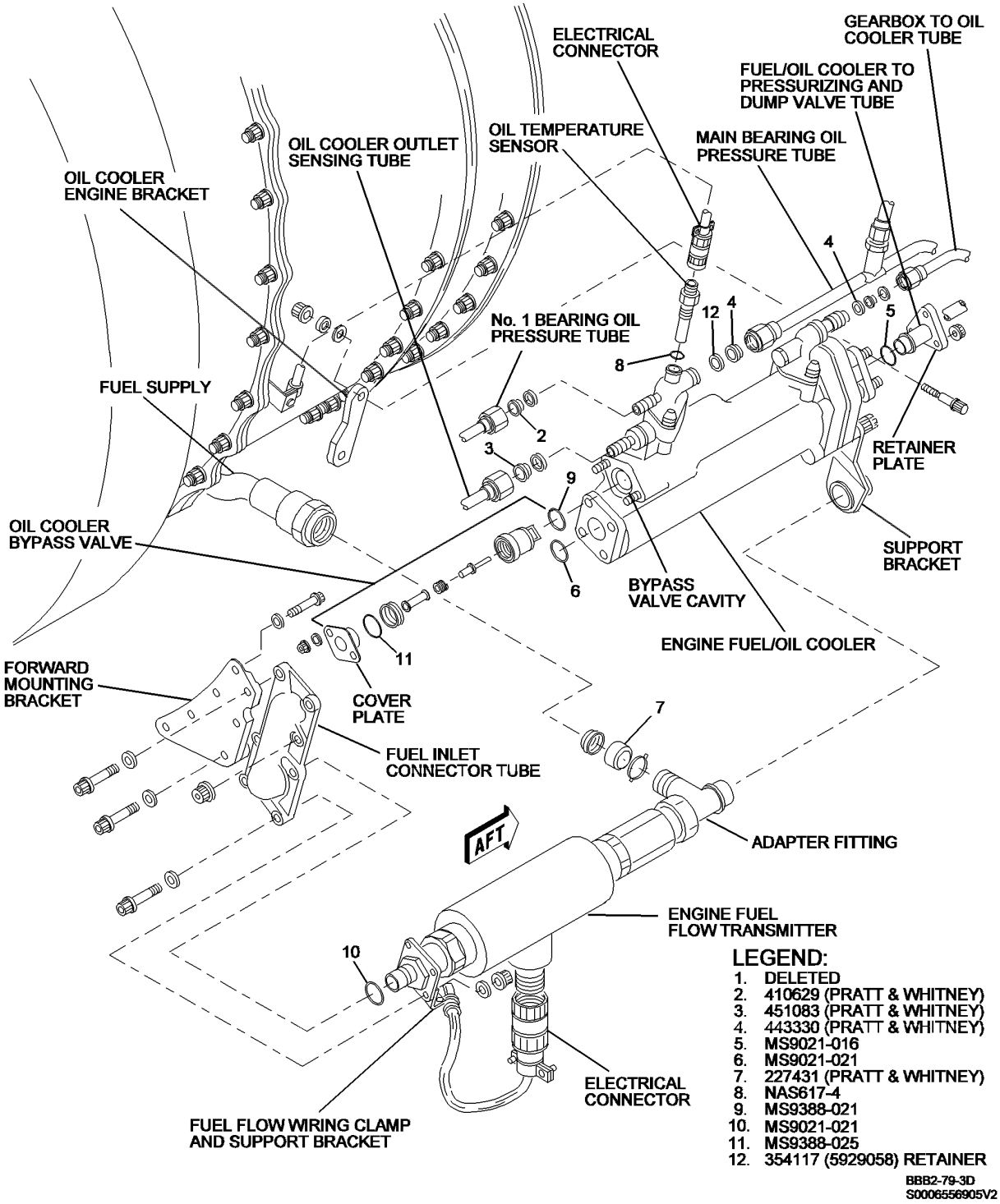
(1) Repair all obvious leaks and clean area of oil.

CAUTION: DO NOT OPEN ENGINE COWL DOORS IF GROUND WIND VELOCITIES EXCEED 30 KNOTS.

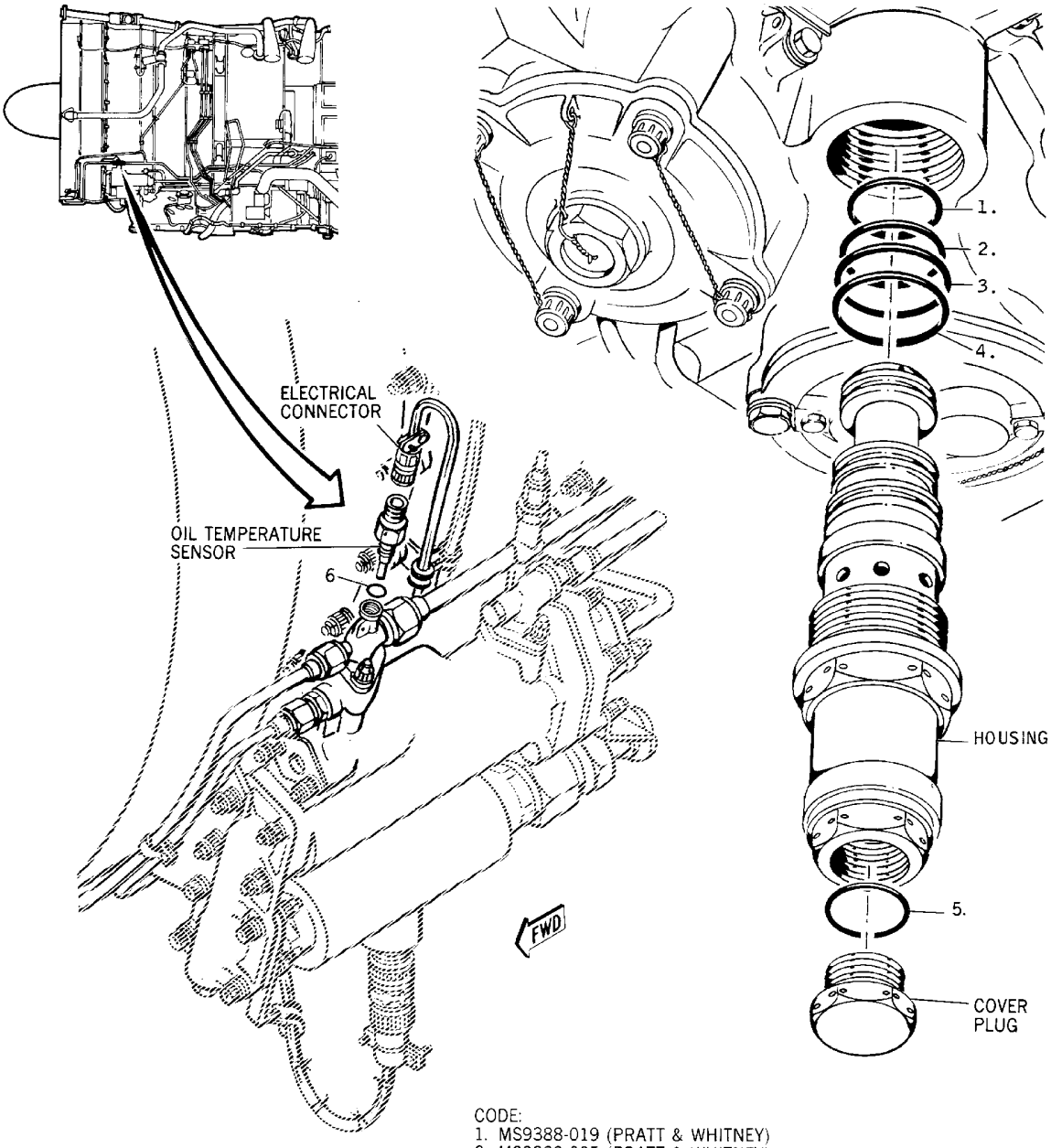
H. Engine Cowling Wind Restrictions



Seals, O-Rings and Gaskets
Figure 201/79-00-00-990-801 (Sheet 1 of 3)



Seals, O-Rings and Gaskets
Figure 201/79-00-00-990-801 (Sheet 2 of 3)



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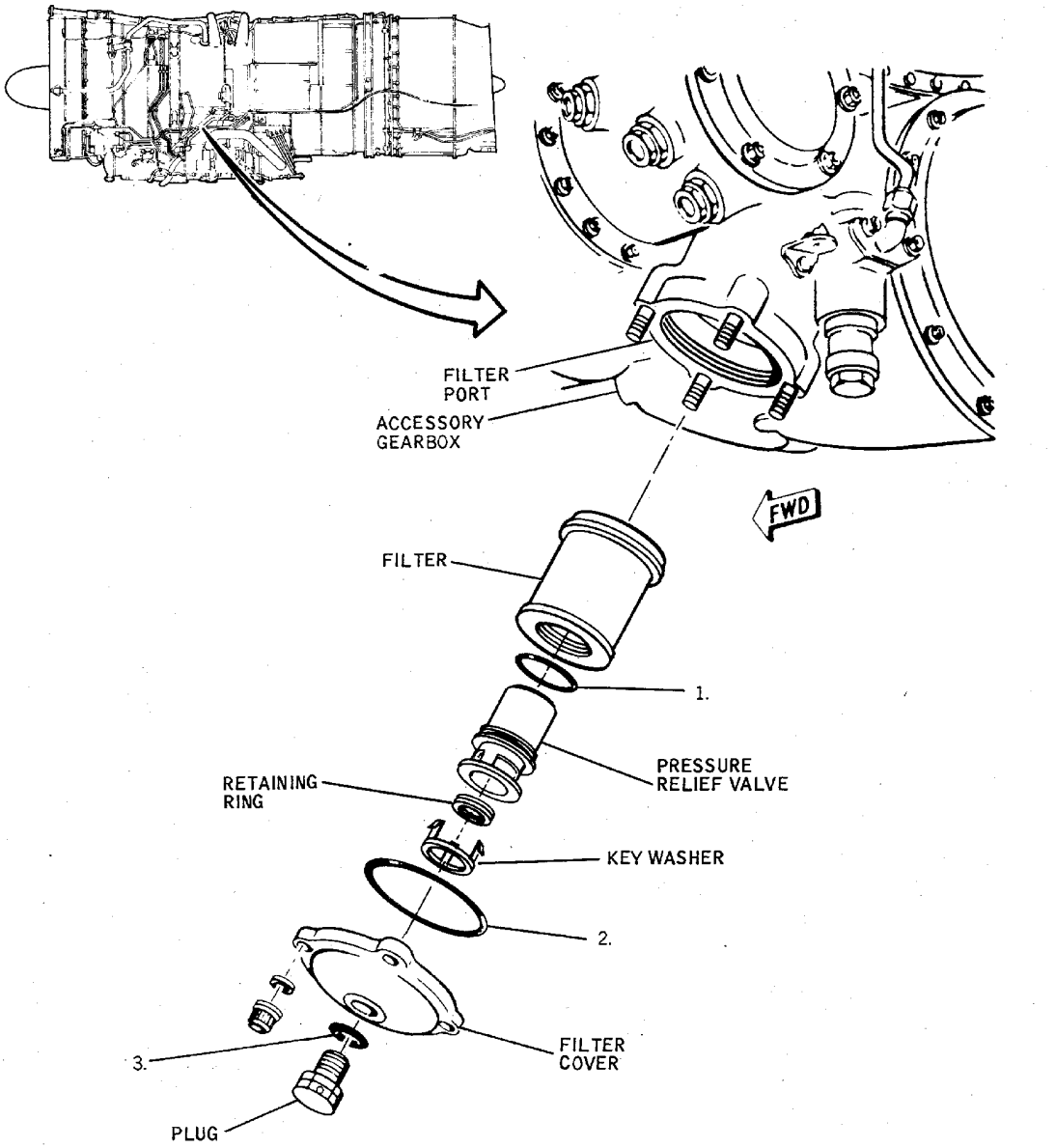
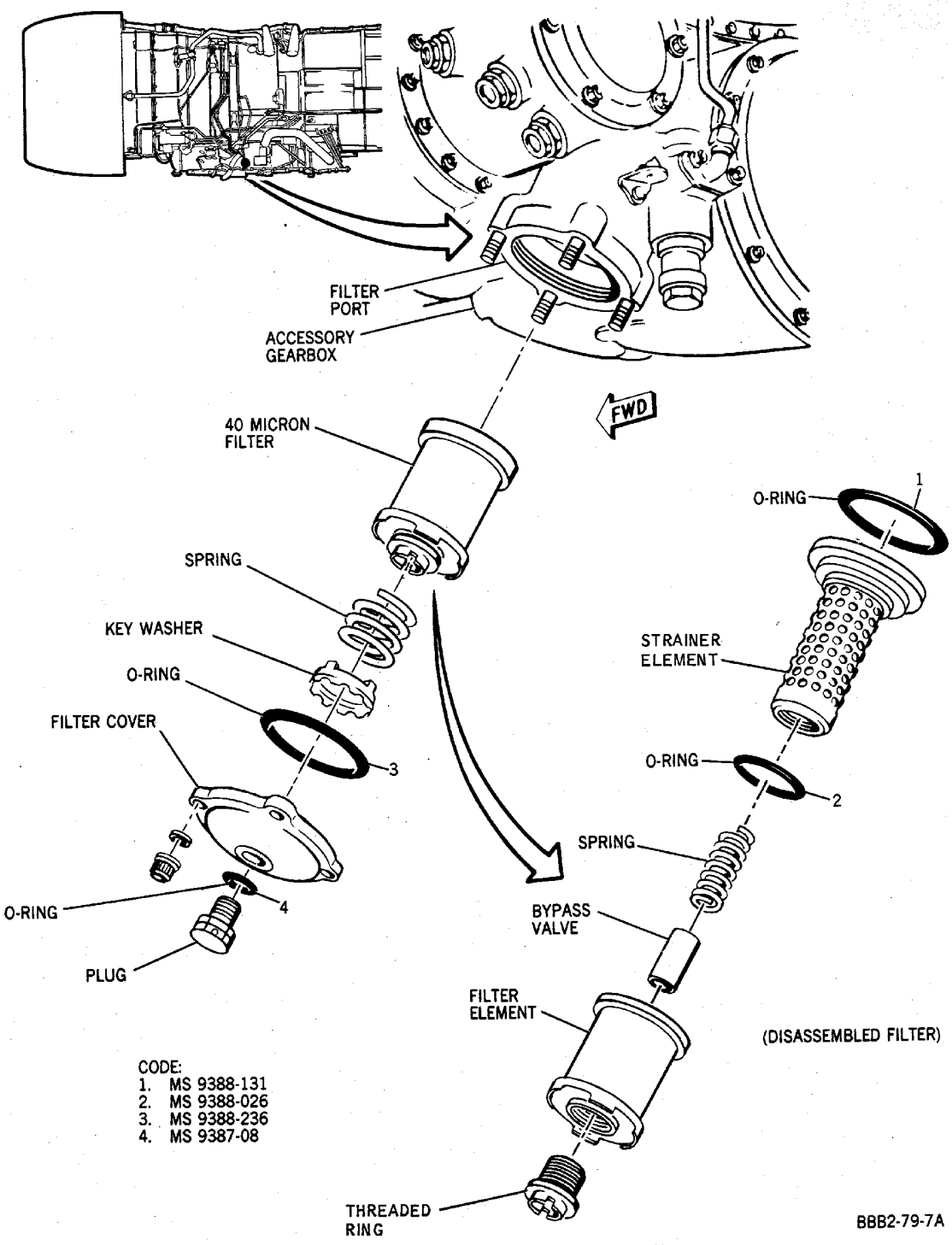
2. MS9388-025 (PRATT & WHITNEY)
3. MS9388-026 (PRATT & WHITNEY)
4. MS9388-220 (PRATT & WHITNEY)
5. MS9387-10 (PRATT & WHITNEY)
6. NAS617-4

BBB2-79-15A

Seals, O-Rings and Gaskets
Figure 201/79-00-00-990-801 (Sheet 3 of 3)



15 Micron Oil Filter Seals, O-Rings and Gaskets
Figure 202/79-00-00-990-802



40 Micron Oil Filter Seals, O-Rings and Gaskets
Figure 203/79-00-00-990-803

STORAGE - DESCRIPTION AND OPERATION

1. General

A. The engine oil tank is used to store and supply deaerated oil to the engine oil pump and lubricating system. The tank is provided with a scupper drain sump and drain line connection, self-locking filler cap and dipstick, internal baffle, internal deaerator, two sight gauges, drain valve, filler strainer, and outlet strainer. In addition, three external mounting flanges are provided. Two of the flanges are capped, the third, at the bottom of the tank, provides a mounting for the oil quantity transmitter.

2. Oil Tank

A. Description

(1) The oil tank is a cylindrical stainless steel tank mounted on the left front face of the engine accessory drive case. Three transfer tubes accommodate the oil flow between the tank and the accessory drive case.

WJE 401-412, 414-427, 429, 861-866, 868, 869, 871, 872, 875-881, 883, 884, 886, 887, 891

(2) Self-locking filler cap and dipstick - The self-locking filler cap with attached dipstick is located in the scupper drain sump.

WJE 873, 874, 892, 893

(3) Self-locking filler cap and dipstick - The self-locking filler cap with attached dipstick is located in the scupper drain sump.

NOTE: On some aircraft, the filler cap has an additional safety mechanism which precludes closing of the oil tank access door, until the arm is pushed down on the oil tank filler cap, and locked.

WJE ALL

(4) Internal baffle - An internal baffle is installed in the tank to minimize oil sloshing.

(5) Internal deaerator - The internal deaerator separates air from oil returned to the tank and conducts the air to the accessory drive case where it is vented overboard.

(6) Sight gauges - Two sight gauges installed on the tank provide a visual means of checking oil level. The upper gauge indicates full level, the lower gauge indicates minimum oil level.

(7) Drain valve - The drain valve is located at the bottom of the oil tank. The handle of the valve is spring loaded to the valve closed position. Rotating the handle 90 degrees clockwise opens the valve and locks the handle in the open position with a ball detent. Counterclockwise movement of the handle unseats the ball from detent and allows spring tension to return the handle to the valve-closed position.

Table 1 Tank Capacity

	Imperial Gallons	US Gallons	Liters
Total Capacity	4.58	5.5	20.82
Total Useable Engine Oil	3.33	4.0	15.14
Expansion Space Approximately 28 percent	1.25	1.5	5.68

ENGINE OIL TANK - MAINTENANCE PRACTICES

1. General

A. The engine oil tank, located on the forward left side of the engine, is attached to the accessory drive case and supported at the forward end by a strap-type mounting attached to the engine case. Access to the oil tank is gained through the lower forward cowl door. Removal and installation procedures for the oil tank on the left and right engines are identical.

2. Equipment and Materials

NOTE: Equivalent substitutes may be used instead of the following listed items:

NOTE: Some materials in the Equipment and Materials list may not be permitted to be used in your location. Persons in each location must make sure they are permitted to use these materials. All persons must obey all applicable federal, state, local, and provincial regulations for their location.

Table 201

Name and Number	Manufacturer
Lockwire, NASM20995N20, DPM 684	Not Specified
Lockwire, NASM20995N32, DPM 684	Not Specified
Petrolatum VV-P-236	
Suitable container approximately 5 US gallons (4.16 Imperial gallons or 18.93 liters)	
Torque wrench 0-100 inch-pounds (0-11.3 N·m) capacity	

3. Removal/Installation Engine Oil Tank

A. Remove Tank

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Tag throttle/thrust reverser lever, and open and tag following circuit breakers.

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891 (Continued)

(Continued)

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT
WJE ALL			
W	37	B1-59	FIRE DETECTORS RIGHT ENGINE LOOP A
W	38	B1-191	FIRE DETECTORS RIGHT ENGINE LOOP B
W	39	B1-282	FIRE DETECTORS LEFT ENGINE LOOP A
W	40	B1-281	FIRE DETECTORS LEFT ENGINE LOOP B

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
S	21	B1-9	LEFT OIL QUANTITY
WJE 401-404, 406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887			
S	34	B1-969	LEFT SYSTEMS DISPLAY PANEL

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
T	21	B1-10	RIGHT OIL QUANTITY
WJE 401-404, 406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887			
T	34	B1-970	RIGHT SYSTEMS DISPLAY PANEL

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Place thrust reverser control valve in dump position and install safety pin.

(3) Drain oil tank. (ENGINE OIL SYSTEM, SUBJECT 12-12-04, Page 301)

NOTE: Be prepared to catch oil in container with approximate capacity of 5 US gallons (4.16 Imperial gallons or 18.93 liters).

(4) Remove drain valve from tank. Discard O-ring.

(5) Remove fire detector unit. (ENGINE FIRE DETECTOR UNITS - MAINTENANCE PRACTICES, PAGEBLOCK 26-10-01/201)

CAUTION: TO PREVENT DAMAGE TO ELECTRICAL CONNECTOR, DO NOT USE ANY TOOL OTHER THAN PLUG PLIERS TO DISCONNECT PLUG.

(6) Disconnect oil quantity transmitter electrical connector.

(7) Remove oil quantity transmitter. Discard O-ring.

(8) Remove oil tank scupper drain line.

(9) Remove locknuts that attach tank to accessory drive case.

(10) Remove fire detector unit bracket and clamp from drive case stud.

(11) Support tank; remove locknut and spherical washer from tank strap tee bolt.

CAUTION: EXERCISE EXTREME CARE WHEN REMOVING OIL TANK TO PREVENT DAMAGE TO TRANSFER TUBES.

(12) Carefully pull tank forward to disengage drive case studs and transfer tubes.

(13) Remove tank and place on suitable pad to prevent damage to accessories. Cover accessory drive case ports to prevent ingress of foreign matter.

(14) Remove transfer tubes from tank ports and cover ports to prevent ingress of foreign matter.

(15) Remove and discard O-rings from transfer tubes.

B. Install Tank

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Make certain throttle/thrust reverser lever is tagged and following circuit breakers are opened and tagged.

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT
WJE ALL			
W	37	B1-59	FIRE DETECTORS RIGHT ENGINE LOOP A
W	38	B1-191	FIRE DETECTORS RIGHT ENGINE LOOP B
W	39	B1-282	FIRE DETECTORS LEFT ENGINE LOOP A

(Continued)

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
W	40	B1-281	FIRE DETECTORS LEFT ENGINE LOOP B

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
S	21	B1-9	LEFT OIL QUANTITY
WJE 401-404, 406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887			
S	34	B1-969	LEFT SYSTEMS DISPLAY PANEL

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
T	21	B1-10	RIGHT OIL QUANTITY
WJE 401-404, 406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887			
T	34	B1-970	RIGHT SYSTEMS DISPLAY PANEL

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6555 TO 7245 KPA) (PRECHARGE PRESSURE).

(2) Make certain thrust reverser control valve is in dump position and safety pin is installed.

(3) Lightly lubricate new O-rings with Petrolatum (VV-P-236) and install O-rings on transfer tubes.

(4) Install tank drain valve as follows:

(a) Install nut on drain valve with counterbored face of nut away from body of valve.

(b) Lightly lubricate back-up ring with Petrolatum (VV-P-236) and install O-ring into counterbored face of nut.

(c) Lightly lubricate O-ring with Petrolatum (VV-P-236) and install O-ring against back-up ring. Adjust nut, O-ring, and back-up ring.

(d) Install drain valve into oil tank drain boss and turn valve until O-ring makes contact with boss.

(e) Position drain valve correctly and torque nut. Safety nut with 0.032 inch lockwire.

(5) Remove protective covers from tank ports and install trans-fer tubes.

CAUTION: EXERCISE EXTREME CARE WHEN INSTALLING OIL TANK TO PREVENT DAMAGE TO TRANSFER TUBES.

(6) Remove covers from accessory drive case ports and position tank with drain valve down. Carefully align and insert transfer tubes into drive case ports, then move tank aft until tank flange engages drive case studs.

(7) Install fire detector unit bracket and clamp on drive case stud and install locknuts that attach tank to accessory drive case.

(8) Install tank strap. Torque locknut 30 to 35 inch-pounds (3.39 to 3.96 N·m).

(9) Install oil tank scupper drain tubes.

(10) Lightly lubricate new O-ring with Petrolatum (VV-P-236), install O-ring on oil quantity transmitter and install transmitter.

NOTE: Install transmitter with electrical connector forward.

CAUTION: TO PREVENT DAMAGE TO ELECTRICAL CONNECTOR, DO NOT USE ANY TOOL OTHER THAN PLUG PLIERS TO DISCONNECT OR CONNECT PLUG. WHEN CONNECTING PLUG, DO NOT OVERTIGHTEN.

(11) Connect electrical connector to oil quantity transmitter. Safety connector with 0.020 inch lockwire.

NOTE: Connector plug is properly installed when no relative motion exists between plug backshell and coupling ring.

(12) Install fire detector unit. (ENGINE FIRE DETECTOR UNITS - MAINTENANCE PRACTICES, PAGEBLOCK 26-10-01/201)

(13) Make certain drain valve is closed.

(14) Service oil tank. (ENGINE OIL SYSTEM, SUBJECT 12-12-04, Page 301)

(15) Remove tag from throttle/thrust reverser lever, and remove tags and close following circuit breakers.

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT
WJE ALL			
W	37	B1-59	FIRE DETECTORS RIGHT ENGINE LOOP A
W	38	B1-191	FIRE DETECTORS RIGHT ENGINE LOOP B
W	39	B1-282	FIRE DETECTORS LEFT ENGINE LOOP A
W	40	B1-281	FIRE DETECTORS LEFT ENGINE LOOP B

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
S	21	B1-9	LEFT OIL QUANTITY
WJE 401-404, 406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887			
S	34	B1-969	LEFT SYSTEMS DISPLAY PANEL

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
T	21	B1-10	RIGHT OIL QUANTITY
WJE 401-404, 406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887			
T	34	B1-970	RIGHT SYSTEMS DISPLAY PANEL

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

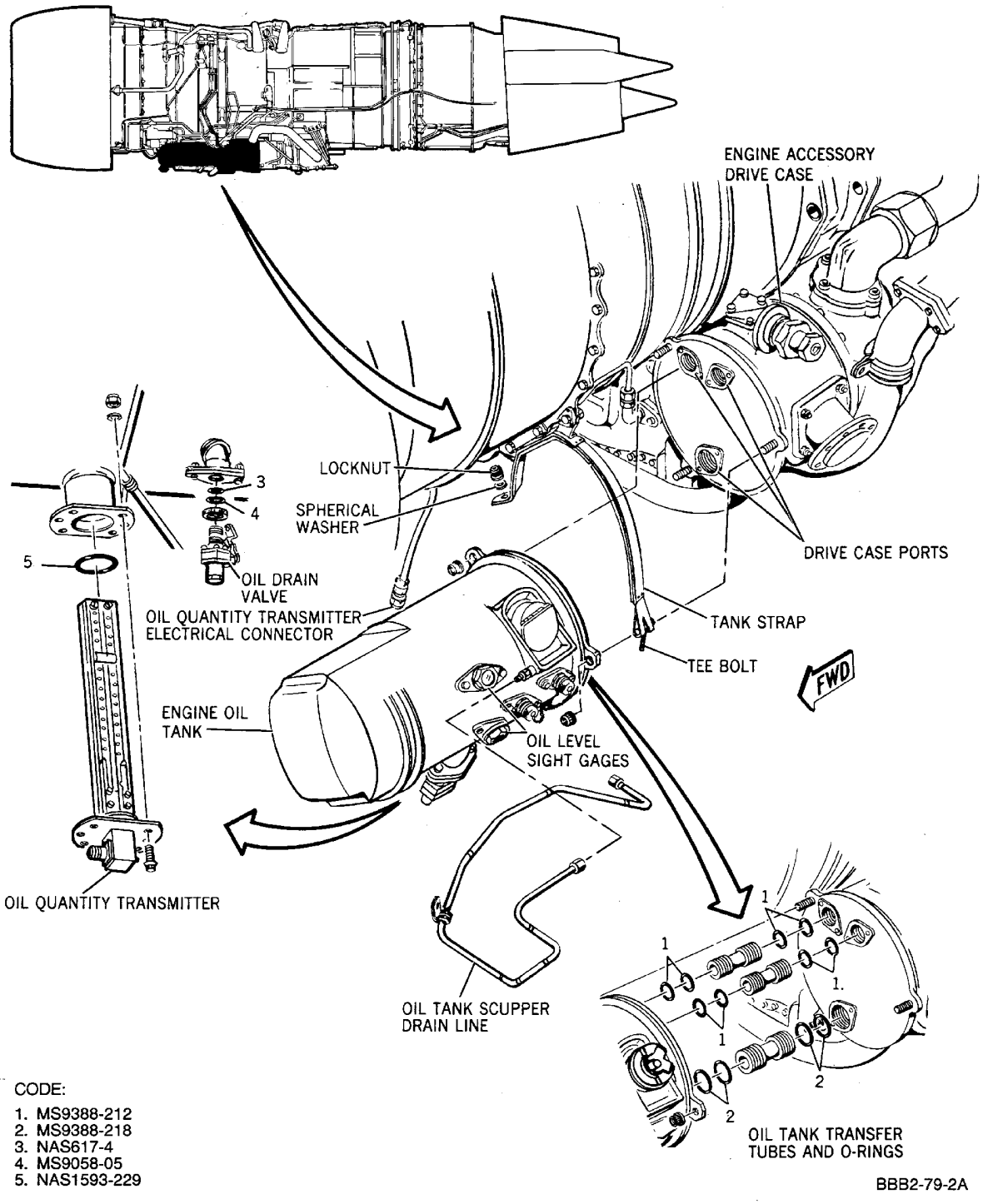
(16) Perform TEST A, (Ground Check At Idle) for 3 to 5 minutes to purge oil system of air and check for leaks. (ENGINE GENERAL, SUBJECT 72-00-00, Page 501)

(17) Check oil level after coastdown, and service oil tank if required. (ENGINE OIL SYSTEM, SUBJECT 12-12-04, Page 301)

(18) Remove tools, equipment, loose hardware, spilled fluid, and debris from maintenance area.

WARNING: MAKE CERTAIN THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARD-LESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

(19) Remove safety pin from thrust reverser control valve. Stow safety pin.



Engine Oil Tank -- Removal/Installation
Figure 201/79-10-01-990-801

4. Check Engine Oil Tank and Fire Warning System

A. Check Tank

(1) Visually check oil tank drain valve and fittings for leaks.

B. Check Fire Warning System

(1) Check fire warning system. (ENGINE FIRE DETECTOR UNITS - MAINTENANCE PRACTICES, PAGEBLOCK 26-10-01/201)

OIL TANK DRAIN VALVE - MAINTENANCE PRACTICES

1. General

A. The oil tank drain valve is located on the bottom of the engine oil tank. Access to the drain valve is gained through the lower forward cowl door. Removal and installation procedures for the drain valve on left and right engines are identical.

2. Equipment and Materials

NOTE: Equivalent substitutes may be used instead of the following listed items:

NOTE: Some materials in the Equipment and Materials list may not be permitted to be used in your location. Persons in each location must make sure they are permitted to use these materials. All persons must obey all applicable federal, state, local, and provincial regulations for their location.

Table 201

Name and Number	Manufacturer
Lockwire, NASM20995N20, DPM 684	Not Specified
Lockwire, NASM20995N32, DPM 684	Not Specified
Suitable container approximately 5 US gallons (4.16 Imperial gallons or 18.93 liters)	
Lubricant, Aircraft Turbine Engine (Synthetic Base) (P03-001)	
Lubricant, Sealing Ring (P06-053)	

3. Removal/Installation Oil Tank Drain Valve

A. Remove Valve

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Tag throttle/thrust reverser lever, and open and tag following circuit breakers.

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891 (Continued)

(Continued)

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Place thrust reverser control valve in dump position and install safety pin.

(3) Drain oil from tank.

NOTE: Be prepared to catch fuel in container with approximate capacity of 5 US gallons (4.16 Imperial gallons or 18.93 liters).

(4) Loosen nut on drain valve and remove valve from boss insert on bottom of tank. Discard O-ring and back-up ring.

B. Install Valve

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Make certain throttle/thrust reverser lever is tagged and following circuit breakers are opened and tagged.

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891 (Continued)

(Continued)

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Make certain thrust reverser control valve is in dump position and safety pin is installed.

(3) Install nut on drain valve, with counterbored face of nut away from body of valve.

(4) Lightly lubricate back-up ring with (P06-053) sealing ring lubricant, or (P03-001) lubricant engine turbine and install back-up ring into counterbored face of nut.

(5) Lightly lubricate O-ring with (P06-053) sealing ring lubricant, or (P03-001) lubricant engine turbine and install O-ring against back-up ring. Adjust nut, O-ring, and back-up-ring.

(6) Install drain valve into oil tank drain boss and rotate until O-ring makes contact with boss.

(7) Position drain valve correctly and tighten nut. Safety nut with 0.032 inch lockwire.

(8) Service oil tank. (ENGINE OIL SYSTEM, SUBJECT 12-12-04, Page 301)

(9) Remove tools, equipment, loose hardware, spilled fluid, and debris from maintenance area.

(10) Remove tag from throttle/thrust reverser lever, and remove tags and close following circuit breakers.

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893 (Continued)

UPPER EPC, ENGINE - LEFT AC BUS

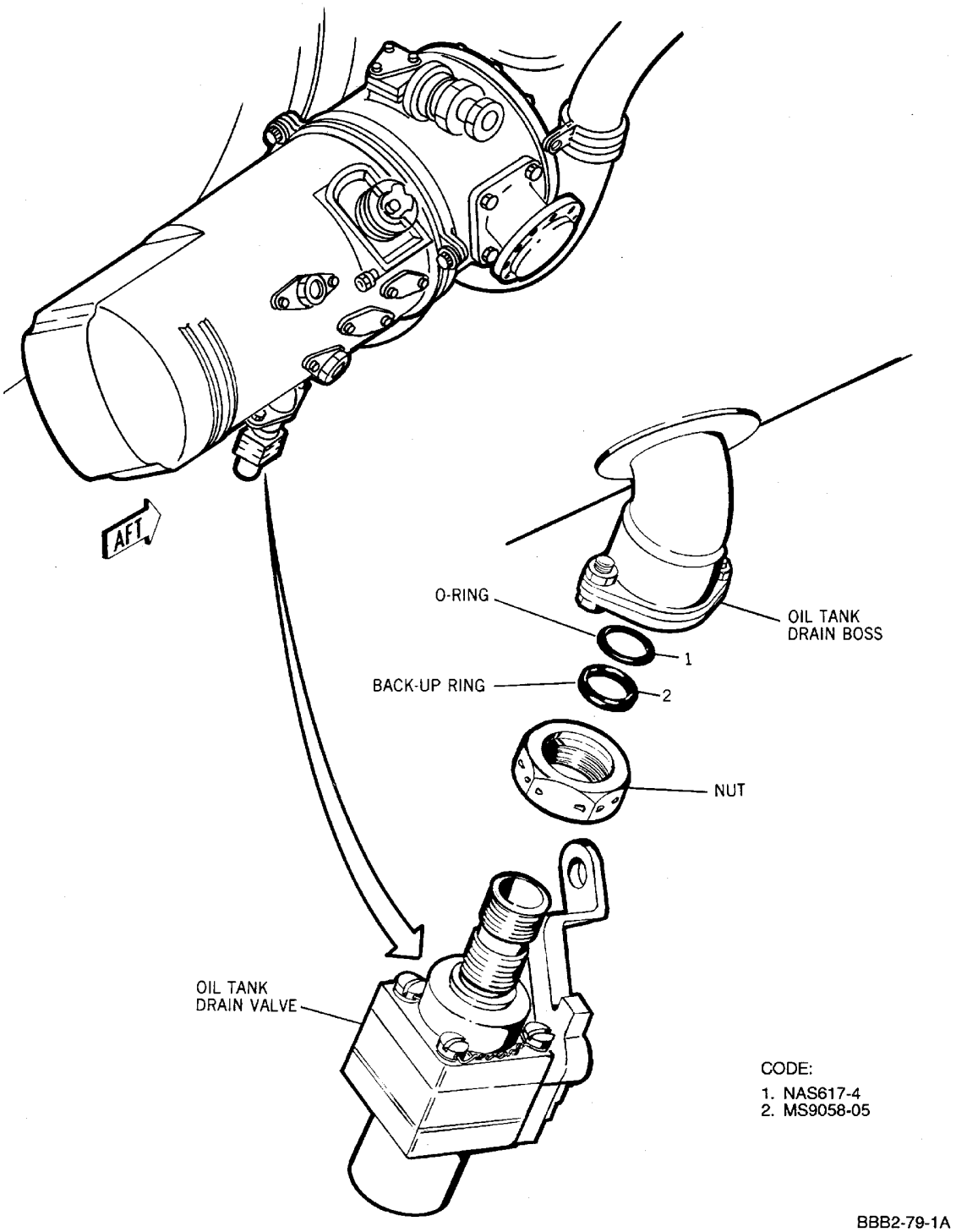
Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

(11) Remove safety pin from thrust reverser control valve. Stow safety pin.



Oil Tank Drain Valve -- Removal/Installation
Figure 201/79-10-02-990-801

4. Check Oil Tank Drain Valve

A. Check Valve

(1) Check valve for leaks.

DISTRIBUTION - DESCRIPTION AND OPERATION

1. General

A. The engine is equipped with a high-pressure oil system which supplies and distributes filtered, temperature-controlled oil to lubricate and cool the engine bearings and accessory drives. The components consist of the main oil pump, oil pressure relief valve, main oil filter, fuel/oil cooler, four oil scavenge pumps, and those external tubes used for oil distribution.

2. Distribution Components

A. Description

(1) Main oil pump - The main oil pump is located in the engine accessory drive case. The pump supplies oil system pressure for circulation of oil.

(2) Oil pressure relief valve - The oil pressure relief valve is located on the lower left side of the engine accessory drive case. The valve controls oil system pressure between 40 and 55 psig at the engine bearings.

(3) Main oil filter - The main oil filter is located in the lower left side of the engine accessory drive case. The filter removes contaminants from the oil downstream of the pressure pump.

(4) Fuel/oil cooler - The fuel/oil cooler is the full-flow type with a pressure bypass valve. The fuel/oil cooler is located on the forward left side of the engine above the oil tank, attached to engine-mounted brackets. Cooling of the oil is accomplished by using engine high-pressure fuel as a heat exchange medium.

(5) External tubes - External tubes consist of pressure, scavenge, and breather tubes used to conduct lubricating oil to the engine bearings and oil system components.

(6) Oil scavenge pumps - Four oil scavenge pumps are located within the inlet accessory drive case, main accessory case, diffuser case, and No. 6 bearing scavenge pump housing. The scavenge pumps return the oil to the tank.

3. Operation

WJE 873, 874, 892, 893

A. Oil is gravity fed from the tank to the main oil pump where the pressure pump forces the oil through an internal passage of the accessory drive case to main oil filter where it is filtered through the stacked-disc (40 Micron) or corrugated paper (15 Micron) element. Oil flows through the filter and another internal passage of the accessory drive case to the pressure relief valve. If filter clogging occurs, a bypass valve incorporated in the center of the element opens allowing continued oil flow. Oil from the filter leaves the accessory drive case and flows into the fuel/oil cooler where it is cooled by circulating around the core of the fuel coolant tubes. If obstruction of the core occurs, a bypass valve in the fuel/oil cooler opens allowing continued oil flow to the inlet case. From the inlet case, oil is directed through internal tubes and screens, metering orifices and clearances, to the engine bearings and drives. As the bearings and drives are lubricated, cavities collect the excess oil. The scavenge pumps force this oil through the scavenge tubes to the accessory drive case sump. From the sump, oil is pumped to the oil tank through the internal deaerator which removes the major part of the air collected from the system. To ensure proper oil flow and scavenge pump operation, the breather system balances the internal oil cavity pressure. The breather tubes conduct this pressure to the accessory drive case, where the oil-laden air passes through rotary breather impellers mounted on the starter drive gearshaft, to remove the oil. The relatively oil-free air reaching the center of the gearshaft is vented overboard.

WJE 401-412, 414-427, 429, 861-866, 868, 869, 871, 872, 875-881, 883, 884, 886, 887, 891

B. Oil is gravity fed from the tank to the main oil pump where the pressure pump forces the oil through an internal passage of the accessory drive case to the main oil filter where it is filtered through the corrugated paper (15 Micron) element. Oil flows through the filter and another internal passage of the accessory drive case to the pressure relief valve. If filter clogging occurs, a bypass valve incorporated in the center of the element opens allowing continued oil flow. Oil from the filter leaves the accessory drive case and flows into the fuel/oil cooler where it is cooled by circulating around the core of the fuel coolant tubes. If obstruction of the core occurs, a bypass valve in the fuel/oil cooler opens allowing continued oil flow to the inlet case. From the inlet case, oil is directed through internal tubes and screens, metering orifices and clearances, to the engine bearings and drives. As the bearings and drives are lubricated, cavities collect the excess oil. The scavenge pumps force this oil through the scavenge tubes to the accessory drive case sump. From the sump, oil is pumped to the oil tank through the internal deaerator which removes the major part of the air collected from the system. To ensure proper oil flow and scavenge pump operation, the breather system balances the internal oil cavity pressure. The breather tubes conduct this pressure to the accessory drive case, where the oil-laden air passes through rotary breather impellers mounted on the starter drive gearshaft, to remove the oil. The relatively oil-free air reaching the center of the gearshaft is vented overboard.

ENGINE FUEL/OIL COOLER - MAINTENANCE PRACTICES

1. General

A. The engine fuel/oil cooler is located on the forward left side of the engine, directly above the oil tank. Access to the fuel/oil cooler is gained through the lower forward cowl door. Removal and installation procedures for the fuel/oil coolers on the left and right engines are identical. The engine fuel flow transmitter is attached to the fuel/oil cooler. The two units are removed as an assembly.

CAUTION: TO PREVENT DAMAGE TO FUEL TUBES AND TO PREVENT CONTAMINANTS FROM ENTERING FUEL SYSTEM, MAKE CERTAIN THAT ALL OPEN TUBES ARE CAPPED.

B. Maintenance of the transmitter is limited to removal/ installation. Removal/installation procedures for the transmitter on both engines are identical.

2. Equipment and Materials

NOTE: Equivalent substitutes may be used instead of the following listed items:

NOTE: Some materials in the Equipment and Materials list may not be permitted to be used in your location. Persons in each location must make sure they are permitted to use these materials. All persons must obey all applicable federal, state, local, and provincial regulations for their location.

Table 201

Name and Number	Manufacturer
Lockwire, NASM20995N32, DPM 684	Not Specified
Lockwire, NASM20995N20, DPM 684	Not Specified
Lubricant, Aircraft Turbine Engine (Synthetic Base) (P03-001)	
Lubricant, Sealing Ring (P06-053)	
Preservative fluid AMSCO 140	American Mineral Spirits Co. South Gate, California
Torque wrench 0-200 inch-pounds (0-22.6 N·m) capacity	
Trichloroethylene MIL-T-27602A Type 2	Commercially available

3. Removal/Installation Engine Fuel/Oil Cooler

A. Remove Cooler

WARNING: MAKE CERTAIN THAT CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Tag throttle/thrust reverser lever, and open and tag following circuit breakers.

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
S	22	B1-11	LEFT OIL TEMP
WJE 401-404, 406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887			
S	34	B1-969	LEFT SYSTEMS DISPLAY PANEL
WJE ALL			

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	22	B1-12	RIGHT OIL TEMP
WJE 401-404, 406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887			
T	34	B1-970	RIGHT SYSTEMS DISPLAY PANEL

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION
K	27	B1-75	LEFT FUEL FLOW

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION
L	27	B1-76	RIGHT FUEL FLOW

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Place thrust reverser control valve in dump position and install safety pin.

CAUTION: TO PREVENT DAMAGE TO ELECTRICAL CONNECTOR, DO NOT USE ANY TOOL OTHER THAN PLUG PLIERS TO DISCONNECT PLUG.

(3) Disconnect fuel flow transmitter electrical connector.

(4) Remove fuel flow wiring clamp from support bracket.

CAUTION: TO PREVENT DAMAGE TO ELECTRICAL CONNECTOR, DO NOT USE ANY TOOL OTHER THAN PLUG PLIERS TO DISCONNECT PLUG.

(5) Disconnect oil temperature sensor electrical connector.

(6) Disconnect No. 1 bearing oil pressure tube. Discard O-ring and retainer.

(7) Disconnect cooler outlet sensing tube. Discard O-ring and retainer.

(8) Disconnect main bearing oil pressure tube. Discard packing and retainer.

(9) Disconnect gearbox to cooler tube. Discard packing and retainers.

(10) Remove cooler to pressurizing and dump valve tube retainer plate and slide plate back on tube.

(11) Disconnect fuel supply tube. Discard O-ring and retainers.

(12) Remove bolts that attach cooler rear mount to engine bracket.

(13) Support cooler, remove forward mounting bracket from engine.

CAUTION: HANDLE FUEL/OIL COOLER CAREFULLY DURING REMOVAL AND INSTALLATION TO PREVENT DAMAGE TO FUEL FLOW TRANSMITTER.

(14) Remove cooler by carefully moving cooler outward and forward from engine case to disengage fuel/oil cooler to pressurizing and dump valve tube.

NOTE: If oil cooler is to be replaced, remove connector, tees, and adapters for use on replacement oil cooler.

WARNING: CLEANING OPERATIONS USING SOLVENTS SHOULD BE PERFORMED IN A WELL VENTILATED ATMOSPHERE. EXERCISE NORMAL SAFETY PRECAUTIONS DURING USE.

(15) Remove O-ring from cooler to pressurizing and dump valve tube. Discard O-ring.

NOTE: If the fuel flow transmitter will be stored or will be subjected to extensive handling, the unit should be flushed thoroughly with trichloroethylene MIL-T-27602A. Fill with 4.5 (127.58 g) ounces of unused AMSCO 140 fluid or equivalent.

(16) Remove forward mounting bracket from cooler.

(17) Disconnect fuel flow transmitter from cooler as follows:

(a) Remove fuel inlet connector tube from cooler and fuel flow transmitter.

(b) Carefully pull transmitter forward to disengage adapter fitting from support bracket.

(c) Remove O-rings from fuel inlet connector tube.

B. Install Cooler

WARNING: MAKE CERTAIN THAT CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Make certain that throttle/thrust reverser lever is tagged and following circuit breakers are opened and tagged.

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
S	22	B1-11	LEFT OIL TEMP
WJE 401-404, 406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887			
S	34	B1-969	LEFT SYSTEMS DISPLAY PANEL
WJE ALL			

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	22	B1-12	RIGHT OIL TEMP
WJE 401-404, 406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887			
T	34	B1-970	RIGHT SYSTEMS DISPLAY PANEL

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION
K	27	B1-75	LEFT FUEL FLOW

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION
L	27	B1-76	RIGHT FUEL FLOW

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Make certain that thrust reverser control valve is in dump position and safety pin is installed.

(3) Connect fuel flow transmitter to cooler as follows:

(a) Lightly lubricate new O-rings with (P06-053) sealing ring lubricant, or (P03-001) lubricant engine turbine and install O-rings in fuel inlet connector tube.

(b) Insert transmitter adapter fitting into support bracket and carefully push transmitter until adapter fitting shoulder is against support bracket.

(c) Position fuel inlet connector tube at forward end of cooler and fuel flow transmitter and install.

(4) Install forward mounting bracket on cooler.

(5) Lightly lubricate new O-ring with (P06-053) sealing ring lubricant, or (P03-001) lubricant engine turbine and install O-ring on cooler to pressurizing and dump valve tube.

CAUTION: USE CARE DURING INSERTION OF TUBE INTO COOLER TO PREVENT DAMAGE TO PACKING.

(6) Position cooler and insert cooler to pressurizing and dump valve tube into cooler. Carefully move cooler aft and inward toward engine case, until tube fitting shoulder is against fitting flange and install cooler.

(7) Lightly lubricate new O-ring and retainers with (P06-053) sealing ring lubricant, or (P03-001) lubricant engine turbine, install O-ring and retainers and connect fuel supply tube. Safety tube nut with 0.032 inch lockwire.

(8) Slide cooler to pressurizing and dump valve tube retainer plate forward on tube, engage cooler studs and install.

(9) Lightly lubricate new packing and retainers with (P06-053) sealing ring lubricant, or (P03-001) lubricant engine turbine. Install packing and retainers and connect gear-box to cooler tube. Torque tube nut 130 to 140 inch-pounds (14.69 to 15.82 N·m). Safety tube nut with 0.032 inch lockwire.

(10) Lightly lubricate new packing and retainer with (P06-053) sealing ring lubricant, or (P03-001) lubricant engine turbine. Install O-ring and retainer in main bearing oil pressure tube and connect tube. Torque tube nut 130 to 140 inch-pounds (14.69 to 15.82 N·m). Safety tube nut with 0.032 inch lockwire.

(11) Lightly lubricate new O-ring and retainer with (P06-053) sealing ring lubricant, or (P03-001) lubricant engine turbine. Install O-ring and retainer in cooler outlet sensing tube and connect tube. Safety tube nut with 0.032 inch lockwire.

(12) Lightly lubricate new O-ring and retainer with (P06-053) sealing ring lubricant, or (P03-001) lubricant engine turbine. Install O-ring and retainer in No. 1 bearing oil pressure tube and connect tube. Safety tube nut with 0.032 inch lockwire.

CAUTION: TO PREVENT DAMAGE TO ELECTRICAL CONNECTOR, DO NOT USE ANY TOOL OTHER THAN PLUG PLIERS TO DISCONNECT OR CONNECT PLUG. WHEN CONNECTING PLUG, DO NOT OVERTIGHTEN.

(13) Connect oil temperature sensor electrical connector. Safety connector with 0.020 inch lockwire.

NOTE: Connector plug is properly installed when no relative motion exists between plug backshell and coupling ring.

(14) Install fuel flow wiring clamp on support bracket.

CAUTION: TO PREVENT DAMAGE TO ELECTRICAL CONNECTOR, DO NOT USE ANY TOOL OTHER THAN PLUG PLIERS TO DISCONNECT OR CONNECT PLUG. WHEN CONNECTING PLUG, DO NOT OVERTIGHTEN.

(15) Connect fuel flow transmitter electrical connector. Safety connector with 0.020 inch lockwire.

NOTE: Connector plug is properly installed when no relative motion exists between plug backshell and coupling ring.

(16) Fill oil tank. (ENGINE OIL SYSTEM, SUBJECT 12-12-04, Page 301)

(17) Remove tools, equipment, loose hardware, spilled fluid, and debris from maintenance area.

(18) Remove tag from throttle/thrust reverser lever, and remove tags and close following circuit breakers.

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
S	22	B1-11	LEFT OIL TEMP
WJE 401-404, 406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887			
S	34	B1-969	LEFT SYSTEMS DISPLAY PANEL
WJE ALL			

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	22	B1-12	RIGHT OIL TEMP
WJE 401-404, 406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887			
T	34	B1-970	RIGHT SYSTEMS DISPLAY PANEL

UPPER EPC, ENGINE - LEFT AC BUS

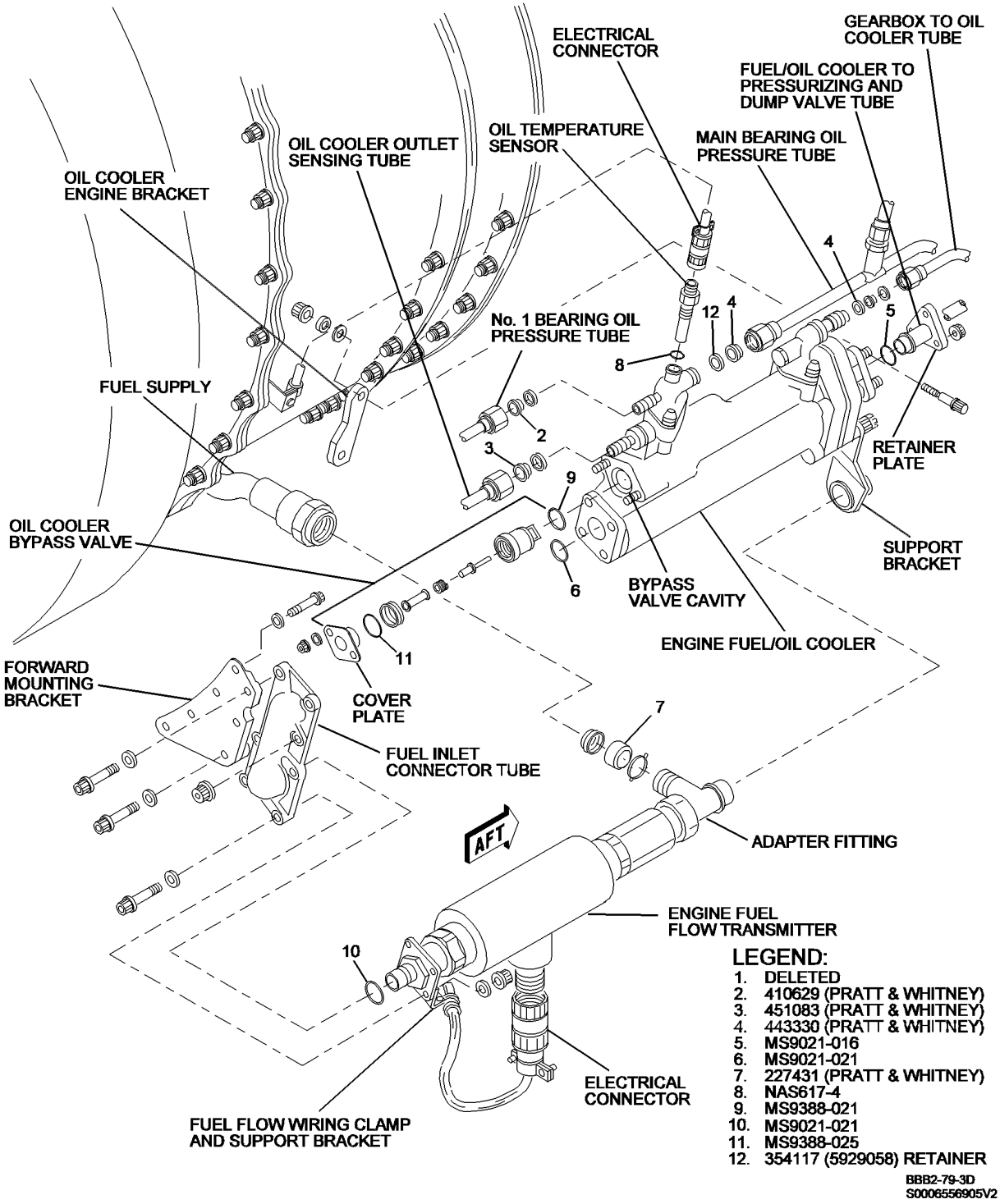
Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION
K	27	B1-75	LEFT FUEL FLOW

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION
L	27	B1-76	RIGHT FUEL FLOW

WARNING: MAKE CERTAIN THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

(19) Remove safety pin from thrust reverser control valve. Stow safety pin.



Engine Fuel/Oil Cooler -- Removal/Installation
Figure 201/79-20-01-990-801

4. **Check Fuel/Oil Cooler and Fuel Flow Transmitter**

   A. Check Cooler and Fuel Flow Transmitter

      (1) Visually check cooler and fuel flow transmitter fittings for leaks on first engine runup.

5. **Fuel/Oil Cooler Bypass Valve**

   A. Remove Valve

      (1) Disconnect No. 1 bearing oil pressure tube, remove packing and retainer.

      (2) Disconnect cooler outlet sensing tube. Discard O-ring and retainer.

      (3) Remove bypass valve cover plate. Discard O-ring and retaining ring.

      (4) Remove bypass valve from cooler.

      (5) Remove O-ring from bypass valve cavity in cooler. Discard O-ring.

   B. Install Valve

      (1) Lightly lubricate new O-ring with (P06-053) sealing ring lubricant, or (P03-001) lubricant engine turbine. Install O-ring in bypass valve cavity of cooler.

      (2) Insert bypass valve in cooler.

      (3) Lightly lubricate new O-ring with (P06-053) sealing ring lubricant, or (P03-001) lubricant engine turbine. Install retaining ring, O-ring, and bypass cover plate.

      (4) Lightly lubricate new O-ring and retainer with (P06-053) sealing ring lubricant, or (P03-001) lubricant engine turbine. Install O-ring and retainer and connect cooler outlet sensing tube. Safety tube nut with 0.032 inch lockwire.

      (5) Lightly lubricate new O-ring with (P06-053) sealing ring lubricant, or (P03-001) lubricant engine turbine. Install O-ring and retainer and connect No. 1 bearing oil pressure tube. Safety tube nut with 0.032 inch lockwire.

6. **Check Fuel/Oil Cooler Bypass Valve**

   A. Check Valve

      (1) Visually check for leaks on first engine runup.

ENGINE EXTERNAL OIL TUBES - MAINTENANCE PRACTICES

1. General

A. This maintenance practice provides removal/installation and check instructions for the engine external oil tubes. Engine external oil tubes include:

(1) No. 4 1/2 and No. 6 bearing front pressure tube.

(2) No. 2 and 3 bearing front pressure tube.

(3) No. 1 bearing pressure tube.

(4) Main bearing pressure manifold.

(5) No. 1 bearing scavenge tube.

(6) No. 4 bearing scavenge tube.

(7) Oil cooler outlet sensing tube.

(8) Oil cooler inlet tube.

(9) No. 1, 2 and 3 and main bearing drain tubes.

(10) No. 1 bearing breather tube.

(11) No. 4 bearing breather tube.

B. The removal/installation and check procedures for tubes on left and right engines are identical. Access to the tubes is through the lower and upper cowl doors as applicable.

NOTE: Forward lower cowl door overlaps aft lower cowl door and must be opened prior to opening aft lower cowl door.

WARNING: TO PREVENT INJURY TO PERSONNEL, EXERCISE CARE TO AVOID STRAKES WHEN WORKING IN ENGINE AREA WITH COWL DOORS OPEN.

CAUTION: TO PREVENT STRUCTURAL DAMAGE, USE HOLD OPEN RODS ON EACH COWL DOOR.

CAUTION: MAKE CERTAIN RIGHT ENGINE UPPER COWL DOOR IS CLOSED BEFORE OPERATING APU, OR APU EXHAUST WILL IMPINGE DIRECTLY ON COWL DOOR CAUSING EXTENSIVE DAMAGE.

C. For procedures to open cowl doors on all engines, refer to GENERAL, SUBJECT 71-00-00, Page 201.

D. Mark location of clamps and brackets to facilitate installation.

2. Equipment and Materials

NOTE: Equivalent substitutes may be used instead of following listed items.

Table 201

Name and Number	Manufacturer
Lockwire, NASM20995N32, DPM 684 (P05-262)	Not Specified
Lubricant, Aircraft Turbine Engine (Synthetic Base) (P03-001)	
Lubricant, Sealing Ring (P06-053)	

Table 201 (Continued)

Name and Number	Manufacturer
Torque wrench 0-200 inch-pounds (0-22.6 N·m) capacity	
Torque wrench 0-600 inch-pounds (0-67.8 N·m) capacity	
Ultrachem Assy. Hold #1 (PWA 36500 Assembly Fluid)	Ultrachem Inc., Wilimington, DC 19899
Royco HF825 (PWA 36500 Assembly Fluid)	Royal Lubricants Co. Inc. East Hanover, NJ 07936

3. **Removal/Installation No. 4 1/2 and 6 Bearing Front Pressure Tube, No. 2 and 3 Bearing Front Pressure Tube, No. 1 Bearing Pressure Tube and Main Bearing Pressure Manifold**

A. Remove Tubes

WARNING: MAKE CERTAIN THAT CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Tag throttle/thrust reverser lever, and open and tag following circuit breakers.

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891

U	41	B1-2	ENGINE IGNITION RIGHT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893

U	41	B1-423	ENGINE START VALVE RIGHT

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891

U	42	B1-1	ENGINE IGNITION LEFT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893

U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name

WJE ALL

K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Place thrust reverser control valve in dump position and install safety pin.

(3) Disconnect and remove No. 4 1/2 and No. 6 bearing front pressure tube. and discard packings and retainers. (Figure 201)

(4) Disconnect and remove No. 2 and 3 bearing pressure tube. Discard packings and retainers.

NOTE: To gain access to gearbox end of No. 2 and 3 bearing pressure tube, it will be necessary to remove starter from engine.(PNEUMATIC STARTER, SUBJECT 80-10-01)

(5) Disconnect and remove main bearing presure manifold. Discard packings and retainers.

(6) Disconnet and remove No. 1 bearing pressure tube. Discard packings and retainers.

B. Install Tubes

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Make certain throttle/thrust reverser lever is tagged and following circuit breakers are open and tagged.

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Make certain thrust reverser control valve is in dump position and safety pin is installed.

NOTE: Minimum clearance between any two adjacent tubes or between one single tube and any other adjacent engine part shall be 0.125 inch (3.175 mm) unless otherwise specified. Exceptions to this required clearance are permitted at specific locations where adjacent tubes are clipped together or where other local constraints will prevent tube contact at clearances below 0.125 inch (3.175 mm) minimum. Minimum clearance refers only to clearance relative to tube and not to fittings or other attached hardware.

(3) Lightly coat two new packings with (P06-053) sealing ring lubricant, or (P03-001) lubricant engine turbine and install packing and retainer on each end of No. 1 bearing pressure tube. Install tube and connect coupling nuts. Torque nuts 65 to 70 inch-pounds (7.28 to 7.84 N·m). Safety nuts with (P05-262) lockwire.

(4) Lightly coat two new packings with (P06-053) sealing ring lubricant, or (P03-001) lubricant engine turbine and install packing and retainer on each end of main bearing pressure manifold tube. Install tube and connect coupling nuts. Torque nuts 130 to 140 inch-pounds (14.56 to 15.68 N·m). Safety nuts with (P05-262) lockwire.

(5) Lightly coat two new packings with (P06-053) sealing ring lubricant, or (P03-001) lubricant engine turbine and install packing and retainer on each end of No. 2 and 3 bearing pressure tube. Install tube and connect coupling nuts. Torque nuts 65 to 70 inch-pounds (7.28 to 7.84 N·m). Safety nuts with (P05-262) lockwire.

(6) Install starter. (PNEUMATIC STARTER, SUBJECT 80-10-01)

(7) Lightly coat two new packings with (P06-053) sealing ring lubricant, or (P03-001) lubricant engine turbine and install packing and retainer on each end of No. 4 1/2 and 6 bearing pressure tube. Install tube and connect coupling nuts. Torque nuts 65 to 70 inch-pounds (7.28 to 7.84 N·m). Safety nuts with (P05-262) lockwire.

NOTE: Tube coupling should be positioned to ensure an 0.030 inch (0.762 mm) clearance with fan exhaust outer duct mount rail. (Figure 201)

(8) Dry motor engine and check for leaks. (GENERAL, SUBJECT 71-00-00, Page 501)

(9) Check oil level after coastdown and service oil tank if required. (ENGINE OIL SYSTEM, SUBJECT 12-12-04, Page 301)

(10) Remove tools, equipment, loose hardware, spilled fluid, and debris from maintenance area.

(11) Remove tag from throttle/thrust reverser lever, and remove tags and close following circuit breakers.

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891 (Continued)

(Continued)

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

(12) Remove safety pin from thrust reverser control valve. Stow safety pin.

4. Removal/Installation No. 1 Bearing Oil Scavenge Tube

A. Remove Tube

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Tag throttle/thrust reverser lever, and open and tag following circuit breakers.

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893 (Continued)

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6555 TO 7245 KPA) (PRECHARGE PRESSURE).

(2) Place thrust reverser control valve in dump position and install safety pin.

(3) Remove oil tank. (OIL TANK, SUBJECT 79-10-01)

(4) Disconnect and remove tube. Discard packings and retainers. (Figure 201)

B. Install Tube

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Make certain throttle/thrust reverser lever is tagged and following circuit breakers are open and tagged.

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6555 TO 7245 KPA) (PRECHARGE PRESSURE).

(2) Make certain that thrust reverser control valve is in dump position and safety pin is installed.

NOTE: Minimum clearance between any two adjacent tubes or between one single tube and any other adjacent engine part shall be 0.125 inch (3.175 mm) unless otherwise specified. Exceptions to this required clearance are permitted at specific locations where adjacent tubes are clipped together or where other local constraints will prevent tube contact at clearances below 0.125 inch (3.175 mm) minimum. Minimum clearance refers only to clearance relative to tube and not to fittings or other attached hardware.

(3) Lightly coat two new packings with (P06-053) sealing ring lubricant, or (P03-001) lubricant engine turbine and install packing and new retainer on each end of tube.

(4) Install tube and connect coupling nuts. Torque nuts 65 to 70 inch-pounds (7.28 to 7.84 N·m). Safety nuts with (P05-262) lockwire.

(5) Install oil tank. (OIL TANK, SUBJECT 79-10-01)

(6) Dry motor engine and check for leaks. (GENERAL, SUBJECT 71-00-00, Page 501)

(7) Check oil level after coastdown, and service oil tank if required. (ENGINE OIL SYSTEM, SUBJECT 12-12-04, Page 301)

(8) Remove tools, equipment, loose hardware, spilled fluid, and debris from maintenance area.

(9) Remove tag from throttle/thrust reverser lever, and remove tags and close following circuit breakers.

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

(10) Remove safety pin from thrust reverser control valve. Stow safety pin.

5. Removal/Installation No. 4 Bearing Oil Scavenge Tube

A. Remove Tube

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Tag throttle/thrust reverser lever, and open and tag following circuit breakers.

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6555 TO 7245 KPA) (PRECHARGE PRESSURE).

(2) Place thrust reverser control valve in dump position and install safety pin.

(3) Disconnect front coupling nut of No. 3 bearing drain tube at drain manifold to provide access. (Figure 201)

(4) Remove bolts from forward end of No. 4 bearing scavenge tube, disconnect aft end of tube from elbow and remove tube. Discard O-ring, packing and retainer.

B. Install Tube

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST RVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Make certain throttle/thrust reverser lever is tagged and following circuit breakers are open and tagged.

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6555 TO 7245 KPA) (PRECHARGE PRESSURE).

(2) Make certain that thrust reverser control valve is in dump position and safety pin is installed.

NOTE: Minimum clearance between any two adjacent tubes or between one single tube and any other adjacent engine part shall be 0.125 inch (3.175 mm) unless otherwise specified. Exceptions to this required clearance are permitted at specific locations where adjacent tubes are clipped together or where other local constraints will prevent tube contact at clearances below 0.125 inch (3.175 mm) minimum. Minimum clearance refers only to clearance relative to tube and not to fittings or other attached hardware.

(3) Lightly coat new O-ring and packing with (P06-053) sealing ring lubricant, or (P03-001) lubricant engine turbine. Install O-ring on front of No. 4 bearing oil scavenge tube and packing and retainer on aft end of tube.

(4) Install and connect tube. Torque bolts at front end of tube 65 to 70 inch-pounds (7.28 to 7.84 N·m). Safety bolts with (P05-262) lockwire. Torque nut at aft end of tube 130 to 140 inch-pounds (14.56 to 15.68 N·m). Safety nut with (P05-262) lockwire.

NOTE: If temperature indicators are attached to tube, make certain that they can be seen easily when tube is installed.

(5) Connect front coupling nut of No. 3 bearing drain tube. Torque nut 270 to 300 inch-pounds (30.24 to 33.6 N·m). Safety nut with (P05-262) lockwire.

(6) Dry motor engine and check for leaks. (GENERAL, SUBJECT 71-00-00, Page 501)

(7) Check oil level after coastdown and service oil tank if required. (ENGINE OIL SYSTEM, SUBJECT 12-12-04, Page 301)

(8) Remove tools, equipment, loose hardware, spilled fluid and debris from maintenance area.

(9) Remove tag from throttle/thrust reverser lever, and remove tags and close following circuit breakers.

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

(10) Remove safety pin from thrust reverser control valve. Stow safety pin.

6. **Removal/Installation Oil Cooler Outlet Sensing Tube**

A. Remove Tube

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Tag throttle/thrust reverser lever, and open and tag following circuit breakers.

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6555 TO 7245 KPA) (PRECHARGE PRESSURE).

(2) Place thrust reverser control valve in dump position and install safety pin.

(3) Remove oil cooler. (OIL TANK, SUBJECT 79-10-01)

(4) Disconnect aft end of tube. (Figure 201)

(5) Remove tube from engine.

NOTE: Front end of tube was disconnected when oil cooler was removed.

B. Install Tube

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Make certain throttle/thrust reverser lever is tagged and following circuit breakers are open and tagged.

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6555 TO 7245 KPA) (PRECHARGE PRESSURE).

(2) Make certain that thrust reverser control valve is in dump position and safety pin is installed.

NOTE: Minimum clearance between any two adjacent tubes or between one single tube and any other adjacent engine part shall be 0.125 inch (3.175 mm) unless otherwise specified. Exceptions to this required clearance are permitted at specific locations where adjacent tubes are clipped together or where other local constraints will prevent tube contact at clearance below 0.125 inch (3.175 mm) minimum. Mimimum clearance refers only to clearance relative to tube and not to fittings or other attached hardware.

(3) Lightly coat two new packings with (P06-053) sealing ring lubricant, or (P03-001) lubricant engine turbine and install packing and retainer on each end of tube.

(4) Position tube on engine and connect aft end of tube. Torque nut 65 to 70 inch-pounds (7.28 to 7.84 N·m). Safety nut with (P05-262) lockwire.

NOTE: Front end of tube will be connected when oil cooler is installed.

(5) Install oil cooler. ENGINE FUEL/OIL COOLER, SUBJECT 79-20-01

(6) Dry motor engine and check for leaks. (GENERAL, SUBJECT 71-00-00, Page 501)

(7) Check oil level after coastdown, and service oil tank if required. (ENGINE OIL SYSTEM, SUBJECT 12-12-04, Page 301)

(8) Remove tools, equipment, loose hardware, spilled fluid, and debris from maintenance area.

(9) Remove tag from throttle/thrust reverser lever, and remove tags and close following circuit breakers.

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

(10) Remove safety pin from thrust reverser control valve. Stow safety pin.

7. Removal/Installation Oil Cooler Inlet Tube

A. Remove Tube

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Tag throttle/thrust reverser lever, and open and tag following circuit breakers.

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6555 TO 7245 KPA) (PRECHARGE PRESSURE).

(2) Place thrust reverser control valve in dump position and install safety pin.

(3) Disconnect and remove No. 4 bearing scavenge tube. Figure 201

(4) Disconnect No. 3 bearing drain tube at main bearing drain manifold to provide access.

(5) Remove bolts from elbow at aft end of oil cooler inlet tube.

(6) Loosen coupling nut attaching forward end of tube to tee.

(7) Remove tee from oil cooler. Discard O-ring.

(8) Remove tube and tee from engine.

(9) Remove tee from tube. Discard tube liner, packing, and retainer.

B. Install Tube

WARNING: MAKE CERTAIN THAT CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Make certain throttle/thrust reverser lever is tagged and following circuit breakers are open and tagged.

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6555 TO 7245 KPA) (PRECHARGE PRESSURE).

(2) Make certain that thrust reverser control valve is in dump position and safety pin is installed.

NOTE: Minimum clearance between any two adjacent tubes or between one single tube and any other adjacent engine part shall be 0.125 inch (3.175 mm) unless otherwise specified. Exceptions to this required clearance are permitted at specific locations where adjacent tubes are clipped together or where other local constraints will prevent tube contact at clearances below 0.125 inch (3.175 mm) minimum. Minimum clearance refers only to clearance relative to tube and not to fittings or other attached hardware.

(3) Lightly coat new O-rings and packing with (P06-053) sealing ring lubricant, or (P03-001) lubricant engine turbine.

(4) Install tube liner, packing, and retainer on front end of oil cooler inlet tube. Loosely attach coupling nut to tee.

(5) Install O-rings on elbow at aft end of tube, and on tee at forward end of tube.

(6) Position tube on engine. Torque bolts at rear end of tube 130 to 140 inch-pounds (14.56 to 15.68 N·m). Safety bolts with (P05-262) lockwire.

(7) Torque nuts attaching tee at front end of tube 75 to 85 inch-pounds (8.4 to 9.52 N·m).

(8) Tighten coupling nut at front end of tube. Torque nut 130 to 140 inch-pounds (14.56 to 15.68 N·m). Safety nut with (P05-262) lockwire.

(9) Connect No. 3 bearing drain tube at main bearing drain manifold. Torque nut 270 to 300 inch-pounds (30.24 to 33.6 N·m). Safety nut with (P05-262) lockwire.

(10) Lightly coat new O-ring and packing with (P06-053) sealing ring lubricant, or (P03-001) lubricant engine turbine. Install O-ring on front of No. 4 bearing oil scavenge tube and packing and retainer on aft end of tube.

(11) Install and connect tube. Torque bolts at front end of tube 65 to 70 inch-pounds (7.28 to 7.84 N·m). Safety bolts with lockwire. Torque nut at aft end of tube 130 to 140 inch-pounds (14.56 to 15.68 N·m). Safety nut with (P05-262) lockwire.

(12) Dry motor engine and check for leaks. (GENERAL, SUBJECT 71-00-00, Page 501)

(13) Check oil level after coastdown, and service oil tank if required. (ENGINE OIL SYSTEM, SUBJECT 12-12-04, Page 301)

(14) Remove tools, equipment, loose hardware, spilled fluid, and debris from maintenance area.

(15) Remove tag from throttle/thrust reverser lever, and remove tags and close following circuit breakers.

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891 (Continued)

(Continued)

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

(16) Remove safety pin from thrust reverser control valve. Stow safety pin.

8. Removal/Installation No. 1, No. 2, No. 3 and Main Bearing Drain Tubes

A. Remove Tubes

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Tag throttle/thrust reverser lever, and open and tag following circuit breakers.

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893 (Continued)

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Place thrust reverser control valve in dump position and install safety pin.

(3) Remove oil tank. (OIL TANK, SUBJECT 79-10-01)

(4) Disconnect No. 1 bearing drain tube and remove tube from engine. Discard O-ring.

(5) Remove No. 4 bearing scavenge tube to provide access.

(6) Disconnect No. 2 bearing drain tube and remove tube from engine.

(7) Disconnect No. 3 bearing drain tube and remove tube from engine.

(8) Disconnect drain manifold from connector and remove from engine.

B. Install Tubes

WARNING: MAKE CERTAIN THAT CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Make certain throttle/thrust reverser lever is tagged and following circuit breakers are open and tagged.

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Make certain that thrust reverser control valve is in dump position and safety pin is installed.

NOTE: Minimum clearance between any two adjacent tubes or between one single tube and any other adjacent engine part shall be 0.125 inch (3.175 mm) unless otherwise specified. Exceptions to this required clearance are permitted at specific locations where adjacent tubes are clipped together or where other local constraints will prevent tube contact at clearance below 0.125 inch (3.175 mm) minimum. Minimum clearance refers only to clearance relative to tube and not to fittings or other attached hardware.

(3) Lightly coat new O-ring with (P06-053) sealing ring lubricant, or (P03-001) lubricant engine turbine and install O-ring on front end of No. 1 bearing drain tube.

(4) Position tube on engine. Torque bolts 85 to 95 inch-pounds (9.52 to 10.64 N·m). Safety bolts with (P05-262) lockwire.

(5) Connect aft end of tube to main bearing manifold tee. Torque nut 90 to 100 inch-pounds (10.08 to 11.2 N·m). Safety nut with (P05-262) lockwire.

(6) Install oil tank. (OIL TANK, SUBJECT 79-10-01)

(7) Position No. 2 bearing drain tube on engine and connect coupling nuts. Torque nuts 270 to 300 inch-pounds (30.24 to 33.6 N·m). Safety nuts with (P05-262) lockwire.

(8) Lightly coat new O-ring and packing with (P06-053) sealing ring lubricant, or (P03-001) lubricant engine turbine. Install O-ring on front of No. 4 bearing oil scavenge tube and packing and retainer on aft end of tube.

(9) Install and connect tube. Torque bolts at front end of tube 65 to 70 inch-pounds (7.28 to 7.84 N·m). Safety bolts with lockwire. Torque nut at aft end of tube 130 to 140 inch-pounds (14.56 to 15.68 N·m). Safety nut with lockwire.

(10) Install No. 3 bearing drain tube and connect coupling nuts. Torque nuts 270 to 300 inch-pounds (30.24 to 33.6 N·m). Safety nuts with (P05-262) lockwire.

(11) Connect main bearing drain manifold to connector. Torque nut 450 to 500 inch-pounds (50.4 to 56.0 N·m). Safety nut to adjacent No. 2 bearing drain tube nut with (P05-262) lockwire.

(12) Dry motor engine and check for leaks. (GENERAL, SUBJECT 71-00-00, Page 501)

(13) Check oil level after coastdown, and service oil tank if required. (ENGINE OIL SYSTEM, SUBJECT 12-12-04, Page 301)

(14) Remove tools, equipment, loose hardware, spilled fluid, and debris from maintenance area.

(15) Remove tag from throttle/thrust reverser lever, and remove tags and close following circuit breakers.

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

(16) Remove safety pin from thrust reverser control valve. Stow safety pin.

9. Removal/Installation No. 1 Bearing Oil Breather Tube

A. Remove Tube

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Tag throttle/thrust reverser lever, and open and tag following circuit breakers.

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP

(Continued)

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Place thrust reverser control valve in dump position and install safety pin.

(3) Remove oil tank .(OIL TANK, SUBJECT 79-10-01)

(4) Disconnect and remove breather tube from engine. Discard packings and retainers. (Figure 201)

B. Install Tube

WARNING: MAKE CERTAIN THAT CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Make certain throttle/thrust reverser lever is tagged and following circuit breakers are open and tagged.

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891 (Continued)

(Continued)

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Make certain that thrust reverser control valve is in dump position and safety pin is installed.

NOTE: Minimum clearance between any two adjacent tubes or between one single tube and any other adjacent engine part shall be 0.125 inch (3.175 mm) unless otherwise specified. Exceptions to this required clearance are permitted at specific locations where adjacent tubes are clipped together or where other local constraints will prevent tube contact at clearances below 0.125 inch (3.175 mm) minimum. Minimum clearance refers only to clearance relative to tube and not to fittings or other attached hardware.

(3) Lightly coat new packings with (P06-053) sealing ring lubricant, or (P03-001) lubricant engine turbine and install packing and retainer on each end of tube.

(4) Position tube on engine and connect coupling nuts. Torque nuts 100 to 120 inch-pounds (11.2 to 13.44 N·m). Safety nuts with (P05-262) lockwire.

(5) Install oil tank. (OIL TANK, SUBJECT 79-10-01)

(6) Dry motor engine and check for leaks. (GENERAL, SUBJECT 71-00-00, Page 501)

(7) Check oil level after coastdown, and service oil tank if required. (ENGINE OIL SYSTEM, SUBJECT 12-12-04, Page 301)

(8) Remove tools, equipment, loose hardware, spilled fluid, and debris from maintenance area.

(9) Remove tag from throttle/thrust reverser lever, and remove tags and close following circuit breakers.

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

(10) Remove safety pin from thrust reverser control valve. Stow safety pin.

10. Removal/Installation No. 4 Bearing Oil Breather Tube

A. Remove Tube

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Tag throttle/thrust reverser lever, and open and tag following circuit breakers.

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP

(Continued)

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Place thrust reverser control valve in dump position and install safety pin.

(3) Disconnect tube and remove tube from engine. Discard O-ring, packing, and retainer. (Figure 201)

B. Install Tube

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Make certain throttle/thrust reverser lever is tagged and following circuit breakers are open and tagged.

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893 (Continued)

(Continued)

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6555 TO 7245 KPA) (PRECHARGE PRESSURE).

(2) Make certain that thrust reverser control valve is in dump position and safety pin is installed.

NOTE: Minimum clearance between any two adjacent tubes or between one single tube and any other adjacent engine part shall be 0.125 inch (3.175 mm) unless otherwise specified. Exceptions to this required clearance are permitted at specific locations where adjacent tubes are clipped together or where other local constraints will prevent tube contact at clearances below 0.125 inch (3.175 mm) minimum. Minimum clearance refers only to clearance relative to tube and not to fittings or other attached hardware.

(3) Lightly coat new O-ring and packing with (P06-053) sealing ring lubricant, or (P03-001) lubricant engine turbine. Install O-ring at aft end of tube and packing and retainer on front end of tube.

(4) Guide aft end of tube into elbow and install plate bolts handtight.

(5) Install tube at gearbox elbow and connect coupling nut. Torque tube nut 200 to 220 inch-pounds (22.4 to 24.64 N·m). Safety tube nut with (P05-262) lockwire.

(6) Torque plate bolts at aft end of tube 85 to 95 inch-pounds (9.52 to 10.64 N·m). Safety bolts with (P05-262) lockwire.

(7) Dry motor engine and check for leaks. No leaks are permitted. (GENERAL, SUBJECT 71-00-00, Page 501)

(8) Do Test B Ground Check at normal takeoff. (ENGINE GENERAL, SUBJECT 72-00-00, Page 501)

(9) Check oil level after coastdown, and service oil tank if required. (ENGINE OIL SYSTEM, SUBJECT 12-12-04, Page 301)

(10) Remove tools, equipment, loose hardware, spilled fluid, and debris from maintenance area.

(11) Remove tag from throttle/thrust reverser lever, and remove tags and close following circuit breakers.

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

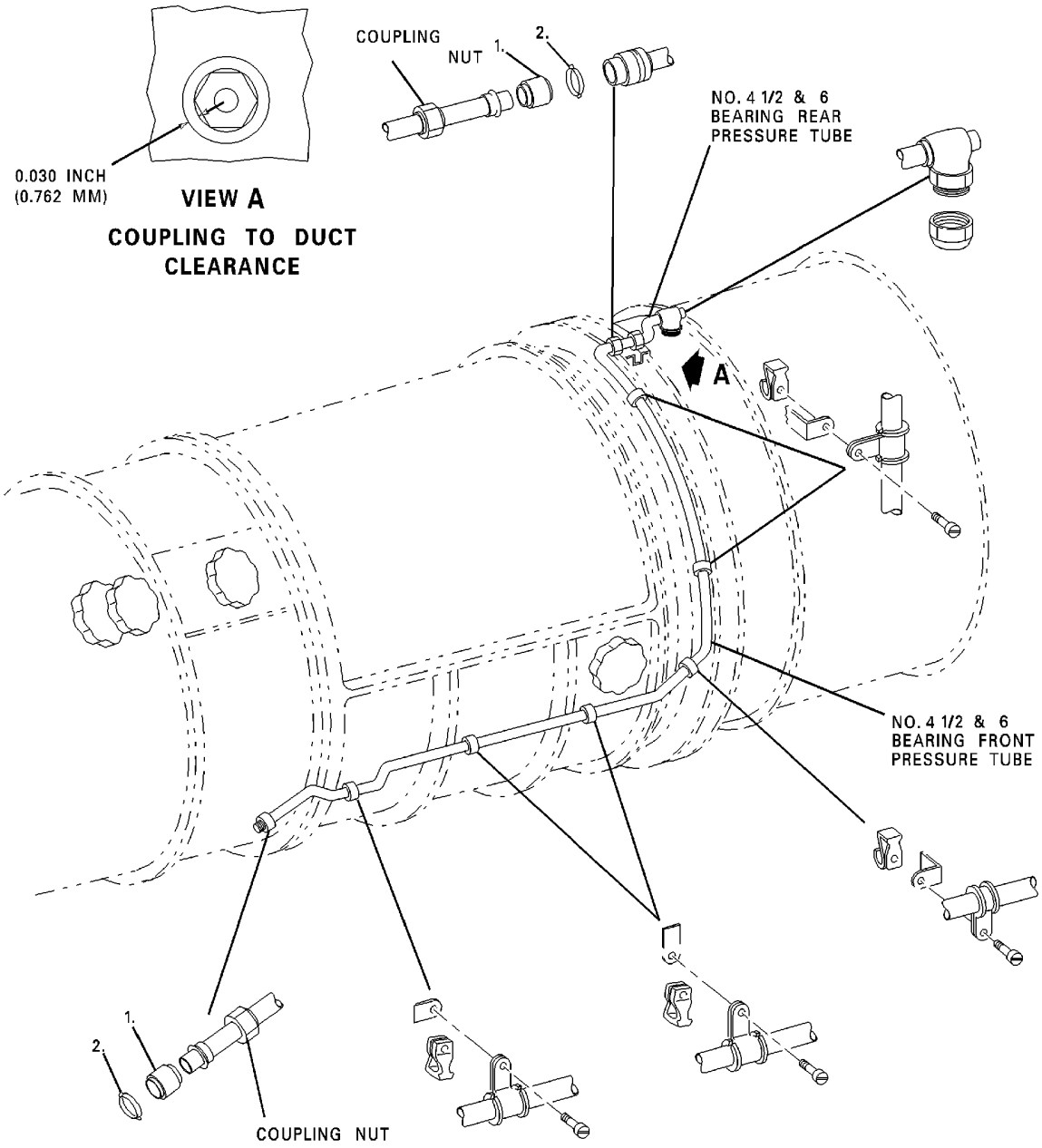
Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

(12) Remove safety pin from thrust reverser control valve. Stow safety pin.

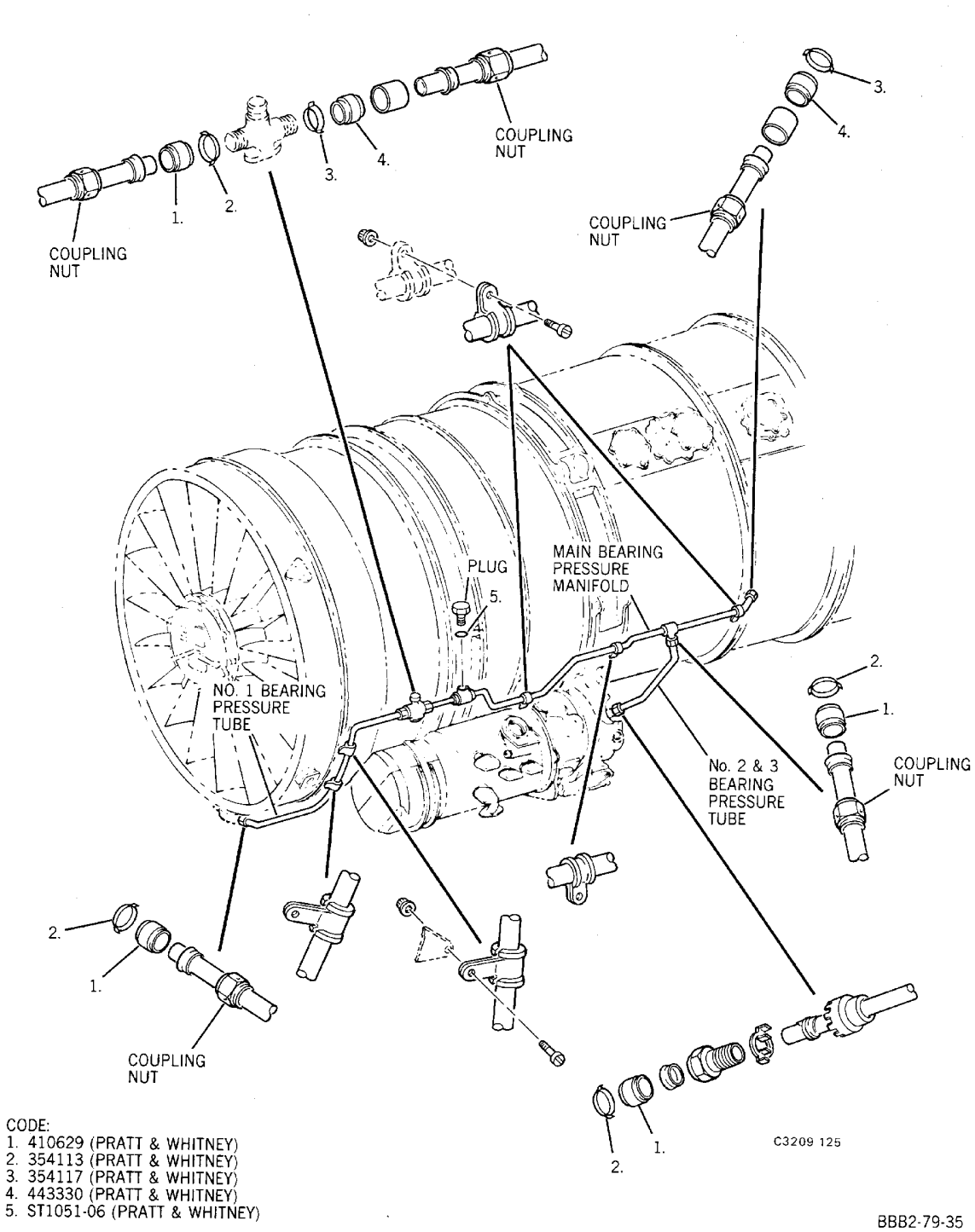


CODE:
1. 410629 (PRATT & WHITNEY)
2. 354113 (PRATT & WHITNEY)

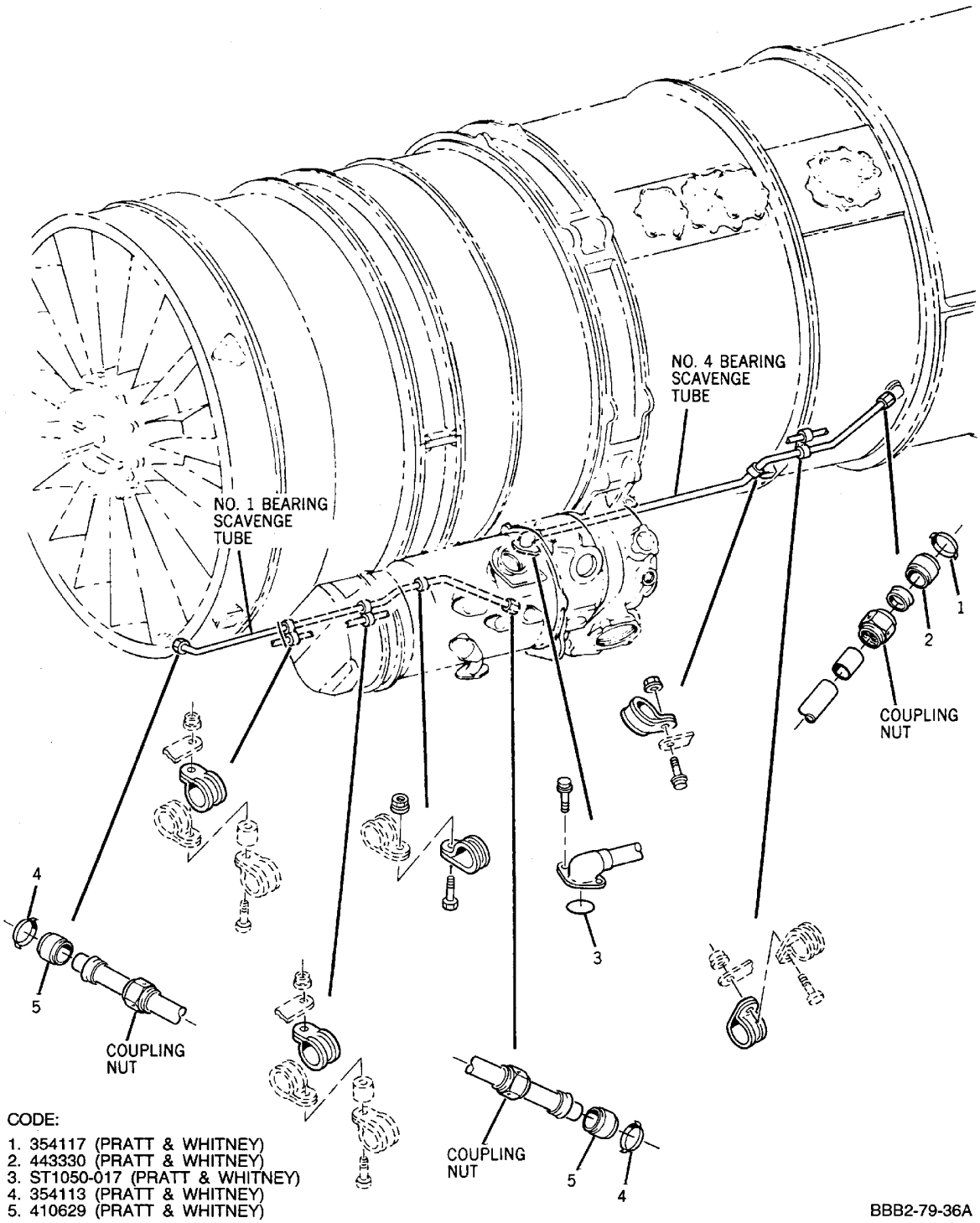
CAG(IGDS)

BBB2–79–34A

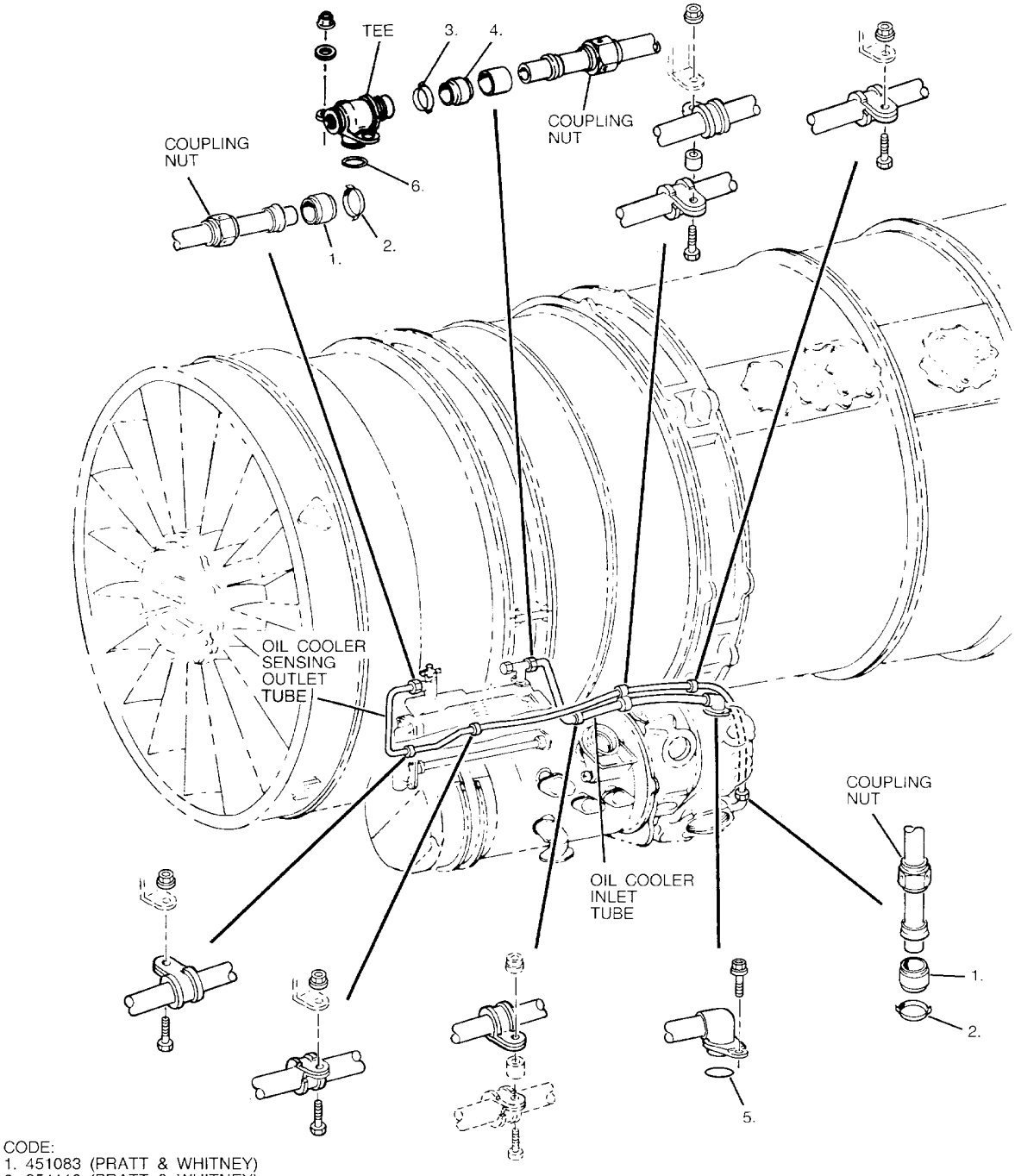
Engine External Oil Tubes -- Removal/Installation
Figure 201/79-20-02-990-801 (Sheet 1 of 6)



Engine External Oil Tubes -- Removal/Installation
Figure 201/79-20-02-990-801 (Sheet 2 of 6)



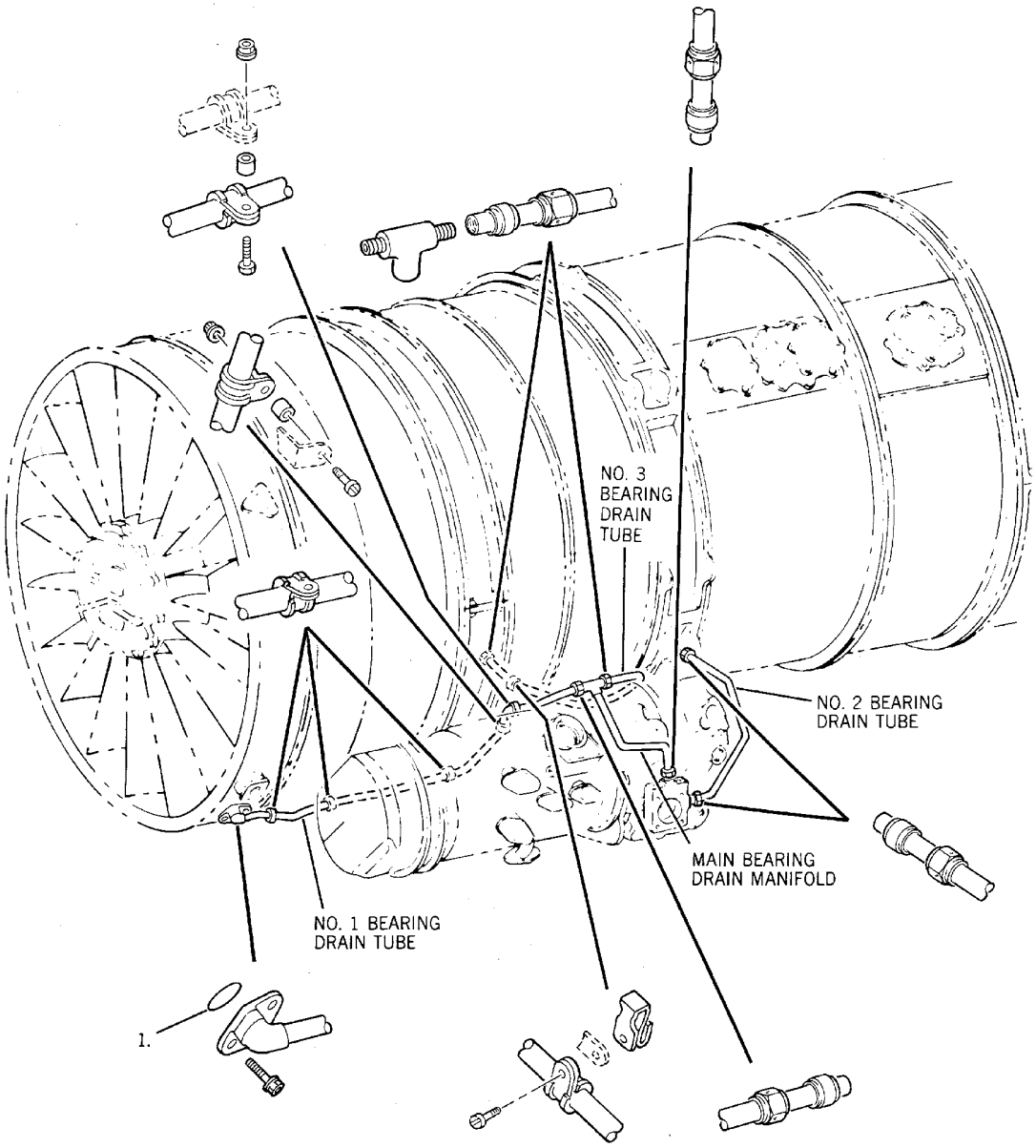
Engine External Oil Tubes -- Removal/Installation
Figure 201/79-20-02-990-801 (Sheet 3 of 6)



CODE:
1. 451083 (PRATT & WHITNEY)
2. 354110 (PRATT & WHITNEY)
3. 354117 (PRATT & WHITNEY)
4. 443330 (PRATT & WHITNEY)
5. ST1050-017 (PRATT & WHITNEY)
6. ST1050-016 (PRATT & WHITNEY)

BBB2-79-37A

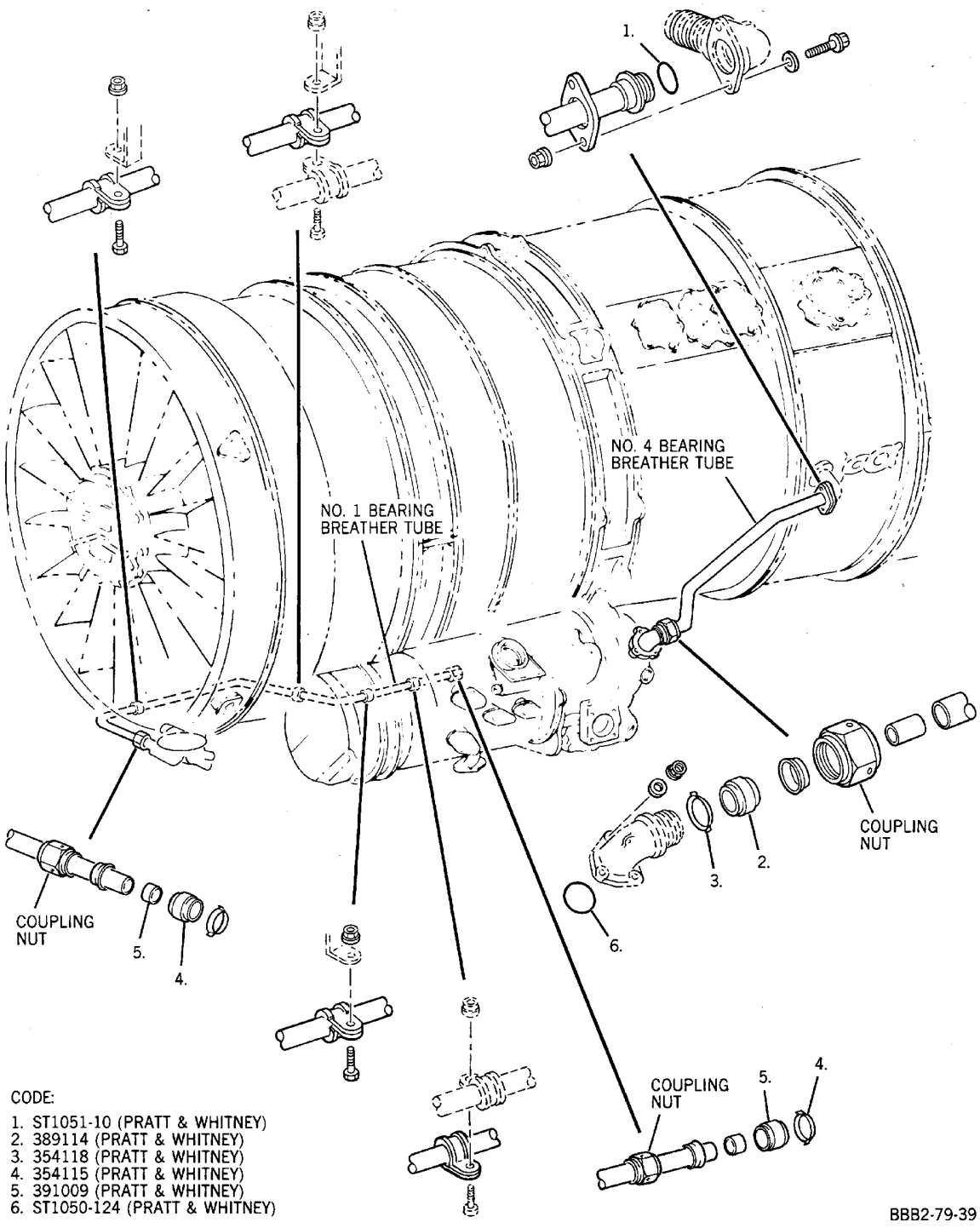
Engine External Oil Tubes -- Removal/Installation
Figure 201/79-20-02-990-801 (Sheet 4 of 6)



CODE:
1. ST1050-107 PRATT & WHITNEY

BBB2-79-38

Engine External Oil Tubes -- Removal/Installation
Figure 201/79-20-02-990-801 (Sheet 5 of 6)



Engine External Oil Tubes -- Removal/Installation
Figure 201/79-20-02-990-801 (Sheet 6 of 6)

OIL PRESSURE RELIEF VALVE - MAINTENANCE PRACTICES

1. General

A. The following maintenance practices provide for the removal/ installation, adjustment/test, and cleaning/painting of the oil pressure relief valve. The relief valve is located at the aft end of the accessory drive case, on the lower left side of the engine. Access to the oil pressure relief valve is gained through the lower forward cowl door.

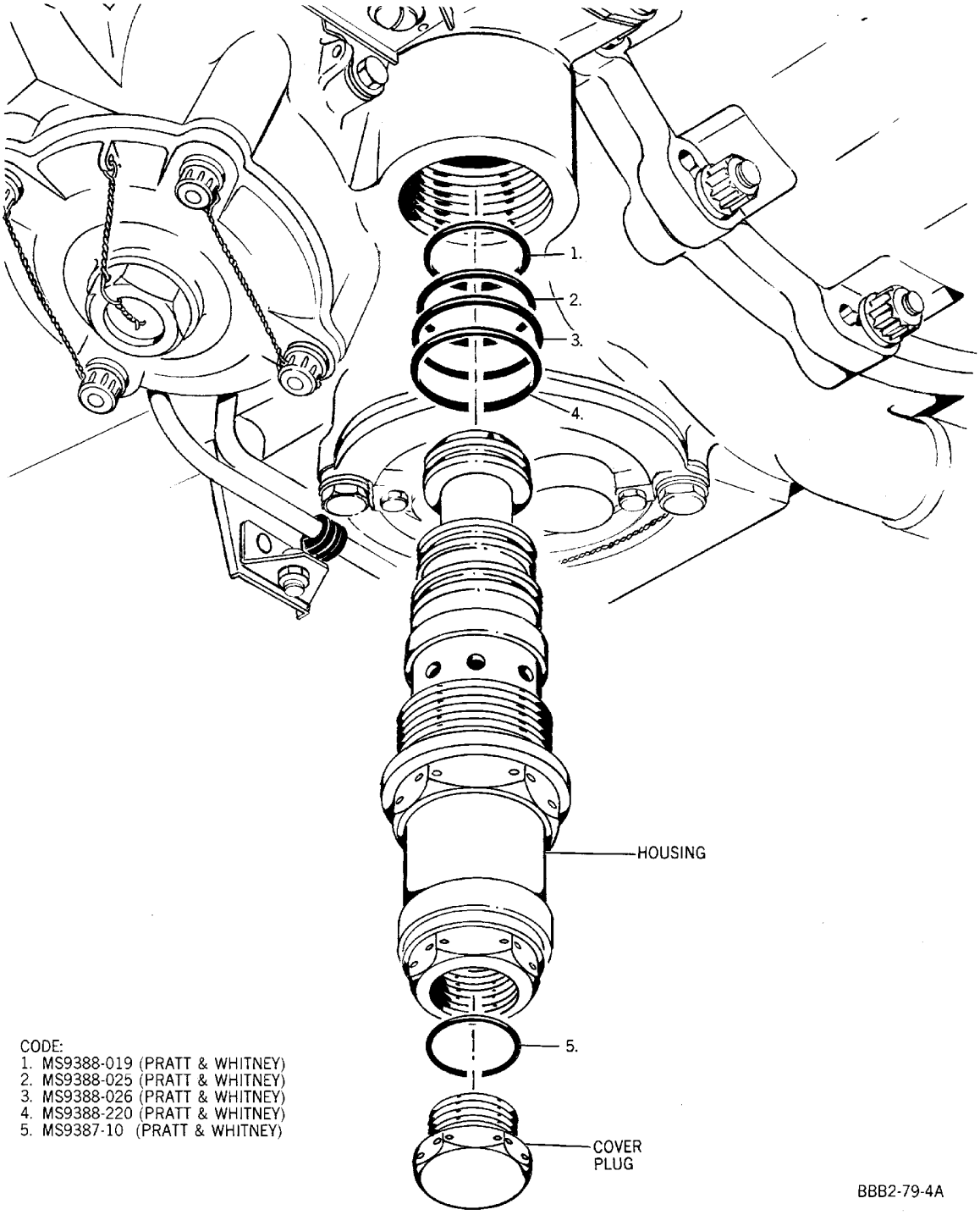
2. Equipment and Materials

NOTE: Equivalent substitutes may be used instead of the following listed items.

NOTE: Some materials in the Equipment and Materials list may not be permitted to be used in your location. Persons in each location must make sure they are permitted to use these materials. All persons must obey all applicable federal, state, local, and provincial regulations for their location.

Table 201

Name and Number	Manufacturer
Solvent, No. 2 P-D-680, Type 1	
Crocus cloth 810	
Petrolatum VV-P-236	
Lockwire, NASM20995N32, DPM 684	Not Specified
Lubricating oil P&W 521	
Torque wrench 0-200 inch-pounds (0-22.6 N·m) capacity	
Torque wrench 50-1000 inch-pounds (5.65-113 N·m)	



Oil Pressure Relief Valve - Removal/Installation
Figure 201/79-20-03-990-801

3. **Removal/Installation Oil Pressure Relief Valve**

A. Remove Valve

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Tag throttle/thrust reverser lever, and open and tag following circuit breakers.

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Place thrust reverser control valve in dump position and install safety pin.

(3) Drain engine oil tank . (ENGINE OIL SYSTEM, SUBJECT 12-12-04, Page 301)

(4) Install wrench on valve hex flats adjacent to accessory drive case and remove valve.

(5) Remove valve from housing . (Figure 201)

(6) Remove and discard O-rings.

B. Install Valve

WARNING: MAKE CERTAIN THAT CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Make certain throttle/thrust reverser lever is tagged and following circuit breakers are opened and tagged:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Make certain that thrust reverser control valve is in dump position and safety pin is installed.

(3) Lightly lubricate new O-rings with Petrolatum (VV-P-236) and install O-rings on valve housing. (Figure 201)

(4) Install valve in accessory drive case. Torque valve 550 to 650 inch-pounds (62.15 to 73.45 N·m). Safety valve with lockwire.

(5) Lightly lubricate new O-ring with Petrolatum (VV-P-236) and install O-ring on lower plug. Torque plug 150 to 160 inch-pounds (16.95 to 18.08 N·m). Safety plug with lockwire.

(6) Service engine oil tank. (ENGINE OIL SYSTEM, SUBJECT 12-12-04, Page 301)

(7) Adjust oil pressure. (Paragraph 4.)

(8) Remove tools, equipment, loose hardware, and debris from maintenance area.

(9) Remove tag from throttle/thrust reverser lever, and remove tags and close following circuit breakers.

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

(10) Remove safety pin from thrust reverser control valve. Stow safety pin.

4. Adjustment/Test Oil Pressure Relief Valve

A. Adjust Valve

NOTE: At ground/descent idle, oil temperature of 100°F (38°C) minimum, an oil pressure of 40 to 47 psig (275.8 to 324.1 kPa) is normal on aircraft instrument panel gages and does not require adjustment.

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6555 TO 7245 KPA) (PRECHARGE PRESSURE).

(1) Place thrust reverser control valve in dump position and install safety pin.

(2) Start engine and run at idle for 2 to 5 minutes, to stabilize power level and allow oil temperature to reach 100°F (38°C) minimum. (GENERAL, SUBJECT 71-00-00, Page 501)

CAUTION: WHEN REMOVING OUTER PLUG, DO NOT ALLOW INNER PLUG OR VALVE HOUSING TO TURN. LOSS OF OIL AND LOSS OF VALVE SECURITY CAN RESULT FROM LOOSENING OF THESE PARTS.

(3) Remove lower plug, use screwdriver to hold adjusting screw stationary and loosen locknut on adjusting screw. (Figure 202)

(4) Turn adjusting screw clockwise to increase oil pressure or counterclockwise to decrease oil pressure until reading of 42 to 45 psig (289.6 to 310.3 kPa) is obtained.

NOTE: One full turn of adjusting screw will change pressure approximately 2 psi (13.8 kPa).

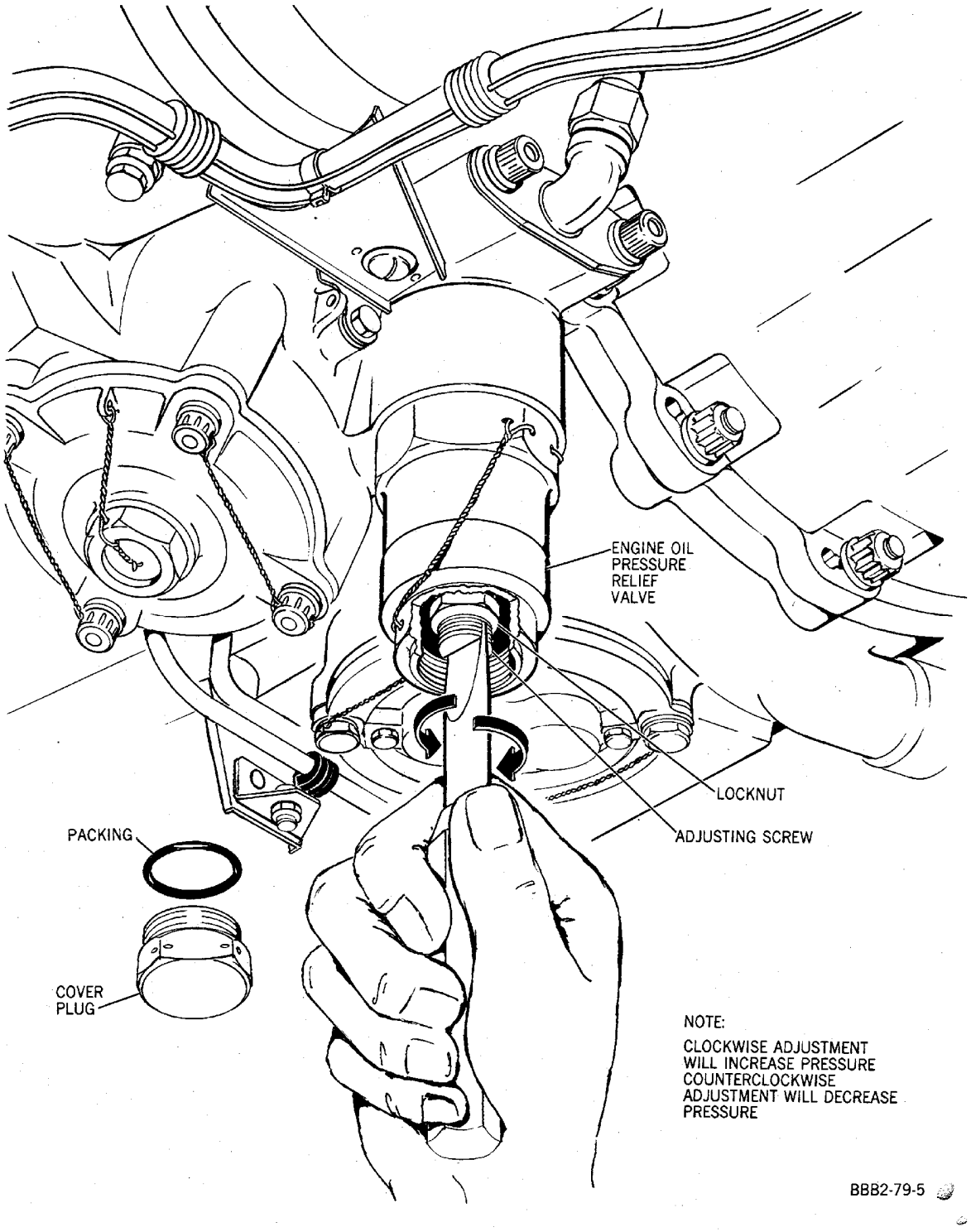
(5) Tighten locknut on adjusting screw. Check that oil pressure is still 42 to 45 psig (289.6 to 310.3 kPa).

(6) Shut down engine. (GENERAL, SUBJECT 71-00-00, Page 501)

(7) Lubricate new O-ring packing with light coat of Petrolatum (VV-P-236) and install on lower plug.

(8) Install lower plug in valve. Torque lower plug 150 to 160 inch-pounds (16.95 to 18.08 N·m). Safety plug with lockwire.

(9) Remove safety pin from thrust reverser control valve. Stow safety pin.



Oil Pressure Relief Valve - Adjustment
Figure 202/79-20-03-990-802

5. Cleaning/Painting Oil Pressure Relief Valve

A. Clean Valve

NOTE: If low oil pressure is experienced during engine operation, valve should be disassembled and cleaned as outlined in the following procedure.

(1) Remove and disassembly valve. (Figure 203)

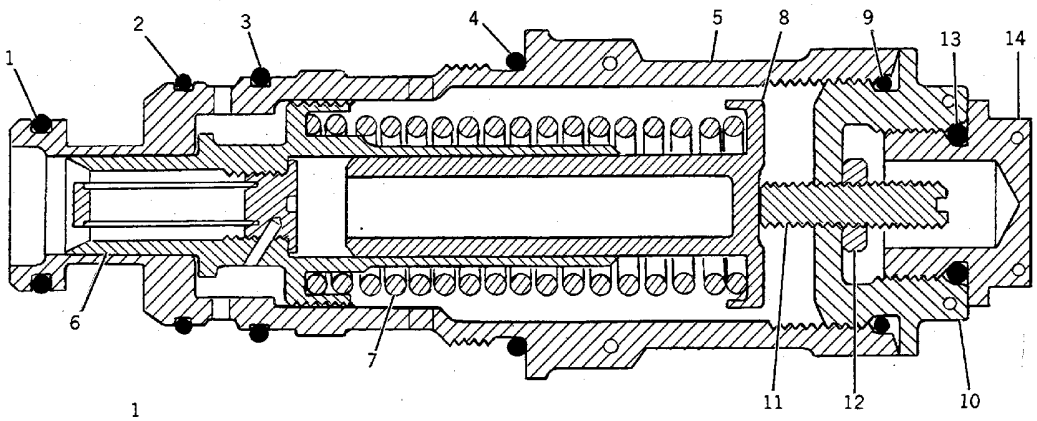
(2) Polish valve shaft and spring retainer with crocus cloth (number 810) soaked in lubricating oil (P&WA 521).

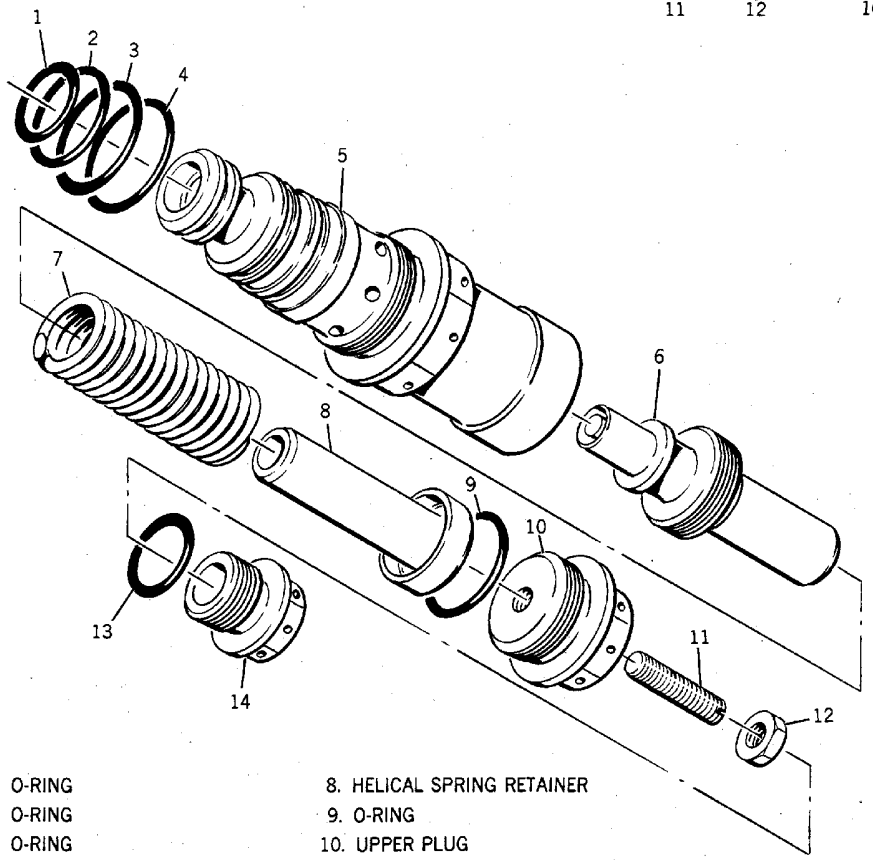
WARNING: CLEANING OPERATIONS USING SOLVENTS SHOULD BE PERFORMED IN A WELL-VENTILATED ATMOSPHERE. EXERCISE NORMAL SAFETY PRECAUTIONS DURING USE.

(3) Clean valve and spring retainer and flush thoroughly with solvent (P-D-680). Dry valve with clean dry compressed air.

(4) Assemble relief valve and install in accessory drive case. (Figure 203)

(5) Make certain valve maintains oil pressure at 40 to 47 psig (275.8 to 324.1 kPa) on next engine run. (Paragraph 4.)





1. O-RING
2. O-RING
3. O-RING
4. O-RING
5. HOUSING
6. OIL PRESSURE RELIEF VALVE
7. SPRING
8. HELICAL SPRING RETAINER
9. O-RING
10. UPPER PLUG
11. ADJUSTING SCREW
12. NUT
13. O-RING
14. LOWER PLUG

BBB2-79-6

Oil Pressure Relief Valve - Cleaning
Figure 203/79-20-03-990-803

MAGNETIC CHIP DETECTOR PLUG - MAINTENANCE PRACTICES

1. General

A. This maintenance practice provides removal/installation, check, and cleaning/painting instructions for magnetic chip detector plug. The plugs are mounted in the following locations: (Figure 201)

(1) Lower right side of the engine accessory drive case.

(2) Engine bearing common scavenge line on the left side of the accessory drive case.

(3) Number one bearing scavenge line on the forward side of the accessory drive case.

(4) Oil tank mounting pad on the forward side of the accessory drive case.

B. Maintenance of the plugs is limited to removal/installation. Removal/installation procedures for the plugs on all engines are identical.

WARNING: EXERCISE CARE TO AVOID STRAKES WHEN WORKING IN ENGINE AREA WITH COWL DOORS OPEN OR INJURY TO PERSONNEL COULD RESULT.

CAUTION: TO PREVENT STRUCTURAL DAMAGE, USE HOLD OPEN RODS ON EACH COWL DOOR.

CAUTION: TO PREVENT CONTAMINANTS FROM ENTERING OIL SYSTEM, MAKE CERTAIN ALL OPEN PORTS ARE CAPPED.

C. Access to the plugs is gained through the lower forward cowl door.

2. Equipment and Materials

NOTE: Equivalent substitutes may be used instead of the following listed items:

Table 201

Name and Number	Manufacturer
Petrolatum VV-P-236	
Lockwire, NASM20995N32, DPM 684	Not Specified
Solvent 1,1,1 trichloroethane stabilized vapor degreasing)	
Torque wrench 0 to 100 inch pounds (0-113 N·m) capacity	
Suitable container approximately 1 US gallon (.833 Imperial gallons or 3.785 liters)	

3. Removal/Installation Magnetic Chip Detector Plug

A. Remove Plug

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN DEATH OR SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Tag throttle/thrust reverser lever, and open and tag following circuit breakers.

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871, 872, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871, 872, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE 401-412, 414-427, 429, 861-866, 868, 869, 871, 872, 875-881, 883, 884, 886, 887, 891, 893; (if installed)			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

(2) Push in on knurled knob of plug, rotate knob counterclockwise, and pull plug from self closing valve. Discard O-rings.

NOTE: The magnetic chip detector plug is located in the self closing valve. This allows removal of the plug from the self closing valve without loss of engine oil. However, a small amount of oil will be lost upon removal of the self closing valve from the engine.

(3) If deposits of foreign matter are evident on plug, clean plug per Paragraph 5..

(4) Remove self closing valve from engine. Discard O-ring.

NOTE: Be prepared to catch oil in container with approximate capacity of 1 US gallon (.833 Imperial gallons or 3.785 liters).

B. Install Plug

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN DEATH OR SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Make certain throttle/thrust reverser lever is tagged, and the following circuit breakers are opened and tagged.

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871, 872, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871, 872, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE 401-412, 414-427, 429, 861-866, 868, 869, 871, 872, 875-881, 883, 884, 886, 887, 891, 893; (if installed)			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

(2) Lightly lubricate new O-ring with Petrolatum (VV-P-236), and install O-ring on self closing valve. Install self closing valve. Torque self closing valve per Table 202. Safety self closing valve with lockwire.

(3) Lightly lubricate new O-rings with Petrolatum (VV-P-236), and install O-rings on plug. Install plug in self closing valve.

(4) Remove tools, equipment, loose hardware, spilled fluids, and debris from maintenance area.

(5) Remove tag from throttle/thrust reverser lever and remove tags and close following circuit breakers.

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871, 872, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 893			
U	41	B1-423	ENGINE START VALVE RIGHT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 893 (Continued)

(Continued)

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
WJE 415-427, 429, 861-866, 868, 869, 871, 872, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

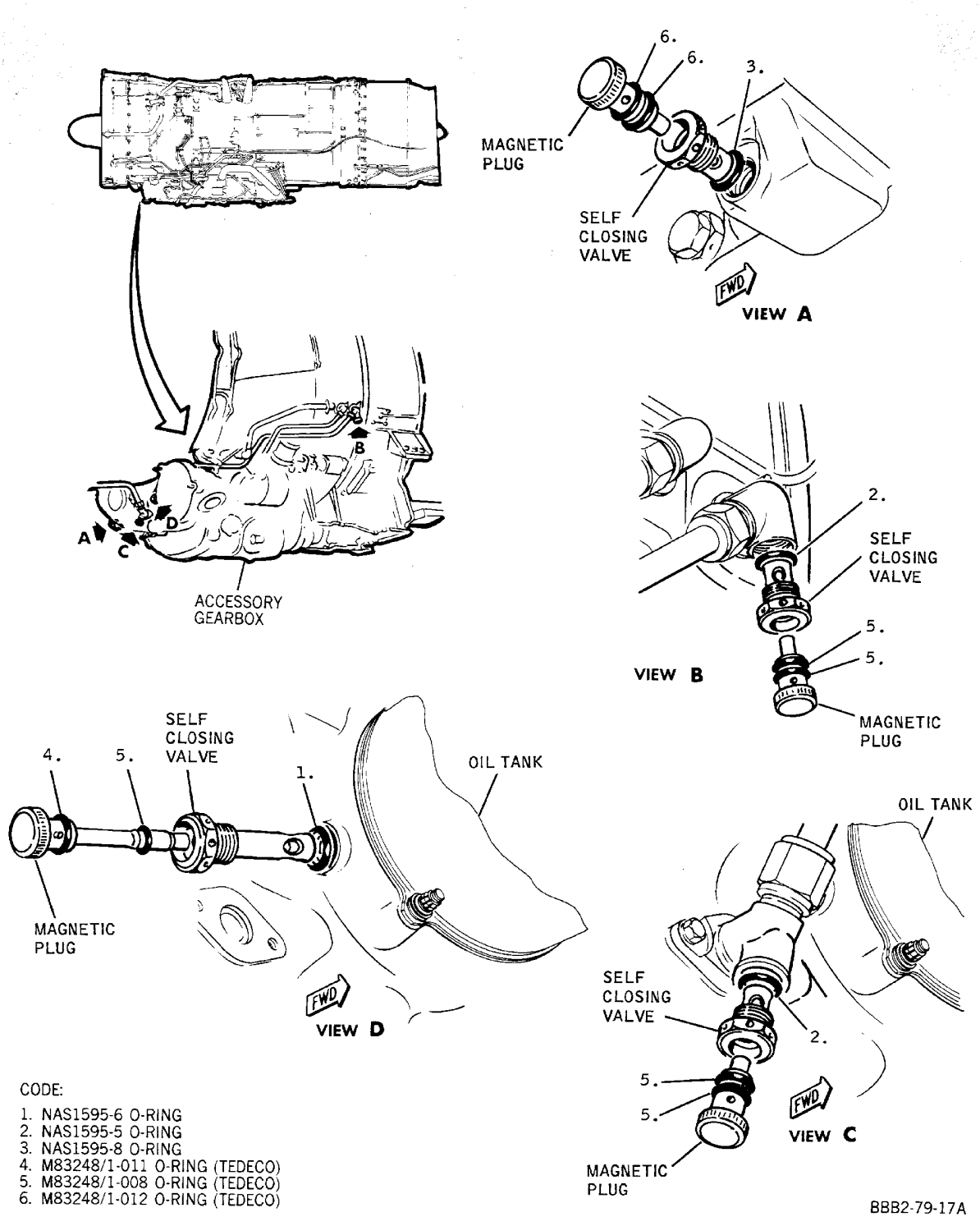
Row	Col	Number	Name
WJE 401-412, 414-427, 429, 861-866, 868, 869, 871, 872, 875-881, 883, 884, 886, 887, 891, 893; (if installed)			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

Table 202 Magnetic Chip Detectors Torque Values

Location	Torque Value
Engine oil tank mount pad, forward side engine accessory drive case	55 to 70 inch-pounds
Engine accessory drive case, lower right side engine	80 to 100 inch-pounds
Engine number 1 bearing scavenge line, forward side engine acces sory drive case	40 to 50 inch-pounds
Engine number 4, 4 1/2, 5, 6 bearing common scavenge line, left side centerline of engine.	40 to 50 inch-pounds



CODE:

1. NAS1595-6 O-RING
2. NAS1595-5 O-RING
3. NAS1595-8 O-RING
4. M83248/1-011 O-RING (TEDECO)
5. M83248/1-008 O-RING (TEDECO)
6. M83248/1-012 O-RING (TEDECO)

Magnetic Chip Detector Plug -- Removal/Installation
Figure 201/79-20-05-990-801

4. Check Magnetic Chip Detector Plug

A. Check Plug

(1) Remove plug from self closing valve body. (Paragraph 3.)

(2) Check plug and valve for foreign particles and contaminants.

(3) Check plug O-rings for damage. Replace if necessary.

(4) Check self closing valve for freedom of movement and proper seating.

NOTE: Self closing valve should be replaced if self closing valve sticks or does not seat.

(5) Check plug for bent pins and proper engagement with self closing valve.

5. Cleaning/Painting Magnetic Chip Detector Plug

A. Clean plug

(1) Remove plug. (Paragraph 3.)

WARNING: 1,1,1-TRICHLOROETHANE IS AN AGENT THAT IS POISONOUS AND AN IRRITANT. MAKE SURE ALL PERSONS OBEY ALL OF THE PRECAUTIONS WHEN 1,1,1-TRICHLOROETHANE IS USED.

- DO NOT USE IN AREAS WHERE THERE IS HIGH HEAT, SPARKS, OR FLAMES.
- USE IN AN AREA OPEN TO THE AIR.
- CLOSE THE CONTAINER WHEN NOT USED.
- DO NOT GET 1,1,1-TRICHLOROETHANE IN THE EYES, ON THE SKIN, OR ON YOUR CLOTHES.
- DO NOT BREATHE THE GAS.

WARNING: REFER TO THE APPLICABLE MANUFACTURER'S OR SUPPLIER'S MSDS FOR:

- MORE PRECAUTIONARY DATA
- APPROVED SAFETY EQUIPMENT
- EMERGENCY MEDICAL AID.

TALK WITH THE LOCAL SAFETY DEPARTMENT OR AUTHORITIES FOR THE PROCEDURES TO DISCARD THIS HAZARDOUS AGENT.

(2) Clean plug by swirling in solution of 1,1,1 trichloroethane or equivalent. Dry with clean, dry compressed air.

(3) Install plug. (Paragraph 3.)

ENGINE MAIN OIL FILTER - MAINTENANCE PRACTICES

1. General

A. The engine main oil (15 micron) filter is located adjacent to the main oil pump on the lower left side of the engine accessory drive case. Access is gained through the lower forward cowl door. Removal and installation procedures for main oil filters on the left and right engines are identical.

2. Equipment and Materials

NOTE: Equivalent substitutes may be used instead of the following listed items.

NOTE: It is possible that some materials in the Equipment and Materials List cannot be used for some or all of their necessary applications. Before you use the materials, make sure the types, quantities, and applications of the materials necessary are legally permitted in your location. All persons must obey all applicable federal, state, local, and provincial laws and regulations when it is necessary to work with these materials.

Table 201

Name and Number	Manufacturer
Base PWA-33201	Pratt & Whitney Hartford, Conn.
Drift PWA-16477	Pratt & Whitney Hartford, Conn.
Holding rod (wood, plastic, or soft metal) 5/8-inch (15.9 mm) diameter approx. 10 inches (254 mm) long	
Lockwire, NASM20995N32, DPM 684	Not Specified
Petrolatum VV-P-236 DPM 675	
Suitable container approximately 5 US gallons (4.16 Imperial gallons or 18.93 liters)	
Torque wrench 0-300 inch-pounds (0-33.9 N·m) capacity	

3. Removal/Installation Engine Main Oil Filter

A. Remove Filter

WARNING: MAKE CERTAIN THAT CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Tag throttle/thrust reverser lever, and open and tag following circuit breakers

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891

U	41	B1-2	ENGINE IGNITION RIGHT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893

U	41	B1-423	ENGINE START VALVE RIGHT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893 (Continued)

(Continued)

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Place thrust reverser control valve in dump position and install safety pin.

(3) Remove plug from filter cover. Discard O-ring.

NOTE: Be prepared to catch oil in container with approximate capacity of 5 US gallons (4.16 Imperial gallons or 18.93 liters).

WARNING: HOLD FILTER COVER SECURELY. SUDDEN RELEASE OF SPRING PRESSURE COULD CAUSE INJURY TO PERSONNEL.

(4) Remove filter from pressure relief valve.

(5) If filter is difficult to remove from pressure relief valve, separate filter and valve as follows:

(a) Depress key washer from slots in pressure relief valve and remove filter cover.

(b) Place filter and pressure relief valve on Base, PWA 33201, valve end up.

(c) Remove filter from pressure relief valve using Drift, PWA 16477.

(6) Remove O-rings from pressure relief valve and cover. Discard O-rings.

B. Install Filter

WARNING: MAKE CERTAIN THAT CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Make certain throttle/thrust reverser lever is tagged and following circuit breakers are open and tagged.

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Make certain thrust reverser control valve is in dump position and safety pin is installed.

WARNING: WHITE PETROLATUM IS AN AGENT THAT IS AN IRRITANT. MAKE SURE ALL PERSONS OBEY ALL OF THE PRECAUTIONS WHEN WHITE PETROLATUM IS USED.

- DO NOT USE IN AREAS WHERE THERE IS HIGH HEAT, SPARKS, OR FLAMES.
- USE IN AN AREA OPEN TO THE AIR.
- CLOSE THE CONTAINER WHEN NOT USED.
- DO NOT BREATHE THE MIST.

(WARNING PRECEDES)

WARNING: REFER TO THE APPLICABLE MANUFACTURER'S OR SUPPLIERS'S MSDS FOR:

- MORE PRECAUTIONARY DATA
- APPROVED SAFETY EQUIPMENT
- EMERGENCY MEDICAL AID.

TALK WITH THE LOCAL SAFETY DEPARTMENT OR AUTHORITIES FOR THE PROCEDURES TO DISCARD THESE HAZARDOUS AGENTS.

(3) Lightly lubricate new O-ring with Petrolatum (VV-P-236) and install O-ring on pressure relief valve.

CAUTION: MAKE CERTAIN O-RING IS FREE OF TWIST AFTER INSTALLATION.

(4) Lightly lubricate new O-ring with Petrolatum (VV-P-236) and install O-ring in filter cover.

(5) If filter pressure relief valve was removed from cover, install valve on cover so that tabs of key washer engage in slots on valve.

(6) Install filter, pressure relief valve and cover into accessory drive case making certain filter is properly seated.

(7) Place 10 x 5/8-inch (254 x 15.9 mm) holding rod through plug hole in cover.

NOTE: Holding rod is used to keep filter in place until filter cover is installed.

(8) Exert sufficient pressure on rod to prevent filter misalignment and install filter cover. Torque locknuts 25 to 30 inch-pounds (2.83 to 3.39 N·m). Safety nuts with lockwire.

(9) Lightly lubricate new O-ring with Petrolatum (VV-P-236) and install O-ring on plug.

(10) Install plug in cover. Torque plug 200 to 225 inch-pounds (22.6 to 25.43 N·m). Safety plug with lockwire.

WARNING: MAKE CERTAIN THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

(11) Remove safety pin from thrust reverser control valve. Stow safety pin.

(12) Check oil filter for leaks. (SUBJECT 72-00-00, Adjustment/Test, Paragraph 6., Test C)

(13) Service oil tank if required. (ENGINE OIL SYSTEM, SUBJECT 12-12-04, Page 301)

(14) Remove tools, equipment, loose hardware, spilled fluid, and debris from maintenance area.

(15) Remove tag from throttle/thrust reverser lever, and remove tags and close following circuit breakers.

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891

U	41	B1-2	ENGINE IGNITION RIGHT

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891 (Continued)

(Continued)

LOWER EPC, DC TRANSFER BUS

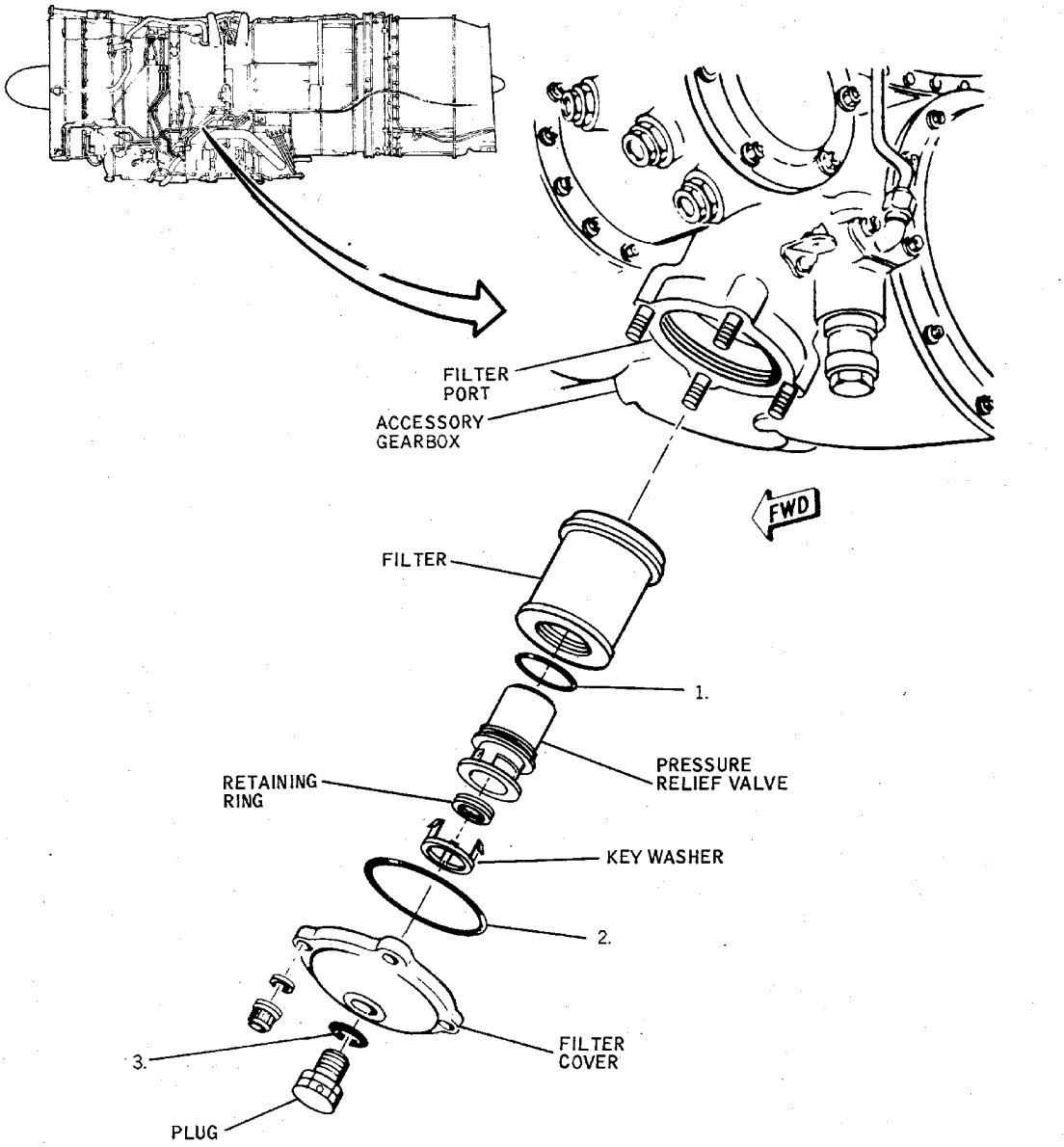
Row	Col	Number	Name
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION



Engine Main Oil Filter -- Removal/Installation
Figure 201/79-20-06-990-803

ENGINE MAIN OIL FILTER - CLEANING/PAINTING

1. General

A. This procedure contains MSG-3 task card data.

TASK 79-20-06-902-801

2. Restore the Engine Main Oil Filter

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
12-12-04 P/B 301	ENGINE OIL SYSTEM - SERVICING
72-00-00	ENGINE GENERAL

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-12666	Oil Pressure Bypass Valve Base **MD80-81, -82, -83, -88** Part #: PWA33201 Supplier: 77445
SPL-12668	Oil Filter Element Drift **MD80-81, -82, -83, -88** Part #: PWA16477 Supplier: 77445
STD-6213	Wrench - Torque, 300 lb-in

C. Consumable Materials

NOTE: Equivalent replacements are permitted for the items that follow.

NOTE: It is possible that some materials in the Consumable Materials chart cannot be used for some or all of the necessary applications. Before you use the materials, make sure the types, quantities, and applications of the materials necessary are legally permitted in your location. All persons must obey all applicable federal, state, local, and provincial laws and regulations when it is necessary to work with these materials.

Reference	Description	Specification
D60024	Lubricant - Antiseize, Petrolatum	DPM 675 (VV-P-236)
G60170	Lockwire - .032 Inconel Annealed	DPM 684 (NASM20995N)

D. Prepare to Restore the Engine Main Oil Filter

SUBTASK 79-20-06-040-001

WARNING: MAKE CERTAIN THAT CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Tag throttle/thrust reverser lever, and open and tag following circuit breakers

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

SUBTASK 79-20-06-010-001

(2) Open the access panel.

(3) Open the lower engine cowl.

SUBTASK 79-20-06-040-002

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(4) Place thrust reverser control valve in dump position and install safety pin.

E. Restore the Engine Main Oil Filter

SUBTASK 79-20-06-865-001

WARNING: HOLD FILTER COVER SECURELY. SUDDEN RELEASE OF SPRING PRESSURE COULD CAUSE INJURY TO PERSONNEL.

(1) Remove filter from pressure relief valve.

(2) If filter is difficult to remove from pressure relief valve, separate filter and valve as follows:

(a) Depress key washer from slots in pressure relief valve and remove filter cover.

(b) Place filter and pressure relief valve on base, SPL-12666, valve end up.

(c) Remove filter from pressure relief valve using drift, SPL-12668.

(3) Remove O-rings from pressure relief valve and cover. Discard O-rings.

SUBTASK 79-20-06-902-002

(4) Route the oil filter for cleaning (restore).

SUBTASK 79-20-06-420-003

(5) Install serviceable oil filter as follows:

WARNING: WHITE PETROLATUM IS AN AGENT THAT IS AN IRRITANT. MAKE SURE ALL PERSONS OBEY ALL OF THE PRECAUTIONS WHEN WHITE PETROLATUM IS USED.

- DO NOT USE IN AREAS WHERE THERE IS HIGH HEAT, SPARKS, OR FLAMES.
- USE IN AN AREA OPEN TO THE AIR.
- CLOSE THE CONTAINER WHEN NOT USED.
- DO NOT BREATHE THE MIST.

WARNING: REFER TO THE APPLICABLE MANUFACTURER'S OR SUPPLIERS'S MSDS FOR:

- MORE PRECAUTIONARY DATA
- APPROVED SAFETY EQUIPMENT
- EMERGENCY MEDICAL AID.

TALK WITH THE LOCAL SAFETY DEPARTMENT OR AUTHORITIES FOR THE PROCEDURES TO DISCARD THESE HAZARDOUS AGENTS.

(a) Lightly lubricate new O-ring with petrolatum antiseize lubricant, D60024 and install O-ring on pressure relief valve.

CAUTION: MAKE CERTAIN O-RING IS FREE OF TWIST AFTER INSTALLATION.

(b) Lightly lubricate new O-ring with petrolatum antiseize lubricant, D60024 and install O-ring in filter cover.

(c) If filter pressure relief valve was removed from cover, install valve on cover so that tabs of key washer engage in slots on valve.

(d) Install filter, pressure relief valve and cover into accessory drive case making certain filter is properly seated.

(e) Place a 10 x 5/8-inch (254 x 16 mm) holding rod through plug hole in cover.

NOTE: Holding rod is used to keep filter in place until filter cover is installed.

(f) Exert sufficient pressure on rod to prevent filter misalignment and install filter cover. Torque locknuts 25 in-lb (2.82 N·m) to 30 in-lb (3.39 N·m). Safety nuts with .032 inconel lockwire, G60170.

(g) Lightly lubricate new O-ring with petrolatum antiseize lubricant, D60024 and install O-ring on plug.

(h) Install plug in cover. Using a Torque torque wrench, STD-6213, torque the plug to 200 in-lb (23 N·m) to 225 in-lb (25 N·m). Safety the plug with .032 inconel lockwire, G60170.

F. Job Close-up

SUBTASK 79-20-06-612-001

(1) Service oil tank if required. (ENGINE OIL SYSTEM - SERVICING, PAGEBLOCK 12-12-04/301)

(2) Remove tools, equipment, loose hardware, spilled fluid, and debris from maintenance area.

(3) Remove the safety tags and close these circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

WARNING: MAKE CERTAIN THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

(4) Remove safety pin from thrust reverser control valve. Stow safety pin.

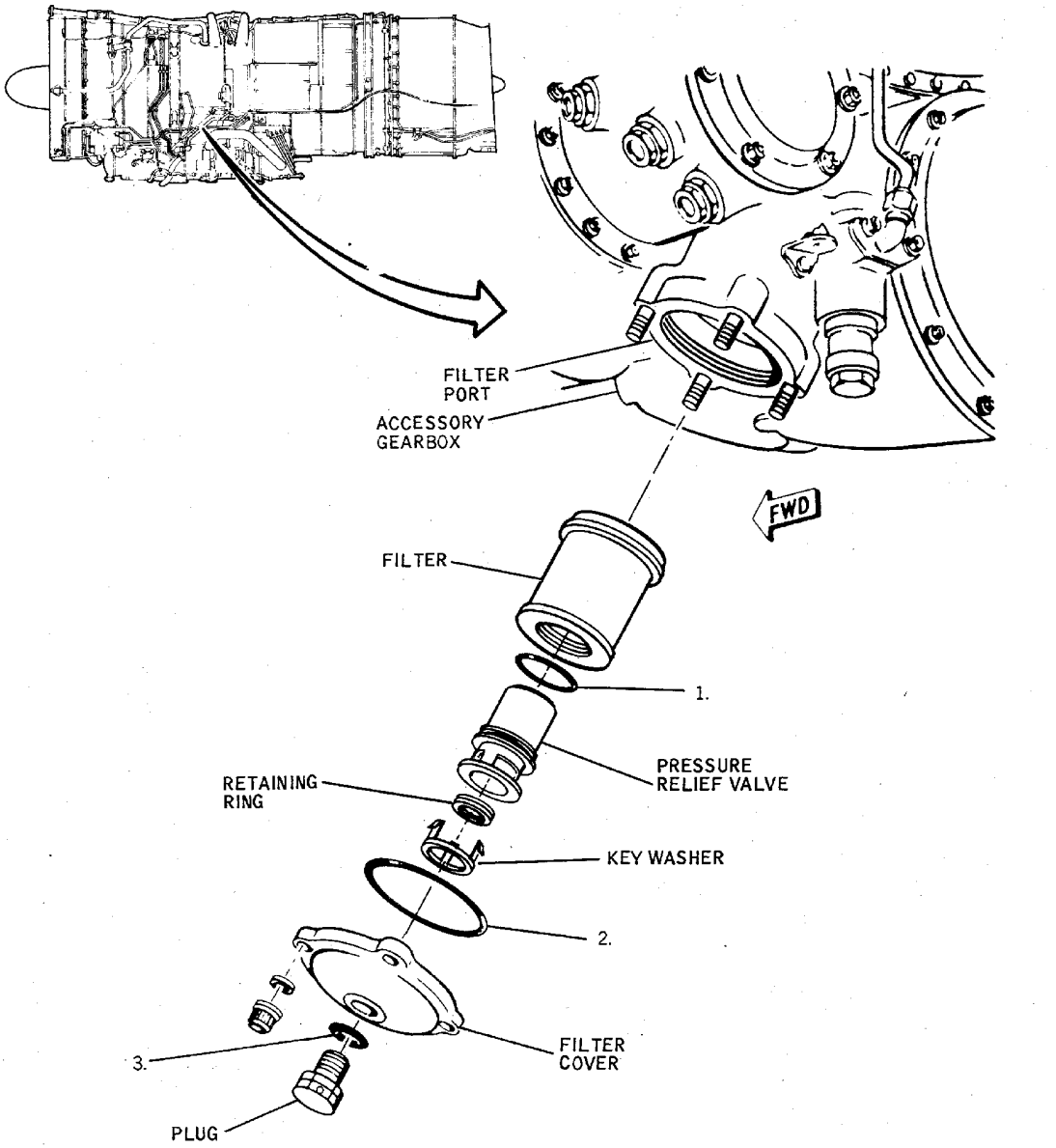
(5) Close access panel.

(6) Close the lower engine cowl.

SUBTASK 79-20-06-868-001

(7) Check oil filter for leaks. (SUBJECT 72-00-00, Adjustment/Test, Paragraph 6., Test C)

END OF TASK



CODE:
1. MS9388-030
2. MS9388-236
3. MS9387-08

BBB2-79-16

ENGINE OIL FILTER
Figure 701/79-20-06-990-805

INDICATING - DESCRIPTION AND OPERATION

1. General

WJE 401-406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887

A. Display systems are provided to monitor the engine oil quantity, oil temperature, and oil pressure. An electronic Systems Display Panel (SDP) in the flight compartment receives information transmitted from components mounted on the engine and converts this information into visual light emitting diode (LED) digital displays for the flight crew. Low oil pressure caution and oil strainer clogging caution are monitored by pressure switches mounted on the engine and provide messages to the overhead annunciator panel in the flight compartment.

WJE 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893

B. Indicating systems are provided to monitor the engine oil quantity, oil temperature, and oil pressure. Indicators in the flight compartment receive information transmitted from components mounted on the engine and convert this information into visual indications for the flight crew. Low oil pressure caution and oil strainer clogging caution are monitored by pressure switches mounted on the engine and indicating lights mounted on the overhead annunciator panel in the flight compartment.

WJE ALL

2. Oil Quantity

A. Description

WJE 401-406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887

(1) The engine oil display system measures the quantity of oil contained in each tank by a transmitter mounted on the oil tank and an electronic Systems Display Panel (SDP) mounted on the center instrument panel. The system is supplied with 28 vdc through a circuit breaker located on the EPC panel. The system is in operation when the electrical buses are energized.

WJE 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893

(2) The engine oil quantity indicating system measures the quantity of oil contained in each tank by a transmitter mounted on the oil tank and an indicator mounted on the center instrument panel. The system is supplied with 28 vdc through a circuit breaker located on the EPC panel. The system is in operation when the electrical buses are energized. If power is interrupted, the indicator swings to a pointer stop below zero.

WJE ALL

(3) Oil Quantity Transmitter - The transmitter consists of a reed-switch potentiometer and a magnetic float which actuates the reed-switches. The float is positioned by the oil level within a perforated enclosure. The reed-switches and potentiometer resistors are mounted inside a sealed tube that extends the length of the enclosure. Reed-switches are closed when the float magnets are in close proximity to them. Two or three switches may be closed simultaneously. In an empty tank, switches are closed which provide a mini-mum resistance path from ground to the transmitter empty terminal, and maximum resistance path to the transmitter full terminal. When the tank is full, minimum resistance is provided to the transmitter full terminal, and maximum resistance to the transmitter empty terminal. Intermediate oil levels change the float position which varies the resistance to ground proportionately at both terminals. The transmitter is not adjustable at field maintenance level.

WJE 401-406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887

(4) Oil Quantity Display - The display is in the electronic SDP which visually indicates the oil quantity using a light emitting diode (LED) digital display. The digital display is not adjustable at field maintenance level.

WJE 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893

(5) Oil Quantity Indicator - The indicator is a two coil system. The common terminal of both coils is connected to the 28 vdc source through a circuit breaker located on the lower EPC panel. The pointer is provided with a permanent magnet oriented to rotate the pointer assembly in response to magneticfields surrounding the coils. The pointer rotates to full when maximum current flows in the full coil. A permanent magnet pulls the indicator off scale below zero when power is interrupted. The indicator is not adjustable at field maintenance level.

WJE ALL

B. Operation

WJE 401-406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887

(1) The float is positioned at the true surface of the oil. Magnets in the float cause corresponding reed-switches within the potentiometer to close. Resistance between the 28 vdc source and the full and empty terminals is varied by changes in oil level. Aircraft wiring provides circuits between the full and empty terminals of the transmitter and SDP. Variations in current through the SDP changes the LED digital display according to float position and oil level in the tank.

WJE 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893

(2) The float is positioned at the true surface of the oil. Magnets in the float cause corresponding reed-switches within the potentiometer to close. Resistance between the 28 vdc source and the full and empty terminals is varied by changes in oil level. Airplane wiring provides circuits between the full and empty terminals of the transmitter and indicator. Variations in current through the indicator coils change magnetic field strength surrounding the coils and position the pointer according to float position and oil level in the tank.

WJE ALL

3. **Oil Temperature**

A. Description

WJE 401-406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887

(1) The oil temperature display system provides a visual display of engine oil temperature on the center instrument panel. The system consists of a temperature sensor and an electronic Systems Display Panel (SDP). The system is supplied with 28 vdc through a circuit breaker on the lower EPC panel.

WJE 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893

(2) The oil temperature indicating system provides a visual display of engine oil temperature on the center instrument panel. The system consists of a temperature sensor and indicator. The system is supplied with 28 vdc through a circuit breaker on the lower EPC panel. If the power source is interrupted, the pointer goes against the stop past zero.

WJE ALL

(3) Oil Temperature Sensor - The oil temperature sensor is mounted on the fuel/oil cooler. The sensor monitors the oil system temperature during engine operation. The temperature sensor is a resistance-type bulb that consists of an element hermetically sealed in an insulating material within a housing. The housing has an electrical connector.

WJE 401-406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887

(4) Oil Temperature Display - The digital display is an electronic SDP which visually displays the oil temperature in degrees Celsius (°C). Red and amber indicating lights, directly above the digits, provide an indication to the flight crew of out of limit parameters. The digital display is not adjustable at field maintenance level.

WJE 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893

(5) Oil Temperature Indicator - The ratiometer-type indicator is integrally lighted and hermetically sealed. The indicator is not adjustable at field maintenance level.

WJE ALL

B. Operation

WJE 401-406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887

(1) When supplied by 28 vdc, the SDP accepts and processes inputs from the oil temperature sensor. The SDP visually displays, in the flight compartment using light emitting diodes (LED), any change of oil temperature sensed by the sensor. When the oil temperature increases and shows a reading of 135°C, the amber indicating light will come on. When the oil temperature continues to increase to a reading of 165°C, the red indicating light will come on.

WJE 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893

(2) When supplied with 28 vdc, the indicator operates on the Wheatstone bridge principle with the temperature sensor forming one arm of the bridge circuit. A change in engine oil temperature, sensed by the sensor, unbalances the bridge, creating a greater current flow in one side of the bridge. The current flow in the circuit results in a movement of the armature and pointer, providing oil temperature indication.

WJE ALL

4. Oil Pressure

A. Description

WJE 401-406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887

(1) The engine oil pressure display system consists of a transmitter mounted on the engine and an electronic Systems Display Panel (SDP) mounted on the center instrument panel in the flight compartment. The transmitter is powered by 28-volt ac from the instrument bus, through a circuit breaker located on the upper EPC panel. The SDP is powered by 28-Volt DC from the Left and Right DC Bus.

WJE 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893

(2) The engine oil pressure indicating system consists of a transmitter mounted on the engine and an indicator mounted on the center instrument panel in the flight compartment. The system is powered by 28-volt ac from the instrument bus, through a circuit breaker located on the upper EPC panel. If the power source is interrupted, the pointer goes against the stop past zero.

WJE ALL

(3) Oil Pressure Transmitter - The transmitter is a variable reluctance type consisting of a diaphragm, a magnetic armature, two stationary coils, and a housing. The housing is provided with a vent port, pressure port, and a removable plug cap which permits access to calibration adjustment.

WJE 401-406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887

(4) Oil Pressure Display - The digital display is in the electronic SDP which visually displays the oil pressure. Red and amber indicating lights, directly above the digital display, provide an indication to the flight crew of out of limit parameters. The digital display is not adjustable at field maintenance level.

WJE 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893

(5) Oil Pressure Indicator - The indicator is integrally lighted and hermetically sealed, and consists of a stationary coil, rotor, and hairspring assembly connected to a pointer, bearings, and several resistors and thermisistors. The indicator is not adjustable at field maintenance level.

WJE ALL

B. Operation

WJE 401-406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887

(1) When supplied by 28 vdc, the SDP accepts and processes inputs from the oil pressure transmitter. The SDP visually displays, in the flight compartment using light emitting diodes (LED), any change of oil pressure sensed by the transmitter. The red and amber indicating lights, on the SDP, are normally on until an increasing pressure of 38 psi (262.2 kpa) is obtained, at which time the SDP processes the transmitters input, and the red indicating light goes off. As system pressure continues to increase to 42 psi (289.6 kPa), the amber indicating light goes off. When system pressure decreases to 40 psi (275.8 kPa), the amber indicating light comes on. As system pressure decays to 35(±1) psi (241.5(±6.9) kPa), the red indicating light comes on.

WJE 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893

(2) The oil pressure transmitter senses the engine oil system pressure downstream of the fuel/oil cooler. The oil pres-sure transmitter and indicator function as an ac bridge. Any change in pressure sensed by the transmitter causes the diaphragm to move the armature, changing the reluctance of the transmitter coils. This reluctance change unbalances the bridge network, creating a greater current flow in one side of the bridge. The current flow in the circuit results in a movement of the indicator rotor and pointer.

WJE ALL

5. Low Oil Pressure Caution

A. Description

WJE 401-406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887

(1) The engine low oil pressure caution system monitors the oil pressure during engine operation. The system consists of a pressure switch mounted on the engine and an indicating message on the annunciator panel in the flight compartment overhead panel. The switch is supplied with 28 vdc from the dc transfer bus through a circuit breaker located on the lower EPC panel.

WJE 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893

(2) The engine low oil pressure caution system monitors the oil pressure during engine operation. The system consists of a pressure switch mounted on the engine and an indicating light on the annunciator panel in the flight compartment overhead panel. The switch is supplied with 28 vdc from the dc transfer bus through a circuit breaker located on the upper EPC panel.

WJE ALL

(3) Low Oil Pressure Switch - The low-pressure caution switch is hermetically sealed and pressure-actuated and consists of a diaphragm, mechanical linkage, and a microswitch. The components are contained in a housing provided with two pressure-sensing port connections and an electrical connector.

B. Operation

WJE 401-406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887

(1) The oil low-pressure caution switch senses the engine oil system pressure downstream of the fuel/oil cooler. The oil low-pressure caution indicating message, on the annunciator panel is normally displayed until an increasing pressure of 38 psi (262.2 kPa) is obtained, at which time the switch opens and the indicating message is removed. When system pressure decays to 35(±1) psi (241.5(±6.9) kPa), the switch contacts close, completing a circuit, and the indicating message will be displayed.

WJE 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893

(2) The oil low-pressure caution switch senses the engine oil system pressure downstream of the fuel/oil cooler. The oil low-pressure caution light is normally on until an increasing pressure of 38 psi (262·2 kPa) is obtained, at which time the switch opens and the light goes off. When the system pressure decreases to 35 (±1) psi (241·5(±)6·9 kPa), the switch contacts close, completing a circuit, and the light comes on.

WJE ALL

6. Oil Strainer Clogging Caution

A. Description

WJE 401-406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887

(1) The engine oil filter differential pressure (strainer clogging) system provides a remote visual indication of main oil filter obstruction. The system consists of an engine-mounted differential pressure switch and an indicating message located on the annunciator panel in the flight compartment. The system is powered by 28-volt dc through a circuit breaker located on the lower EPC panel.

WJE 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893

(2) The engine oil filter differential pressure (strainer clogging) system provides a remote visual indication of main oil filter obstruction. The system consists of an engine-mounted differential pressure switch and an indicating light located on the annunciator panel in the flight compartment. The system is powered by 28-volt dc through a circuit breaker located on the lower EPC panel.

WJE ALL

(3) Filter Differential Pressure Switch - The filter differential pressure switch is hermetically sealed and pressure actuated, and consists of a diaphragm, mechanical linkage, and a microswitch. These components are contained in a housing provided with two pressure-sensing port connections and an electrical connector.

B. Operation

WJE 401-406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887

(1) The filter differential pressure switch sensing ports are connected to the main oil filter cavity in the accessory drive case. The differential pressure switch senses the difference between filter inlet and outlet pressure. When the differential pressure reaches 35(±2) psi (241.5 (±13.8) kPa), the diaphragm and mechanical linkage contained in the pressure switch housing actuate the microswitch to the closed position. A circuit is completed and an indicating message comes on indicating filter obstruction. The indicating message will go out by the time the differential pressure decreases to 30 psi (207 kPa).

WJE 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893

(2) The filter differential pressure switch sensing ports are connected to the main oil filter cavity in the accessory drive case. The differential pressure switch senses the difference between filter inlet and outlet pressure. When the differential pressure reaches 35 (±2) psi (241·5 (±13·8) kPa), the diaphragm and mechanical linkage contained in the pressure switch housing actuate the microswitch to the closed position. A circuit is completed and an indicating light comes on indicating filter obstruction. The indicating light will go out by the time the differential pressure decreases to 30 psi (207 kPa).

WJE 401-406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887

7. Built-In-Test (BIT)

A. Description

(1) The System Display Panel (SDP) provides a Built-In-Test (BIT) facility for testing the SDP to a functional level. This test calls in sequence all of the internal BIT Test modules required to fully test all of the various parameters, and if a fault is detected, displays the necessary error code.

B. Operation

(1) A Built-In-Test (BIT) is incorporated in the Systems Display Panel. It is initiated by pressing the unlabled recessed button on the lower bezel of display panel. During the BIT test, each module will operate its own BIT sequence. The processor will do a Random Access Memory (RAM) check to ensure that all bits of the RAM function correctly and an Erasable Programmable Read Only Memory (EPROM) check sum to ensure that the EPROM contents are correct. These two tests will also be automatically done at power-up as they are "transparent" and only take a few milliseconds. Failure ofthese tests during a BIT-initiated test will result in a failure code (RAM, ROM) being displayed in the relevant display. If during power-up, these tests are not passed, then a row of horizontal dashes will be displayed. A Display Test input is required to free the module from displaying an error code.

NOTE: Display test push-button (ANNUN/DIGITAL LTS TEST) is located on overhead panel.

(2) In the BIT-initiated tests, after the RAM and ROM tests are completed a predetermined test input will be injected into the input module as near as possible to the normal signal input. This input will be processed and displayed in the same way as a normal signal would be, thus checking the processing and display channel. In the case of Engine Oil Pressure and Temperature, these values shall be the limit to bring on the red annunciators.

8. Display Test

A. Description

(1) The display test performs a dynamic lights test of all seven segment light emitting diode (LED) displays, matrix display, and discrete annunciators.

B. Operation

(1) The display test energizes the seven segment LED display and annunciator lights on the Systems Display Panel (SDP). The test also energizes the matrix display in the overhead annunciator panel. The LED display will show figure eights except for the first digit of the oil temperature which it will display the number one. The red and amber annunciator lights on the SDP for oil pressure and oil temperature will also come on. In the overhead annunciator panel, the matrix digits will come on one at a time at one second intervals with a full matrix display on and the adjacent annunciator lights will also come on. A second function of the display test when used after a Built-In-Test (BIT), frees the SDP from displaying an error code on the SDP.

NOTE: Display test push-button (ANNUN/DIGITAL LTS TEST) located on the overhead panel.

INDICATING - TROUBLE SHOOTING

1. General

A. The following provides trouble shooting instructions for the indicating system.

2. Trouble Shooting Indicating

CAUTION: TO PREVENT DAMAGE TO ELECTRICAL CONNECTOR, DO NOT USE ANY TOOL OTHER THAN PLUG PLIERS TO DISCONNECT OR CONNECT PLUG. WHEN CONNECTING PLUG, DO NOT OVERTIGHTEN.

CAUTION: ENSURE SYSTEM DISPLAY PANEL CONNECTOR WIRES ARE CONNECTED PROPERLY UPON COMPLETION OF TROUBLE SHOOTING PROCEDURES.

A. NO OIL QUANTITY INDICATION

NOTE: Connector plug is properly installed when no relative motion exists between plug backshell and coupling ring.

Table 101

Possible Causes	Isolation Procedures	Correction
(1) Defective transmitter, indicator, or wiring	Interchange indicator connectors.	
	Inoperative indicator still inoperative.	Replace defective indicator.
	Inoperative indicator now operates.	Trouble is in wiring of transmitter (Ref. steps (2), (3) and (5)).
(2) Circuit breaker tripped due to circuit malfunction	Disconnect indicator electrical connector.	
	Check for continuity from connector power pin B to ground.	Repair wiring.
(3) System ground wire open	Disconnect transmitter electrical connector.	
	Check for continuity from connector pin B to structure.	Repair ground wire.
(4) Oil quantity indicator defective	Disconnect indicator electrical connector.	
	Connect a dc voltmeter between connector pin B and ground.	
	A reading of 28 vdc should be obtained.	Replace indicator.
(5) Oil quantity transmitter defective	Disconnect transmitter electrical connector.	
	Connect a dc voltmeter between connector pins A or C and pin B.	
	A reading of 28 vdc should be obtained.	Replace transmitter.

B. OIL QUANTITY INDICATION FLUCTUATING

Table 102

Possible Causes	Isolation Procedures	Correction
(1) Continuity poor in wiring and electrical connections in indicator	Interchange right and left indicators. Fluctuations cease.	Replace defective indicator.

Table 102 (Continued)

Possible Causes	Isolation Procedures	Correction
(2) Continuity poor in wiring and electrical connections in transmitter	Check continuity between transmitter pins A and B, and pins B and C.	Replace defective transmitter.
(3) Continuity poor in wiring between indicator and transmitter connectors	Check continuity between indicator and transmitter connectors, between indicator connector and 28 vdc bus, and between transmitter connector and ground.	Repair defective wiring and/or connections.

C. OIL QUANTITY INDICATION BELOW MEASURED QUANTITY OF OIL IN TANK. FULL, OR PORTION OF INDICATING RANGE ERROR EXCEEDS 1.5 QUARTS (1.43 LITERS)

Table 103

Possible Causes	Isolation Procedures	Correction
(1) Open circuit between transmitter pin B and ground	Check continuity between transmitter connector pin B and ground.	Repair defective wiring.
(2) Open circuit between indicator pin B and 28 vdc bus	Check for 28 vdc at indicator connector pin B.	Repair defective wiring.
(3) Open circuit between indicator pin F and transmitter pin A.	Check continuity between indicator connector pin F and transmitter connector pin A.	Repair defective wiring.
(4) Open circuit between indicator pin G and transmitter pin C	Check continuity between indicator connector pin G and transmitter connector pin C.	Repair defective wiring.
(5) Indicator defective	Interchange right and left indicators. Indicator reads correctly.	Replace defective indicator.
(6) Transmitter defective	Interchange right and left indicators. Indicator still reads in error.	Replace defective transmitter.
(7) Transmitter defective	Check transmitter connector pin A for correct voltage reading. If above 18 vdc	Replace defective transmitter.
(8) Circuit grounded between transmitter connector pin C and indicator connector pin G	Check continuity between indicator connector pin G and ground. If no continuity exists	Repair defective wiring.
(9) Reed-switch in transmitter failed in closed position below oil level	Drain oil. If indicator reads correctly below failed reed-switch level	Replace defective transmitter.
(10) Circuit shorted between indicator connector pins F and G	Oil level indicator reads 8.8 gallons (33.308 liters) regardless of oil level in tank when tank is drained or filled.	Repair defective wiring.

D. OIL QUANTITY INDICATION MEASURED QUANTITY IN TANK OVER ENTIRE RANGE, OR A PORTION OF RANGE (ERROR EXCEEDS 1.5 QUARTS) (43 LITERS)

Table 104

Possible Causes	Isolation Procedures	Correction
(1) Grounded full circuit between indicator connector, pin F; and transmitter connector pin A	Interchange right and left indicators. Indicator reads correctly in opposite circuit.	Repair defective wiring.

Table 104 (Continued)

Possible Causes	Isolation Procedures	Correction
(2) Indicator grounded internally (Pin F to structure)	Interchange right and left indicators. Indicator still reads in error in opposite circuit.	Replace defective indicator.
(3) Open circuit between indicator connector pin G and transmitter connector pin C	Check continuity between indicator connector pin G and transmitter connector pin C. If continuity exists	Replace defective transmitter.
(4) Open circuit between indicator connector pin G and transmitter connector pin C	Check continuity between indicator connector pin G and transmitter connector pin C. If no continuity exists	Repair defective wiring.

E. NO OIL PRESSURE INDICATION

Table 105

Possible Causes	Isolation Procedures	Correction
(1) Defective indicator, transmitter, or wiring	Interchange indicator connectors	
	Inoperative indicator still inoperative.	Replace defective indicator.
	Inoperative indicator now operates.	Trouble is in wiring or transmitter (Ref. steps (2), (3) and (5)).
(2) Circuit breaker tripped due to circuit malfunction	Disconnect indicator electrical connector. Check for continuity from connector pin C to B.	Repair wiring.
(3) System ground wire open	Disconnect indicator electrical connector.	
	Disconnect transmitter electrical connector.	
	Check for continuity from indicator and transmitter connector ground pins to structure.	Repair ground wire.
(4) Oil pressure indicator defective	Disconnect indicator electrical connector. Check for 26 vac power from connector pin C to B.	Replace indicator.
	Interchange indicators.	
(5) Oil pressure transmitter defective	Disconnect transmitter electrical connector. Check for 26 vac power from connector pin B to ground.	Replace transmitter.

F. OIL PRESSURE INDICATOR FLUCTUATES

Table 106

Possible Causes	Isolation Procedures	Correction
(1) Loose electrical connections	Check all connections for tightness.	Tighten connections.
(2) Fluctuating AC power	Check for constant volt- age and frequency at bus.	Repair electrical system.
(3) Oil pressure transmitter leaking	Check transmitter for leakage.	Replace transmitter.

G. OIL PRESSURE INDICATOR READS BELOW 35 PSIG (241·5 kPa) (NO LOW-PRESSURE CAUTION LIGHT)

Table 107

Possible Causes	Isolation Procedures	Correction
(1) Low pressure indicating light defective	Press master caution test switch.	Replace bulb.
(2) Oil pressure indicator defective	Repeat step (4) of condition E.	Replace indicator.
(3) Oil pressure transmitter defective	Repeat step (5) of condition E.	Replace transmitter.
(4) Pressure relief valve faulty	Adjust relief valve in accordance withOIL PRESSURE RELIEF VALVE - MAINTENANCE PRACTICES, PAGEBLOCK 79-20-03/201.	Replace relief valve.
(5) Corrosion or moisture on electrical connections	Check all connections for corrosion or moisture.	Clean connections.
(6) System wire shorted to ground	Disconnect indicator electrical connector. Disconnect transmitter electrical connector.	
	Check for continuity between system wires and ground.	Repair wire.

H. OIL PRESSURE INDICATOR READS IN EXCESS OF 55 PSIG (379·5 kPa)

Table 108

Possible Causes	Isolation Procedures	Correction
(1) Oil pressure transmitter vent line obstructed	Check vent line for obstruction.	Clean line.
(2) Oil pressure indicator defective	Repeat step (4) of condition E.	Replace indicator.
(3) Oil pressure transmitter defective	Repeat step (5) of condition E.	Replace transmitter.
(4) Pressure relief valve faulty	Repeat step (4) of condition G.	Replace relief valve.

I. OIL PRESSURE INDICATION FOLLOWS POWER LEVER

Table 109

Possible Causes	Isolation Procedures	Correction
(1) Oil pressure transmitter defective	Repeat step (1) of condition E.	Replace transmitter.
(2) Pressure relief valve faulty	Repeat step (1) through (5) of condition E.	
	Adjust relief valve in accordance with OIL PRESSURE RELIEF VALVE - MAINTENANCE PRACTICES, PAGEBLOCK 79-20-03/201.	Replace pressure relief valve.

J. OIL PRESSURE INDICATOR SLUGGISH

Table 110

Possible Causes	Isolation Procedures	Correction
(1) Oil pressure line obstructed	Check pressure line for obstruction or damage.	Clean or repair line.

Table 110 (Continued)

Possible Causes	Isolation Procedures	Correction
(2) Orifice in restrictor bolt or restrictor union blocked	Check orifice in restrictor bolt and restrictor unionOIL PRESSURE SENSE LINES - MAINTENANCE PRACTICES, PAGEBLOCK 79-36-01/201.	Clean or replace restrictor bolt.
		Clean or replace restrictor union.

K. LOW PRESSURE INDICATING LIGHT WILL NOT GO OFF (PRESSURE VERIFIED TO BE NORMAL)

Table 111

Possible Causes	Isolation Procedures	Correction
(1) Low-pressure switch defective		Replace low pressure switch.
(2) Low-pressure switch pressure obstructed	Check pressure line for obstruction or damage.	Clean or repair line.
(3) Orifice in restrictor bolt or restrictor union blocked	Check orifice in restrictor bolt and restrictor union OIL PRESSURE SENSE LINES - MAINTENANCE PRACTICES, PAGEBLOCK 79-36-01/201.	Clean or replace restrictor bolt.
		Clean or replace restrictor union.

L. OIL STRAINER BLOCKED INDICATING LIGHT WILL NOT GO OFF

Table 112

Possible Causes	Isolation Procedures	Correction
(1) Engine oil strainer blocked	Check for blocked strainer.	Clean strainer.
(2) Filter differential pressure switch defective	Disconnect differential pressure switch electrical connector.	
	Check for continuity between differential pressure switch pins.	If there is continuity, replace differential pressure switch.
(3) Orifice in restrictor bolt blocked	Check restrictor bolt orifice OIL PRESSURE SENSE LINES - MAINTENANCE PRACTICES, PAGEBLOCK 79-36-01/201.	Clean or replace restrictor bolt.

INDICATING - TROUBLE SHOOTING

1. General

A. The following provides trouble shooting instructions for the indicating system.

2. Trouble Shooting Indicating

CAUTION: TO PREVENT DAMAGE TO ELECTRICAL CONNECTOR, DO NOT USE ANY TOOL OTHER THAN PLUG PLIERS TO DISCONNECT OR CONNECT PLUG. WHEN CONNECTING PLUG, DO NOT OVERTIGHTEN.

CAUTION: ENSURE SYSTEM DISPLAY PANEL CONNECTOR WIRES ARE CONNECTED PROPERLY UPON COMPLETION OF TROUBLE SHOOTING PROCEDURES.

A. ENGINE OIL DISPLAY SYSTEM NOT FUNCTIONING

NOTE: Connector plug is properly installed when no relative motion exists between plug backshell and coupling ring.

Table 101

Possible Causes	Isolation Procedures	Correction
(1) Defective oil indicating display on System Display Panel (SDP).	Perform BIT TEST (INDICATING, SUBJECT 79-30-00, Page 1)	If failure is displayed, replace Systems Display Panel (SDP).
	Replace (SDP) with known good (SDP).	If no failure displayed, replace failed (SDP).
	SDP still inoperative.	Trouble is in wiring, refer to steps B. thru M.
NOTE: If engine operation is not possible, begin trouble shooting with Paragraph 2.B..		

B. NO OIL QUANTITY INDICATION

Table 102

Possible Causes	Isolation Procedures	Correction
(1) Defective transmitter, Systems Display Panel (SDP)	Interchange SDP	
	Display still inoperative.	Trouble is in wiring of transmitter (Ref. steps (2), (3) and (5)).
	Display now operates.	Replace defective SDP.
(2) Circuit breaker tripped due to circuit malfunction	Disconnect SDP electrical connector.	
	Check for continuity from connector power pin *D to ground.	Repair wiring.
(3) System ground wire open	Disconnect transmitter electrical connector.	
	Check for continuity from connector pin B to structure.	Repair ground wire.
(4) Oil quantity SDP defective	Disconnect SDP electrical connector.	
	Connect a dc voltmeter between connector pin *D and ground.	

Table 102 (Continued)

Possible Causes	Isolation Procedures	Correction
	A reading of 28 vdc should be obtained.	Replace SDP.
(5) Oil quantity transmitter defective	Disconnect transmitter electrical connector.	
	Connect a dc voltmeter between connector pins A or C and pin B.	
	A reading of 28 vdc should be obtained.	Replace transmitter.

C. OIL QUANTITY INDICATION FLUCTUATING

Table 103

Possible Causes	Isolation Procedures	Correction
(1) Continuity poor in wiring and electrical connections in Systems Display Panel (SDP).	Interchange (SDP)	Replace defective SDP.
(2) Continuity poor in wiring and electrical connections in transmitter	Check continuity between transmitter pins A and B, and pins B and C.	Replace defective transmitter.
(3) Continuity poor in wiring between SDP and transmitter connectors	Check continuity between SDP and transmitter connectors, between SDP connector and 28 vdc bus, and between transmitter connector and ground.	Repair defective wiring and/or connections.

D. OIL QUANTITY INDICATION BELOW MEASURED QUANTITY OF OIL IN TANK. FULL, OR PORTION OF INDICATING RANGE ERROR EXCEEDS 1.5 QUARTS (1.43 LITERS)

Table 104

Possible Causes	Isolation Procedures	Correction
(1) Open circuit between transmitter pin B and ground	Check continuity between transmitter connector pin B and ground.	Repair defective wiring.
(2) Open circuit between Systems Display Panel (SDP) pin *D and 28 vdc bus	Check for 28 vdc at SDP connector pin *D.	Repair defective wiring.
(3) Open circuit between SDP pin *U and transmitter pin A	Check continuity between SDP connector pin *U and transmitter connector pin A.	Repair defective wiring.
(4) Open circuit between SDP pin *V and transmitter pin C	Check continuity between SDP connector pin *V and transmitter connector pin C.	Repair defective wiring.
(5) Display defective	Interchange SDP. Display reads correctly.	Replace defective SDP.
(6) Transmitter defective	Interchange SDP. Display still reads in error.	Replace defective transmitter.
(7) Transmitter defective	Check transmitter connector pin A for correct voltage reading. If above 18 vdc	Replace defective transmitter.
(8) Circuit grounded between transmitter connector pin C and Systems If no continuity exists Display Panel (SDP) connector pin *V	Check continuity between display connector pin *V and ground.	Repair defective wiring.
(9) Reed-switch in transmitter failed in closed position below oil level	Drain oil. If display reads correctly below failed reed-switch level	Replace defective transmitter.

Table 104 (Continued)

Possible Causes	Isolation Procedures	Correction
(10) Circuit shorted between SDP connector pins *U and *V	Oil level display reads 8.8 gallons (33.308 liters) regardless of oil level in tank when tank is drained or filled.	Repair defective wiring.

E. OIL QUANTITY INDICATION MEASURED QUANTITY IN TANK OVER ENTIRE RANGE, OR A PORTION OF RANGE (ERROR EXCEEDS 1.5 QUARTS) (1.43 LITERS)

Table 105

Possible Causes	Isolation Procedures	Correction
(1) Grounded full circuit between Systems Display Panel (SDP) connector, pin *U; and transmitter connector pin A	Interchange SDP. Display reads incorrectly.	Repair defective wiring.
(2) SDP grounded internally (Pin *U to structure)	Interchange SDP. Display still reads in error.	Replace SDP.
(3) Open circuit between SDP connector pin *V and transmitter connector pin C	Check continuity between SDP connector pin *V and transmitter connector pin C. If continuity exists	Replace defective transmitter.
(4) Open circuit between SDP connector pin G and transmitter connector pin C	Check continuity between SDP connector pin *V and transmitter connector pin C. If no continuity exists	Repair defective wiring.

F. NO OIL PRESSURE INDICATION

Table 106

Possible Causes	Isolation Procedures	Correction
Defective System Display Panel (SDP), transmitter, or wiring	Interchange SDP	
	SDP still inoperative.	Trouble is in wiring or transmitter (Ref. steps (2), (3) and (5)).
	SDP now operates.	Replace defective SDP.
(2) Circuit breaker tripped due to circuit malfunction	Disconnect SDP electrical connector. Check for continuity from connector pin *D to *C.	Repair wiring.
(3) System ground wire open	Disconnect SDP electrical connector.	
	Disconnect transmitter electrical connector.	
	Check for continuity from SDP and transmitter connector ground pins to structure.	Repair ground wire.
(4) Oil pressure display defective	Disconnect SDP electrical connector. Check for 28 VDC power from connector pin *D to *C.	Replace Systems Display Panel (SDP).
	Interchange SDP.	
(5) Oil pressure transmitter defective	Disconnect transmitter electrical connector. Check for 26 vac power from connector pin B to ground.	Replace transmitter.

G. OIL PRESSURE DISPLAY FLUCTUATES

Table 107

Possible Causes	Isolation Procedures	Correction
(1) Loose electrical connections	Check all connections for tightness.	Tighten connections.
(2) Fluctuating AC power	Check for constant volt- age and frequency at bus.	Repair electrical system.
(3) Oil pressure transmitter leaking	Check transmitter for leakage.	Replace transmitter.

H. OIL PRESSURE DISPLAY READS BELOW 35 PSIG (241·5 kPa) (NO LOW-PRESSURE CAUTION INDICATION)

Table 108

Possible Causes	Isolation Procedures	Correction
(1) Oil pressure display defective	Repeat step (4) of condition F.	Replace Systems Display Panel (SDP).
(2) Oil pressure transmitter defective	Repeat step (5) of condition F.	Replace transmitter.
(3) Pressure relief valve faulty	Adjust relief valve in accordance with OIL PRESSURE RELIEF VALVE - MAINTENANCE PRACTICES, PAGEBLOCK 79-20-03/201.	Replace relief valve.
(4) Corrosion or moisture on electrical connections	Check all connections for corrosion or moisture.	Clean connections.
(5) System wire shorted to ground	Disconnect SDP electrical connector. Disconnect transmitter electrical connector.	
	Check for continuity between system wires and ground.	Repair wire.

I. OIL PRESSURE DISPLAY READS IN EXCESS OF 55 PSIG (379·5 kPa)

Table 109

Possible Causes	Isolation Procedures	Correction
(1) Oil pressure transmitter vent line obstructed	Check vent line for obstruction.	Clean line.
(2) Oil pressure display defective	Repeat step (4) of condition F.	Replace Systems Display Panel (SDP)
(3) Oil pressure transmitter defective	Repeat step (5) of condition F.	Replace transmitter.
(4) Pressure relief valve faulty	Repeat step (4) of condition H.	Replace relief valve.

J. OIL PRESSURE INDICATION FOLLOWS POWER LEVER

Table 110

Possible Causes	Isolation Procedures	Correction
(1) Oil pressure transmitter defective	Repeat step (1) of condition F.	Replace transmitter.
(2) Pressure relief valve faulty	Repeat step (1) through (5) of condition F.	
	Adjust relief valve in accordance with OIL PRESSURE RELIEF VALVE - MAINTENANCE PRACTICES, PAGEBLOCK 79-20-03/201.	Replace pressure relief valve.

K. OIL PRESSURE DISPLAY SLUGGISH

Table 111

Possible Causes	Isolation Procedures	Correction
(1) Oil pressure line obstructed	Check pressure line for obstruction or damage.	Clean or repair line.
(2) Orifice in restrictor bolt or restrictor union blocked	Check orifice in restrictor bolt and restrictor union (OIL PRESSURE SENSE LINES - MAINTENANCE PRACTICES, PAGEBLOCK 79-36-01/201).	Clean or replace restrictor bolt. Clean or replace restrictor union.

L. LOW OIL PRESSURE WARNING INDICATION WILL NOT GO OFF (PRESSURE VERIFIED TO BE NORMAL)

Table 112

Possible Causes	Isolation Procedures	Correction
(1) Low-pressure switch defective		Replace low pressure switch.
(2) Low-pressure switch pressure obstructed	Check pressure line for obstruction or damage.	Clean or repair line.
(3) Orifice in restrictor bolt or restrictor union blocked	Check orifice in restrictor bolt and restrictor union (OIL PRESSURE SENSE LINES - MAINTENANCE PRACTICES, PAGEBLOCK 79-36-01/201)	Clean or replace restrictor bolt. Clean or replace restrictor union.

M. OIL STRAINER CLOGGING CAUTION INDICATION WILL NOT GO OFF

Table 113

Possible Causes	Isolation Procedures	Correction
(1) Engine oil strainer blocked	Check for blocked strainer.	Clean strainer.
(2) Filter differential pressure switch defective	Disconnect differential pressure switch electrical connector.	
	Check for continuity between differential pressure switch pins.	If there is continuity, replace differential pressure switch.
(3) Orifice in restrictor bolt blocked	Check restrictor bolt orifice (OIL PRESSURE SENSE LINES - MAINTENANCE PRACTICES, PAGEBLOCK 79-36-01/201)	Clean or replace restrictor bolt.

OIL QUANTITY TRANSMITTER - MAINTENANCE PRACTICES

1. General

A. An oil quantity transmitter is located on the lower right side of each oil tank. Access is gained through the lower forward cowl door. Removal and installation procedures for the transmitter on left and right engines are identical.

WJE 401-404, 412, 414, 886, 887

B. The oil quantity displays are located on the center instrument panel. For removal and installation procedures, refer to INSTRUMENTS - GENERAL - MAINTENANCE PRACTICES, PAGEBLOCK 31-00-01/201.

WJE 405-411, 415-427, 429, 861-866, 868, 869, 871-881, 883, 884, 891-893

C. The oil quantity indicators or displays are located on the center instrument panel. For removal and installation procedures, refer to INSTRUMENTS - GENERAL - MAINTENANCE PRACTICES, PAGEBLOCK 31-00-01/201.

WJE ALL

2. Equipment and Materials

NOTE: Equivalent substitutes may be used instead of the following listed items:

NOTE: Some materials in the Equipment and Materials list may not be permitted to be used in your location. Persons in each location must make sure they are permitted to use these materials. All persons must obey all applicable federal, state, local, and provincial regulations for their location.

Table 201

Name and Number	Manufacturer
Petrolatum VV-P-236	
Lockwire, NASM20995N32, DPM 684	Not Specified
Suitable container approximately 5 US gallons (4.16 Imperial gallons or 18.93 liters)	
Torque wrench 0-100 inch-pounds (0-11.3 N·m) capacity	

3. Removal/Installation Oil Quantity Transmitter

CAUTION: TRANSMITTER FLOAT IS SECURED WITH SHIPPING CLIP (PLASTIC TUBING) WHICH IS STRUNG THROUGH TWO OIL HOLES. CLIP AND ACCOMPANYING RED TAG MUST BE REMOVED BEFORE TRANSMITTER IS INSTALLED. CLIP AND RED TAG MUST BE INSTALLED WHENEVER TRANSMITTER IS REMOVED.

A. Remove Transmitter

WARNING: MAKE CERTAIN THAT CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Tag throttle/thrust reverser lever, and open and tag following circuit breakers.

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 401-404, 412, 414, 875, 876, 878, 879, 881, 883			
U	42	B1-872	ENG START VALVE LEFT & RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
S	21	B1-9	LEFT OIL QUANTITY
WJE 401-404, 406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887			
S	34	B1-969	LEFT SYSTEMS DISPLAY PANEL

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
T	21	B1-10	RIGHT OIL QUANTITY
WJE 401-404, 406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887			
T	34	B1-970	RIGHT SYSTEMS DISPLAY PANEL

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Place thrust reverser control valve in dump position and install safety pin.

(3) Open oil tank drain valve and drain oil tank.

NOTE: Be prepared to catch oil in container with approximate capacity of 5 US gallons (4.16 Imperial gallons or 18.93 liters).

CAUTION: TO PREVENT DAMAGE TO ELECTRICAL CONNECTOR, DO NOT USE ANY TOOL OTHER THAN PLUG PLIERS TO DISCONNECT PLUG.

(4) Disconnect electrical connector.

(5) Remove scupper drain line bracket.

CAUTION: HANDLE TRANSMITTER WITH CARE DURING REMOVAL AND INSTALLATION TO PREVENT DAMAGE.

(6) Remove transmitter. Discard O-ring.

B. Install Transmitter

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Make certain throttle/thrust reverser lever is taggedand following circuit breakers are opened and tagged.

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 401-404, 412, 414, 875, 876, 878, 879, 881, 883			
U	42	B1-872	ENG START VALVE LEFT & RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
S	21	B1-9	LEFT OIL QUANTITY

WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893 (Continued)

(Continued)

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
WJE 401-404, 406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887			
S	34	B1-969	LEFT SYSTEMS DISPLAY PANEL

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
T	21	B1-10	RIGHT OIL QUANTITY
WJE 401-404, 406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887			
T	34	B1-970	RIGHT SYSTEMS DISPLAY PANEL

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Make certain thrust reverser control valve is in dump position and safety pin is installed.

(3) Check transmitter and tank opening to make certain no foreign matter is present.

(4) Lightly lubricate new O-ring with Petrolatum (VV-P-236) and install O-ring on transmitter.

(5) Install transmitter.

NOTE: Install transmitter with electrical connector forward.

(6) Install scupper drain line bracket.

CAUTION: TO PREVENT DAMAGE TO ELECTRICAL CONNECTORS, DO NOT USE ANY TOOL OTHER THAN PLUG PLIERS TO CONNECT PLUG. WHEN CONNECTING PLUG, DO NOT OVERTIGHTEN.

(7) Connect electrical connector. Safety connector with lockwire.

NOTE: Connector is properly installed when no relative motion exists between backshell and coupling ring.

(8) Make certain that oil tank drain valve is closed.

(9) Service oil tank. (ENGINE OIL SYSTEM, SUBJECT 12-12-04, Page 301)

(10) Remove tools, equipment, loose hardware, spilled fluid, and debris from maintenance area.

(11) Remove tag from throttle/thrust reverser lever, and remove tags and close following circuit breakers.

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 401-404, 412, 414, 875, 876, 878, 879, 881, 883			
U	42	B1-872	ENG START VALVE LEFT & RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
S	21	B1-9	LEFT OIL QUANTITY
WJE 401-404, 406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887			
S	34	B1-969	LEFT SYSTEMS DISPLAY PANEL

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
T	21	B1-10	RIGHT OIL QUANTITY
WJE 401-404, 406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887			
T	34	B1-970	RIGHT SYSTEMS DISPLAY PANEL

UPPER EPC, ENGINE - LEFT AC BUS

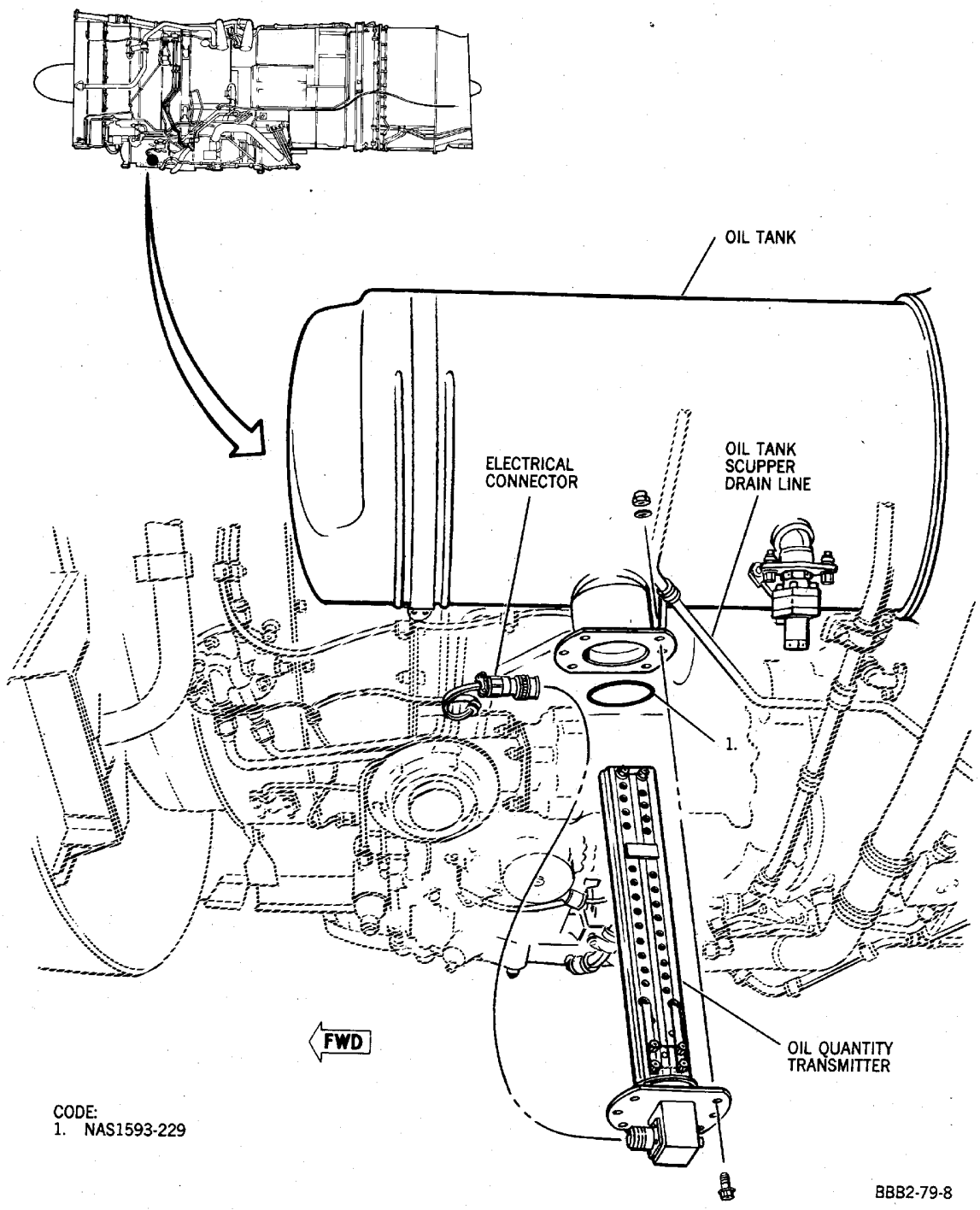
Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

(12) Remove safety pin from thrust reverser control valve. Stow safety pin.



Oil Quantity Transmitter -- Removal/Installation
Figure 201/79-31-01-990-801

4. Check Oil Quantity Transmitter

A. Check Transmitter

(1) Visually check for leaks after oil tank is serviced.

(2) Check oil level. (ENGINE OIL SYSTEM, SUBJECT 12-12-04, Page 301)

WJE 401-404, 412, 414, 886, 887

(3) With electrical buses energized, check for proper oil display. Ensure display reading and oil quantity in tank agree within 1.5 quart (1.43 liters).

WJE 405-411, 415-427, 429, 861-866, 868, 869, 871-881, 883, 884, 891-893

(4) With electrical buses energized, check for proper oil indication or display. Ensure indicator or display reading and oil quantity in tank agree within 1.5 quart (1.43 liters).

WJE ALL

(5) Check visually for oil leaks on first engine run.

OIL TEMPERATURE SENSOR - MAINTENANCE PRACTICES

1. General

A. An engine oil temperature sensor is located on the forward left side of each engine and is mounted in the fuel/oil cooler out-let line. Access is gained through the lower forward cowl door. Removal and installation procedures for the temperature sensor on left and right engines are identical.

WJE 401-404, 412, 414, 886, 887

B. The oil temperature displays are located on the center instrument panel. For removal and installation procedures PAGEBLOCK 31-00-01/201.

WJE 405-411, 415-427, 429, 861-866, 868, 869, 871-881, 883, 884, 891-893

C. The oil temperature indicators or displays are located on the center instrument panel. For removal and installation procedures PAGEBLOCK 31-00-01/201.

WJE ALL

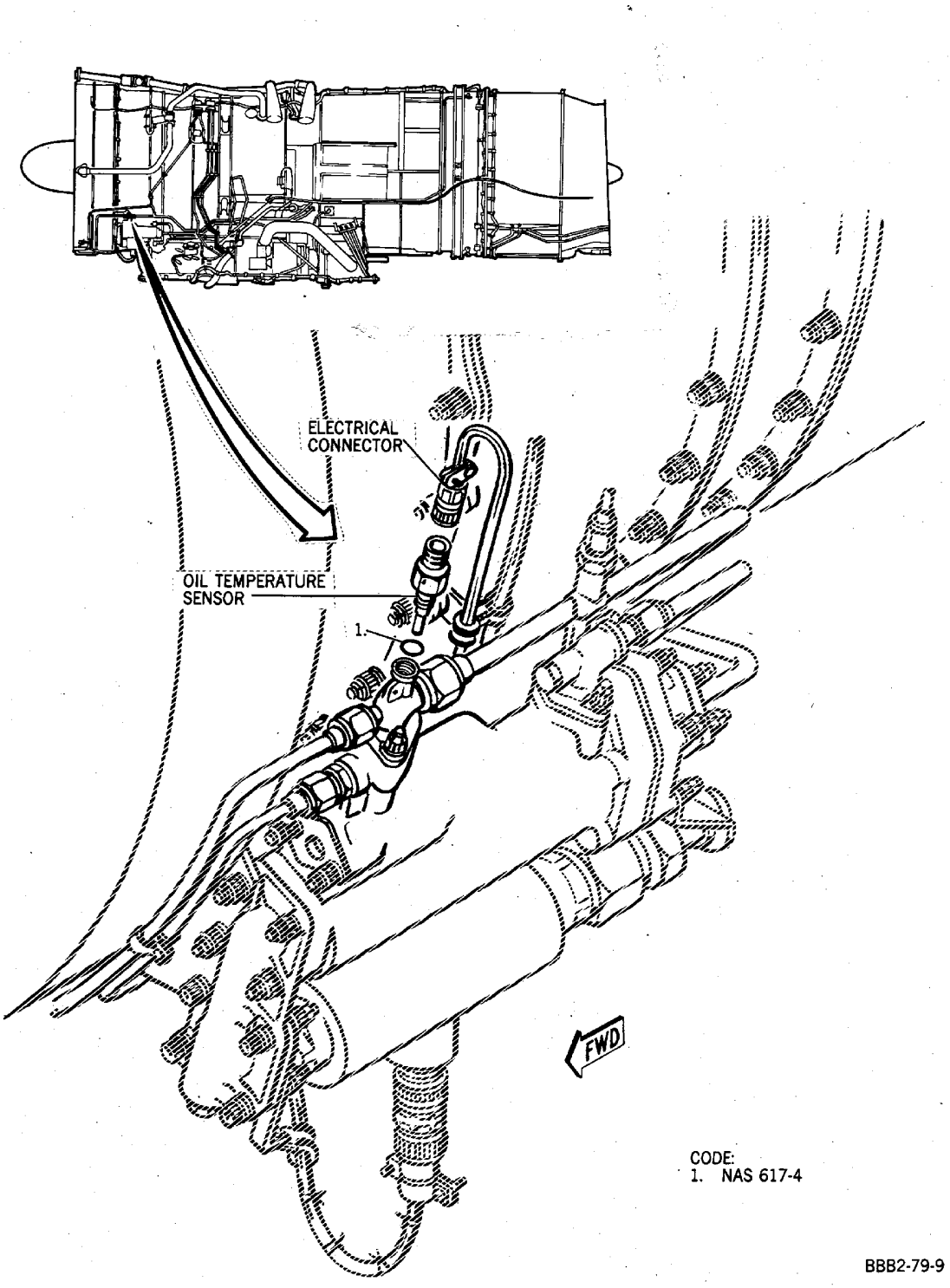
2. Equipment and Materials

NOTE: Equivalent substitutes may be used instead of the following listed items:

NOTE: Some materials in the Equipment and Materials list may not be permitted to be used in your location. Persons in each location must make sure they are permitted to use these materials. All persons must obey all applicable federal, state, local, and provincial regulations for their location.

Table 201

Name and Number	Manufacturer
Lockwire, NASM20995N20, DPM 684	Not Specified
Lockwire, NASM20995N32, DPM 684	Not Specified
Petrolatum VV-P-236	



Oil Temperature Sensor -- Removal/Installation
Figure 201/79-32-01-990-801

3. **Removal/Installation Oil Temperature Sensor**

A. Remove Sensor

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Tag throttle/thrust reverser lever, and open and tag following circuit breakers.

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 401-404, 412, 414, 875, 876, 878, 879, 881, 883			
U	42	B1-872	ENG START VALVE LEFT & RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
S	22	B1-11	LEFT OIL TEMP
WJE 401-404, 406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887			
S	34	B1-969	LEFT SYSTEMS DISPLAY PANEL
WJE ALL			

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	22	B1-12	RIGHT OIL TEMP
WJE 401-404, 406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887			
T	34	B1-970	RIGHT SYSTEMS DISPLAY PANEL

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Place thrust reverser control valve in dump position and install safety pin.

CAUTION: TO PREVENT DAMAGE TO ELECTRICAL CONNECTOR, DO NOT USE ANY TOOL OTHER THAN PLUG PLIERS TO DISCONNECT PLUG.

(3) Disconnect electrical connector.

(4) Remove sensor from fuel/oil cooler. Discard O-ring.

B. Install Sensor

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Make certain throttle/thrust reverser lever is tagged and following circuit breakers are opened and tagged.

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 401-404, 412, 414, 875, 876, 878, 879, 881, 883			
U	42	B1-872	ENG START VALVE LEFT & RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
S	22	B1-11	LEFT OIL TEMP
WJE 401-404, 406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887			
S	34	B1-969	LEFT SYSTEMS DISPLAY PANEL

(Continued)

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name

WJE ALL

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	22	B1-12	RIGHT OIL TEMP

WJE 401-404, 406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887

T	34	B1-970	RIGHT SYSTEMS DISPLAY PANEL

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name

WJE ALL

K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Make certain thrust reverser control valve is in dump position and safety pin is installed.

(3) Lightly lubricate new O-ring with Petrolatum (VV-P-236) and install O-ring on sensor.

(4) Before installing sensor, check fuel/oil cooler opening to make certain no foreign matter is present.

(5) Install sensor in fuel/oil cooler. Torque sensor 80 to 100 inch-pounds (9.04 to 11.3 N·m). Safety sensor with 0.032 inch lockwire.

CAUTION: TO PREVENT DAMAGE TO ELECTRICAL CONNECTOR, DO NOT USE ANY TOOL OTHER THAN PLUG PLIERS TO CONNECT PLUG. WHEN CONNECTING PLUG, DO NOT OVERTIGHTEN.

(6) Connect electrical connector. Safety connector with 0.020 inch lockwire.

NOTE: Connector plug is properly installed when no relative motion exists between plug backshell and coupling ring.

(7) Remove tools, equipment, loose hardware, spilled fluid, and debris from maintenance area.

(8) Remove tag from throttle/thrust reverser lever, and remove tags and close following circuit breakers.

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP

(Continued)

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 401-404, 412, 414, 875, 876, 878, 879, 881, 883			
U	42	B1-872	ENG START VALVE LEFT & RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
S	22	B1-11	LEFT OIL TEMP
WJE 401-404, 406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887			
S	34	B1-969	LEFT SYSTEMS DISPLAY PANEL
WJE ALL			

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	22	B1-12	RIGHT OIL TEMP
WJE 401-404, 406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887			
T	34	B1-970	RIGHT SYSTEMS DISPLAY PANEL

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

(9) Remove safety pin from thrust reverser control valve. Stow safety pin.

4. Check Oil Temperature Sensor

A. Check Sensor

WJE 401-404, 412, 414, 886, 887

(1) Check oil temperature display for proper indication on first engine run and check engine temperature sensor installation for leaks.

WJE 405-411, 415-427, 429, 861-866, 868, 869, 871-881, 883, 884, 891-893

(2) Check oil temperature indicator or display for proper indication on first engine run and check engine temperature sensor installation for leaks.

OIL PRESSURE TRANSMITTER - MAINTENANCE PRACTICES

1. General

A. An oil pressure transmitter is located on the forward upper left side of each engine. Access is gained through the upper cowl door. Removal and installation procedures for transmitters on left and right engines are identical.

WJE 401-404, 412, 414, 886, 887

B. The oil pressure displays are located on the center instrument panel. For removal and installation procedures PAGEBLOCK 31-00-01/201.

WJE 405-411, 415-427, 429, 861-866, 868, 869, 871-881, 883, 884, 891-893

C. The oil pressure indicators or displays are located on the center instrument panel. For removal and installation procedures see PAGEBLOCK 31-00-01/201.

WJE ALL

2. Equipment and Materials

NOTE: Equivalent substitutes may be used instead of the following listed items:

NOTE: It is possible that some materials in the Equipment and Materials List cannot be used for some or all of their necessary applications. Before you use the materials, make sure the types, quantities, and applications of the materials necessary are legally permitted in your location. All persons must obey all applicable federal, state, local, and provincial laws and regulations when it is necessary to work with these materials.

Table 201

Name and Number	Manufacturer
Lockwire, NASM20995N20, DPM 684	Not Specified
Petrolatum VV-P-236 DPM 675	

3. Removal/Installation Oil Pressure Transmitter

A. Remove Transmitter

WARNING: MAKE CERTAIN THAT CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Tag throttle/thrust reverser lever, and open and tag following circuit breakers.

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893 (Continued)

(Continued)

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
WJE 401-404, 412, 414, 875, 876, 878, 879, 881, 883			
U	42	B1-872	ENG START VALVE LEFT & RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
WJE 401-404, 406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887			
S	34	B1-969	LEFT SYSTEMS DISPLAY PANEL

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	34	B1-970	RIGHT SYSTEMS DISPLAY PANEL

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

UPPER EPC, LEFT INSTR BUS

Row	Col	Number	Name
		B1-5	LEFT ENGINE OIL PRESSURE

UPPER EPC, RIGHT INSTRUMENT BUS

Row	Col	Number	Name
A	1	B1-6	RIGHT ENGINE OIL PRESSURE

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Place thrust reverser control valve in dump position and install safety pin.

CAUTION: TO PREVENT DAMAGE TO ELECTRICAL CONNECTOR, DO NOT USE ANY TOOL OTHER THAN PLUG PLIERS TO DISCONNECT OR CONNECT PLUG. WHEN CONNECTING PLUG, DO NOT OVERTIGHTEN.

(3) Disconnect electrical connector.

(4) Disconnect pressure lines from tee fitting.

(5) Loosen tee fitting jamnut and remove fitting. Disconnect O-rings.

(6) Disconnect vent lines from tee fitting.

(7) Remove retainer nut and remove transmitter from mounting bracket.

(8) Loosen tee fitting jamnut and remove fitting.

(9) Remove O-ring from fitting.

(10) Loosen pressure and vent lines supporting clamps.

B. Install Transmitter

WARNING: MAKE CERTAIN THAT CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Make certain that throttle/thrust reverser lever is tagged and following circuit breakers are opened and tagged.

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 401-404, 412, 414, 875, 876, 878, 879, 881, 883			
U	42	B1-872	ENG START VALVE LEFT & RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
WJE 401-404, 406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887			
S	34	B1-969	LEFT SYSTEMS DISPLAY PANEL

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	34	B1-970	RIGHT SYSTEMS DISPLAY PANEL

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

UPPER EPC, LEFT INSTR BUS

Row	Col	Number	Name
		B1-5	LEFT ENGINE OIL PRESSURE

UPPER EPC, RIGHT INSTRUMENT BUS

Row	Col	Number	Name
A	1	B1-6	RIGHT ENGINE OIL PRESSURE

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6555 TO 7245 KPA) (PRECHARGE PRESSURE).

(2) Make certain that thrust reverser control valve is in dump position and safety pin is installed.

WARNING: WHITE PETROLATUM IS AN AGENT THAT IS AN IRRITANT. MAKE SURE ALL PERSONS OBEY ALL OF THE PRECAUTIONS WHEN WHITE PETROLATUM IS USED.

- DO NOT USE IN AREAS WHERE THERE IS HIGH HEAT, SPARKS, OR FLAMES.
- USE IN AN AREA OPEN TO THE AIR.
- CLOSE THE CONTAINER WHEN NOT USED.
- DO NOT BREATHE THE MIST.

WARNING: REFER TO THE APPLICABLE MANUFACTURER'S OR SUPPLIER'S MSDS FOR:

- MORE PRECAUTIONARY DATA
- APPROVED SAFETY EQUIPMENT
- EMERGENCY MEDICAL AID.

TALK WITH THE LOCAL SAFETY DEPARTMENT OR AUTHORITIES FOR THE PROCEDURES TO DISCARD THIS HAZARDOUS AGENT.

(3) Lightly lubricate new O-ring with Petrolatum VV-P-236 and install O-ring on vent port tee fitting.

(4) Install and position vent line fitting in transmitter. Do not tighten jamnut.

(5) Before installing transmitter, check all openings to make certain that no foreign matter is present.

(6) Align locating stud on transmitter with hole in mounting bracket.

CAUTION: TO PREVENT FATIGUE CRACKS AROUND TUBE FLARES, MAKE CERTAIN "B" NUTS, SUPPORTING LINE CLAMPS, TEE FITTING JAMNUTS, AND TRANSMITTER RETAINING NUT ARE LOOSE PRIOR TO INSTALLING PRESSURE LINE.

(7) Install transmitter retainer nut, make certain that transmitter is properly positioned, and tighten nut.

(8) Connect vent lines on fittings loose, making certain tube flares are properly seated on fitting before finger tightening "B" nuts.

(9) Lightly lubricate new O-ring with Petrolatum VV-P-236 and install O-ring on pressure port tee fitting.

(10) Install and position pressure line tee fitting in transmitter. Do not tighten jamnut.

(11) Connect pressure lines on fittings loose, making certain tube flares are properly seated on fitting before finger tightening "B" nuts.

(12) Tighten transmitter retaining nut.

(13) Tighten pressure line and vent line "B" nuts.

(14) Tighten pressure line and vent line tee fitting jamnuts.

(15) Tighten line supporting clamps.

CAUTION: TO PREVENT DAMAGE TO ELECTRICAL CONNECTOR, DO NOT USE ANY TOOL OTHER THAN PLUG PLIERS TO DISCONNECT OR CONNECT PLUG. WHEN CONNECTING PLUG, DO NOT OVERTIGHTEN.

(16) Connect electrical connector. Safety connector with lockwire.

NOTE: Connector plug is properly installed when no relative motion exists between plug backshell and coupling ring.

(17) Remove tools, equipment, loose hardware, spilled fluid, and debris from maintenance area.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(18) Remove tag from throttle/thrust reverser lever, and remove tags and close following circuit breakers.

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 401-404, 412, 414, 875, 876, 878, 879, 881, 883			
U	42	B1-872	ENG START VALVE LEFT & RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893 (Continued)

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
WJE 401-404, 406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887			
S	34	B1-969	LEFT SYSTEMS DISPLAY PANEL

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	34	B1-970	RIGHT SYSTEMS DISPLAY PANEL

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

UPPER EPC, LEFT INSTR BUS

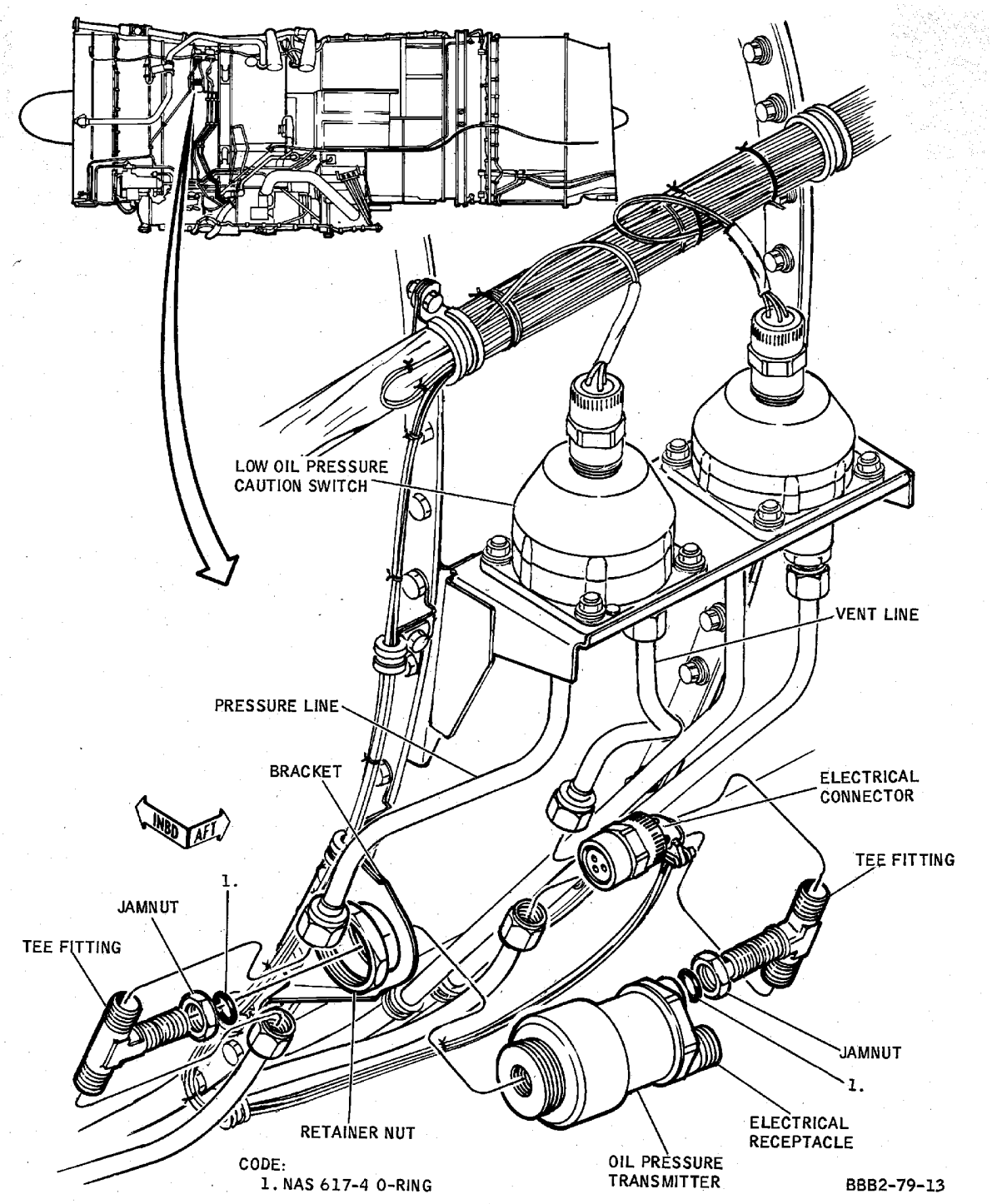
Row	Col	Number	Name
		B1-5	LEFT ENGINE OIL PRESSURE

UPPER EPC, RIGHT INSTRUMENT BUS

Row	Col	Number	Name
A	1	B1-6	RIGHT ENGINE OIL PRESSURE

WARNING: MAKE CERTAIN THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

(19) Remove safety pin from thrust reverser control valve. Stow safety pin.



Oil Pressure Transmitter -- Removal/Installation
Figure 201/79-33-01-990-801

4. Check Oil Pressure Transmitter

A. Check Transmitter

(1) Check for proper pressure indication on first engine runup and visually check engine connections for leaks.

OIL LOW-PRESSURE CAUTION SWITCH - MAINTENANCE PRACTICES

1. General

A. An oil low-pressure caution switch is located on the forward upper left side of each engine. Access is gained through the upper cowl door. Removal and installation procedures for pressure switches on left and right engines are identical.

WJE 401-406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887

B. Left and right engine oil low-pressure caution digital displays are displayed on the annunciator panel. Removal and installation procedures are as follows:

WJE 405, 875, 876

PAGEBLOCK 33-12-00/201 Config 1.

WJE 401-404, 406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 877-879, 886, 887

PAGEBLOCK 33-12-00/201 Config 2.

WJE ALL

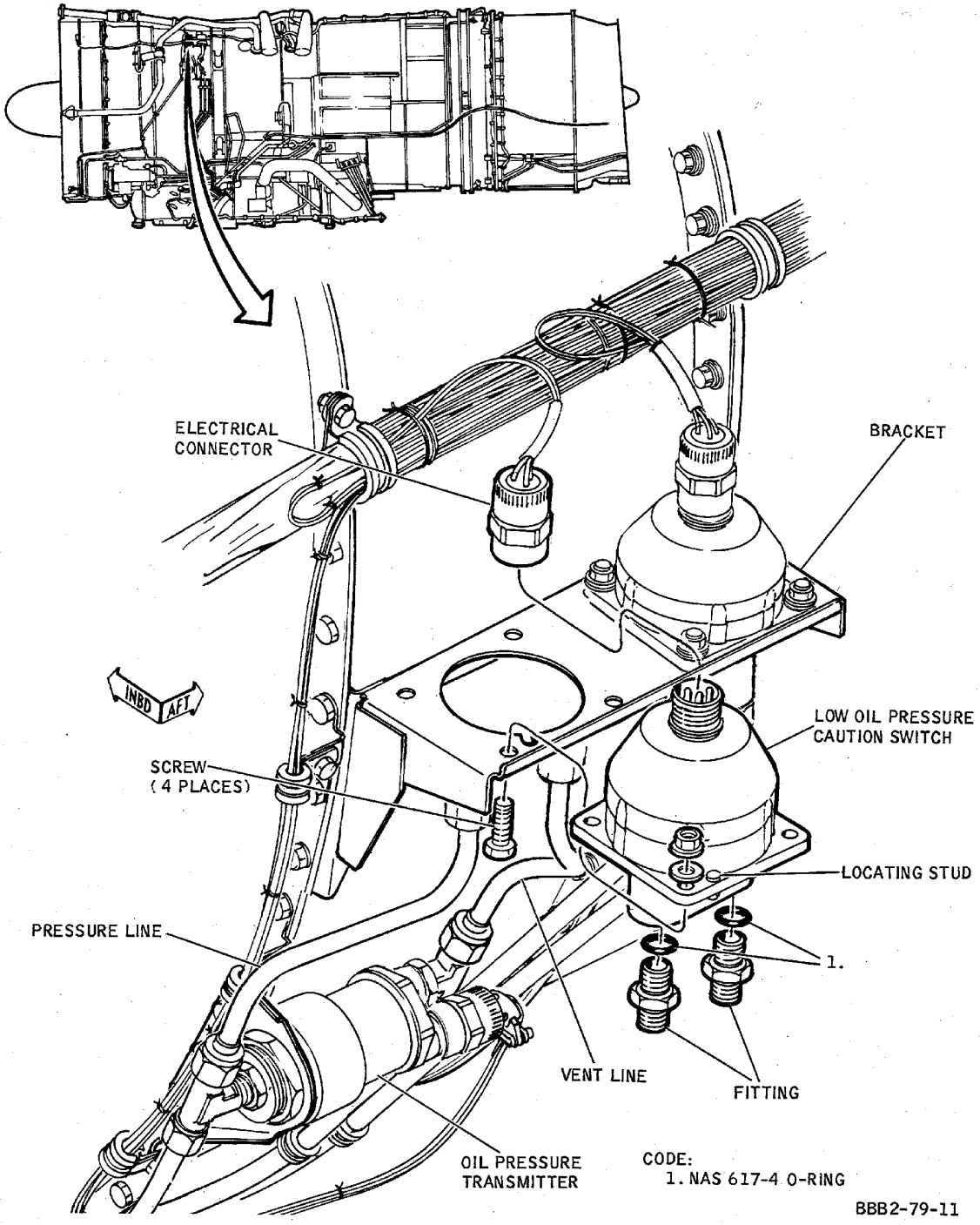
2. Equipment and Materials

NOTE: Equivalent substitutes may be used instead of the following listed items:

NOTE: Some materials in the Equipment and Materials list may not be permitted to be used in your location. Persons in each location must make sure they are permitted to use these materials. All persons must obey all applicable federal, state, local, and provincial regulations for their location.

Table 201

Name and Number	Manufacturer
Lockwire, NASM20995N20, DPM 684	Not Specified
Petrolatum VV-P-236	



Oil Low-Pressure Caution Switch -- Removal/Installation
Figure 201/79-34-01-990-801

3. **Removal/Installation Oil Low-pressure Caution Switch**

A. Remove Switch

WARNING: MAKE CERTAIN THAT CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Tag throttle/thrust reverser lever, and open and tag following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
WJE 401-404, 407-409, 411, 412, 414, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 886, 887, 891-893			
U	34	B1-140	OIL PRESSURE LOW CAUTION RIGHT
WJE 401-404, 406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887			
U	35	B1-967	ANN PANEL
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
U	35	B1-139	OIL PRESSURE LOW CAUTION LEFT
WJE ALL			
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 401-404, 412, 414, 875, 876, 878, 879, 881, 883			
U	42	B1-872	ENG START VALVE LEFT & RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
S	23	B1-137	LEFT OIL STRAINER CLOGGING CAUTION

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	23	B1-138	RIGHT OIL STRAINER CLOGGING CAUTION

WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893 (Continued)

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6555 TO 7245 KPA) (PRECHARGE PRESSURE).

(2) Place thrust reverser control valve in dump position and install safety pin.

CAUTION: TO PREVENT DAMAGE TO ELECTRICAL CONNECTOR, DO NOT USE ANY TOOL OTHER THAN PLUG PLIERS TO DISCONNECT PLUG.

(3) Disconnect electrical connector.

(4) Disconnect vent line.

(5) Disconnect pressure line.

(6) Remove switch from mounting bracket.

(7) Remove pressure line fitting from switch. Discard O-ring.

(8) Remove vent line fitting from switch. Discard O-ring.

B. Install Switch

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Make certain that throttle/thrust reverser lever is tagged and following circuit breakers are opened and tagged:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
WJE 401-404, 407-409, 411, 412, 414, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 886, 887, 891-893			
U	34	B1-140	OIL PRESSURE LOW CAUTION RIGHT
WJE 401-404, 406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887			
U	35	B1-967	ANN PANEL

(Continued)

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
U	35	B1-139	OIL PRESSURE LOW CAUTION LEFT
WJE ALL			
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 401-404, 412, 414, 875, 876, 878, 879, 881, 883			
U	42	B1-872	ENG START VALVE LEFT & RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
S	23	B1-137	LEFT OIL STRAINER CLOGGING CAUTION

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	23	B1-138	RIGHT OIL STRAINER CLOGGING CAUTION

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6555 TO 7245 KPA) (PRECHARGE PRESSURE).

(2) Make certain thrust reverser control valve is in dump position and safety pin is installed.

(3) Lightly lubricate new O-ring with Petrolatum VV-P-236 and install O-ring on pressure line fitting.

(4) Install fitting in switch. Do not tighten jamnut.

(5) Lightly lubricate new O-ring with Petrolatum VV-P-236 and install O-ring on vent line fitting.

(6) Install fitting in switch.

(7) Before installing pressure switch, check all openings to make certain no foreign matter is present.

(8) Align locating stud on switch with hole in mounting bracket and install switch in mounting bracket.

(9) Connect pressure line, position fitting, and tighten jamnut.

(10) Connect vent line.

CAUTION: TO PREVENT DAMAGE TO ELECTRICAL CONNECTOR, DO NOT USE ANY TOOL OTHER THAN PLUG PLIERS TO CONNECT PLUG. WHEN CONNECTING PLUG, DO NOT OVERTIGHTEN.

(11) Connect electrical connector. Safety connector with lockwire.

NOTE: Connector plug is properly installed when no relative motion exists between plug backshell and coupling ring.

(12) Remove tools, equipment, loose hardware, spilled fluid, and debris from maintenance area.

(13) Remove the safety tags and close these circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
WJE 401-404, 407-409, 411, 412, 414, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 886, 887, 891-893			
U	34	B1-140	OIL PRESSURE LOW CAUTION RIGHT
WJE 401-404, 406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887			
U	35	B1-967	ANN PANEL
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
U	35	B1-139	OIL PRESSURE LOW CAUTION LEFT
WJE ALL			
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 401-404, 412, 414, 875, 876, 878, 879, 881, 883			
U	42	B1-872	ENG START VALVE LEFT & RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
S	23	B1-137	LEFT OIL STRAINER CLOGGING CAUTION

WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893 (Continued)

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	23	B1-138	RIGHT OIL STRAINER CLOGGING CAUTION

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

(14) Remove safety pin from thrust reverser control valve. Stow safety pin.

4. Check Low-pressure Caution Switch

A. Check Switch

WJE 401-406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887

(1) With electrical buses energized, check that applicable oil low-pressure caution light and digital display comes on.

(2) On next engine runup, check that applicable oil low-pressure caution light and digital display goes off.

WJE 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893

(3) With electrical buses energized, check that applicable oil low-pressure caution light comes on.

(4) On next engine runup, check that applicable oil low-pressure caution light goes off.

WJE ALL

(5) Visually check engine connections for leaks.

OIL FILTER DIFFERENTIAL PRESSURE SWITCH - MAINTENANCE PRACTICES

1. General

A. The oil filter differential pressure switch is located on the forward upper left side of the engine. Access is gained through the upper cowl door. Removal and installation procedures for the switch on left and right engine are identical.

B. Left and right engine oil strainer clogging caution digital displays are displayed on the annunciator panel. For removal and installation procedures, refer to:

WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873-876, 880, 881, 883, 884, 891-893

PAGEBLOCK 33-12-00/201 Config 1

WJE 401-404, 406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 877-879, 886, 887

PAGEBLOCK 33-12-00/201 Config 2

WJE ALL

2. Equipment and Materials

NOTE: Equivalent substitutes may be used instead of the following listed items:

NOTE: Some materials in the Equipment and Materials list may not be permitted to be used in your location. Persons in each location must make sure they are permitted to use these materials. All persons must obey all applicable federal, state, local, and provincial regulations for their location.

Table 201

Name and Number	Manufacturer
Lockwire, NASM20995N20, DPM 684	Not Specified
Petrolatum VV-P-236	
Source of clean dry compressed air	

3. Removal/Installation Oil Filter Differential Pressure Switch

A. Remove Switch

WARNING: MAKE CERTAIN THAT CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Tag throttle/thrust reverser lever, and open and tag following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
WJE 401-404, 407-409, 411, 412, 414, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 886, 887, 891-893			
U	34	B1-140	OIL PRESSURE LOW CAUTION RIGHT
WJE 401-404, 406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887			
U	35	B1-967	ANN PANEL

(Continued)

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
U	35	B1-139	OIL PRESSURE LOW CAUTION LEFT
WJE ALL			
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 401-404, 412, 414, 875, 876, 878, 879, 881, 883			
U	42	B1-872	ENG START VALVE LEFT & RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
S	23	B1-137	LEFT OIL STRAINER CLOGGING CAUTION

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	23	B1-138	RIGHT OIL STRAINER CLOGGING CAUTION

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Place thrust reverser control valve in dump position and install safety pin.

CAUTION: TO PREVENT DAMAGE TO ELECTRICAL CONNECTOR, DO NOT USE ANY TOOL OTHER THAN PLUG PLIERS TO DISCONNECT PLUG.

(3) Disconnect electrical connector.

(4) Disconnect low-pressure line.

(5) Disconnect high-pressure line.

(6) Remove switch from mounting bracket.

(7) Remove fittings from switch. Discard O-rings.

B. Install Switch

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Make certain that throttle/thrust reverser lever is tagged and following circuit breakers are opened and tagged:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
WJE 401-404, 407-409, 411, 412, 414, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 886, 887, 891-893			
U	34	B1-140	OIL PRESSURE LOW CAUTION RIGHT
WJE 401-404, 406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887			
U	35	B1-967	ANN PANEL
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
U	35	B1-139	OIL PRESSURE LOW CAUTION LEFT
WJE ALL			
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 401-404, 412, 414, 875, 876, 878, 879, 881, 883			
U	42	B1-872	ENG START VALVE LEFT & RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
S	23	B1-137	LEFT OIL STRAINER CLOGGING CAUTION

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	23	B1-138	RIGHT OIL STRAINER CLOGGING CAUTION

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Make certain thrust reverser control valve is in dump position and safety pin is installed.

(3) Lightly lubricate new O-rings with Petrolatum, VV-P-236, and install O-rings on fittings.

(4) Install fittings in switch.

(5) Before installing switch, check all openings to make certain no foreign matter is present.

(6) Install switch in mounting bracket.

(7) Connect high-pressure line.

(8) Connect low-pressure line.

CAUTION: TO PREVENT DAMAGE TO ELECTRICAL CONNECTOR, DO NOT USE ANY TOOL OTHER THAN PLUG PLIERS TO CONNECT PLUG. WHEN CONNECTING PLUG, DO NOT OVERTIGHTEN.

(9) Connect electrical connector. Safety connector with lockwire.

NOTE: Connector plug is properly installed when no relative motion exists between plug backshell and coupling ring.

(10) Remove tools, equipment, loose hardware, spilled fluid, and debris from maintenance area.

(11) Remove the safety tags and close these circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
WJE 401-404, 407-409, 411, 412, 414, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 886, 887, 891-893			
U	34	B1-140	OIL PRESSURE LOW CAUTION RIGHT
WJE 401-404, 406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887			
U	35	B1-967	ANN PANEL

(Continued)

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
U	35	B1-139	OIL PRESSURE LOW CAUTION LEFT
WJE ALL			
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 401-404, 412, 414, 875, 876, 878, 879, 881, 883			
U	42	B1-872	ENG START VALVE LEFT & RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
S	23	B1-137	LEFT OIL STRAINER CLOGGING CAUTION

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	23	B1-138	RIGHT OIL STRAINER CLOGGING CAUTION

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

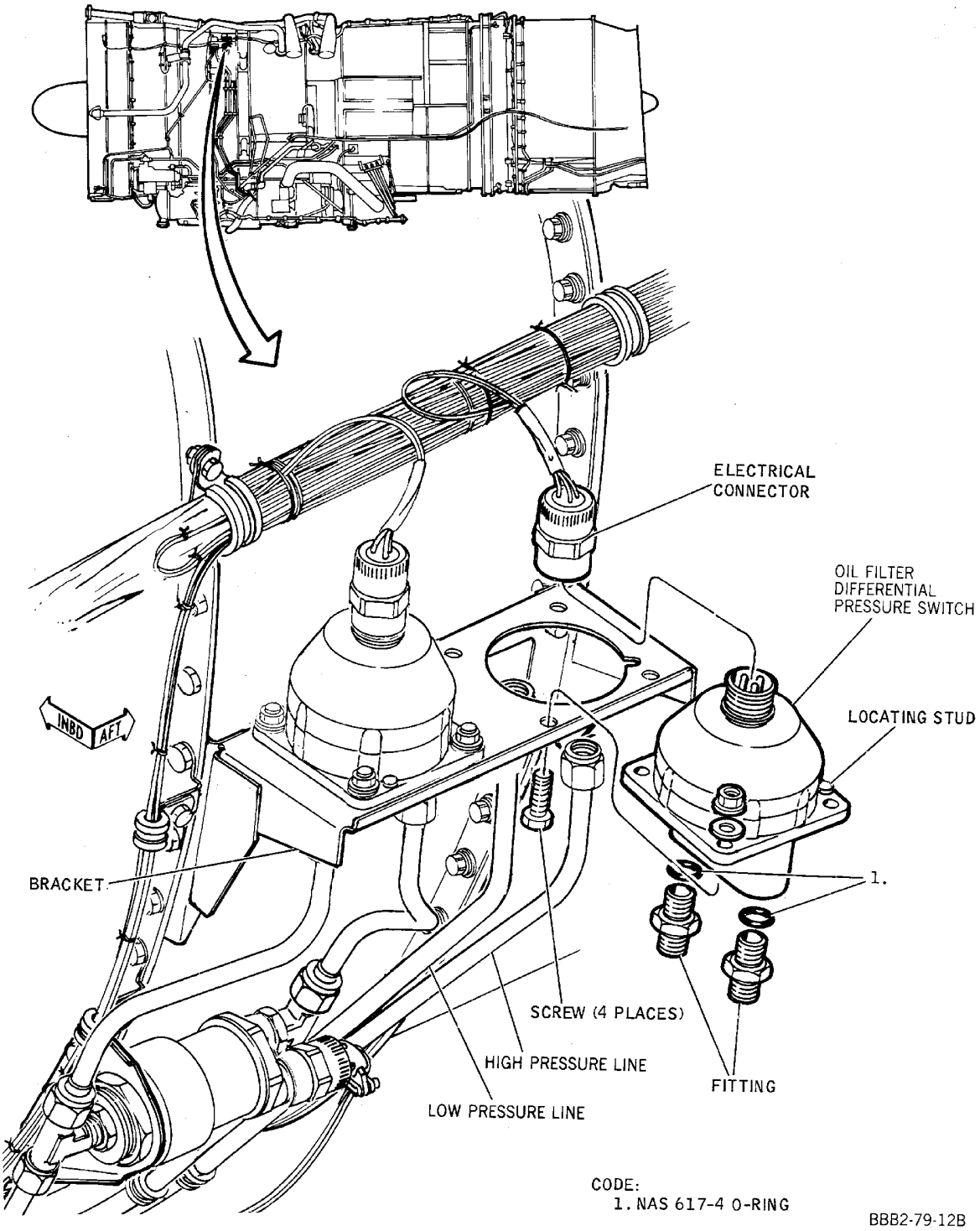
(12) Remove safety pin from thrust reverser control valve. Stow safety pin.

C. Operational check

(1) With electrical busses energized, check that applicable filter pressure drop CAUTION light stays off.

(2) On next engine run, check that applicable filter pressure drop light stays off.

(3) Visually check for leaks on first engine run-up.



Oil Filter Differential Pressure Switch -- Removal/Installation
Figure 201/79-35-01-990-801

4. **Adjustment/Test Oil Filter Differential Pressure Switch**

A. Test Switch

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Tag throttle/thrust reverser lever, and open and tag following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 401-404, 412, 414, 875, 876, 878, 879, 881, 883			
U	42	B1-872	ENG START VALVE LEFT & RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

(2) Place thrust reverser control valve in dump position and install safety pin.

(3) Prepare test equipment, with source of clean dry compressed air or nitrogen, pressure regulator, and 0 psi (0.00 kPa) to 50 psi (344.74 kPa) gage.

(4) Disconnect tube from port marked "HI" on switch. (Figure 201)

(5) Connect regulated source of clean dry compressed air including line gage, to "HI" port of switch.

(6) Check that oil strainer clogging caution circuit breaker, located on dc bus section of lower main circuit breaker panel, is closed.

(7) Slowly increase pressure and observe that oil strainer clogging light on engine caution annunciator panel comes on at 35 ±2 psig (241.32 ±13.79 kPa), increasing pressure.

WJE 401-406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887

(8) Slowly increase pressure and observe that oil strainer clogging digital display on engine caution annunciator panel comes on at 35 ±2 psig (241.32 ±13.79 kPa), increasing pressure.

WJE 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893

(9) Slowly decrease pressure and observe that light goes out by 30 psig (206.84 kPa).

WJE 401-406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887

(10) Slowly decrease pressure and observe that digital display goes out by 30 psig (206.84 kPa).

WJE ALL

(11) Shut off air pressure and disconnect air pressure source.

(12) Connect tube to "HI" port of switch.

(13) Remove tag from throttle/thrust reverse lever, and remove tags and close circuit breakers.

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891

U	41	B1-2	ENGINE IGNITION RIGHT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893

U	41	B1-423	ENGINE START VALVE RIGHT

WJE 401-404, 412, 414, 875, 876, 878, 879, 881, 883

U	42	B1-872	ENG START VALVE LEFT & RIGHT

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891

U	42	B1-1	ENGINE IGNITION LEFT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893

U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name

WJE ALL

K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

(14) Remove safety pin from thrust reverser control valve. Stow safety pin.

OIL FILTER DIFFERENTIAL PRESSURE SWITCH - ADJUSTMENT/TEST

1. General

A. This procedure contains MSG-3 task card data.

TASK 79-35-01-720-801

2. Functional Check of the Oil Filter Differential Pressure Switch

NOTE: This procedure is identical for either left or right engine, except as noted.

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
78-00-00 P/B 201	GENERAL - MAINTENANCE PRACTICES

B. Tools/Equipment

Reference	Description
STD-1201	Gauge - Pressure, 0-75 PSIG (0-518 KPa)
STD-1375	Regulator - Pressure, 0 to 100 PSI (0-690 KPa) with Pressure Gauge

C. Consumable Materials

NOTE: Equivalent replacements are permitted for the items that follow.

NOTE: It is possible that some materials in the Consumable Materials chart cannot be used for some or all of the necessary applications. Before you use the materials, make sure the types, quantities, and applications of the materials necessary are legally permitted in your location. All persons must obey all applicable federal, state, local, and provincial laws and regulations when it is necessary to work with these materials.

Reference	Description	Specification
G60037	Air - Pure Dry	DPM 5148
G60193	Nitrogen - Dry, High Purity	DPM 154-2 (MIL-PRF-27401, Type 1, Grade A)

D. Prepare for Functional Check of the Oil filter Differential Pressure Switch

SUBTASK 79-35-01-865-001

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

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

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891

U	41	B1-2	ENGINE IGNITION RIGHT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893

U	41	B1-423	ENGINE START VALVE RIGHT

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891

U	42	B1-1	ENGINE IGNITION LEFT

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891 (Continued)

(Continued)

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

SUBTASK 79-35-01-010-001

WARNING: EXERCISE CARE TO AVOID STRAKES WHEN WORKING IN ENGINE AREA WITH COWL DOORS OPEN OR INJURY TO PERSONNEL COULD RESULT.

(2) Open engine upper cowl doors.

(3) Open thrust reverser hydraulic release handle access panels.

SUBTASK 79-35-01-040-001

(4) Place thrust reverser control valve in dump position and install lockpin. (PAGEBLOCK 78-00-00/201)

SUBTASK 79-35-01-480-001

(5) Prepare test equipment, with source of pure dry air, G60037 or dry nitrogen, G60193, pressure regulator (0 to 100 PSI), STD-1375, and pressure gauge, STD-1201.

E. Do a Functional Check of the Oil filter Differential Pressure Switch

SUBTASK 79-35-01-480-002

(1) Disconnect tube from port marked "HI" on switch. (Figure 501)

(2) Connect regulated source of clean dry compressed air or nitrogen including line gage, to "HI" port of switch.

SUBTASK 79-35-01-865-002

(3) Make sure the applicable circuit breaker is closed:

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
S	23	B1-137	LEFT OIL STRAINER CLOGGING CAUTION
WJE 401-404, 406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887			
S	34	B1-969	LEFT SYSTEMS DISPLAY PANEL

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
T	23	B1-138	RIGHT OIL STRAINER CLOGGING CAUTION
WJE 401-404, 406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887			
T	34	B1-970	RIGHT SYSTEMS DISPLAY PANEL

WJE 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893

SUBTASK 79-35-01-720-001

(4) Slowly increase pressure and observe that oil strainer clogging light on engine caution annunciator panel comes on at 35 ±2 psig (241.32 ±13.79 kPa), increasing pressure.

(5) Slowly decrease pressure and observe that light goes out by 30 psig (206.84 kPa).

WJE 401-406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887

SUBTASK 79-35-01-720-002

(6) Slowly increase pressure and observe that oil strainer clogging digital display on engine caution annunciator panel comes on at 35 ±2 psig (241.32 ±13.79 kPa), increasing pressure.

(7) Slowly decrease pressure and observe that digital display goes out by 30 psig (206.84 kPa).

WJE ALL

SUBTASK 79-35-01-080-001

(8) Shut off air pressure and disconnect air pressure source.

(9) Connect tube to "HI" port of switch.

F. Job Close-up

SUBTASK 79-35-01-410-001

(1) Close the applicable engine upper cowl door.

SUBTASK 79-35-01-865-003

(2) Remove the safety tags and close these circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

SUBTASK 79-35-01-440-001

WARNING: MAKE CERTAIN THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

WARNING: MAKE CERTAIN THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

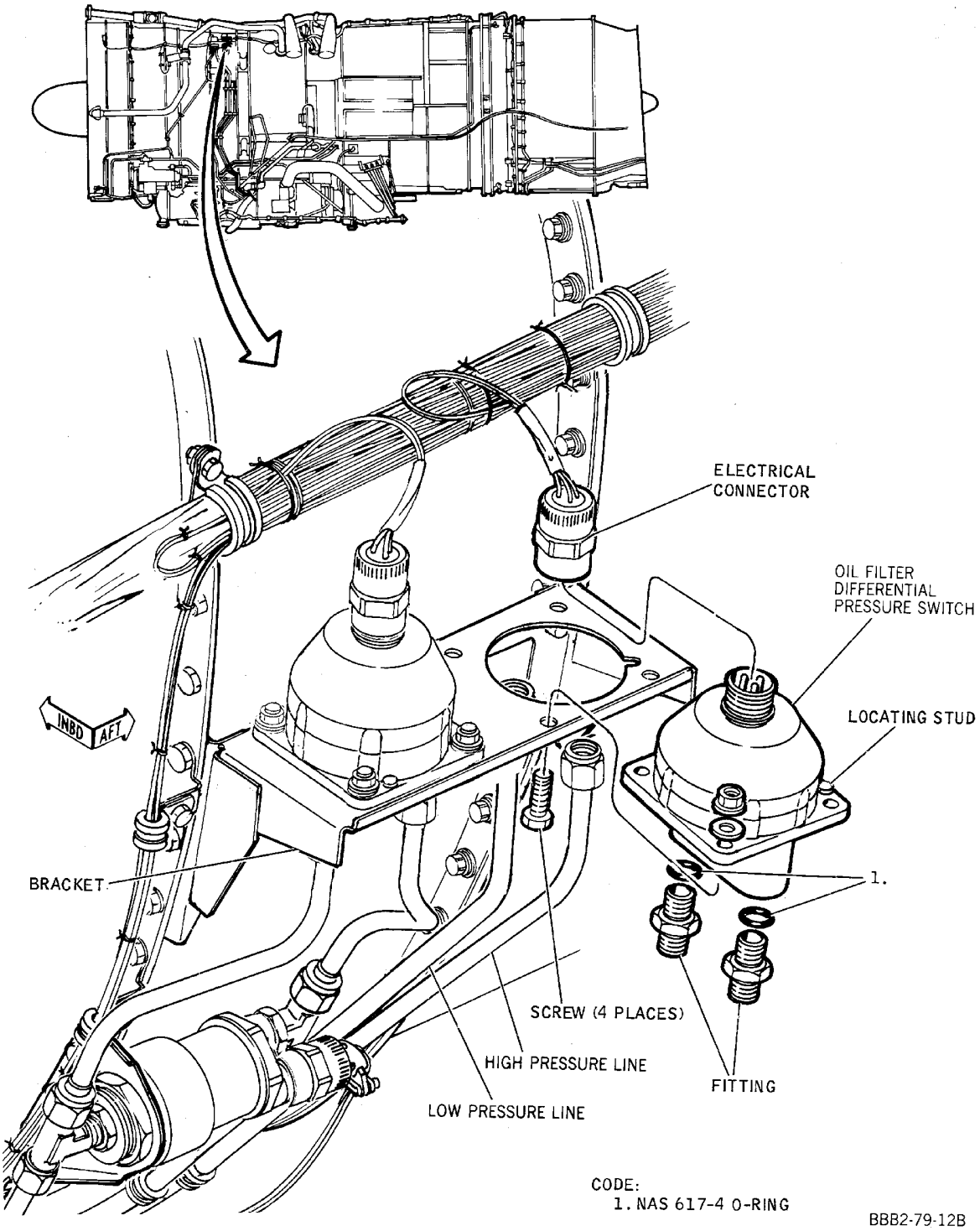
(3) Remove the lockpin from the control valve and place the arm in the open position. Stow lockpin. (PAGEBLOCK 78-00-00/201)

(4) Close thrust reverser hydraulic release handle access panels.

SUBTASK 79-35-01-942-001

(5) Remove all the tools and equipment from the work area. Make sure the area is clean.

——— END OF TASK ———



Oil Filter Differential Pressure Switch - Removal/Installation
Figure 501/79-35-01-990-802

OIL PRESSURE SENSE LINES - MAINTENANCE PRACTICES

1. General

A. This maintenance practice provides removal and installation procedures for the oil pressure sense lines. Also included are the check instructions for the restrictor bolts attaching the oil fittings to the engine accessory case and restrictor union.

B. The oil pressure sense lines are located on the forward left side of each engine. Access is gained through the upper and lower cowl doors.

NOTE: Forward lower cowl door overlaps aft lower cowl door and must be opened prior to opening aft lower cowl door.

WARNING: TO PREVENT INJURY TO PERSONNEL, EXERCISE CARE TO AVOID STRAKES WHEN WORKING IN ENGINE AREA WITH COWL DOORS OPEN.

CAUTION: TO PREVENT STRUCTURAL DAMAGE, USE HOLD OPEN RODS ON EACH COWL DOOR.

CAUTION: MAKE CERTAIN RIGHT ENGINE UPPER COWL DOOR IS CLOSED BEFORE OPERATING APU, OR APU EXHAUST WILL IMPINGE DIRECTLY ON COWL DOOR CAUSING EXTENSIVE DAMAGE.

C. For procedures to open cowl doors on all engines. (GENERAL - MAINTENANCE PRACTICES, PAGEBLOCK 71-00-00/201)

2. Equipment and Materials

NOTE: Equivalent substitutes may be used instead of the following listed items:

NOTE: It is possible that some materials in the Equipment and Materials List cannot be used for some or all of their necessary applications. Before you use the materials, make sure the types, quantities, and applications of the materials necessary are legally permitted in your location. All persons must obey all applicable federal, state, local, and provincial laws and regulations when it is necessary to work with these materials.

Table 201

Name and Number	Manufacturer
Lockwire, NASM20995N32, DPM 684	Not Specified
Petrolatum VV-P-236 DPM 675	
Torque wrench 0-200 inch-pounds (0-22.6 N·m) capacity	
Ultrachem Assy. Hold #1 (PWA 36500 Assembly Fluid)	Ultrachem Inc. Wilmington, DE 19899
Royco HF825 (PWA 36500 Assembly Fluid)	Royal Lubricants Co. Inc. East Hanover, NJ 07936

3. Removal/Installation Oil Pressure Sense Lines

A. Remove Sense Line (Oil Pressure Transmitter to Port LP2 or Accessory Case Port LV3) (Figure 201)

WARNING: MAKE CERTAIN THAT CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Tag throttle/thrust reverser lever, and open and tag following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
WJE 401-404, 407-409, 411, 412, 414, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 886, 887, 891-893			
U	34	B1-140	OIL PRESSURE LOW CAUTION RIGHT
WJE 401-404, 406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887			
U	35	B1-967	ANN PANEL
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
U	35	B1-139	OIL PRESSURE LOW CAUTION LEFT
WJE ALL			
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 401-404, 412, 414, 875, 876, 878, 879, 881, 883			
U	42	B1-872	ENG START VALVE LEFT & RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
S	23	B1-137	LEFT OIL STRAINER CLOGGING CAUTION

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	23	B1-138	RIGHT OIL STRAINER CLOGGING CAUTION

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6555 TO 7245 KPA) (PRECHARGE PRESSURE).

(2) Place thrust reverser control valve in dump position and install safety pin.

(3) Disconnect and remove oil sense line between oil pressure transmitter and port LP2 or accessory case port LV3.

B. Install Sense Line (Oil Pressure Transmitter to Port LP2 or Accessory Case Port LV3)

WARNING: MAKE CERTAIN THAT CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Make certain that throttle/thrust reverser lever is tagged and following circuit breakers are opened and tagged:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
WJE 401-404, 407-409, 411, 412, 414, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 886, 887, 891-893			
U	34	B1-140	OIL PRESSURE LOW CAUTION RIGHT
WJE 401-404, 406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887			
U	35	B1-967	ANN PANEL
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
U	35	B1-139	OIL PRESSURE LOW CAUTION LEFT
WJE ALL			
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 401-404, 412, 414, 875, 876, 878, 879, 881, 883			
U	42	B1-872	ENG START VALVE LEFT & RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893 (Continued)

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
S	23	B1-137	LEFT OIL STRAINER CLOGGING CAUTION

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	23	B1-138	RIGHT OIL STRAINER CLOGGING CAUTION

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Make certain thrust reverser control valve is in dump position and safety pin is installed.

(3) Install oil sense line between oil pressure transmitter and port LP2 or accessory case port LV3 as follows:

CAUTION: TO PREVENT FATIGUE CRACKS AROUND TUBE FLARES, MAKE CERTAIN "B" NUTS, SUPPORTING CLAMPS, TEE FITTING JAMNUTS, AND TRANSMITTER RETAINING NUT ARE LOOSE PRIOR TO INSTALLING PRESSURE LINE.

(a) Loosen vent line "B" nuts.

(b) Loosen vent line support clamps.

(c) Loosen pressure and vent line tee fitting jamnuts.

(d) Loosen pressure transmitter retaining nut until transmitter is loose in its mounting bracket.

(e) Connect pressure line on fitting loose, making certain tube flares are properly seated on fitting before finger tightening "B" nuts.

(f) Tighten transmitter retaining nut.

(g) Tighten pressure and vent line "B" nuts.

(h) Tighten pressure and vent line tee fitting jamnuts.

(i) Install and tighten line supporting clamps.

NOTE: Minimum clearance between any two adjacent tubes or between one single tube and any other adjacent engine part shall be 0.125 inch (3.175 mm) unless otherwise specified. Exceptions to this required clearance are permitted at specific locations where adjacent tubes are clipped together or where other local constraints will prevent tube contact at clearances below 0.125 inch (3.175 mm) minimum. Minimum clearance refers only to clearance relative to tube and not to fittings or other attached hardware.

(4) Dry motor engine and check for leaks. (GENERAL - ADJUSTMENT/TEST, PAGEBLOCK 71-00-00/501 Config 1 or GENERAL - ADJUSTMENT/TEST, PAGEBLOCK 71-00-00/501 Config 8 or GENERAL - ADJUSTMENT/TEST, PAGEBLOCK 71-00-00/501 Config 7 or GENERAL - ADJUSTMENT/TEST, PAGEBLOCK 71-00-00/501 Config 5)

(5) Check oil level after coastdown, and service oil tank if required. (ENGINE OIL SYSTEM - SERVICING, PAGEBLOCK 12-12-04/301)

(6) Remove tools, equipment, loose hardware, spilled fluid, and debris from maintenance area.

(7) Remove the safety tags and close these circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
WJE 401-404, 407-409, 411, 412, 414, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 886, 887, 891-893			
U	34	B1-140	OIL PRESSURE LOW CAUTION RIGHT
WJE 401-404, 406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887			
U	35	B1-967	ANN PANEL
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
U	35	B1-139	OIL PRESSURE LOW CAUTION LEFT
WJE ALL			
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 401-404, 412, 414, 875, 876, 878, 879, 881, 883			
U	42	B1-872	ENG START VALVE LEFT & RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
S	23	B1-137	LEFT OIL STRAINER CLOGGING CAUTION

WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893 (Continued)

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	23	B1-138	RIGHT OIL STRAINER CLOGGING CAUTION

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

(8) Remove safety pin from thrust reverser control valve. Stow safety pin.

C. Remove Sense Line (Oil Filter Differential Pressure Switch to Accessory Case Port LP5 or LP6)

WARNING: MAKE CERTAIN THAT CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Tag throttle/thrust reverser lever, and open and tag following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
WJE 401-404, 407-409, 411, 412, 414, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 886, 887, 891-893			
U	34	B1-140	OIL PRESSURE LOW CAUTION RIGHT
WJE 401-404, 406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887			
U	35	B1-967	ANN PANEL
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
U	35	B1-139	OIL PRESSURE LOW CAUTION LEFT
WJE ALL			
U	40	B1-40	ENGINE START PUMP

(Continued)

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 401-404, 412, 414, 875, 876, 878, 879, 881, 883			
U	42	B1-872	ENG START VALVE LEFT & RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
S	23	B1-137	LEFT OIL STRAINER CLOGGING CAUTION

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	23	B1-138	RIGHT OIL STRAINER CLOGGING CAUTION

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Place thrust reverser control valve in dump position and install safety pin.

WJE 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893

(3) Disconnect and remove oil sense line between oil filter differential pressure switch to accessory case port LP5 or LP6.

WJE 401-406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887

(4) Disconnect and remove oil sense line between oil pressure transmitter and accessory case port LV3.

WJE ALL

D. Install Sense Line (Oil Filter Differential Pressure Switch to Accessory Case Port LP5 or LP6)

WARNING: MAKE CERTAIN THAT CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Make certain that throttle/thrust reverser lever is tagged and following circuit breakers are opened and tagged:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
WJE 401-404, 407-409, 411, 412, 414, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 886, 887, 891-893			
U	34	B1-140	OIL PRESSURE LOW CAUTION RIGHT
WJE 401-404, 406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887			
U	35	B1-967	ANN PANEL
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
U	35	B1-139	OIL PRESSURE LOW CAUTION LEFT
WJE ALL			
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 401-404, 412, 414, 875, 876, 878, 879, 881, 883			
U	42	B1-872	ENG START VALVE LEFT & RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
S	23	B1-137	LEFT OIL STRAINER CLOGGING CAUTION

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	23	B1-138	RIGHT OIL STRAINER CLOGGING CAUTION

WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893 (Continued)

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Make certain that thrust reverser control valve is in dump position and safety pin is installed.

WJE 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893

(3) Install oil sense line between oil filter differential pressure switch to accessory case port LP5 or LP6.

NOTE: Minimum clearance between any two adjacent tubes or between one single tube and any other adjacent engine part shall be 0.125 inch (3.175 mm) unless otherwise specified. Exceptions to this required clearance are permitted at specific locations where adjacent tubes are clipped together or where other local constraints will prevent tube contact at clearances below 0.125 inch (3.175 mm) minimum. Minimum clearance refers only to clearance relative to tube and not to fittings or other attached hardware.

WJE 401-406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887

(4) Install oil sense line between oil pressure transmitter and accessory case port LV3.

NOTE: Minimum clearance between any two adjacent tubes or between one single tube and any other adjacent engine part shall be 0.125 inch (3.175 mm) unless otherwise specified. Exceptions to this required clearance are permitted at specific locations where adjacent tubes are clipped together or where other local constraints will prevent tube contact at clearances below 0.125 inch (3.175 mm) minimum. Minimum clearance refers only to clearance relative to tube and not to fittings or other attached hardware.

WJE ALL

(5) Dry motor engine and check for leaks.(GENERAL - ADJUSTMENT/TEST, PAGEBLOCK 71-00-00/501 Config 1 or GENERAL - ADJUSTMENT/TEST, PAGEBLOCK 71-00-00/501 Config 8 or GENERAL - ADJUSTMENT/TEST, PAGEBLOCK 71-00-00/501 Config 7 or GENERAL - ADJUSTMENT/TEST, PAGEBLOCK 71-00-00/501 Config 5)

(6) Check oil level after coastdown, and service oil tank if required.(ENGINE OIL SYSTEM - SERVICING, PAGEBLOCK 12-12-04/301)

(7) Remove tools, equipment, loose hardware, spilled fluid, and debris from maintenance area.

(8) Remove the safety tags and close these circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
WJE 401-404, 407-409, 411, 412, 414, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 886, 887, 891-893			
U	34	B1-140	OIL PRESSURE LOW CAUTION RIGHT
WJE 401-404, 406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887			
U	35	B1-967	ANN PANEL
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
U	35	B1-139	OIL PRESSURE LOW CAUTION LEFT
WJE ALL			
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 401-404, 412, 414, 875, 876, 878, 879, 881, 883			
U	42	B1-872	ENG START VALVE LEFT & RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
S	23	B1-137	LEFT OIL STRAINER CLOGGING CAUTION

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	23	B1-138	RIGHT OIL STRAINER CLOGGING CAUTION

UPPER EPC, ENGINE - LEFT AC BUS

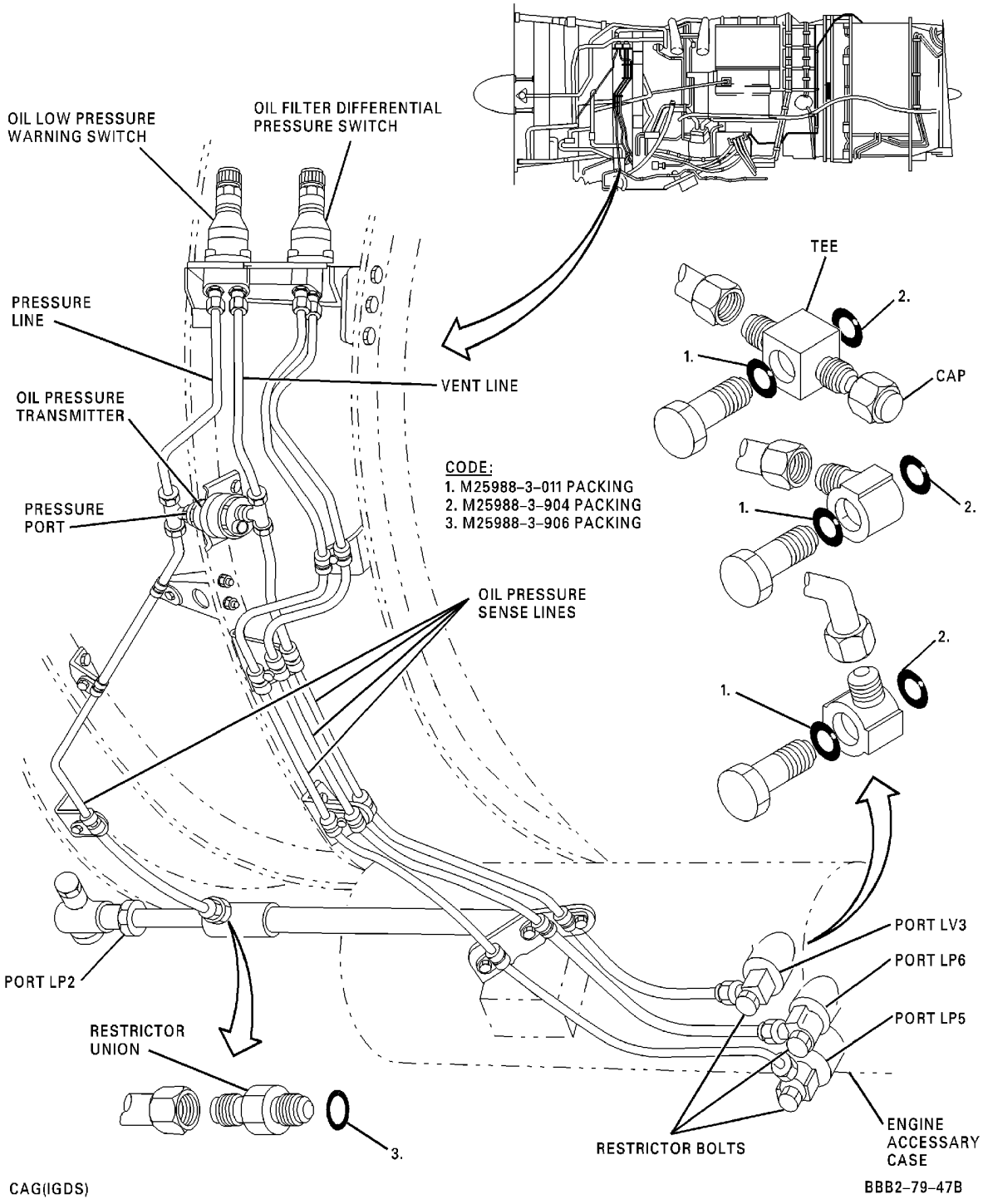
Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

(9) Remove safety pin from thrust reverser control valve. Stow safety pin.



Oil Pressure Sense Lines -- Removal/Installation
Figure 201/79-36-01-990-801

4. **Check Restrictor Bolts and Restrictor Union**

A. Check Restrictor Bolts

WARNING: MAKE CERTAIN THAT CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Tag throttle/thrust reverser lever, and open and tag following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
WJE 401-404, 407-409, 411, 412, 414, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 886, 887, 891-893			
U	34	B1-140	OIL PRESSURE LOW CAUTION RIGHT
WJE 401-404, 406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887			
U	35	B1-967	ANN PANEL
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
U	35	B1-139	OIL PRESSURE LOW CAUTION LEFT
WJE ALL			
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 401-404, 412, 414, 875, 876, 878, 879, 881, 883			
U	42	B1-872	ENG START VALVE LEFT & RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
S	23	B1-137	LEFT OIL STRAINER CLOGGING CAUTION

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	23	B1-138	RIGHT OIL STRAINER CLOGGING CAUTION

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Place thrust reverser control valve in dump position and install safety pin.

(3) Remove restrictor bolt from port of accessory case (port LV3, LP5, or LP6).

(4) Examine bolt to make certain that holes are clear of debris or obstructions, and there is no sign of damage.

NOTE: There should be a large hole in center of bolt, connected to a small hole in one side of shank. Any damage to hole due to cleaning or otherwise is cause for rejection.

(5) Discard packings from oil fitting.

WARNING: WHITE PETROLATUM IS AN AGENT THAT IS AN IRRITANT. MAKE SURE ALL PERSONS OBEY ALL OF THE PRECAUTIONS WHEN WHITE PETROLATUM IS USED.

- DO NOT USE IN AREAS WHERE THERE IS HIGH HEAT, SPARKS, OR FLAMES.
- USE IN AN AREA OPEN TO THE AIR.
- CLOSE THE CONTAINER WHEN NOT USED.
- DO NOT BREATHE THE MIST.

WARNING: REFER TO THE APPLICABLE MANUFACTURER'S OR SUPPLIER'S MSDS FOR:

- MORE PRECAUTIONARY DATA
- APPROVED SAFETY EQUIPMENT
- EMERGENCY MEDICAL AID.

TALK WITH THE LOCAL SAFETY DEPARTMENT OR AUTHORITIES FOR THE PROCEDURES TO DISCARD THIS HAZARDOUS AGENT.

(6) Lightly coat new packings with PWA 36500 assembly fluid (or petrolatum) and install packings in oil fitting.

(7) Install bolt. Torque 40 to 65 inch-pounds (4.48 to 7.28 N·m). Safety bolt with lockwire.

(8) Dry motor engine and check for leaks.(GENERAL - ADJUSTMENT/TEST, PAGEBLOCK 71-00-00/501 Config 1 or GENERAL - ADJUSTMENT/TEST, PAGEBLOCK 71-00-00/501 Config 8 or GENERAL - ADJUSTMENT/TEST, PAGEBLOCK 71-00-00/501 Config 7 or GENERAL - ADJUSTMENT/TEST, PAGEBLOCK 71-00-00/501 Config 5)

(9) Check oil level after coastdown, and service oil tank if required. (ENGINE OIL SYSTEM - SERVICING, PAGEBLOCK 12-12-04/301).

(10) Remove tools, equipment, loose hardware, spilled fluid, and debris from maintenance area.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(11) Remove the safety tags and close these circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
WJE 401-404, 407-409, 411, 412, 414, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 886, 887, 891-893			
U	34	B1-140	OIL PRESSURE LOW CAUTION RIGHT
WJE 401-404, 406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887			
U	35	B1-967	ANN PANEL
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
U	35	B1-139	OIL PRESSURE LOW CAUTION LEFT
WJE ALL			
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 401-404, 412, 414, 875, 876, 878, 879, 881, 883			
U	42	B1-872	ENG START VALVE LEFT & RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
S	23	B1-137	LEFT OIL STRAINER CLOGGING CAUTION

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	23	B1-138	RIGHT OIL STRAINER CLOGGING CAUTION

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

(12) Remove safety pin from thrust reverser control valve. Stow safety pin.

(13) Visually check engine connections for leaks.

B. Check Restrictor Union

WARNING: MAKE CERTAIN THAT CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Tag throttle/thrust reverser lever, and open and tag following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
WJE 401-404, 407-409, 411, 412, 414, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 886, 887, 891-893			
U	34	B1-140	OIL PRESSURE LOW CAUTION RIGHT
WJE 401-404, 406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887			
U	35	B1-967	ANN PANEL
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
U	35	B1-139	OIL PRESSURE LOW CAUTION LEFT
WJE ALL			
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 401-404, 412, 414, 875, 876, 878, 879, 881, 883			
U	42	B1-872	ENG START VALVE LEFT & RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893 (Continued)

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
S	23	B1-137	LEFT OIL STRAINER CLOGGING CAUTION

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	23	B1-138	RIGHT OIL STRAINER CLOGGING CAUTION

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Place thrust reverser control valve in dump position and install safety pin.

(3) Remove sense line from union in port LP2.

(4) Remove restrictor union from port LP2.

(5) Examine union to make certain that hole is clear of debris or obstructions, and there is no sign of damage.

NOTE: Any damage to hole due to cleaning or otherwise is cause for rejection.

(6) Discard packing from union.

WARNING: WHITE PETROLATUM IS AN AGENT THAT IS AN IRRITANT. MAKE SURE ALL PERSONS OBEY ALL OF THE PRECAUTIONS WHEN WHITE PETROLATUM IS USED.

- DO NOT USE IN AREAS WHERE THERE IS HIGH HEAT, SPARKS, OR FLAMES.
- USE IN AN AREA OPEN TO THE AIR.
- CLOSE THE CONTAINER WHEN NOT USED.
- DO NOT BREATHE THE MIST.

WARNING: REFER TO THE APPLICABLE MANUFACTURER'S OR SUPPLIER'S MSDS FOR:

- MORE PRECAUTIONARY DATA
- APPROVED SAFETY EQUIPMENT
- EMERGENCY MEDICAL AID.

(WARNING PRECEDES)

TALK WITH THE LOCAL SAFETY DEPARTMENT OR AUTHORITIES FOR THE PROCEDURES TO DISCARD THIS HAZARDOUS AGENT.

(7) Lightly coat new packing with PWA 36500 assembly fluid (or petrolatum) and install packing on union.

(8) Install union.

(9) Install sense line on union.

(10) Dry motor engine and check for leaks. (GENERAL - ADJUSTMENT/TEST, PAGEBLOCK 71-00-00/501 Config 1 or GENERAL - ADJUSTMENT/TEST, PAGEBLOCK 71-00-00/501 Config 8 or GENERAL - ADJUSTMENT/TEST, PAGEBLOCK 71-00-00/501 Config 7 or GENERAL - ADJUSTMENT/TEST, PAGEBLOCK 71-00-00/501 Config 5)

(11) Check oil level after coastdown, and service oil tank if required (ENGINE OIL SYSTEM - SERVICING, PAGEBLOCK 12-12-04/301).

(12) Remove tools, equipment, loose hardware, spilled fluid, and debris from maintenance area.

(13) Remove the safety tags and close these circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
WJE 401-404, 407-409, 411, 412, 414, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 886, 887, 891-893			
U	34	B1-140	OIL PRESSURE LOW CAUTION RIGHT
WJE 401-404, 406, 410, 412, 414, 415, 417-419, 421, 423, 863-866, 869, 871, 872, 875-879, 886, 887			
U	35	B1-967	ANN PANEL
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
U	35	B1-139	OIL PRESSURE LOW CAUTION LEFT
WJE ALL			
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 401-404, 412, 414, 875, 876, 878, 879, 881, 883			
U	42	B1-872	ENG START VALVE LEFT & RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
S	23	B1-137	LEFT OIL STRAINER CLOGGING CAUTION

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	23	B1-138	RIGHT OIL STRAINER CLOGGING CAUTION

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

(14) Remove safety pin from thrust reverser control valve. Stow safety pin.