

CHAPTER 79 — ENGINE OIL SYSTEM

CONTENTS — MAINTENANCE PROCEDURES

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ENGINE OIL SYSTEM

79-1. ENGINE OIL SYSTEM.

The engine oil system is a dry sump type with an externally mounted oil supply tank and oil cooler located on top aft section of fuselage. Oil is supplied by tank to gear type pressure and scavenge pump mounted within the engine accessory gearbox. Return oil is routed from engine oil outlet port to oil cooler and from cooler to the tank. (Refer to figure 79-1 for engine oil supply system schematic.) Refer to applicable Allison Operation and Maintenance Manual for description and maintenance of the engine lubrication system.

79-2. TROUBLESHOOTING.

For engine oil system troubleshooting procedures, refer to Allison 250-C18 or 250-C20 Series Operation and Maintenance Manual No. 5W2 or No. 10W2.

79-3. ENGINE OIL PUMP PRIMING.



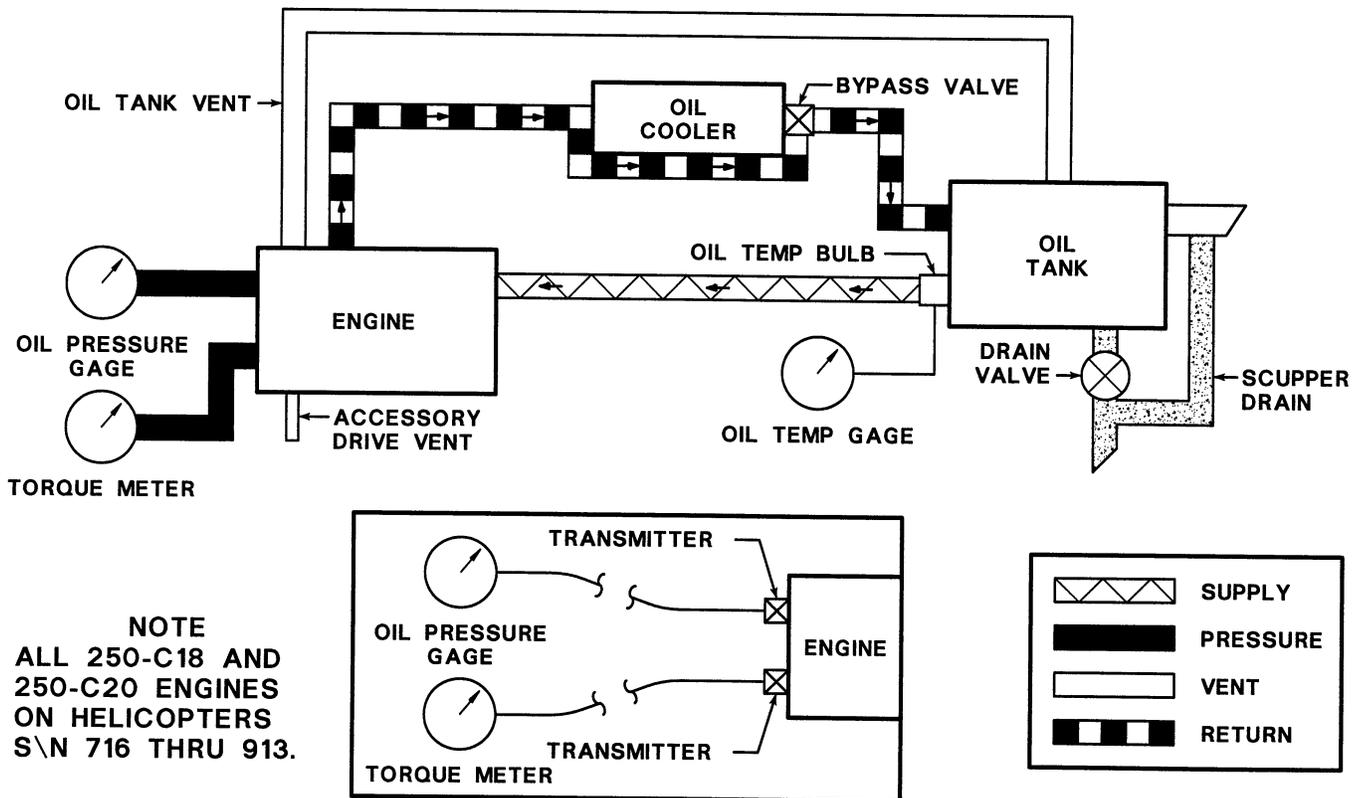
AFTER ENGINE CHANGE, AND/OR DISCONNECTING ENGINE OIL INLET

TUBE, OIL PUMP PRIMING SHALL BE ACCOMPLISHED PRIOR TO ENGINE START. ADEQUATE OIL SUPPLY IS REQUIRED TO PREVENT DAMAGE TO ENGINE DURING OPERATION.

THE ENGINE OIL PUMP WILL NORMALLY SELF-PRIME, HOWEVER, THERE HAVE BEEN A FEW INSTANCES WHERE THE PUMP HAS CONTINUED TO RUN IN A DRY OR UNPRIMED CONDITION FOLLOWING INITIAL ENGINE START.

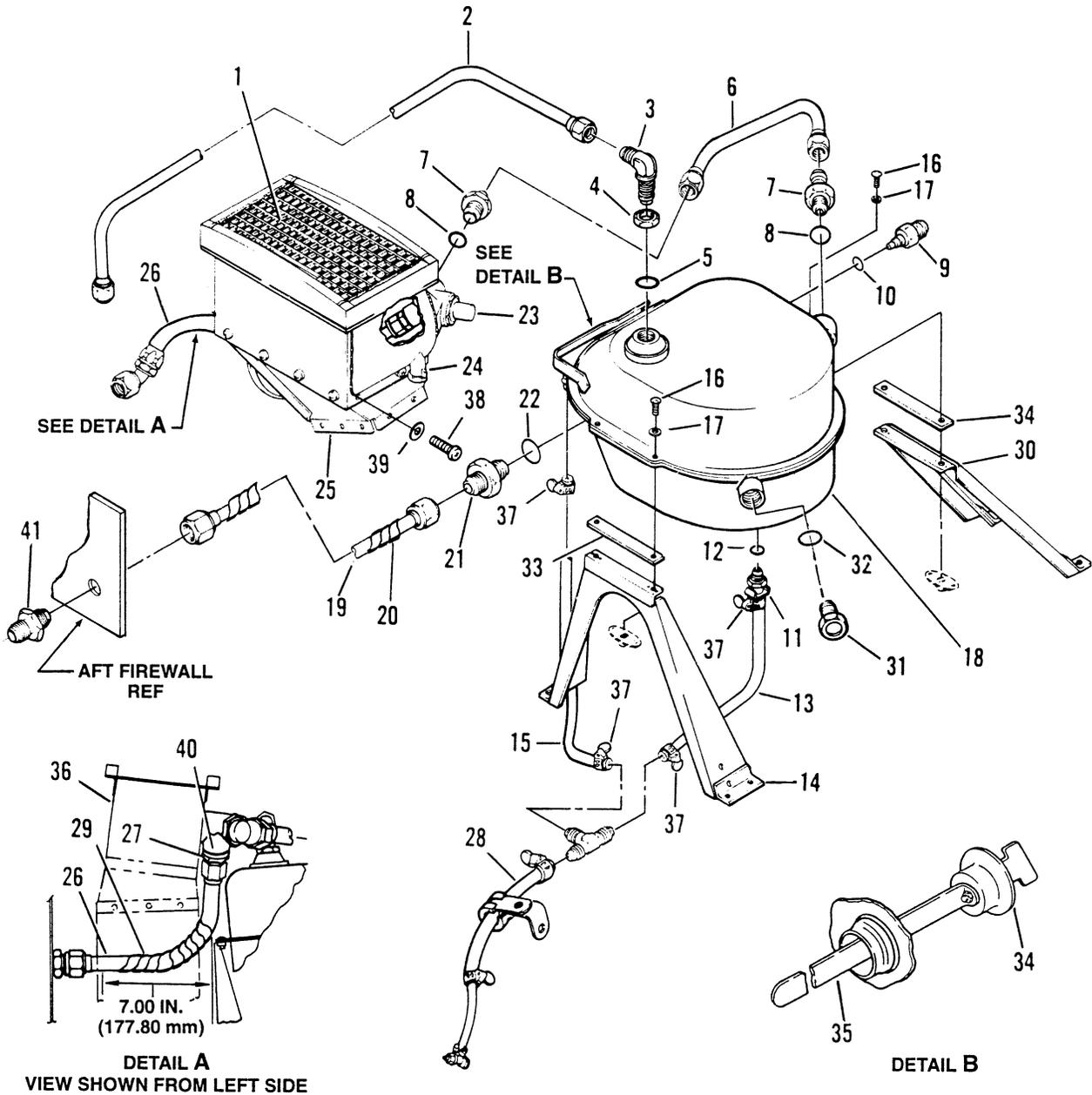
Perform the following steps to prime the engine-driven oil pump.

1. Disconnect oil supply tube (19, figure 79-2) from union (42) on aft firewall.
2. Fill engine oil supply tube (19) with approved oil (Chapter 12).
3. Connect oil supply tube (19) to fittings on aft firewall and tighten nut.
4. Fill engine oil filter cavity with approved oil (Chapter 12). Refer to Allison Operations and Maintenance Manuals.



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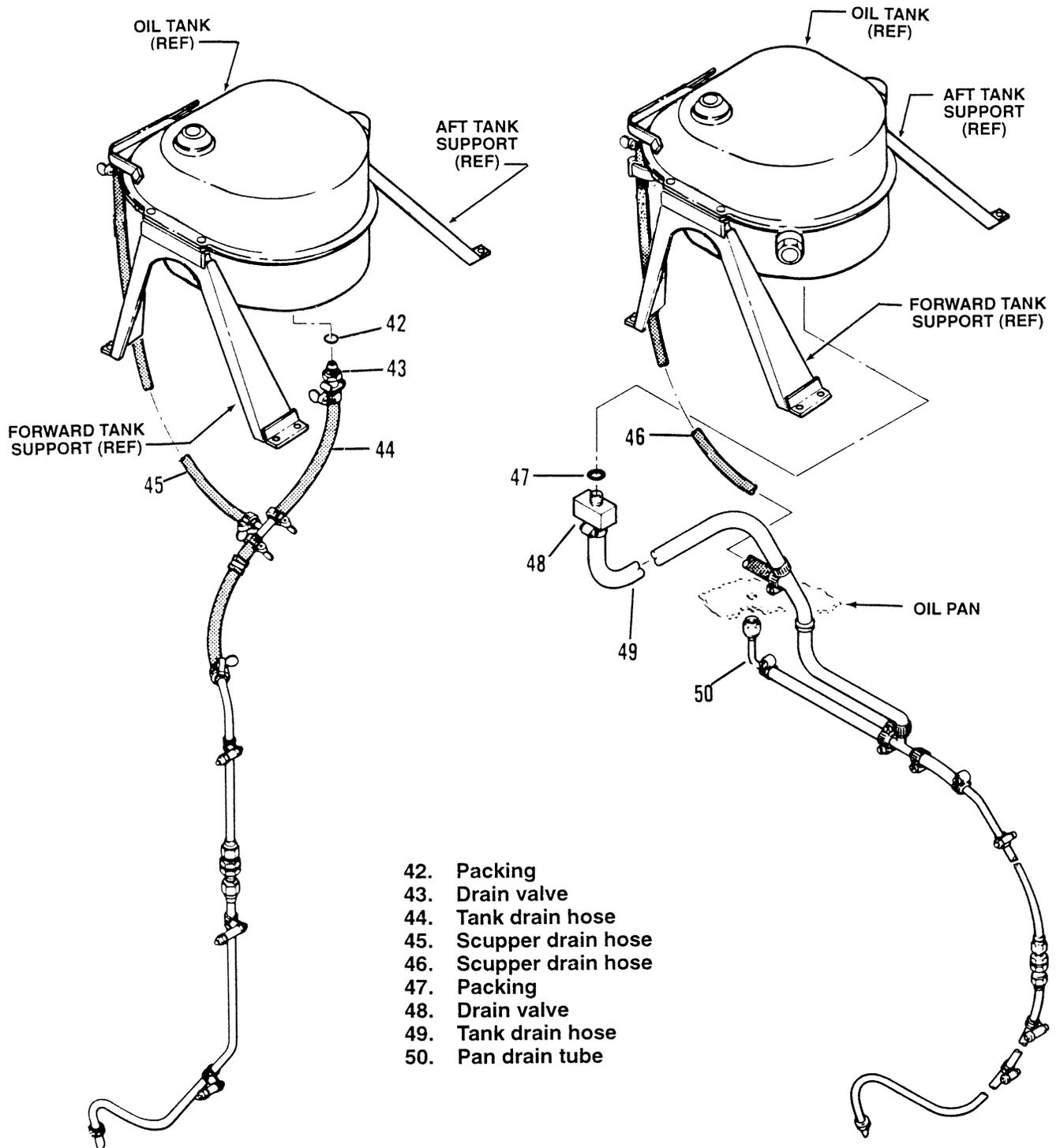
Figure 79-1. Engine oil supply system schematic



- | | | |
|--------------------------|------------------------|----------------------|
| 1. Oil cooler | 15. Scupper drain hose | 29. Chafing sleeve |
| 2. Vent tube | 16. Bolt | 30. Aft tank support |
| 3. Elbow | 17. Washer | 31. Plug |
| 4. Nut | 18. Oil tank | 32. Packing |
| 5. Packing | 19. Oil supply tube | 33. Rubber pads |
| 6. Scavenge tube | 20. Chafing sleeve | 34. Cap adapter |
| 7. Reducer | 21. Reducer | 35. Dipstick |
| 8. Packing | 22. Packing | 36. Blower |
| 9. Temperature bulb | 23. Bypass valve | 37. Clamp |
| 10. Packing | 24. Drain plug | 38. Bolt |
| 11. Drain valve | 25. Duct | 39. Washer |
| 12. Packing | 26. Oil return tube | 40. Packing |
| 13. Tank drain hose | 27. Reducer | 41. Union |
| 14. Forward tank support | 28. Pan drain hose | |

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Figure 79-2. Engine oil supply system (Sheet 1 of 2)



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Figure 79-2. Engine oil supply system (Sheet 2)

ENGINE OIL TANK

79-4. ENGINE OIL TANK.

The engine oil tank has a normal capacity of 1.5 U.S. gallons (5.68 liters) and oil level is checked with a dipstick mounted on the filler cap. The tank provides port openings for engine supply, engine return, vent, oil temperature bulb, oil level sight gage, and a self-locking drain valve.

79-5. REMOVAL.

1. Remove aft fairing (Chapter 71).
2. Open drain valve (11, figure 79-2) by pushing upward on scupper drain hose (15, 45 or 46) and drain oil into a suitable container.
3. Disconnect electrical connector at temperature bulb (9). Remove bulb and packing (10) if necessary. Discard packing.
4. Disconnect the following tubes and hoses.

NOTE

To prevent oil system contamination, cap or plug openings.

- a. Remove vent tube (2), loosen nut (4), and remove elbow (3) and packing (5) from oil tank (18). Discard packing.
- b. Remove scavenge tube (6), reducer (7), and packing (8). Discard packing.
- c. Remove oil supply tube (19), reducer (21), and packing (22) from oil tank (18), and union (41) at aft firewall. Discard packing.
- d. Remove plug (31) and packing (32). Discard packing.
- e. Loosen clamps (37) on tank drain hose (13, 44 or 49). Remove tank drain hose.
- f. Loosen clamps (37) on scupper drain hose (15, 45 or 46). Remove scupper drain hose.
- g. Remove drain valve (11, 43 or 48) and packing (12, 42 or 47). Discard packing.

5. Remove bolts (16) and washers (17) from oil tank (18) and forward and aft tank supports (14 and 30).

6. Remove oil tank (18) and rubber pads (34).

79-6. INSPECTION AND REPAIR.

1. Inspect oil tank (18, figure 79-2) for the following:
 - a. Cracks or leaks in welds.
 - b. Damaged threads in ports or mating fittings.
 - c. Damage which affects capacity or function.
 - d. Loose, missing or improperly installed hardware.
 - e. Damage to mounting flanges.
2. Inspect forward and aft tank supports (14 and 30) for cracks, damaged nutplates, and security.
3. Inspect all attaching oil tubes and hoses for deterioration.
4. Inspect drain valve (11, 43 or 48) for proper operation, and tank drain hose (13, 44 or 49) for clogging.

79-7. INSTALLATION.

1. Install rubber pads (33, figure 79-2) on top of forward and aft tank supports (14 and 30).
2. Position oil tank (18) mounting flanges over forward and aft tank supports (14 and 30), align holes and install washers (17) and bolts (16).
3. Remove protective caps and plugs.



DO NOT OVERTORQUE FLUID CONNECTORS. AVOID CRACKS, STRIPPED THREADS, AND OTHER DAMAGE. REFER TO BHT-ALL-SPM MANUAL FOR STANDARD TORQUES.

NOTE

Lubricate all packings with approved engine oil (Chapter 12) prior to installation.

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- 4.** Install packing (12, 42 or 47), and drain valve (11, 43 or 48), in oil tank (18).
- 5.** Install tank and scupper drain hoses (13, 44 or 49 and 15, 45 or 46) and tighten clamps (38).
- 6.** Install packing (32) and plug (31) in oil tank (18).
- 7.** Install packing (8), and reducer (7), in oil tank (18). Install scavenge tube (6).
- 8.** Install packing (10) and temperature bulb (9) in oil tank (18). Connect electrical connector to temperature bulb.
- 9.** Install nut (4), packing (5), on elbow (3). Install elbow (3) in oil tank (18).

- 10.** Install vent tube (2) on elbow (3) and fitting on aft firewall.

NOTE

If oil tube (2, 6, or 19, figure 79-2) is preloading oil tank (18), adjust applicable attaching fitting on aft firewall or oil tank.

- 11.** Install packing (22) and reducer (21) in oil tank (18). Install oil supply tube (19) on reducer (21) and union (42) on aft firewall.
- 12.** Ensure lever on drain valve (11) is in closed position. Remove cap adapter assembly (35, detail B) and fill oil tank with lubricating oil in accordance with servicing instructions (Chapter 12).
- 13.** Install aft fairing (Chapter 71).

ENGINE OIL COOLER

79-8. ENGINE OIL COOLER.

Oil cooler is mounted on top of duct attached to oil cooler blower. When oil cooler bypass valve is open, return oil from engine flows through oil cooler and returns to oil tank.

79-9. REMOVAL.

1. Remove aft fairing (Chapter 71).
2. Open drain valve (11, figure 79-2), and drain oil from oil tank (18) and oil cooler (1) into a suitable container.

NOTE

To prevent contamination of engine oil cooler, cap or plug disconnected tubing, and openings.

3. Remove oil scavenge tube (ENG OUT) (6) from reducer (7) on oil cooler (1).
4. Remove reducer (7) packing (8) from oil cooler (1). Discard packing.
5. Remove oil return tube (ENG IN) (26) from reducer (27).
6. Remove reducer (27) and packing (41). Discard packing.
7. Remove bolts (39) and washers (40) attaching oil cooler (1) to duct (25). Remove oil cooler (1).
8. For removal and installation of oil cooler blower (Chapter 65).

79-10. INSPECTION.

1. Inspect oil cooler (1, figure 79-2) for cleanliness of air passages.
2. Inspect threaded ports and mounting flange for damage.
3. Inspect core for leakage and damage.

79-11. REPAIR.

Repair of damaged oil coolers is not recommended by the manufacturer. A method of cleaning or flushing a contaminated oil cooler to ensure complete removal of all contaminants has not been authorized or approved

by the engine manufacturer. Damaged or contaminated oil coolers should be replaced.

79-12. ENGINE OIL COOLER BYPASS VALVE FUNCTION TEST.

1. Check function of bypass valve by submerging bypass valve (23, figure 79-2) in water heated to 160 °F (71 °C) for 5 minutes. Remove bypass valve and measure length. Submerge bypass valve in water heated to 178 °F (81 °C) for 5 minutes. Remove bypass valve and measure length. The minimum increase in length allowed is 0.080 inch (2.03 mm).

NOTE

Start-to-Close temperatures are approximate.

BYPASS VALVE P/N	TEMP RANGE		MINIMUM TRAVEL (INCHES)
	Start-to- Close	Fully Closed	
8527855	160 °F (71 °C)	178 °F (81 °C)	0.080 (2.03 mm)

2. Travel should occur between the two temperatures shown.
3. If bypass valve under test does not function properly, replace with new bypass valve.

79-13. INSTALLATION.



IF INTERNAL ENGINE FAILURE OR METAL CONTAMINATION HAS OCCURRED, WHICH MIGHT CONTAMINATE THE OIL COOLER, REMOVE AND INSTALL SERVICEABLE OIL COOLER. FLUSH OIL SYSTEM TUBES, FITTINGS, AND OIL TANK.

1. If removed, install bypass valve (23) and lockwire.

NOTE

Lubricate all packings with approved engine oil prior to installation (Chapter 12).

2. Install packing (8) on reducer (7). Install in oil cooler (1).

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- 3.** Install packing (41) on reducer (27). Install in oil cooler (1).
- 4.** Position oil cooler (1) above duct (25) with bypass valve (23) located on right side, secure with washers (40) and bolts (39).
- 5.** Seal corners of duct (25) with sealing compound (C-308).
- 6.** Install scavenge tube (ENG OUT) (6) between reducer (7) and elbow.
- 7.** Install oil return tube (ENG IN) (26) on reducer (27).
- 8.** Service oil system (Chapter 12).
- 9.** Install aft fairing (Chapter 71).

79-14. ENGINE OIL INDICATING COMPONENTS.

An engine oil temperature bulb is mounted in the engine oil tank located aft of engine and is connected to an indicator on instrument panel.

79-15. TEMPERATURE BULB REPLACEMENT.

- 1.** Remove aft fairing (Chapter 71).
- 2.** Disconnect electrical connector from temperature bulb (9, figure 79-2).
- 3.** Remove temperature bulb (9) and packing (10). Discard packing.
- 4.** Lubricate with approved oil and install packing (10) on temperature bulb (9).
- 5.** Install temperature bulb (9) in oil tank (18).
- 6.** Connect electrical connector to temperature bulb (9).
- 7.** Install aft fairing (Chapter 71).