CHAPTER TEN

LIQUID COOLING SYSTEM

Certain 1978 and later Blizzard and Everest models are equipped with a liquid cooling system. The cooling system consists of a water pump, coolant tank, thermostat, and tunnel mounted radiators. Refer to **Figure 1** for a typical liquid cooling system.

The thermostat maintains uniform engine temperatures throughout the engine's operation range.

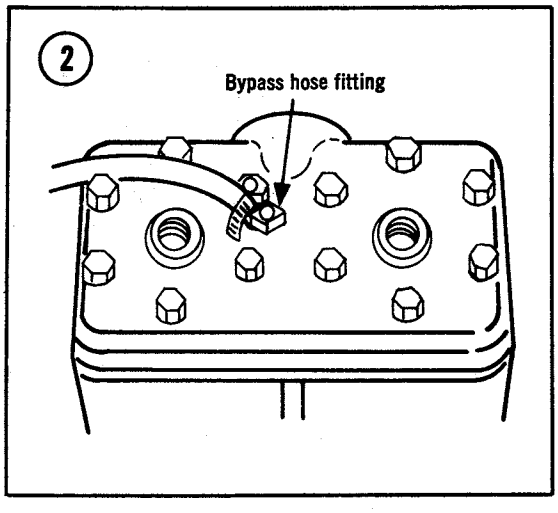
The pressure cap maintains the cooling system under pressure to achieve a higher potential coolant boiling point. Coolant is a 60/40 mixture of ethylene glycol anti-freeze and water. The coolant recovery tank holds any possible system overflow. Coolant captured in the recovery tank is siphoned back into the cooling system when engine cools. See **Table 1** for cooling system specifications.

COOLING SYSTEM PRESSURE TESTING

Special pressure testing tools and adapters are required for system pressure tests. For this reason, have an authorized dealer perform any necessary cooling system tests.

DRAINING AND FILLING COOLING SYSTEM

Drain and refill cooling system at least every two years.



1. Remove coolant tank pressure cap and disconnect bypass hose from cylinder head fitting (**Figure 2**).
2. Route bypass hose into a clean container if coolant is to be kept. Block off bypass fitting and keep bypass hose as low as possible to drain the system.
3. Cover filler neck with your hand and blow through tank vent tube to completely drain the system (**Figure 3**). Elevate rear of snowmobile to help drain radiators.
4. Rinse engine and engine compartment with clean water.
5. Position machine on a level surface.

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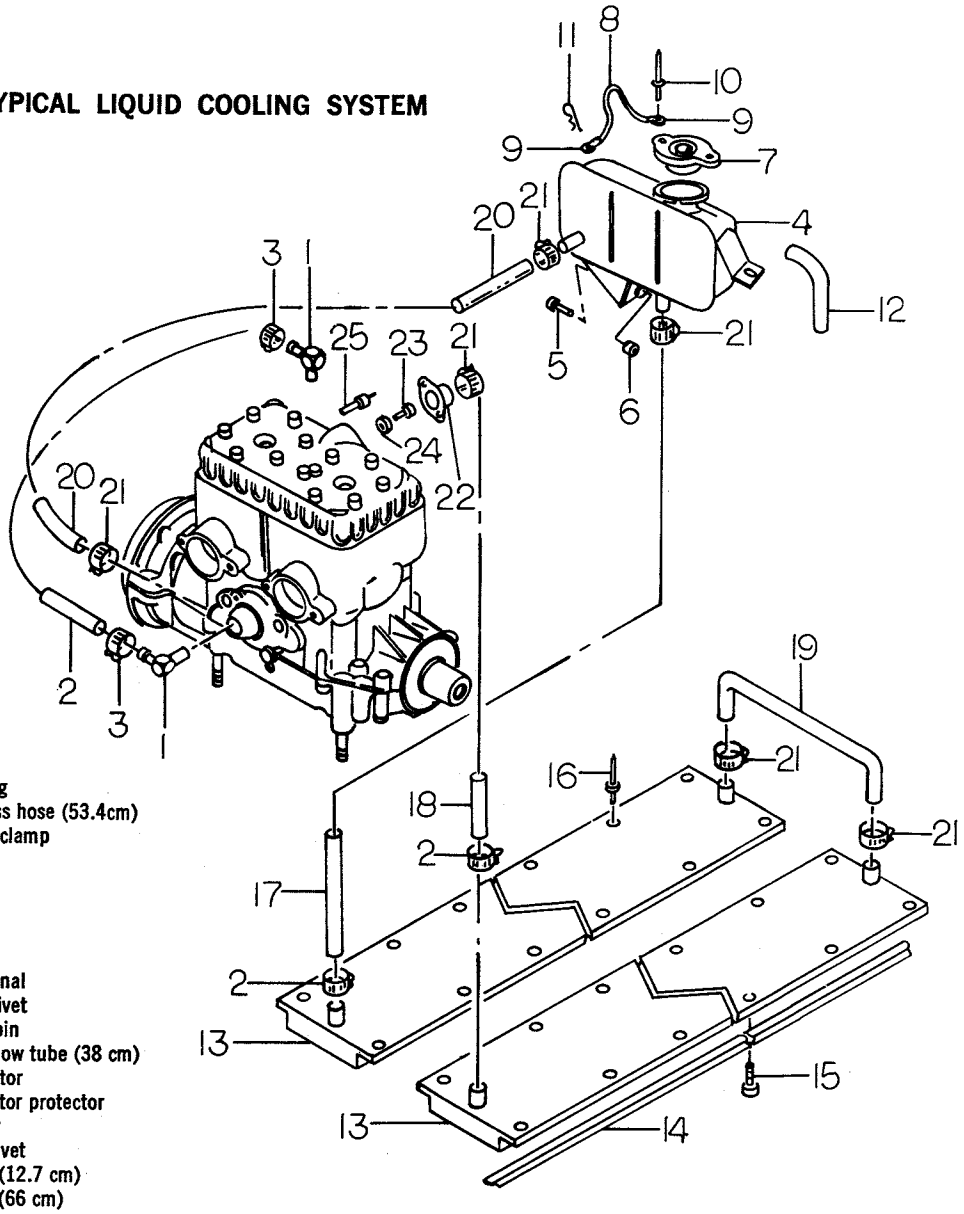
TYPICAL LIQUID COOLING SYSTEM



1. Fitting
2. Bypass hose (53.4cm)
3. Hose clamp
4. Tank
5. Bolt
6. Nut
7. Plug
8. Wire
9. Terminal
10. Pop rivet
11. Hair pin
12. Overflow tube (38 cm)
13. Radiator
14. Radiator protector
15. Screw
16. Pop rivet
17. Hose (12.7 cm)
18. Hose (66 cm)
19. U-hose
20. Hose (66 cm)
21. Hose clamp
22. Coolant outlet collar
23. Thermostat
24. Sealing ring
25. Temperature gauge sender

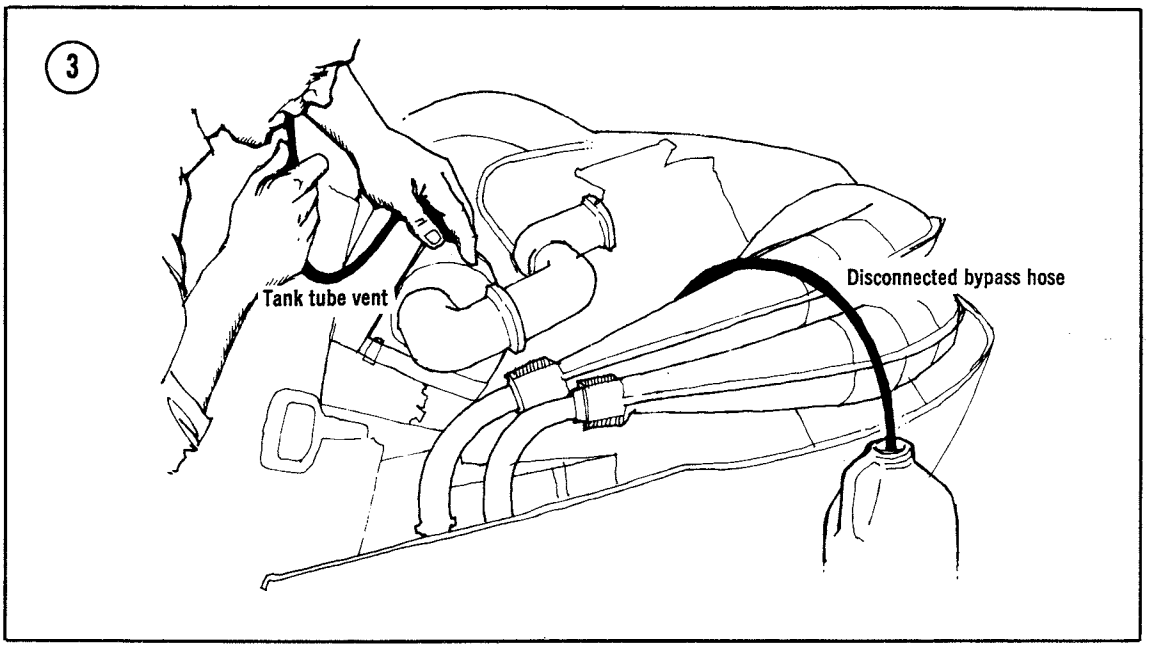


Table 1 COOLING SYSTEM SPECIFICATIONS

Engine	Liter	Coolant Capacity* U.S. Gal.	Imp. Gal.
354	2.5	0.6	0.5
444	5	1.2	1.0
Pressure cap		13 psi	
Coolant mixture ratio		60% anti-freeze, 40% water	
Thermostat opening temperature		110°F (43°C)	

*Coolant capacities are approximate. After cooling system is bled, fill until coolant level is 1 in. (25mm) below filler neck.

6. Keep bypass hose near fitting on cylinder head and fill coolant tank with proper mixture of anti-freeze and water.

7. Cover filler neck with your hand and blow through tank vent tube until coolant comes out the bypass hose and the fitting on the cylinder head (**Figure 4**). Keep coolant tank full while purging the system of air.

8. Connect bypass hose and fill coolant tank until level is 1 in. (25mm) below filler neck. Refer to **Table 1** for approximate coolant capacities.

9. Check all hose connections for leaks. Install filler cap.

10. Block up rear of machine to clear track off the ground.

11. Start engine and warm up to operating temperature. Check entire cooling system for leaks.

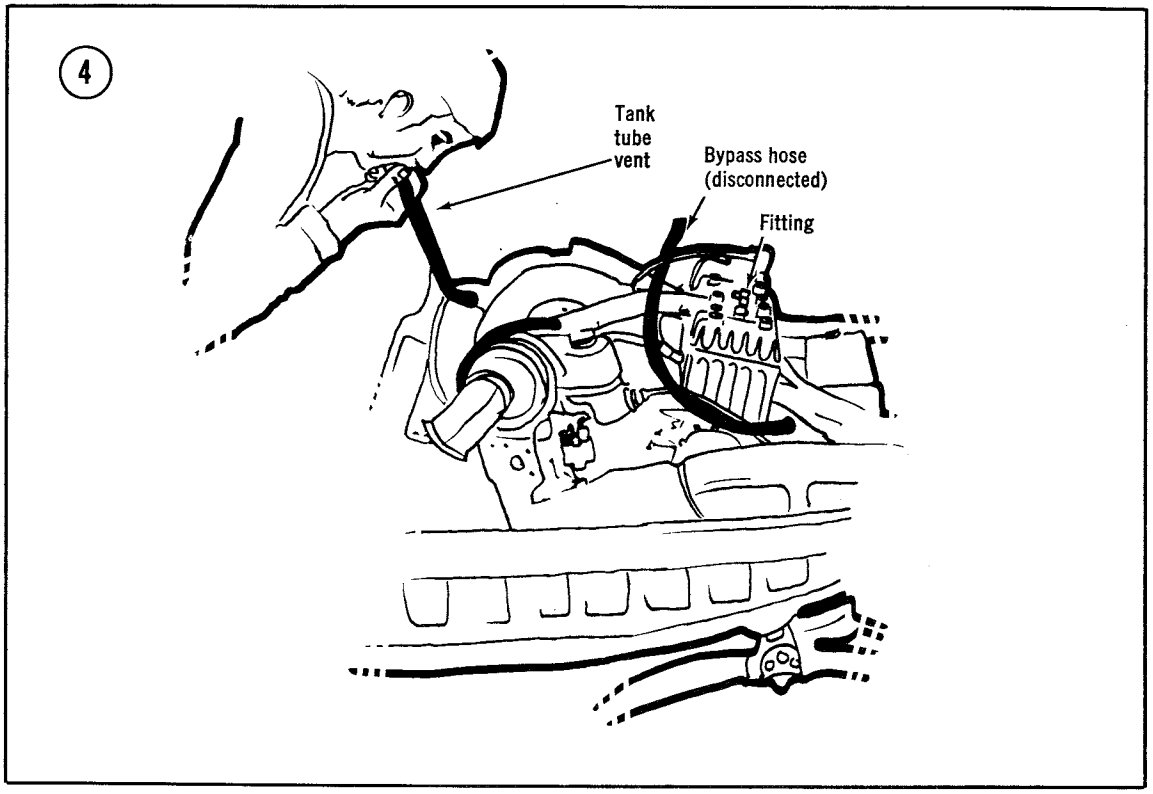
12. Shut off engine and let cool. Recheck coolant level.

THERMOSTAT REMOVAL/INSTALLATION

Refer to **Figure 1** for this procedure.

1. Drain cooling system.

2. Remove bolts securing thermostat housing and remove housing. Lift out thermostat. If engine has been running too cold or overheating, replace thermostat.



3. Installation is the reverse of these steps. Use a new gasket on thermostat housing. Fill cooling system as outlined under *Draining and Filling Cooling System.*

WATER PUMP REMOVAL/INSTALLATION

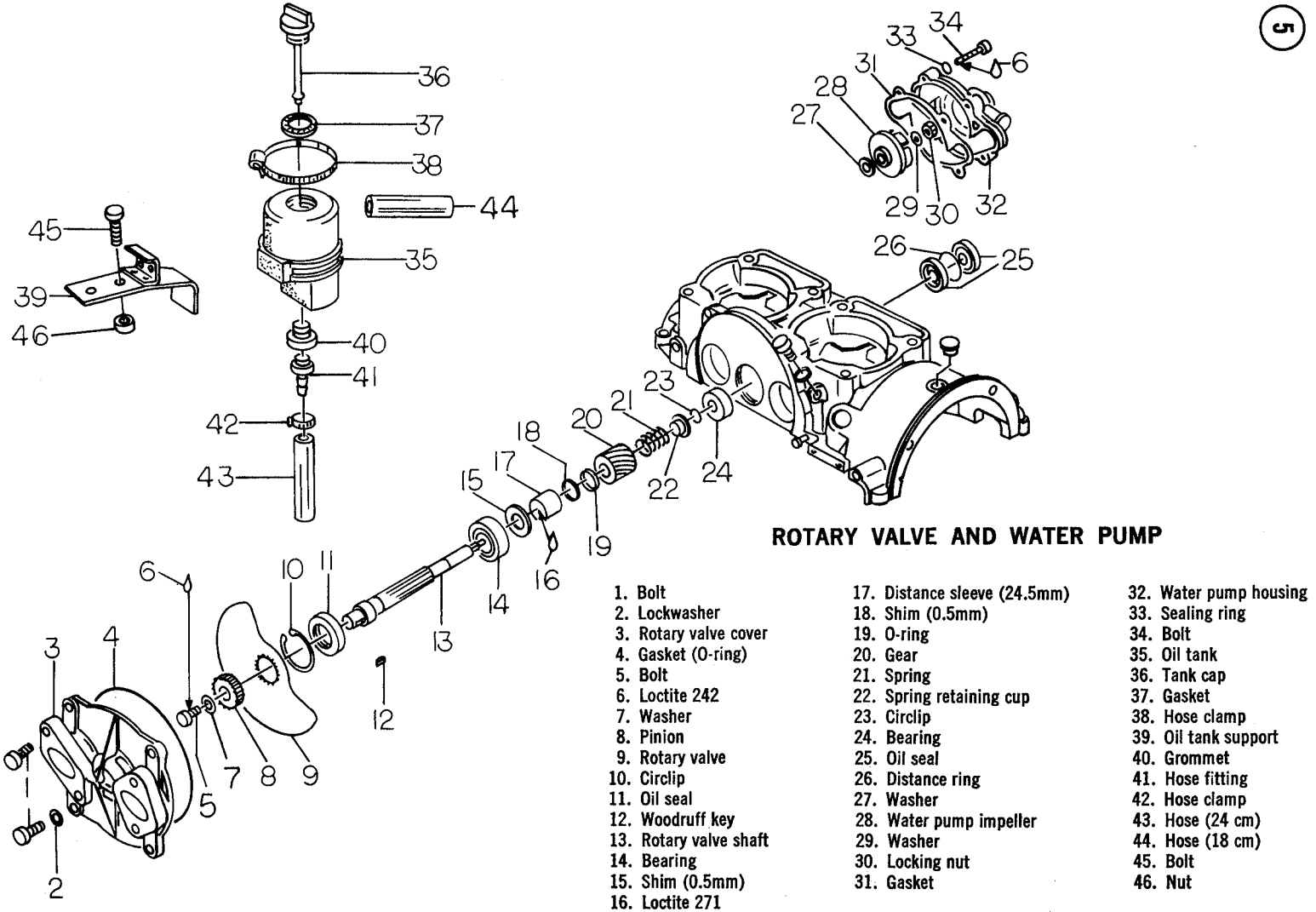
Refer to **Figure 5** for this procedure.

1. Drain cooling system.
2. Loosen clamps securing coolant hoses to water pump housing.
3. Remove bolts and O-ring gaskets securing pump housing and remove housing. Remove and discard pump housing gasket.
4. Remove locking nut and washer securing pump impeller to pump shaft and remove impeller.
5. If pump shaft, bearings, and seal removal is desired, perform *Rotary Valve Removal* as outlined in Chapter Four. Refer shaft bearing and seal replacement to a dealer.
6. Installation is the reverse of these steps. Keep the following points in mind:
   a. Install a new pump housing gasket.
   b. Apply Loctite Lock'N'Seal to bolts securing pump housing.
   c. Secure coolant hoses and fill cooling system as outlined in *Draining and Filling Cooling System.*

RADIATOR REMOVAL/INSTALLATION

Refer to **Figure 1** for this procedure.

1. Drain cooling system.
2. Refer to Chapter Nine and perform *Torque Reaction Suspension Removal/Installation.*
3. Remove screws securing radiator protector strips and remove strips.
4. Disconnect radiator hoses.
5. Using a cold chisel, gently remove rivets securing radiators.
6. Installation is the reverse of these steps. Pop rivet radiators to tunnel from the top. Refer radiator repair to an authorized dealer. Fill cooling system as outlined under *Draining and Filling Cooling System.*



ROTARY VALVE AND WATER PUMP

1. Bolt
2. Lockwasher
3. Rotary valve cover
4. Gasket (O-ring)
5. Bolt
6. Loctite 242
7. Washer
8. Pinion
9. Rotary valve
10. Circlip
11. Oil seal
12. Woodruff key
13. Rotary valve shaft
14. Bearing
15. Shim (0.5mm)
16. Loctite 271
17. Distance sleeve (24.5mm)
18. Shim (0.5mm)
19. O-ring
20. Gear
21. Spring
22. Spring retaining cup
23. Circlip
24. Bearing
25. Oil seal
26. Distance ring
27. Washer
28. Water pump impeller
29. Washer
30. Locking nut
31. Gasket
32. Water pump housing
33. Sealing ring
34. Bolt
35. Oil tank
36. Tank cap
37. Gasket
38. Hose clamp
39. Oil tank support
40. Grommet
41. Hose fitting
42. Hose clamp
43. Hose (24 cm)
44. Hose (18 cm)
45. Bolt
46. Nut