



Direct Cooling Conversion Kit - PA-241306 7.5 Marine Generator-L654 Engine

This kit is designed to convert L654 powered marine generator sets from direct cooling to heat exchanger systems. The heat exchanger system consists of two circuits—a closed engine circuit and a raw or sea water circuit. In the closed circuit, coolant (antifreeze if required) is circulated by the water pump through the water jacket and past the heat exchange bundle in the manifold before returning to the water pump for recirculation. The raw water circuit cools the engine coolant through circulation of sea water through the heat exchange bundle in the manifold. As in the direct cooling system, the heated sea water is then mixed with the exhaust and expelled through the exhaust outlet. The direct cooling system can be identified by the presence of a solid, non-pressure cap and the absence of cooling bundles in the manifold.

WARNING

UNIT STARTS WITHOUT NOTICE! To prevent accidental starting on units with a remote start/stop switch or on automatic models, place controller master switch in OFF position and disconnect battery (remove negative lead first and reconnect it last) to disable generator set before working on any equipment connected to generator.

WARNING

HOT COOLANT! Allow engine to cool and release pressure from cooling system before checking the coolant level. To release pressure, cover the radiator cap with a thick cloth and slowly turn it counterclockwise until pressure is released from the system. After the pressure has been completely released and the engine has cooled, begin installation.

INSTALLATION

1. Place controller master switch in OFF position and disconnect battery (remove negative lead first and reconnect it last) to disable generator set.
2. Allow unit to cool before proceeding. Release pressure in cooling system by placing a thick cloth over the manifold cap and slowly turning it counterclockwise until pressure is released from the system. Remove manifold cap and washer.

3. Remove engine coolant from manifold by removing the two drain plugs located on the bottom of the manifold tank. See Figure 1. The small amount of fluid remaining in the thermostat housing can be removed by opening the petcock (if provided) or removing the plug located on the side of the engine block. Replace drain plugs and close petcock after coolant is removed.
4. Coat threads of adapter neck 241311 with locktite and screw adapter neck into the opening vacated by the solid manifold cap. Be sure the adapter neck is threaded tightly. This will insure the overflow tube is positioned correctly for proper routing of the overflow hose. Allow to set 24 hours before operating generator.
5. Attach overflow hose to the overflow tube of the manifold adapter. Route the hose along the side of the manifold and behind the fuel pump. At this point the overflow hose should be routed through the overflow hose bracket. To mount the bracket, remove the oil pan screw directly beneath the fuel pump. See Figure 2. Align the smaller hole of the bracket with the pan screw shaft. Replace screw and torque to 150 in. lbs.

NOTE

If a coolant recovery tank is not used, be sure overflow tube is not immersed in the bilge. This must be done to prevent bilge water from being siphoned back into the cooling system.

6. Remove the four screws securing the inlet/outlet adapter. Separate the adapter from the manifold, allowing the hoses to remain attached to the adapter. Discard outer gasket.
7. Withdraw direct cooling tube assembly from the manifold. Remove inner gasket and discard. With manifold surface clean and dry, position new inner gasket 241261 on manifold.
8. Carefully insert heat exchanger bundle 241279 into manifold. Be sure the four corner mounting holes of the bundle align with those in the manifold.
9. Position outer gasket 241260 and inlet/outlet adapter over the heat exchanger bundle endplate. Replace the four mounting screws and torque to 70 in. lbs.
10. Remove the two nuts securing the thermostat housing to the engine cylinder. Separate the housing and gasket from the engine to expose the thermostat. Remove the 138°F thermostat. It is not necessary to remove the inlet hose from the thermostat housing. Discard thermostat gasket.

11. The outlet adapter 50 029 02 is required to accommodate the larger thermostat used in the heat exchange system. Use of the adapter requires replacement of the thermostat housing mounting studs. Remove studs and replace with X-352-48 studs.

12. Position outlet gasket 240160 over the cylinder head opening. The outlet adapter (recessed side up) is sandwiched between this gasket and the second outlet gasket provided with the kit. See Figure 3. Position the new 170°F thermostat in the recessed opening of the outlet adapter before installing upper gasket. Replace thermostat housing. Install washers X-25-93 and mounting nuts X-83-1. Torque to 260 in. lbs.

13. Replace engine coolant. When full, the coolant level should be approximately 1/2 in. below the bottom of the manifold adapter neck. Insert pressure cap and rotate clockwise until secure. Be sure the adapter neck has set 24 hours and the pressure cap is installed properly before operating generator.

NOTE

The closed circuit of the heat exchanger cooling system can be protected with antifreeze. Before adding antifreeze, drain the entire cooling system to assure correct proportions of antifreeze to water. Refill closed circuit with

approximately five quarts of antifreeze solution. Always use a solution of antifreeze and water which will remain liquid well below the lowest anticipated temperature. Check fluid level regularly.

NOTE

Reconversion to direct cooling is possible through reinstallation of the direct cooling tube and 138°F thermostat. Retain these parts if reconversion is anticipated.

Parts Listing

Part No.	Description	Qty.
X-25-93	Washer, Plain 3/8	2
X-352-48	Stud	2
X-386-32	Line, Overflow	1
X-83-1	Nut, Hex 3/8 - 24	2
240160	Gasket, Water Outlet	2
241260	Gasket, Manifold	1
241261	Gasket, Manifold	1
241276	Bracket, Overflow Hose	1
241279	Bundle, Heat Exchanger	1
241311	Neck	1
258126	Cap, Radiator Pressure	1
50 029 02	Adapter, Thermostat	1
50 453 02	Thermostat, 170°	1

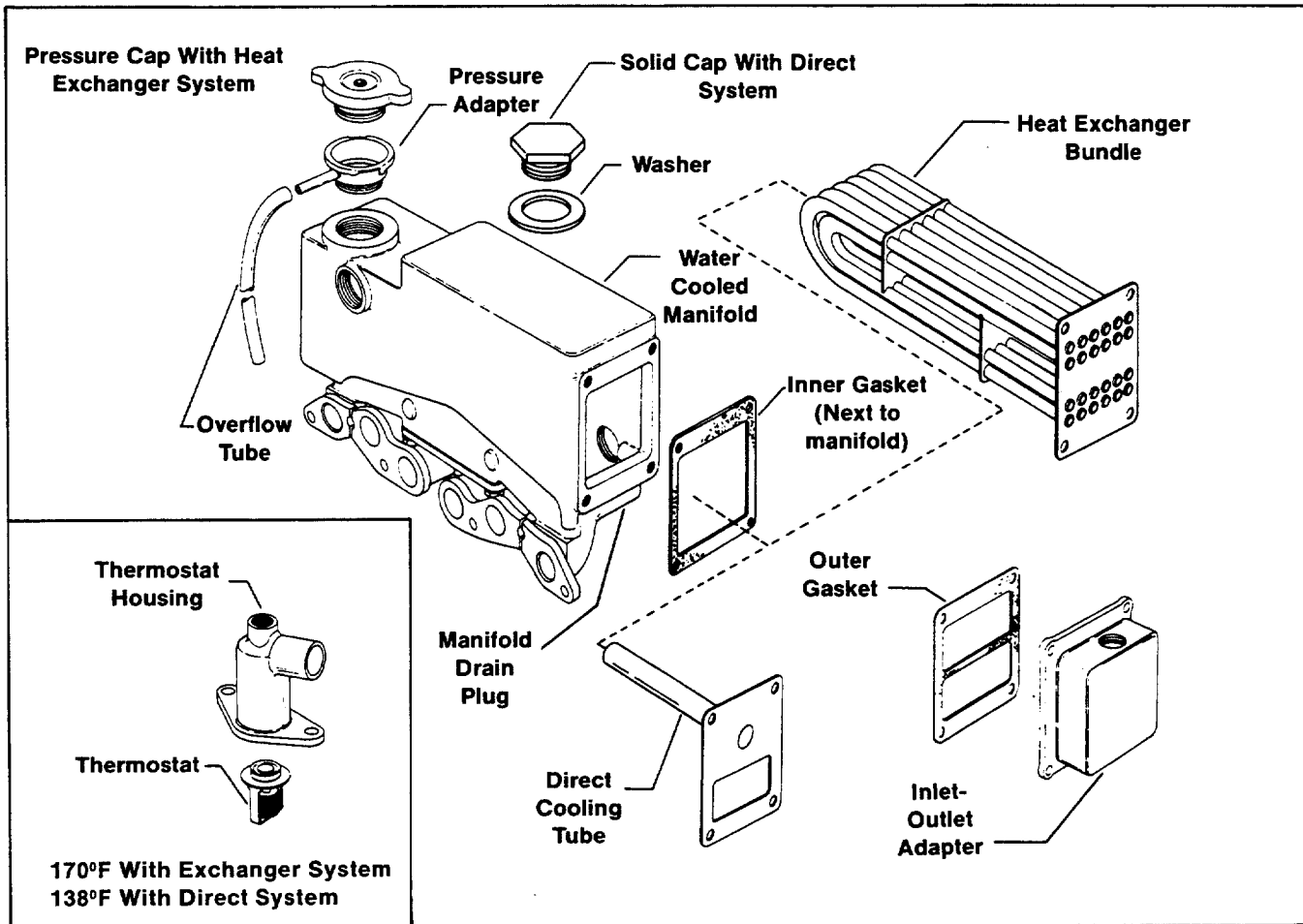


Figure 1. Cooling System Components

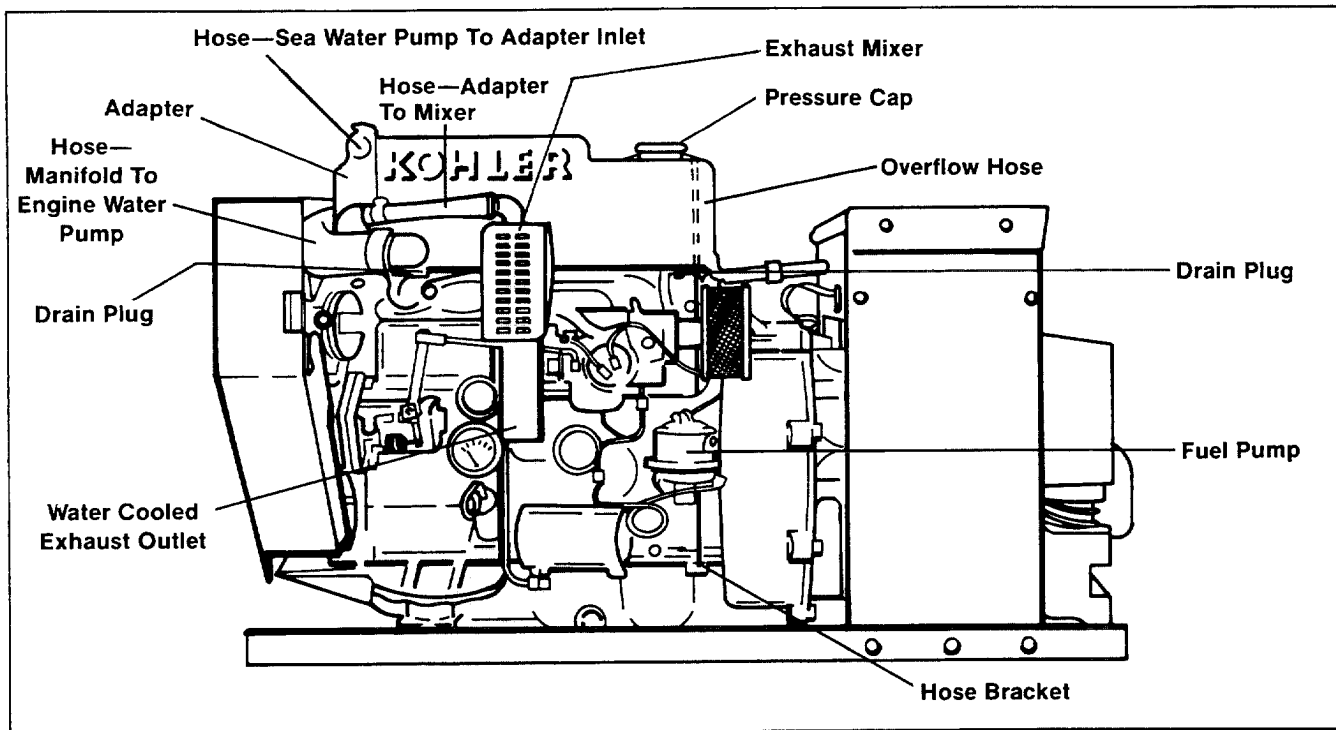


Figure 2. Side View—Heat Exchange System

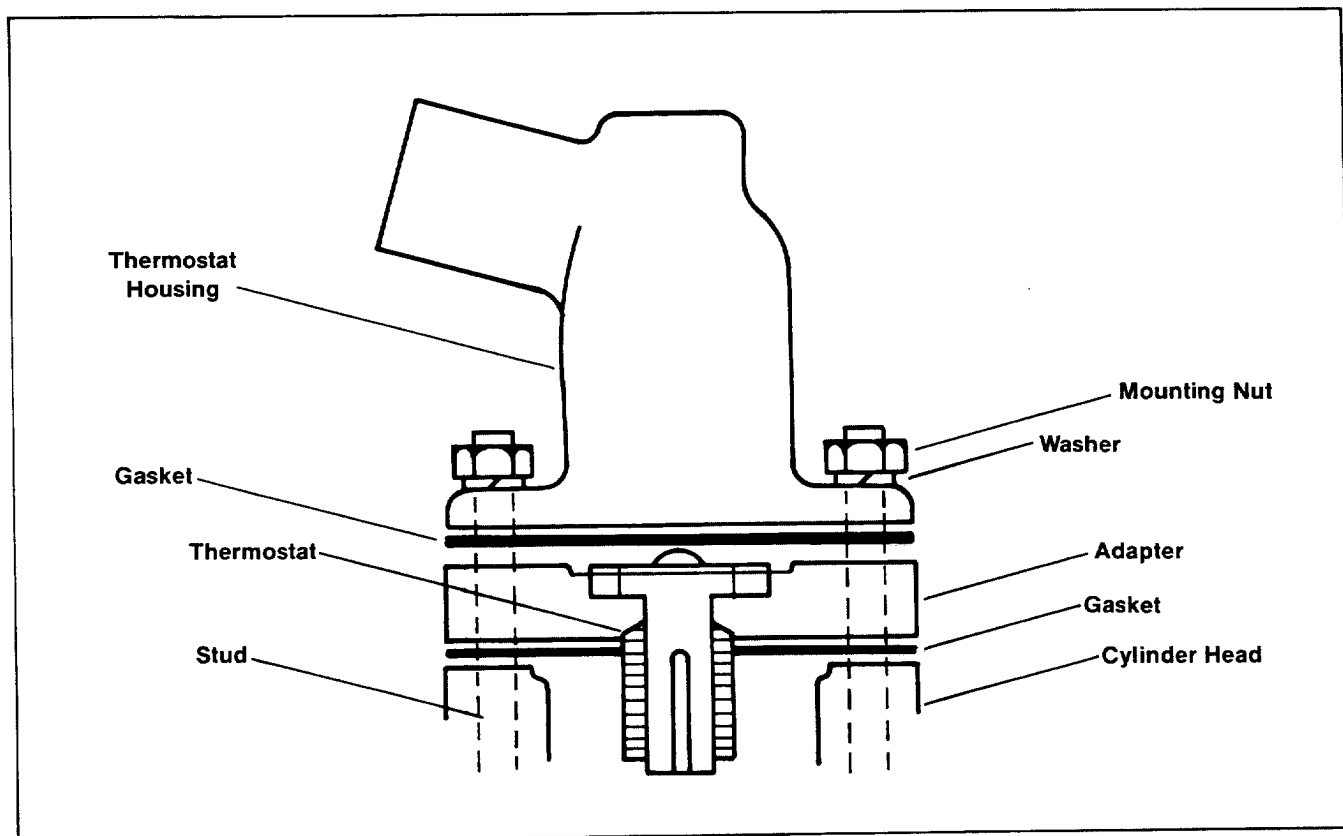


Figure 3. Thermostat Housing Assembly