

**ORCA
MARINE COOLING SYSTEMS
BELLINGHAM, WA 98226**

**MerCruiser 7.4L
1986 to 1998 TBI & Carb**

Installation instructions

**300953
Half system**

1. Disconnect the battery before working on the engine. Drain the engine according to the manufacturer's instructions. Remove all hoses at the thermostat housing. Remove the 1-1/4" 90 degree hose and the 1-3/4" hose from the engine. Save for re-use. Remove the wire from the temp sending unit and then remove the unit. Remove the thermostat housing. Clean the gasket surface and plug the hole with a rag for now.

2. Gently clamp the aluminum 3-hole thermostat housing in a vise and thread the 3/8F x 3/8M brass adapter in the center hole. NOTE: these are tapered thread holes. Do not overtighten. When installed the recess for the thermostat will be up. Thread the 5/8H x 3/8M brass elbow into the adapter so it will be facing to starboard when installed. Thread the sending unit from step 1 into the starboard hole. Plug the other hole with the 3/8 brass plug.

3. Set the #5-A continuity gasket on the intake manifold. Next the thermostat housing and the 160 degree thermostat. A #5 fiber gasket goes on top and then the aluminum KA-118A water outlet. Secure the assembly with the 3/8 x 3-1/2 plated HCS and lock washers.

4. Remove the 1/2" recessed plug from the starboard side of the engine circulating pump and replace it with a 5/8H x 1/2M brass hose elbow. Tighten so it is facing upwards. Connect the two hose barbs with the 5/8 wire hose unless you are installing a heater or hot water setup.

HEATER/HOT WATER: The pressure to the accessory will come from the hose elbow on the front of the thermostat housing. The suction from the accessory will connect to the fitting on the circulating pump.

5. Remove the upper bolt from the tensioner pulley bracket and install the port steel bracket. Use the 7/16 x 1-3/4 HCS and lock washer. If needed, space the bracket out with the 7/16 flat washers. If you have to loosen the steel oil line to install the bracket make sure you retighten it. Repeat the process for the starboard bracket. Use the aluminum spacers if needed to align the brackets.

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6. Leave the white covering on the cushion tape and stick it to the brackets. Replace the 1-3/4" hose removed in step 1 and then set the heat exchanger in place. Trim the hose so it comes up as far as possible on the heat exchanger fitting. Repeat the process with the 1-1/4 90 degree hose and leave it attached to the heat exchanger with the original #20 ss clamp.

7. Temporarily set aside the heat exchanger. Disconnect the original 1" hoses from the bottom of the exhaust manifolds. Remove the plastic elbows and replace them with the 1H x 3/4M brass 90 elbows supplied in the kit. Reconnect the hoses to the brass elbows. Attach the other end of each hose to the 1"OD legs on the copper raw water out tee. Secure with the original #16 ss clamps. You may have to run the port hose behind the lifting eye and under the oil line hose to make it fit.

8. Set the heat exchanger back on the brackets and secure the 1-3/4" and 1-1/4" hoses. Double clamp the 1-3/4" hose. Use the 1-1/4" rubber cap to plug the fitting not used on the raw water in tee. Secure the heat exchanger with the #650-T clamps that have the clear vinyl sleeves. Make sure the clamps catch the lip on the brackets. Loop the 1" x 22" wire hoses between the water outlet fittings and the fittings on the ends on the heat exchanger. Secure with the #16 ss clamps.

9. Check all clamps for tightness and use the cable ties if needed to keep hoses from rubbing against metal parts. Fill the system with a maximum 50/50 mix of antifreeze and distilled water. Reconnect batteries. Start engine with the pressure cap on to check for leaks at any connections. Shut down the engine once you are sure there are no leaks. CAREFULLY remove the pressure cap (use heavy gloves and keep your face away from the opening) and check to make sure the heat exchanger is full. If needed, top off to about 3/4" below the neck and replace the pressure cap.

CAUTION:

INSTALLATION OF THE COOLANT RECOVERY BOTTLE IS CRITICAL TO THE OPERATION OF THIS SYSTEM.

IT MAY BE INSTALLED ANYWHERE BUT MUST MAINTAIN THE LIQUID LEVEL IN THE BOTTLE BETWEEN THE WARM AND COLD LINES AT ALL TIMES.

THE RECOVERY BOTTLE ALLOWS FOR EXPANSION AND CONTRACTION OF THE ANTI-FREEZE SOLUTION IN NORMAL OPERATION AND HELPS KEEP THE SYSTEM FULL.

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