

SANJUAN FRESH WATER COOLING SYSTEMS

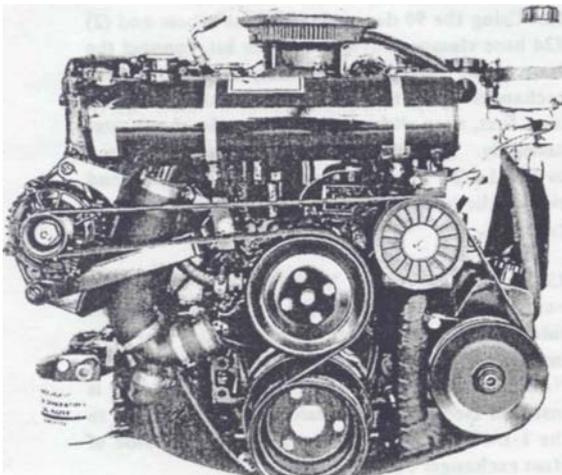
4.3/5.0/5.7 MerCruiser With Serpentine Belt "Block Only Cooling" Kit #MC336 Installation Instructions

San Juan Engineering Heat Exchangers provide thermostatically controlled fresh water cooling for marine engines, its compact installation does not increase the height, width, or length of the overall engine dimensions, allowing for installation in most existing engine compartments. Designed to ensure years of satisfactory service, the entire unit is constructed of pure copper with silver alloys. This system is built by quality craftsmen that have made San Juan Engineering the leader in our field for over 44 years.

San Juan Engineering Heat Exchangers prolong engine life by preventing corrosion in the cylinder block. Antifreeze solution can be added to the coolant if the boat is used in extreme cold weather. Only draining the sea water side of the cooling system from the zinc anode in the heat exchanger is required when the boat is not in operation. Also, see winterizing sheet.

Installation is simple. All necessary parts are supplied and no special tools are required.

1. All instructions are given while facing the front of the engine. The alternator is on the left hand side, the power steering on the right side.
2. Disconnect the battery cables.



Remove automatic drain, (a) Locate the automatic drain reservoir (ADR) on the front, right side and mounted low. (Gray plastic unit with blue plastic drain plug). Remove plug and drain the fluids, (b) Remove the 3/8" NC bolt and the 3/8" NC nut to remove the ADR bracket from the engine. Replace bolt and nut after removal. C. Locate and remove the hose that connects to the ADR and runs up the front side of the engine to a plastic tee. The hoses from the tee go to the exhaust elbows. Discard entire assembly. Remove the straight fittings from the elbows and replace with the brass hollow head pipe plugs from kit. Locate the exhaust manifold inlet/drain fitting on the bottom center of the right side exhaust manifold. Remove hoses from fitting (save the upper hose. 7/8" ID and let the lower hose hang loose) then remove the fitting. Locate the 3/8" ID drain hose, connected to the block (this hose is located behind the exhaust manifold inlet/drain fitting but is attached to the block). Press the white quick release button to remove the hose. Remove the brass fitting from the block and replace it with a 1/4" NPT drain plug from your kit Now install the 3/4" NPT X 90 degree X 7/8" OD fitting from your kit, into the 3/4" NPT hose in the bottom of your exhaust manifold. * Repeat this procedure on the other side of your engine. Re-install original 7/8" OD hose onto fitting, (e) Locate the engine pump and the 1-3/4" or 2" OD hose that is connected to it. There is a plastic tee in the center of the hose. Remove the 1-1/4" hose attached to the tee. Save the hose clamp and replace the hose with the 1-1/4" ID rubber cap in your kit. (0 There is a 1-1/4" ID "S" shaped raw water inlet hose connected to the rear of the ADR remove this hose from ADR and install the 1-1/4" OD X 90 degree copper elbow into the "S" hose, pointing straight up, from your kit. (At this point the ADR and all its hoses should be removed). Next attach the 1-1/4" ID X 19-1/2" long, straight hose, from your kit, to the copper elbow and route it just to the left of the power steering pump up and behind the belt tensioner. Use original clamps.

4. Remove thermostat housing assembly from engine by taking out the (2) 8MM bolts at back end of housing. Carefully remove high water temperature alarm sender and water temperature alarm sender from housing and thermostat. These

will be used later. Discard original thermostat housing and the bolts. You will replace these with new parts from your SJE kit.

5. Remove all hose clamps and hoses connected to this assembly. Use care not to destroy hoses or hose clamps, they will be used later. Leave all hoses connected at their other ends.

6. Remove the 1/2" pipe plug from the intake manifold. This is located slightly in front and to the left of the thermostat, next to left valve cover (Figure 2). We recommend using pipe thread sealant when installing threaded fittings. Install the brass pipe fittings from your kit into the intake manifold in this order: 3/8" NPT X 1/2" NPT bushing, 3/8" NPT close nipple, 3/8" NPT cross, 3/8" NPT X 5/8" OD 90 degree fitting on top hole of the cross. (Note: when tightening this assembly be sure to make room for both sending units on either side of the cross). Install sending units into side of the cross and connect their corresponding wires. Remove 1/2" NPT plug from engine circulating pump on left side just above large hose. Install the 1/2" NPT X 5/8" hose fitting in this hole. Plumb the 5/8" ID X 13" long hose and (2) #10 clamps between the pump and pipe fitting assembly on the intake manifold.

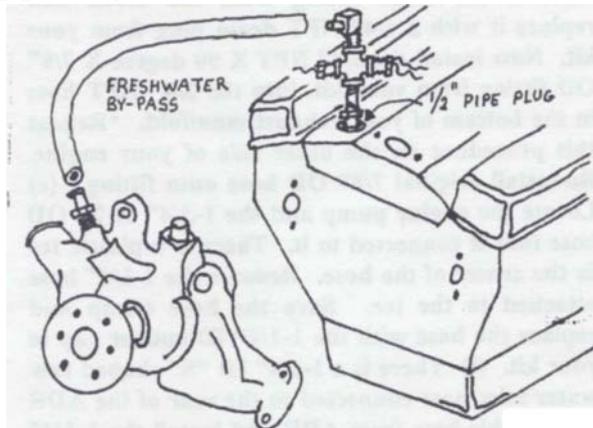


Figure 2

7. Retrieve from you SJE kit the new thermostat housing assembly (figure 1). Clean thermostat housing gasket surface on the intake manifold. Then install original thermostat with the thermostat housing on top. Position new gasket from kit on intake manifold. **Be Sure Thermostat fits in the recess before tightening.** Secure thermostat housing with (2) 8MM X 1" bolts and lockwashers. Tighten the bolts evenly and firmly.

8. Remove top, front, right-hand bolt from power steering pump bracket From your kit install

bracket #MC319RH using the 1-9/16" long spacer, 3/8" NC X 2-3/4" bolt, washer and lockwasher.

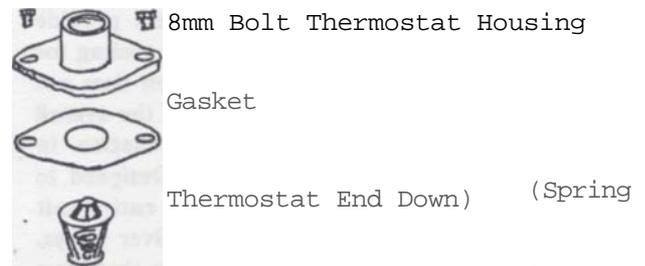


Figure 1

9. Remove the 3/8" NC bolt located just above the engines circulating pumps left side mounting point Install bracket #MC319LH, 1-3/8" long spacer, 3/8" NC X 2-3/4" bolt, washer, lockwashers. The (2) 1" hoses (connected to the bottom of the exhaust manifold) that were connected to the original thermostat housing now should be connected to the salt water divider tee. Add 1-1/4" X 4-1/2" hose and clamp onto tee.

10. Lay the rubber strips on top of mounts then place heat exchanger on brackets, keeping the right end approximately 1/4" from the power steering pump, use the large #64 hose clamps to secure. Tighten clamps firmly.

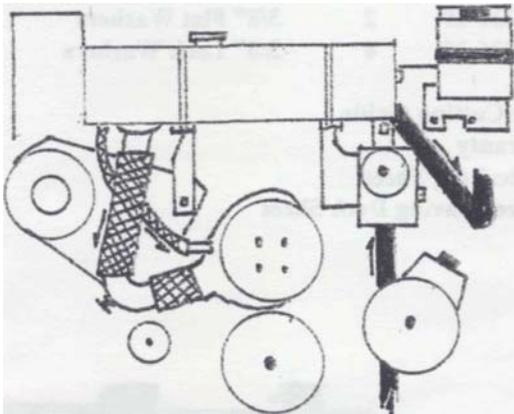
11. On some engines the lifting ring may need to be bent slightly backwards.

12. Using the 90 degree 1-1/2" hose elbow and (2) #24 hose clamps provided in your kit, connect the hose to the thermostat assembly and to the heat exchanger. Slip the hose clamps loosely over the hose first, then slide the hose onto the thermostat assembly. The other end of the hose is connected to the 1-1/2" hose barb on the back, right-hand side of the heat exchanger. Hose may need to be cut to fit.

13. Attach the 1-1/4" X 19-1/2" raw water inlet hose to the 1-1/4" OD fitting on the bottom right side of heat exchanger. This is the hose you installed when you removed the Automatic Drain. Now connect the 1-1/4" OD X 4-1/2" hose that is installed (see #9) on the salt water divider tee to the 1-1/4" OD X 90 degree, fitting on left side of Heat exchanger, clamp firmly.

14. Using the hose cutting guide, carefully cut the 1-3/4" fresh water suction hose located on the left hand side of the fresh water pump. Referred to as "hose B" in the cutting guide. Loosely slide the original hose clamps over the hose and slip hose on to the 1-3/4" hose nipple located on the left hand bottom of the heat exchanger. Tighten hose clamp firmly.

15. This system uses a recovery type accumulator tank for the expansion of the coolant and also removal of air from the system. Secure the plastic expansion tank in the best location for checking fluid. Cut a piece of 5/16" hose to connect the spud at the heat exchanger fill neck to the spud at the bottom of the expansion tank. Use the (2) 5/16" spring clamps to secure the hose.

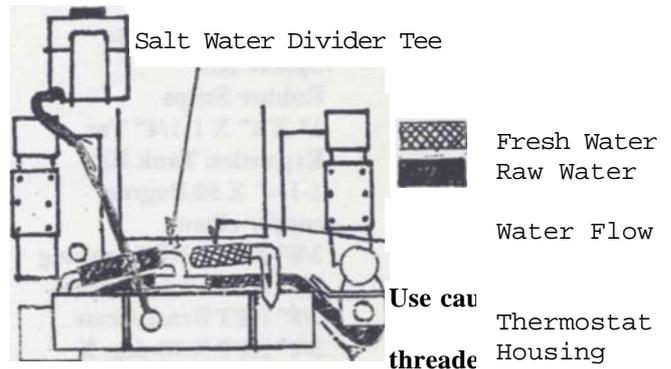


16. Fill accumulator tank to cold line. Fill through the fill cap neck on the heat exchanger until full. Continue to fill until water is overflowing at the fill neck. As it is **IMPORTANT** to remove all air from the system, leave the fill cap off after starting engine and be prepared to refill water into the fill neck as AIR is removed and water level drops. All air must be out of the system if it is to work properly. This may take 10 minutes, or more of running the engine in neutral at 1,000 to 1,500 RPM at the dock. Do not run the engine at all without a water supply to the water inlet on the lower unit. The sea water pump will be damaged or destroyed if run dry. When you are sure all air has been purged from the system and the water level has stabilized at the fill neck, and it is full, install the fill cap. **DO NOT** remove the fill cap when engine is **HOT!** Coolant capacity is approximately 14 quarts.

NOTE OPTION: Expansion tank may be mounted in the transom area or wherever desirable.

17. The zinc anode retards corrosion in the raw water side of the cooling system. Check occasionally and replace when 3/4 eroded.

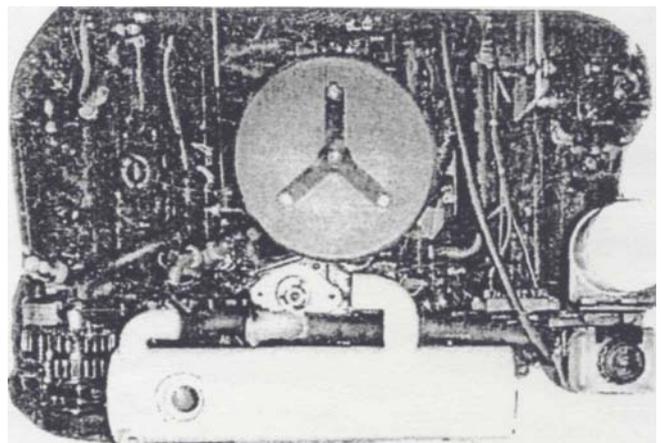
Remote Mounted Expansion Tank Note: for best results mount expansion tank level w/ heat exchanger fill point



18. Check to make sure all hose clamps and bolts are firmly before moving on to the start up procedure.

Never over tighten and always use a back-up wrench on threaded NPT female fittings i.e., temperature senders and zinc anode.

For installation and technical assistance, or information on other San Juan Products, please call (360) 734-1910.



HOSE CUTTING GUIDE FOR SAN JUAN KITS # MC-336, MC-337

