5.7 M.P.I. MerCruiser With Flat Serpentine Belt "Full System Cooling" (Total EFI) Kit #MC-326 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 craftsman that have made San Juan Engineering the leader in their field for over 39 years.

San Juan Engineering Heat Exchangers prolong engine life by preventing corrosion in the cylinder block. Anti-freeze 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.

Installation is simple. For installation & Technical assistance, or information on other San Juan Products, please call (360) 734-1910. 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 right hand side, the fuel pump on the left hand side.

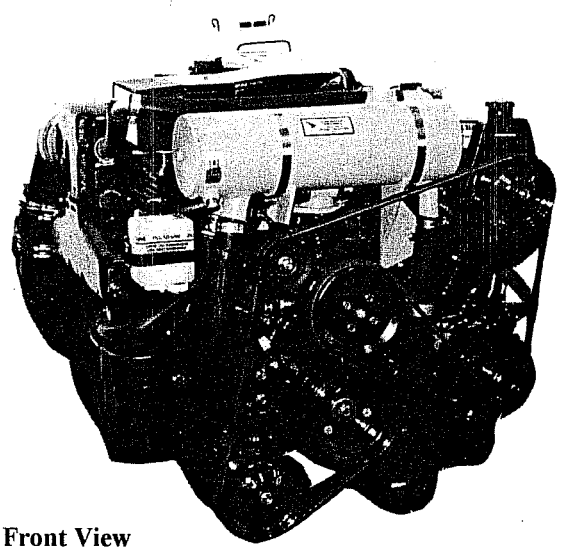
2. Disconnect battery cables.

3. Locate original thermostat housing assembly at top, front, center of engine. Disconnect wire connected to the high water temperature alarm sending unit and the wire connected to the water temperature sending unit. Be sure wires are re-connected to the same sending units.

4. 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.

5. Remove thermostat housing assembly from engine by taking out the (2) 3/8" bolts at back end of housing. Carefully remove high water temperature alarm sender and water temperature sender from housing. These will be used later. Discard original thermostat housing, thermostat, and bolts. You will replace these with new parts from your SJE Kit.

Use caution when tightening threaded fittings. Never over tighten and always use a back-up wrench on threaded NPT female fittings ie., temperature sending units and zinc anodes.



Front View

SAN JUAN ENGINEERING & MANUFACTURING CO.
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6. (See By-Pass Hook Up). 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. We recommend using pipe thread sealant when installing threaded fittings. Thread 1/2" NPT X 5/8" hose fitting into intake manifold. Connect 5/8" X 8" hose and (2) #10 clamps to fitting then connect other end to 1/2" NPT X 5/8" fitting screwed into tee. Screw large probe (two wire sending unit) into 3/8" NPT opening using caution not to over tighten. Screw 1/2" NPT X 5/8" hose into tee and connect 5/8" X 7-1/2" hose and (2) #10 clamps to fitting and then connect other end to lower opening of water pump with 1/2" NPT and 5/8" fitting and clamp. This is your fresh water by-pass and can also be used for a heater. For a heater plumb the bottom of the heater to the by-pass outlet next to the thermostat assembly, the top of the heater to the outlet at the water pump. Connect sending unit wire.

7. Retrieve from your SJE kit the new thermostat housing assembly (Figure 1). Thread small probe, single wire temperature sending unit, into the threaded hole on thermostat housing. Tighten sender firmly use caution not to over tighten. Clean thermostat housing gasket surface on the intake manifold. Insert original thermostat, spring end down (Figure 1). Position new gasket, supplied in your SJE kit between thermostat and thermostat housing. Secure thermostat housing with the (2) 3/8" X 7/8" bolts and lock washers. Tighten the two bolts firmly and evenly. Connect sending unit wire.

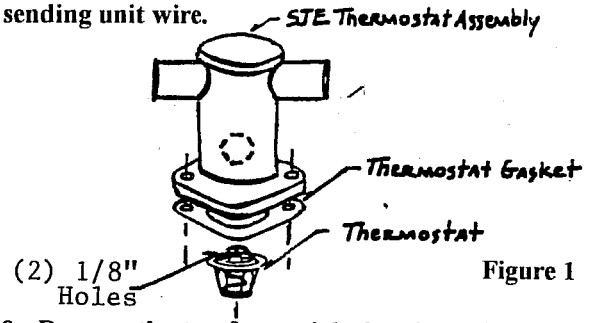


Figure 1

8. Remove the top front, right hand nut from the power steering pump bracket. Discard this nut. From your kit install the RH heat exchanger bracket, marked #MC 326-3RH using the 3/8" NYLOCK NUT. (NOTE: it is absolutely essential that you use the NYLOCK NUT).

9. Remove upper 3/8" X 3/4" bolt from idler bracket, inboard side of left head. Install #MC-326-4LH bracket using 3/8" X 2-1/4" bolt, lock washer, flat washer and 3/8" X 1" spacer.

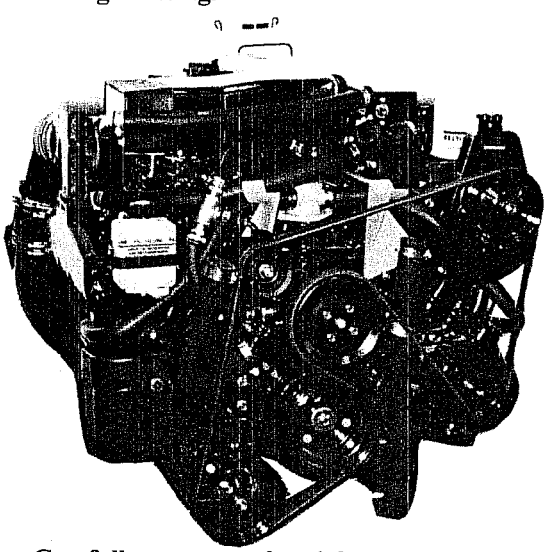
NOTE: Read installation supplement sheet before continuing.

10. Remove the (2) 3/4" pipe plugs from the right hand exhaust manifold assembly. The top plug comes out of the riser, the bottom plug out of the exhaust manifold. Use the brass 3/4" pipe to 1" 90 degree hose fitting from your SJE kit to thread into the hole in the riser.

11. Repeat these procedures to the left hand side. Remove (2) 3/4" pipe plugs from left hand side.

12. Separate the right hand riser from the exhaust manifold by loosening the hose clamps at the exhaust outlet and then removing the (4) 9/16" head bolts on the top. With the assembly separated, thread the brass 3/4" pipe to 1" hose 90 degree fitting provided in your kit into the hole in the exhaust manifold. Be sure that this fitting is facing towards the front of the engine. Clean the gasket surface thoroughly and replace with the new block-off gasket provided. This gasket allows the exhaust manifold to be cooled with engine water rather than raw water. Re-install riser to the manifold, tighten the bolts and hose clamps evenly and firmly.

13. Repeat these procedures to the left hand side. The left hand exhaust riser has a 3/4" NPT X 1" brass straight fitting.



14. Carefully re-route the right hand 3/4" raw water hose that leads from the bottom of the right hand exhaust manifold. It will now run outside the power steering bracket and over the valve cover. With the original hose clamp connect this hose to the spud on the right side of the

thermostat assembly. Connect the 3/4" hose leading from the bottom of the left hand exhaust manifold to the spud on the left. Again use the original hose clamp and this hose does not need to be re-routed (Figure 2).

15. Carefully cut the 1-1/4" raw water hose on the right hand side of engine. Use the hose cutting guide insert sheet to acquire the correct length. This hose is referred to as "Hose A". With hose cut to length, slide original hose clamp loosely over hose and slip hose over the 1-1/4" spud located on the lower right hand end of heat exchanger. Tighten hose clamp firmly.

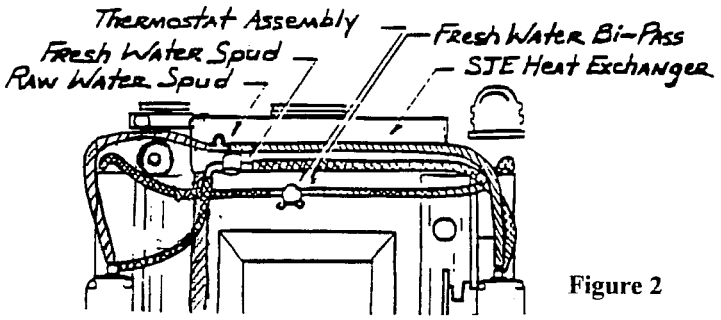


Figure 2

16. Place heat exchanger on brackets keeping the right end approximately 1/4" from the steering pump. Use the large #80 or #550 hose clamps to secure. Tighten clamps firmly.

17. Using the hose cutting guide, carefully cut the 1-1/2" 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 clamp over the hose and slip hose on to the 1-1/2" spud located on the left hand bottom of the heat exchanger. Tighten hose clamp firmly.

18. Use the 9" piece of 1" hose and (2) #16 hose clamps to connect the brass fitting, threaded into the right hand exhaust manifold to the fresh water spud on the right end of the heat exchanger. Use the 19-1/2" piece of 1"and (2) #16 hose clamps hose to connect left side.

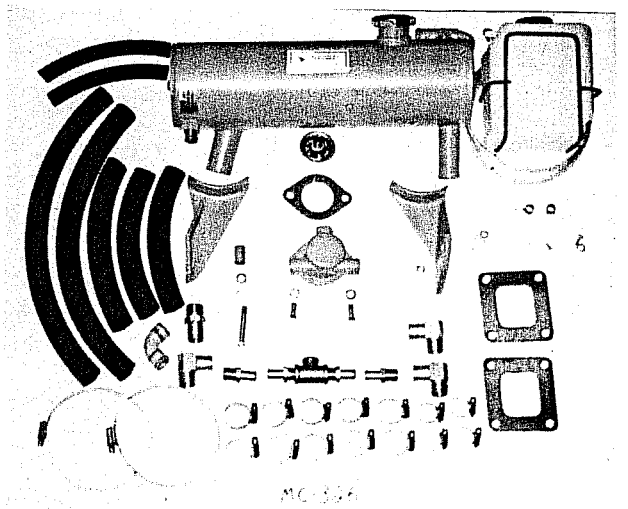
19. Use the 1" X 10-1/2" hose and (2) #16 hose clamps to connect the brass 1" elbow, threaded into the right hand riser, to the raw water spud on the right end of the heat exchanger. This hose length may need to be trimmed. Use the 18" piece of 1" hose and (2) #16 hose clamps and connect to the #W-2034 copper elbow. From the copper elbow use the 9" hose and (2) #16 hose clamps to the 1" straight fitting on the exhaust outlet.

20. 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 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.

21. 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 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 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.

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

23. Check to make sure all hose clamps and bolts are firmly tightened before moving on to the start-up procedures.

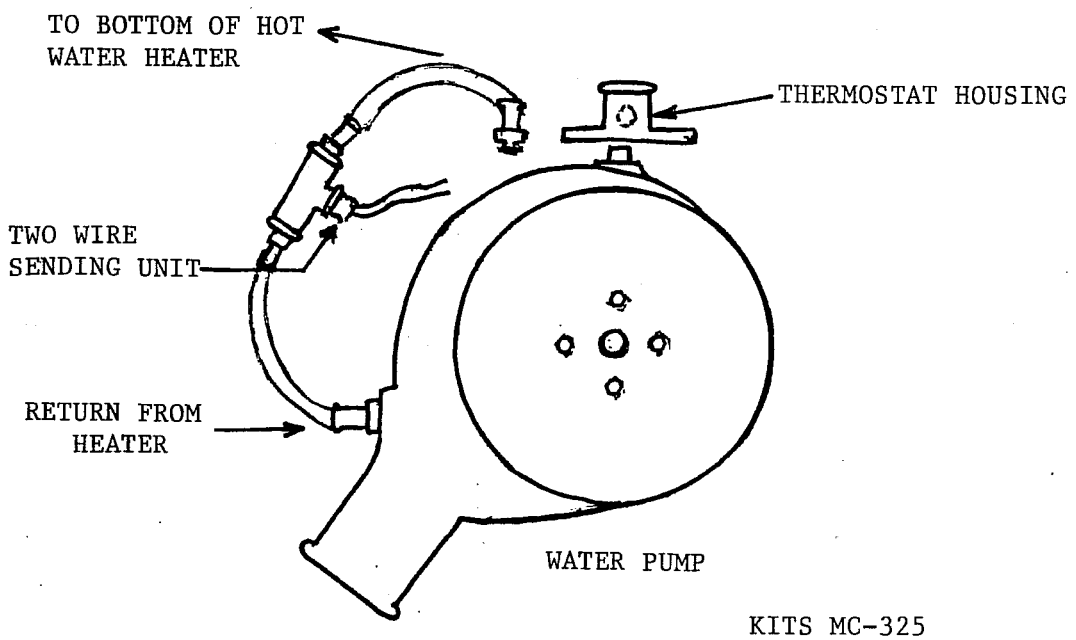


5.7 M.P.I. MerCruiser With Flat Serpentine Belt
"FULL SYSTEM" Cooling (Total E.F.I.) Kit #MC-326

PARTS LIST

		Description
MC 326-0	1	Installation Manual
MC 326-1	1	Heat Exchanger
MC 326-2	1	Thermostat Assembly
MC 326-3	1	#MC326-3 RH Bracket
MC 326-4	1	#MC326-4 LH Bracket
MC 326-5	1	Expansion Tank
MC 326-6	1	Thermostat 160 degree, with (2) 1/8" Holes
MC 326-7	1	3/8" X 1" Spacer
		Hoses
MC 326-8	1	1" X 19-1/2" Fresh Water Spud to LH Manifold
MC 326-9	1	1" X 18" Raw Water Spud to Elbow
MC 326-10	1	1" X 9" Elbow to Exhaust Outlet
MC 326-11	1	10-1/2" Raw Water to RH Exhaust Outlet
MC 326-12	1	9" Fresh Water to Manifold
MC 326-13	1	5/8" X 8" By-Pass
MC 326-14	1	5/8" X 7" By-Pass
MC 326-15	1	#W-2034 Elbow
		Gaskets
MC 326-16	1	Thermostat, GMT-1
MC 326-17	2	Exhaust/Riser, Block off, Solid Gasket, #MC 330 TR
		Hose Clamps
MC 326-18	2	#80 or #550 HE Bracket
MC 326-19	10	#16, Riser, Manifold
MC 326-20	4	#10, Fresh Water By-Pass
		Fittings
MC 326-21	4	1/2" X 5/8" NPT to Hose Fresh Water By-Pass
MC 326-22	3	3/4" X 1", NPT to Hose 90 degree
MC 326-23	1	3/4" NPT X 1"
MC 326-24	1	1/2" X 3/8" X 1/2" Tee
		Bolts, Nuts, & Washers
MC 326-25	2	3/8" X 7/8"
MC 326-26	1	3/8" X 2-1/4"
MC 326-27	1	3/8" Flat Washer
MC 326-28	3	3/8" Lock Washer
MC 326-29	1	3/8" Nylock Nut.
MC 326-30	1	Installation Supplement
MC 326-31	1	Hose Cut Guide Insert

BY-PASS HOOK UP



KITS MC-325
MC-326

Packed by_____ Date_____

Form #MC-326-97