SAN JUAN FRESH WATER COOLING SYSTEMS

5.7 EFI MerCruiser 350 Magnum M.P.I. GEN+
Block Only Cooling
Kit # MC-317 Installation Instructions

San Juan Engineering Heal Exchangers provide thermostatically controlled fresh water cooling for marine engines. Its compact installation fits within 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 *35* 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 boat is used in extreme cold weather. Draining the sea water side of the heat exchanger is required when the boat is not in operation.

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 right hand side, the fuel pump on the left hand tide.

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2. Disconnect battery cables

3. Locate original thermostat housing assembly at top, front, center of engine (Figure 1*).* Unfasten the wire connected to the high water temperature alarm sending unit on the left side and the wire connected to the water temperature sending unit on the right side.

4. Remove all hose damps 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 plastic retainer and thermostat, high water temperature alarm sender and water temperature sender from housing. These will be used later. Discard original thermostat housing, and bolts. Yon will replace these with new parts from y«ur SJE kit.

Original Thermostat Assembly

Right hand bracket mounting point

Remove top bolt on lifting bracket

Left hand bracket mounting point

Fuel filter

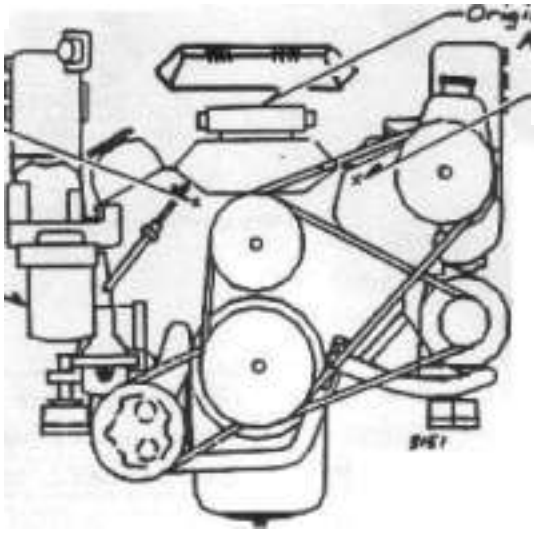

Figure 1

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6. Remove the thermostat housing assembly from your SJE kit (Figure 2).

7, Take out the two 1/2" hollow headed pipe plugs on each side of the Thermostat housing. Take out 1/2" pipe plug on the water pump (Hole used for bi-pass) screw in straight 1/2" NPT to 5/8" hose Fitting (save 1/2'" plug for thermostat housing). Take the 3/8 x 1/2" pipe bushing screw into opening on right side of thermostat housing and screw in <u>one</u> wire sending unit. Take close 1/2" pipe nipple, tee and 90 degree fitting, screw into 1/2" hole on left side of thermostat housing and screw the two wire sending unit pointing forward.

Be sure thermostat 1B pointing UP.

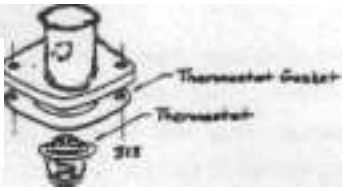
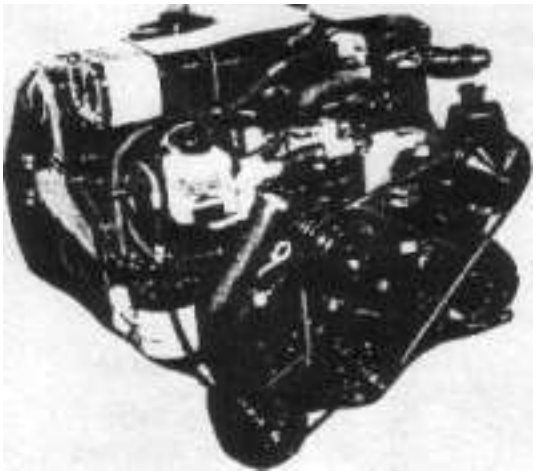


Figure 2



8. Using the 27" piece of 5/8" hose and (2) hose clamps, plumb these two fittings together following the route shown in Figure 3. This is your <u>fresh water by-pass</u> and can also be used for a <u>heater</u>. 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.

9. Clean thermostat housing gasket surface on the intake manifold. Insert original thermostat, spring end down (Figure 2), Position new gasket, supplied in your SJE kit between thermostat and thermostat housing. Secure thermostat housing with the (2) 3/8" by 1" bolts. Tighten the two bolts firmly and evenly.

10. Remove the top front, left hand bolt from the power steering pump bracket (Figure 1). From your kit install the RH heat exchanger bracket, marked RH MC317-2 using the 3/8" by 1-1/2" bolt, lock washer and flat washer. Tighten bracket bolt firmly.

11. Use a lock washer and flat washer on tbe 3/8" by 1" bolt. Install LH beat exchanger bracket, marked LH MC3I7-3 using the empty hole located on the top, inboard side of the left head (Figure *I)*. Tighten bracket bolt firmly.

12. Carefully cut the 1-1/4" raw water hose, "Hose A" on the right side of engine (Figure 3). Use the hose cutting guide on the insert page to acquire the correct length.

13. Using the hose cutting guide, cut the 1-3/4" Fresh water suction hose, "Hose B" located on the left side of the fresh water pump (Figure 3).

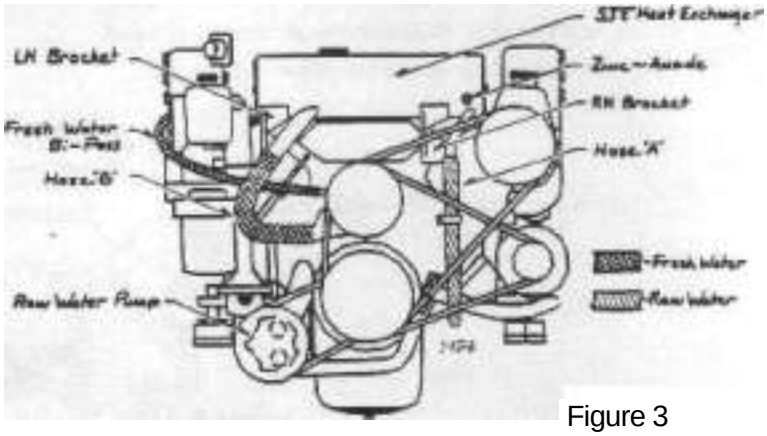
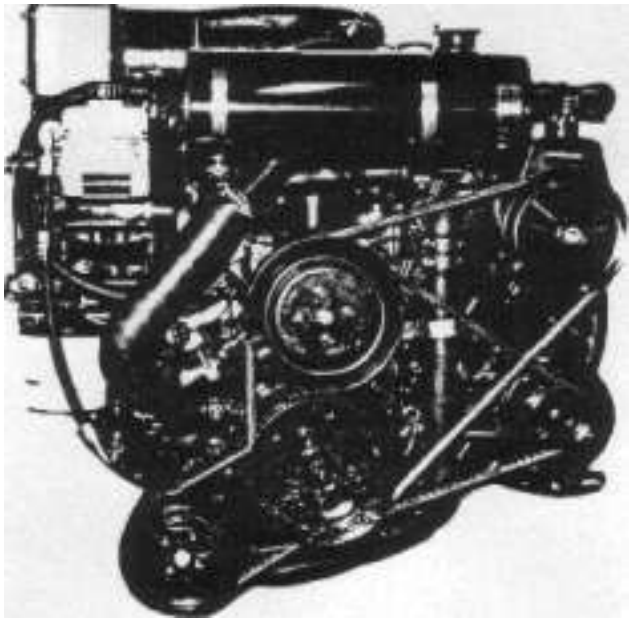


Figure 3

Use caution when tightening threaded fittings. Always use back-up wrench on threaded NPT female fittings ie., temp senders and zinc anode.

14. Using the 90 degree 1-1/2" hose elbow and *(2) #14* hose clamps provided in your kit, connect the thermostat assembly 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" spud on the back, right hand tide of the heat exchanger. This can be attached as you slowly set the heat exchanger tank down into its brackets.

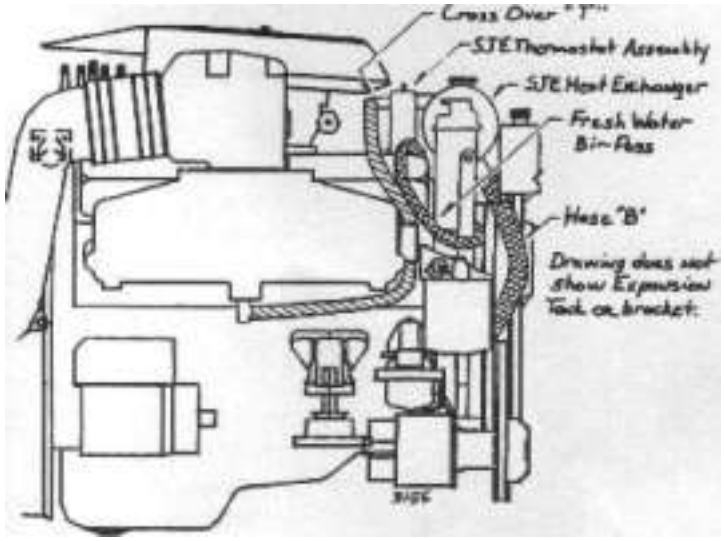
15. Connect raw water crossover divider tee to two 1" hoses from each manifold, then connect 1-1/4" (#70959) curved hose to top of 1-1/4" spud that connects to the heat exchanger pointed up. Connect other end when setting the heat exchanger down into its brackets.



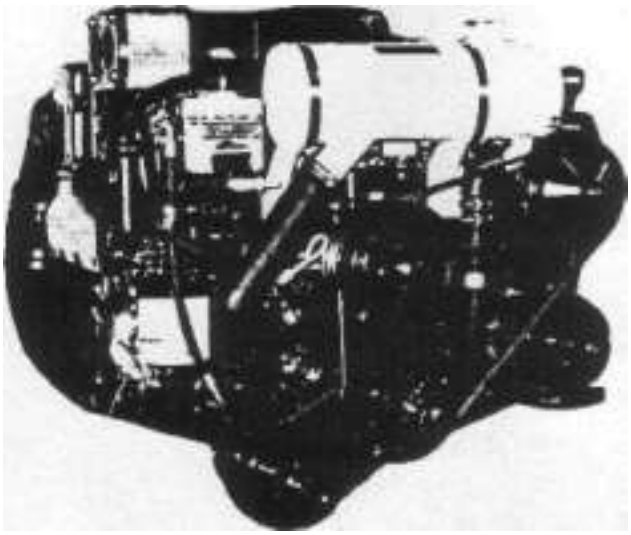
16. Place heat exchanger on brackets keeping the right end approximately 1/4" from the steering pump. Use the large #550 hose clamps to secure. Tighten clamps firmly. Connect hoses "A" and "B" to the spuds at the bottom of heat exchanger, Use the original hose clamps.

For installation and technical assistance, or information on other San Juan Engineering & Mfg. Co. Products, Please call (360) 734-1910 or fax 360) 734-9683

17. Mount the plastic accumulator tank in its wire hanger in a vertical position, near the engine and as high as possible. The stern location is the most desirable on stern drive boats. Install the plastic tube onto the heat exchanger overflow spud, just under the heat exchanger fill cap. Then route the tube in the least obstructional path and connect to the lower nipple on the plastic tank. Use spring clamp to secure tube to tank. Be sure that there is no sharp bends or kinks in this tube. Then place rubber hose supplied on tanks top overflow spud.



18. The zinc anode retards corrosion in the raw water side of the cooling system. Check occasionally, replace when 3/4 eroded. Make sure all hose clamps & bolts are firmly tightened before moving onto the start-up procedures.



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Parts List

MC317-0	**1**	**Instruction Manual**
MC 317-1	**1**	**Heat Exchanger**
MC 317-2	**1**	**RH Mount**
MC 317-3	**1**	**LH Mount**
MC 317-4	**1**	**Plastic Exp.Tank w/parts**
		pressure cap, plain cap, hose & clamps
MC 317-5	**1**	**Thermostat Housing #2025**
MC 317-6	**1**	**Thermostat Gasket #SJE-023-4A**
		Fittings
MC 317-7	**1**	**#54SB**
MC317-8	**1**	**#54EB**
MC 317-9	**1**	**1/2" X 1/2" X 3/8" Tee**
MC 317-10	**1**	**1/2" Close Galv. Nipple**
MC 317-11	**1**	**1/2" X 3/8" Bushing Galv.**
		Hoses
MC 317-12	**1**	**5/8" X 27"**
MC317-13	**1**	**#70959 Curved Hose (Cut)**
MC 317-14	**1**	**#70541Curved Hose (Cut)**
		Hose Clamps
MC 317-15	**2**	**#10**
MC 317-16	**4**	**#20**
MC 317-17	**2**	**#24**
MC 317-18	**2**	**#550**
		Bolts
MC 317-19	**3**	**3/8" X 1"**
MC 317 20	**1**	**3/8"X 1-1/2"**
MC317-21	**4**	**3/8" Lock Washers**
MC 317-22	**2**	**3/8" Flat Washers**

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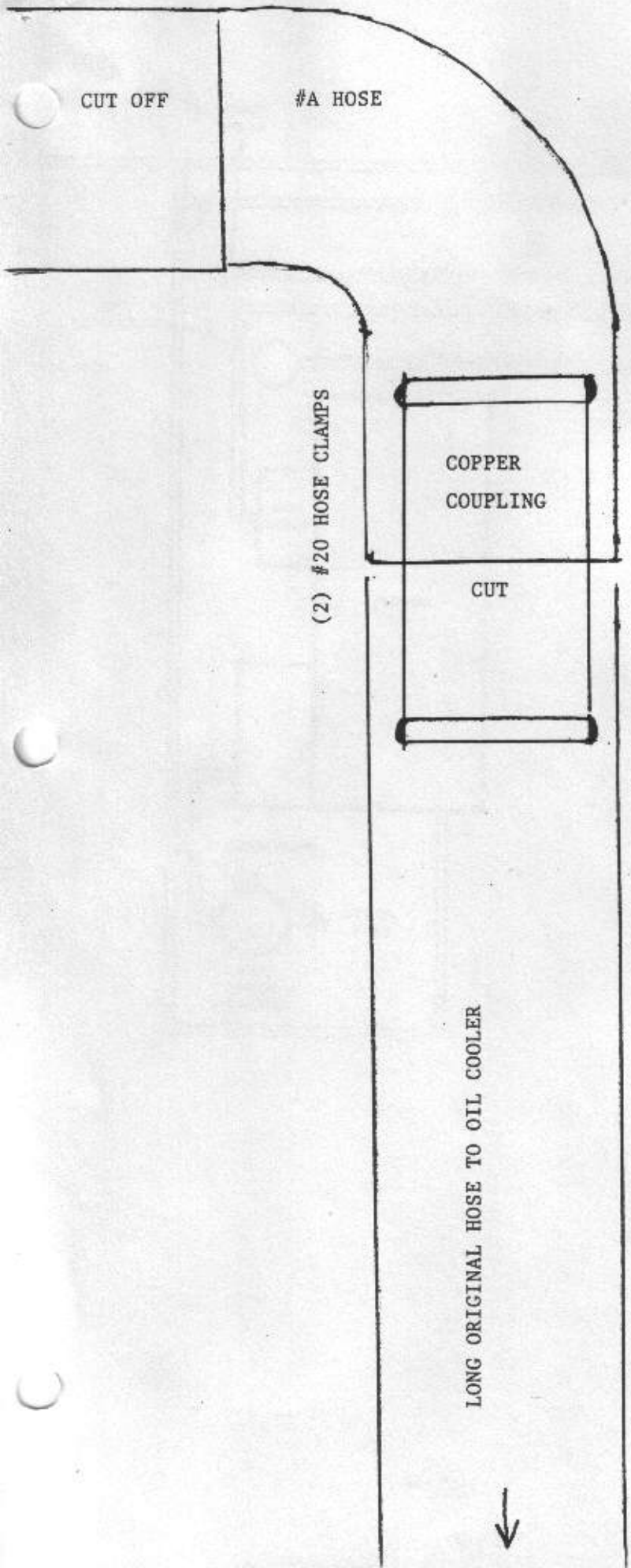
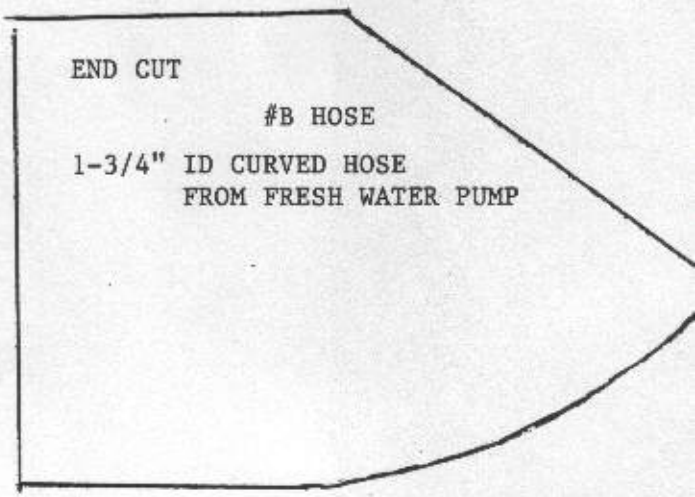
KIT #MC-317



HOSE CUTTING GUIDE



FORM #MC-317-96