

SANJUAN FRESH WATER COOLING SYSTEMS

5.7 M.P.I. MerCruiser With Flat Serpentine Belt "Block Only Cooling" (Total EFI) Kit #MC-325 Installation Instructions

San Juan Engineering Heat Exchangers provide thermostatically controlled fresh water cooling for marine engines. When installed on the engine, it does not increase the height, width, or length to 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 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 for the zinc anode in 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.

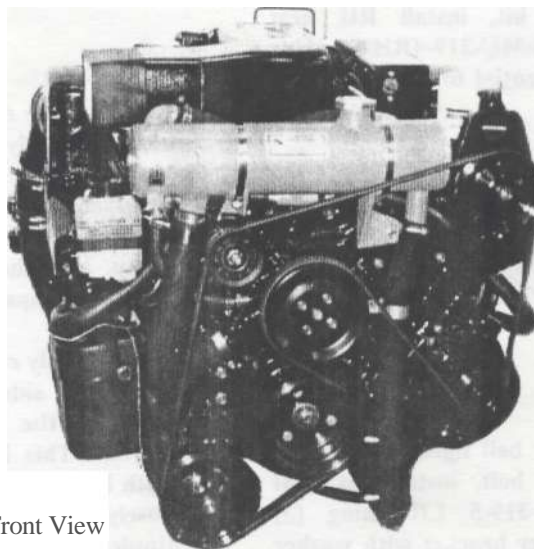
1. All instructions are given while facing the front of the engine. The alternator is on the right hand side, the fuel pump on the left hand side.

2. Disconnect battery cables.

3. Locate original thermostat housing assembly at top, front, center of engine (Figure I). 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 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 the bolts. You will replace these with new parts from your SJE kit.



Front View

SAN JUAN ENGINEERING & MANUFACTURING CO.

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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 1) 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 the large probe of the 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.

7. Retrieve from your SJE kit the new thermostat housing assembly (Figure I). 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.

8. Remove top front right hand nut from steering pump bracket. From kit, install RH heat exchanger bracket, #MC-319-4RH using NYLOCK NUT. It is essential to use NYLOCK NUT. Tighten nut firmly.

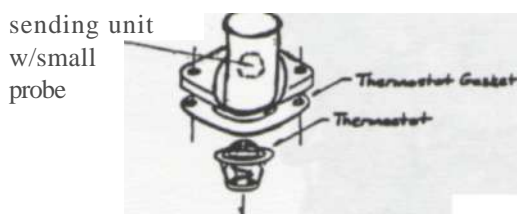


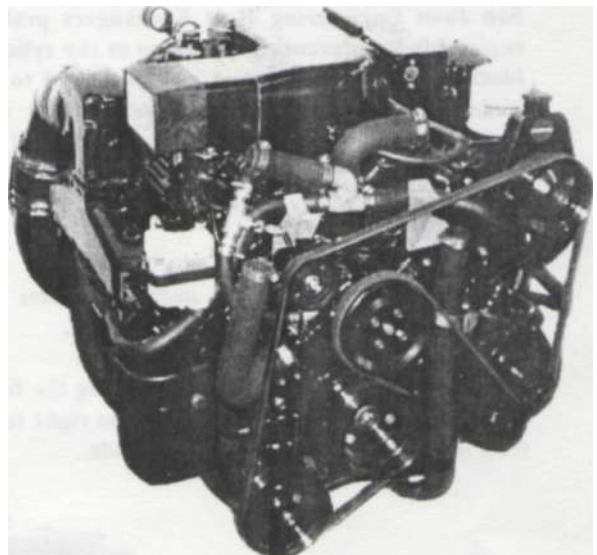
Figure 1

9. Remove top bolt under belt tightening pulley. Using the 3/8" X 1-1/2" bolt, install LH heat exchanger bracket #MC-319-5 LH using (3) SPACER WASHERS under bracket with washer and lock washer. Tighten bracket bolt firmly.

10. The (2) 1" hoses that were connected to the original thermostat housing now should be connected to the salt water divider tee. Add 1-1/4" x 5-3/4" hose and clamp onto tee.

11. 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 (he hose onto the thermostat assembly. The other end of the hose is connected to the 1-1/2" hose barb on (he back, right hand side of the heat exchanger. This can be attached as you slowly set the heat exchanger tank down into its brackets.

12. Connect all hoses.

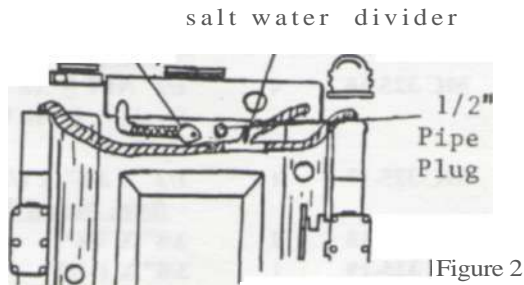


13. On some engines the lifting ring may need to be bent slightly backwards.

14. Place heat exchanger on brackets keeping the right end approximately 1/4" from the steering pump. Use the large #64 hose clamps to secure. Tighten clamps firmly.

15. Carefully cut the 1-1/4" raw water hose on the right hand side of engine. Use the hose cutting guide on the last page 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" hose nipple located on the lower right hand end of heat exchanger. Tighten hose clamp firmly.

16. 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.

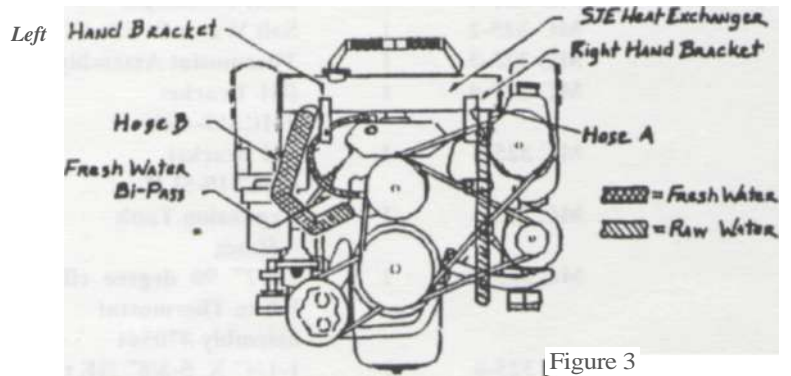


17. This system uses a recovery type accumulator tank for the expansion of the coolant and also removal of air from the system. Secure the plastic expansion tank in the best location for checking fluid. Cut a piece of 5/16" hose to connect the spud at the heat exchanger fill neck to the spud at the bottom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

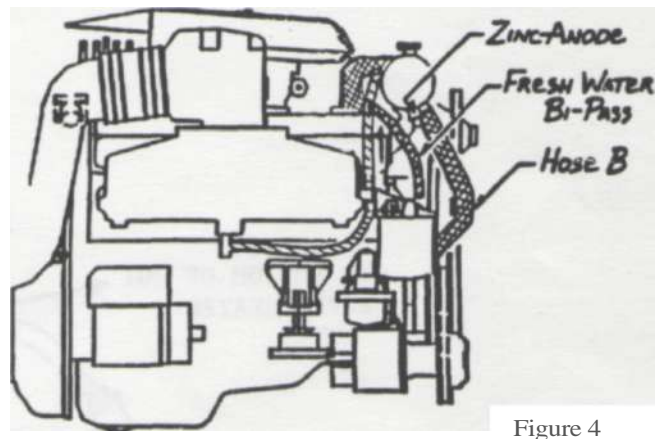
18. Fill accumulator tank to cold line. Fill through the fill cap neck on the heat exchanger until full. Continue to fill until water is overflowing at the fill neck. As it is IMPORTANT to remove all air from the system, leave the fill cap off after starting engine and be prepared to fill water into 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.

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

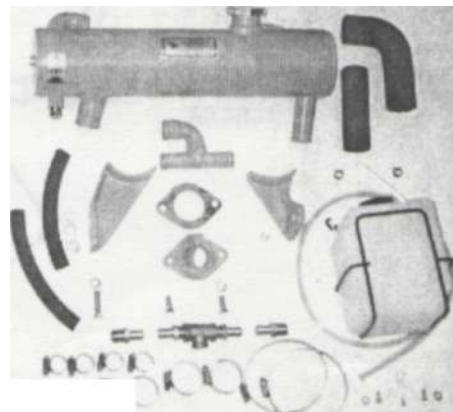
20. Check to make sure all hose clamps and bolts are firmly tightened before moving on to the start-up procedures.



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



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

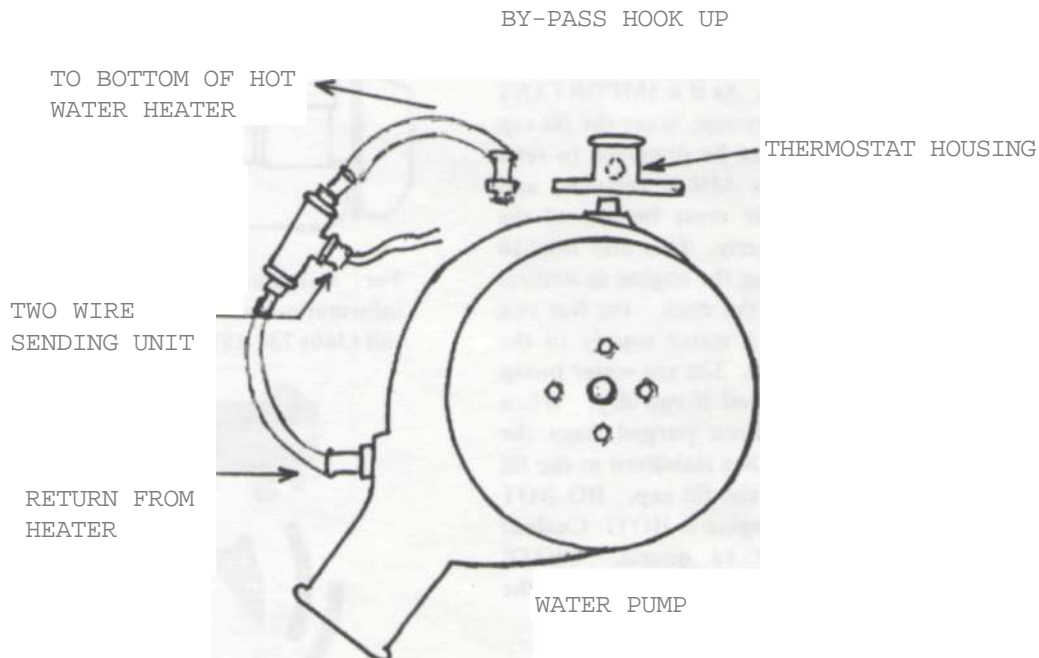


San Juan Engineering providing the highest quality of craftsmanship for over 39 years.

5.7 M.P.I. MerCruiser With Flat Serpentine Belt "Block Only Cooling" (Total E.F.I.) Kit #MC-325

PARTS LIST

| | | <i>Description</i> | | | <i>Hose Clamps</i> |
|-----------|---|--|-----------|---|---|
| MC-325-0 | 1 | Installation Manual | MC 325-11 | 2 | #64 HE Bracket |
| MC-325-1 | 1 | Heat Exchanger | MC 325-12 | 2 | #24 HE to Thermostat assembly |
| MC-325-2 | 1 | Salt Water Divider Tee | | | |
| MC-325-3 | 1 | Thermostat Assembly | MC 325-13 | 2 | #20 HE to Salt Water Divider Tee |
| MC-325-4 | 1 | RH Bracket #MC3I9-4RH | MC 325-14 | 4 | #10 Fresh Water By-P'ass Gasket |
| MC-325-5 | 1 | LH Bracket #MC3I9-5LH | MC 325-15 | 1 | Thermostat, SJE 03-4A |
| MC 325-6 | 1 | Expansion Tank | | | <i>Fittings</i> |
| | | <i>Hoses</i> | MC 325-16 | 4 | 1/2" NPTx5/8" Hose. Straight, Fresh Water By-Pass |
| MC 325-7 | 1 | 1-1/2" 90 degree elbow, HE to thermostat assembly #70541 | MC 325-17 | 1 | 1/2" X 3/8" X 1/2" Tee |
| MC-325-8 | 1 | 1-1/4" X 5-3/8" HE to Salt Water Divider Tee | MC 325-18 | 2 | <i>Bolts, Nuts & Washers</i> 3/8" X 7/8" |
| MC-325-9 | 1 | 5/8" X 7-1/2" Fresh Water By-Pass | M(325-10 | 1 | 3/8" X 1-1/2" |
| | | | M(325-20 | 4 | 3/8" Flat Washers |
| MC-325-10 | 1 | 5/8" X 8" Fresh Water By-Pass. | MC 325-21 | 3 | 3/8" Lock Washers |
| | | | MC 325-22 | 1 | 3/8" Nylock Nut |
| | | | MC 325-23 | 1 | Hose Cut Guide Insert |



KITS MC-325
MC-326

HOSE CUTTING GUIDE
INSERT SHEET KIT
#MC-325

#70541

HOSE
A

CUT

ORIGINAL LENGTH

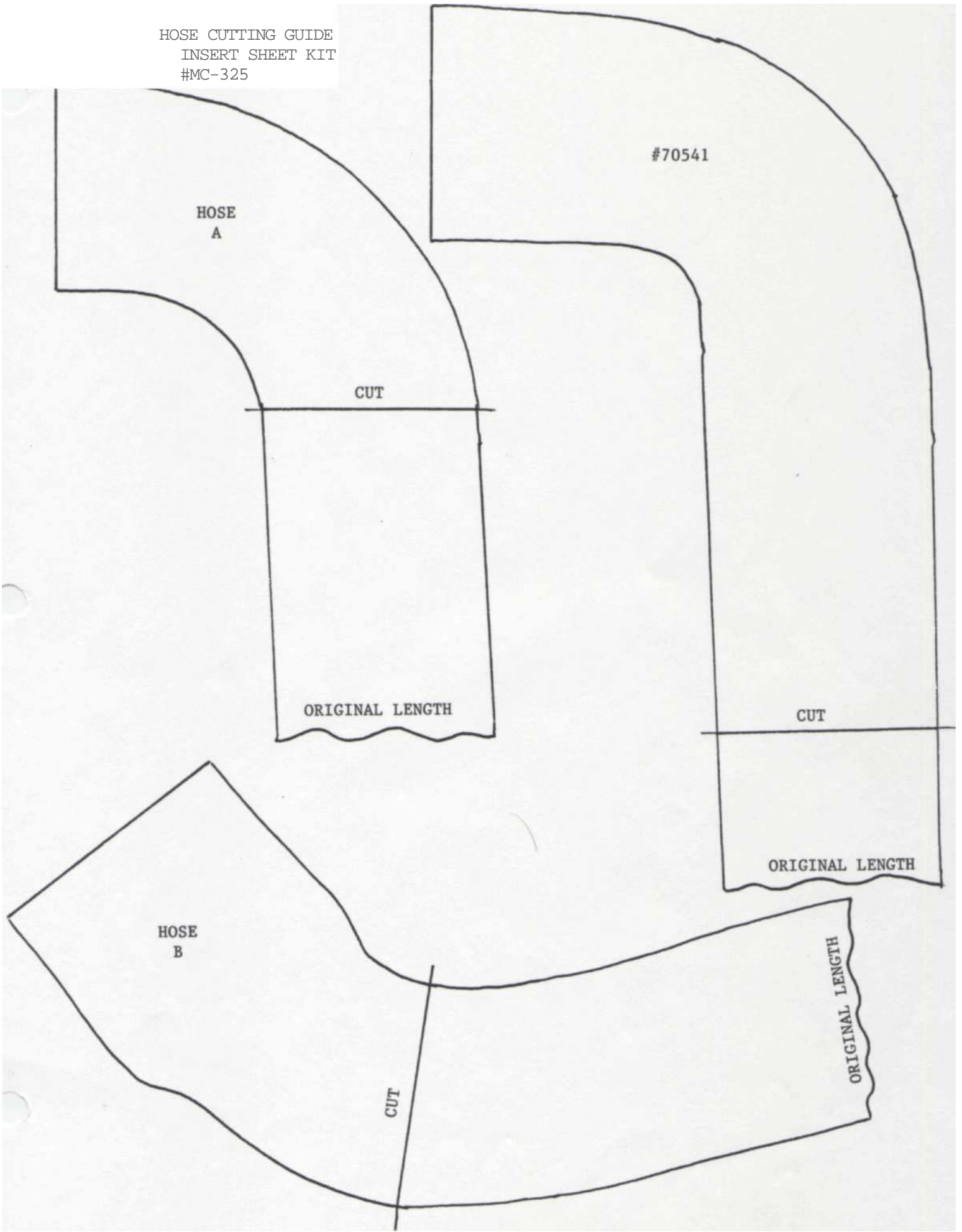
CUT

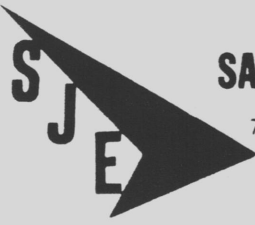
ORIGINAL LENGTH

HOSE
B

CUT

ORIGINAL LENGTH





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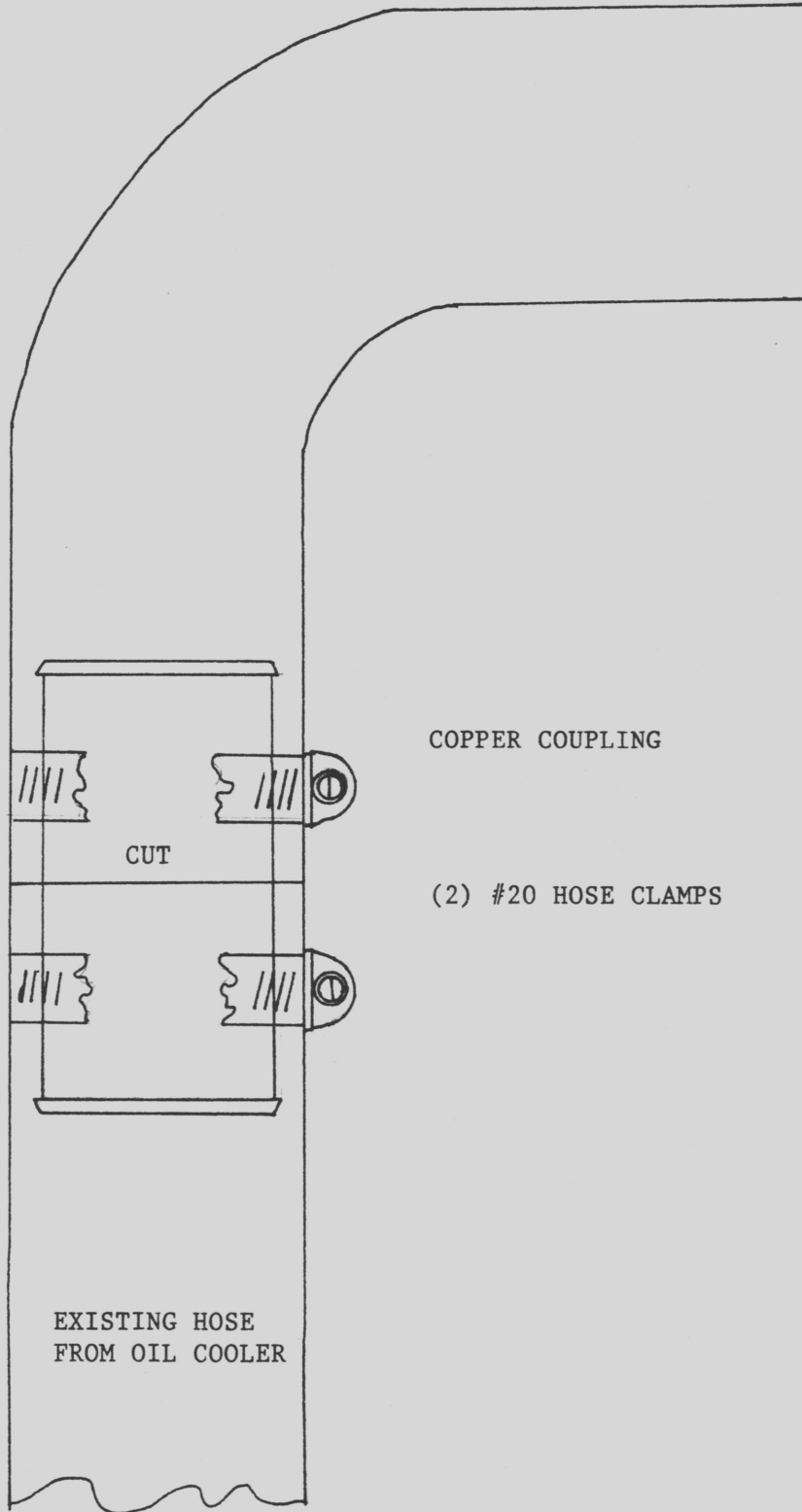
Fax (360) 734-9683

MC-320

MC-325

INBOARD & V-DRIVE

HOSE CUTTING GUIDE



1-1/4" O.D.

COPPER COUPLING

(2) #20 HOSE CLAMPS

CUT

FULL SCALE

EXISTING HOSE
FROM OIL COOLER