

SAN JUAN FRESH WATER COOLING SYSTEMS

3.0 Litre Volvo With Serpentine Belt "On Engine Mount" Block Only Cooling Kit #V115 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 their field for over 40 years. San Juan Engineering heat exchangers prolong engine life by preventing corrosion in the cylinder block. A hot water heater or cabin heater is now possible with fresh water cooling.

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

Use caution when tightening threaded fittings. Never over tighten and always use a back-up wrench on threaded NPT female fittings i.e., temperature sending units and zinc anodes. Be sure to use gasket cement on all gasket surfaces.

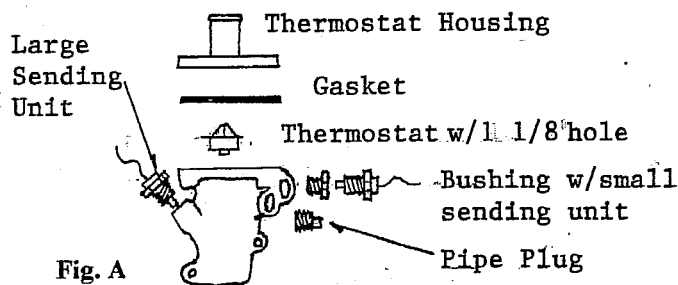
1. All instructions are given while facing the front of the engine. The alternator is on the right hand side.

2. Drain engine block, lower right side of engine near flywheel housing.

3. Locate the original thermostat housing at Top, Front, Center of the engine. Remove all the hoses from housing, leaving their other ends attached. Now, remove wires from temperature sending units and remove the sending units. Save.

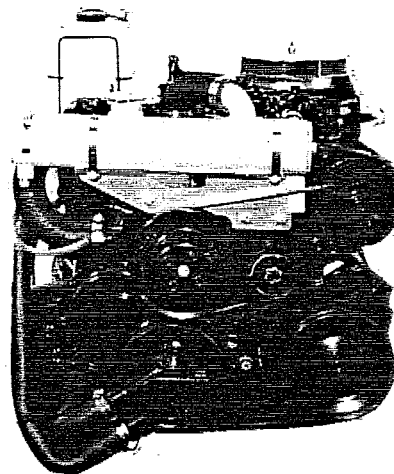
4. Remove and discard the original housing. Take the NEW water outlet casting from kit. Then install new housing and gasket onto engine, threading original bolt through the top, right hole. Place the new thermostat into water outlet recess. **BE SURE POINTED END IS UP.** Then lay gasket over thermostat and place the new thermostat housing on top. Bolt housing in place using (2) 3/8" X 7/8" bolts and lock washers. Next, install the sending units into the lower thermostat housing and connect wires. Also, install plug into remaining hole. (See figure A).

5. Retrieve the steel mount, retrieve (3) 3/8" X 2-3/4" bolts, (3) 3/8" lock washers, and the 3/8" steel pipe spacers from kit. Using one bolt, lock washer and 15/16" spacer, thread through farthest left hole in mount, and through lower left hole in lower thermostat housing. Leave finger tight. Take remaining bolts, lock washers and thread them through the mount into corresponding holes in exhaust manifold. Leave the existing spacer block in place. Tighten all bolts firmly.



6. Remove the 3/4" ID 90 degree hose from manifold, and using the hose cutting guide insert sheet, cut hose and assemble the 3/4" X 3/4" X 1/2" Tee and (2) #12 hose clamps to the hose. Fasten assembly to front end of exhaust manifold with the 1/2" OD spud pointing to the rear of the engine. Now, cut to fit the 1/2" ID hose from exhaust manifold outlet and attached to 1/2" OD spud on tee.

7. Use the two rubber strips between heat exchanger and mounting bracket. Using the (2) #52 clamps, fasten heat exchanger to mounts. (NOTE: The heat exchanger can be moved from side to side or twisted to help accommodate hoses).



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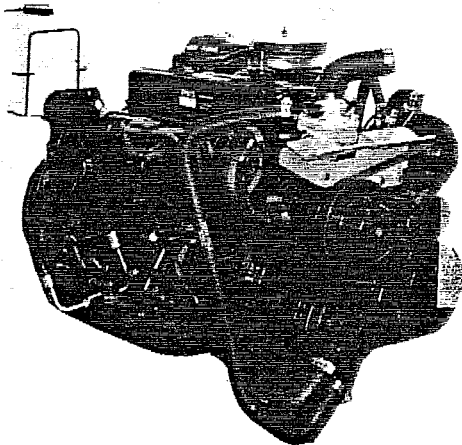
766 Marine Drive Bellingham, Washington 98225 USA PH: (360) 734-1910 FAX: (360) 734-9683

8. Cut the 1-3/4" ID fresh water suction hose using the hose cutting guide, and clamp to the 1-1/2" 90 degree elbow on the back left side of the heat exchanger, clamp firmly.

9. Remove the 1-1/2" ID 90 degree hose and (2) #24 clamps from the kit. Cut the hose to fit (see hose cutting guide insert) and plumb hose from the 1-1/2" OD 90 degree elbow on top, right side of heat exchanger to the 1-1/2" OD spud on thermostat housing.

10. Route the 3/4" ID hose (Cut to fit) from raw water pump and clamp to the 3/4" OD spud on left side of heat exchanger.

11. Attach the 3/4" ID hose assembly from the front of the exhaust manifold to the 3/4" OD spud on right side of the heat exchanger.



12. If an auxiliary hot water heater is to be installed, use 1/2" NPT hole in lower thermostat housing on the right side to the LOWER FITTING on heater. Use the 3/8" NPT fitting on the 1-1/2" OD copper elbow on left rear of heat exchanger, plumb hose to the TOP FITTING on heater.

IMPORTANT: When connecting cabin heater or hot water heater, certain requirements must be met.

A. Supply hose (from engine to heater) and return hose (from heater to engine) **MUST NOT EXCEED** 5/8 in. (16mm) inside diameter.

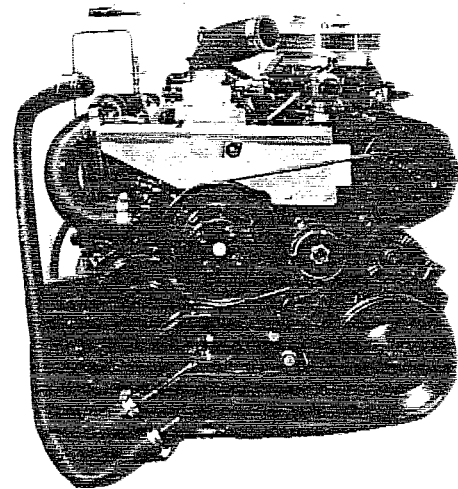
B. Make heater connections **ONLY** at locations described in the following instructions.

C. Check complete system for leaks after heater is connected into cooling system.

D. Check for overheating condition (of engine) after heater is connected.

CAUTION!

Heater must be mounted lower than the fill cap on the heat exchanger. If the heater is higher than the fill cap on the heat exchanger and some coolant is lost from the system, an air pocket may form in the closed cooling system. This can cause the engine to overheat.



13. 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.

14. Fill through the fill cap neck on heat exchanger until full. 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 without a salt 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. Fill accumulator tank to cold line. Do Not remove the fill cap when engine is hot! **OPTION:** Expansion tank may be mounted in the transom area or where ever desirable.

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

16. Check to make sure all hose clamps and bolts are firmly tightened before moving on to the start-up procedures on reverse side, (Sheet 1A).

PARTS LIST

PART # QTY. DESCRIPTION

V115-0	1	Installation Manual
V115-1	1	Heat Exchanger
V115-2	1	Thermostat Assembly, Upper
V115-3	1	Thermostat Assembly, Lower
V115-4	1	Hanging Bracket #117-B
V115-5	1	Water By-Pass Tee/Exh.Outlet
V115-6	1	Expansion Tank Kit
V115-7	1	Thermostat 330-160 w/1/8" hole
V115-8	2	Rubber Strips 1/8"
		<u>Hose Clamps</u>
V115-9	2	#12
V115-10	2	#24
V115-11	2	#52

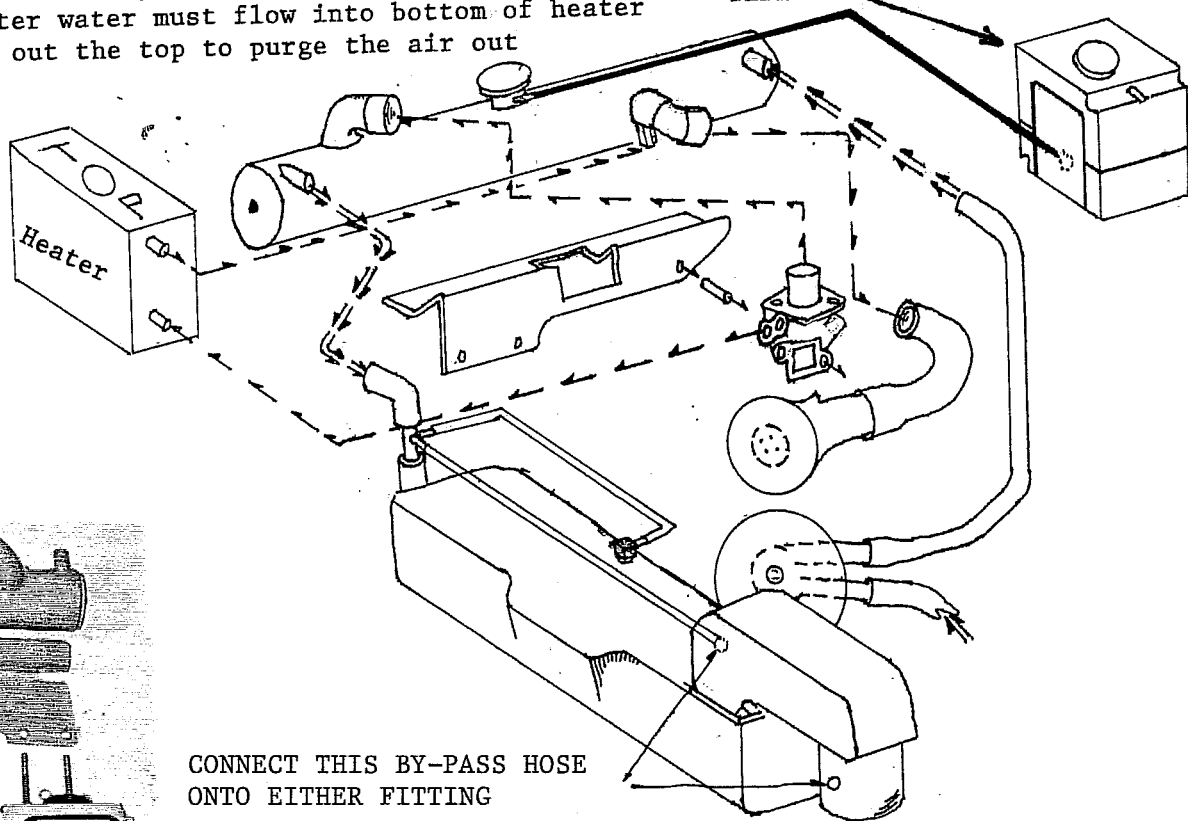
		<u>Hose</u>
V115-12	1	#70541 Curved
		<u>Gaskets</u>
V115-13	1	Thermostat, GMT-1 Upper
V115-14	1	Thermostat, #10140501 Lower
		<u>Fittings</u>
V115-15	1	1/2" Pipe Plug
V115-16	1	3/8" Pipe Plug in Heat Exch.
V115-17	1	3/8 X 1-5/16, 3/8" pipe spacer
		<u>Bolts, Nuts, & Washers</u>
V115-18	3	3/8" X 2-3/4"
V115-19	2	3/8" X 7/8"
V115-20	5	3/8" Lock Washers

Packed by _____ Date _____

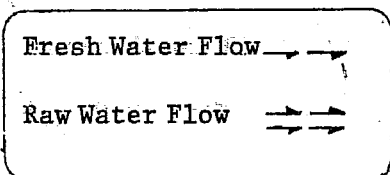
Photographs of heat exchangers and parts are painted yellow in this manual for clarity. In kits parts and heat exchanger are painted black.

(Optional)
Heater Hookup
Heater water must flow into bottom of heater
and out the top to purge the air out

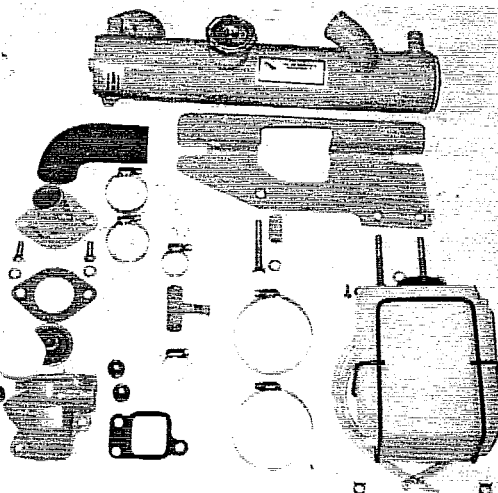
Accumulator
Tank



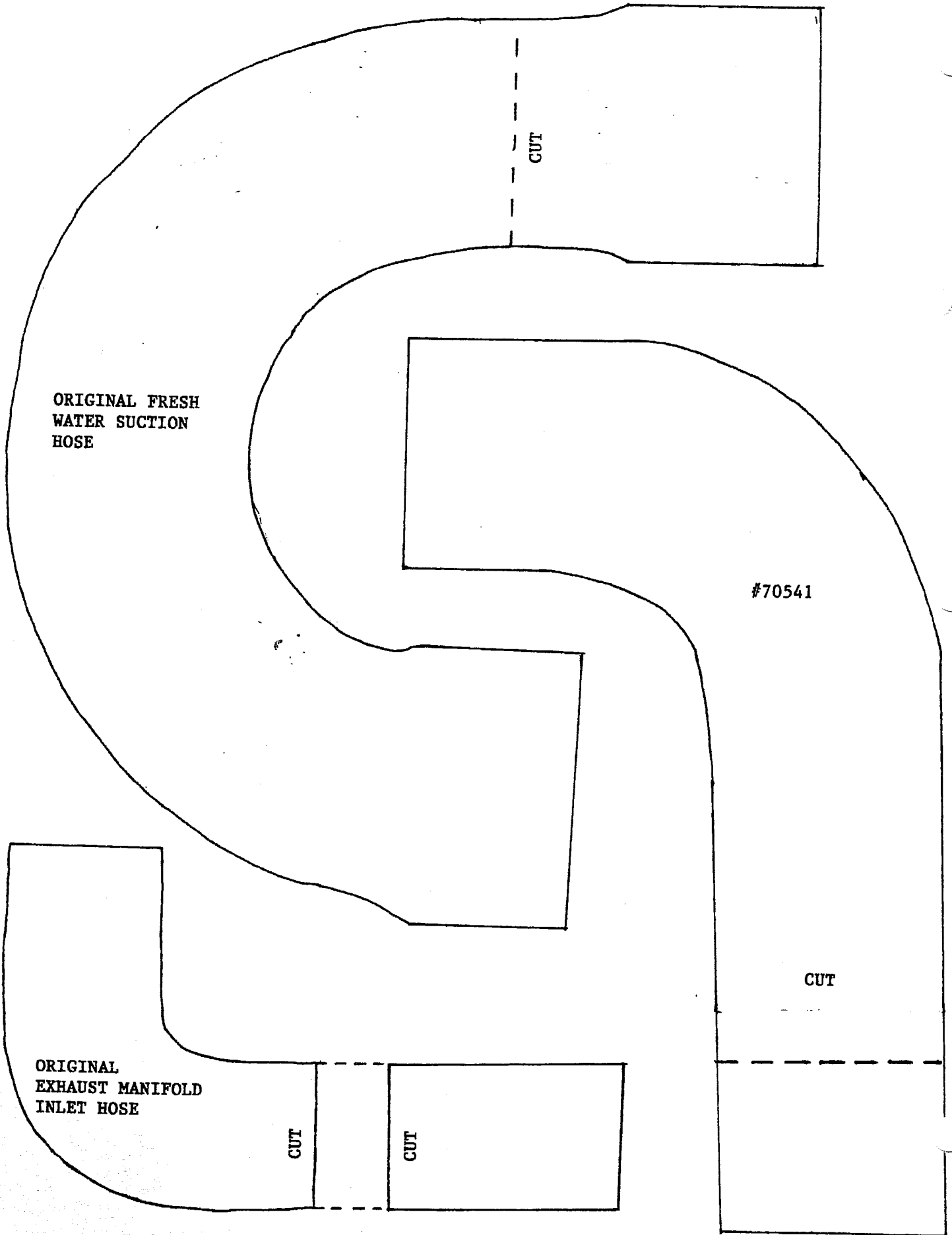
CONNECT THIS BY-PASS HOSE
ONTO EITHER FITTING



Form #V115-00



KIT V-115 HOSE CUTTING GUIDE



ORIGINAL FRESH
WATER SUCTION
HOSE

#70541

CUT

ORIGINAL
EXHAUST MANIFOLD
INLET HOSE

CUT

CUT

CUT