

# SAN JUAN FRESH WATER COOLING SYSTEMS

## 4.3 - 5.7 GI VOLVO Block Only Cooling, Mounted Off Engine Kit #V-111 Installation Instructions

San Juan Engineering Heat Exchangers provide thermostatically controlled fresh water cooling for marine engines. This installation adds 1-3/4" to the bottom of the engine, 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. 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.

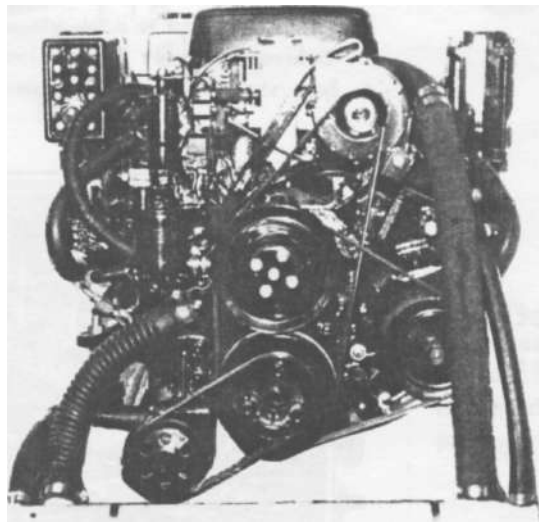
1. All instructions are given while facing the front of the engine. The alternator is on the right hand side, the fuel pump on the left hand side.

2. Disconnect the battery cables.

3. Locate the original thermostat housing assembly at the top, front, center of the engine. Remove all the 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. Remove the 1/4" NPT X 1/4" hose 90 degree fitting from top of housing and save for later. Disconnect wires connected to the water temperature sending units. Remove temperature senders and save for later.

4. Remove thermostat housing from engine by taking out the (2) 9/16" head bolts. Discard original thermostat housing, thermostat, lifting strap and bolts. You will replace these with new parts from your SJE kit. Clean thoroughly the thermostat gasket surface on intake manifold.

5. Remove temperature sender threaded into the intake manifold and save. This is located just to the left of the thermostat recess. Thread the provided 1/2" X 2" pipe nipple into this hole. Thread the provided 1/2" X 1/2" Cross onto the nipple. We recommend using pipe thread sealant on all threaded fittings.

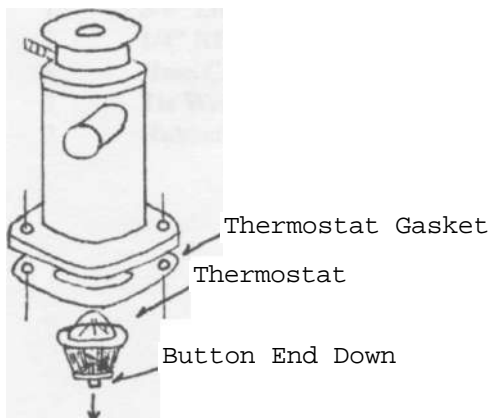


Front View

Photo 1

6. Connect together the two 3/4" raw water hoses leading from the exhaust manifolds using the 3/4" X 1/4" NPT X 7" copper "T" and the original hose clamps. These hoses were removed from the original thermostat housing in step #3. The 1" O.I), elbow on the "T" needs to point up and to the right. Using the original 1/4" NPT X 1/4" hose 90 degree fitting to thread into the 1/4" NPT nut on the tee. Connect the 1/4" raw water hose leading from the back of the engine to this spud using the (1) #8 or mini hose clamp. These hoses will be routed behind the thermostat housing and fresh water by-pass "T" to be installed next. You might need to cut one tie holding the 1/4" hose to the fuel line.

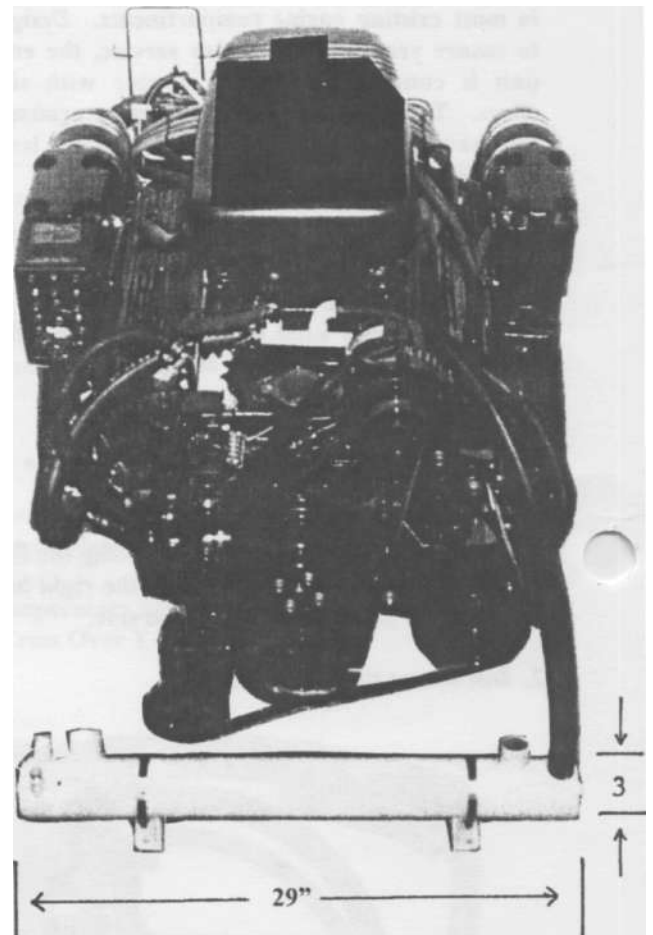
7. Thread the provided 1/2" NPT X 5/8" hose fitting into top of the Cross you threaded into the manifold. Make sure the 3/4" raw water hoses are behind the "T". This 5/8" spud needs to face out and between the front of the valve cover and behind the lifting strap. Install temperature senders into the remaining holes in the 1/2" NPT Cross. Remove the 1/2" pipe plug located on the left side of the fresh water pump, just above the 1-3/4" suction hose. Thread the provided 1/2" NPT X 5/8" hose straight fitting into this hole. Using the 20" piece of 5/8" hose and (2) #10 hose clamps, plumb these two fittings together. This is your fresh water by-pass and can be used for a heater. For a heater, plumb the bottom of the heater to the by-pass outlet at the top of the "T", the top of the heater to the outlet at the water pump.



8. Retrieve from you SJE kit the new thermostat housing (Figure 2). Insert new thermostat, button end down into recess in manifold. Position new

thermostat gasket between thermostat and thermostat housing. With the 1-1/4" O.D. hose spud pointing forward, secure the housing with (2) 3/8" X 7/8" bolts and lockwashers. **TIGHTEN BOLTS EVENLY & FIRMLY.** Make sure the 3/4" raw water hose is behind the thermostat housing. Connect wires to both temperature senders.

Photo 2



On some engines, use 1/4" NPT pipe plug to plug hole in raw water "T".

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

**San Juan Engineering providing the highest quality of craftsmanship for over 40 years.**

9. **NOTE; Tie Wrap applications (also see supplement sheet).** The 1" I.D. hose that connects the heat exchanger to the salt water tee, needs to be tie wrapped or taped to the 3/4" I.D. hose from the exhaust manifold to the tee, so as to clear the power steering pump pulley. The 1-1/4" I.D. hose from the thermostat housing to the heat exchanger should be tie wrapped to the hole below the red button on the fuel pump bracket, to keep hose away from belts, (see drawing on supplement sheet).

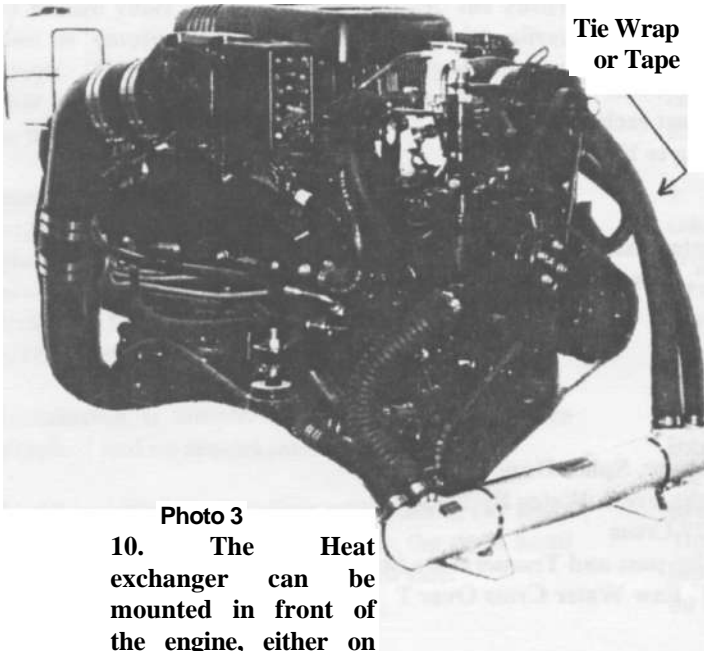


Photo 3

10. The Heat exchanger can be mounted in front of the engine, either on the deck or bulkhead using the 3" aluminum brackets and clamps provided. Use rubber pads between heat exchanger and mounts.

11. Now Hose up as shown in Photo's 1,2,3, 4, and 5. Cut and fit hoses according to hose cutting guide inserted in this manual

12. This system uses a recovery type accumulator tank for the expansion of the coolant and also the removal of air from the system. This assembly can be re-located back to clear engine hatch or any other desirable location including the transom area. Cut a piece of 5/16" hose to connect the spud at the thermostat housing fill neck to the spud at the bottom of the expansion tank. Use the (2) 5/16" spring clamps to secure the hose. The remaining hose is used as overflow. Attach one end to the spud at the top of the tank and the other is routed toward the bilge area.

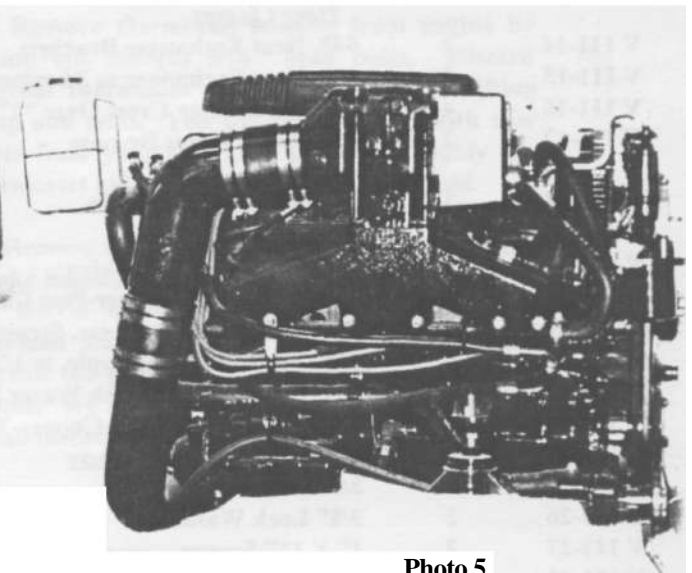


Photo 5

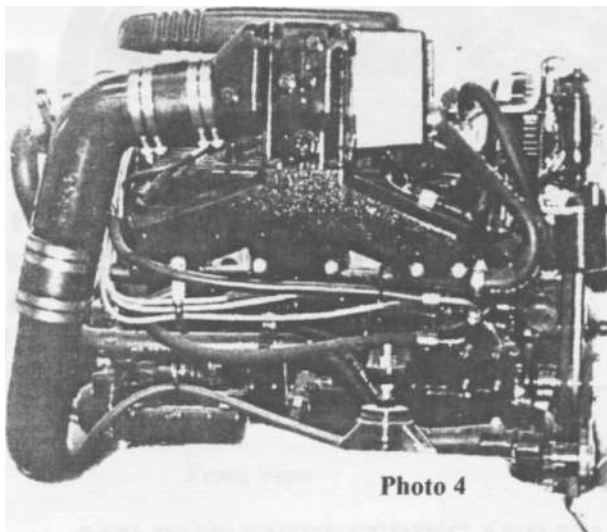


Photo 4

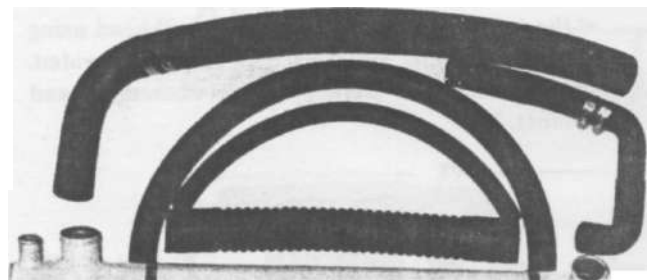
13. The zinc anode retards corrosion. Check occasionally and replace when 3/4 eroded. Check to make sure all hose clamps and bolts are firmly tightened before moving onto the start-up procedures.

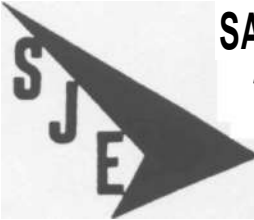
For installation and technical assistance, or information on other San Juan Engineering products, please call PH: (360) 734-1910 or by FAX (360) 734-9683.

## 4.3-5.7 G1 VOLVO "BLOCK ONLY" COOLING MOUNTED OFF ENGINE KIT #V-111

### Parts List

		<u>Description</u>
V 111-0	1	Installation Manual
V 111-1	1	Heat Exchanger, SJE ID # located top RH end.
V 111-2	1	Thermostat Housing
V 111-3	1	Right Hand Mounting Bracket
V 111-4	1	Left Hand Mounting Bracket
V 111-5	1	Expansion Tank
V 111-6	1	Thermostat, 160 degree
V111-7	1	Pressure Cap
		<u>Hoses</u>
V 111-8	1	5/8" X 20", Fresh Water By-pass
V 111-9	1	5/16" X 48", Expansion Tank Overflow
V 111-10	1	1-3/4" X 16-1/2" Flex Hose #81331
V 111-11	1	1" X 37", Heat Exchanger to Raw water T
V 111-12	1	1" X 11", Raw water pump to Heat exchanger
V 111-13	1	1-1/4" X 36", Thermostat Housing to Heat exchanger
		<u>Hose Clumps</u>
V 111-14	2	#48, Heat Exchanger Brackets
V 111-15	2	#20, Heat Exchanger to Thermostat Assembly
V 111-16	4	#16, Raw Water Cross Over "T", Raw Water Pump
V 111-17	2	#10, Fresh Water By-pass
		<u>Gaskets</u>
V 111-18	1	Thermostat, SJE 023-4A
		<u>Fittings</u>
V 111-19	1	3/8" X 1/2" Brass Bushing
V 111-20	1	1" OD X 2-3/4" Copper Pipe Coupler, Splice Hose
V 111-21	2	1/2" X 5/8", NPT to Hose, Straight, Fresh Water By-Pass
V 111-22	1	1/2" X 1-1/2", Pipe Nipple, to 1/2" Cross
V 111-23	1	1/2" X 1/2" Cross, Fresh Water By-pass and Temperature Sending Unit
V 111-24	1	3/4" X 1/4" NPT X 7", Copper T, Raw Water Cross Over T
		<u>Bolts, Nuts, and Washers</u>
V 111-25	2	3/8" X 7/8" Bolts
V 111-26	2	3/8" Lock Washers
V 111-27	2	1" X 12" Screws
V 111-28	2	1/4" Flat Washers
V 111-29	1	3/8" Zinc Anode
V 111-30	1	1/4" NPT Pipe Plug
V 111-31	1	Hose Cutting Insert Sheet
V 111-32	2	Tie Wraps
V 111-33	2	Rubber Pads





# SAN JUAN ENGINEERING & MANUFACTURING CO.

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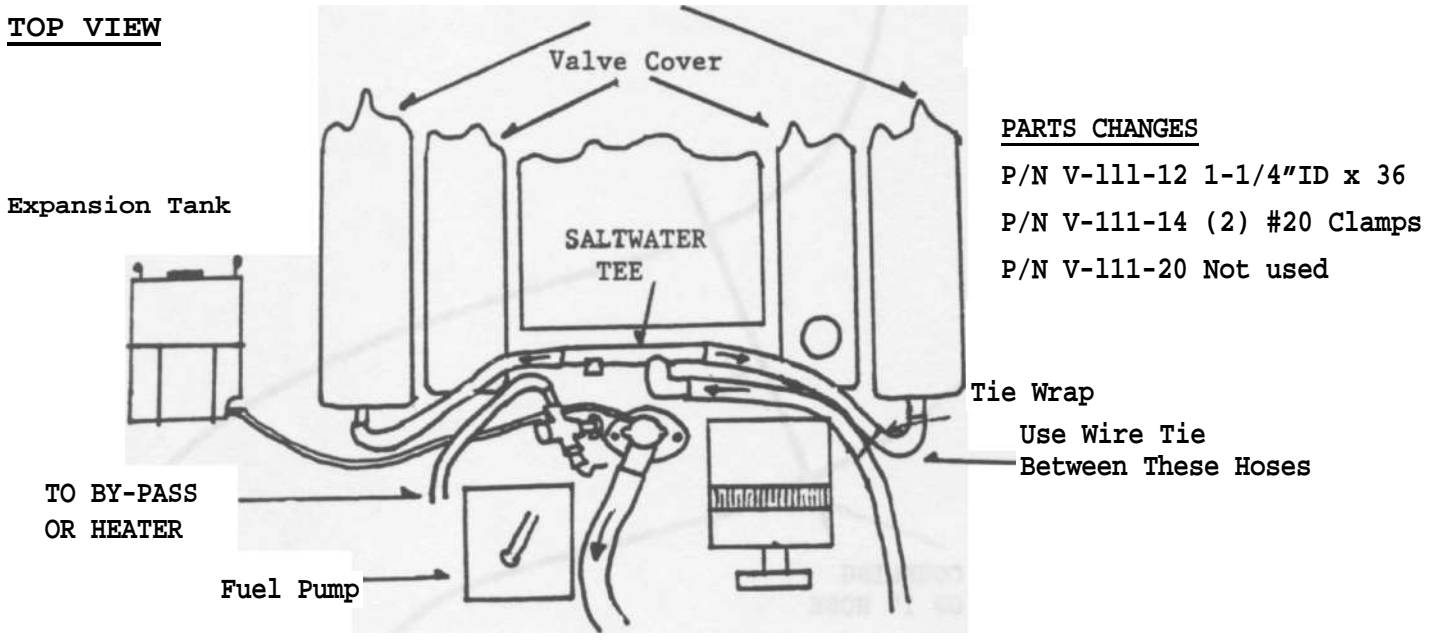
Phone (360) 734-1910

Fax (360) 734-9683

## PARTS CHANGE AND HOSE GUIDE SUPPLEMENT FOR 1999 VOLVO V-111

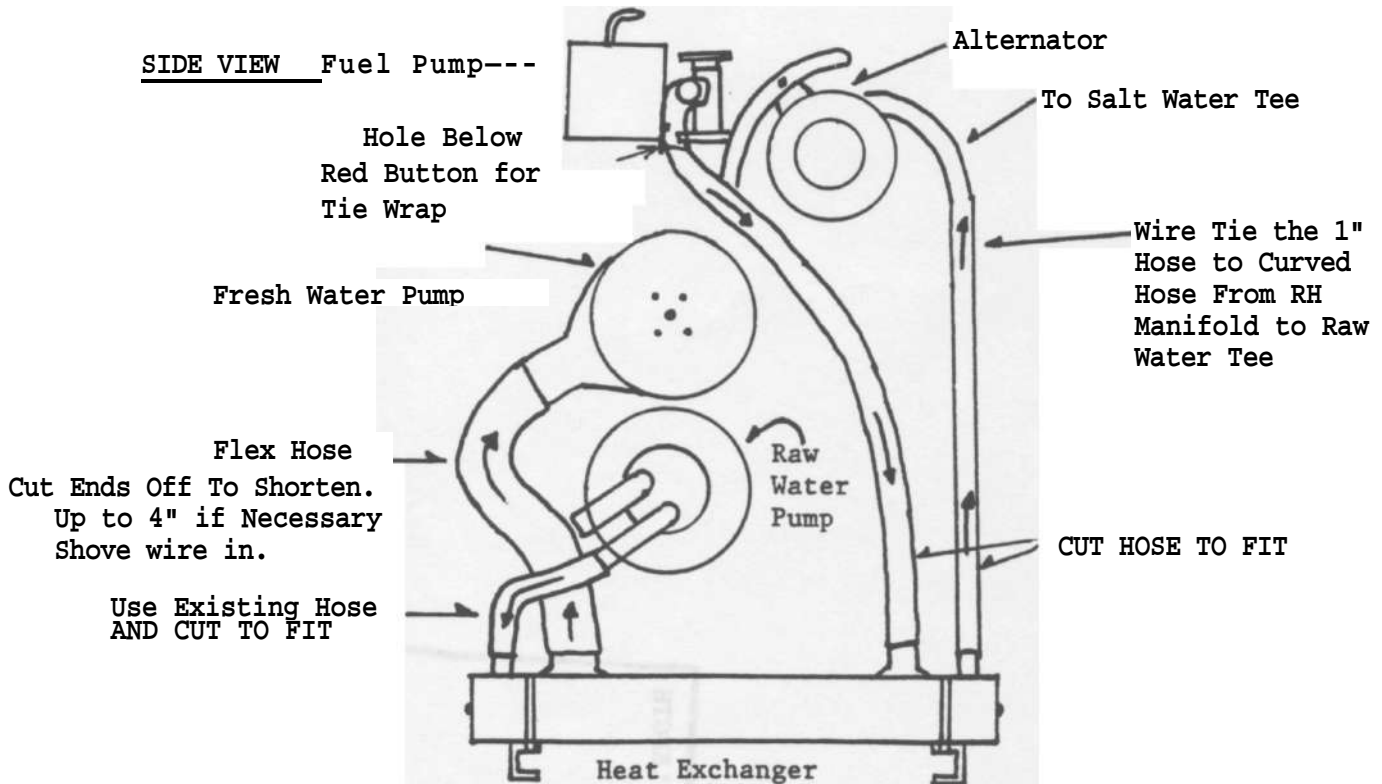
### Exhaust Manifold

#### TOP VIEW

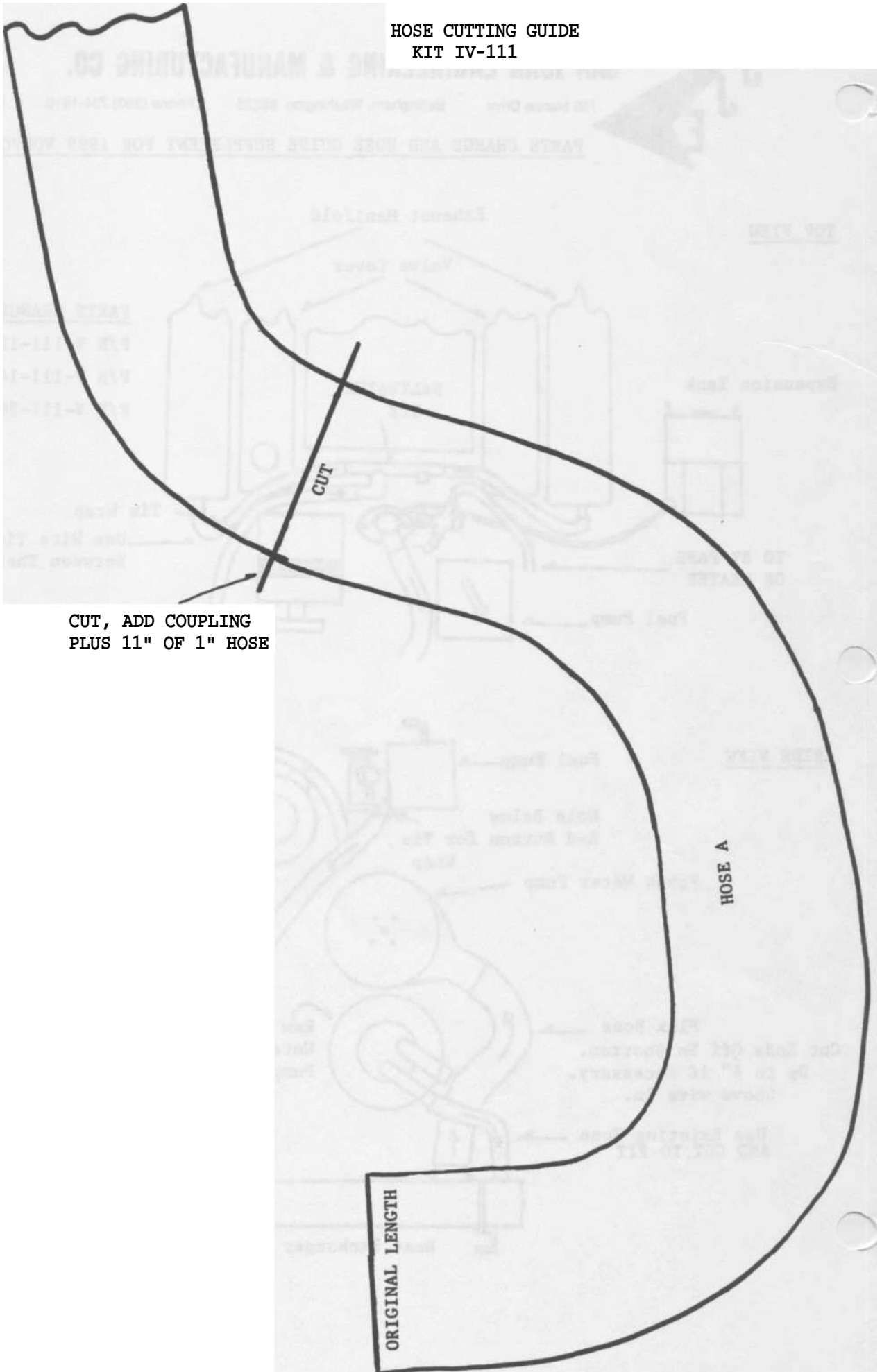


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#### SIDE VIEW



**HOSE CUTTING GUIDE  
KIT IV-111**



**CUT, ADD COUPLING  
PLUS 11" OF 1" HOSE**

**ORIGINAL LENGTH**

**HOSE A**