

**ORCA
MARINE COOLING SYSTEMS
BELLINGHAM, WA 98226**

**4.3/5.0/5.7
2002 - 2007
Serpentine belt**

**Installation instructions
20 February 2008**

**00252-500581
1/2 system
Horizontal mount**

NOTE: This kit does not include a new engine shroud. If needed, it is available from Volvo, Part #3862306.

1. Remove the engine shroud. If you choose to save it you may have to trim the front to allow the heat exchanger to fit. Drain and flush the engine according to your owner's manual. Detach all hoses at the thermostat housing. Pull the top end of the large water pump hose from under the fuel lines and out of the way to the side of the engine. Detach the sending unit wire and then remove the sending unit from the thermostat housing. Remove but save the 5/16 brass 90° hose elbow from the thermostat housing. Remove and discard the thermostat housing but save the lifting eye. Clean the gasket surface on the intake manifold and then stuff a clean rag temporarily in the opening.

2. Install the sending unit from step 1 in the center hole of the new, 3-hole thermostat housing. This housing will be installed with the thermostat recess on top and the brass fittings forward. Install the 5/8H x 3/8M brass hose barb in the port side of the thermostat housing and the 3/8 brass plug in the remaining hole. Replace the 3/4 plug in the top of the circulating pump with the 5/8H x 3/4M brass hose barb.

HEATER INSTALLATION: Fittings and hose not provided. If you are installing a heater you will thread in a 3/8F x 3/8M brass adapter into the 3-hole housing instead of the hose barb. Into that adapter will go a 5/8H x 3/8M 90° brass hose elbow. This will be the pressure feed to your heater. You will replace the 3/4 plug in the top of the circulating pump with a 1/2F x 3/4M brass adapter and then a 5/8H x 1/2M 90° brass hose elbow. This will be the suction return from your heater.

3. Remove the rag and place the #5-A continuity gasket on the cleaned, intake manifold gasket surface. This gasket has the small brass buttons that are crucial for electrical continuity. Set the 3-hole housing in place and then the new thermostat with the spring down. The #5 fiber gasket goes on top and then the new water outlet with the 1/4" tapped hole towards the starboard side of the engine. Connect the 5/8 brass hose barbs with the 5/8 x 90° hose (trim as required) and #08 clamps. The lifting eye will go on the port side of the water outlet.

Use the 3/8 x 2-1/4 hex cap screws and lock washers to attach the assembly if prior to model year 2002. Otherwise use the 8 x 55 mm hex cap screws, lock washers and 3/8 copper sleeves to secure the assembly. Reconnect the sending unit wire.

4. Remove the 2 flange bolts holding the fuel pump to its bracket. Do not remove the rubber grommets. Insert the new, 2-piece saddle bracket assembly between the rubber grommets and the steel fuel pump bracket. The saddle will be forward and nearest to the center of the engine. Secure loosely with the 3/8 x 1-1/4 plated flange bolts if prior to 2002 model year and the 10 x 30 flange bolts and washers for the newer engine. Remove the inboard alternator bolt and slip the new saddle bracket over the bushing. The saddle will be inboard and the tang on the bracket will rest against the alternator bracket. Replace the alternator bolt and tighten securely.

5. Connect the original 3/4 hoses from the front of the exhaust manifolds to the legs of the 3/4 x 3/4 x 1-1/4 90° copper tee. Face the elbow upright and to starboard. Trim the hoses as needed to center the tee. Use the 1 x 1 x 1/4NPTF copper tee and #16 clamps to connect the **sea water inlet hose** from the pump to the 1 x 8 extension hose. Orient the 1/4 NPTF fitting upright and thread in the 5/16 hose elbow removed in step 1. Connect the 5/16 fuel cooler hose to the elbow and secure with the clamp.

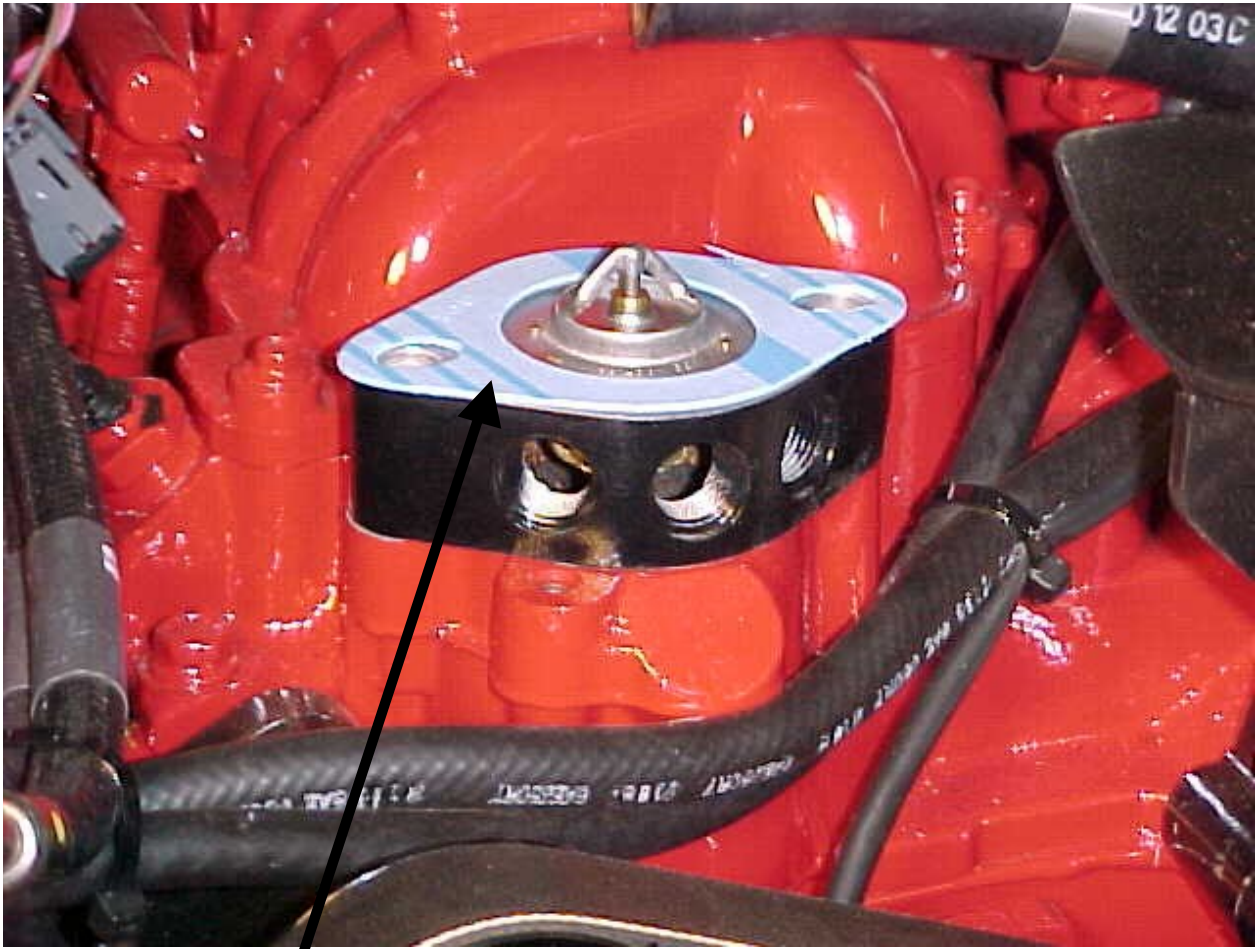
6. Place the cushion tape on the saddle brackets and loosely secure the heat exchanger with the 5.25 T-bolt clamps. Trim and fit the large water pump hose from step 1 to fit the 1-1/2OD elbow on the bottom of the heat exchanger. Secure with the #24 clamp. Trim and fit the 1-1/2 90° formed hose between the water outlet and the elbow on the heat exchanger. Trim and connect the extended raw water supply hose to the heat exchanger and secure with a #16 clamp. Finally, connect the 1-1/4 elbow on the heat exchanger to the 3/4 x 3/4 x 1-1/4 90° copper tee by trimming the 1-1/4 x 11 hose to fit and securing with the #20 clamps.

7. Adjust the 2 piece slotted saddle bracket so the heat exchanger is level and square to the engine. Use the P-clamp, the 1/4" hex cap screw and lock washer to hold the copper tee to the water outlet. Check that all screws, clamps and mounting bolts are secure and that no hoses will be rubbing against belts or engine parts.

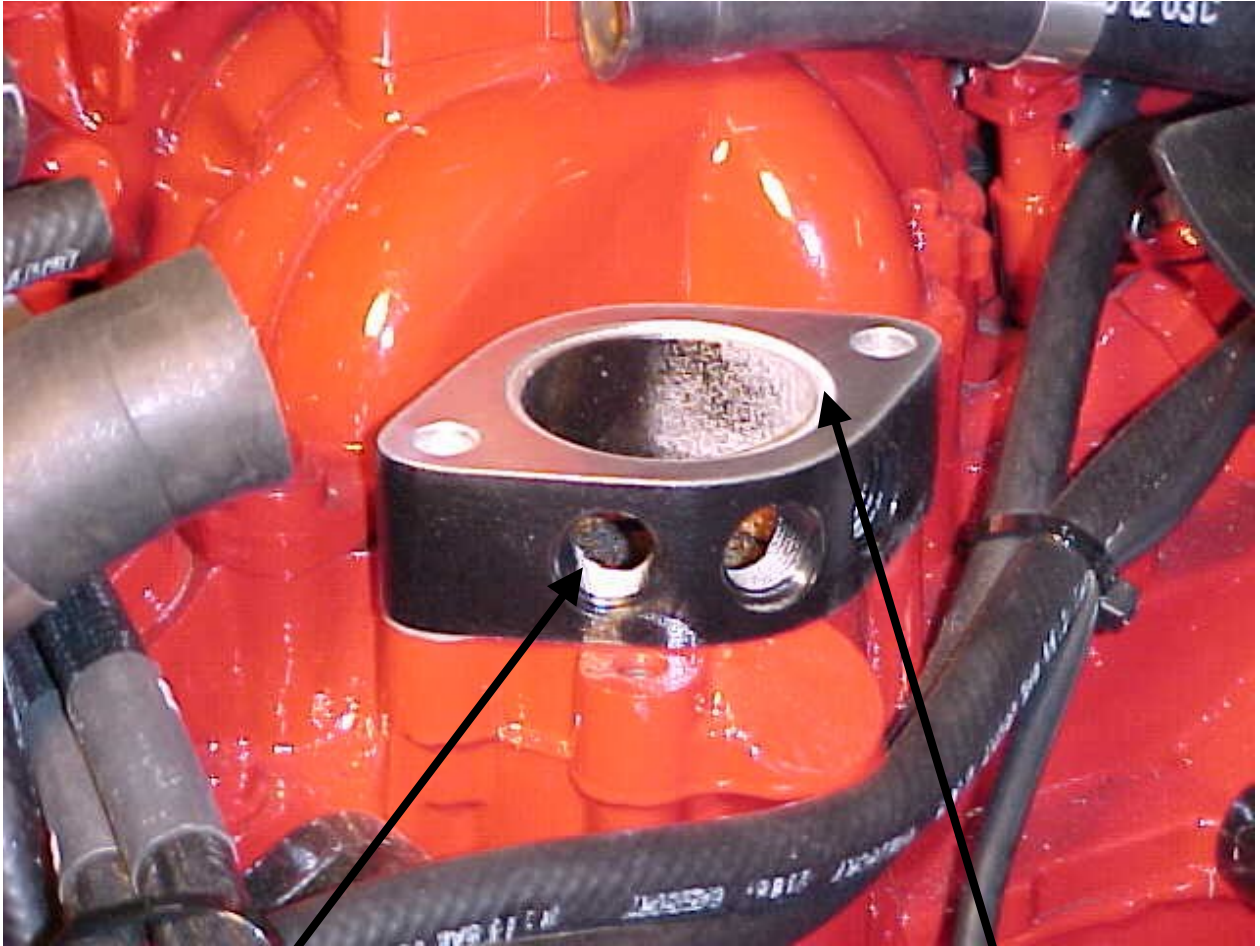
8. Fill the system with a maximum 50/50 mix of antifreeze and distilled water. Install the coolant recovery tank so it will siphon the overflow back into the engine when it cools.

The fluid level in the system should be adjusted so it is always at least above the cold level in the recovery bottle when the engine is not warmed up and under the hot level when the engine is at operating temperature. Idle to operating temperature and check all connections for leaks.

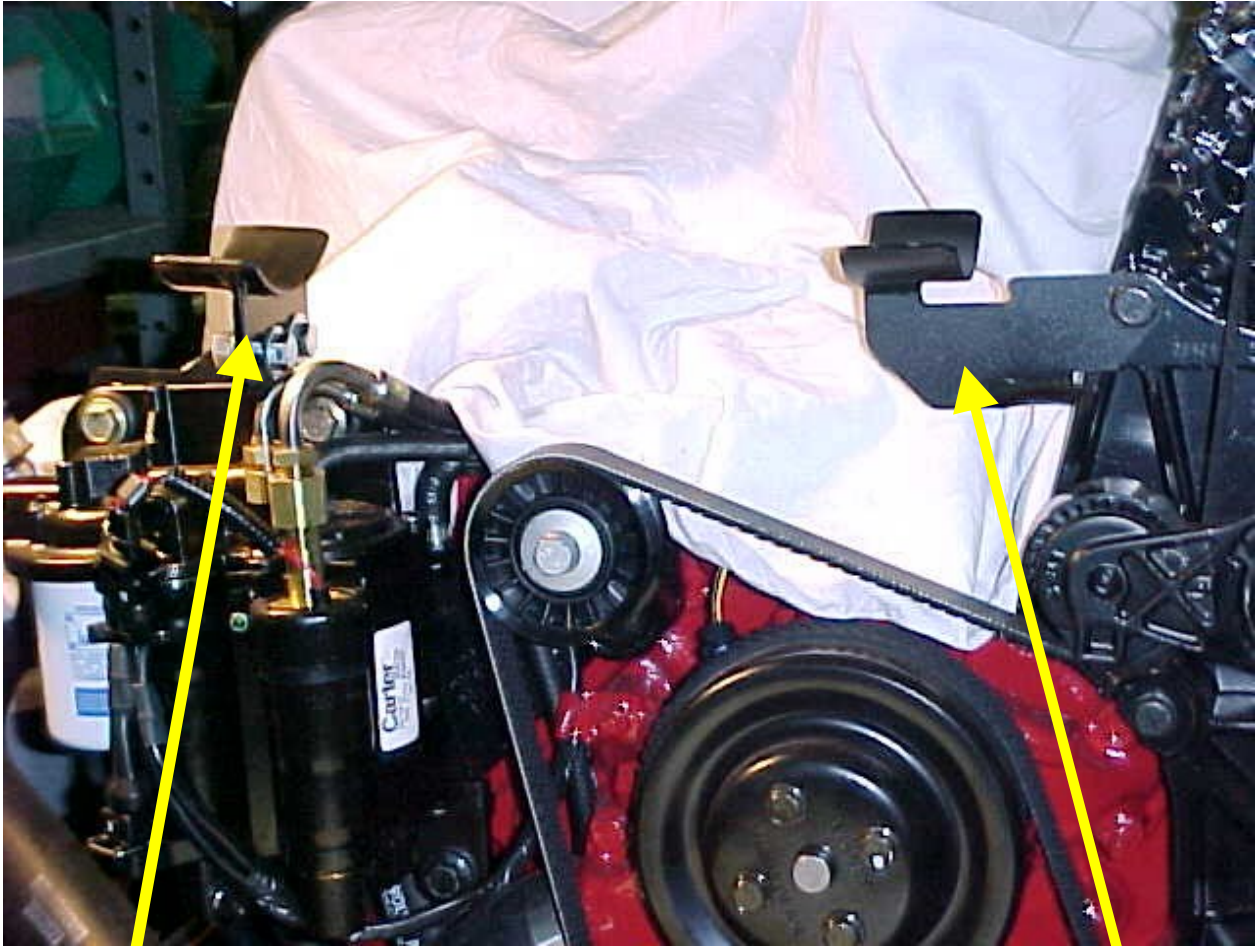
9. Install the engine cover. Use a heat gun or hair dryer to soften the front lip to mould and clear the heat exchanger. Use gloves or pliers if needed to prevent injury.



FIBER GASKET ON TOP OF 3-HOLE THERMOSTAT HOUSING WITH THERMOSTAT IN PLACE.



3-HOLE THERMOSTAT HOUSING ON TOP OF CONTINUITY GASKET (4 SMALL BRASS BUTTONS). THERMOSTAT RECESS IN UP POSITION. TAPPED HOLES FACING FRONT.

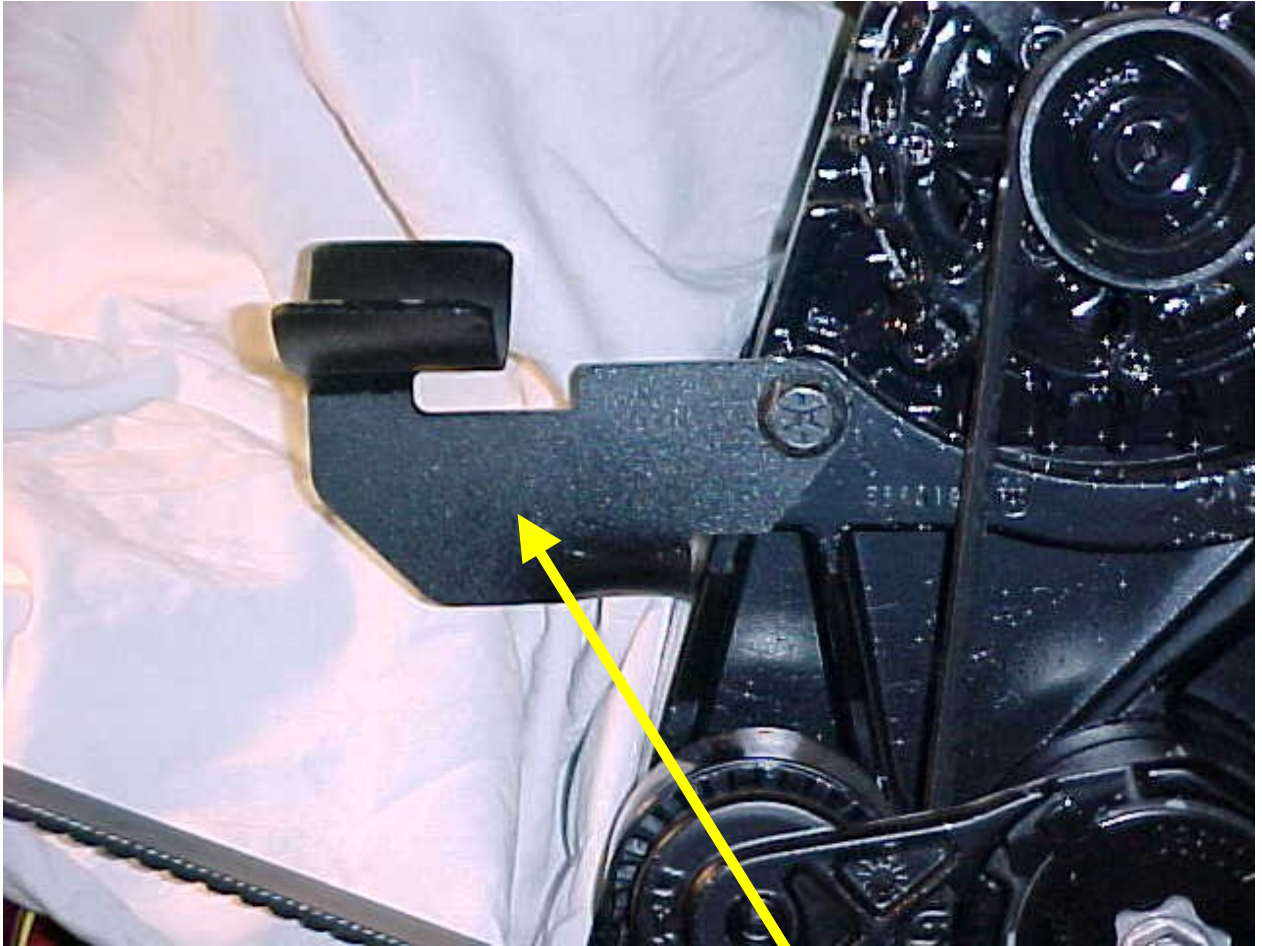


STARBOARD
BRACKET
INSTALLED

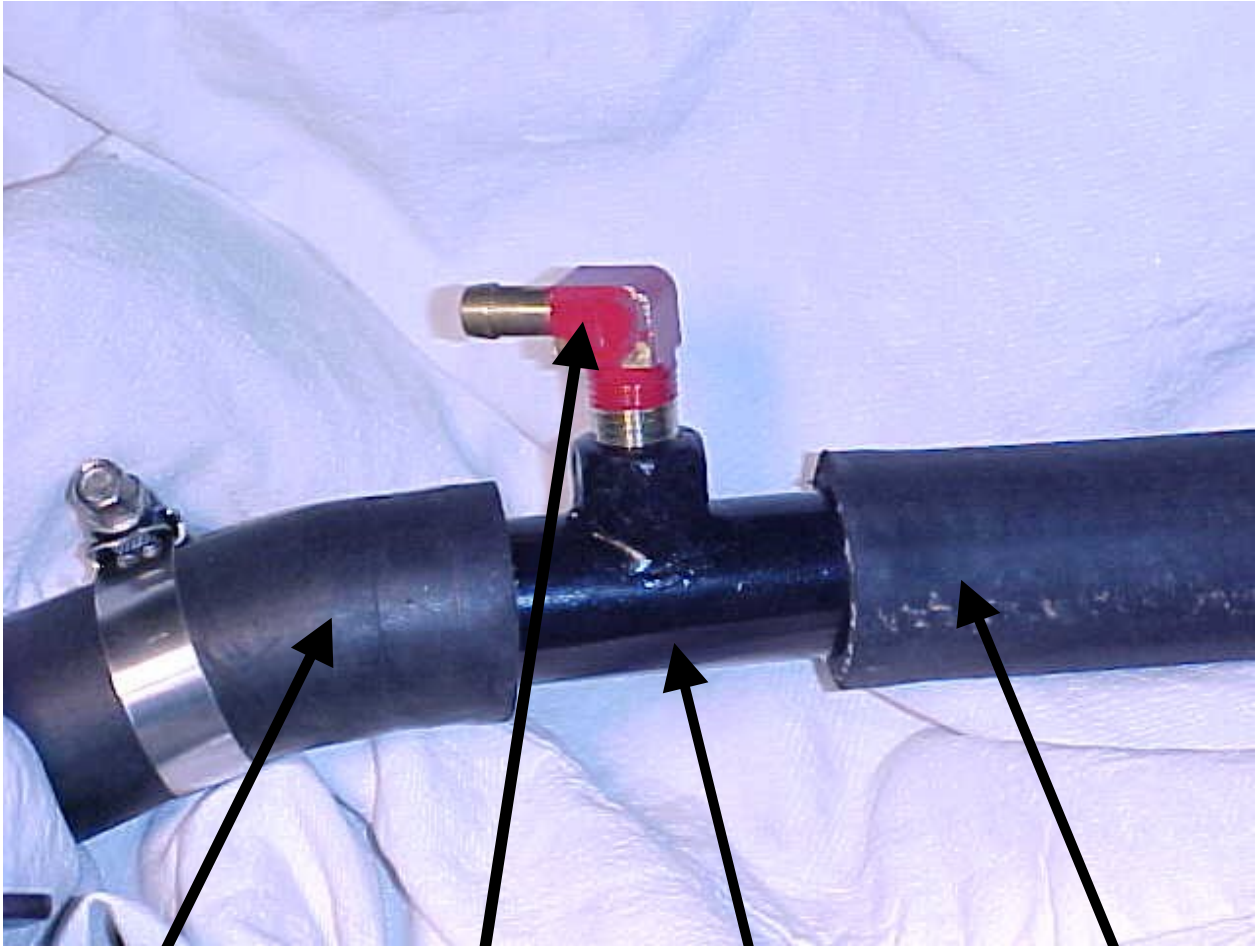
PORT BRACKET
INSTALLED



CONTINUITY GASKET MUST
BE INSTALLED IN CONTACT
WITH INTAKE MANIFOLD



NEW PORT BRACKET IN KIT



RAW WATER IN
HOSE FROM PUMP

1 X 8 HOSE
EXTENSION IN KIT

ELBOW FROM
THERMOSTAT
HOUSING

1 X 1 X 1/4 NPTF
TEE INCLUDED IN
KIT

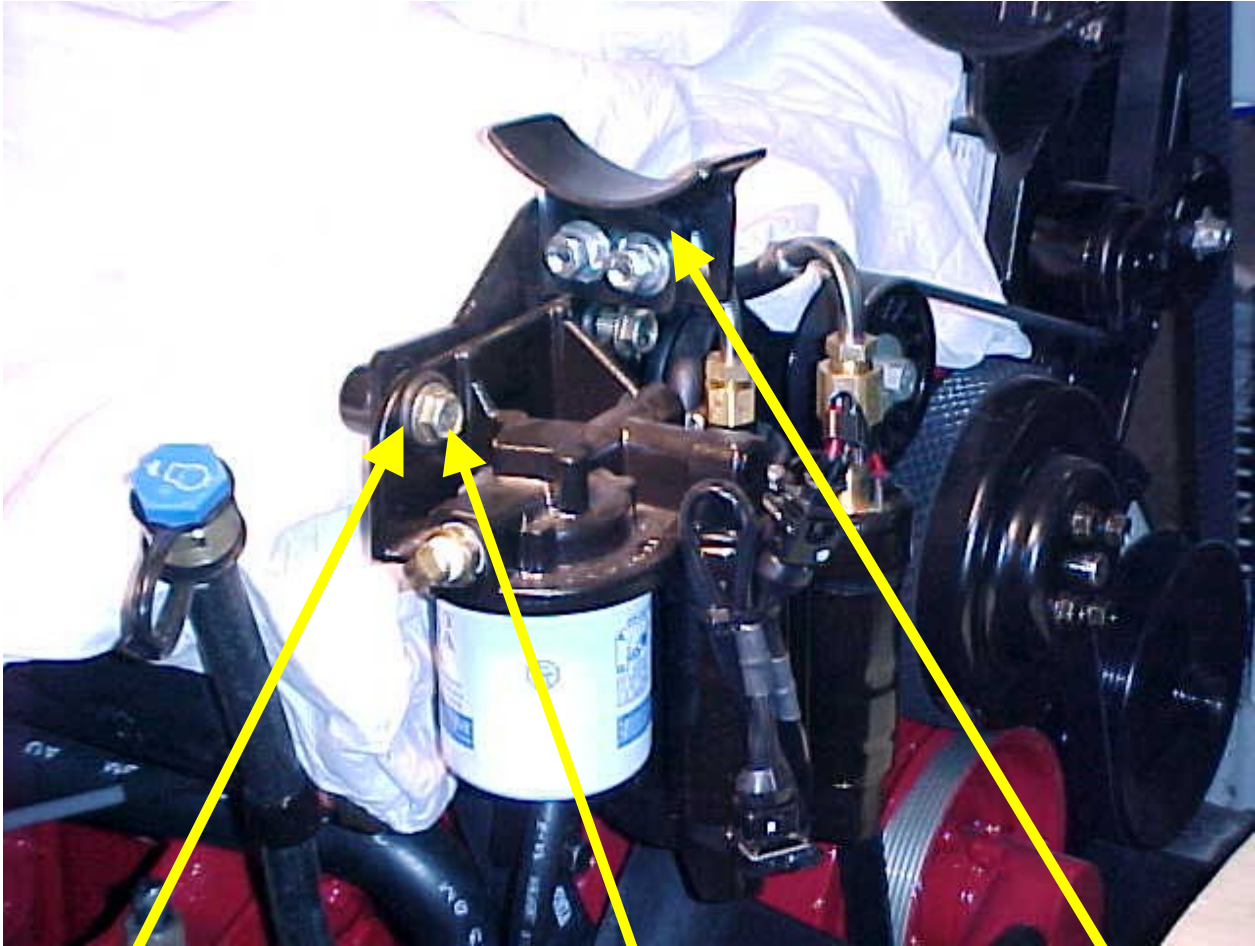


ORIGINAL 3/4 HOSE
TO STB EXHAUST
MANIFOLD

1-1/4 X 12 RW OUT
HOSE TO HEAT
EXCHANGER

3/4 X 3/4 X 1-1/4 90
RW OUT TEE

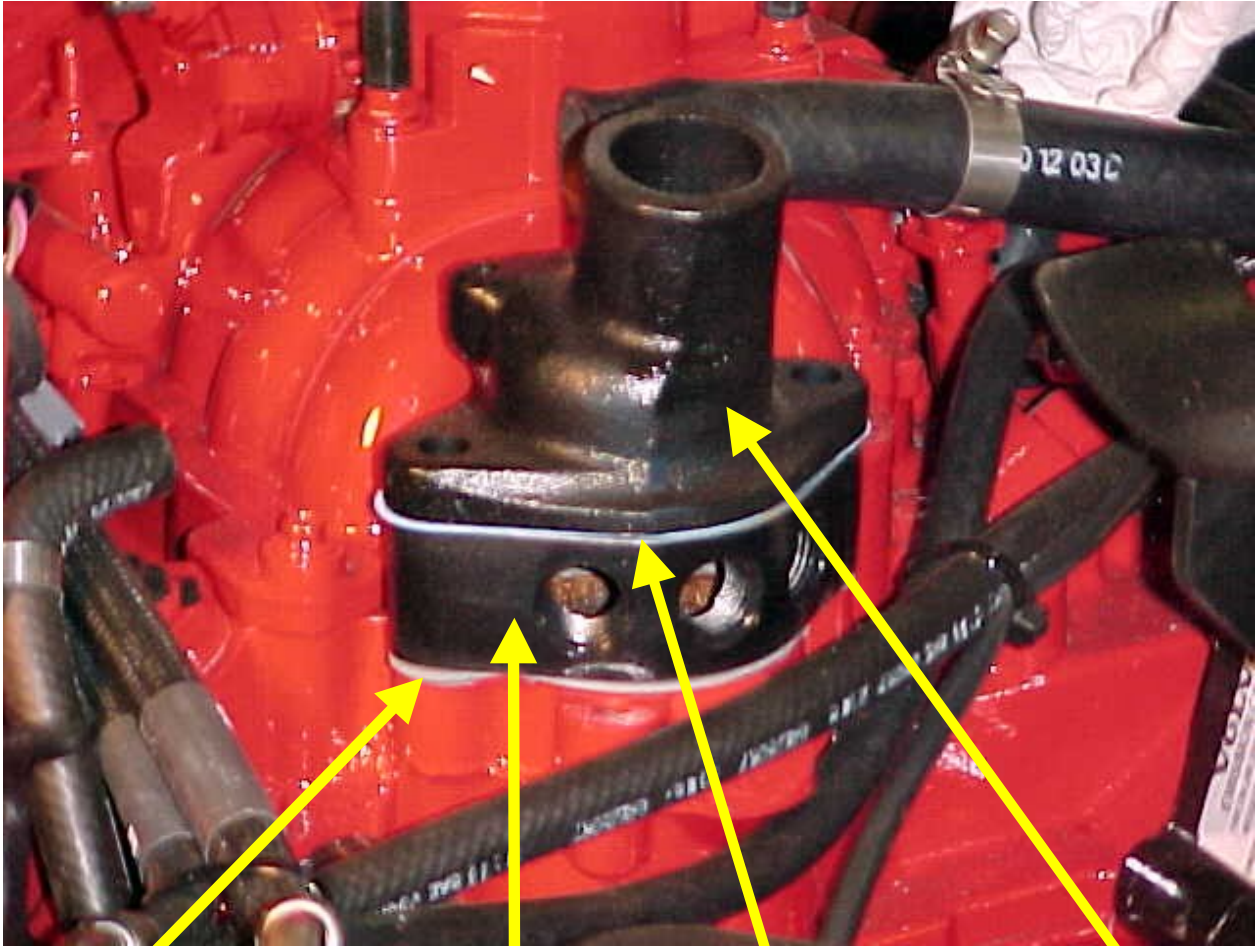
ORIGINAL 3/4
HOSE TO PORT
EXHAUST
MANIFOLD



SAVE THE TWO
RUBBER
GROMMETS

NEW ADJUSTABLE
STARBOARD
BRACKET

NEW HEX CAP SCREWS
SUPPLIED IN KIT



CONTINUITY
GASKET UNDER 3-
HOLE HOUSING

3-HOLE
THERMOSTAT
HOUSING

NEW WATER
OUTLET SUPPLIED
IN KIT

FIBER GASKET ON
TOP OF 3-HOLE
HOUSING

ORCA
MARINE COOLING SYSTEMS
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VOLVO 4.3 - 5.7
2002 - 2007
SERPENTINE BELT

PARTS LIST

500581
1/2 SYSTEM
HORIZONTAL MOUNT

NOTE: This kit does not include a new engine shroud, Volvo #3862306.

Bag #1:

1	1 - HCS, ss 1/4 x 1/2 400283	11	1 - Hose barb, brass 5/8H x 3/4M 400259
2	1 - Lock washer, ss 1/4 400285	12	2 - Sleeve, cpr 3/8OD x 1-5/8 001028
3	2 - HCS, ss 8 x 55 mm 400354	13	1 - Tee, cpr 1 x 1 x 1/4NPTF 400300
4	2 - Lock washer, ss 8mm 400313	14	1 - Clamp, ss #04 021875
5	2 - Flange bolt, ss 10 x 30 mm 400292	15	2 - Clamp, ss #08 006101
6	2 - Flange bolt, plated 3/8 x 1-1/4 400293	16	2 - Clamp, ss #12 006843
7	2 - HCS, plated 3/8 x 2-1/4 000991	17	4 - Clamp, ss #16 006105
8	2 - Lock washer, plated 3/8 070206	18	2 - Clamp, ss #20 006844
9	1 - Hose barb, brass 5/8H x 3/8M 001055	19	3 - Clamp, ss #24 006845
10	1 - Plug, brass hex head 3/8 300809	20	2 - Clamp, ss 5.25 T-bolt 400291

Bag #2:

21	1 - Clamp, rubber/ss "P" 400257	25	1 - Gasket, fiber #5 300479
22	1 - T-stat housing, alum 3-hole 400040	26	1 - Gasket, fiber/brass grounding 300233
23	1 - Thermostat, 160 000962	27	1 - Water outlet, cast #1510 300498
24	1 - Tee, cpr 3/4 x 3/4 x 1-1/4 90 300380	28	2 - Cushion tape, foam 1-1/2 x 4 300496

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Bag #3:

29	1 - Bkt assembly, steel 2-piece stb 400662	30	1 - Bkt, stl alternator mount port 400289
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Hose:

31	1 - Formed, 90 5/8 300639	33	1 - Heater, 1-1/4 x 11 006775
32	1 - Heater, 1 x 8 001061	34	1 - Formed, 90 1-1/2 400317

Loose packed:

35	1 - Coolant recovery bottle 300671	36	Installation instructions
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PROUDLY PACKED AND SHIPPED BY _____

29 MAY 2008