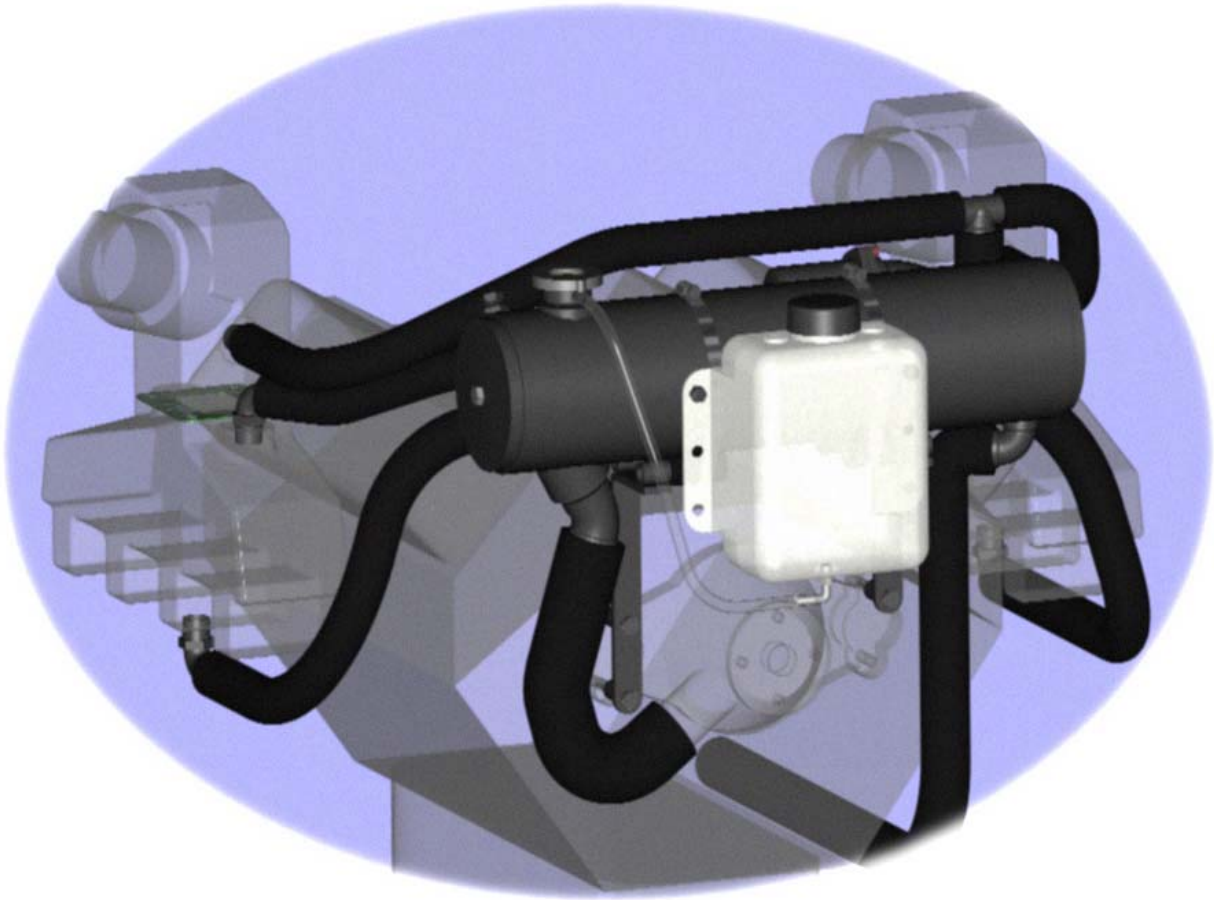


MFH-5374

Big Block On-Engine Block & Manifold Freshwater Cooling Kit Instructions



MONITOR PRODUCTS, INC.

15400 Flight Path Dr
Brooksville, FL 34604

Tel: 1-800-334-4591 or 352-544-2620

Sales: ext 201

Technical Support: ext 209

Fax: 352-544-0870

IMPORTANT

Before you unpack the kit and start installation, make sure you have the right kit for your engine by studying these installation instructions. These instructions have been written to cover most installations on late model Chevy big block engine conversions made by the major marine engine manufacturers. The system is front mounted at the level of the thermostat housing. The heat exchanger can be centered between the exhaust elbows of the engine and this kit is, therefore, suitable for V-drive engines. This kit is intended for both V-belt and serpentine belt installations.

These instructions cover a normal installation situation. Sometimes problems can occur due to engine variations and boat-builder or owner modifications. If you run into such problems you can call Monitor Products for advice during normal business hours. The phone number is 1-800-334-4591.

If you determine this is the wrong kit for your type of engine:

- Call the distributor you purchased the kit from for their return policy.
- If you purchased the kit from Monitor Products Inc., call 1-800-334-4591 for return authorization. No returns will be accepted without this authorization. The kit must be in new condition and repacked in its original packaging to qualify for credit or replacement.

MONITOR PRODUCTS, INC.

1-800-334-4591

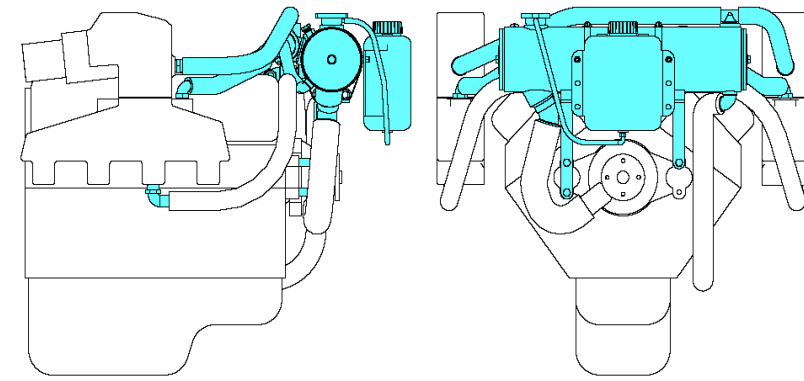
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The installer must make sure that the overall installation is safe and in accordance with Coast Guard and industry standards.

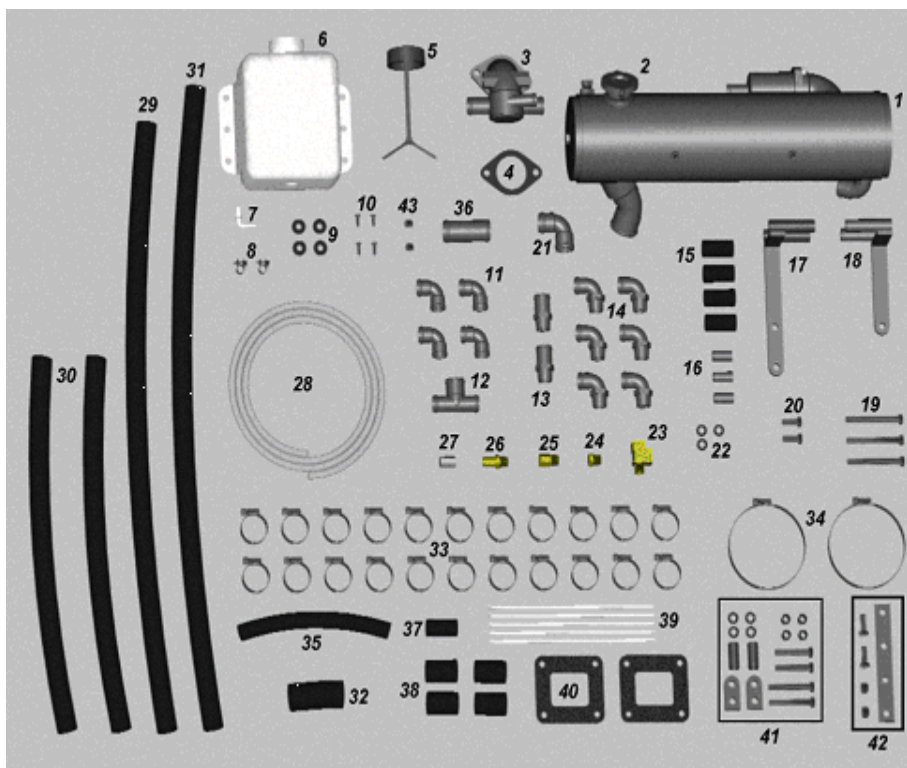


Installation tools & supplies

Flat head screw driver
Phillips head screw driver
11/16" deep socket or box wrench
9/16" socket or box wrench
7/16" socket or box wrench

Hose Cutter or Knife
Gasket scraper
RTV silicone gasket sealer
Antifreeze solution (See flush and fill instructions)

Items Included in kit:



Item	Qty	Part Number	Description
1	1	M5374-5176	Heat Exchanger
2	1	4000-1857	Pressure Cap 16#
3	1	5000-2994	Intake Manifold Cover Elbow Ass'y
4	1	4500-1381	Gasket, Thermostat Housing
5	1	5000-1763	Cap, Expansion Tank
6	1	5001-1327	Expansion Tank
7	1	5000-1343	1/8" NPT x 5/16" Hose Barb Elbow
8	2	5200-1344	Mini-Clamp
9	4	4300-2801	5/16" Flat Washer
10	4	4300-2802	#12 Screw x 3/4"
11	4	3120-1137	1" 90° Hose Coupling
12	1	3001-2906	Tee, 1 1/4" x 1" x 1"
13	2	5000-1980	Fitting Exhaust Straight
14	6	5000-1979	Fitting Exhaust Elbow
15	4	5102-2124	Isolators (3/4" Hose x 2")
16	3	0506-2103	1 1/4" Spacer
17	1	5000-2992	Bracket, Big Block, Left
18	1	5000-2993	Bracket, Big Block, Right
19	3	4300-2998	3/8-16 x 3 1/2" Bolt
20	2	4300-1730	3/8-16 x 1" Bolt
21	1	3108-1202	1 1/4" 90° Hose Coupling
22	3	4300-1386	3/8" Lock Washer

Item	Qty	Part Number	Description
23	1	3000-3003	3/8" NPTx3/8" NPTx3/8" NPT Tee
24	1	4400-1314	3/8" NPT Plug
25	1	3000-1619	3/8" NPT x 3/8" NPT Adapter
26	1	3000-1351	3/8" NPT x 5/8" Hose Barb
27	1	5000-2668	Plug Removal Tool
28	1	5102-2125	5/16" PVC Hose x 48"
29	1	5120-2126	1" Hose x 36"
30	2	5114-2126	1" Hose x 22"
31	1	5123-2126	1" Hose x 38"
32	1	5107-2134	1 1/4" Hose x 3 1/2"
33	22	5200-1144	#16 Hose Clamp
34	2	5200-2914	#88 Hose Clamp
35	1	5108-2124	3/4" Hose x 11"
36	1	0320-2080	1 1/4" Hose Coupling
37	1	5102-2124	3/4" Hose x 2"
38	4	5122-2126	1" Hose x 2"
39	5	5000-2993	Tie Wraps
40	2	4500-1824	Gasket, Blind Exhaust Elbow
41	1	4000-1849	Oil Filter Relocation Kit
42	1	4000-2999	Lube Reservoir Relocation kit
43	2	4300-2790	5/16-18 Nylon Locking Nut

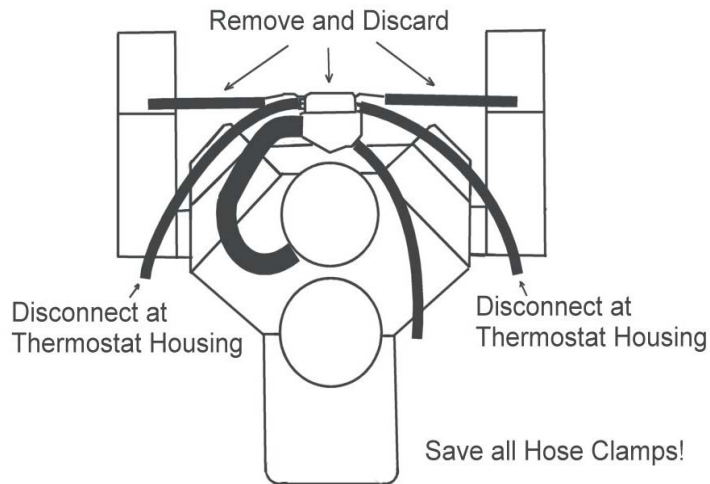
Installation Steps

1. Disconnect both cables from the battery.

2. Drain water from the block by removing plugs from both lower sides of engine.

3. Remove hoses from the existing thermostat housing. Save all hose clamps.

4. Disconnect wire(s) from temperature sender(s) and remove the temperature sending unit(s) and/or pipe plug from the thermostat housing. Set these aside for later use. MONITOR PRODUCTS strongly recommends that you install an audible "buzzer" type alarm, if the engine is not currently equipped with one.



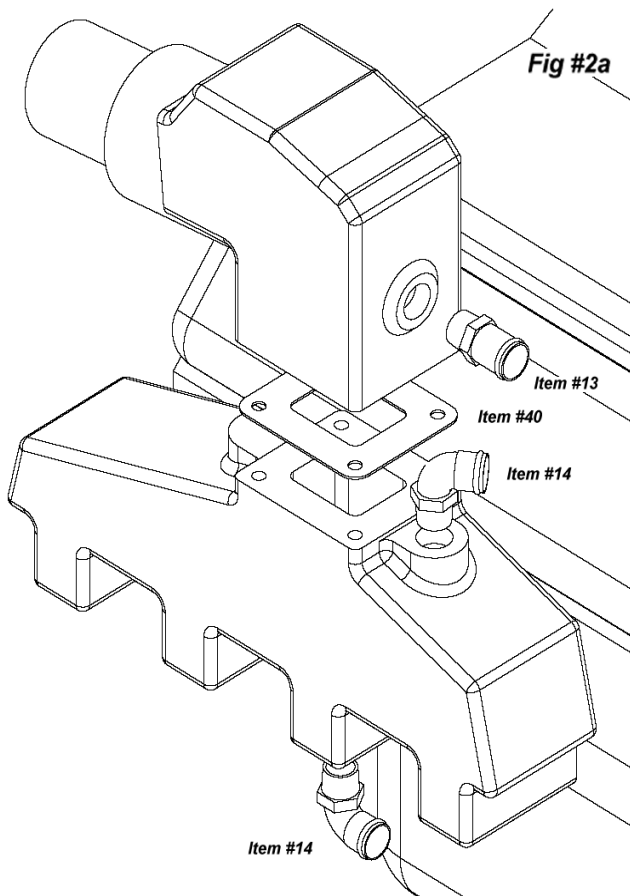
5. Remove and discard existing thermostat housing, thermostat, gasket and bolts. Scrape gasket surface clean.

6. Flush engine.

- a. If the engine is new, flush briefly with fresh water through thermostat opening. Use a garden hose with a clean rag around it.
- b. If the engine is used, more thorough flushing is required. MONITOR PRODUCTS recommends the purchase of a good quality flush-&-fill kit and engine flushing/cleaning fluid. Please follow the manufacturer's recommendations.

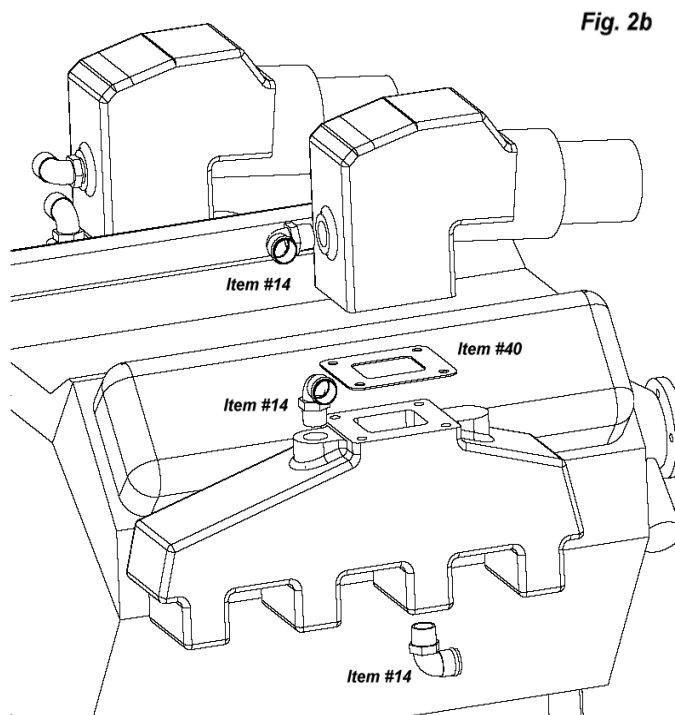
7. Remove plugs directly in front of mounting studs for exhaust elbows. (1/2" breaker bar and penetrating oil may help, plug removal tool (Item #27) is supplied for hex type plugs) Remove the plugs in the exhaust elbows (or spacers). Remove exhaust elbows. (If your engine has spacers, remove both spacers and exhaust elbows.) Scrape gasket surface clean ensuring nothing falls into ports. If your oil filter is remotely mounted, this is the time to remove it and set it aside.

8. Replace elbows in the bottom of exhaust manifolds (port & starboard), with 90° elbow assembly (Item #14). Use sealer. Be sure to thread in 90° elbow assembly completely. Reattach existing hoses to 90° elbows.

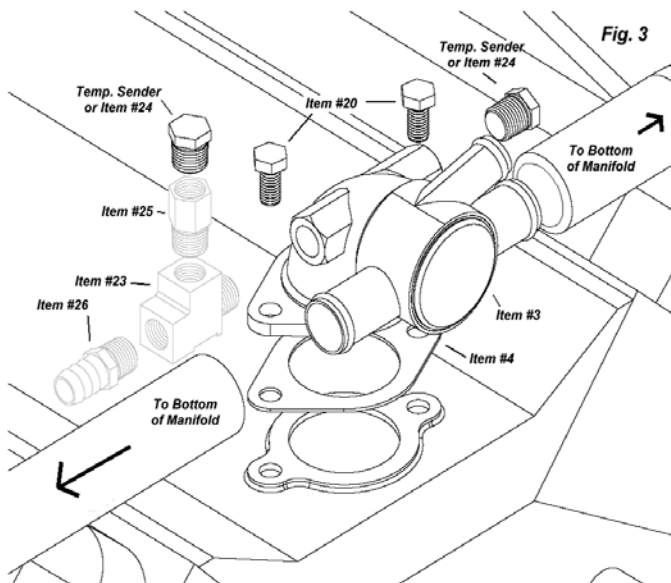


9. V-drives skip to the next step, On inboard and sterndrive engines, thread 90° elbow assembly (Item #14) using sealer, into openings on top of exhaust manifolds (port & starboard) insuring they point toward thermostat opening. Be sure to thread in 90° elbow assembly completely. Thread straight fittings (Item #13) into exhaust elbow on both sides. (If your engine has spacers, install the straight fitting into spacer. If your spacers don't have the threads to install the fitting, install the fittings in the elbows.) Lube reservoir may need to be move to install these fittings, use lube reservoir relocation kit (Item # 42). Continue at Step 11.

10. For V-drives, thread 90° elbow assembly (Item #14) using sealer, into openings on top of exhaust manifolds (port & starboard) insuring they point toward the outside of engine. Be sure to thread in 90° elbow assembly completely. Thread two more 90° elbow assemblies (Item #14) into exhaust elbow on both sides also pointing to the outside of engine. (If your engine has spacers, install the straight fitting into spacer. If your spacers don't have the threads to install the fitting, install the fittings in the elbows.)



11. Install manifold gaskets (blind), (Item #40), and reinstall exhaust elbows (and spacers) tightening evenly using torque wrench to 30-35 ft lbs. A good seal here is critical and we recommend you have a pressure test done prior to starting the engine.



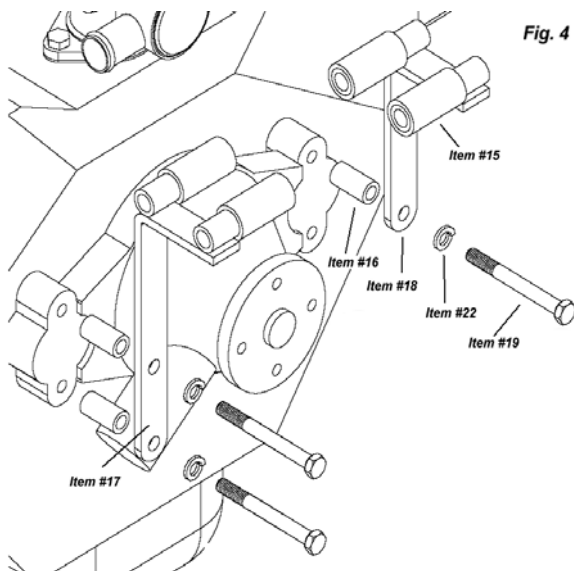
12. Install the thermostat-housing gasket (Item #4). Use RTV silicone sealer on both sides of the gasket. (The thermostat will no longer be located in the intake manifold. It is included in the heat exchanger.)

13. Install manifold cover elbow (Item #3) on the manifold. Use 3/8"-16 x 1" bolts (Item #20).

14. Install temperature sending units into manifold cover elbow. If only one temperature sending is to be used, install 3/8" NPT plug (Item #24). (Don't use thread tape or pipe dope, as these will prevent the sensor from

grounding properly.) *MONITOR PRODUCTS strongly recommends that you install an audible "buzzer" type alarm, if the engine is not currently equipped with one.*

If your boat is equipped with a galley heater, install the 3/8" street tee (Item #23) to one of the fittings on the manifold cover elbow. Connect galley heater connection (Item #26, if needed) to one outlet of tee and install temperature sender in the other outlet, use the 3/8" adaptor (Item #25) with long temperature sender probes. The galley heater outlets should return to the jacket water pump.



15. Install left bracket (Item #17) to front of jacket water pump by removing bolts from left side of water pump and installing the bracket with two spacers (Item #16) using 3/8"-16 x 3 1/2" bolts (Item #19) and lock washers (Item #22). See Fig. # 4.

16. Install right bracket (Item #18) to front of jacket water pump by removing top bolt from right side of water pump and installing the bracket with a spacer (Item #16) using 3/8"-16 x 3 1/2" bolt (Item #19) and lock washers (Item #22).

17. Install isolators (Item #15) onto bracket rails.

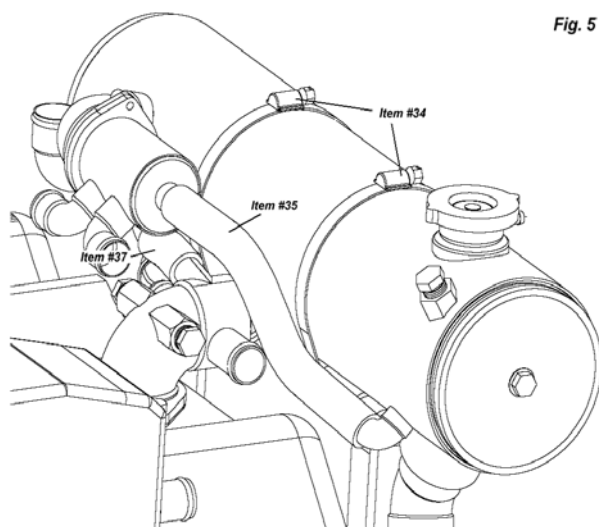


Fig. 5

18. Install 3/4" ID x 11" by-pass hose (Item #35) from 3/4" fitting on heat exchanger to 3/4" fitting on thermostat housing, using two #16 hose clamps (Item #33).

19. Install 3/4" ID x 2" hose (Item #37) to 3/4" manifold by-pass inlet fitting thermostat housing of heat exchanger. Loosely install two hose clamps.

20. Install heat exchanger, by first setting heat exchanger on bracket. While connecting 3/4" hose from heat exchanger to 3/4" fitting on the manifold cover elbow.

21. Install #88 hose clamps (Item #34) around heat exchanger and bracket.

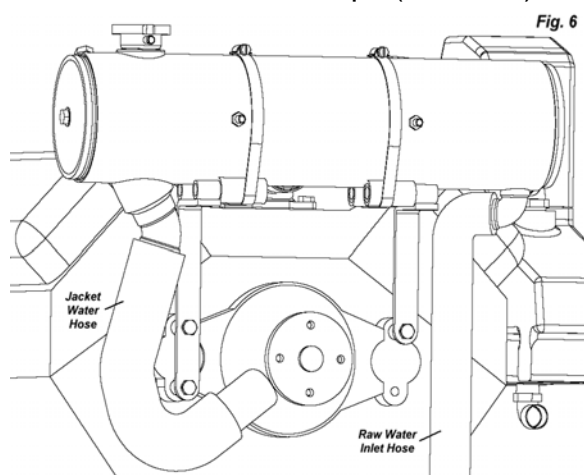


Fig. 6

22. Connect the jacket water hose from the water pump to the 1 3/4" fitting on the bottom of the heat exchanger, using hose clamps saved in Step #3. Hose will need to be trimmed to fit.

23. Connect the raw water inlet hose to the raw water inlet elbow on bottom of the heat exchanger, using hose clamps saved in Step #3. Hose may need to be trimmed to fit. (Items #21 & 36 may be needed to manipulate hose to correct position.)

24. Attach the two hoses from bottom of exhaust manifolds to the fittings on the manifold cover elbow, using hose clamps saved in Step #3.

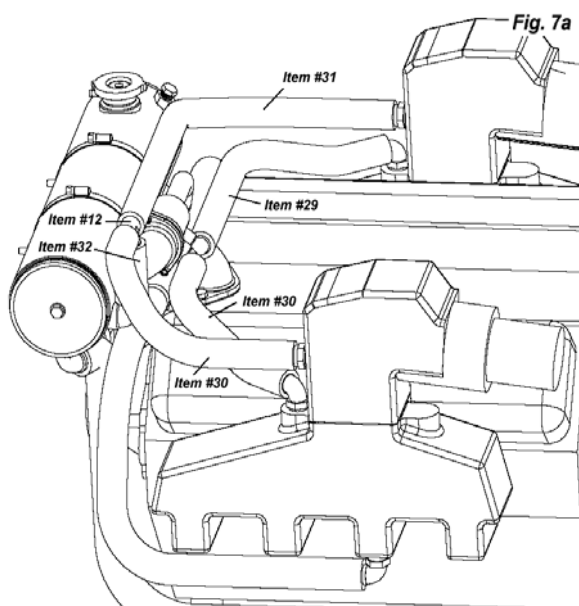


Fig. 7a

25. Install 1 1/4" ID x 3 1/2" hose, (Item #32), between elbow fitting on exchanger to the tee (Item #12), using two clamps (Item #33).

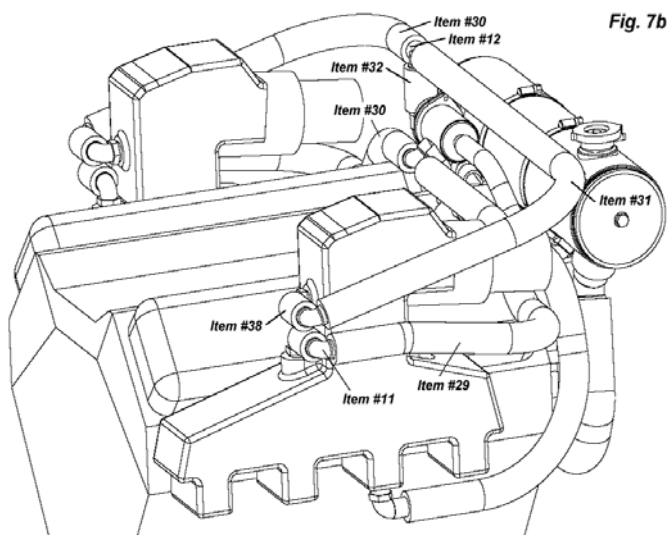
On stern drives & inboards, (V-drives skip to Step 30):

26. Cut 1" ID x 22" hose (Item #30) to 13" and install it between the 90° elbow on top of the right exhaust manifold and the elbow on top right of the thermostat housing. Secure with #16 hose clamps (Item #33).

27. Cut 1" ID x 36" hose (Item #29) to 27" and install it between the 90° elbow on top of the left exhaust manifold and the elbow on top left of the thermostat housing. Secure with #16 hose clamps (Item #33).
28. Cut 1" ID x 22" hose (Item #30) to 13" and install it between the straight fitting assembly on the right side exhaust elbow and the tee (Item #12). Secure with #16 hose clamps (Item #33).
29. Cut 1" ID x 38" hose (Item #31) to 28" and install it between the straight fitting assembly on the left side exhaust elbow and the tee (Item #12). Secure with #16 hose clamps (Item #33). Continue at Step 34.

On V-drives:

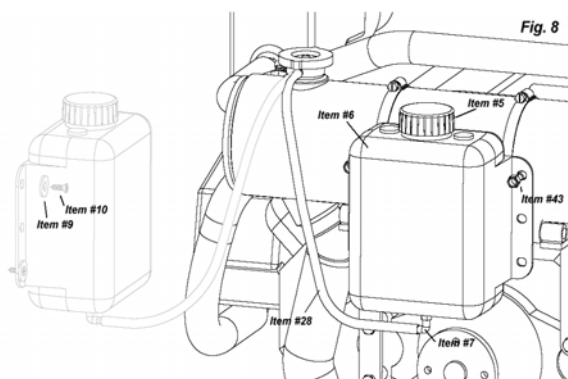
30. Attach 1" ID x 2" hose (Item #38) to 90° elbow on top of the right exhaust manifold and 1" 90° hose coupling (Item #11), using #16 hose clamps (Item #33), and install 1" ID x 22" hose (Item #30) between the 90° hose coupling and the elbow on top right of the thermostat housing. Secure with #16 hose clamps (Item #33).



31. Attach 1" ID x 2" hose (Item #38) to 90° elbow on top of the left exhaust manifold and 1" 90° hose coupling (Item #11), using #16 hose clamps (Item #33), and install 1" ID x 36" hose (Item #29) between the 90° hose coupling and the elbow on top left of the thermostat housing. Secure with #16 hose clamps (Item #33).

32. Attach 1" ID x 2" hose (Item #38) to 90° elbow on right exhaust elbow and 1" 90° hose coupling (Item #11), using #16 hose clamps (Item #33), and install 1" ID x 22" hose (Item #29) between the 90° hose coupling and the tee (Item #12). Secure with #16 hose clamps (Item #33).
33. Attach 1" ID x 2" hose (Item #38) to 90° elbow on left exhaust elbow and 1" 90° hose coupling (Item #11), using #16 hose clamps (Item #33), and install 1" ID x 38" hose (Item #31) between the 90° hose coupling and the tee (Item #12). Secure with #16 hose clamps (Item #33).
34. If your oil filter was remotely mounted, this is the time reinstall it using the oil filter relocation kit (Item #41).

35. Install the 1/8" NPT elbow (Item #7) to the bottom of the expansion tank (Item #6). No thread tape or sealer is needed.



36. Install the expansion tank on the front of the heat exchanger using nylon-locking nuts (Item #43). If space in front of engine does not allow installation on heat exchanger, install on vertical surface next to engine using supplied screws and washers (Items #10 & #9). Keep as close to heat exchanger as is practical with top of tank level with top of heat exchanger.

37. Route the clear 5/16" hose (Item #28) between the heat exchanger filler neck and the expansion tank elbow. Secure in place with mini-clamps (Item #8).
38. Use tie wraps (Item #39) to make sure that hoses or other parts are not in contact with critical engine components such as belts and fuel lines.
39. Reinstall plugs in bottom of engine block.
40. Double check total installation and make sure all fasteners, fittings, and hose clamps are tightened properly. See separate Filling and Start-Up instructions.

MONITOR PRODUCTS strongly recommends that you install an audible "buzzer" type alarm. These overheat alarms are usually combined with low oil pressure alarm and are very reasonable in price.

Replacement Parts

Part Number	Description
5000-1763	Cap, expansion tank, 2-1/4 vented w/tee
4000-1857	Pressure cap, 16# SS
5000-1709	Thermostat with control
4500-1381	Gasket, thermostat housing
4500-1622	Gasket, rubber thermostat
4500-1082	O-Ring, Buna-N
4500-1815	Gasket, 5" (end cover)
4400-1044	Zinc Anode, 3/8NPT, 1-1/4" Long

OIL FILTER RELOCATION KIT

(4000-1849)

ASSEMBLY INSTRUCTIONS

- If studs are used to fasten exhaust elbows, use the original nuts to secure the oil filter relocation spacer and bracket as shown in **Figure A**.
- If bolts are used, discard original hardware. Then fasten spacer and bracket with 2-3/4" bolts supplied.
- Use 2-1/4" bolts to fasten oil filter bracket into relocation bracket. Then, position the bolts so that the heads of the bolts are facing

downward. **See Figure A.**

- Use the 3/8" lock washers and nuts supplied and tighten securely.
- Recheck all instructions.

OIL FILTER RELOCATION KIT PARTS

<u>PART#</u>	<u>QTY</u>	<u>DESCRIPTION</u>
0505-2103	2	Spacers 1 ½ x 5/8 OD
5000-2499	2	Bracket ¼ x 1 x 2
4300-1851	2	Bolts 3/8-16 x 2 ¼
4300-1852	2	Bolts 3/8-16 x 2 ¾
4300-1280	2	Nuts 3/8-16
4300-1386	2	Lock Washers 3/8

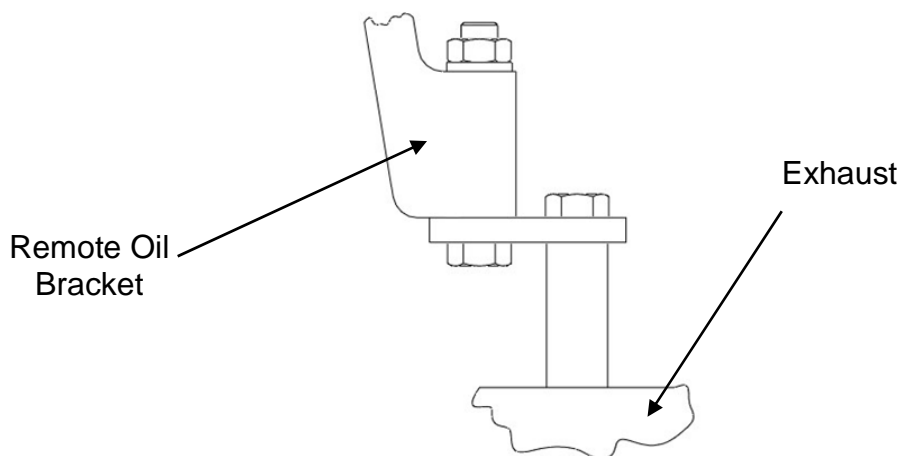


Figure A

LUBE RESERVOIR RELOCATION KIT

(4000-2999)

LUBE RESERVOIR RELOCATION KIT PARTS

ASSEMBLY INSTRUCTIONS

- Remove Lube Reservoir from original location and attach bracket (Item #1) using original bolts to oil filter bracket.
- Use 3/8"-16 bolts and nuts (Items #2 & #3) to attach lube reservoir to new bracket.
- Recheck all instructions.

<u>PART#</u>	<u>QTY</u>	<u>DESCRIPTION</u>
0502-2800	1	Bracket, Lube Reservoir
4300-1730	2	Bolt, 3/8-16 x 1"
4300-2791	2	Nut, 3/8-16

