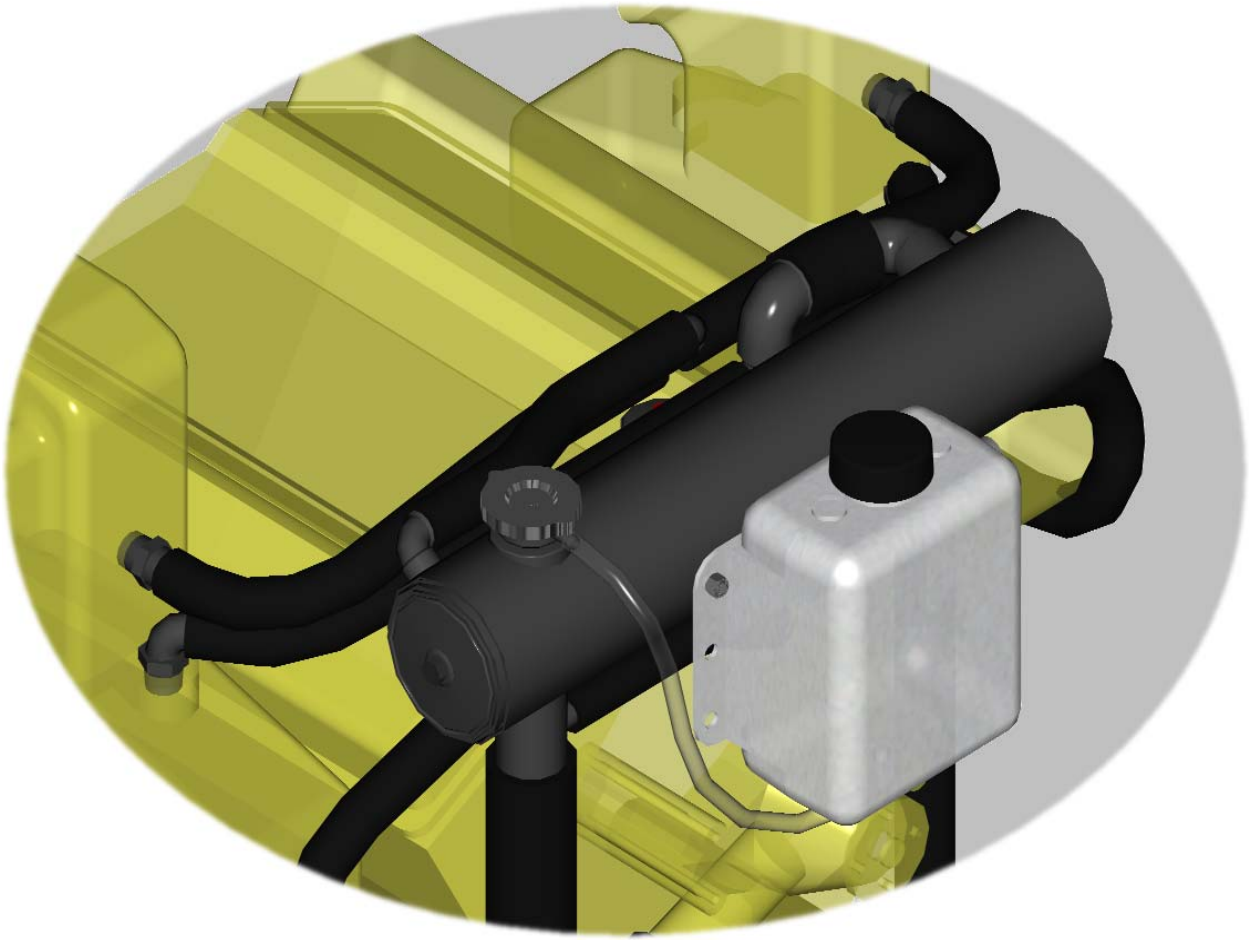
MFH-5399

Block & Manifold Fresh Water Cooling Kit Instructions



MONITOR

IMPORTANT

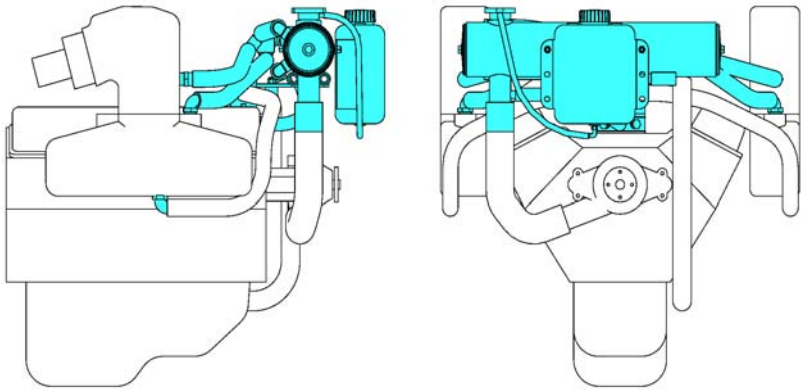
Before you unpack the kit and start installation, make sure you have the right kit for your engine by studying these installation instructions. These installation instructions have been written to cover most sterndrive and inboard installations on Chevy small block engine conversions made by the major marine engine manufacturers before 1999. The system is front mounted at the level of the thermostat housing and the engine must have the alternator and/or the power steering pump mounted low or to the extreme port side of the engine. The heat exchanger is 22 inches long.

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.

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 a 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.

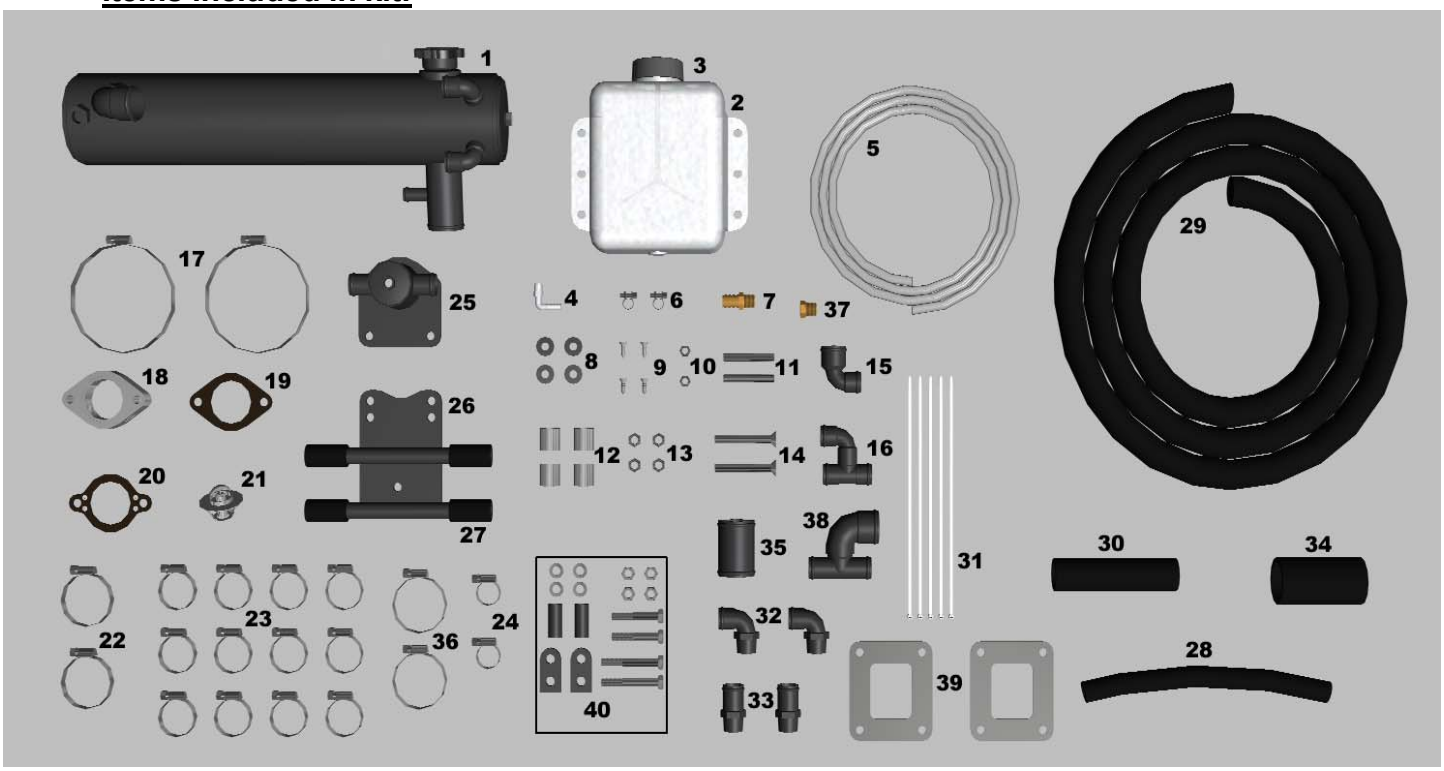
The installer must make sure that the overall installation is safe and in accordance with Coast Guard and industry standards.



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
3/16” hex key
7/32” hex key
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	M5399-4176	Heat Exchanger
2	1	5001-1327	Expansion Tank
3	1	5000-1763	Cap, Expansion Tank
4	1	5000-1343	1/8” NPT x 5/16” Hose Adapter
5	1	5102-2125	5/16” ID x 48” PVC Hose
6	2	5200-1344	Mini Clamp #02
7	1	3000-1351	3/8” NPT x 5/8” Hose Adapter
8	4	4300-2802	5/16” Washer
9	4	4300-2801	#12 x 3/4” Flat Head Screw
10	2	4300-2790	5/16-18 Nylon Locking Nut
11	2	4300-3015	3/8-16 x 2-1/2” Stud
12	4	5000-2637	Spacer, 1” OD X 1” Long
13	4	4300-2791	3/8-16 Nylon Locking Nut
14	2	4300-3016	3/8-16 x 3” Flat Head Cap Screw
15	1	3103-1291	1” x 1-1/4” 90° Hose Coupling
16	1	5000-3014	Raw Water Splitting Tee
17	2	5200-1610	Hose Clamp #72
18	1	4005-2003	Thermostat Spacer
19	1	4500-1381	Thermostat Housing Gasket
20	1	4500-3004	Grounded T’stat Hous. Gasket

Item	Qty.	Part Number	Description
21	1	5001-3012	Thermostat
22	2	5200-1143	Hose Clamp #24
23	12	5200-1144	Hose Clamp #16
24	2	5200-1401	Hose Clamp #12
25	1	5000-3020	Lower Bracket
26	1	5002-2611	Upper Bracket
27	4	5102-2124	Isolators
28	1	5107-2128	5/8” ID x 12” Hose
29	1	5124-2126	1” ID x 96” Hose
30	1	5102-2603	1-1/2” ID x 6” Hose
31	5	5000-1154	Tie Wraps
32	2	5000-1979	Fitting, Exhaust Elbow
33	2	5000-1980	Fitting, Exhaust Straight
34	1	5104-2129	1-3/4” ID x 4” Hose
35	1	0321-2100	1-3/4” Hose Coupling
36	2	5200-1475	Hose Clamp #28
37	1	4400-1314	3/8” NPT Plug
38	1	5000-3017	Jacket Water Return Tee
39	2	4500-1824	Gasket, Blind (Exhaust Manifold)
40	1	4000-1849	Oil Filter Relocation Kit

Installation Steps

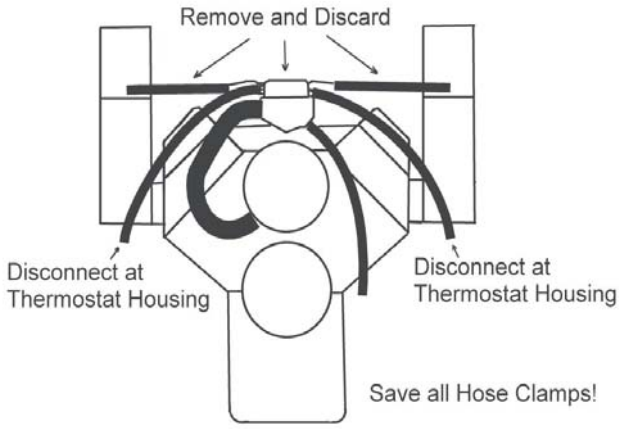


Fig. 1

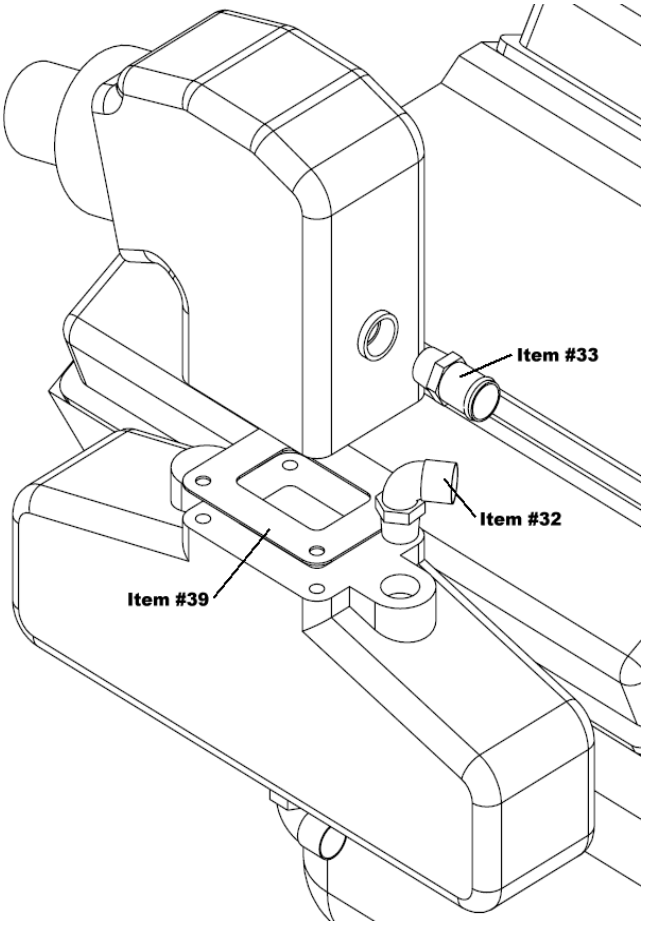


Fig. 2

1. Drain water from block by removing plugs from both lower sides of engine.
2. Remove hoses from the existing thermostat housing. Save all hose clamps. See Fig. 1.
3. Disconnect wires from temperature sender(s) and remove the sender(s) from thermostat housing.
4. Remove and discard existing thermostat housing, thermostat, gasket and bolts. Scrape surface clean especially grooves where new thermostat will be located. Avoid getting scrapings into thermostat opening. See Fig. #1
5. Flush engine. If new, flush engine briefly with fresh water through thermostat opening. Use a garden hose with a rag around it. If used, more thorough flushing may be needed. See Flushing instructions in Fresh Water Cooling General Maintenance Manual.
6. Remove plugs directly in front of mounting studs for exhaust elbows. (1/2″ breaker bar and penetrating oil may help) Remove 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 to the side.
7. Thread, using sealer, 90° elbow assembly (Item #32) 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 #33) into exhaust *elbow* on both sides.
8. Install manifold gaskets (blind), (Item #39), and reinstall exhaust elbows 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.

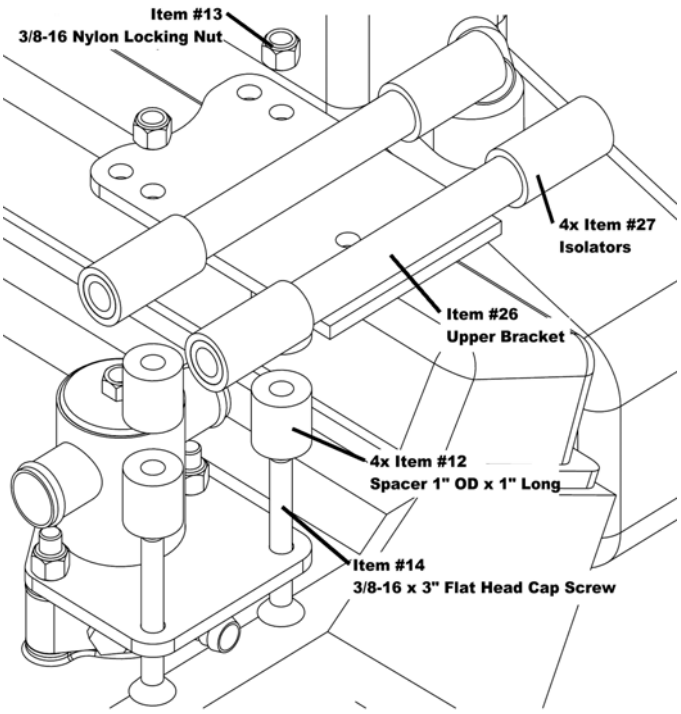


Fig. 3

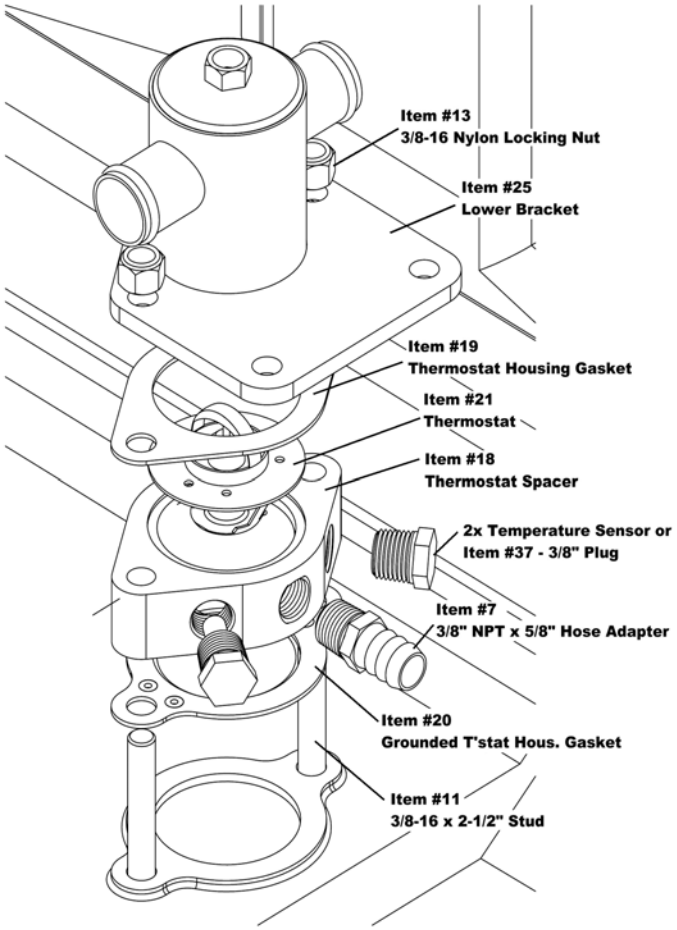


Fig. 4

9. Install two 3/8-16 studs (Item #11) into intake manifold.

10. Install spacer (Item #18), thermostat (Item #21), and lower bracket (Item #25), with two gaskets (Item #20 and Item #19) as shown in Fig. #3. Tighten 3/8-16 nuts (Item #13) securely.

11. Thread straight hose adapter (Item #7) into center threaded hole of spacer.

12. Thread temperature sender into spacer. If overheat alarm is used, thread it into the other threaded hole of spacer. If not, install 3/8" plug (Item #37). Reconnect wire to temp sender(s). We strongly recommend 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.

13. Install upper bracket (Item #26), with the 3/8-16 flat head screws (Item #14) and 3/8-16 nylon locking nuts (Item #13), using the appropriate number of spacers (Item #12) for your application. Be sure that when heat exchanger is installed it will not interfere with any belts, fuel lines, or hatches and covers. See Fig. # 4.

14. Install isolators (Item #27) onto bracket rails. See Fig. # 4.

15. Install heat exchanger (Item #1) on rails of upper bracket and secure with two large hose clamps (Item #17). See Fig. # 5.

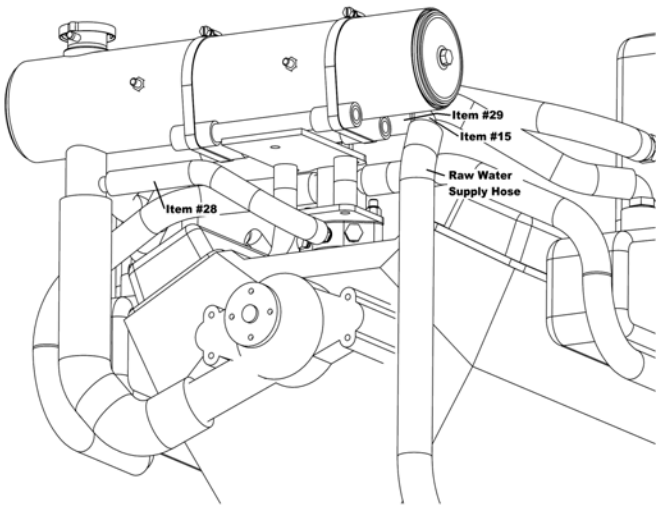


Fig. 5

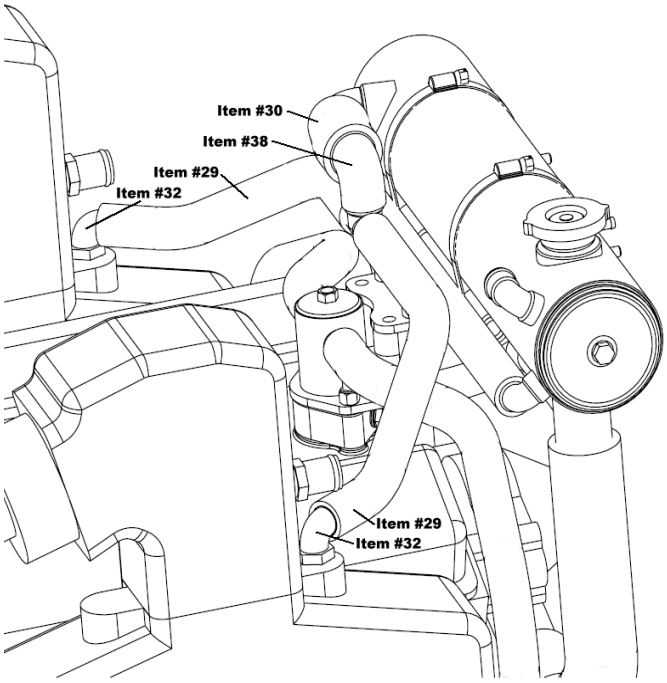


Fig. 6

16. Install the 90° hose coupling, (Item #15) into raw water supply hose located vertically along the front portside of the engine under the heat exchanger bracket using existing clamp. Supply hose may need to be trimmed. Measure and cut 1" ID hose (Item #29) to length. Trim hose as required to fully engage 90° hose coupling. Secure using two hose clamps (Item #23).

17. Trim 1 3/4" molded hose running from circulating pump to engage 1 3/4" fitting on heat exchanger. Secure using existing clamps. See Fig. # 5. (If need, use 1 3/4" hose coupling (Item #35), 1 3/4" hose (Item #34), and hose clamps (Item #36) to make this connection.)

18. Attach 5/8" ID hose (Item #28) using clamps (Item #24) to hose adapter on spacer and 5/8" hose fitting on heat exchanger. See Fig. #5. If heater system hook-up is used this 5/8" hose is extended to heating devices and back. Trim as necessary. If desired, an optional flushing tee, available at most automotive supply stores, can be installed in this 5/8" hose.

19. Attach hoses leading to bottom or front of exhaust manifolds to each side of lower bracket. Use existing hose clamps. See Fig. #6.

20. Connect jacket water return tee (Item #38) to heat exchanger with 1 1/2" hose (Item #30), using hose clamps (Item #22).

21. Cut 1" hoses to length to reach from jacket water return tee to elbow fittings on top of exhaust manifolds. Connect hoses with hose clamps (Item #23).

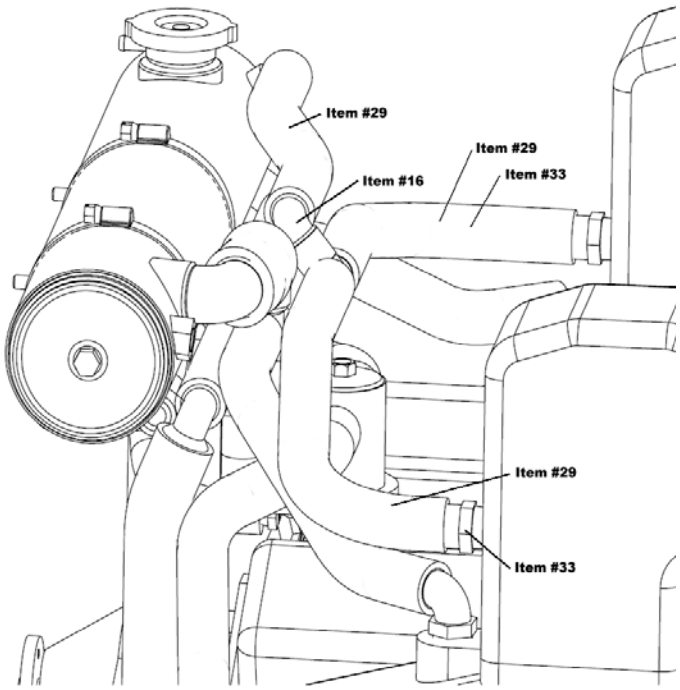


Fig. 7

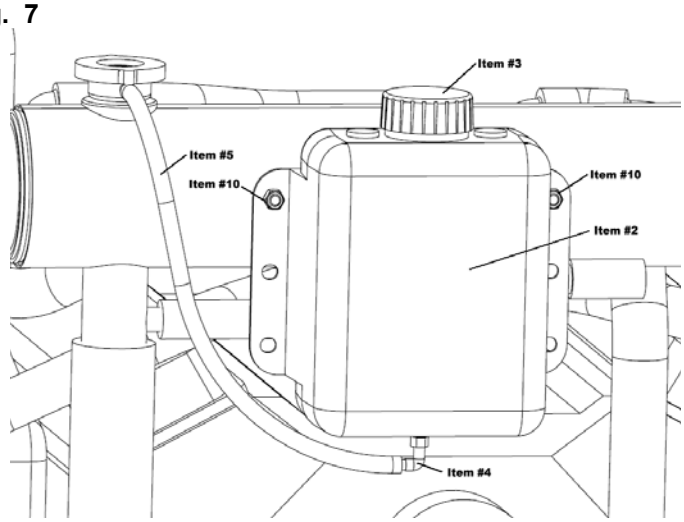


Fig. 8

22. Connect raw water splitting tee assembly (Item #16) to heat exchanger with 1" ID hose (Item #38) using clamps (Item #23). See Fig. #7.

23. Cut 1" hoses to length to reach from raw water splitting tee to straight fittings on front of exhaust elbows. Connect hoses with hose clamps (Item #23).

24. Thread plastic elbow (Item #4) into bottom of expansion tank (Item #2) using sealer. Expansion tank cap (Item #3) should already be in place.

25. Mount expansion tank on studs on front of heat exchanger using 5/16-18 nylon locking nuts (Item #10). If space in front of engine does not allow installation of on heat exchanger, install the expansion tank on vertical surface next to engine using washers (Item #8) and screws (Item #9). Keep it as close to heat exchanger as is practical, with top of tank at the same height with top of heat exchanger.

26. Connect 5/16" clear PVC hose (Item #5) to the fitting on filler neck and elbow on bottom overflow bottle with mini clamps (Item #6). See Fig. #8.

27. Use tie wraps (Item #31) to make sure that hoses or other parts are not in contact with critical engine components, such as V-belt and fuel lines.

28. Reinstall engine block drain plugs.

29. Double check total installation and make sure all fasteners, fittings, and hose clamps are tightened properly. See Filling and Start-Up Instructions in Fresh Water Cooling General Maintenance Manual.

We strongly recommend 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
4000-1857	Pressure Cap, 16# SS
5001-3012	Thermostat
4500-1381	Gasket, Thermostat Housing
4500-1622	Gasket, Rubber Thermostat
4500-3004	Grounded T'stat Hous. Gasket
4500-1082	O-Ring, Buna-N
4500-2005	Gasket, 4" (end cover)
4400-1044	Zinc Anode, 3/8"NPT, 1-1/4" Long