HARDIN MARINE CYCLONE™ HEADERS

IMPORTANT – Read this entire document carefully prior to the removal of your existing exhaust system and installing your new Hardin Cyclone system.

General Notes & Information - Before you begin installing your new Hardin Marine Cyclone Headers, we strongly urge that you thoroughly inspect the cooling water circulating system and replace any worn or damaged components. This will prevent premature failure of your new exhaust system due to insufficient cooling water flow.

This exhaust system is designed to utilize the water circulation system plumbing shown in the attached diagrams “A” and “B” are standard factory MerCruiser® circulating systems (except for Mercury Hi-Performance engines which do not circulate water through the exhaust until the thermostat opens). Use of a system that does not provide constant water circulation with Hardin Cyclone Headers may result in overheating and premature failure. Hardin Cyclone Headers must have water circulation at all times.

The addition of Hardin Cyclone Headers may cause a lean condition in the air/fuel ratio. We suggest increasing the carburetor jet size by about 8 steps or approximately 10% and then begin your tuning calibrations from there. All EFI, MPI engines MUST be recalibrated. Hardin Marine offers this service as an option, please contact our technical staff for more information.

Checking For Water Reversion – Reversion, what is it? It is simply the exhaust pulse flowing backwards momentarily during the overlap phase of the camshaft at low cycling rates. During the overlap phase, the piston is pushing out the last of the exhaust gases and prior to reaching top dead center (T.D.C) the intake valves and the exhaust valves are still partially open. At high cycling rates the inertia of the incoming intake charge and the outgoing exhaust pulses keep the exhaust flowing in the proper direction. But at low cycling rates, as the piston is pushing out the last of the exhaust gases the intake valve opens and some of the spent exhaust charge is pushed into the intake manifold. As the piston reaches top dead center and begins the intake stroke the exhaust valve is still not completely closed. As a result, the piston pulls from the intake and exhaust valves simultaneously causing the exhaust gases to flow in a reverse direction. This is normally not a problem until you add water into the exhaust stream. Reversion can be severe enough to seize or stall the engine, add water to the oil, rust the exhaust seats, etc. This effect only happens at idle speeds, but remember that during shut down the engine encounters the greatest chance of reversion.

For these reasons Hardin Marine has set a guideline for camshaft selection. Our guidelines are based on 454 c.i. with a 285 degree camshaft (230 degree exhaust duration at .050), on a 112 degree lobe center. More aggressive cams may cause reversion. These figures are just guidelines. Cubic inches, valve size, exhaust valve timing, etc., will all have an effect on reversion. The only true test is to run the engine with the headers attached, shut it down, remove the headers and check for water residue in the header and exhaust ports. Should your engine exhibit signs of reversion Hardin offers many optional tail pipe configurations that can totally eliminate water reversion.

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INSTALLATION INSTRUCTIONS

Determine Your Water Circulation System Type:
Step 1 – Review the drawings included with this instruction packet as appendix A-D. Determine if your circulating system is similar to drawing A, B, C, or D. Some engines were equipped with the B system starting in 1988. Go to Step 2, then follow instructions for system A, B, C or D below.

Step 2 – Remove the original exhaust manifolds and tail pipes. Clean all gasket surfaces thoroughly. This is a good time to change spark plugs and do some touch-up on any rust spots on the engine. Go to Step 3.

Step 3 - Install both Cyclone headers and tailpipes using the gaskets, bolts and hardware furnished with the system.
Hint: If your system uses dry style thru-transom tail pipes leave the header to head bolts loose while attaching your tailpipes. This allows for a bit of adjustment to guide and align the pipes through your transom.
Torque all header and tailpipe bolts to 30 foot pounds. Continue by following the instructions for the water circulating system that matches your application.

NOTE: We recommend that you re-torque both the header and tailpipe bolts after the first 3 hours of operation.

For short wet tailpipes – those that mix the water with exhaust at the end of the tail pipe and stop short of the transom, connect a 4" exhaust hose between the exhaust pipe and a 4" transom tip. Tips are not included with Cyclone exhaust systems.

For Dry Tailpipes – those with a water outlet fitting plumb the water outlet to a transom mounted discharge fitting for through transom discharge. Fittings are available from Hardin Marine.

Step 4 – Continue with the installation for your particular water circulating system.

Circulating System "A"

Step 1 – Remove the outlet "Tee" and the two (2) hoses that were running to the old risers and plug the thermostat housing with a ¾" NPT pipe plug. These will not be needed with our system. This is only for Figure "A" style circulating systems.

Step 2 – Remove the thermostat cover and the original gasket, which covers the bypass hole to the cover discharge line. Install the new gasket (furnished) now exposing the bypass outlet and re-install the thermostat cover. This is only for Figure "A" circulating systems.

Step 3 – Plumb the rubber hose from the thermostat cover to the bottom front of each header. Plumb the water outlet from the top of the header to the tailpipe using the jump "U" shaped molded 1" hose.

Step 4 – Attach the controls for the (Port) electrical module, EFI module (STBD), and shift cable assembly to the furnished Hardin adapter brackets and bolt them to the exhaust system using the two inside tail pipe flange bolts.
Note Brackets are provided for standard Mercury installations only, you are responsible for modifications to fit other brands.

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Water Circulating System "B"

Step 1 – Drawing "B" shows the header installation on the starboard side. The original configuration is shown on the port side. Note that on the original installation hose 1A connects to the header hose. 2A connects to the exhaust riser.

In the header installation hoses 1B and 2B are connected to a "Y" fitting. Two (2) "Y" fittings are included with every Hardin Cyclone system that is destined for carbureted engines using a stock cooling system. MPI systems do not use "Y" fittings. Cut the hose and install the "Y" fittings for both port and starboard manifolds.

Circulating System C

Step 1 – Drawing "C" shows the Mercury Hi-Performance plumbing installation. On the starboard side is how the Hardin Cyclone Header will be plumbed. Using the Y-Pipe fitting to connect hose 1A and hose 2B together and plumb to the bottom inlet fitting on the header.

Circulating System D
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Step 1 – Plumbing with after market crossover systems with thermostat bypass see Figure 1. In Figure 2 the thermostat housing hoses go to the bottom of Hardin Cyclone inlet fittings. Use the jump hose from header to tail pipe.

If you have any question on plumbing your new Hardin Cyclone Series Headers please call our tech line at 707-585-9006. We will be glad to answer any question, we are here to help you.

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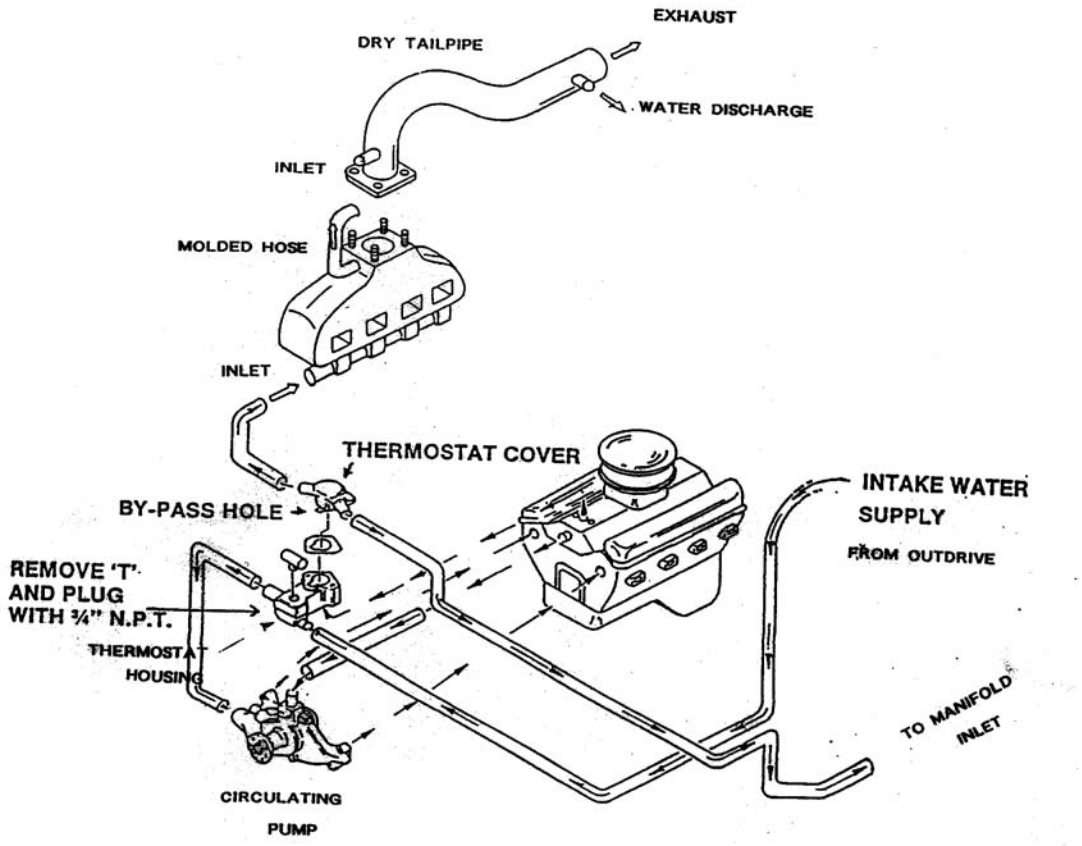
APPENDIX A

WATER CIRCULATING SYSTEM "A"



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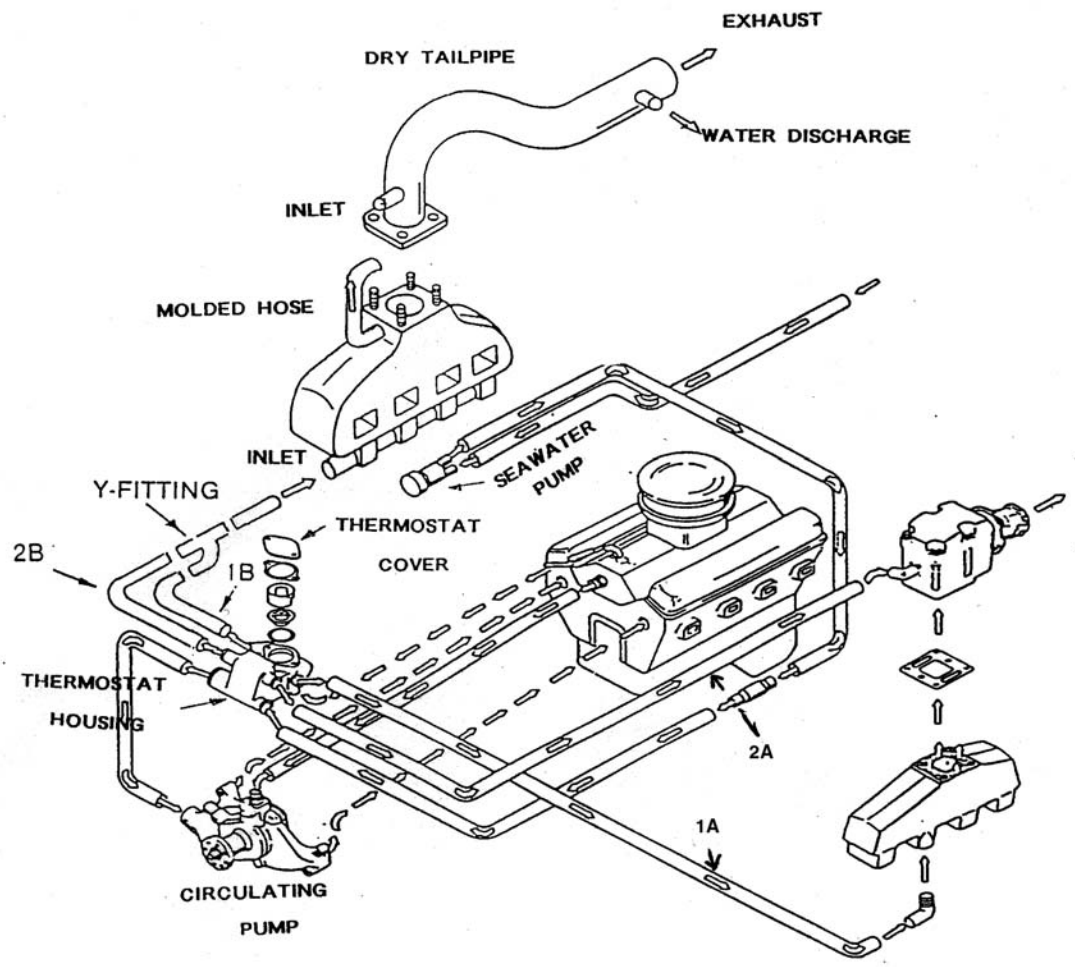
APPENDIX B

WATER CIRCULATING SYSTEM "B"



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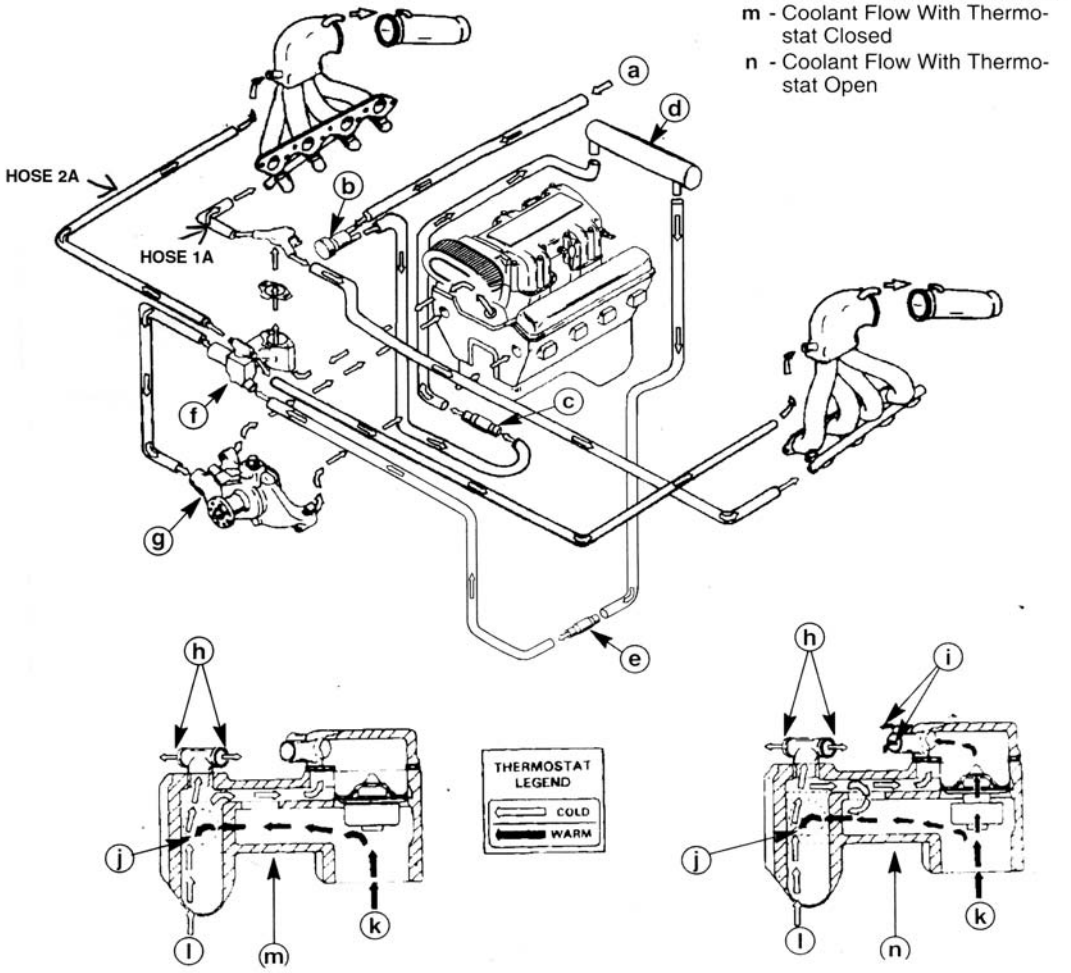
APPENDIX C

WATER CIRCULATING SYSTEM "C"

a - Seawater Inlet
b - Seawater Pickup Pump
c - Fuel Cooler
d - Engine Oil Cooler
e - Power Steering Cooler
f - Thermostat Housing
g - Engine Circulating Pump
h - To Exhaust Elbows
i - To Exhaust Manifold
j - To Engine Circulating Pump
k - Coolant From Engine
l - From Seawater Pickup Pump
m - Coolant Flow With Thermostat Closed
n - Coolant Flow With Thermostat Open



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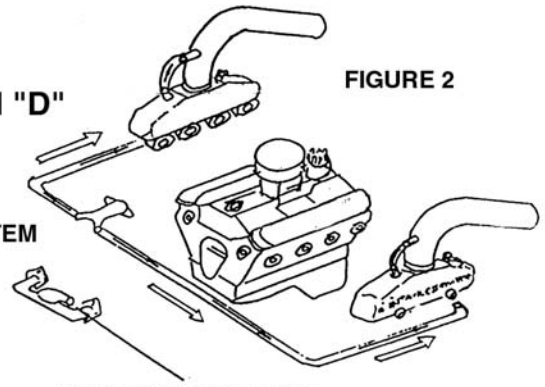
APPENDIX D

WATER CIRCULATING SYSTEM "D"

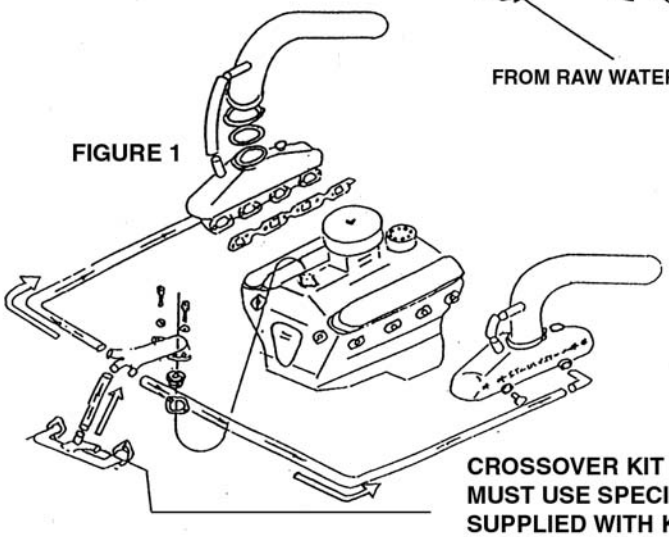
CROSSOVER KIT WITHOUT BYPASS
NO THERMOSTAT CAN BE USED WITH THIS SYSTEM

FIGURE 2



FROM RAW WATER PUMP

FIGURE 1



CROSSOVER KIT WITH BYPASS
MUST USE SPECIAL THERMOSTAT
SUPPLIED WITH KIT.
(NOTE HOLES DRILLED IN THERMOSTAT)

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