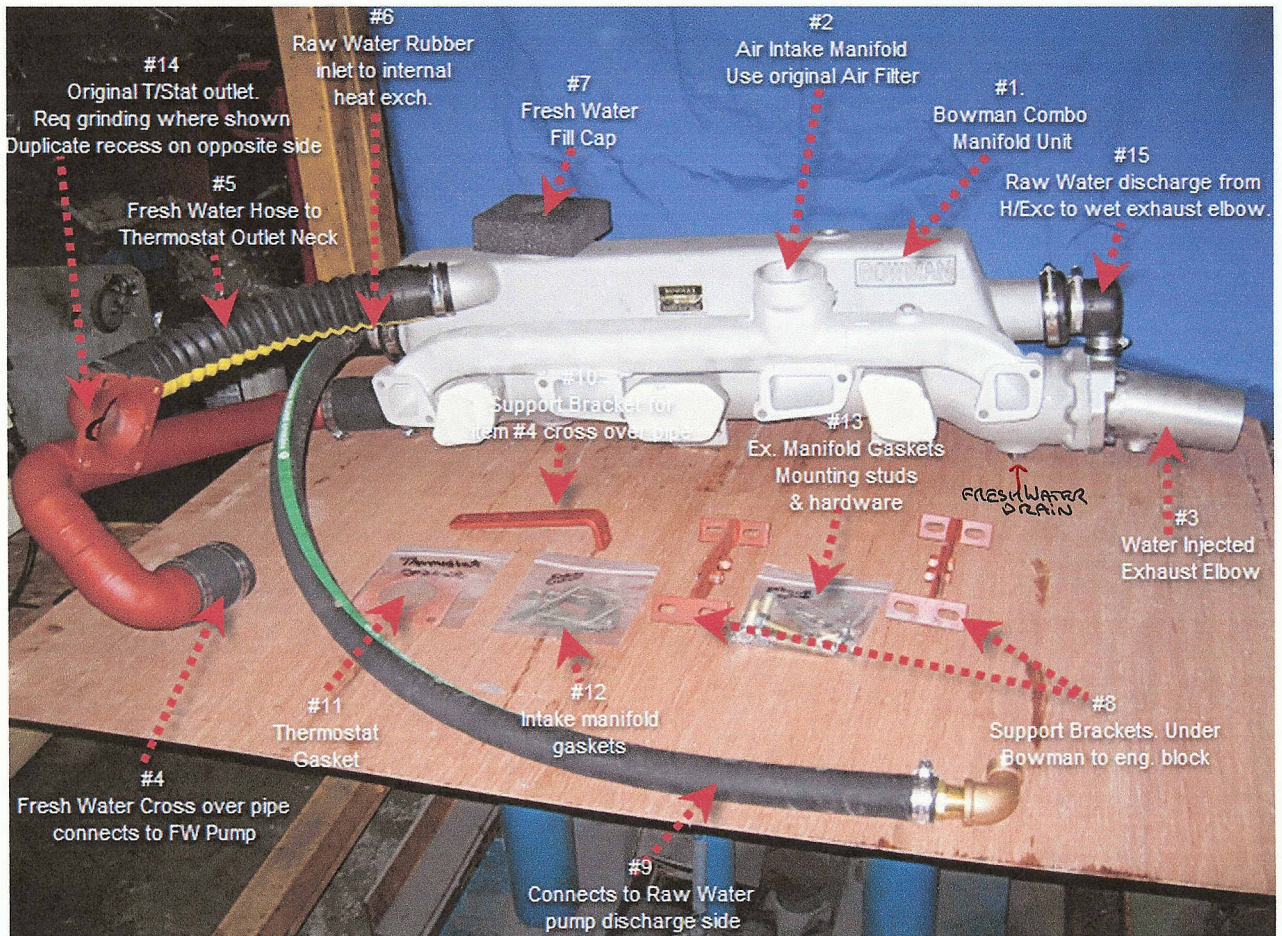


## Bowman 6354 Exhaust Manifold & Heat Exchanger Combo Conversion



**Installation Tips.** Disconnect the battery and turn off main seacock. Remove the following old components from the engine. Exhaust manifold, water injected exhaust elbow assembly, the heat exchanger, header tank assembly and the thermostat outlet. The thermostat outlet will be re-used but requires a slight modification. The other items listed will not be re-used. Located on the inside of the thermostat outlet there is a ground recess on the flat surface it is necessary to grind a similar recess 180 deg opposite, a Dremmel grinder works well for this. This allows the housing to line up and vent into the cyl. block vent hole. The thermostat housing should then be rotated 180 deg. and re fitted using the new gasket supplied. Original thermostat can be re-used providing the engine was previously operating at the normal temperature of 180deg f. If not it is recommended that the thermostat be replaced.

Fit the Bowman manifold to the engine using the hardware and gaskets supplied. If the intake manifold is similar to the one shown in the picture, it should be possible to re use it along with the original air filter. (If different, contact us for advice) Before making any hose connections to the new Bowman, ensure that all the protective shipping caps are removed. There are 4 hose connections, 2 Fresh Water and 2 Raw Water, connect as shown in the above sketch. Fit the support brackets from the bottom of the Bowman to the engine block using the adjustable brackets. Fit the front cross hose support. Once installation is complete follow the instructions on replacing coolant and venting air from system as detailed below.



**Replacing coolant.** If the coolant has not been changed within the recommended period, this is a good time to do so. We suggest a good quality extended life ethylene glycol anti freeze with corrosion protection and rust inhibitor. Ratio of mix to 50%-50%

It is normal for air to be present in the Fresh Water system after it has been drained; this should be vented as the anti freeze is being filled. To vent air, choose a high point on the front of the engine, the water temp sender or alarm switch are a good choice as they are normally located at the front on the top side of the cylinder head. Either one of these can be taken out, or loosened to the last thread so it can allow air escape. During this process the level in the Bowman tank should start to drop as the air is vented. Continue until anti freeze without the presence of air is coming from the vent point. Top off system to within 1 " of filler neck, this will allow for expansion of coolant. Re connect battery and turn on sea cock. Check the installation for leaks, none being present, the engine should now be ready to start. It is very important to monitor the fluid level and temperature carefully before and after engine comes up to working temperature. It is recommended that the engine run at the dock for approx 20 to 30 mins. to ensure coolant level is correctly maintained. **Caution:** Do not remove cap to check level until engine has cooled down as the system will be under pressure and could cause burns.

**Cleaning & maintenance procedure of heat exchanger tube bundle.** Even with a good sea strainer, it is possible for the tube bundle to become restricted. The most common cause is a failed RW pump impeller. When it fails fragments of the impeller will be pumped up to the tube bundle inlet causing a restriction or blockage. This can result in overheating. To remove tube bundle you must first drain the anti freeze from the tank via the drain plug located towards the rear on the bottom of the tank. Drain to a level just below the tube bundle being removed. It is not necessary to drain the engine block. Loosen both sets of hose clamps on the front and rear rubber end caps Item #'s 6 & 15., with the end caps removed, the tube bundle should then slide out in the direction that is easiest for the installation.

**Important:** When re installing the tube bundle, be sure to leave an equal protrusion of the tube bundle 1" (25mm) on either end, be careful not to push the bundle further in one direction when pushing the rubber end cap back on. This is critical. Failure to re install correctly will result in raw water contaminating the fresh water side of the engine and overheating.

Follow instructions on replacing coolant as detailed above.

**Questions ?** Give us a call, with any questions, don't take a chance. Contact us at:

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<b>Item #</b>	<b>Description</b>	<b>Additional Instructions</b>
<b>1</b>	Bowman Combo Manifold Unit	This unit will replace the existing exhaust manifold, header tank and heat exchanger.
<b>2</b>	Air Intake for Intake Manifold	Original Intake manifold will be used if it looks like one shown.
<b>3</b>	Water Injected Exhaust Elbow - options available	Water injected Exhaust Elbow accepts 3" inside Dia hose.
<b>4</b>	Fresh Water cross over pipe	Pipe connects Fresh Water between Bowman built in heat exchanger Fresh Water pump inlet
<b>5</b>	Fresh Water Hose to Thermostat Outlet Neck	Hose feeds Fresh Water from Thermostat outlet to Bowman built in heat exchanger
<b>6</b>	Raw Water Rubber Inlet to Internal Heat Exchanger	Raw water heat exchanger inlet rubber end connector. This is removable should it be necessary to remove the tube bundle for cleaning. (See installation notes for procedure)
<b>7</b>	Fresh Water Fill Cap	Fresh Water fill cap. Fill with 50%-50% Extended life Ethylene Glycol antifreeze. Preferably with Aluminum corrosion inhibitor.
<b>8</b>	Support Brackets	Used as extra support between underside of Bowman and engine block.
<b>9</b>	Connects to Raw Water Pump discharge side	Hose connects between discharge side of Raw water pump and raw water rubber inlet on front of Bowman Item # 6
<b>10</b>	Support Brackets for Item #4 cross over pipes	Bracket to support hose #4 that connects between FW pump and FW side of Bowman.
<b>11</b>	Thermostat Gasket	Fit after removing neck, grinding indent as mentioned #14
<b>12</b>	Intake Manifold Gaskets	Only required if the original inlet manifold is not re usable and has to be replaced.
<b>13</b>	Exhaust manifold gaskets, mounting studs and hardware	Required for mounting new Bowman Manifold
<b>14</b>	Original Thermostat housing to be reused	Remove the thermostat neck, and grind a little indent on the opposite side to existing indent. Rotate neck 180 deg.
<b>15</b>	Raw Water discharge from Heat Exchanger to Wet Exhaust Elbow	Removable end cap, connection to Water Injected Exhaust elbow. See installation notes for cleaning procedure.

3/9/07