



Chesapeake Tartan 30 Association

SUPER BILGE PUMP

Brad Armendt, T-30 #282, *Emprise*, December 1993*

Tartan 30s were factory-equipped with a manual bilge pump, but many owners have wished their boats had a *powered* bilge pump in addition to the manually-operated one. If you're out on a cruise, miles from any port, and the boat develops a leak that you can't remedy on the spot (or can't even find!), it might be tough to make it back to safety using only the manual bilge pump.

You could install an electric bilge pump, but you have to wonder whether one of those plastic centrifugal pumps would hold up if you had to run it for hours to get back to port. Or, you could install one of the electric-powered diaphragm pumps, but they're pretty expensive, and their low pumping capacity isn't reassuring. What people tend to forget is that they already *have* a very powerful and efficient seawater pump on their boats. It's your engine! In normal operation, the seawater pump on the engine sucks water from a thru-hull seacock, forces it through the engine cooling water passages (or a heat exchanger, if you have fresh-water cooling) and from there into the engine exhaust system for overboard discharge. It moves a lot of water, and it can do this reliably for long periods. All you need to make it an emergency bilge pump is some means of shifting the intake from the thru-hull seacock to the bilge.

On *Emprise*, we added a $\frac{3}{4}$ inch bronze 3-way diversion ball valve by Apollo (see Figure 1) near the engine intake thru-hull seacock. *CAUTION: Don't use one of the plastic Y-valves, or waste diverter valves intended for use in marine sanitation systems. They are not suitable for below-waterline use in seawater intake applications.*

The hose from the engine goes to the center of the 3-way valve, while the seawater intake from the thru-hull and the bilge intake go to the two ends of the valve. Make sure you get this right. With the handle of the 3-way valve in one position, the engine should suck water from outside the boat (normal operation). When the handle is turned 90°, the engine should suck water from the bilge, but the path from the seawater intake is *blocked off*. Hooked up wrong, the engine sucks water from the thru-hull in normal operation, but when the 3-way valve is thrown, the engine intake is blocked off, and water runs directly from the seacock into the bilge. Shortly, the engine seizes and the boat is scuttled. Please don't laugh. I almost did this.

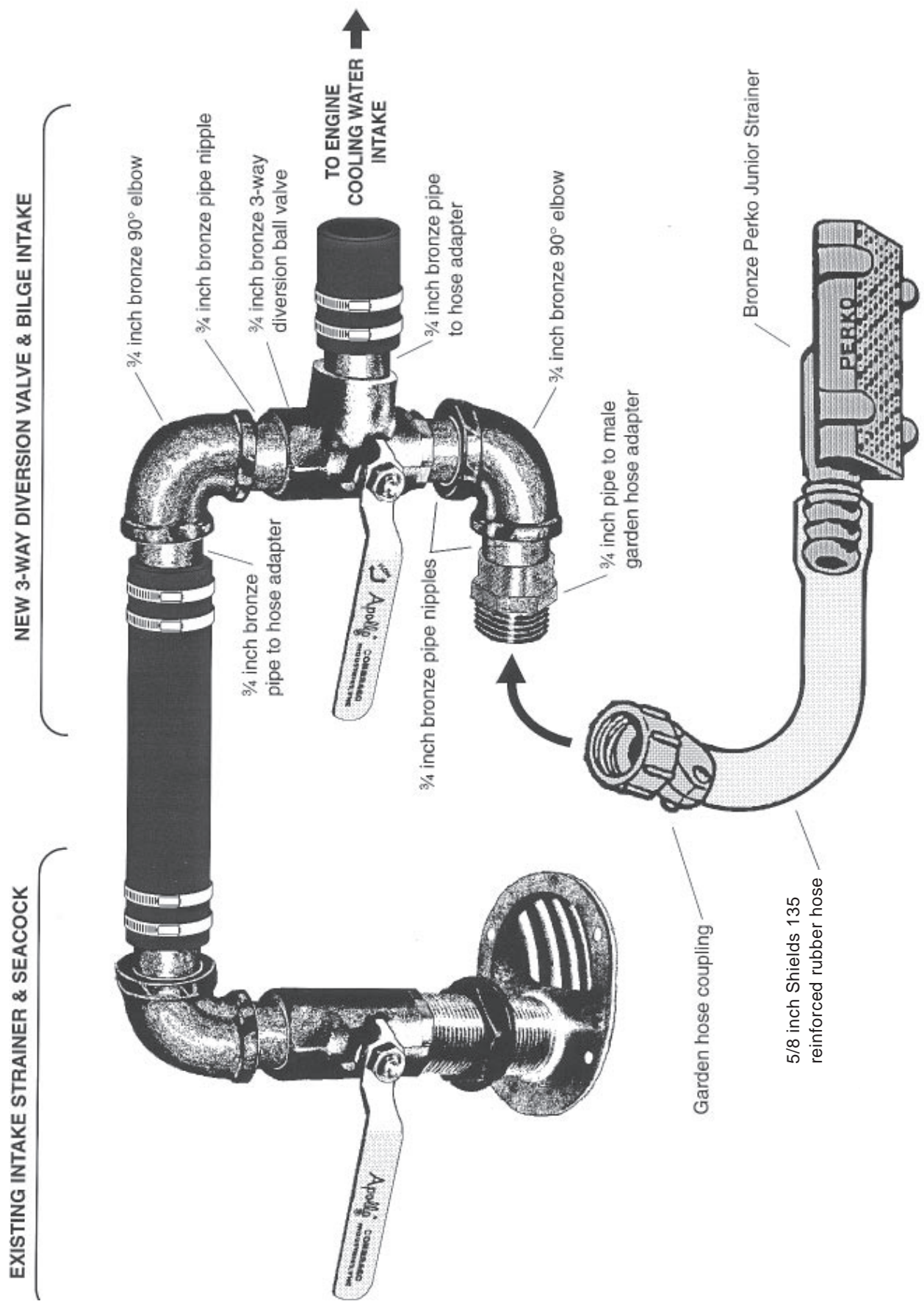
To hook the valve to the hoses, you'll need $\frac{3}{4}$ inch bronze pipe-to-hose adapters for the seacock-to-valve hose and the valve-to-engine hose. Both straight and 90° curved pipe-to-hose adapters are available. The curved ones take up more space. To fit in the space available, I used straight hose adapters, together with bronze pipe nipples and 90° elbows. The valve assembly was attached to a block of plywood using two stainless steel U-bolts, and then the plywood was screwed to the bulkhead between the engine and the boat batteries.

Instead of using one of the bronze pipe-to-hose adapters to attach the bilge-to-valve hose, I elected to use a male garden-hose-to-pipe adapter, to make winterizing easier. My hose to the bilge is $\frac{5}{8}$ inch Shields Series 135 heavy duty water hose, with a female garden hose coupling. The end of this hose in the bilge is attached to a bronze Perko Junior Strainer. Remember, impeller pumps such as the seawater pump on your engine can handle only small particles of solid material. An intake strainer is essential to avoid pump impeller destruction, should large solid particles be ingested. And, sooner or later, large solid particles of trash *will* get into your bilge.

Even with the heavy bronze strainer on the end, I had trouble keeping the intake flat on the bottom of the bilge. Eventually I semi-fixed it in place, as follows. I cut a piece of $\frac{3}{16}$ inch-thick sheet plastic about 2 x 4 inches, then drilled a 1-inch hole near one end. From Annapolis Marine Fasteners I obtained a 1-inch stainless steel nut and washer, to match those that hold the keel on the boat. (I'd have been happy with a cheap, plastic 1-inch nut, but didn't know where to find one.) The sheet plastic was fitted over one of the keel bolts, and held down with the washer and nut. The bilge intake strainer was slipped under the opposite end of the sheet plastic and held in place by a plastic cable tie. In an emergency (e.g., to clear a stoppage), the cable tie can be quickly cut and the strainer pulled out of the bilge.

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FIGURE 1. ADDITION OF 3-WAY DIVERSION VALVE TO ENGINE WATER INTAKE

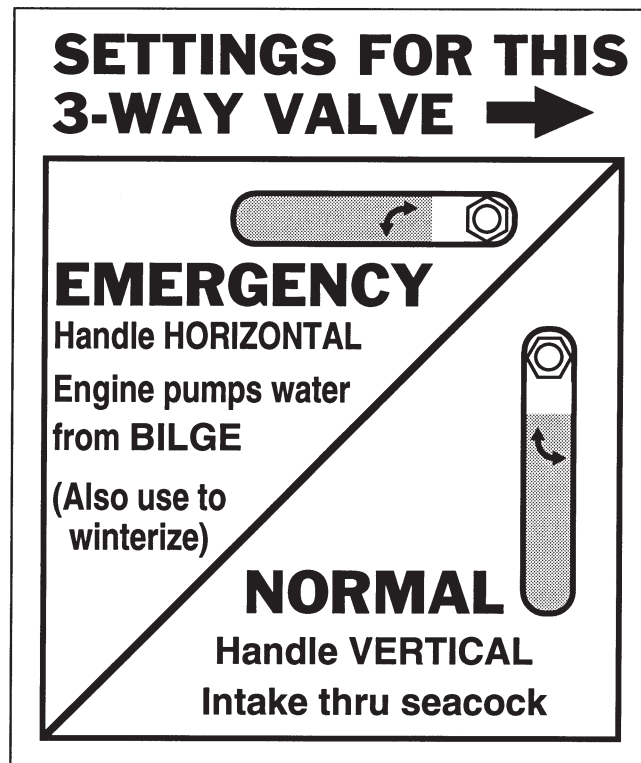


After installing this system, be sure to put a sign next to the 3-way valve explaining its function (see Figure 2). The sign needs to be idiot-proof because (a) if the valve has to be thrown, you're probably in a near-panic situation, or (b) you may be otherwise engaged and have to ask somebody who is *not* familiar with the innards of your boat to throw the valve *for* you.

With the engine running, if the 3-way valve is turned to suck water from the bilge (whether it's an emergency, or a test, or just to clear out the bilgewater) it is absolutely essential that somebody watch the bilge water level and turn the 3-way valve back to the normal operation position as soon as the water level is near bottom. Remember, no flexible impeller pump can run dry for very long without impeller damage. If you ruin the impeller, you'll be without a powered bilge pump *AND* an engine to help you get out of the emergency. For the same reason, if the 3-way valve is turned to suck water from the bilge, and then the engine is turned off for any reason, be sure to put the valve back into its normal operation position. Else the water pump impeller will self-destruct *later* when the engine is restarted.

FIGURE 2.

Place a sign like this where easily visible next to the new water intake diverter valve.



Besides contributing to safety, the 3-way valve system makes winterizing the engine cooling system a snap. Make yourself a winterizing hose from a spare piece of PVC hose and a cheap, plastic female garden hose coupling; keep in a good place until winter. To winterize, disconnect the bilge garden hose connector (no tools!), attach the winterizing hose and stick its other end into a jug of antifreeze. Start the engine and warm it up thoroughly (until the thermostat opens), with the 3-way valve in normal position. When ready, throw the 3-way valve to suck antifreeze into the engine cooling system. Watch the level in the jug closely. When it's almost gone, stop the engine. Put the 3-way valve back to normal operation position, remove the winterizing hose and reattach the bilge hose. Close the through-hull seacock. You're done.