



Major Maintenance and Repair Action

Hull 269 – Jade

Maintenance or Repair Action: **Replace Marine Toilet Overboard Valve** Number: **001**

| | | | |
|--------------------------|---|-----------------|---------------|
| Reason for Action | Old or original bronze valve stuck in the closed position and could not be turned using penetrating oil and pipe wrenches | System | Marine Toilet |
| | | Start | 11/24/2017 |
| | | Complete | 12/17/2017 |
| | | Cost | \$200.00 |

DESCRIPTION OF ACTION

Either the original or last installed overboard valve from the marine toilet system (known in the Maritime Industry as the Sanitary System) was stuck closed. The sailboat at this time was “on the hard” – dry and suspended ashore on special stands to keep the keel from touching ground (Maritime Industrial equivalent: Drydock). Penetrating oil and pipe wrenches could not open the valve. The valve was integral to the through hull fitting, similar if not identical to Perko fittings found during material source research.

The Perko fittings found during research were very expensive. Therefore, bronze and brass fittings listed below were found to be adequate replacements according to West Marine representative. However, the old fitting had to be cut out using a “saws-all” (reciprocating saw) – again, the West Marine representative was helpful in relaying the concept. The fitting was cut almost flush to the bilge. Then five radial cuts from the center outwards were made, allowing a chisel to be used to knock out the wedge shaped pieces remaining. The radial cuts had to be filled in with Marine-Tex Epoxy and sanded smooth.

A new bronze through-hull valve was installed and sealed on both sides with 3M 5200 Fast Cure Marine Sealant, as recommended from the West Marine representative. Finally, a 90 degree brass elbow, nipple, valve with grease fitting, and 2" NPT pipe to hose barb fitting was installed to connect to the original flexible hose with two existing stainless steel hose clamps. All joints were coated with “pipe dope” (pipe thread sealant) vice Teflon tape. Two copper electrical grounding connectors were clamped onto the through-hull fitting and connected to the adjacent 1-½" water supply valve as per the original configuration. The valve was lubricated with marine grade (STP) grease via the zerk fitting.

After launch on May 10, 2018, no leaks were detected from the valve or through-hull fitting. No diagrams of the toilet system exist. It was discovered later that Sanitary Systems were aftermarket options for Pearson Yachts.

See attached pictures.

NOTES

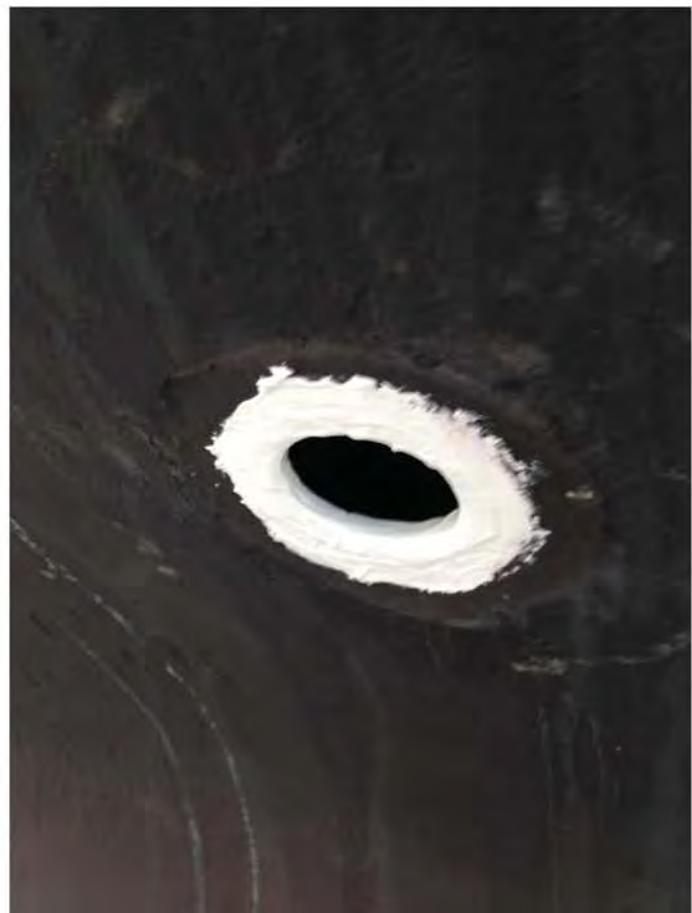
Besides consumable materials, a Saws-all (reciprocating saw) and blades, along with two pipe wrenches, a grease gun, and marine grease were procured for the project. A vibrating sander and sanding pads were used to sand the two part Marine-Tex epoxy smooth. A chisel set was most useful for punching out radial sections of cut through-hull fitting sections. Pipe wrenches were essential for re-assembly. Cautions: Careful radial cuts are key, as well as many rags during the application of the 3M Sealant. Highly recommend all products listed.

West Marine is usually an expensive outfitting source; however the technical help in this case was worth the purchase price.

| Tools, Materials, Manuals, and Diagrams Used | Parts Used | Part Number |
|--|------------|-------------|
| | Name | |
| Saws-All and Blades | | |
| Marine-Tex White Epoxy, 2 oz. | | |
| 3M 5200 Fast Cure Marine Sealant, 3 oz. tube | | |
| Marine Grease (STP) | | |
| 2" NPT Bronze Valve (West Marine) | None | None |
| 2" NPT Bronze Through-Hull Fitting (West Marine) | | |
| 2" NPT Brass Close Nipple (West Marine) | | |
| 2" NPT Brass Elbow | | |
| 2" NPT Brass Hose Barb fitting | | |



Hull from inside after removal
of old valve/through-hull assembly



Hull from outside after removal
of old valve/through-hull assembly



Old Perko valve and through-hull assembly. Note the radial cuts on the through-hull flange to facilitate the removal of the old threaded collar (not pictured). Old valve was frozen stuck in the closed position. Grounding wire (green - see left picture) was attached to the flange with a brass screw. A brass lug was connected and attached with a stainless steel hose clamp to the new valve (not pictured).



Final through-hull and valve hardware installed to original flexible hose from marine toilet system