T3500 #131 Sole Repair & Re-setting, Adding Access to the Hidden Bilge

Purpose: 1. To repair a damaged portion of the holly/teak veneered plywood sole by the mast base and provide ventilation and drainage between the sole and the fiberglass ‘sub sole’.

2. To install a new hatch in the sole to access the bilge (and keel bolts) under the table.

Background: The Tartan 3500’s had differing sole manifestations during their production. Mine is a holly/teak veneered plywood sole screwed down onto a fiberglass “sub-sole” with cutouts. T3500 #115, just 16 builds and a year earlier than my boat, has her sole glued down to the fiberglass sub-sole! I have not seen this boat (Intuition) and it may be that this permanent installation was done after the boat was bought, but from what Don has told me, it seems to be in the situation of never allowing the sole to be replaced, the keel to be re-bedded or even the keel bolts to be tightened.
**T3500 #131 Sole Repair & Re-setting, Adding Access to the Hidden Bilge**

**Issues:** Rainwater, that makes its way through the starboard shroud plates and drips down the inside of the mast itself, can wet the base of the mast. Over the years the plywood under the veneer has de-laminated here and degenerated on my boat. The sole is split along the centerline in the middle of the main cabin into port and starboard pieces that are screwed down. This means that the port half has to jog around the mast base in a strip about 3/4” wide and 5” long, a weak point (especially when it has already degenerated) when you are lifting the sole out.

The sub sole as uncovered showing the bilge access aft of the mast that is normally inaccessible. Note the thin passage to the starboard side of the mast base that a strip of the sole has to go through.

**Removal:** the table has to be removed to extricate the sole. It has four 1/4-20 Phillips head machine screws holding it to the sub-sole. On my boat these had at one time been secured with Loctite™ and I had to drill the heads off two of them to lift the table out. With heads removed the table could be lifted off and the bolts could then be unscrewed using vice-grips. The mast base cover box is loose and can be slid up the mast. The floor was a tight fit into the fiberglass molded ‘nest’ that it sat in and it took some pulling to get it out. The thin strip on the port side of the mast base broke.

**Repair of the sole:** the two separated pieces of the starboard side of the sole were interlaced back together until the grain on the veneer matched
T3500 #131 Sole Repair & Re-setting. Adding Access to the Hidden Bilge

well. Then the joining area of the plywood was injected with West epoxy using a glue syringe and was clamped together using wax paper on the veneer. After this cured the sole was cleaned up and then cut at this point with a thin-kerf pull-saw to create two individual pieces for ease of re-installation.

New hatch: there is a hidden access aperture in the fiberglass ‘sub-sole’ to the bilge under the table. I marked the wooden sole to show the location of this. Since this rectangular opening proceeds forward of the forward table foot, I stopped the hatch at the forward edge of that table foot to allow it to be removed while the table was in place.
I cut the marked opening on the wood sole roughly with a jig saw, saving the cut pieces. I then routed the opening on both port and starboard pieces using carefully aligned and clamped fences of scrap lumber on the sole. This provided a very regular rectangular opening which was lined with cherry wood. This wood was cut down to match the thickness of the sole and sawn to match the width of the other hatch-opening frames. This was clamped and glued in place. The two pieces of sole that I had cut out with my jigsaw were cleaned and glued together along the centerline. This block was then cut down on the tablesaw to match the opening I now had in the sole (and to line up with the holly strips on the rest of the sole!), less 1/16” each edge (clearance), plus the width of the cherry I was adding. The cherry strips were glued to the edges of this block. At this point all the raw cherry was rounded down a bit and sealed and finished with varnish.

Using a manual milling machine I machined a two-depth recess in the surface of this hatch for the pull ring (you could router this, I just happen to have a milling machine available). The pull ring perfectly matches all the others on my boat. I bought mine from go2marine.com as #22717, Perko, lifting pull ring, flush ($43.18 including shipping in 2011). It is installed with the four screws provided.
Installation and Ventilation Provision: spacers, (actually, 1/4” cruciform tile spacers, about 1/8” thick. Available in bags of 200 from Orchard Supply Hardware (or etc.) for a dollar or two) were glued, using instant glue, to the cleaned sub-sole. Spaced on an approximately 2” grid with concentrations around the edges, the new hatch opening, the table attachment points and the cut holes in the sub-sole. The floor was screwed back down with the original #8 one inch long, black oxide, Phillips, oval head screws. I bought more from McMaster Carr.

Lowering the table (since it was out anyway): the table was just too high for us. We could have beefed up the cushion thickness on the seats, but we
didn’t like that idea. The feet of the table are, luckily, fairly chunky and are cherry. There are foot pads and an intervening cross space that is elevated away from the floor. I used planks clamped to the edges of the legs to support the router as I went down one inch (in two stages) on each foot, and then one inch on each cross space. I used a 3/8” diameter single blade carbide cutter with a top flush bearing so I could use the edges of the features (with blocks clamped to them) to act as guides for the limit of the cut. I then rounded over the cut edges a bit (220 then 320 sandpaper) and sealed and finished all cut surfaces with varnish.

Strengthening the table (and why not?): I also added strength to the table by screwing the ‘cabinet’ part to the legs (as had been done through the bottle storage locker at the fore end) through the drawer space with 2-1/2” long #12 ss FH wood screws. You will be drilling through the lower drawer runners at an angle here, so ensure you countersink the screw heads well. Space is tight but it works with small cordless drills.

Conclusion: If you ever have to take the sole out, then I strongly recommend gluing down spacers to provide ventilation and drainage before you replace it. You won’t notice the difference except in the longevity of the sole. Add the hatch if you want access - I added another bilge pump in the newly accessible space as a back up. Lowering and strengthening the table is pretty straightforward and certainly the strengthening is a good idea.

©Philip Roberts 2012, Palo Alto, CA