

DAYSAILER TECHNICAL NOTE

D. J. Bents [From *The Day Sailer*, #100, Spring 1986]

DS II Center-board Trunk Leaks

Although the DaySailer II's rugged "double hull" design is potentially very watertight, the manufactured article in practice has not lived up to this potential due to lax quality control. Of particular concern are leaks into the inner hull (bilge) area between the hull and cockpit/interior pan moldings. This area is supposed to be sealed watertight, but a few hours sailing always seems to produce a good-sized puddle in the bilges. You get a lot of practice reaching through those inspection ports with a sponge. In rough water, it is particularly annoying — in no time at all there may be a good inch or more sloshing back and forth. When this happens, the boat begins to develop an ugly personality. Passengers tend to get nervous and ask a lot of questions.

The water is probably coming in through the centerboard trunk.

The problem is with the centerboard pendant through-holes which are drilled into the trunk from the cabin (one faces forward and has a stainless steel cable running through it; the other is on top).

These holes penetrate a three-layer sandwich of material:

1. Centerboard trunk cap (laminated fiberglass).
2. Filler material.
3. Centerboard trunk (the trunk cavity is molded into the hull).

The filler in this sandwich is a chopped fiber(glass) putty, used to cement the joints between the hull and cockpit moldings. During assembly, most of it gets squeezed out to fill voids when the moldings are pressed together. The pendant through-holes are drilled after this assembly step. If the voids were not completely filled in where the hole is drilled, or if the filler material has cracked and broken away from inside the hole, then there is a direct path for water to get in. The pendant holes themselves are pretty large — 3/4" — fortunately, they are located above the waterline. Nevertheless, water splashing up inside the confines of the centerboard trunk is under considerable surge pressure; it is literally pumped in by wave action through any opening that appears.

The forward (raising) pendant hole is the most likely place for this to occur since it is the lowest. Worse yet, the steel cable tends to cut into the surrounding material like a bandsaw, each time the board is raised. Over time, the hole will grow into an elongated slot; this only lets more water in.

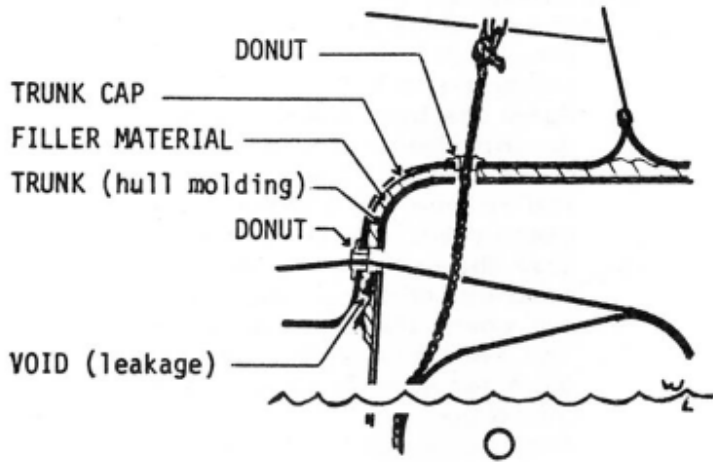
The problem can be fixed temporarily by jamming some filler putty inside the hole. Or, you can fix the problem for good simply by tapping out the holes and threading brass pipe nipples into them!

The factory-drilled pendant holes are only slightly larger than the starting diameter of a half-inch NPT pipe tap. The trick is to tap each hole only deep enough to thread the nipple all the way through the centerboard trunk, yet protrude no more than 1/8" or so into the interior cavity (to allow clearance for the board and pendants). The fiberglass taps easily and will hold a threaded joint that is strong and tight. The pipe nipple will reinforce the hole, stop the leakage and allow the cable to slide freely without sawing into anything. A swaged loop will pass through the diameter that remains without difficulty.

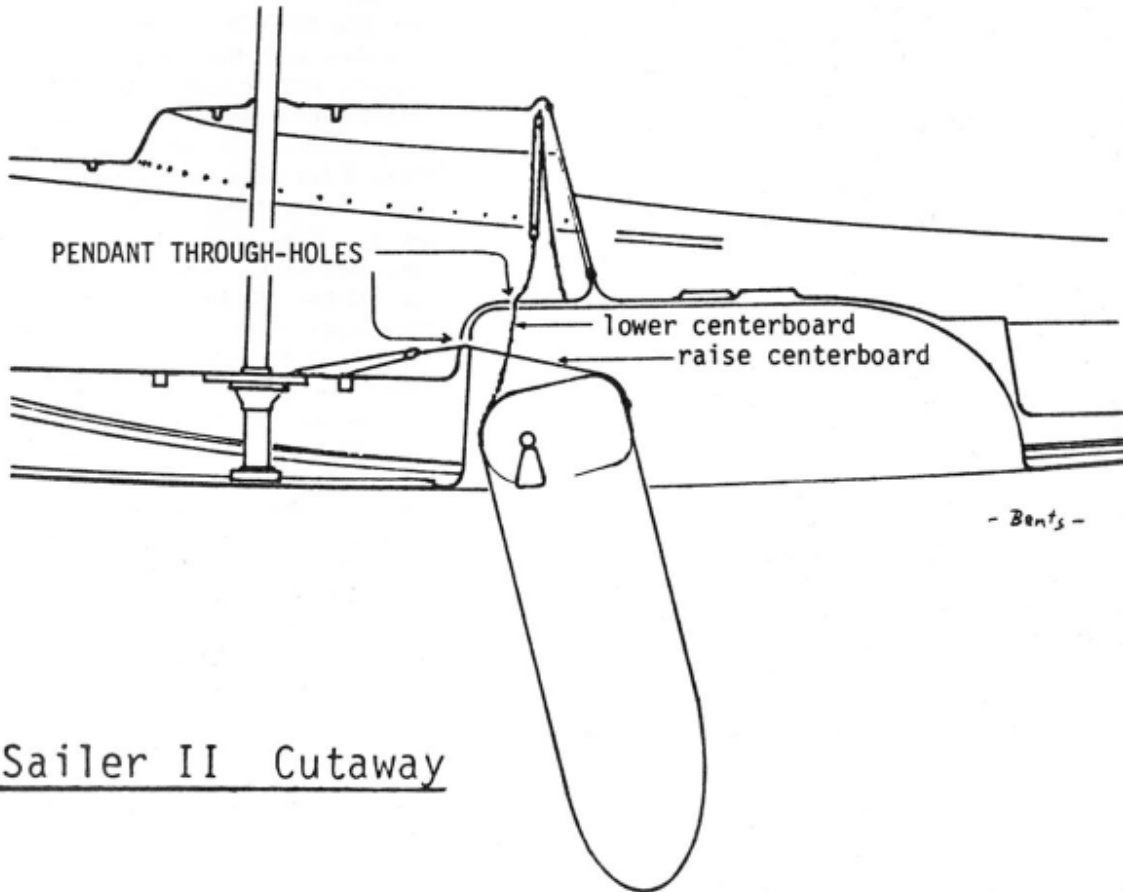
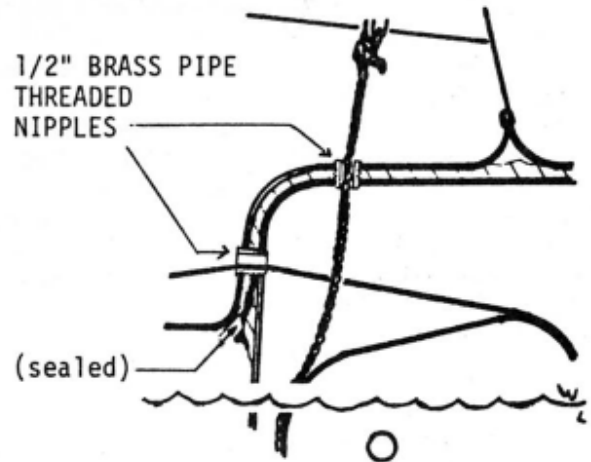
Here are the steps for making the repair. You will need a half-inch pipe tap, some threaded lengths of half-inch brass pipe, a basin wrench, hacksaw and a wide mill file:

1. Release all the centerboard control lines. Untie the top pendant and disconnect it. Disconnect the forward pendant shock cord.
2. Raise the boat enough to get some ground clearance under the centerboard trunk. Then go underneath and remove the stainless steel centerboard pivot retainer plates.
3. Ease the centerboard down and forward out of the trunk until you can see where the cable is connected to it. The head end of the board should come down far enough to let you get at this connection.
4. Remove the cable assembly from the board. You should now be able to slide it forward and all the way out of the trunk.
5. Let the boat back down, then go inside and pry out the little plastic "donut" inserts that cover the pendant holes. The cable and its tang plate can now be pulled out. At this point, you should be able to clearly see where the leaks came from. Throw the donuts away. You will never use them again.
6. Tap out each hole with the pipe tap. Tap it out in several passes; taking care each time to stop and thread the nipple in to see how much further it needs to go. If the hole is very much off-center in the trunk, you may want to grind or file down the nipple end to match the trunk cavity's interior contour more closely. Brass is a very easy metal to work with, so don't let filing to match a contour scare you. You will have to go back underneath the boat many times to see where the nipple is emerging. Strong sunshine or a powerful drop light helps.
7. When you are satisfied with the way the nipples fit when they are threaded in tight, go back and remove them, clean them, and re-install them with epoxy.
8. Any drips or spatters inside the centerboard trunk should be removed right away; this is done best using a rag that is slightly moistened with solvent, pulled over a long narrow stick. Swab the trunk interior clean before the glue hardens.
9. Wait for a day, then go back and cut the remaining pipe off next to the trunk cap. Use the file to face it off smooth and flush.
10. Re-install, re-assemble, re-connect. You will be surprised at how dry the bilges remain, even in rough water.

How water gets in



How to fix it



DaySailer II Cutaway