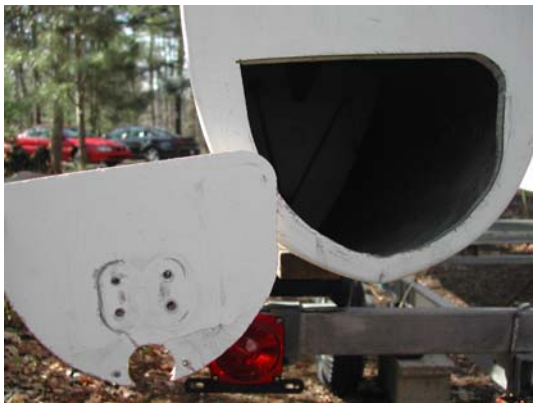
Transom repair on H-18

The port transom was cracked around the lower gudgeon. It flexed when the rudder was pushed and pulled. This explained why 4-5 gallons were dumped after every 2-3 hour sail. The extra ballast proved to be helpful one day when sailing in 23-knot wind and 4-6 foot waves; but long-term this is not good for performance. A repair had to be made.

I decided to cut out a large opening and make the repair from the outside, instead of trying an inside repair through an access port. Adding ports can weaken the hull's deck, and can leak water into the hull. Here's what I did:

Removed all hardware. Drew a line for the cut. The line started at the lower tangent of the drain hole, followed the hull shape upwards to a place where the transom was solid, extended to the other side, and then back to the drain hole. The line left enough "lip" (about 1 inch from the edges), so the cut would leave a flange for attaching reinforcement blocks. It was big enough to easily get my hand into the hull. There is a ¼" X 2" X 2" chunk of steel sandwiched in the transom for mounting the lower gudgeon. I imagine there is a similar chunk for the upper gudgeon too. Mark locations of the drain hole, drain plug base mounting holes, and the gudgeon hole alignment (2 ways). Make these marks on the hull's sides.

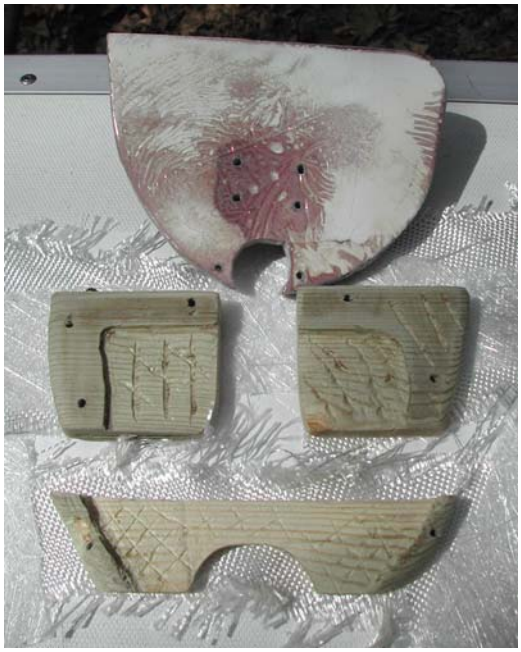


Cut the transom section out with a coarse-bladed reciprocating saw. Save the piece to put it back in later. Be careful to retain the steel plate in its original location, so the gudgeon screws will line up again.

Repaired the transom section. It had delaminated. Clean all surfaces including the plate, with acetone. Some can be poured through he layers. Always wear gloves and safety glasses. Mix epoxy (West 105 resin, 205 hardener) with 407 filler: and add 1/16th to ¼" cuttings of fiberglass for extra strength. I made up the composite slurry in a small plastic drinking cup. I could use the cup's molded-in ribs as measuring marks I had pre-determined with using water and a marker. I usually made enough epoxy composite to fill the cup about 1/3rd to ½ full. Carefully lift the transom layers, and use a tongue depressor or equivalent to lather in the epoxy/glass, thick gooey paste. The goal is to make the cutout the same thickness as original.

Sandwich the cutout between thick, flat plastic and clamp down with several clamps, starting the center and working to the edges to squeeze out air. Wood boards on each side can stiffen the clamp effort. Wipe off excess epoxy, down to the core cutout material. Let cure overnight, finish side down, in a warm area where the odor won't bother anyone.

Make the cutout fit the opening. Use a rasp file, a Surform, coarse sandpaper, etc. to shape the cutout so it fits back into the opening.



Made and mounted flange blocks. Using clear 1 X 6 pressure-treated wood, make 3 or 4 blocks to epoxy and screw to the "flange" left around the transom hole. I made one for each of the upper corners using a wood piece about 3 X 3". I also made one about 2" wide, to run from side to side, just above the drain hole. The inside of the hull is not smooth. The blocks will have to be whittled using a rasp file so a flat surface is presented to the cutout piece, so it will fit back in the opening slightly recessed from the original transom surface. I scored and gouged the surfaces for extra locking by the epoxy.
Once the blocks look like they will fit in, mount them in place one at a time, starting with those in the upper corners. Clamp them to the hull "flange" and drill two 1/8" holes through the hull and into the block. Remove the block, enlarge the hole to 3/16" and countersink deep enough so the head of a #8 stainless steel wood screw will seat a little below flush. Be careful not to go too deep. Do a dry installation and make the cutout fit in place as well. Once it looks like it will all go together well, mount in place for real. Lather up the entire surface of the wood block being installed. Wearing gloves and glasses. Hold the block in place while driving in the screws. These need to be snug. Over-tightening will split the block. Repeat for the other blocks. Being a little anal, I then wetted strips of fiberglass cloth in epoxy, and fingered them onto the backside of the blocks, extending the glass onto the hull, and pushing them into the radius between block and hull. I am not sure how effective this is,

because there is no clamping to hold the strips in place. The extra epoxy filled remaining gaps. Wipe excess from the edges of the opening and the front surface of the blocks.

Make the cutout fit. I used a rotary file in a Dremel to grind away wood and transom flange so the cutout would fit sub-flush. Once satisfied, align the cutout to the marks made on the hull, and drill as above, using no more than two screws per block, evenly spaced. Make the countersunk holes in the cutout. Wear gloves and make up some epoxy. Lather up the blocks and edges of the opening with a small amount of epoxy composite slurry. Set the cutout in place, driving the screws through the cutout and into the blocks. Do not over-tighten. Fill in the gap with remaining epoxy. Protect from elements. If cool outside, apply heat with a hairdryer or heat lamps. Even a light bulb and a foil hood will help raise the temperature to make the cure happen faster.

Fair the transom. Make epoxy fairing composite and add white pigment (I did not use pigment and wish I had). Spread thin layers across the entire transom, letting each layer cure to being tacky before applying the next. Do not loose the holes for the gudgeons (toothpick them open). After 3 or 4 layers, rasp file and flat sand with 60 and 100-grit. Continue to add layers and sand until it looks smooth and flush.

I tried holding a piece of 3/16” polyethylene plastic sheet against the epoxy using blocks and a 2X4 to hold it in place. It helped reduce filing and finishing.

Drill mounting holes and finish the drain port. Drill 1/16th pilots into where the gudgeon mounting holes should be, using the upper one to locate the lower one, with rudder pin in between them. Adjust locations as the hole size is increased to 5/32". Run a #12-24 tap through the 8 gudgeon holes. Finish the drain port, making sure the plug base fits snugly.

Finish the transom. Mix white repair gelcoat per manufacturer's directions. Three or four coats should do it, sanding to 320 in between coats. After applying the last coat, sand the transom in steps to 800 or even 1000-grit. Let it all cure well. Mount the hardware using silicone sealant. Go play the next day.