

32. The repaired holes. Still looks pretty ugly, though maybe not quite as bad. The epoxy probably isn't strong enough to make any difference in strength, but you never know



of a piece of masking tape. Then I carefully placed the epoxy over the center of the hole, making sure that the epoxy button touches the edges of the hole. Then I smoothed the surface of the masking tape, and let the epoxy cure. The result looks pretty good... about the best than can be expected with this type of repair.

Rebuilding the keel

Without a doubt, the most difficult and stressful part of the entire restoration (apart from paying for it) was restoring the keel. Early Ventures had a keel that was made from three layers of half-inch steel, set into a female mold that was poured full of resin. Only a little fiberglass was used. Over time, water found it's way into my keel's core and it started to rust. Rust expands. A lot. Enough to push the keel tight against the keel trunk, wedging it into place. Since repairing it properly takes a lot of work, some misguided boat owner had the idea that the fiberglass was the culprit, and sawed it away with a skilsaw. The keel had to be repaired properly, and in order to do that, it had to come out.

The keel was resting on the trailer's cross bar, so there's no way to get it out without lifting the boat. On a dead flat, concrete driveway, this wouldn't be so bad, but my boat was on dirt with a gentle slope. I used a half-sheet of 3/4" plywood under the blocks so that they wouldn't sink unevenly into the soft soil. I lifted the boat a little at a time, using a scissors jack, supporting it with cinderblocks and timbers. It worked... I eventually got the boat high enough to clear the width of the keel... but it was VERY unstable and wobbly. I clamped legs to the side to support it, put up extra jackstands, but it still was precarious. (In fact, when I was lowering it back



33. The boat going up. You can just start to see the keel underneath.



34. Aft view of the boat at it's highest point.

down, it started to fall sideways, and I saved it by bracing with two by fours.

Generally, going up was more straightforward, but each time I lowered it, the boat started to drift to the side. The whole process took years off my life.)

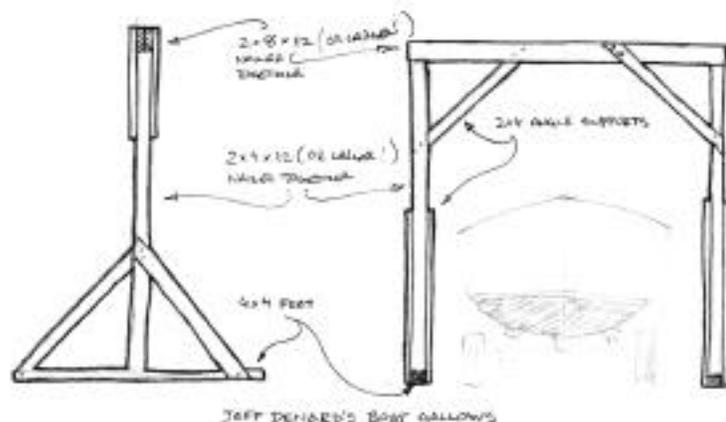
The keel was lowered with the boat's keel winch until the bottom edge was resting on the trailer and secured there. Whatever you do, DON'T disconnect the keel winch cable until the end. (You'll need a properly functioning keel winch to lower your keel. If yours needs work, fix it before you attempt to lower the keel out of the boat.) I lifted the forward end of the keel with a jack...just enough to take the pressure off the keel pivot bolt... and removed the keel bolt, which I discovered was bent nearly 45 degrees. I had to drive it out with a hammer. Once it was removed, I lowered the jack... and nothing happened. The keel was wedged tightly into the trunk. I went inside the boat, drilled a hole in the top of the trunk, (actually I enlarged an existing hole) and started to drive the the forward end of the keel out by hammering on a steel rod that passed through the hole. I would lower the jack by

LIFTING OPTIONS

You will likely need to get the boat off the trailer at some point for keel work or painting the hull. If not done carefully, this can be disastrous, resulting in a wrecked boat and/or serious injury. One option is to pony up the bucks and take the boat to a boatyard with a travelift. They'll raise and block the boat, and return it to the trailer when the work is done. Expect to pay about \$200 plus a daily yard fee.

Another option is lifting from above. An example of this can be seen at <http://jeffreydenard.staff.noctrl.edu/boatpage/>. Jeff used a pair of 2x4s nailed together for the uprights, and a pair of 2x8x12s

35. Jeff Denard's alternative method for lifting his boat





36. The keel removed, the boat back down on the trailer.



37. A look at the trailing edge. I also tried to bevel the edges of the plates a little.

LIFTING OPTIONS-CONTINUED
 for the vertical piece that connects the two uprights.
 If the uprights are well braced and strong, this would be an easier and safer way to lift the boat, and one I'll employ next time. Assembled with bolts, a gallows can be disassembled and stored for later use. A heavy-duty crane strap and a pair of 'come-alongs' lift the boat.

A second alternative is lifting from below, as I did. While requiring a less elaborate setup, it's much less stable and requires you to be too close to the underside of the boat as it's jacked up. There is another description of this process at <http://home.usaa.net/~spiritofsailing>.

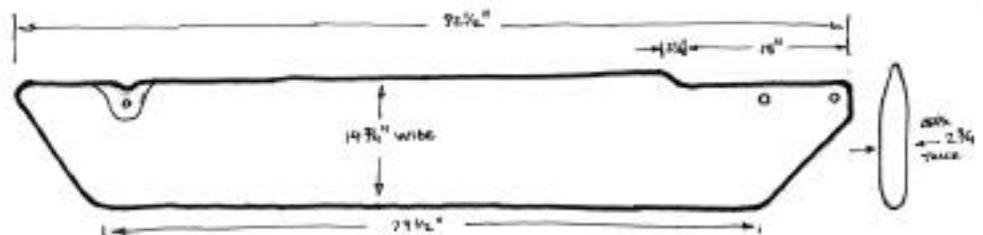
Lifting from below is complicated by the fact that the Mac sits lower on the trailer, and once you get the boat up, you can't remove the trailer.

about half an inch, then go inside and hammer awhile, then come out and check the jack. After a few trips, the keel was touching the jack, so I lowered it another half inch. This time the keel went down a little sooner. After lowering the jack a third time, the keel slid free of the trunk and could be lowered by its own weight. Once clear of the hull, the keel cable held the keel upright and prevented its falling over. Since the keel weight is about 400 pounds, this wouldn't be an insignificant event. I went back into the boat and gently lowered the winch cable, and the keel slowly laid over.

After I dragged it out from under the boat, it was immediately obvious why it was stuck in the centerboard case. Water had found its way to the steel core decades ago. As the core started to rust, it expanded. Rust takes up a much larger volume than steel does. Rather than going through all the grief that I just went through, one of the previous owners just cut out the swollen spots with a Skilsaw and left the core exposed. It had been this way for years.

The only repair was to replace or relaminate the keel. Some of the old Ventures reportedly had solid cast iron keels, and I wish I could have found one. Repairing a cast iron keel involves sandblasting and painting, where composite keels must be relaminated with fiberglass.

38. MacGregor Venture 222 keel dimensions (72 model with fiberglass composite keel, measured from my boat)



Maneuvering the keel to work on it was extremely difficult, but I was able to do it with a “keel fork” that I welded together out of scrap re-bar (concrete reinforcing steel). I kept the keel on a wooden loading pallet so that I could get the fork under it to turn it, or work on its edge, etc. I had endless visions of this thing falling on my leg and breaking it, since it was about this time that I fell getting in and broke my wrist. It wasn't fun. If you need to do this with your boat, then I would seek professional help if at all possible. When you get back from the psychiatrist, then maybe you can find someone with an engine hoist to help you move this thing around while you work on it.

The first thing I did was to strip off the old fiberglass. since much of it was already cut away, this was easy. I did save the leading and trailing edge pieces for a while... just long enough to make sure I had the correct profile for the part of the keel that extended beyond the core.

Since the center keel core plate was 1" thick, I welded on a 1 1/2" x 1/4" strip along the trailing edge to support the filler that I'd be adding. Here's where the chunk of keel skin that I'd saved came in handy, since I could check the keel for the correct profile.

Next, the keel was sandblasted and primed. I used a high zinc spray primer, and hoped it wouldn't react with the resin I was about to put on.

Here's where I made a big mistake. I filled one side of the keel using polyester resin, thinking that since this was basically a new construction, I wouldn't need to



39. Drilling out the pivot hole for a larger size bolt



40. Here I've applied filler (resin and microballoons) , sanding is next



41. A look at my “keel fork,” above. It’s in use on the left, (42.)holding the keel upright so I can laminate the edge

use the expensive epoxy. I mixed up some filler and troweled it in sanded it to shape, and laminated with three layers of glass. That’s when I noticed the tiniest gaps near the core and filler, where the polyester must have slightly shrunk. I had already used up a good amount of my materials that I’d bought for the keel, and was essentially committed, so I gave the cracks a coat of epoxy, then laminated another layer of glass with epoxy and turned it over. The other side was done in all epoxy. So far, it appears that the epoxy has sealed it up, but I wish I hadn’t used any polyester at all... and ended up throwing away half a gallon.

Moving right along- the interior

While I was working on the keel, I started some of the work inside. I had a fairly empty, but still gross-looking shell. All of the rotten fabric had been torn out, and it left a horrible surface... a mix of peeling paint and some sort of adhesive. Worse, in some areas the paint was holding solid, in others it was peeling. In some places, the adhesive was thick and sticky, in others dried and flaking. The surface would need lots of preparation if the paint had a prayer of holding up.

After experiments with various chemical removers were unsuccessful, I had to resort to mechanical methods. The 4 1/2" side grinder with a very coarse sanding disc worked about as well as anything, so I sanded everything I could get to. It was tedious, dirty work. Ear, eye, and lung protection was absolutely essential, and I set up a box fan over one of the hatches to pull as much fresh air into the cabin as possible.