

'From the Bilge' by Tech commodore Bob Banzett

MAST STEP REPAIR

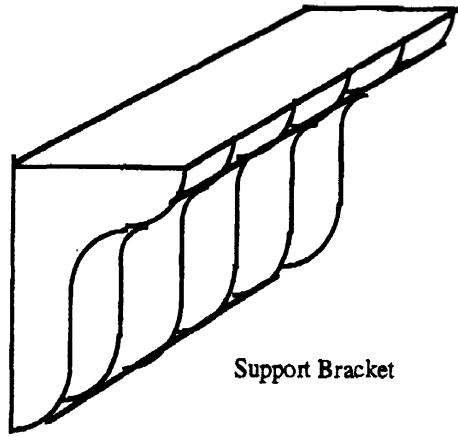
Several L/33 owners and former owners have recited tales of woe of losing the rig due to softening of the deck in way of the mast step. The lore is that when the deck gets compressed, the starboard side sags more than the port because it overhangs the supporting bulkhead. The mast therefore gets 'out of column', and collapses by bending in compression when beating. The events I heard about occurred on racing boats, which are generally pushed pretty hard, but sometimes we are forced by Mother Nature to stress our boats pretty hard.

After years of vague worry, I noticed some tangible evidence of a problem. I tune my rig by leveling the boat (on Puff I have determined that the bridgedeck is level when the waterline is even on port & starboard), then tightening the lower shrouds in such a way as to bring the lower part of the mast into plumb (as gauged by a carpenter's level held against the side and front of the spar). The shrouds should be plenty tight -- if they go slack when sailing bard on the wind, they are too loose. Last spring when I tuned the rig, I found that when the lowers were good and tight there was a curve in the lower mast (convex to starboard). The curve lessened when I loosened the shrouds. Uh Oh! When I looked very closely at the deck in the region of the mast step, it sagged ever so slightly on the starboard side. This was also detectable with a level on the mast step block.

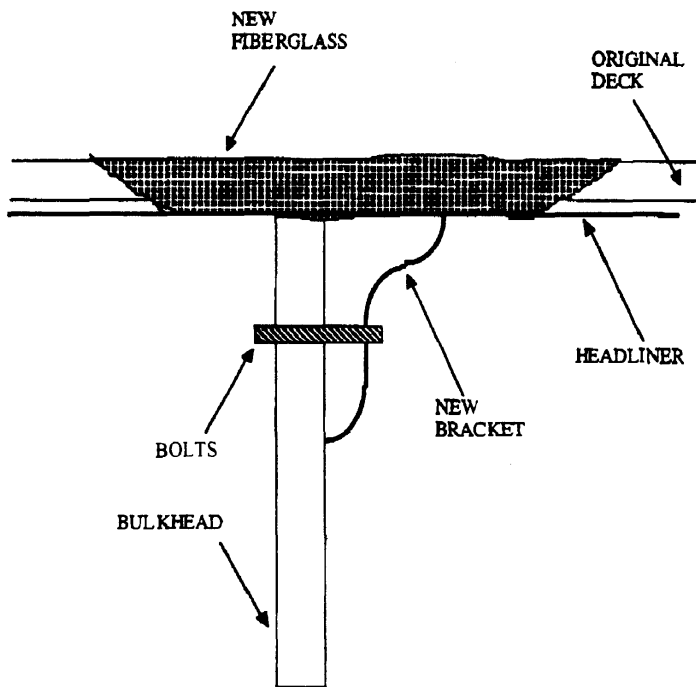
This Spring I removed the step block (drill or pry out the 2 plugs and back out the two hex head lag screws with a socket wrench, then cut through the deck with my Makita panel saw. I first gauged the depth by taking a core sample with a drill & hole saw. I set the saw to go through the upper & lower fiberglass layers of the deck itself, without going through the cabin headliner. The hole extended several inches beyond the mast step block. After cutting the hole I made *a generous* bevel about 1" wide to ensure better bonding of the repair.

I was surprised to find that under the step the deck was cored with balsa! No wonder it compressed under the load. The balsa was not wet or delaminated -- it just isn't strong enough to bear the compression load after all these years. I'm a bit surprised it didn't fail sooner. The forward third of the deck under the step was cored with plywood -- I suspect the plywood was placed in the wrong spot on my boat during deck layup. This could be a widespread problem, invisible once the deck is laid up.

Using the upper surface of the cabin headliner as a base I laid fiberglass mat, roving, and cloth in layers with West epoxy until I filled the hole *to the* level of the deck (fairing the last bit with high strength filler). *Very* solid. I built a laminated wooden bracket about 6" long which extends 3" from the starboard face of the bulkhead, and supports the cabin headliner. (*Cut. the* shape indicated from 3/4" marine plywood, then epoxy together and sand it even.) It is bedded with epoxy putty, and bolted to the 2" thick bulkhead with three SS bolts (3/8"); one of the bolts runs through the angle iron inside the corner of the bulkhead. At this point I could have re-installed the wooden step block (or a new one) and had a solid repair -- much stronger than the original. I chose to fabricate an aluminum base and tabernacle, which I will report on in another installment if it works out well.



Support Bracket



NEW FIBERGLASS

ORIGINAL DECK

HEADLINER

NEW BRACKET

BOLTS

BULKHEAD