

Rebuilding the rudder on a 419

by Mike Pearce

During the survey of Gypsy Dancer, water was seen dripping from the bottom of the rudder. As she had been ashore for the best part of a year, and hauled out every winter for the 12 years before that, it was evident that there was a problem.

Tap-testing (it sounds dull when wet internally) and drilling small holes (water leaks out!) in various places showed that the whole thing was waterlogged and that major surgery would be required to bring it up to spec.

The work was done at Barker's Island Marina on Lake Superior, a professional yard where staff were happy for me to work alongside them doing the parts I could do myself.

Getting the rudder off is a matter of removing the quadrant (easy to access on a 419) and then uncovering the four bronze bolts that hold it to the skeg. These were hidden under filler on the lower, forward face of the skeg. The bronze 'shoe' attached to the bottom of the skeg needs to be removed completely to allow the rudder to drop. This is secured by bronze rods inserted sideways through the shoe. They have hammered over ends so they are not easy to remove as you need to leave enough material to hammer over the end when they are replaced if you don't want to renew them.

Once these were removed the rudder dropped down without too much trouble, but it was heavy and awkward to handle.

After the rudder was laid on a bench, inserting a chisel into the gap between the two moulded fibre-glass face covers, split it easily apart like opening a huge clam shell.

Inside, the stainless steel web was in good condition and the small amount of epoxy round the web was solid. However the foam filler that occupied the majority of the internal volume was totally waterlogged. Handfuls could be pulled out and water squeezed from it like a sponge.



Internal structure before chopping out



The two halves cleaned out and starting the rebuild

I spent an afternoon with a hammer, cold chisel and various scraper tools removing all the foam and original epoxy so we ended up with just the web and the two fibreglass outer halves of the rudder. The guys from the yard then filled the rudder with new epoxy and bead filler, building it up in layers. This was quite a skilled operation as the next layer had to be added at

the right moment, judged by temperature, to make sure each layer bonded to the one below.

Eventually the build up was enough to allow a final layer to be applied and the top half of the shell was fitted, squeezing out excess filler round the edges.

Rebuilding the rudder on a Moody 419 *(continued)*

This was weighted down with batteries and large lumps of lead removed from a power-boat bilge to make a good seal.

Once dry the shell was tap-tested to find any voids. Two small holes were drilled at either end of each void and using a syringe epoxy was injected in one hole until it appeared in the exit hole making sure the void was completely filled.



Filling a void with epoxy coming out of the exit hole

Once the rudder was full and given time to dry, fibre-glass reinforcement tape was applied to the join between the two halves of the shell, then filled and smoothed to get a good clean curve.



Edges taped and filled



Joined, weighted down and clamped

Refitting was the reverse of getting it off the boat with the main problem being weight. A jack and four large men solved the problem.

I have a lot of confidence in the structural integrity of Gypsy Dancer's rudder now. The

stainless steel web has been internally inspected and the whole thing is covered in solid epoxy with no voids or filler material. I hope never to test it, but the yard manager commented "You'll have no problems grounding that!"



Edges smoothed and rudder refitted