S III - REBUILD - PART 5 - RUDDER ASSEMBLY.

If you are unable to steer the boat you can neither get where you wish to go, or return to where you started and you will rapidly be at the mercy of the elements.
The S III's were fitted with several rudder variations but all used a 'glassed-in' tube. This was in fact a piece of steam pipe with a brass flange nut at the top and bottom inside,with a block nut outside at the bottom,then the bottom six inches or so securely glassed in to the hull and the top flange nut tightened onto a gasket of either rubber or fibre.
The steam pipe, flange nuts, block nuts are all common plumbers terms and the threads are B.S.P.(British Standard Pipe)
The size used on S III's is 1" B.S.P. and on S II's 3/4" B.S.P. (11 and 14 T.P.I. respectively).
The sizes of steam pipe threads refer more to the bore of the pipe than the thread sizes, so don't be misled.
There are several ways to determine whether or not the tube needs replacing.One way that I have used when I don't wish to first remove the rudder and shaft is to put a large spanner on the block nut under the stern and give it a good pull. It will often just come off loose onto the shaft, meaning that the tube is worn completely through to the base of the threads, it may even be loose already indicating even more wear.
When the bottom of the tube is worn through, the rudder shaft will be bearing in the glassfibre at the bottom of the tube and although it will operate for some time like this it is subject to leaks and eventual failure. This is why if you look with a good torch or hand lamp at this region under the cockpit floor you may see rusty marks!
(If you do not have this rudder tube problem it will almost certainly be because the bottom bearing of the rudder shaft has been well maintained.)

If you suspect that you have this problem you need to remove the rudder and shaft. To do this you will have to raise the stern of the boat high enough for it to drop out. If the boat is on a trailer it is usually sufficient to jack the trailer up with about 9" under each wheel , then lower the hitch on to the ground. If this is not enough then jack up the rear of the keels.
On the bottom of the skeg there is a metal bearing bracket bolted through the skeg with two, sometimes three, small nuts and bolts. There is a vertical hole about 3/8" dia. in this bracket into which a spigot turned onto the bottom of the shaft fits.Over the years both the spigot and the hole wear almost completely away, allowing the shaft to wear away at its tube where it is now supported.You must remove this bottom bracket to allow the rudder and shaft to drop out.
If you need to replace the tube you will need about 27" of pipe, threaded about 2" at each end, 2 off 1" B.S.P. brass flange nuts and one 1" B.S.P. block nut.The hardest part by far is the removal of the old one! I do this through the rear locker. The tube is located out of sight between the rear bulkhead and the cockpit moulding. The best way to get at it is to remove a part of the rear bulkhead about 9" to 12" wide, right at the bottom in the centre of the boat and as high as you can, about 6", without damaging the cockpit floor. Be very careful drilling here or you will drill through the rear of the cockpit.Remove the top flange nut, saw through the tube under the cockpit floor and remove the top piece.You now need to chisel, saw, drill and lever until you have removed the remains of the bottom of the tube and nut , if possible.
Now it is just a case of fitting the new tube and carefully and thoroughly glassing it into the bottom of the boat. Make a neat cover for the hole in the bulkhead and fasten it with screws so that you will be able to remove it in order to inspect this vital area.
Now take a look at the rudder/ shaft assembly. If the shaft is very badly worn where it exits the boat then you must consider renewing the whole assembly.
There were two main types of rudder/ shaft assembly.
On the later ones the shaft had mild steel strips about 9" long by 1 1/4" and 1/4" thick, welded end onto the centre line of the shaft and the foam-filled glassfibre rudder was moulded on to the shaft using a split mould.
Earlier versions had the rudder moulded on to the strips but not encapsulating the shaft, and some very early ones had metal rudders welded on to the shaft. The shaft itself is 1" diameter bright mild steel.

I tend to weld on about 4 strips and then sandwich the whole assembly between two thick pieces of marine ply screwing from each side and through the holes in the strips.Take care to give the rudder a good shape in the water as it makes a lot of difference to sailing performance, something I shall deal with in a later series of articles.

The bearing on the bottom of the skeg can be remade by drilling and tapping about a 3/8" (10mm) hole up the shaft and inserting a suitable bolt with the plain part of the bolt as the spigot, and perhaps a welded up and redrilled skeg bracket.

Make sure when you reassemble to firmly secure the tiller assembly. If you have renewed the shaft you will have to re- drill for the locating stud.

D. Heard.