SAILSetc

Product Information - TubeJ-LOWER

October 2019

Addition of headsail boom swivel adjustment fitting to lower end of TubeJ

Background

The use of a tube in the foredeck so that the headsail boom can swivel on a long line attached to the bottom of the hull was first used by Graham Bantock in 1994 for the IOM world championship (the first) of that year so that the headsail would goosewing out more easily.

As it was very successful the concept was used in all the SAILSetc built boats after that except for the 65 class ARGON. The moulded item ref. TubeJ has been the part that is fitted into the hull. It connects the bottom of the hull to the foredeck so that, regardless of whether the boom swivel is attached to the bottom of the tube or to the deck, the load is taken by a stiff structure.

Detail

To allow the swivel line to be fitted securely a 1.2 mm diameter wire is incorporated into the bonding of the lower end of the tube into the hull bottom. The swivel line of 55 or 75 kg breaking strain Dyneema (D55 or D75) is attached to this wire and led up the tube. It is led through a ref. 52-006 fairlead which is then placed in the top of the tube to ensure the line is not abraded. Then a stainless steel rig, ref. 45B, is attached as close as possible to the deck.

When the boat is rigged the load on the swivel line pulls the ring up above the deck so it is not a low as it could be.

Tim Brown solved this problem by adding a neat fitting to the lower end of the swivel tube. I first saw his idea in the AKZIOM One Metre built for me by Tim for the 2015 European Championship. The inside of the tube is threaded and the lower end of the swivel line is attached to a grub screw that can be raised and lowered inside the tube using a screwdriver or Allen key inserted into the lower end of the tube. The screw is raised as much as possible before the ring is attached and when the rig is tensioned the screw can be lowered to arrange for the ring to be just above the deck.

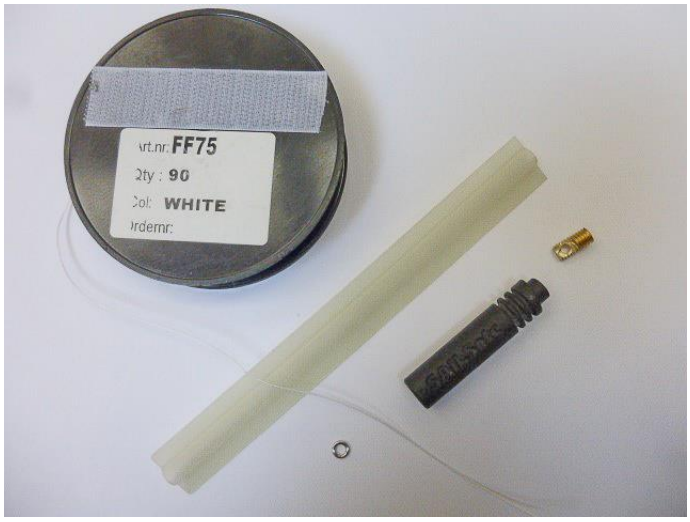
SAILSetc version

A similar fitting is now available from SAILSetc, ref. TubeJ-LOWER. It is best added to the TubeJ when the boat is first built but it can be successfully retro-fitted to an existing boat. The following notes describe the process of retro-fitting the item to a DIAMOND, Ten Rater.

Parts required

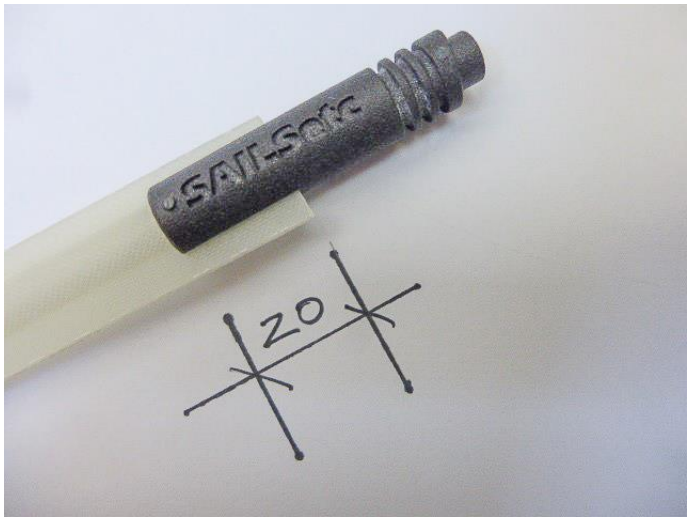
To retro-fit the fitting you will need Dyneema line, the existing 45B stainless steel ring and epoxy resin/filler.

The TubeJ-LOWER fitting comprises a printed part and a specially machined grub screw.



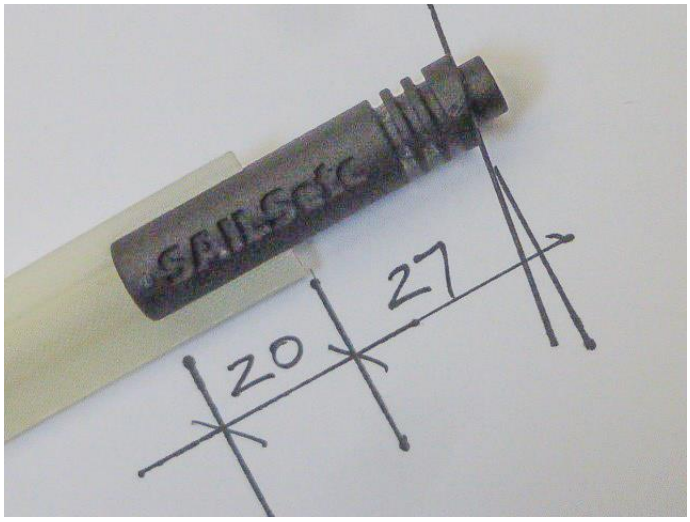
How the tube fits the fitting

The upper end of the fitting has a hole and slot so that the lower end of the TubeJ will fit snugly. The overlap is 20 mm.



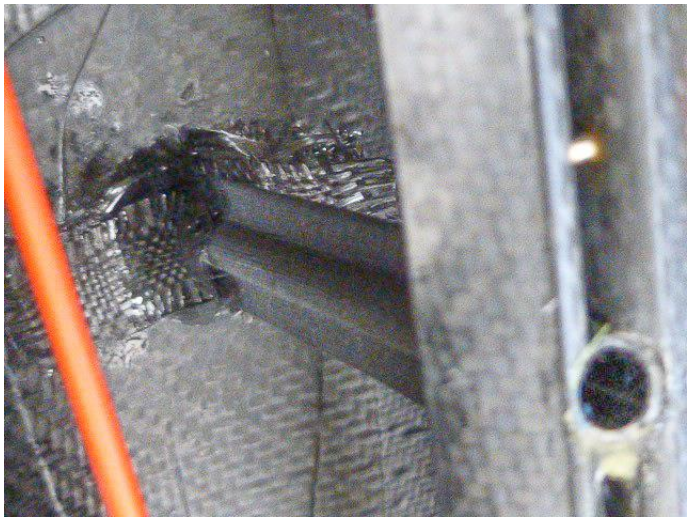
Important to note

The next 27 mm of the fitting has an internal thread for the grub screw. The lower end of the fitting has an 8 mm diameter extension that can be used to locate the lower end into an 8 mm hole in the bottom of a new hull. Note the angle of the lower face of the fitting – approximately in line with the rocker line of the hull. There are three grooves around the lower end that permit a good grip between the fitting and the epoxy paste that is used to bond it to the hull.



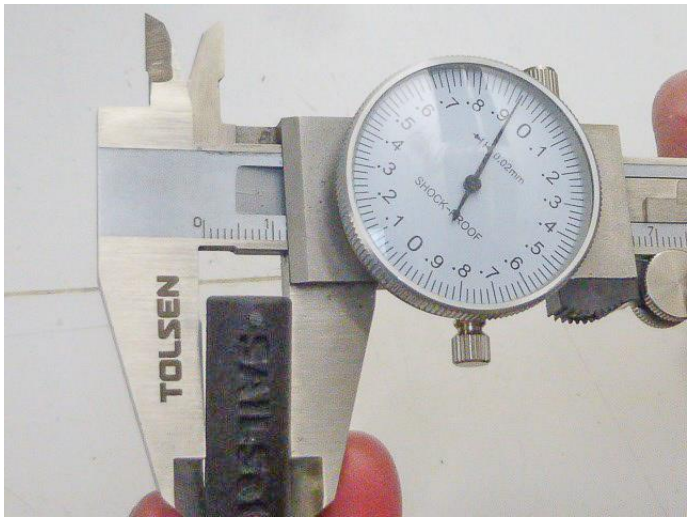
The existing TubeJ in the hull.

The original TubeJ is bonded into the hull using a fillet of epoxy resin. Some carbon cloth has been added to reinforce the join.

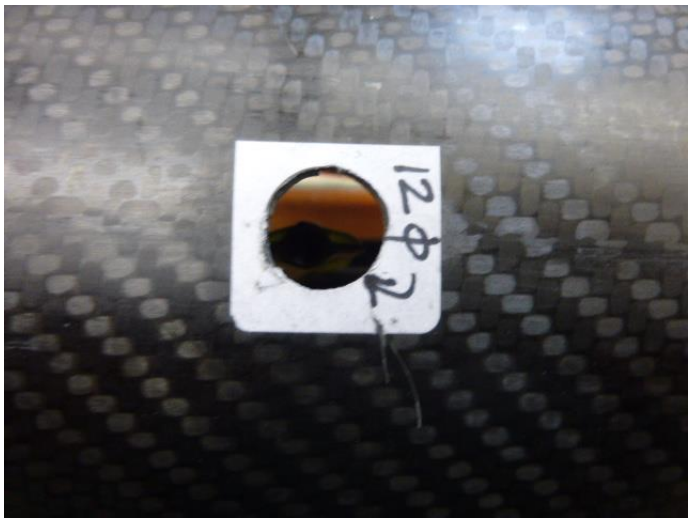


Make a hole in the bottom of the hull

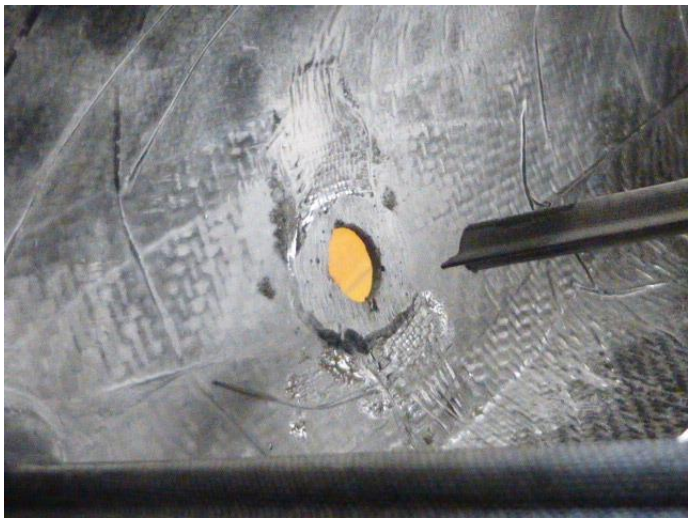
The fitting is 12 mm diameter so a 12 mm diameter hole is required in the hull bottom so that it can be inserted from below and connected to the lower end of the TubeJ.



Make the hole in the bottom of the hull by drilling a series of 2 mm diameter holes around the existing hole and joining them with a small file.

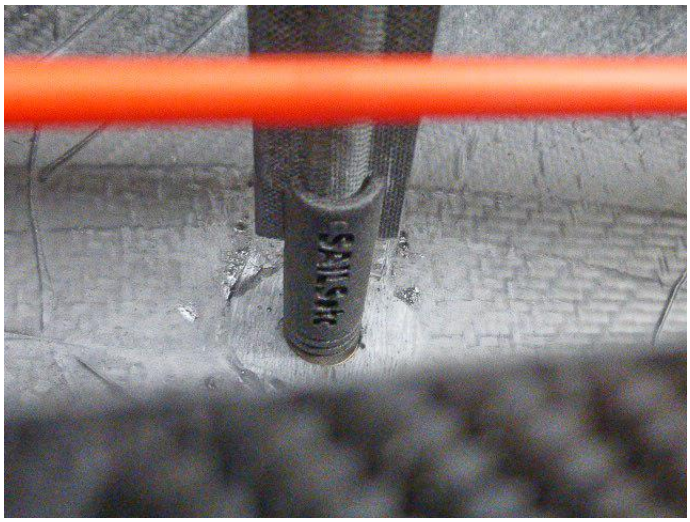


Cut off the lower end of the existing TubeJ a distance 25 mm above the inside of the hull bottom. Smooth the inside of the hull bottom by removing the original bonding material.

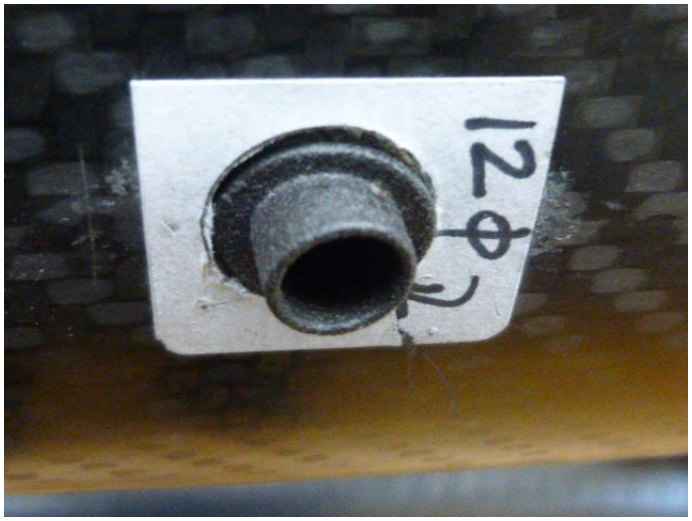


Trial fit the fitting

Trial fit the fitting to the lower end of the TubeJ.



Shorten the Tube J so that the 12 mm diameter section of the fitting just fills the hole in the hull bottom.



Protect the internal thread of the fitting

Add a M6 bolt/screw into the fitting as shown. The upper end of the screw should be just below the slot in the fitting. Place a small ball of Blutack, Plasticene, modelling clay, or wax into the open end of the tube and flatten it onto the end of the screw to protect the thread from the resin that will bond the fitting to the lower end of the TubeJ.

Protect the TubeJ

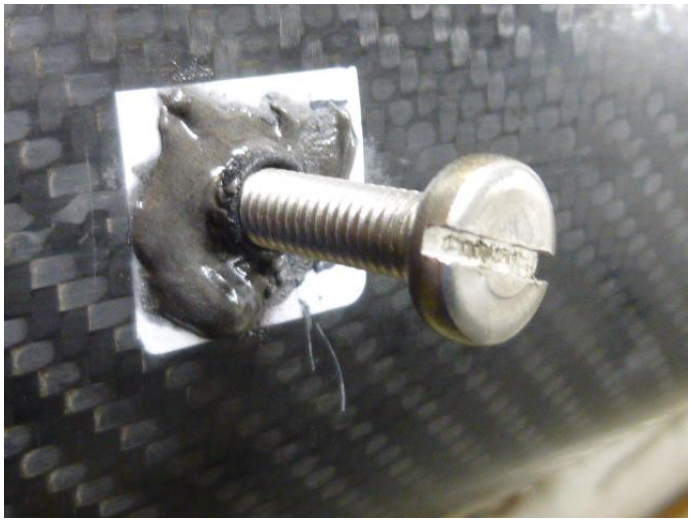
Place a small plug of Blutack, Plasticene, modelling clay, or wax into the lower open end of TubeJ to protect it from the resin that will be used to bond the fitting to the lower end of the TubeJ.

Bond the fitting in place

Use acetone or alcohol to clean the inside of the hull around the hole and the lower 20 mm of TubeJ.

Mix about 5 ml of epoxy resin and add microballons to add bulk. Before adding silica use a little of this liquid mix to wet all the surfaces on the hull and the fitting that will be bonded. Then add silica to make the filler non-slumping.

Use the thickened filler to coat the lower end of TubeJ, the inside of the hull around the hole, the inside of the upper end of the fitting and the groves at the lower end of the fitting. Push the fitting through the hole and fully onto the TubeJ.



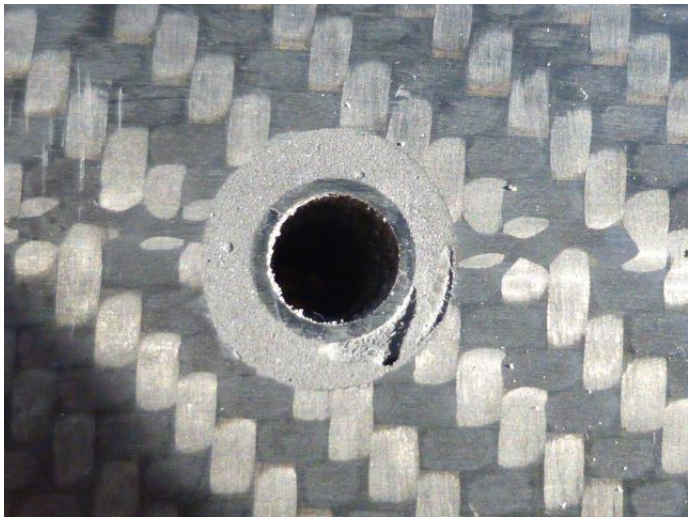
Clean up excess resin and form the remainder into roughly the shape required. Allow to cure until tacky but still malleable – between 1 and 2 hours depending on temperature and speed of cure.

When the filler has partly cured, coat your fingers with liquid soap and smooth the roughly formed filler to make a smoother surface. If the resin is too soft to do this come back to it after another 30 minutes. Access to the lower end of the tube may be difficult in the confined space of the bow.

When cured

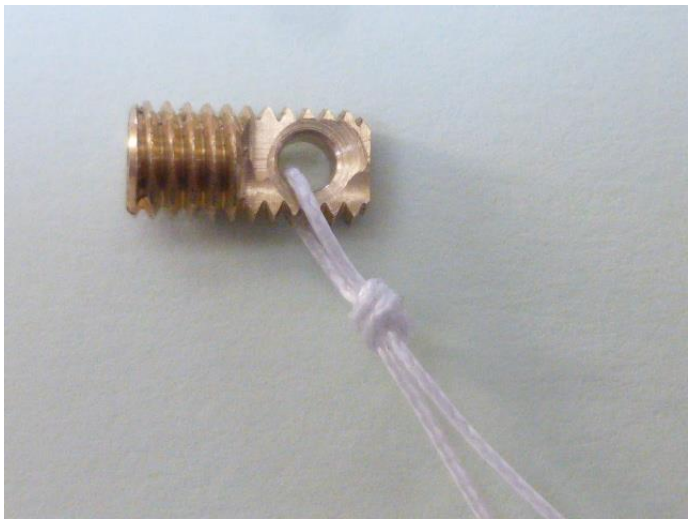
When the resin has cured rotate the M6 screw through + and – 90 degrees to free it from the resin. Unscrew it and use a rod to clear out the Blutack used to protect the thread and tube.

The excess material protruding from the hull bottom can be trimmed off with a sharp cutting knife. Smooth with 1200 grade abrasive paper. Any voids in the filler can to be filled the next time you use any filler.

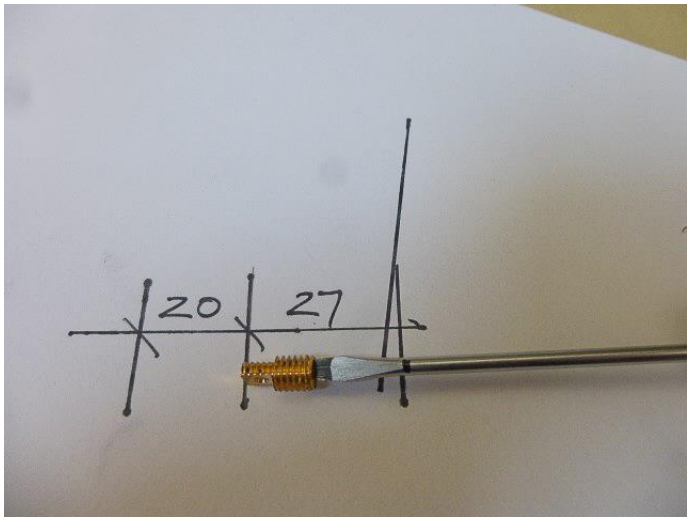


Add the swivel line

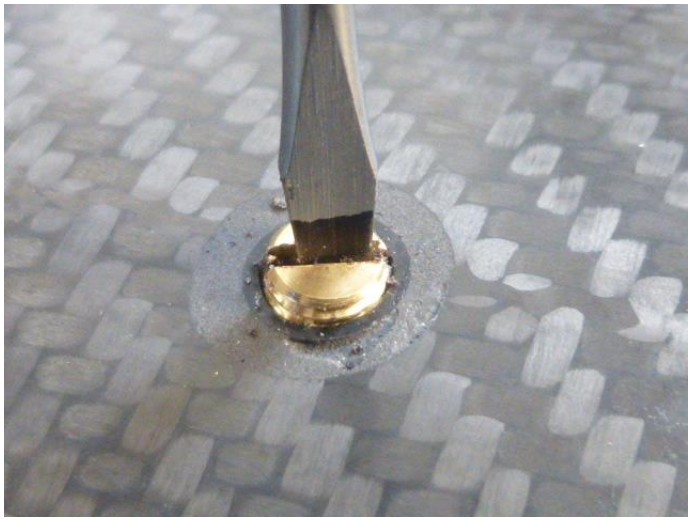
Cut 300 mm of Dyneema and tie it securely to the eye of the grub screw. Seal the knot with cyanoacrylate glue and trim off the excess line.



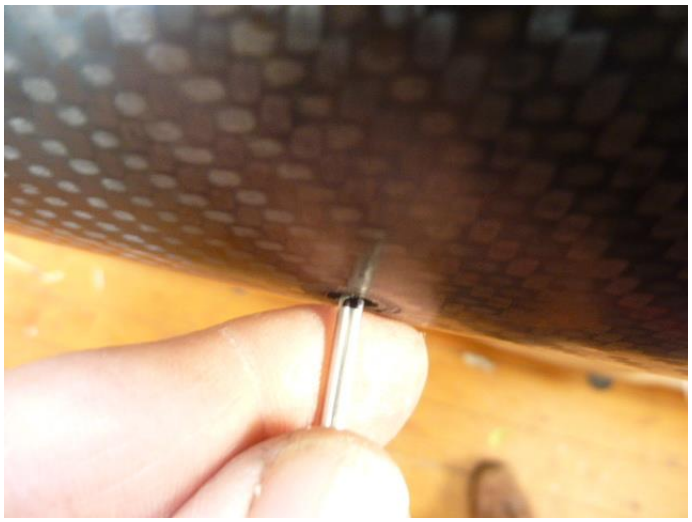
The grub screw will be inserted until its upper end is still just engaged with the thread. Mark your screwdriver to show where this will be.



Pass the line up the tube and screw the grub screw into the thread.



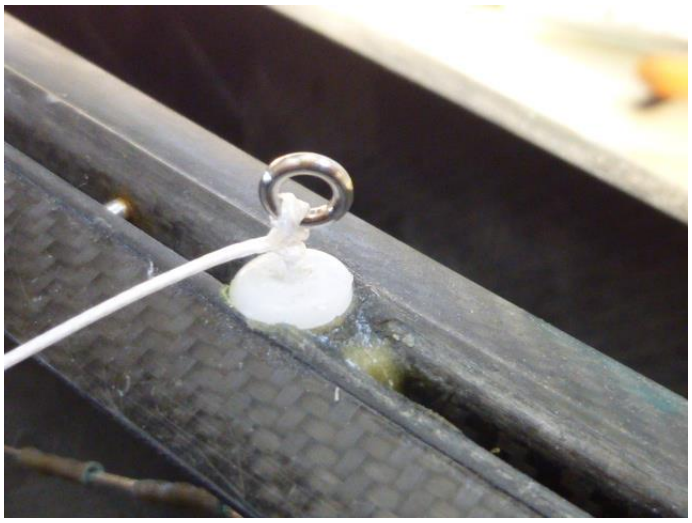
Screw the grub screw into the fitting until the pen mark is level with the bottom of the hull. The mark on the screwdriver shaft is just visible in the photo below. The fitting is now fully inserted.



Add the fairlead and ring

Pass the line through the fairlead and press the fairlead into the upper end of TubeJ. There is no need to bond it.

Tie the ring securely as close as possible to the deck. Seal the knot with cyanoacrylate glue and trim off excess line.



When the rig is added and tensioned you can use the grub screw to lower the ring until it just clears the deck.

End

1st October 2019