

# 3. Tailplanes

## Overview

This chapter will take you through the assembly of the tailplanes, which involves bonding in place the lower skin and tip. The instructions describe the assembling of one tailplane side, but doing them both together is just as easy.

The photograph, figure 1, shows the tailplane sub-assembly before the lower skin and tip are installed.



Fig 1. Tailplane before adding lower skin and tip.

Figure 2 shows an exploded view of the tailplane torque tube components.

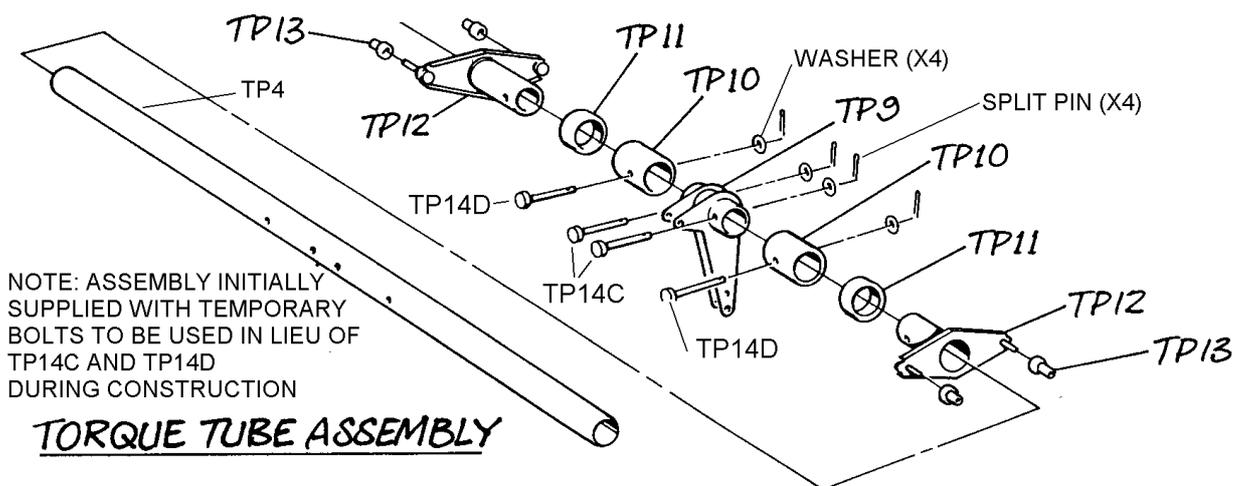


Fig 2. Torque tube components.



## Preparation

With the main structure of the tailplane placed onto a flat surface with the skin side down, try in place the lower skin. Use the tip end joggle and the hole for the pip pin to aid alignment, and verify that it fits properly with all the other parts.

Mark the skin to indicate where it contacts the ribs, close-out, etc., and scuff sand these areas ready for bonding. Use sand paper of approximately 80 grit for this, sanding until most, if not all, of the gloss is removed. Be careful at the same time not to sand through the skin.

Scuff sand also the bonding surface areas of the ribs, etc., not forgetting the underside of the leading edge flange where the lower skin contacts. Likewise, scuff sand the corresponding joggled flange of the lower skin.

## Applying adhesive

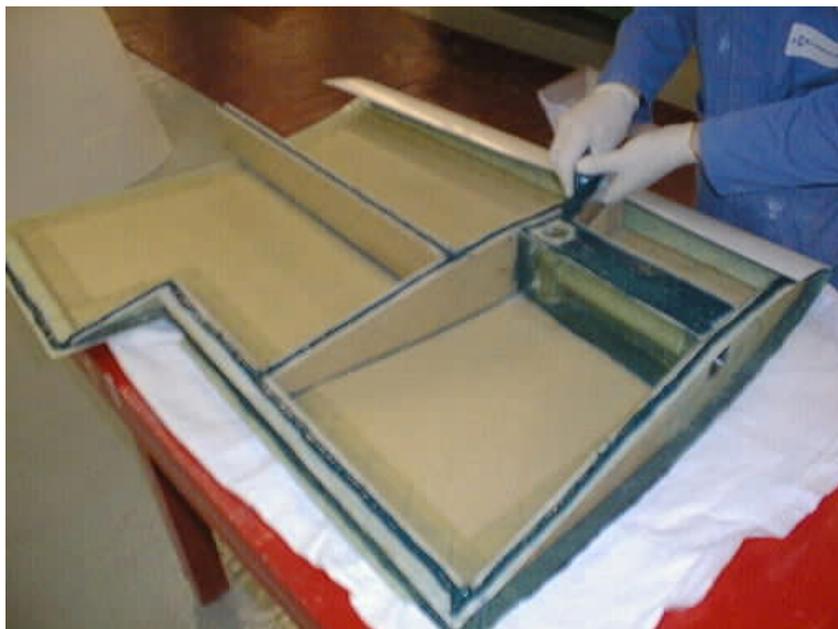
Mix 280g of Araldite 420 (200g of paste and 80g of hardener), then mix in floc until it has stiffened it just enough not to drip. Apply the mix to all the bond surfaces on the tailplane sub-assembly. A bead of approximately 10mm (3/8") diameter will be necessary to ensure good contact.

**Note:** *To apply adhesive in a bead, put it first into a plastic bag, twist the open end closed, then snip off about 6-7mm (1/4") from one of the corners - see figure 3.*



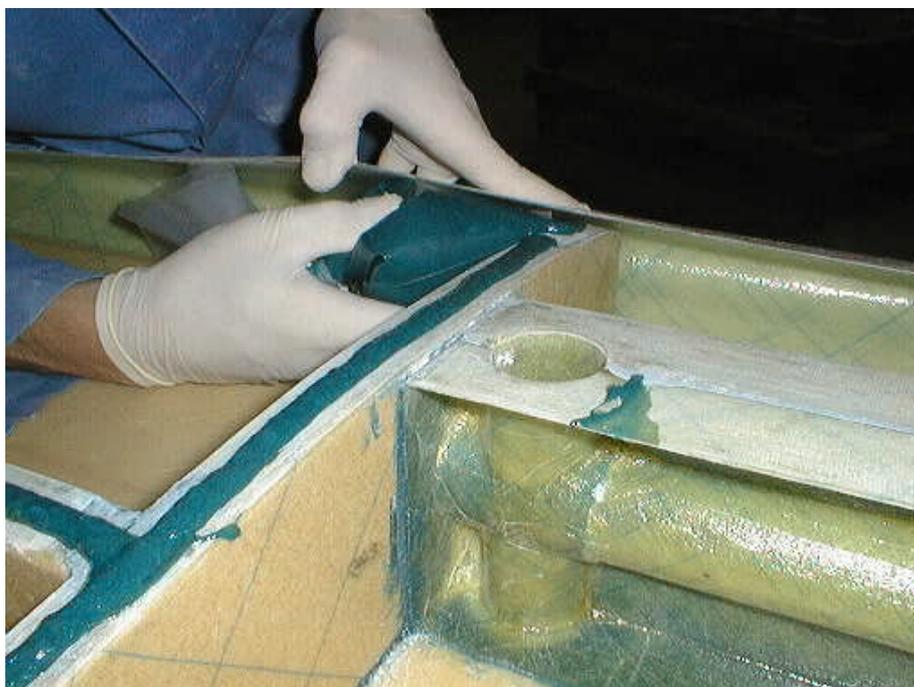
*Fig 3. The "cake icing" technique.*

Apply the adhesive much like you would when decorating a cake, by gently squeezing the bag as you move the opened corner along the area to be bonded - see figure 4.



*Fig 4. Applying adhesive.*

Adhesive will need to be applied to the root rib and mid rib underneath the overhanging leading edge skin. Pull the leading edge skin away to get access - see figure 5.



*Fig 5. Obtaining access under the leading edge skin.*

Apply adhesive also to the leading edge joggle of the lower skin.

## Lower skin

Installing the lower skin is best done with a helper to pull the leading edge up and so avoid scraping any of the adhesive off. See figure 6.



*Fig 6. Fitting lower skin.*

Carefully ease the lower skin into place, with the forward edge underneath the leading edge of the assembly, and then lower it in position making any adjustments necessary.

Press the skin over the bond areas to ensure good contact. Allow reasonable time for the adhesive to ooze, scraping away any excess around the accessible edges. You can see inside the tip end to verify that the skin has settled properly.

To ensure that the unsupported areas of the leading edge joint are making good contact install Clecos. (Smear a thin layer of grease onto them first to ensure that they don't get stuck).

Spring clips can be used in all the other areas. See figure 7.

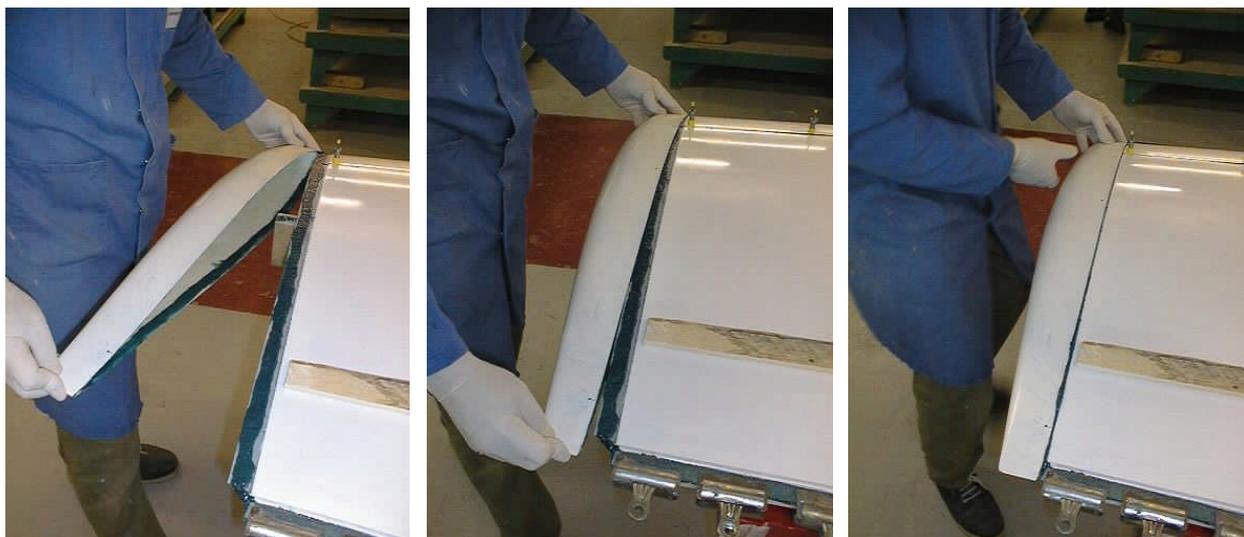


*Fig 7. Holding skin place with spring clips.*

## Tip

Apply a bead of adhesive to the inside edge of the tip, and also to the joggled flange of the tailplane tip. Smooth the bead down flat on these areas, otherwise a lot of the adhesive will be scraped off when positioning the tip moulding.

Starting at the leading edge, ease the tip into position until it is fully located on the end of the tailplane. See figures 8, 9, and 10.



*Figs 8 - 10. Fitting tip.*

Press down over the joint area and scrape away any excess adhesive.

At the leading and trailing edges, top and bottom, drill through both the tip and tailplane flange with a 3.3mm (1/8") drill and install a Cleco. Where required, add further Clecos.



*Fig 11. Fitting Clecos.*



Having checked that all the joints are good, leave the adhesive to cure before removing the Clecos and clips.

### **Venting / draining**

Finally, drill a 3.3mm (1/8") hole in the underside of the tip 75mm (3") from the trailing edge and 10mm (3/8") outboard of the joint line to ensure that the tailplane's interior is vented to atmosphere, and can also be drained should water get inside.



*Fig 12. Drilling venting / drainage hole*