



Anti-servo/trim tab drive pin replacement

Classification - Mandatory

Applicability All Europa aircraft (stage1 kits supplied prior to 1st December 2000)

Compliance **Inspection** - before the next flight

Incorporation - Within the next 15 flying hours

Parts provided

1 x TP16P tab drive pin, 1 x TP16S tab drive pin

Introduction

An incident occurred to the company demonstrator aircraft G-GBXS where one of the TP16 anti-servo/ trim tab drive pins became detached due to the plate it was welded to fracturing. The aircraft was on the ground when the failure occurred, probably during engine starting, and the resulting behaviour of the aircraft in flight was to pitch nose up. The pitch up force was containable by the pilot and a circuit and landing was successfully flown.

The fracture was established to have been caused by fatigue due to repeated bending of TP16's plate. The bending that this plate had been subjected to was likely to have been in excess of normal due to vibrations caused by an engine starting problem. The aircraft had completed 426 hours of flight which included 895 take-off and landings. It is important that the cause of unusual vibrations, for example engine starting problems or an unbalanced propeller, are resolved at the earliest opportunity.

Samples of the TP16 component were taken from six aircraft which had flight times up to approximately 600 hours, and analysis revealed no cracking. However, since there has been a failure of part of the aircraft control system, it is necessary that the tab pin drive plates are replaced by a stronger design than the original.

This modification details the replacement of the TP16 tab pins which have already been fitted to the anti-servo trim tabs. Where the fitment of the TP16's has yet to be carried out, ensure that the originally supplied TP16's are destroyed, then fit the new TP16's according to the build manual, chapter 5. To identify the correct TP16's, the plate part should be 2.5mm (0.1") thick.



Action

1. Inspection

Remove the tailplanes from the aircraft, and remove paint from the area of the trim tab drive pin where the pin is welded to the plate. Using a strong light with a magnifying glass of at least 2x magnification, check the cleaned area for cracks.

If any cracks are found the aircraft must not be flown until the Mod is incorporated. If no cracks are found, the Mod must be incorporated within the next 15 flying hours.

The following instructions assume that the tab pins have already been fitted. Where this stage of the build has not yet been reached, simply substitute the original TP16 parts with the new ones provided.

2. Removal of TP16 pin plates

The original TP16P and TP16S anti-servo/trim tab drive pins are to be substituted with a new pin which is welded to a thicker plate than the original.

Remove the tab from the tailplane by removing the hinge bolts.

Prior to the removal of the TP16 pins from the tabs, make a template which will enable positioning of the new TP16 pins in exactly the same place as the originals. See figure 1.

It may be prudent to make a template for each tab pin as the build up of differences may affect the positioning.

Adjust each template so that they fit in place exactly.

Grind away the glassfibre which retains the pin plate until all the metal is exposed. The pin should remain attached to the tab at this stage. Place the template onto the pin so that it is flat up against the pin plate and mark on the tab surface the position of the template. The template should be at 90° to the tab hinge centre line.

Continue with the removal of the pin plate from the tab's root, drilling the floc out of the 1/4" holes in the plate and by gentle application of heat, which will allow the plate to be removed. Then clean away any residual adhesive but take care not to grind into the glassfibre of the tab in the process. If you do, this damage should be repaired by replacing the removed material prior to installing the new tab pin plate. If the plates on the original TP16's had become bent whilst drilling the lightening / bonding holes, it will be necessary to file the floc pad to let the new TP16's sit in the correct place.

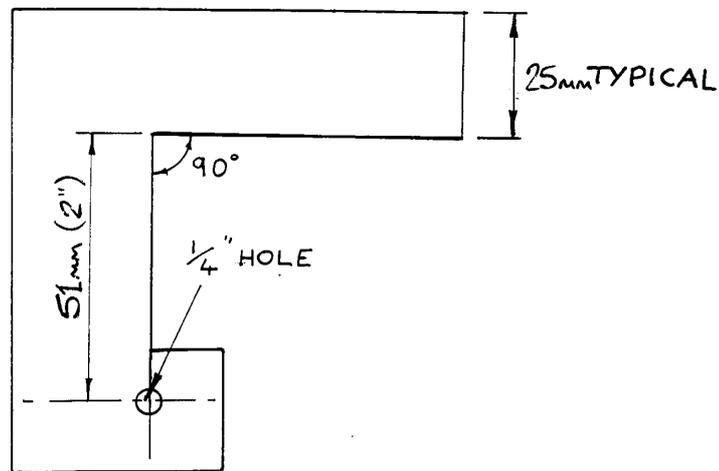


Fig 1. Tab drive pin setting template - not full size.

3. Preparation prior to bonding

Firstly, drill a few holes through the plates of the drive pins to aid bonding and to make them lighter. The hole pattern should be similar to that shown on figure 2. Do not drill any hole with its centre less than 20mm (3/4") from the pin centre.

Also, taking care not to scratch the portion of the plate which is *not* to be bonded, scuff sand the surface of the plate to aid bonding. Refer to figure 2.

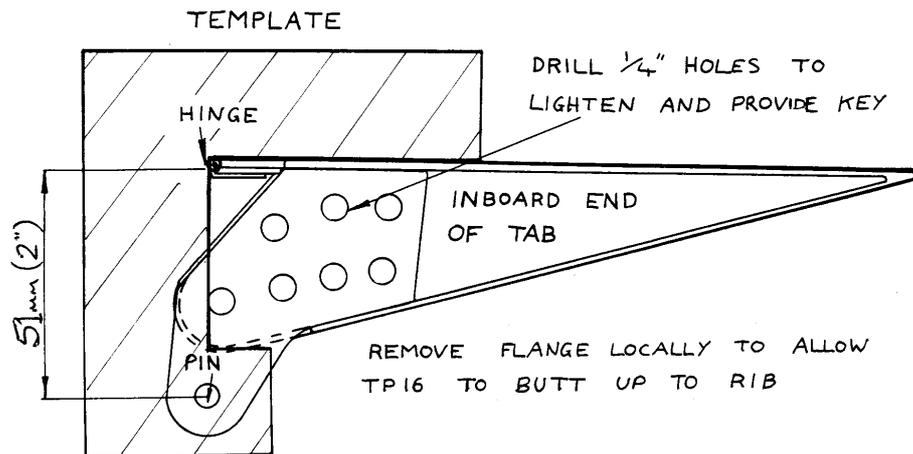


Fig 2. Positioning drive pin in root of hub.

4. Tab pin plate attachment

Referring to figures 2 and 3, and using your template, align the drive pin TP16P or TP16S so that the pin is in line with the hinges. As the tab's root is angled relative to the aircraft centreline a fillet of dryish flox is required behind the TP16's to align them correctly.

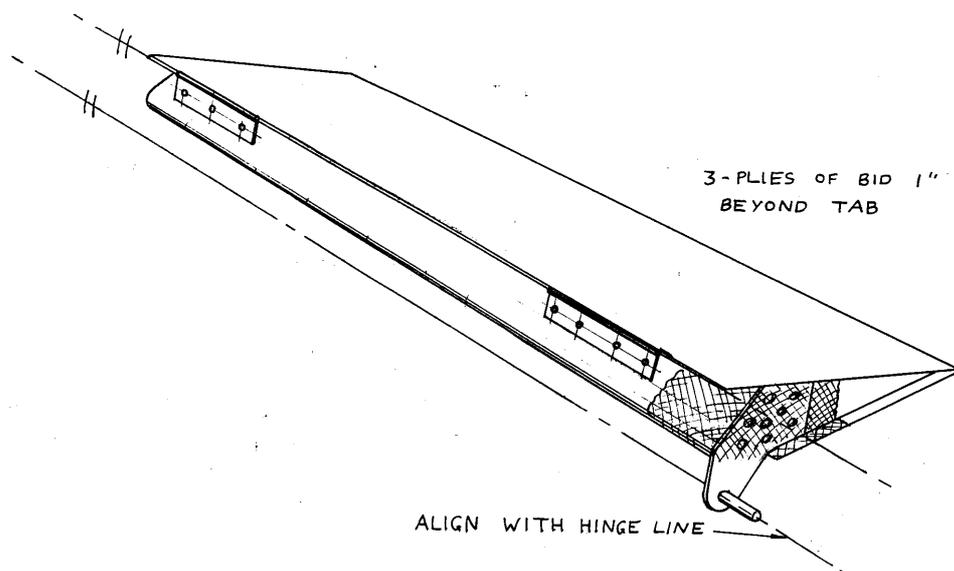


Fig 3. Tab with drive pin attached.



Allow the floc to squeeze through the holes to give a good key then cover the plate with peel ply then allow to cure ensuring alignment is not disturbed.

Remove the peel ply, then layup 3 plies of 'bid' at $\pm 45^\circ$ over the TP16, extending this layup around the leading edge of the tab and the top and bottom flanges, then peel ply all the edges.

After cure remove the peel ply and paint the new glassfibre and plate which is exposed.

As the new TP16's are thicker than the originals it may be necessary to shorten the TS05 "T-bar" into which the pins locate.

If this is necessary, the TS06 bushes will first need to be removed from the ends of TS05. It may be necessary to apply heat carefully to soften the rapid epoxy which is holding the bushes in place. Take care when removing the bushes as they are made from a plastic material.

Reinstall the tabs onto the tailplanes and rig the tailplanes to the aircraft. Check that the tailplanes can be moved throughout their total range, with the trim set to both extremes of travel, with no binding or contact with any part of the airframe. With the tab pins set using templates made to fit the original positions, trim range and tab to tailplane gearing should be unchanged.

Annotate the aircraft technical records - Mod 58 incorporated.