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## Groppo Trail & Groppo Trail Mk. 2 Lift Strut to Wing Attachment Swivel Bolts Implementation of Hours-Based Bolt Life

The Groppo Trail's wings are designed to fold alongside the fuselage structure for storage without the use of tools. Wing fold-back is achieved by the use of swivelling joints between the wing structure and the fuselage and between the strut to fuselage and strut to wing attachments.

To accomplish this fold-back operation, a securing pin is first released inside the cockpit, this frees the wing so that it can be rotated through 90° (so that the leading edge faces down). The wing is then free to be folded back alongside the fuselage.

During the type acceptance process, the wing attachment swivel bolts were identified as critical components subject to forces that could cause fatigue damage to accumulate. So as not to delay initial approval, the aircraft was released to service with, what was considered a very conservative requirement, to replace the top wing strut bolts annually.

In the light of service experience, and further stress analysis work by both the manufacturer and the manufacturer's UK agent, the LAA has amended the calendar-based annual requirement to replace these bolts with an hours-flown life limit.

To accomplish this change, an Airworthiness Information Leaflet (LAA/MOD/372/029 Issue 1) has been issued requiring bolt to be replaced each 200 flying hours.

Service experience has 'flagged-up' two areas of concern with regard to changing this bolt in the field. The first, a rather ubiquitous concern, is that some examples of bolts purchased commercially have been found not to meet the strength requirements specified by the manufacturer. It is essential that these critical bolts are replaced with bolts of known quality; the manufacturer specifies an M12 - 8.8 Grade - manufactured with a rolled thread. New bolts should always be sourced from the manufacturer or an approved manufacturer's agent.

The second concern relates to one example where, during assembly, this connection was tightened such that the joint wasn't free to move. The explanation for this assembly error was a not well advertised manufacturer's change in the bushing sizes and a concurrent new requirement to shim the joint. Fitting instructions, new bushes and shim sets are available from the manufacturer or their UK agent.

LAA/MOD/372/029 Issue 1 can be downloaded [HERE](#)



Fig. 1 An example of the Groppo Trail with the wings in the fold-back position; a huge advantage in hangars with limited space ... though introducing different continuing airworthiness issues, both from the perspective of the approving engineering team and LAA Inspectors carrying out their annual inspection.

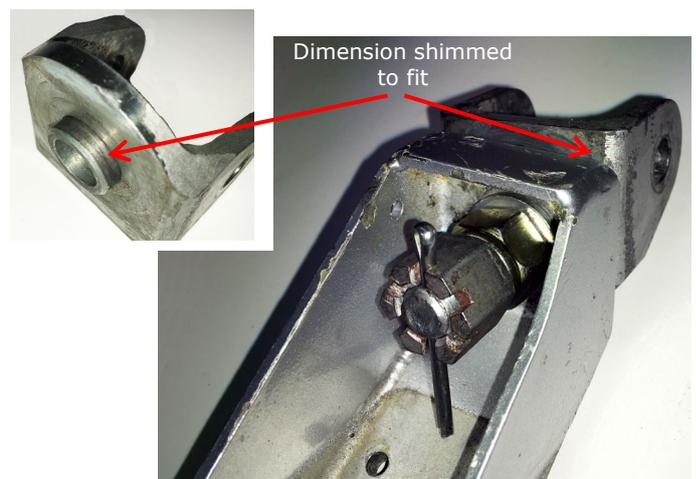


Fig. 2 A picture of the three-dimensional swivel: Note that the designer requires this bolt to be secured with a nyloc nut and a split-pinned castle nut. When fitting the later bushes, it is essential that this joint is accurately shimmed during assembly to remove any angular play, but remains free to rotate.