



**SERVICE BULLETIN** No. 0087 issue 1

**THE CAA HAVE CLASSIFIED THIS BULLETIN AS MANDATORY.**

**TITLE** LIFING AND REDESIGN OF LEADING EDGE BOLT ASSEMBLY

**NOTE:** THIS SERVICE BULLETIN SUPERCEDES MODIFICATION 110  
(5/16" LEADING EDGE BOLTS INSTALLED HEAD UP)

**COMPLIANCE** WITHIN 100 HOURS OR 300 FLIGHTS (whichever is least)  
LIFE OF 5/16" LEADING EDGE BOLTS.

**APPLICABILITY** ALL PEGASUS AND SOLAR WINGS XL WINGS.

**INTRODUCTION:**

A leading edge to crossboom bolt failed recently in France. Remarkably, the structure remained intact enough for the pilot to safely land. The aeroplane in question used a modified XL wing at a maximum all up weight of 390kg (the maximum UK certificated AUW is 365kg). It had flown for 500 hours of circuit training - estimated to be 2500 flights from a grass strip.

There has been one previous case of leading edge bolt failure on the XL wing bolts, in the original design when the bolts were positioned upside down. In that incident, the bolt failed in fatigue at the thread roots. Modification 110 (service bulletin 0041) introduced bolts located head upwards, so as to load the plain shank.

In the recent French case, the bolt assembly was to mod 110 standard and the bolts were of AN-5 quality. The 5/16" bolt had failed in fatigue over many flights until the remaining cross section, which was only 3mm wide, finally broke. The fatigue crack started on the bolt shank where it emerges from the leading edge channel.

The reason for the fatigue failure was found to be due to the vertical movement at the centre of the XL crossboom. In flight, the leading edge bolts may be misaligned by up to 5 degrees. On a heavy landing, the crossboom may drop until it hits the keel. During taxiing on rough ground, the cross boom also moves up and down.

Due to the very thick wall at the end of the crossboom, this vertical misalignment cannot be accommodated, so the bolts can be levered back and forth. Also, the outward thrust of the crossboom in flight tends to act on the inside wall of the tube, putting the bolt into bending. Both these factors cause fatigue crack propagation.

The leading edge bolt assembly has been redesigned by modification PG123 to accommodate misalignment and incorporate larger 10mm bolts. See drawing SW-90608.

There has never been an incident with the Q wing / Q2 wing bolts, because the crossboom wall is thinner and the vertical movement is much less. However, a similar 10mm bolt assembly will be introduced for the Q wing and attention is drawn to the 500 hours life of the existing Q wing leading edge bolts in the flight manual.

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**ACTION:**

The original leading edge bolt assembly must be replaced with the new 10mm bolt assembly.

The work is possible to do without total disassembly of the wing. However, without the use of a pillar drill, great care must be taken in drilling the 13mm hole at the crossboom end and the 10mm holes in the leading edge channels.

- 1) Remove wing from the trike and de-rig the wing.
- 2) Turn the wing upside down and open the leading edge bolt inspection zips.
- 3) Disassemble the leading edge bolt assembly.
- 4) Remove the side rigging cables from the crossboom.
- 5) On the XL Wing only drill out the pop rivet securing the crossboom insert, and withdraw the insert.
- 6) Drill out the leading edge bolt hole to 13mm. (Practice first on the discarded insert)
- 7) Drill out the leading edge bolt channel to 10mm. Protect the sail from the drill.
- 8) Deburr the holes and remove swarf.
- 9) Assemble the leading edge bolt assembly according to drawing SW90608 issue A
- 10) Torque the bolt to 15 NM.
- 11) Reattach side rigging to the crossboom, using a new nyloc nut if necessary.
- 12) A Pegasus or BMAA inspector must inspect the assembly and sign off "modification PG123 (leading edge 10mm bolts) incorporated"

**LIFE OF NEW ASSEMBLY:**

The life of the new 10mm bolt assembly is 1000 hours, dependent on an annual inspection for corrosion and wear. Obviously, the assembly must be stripped and checked after an accident.

**AVAILABILITY:**

Only genuine Pegasus components should be used in this primary structure.  
A kit of parts ref: KIT-XL-001 is available from the Factory. Contact the address below.

**Approved:**

**Date:**

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