

Feb., 1973.
Issue 1.

TECHNICAL INSTRUCTION No. 54

Antisymmetric Wing Bending Vibration
of 17M and 19M Kestrel Gliders

This notice is applicable to all Slingsby built T59A, T59D, T59E, and T59F Kestrel gliders.

On production test flights it is customary to stick nudge, to check that the aircraft does not suffer from flutter. On one aircraft this was found to produce a damped antisymmetric wing bending mode vibration which could be eliminated by holding the stick. Over the permissible speed range and flap configuration it is considered that it may be possible for this vibration to be undamped, in which case catastrophic structural failure could result.

The British Civil Aviation Authority has therefore made mandatory the incorporation of a modification to eliminate this problem, which must be incorporated before the next flight.

A solution to the problem is in hand and a Technical Instruction together with the necessary modification kit will be despatched to all owners within the next few days.

Circulation

All known owners	
C.A.A.	- 6 copies
F.A.A. Brussels	- 6 copies
D.C.A. Australia	- 6 copies
B.G.A.	- 6 copies
G. Thomson	- 6 copies
H. Schneider	- 6 copies

Feb., 1973.
Issue 2.

TECHNICAL INSTRUCTION No. 54

Antisymmetric Wing Bending Vibration
of 19M Kestrel Gliders

Further to Technical Instruction No. 54 Issue 1 dated February, 1973, it has been found that the reason why the aircraft referred to in the Technical Instruction produced a damped antisymmetric wing bending mode vibration was that the ailerons of the particular aircraft required mass balancing.

As a result of the foregoing and following discussions between Slingsby Sailplanes and the Civil Aviation Authority it has been decided that the weights and hinge moments of all 19M Kestrel ailerons are to be measured and recorded in line with Sections 1 and 2 of this Technical Instruction.

The British Civil Aviation Authority has made mandatory the incorporation of this Technical Instruction before the next flight.

The requirements of this Technical Instruction are not applicable to the Slingsby 17M Kestrel gliders which have now been cleared for flight by the Civil Aviation Authority.

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SECTION 1 - INSPECTION

1. Remove flaps and ailerons from the wing.
2. Determine the hinge moment of both ailerons as follows:
 - (a) Support the aileron on a rig as shown in Fig. 1 which allows the aileron to pivot on three hinges (numbering from the root No's. 2, 4 & 6).
 - (b) Measure the load at some point on the trailing edge (hinge 5 is suitable) to keep the aileron level, see Fig. 2.
 - (c) The hinge moment is the weight from (b) multiplied by the distance from the point at which the load was measured to the hinge line.
3. If the average hinge moment of the two ailerons is less than or equal to 8.5 lb.in. and neither aileron has a hinge moment greater than 9.5 lb.in. the aircraft is relieved of all restrictions without further action.

Please record the hinge moments and overall weights of the ailerons and send these to Slingsby Sailplanes.

SECTION 2 - MASS BALANCE

1. If the hinge moments are outside the above limits the ailerons should be partially mass balanced to give hinge moments less than 8 lb.in. on each aileron.
2. Calculate the required reduction in hinge moment. The mass balance weight can be riveted to the leading edge lip of the aileron to give an effective moment arm of approx. 1". If it is required to correct the hinge moment by $1\frac{1}{2}$ lb.in. a $1\frac{1}{2}$ lb. weight manufactured from lead strip 25mm. x 2mm. x required length is attached to the aileron as shown.
3. Check the hinge moment as before.
4. Check the maximum aileron movements as given in the Pilots Notes.
5. Please record all hinge moments and aileron weights before and after mass balancing and send these to Slingsby Sailplanes.

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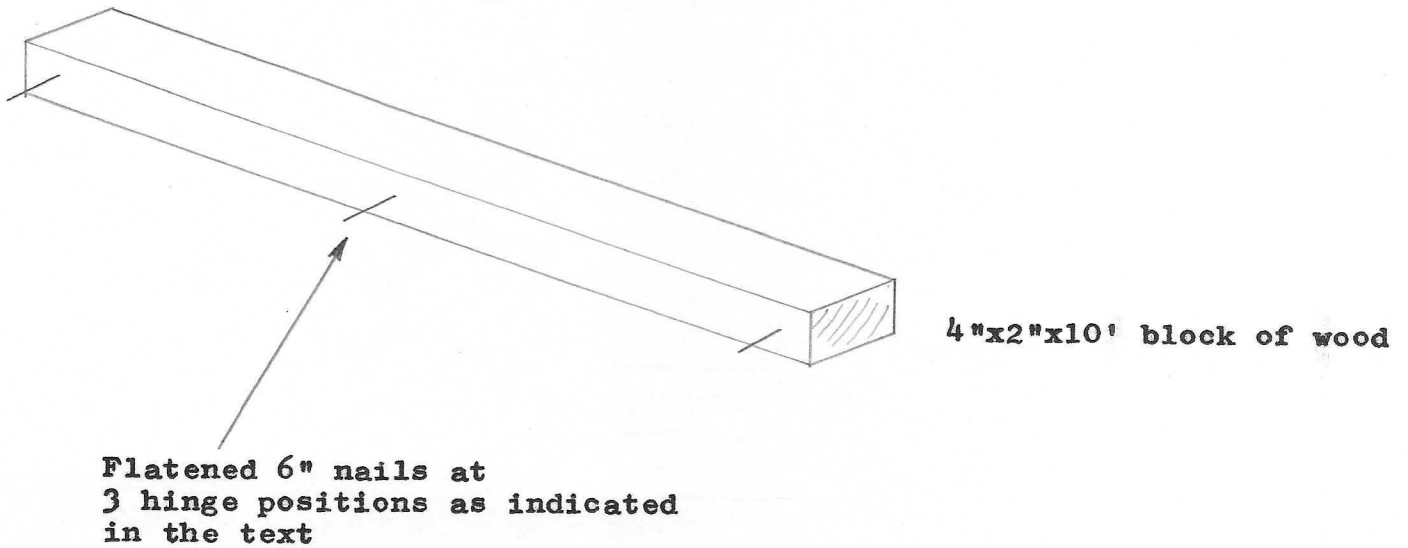


Figure 1 - Typical Rig for Aileron Hinge Moment Measurement

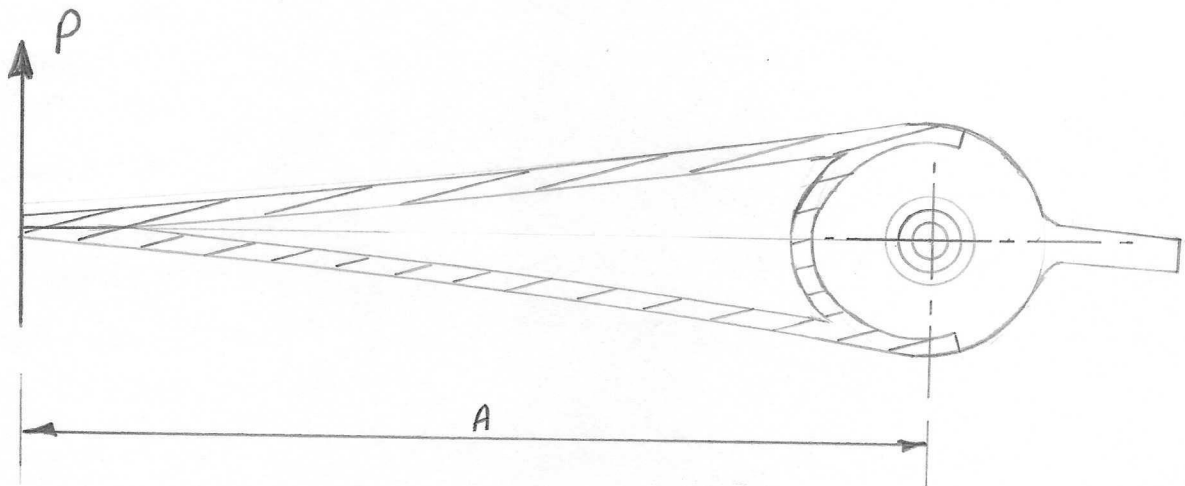


Figure 2 - $P \times A = \text{Hinge Moment}$

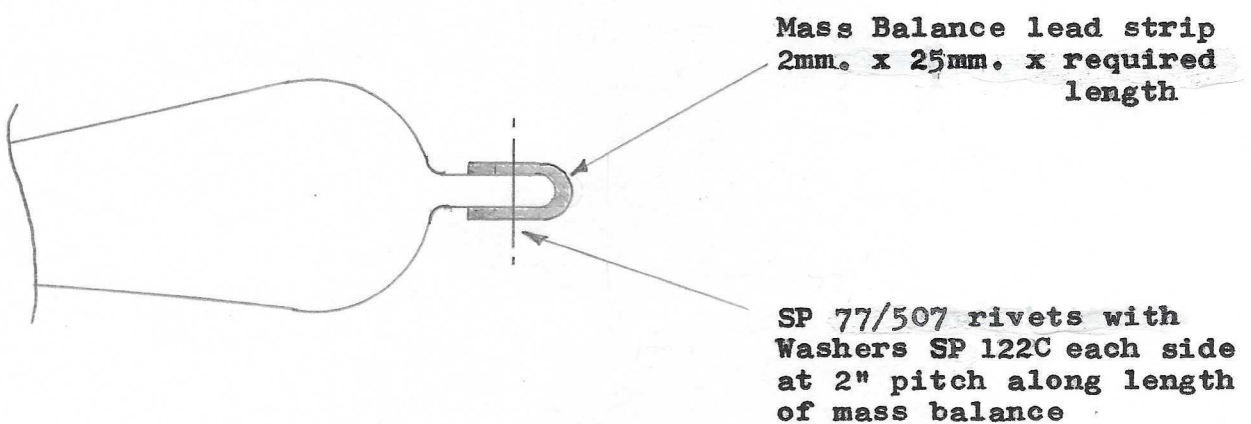


Figure 3

ADDENDUM TO TECHNICAL INSTRUCTION No. 54

Removal of Flaps and Ailerons from Kestrel Gliders

1. With the wings set chord line vertical and leading edge downwards remove the two stiff nuts holding the flap root hinge to the wing.
2. Withdraw the flap inboard $\frac{3}{4}$ " and lift it off the wing.
3. Remove the filler paste or tape covering the aileron actuator and remove all four socket headed screws.
4. Withdraw the actuator mounting plates outward from the actuator by pulling normal to the wing surface.
5. Slide the aileron inboard $\frac{3}{4}$ " and lift off leaving the actuator in the wing.

Note If sealing tape is fitted this must be removed before the control surfaces are removed.