

Slingsby Engineering Limited  
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TECHNICAL INSTRUCTION NO. 95

SLINGSBY T65A, T65D VEGA GLIDER

AILERON/WING VIBRATION OF  
T65A and T65D VEGA GLIDERS

INTRODUCTION

Cases have occurred of aileron vibrations between 110 and 120 kts IAS, as a result the following instruction for fitting mass balance to the ailerons, amending the T65A/D Vega manual and reporting back to Slingsby Engineering Limited, has been raised.

APPLICABILITY

All T65A and T65D Vega gliders except Work Nos. 1889, 1890 and 1903 which already apply.

COMPLIANCE

This modification has been made mandatory by the Civil Aviation Authority and must be embodied by December 31st 1981.

RESTRICTIONS

On embodiment of this modification the restrictions as laid down in Slingsby Engineering Limited Technical Instruction No. 92 Issue 1 are lifted and the glider resumes its original flight limits.

OBJECT

Aileron out of balance not to exceed 3.0 lbs ins (35 kg mm). To achieve this approximately 2 lbs (0.9 kg) of lead has to be added to the leading edge beaks of each aileron.

PROCEDURE

1. Remove ailerons in accordance with the Vega Manual, Section 3.2.3 "Removal and Replacement of Ailerons."

NB Sealing tape must be removed before the ailerons are removed.

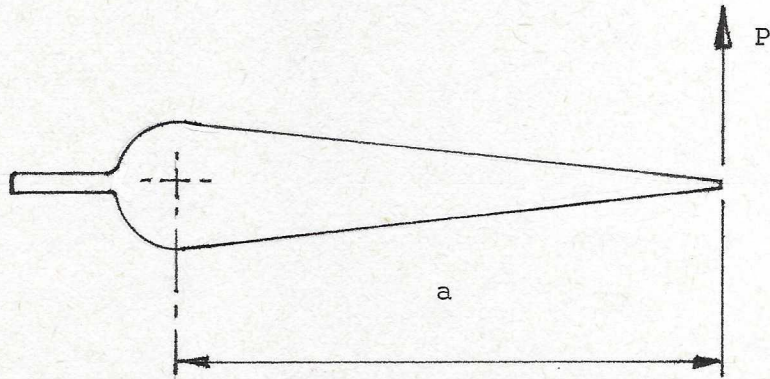
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PROCEDURE (Cont'd)

2. Determine the out of balance moment of each aileron as follows:
  - a) Support the aileron at hinge positions 1, 4 & 6 (numbered from aileron inboard hinge) on locally produced jig Ref Fig.1.
  - b) Calculate out of balance as detailed below:

NB Take measurements at the actuator position.



$P$  = load required to hold aileron level, i.e. spring balance reading.

$a$  = distance from hinge line at the point where load "P" was measured.

OUT OF BALANCE MOMENT =  $P \times a$ .

3. Record the actual weight and out of balance moment for each aileron (Ref. Para 7.)
4. From the out of balance moment for each aileron calculate the required amount of lead needed to reduce the out of balance to 3.0 lbs ins and add lead to the aileron beaks as detailed on Fig. 2.
5. Check out of balance moment as in Para. 2.
6. Temporarily fit ailerons and check maximum movements.

Pre Mod 20 or 34      $32^\circ \pm 1^\circ$  Up  
                               $20^\circ \pm 1^\circ$  Down

Post Mod 20 or 34     $35^\circ \pm 1^\circ$  Up  
                               $20^\circ \pm 1^\circ$  Down

Refer T65A/D Vega Manual Section 1.8 Control Surface Movements.

7. Record weights and out of balance moments for each aileron before and after modification and forward to Slingsby Engineering Limited.
8. Refit ailerons in accordance with the Vega Manual Section 3.2.3.

Cont'd.....



9. Refer Slingsby Engineering Limited Technical Instruction No.49 (Pages 1 & 3 attached) for refitment of aileron seals.
10. Raise T65A Vega Manual to Issue 7 with the following hand written amendment:

Page 132

Section 3.2.5 Balancing Requirements for Control Surfaces

Aileron:- under column "Maximum allowable unbalance"

Delete 5.00 substitute 3.00

Delete 58.00 substitute 35.00

under column "Maximum Mass"

Delete 4.50 substitute 6.50

Delete 2.05 substitute 2.95

At base of page 132 raise issue from 2 to 3 and raise Am No. from 4 to 7.

Record completion of amendment No.7 on amendment sheet.

PARTS REQUIRED

The following items may be obtained from Slingsby Engineering Limited as separate items or as a complete kit.

SP68/314 Rivet 3/32" 100° CNSK L36	Qty 60
Araldite Rapid	Two packs
Lead strip commercial 640 x 15 x 2mm thick	Qty 24
Aileron seal kit comprising	
103AE/103T Tygadore PTFE Commercial Strip 2900mm x 4"	Qty 2
Bostick 2762	500ml
Bostick D10	10ml

For and on behalf of  
Slingsby Engineering Limited



R Sanders  
Chief Designer/Aircraft Division

RS/PMS  
26.11.80



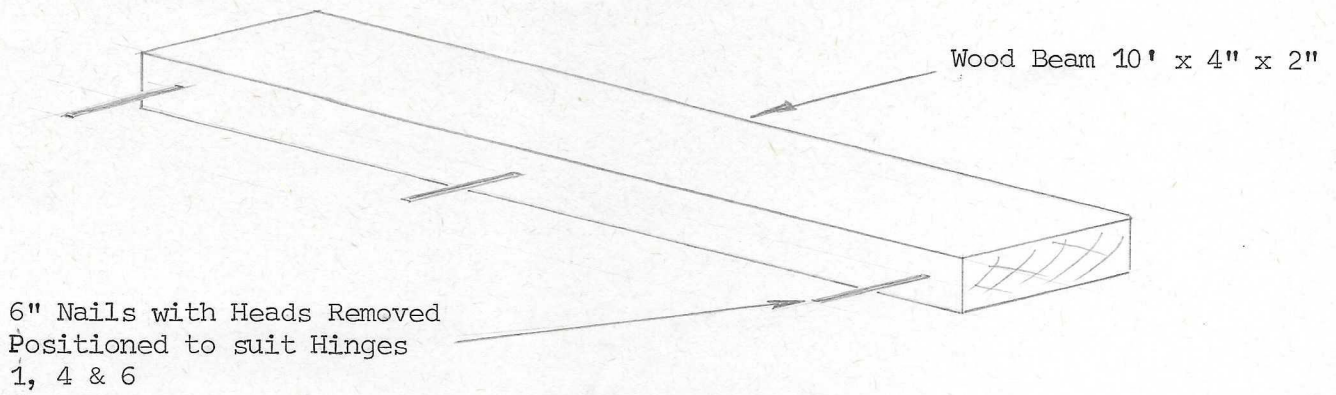
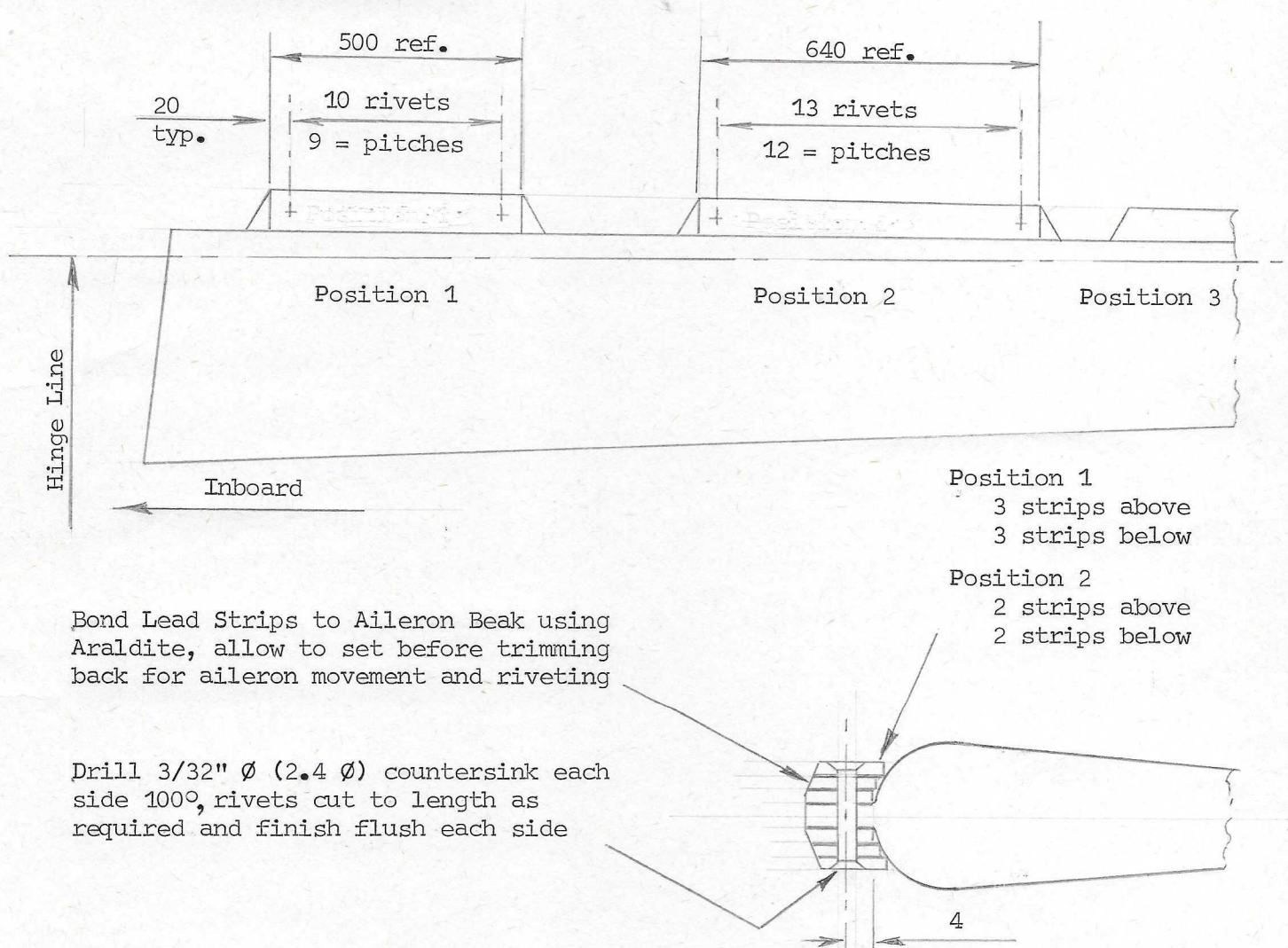


Fig. 1 TYPICAL BALANCE JIG



Note: At Position 3 '1' lead strip above and below may be added. Minimise length and attach as detailed above to inboard portion of Aileron Beak.

Fig.2 LEAD ADDITION TO AILERON BEAK



AILERON MASS BALANCE

(REF FORT 95)

DWS

31'2

BACKGROUND:Flutter →, aileron → require mass balance →  
how much?

29'2

- (i) D.O.I. T6SA-673 <sup>(22-5-80)</sup> by DNL - RS approved.  
(A/C 1903 TONY BURTONS)

2.8 LBS lead added to port aileron3.0 LBS lead " " stbd "

out of balance achieved: port 5.04 LBS

port:	<u>5.4</u> LBS	before	:	<u>2.2</u> LBS	after	-
stbd:	<u>5.04</u>		:	<u>1.8</u> LBS	"	

- (ii) D.O.I. T6SA-682 <sup>(10-10-80)</sup> by MSR approved by RS.  
A/C: G-VEGA.

D.O.I. calls for 1.5 LBS lead to be added  
to each aileron - no out of balance mentioned.

- presumably this was intended to minimize  
the amount of lead required.

- (iii) D.O.I. T6SA-683 <sup>(3-11-80)</sup> by DNL approved RS.

this D.O.I. calls for an extra 1/2 lb of lead  
to be added to each aileron - total now 2 LBS.  
- presumably with 1 1/2 LBS lead the test flight  
proved unsatisfactory.

- 2 LBS was also added to A/C N° 1890



(Mr. Richards) for test evaluation.

① G - BGV (Richards)

<u>WT</u>		<u>WT</u>	<u>Lead</u>	<u>MOMENT</u>
4.25 LBS	→	6.25	(+2)	3.50 LB. INS.
4.25 "	→	6.25	(+2)	3.50 LB. INS.

② 1903 TONY BURTONS

4.30 LBS	→	7.10	+2.8	2.2 LB. INS.
4.19 LBS	→	7.19	+3.0	1.8 LB. INS.

③ G - VEGA

4.25	→	5.53	(+1.28)	4.0 LB. INS.
4.13	→	5.41	(+1.28)	4.0 LB. INS.



→	6.25	(+2)
→	6.13	(+2)

NO. 40

3.50 LB. INS.  
NOT RECORDED  
3.50 LB. INS.  
NOT

CONCLUSIONS:

∴ 3.50 LB. INS. proved O.K. by test flight

Remove <sup>aluminum</sup> blind on G-Vega & measure out of balance.

W.