

GFA/AD/20

SLINGSBY 3

COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF CIVIL AVIATION

AIRWORTHINESS DIRECTIVE GLIDERS.

REFERENCE GFA/SLINGSBY. 1/73/1.

Background:

It has been suspected for some time that all information relating to glider defects from overseas was not being received in Australia; enquiries made to overseas Aviation Authorities has led to receipt of a considerable number of airworthiness directives, service bulletins and advisory notices some of which may have been previously forwarded to operators of the affected types in Australia.

Slingsby Aircraft Co. Ltd., Technical Instructions Nos. 28, 29, 30, 32 and 35 apply to Slingsby T.51 Dart & Dart 17.R. gliders.

Technical Instruction No. 28 relates to the retractable undercarriage label which was of a non-durable material. It is unlikely that this deficiency if it existed in gliders of this type in Australia has not been rectified. It is required that permanent labels, not necessarily "Dymo", be fitted in accordance with the details of Technical Instruction No. 28.

Technical Instruction No. 29 relates to strengthening of the manual retractable undercarriage main fork.

Technical Instruction No. 30 relates to modification of the tailplane mass balance weight.

Technical Instruction No. 32 relates to an alternative modification where the modification set out in Technical Instruction 30 is inapplicable.

Technical Instruction No. 35 relates to an undercarriage down lock with a heavier duty bearing.

The requirements of Technical Instructions 28, 29 & 30 or 32 as applicable if not already incorporated are required to be incorporated as mandatory modifications. The requirements of Technical Instruction No. 35 are optional.

Compliance:

If not already incorporated modification in accordance with Slingsby Technical Instructions Nos. 28, 29 & 30 or 32 as applicable is mandatory and to be incorporated before 1st June, 1973.

This Airworthiness Directive is issued under the delegated authority of the Director-General of Civil Aviation pursuant to Air Navigation Regulations.

GFA/GTA GLT

R.T.O./A.

ADC.

DCA

DOUGLAS LYON,
Chief Technical Officer Airworthiness,
Gliding Federation of Australia

TECHNICAL INSTRUCTION NO. 28.

- T 51. Dart Mod. No. 63. (All Manual).
 Dart Mod. No. 64. (Hydraulic converted to manual).

REPLACEMENT OF RETRACTABLE UNDERCARRIAGE LABEL.

This modification has been prepared at the request of the British Gliding Association.

The dyeline printed label fades in daylight.

The existing label for the retractable undercarriage is to be replaced by a "Dymo" label.

The modification has been made mandatory by the British Gliding Association.

MODIFICATION PROCEDURE. (All Manual). Mod. No. 63.

1. Remove the dyeline printed "DOWN-U/C-UP" label.
2. Clean the paintwork thoroughly using methylated spirit or equivalent.
3. Fix the labels.
NOTE: The "DOWN" Label FORWARD of the Slot.
 The "UP" Label REAR of the Slot.
 The "UNDERCARRIAGE" Label UNDER the Slot.

MODIFICATION PROCEDURE. (Hydraulic converted to Manual). Mod. No. 64.

1. Remove the dyeline printed "UP-U/D-DOWN" label.
2. Clean the paintwork thoroughly using methylated spirit or equivalent.
3. Fix the labels.
NOTE: The "UP" Label FORWARD of the Slot.
 The "DOWN" Label REAR of the Slot.
 The "UNDERCARRIAGE" Label UNDER the Slot.

The parts required for the embodiment of this modification can be supplied by Slingsby Sailplanes Limited, Kirbymoorside, York., England, and comprise of:

<u>PART NO.</u>	<u>DESCRIPTION.</u>	<u>NO. OFF.</u>
-	Label "UP".	1.
-	Label "DOWN".	1.
-	Label "UNDERCARRIAGE".	1.

Redundant Parts.

Dyeline UP-U/C-DOWN Label.

August, 1967.

TECHNICAL INSTRUCTION NO. 29

T.51 DART 17R

Mandatory Modification No.66

STRENGTHENING OF MANUAL RETRACTABLE UNDERCARRIAGE

Due to a small number of main undercarriage fork failures a design change has been made, introducing strengthening of the Fork.

This modification is in the form of an internal tube inserted into the existing 1.0" ϕ /D Tubes.

Embodiment: This modification has been made mandatory by the British Gliding Association and should be incorporated as soon as possible and in any case before the 30th November, 1967.

Modification Procedure:

1. Remove undercarriage doors.
2. Disconnect wheel brake.
3. Remove Wheel.
4. Remove radius rod bolts.
5. Remove ply skin between longeron and wheel box top in line with undercarriage pivot bolts taking care not to damage longeron. Remove only sufficient to enable nuts to be removed from undercarriage fork pivots.
6. Remove wheel brake lever.
7. Remove undercarriage fork, 51-1-417.
8. Cut existing fork as shown on SK 51/423 (attached).
9. Carry out instructions as per SK 51/423.
10. Fit $\frac{7}{8}$ " O/D 12G. tube inside undercarriage fork as shown.
11. Drill and Ream for 4 taper pins or bolts, each side as shown.
12. Fit taper pins or bolts.
13. Touch up paint on undercarriage as required.

14. Replace undercarriage fork 51-1-417.
15. Replace wheel brake lever.
16. Reconnect radius rod.
17. Replace wheel.
18. Reconnect wheel brake.
19. Replace undercarriage doors.
20. Check operation of undercarriage mechanism.
21. Splice in 2 mm ply skin where removed and finish to existing undercarriage finish.
22. Ensure that tyre pressure is between 20 and 25 P.S.I.
23. Make the appropriate entry into the glider log-book to certify that the modification has been incorporated.

Parts required for the embodiment of this modification can be obtained from Slingsby Sailplanes Ltd., Kirkbymoorside, York, England, and comprise:

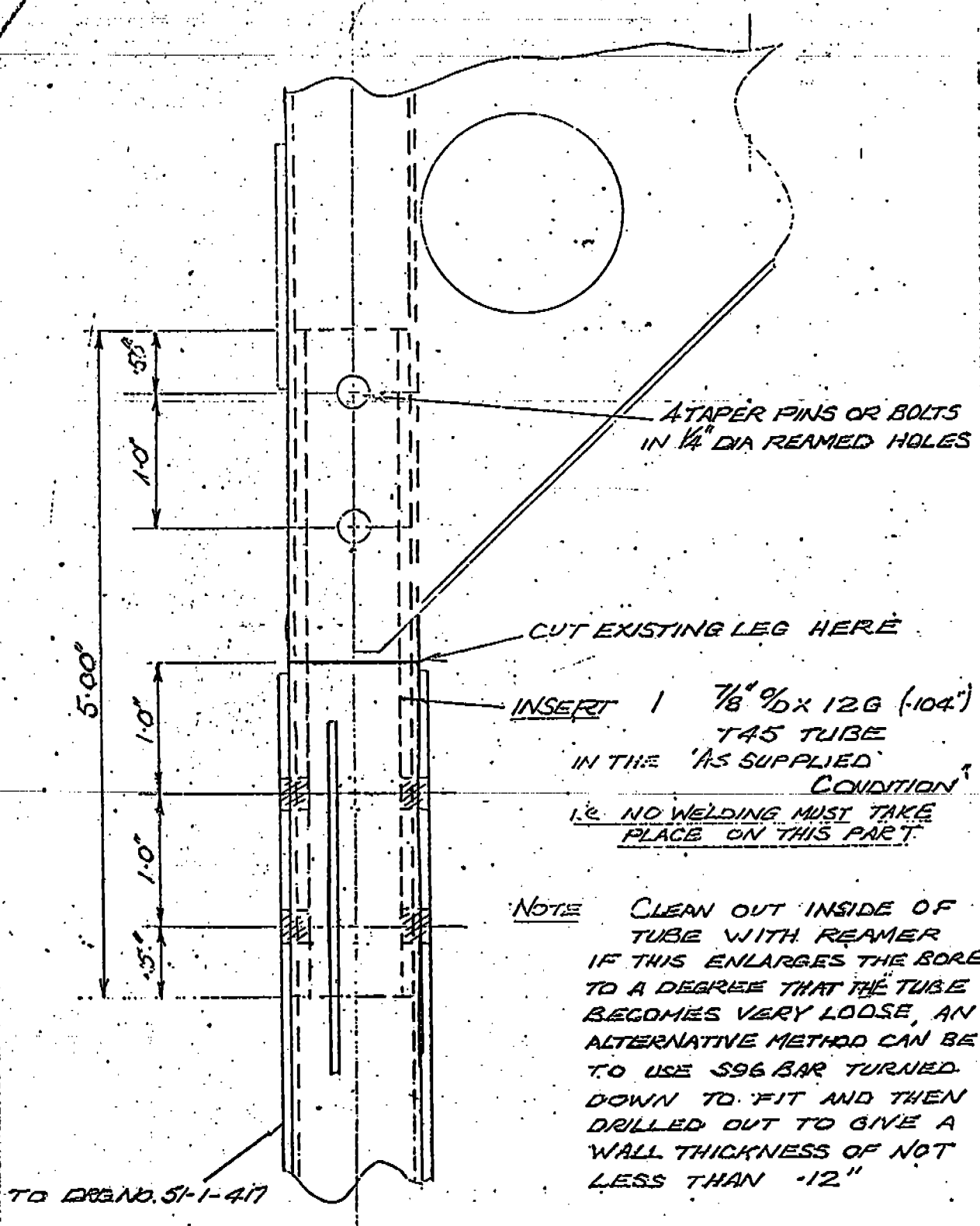
<u>Part No.</u>	<u>Description</u>	<u>No. Off</u>
SK 51/417/1	Tube	2
	Taper Pin $\frac{1}{4}$ dia.	8
	Bolt. Nut	8 each

NOTE: Operations 8 to 13 inclusive will be undertaken by Slingsby Sailplanes Limited free of charge, upon receipt of the undercarriage fork at their Kirkbymoorside factory.

51/443

DART 17R

UNDERCARRIAGE REPAIR SCHEME



SK51/443

1000 1 1000 1000

10-8-67

August, 1967.

STINGSBY SAILPLANES LIMITED, KIRBYMOORSIDE, YORKSHIRE
ENGLAND.

TECHNICAL INSTRUCTION NO. 30

T.51 DART ALL VARIANTS

Mandatory Modification No.67

INCREASE IN TAILPLANE MASS BALANCE WEIGHT

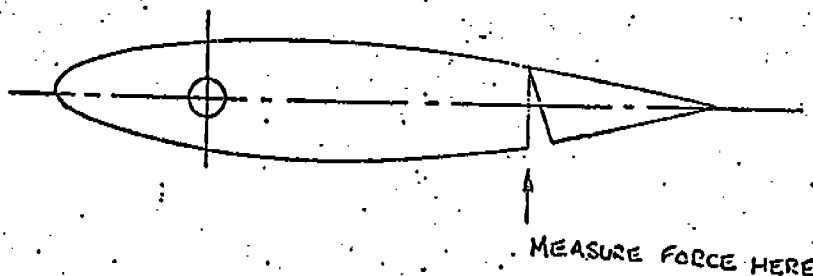
Object of the Modification: It seems likely that, in two or three incidents, Darts have suffered from fairly high-frequency pitching oscillations when flying fast. A detailed analysis of the dynamic stability confirms this possibility and indicates that a larger mass-balance weight for the all-moving tail is required.

Flight tests have confirmed that, when fitted with modified weights, the aircraft has no tendency to oscillate rapidly in pitch, and if such motions are deliberately induced they rapidly damp out.

The modification therefore consists of replacing the present tailplane mass balance weights by larger weights. This modification is to be carried out as soon as possible and in any case before the 31st October, 1967.

Modification Procedure:

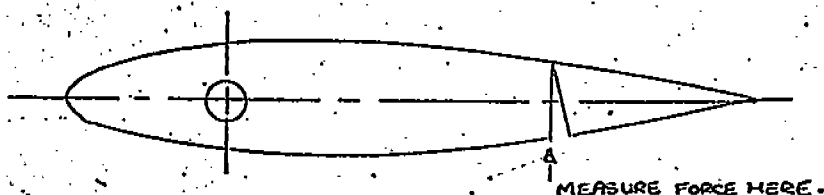
1. Remove the two inspection panels forward of the tailplane in the rear fuselage.
2. Remove the existing elevator mass balance weights via the inspection panels.
3. Disconnect the rear end of the elevator push rod from the lever in the rear fuselage.
4. Since there are several different types of "Dart" tailplane, the new balance weights are somewhat too large as supplied, and must be trimmed to suit each aircraft.
5. Fit the new balance weights to the balance weight arm but do not tighten the attachment bolt fully.
6. Fit the tailplanes.
7. Measure the force which has to be applied to the root rib of the tailplane, immediately forward of the leading edge of the tab, to bring the tail to its neutral position.



8. Trim the balance weights, taking roughly equal amounts off each, until the upwards force, measured in the manner described above, is between 1 and 1.25 lb (0.45 to 0.56 kg).

Be careful to allow for the effect of friction by taking the mean of the forces which (a) just allow the trailing edge to rise and (b) just push it down.

9. Tighten the balance weight attachment bolt and reconnect the elevator pushrod. Inspect to ensure that the balance weight does not foul the adjacent structure, the push rod or trimmer cables when the tailplane is at the limits of its movement.
10. Check the adjustment of the elevator bias spring attached to the elevator push rod in the vicinity of Frame No. 3 by ensuring that the upwards force which has to be applied to the root rib of the tailplane, just forward of the leading edge of the tab, to bring the tail to its neutral position, is between $5\frac{1}{4}$ lb and $5\frac{3}{4}$ lb (2.38 kg to 2.60 kg).



11. Replace the rear fuselage inspection panels.
12. Inspect the tab for backlash.

Set the cockpit trimmer lever so that the tabs are neutral when the tailplane is neutral. Holding the tailplane in this attitude, apply first an upwards force of 5 lb. (2.26 kg) to the trailing edge of the tab at the root end and then a downwards force of the same amount. The total movement of the tab trailing edge at the root must not exceed 2 mm.

13. Inspect the setting of the tab friction device.

With the tailplane held neutral observe that the tab control does not move when a downwards force of not less than 5 lb. is applied at the trailing edge of the tab. Repeat with an upward force applied at the trailing edge of the tab.

Sheet 3 - Instruction Sheet No.30

14. If the tab control does move, the friction device in the rear fuselage should be tightened. Access is obtained by removing the transparent panel on the port side. Do not over-tighten the friction device.
15. The effect of the increased balance weight will be to decrease the maximum permitted cockpit load by about 4 lb. and to increase the minimum permitted cockpit load by about 17 lb. Amend the cockpit placard accordingly.
16. The incorporation of this modification must be supervised and inspected by a BGA Approved Inspector or Senior Inspector. He must make the appropriate entry in the glider log book and must sign and return the enclosed postcard.

Modification Kits are available from Slingsby Sailplanes Ltd.,
Kirbymoorside, Yorks, price 25/-

SLINGSBY AIRCRAFT COMPANY LTD., KIRKBYMOORSIDE,
YORKSHIRE ENGLAND.

Technical Instruction No. 32
T.51 Darts which are outside the scope of
Mandatory Modification No. 67

MANDATORY MODIFICATION No. 67A

Object of Modification

It has been found that whilst there is no difficulty in fitting Dart Modification No. 67 to the later Dart variants with wooden tailplanes it is not practicable to apply it to those with metal tailplanes, nor to some earlier machines with a small range of cockpit load.

This Modification, No. 67A is intended for those aircraft as an alternative to Modification No. 67.

Modification Procedure

1. Remove the inspection panel in the port side of the fin immediately behind the tailplane axle.
2. Remove the trimmer friction washers of red fibre from the trimmer layshaft, having first removed the 2BA locknut from the back side, and the 2BA round headed securing screw.
3. Remove the anchor nut on the trimmer layshaft by drilling out the two $\frac{3}{32}$ rivets securing same, and apply protective treatment to remaining rivet holes.

Alternatively, if the rivets are not readily accessible to be drilled out, drill out the 2BA thread in the anchor nut using a $\frac{3}{16}$ " drill.

4. Fit items 18, 19, 20, 21, & 23 as supplied in Modification kit in accordance with sketch attached. Use existing large dia. $\frac{3}{16}$ " washer removed from old assembly.

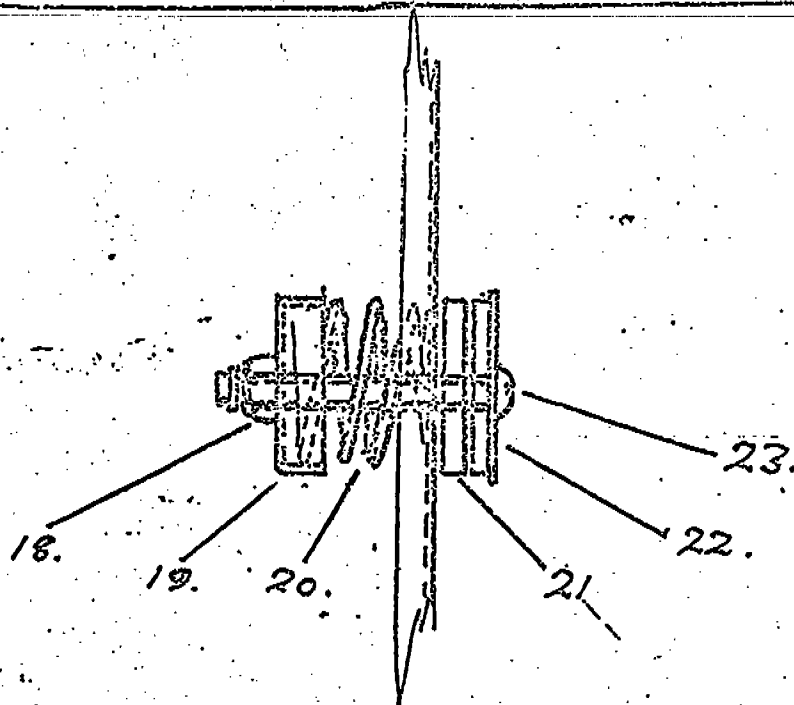
Tension in accordance with rigging drawing 51-1-1 Iss. 6 or 7 or 51-1-201 Iss. 8 or 9 whichever is applicable. No grease whatsoever should be present on the friction device.

5. Refit inspection panel removed in 1. above.

This completes Modification No. 67A.

Modification kits are available from Slingsby Aircraft Ltd., Kirkbymoorside, York.

ASSEMBLY OF FRICTION DEVICE. DART MOD 67A.



SLINGSBY AIRCRAFT COMPANY LTD.,
KIRKBYMOORSIDE, YORK, ENGLAND.

SEPTEMBER 1968.

TECHNICAL INSTRUCTION NO. 35

T 51. Dart Mod No. 69

REPLACEMENT OF RETRACTABLE UNDERCARRIAGE (MANUAL) BODY DOWN LOCK

This modification has been prepared at the request of the British Gliding Association.

The body down lock Item 51-1-419 (issue 3) is to be replaced by 51-1-419 (issue 4) which incorporates an extra capacity rose bearing No. RBJ - 40 in place of rose bearing No. RM - 5.

The modification has been made optional by the British Gliding Association.

MODIFICATION PROCEDURE

Remove Item 51-1-419 Issue 3 and replace with 51-1-419 issue 4.

The part required for the embodiment of the modification can be supplied by Slingsby Aircraft Co. Ltd., Kirkbymoorside, Yorkshire, England.