

Tail Modification Kit

ASSEMBLY MANUAL

Revised 15 July 82

1.0 INTRODUCTION

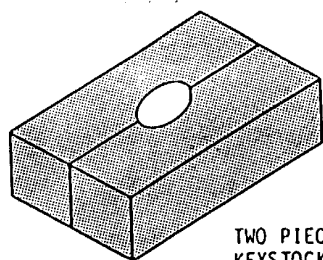
1.1 This kit contains the new parts necessary to modify early model Lazairs to the tail configuration which became effective on new kits in May 1982. The modification incorporates four changes:

- (a) The stabilizer and ruddervator have been shortened approximately seven inches to provide more ground clearance for rotation during takeoff.
- (b) The drag cables have been raised to facilitate takeoff and landing in long grass.
- (c) The tail has been made to fold for easier storage and transportation.
- (d) Tailwheels have replaced the tailskids to facilitate operation from paved runways.

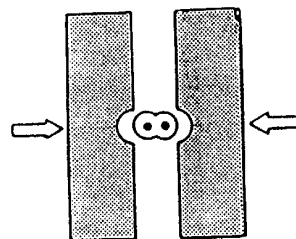
1.2 If you are planning to recover your aircraft, the tail modification should be incorporated before the new covering is applied to the stabilizers and ruddervators. However, if you wish to retain the original covering, it is possible to carefully peel back the covering from the outboard panels of the stabilizers and ruddervators, then retape and reshrink it after the modification is complete.

1.3 To fit the cables as required, it will be necessary to shorten them a few inches. Although this is not difficult, it does require the use of the proper tool for swaging the Nicopress sleeves. If you have difficulty locating the tool, check with the mechanics at your local general aviation airport or with your local EAA chapter. Although it may be possible to rent or borrow the tool, it would be easier (and probably cheaper) to determine the required cable length (as in step 3.2), then take your cables and the Nicopress sleeves to someone who has the swaging tool.

If you prefer to make your own tool for swaging the Nicopress sleeves, the following illustrations may be helpful.



TWO PIECES 3/8 x 3/8
KEYSTOCK OR MILD STEEL.
CLAMP TOGETHER AND
DRILL 3/16 INCH HOLE
EXACTLY ON JUNCTION

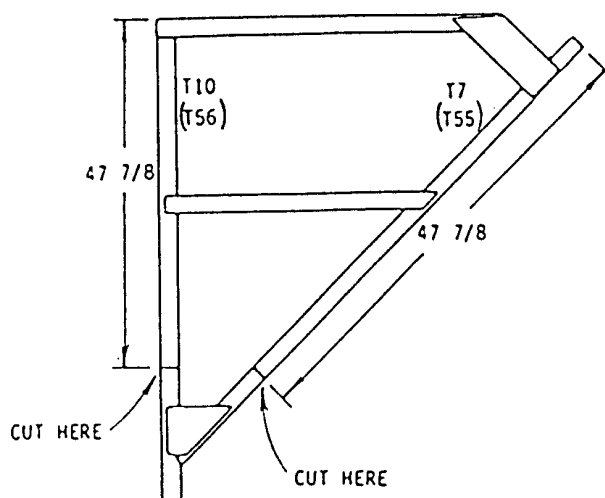


POSITION NICOPRESS
SLEEVE AND CABLE AS
SHOWN AND SQUEEZE
IN VISE

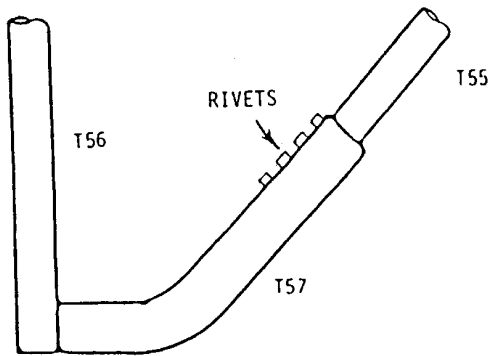
2.0 STABILIZER MODIFICATION

2.1 Remove both ruddervators from the stabilizers. Remove both stabilizers from the aircraft. Remove the inboard F5 ruddervator hinges from the F4.

2.2 Peel back the covering material from the outboard panels of the stabilizer. Saw off T7 and T10 as shown. Note that after sawing these tubes become new part numbers T56 and T55 respectively.

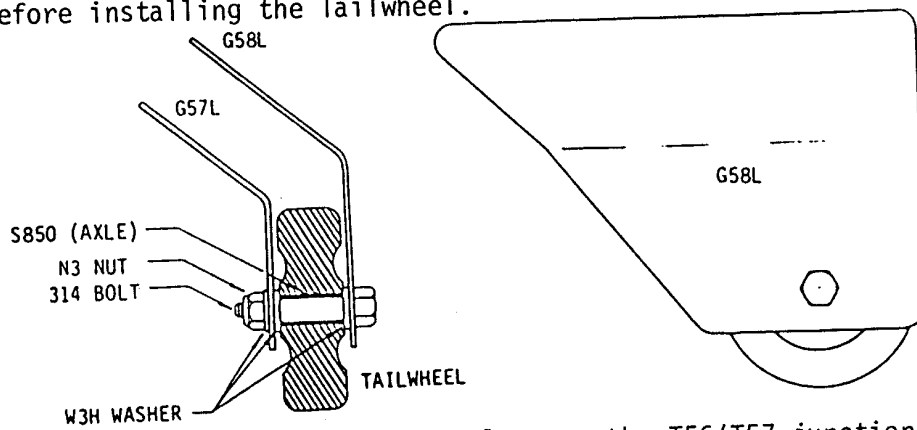


2.3 Slide the long end of T57 over the end of T55. With the stabilizer on a flat surface, position T57 so that the short end is aligned with the end of T56 as shown and rivet T57 to T55 with four rivets. Put the rivets on the inside of the stabilizer where they will not interfere with the covering.



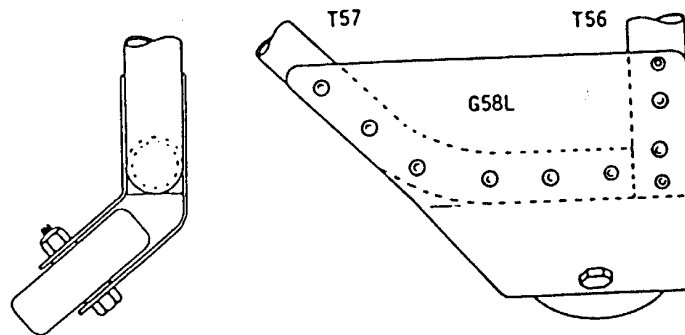
2.4

Make up two Tailwheel Gusset Assemblies as shown below (left side shown, use G57R and G58R for right side). Grease the axle (S850) before installing the Tailwheel.



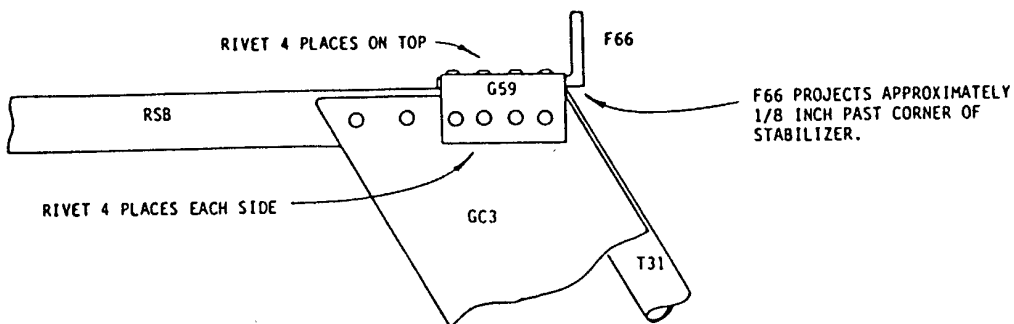
2.5

Fit the Tailwheel Gusset Assembly over the T56/T57 junction and rivet in place as shown.

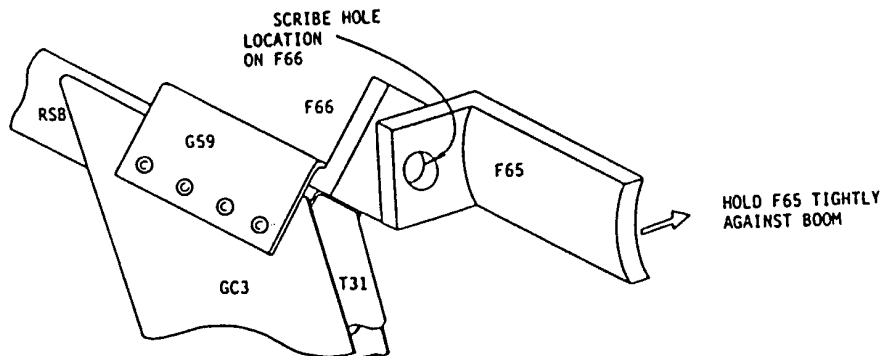


2.6

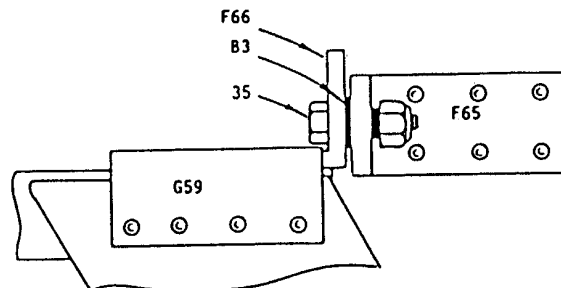
Rivet the Stabilizer half of the hinge F66 to the forward corner of each stabilizer using clam G59 as shown.



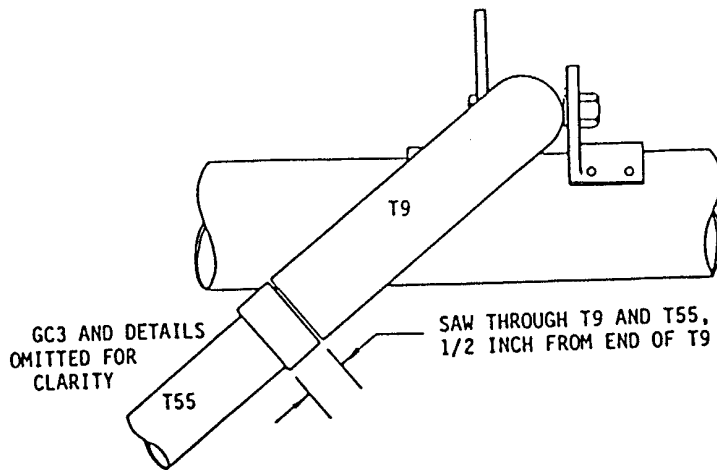
- 2.7 Refit the Stabilizers on the aircraft. Use washers under the heads of the 313 and 314 bolts through F4 to avoid bottoming the threads in the nutplates on T56.
- 2.8 Drill out the rivets and temporarily remove the Tail Gap Cover from the aircraft.
- 2.9 With the Stabilizers installed on the aircraft, hold the boom half of the Stabilizer hinge F65 in position as shown and mark the location of the Pivot Hole in the F66's. Note that the Pivot Hole need not be in the centre of F66, but it should be located such that there is sufficient space for the head of the 35 bolt as shown in step 2.10. Drill a 3/16 inch Pivot Hole in F66.



- 2.10 Bolt the hinge halves together using a 35 bolt and B3 bearing as shown. Make sure that the bearing is clamped securely to F66, and F65 rotates on the bearing. Enlarge the hole in F65 slightly if necessary. Rivet the F65's to the boom with 6 stainless steel rivets in each as shown.



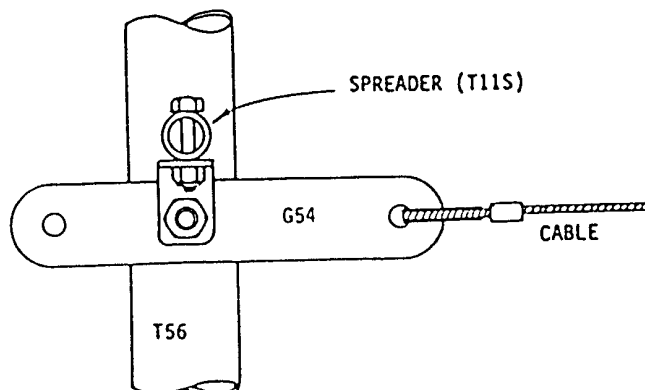
- 2.11 With the Stabilizer in place, saw through T9 and both T55's as shown. Make sure that the saw cut is perpendicular to the axis of T55. This allows the Stabilizers to be folded for storage or transit.



- 2.12 To check that the tail folds properly, remove the T11 spreader. Remove the two *top* bolts (314's) holding the T56's to F4 and loosen the two bottom bolts (313's). The tail should now fold, using the 313 bolts as hinge pins.

3.0 DRAG CABLE INSTALLATION

- 3.1 Cut the Tab (or eyebolt) off the cables (from the end which was attached to the T10's) leaving the remaining cable as long as possible.
- 3.2 With the forward end of the cables attached to the airframe and the turnbuckles adjusted to approximately 3/4 of their maximum extension, pull the cables tight and determine the cable length required to attach the long Tab (G54) to T56 as shown. Do not drill or cut G54 at this time. Fit a Nicopress sleeve over the cable and attach the cable to G54 using the Nicopress thimble removed from the short tab.



3.3

When the Nicopress sleeve has been properly swaged, pull the cables tight and drill a hole in G54 as required. Cut and file the end off the G54 if necessary and bolt it in place. Tighten the cables as required using the turnbuckles.

NOTE that the long Tabs are provided to allow additional adjustment of the cable length should a cable be stretched beyond the range of adjustment of the turnbuckles.

If it becomes necessary, a new hole may be drilled in the G54's to shorten the cables.

Be sure to lockwire the turnbuckles after they have been adjusted.

4.0

RUDDERVATOR MODIFICATION

4.1

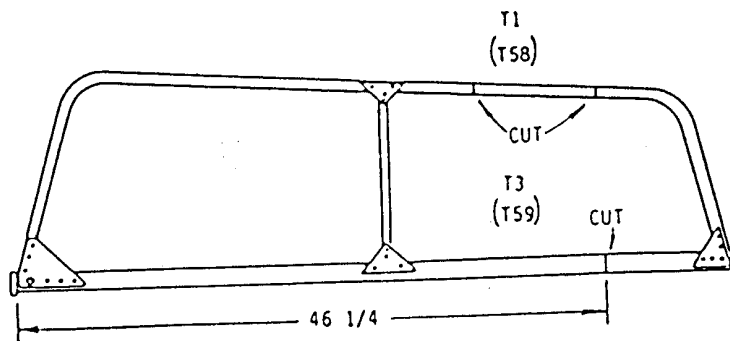
Remove or fold back the covering from the outboard panel of the Ruddervators. Drill out the rivets which hold the GC Gussets to the outboard end of the Ruddervator Torque Tube T3. (Leave the Gussets riveted to T1).

4.2

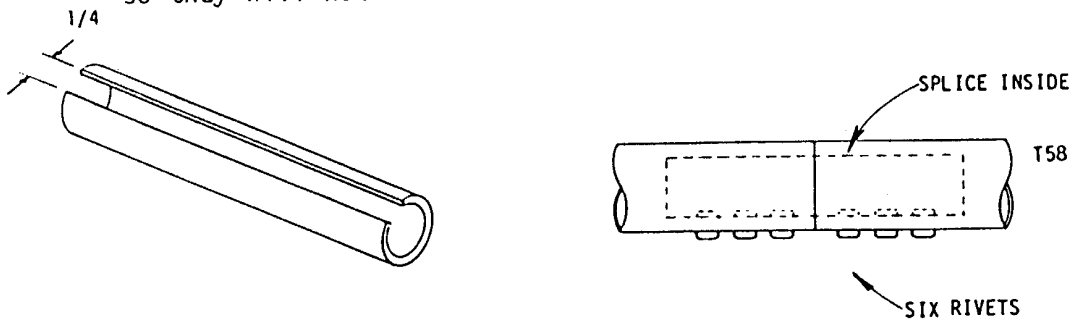
Saw off the outboard end of T3 to make it 46 1/4 inches long. T3 now becomes new part number T59. Remove the P2 plug from the discarded end of T3 and reinstall it in T59. (Rotate P2 and drill new rivet holes - do not attempt to use the existing holes).

4.3

Measure the length of the piece cut off T3. Cut an equal length from the straight portion of T1 as shown. After splicing, T1 will become new part number T58.

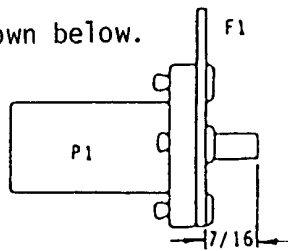


- 4.4 To make a splice for the T58, cut a 3 inch piece from the discarded section of T1. Saw a 1/4 inch wide strip from it as shown. Squeeze the tube with a vise or pliers so it will fit tightly inside T58. Use it to splice the two parts of T58 together as shown. Rotate the splice so that the seam faces the outside and put the rivets on the inside of the Ruddervator so they will not interfere with the covering.

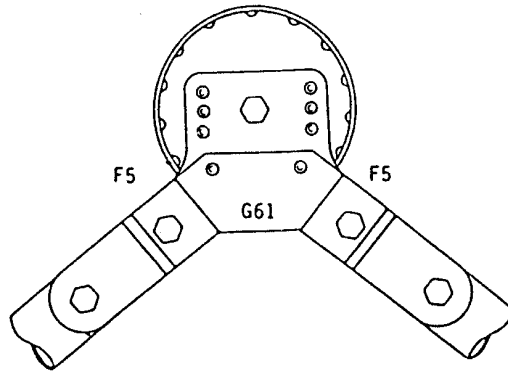


- 4.5 Refit, trim, tape and heatshrink the covering on the Ruddervator.

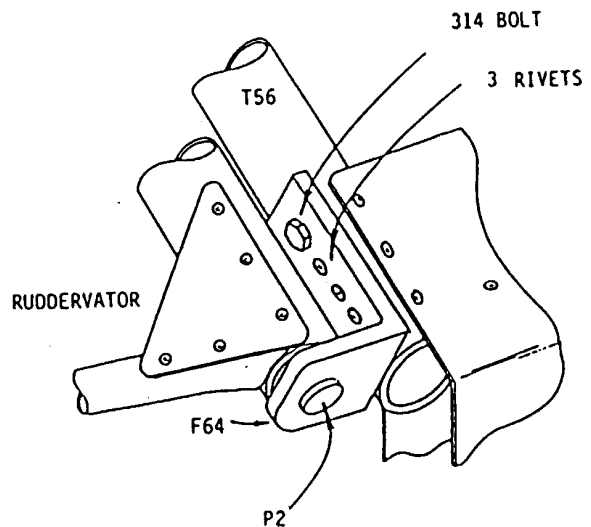
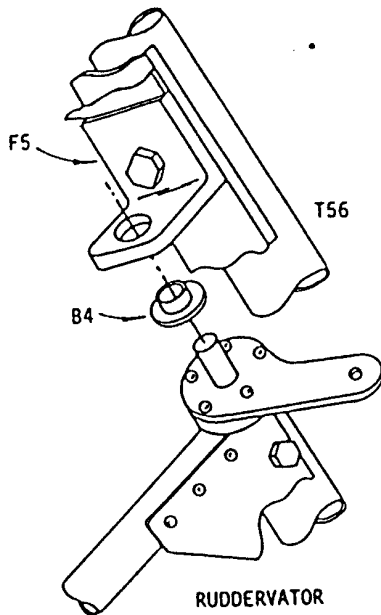
- 4.6 Thread the 47 bolts into the P1 plugs (in the inboard end of T56) and screw them in *very tightly*. Be sure they bottom in the threads so they cannot work loose (or use Loctite or other thread locking compound). Note that these bolts will not be removed again. Saw off the heads of the bolts to leave a 7/16 inch long stud on the end of each P1 as shown below.



- 4.7 Reinstall the F5's on F4. Make sure the exposed surface of each F5 is perpendicular to the axis of T56, and rivet the hinge lock G61 in place with 2 stainless steel rivets as shown. Note that it will be necessary to remove at least two (and possibly four) rivets to allow the G61 to mount flat on the F4. Make sure the G61 fits tightly against the F5's to prevent them from rotating.



- 4.8 Fit the top of the ruddervator into F5 with a B4 bearing as shown at left below. Make sure the B4 is properly seated, then fit the F64 over the end of P2 and locate it as shown at right below. Make sure the ruddervator fits properly (T59 is parallel to T56 and there is no end play), then mark the location of F64. Remove the ruddervator and bolt and rivet F64 to T56 as shown.

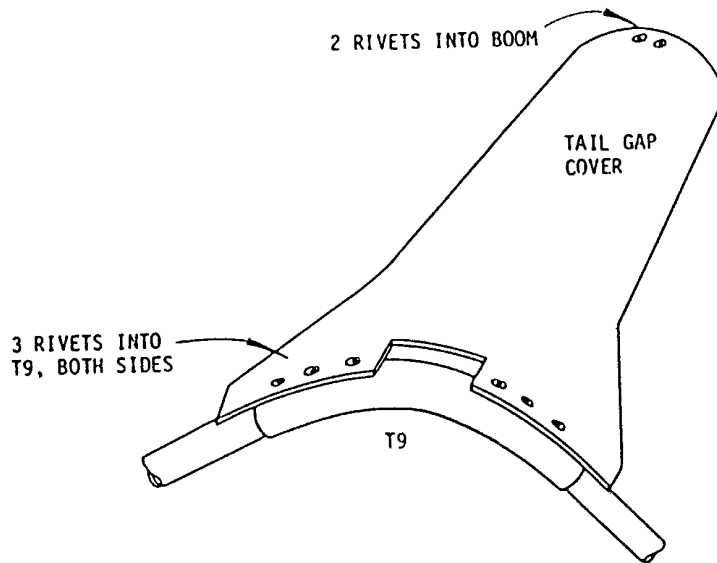


- 4.9 Reinstall the ruddervators (it will be necessary to remove the bolts in the F5's) and check that they move freely but without excessive end play.
- 4.10 Check that the ruddervator controls work smoothly and freely but without excessive end play in the ruddervator.

5.0 COVERING

5.1 If everything appears to work properly, refit, trim tape and heatshrink the covering on the stabilizer.

5.2 Reinstall the Tail Gap Cover as shown



PARTS LIST, FOLDING TAIL MODIFICATION KIT

<u>QTY.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
2	B3	Bushing
2	F64	Ruddervator Hinge, Outboard
2	F65	Stabilizer Hinge, Boom Mt.
2	F66	Stabilizer Hinge, Stab. Mt.
2	G55	Gusset, Ruddervator
1	G57R	Gusset, Tailwheel, Inboard Right
1	G57L	Gusset, Tailwheel, Inboard Left
1	G58R	Gusset, Tailwheel, Outboard Right
1	G58L	Gusset, Tailwheel, Outboard Left
2	G59	Clamp, Stabilizer Hinge
1	G61	Lock, Ruddervator Hinge
2	S850	Axle, Tailwheel
2	-	Tailwheel
2	T57	Bent Tube, Stabilizer, Outboard
10	W3H	Washer
2	36	Bolt
4	314	Bolt
2	N3	Nut
2	G54	Tab
2	-	Nicopress Sleeve
100	-	Rivet, Aluminum Alloy
10	-	Rivet, Stainless Steel