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Eurostar Trim Restrictor – Installation Instructions, II/EV97/002

Issue 6 *Paras.3.1 & 3.2, Test flights' sequence changed; fully rear cg conditions amended. Top trim speed tolerance added, full flap added. 5.20 & 6.5 Second inspection conditions and Footnote 2 amended. 3.3.2 tab down limits increased.*

1. Introduction

Following identification of the risk of inadvertent adjustment and excessive pitch down authority, it has been found necessary to modify the pitch trim lever and trim limits of the Evektor Eurostar. (**The latter is optional on the Eurostar SL; it is only necessary to shorten the SL's lever to reduce the risk of inadvertent adjustment).** Airmasters' kit "EV-97 Trim Modification Kit" satisfies this requirement. The modification may be performed by the owner provided that the following instructions are complied with.

2. Cable Tension and Condition Check

Check the condition and freedom of the trim control Bowden cables in accordance with SB/EUR/022. Check the trim cable tension in accordance with para. 3.6 of the EV-97 Team Eurostar Maintenance Manual Iss. 11 and Section 17 of the Eurostar SL Maintenance Manual, Iss.7. This is essential before installing the mod.

3. Check Flights

There have been unexplained variations in the trim system's response to earlier issues of this Installation Instruction and its associated Service Bulletin, SB/EUR/021. For this reason it is necessary to tailor the trim tab settings of each individual aircraft according to the results of flight tests. These flight tests are used to determine specific trim tab angles for the required low and high speed trim settings. Proceed as follows:

3.1 *First Check Flight (nose up trim):*

3.1.1 Set the CG at or near its forward limit. This is best accomplished by flying solo with low fuel (but minimum 15 litres) and no baggage.

3.1.2 Check fly to ensure that a trimmed approach speed of around 60 mph can be achieved with full flap and with little or no back pressure on the stick before the trim lever reaches the rear of its slot. Mark its position on the trim/flap lever cover.

3.2 Second Check Flight (nose down trim):

3.2.1 Set the cg at or near its rear limit. This is best accomplished by flying solo, with full fuel and 15kg in the baggage bay. Note that for LAA Eurostars, both Group A and microlights, the pilot must check that loading is within the aft CG limit with 15kg of baggage.

3.2.2 Check fly to ensure that 120mph ± 5mph IAS trim speed can be achieved before the trim lever reaches the forward limit of its slot. Mark this position on the trim/flap lever cover.

3.3 Tab Deflection Measurements

3.3.1 On the ground, with the trim lever at its nose-down test marked position, measure the up-deflection of the trim tab. It should lie in range +5°, ± 3° (i.e. between 2° and 8° up) as measured by the difference between the top surface of the elevator and the top surface of the tab. Record this deflection. If the deflection lies outside this limit, please contact Airmasters UK Ltd.

3.3.2 With the trim lever in its nose-up test marked position, measure the down-deflection of the trim tab. This should lie in the range -15°, -8° +5° (i.e. between 23° and 10° down) as measured by the

difference between the top surface of the elevator and the top surface of the tab. Record this deflection. If the deflection lies outside this limit, please contact Airmasters UK Ltd.

3.3.3 Measure total trim lever travel between the two marked positions. The new cover has a lever slot length of 95mm. If the measured, required, lever movement exceeds 95mm[1] please contact Airmasters UK Ltd.

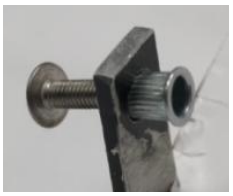
4. Kit Contents

- Replacement trim and flap lever cover[1];
- 4mm Rivnut;
- M4 x 12 flanged, button head screw;
- Decals;
- Replacement flap lever gaiter;
- Sewing Thread;

5. Installation

5.1 Remove the seat cushions.
5.2 Detach the knob of the trim lever.
5.3 Carefully measure and mark a line 20mm +0.0, –1.0 mm, down from the top of the trim lever. It is important not to remove more than 20mm from the lever, otherwise the bottom of the knob may contact the cover before full nose-down trim is reached.
5.4 The lever is to be reduced in length by 20mm. Do this using a saw or Dremel, but first place a rag or paper over the gaps in the existing trim cover to minimise the risk of swarf entering the area below. Tape this in place. Cut off the top of the lever at the mark and deburr.
5.5 Trial refit the knob, ensuring it is seated down properly. If the appropriate (4.2mm) drill and M5 tap are available, drill and tap an M5 thread into the lever and refit the original screw. Otherwise proceed as follows:

The knob can be refitted and secured using an unset (un-pulled) M4 Rivnut, passing through the knob and the lever top. The Rivnut has its head sitting on the right hand side of the knob with an M4 screw installed from the left hand side into the stem of the Rivnut. The assembly, less the knob, is shown on the right.



5.6 Using a sharp 5mm drill as a pilot, keeping it square to the lever and using the knob's hole as a guide, drill through the lever and the other side of the knob.
5.7 Using a 6mm drill, open out the holes in both knob and lever to 6mm; deburr.
5.8 Remove the M4 screws, 8 off, securing the trim lever/flap lever cover to the seat support.
5.9 Loosen, but do not remove, the inboard seat belt attachment point at each side. The cover has slots in it which fit over the belt attachment bolts. Now remove the trim cover by drawing it upwards. Draw the gaiter off over the flap lever.
5.10 Using a vacuum cleaner, clean up any debris in the area below the cover.
5.11 Apply the trim lever and flap lever decals to the cover in the appropriate positions.
5.12 Peel the backing paper from the double-sided sticky tape attached to the underside of the flap lever slot. Position the gaiter on to this tape for sewing, then, using the supplied thread, attach the flap gaiter to the new cover replicating the original stitch pattern.
5.13 Fit the cover, passing the gaiter over the flap lever. Refit 8 off M4 screws along the sides.
5.14 Taking care that the cover slot is correctly located over the stepped bushes, **tighten the seat belt attachment bolts.**
5.15 Refit the trim lever knob using one of the methods above. The Rivnut should be a light interference (push) fit in the knob. Pass the Rivnut stem from right to left, through the holes in the knob and lever, install the button head M4 x 12 screw from the left side and tighten. The fitted knob is shown on the right with the head of the Rivnut visible in the picture, but

[1] Each kit delivered after 14/01/25 has its trim lever slot's rear limit extended by 15mm, to give a total slot length of 95mm.

sub-flush with the knob's surface.

5.16 With the trim lever at, or very near, the forward end of its slot, use the Bowden cable nipples on the elevator to adjust the trim tab so that it lies in the position recorded in 3.3.1.

5.17 Check that the elevator trim tab position recorded in 3.3.2 can be obtained with the trim lever pulled back. If not, adjust the Bowden cable nipples on the elevator to achieve this. If necessary coarse adjustments can be made by loosening the cable clamp bolt on the tab horn.

5.18 Re-check the cable tension in accordance with para. 3.6 of the Maintenance Manual.

5.19 Refit the seat cushions.

5.20 The work is subject to a second inspection[2].

6. Inspection, Adjustments and Records

6.1 **EV-97 teamEurostar:** In the Airframe and Engine log book, record the work and the trim tab angles at the fully nose down and full nose up positions.

6.2 **EV-97 Eurostar SL (optional): -** With the trim lever in its fully nose down position, check that the trim tab's top surface sits up at an angle of 0° ± 2.0° with respect to the top surface of the elevator. Adjust the Bowden cable nipples if necessary to achieve this.

With the trim tab lever in its fully nose up position, check that the trim tab's top surface sits down at an angle of 40° ± 5° with respect to the top surface of the elevator. Adjust the Bowden cable nipples if necessary to achieve this. If the range of adjustment of the Bowden cable nipple is inadequate, it is permitted to remove up to 15mm of material from the **rear** of the trim lever slot if this has not already been done; see Footnote 1 on page 2. Following setting of the tab down angle, re-check its up angle.

6.3 **Check security of the inboard seat belt attachment bolts**.

6.4 Check for full and free trim and flaps controls.

6.5 Enter the work in the aircraft's Airframe and Engine Logbook, including the new trim tab angles recorded in 3.3.1 and 7.1. This modification affects the controls, so a duplicate inspection is required[2]. Have the work inspected and signed off in the logbook. Mark the entry "in accordance with Airmasters' Service Bulletin SB/EUR/021".

6.6 Note that the Maintenance Manual for the EV-97 Eurostar, available on the Airmasters web site, has been amended to reflect the new trim tab deflections. SL settings are unchanged

On completion of the installation, owners are kindly requested to contact Airmasters to report any problems, and to feed back the results of the mod's installation.

It is recommended that care is taken to become familiar with the new trim lever arrangement on the flights immediately following the modification.

Airmasters
26/3/25

[2] For BMAA aircraft, this second inspection may be a person considered competent to inspect the work eg. a second (independent) licenced microlight pilot or an Inspector. For LAA aircraft, this second inspection must be performed by an LAA Inspector.