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SERVICE BULLETIN: **JSB 029-1**

Issue: **1**

Date: **20th January 2011**

Subject: **J170 Handling Upgrade**

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1	Original Issue	CURRENT

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1 Applicability

- The content of this bulletin is applicable to all variants of the Jabiru J170 model.

Notes:

- For aircraft in Light Sport Aircraft categories this Bulletin is equivalent to a Manufacturer's Safety Direction.
- This bulletin has not been mandated (as an AD or similar) by any National Airworthiness Authority at the time of writing.

2 Background:

- Recently Jabiru Aircraft subjected a J170 to handling tests beyond those normally required for the category. We have used these tests to create a package of upgrades to improve the handling of all J170 aircraft:
 - Fitting stronger rudder springs.** This reduces the need for pilot rudder inputs, making the aircraft easier to handle.
 - Reducing maximum flap deflection.** Testing showed that the final stages of the flap movement produced no significant effect on the aircraft's stall speed but had a slight negative effect on the aircraft's handling at low speeds.
 - Fitting a larger ventral fin.** Similar to point i, fitting a larger ventral fin improves the aircraft's directional stability – the pilot's rudder inputs are fewer and smaller in all modes of flight.
- Kits containing all the required parts are available from Jabiru Aircraft or our local representative.

3 Compliance – Implementation Schedule

- The changes detailed within this Bulletin are mandatory for all J170 aircraft. They must be carried out within the next 300 hours of flight or within 12 months of the date of issue of this Bulletin – whichever is the sooner.

4 Procedures:

- Note that the procedures given below rely on a degree of assumed knowledge in the person carrying out the work. They are intended for an experienced owner-builder or industry professional.

4.1 i. – Rudder Spring Replacement

- Remove the existing rudder springs and chains from the rudder pedals.
- Fit the new spring mounting bracket to the aircraft's centre console using 6 off TLR rivets as shown in Figure 2. The exact position is not critical – but it should be aligned with the front of the rudder cable mount and positioned so that the chains and springs run as straight as possible.
- Fit the new springs as shown in Figure 2. Adjustment of these springs is important for correct handling of the aircraft. The springs must be set so that when the rudder pedals are centered neither spring is carrying any load – but as soon as the pedals move slightly a spring takes up tension. If the springs are set too tight – i.e. when the pedals are centered both springs are carrying some tension – this will reduce the centring effect of the spring system and must be avoided. If the springs are set too loose the pedals must move too far before there is any centring effect – this makes the system ineffective near centre and must also be avoided.

Rudder centring spring & chain assemblies – remove.



Figure 1 – Original Rudder Centring Springs

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New rudder centring spring & chain assembly

Spring anchoring bracket – rivet to centre console

Align rear of bracket to front of rudder cable mount

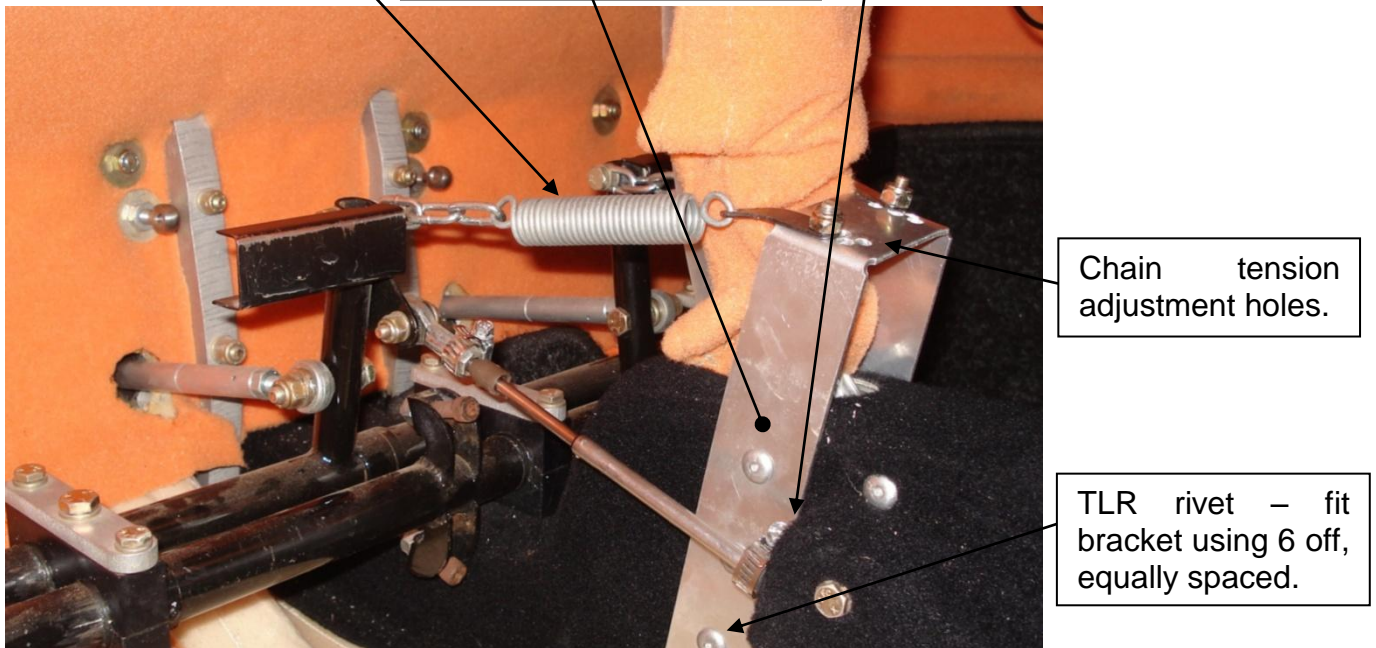


Figure 2 – New Rudder Centring Springs

4.2 ii. – Full Flap Deflection Reduction

- Apply tape or fit stands to the aircraft's flaps to prevent them from falling down while the drive mechanism is disconnected. Use a digital protractor or make a gauge from cardboard to accurately show the position of the flaps – this will be used at the end of the job to check that the “up” position of the flaps has not been altered by the addition of the adaptor.
- Remove the ¼” bolt from the rod end fitted to the flap motor drive. Note that in some cases this bolt was inserted from the outboard side of the arm when the aircraft was built, leaving insufficient room to remove it without moving the whole flap cross tube. In these cases the easiest way to remove this bolt is to loosen it slightly, push it about 2mm to the outboard and then cut the head off the bolt. Do not drill a hole in the fuselage to remove the bolt.
- Turn the aircraft master power on and drive the motor to the full “up” position. This will retract the motor shaft away from the flap drive arm, leaving room to work. Turn the aircraft master power off.
- Apply the new drive adaptor to the existing internal flap drive arm from the outboard side – it will be obvious how much material must be removed from the existing arm to fit the adaptor. Figure 3 (right) shows this. Carefully remove this material, removing just enough so that the extension slides onto the arm far enough to align the bolt holes and to fit snugly around the arm. De-burr the tip. Note the minimum edge distance shown in Figure 3 (right).
- The adaptor can now be placed on the inboard side of the flap drive arm and used as a guide to drill the new 3/16” hole. Carefully drill through the hole on the adaptor and through the existing drive arm.
- Remove the adaptor from the drive arm. Clean it using Acetone. Mix and apply 5-minute epoxy resin to its socket.
- Bolt the adaptor to the arm using 1 off ¼” and 1 off 3/16” bolts, orienting it as shown in Figure 4. Wipe off any excess resin. Both bolts can be fitted from the cabin side of the drive arm – care will be needed to use the correct length bolt so that the tails of the bolts do

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not rub on the side of the fuselage. If required AN363 or MS21042 nuts may be used as they are thinner than Nylock-type nuts.

- Turn the aircraft master power on and drive the motor to the fully “down” position, then turn the master power off.
- Once in position, adjust the rod end in the motor shaft to align with the lowest hole in the adaptor and re-connect it using a ¼” bolt. Note that if there is not enough adjustment in the rod end the external flap drive pushrods can be adjusted to suit. Again, AN363 or MS21042 nuts may be used if required to give clearance from the fuselage.
- Remove the tape or stands from the flaps.
- Turn the aircraft master power on and cycle the flaps, checking for smooth operation with no binding or other issues. Measure the flap deflection – between full up and full down positions the flaps must travel $30^{\circ} \pm 1.5^{\circ}$.
- Note that it is not necessary to disconnect the flap position indicator during this job or to adjust the position indicator once the task is complete.

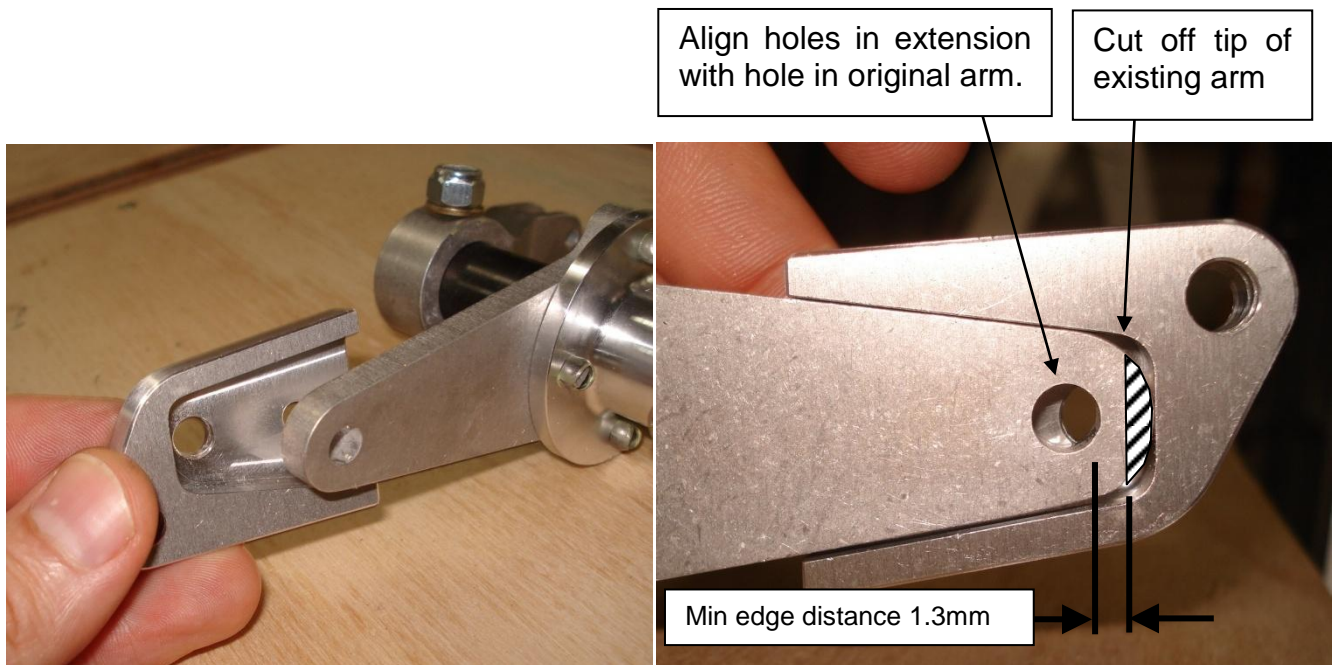


Figure 3 – Fitting Adaptor to Drive Arm

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Use the 3/16" hole in the adaptor as a guide to drill a matching hole in the existing arm

Adaptor bolted & bonded in place. Use of penny washer is optional.

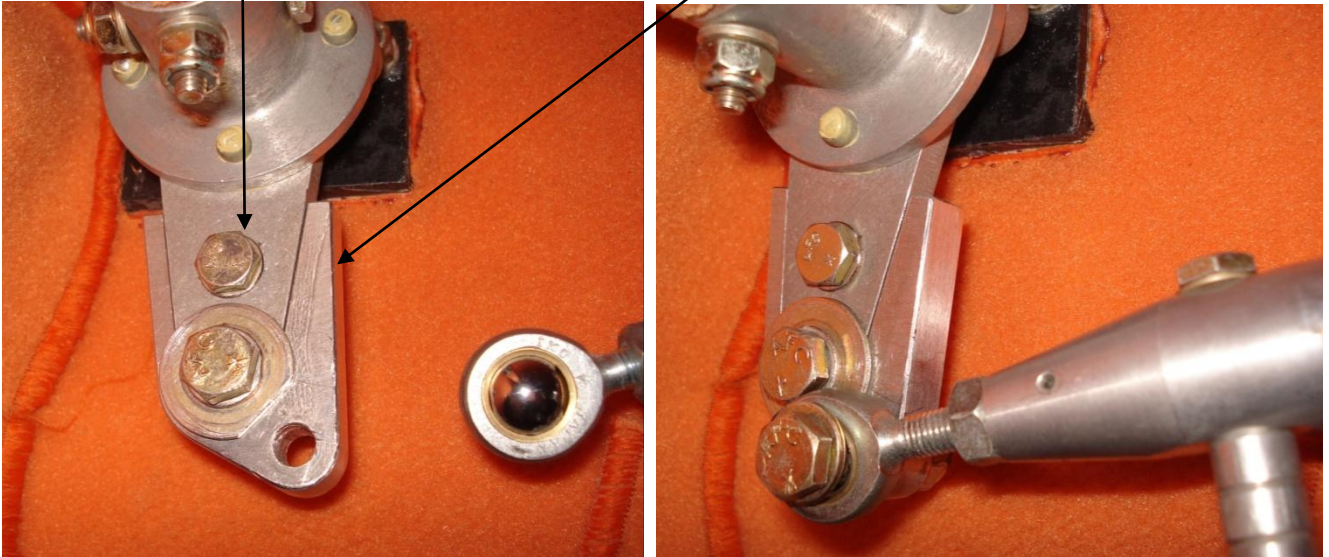


Figure 4 – Adaptor in Place

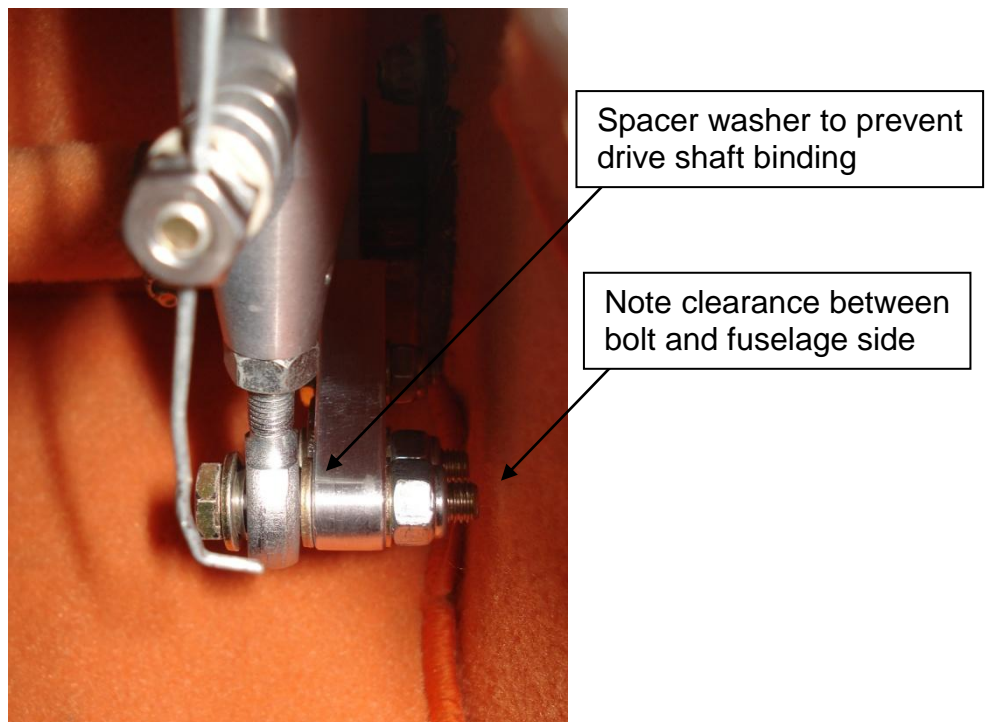


Figure 5 – Flap Drive Modification

4.3 iii. – Ventral Fin Replacement

- Remove the existing ventral fin and weigh it accurately.
- Cut the inspection hole and fit the tie-down tube to the new ventral fin. Drill two ¼” drain holes in the bottom of the fin at the positions indicated in Figure 7. Paint to match the aircraft.
- Match drill the replacement fin mounting screw holes to the original part. Note that although the replacement fins are supplied with pilot holes drilled the exact hole positions must be found by comparison to the original parts.
- Weigh the replacement fin accurately.
- Fit the new fin.
- Some J170 aircraft operate quite close to the rear of their CG envelope and in some cases the extra weight added by this new ventral fin will be sufficient for the aircraft to exceed its rear CG limit in some load cases. Operators must calculate the effect that changing this part has had on their aircraft and assess if any ballast or operating changes are required. Depending on the category in which the aircraft is operating these calculations may need to be carried out by an approved Weight Control Authority.

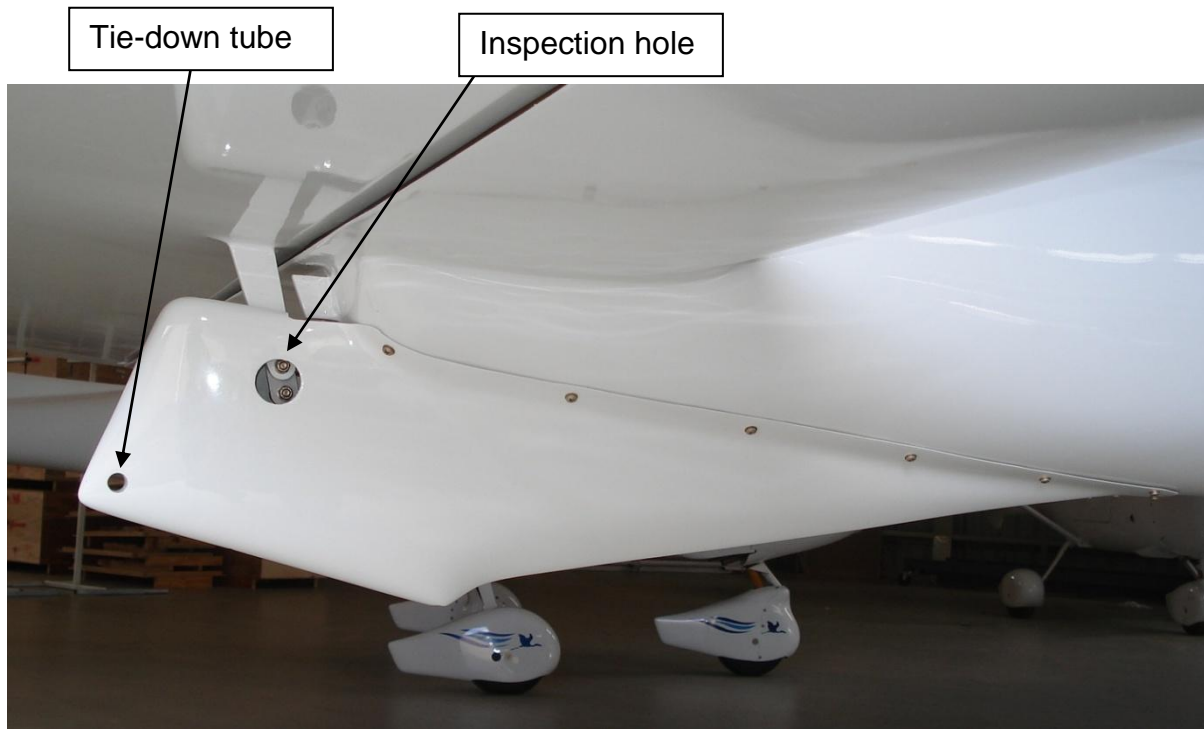


Figure 6 – Original Ventral Fin



Figure 7 – New Ventral Fin Fitted

5 Airworthiness Note:

- Standard aircraft practices apply to nuts used in the control system assembly: when tightened no less than 1 and no more than 3 threads must show through the nut.
- All work called for by this Bulletin must be carried out by authorised personnel. For the aircraft detailed herein this may mean the owner, an RA-Aus Level 2 holder, a Licensed Aircraft Maintenance Engineer (LAME) or equivalent – as appropriate to the aircraft's registration and use.
- On completion of the work, the authorised person must note the completion of the actions required by this bulletin in the aircraft's maintenance logbook. This note should include the date of the work and the identity (including licence number where appropriate) of the person carrying out the work.