SERVICE BULLETIN SB/EUR/023, Issue 3

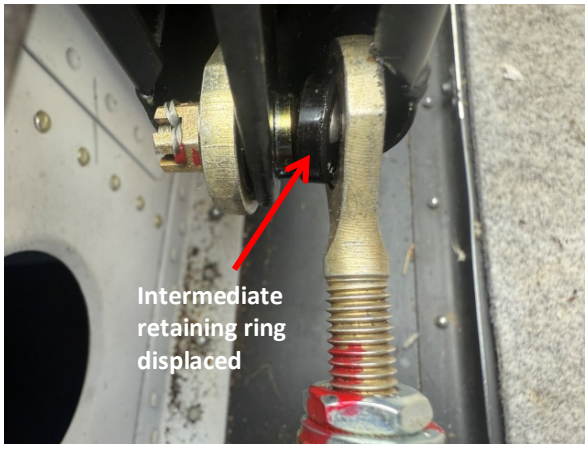
Evektor Eurostar Aircraft, Aileron and Rudder Rose Joints
1st Oct. 2025

Issue 3: Details added for rearward test; new Evektor-sourced joints' test added; "Inspections" modified;

Classification: - Essential. Before next flight.

Nature of Defect

There have been reports of failures of the rose joint (rod end) connecting the bottom of the control stick to the aileron push rod. In one instance, the centre of the rose joint had become displaced and jammed the aileron control. A subsequent investigation revealed that it could be disconnected completely. This aircraft was factory-built in 2010 and had completed 493 hours; a second, built in 2011, 1100 hrs; a third, built in 2015, 1301 hours.



The defect was the subject of Service Bulletins SB/EUR/008 (Ready to Fly aircraft), and SB EV97-UK-014, (kits) issued by Cosmik Aviation 1st June 2012. The bulletins required inspection and strength (pull out) tests with a replacement rose joint if necessary. The recent incidents suggest there are aircraft in the fleet which still have defective rose joints, not corrected or detected by addressing these Service Bulletins, and which require further action. It is also probable that extended service and poor adjustment have resulted in premature failures of badly made rose joints (see below). This Service Bulletin, SB/EUR/023 Issue 3, follows Issue 2 published on 12th Sept. and contains clarification of test and inspection actions, and inclusion of rose joints sourced directly from Evektor which have not been subject to Airmasters' goods-in checks. In all other respects satisfaction of SB/EUR/023 Issue 2 satisfies the requirements of this, Issue 3.

The same rose joint is used as an upper rudder hinge; this Service Bulletin includes an inspection of this component.

Airworthiness Implications

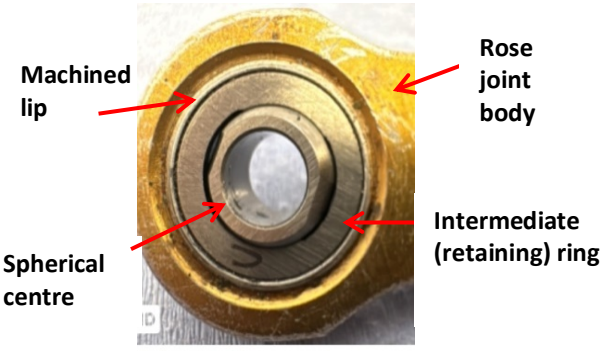
Loss of roll control can result in a serious accident. Fortunately, in the recent cases, the joints failed on the ground or were detected following the inspection required by the first issue of this Service Bulletin.

Aircraft Affected

All UK-registered EV-97 Eurostar and Eurostar SL aircraft are vulnerable, both kit and factory-built.

Inspection and Test Required - Aileron Control Stick Connection

The rose joint assembly is shown on the right. During manufacture a thin lip is machined in the body of the joint and swaged over on each side to secure the intermediate, retaining ring. On the failed joints this swage was not present, or was inadequate, allowing the retaining ring with its spherical centre to move out of the body.



Inspections

The following checks, ***(i), (ii) and (iii),*** are to be carried out by a BMAA or LAA Inspector according to which organisation oversees the aircraft.

On some aircraft, notably homebuilts, it is necessary to remove the cover at the bottom of the stick assembly to facilitate the work.

On aircraft fitted with an autopilot, this is located under the P2 seat and fitted with a cover plate over the servos. In order to inspect the affected rose joint it is necessary to remove the cover plate. (The autopilot servo arm is separate from the main aileron push rod and its rose joint is a different type).

The checks are also to be carried out on any new joints which may have been sourced from Evektor directly. Such joints will not have been subjected to Airmasters' Goods-in inspection.

Perform the checks on both sides of the aircraft at the sticks' bottoms.

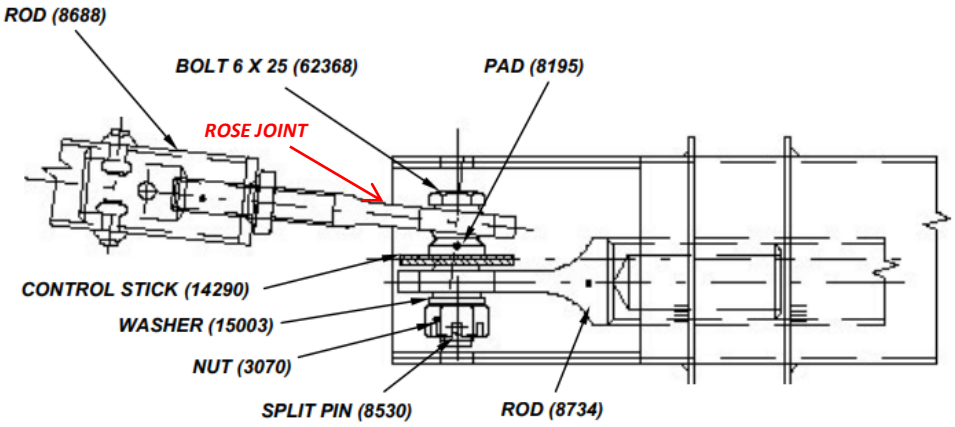
(i) ***Loose intermediate (retaining) ring***: Where the aileron push rod 8688 connects to the bottom of the control stick via a rose joint, clean off any grease or dirt from the joint. Using a torch and mirror, carefully examine the rose joint. The edge of the retaining ring should lie flush with the inner edge of the body around the entire perimeter of the ring. Push the retaining ring firmly around its perimeter to check that it is not cocked and jammed in the body. There should be no movement. If the retaining ring has become displaced from the body, replace the rose joint. Also conduct the following two checks after replacement.

(ii) ***Correct Adjustment & Smooth Operation***: the rose joint must be aligned in its push rod so that there is freedom over the whole range of stick pitch movement. At each extreme of the stick's pitch range, gently twist the push rod back and forth to check that there is still a little play left before it reaches its limits. If not, adjust accordingly.

It is possible that this play cannot be achieved over the full range of the stick's pitch movement. It will then be necessary to adjust (reduce) the pitch limit stops' range until there is play in the rose joint. ***If this adjustment is required, ensure that the elevator deflections remain within the limits stated in the Maintenance Manual (UP 25°±1°; DOWN 20°±1°).***

While twisting the push rod also ensure that there is smooth movement over the whole range. If there is any roughness or catching of the ball within the retaining ring, then the rose joint must be replaced.

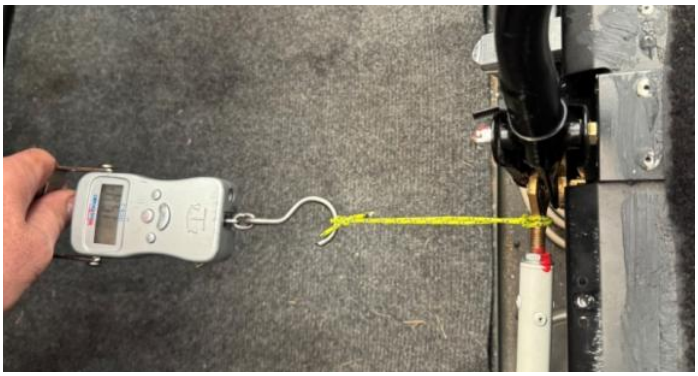
(iii) ***Correct Assembly***: the correct assembly is shown below. The "pad" (8195) is an essential component ensuring that the joint can move freely over the control stick's fore-aft angular range. Note that the bolt 6 x 25 (62368) is a special fastener with a ground shank and 9mm head.



Load test

The following tests must be carried out by a BMAA or LAA Inspector, or Airmasters.

It is necessary to apply loads to the rose joints to check that the centres are securely held in their housings. This can be done in situ. Using a spring balance, apply a forward load of 12kg to the body of the aileron push rod's rose joint as near to the 6mm bolt as possible and perpendicular to the plane of the rose joint. See method on the right.



Check that this has not resulted in any movement of the retaining ring within the body of the rose joint.

Remove the seat cushion and push the stick fully forward. A spring balance can then be used behind the assembly to apply the load perpendicular to the plane of the rose joint. Repeat the above test, applying the load rearwards. See method on the right.

Check again that there has been no movement of the retaining ring within the body of the rose joint.

Repeat the above tests on the other side.

<u>Inspection Required – Rudder Upper hinge</u>

Note: The following checks are to be carried out by Airmasters or a BMAA or LAA Inspector.

The rudder's upper hinge must be carefully inspected to ensure there has been no movement of the retaining ring within the body of the rose joint. The inspection is more easily carried out by two people: one to hold the rudder over to one side, the second to carry out the inspection. If such help is not available, ensure the rudder is pushed and held firmly and safely to one side by a strap or adhesive tape for the inspection. Be aware of a finger trap and risk of injury between the trailing edge of the fin and leading edge of the rudder if the rudder is accidentally released.

With the rudder held firmly over to the left, carefully clean off any grease or dirt on the rose joint. Then, using a torch and small dental mirror, examine the underside of the rose joint (it is not possible to examine the upper side). Ensure that the retaining ring is fully home in the rose joint body, as shown on the right, and that there is no evidence of tipping, misalignment or looseness of the joint. If it is not possible to see the retaining ring clearly then an endoscope must be used.

Repeat this inspection from the other side with the rudder pushed over to the right.

On-Going Inspections

The above inspections and testing are now added to the inspection regime prescribed in the Maintenance Manual to be carried out every 100 hours or annually, whichever occurs first.

Duplicate Inspections if the Connection has been Dismantled

If it has been necessary to replace a rose joint or if the connection was removed for inspection, then the completed work is subject to a duplicate inspection by a Qualified Person, as defined below:

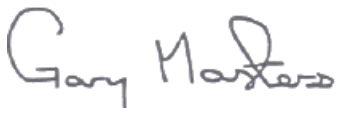
For BMAA Aircraft: A Qualified Person is defined as one considered competent by the owner to inspect the work.
For LAA Aircraft: The first inspection must be carried out by an LAA Inspector. The duplicate inspection may be carried out and signed for by another LAA Inspector, a licensed pilot who is a member of the LAA, or other acceptable signatory, refer to LAA Technical Leaflet 2.04.

When signing for a duplicate inspection, the signatory must include the appropriate authorisation reference with their signature. (Inspector no., Licence no. etc.)

Records

Record the work in the Airframe and Engine Log Book, noting this SB and its issue.

Please notify Airmasters if a faulty rose joint is found, giving aircraft registration, age and location. In this way Airmasters can gather data on the extent of the problem.



Airmasters UK Ltd.

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