
Pitch torque tube end cap - replacement

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|-------------------------|------------------------|
| Classification - | Mandatory |
| Applicability | All Europa aircraft |
| Compliance | Before the next flight |

Introduction

Two cases have been found of cracking occurring in the pitch torque tube end cap (part no. CS10C), see the photo in figure 1.

The cracks occurred at the base of the bolt hole boss. A crack at this position can result in fore and aft movement of the pitch torque tube under load, causing movement of the tailplane relative to the control column position. It is then theoretically possible for there to be less than the minimum required movement of the tailplane resulting in degraded elevator authority.



Action

Note: *the following instructions apply to those aircraft which have been completed. For aircraft which are still under construction the builder should comply with those parts of the instructions which are appropriate.*

De-rig the aircraft and support the fuselage upright.

Removal of pitch torque tube

Gaining access via the spar entry position in the sides of the fuselage, undo the two bolts securing each pitch torque tube bracket CS09 to the cockpit module. Undo the AN4-13A bolts holding the pitch torque tube to the bearing in the CS09 assembly. Don't forget the washer between the bearing and the end cap.

Working on the port side, undo the MS21042-4 nut holding the aileron quick connect assembly to the bracket; and undo the short quick connect pushrod from the aileron control crank CS08. Remove the pushrod and quick connect assembly.

Undo the two AN525-10R10 bolts holding the port side fuel tank support bracket onto the seat back, and remove the support bracket assembly.

Remove the rear fuselage access panel at the back of the baggage bay.

Disconnect the flap drive pushrod from the flap cross tube.

The rod-ends at the rear of the two pitch push rods running under the seats must now be disconnected from the push rods. Disconnect the pushrods at the front from the bottom of the control column. At the rear, slacken the locknut and then unscrew the pushrod from the rod end by rotating it at the front, leaving the rod end attached to the torque tube. Now rotate the rod ends so that they lie in between the two lugs of their mounting brackets, to keep them out of the way when removing the torque tube

Disconnect the rear pitch pushrod from the torque tube by removing the AN5-11A bolt. Remember to catch the two AN960-516L washers.

It is now possible to remove the pitch torque tube from the aircraft through the port spar access hole. Mark port and starboard to ensure that it is returned the same.

Replacing CS10C end caps

Drill the new end caps for the supplied MS21047-4 anchor nut, and open up the anchor nut mounting holes, with a 3.3 mm drill, and rivet the anchor nut as shown in figure 2. **Note the orientation of the anchor nut on the new cap, which is not the same as the original.**

Drill out the 4 rivets holding the end cap into each end of the torque tube, and remove and discard the end caps.

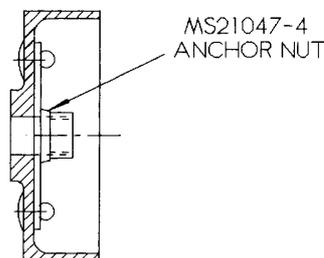


Fig 2. End cap with anchor nut.

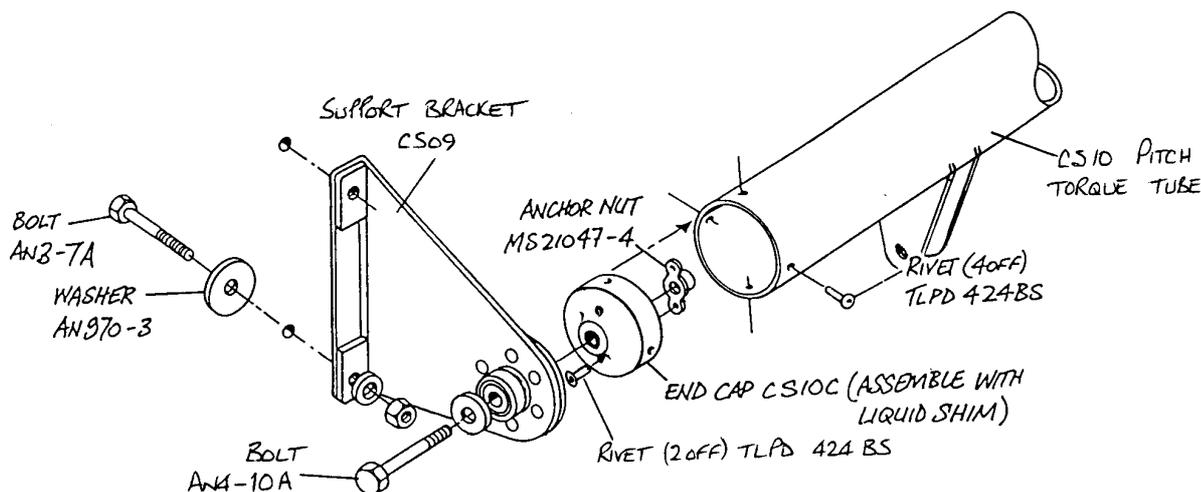


Fig 3. Pitch torque tube / support bracket assembly

Holding the tail of each rivet will stop it rotating with the drill and may enable the existing holes to be used again.. It will be necessary to use heat to soften the rapid Araldite which was used as a liquid shim in the original build.

The EUR001 washer that was fitted between each original CS10C and self-aligning bearing is no longer used, and the new CS10C has a boss machined on it to take up the clearance created by removing the washer. Therefore when fitting the new end cap the base should be flush with the tube end, with the boss proud of the tube end. First restore any corrosion inhibiting in the inside of the tube.

Insert the end cap with the anchor nut attached into the end of the torque tube with rapid epoxy between the mating surfaces. The two end caps must be as square as possible to each other to minimize misalignment of the pivot bolts. Any remaining misalignment will be accommodated for by the self-aligning bearings that are mounted to the support brackets. The rapid epoxy is used as a liquid shim only in this application. See figure 4.

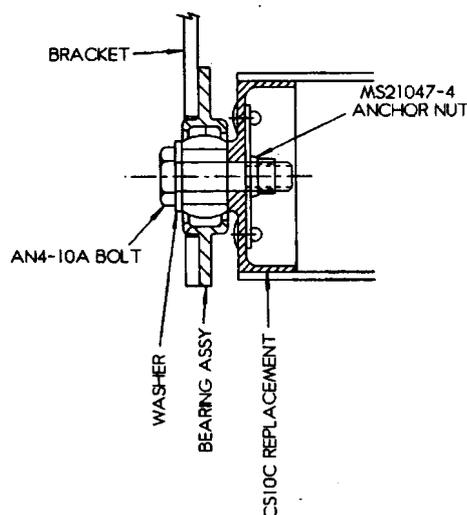


Fig 4. New end cap installed in torque tube.

After the adhesive has cured, mark and drill four 3.3 mm holes through both CS10 and the end cap for pop-rivets as shown in figure 3, then install TLPD424BS rivets in all of the holes. Pull the rivets progressively, going from one to another in two or three stages before the final pull.

At this stage the riveting of the end caps should be checked by your inspector.

Reassemble all removed components in the reverse order of removal.

Note: You may find it helpful to glue the AN960-516L washers to the torque tube centre drive bracket with rapid epoxy to ease re-assembly.

Check controls for correct, and full and free, movement.

It will be necessary to have the control system installation checked and signed off prior to flight.

Annotate the aircraft technical record - Mod 46 incorporated.