

**EUROPA CLUB  
AIRCRAFT MODIFICATIONS**

**OUTRIGGER PIVOT BEARING  
(MOD NUMBER 10661)  
(Version 2 -May 2007)**

# **EUROPA CLUB AIRCRAFT MODIFICATIONS**

These modifications are separate from those issued by the factory but have been approved by the PFA. They can be considered as build instructions and should be carried out in consultation with your PFA inspector before submitting the paperwork to the PFA for final approval. Most modifications add weight. Beware of incorporating too many at the expense of performance and payload. When following these instructions read at least three times, measure twice, cut once. Be sure you fully understand the instructions before proceeding. Any queries please contact me on e-mail [nwcmc@tiscali.co.uk](mailto:nwcmc@tiscali.co.uk) or telephone 01380 860620. If you have any suggestions to improve the modification I would be pleased to pass them on to the PFA for their consideration. On completion get the modification checked and signed off by your inspector quoting the modification reference number on the front cover of this build instruction and submit the application to the PFA.

Nigel Charles

## **OUTRIGGER PIVOT BEARING INSTALLATION**

### **Overview**

The existing pivot arrangement of the outriggers on the monowheel Europa is less than ideal for two reasons.

Firstly the pivot bolt and the outrigger are both free to rotate independently leading to wear on both the head of the outrigger (OR1) and the pivot support plates (W21). The factory have supplied inserts to reduce the wear on the W21's but this is only a slight improvement as any lubrication is soon displaced allowing wear to continue at a slower rate. It also does not prevent wear within the OR1.

Secondly the pivot bolt tightening is critical. If it is slightly too tight it causes the outrigger to drag on the W21's (leading to gear lowering problems). If it is too loose the leg is sloppy (accelerating the wear described above).

The amount of load and subsequent wear should not be underestimated on the outriggers especially if the aircraft is to be operated off grass. Version 1 of this modification clamped the pivot bolt between the plates and introduced the grease nipple for lubrication. However it was found that over time that either the pivot bolt worked loose and/or the inner fixed tube distorted creating friction on the bolt reverting it to becoming a rotating pivot. Version 2 below still provides a simple bearing using the Stainless tube as before and replacing the AN4 bolt and inner tube with an AN5-21 bolt. This provides a stronger axle with increased area to distribute lubrication. At the same time the AN5 bolt is prevented from rotating using a retaining fork. The grease nipple still provides means of lubrication during servicing.

## **Purchasing Tips**

### Grease Nipples

The grease nipples are readily available through motor accessory shops (the 6mm thread size is ideal). Make sure you also have a tap available of the same thread. The type with the shorter neck is preferable to improve clearance from the speed kit (if fitted).

### Stainless Tube (0.375" outside diameter, 0.3125" inside diameter)

The inside of the stainless tube is the critical dimension so that it provides a sliding fit for the AN5 bolt. A slightly larger outer diameter is acceptable which will require a larger hole in the OR1. This tube can be obtained in the USA through craft shops. The wholesaler is K&S. If anyone in Europe has problems obtaining the tube I hold a small stock and can pass it on at cost.

### Washers

The nylon washers are similar to those used in the kit but are 0.3125" inside diameter. They are usually supplied 2mm thick. Experience has shown that their thickness will probably need reducing to 1mm. They are available through Home Depot in the USA. If difficulty is found obtaining them, thin metal washers can be used if they are greased. Subsequently applying grease through the grease nipple will force grease to these washers maintaining lubrication.

## **Bearing Installation**

If this mod is retrofitted the OR1 will need removing from its leg. Its pivot hole is then drilled out to accept the stainless tube. This may need to be one size larger than 0.375" (i.e. 25/64" or 10mm) to enable the tube to fit. As the tube is glued in using Redux it doesn't matter if it is a little loose. The Redux will take up any gap.

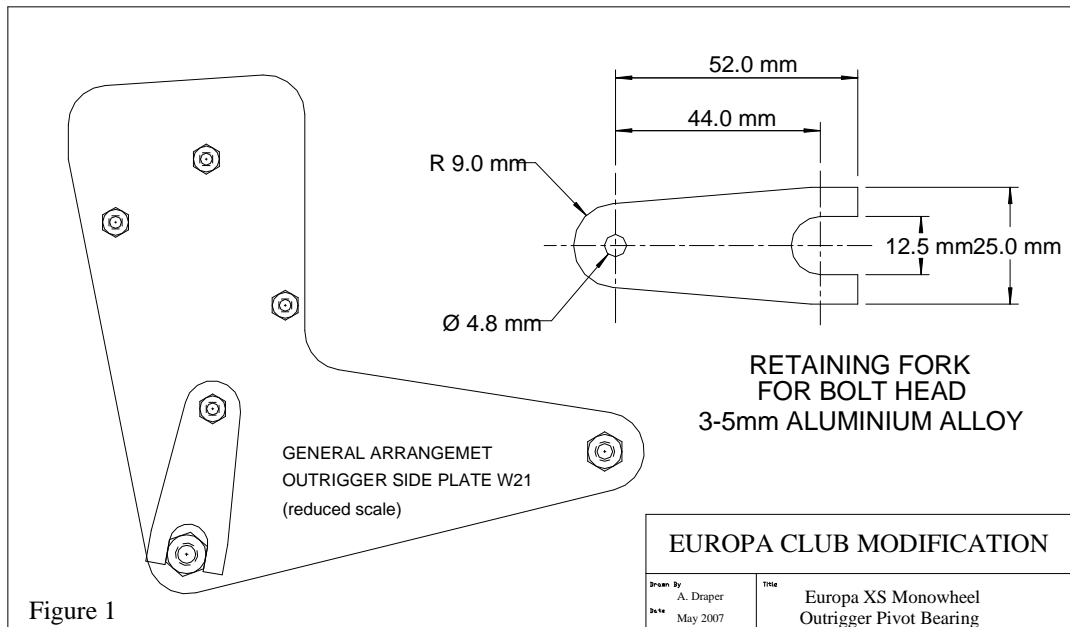
Cut the stainless tube to a length so that it is equal to or slightly less than the width of OR1. Keep any remaining off cut (see later). Abrade its outer surface in preparation for bonding in position. Place OR1 inverted in a vice and slide the tube into position. Pour neat mixed Redux into the OR1 from above, rotating the tube and moving it laterally so that its exterior is thoroughly coated with Redux. Stop pouring when the tube inside the OR1 cavity is fully covered. Leave to cure.

Drill an 1/8" hole into the front of OR1 so that it passes through into the inside of the stainless tube. Then drill the hole out to a shallower depth at the size required for the tap. Cut the thread for the grease nipple, a little at a time (aluminium is especially prone to clog the tap) and fit the grease nipple using a little Loctite for security.

Early W21 pivot support plates were drilled for AN4 bolts. Later ones were bored out to accept a bush. With the earlier type it is a simple matter to drill out for the AN5 bolt. With later types, if the bush is drilled out it will fall out of the hole as there is insufficient material left to act as a bush. Unfortunately the remaining hole is too big for an AN5 bolt.

If new larger bushes are too difficult to obtain use 1/8" off cuts from the remaining piece of stainless tube instead.

Make up the retaining fork as shown in Figure 1 using at least 3mm sheet aluminium (3/16" / 5mm is ideal). The slot should be initially made slightly undersize and the bolt head used to judge how much material should be removed to create a sliding fit. If thick enough plate is not readily available I have a limited supply.



Mount the outrigger in position. Use washers as necessary under the bolt head to ensure the split pin hole aligns with the slots in the castle nut. Do not tighten the nut so much that the side plates pinch the outrigger leg. Replace the existing AN3 bolt above the pivot with an AN3-21A bolt, slide the retaining fork in position, rotating the bolt head so that it is located in the slot. Finally fit the existing nut to clamp the plate in position.

Pump grease into the bearing until it appears at both sides of the OR1. You should now find that OR1 moves freely on a layer of grease whilst being positively located.

If the wings are fitted to the aircraft remove them and make sure the outrigger mechanism operates correctly when the flaps are moved up and down. Confirm that the outrigger is locked in the down position with the flap down. Refit the wings. With the outrigger just clear of the ground check that the outrigger is locked down but is free on its bearing.

After the installation has been signed off by your inspector notify the PFA quoting Mod Number 10661 – Version 2. This is a standard mod. Complete a test flight to confirm correct operation.