

A Custom Flight Creations alternative to Mod 66

The following is lessons learned from installing **Europa Mod 66 door strut repositioning**. We found the Mod 66 adds a molded skin to the inside of the rear door increasing the door thickness and weight. While accomplishing the task of repositioning the strut, this also stiffens the door preventing it from flexing which prevents getting a pleasing fit during construction. In the case of a finished door, it may actually reshape the door slightly and cause closure problems.

The thicker aft door rail makes the rear door seal very tight and often prevents door closure, wear on the shoot bolts. A fix was needed as the Europa Mod 66 is expensive, creates much work and grinding mess, and frankly doesn't fit well. Bob Berube made the first modification and with a little tweaking we found a way to make the installation cheaper, lighter, and easier to install.

Bob found by moving the door strut to about 1/3 of the way down the door and moving the fuselage mounted ball stud of the strut to about 1 inch by 1 inch from the very corner of the door insert, the Europa door does not push up as it did with the original strut positioning. However, to do this easily, some jigs would be needed to get the geometry just right so each door would behave exactly the same.

Our method allows for a very quick change of strut position and makes the door easier to close.

Parts Required:

6 inches of any 1/8 inch thick by 1 inch flange aluminum angle. Two #4 taper head screws or rivets. Araldite 420 A/B (Epibond 420 A/B) (aka Redux) or JB Weld, and a laminating resin such as Ampreg 21,22, Aeropoxy PR 2032, or West Systems part A and B and a couple of scraps of Rutan Bid cloth left over from construction.

Directions:

Make two brackets out of the 1/8 inch angle stock as depicted in figure 1.

Make key holes (about 3/32") to help hold the item when epoxied in. Countersink the hole for the #4 screw in the center. On the opposite face, taper the sides as shown and tap for the stud or just make a 4.8 mm hole (3/16 inch) for the 5mm ball stud and nut.

Position the door open with a support holding stick it so the door is 36 inches from the door flange to the cockpit sill. See figure 2.

Drill a 3/16 inch hole in the upper corner of the door cutout for the fuselage ball stud. This hole is about 1 inch down and 1 inch out from the corner of the aft upper door rebate.

Note:

Measure from the inset not the outer skin.

Make yourself a jig out of .016 aluminum sheet or card stock, to make a matched hole in the other door sill.

Remove the door seal.

Remove the fuselage stud from its hole and install in the new hole you made in the fuselage.

Remove the ball stud from the door and install it on the aluminum bracket you just made.

Position the gas strut on the angle bracket stud.

Install the gas strut and bracket on the fuselage and lay against the opened door.

Ensure the bracket has the horizontal flange facing forward like in the photos.

Mark the position so it can be seen from inside the cockpit.

With the door still blocked open, remove the strut from the fuselage ball stud.

Unscrew the plastic strut end complete with bracket installed.

Remove the ball stud from the fuselage.

Make a jig. This jig will allow precise alignment which is not possible by eyeballing the bracket.

The Jig:

Make a thin piece of aluminum about 12 inches long and ½ inch wide from .032 or similar stock.

Make 3/16 inch holes in the aluminum 8 inches apart.

(This is the distance of the nearly compressed strut or measure your strut stud to stud.)

Unscrew the ball stud from the bracket and install the one end of the thin aluminum jig through the threaded end of the ball stud between the bracket and hex side of the ball and attach a temp nut. Slide the other hole of the thin aluminum strip with a 3/16 bit onto the drill bit in upper fuselage hole to act as a temporary stud. Reattach the plastic or metal female stud end to the ball on the bracket.

This whole setup allows you to install the bracket precisely so neither the strut or its socket to scrape the aircraft door rebate and sit precisely aligned on the door. The metal strip sets the position of the bracket to simulate the compressed strut distance so the door will be opened to the proper distance and still allow the strut to compress fully. See figure 3.

Set the bracket, with plastic stud retainer now attached, into the cutout in the door recess.

Make thin spacers of metal, tape, or cardboard .016-.032 inch thick to keep the stud cap from hitting the aft end of the fuselage door rebate.

Use clay to help hold the bracket assembly firmly attached to the door when closed so the flange will set on the door dead flat.

Close the door and see how the bracket lines up. It should be close to the alignment marks you made previously. Reposition the bracket as necessary to make it align with the door and still be up against the spacer on the fuselage rebate.

Reopen the door and use 5 min epoxy to temporarily attach the bracket to the door.

When cured, remove the 3/16 inch drill bit from the fuselage hole by gaining access from the other side of the aircraft from the jig to allow the door to be opened.

Open the door, and check the position of the bracket. If alignment looks good, drill a hole through the center hole of the bracket into the door. Affix with the #4 screw.

Reinstall the fuselage ball stud.

Remove the thin aluminum from the bracket.

Attach the door strut to the bracket and fuselage ball stud and check opening for clearance.

When satisfied. Remove the bracket, clean off the 5 minute and scuff sand the attach area and surrounding glass reinforcement area.

Install the bracket with Redux, then peel ply, and allow it to cure.

Reassemble the strut and ball stud.

- Test the door for operation. If binding or clearance problems occur, break loose and reapply as before, adjusting as necessary.
- When satisfied, lay two layers of glass over the bracket base using floc to smooth the edges and prevent air bubbles.

Fill, sand, prime and paint to suit.

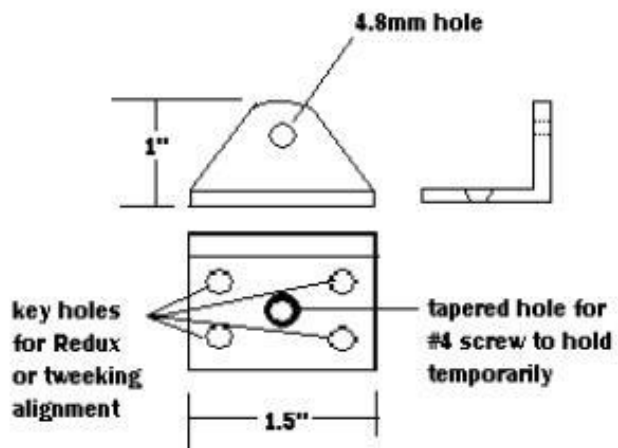


Figure 1

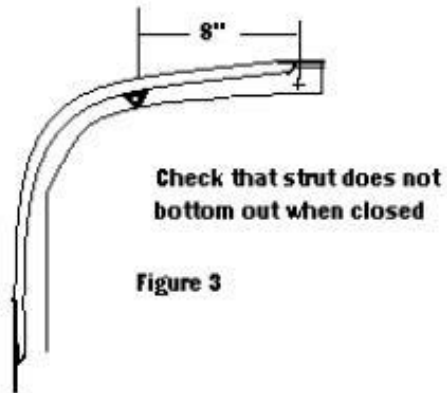


Figure 3

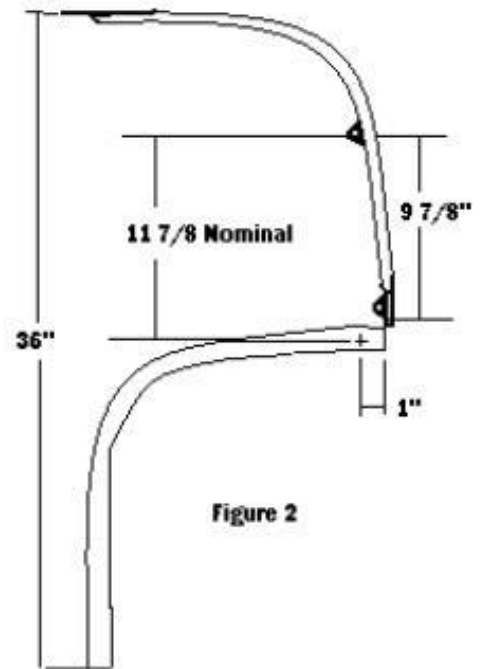


Figure 2



Europa Mod 66 after grinding and installation on new door. Some filling and sanding required.

Note the thickness of the insert for the strut.
Also note the doors do not open exactly the same amount from sill to opening.
It looks funny when the doors are not open the same amount, and the doors close with a bit more difficulty.

Below is the modified bracket installed



This is the other side. Note the door is shape is exactly as it was originally installed.

