

7. Ailerons

Overview.

The ailerons are made in much the same way as the rudder. They are supplied with all the fibreglass work completed. Bonded in the root end of each aileron is a plate and bolt with which to attach the actuating push-rod. The two hinges which hold the aileron to the wing, pivoting on its lower surface, are to be attached.

Attaching the hinges

The attachment of the hinges follows the same principle as that of the rudder and anti-servo tabs. Two MS20001-5 hinges, one 5" and the other 6" long, are attached to the inside of each aileron flange with flux and pop-rivets. See figure 1.

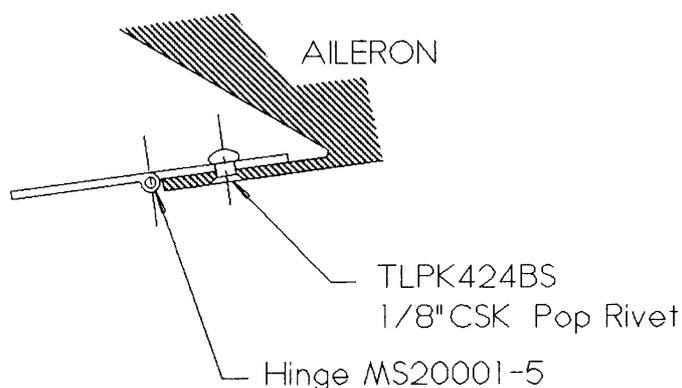


Fig 1. Typical section through aileron hinge.

The positions of the hinges are shown in figure 2.

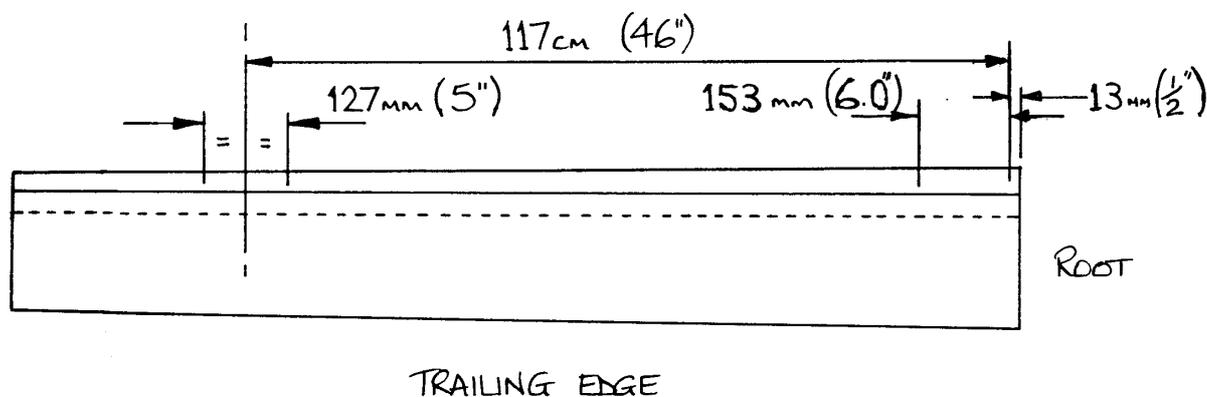


Fig 2. Hinge positions to be marked on aileron flange.



Cut away the flange of the aileron locally to accept the hinge pivot and sand the corners at an angle thus giving clearance for the bent hinge pin ends. See figure 3.

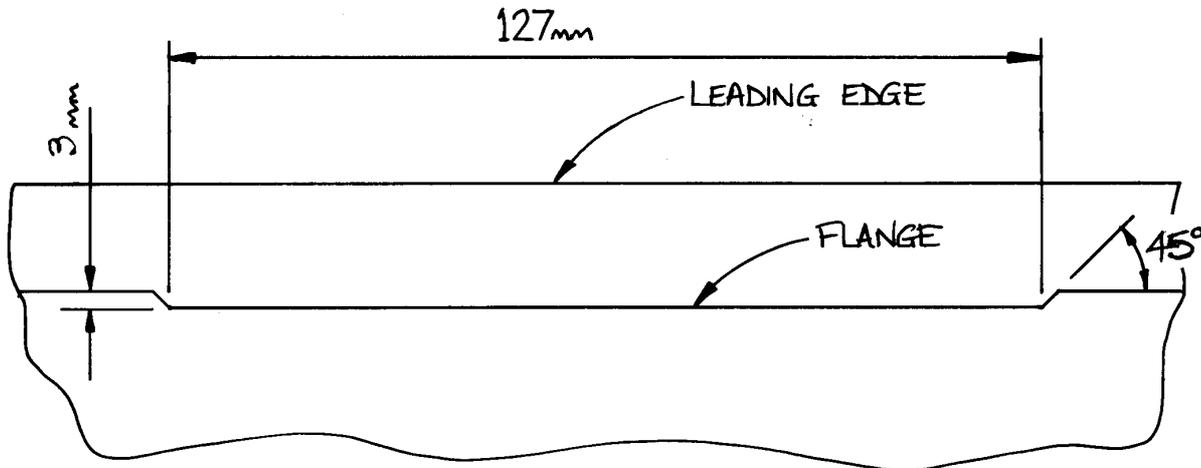


Fig 3. Flange cut back locally for hinge (outboard shown).

Adjust the cut-outs until the hinges fit correctly.

Clamp the two hinges for one aileron onto a straight edge (see figure 4) in their relevant positions placing them against the aileron as a double check.

Mark the rivet hole centres onto the aileron as laid out in figure 5 then, holding the hinges in place, drill through with a 3.3 mm drill placing a cleco in the first few holes to maintain their positions whilst drilling the remaining holes. Ensure when doing this operation that the distance from the hinge pin to the AN4-10A bolt is exactly the same for each aileron.

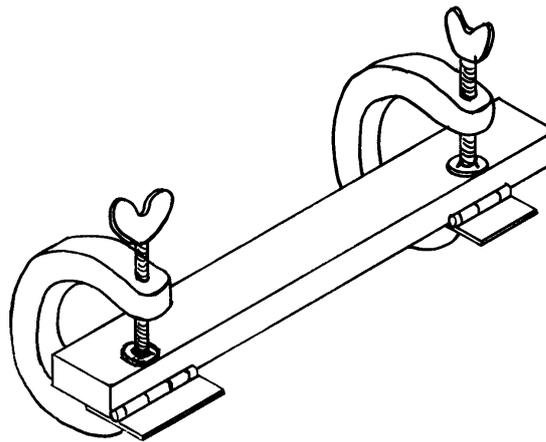


Fig 4. Hinges held in line on straight edge.

With all holes drilled remove the clecos and deburr each hole, removing all remaining swarf, then scuff sand the hinge flange in preparation for bonding to the aileron. Countersink the flange's holes with a drill bit for the rivets.

Mix up a small quantity of wet flox. Carefully apply a skim of flox to the correct side of the hinge flange to be riveted, making sure not to get any in the joints, (*otherwise your Europa will have a very poor roll rate!*) then offer them up in place with the aileron. Rivet them up, using TLPK424BS rivets, wiping the excess flox off as it oozes out then leave to cure.

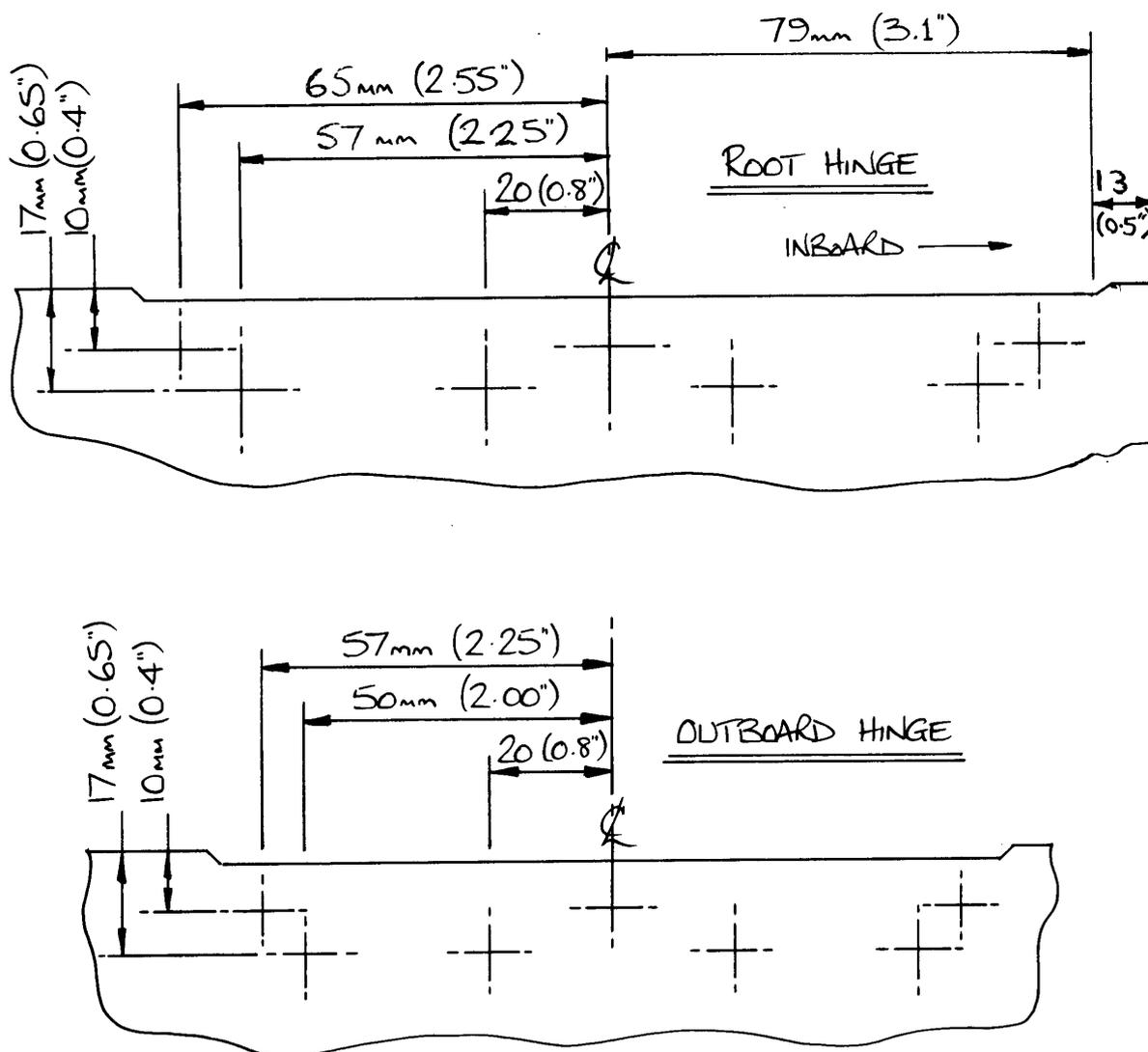


Fig 5. Rivet hole centres in flange - aileron L.E. not shown

Aileron mass balancing

The ailerons are next statically balanced, the purpose of which is to resist an aerodynamic resonance causing the aileron to flutter and result in its catastrophic failure. Lead weights on arms attached to the aileron's leading edge are used to achieve balance.

The lead weights supplied are slightly heavier than required so you can drill holes in them for fine tuning after painting.



Step 18

Checking for balance

The final aim is that the aileron, when suspended from the hinges, will lie horizontal through its centreline. This can only be accurately checked after the final paint has been applied. Before painting, however, to get an idea of balance, suspend the aileron by its hinges. It should hang with the nose of the mass balance horns pointing down at about 45° as in figure 6. In other words the aileron should be over balanced.

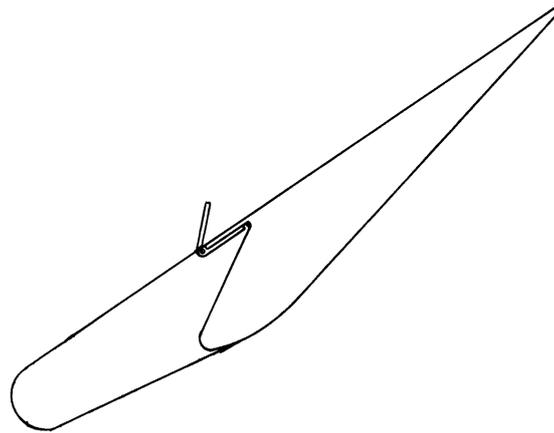


Fig 6. Aileron before finishing and balancing.

After final paint has been applied, to bring the aileron into balance, simply drill into the side of the lead with a 1/4" drill to remove sufficient material. Fill the hole(s) with a foam plug and dry micro. The final balanced state is shown in figure 7.

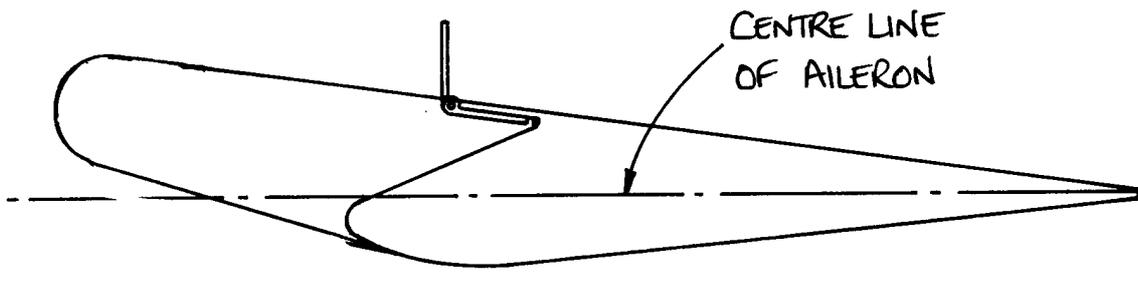


Fig 7. Aileron properly balanced after final painting.