23/8/2019 - rudder stops and pushrod fitting - 4h30

Category: 3.11. Empennage mounting
Published: Monday, 02 December 2019 12:56
Hits: 935

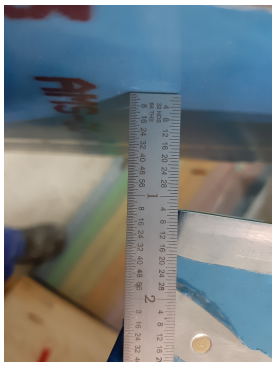
After making the rudder stops, I drilled them to the end of the fuselage. The rudder stops make sure that the rudder can not bounce into the elevators which would destroy it's skin and have catastrophic consequences.

Measured according to plans and drilled them to the last bulkhead. It's more tricky then it looks.

Then cross checked that the rudder is at max 35° degrees deflection. The alternate method given in the manual is making sure that the distance between the rudder skin and elevator trailing edge is at least 1 inch and 1/8.
Vans support replied in one of my mails that it should definiitly not be less than 1 inch. If the spacing is still too large, grind down the rudderstop horizontal surface trailing edge until the deflection is at the right distance.
The manual states:

"The proper 350 degree swing is attained when the clearance between the inboard trailing edge of the elevator skin and rudder skin is 1 1/8" when measured perpendicular to the rudder skin with the elevator in the neutral position. File the rudder stops if necessary to achieve this dimension."

Here's the picture of the measurement. Exactly 1" 1/8.



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Did the same thing on the other side.

Then took it appart, deburred holes on the fuselage and countersunk the rudder stops. These are ready for priming.

I had some time left and test fitted the elevator pushrod in the tail section of the fuselage.
The idea here is to make sure that the rod end bearings on the pushrod are installed and extended in such a way that with the elevators in neutral position, the F635 elevator bellcrank is in a full vertical position.
You achieve this by shortening or extending the rod end bearings on the VA-101 threaded rod end. The manual also states that you have to ensure that on both ends, at least half of the threads of the rod end bearings are engaged in the VA-101.

Looks so cool that I took another picture.

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Here's a look at the elevator bellcrank F635 assembly. (the pivoting triangular shape in the picture). On the other end (not visible), the shorter pushrod will connect the bellcrank to the control column.
The F635 needs to be perpendicular but this actally not as simple as it sounds since the whole fuselage tail section is tilted, including the F-729B angle on the bellcrank rib.

Finally I came up with this construction where I put the inclinometer out and set it to 0 degrees on the angle and then measured perpendicular state using a geo triangle. Looks pretty good.

State of the elevators

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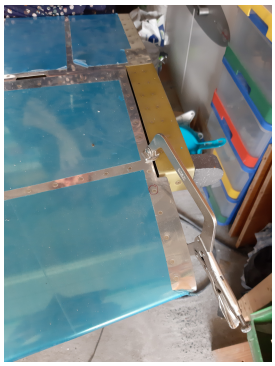

I found this little dent in te elevator pushrod. No idea where this came from. Looks like something bumped into it or fell on it. Fortunatly it's only on the surface and won't harm the strength. Sanded it smooth and will be covered when priming.

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