# Rivetting the right wing skeleton - 26/11/2011 - 9h

Category: 2.4. Main Wings
Published: Sunday, 27 November 2011 08:21
Hits: 1652

Today was a very productive day.
It's finally rivetting time again. I'm always very excited about this as it means you will be assembling pieces together one final time after which they will be permanently in place, hopefully forever.

My buddy builder and neighbour Jacques came by to help me out with the rivetting job.

The main wing ribs have to be rivetted to the main spar using the rivet gun, the flanges of the main spar are just too thick to be able to reach in with a squeezer.

Don't even think about doing this by yourself. There are enough flash warning lights to warn you not to :

- you will be using the double offset rivet set (I find this harder to handle than the straight one)
- the rivets are AD4 (1/8"), requiering more pressure and thus more risk on jumping of
- in many places (next to the main spar reinforcements top and bottom of the flange, you will be bucking very closely to the spar. Don't even think about what will happen if the bucking bar smashes into your nice main spar).

So if you can't find anyone now, be patient. Do something else until you can find a reliable and experienced rivetting partner

While I was waiting for Jacques to arrive, I started squeezing the rivets that attach the reinforcement doubler plates on the rear spar. At random, I started with the left wing spar.
Most of the holes can not be rivetted yet because other structures will attach to them. Instead of taping the holes - as the manual says - I decided to put clecoes in so everything stays nicely in place while squeezing the rivets.

Here is the W707-E reinforcement place that holds the aileron supports and where the pushrod from the aileron bellcrank passes through.

What I did notice is that, due too the thickness of the layer of primer, the holes in the doublers don't perfectly align anymore and in some rivets I had to go gently through with the drill bit.



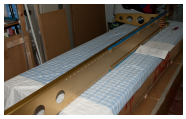
Phoca PDF

**Rivetting the right wing skeleton - 26/11/2011 - 9h**

Category: 2.4. Main Wings
Published: Sunday, 27 November 2011 08:21
Hits: 1652

As you can see, not many holes to rivet here as most of them also serve another function. Then did the same thing on the reinforcement fork and it's doubler: W707-G and W707-D.

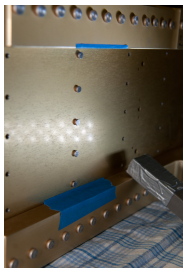
Then, I started setting up the scene for rivetting the ribs to the spar. I had a lot of reflection about this. I was going to mount the spar in the jig first and rivet from there (even putting on one side skin for straightness etc..)
Started thinking about it and realised the spar will be vibrating heavily while rivetting with risk on damaging the spar. Imobilising the spar on a table has as a countereffect that you may loose precision in the wing straightness. But we are working with pre- and matchdrilled holes, so how could we get misaligned ? I finally have chosen for the table option and put the spar vertically on a table top, with a protective sheet underneath and clamed the outboard side to one of my wing jig supports.



As the manual dictates, set the rivets on the spar side, the manufactured head should go on the rib side to prevent distortion of the rib flanges.

The rivetting process is not at random. Start with rib nr 3 (counting from inboard). The space between the wing walk ribs is soo thight that you won't be able to get the rivet gun in if you don't follow this sequence.
I did 3, 2, 1 and then moved to 4 and continued outboard.

The picture below was taken after the first 5 rivets had been set. Protect the spar and secure you bucking bar



In the picture above, you can see that I used painters tape to protect the reinforcement bar on the spar flange from bucking bar damage. I also used gorilla tape on the sides of the bucking bar.



Phoca PDF

**Rivetting the right wing skeleton - 26/11/2011 - 9h**

Category: 2.4. Main Wings
Published: Sunday, 27 November 2011 08:21
Hits: 1652

5 Ribs set. The shop heads are nicely set. I have to admit that the rivetting went slowely and we had to drill out many rivets. The double offset set makes it difficult not to create smilies in the rivet heads and on the other side, I first used only my tungsten bucking bar which is actually a bit small to handle that kind of force. Luckily, I'm quite good at drilling out rivets and did not enlarge or touch any hole on the spar side. Only 2 rivet holes on the rib flange were slightly oval but really nothing to worry about.

I started using a larger bucking bar surface and things started going smoother then. I also used a PSI of 68 instead of the 60 before and this required much less 'shooting' giving less risk on deformed heads.

Below you see the wing walk doubler ribs. The flanges of the ribs fit thightly against the spar. The manufactured heads look intact after all that brutal pounding action.

We had again the same problem that some rivets would just not fit in without passing through with the #30 drill. I hope this does not create problems later with small deformations.

Late in the afternoon, we finalised the rivetting process to the spar.

Some words of advise:

- the last ribs on the far outboard end can be reached with a pneumatic squeezer throught the lightning holes in the main spar. Be carefull not to scratch the spar. Squeezing is much much easier and forms nicer and uniform shop heads.
- as the manual says: don't rivet the most outboard rib to the main spar !



Phoca PDF

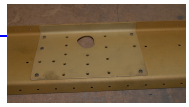
**Rivetting the right wing skeleton - 26/11/2011 - 9h**

Category: 2.4. Main Wings
Published: Sunday, 27 November 2011 08:21
Hits: 1652

We continued then working on the rear spar and finalised rivetting the doublers on the rear spar of the left wing.
You may notice that in some of the pictures, the primer has some smears of bare aluminum in them. This must have happend while handling the wet pieces during priming. I will touch those up once the skeleton is completely rivetted on.

Reinforcement fork done.

And W707-E done



I promised one of the kids he could help me out clecoeing the rear spar to the skeleton and then realised I did the left wing rear spar and the right wing spar... DDDDeeeeuuuhhheeeu....
So continued working on the right wing rear spar afterward. But it 's getting late and won't be able to complete that today. More fun tomorrow.



Phoca PDF

# Rivetting the right wing skeleton - 26/11/2011 - 9h

Category: 2.4. Main Wings
Published: Sunday, 27 November 2011 08:21
Hits: 1652



Phoca PDF