Matchdrilling the F704 - 22/12/2013

Category: 3.8. Center Fuselage
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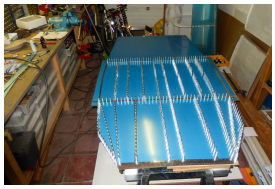
Today, I decided to matchdrill the F704 to the center fuselage bottom skin. What sounds like a simple task at first is in reality one of the most important in the construction of your RV-7. This is where the spacing between the F704 forward and aft bukhead gets fixed. As you know by now, this is where the wings mate to the fuselage. Too large of a gap and you will bend the bulkhead sides inwards when tightning the wing attach bolts (a no-no !). Too small and you wouldn't even be able to insert the wing spar in the fuselage !. This may seem obvious to you know, but there are many many examples on the forums of people who end up with too thight slots between the F704 bulkheads. Some people have sanded on their main spars to be able to insert them (an even bigger and absolute NO NO !).

All this, just to get your attention and make sure that you take your time when you start doing this. This is one of those places where you measure at least 3 times before you move on.



The first step is easy. You only have the aft part of the F704 in place with clecoes and just have to matchdrill each predrilled hole to size. But... wait a sec... The manual doesn't talk about the forward bottom skin at this point. If you think about it, the forward skin will have to be matchdrilled too at some point. If you would just do the center fuselage bottom skin and F704 bulkheads now, the next step would be to deburr holes and dimple them. (no way you would be able to dimple the second row on the F704 later once the bottom skin is rivetted to the seat ribs. So, the bulkheads must be dimpled. This means that it become difficult to matchdrill in an already dimpled part later. That's why I pulled out the forward bottom skin now and clecoed it to the F704. The forward skin goes over the center fuselage bottom skin. I clecoed the whole thing together again and then matchdrilled the aft F704 row.That fixates the bulkhead, the center fuselage bottom skin and the front fuselage bottom skin.

Next I pulled out the spacers made earlier when assembling the F704 bulkhead. I made these spacers out of aluminum tube.

I didn't like the idea of wood as it is too sensitive to temperature and humidity changes. Also, I find would more difficult to set to exact size. And as I'm being anal again, i would like these spaces to

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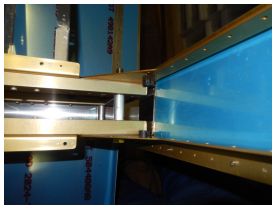
be within few thousands of an inch.The spacers need to be 1 inch 7/16" or 1.438". In this case I'm using the thousands value on my caliper to be as accurate as possible. I remade one spacer as I found it too short. 1.438 is exactly the gauge of the wing spars. To make these spacers, I cut some aluminum tube, the straightened them with the vixen file. Next, I chucked the aluminum tube in my drill press. Then hold the vixen file flat on the drill press table on some would and gently press the tube against it. This way you take away thousands om an inch easily. Last, I brought it to final size by pressing the tube on some 400 grit sandpaper until I got somewhere between 1.438 and 1.440 inch.

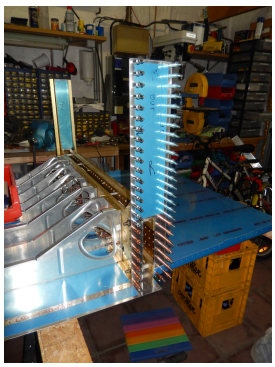
Finally installed the forward side and put the spacers in place. I bought some bolts at Lowes earlier and sanded away a bit of the shaft so they go in without forcing. DO NOT USE THE FINAL BOLTS. They are very thight (and it's supposed to be like that).



After measuring multiple times, I also clecoed on the F704H center section side plates.

Then matchdrilled the foward side F704 row.

As a last step, I matchdrilled the side plates.



I realised I forgot to matchdrill the seat ribs to bagagge rib holes. Most are easy but the intersection show in this picture is quite tricky and will require you to get out the 12" drill with some bending in order to have access.

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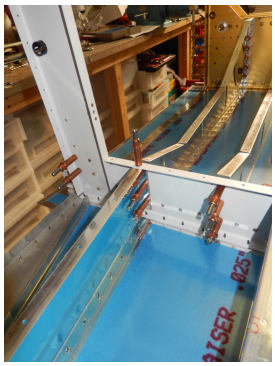
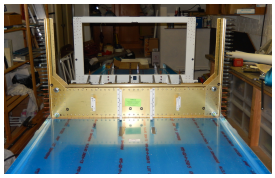


And here is finished work of the day. F704 matchdrilled.



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