

Category: 2.4. Main Wings

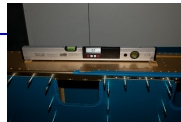
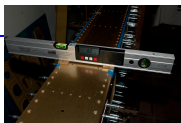
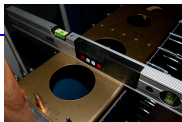
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The right wing skeleton has been completely rivetted and is back in the jig. We are also working on the left wing skeleton rivetting but since we do this in short batches of couple of ribs at a time, I decided to continue also on the next step which is matchdrilling the main skins to the skeleton of the right wing.

Time again to level the spar in the jig. This was still the case for the upper spar measurements since I didn't move anything from last time. I hang the plumb bobs back to the front, middle and rear of the spar and measured for twist.

First some pictures on the spar (boring but I may want to look back them later).



Then came the real misery, the picture below is to give you an idea how nice it is to measure twist... Hands in the hair...



When measuring in and outboard I measured a difference of $\frac{1}{32}$ " . Being perfectionist as I am, I tried to get rid of this last $\frac{1}{32}$ " (0.79mm) .

When pulling the end of the rear spar in, to shorten the gap, I

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noticed that actually the gap had also increased on the other side. The structure with the skins on is so stiff that you just move the entire thing and just tilt.

At some point, I got rid of the 1/32" difference, but when measuring the top of the spar then I had 0.4° tilt already and there was a huge amount of tension to keep things in place. When releasing the clamps later, things would fold back and I would get more difficulties and possible alignment problems when rivetting.

I put everything back in its original 0.0° and measured again. Back to 1/32". After two days of messing with this (note for later: "loosing time on the project for irrelevant details"), I decided to keep the 1/32" gap.

I started reading in the forums also and found the following (for some reason I did not find this in the manual).

- *"Right now I've got it just barely to Vans' published tolerance (3/32 inch difference between inboard and outboard plumb-bob string to rear spar flange distance)."*
- *"When I was building my wings, I talked with Van's about that issue. On my RV-9A with 28-foot wing span, the twist was considered to be OK if under 1/8". "*

So tolerance is 3/32" for an RV7 and 1/8" for an RV9, so I'm well within tolerance for now. I hope there will be no change in this while rivetting but I doubt it.

Here are the measurements of the plumb bob in the end.



Things really look cool with those bottom skins clecoed on.



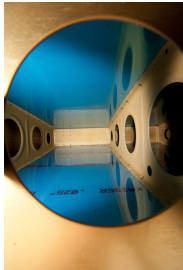
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Another great shot through the lightning holes outboard 2 ribs. Notice the nice alignment of ribs and skins, they nicely butt against each other. Good fluting job.



Then it was time to matchdrill. Nothing difficult but time consuming. There are over 1000 holes to drill on both sides. I used my drill alignment tool that keeps the drill always at 90°. This surely speeds up things as you don't have to constantly bother if you are aiming perpendicular or not. I used a sharpie pen to make markings on the vinyl as I proceeded. First the top of the middle 3 rows for 6 holes down. Then moving in and outboard for the same amount. Then moving down from the middle. Finally the top row at the spar and bottom row at the rear spar. Finally move all clecoes down one row and drill those holes. The marking is necessary because you will sometimes doubt if you drilled a hole or not. A little trick that may help you can be seen in the picture below.

If you doubt if a hole was already drilled or not. Compare the color with the surrounding holes. In the picture, the hole right of the vertical sharpie marking has been drilled, the others not. Look at the difference in color. The drilled hole looks black, the punched (undrilled) holes look silver. The effect is even more pronounced with the led light shining on it.



After 4 hours matchdrilling spread over 2 days, the main skins of the right wing are finished... Another milestone achieved and an overall good feeling about it.

When I was finished, and looked back in to my workshop I was astonished to see the following view. The simple garage it once was is now turned into a real airplane assembly plant.

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As I had some time left, I started prepping the leading edge ribs, but that's a story for next time. Stay tuned.