Wing Ribs Left Wing - 08/10/2011 - Tot 19h30

Category: 2.4. Main Wings
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For the last few weeks, I have been immersed in the seemingly endless task of preparing the main ribs for the wings. There are a lot of ribs in the wings, over 50 of them actually, and each one needs some work and attention to some details before it can be riveted in place as part of the internal skeleton for the wing. They are formed at the factory in a big press and all the rivet holes are pre-punched in most of them, but the process leaves them warped and twisted to some extent, with rough edges all around. It has been a very boring, repetitious task that involves a number of tools.I do them in batches of a few at a time, to help keep my sanity and give me the feeling that I'm making progress. I probably spent more time on these ribs than some of the other guys do, but I don't see how I could have done it any easier.

I start for each rib by using the vixen file to remove the rough edges and bumps. very lightly making sure the file is square on the edge. This is thin material so don't push it !

Then I use the V-deburr tool. Go over 3 times with the V flat and very light pushing. Then tilt the Vtool 45° left, go over it, 45° right , go over it and then twice flat again. This creates a nice unsharp rib.

Next step is to use the lightning hole deburr tool. I use the curved knife deburr tool for this. Take away the sharp edge on both sides.

Next use the scotchbrite 1inch wheels with a small gap graved in to go over the edges 2 to 3 times without pushing too hard. Same for the lightning holes.

Next go over the edges with 400 grit sandpaper.

Last, use small key files with some sandpaper over to clean the edges of those small openings between the edges and on corners. This is actually the most boring part.

When they're all done, I will match-drill them to the spars

The last step is to bend the flanges slightly as needed to make sure they are at a right 90° angle to the web of the rib. The flanges all need this fix. I haven't found one yet that doesn't.
Finally, I use my fluting pliers to put flutes, or small creases in the rib's flange in between the rivet holes. This has the effect of "shrinking" the length of the metal flange, and it causes the rib to straighten out.
It's really quite amazing to see. I work with each one until it will lay flat and has no warp or twist remaining, and the line of rivet holes is straight.

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If you over-flute and go too far, you can use the hand seamers to undo the flutes a bit, partially flattening about 3 of them at a time. It doesn't take much of a squeeze! Working this way, you can eventually get them flat and straight.
It is not difficult but you have to remain patient. The best way to test is to lay a ruler (or then final skin) over the flange and check that all the holes align on a straight line.

Once fluted I recheck the 90° position of the flanges a the fluting may shift them a little in or out.

Since there isn't much to see in this process, I haven't bothered taking many pictures at this point.Here is a batch of unprocessed ribs :

Here we are at the end of prepping all ribs for the left wing and I installed them in the correct sequence and with flanges facing the right way.

There are differences so pay attention !

Nice ! It really start looking like a wing :)

The wing has to be supported in the middle because it will sag. I haven't measured it until now. I will do that before starting the matchdrilling to ensure the wing is straight, level and has no sag or twist.

I couldn't resist taking the next picture which is considered ' a classic ' picture with homebuilders.

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Stay tuned.

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