

27TH OCT

Today's been a bit fraught with the Denford trying to make me respect it more :(The four rear right struts are cut out to depth and the first of those has been turned over and machined down to just over the finished 10mm thick. My first attempt at skimming the second face had to be aborted because the clamping mechanism I thought might work wouldn't hold the part finished item flat so I had to resort to drilling and counterboring holes to improve that - or rather make it possible - by screwing the part finished blank down. Fortunately I found three places where I could align the holes with the 40 x 40 grid of holes in the Denford table but unfortunately when I got close to the final thickness, a part of the blank began vibrating causing some chatter tool-marks to appear. Not so much that they can't be sanded out but enough to make me look at finding another clamping hole. I can't show an image since my phone/camera can't see the damage - I might try using an endoscope tomorrow to see if that will pick it up.

The annoying part is that the next operation - cutting a recess - had to be abandoned. At least I can take comfort in the fact that this is exactly what the project is about - finding out how to handle materials in a CNC environment.

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Having slept on the problem of the uncut recess, I think I can solve it by re-designing the G-Code. The issue is that the depth of the recess has to be 3mm from the top surface and although the blanks are all about the same thickness the potential .2-.4 mm difference does matter so that was the reasoning behind trimming to the final thickness first but in fact if I use the table surface as the datum, then I do know that the recess must also be 7mm from there. So, I can set the G-Code to cut a recess stopping at +7mm from the table rather than what I currently have which is - 3mm from the top surface - the end result will be the same.

This tactic also obviates the need to use the 40 x 40 grid holes to hold the parts. The part finished one can be positioned just as easily as the other three. Once the recess has been machined on all four I can go back to the surfacing operation using the clamping holes including the one which has been recessed though that won't be on the grid so will need a wood-screw into the table which won't matter a jot.

Having cut the recess I took a photo' to show the clamping strategy but then thought that I could also try-out the endoscope to see if that would pick up the 'chatter' damage. It took a while since I had to install first Zoom, to give the Endoscope somewhere to display the image, and then Photoshop so that I could display the screen-grab.

As it happens, the chatter damage *can* be seen on the Phone Photo' (Fig-93) but the Endoscope image (Fig-94) makes it more visible.



The four Rear Frame E Struts are now both recessed and skimmed to just over the 10mm finished thickness and I've started on the G-Code for the Rear Frame 'C' strut which is the opposite side. Having found that clamping down to the table via the grid of threaded inserts is necessary I'll include the clamping holes in the G-Code and, bearing in mind the 'chatter' problem, modify the [Holding Tabs] from the 3mm x 3mm triangular default to 4mm x 4mm and square which will give a stronger hold for the second side machining. I'll still have to cut the counterbores as a second operation on the mill since they have to be from the side that is against the table but the positioning of the screw hole will be accurate and the counterbore is by definition oversize and not critical.

Although I have the blanks for the Front Frame C & E struts prepared, I think that it will be better to prepare the blanks and finish the Rear Frame D extension first which will mean that I can get the whole Rear Frame put together.