Large Fixed Steady for the HBM 290

The fixed steady supplied with the HBM 290 lathe had a max. capacity of 60mm diameter. If you want to turn a long piece of say 100mm dia. tube the supplied steady could not cope. So I decided to make a larger steady from a some of pieces of steel from my scrap box.

I used a piece of 20mm thick steel for the base and 12mm thick for the steady. My plan was to use 15mm thick material but my scrap box only contained a 12mm thick piece of sufficient size. The plan was to mill 3mm deep slots for the fingers, with only 12mm thickness I decided to try and attach some 3mm thick pieces of steel with epoxy and some countersunk M4 screws.

Base

The work was squared and then mounted in the milling vice to mill the underside. The front part was given a very light cut with a face mill, for the slot that will fit the rear prismatic way I first used a 10mm slot drill. When the slot got deeper I instead used a 6mm slot drill and for the final cut a 5mm ball nose. To give the slot its 90 deg. Profile I simply used a countersink with 3 cutting edges, probably not the best solution, but it cut well and gave a nice finish.

When the other part is finished I will drill two 6.8mm holes and tap them M8.

Steady

This part was made from 12mm steel plate. First I marked out the outer and inner outlines and made a centre punch where the lathe centre line will be when the steady is finished. From this I used a pair of dividers to mark out the position of the screws that clamp the fingers (120 deg. apart). In the inner part – that will be removed, I drilled a few 13mm holes, two 8mm holes and a 12mm hole in the centre – right photo.

The outer profile was hacksawed as close to the marked out lines as possible. I also hacksawed away a corner portion.
For the upper curved surface I mounted the work on the rotary table, the 12mm centre hole was used to centre the work on the rotary table. I could then use a 10mm end mill to mill the curve on the upper part of the work.

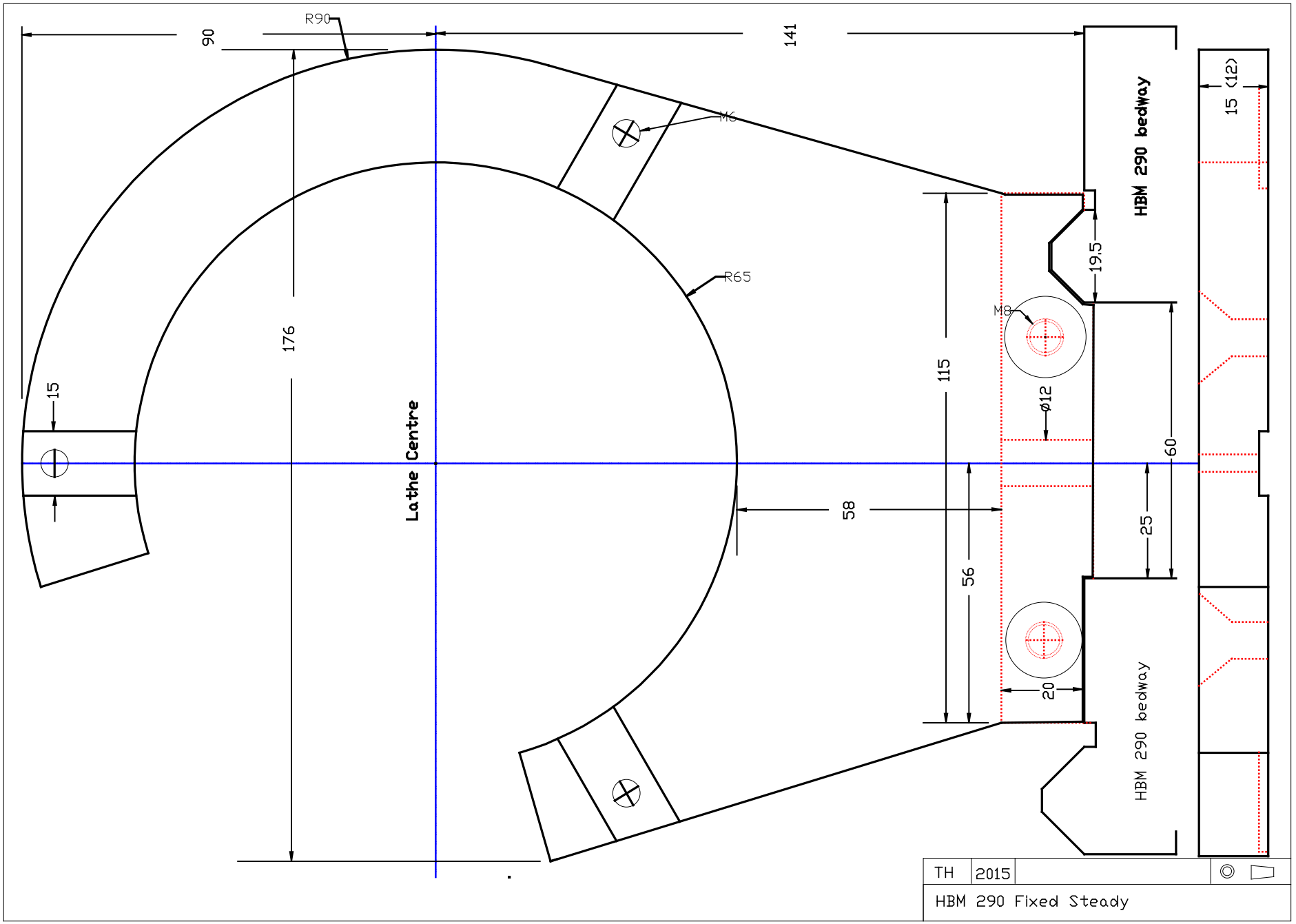
To cut out the inner part I decided to mount the work on a sub table on the rotary table, and use a 3-flute end mill to cut slots. This is like a trepanning operation, and I milled from both sides.
As much of the clamping was on the inner part the I wanted to remove I didn't mill through all the way round, but left around 1mm of material for some of the distance. I also had to move the clamps around to be able to mill all parts of the slot. I drilled two countersunk 8mm holes in the bottom part (as shown in the drawing at the end of this document).

After milling almost through the work was moved to the bench vice and I used a hacksaw to cut out the centre part, a bit of elbow grease and a half round file gave what you can see in the left photo.

Since I only found a 12mm thick piece in my scrap box I decided to attach some pieces of 3mm steel plate to the steady and use these to make "slots" for the fingers. After the epoxy had cured I milled the slots with a slot drill to get a sliding fit for the fingers. After a coat of paint I got what you see underneath.

The fingers are simply rectangular pieces of steel with a 6mm slots for most of their length. At one end I drilled a 5mm hole and tapped M6 for the shaft that will hold the ball bearing.

Here the large steady is mounted on the lathe (as a test).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90
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M6
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115
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56
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