Toolpost for HBM 290 lathe

When I bought a new lathe it came with just a square toolpost so I had to use shims to get the tool to correct height. I decided to make a simple toolpost with tool-holders with height adjustment. I had found George Carlson's description of one at the Home Metal Shop Club web site and based mine on his. Mason published a similar design in ME # 3384. I didn't follow Carlson's design to the letter, but made adjustments to suit my preferences.

The toolpost itself was simply made from a piece of 40mm diameter steel bar cut to length and a 10mm hole drilled through lengthways for the M10 screw on the top-slide.

I made the tool-holders from a piece of steel I had found in a local skip. I hacksawed off a piece to make two holders. The first operation was to square the work in the milling machine, I clamped the work against an angle plate and milled the two long edges (right photo).

I then used a hacksaw to cut it in two pieces – same with the next, se photo below. The reason for cutting

this way was twofold, I would get 5 tool-holders instead of 4 and for 4 of them I would get more room when turning close to a revolving centre in the tailstock. The hacksawed parts of the 5 pieces were then milled before the centre hole was bored.

I decided to mount the tool-holder pieces on the faceplate (using two pieces of angle iron and some bolts and clamps to prevent sideways movement) when boring the 40mm diameter centre hole. The faceplate for my 290 lathe has a 70mm diameter hole in the centre so there was no risk of my boring tool running into the faceplate. This set-up worked well.

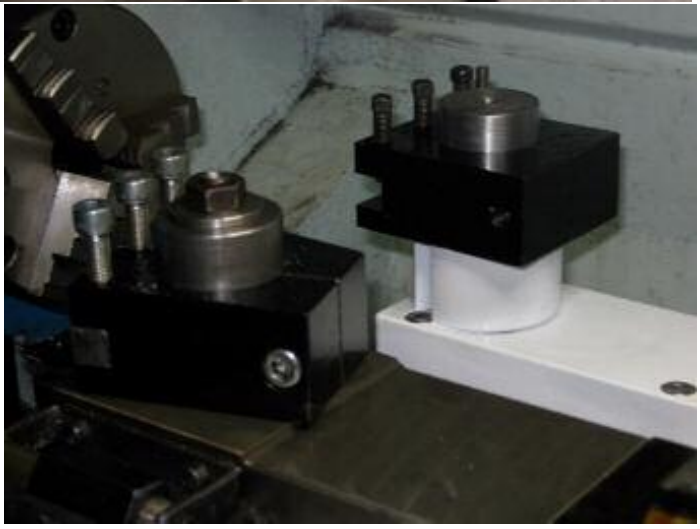
After boring the 40mm hole to a sliding fit on the toolpost the work was mounted in the milling vice so I could cut a slot for the lathe tools. My 290 lathe can take tooling with 13mm shanks so I decided to use a 14mm slot drill to mill the slot to a depth of 14mm – right photo.

Then I drilled a 6.8mm hole close to the end opposite the slot. The 6.8mm hole was opened up to 8mm for a little over half the length, the 6.8mm part of the hole was then tapped M8. I then used a hacksaw to make a cut from the outside and in to the 40mm hole so the M8 bolt could clamp the tool-holder to the post.

I also drilled a 5mm hole that was tapped M6 for the height adjustment screw.

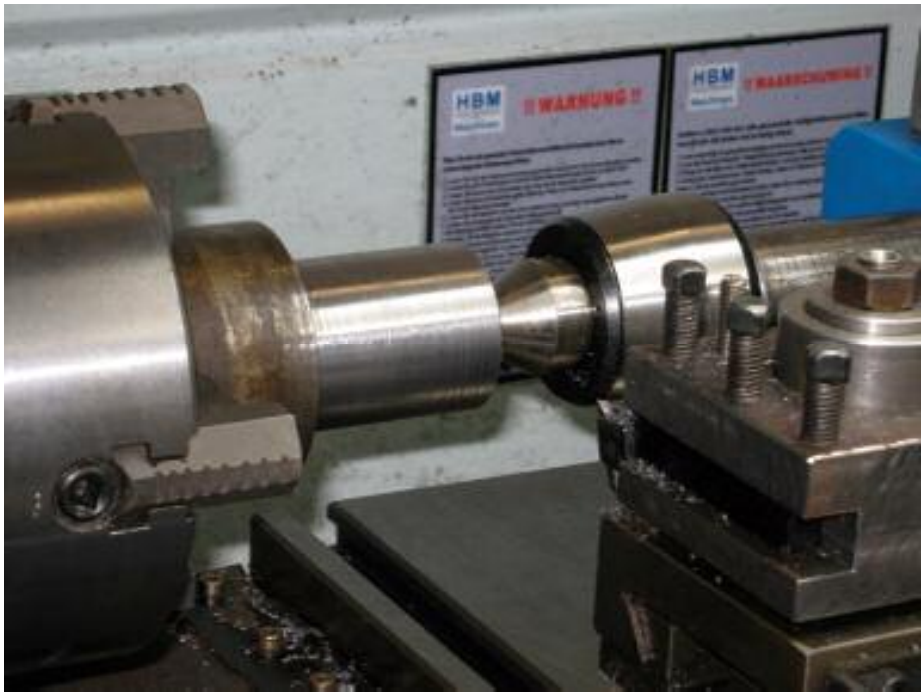
This photo show the toolpost and some of the tool-holders I made (and one I made earlier for my much smaller lathe).

Here is a photo of two of the tool-holders after painting, one is mounted on the topslide, the other on the rear toolpost.



Rear toolpost and parting-off tool-holder

I also wanted a rear toolpost with a parting-off tool-holder. I made the rear toolpost the same diameter as the one for the topslide so I could use the same tool-holders. The cross slide of the HBM 290 has two T-slots so it is easy to clamp a rear toolpost at the rear of the cross slide.



I had a piece of 60mm diameter mild steel rod in my scrap box and used that to make a column for the rear toolpost, a piece of rectangular steel 15mm thick was used for the base.

The 60mm diameter bar was faced both end and the upper part of it turned down to 40mm (right photo).

The bar will be clamped to the base by four M8 Allen screws. I also used Allen screws to clamp the base to the cross slide, and had to mill a groove in the widest part of the column to be able to get a key into the socket and turn the clamping screw.

The *parting* tool-holder use a HSS parting blade. The holder was made pretty much the same way as before, just square.

Since the parting blade is trapezoid I mounted the tool-holder in my tilting vice, tilted so that there will be clearance on both sides of the parting blade. The recess that holds the parting blade is angled so the parting blade gets a top rake.

Since the bottom (and top) of the parting blade is angled, I used a 45 deg. dovetail cutter to make a finishing cut along the recess. This is so the HSS blade will seat well. On the opposite side I use a wedge shaped piece to clamp the HSS blade. I made two sizes of the wedge shaped piece so I can clamp two different sizes of HSS parting-off blades.

The base is just a rectangular piece of mild steel to suit the lathes cross slide with four counter-bored holes to fit the T-slots in the cross slide.

Here is the rear toolpost and parting off tool-holder together with the toolpost for the topslide.

Making Richard Smith's toolholder

In Model Engineer's Workshop #248 and #255 Richard Smith explain how he made his quick change tooling system, where most of the turning operations are made using just one tool-holder. I had made a similar tooling system earlier, but with different tool-holders. I liked the idea of one holder performing as many operations as possible, so I decided to make my version of the tool-holder that would fit my exiting system, and could be used for facing, turning and chamfering. I had a piece of steel that could be used to make the tool-holder, so I used that. The piece was 30mm thick and about 60x85mm. It would have been an advantage if it was and a bit thinner and slightly longer, but I managed to find a way round that.

The work was first milled rectangular in the milling machine and the centre of the 40mm diameter hole was marked out as well as the hole for the M8 pinch bolt. I drilled the hole for the pinch bolt first using a 6.9mm drill. The hole was opened up to 8mm for a depth of just over half the length of the hole. The hole was then tapped M8.

The work was transferred to the lathe and mounted in the 4-jaw centred on the centre where the 40mm hole should be. A small pilot hole was drilled through and the hole opened up to 16mm with a twist drill. The 16mm hole was then bored out to 40mm, a sliding fit on the tool-post pillar – see right photo.

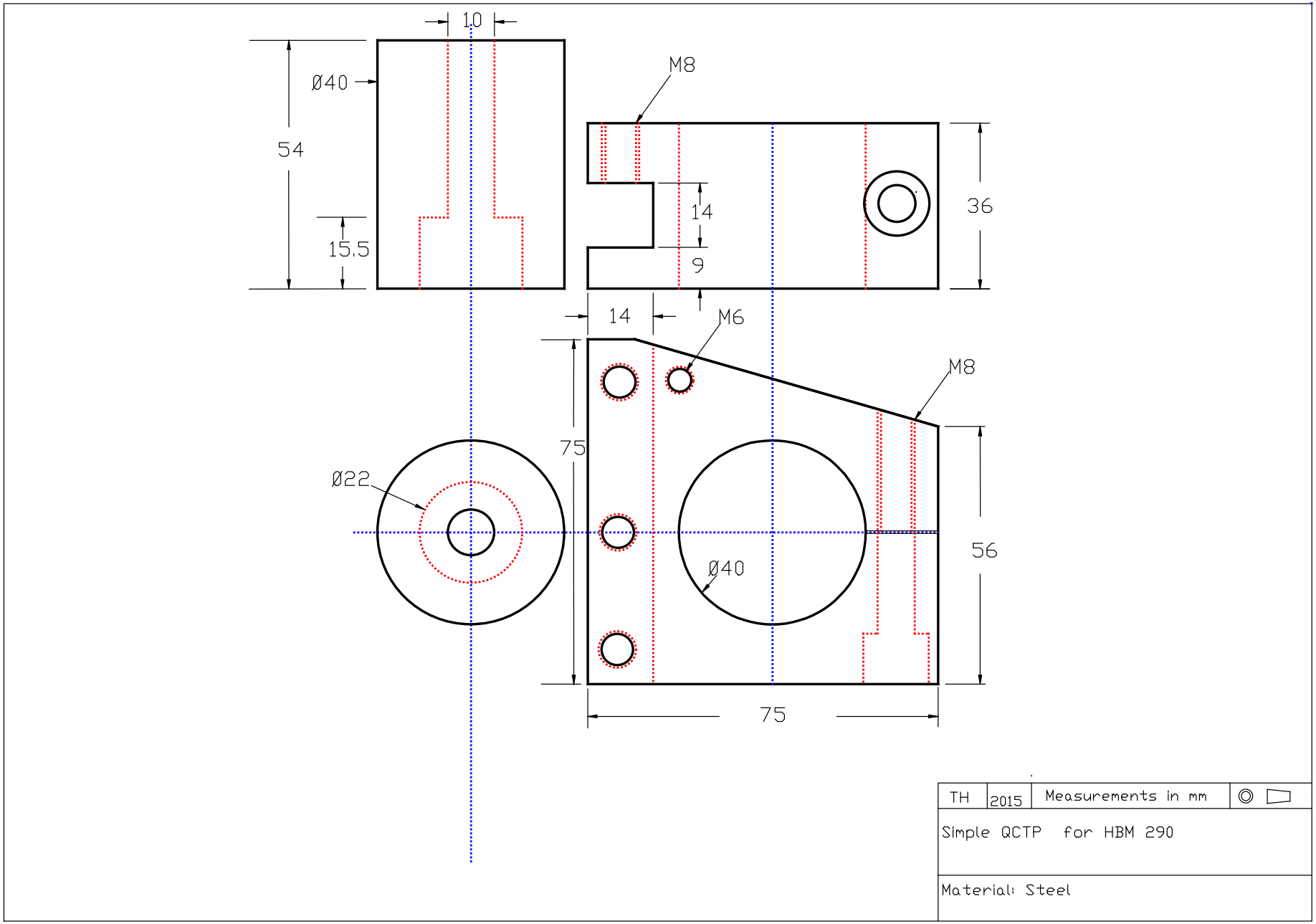
The next operation was to mark out the 60 deg. point on the "business end" of the tool-holder. Since the piece of steel from my scrap box was a bit short I couldn't have a 60 deg. angle all the way, as that would leave too little material, so I made a step when I hack-sawed it roughly to shape.

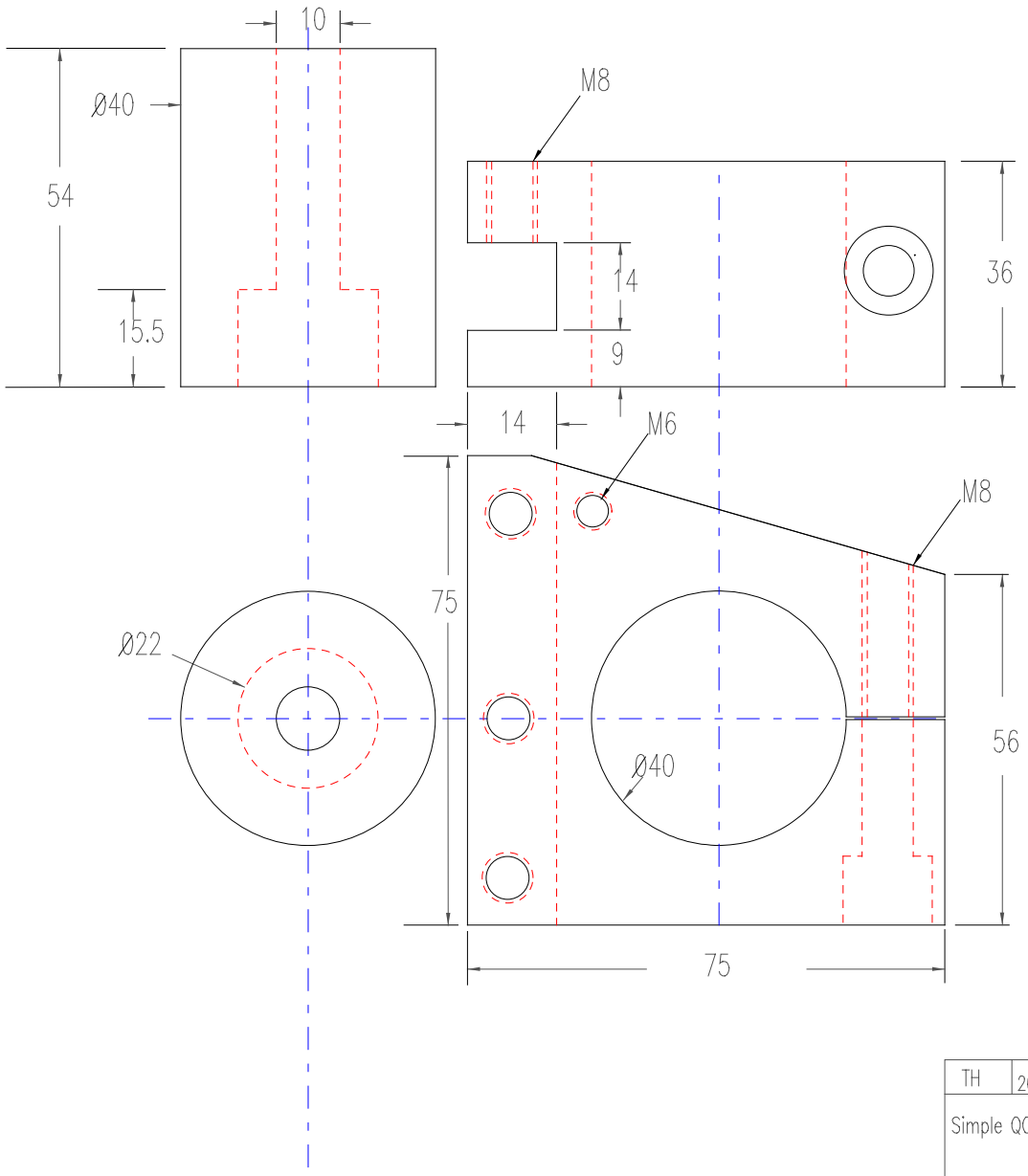
The work was transferred to the milling machine and I used a tilting vice to hold the work. The long side was clamped at 30 deg. to the top of the vice. The vice was then tilted 5 deg. to give a bit of inward slope from the insert and down to the bottom of the holder. This will provide some backoff when facing. I then milled the outer part to the marked line, wound the head up a few millimetre and milled the rest – see right photo. Doesn't look as good as Richard's but it does work.

The tool-holder was mounted in the milling vice and I milled a step for the tungsten carbide insert. The insert was put in place and the hole for the clamping screw marked out. I didn't have a M2.5 screw so I tried to put a countersunk M3 Allen screw through the hole in the insert, and the hole was wide enough to let the screw pass. So I drilled a 2.5mm hole and tapped M3 – right photo.

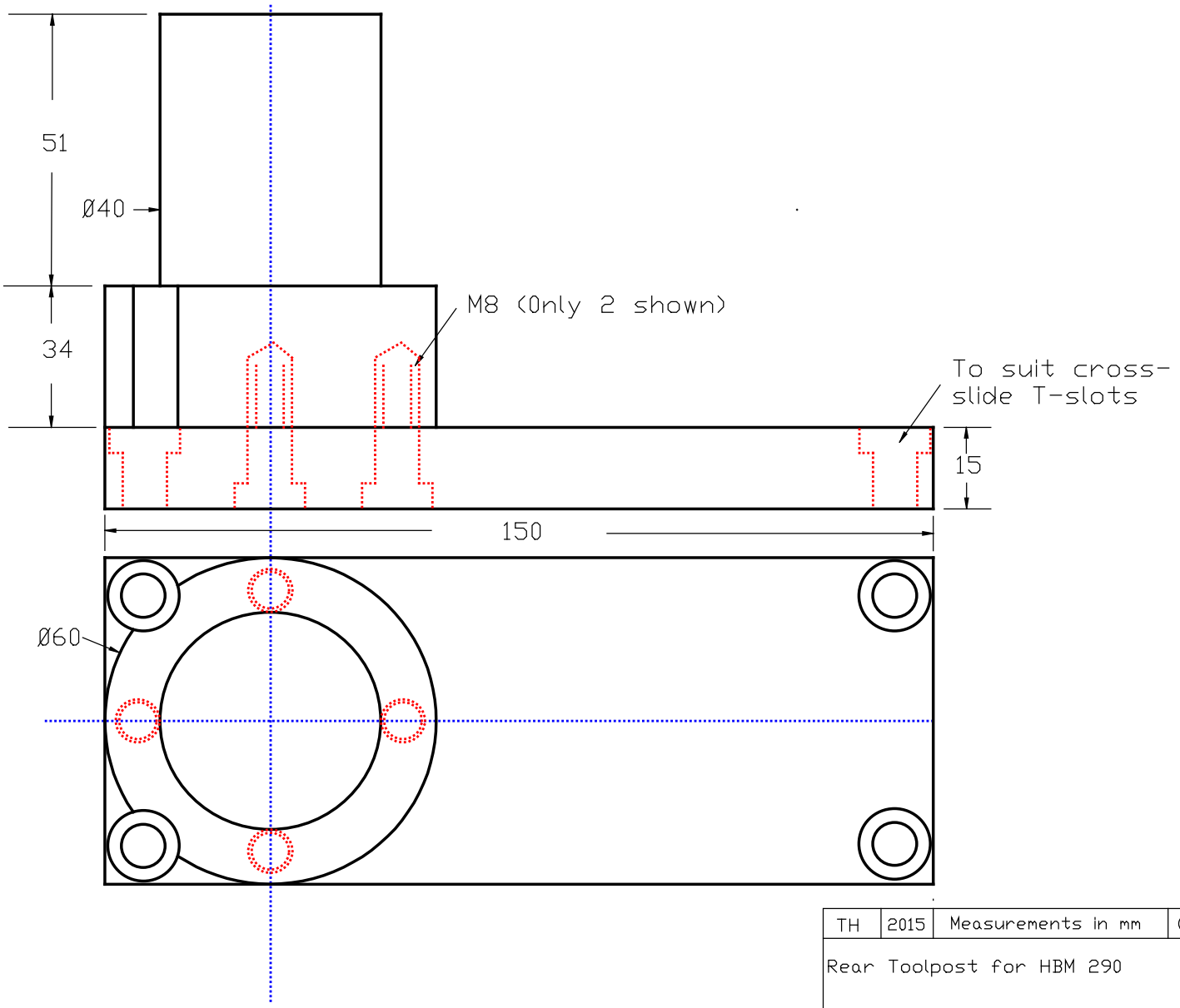
I also drilled a 5mm hole and tapped M6 for a height adjustment screw.

The holder was given a coat of paint and the right photo show the holder mounted on the topslide. I usually use it mounted (upside down) on the rear tool-post.

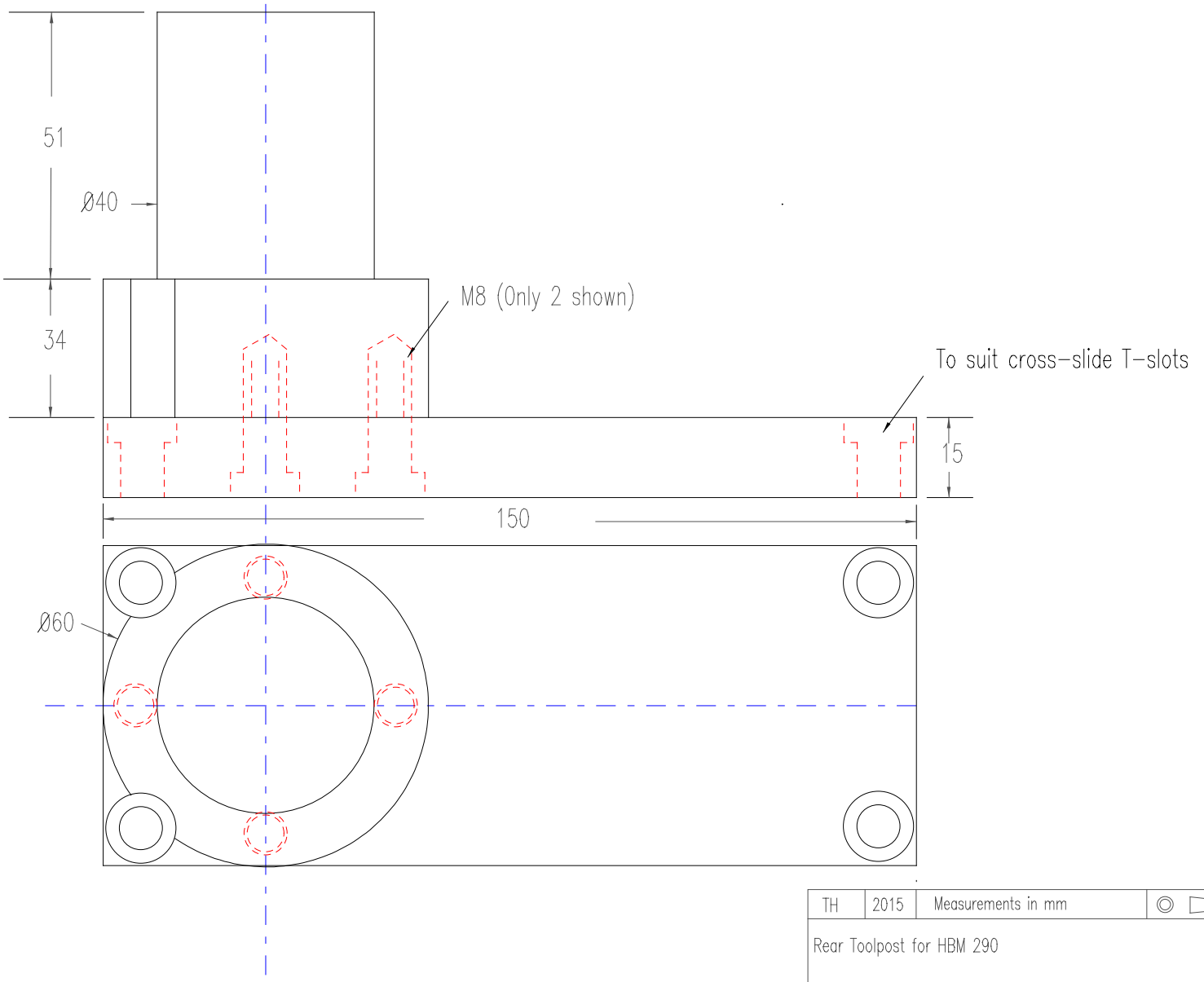

10
Ø40
54
15.5
M8
14
9
36
14
M6
M8
75
Ø22
Ø40
56
75
TH
2015
Measurements in mm
SImple QCTP for HBM 290
Material: Steel

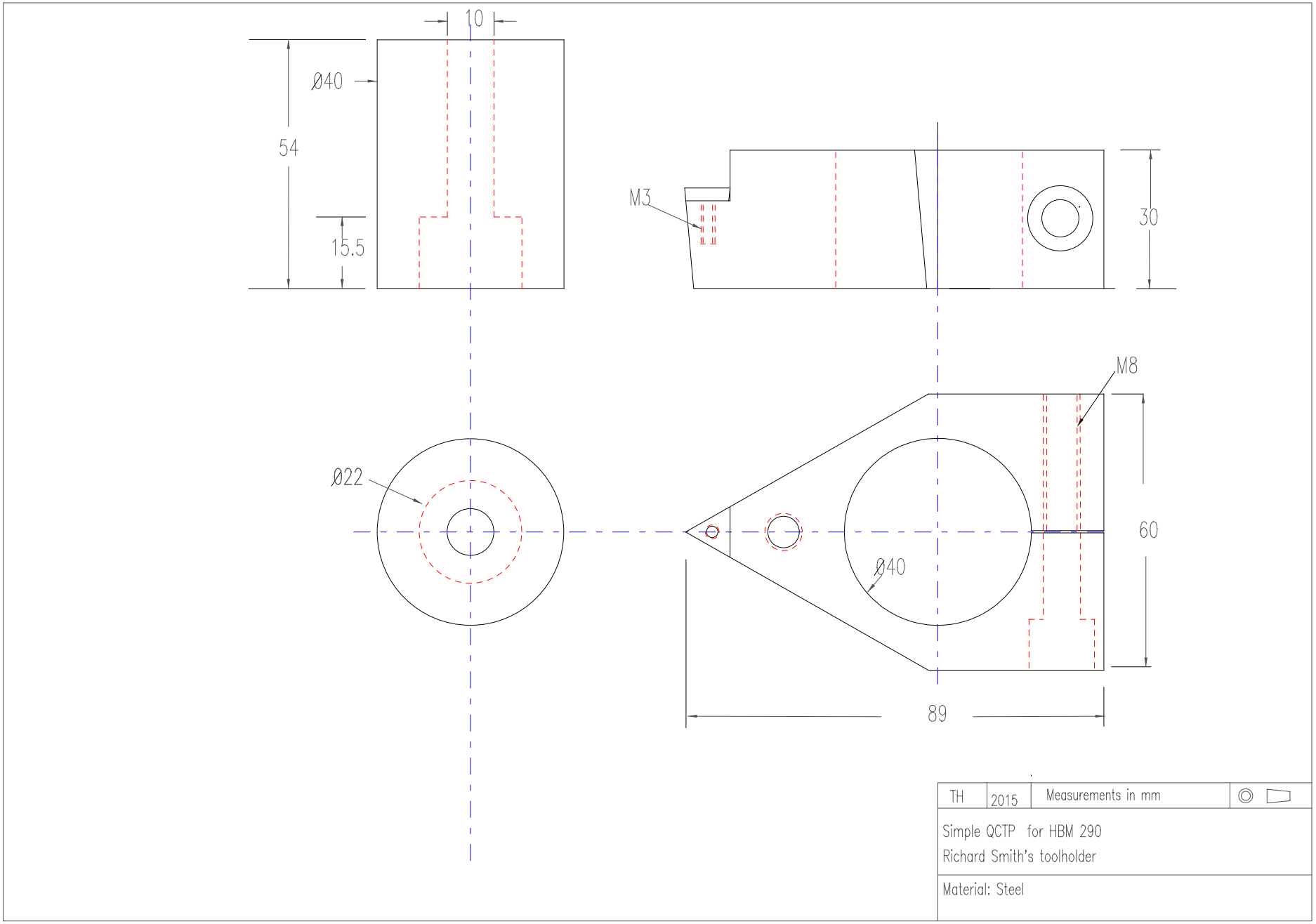


TH	2015	Measurements in mm	◎ ▱
Simple QCTP for HBM 290			
Material: Steel			



TH	2015	Measurements in mm	◎ ▱
Rear Toolpost for HBM 290			
Material: Mild Steel			


51
Ø40
34
M8 (Only 2 shown)
To suit cross-slide T-slots
15
150
Ø60
TH
2015
Measurements in mm
Rear Toolpost for HBM 290
Material: Mild Steel


10
Ø40
54
15.5
M3
30
M8
Ø22
60
Ø40
89
TH
2015
Measurements in mm
Simple QCTP for HBM 290
Richard Smith's toolholder
Material: Steel