Attaching the Bottom Plate to the Ram

by R.G. Sparber

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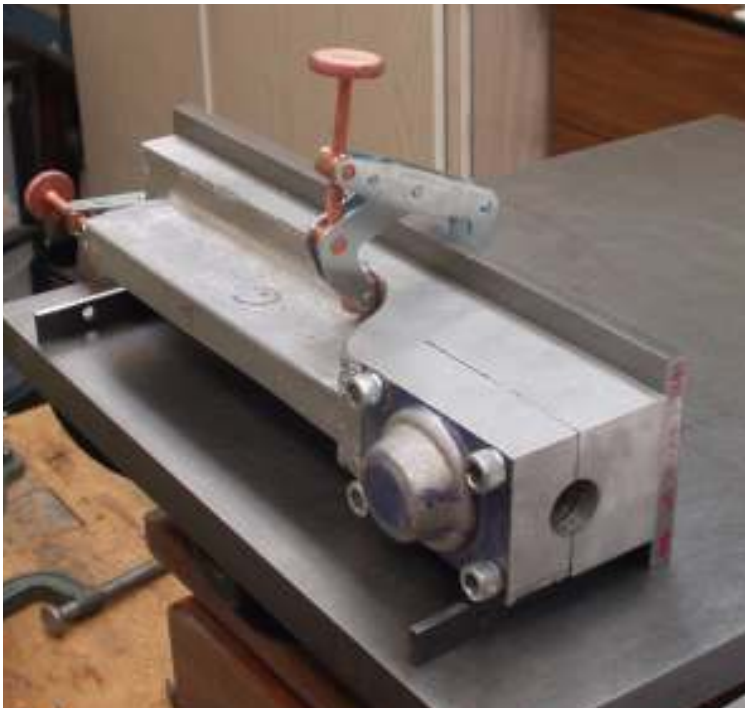
Today I started to attach the CRS plate to the bottom of the ram casting. Gingery calls for 1/4” thick plate but I have chosen 3/8” for added rigidity.

I must position the plate so it is square with the casting and have the casting's non-crank side offset 1/2” from the plate's edge.

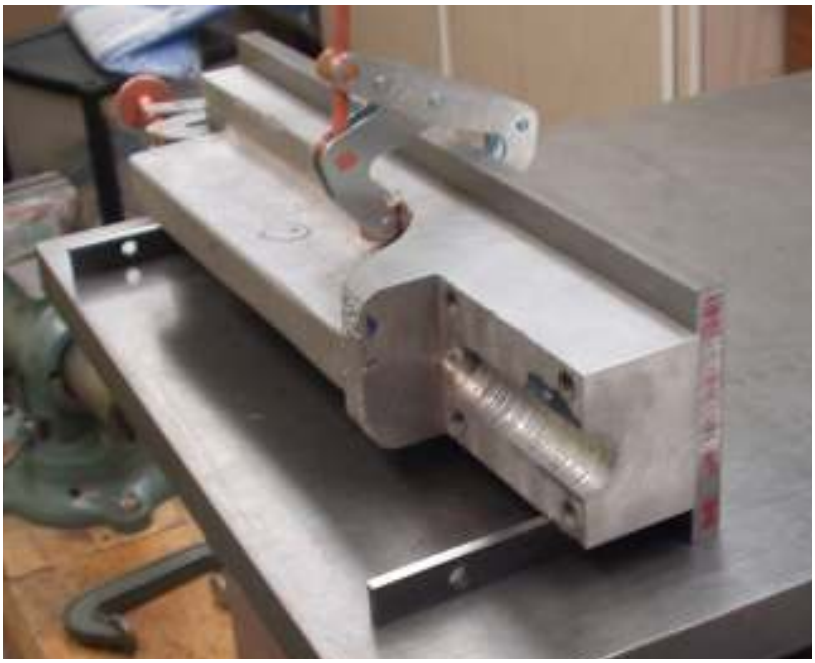
The first step was to put the casting on two 0.500” parallels on my surface plate.

The CRS plate was inspected for burrs and cleaned up as needed with a file. I placed it down on the surface plate to verify it was dead flat. It was then placed on edge on the surface plate and clamped. The front edge of the plate is about 1/16” back from the front of the casting. This offset permits the down feed assembly to contact only the casting.

I then moved the assembly to the mill table and quickly found that that big C-clamp made set up difficult.

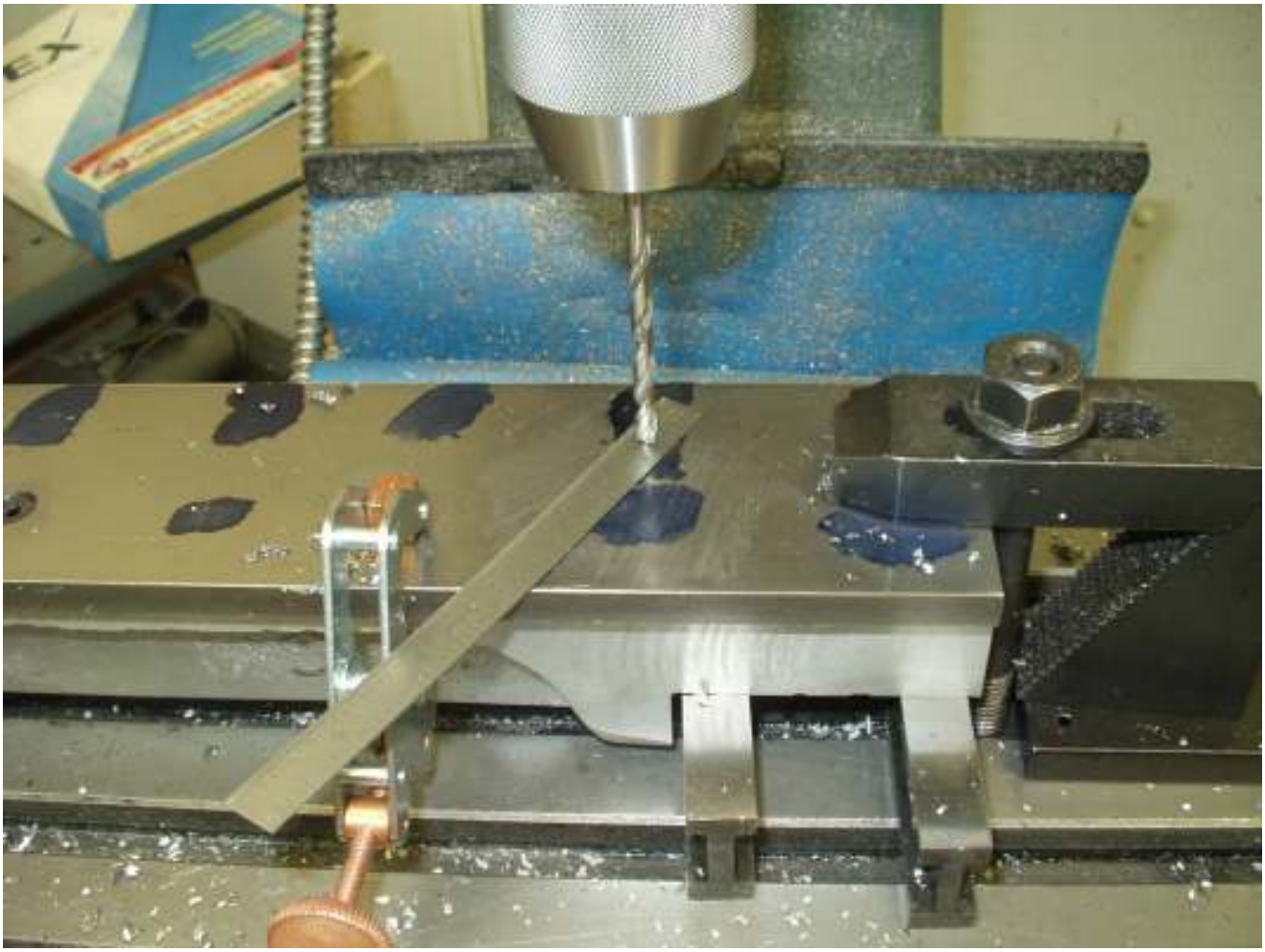


Back to the surface plate where I moved one of the smaller clamps. I was still not happy because I have no simple reference surface facing the mill table.



I finally saw the simple answer – remove the cap to expose a top side reference surface.

The casting can now easily be set up on the mill table. On the right end you see one of two parallels that support the cap pocket's reference surface. I clamped this end down first and then placed jacks on the other end of the casting so they are snug. The plate with casting was set parallel to the X-axis by mounting a spud into the drill chuck and sighting its point along the edge. I am drilling bolt holes here so being with 10 thou is acceptable.

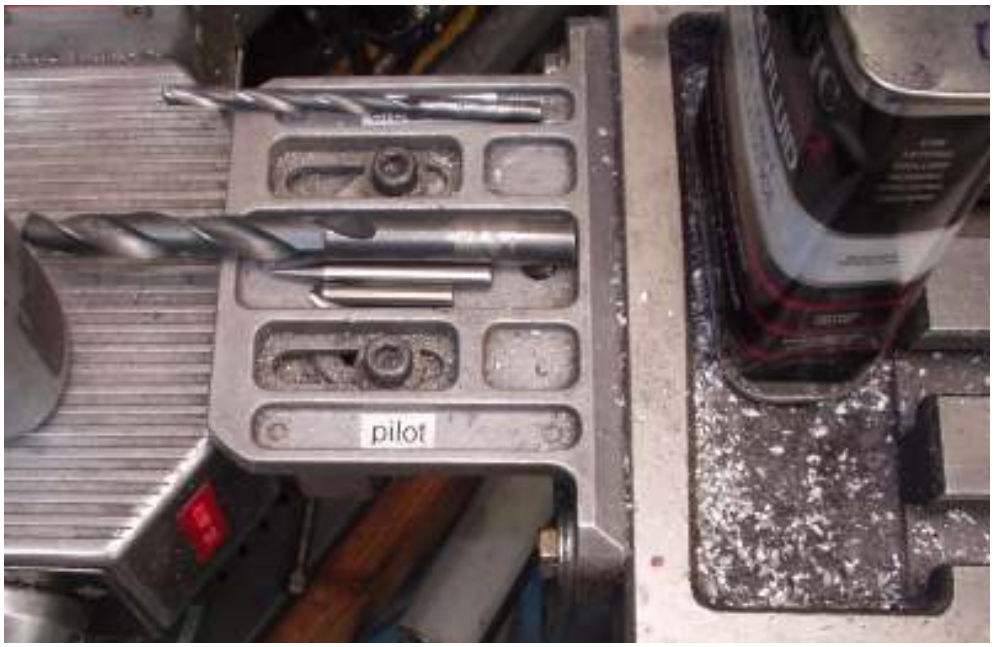


Now you can clearly see the support of the cap pocket with two parallels and a clamp.

I must do a series of drilling operations next and want a simple way to set the various drills. I sketched out the finished hole and then measured the lip to point distance for each drill. I then measured the thickness of my steel ruler. It was then a simple matter to chuck up the proper drill, lower it onto the ruler, set Z=0, and drill to the proper depth.

My first operation is to move to the proper location of the hole. Having a DRO is very helpful but I back this up with layout lines. It is just too easy to drill a hole exactly 1.000” off.

The center drill is used next and followed by my clearance drill, size F. I set Z=0 with the steel ruler. Note that I start with the largest diameter and the point of this drill provides the centering for the next smallest drill. I drill down through the 3/8” steel plate with the drill's point going into the casting. I then chuck up my #7 drill, set Z=0 with my steel ruler, and go in a depth that puts the point of the drill about 0.1” from breaking through the other side of the casting. My final step is to use my 1/2” drill as a countersink. I know, I know, isn't this the largest drill? Yes, but this big drill cuts better with the F size hole showing it the way.



A justified fear for me is that I confuse the different drills. I have learned the hard way that it is best to call out “clearance” and “pilot” in my procedures. Then I place the proper drill in the little marked pockets. I have the pilot drill chucked so you see the reminder tag. There is just a limit to what I can focus on at the same time. Anything that moves me towards fool proof is a help.

As per Gingery's instructions, I drilled and tapped two holes 1/4-20 to secure the plate. Then the Kant-Twist clamps are removed and the remaining holes drilled. I was going to use my tapping head on these blind holes but found it easy to run in a hand tap for the few threads needed. The clearance hole does a fine job of guiding the tap.

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