Assembling the Shaper Column

By R.G. Sparber

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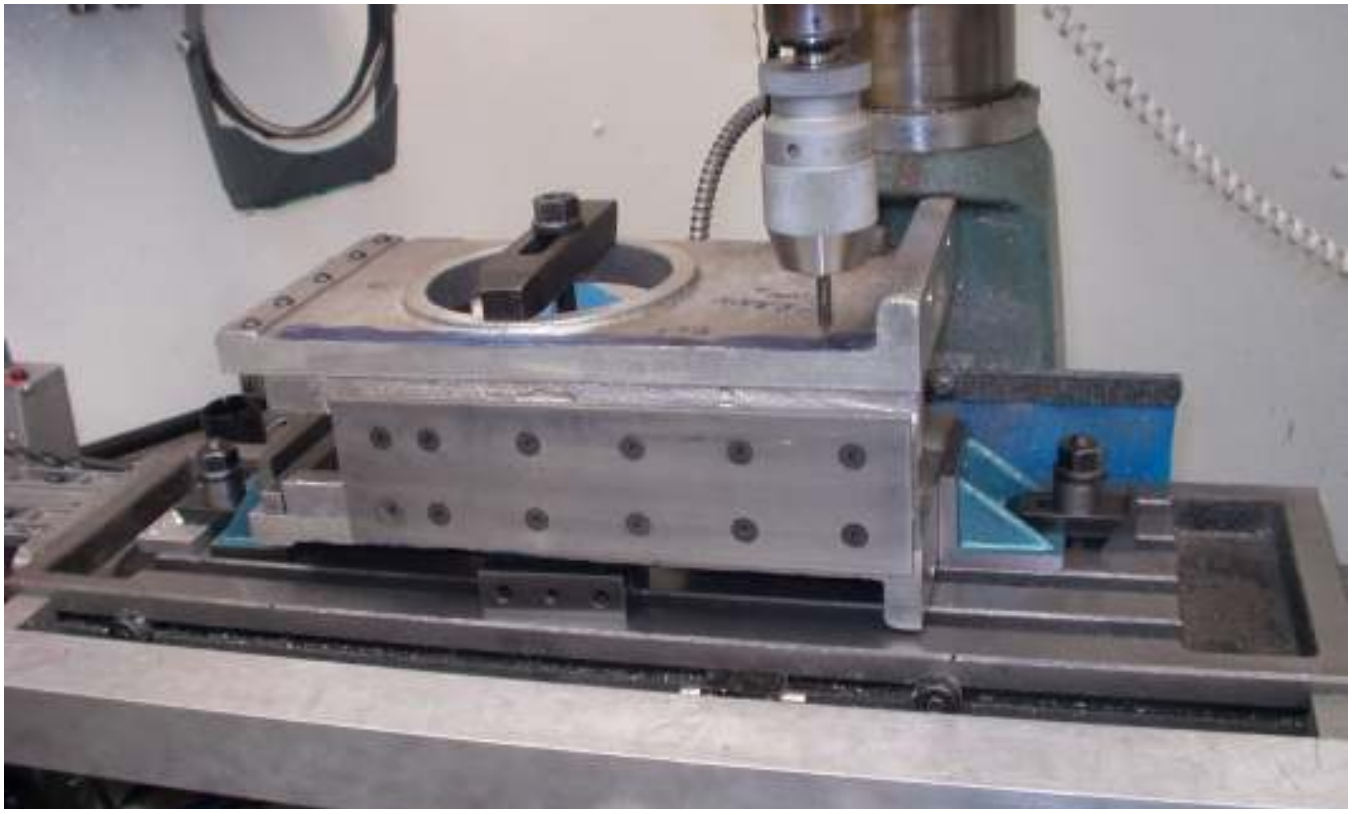
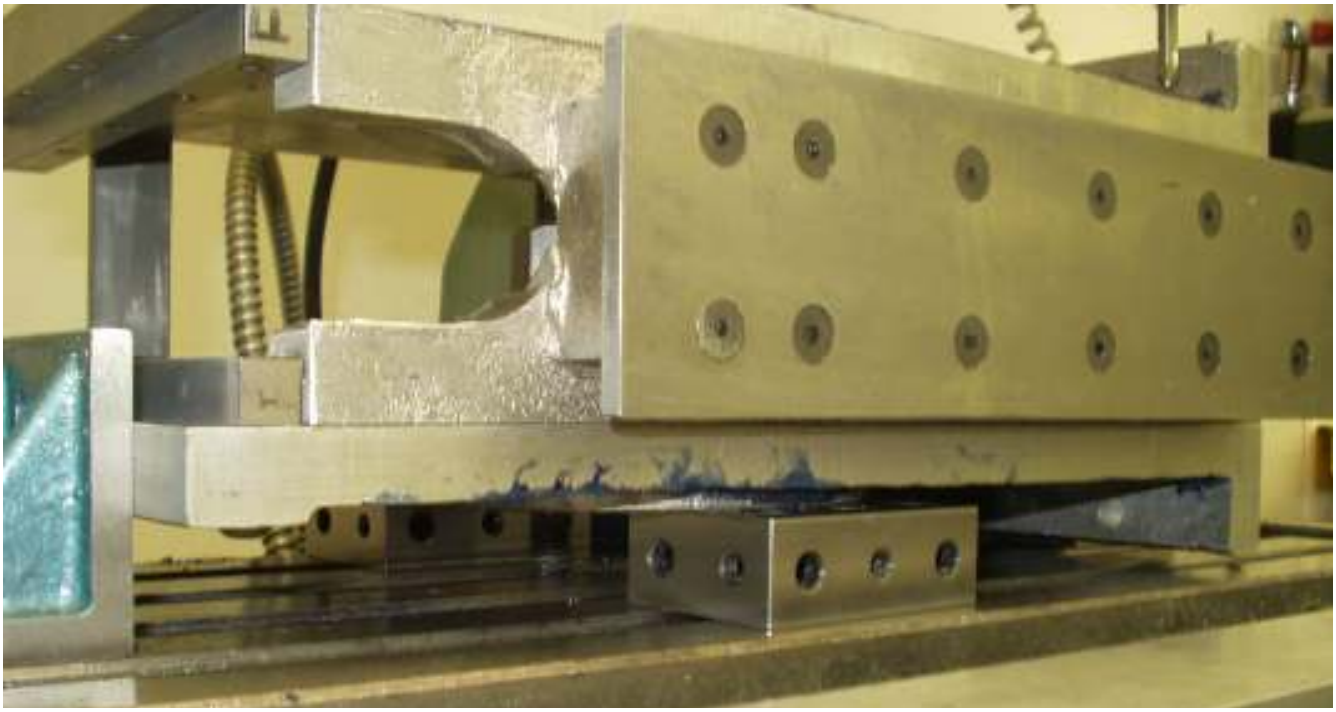
I've done some simple machining that did not warrant pictures. The front column casting was set perpendicular to the ram supports. I then drilled four 1/8” diameter holes and drove in roll pins to prevent any movement between the 3 castings. The spreader rod was installed in the back bottom area and a spreader bar was installed in the back top area.

Both of these additions should have been non-eventful but, alas, they were not. I step drilled the 3/8” holes for the spreader rod and somehow the drill walked sideways without me noticing. That is what I get for using an electric drill rather than the mill or drill press. The holes had to be elongated to get the bar to be reasonable true. You can't see the error but I certainly know it is there.

The spreader bar would have been a quick job but I had a momentary “senior moment” and forgot to lock the head of the mill to the column. As the cutter caught the part, the head swung over and, shall we say, it was not pretty. I was never in harms way and nothing other than the bar was damaged. A quick redesign of the bar and now it looks fine. Gingery calls for a 1/4” x 1” bar but I had 1/4” x 1 1/4”. I milled the area between the side castings so it was 1” and left in 1 1/4” where it attaches to the the side castings.

I was then able to start the process of bolting the 3 column castings together.





The bolt rings are secondary reference surfaces and sure came in handy. I put down two 1-2-3 blocks and clamped the casting to them. You can't see it here, but I have a clamping bar pressing on the top of the lower side plate. A second clamping bar presses on the top of the upper side plate. This second bar is to insure that the top plate does not lift up. Angle plates press on the sides just in case the casting tries to turn.

My column is 3” taller than standard so I added another screw on each side and changed the spacing

slightly.

For each hole I started with a center drill, then ran in my clearance drill. The tap drill came next. Note that the clearance drill's point cuts a center drill like cone that is then used to center the tap drill. I can't recall where I learned that trick but it works well.

I ran into a small problem that was related to my extra thick side plates. I had sized my button head screws for 1/2” plates but then cast 3/4”. I had three choices:

1. do nothing and live with the fact that only about 0.1” of the screw meshes with threads (not a good choice)
2. buy 1/4” longer button head screws (not a good choice because I've already spent way too much on fasteners)
3. counterbore the holes to a depth of 0.2” (the obvious winner)

The only hitch to counterboring is that the button head has a diameter of 0.53”. I want a flat bottom on the counterbore so using a drill is out. I did not have a suitable end mill. Not to worry, I used my boring head and it worked well.

You can see that all but the right most screw sits in a counterbore. That last screw will be replaced by a much longer screw at a later date. The lower end of the table's vertical feed is supported by a small casting held in place by that screw.

Here is a clear view of that lower clamping bar plus a good view of a counterbored screw.

For all of the effort I put forth to buy and adapt my tapping head to my drill press, in the end I just used my hand tap in the drill chuck. I turned the spindle by hand until the tap was solidly in place. Then I turned the tap with a wrench being very careful not to snap it. One side is now done and the other side should not take so long to do. It was just too difficult to secure this large assembly of castings to my drill press table. The tapping head is far too tall to fit on the mill/drill.

I have one more row of screws to install and then it will be time to draw up plans for the next set of castings.

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