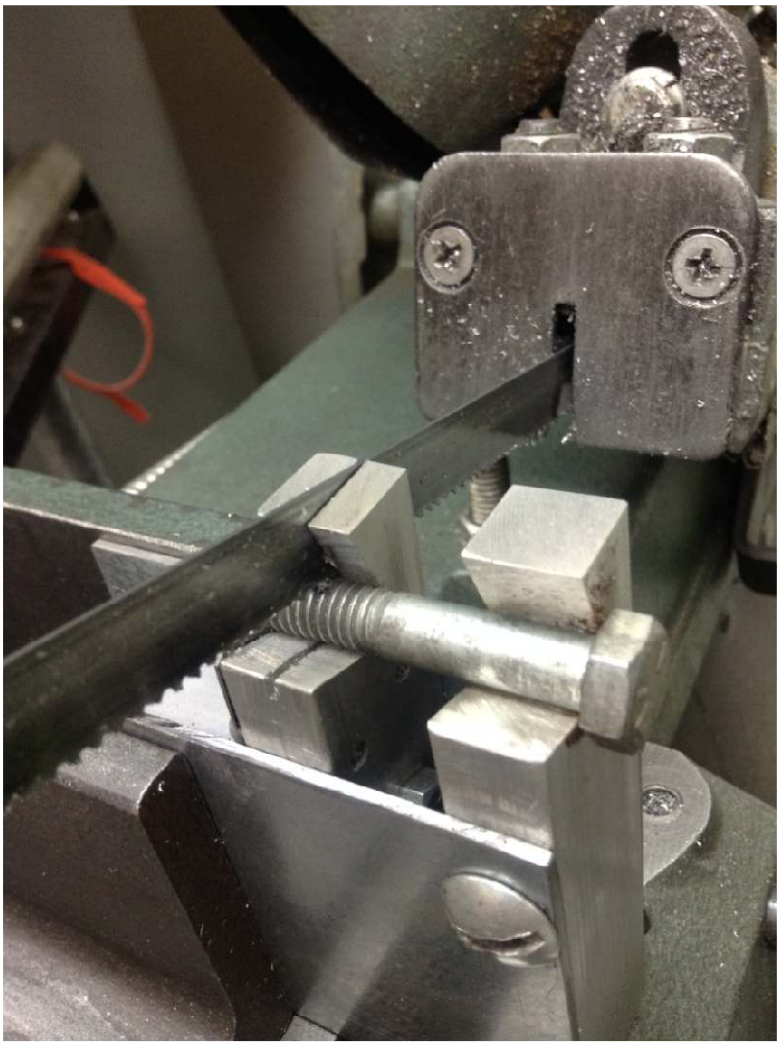
A Universal Bolt Cutter For a Bandsaw, version 1.1

By R. G. Sparber

This project has been design to be built with a minimum of machine tools and skill.

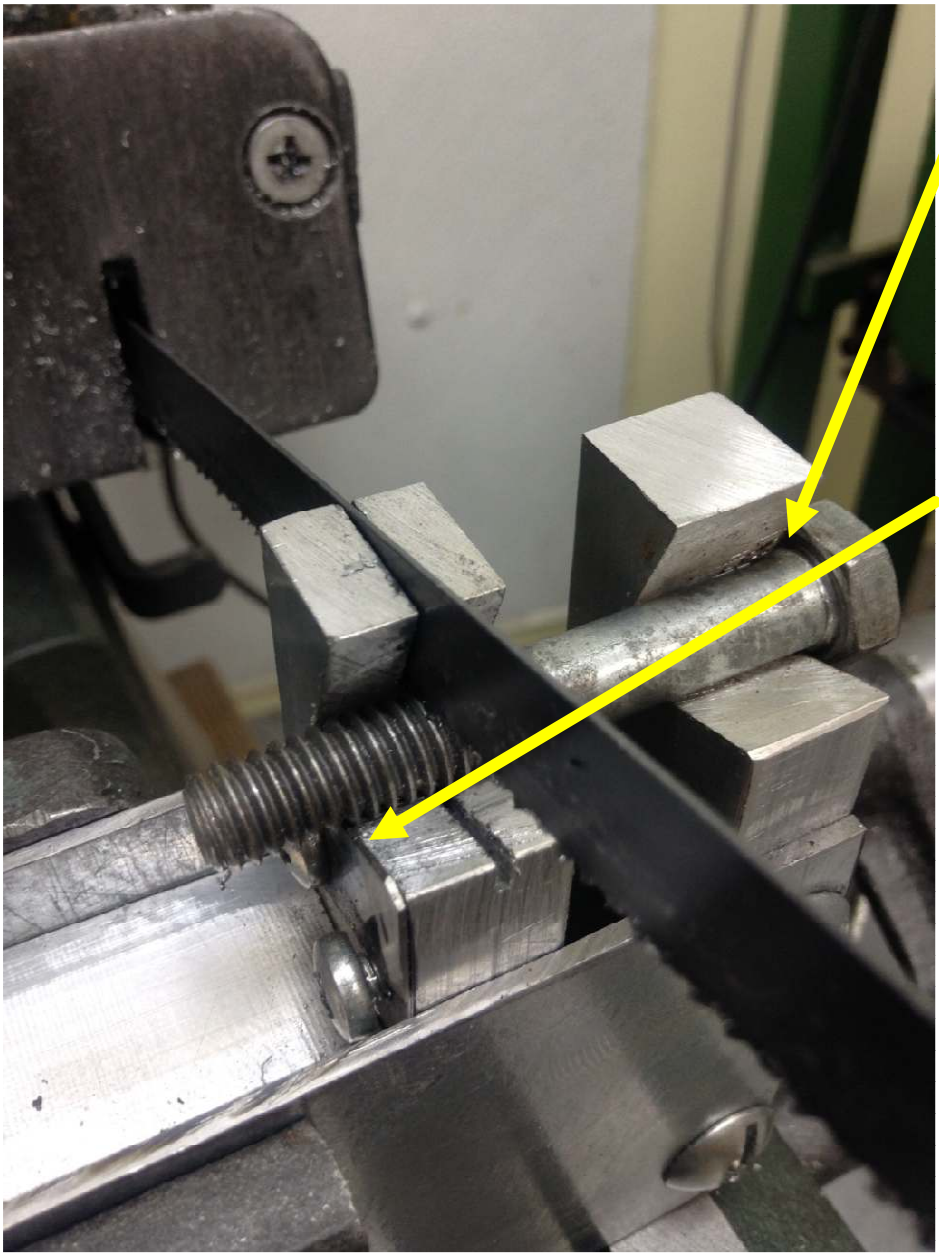
For a good overview of this bandsaw attachment, you may want to see my video on YouTube: https://www.youtube.com/watch?v=9uMnIKKZj4M



This fixture evolved from a previous design that only handled ¼-20 bolts. It can now handle bolts ½" in diameter and smaller both in metric and English. It also references the underside of the head to set overall length.

As with the previous version, the action of the saw blade locks the bolt into position. When done, the cut bolt lifts out and the scrap falls away.

If you are only cutting one bolt, it is likely to be done free hand. But if you need 2 or more bolts to be cut to the same length, this fixture can speed up the task and improve accuracy.



Here you can see the underside of the bolt head snug against the right face of the outer V support.

A short length of hacksaw blade is bolted to the left face of the inner V support. The top edge has been ground to approximately a 60° included angle to match the profile of the thread.

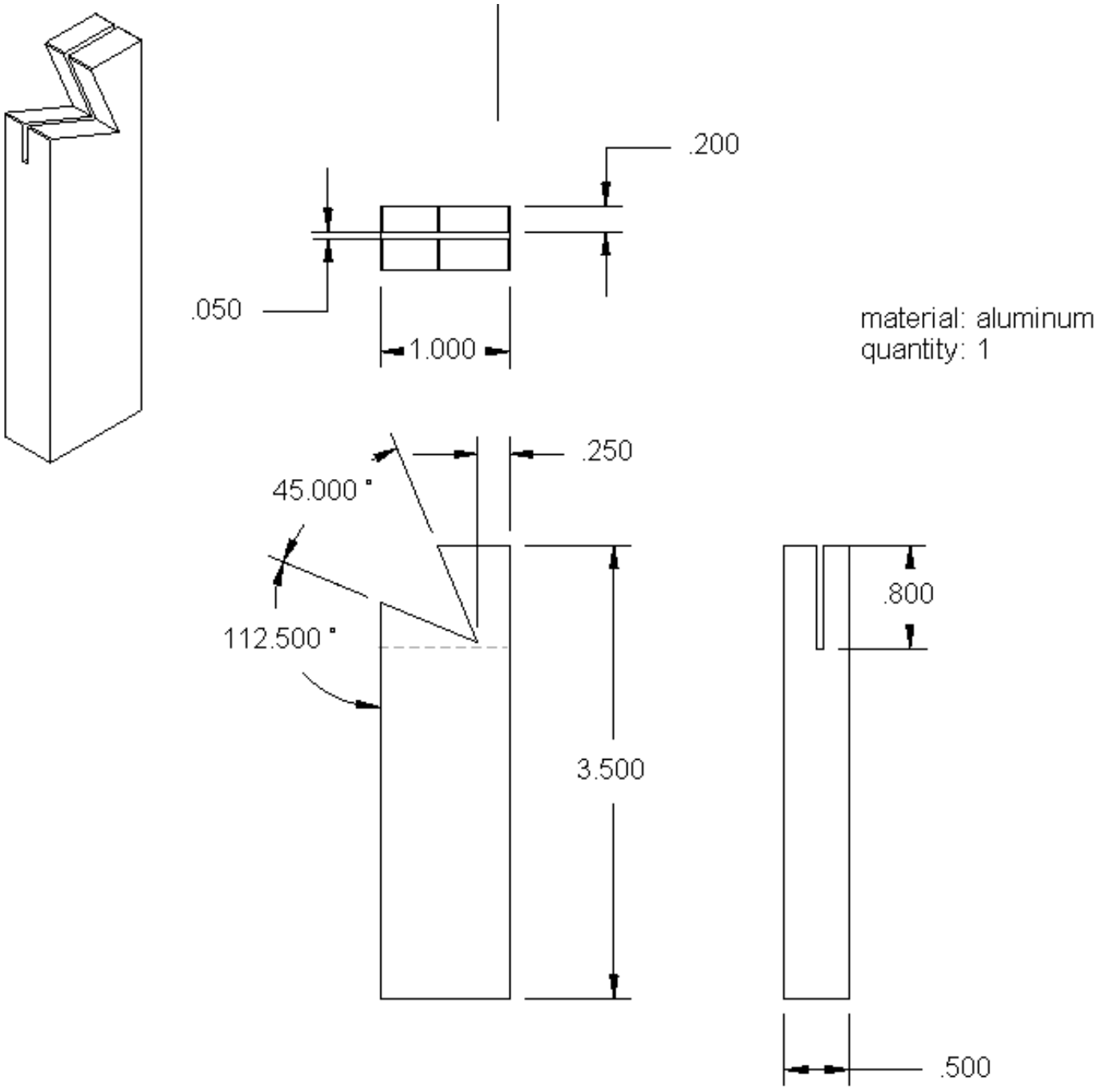
If the underside of the head is not in contact with the right face of the outer V support, the action of the saw blade will cause the bolt to turn clockwise as viewed from the right face. The short piece of hacksaw blade acts as a nut and draws the bolt to the left. Once the head is contacting the outer V support, rotation stops and the saw cuts through.

With the bolt cut through, the user can easily lift it out. The scrap is also free to be removed if it does not fall out.

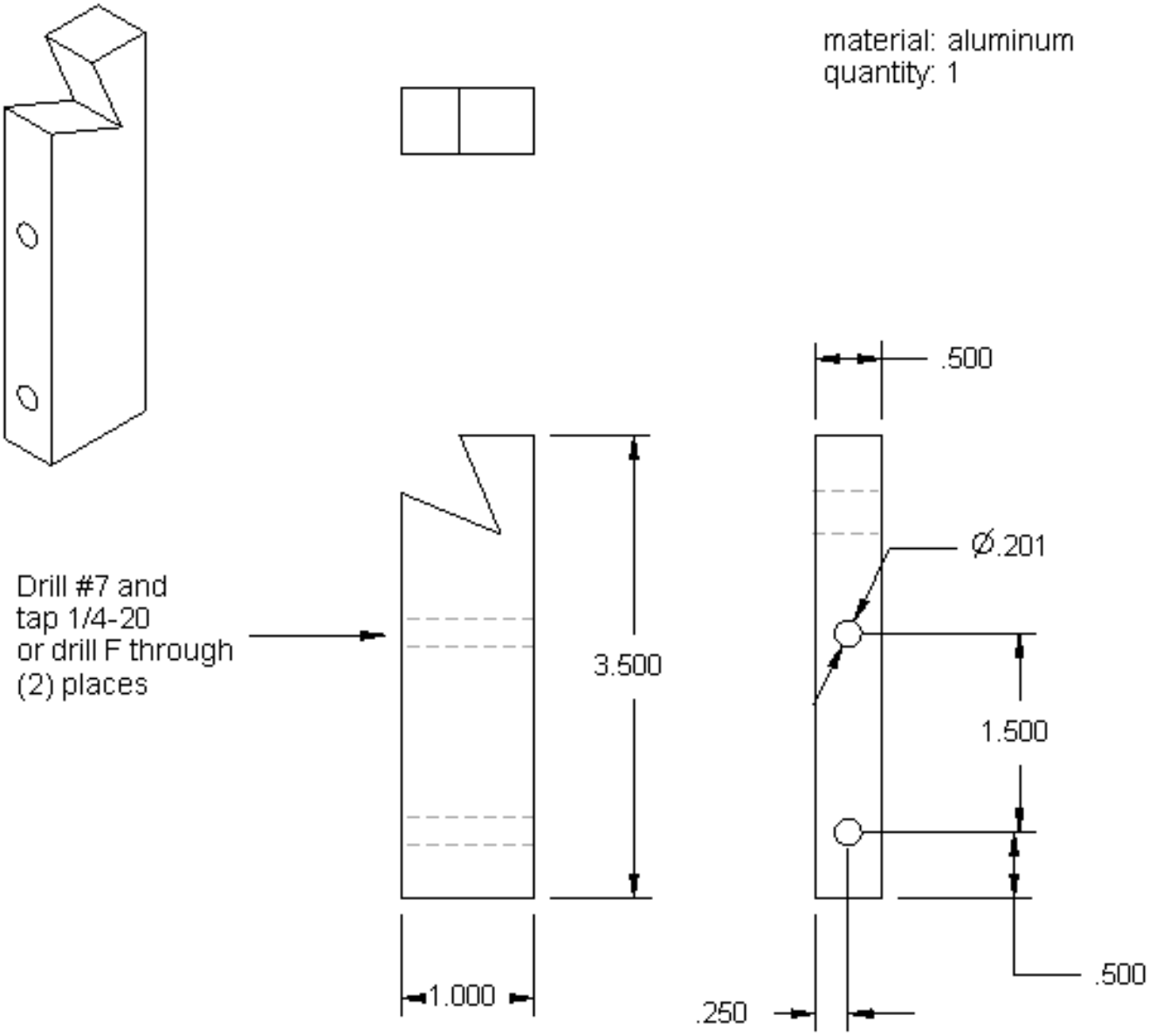
Shop Work

I will assume you own a bandsaw plus a few common hand tools. Although I do drill and tap a few holes, it is easy to change the design to avoid tapping. The shop drawings are presented first and that may be all an experienced hobbyist needs. But for further help, keep reading.

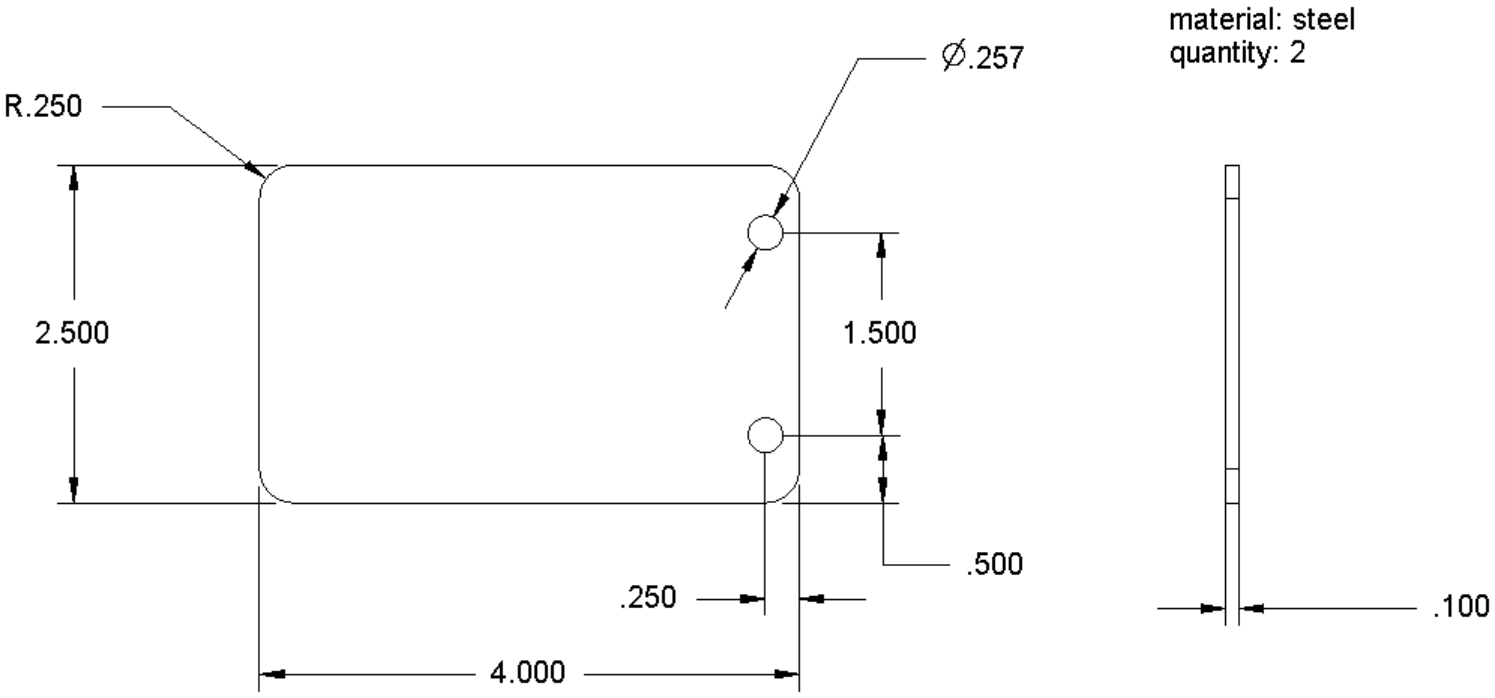
Left Support



Right Support



Side Plates

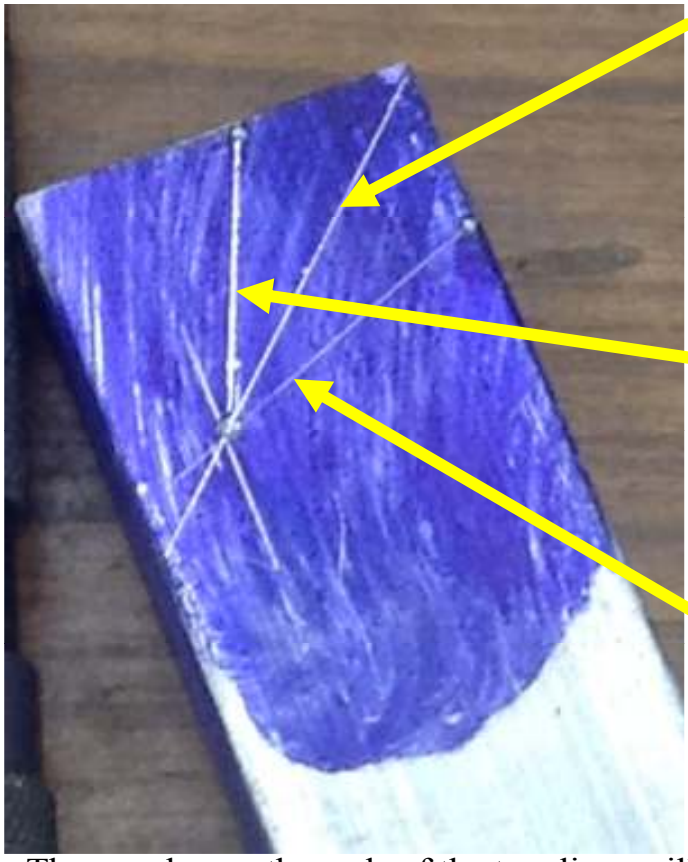

material: steel
quantity: 2
R.250
Ø.257
2.500
1.500
.500
.250
4.000
.100

Shop Procedure

Using ½" x 1" aluminum bar stock, I cut a piece 3.5" long. Then I used that piece as a measure to set the distance for a second piece. Note that the workpiece is laying flat on the vise ways. On my bandsaw, cutting it this way reduces the tendency for the blade to wander.

Use a file or emery cloth to remove all burrs.

The V was cut next. I used a square, a digital caliper, a protractor, and a spring loaded punch to mark out where to cut. A steel rule could be used in place of the caliper. Accuracy is not that important here.



Using the square's 45° end, draw a line from a corner to the far side of the workpiece. Then scribe a line ¼" from that far side that intersects the diagonal line. Use the punch to mark this point. It will be the bottom of the V.

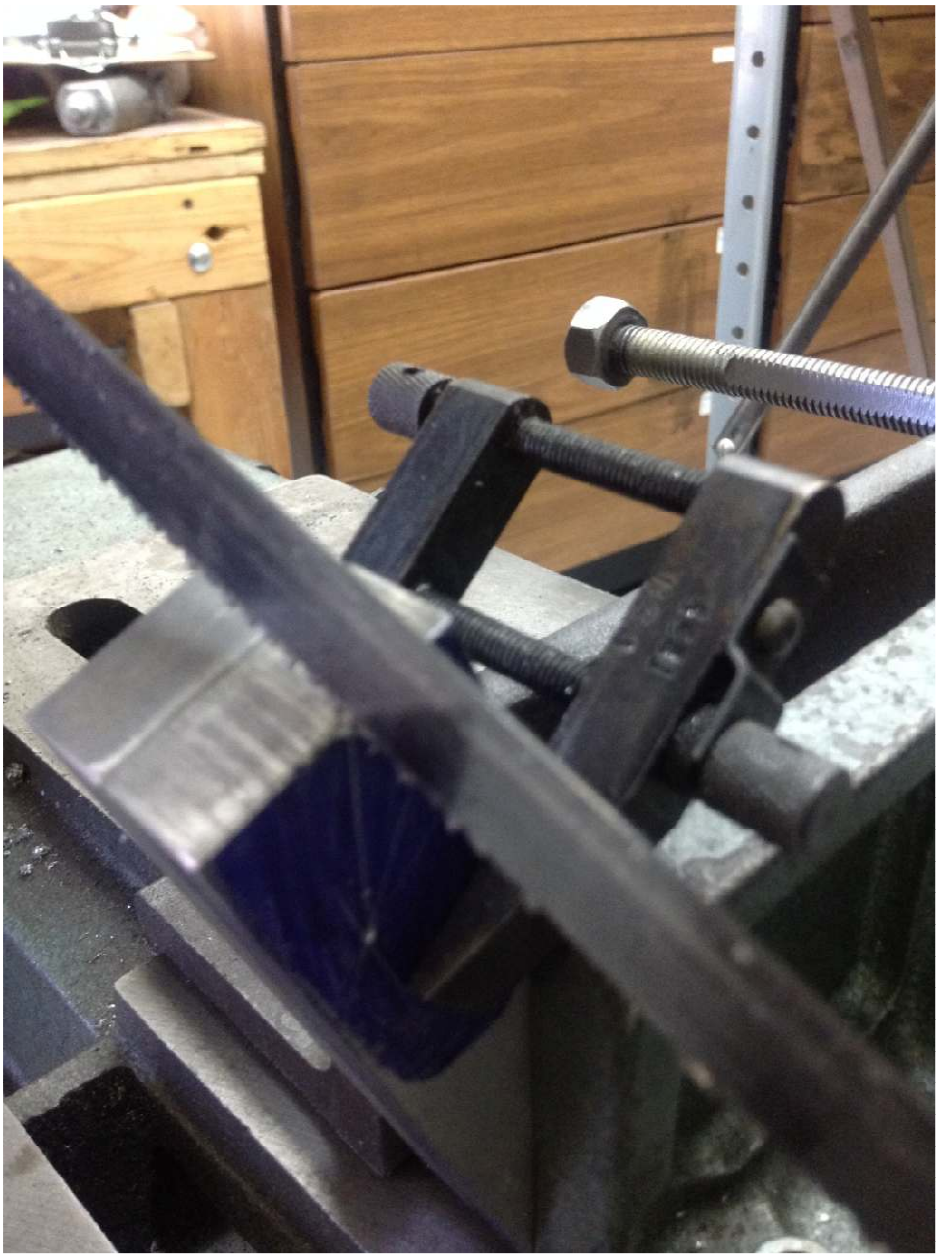
Next, use the protractor to draw a line from the punch mark that is about 22° from the diagonal line heading towards the end of the workpiece. Punch the end of this line.

And finally, use the protractor to draw a line from the first punch mark that is -22° from the diagonal line heading towards the right edge of the workpiece. Punch the end of this line.

The punches as the ends of the two lines will help you place the saw at the correct location. You may also want to use a small file to mark the top and side for even better visibility.

The second workpiece was clamped to the first one. By using two clamps, I could move one at a time and not lose alignment.

I then cut both blocks at the same time. The result was two Vs that are identical. No measuring yet precise alignment.



The two work pieces were placed in the band saw's vise such that the first line could be cut. The punch marks were facing the pivot of the saw.

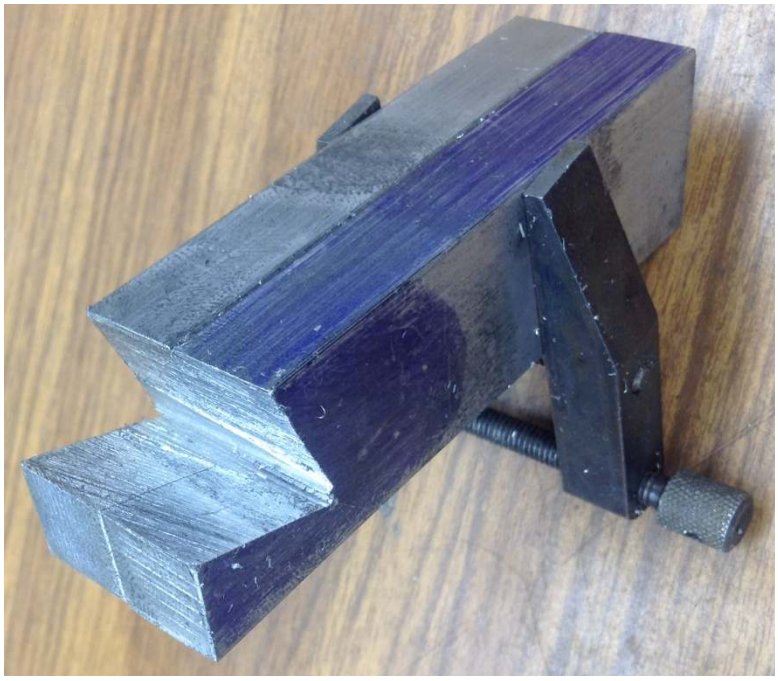
Having a punch at each end of the line made it easier to align the parts to the blade. I used a small square to verify the scribed line was at the saw blade and the two punch marks were aligned vertically.

Saw such that the kerf is inside the V.

I cut through both work pieces until the blade reaches the lower punch mark.

The work pieces were removed from the saw's vise and I freehand cut to the punch mark.

Repeat the process for the second cut.



I then had two work pieces with identical V cuts in them. You could smooth the surfaces with a file if you like but take care not to open out the bottom of the V.

How you drill the side plates depends on if you plan to tap the mounting holes.

If you do plan to use a tap, then clamp the plates together and drill through.

If you plan to use bolts all the way through, then drill holes in only one plate.

Here you see both holes center drilled. I then followed up with a #7 drill. I know, the plans call for an F drill. You will soon see the strategy.

I used a block of steel to help me align the first side plate with the face of the right support block. A clamp was then applied to hold that position.

I then took the assembly to my drill press and drilled ***one hole*** through the side plate and all the way through the right support block using my #7 drill. Since the holes in the side plates are #7, I retain alignment. Had I drilled out with my F drill, how could I center the #7 that had to go through the block?

Why drill only one hole? The answer will become obvious soon enough.

The block went into my vise with the side were flush with the top of the jaws. I then squirted a little cutting fluid into the hole to make tapping easier.

I used a tapping handle with built in perpendicular support. Although you can't see it, I was using a spiral point tap. They work much better than the old hand taps.

Only tap in ½" on each side or, it your tap is long enough, run the tap all the way through from one side. You do not want to run the tap most of the way through from one side and then try to match the thread from the other side.

The corresponding hole in the side plate is now drilled out with an F drill.

The clamp was then removed and I ran a bolt through the side plate and into the threaded hole in the block. With the end of the block resting on the table and the plate's bottom edge also resting on the table, I tightened the screw. This insures proper alignment of the plate and block on the bottom.

I went back to my drill press and drilled the second hole with my #7 bit.

Notice what was going on here. The first bolt was in place and I just drilled the tap hole for the second bolt. This guaranteed that the two bolts fit correctly. If I did it blindly by just using measurements, it is likely that something would be off enough that a hole would have to be enlarged or filed to an elongated shape.

After the second hole was tapped, I opened out the hole in the plate with an F drill. Keep track of which hole in the plate goes with which hole in the block. If you discover that something is not square, try flipping over the plate. You may have mixed up the holes.

I repeated the procedure for the other side with one exception. The block was set vertically and the second side plate bottom edge rested on the table top. This was done to insure that the bottom edges of the two side plates were aligned.

If you plan to run bolts through the body, then drill the first side plate with an F bit. Clamp it to the right support block as described above. Then use the F bit to drill all the way through the block. Clamp the second side plate on making sure the bottom edges of the side plates are aligned. Then run the F bit through the first side plate, through the block, and through the second plate. Run a bolt all the way through and secure it with a nut. Repeat for the second hole.

Thread Plate

Here is a particularly ratty piece of old hacksaw blade. Of course, I rarely throw things away and now it is just what I need.

I didn't need the entire length so used my grinding wheel to score both faces about 2" from the end. I did preserve the rounded end and mounting hole. It then easily snaps off.

I then used my belt sander to grind a 60° included angle into the non-tooth edge. The tooth edge was ground smooth on my grinding wheel.

I could have used a lot of math to figure out exactly where to place the thread plate. But the direct method is far less work. I took a ¼-20 bolt and place it in the V. Then the beveled edge of the hacksaw blade was pressed into the threads so the bolt could not slide in and out. The clamp was then loosely tighten to the hacksaw blade.

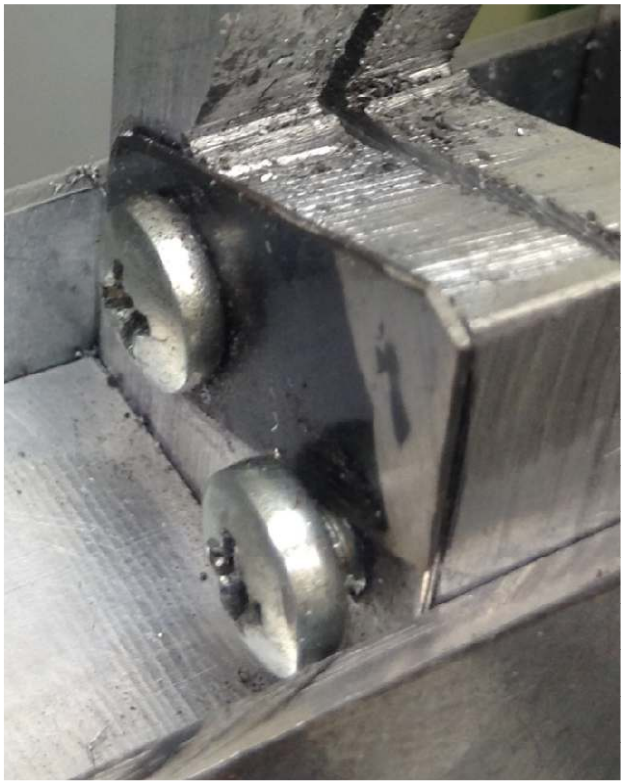
I repeated the process with a ½-13 bolt or hold down stud. Rechecked the position with the ¼-20. When satisfied, tightened the clamp.

Selected a drill bit who's end snuggly fits through the hole in the hacksaw blade. Drill in enough to form a small cone.

Then used a #36 drill and went all the way through the block. Tapped 6-32.

Alternately, I could have drilled a clearance hole for a 6-32 and run a bolt all the way through.

Then I would have secured the hacksaw blade with a nut on the back side. Place a 3/8-16 bolt in the V and pivot the thread plate until the bolt does not slide. Tighten the screw.



I used a tap, so ran a #36 drill in to form a hole that flanked the bottom edge of the hacksaw blade. The idea is to prevent the blade from sliding away from the bolt resting in the V. Note that this second bolt was not tightened all the way into the thread plate. When I did that, it pushed the hacksaw blade up. As shown, the hacksaw blade is solidly mounted.

Note that the force on this piece of hacksaw blade tends to pull it tighter to the support block.

I then ground a slot into the face of the hacksaw blade just beyond the edge of the block with my grinding wheel and snapped off the excess. Using my belt sander, I ground the edge flush.

Acknowledgments

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I welcome your comments and questions.

If you wish to be contacted each time I publish an article, email me with just "Article Alias" in the subject line.

Rick Sparber
Rgsparber.ha@gmail.com
Rick.Sparber.org