Pop Rivet Drill Guide, Version 1.0

By R. G. Sparber

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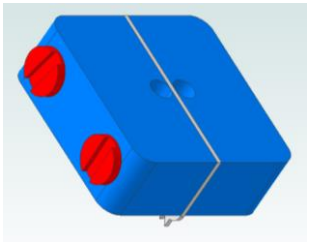
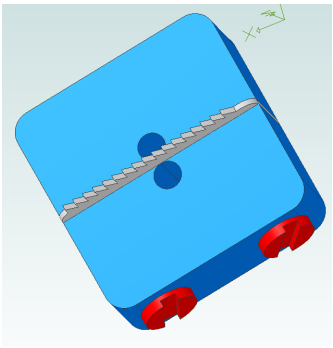
When I drill out Pop Rivets, one of these happens:

- The rivet falls out, and nothing remains on the drill (rarely)
- The rivet falls out, and the top of the rivet rings the drill bit. It is a PITA to get that ring off of the drill (often).
- The entire rivet spins and no further drilling is possible. This fault condition occasionally happens, and removing the rivet takes a lot of effort.

A new project is coming that will entail the drilling out of hundreds of such rivets. Now is the time to find a solution!

The resulting tool was an amusing combination of prototyping, mistakes during fabrication that turned out to work well, and problems with my CAD tool that I liked.





I'm showing you my CAD rendering because my prototype isn't as good a design.

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To use the tool, I slide my 1/8th inch drill bit through one of the holes. The teeth face towards the point of the drill.

You are viewing my overly complicated prototype.

I then place the drill point into the rivet and press down on the tool. The teeth dig into the face of the rivet.

Drill into the rivet while firmly holding the tool down until you break through. The rivet will not spin, and the top of the rivet will not ring the drill.

One handy trick is that I'm using ½-inch wide bandsaw blade. It is soft steel except for the teeth. This makes the drilling of the holes through it easy[2].

I used a file to cut part way through the flank of the bandsaw blade and then bend it back and forth until it broke.

Although these pictures show the prototype, you should be able to figure out how to apply the techniques to the CAD rendering shown on page 1.

[2] Drilling through hacksaw blades can be done if it is first annealed. The trick is to not also soften the teeth.

After laying out one of the bars for the four holes (two on the final design), I set up my drill press with a fence and located the first punch mark with my floating center drill cover[3].

I'm using my Floating Vise Jaw, which is particularly handy.

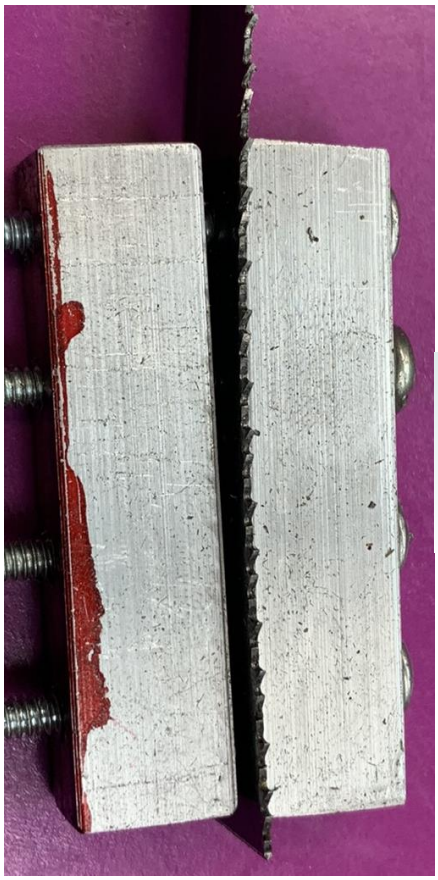
I then used my center drill, followed by my #36 drill (6-32 tap hole) for each hole. All holes were deburred.

I placed the drilled block on the other block and aligned the ends. Then, I used the #36 drill to pass through the top block and drill the lower block. I had to be careful not to "tag" my vise ways on the end holes.

I then opened out the top block holes using my #27 (6-32 clearance) drill and tapped the bottom block 6-32. (In the prototype, I screwed up and started with the #27, so tapping the lower block was not an option.)

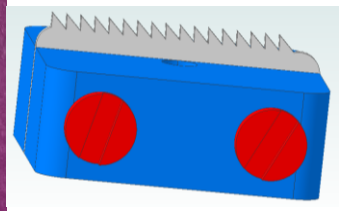
[3] The cover is a cylinder that is a close sliding fit to the center drill and has a fine point cut into it. I can quickly slide on this cover to accurately see the where the center drill will cut.

Again using the top block as a guide, I drilled matching holes in the bandsaw blade. The trick was to hold the blade down while clamping the block horizontally. I did this with my holdown clamp on the Floating Vise Jaw.

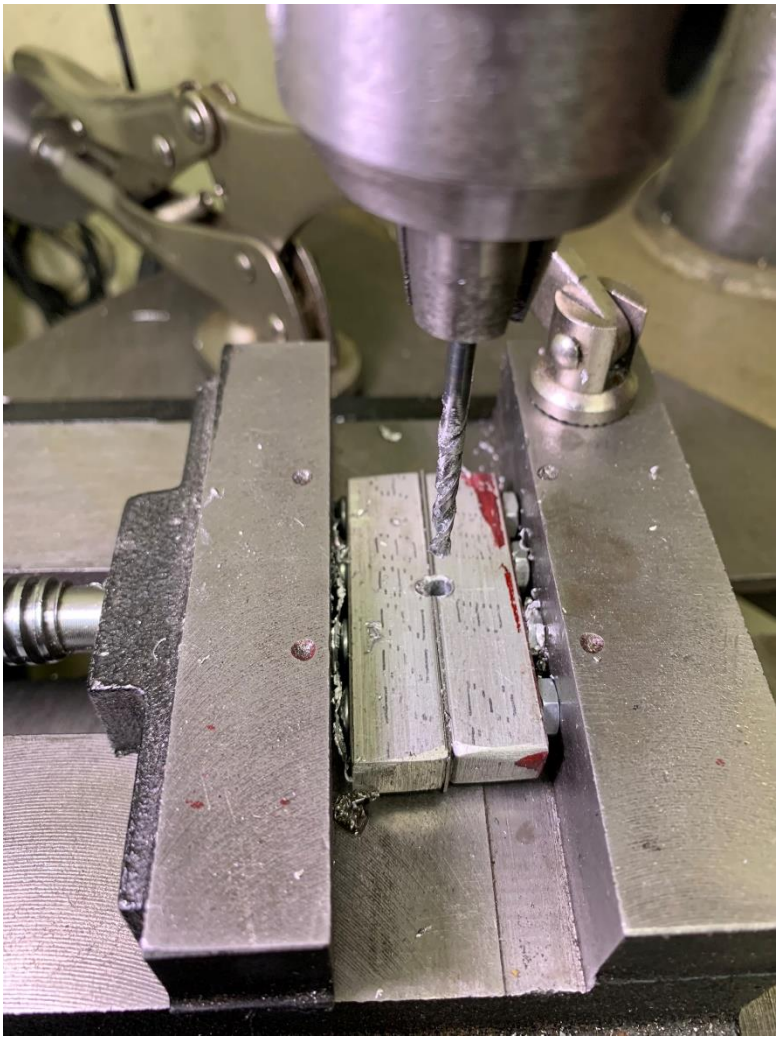


The four bolts smoothly passed through the assembly since I used the top block as my template for all other holes.

I marked the bandsaw blade as it exited the block and cut it to fit.



I then used my belt sander to remove teeth near the ends to reduce the chance of me getting stabbed.

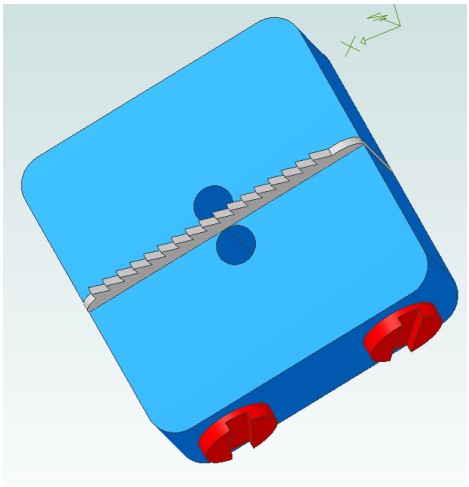


Here is where a screw-up became a feature.

I intended to drill between the aluminum blocks at the center of the steel blade. The idea was that the steel blade would be cut in two, and I would end up with two small pieces of saw blade flanking the hole.

This can’t work because the drill deflects off of the steel and cuts entirely into the softer aluminum.

Ah! This hole placement is better. With the sawblade in one piece, I don’t need four bolts; two will secure it.



As I tried to render the single hole in my 3D CAD program, I encountered a problem since I had used the block twice in the drawing. Movify one block, and the other has the same feature. Oh! I want that.

I can drill a second hole on the other side of the blade. It gives me a two guidehole, doubling the tool’s life.

If I expected to use two different drill sizes, I would drill this second hole using the other drill bit.

Looking at the finished tool, you wouldn’t know that many of its innovations started as mistakes.

I drilled out a few Pop Rivets, and the tool worked as expected. It will be getting a heavy workout soon enough.

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