

Bolt Cutting Fixture and Bevel Fixture, version 1.1

By R. G. Sparber

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This fixture lets me cut 1/4-20 bolts on my horizontal bandsaw quickly and safely.



First the stop is set for the desired bolt length. Then a 3"

long 1/4-20 all thread bolt is inserted into the recess in the stop. When the bolt is pivoted so it rests in the bottom of the slot, the running bandsaw blade is lowered through the slot and onto the bolt. This action causes the bolt to rotate. Because of the threads in the bottom of the slot, the bolt snugs up on the stop and is locked into position until cut through. Then the bolt is lifted out and the scrap falls away.

To see the fixture in action, see the YouTube video:

<http://youtu.be/xaocJBTeLmU>

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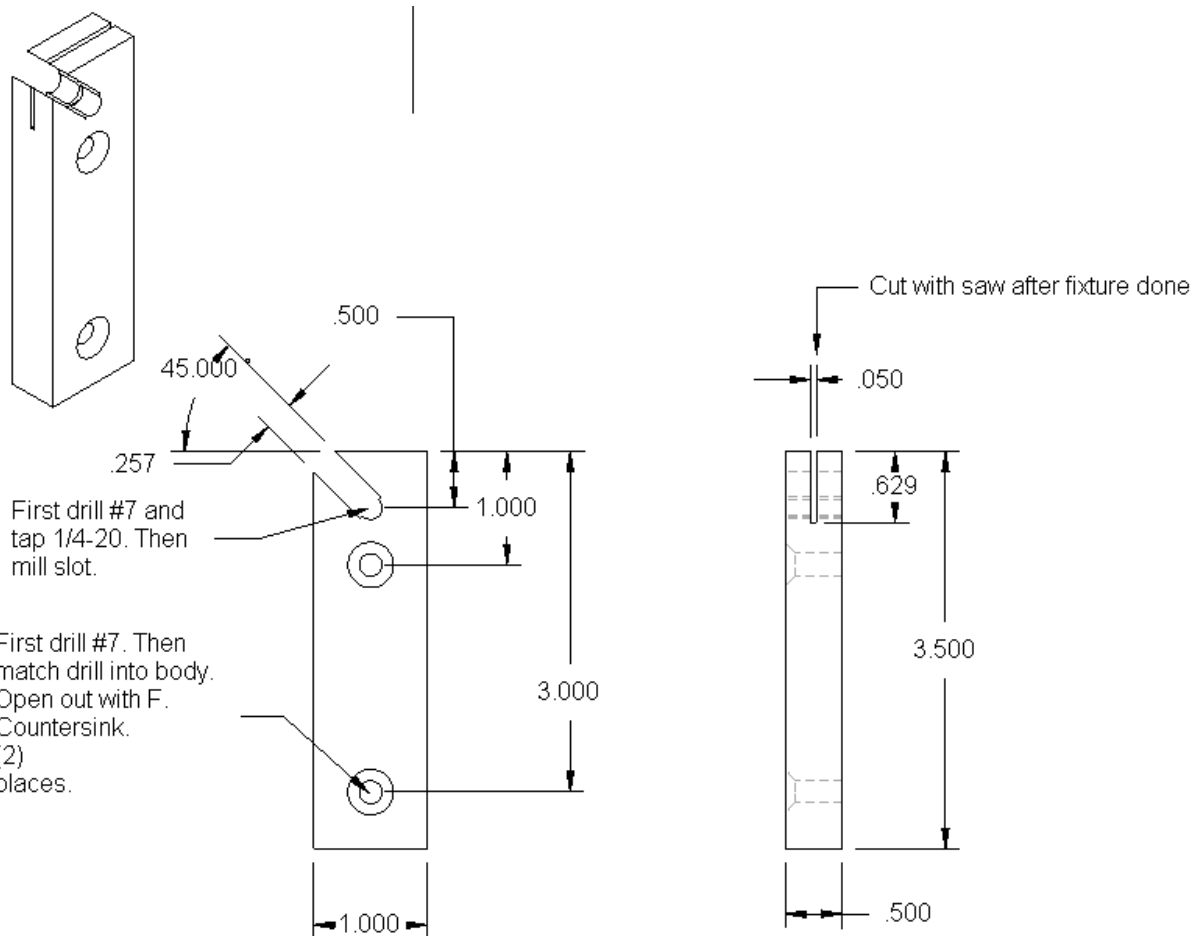
The back story:

When the Ace Hardware® just 2 miles from my shop closed, I was forced to drive 7 miles to the nearest Home Depot®. After one such trip, I decided there had to be a better way to at least have a good selection of 1/4-20 hex head bolts. I started to stock pile different sizes but that got expensive rather quickly. So instead I bought a bag of 150 1/4-20 hex head 3" long bolts on eBay. Total cost was \$21. All I needed was a quick way to cut bolts to length as needed. That was the genesis of this fixture.

Bolt Cutting Fixture

This fixture consists of two bars of steel, a block of aluminum, and a length of 3/8-16 threaded rod. Optionally, a knob can be added to make turning the rod easier.

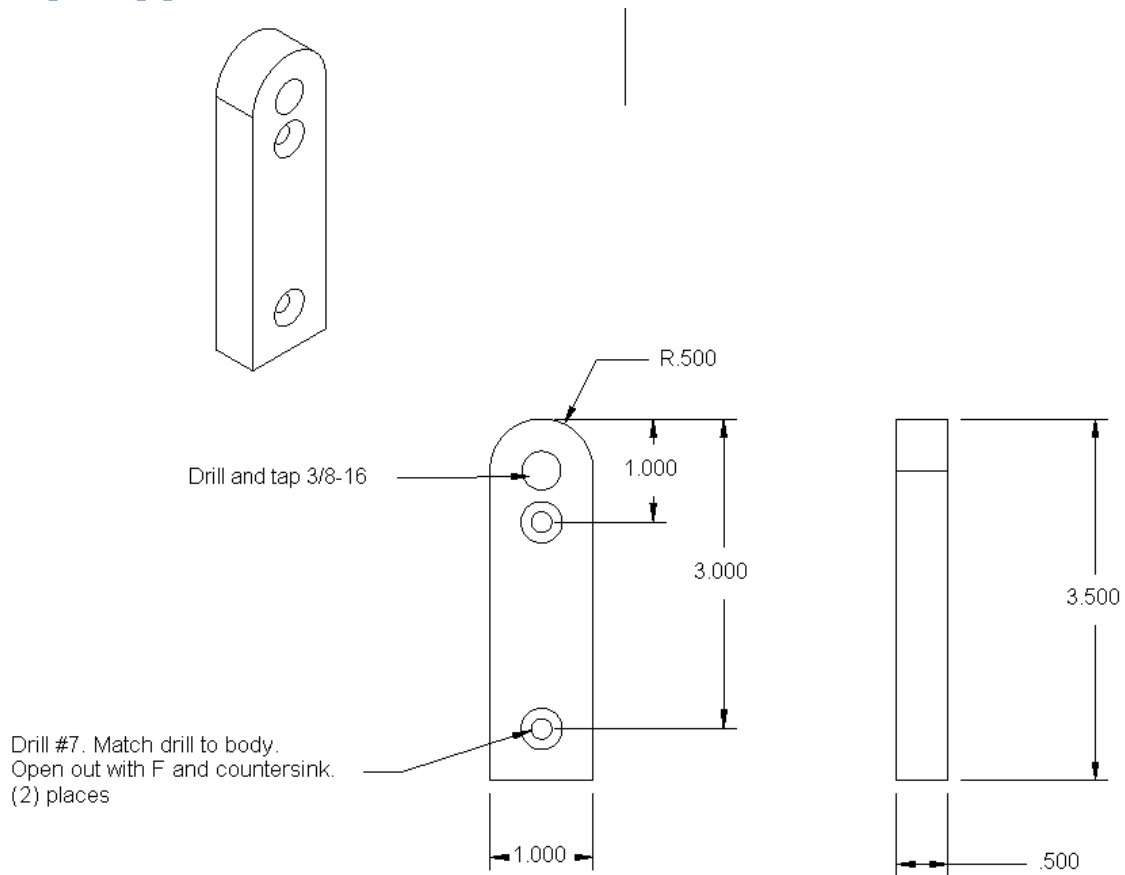
The End Guide



This part is made of steel.

There is a trick to making this part. First use a #7 drill to cut the round bottom of the slot plus the two mounting holes. Then tap the slot hole 1/4-20. Screw in a bolt into this hole and use a locking nut to secure it. Place the part in the mill and set it at 45°. The angle is not critical. Use the bolt's OD to set the center of the slot. Remove the bolt without disturbing the part. Then mill down to the center of the threaded hole. Put this part aside for now.

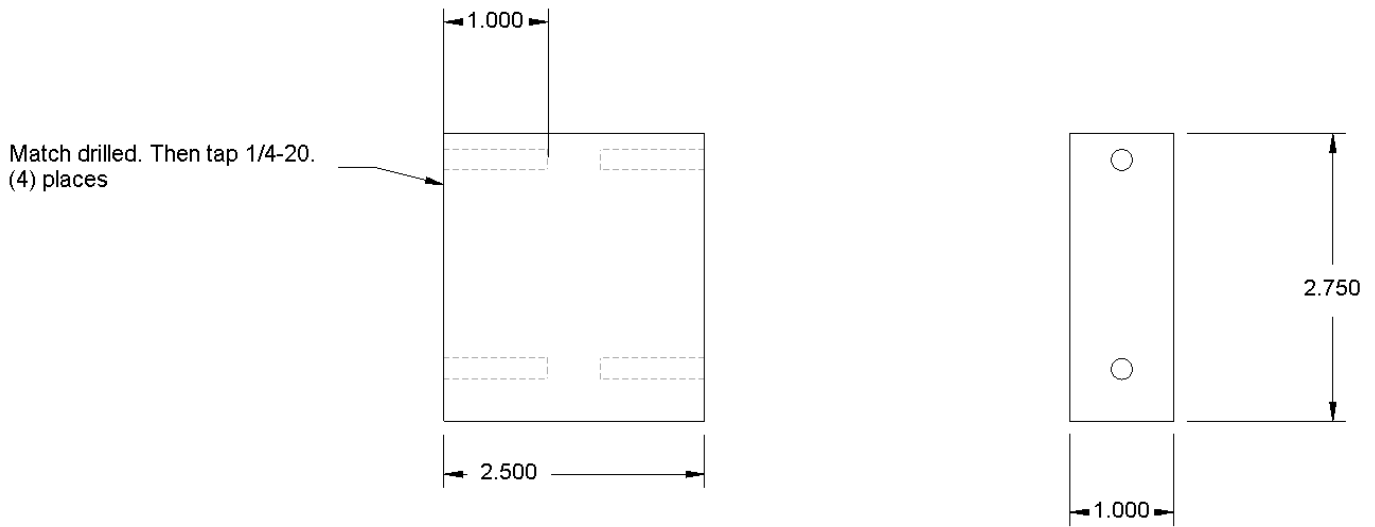
Stop Support



This part is made of steel.

Drill the large hole 5/16" and then tap 3/8-16. As was the End Guide, drill the two mounting holes with a #7 drill and set the part aside. The rounded top looks nice but is optional.

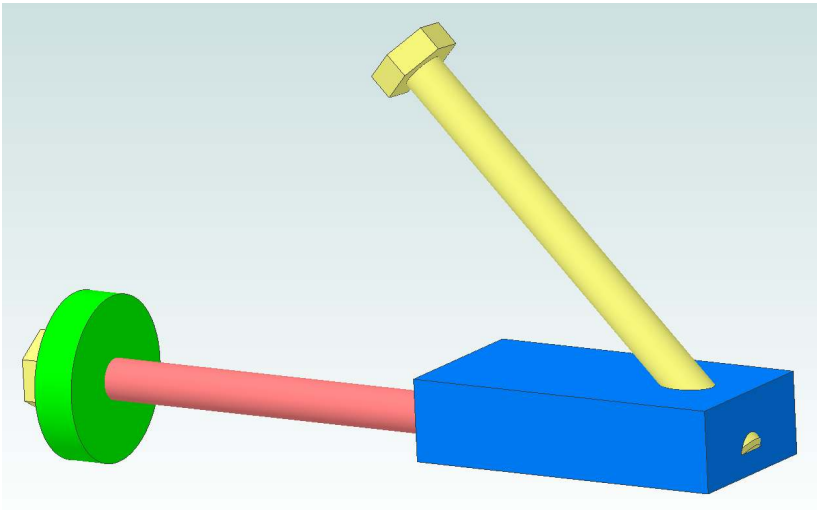
Body



The body is made of 6061 aluminum. All holes are match drilled. Clamp the End Guide to the right end of the body such that the slot is facing you and is aligned. Using a #7 drill, drill into the aluminum about 1". Tap the hole 1/4-20. Then use an F drill to open out the hole in the End Guide. Optionally countersink the hole. Then use a bolt to secure the End Guide to the body. Repeat the process for the second mounting hole. In this way you are guaranteed that the bolts will fit.

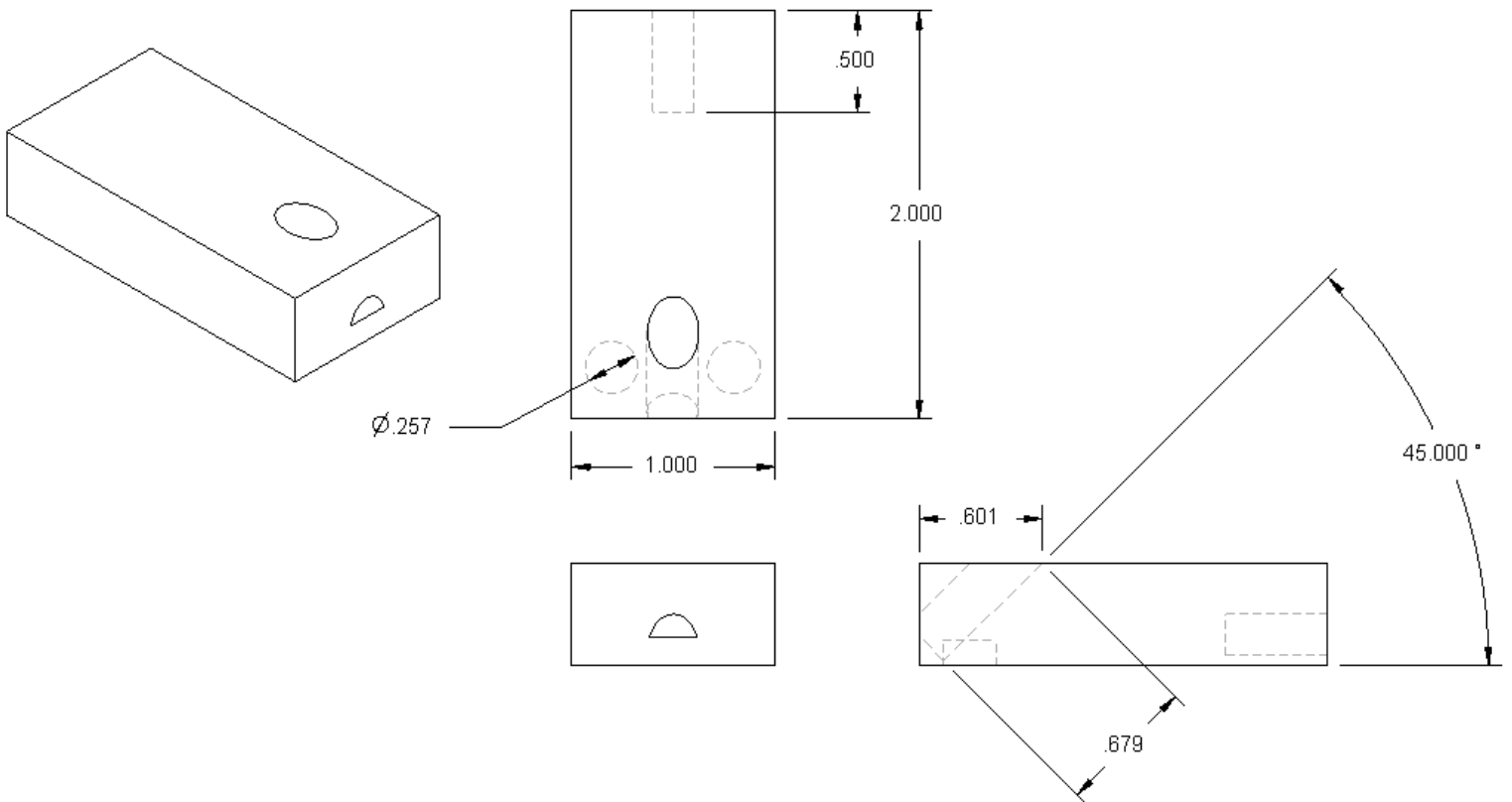
Repeat the process for the stop support.

Bevel Fixture



This fixture positions a 1/4-20 bolt so a small bevel can be cut in its end on a small vertical belt sander. The machining is necessary after cutting a bolt. Bedded into the bottom of the fixture's body (in blue), are two small magnets. These help hold the fixture in position. A stop (in green), contacts the back edge of the table to set the depth of grind.

Just drop in the bolt (in yellow), give it a full turn. Then remove.



The body and stop are made of aluminum. The magnets are 1/4" diameter by 1/8" thick neodymium. Drill the end hole with a #7 and then tap 1/4-20. The angled hole was drilled with a center cutting 1/4" end mill.

Acknowledgements

Thanks to John Herrmann for suggesting a design change. Thanks to Corey Renner for challenging me to find a way to cut bolts of varying lengths (mentioned in the video).

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.

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