

# Motor Support and Belt Tensioner

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Figuring out how to make the motor support and belt tensioner was a lot like making sausage. You *really* don't want to know how it was done. So instead I will mostly present what I ended up making. It isn't completely finished but the loose ends must wait until other parts are designed and built.



I call the motor plus jack shaft mounted on a common plate my power module. This picture shows the power module but was taken while I was still figuring out what to do. The original idea was to just use the weight of the power module to tension the cone pulley belt. This did not work well because the load is discontinuous as the ram move from cutting to retracting. The pulsating load caused the power module to bounce up and down. Not good for the belt and certainly not effective. A test cut on aluminum showed a washboard effect.



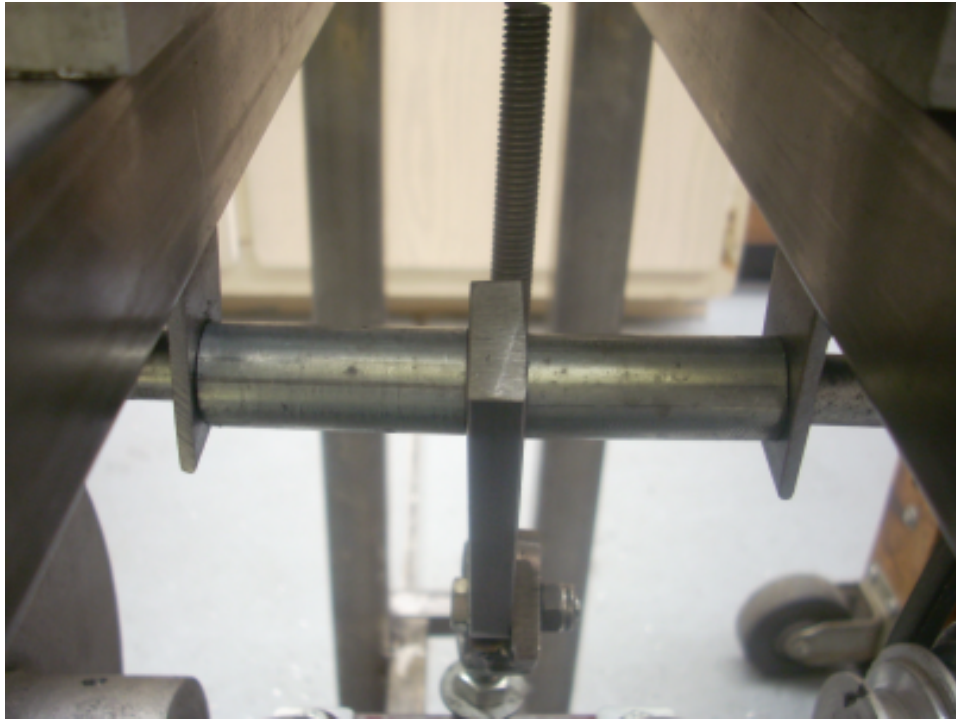
After a few false starts, I ended up with an “over the center” belt tensioner. Once in place, the washboard texture of my cuts went away and it is now much smoother.

Most of the belt tensioner is done and shown here but I have not tested it under heavy load.

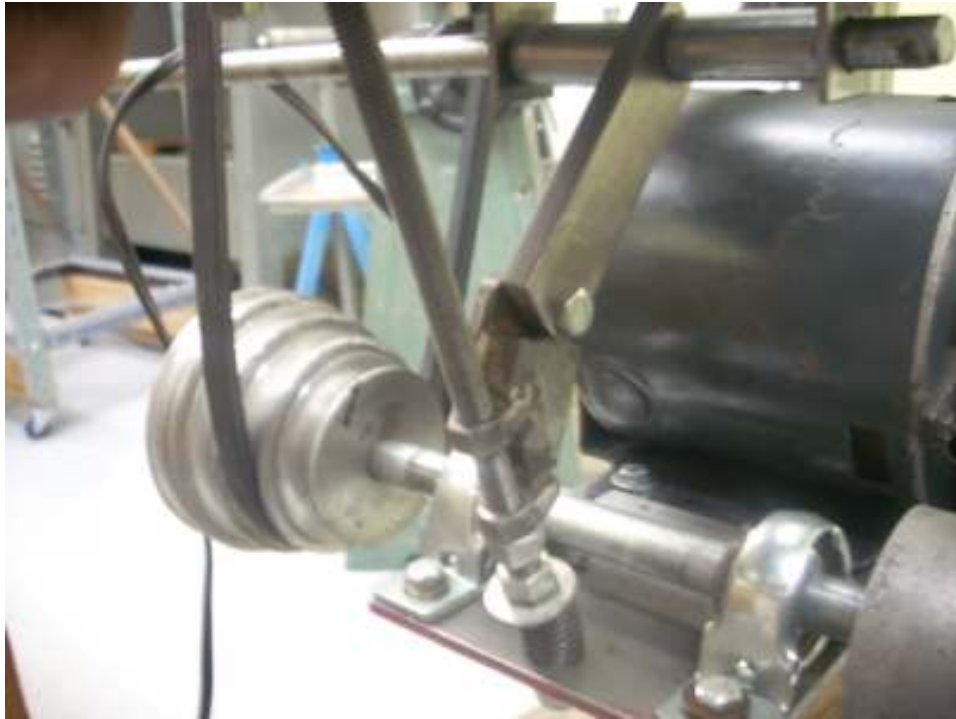
The spring has two purposes. It permits some give in the pulley tension but more importantly, it enables the belt tensioner to hold in the locked position. A nut barely visible under the horizontal plate limits how low the plate can swing. The hole in the plate is drilled  $7/16$ ” to permit the threaded rod to tilt forward when the belt tensioner is unlocked.

The upper arm of the belt tensioner is able to pivot on a piece of  $1/2$ ” CRS. Two pieces of electrical conduit flank the upper arm to keep it centered. This pivot rod may be helpful in supporting the cone pulley belt guard so I have not cut it to fit yet.

Similarly, I have not cut the  $3/8$ ”-16 threaded rod to size either. I may add a linkage to it so I can unlock the belt tensioner from the front of the stand.



Looking down from the back of the shaper you can see some of the belt tensioner better. The  $\frac{1}{2}$ " rod is supported by 1" pieces of angle stock that share bolts with the mounting flanges of the column. I hope to bolt an oil pan down here. It would go between the bottom of the top stand rails and these pieces of angle stock.



Here you see the belt tensioner in the released state. I can roll the belt along the cone without too much trouble but the task is made easier if I pull the threaded rod forward a bit as shown here.

Most of the belt tensioner was MIG welded. As usual, only my last few beads look good. Even so, welding sure speeds up construction.

My next step will be to make the two belt guards. Then I will start to track down problems with the shaper's operation. I've noticed a few things that aren't right but so far none are show stoppers.

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