A Pneumatic Horizontal Bandsaw Feedrate Limiter, Version 1.0

By R. G. Sparber

By using an "AirShim" which I bought at Home Depot for $15 plus a small modification, I can limit the feedrate on my horizontal bandsaw. To see it in action, go to

https://www.youtube.com/watch?v=qJuM1ukrAIY&t=5s

This attachment is designed to be added and removed with minimal fuss.

With this screw fully tight, the AirShim works normally and can lift up to 300 pounds and hold it there for a while. By backing out the screw, a small amount of air escapes causing a slow deflation of the AirShim. The bandsaw's arm, resting on the AirShim, then descends at a controlled rate.

This article is mostly devoted to the making of the bleed valve.

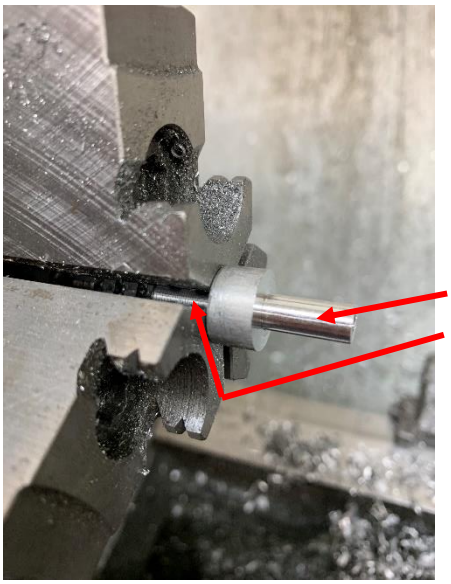
I started by taking some ½ inch aluminum rod and cutting off about 1-¼ inches.

The stock is placed in my 3 jaw chuck with a 0.1” spacer between one jaw and the rod. This packing offsets the rod. The stickout is around ¾ inch.

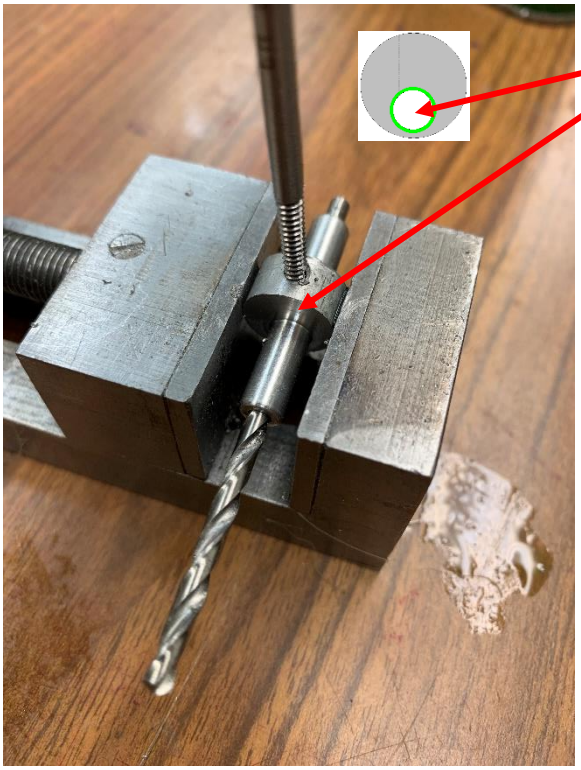
Most of the turning was interrupted cuts which slam into the cutter on every revolution. To reduce this jolt, I fed in only 0.01 inches per pass until most of the surface was being cut. Then I fed in 0.025 inches per pass. Machining stopped when the diameter of the spigot was about 0.01 inches larger than the inside diameter of the tubing I had chosen. Overall length was about ½ inch.

Next I spot drilled the end followed by drilling in about 1-¼ inches with a 1/8 inch drill. Fed in about 1/8 inch at a time, retracted, and cleaned out the swarf embedded in the flutes of the drill. Used cutting fluid.

Finally, I beveled the end of the spigot to make it easier to enter the tubing.



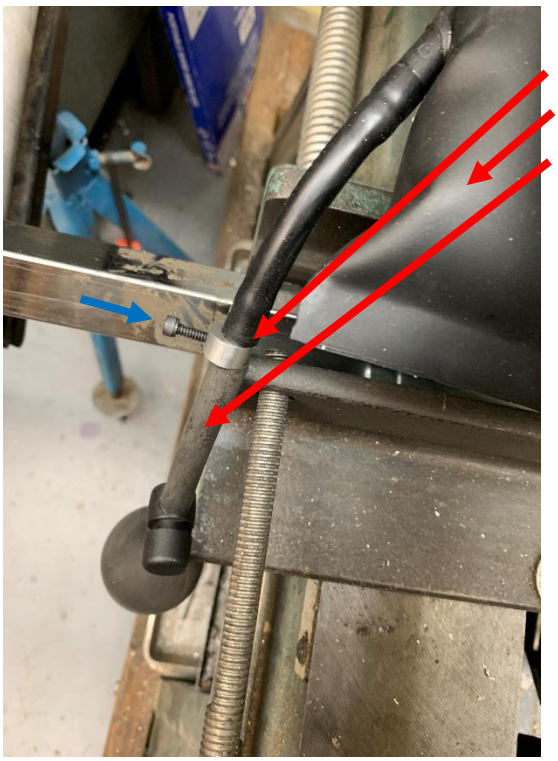
I needed to machine the second spigot so it aligned with the first spigot. Not a problem. Just held the part by the first spigot and took light cuts. If the 1/8 inch drill had not gone through this end, I would have spot drilled and drilled deep enough to get a through hole.



Moving over to my Drillpress, I first aligned the part in my vise so the spigots were at the bottom. This gives me the maximum amount of metal above the axial hole for tapping. I used a #36 drill to cut a hole down to the axial hole.

With the 1/8 inch drill back in the axial hole, I carefully turned my 6-32 ***tapered*** tap down using plenty of tapping fluid. When it made contact with the drill, I stopped. Then I backed out the tap, removed swarf, took out the drill, and fed the tap back in to cut one more turn.

The goal was to have a partial thread at the bottom of the hole. This wedges into the end of the screw and seals it in the fully tightened position.



Here is the
bleed valve installed between the
Air Shim and
new length of tubing. Gently tightening the screw (blue arrow) all the way down restores the Air Shim to normal operation. Backing it out just a little gave me the right amount of air bleed to lower my bandsaw blade at the desired rate.

Acknowledgments

Thanks to John Herrmann for his various contributions to this idea.

I welcome your comments and questions.

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