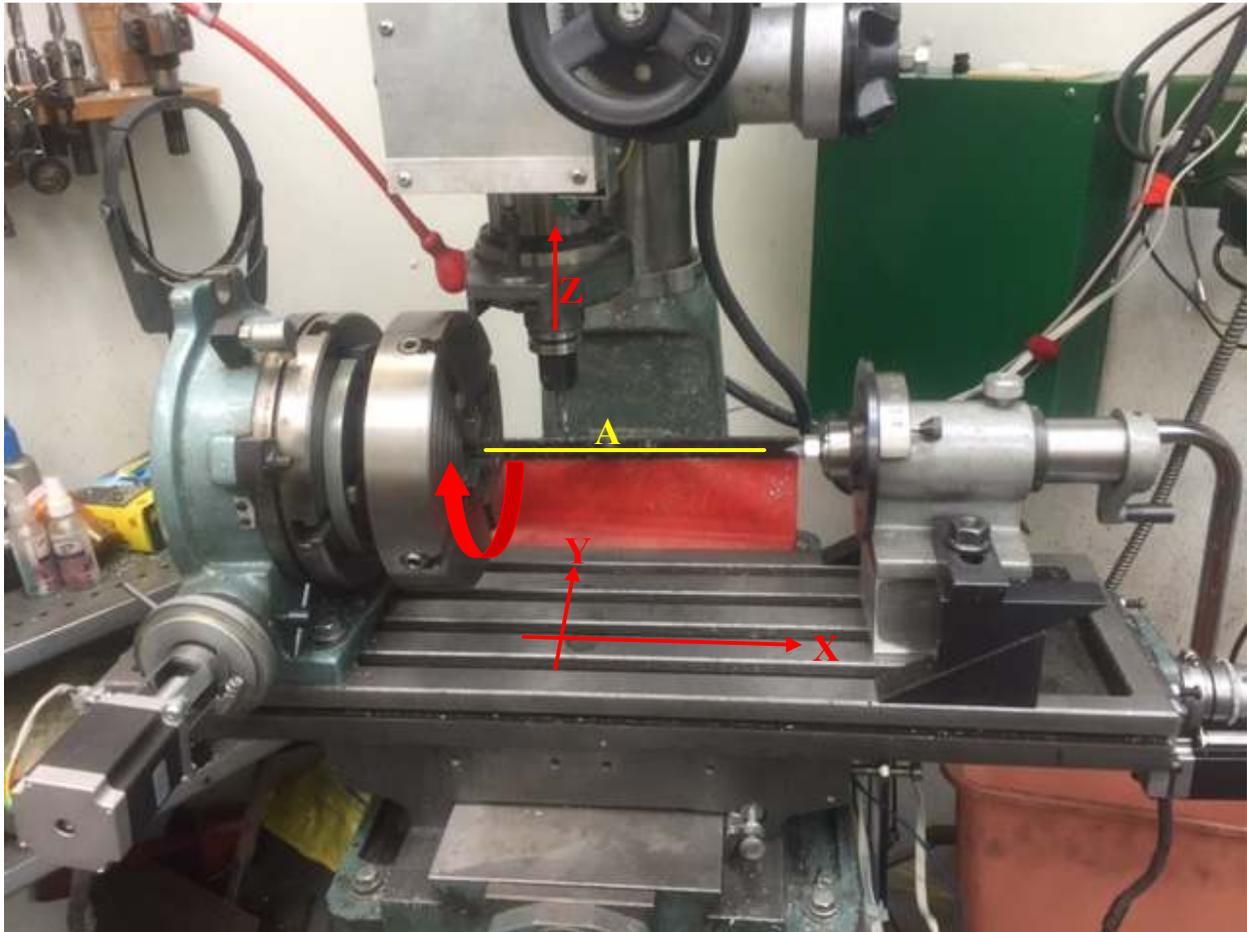


# Zeroing the Y and Z axes to the A Axis Center Of Rotation, Version 1.0

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By R. G. Sparber

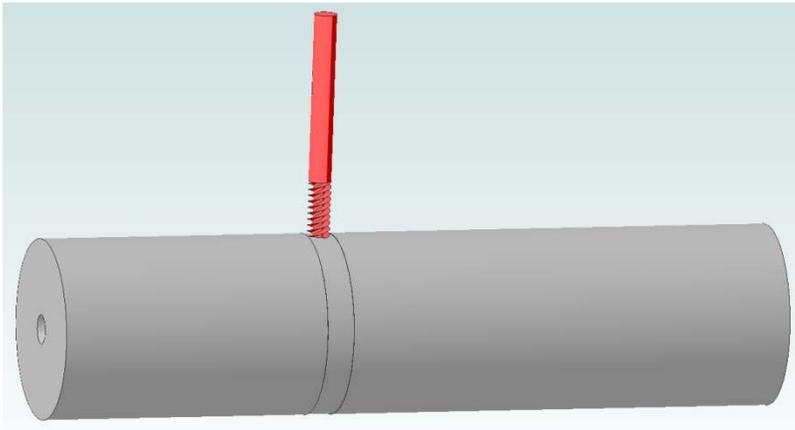
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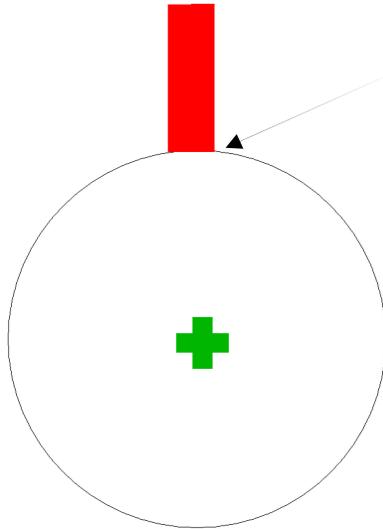
I needed to zero my Y and Z axes relative to the A axis Center Of Rotation (yellow) to within  $\pm 0.001$  inches. Here is how I did it.

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<sup>1</sup> You are free to distribute this article but not to change it.

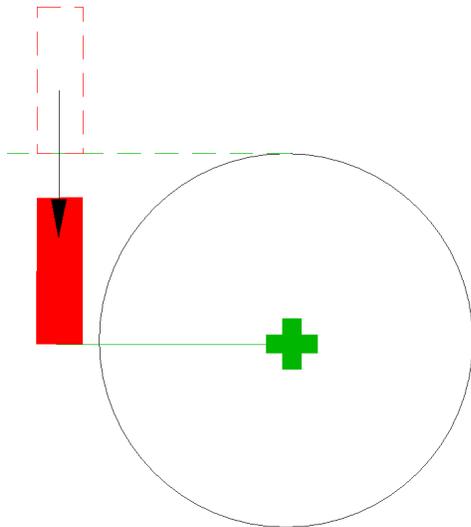


I mounted my stock in the A axis drive and installed a  $\frac{1}{4}$  inch 3 flute end mill in the spindle. By eye, I centered the cutter at the Center of Rotation (COR) along the Y axis and took a skim cut.



Here is an end view of just the cut surface. The bottom of the end mill is tangent to the surface. It doesn't matter if the end mill is *exactly* aligned with the COR. The further off alignment, the more cupped will be the cut surface. You may need to move the spinning cutter along the X axis in order to form a flat surface. We need this flat surface in order to accurately measure the diameter.

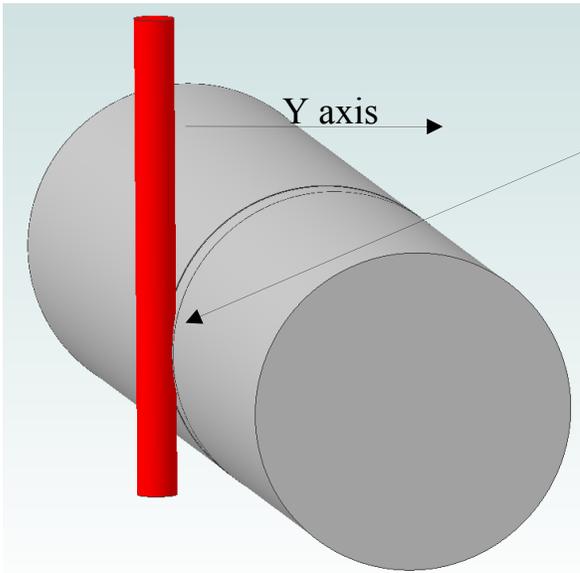
Record half of this diameter which is the workpiece radius.



To zero the Z axis at the COR (green cross), move the cutter clear of the workpiece and zero the Z axis.

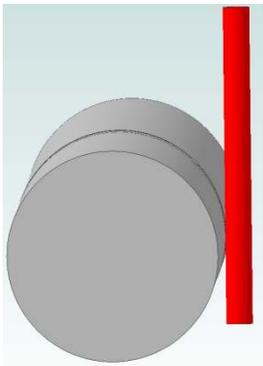
Then move down by the radius of the workpiece and zero the Z axis again. The bottom of the end mill is now at the COR and is set to zero.

Next we will set the Y axis zero at the COR.

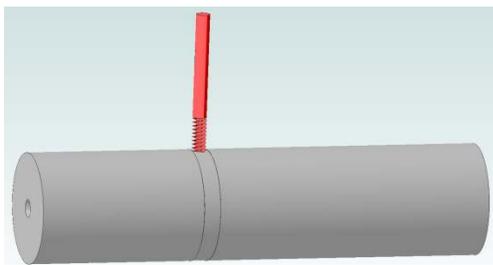


Remove the end mill<sup>2</sup> and install a length of drill rod of known radius. Position the rod such that its side just contacts the cut surface.

Add the rod's radius to the cut surface's radius. Zero the Y axis. After raising the rod to clear the workpiece, move along the Y axis by the sum of the radii. Then zero the Y axis again.



As a check, move the rod to the opposite side of the workpiece and verify you read the sum of the radii.



Check the Z axis zero by moving to  $Y = 0$  and take a skim cut. Verify that your Z value equals the radius just cut.

You now have Y and Z zeros aligned with the COR of the A axis.

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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<sup>2</sup> If accuracy is not that important, you can use the an end mill with more than 2 flutes.