

# Tightening the Y Axis Nut on a RF30 Mill/Drill, version 1

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When you reverse the direction of the Y axis hand wheel, how far does it freely turn before the table moves? This backlash might be due to worn threads but it is more likely due to a loose nut<sup>2</sup>.

This article provides step by step instructions for tightening the Y axis nut.

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

<sup>2</sup> My backlash was over 0.100 inches. After tightening the nut, it was 0.03 inches.



My right bearing probably doesn't look like yours. I have one original cap head screw and one head hex screw<sup>3</sup>. Remove both screws.

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<sup>3</sup> This was done because the X axis would bind up as I cranked the table all the way to the left. The bearing was not put in the right place.



My left X axis bearing has a power feed on it. Those are the bits laying on the shelf all the way to the left. The original crank coupler is still on the shaft. Drive out the roll pin and this coupler should slide right off. No need to remove the bearing.

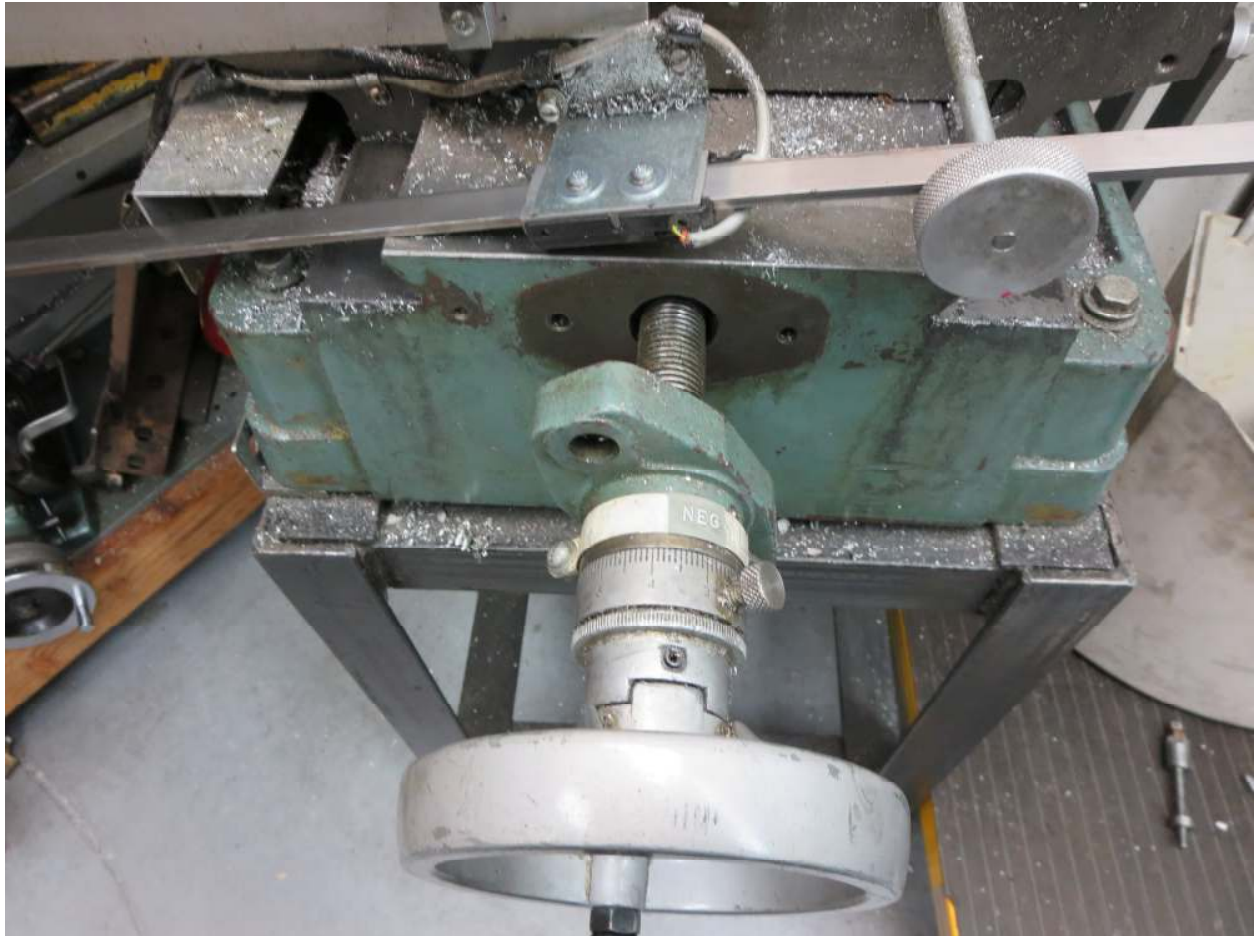


You can now turn the crank on the right side of the table a few turns to get it out of the way. No need to completely remove the X axis lead screw.

If you have a Y axis ways cover, remove it.



Next, unscrew the right X axis bearing retaining bolts and slide out the gib.



Remove the screws holding the Y axis lead screw in place and turn the crank to completely remove the lead screw.

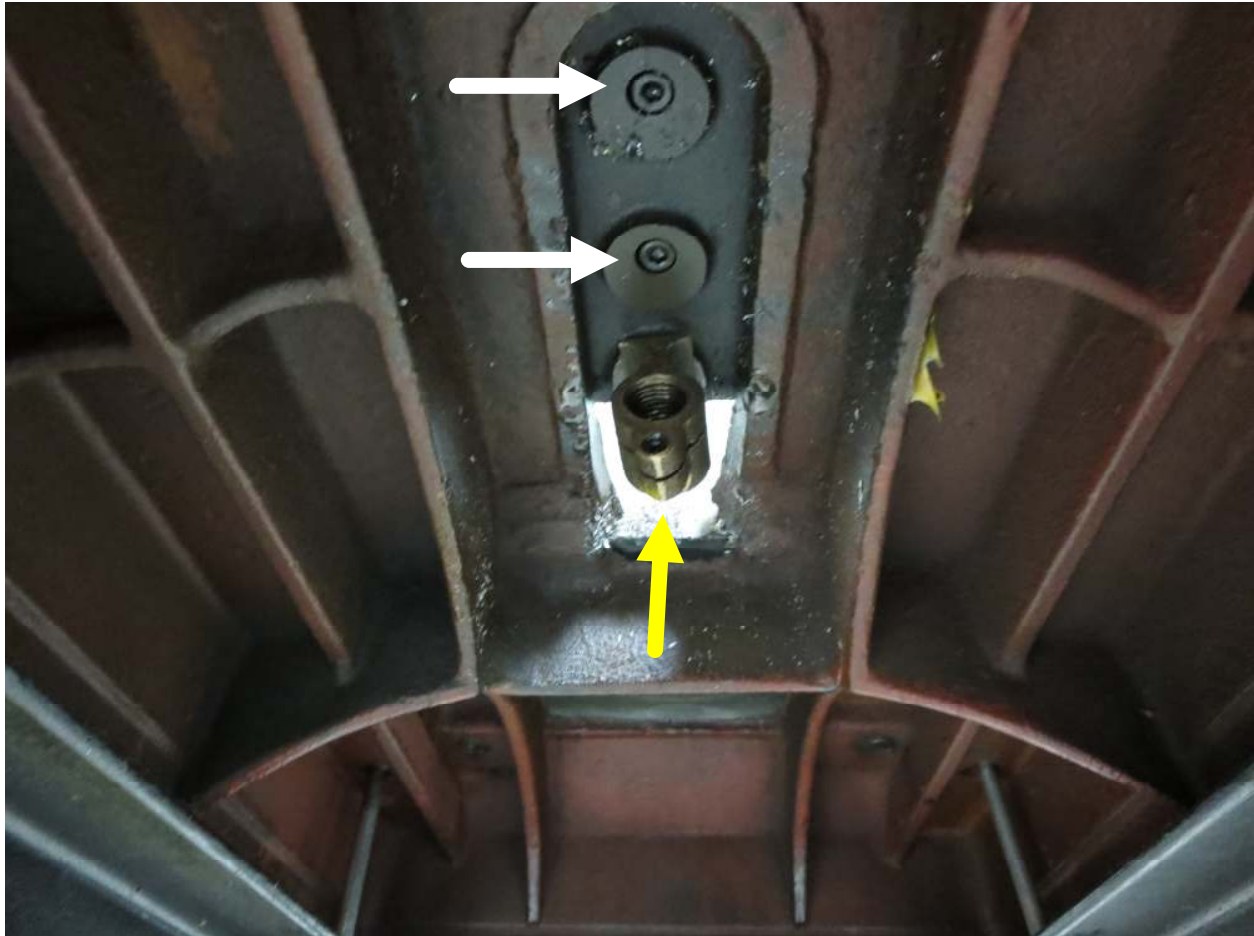
In my case, I had to also remove the X axis DRO scale. You see it laying on top of the Y axis dovetails.



**Danger: if your mill is not secured solidly to the floor, moving the table over this much could cause the mill to fall over. You may need to support the left end of the table.**

You can now slide the table along the X axis until a cap head screw is visible on the back ways in the center. My Allen wrench is stuck into this screw. Do not move the table any further than necessary or you may have it fall off of the machine.

While this is all open, verify that the X axis nut is solidly screwed down. You can reach those screws from under the mill.



Looking up from under the mill, you can see the Y axis nut (yellow arrow). Turn the cap head screw from above while holding the nut until it comes off.

You can also clearly see the two cap head screws that hold the X axis nut in place (white arrows).





Using plenty of WD-40 and a toothbrush, I cleaned all of the old grease from the Y axis nut. Only then can you clearly inspect the threads for wear and damage. Mine didn't look half bad even though I have owned this mill/drill since 1990.

Rinse in more WD-40, spray down with alcohol inside and out, and dry with toilet paper.



Here is the Y axis nut with cap screw. There is a split washer on there too. This washer goes between the bottom of the head and the apron casting.

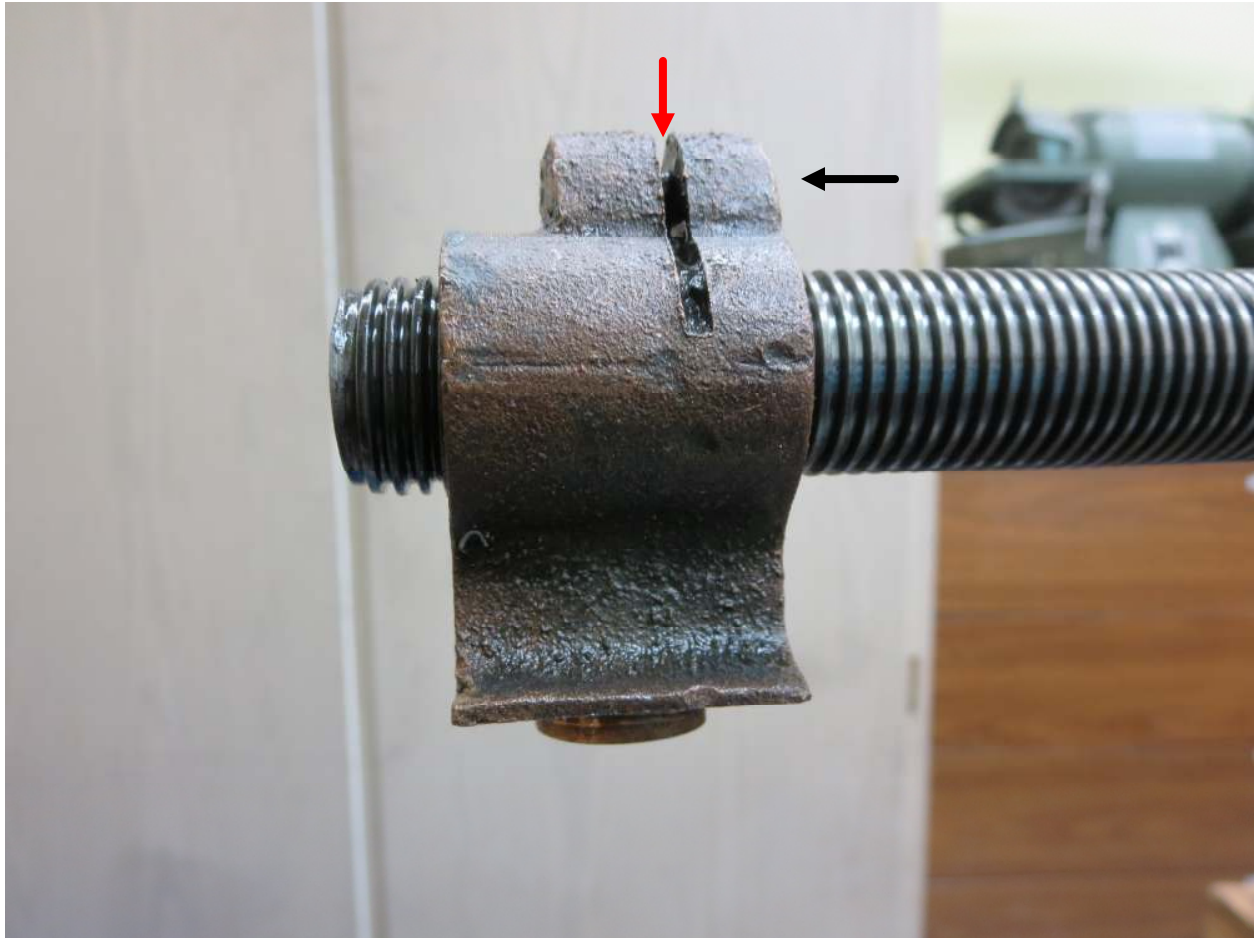


I clamped the Y axis lead screw with handle into my bench vise. This makes cleaning and inspecting the threads easy.

Using WD-40, I sprayed down the lead screw. Then I put a wad of toilet paper against the thread near the bearing. By turning the crank, I was able to completely clean the thread.



It was then possible to clearly see the thread and detect any excessive wear or damage. The thread within a few inches of the bearing has no wear so you can compare them.



Screw on the Y axis nut and check for excessive backlash. You can tighten the screw (black arrow) that spans the gap (red arrow) to take up any play.

I found the play reasonable so did not touch the screw.



I used alcohol and a pipe cleaner to remove all grease and oil from the threads of the screw hole. I then cleaned the cap head screw with alcohol and toilet paper. Be sure all thread surfaces are clean and dry.

Coat the cap head screw threads with Loctite. I used Blue which is medium strength. We don't want to have to repeat this Y axis nut tightening task twice!



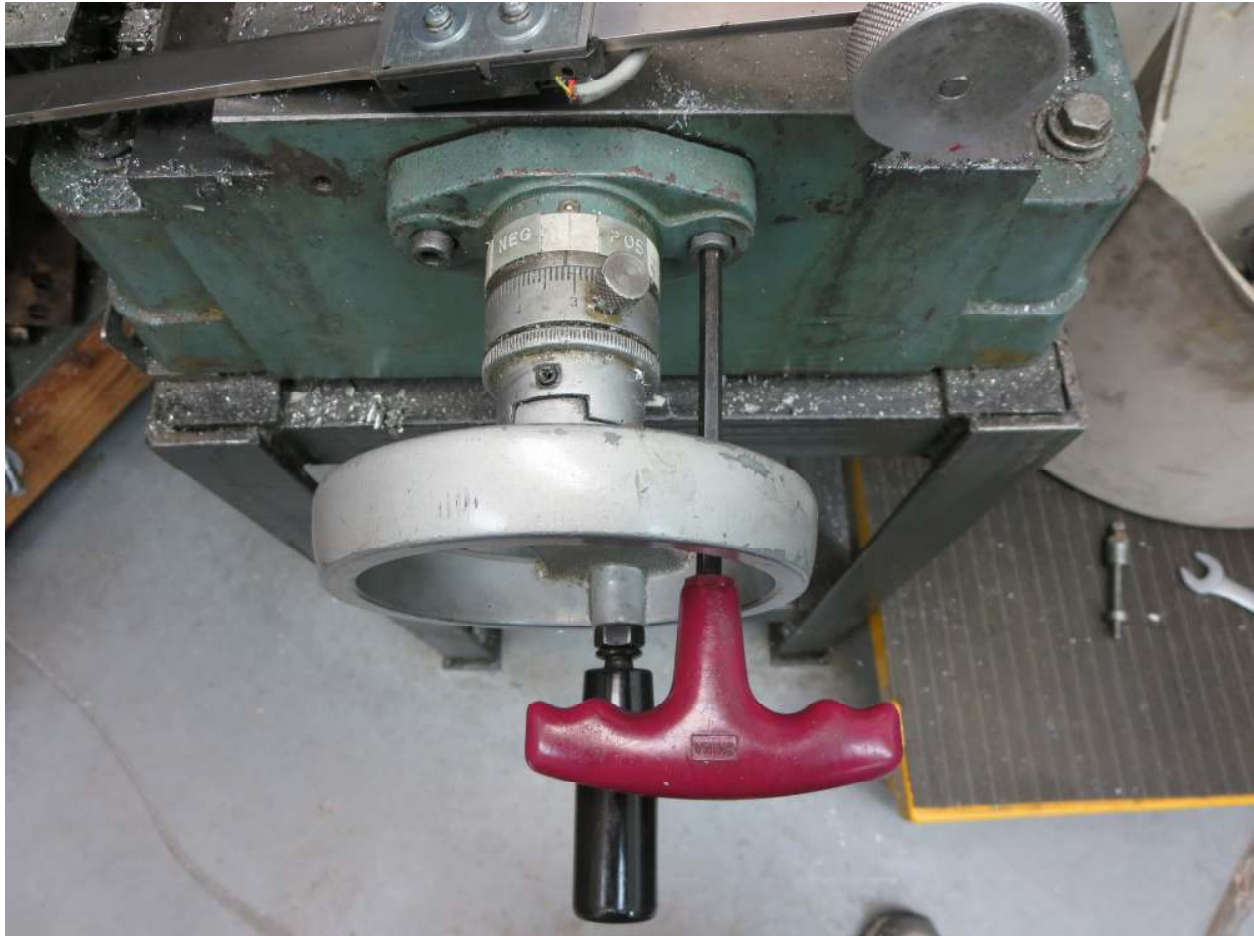
Reinstall the Y axis nut but leave the bolt a little loose.

The Y axis lead screw will be installed next. No, I didn't forget to grease it up. That will be done after it has been fully installed. Otherwise, you will be handling a really messy bit of steel.



Slide the Y axis lead screw through the front hole. Then guide it into the Y axis nut from under the mill/drill. The anti-backlash screw faces forward.

Do not tighten the Y axis nut's screw yet.



Install the two cap head screws through the Y axis bearing and tighten.

Now you can tighten the Y axis nut's screw.

As a final step, grease up the Y axis lead screw. I use automotive grade lithium grease.

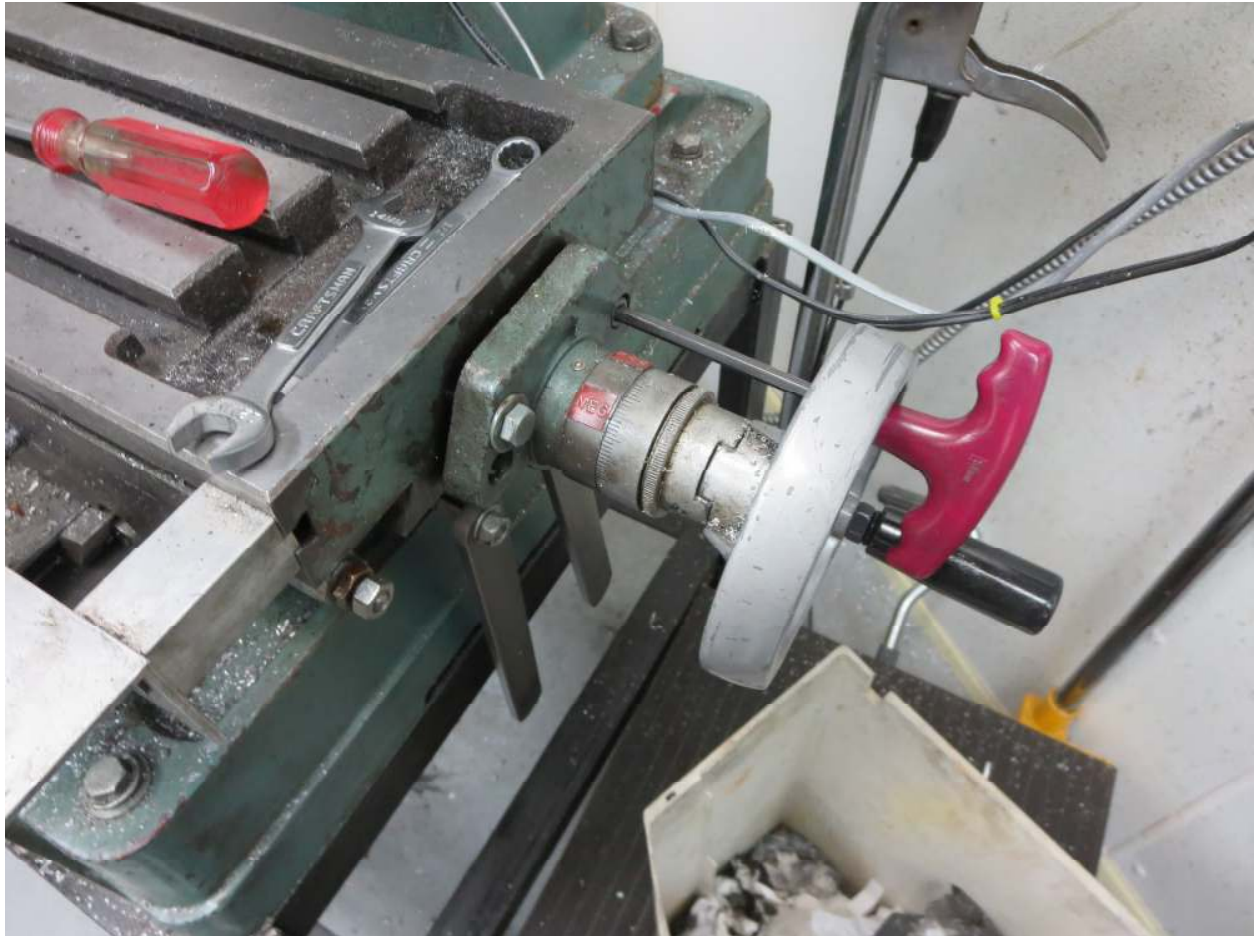


Crank in the X axis lead screw until you feel it hit something. Then stop.





At the left X axis bearing you will find that the X axis lead screw end. Guide it through the bearing while continuing to turn the crank.



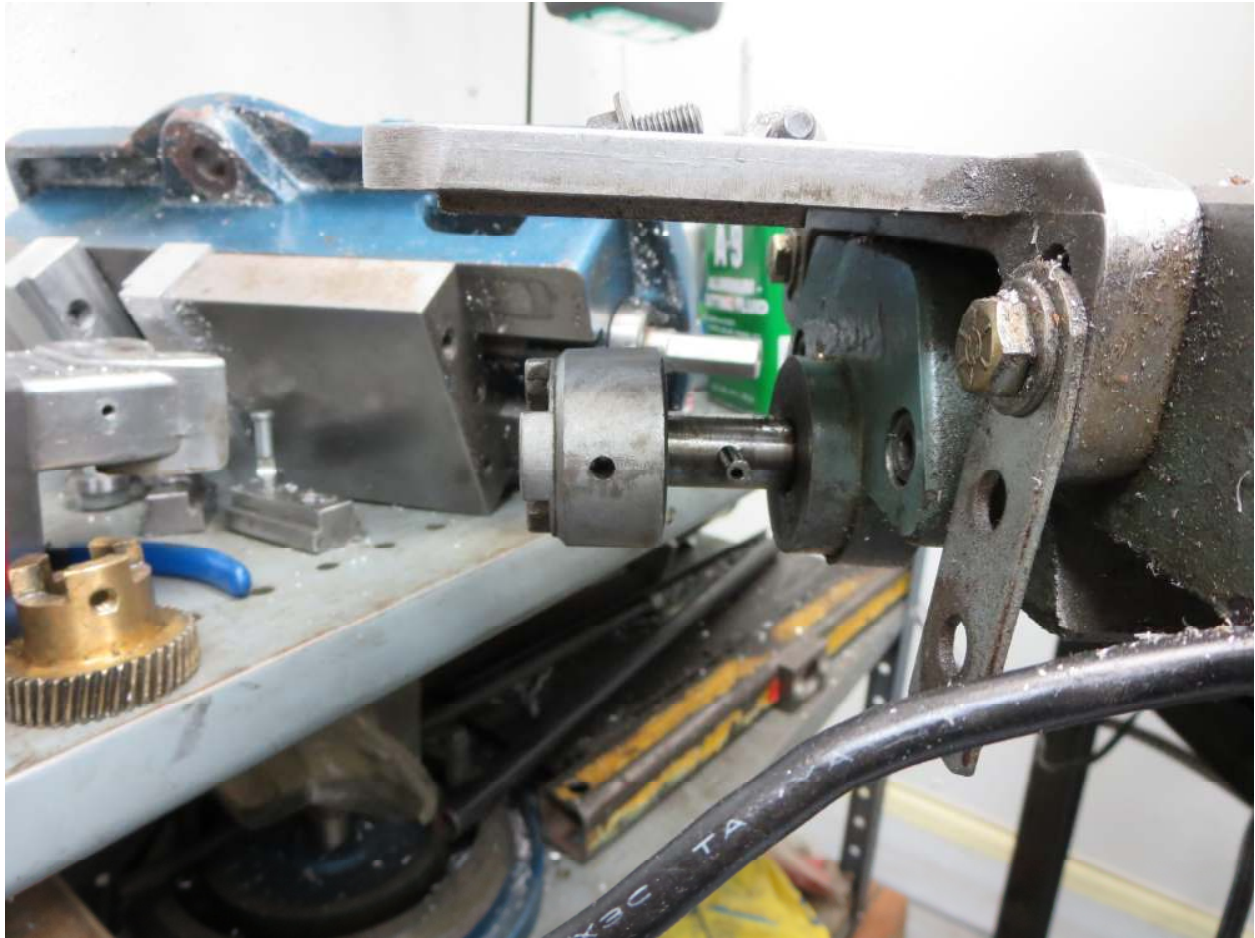
Continue to crank the X axis until the right bearing is in contact with the table.  
Reinstall the screws.



Reinstall the gib. The gap is supposed to face down.

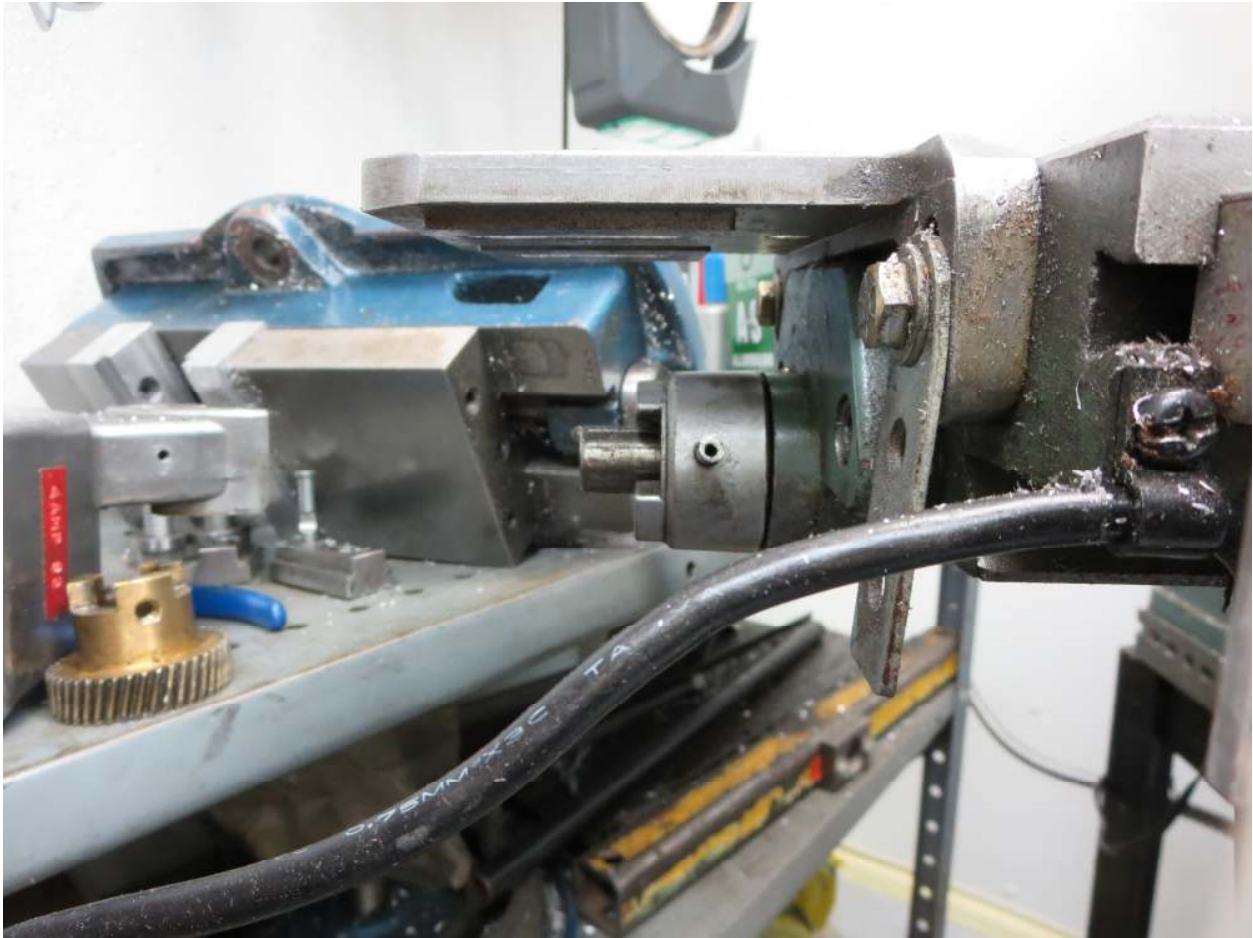


Moving over to the left X axis bearing, note the cross drilled hole (red arrow). This hole is tapered. Use the original roll pin to locate the larger diameter end of this hole. Have the larger diameter facing towards you.



The roll pin should easily enter the cross drilled hole. If it won't go in easily, try feeding the pin from the other end of the hole.

Once you have the larger diameter of the cross drilled hole facing you, mount the coupler. It has a tapered hole too. Be sure the larger diameter of the coupler's cross drilled hole also faces you.



If the holes are arranged correctly, you can easily slide the roll pin in about half way.



Using a drift and a small hammer, drive the roll pin in the rest of the way.

If you have a power feed, now would be a good time to install it.

Reinstall the DRO if you have it along with the Y axis ways cover.

Congratulations! You have tighten your Y axis nut.

I welcome your comments and questions.

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