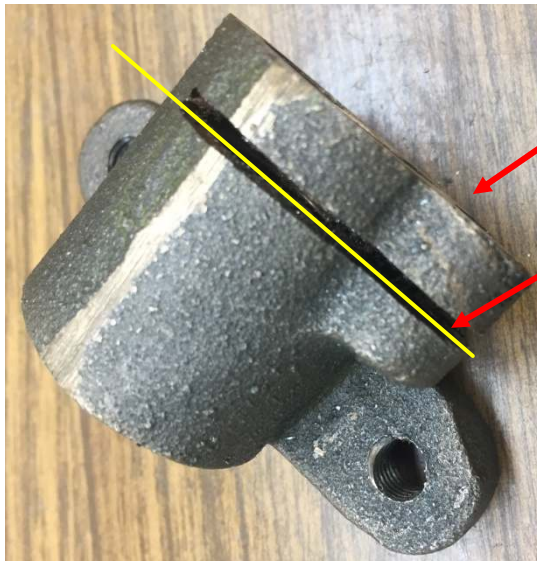


# Improving the RF-30 Mill/Drill X Axis Take Up Nut, version 1

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The X axis take up nut worked fine when new. But as it wore, the partially cut segment of this casting was bent over by the take up screw in order to reduce backlash and it fit the leadscrew threads worst and worst.

My solution involves sawing off the segment that bends and reattaching it with a second screw. This has the benefit of reducing misalignment of the nut with respect to the leadscrew due to uneven pressure on the leadscrew. It also enabling the backlash to be reduced to 0.002 inches which was the ultimate goal.



On the Y axis take up nut, there was plenty of room for the second screw so a 10-24 was used. But on the X axis nut, space is limited. We only have a wall thickness of about 0.2 inches. The largest screw that can fit is a 6-32. It has a close fit clearance hole of 0.1440 inches giving a wall thickness of about 0.028 inches. Ouch! That ain't much.

A search of the web turned up a maximum pull strength of over 300 pounds for a 6-32 screw. The maximum machining force I have found is around 100 pounds. Since two screw will carry this force, the 6-32 should not see more than about 50 pounds. Therefore, we should be safe using it.

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The first step was to drill a #36 tap hole at approximately the same height above the flange as the existing take up screw hole. Take care to position the hole so the screw head does not contact the leadscrew and the threads to be cut in this hole do not break out of the casting. It is best to drill using a drillpress to insure the bit does not tilt and break through the inner or outer walls of the casting.



After drilling this tap hole, saw off the smaller section. Then open out the hole in the smaller part using a #27 for a close clearance. Run the tap through the hole in the larger piece.



Here is the assembled modified nut on the X leadscrew. I used Loctite<sup>®</sup> Red on the threads of both screws. Then the screws were adjusted to give a sliding fit on the leadscrew.

It is hard to see, but the socket head of the 6-32 screw does not touch the threads of the leadscrew.



This side view shows how much the mounting holes and body of the casting are out of true with the major axis of the leadscrew. It really does not matter as long the leadscrew can be aligned with the X ways.

The smaller part of the casting floats but is captured by the bolt heads and the threads of the leadscrew. No pressure is applied to the leadscrew threads by these screws.

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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