

Splitting the feed screw nuts and adjusting backlash on a Bridgeport Milling Machine.

Bridgeport manufactures their milling machines with 0.005 backlash in the feedscrews, which increases over time due to wear. They also provide for takeup of this via an adjustment of the bronze nuts for the feedscrews.

Newer Bridgeports come with the nuts in two pieces, which are pushed together by an adjusting screw. The older Bridgeports come with a solid nut, which has been split 75% of the way. When worn, they need to be split in order to allow adjustment via the backlash adjusting screw.

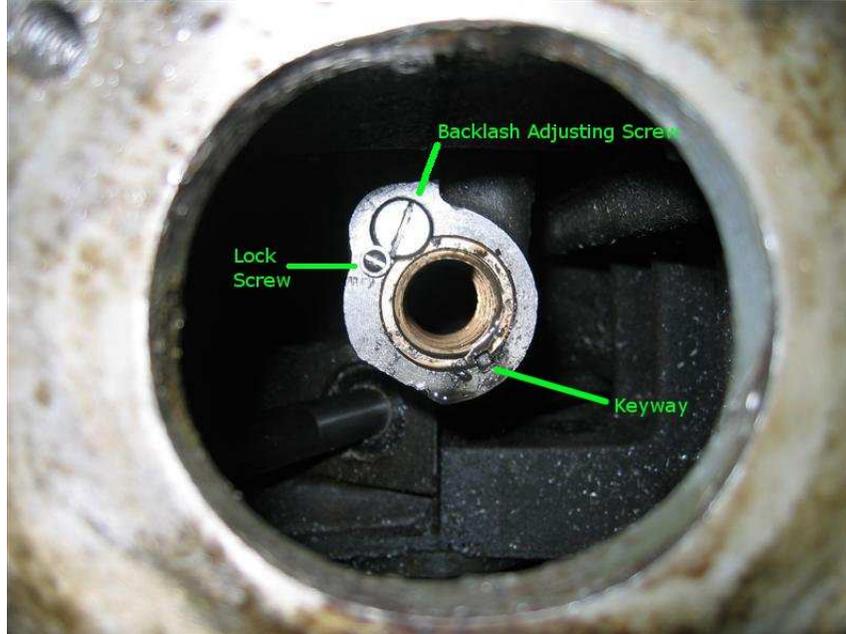


I removed the table in order to gain access to the nuts.
Note the table hanging from my engine hoist via an
eyebolt in the middle table slot.



After I removed the table to gain access to the nuts, I read in a machinists' forum that both nuts could be removed without doing this, so I will describe how I would gain access to the nuts if I were doing it without removing the table. The splitting of the nuts and adjustment of backlash is almost identical for either method. The nuts are a sliding fit in the casting, held in place by the adjusting screw seen in the photo below. Theoretically they should easily pull out of the casting, since once they're clean of old gunk, they do. After 30 years of life, the nuts in mine required some gentle tapping. If you can't pull the nut out of the casting with the feed screw itself, you'll have to remove the table to gain access.

Here is what the Y axis nut looks like when seen through the saddle.



The big screw head at 11:00 is what's used to squeeze the two halves of the nut together to take up backlash. The smaller screw at 10:00 is to lock the larger adjusting screw in place. Notice the keyway at 5:00.

Removing the X-feed nut

Begin by removing both the large and small screws from the X-feed nut which you can access beneath the table inside the left side of the saddle as seen below with the table removed.



Remove the power drive or handle and casting from the right side of the table. Lock the table and screw the left side handle clockwise to pull the nut out of the casting. As mentioned in the beginning, I had already removed the table, but I think the approach above would be the easiest way to remove the nut. Alternatively, once you have the right side handle off, you could put a block of wood on the right end of the feed screw and then tap on that to push the nut (and table) out of the casting. Once the nut is free from the casting, remove the left side handle and bracket with attached X-axis feed screw from the table

Removing the Y-axis nut

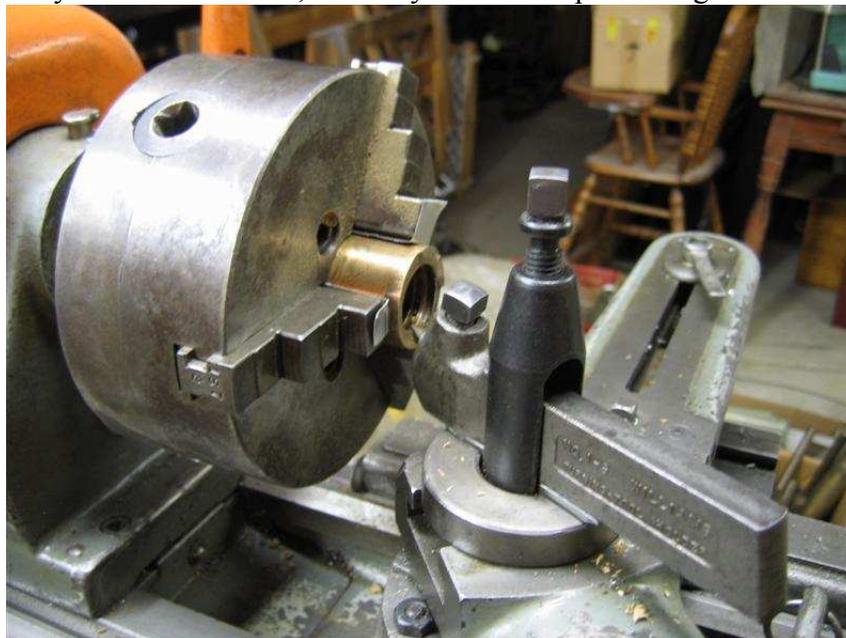
Remove the handle and cross feed bearing casting from the front of the saddle to gain access to the Y feed nut. Remove the two screws from the casting to release the Y-axis nut. Lock the saddle. Put the handle alone back on the feed screw and see if you can pull the nut out of the casting. It can be done with a clean nut, but possibly not one with decades of dried oil holding it in place. If you can't pull it by hand, put the cross feed bearing casting back on and turn the handle counterclockwise to pull the nut out of its casting.

If all else fails, remove the table to gain access to the casting which holds both the X and Y axis feed screw nuts as seen in the photo above. The oil lines can be pretty tight due to old dried oil residue, so they are stiff to pull out of the casting, if you have to remove the casting. If you've had to remove the casting for the nuts, drive each nut out by tapping on it with a block of wood.

After removing the nuts, saw through them to complete the slot. A hack saw would work, but would be slower.



Square up the end of the nut to remove the protruding tab of remaining metal. I used my lathe to face off the ends, but if you don't have one, carefully file off the protruding tab.



The threads at the cut end will be sharp on top. If you look at the opposite end of the nut, you'll see how Bridgeport machined away the narrow knife-like edge to create a broader ramp for the leading edge of the screw to grab. I recommend taking a rotary file in your dremel and knocking off this knife-like edge to make a ramp more like the end with the factory finish. It might work if you skipped this step, but it may cause difficulty screwing the nut onto the screw.



Take the time now to clean out the threads and the outside of the nuts with solvent. Clean out the holes in the casting where the nuts go. When clean, they are a push fit in the casting and the nuts can slide back and forth a little with hand pressure.

Reassembly of the Y axis (Saddle).

Remove the handle and casting from the cross feed screw if they're still attached. Screw the end of the feed nut with the adjusting notch (as seen on the left in the picture below) on the screw first, then screw on the other half of the nut. The two sawed ends should be facing each other. Screw them together, then back off one revolution to leave a gap between the two halves of the nut.



Line up the keyway in the nuts and slide it into its casting in the saddle until the distal end of the nut bottoms in its hole. Screw the large headed adjusting screw back in its hole, and tighten it until you can't easily turn the feed screw with your hand. Temporarily reassemble the cross feed bearing casting and handle onto the feed screw and check how much backlash there is in the screw. The two ends of the feed screw are least worn,

and in this area the ideal is to obtain about 0.005" backlash. You may have to remove and replace the feed screw bearing casting and handle a few times until you have the nut adjusted to your satisfaction. On an old worn machine, the middle of the feed screw will always have more backlash than the unworn ends. You'll just have to live with this. If you tighten the backlash adjusting screw until it's tight and you still have excess backlash, remove the nut from the casting again. Back the proximal end of the nut away from the distal end one more turn and reinsert the nut into the casting.

When you're done, remember to insert and tighten the smaller lock screw to keep the large headed backlash adjusting screw from moving.

Reassembly of the X-axis (Table).

Similar to the description above put the nut on the end of the feed screw and push it into its hole in the casting. Screw the loose feed screw into the nut until you can bolt the bearing casting and handle onto the left side of the table. Now, turn the backlash adjusting screw until it's difficult to turn the feed screw. Check the amount of backlash and adjust until one of the little worn ends of the feed screw has about 0.005" of backlash. Tighten the small lock screw to keep the backlash adjustment screw from loosening. Reinstall the power feed or handle on the right side of the table.