

# Powermatic 3520A Spindle Removal and Reinstallation

Being faced with replacing a broken spindle locking collar, I searched various internet sites, woodturning forums and Powermatic literature to find a step-by-step procedure for removing the spindle on the 3520A lathe. Nothing of substance was found. With input from a few 3520A owners, I plowed into the project, but decided to document, in some detail the steps taken. As it turned out, the task was relatively easy. However, along the way I discovered some techniques that should assist other 3520A owners who are faced with a similar situation.

In total, it probably took approximately two hours to carefully remove and reinstall the spindle the first time. With the proper tools at hand, the procedure could probably be repeated in 30 minutes.

As you go through the various steps, refer to the sketch of the headstock and spindle assembly shown below in Figure 1.

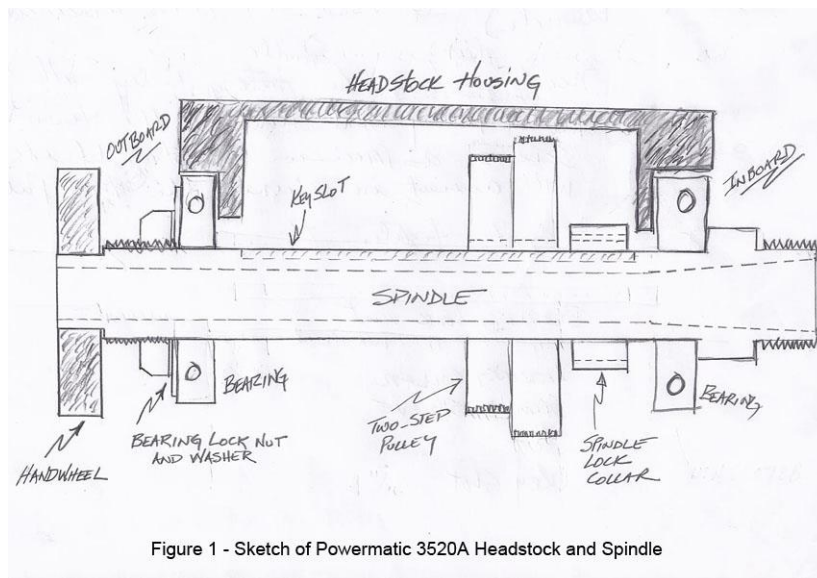


Figure 1 - Sketch of Powermatic 3520A Headstock and Spindle

## Hand wheel Removal

1. Loosen the two set screws with a 1/8" Allen wrench
2. Grab the hand wheel with both hands and forcefully try to pull it off of the end of the spindle.
3. The hand wheel is **not** threaded onto the spindle.
4. If the hand wheel will not come off of the spindle, use a wheel puller. If you don't have a wheel puller, see if you can borrow one from your auto mechanic or machinist friend.
5. After the hand wheel is removed, clean up the exposed spindle threads, the spindle shaft under the hand wheel, and the hand wheel bore.
6. If the hand wheel was difficult to remove, it was probably because of the dimples on the spindle shaft caused by the hand wheel set screws

## Spindle Removal

1. Locate where the tab on the bearing lock washer was bent over into the notch in the bearing lock nut. Mark this notch as a reference.
2. Using a small screw driver or similar tool, bend the washer tab back until it is away from the notch in the bearing lock nut.

3. Remove the bearing lock nut and washer. Count the exact number of turns required to remove the bearing lock nut. In my case, it was exactly 10 complete turns.
4. Loosen the two set screws on the spindle pulleys. You will need an Allen wrench with at least a 4" reach.
5. With a soft mallet, gently tap the outboard (the hand wheel side) end of the spindle. The spindle and inboard bearing (opposite the hand wheel end) should start coming out of the headstock housing.
6. At the same time the spindle is coming out of the headstock housing, hold the step-pulley so the spindle will slide through the pulley. If the stop collar is broken, the spindle shaft key may move towards the outboard end and bind the pulley. If this occurs, gently tap the key back in place so the spindle will continue to slide through the pulley.
7. Completely remove the spindle and inboard bearing from the head stock housing. Be careful not to drop and damage the pulley. Remove the belt and pulley from inside the head stock housing.
8. Clean up, deburr and lightly oil all machined surfaces. If needed, lightly remove any corrosion with 0000 steel wool. File down all Allen screw dimples on the spindle shaft and key.

### **Spindle Installation and Reassembly**

1. If it was removed, reinstall the inboard bearing on the spindle shaft.
2. Put the outboard end of the spindle through the inboard end of the headstock housing.
3. From inside the headstock housing, install the key, stop collar, 2-step pulley and the belt on the spindle. **Do not forget the belt!**
4. Continue to slide the spindle through the headstock housing until the inboard bearing is firmly seated in the housing.
5. Install the outboard spindle bearing, making sure it is firmly seated in the headstock housing.
6. Install the lock nut washer and screw on the bearing lock nut. Reinstall the lock nut with the exact number of turns used when removing the nut.
7. Check the spindle for end play. If there is still a slight amount of end play, tighten the nut slightly. After all end play has been eliminated, bend a washer tab over a slot in the nut to lock the assembly in place.
8. From inside the headstock housing, align the spindle step pulley with the motor pulley and tighten the two set screws. A 6" metal straight edge will assist in aligning the two pulleys. Align the stop collar with the spindle lock plunger and tighten the set screws. Install the drive belt and check for proper belt alignment.
9. Finally, install the hand wheel and tighten the two set screws. Rotate the assembly by hand to check for tightness and proper alignment.

Notes: a) For purposes of this procedure, the "outboard" end is defined as the end nearest the hand wheel. b) The procedure described is specific to the Powermatic 3520A. However, this same basic procedure would also apply to the newer Powermatic 3520B. c) While the purpose of this exercise was to replace a broken spindle locking collar, the same basic procedure would be used to replace a worn or broken drive belt or a bad inboard or outboard bearing.

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