

By Jim Rodgers

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American Association of Woodturners

Oval pens driving you nuts?

Can't align two halves of a segmented bowl for glue-up?

Join the crowd. If your lathe—or your turning work—suffers from poor alignment, call a time-out and review these five alignment checkpoints.

1 Tailstock does not align with the headstock

To check the alignment of your headstock and tailstock, insert a live center into the tailstock and a spur drive into the headstock.

Make sure that the points are not dulled or bent in either the spur or the live center—this will mislead you in your measurement.

Bring up the tailstock to within 1/4" to 1/2" from the spur center, then tighten down the tailstock and quill. Now, observe the alignment of the two points. If the points are misaligned, you can

compensate by placing a shim under the appropriate corner(s) of the tailstock to adjust the alignment. Often a sheet or two of paper will be adequate to shim the tailstock.

For more exaggerated errors, contact the lathe manufacturer for repair or replacement of the tailstock or tailstock quill. An extreme case may require reboring of the Morse taper on the tailstock quill.

If the lathe headstock is bolted to the frame or ways as with the Jet mini-lathe and Delta Midi, you can realign it with the addition of

a permanent shim under the appropriate corner. On other lathes such as the Oneway, for example, you can align the headstock by adjusting the jack screws provided for that purpose.

If you own a Nova 3000/DVR, you can reposition the lathe ways themselves, as they are screwed to the headstock unit. Be sure to follow the instructions in your owner's manual for all adjustments noted above.

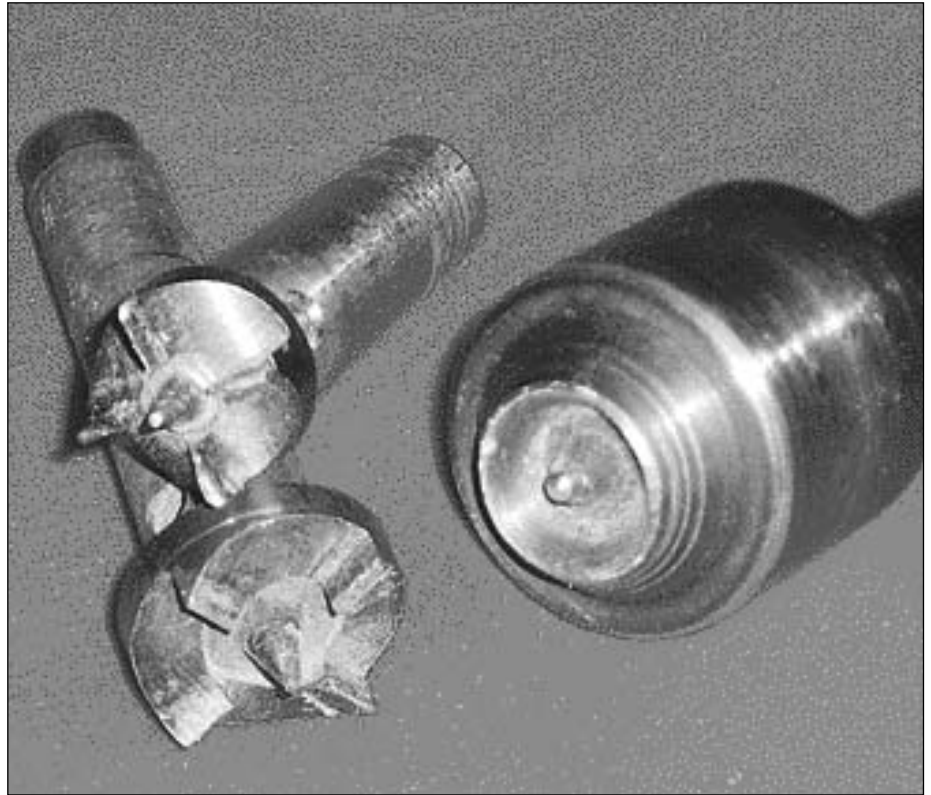
On lathes with a rotating headstock, the click stop positioning may not be accurate enough to return to perfect alignment. A double-ended Morse taper will aid in regularly realigning the headstock each time it is moved.

2 Live center does not run true

Inexpensive live centers, centers with worn out bearings, or poorly designed live centers like the examples at *right* cause problems. If the live center was inexpensive, just discard it and upgrade.

One of the causes of a live center becoming out of true is excessive wear of the bearings due to operating the lathe with a headstock/tailstock misalignment. Angular pressure on the live center will rapidly increase the radial runout to an unacceptable point. (Oneway advertises that the radial runout of its live center system is less than .001 inches.)

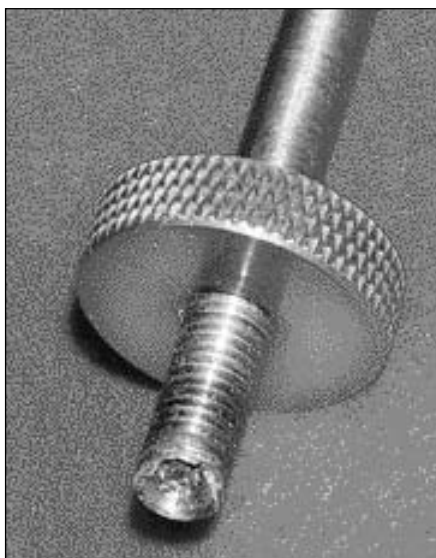
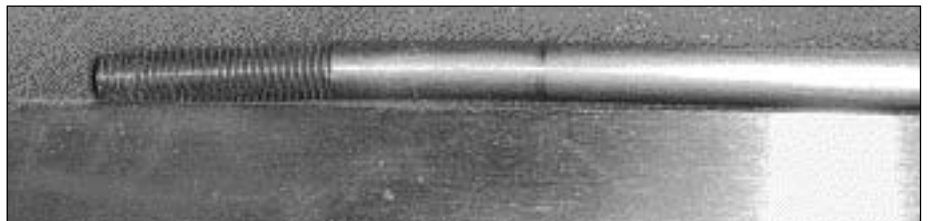
If you have a reliable live center that's repairable, consider replacing the bearings. For a minimal fee, you can return many live centers for bearing replacement.



3 Too much pressure applied to the mandrel in penturning

If your pen barrels are oval and you've checked the first two solutions, applying too much pressure to the tailstock when tightening on the mandrel may be the culprit. The amount of pressure applied should be just enough to stabilize the mandrel shaft and minimize vibration from the turning activity. Too much pressure bends the shaft (*middle right*).

A crooked live center point will also cause the mandrel to operate eccentrically and will enlarge and distort the alignment dimple in the tailstock end of the mandrel shaft (*bottom right*). The better designed mandrels allow the user to replace the shaft when it becomes bent or the dimple has excessive wear.



Tips to improve your accuracy

- Always clean the female Morse tapers before inserting any accessory.
- Remove all defects or burrs from the surface of male Morse tapers.
- Store and protect spur drives and live centers from scratches and dings. Find a place near your lathe where these valuable attachments won't get beat about by lathe tools, hammers, and accessories.

4 Poor centering with vacuum chucks

If you align a bowl or vessel in your vacuum chuck and it slips or won't hold the desired alignment, the cause may be related to the material used to seal the vessel to the chuck. Foam rubber and other soft, flexible

seals may vary in density throughout the material, thus not compressing equally everywhere, causing the vessel to be forced out of alignment.

Vacuum chuck design and the shape of the vessel also tend to exaggerate this problem. A round vessel held against a rounded

chuck surface may exhibit this problem more readily.

To improve centering, try each of these solutions: Replace the material, readjust the material, or buy thicker (or thinner) stock.

Silicon rubber works well but is difficult to attach to the chuck because there's no known effective adhesive for this material.

On a finished edge bowl, consider using a flat plate as a vacuum chuck, thus spreading out the hold over a large area and minimizing the problem as shown at *left*.

5 Hole-drilling errors

Improperly mounting a Jacobs chuck on a Morse taper may cause centering problems when drilling holes in the end of a project. To avoid this problem, be sure that you properly seat the Morse taper in your tailstock, then run the quill out far enough that the drill chuck completely seats—no further. Bring the tailstock up into close proximity of the work and lock down the tailstock before drilling.

Other drilling issues may not be related to the alignment but be caused by the drill wandering from hard, winter-growth grain and into softer summer growth. Solve this issue by creating a small pilot hole for the drill point. Brad-point or Forstner bits also reduce this drifting problem. Always be sure that the bit you select is sharp.

Jim Rodgers (www.jlrogers.com) is a member of the Bay Area Woodturners, Silicon Valley Woodturners, and Diablo Woodworkers. He lives in Martinez, California.

