

Tip 36 — A Live Center Tailstock Chuck Adapter/Dan Pines



FIGURE 1—The bearing adapter is shown without the chuck attached. The Jacobs chuck screws onto the 3/8-24 thread. A Tommy bar hole in the body (not shown) allows the chuck to be tightened against the body.

Dan is a Sherline dealer in Israel and an avid user of his Sherline tools. He has made a number of modifications to his lathe including adding a milling column behind it instead of using the headstock pin. In the photos you can also see his ball bearing steady rest behind the lathe bed. Featured here, however is how he made a ball bearing fixture to adapt a Jacobs chuck to allow it to function like a live center on the tailstock. Here is what Dan has to say:

“I have long felt the need to have a live center with the possibility to replace tips and best of all with 3/8”-24 thread to fit a drill chuck. Such devices are available (thanks to group member Jim Knighton who pointed me to their availability). Unfortunately these are quite expensive (100\$ ++ with a tip selection) and also they are usually with MT1 so they will not fit the Sherline tailstock.

This weekend I decided to see whether I could make one. I drilled the whole length for 3/8-24 inside tapping. Then I bored one end to accept 15 mm. OD bearing. Total depth 15mm to hold 2 bearings and a spacer. (of course any other size of bearing will do) I did the boring on the lathe. I then tapped the other end (inside) for the Sherline

adapter. All work was done without removing the work in order to ensure concentric results.

I turned a shaft to press fit into the inside diameter of the bearing. In fact, I used 2 bearings with a spacer press fitted between them. The spacer OD is about 13mm; i.e., smaller than the bearings. I faced it on both sides so it has a slight hub on both sides (thicker in the center) and does not touch the outer races of the bearings. Next I drilled a hole for a Tommy bar thru the outside body and the spacer. Without it there would be no easy way to thread the tips onto the live center. Last step was to fit the shaft with the bearings and spacer into the body.

That’s it!! All in all it took about 2 hours as I designed on the go. I haven’t made any tips yet.

I mounted it on the tailstock using the Sherline MT0 drill chuck adapter, thread a 1/2" chuck on the other end of the live center, held a long 3/8" bar between a chuck on the headstock and the chuck on the live center. I let it run at about half speed for 15 minutes or so; it worked beautifully and did not heat up; no visible wobble at all at any speed. Just in case anyone is curious, I did not bother to indicate it for runout. A nice mornings’ project resulting in a useful accessory, at least for me.

Two notes regarding the photo: the slot at the right end of the body is meaningless, it was a piece of leftover bar and I did not bother to face it. The protrusion on the left side of the shaft was first left there on purpose because I started with the threading (just in case it did not come out true). I then held the shaft by this end for turning down the rest of the shaft to the ID of the bearing. For some reason I did not cut it off, although it is no problem with the chuck which is bored through anyway.”

Regards,
Dan Pines

More ideas from Dan...



FIGURE 2—The lathe fitted with the live chuck adapter holds a long piece of stock. Behind the lathe you can see Dan's center-mounted milling column and some of his accessories. Notice also his custom chip guard.

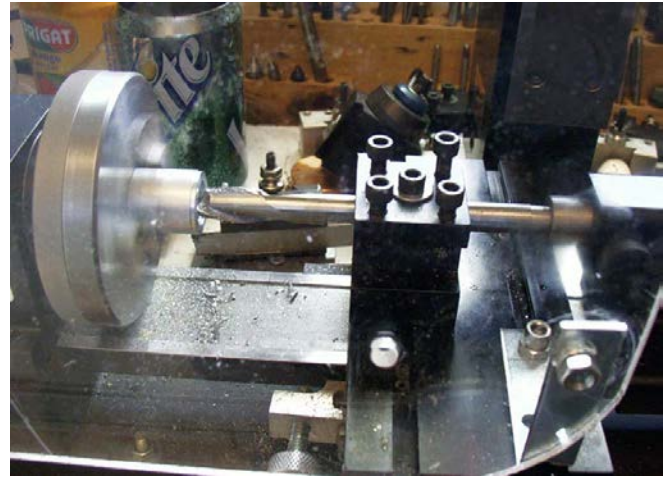


FIGURE 4—Dan uses a 3/8" shaft with a 0 Morse taper on one end to align the P/N 7600 tool post. In the tool post is a 3/8" end mill facing to the left to bore a hole in a part held in the headstock chuck. (Click on any photo for larger image.)

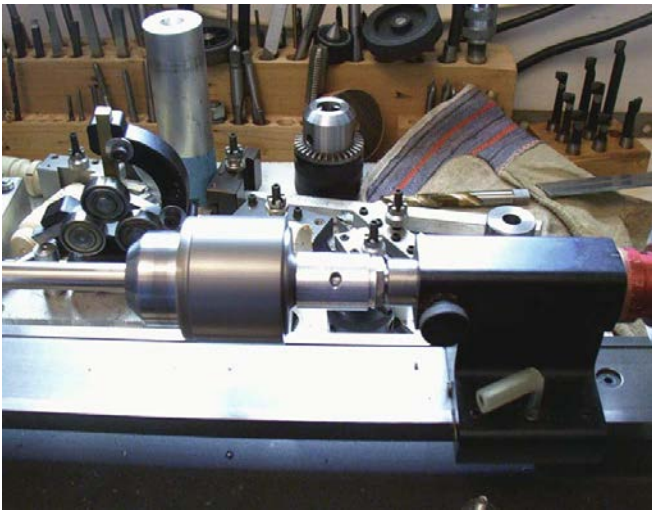


FIGURE 3—A detail of the spinning tailstock chuck. Note also the tailstock locking lever Dan leaves in place for locking and unlocking. Behind the chuck you can get a better view of Dan's custom ball bearing steady rest.