



## Benchtop Tailstock Accessories

### Jacobs drill chuck adapter

Sherline / UNIMAT / Craftsman / China Lathe / etc.

Tailstock accessories for benchtop lathes: the adapter has a Morse #0 taper on one side and  $\frac{1}{2}$ "-20 threads ( $\frac{3}{8}$ "-24,  $\frac{3}{4}$ "-16, etc.) on the other side. We offer version for Sherline, UNIMAT (M12, M14), Craftsman, China lathe (here it's a MT2 or MT3), etc. We do also offer MT #1 and custom sizes/adapters. The instructions are basically the same for all models, as are the safety instructions. Read all safety notes given here before using the accessory.

**Typical application:** Accessory for benchtop / tabletop lathes. Adapter mounts in a Morse arbor, e.g., in the tailstock spindle of a small tabletop lathe and connects to a Jacobs drill chuck. UNIMAT versions are screw-on or PIN type holders.

**Tailstock drilling & safety:** This adapter allows for using a somewhat larger Jacobs drill chuck in a small benchtop lathe. Therefore, somewhat larger diameter drill bits can be used on a small lathe. **However, don't over-do it!** Mounting a huge drill bit in a huge Jacobs drill chuck can result in unstable (dangerous) working conditions on a small lathe. **The lathe tailstock can be damaged beyond repair.**

**When using large drill bits, it's not too hard to jam the drill bit in**

**the work piece, i.e., use the correct RPM and plenty of cutting oil. The larger the diameter the smaller the RPM. Use a small feed of the drill bit and remove chips frequently. When pulling back the tailstock make sure not to pull the work piece out of the chuck.**

**Procedure:** Extend the tailstock spindle with the Morse arbor by about  $\frac{1}{4}$ ". For best fit, *slightly* (and carefully) slam the taper adapter in the spindle *by hand*. To remove the taper, pull back the spindle. Typically, taper arbors/spindles have an internal draw bar, which will push out the taper. Mount a Jacobs drill chuck (not included) on the other end of the adapter.

**Safety Notes, Trouble Shooting, and Disclaimer:** General safety rules for machine/power tools are in place. For an extended list of safety notes, consult the literature or go to our website. You can download free of charge a safety booklet, which is also typically included (free of charge) for first-time customers.

Use protective clothing including, most importantly, **safety glasses** for metal work.

The adapter may start to rotate. Do not try to stop the rotating adapter with your hands.

Make sure that the adapter is properly inserted in the Morse arbor – the quill typically needs to be moved out somewhat. **The tailstock needs to be locked.**

Do not reverse the lathe rotation direction or one may unscrew the drill chuck. The spindle should rotate towards you (front side of the lathe bed).

**When using large drill bits, it's not too hard to jam the drill bit in the work piece, i.e., use the correct RPM and plenty of cutting oil. The larger the diameter the smaller the RPM! The torque of the lathe motor is limited and rather small at small RPM on a small lathe. Therefore, use a small feed rate of the drill bit and remove chips frequently. Use cutting oil. When pulling back the tailstock make sure not to pull the work piece out of the chuck. **Disregarding these safety precautions can damage the tailstock beyond repair, i.e., when a drill gets stuck in a work piece the entire tailstock quill may be unscrewed, damaging the threads of the tailstock quill. Some version of Sherlines tailstock did use a left handed tailstock spindle which may prevent this from happening, but newer Sherline models appear to have a right handed tailstock spindle.** What we describe here can also happen with a smaller drill bit.**

**Save working practice will be at your responsibility. LatheCity will not repair or replace damaged tailstocks.**

However, a 1/16" drill will break (we don't replace drill bits either) when jammed, a 3/4" may damage the tailstock spindle.

#### **Further technical notes**

**Morse taper:** Please note the length and end style of Morse taper varies, depending on application and lathe model. Our version is tailored towards small benchtop lathes. The standard version we offer for Sherline has a taper length of ~0.75" for short benchtop tailstock spindles. That taper is cut off at the small diameter end. For Craftsman it's the opposite. UNIMAT's don't have a MT, but just a straight pin or threaded bushings. Other sizes are available on request as custom designs. The taper has no tang, i.e., the adapter may start to rotate under heavy load. Adding a tang would not be compatible with Sherline's tailstock spindle. A Morse taper with a tang would not be safer, probably rather the opposite since the tailstock spindle may start to rotate even faster on a small system. Some lathes have left hand quill spindles which may be somewhat safer. Newer lathe versions often don't have this feature.

**Centricity:** All pieces are individually measured before mailing. Please make sure that the headstock of your lathe is locked, the alignment key for the headstock is inserted, the tailstock is locked, and the Jacobs chuck is not so heavy that it bends down the tailstock quill. Tailstock accessories are stationary tool. Therefore, it is common practice to label the best position (with the highest centricity) on the tool using e.g. an engraving tool or a file. For UNIMAT and Sherline we do also offer alignment tools (Buddy bars). UNIMAT is just aligned with a pin which is problematic.

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