



Caring for Your Lathe

Photo 1—Lubricate Cam. Take the tool rest base off the bed, turn it over, clean the cam, and oil it. Oil the bearings at the ends of the cam shaft. Do the same thing with the tailstock if it is equipped with a cam lock.

This is the first of a two-part article. The second part will cover accuracy and alignment of the lathe.

In my youth I garnered the nickname *The Duke of Oil* because I always ran around the shop with an oil can. So many mechanical problems can be avoided by routine lubrication, yet the benefits go beyond preventive maintenance. Lubrication allows the machine to operate as intended so you don't have to fight against it. The single most important thing you can do to get the best performance and longest service life out of your lathe is to lubricate it.

Volumes have been written on types of oil and grease for machinery, and some modern machines with high-tech bearings and gears have strict requirements—but most wood lathes are not that sophisticated. Use what is the most handy—motor oil—and that's fine. Some people use grease on cams, but I think grease attracts dust and is harder to clean. Don't fret about the kind of oil, the main thing is just do it.

Cam Locks & Clamp Screws

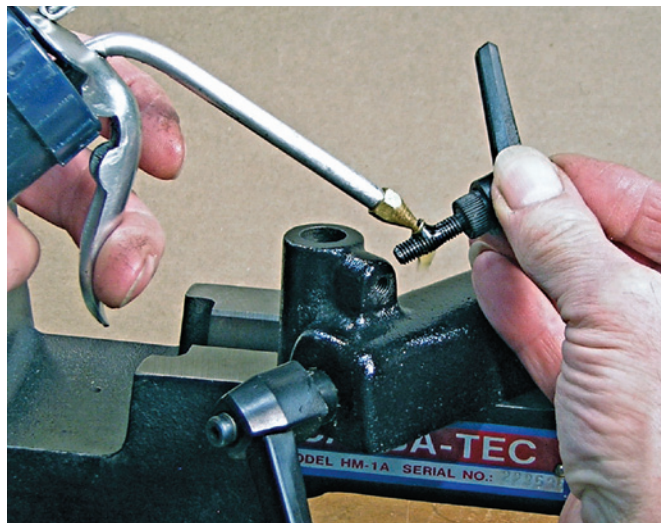
Tool rest bases and tailstocks are frequently locked with a cam although some still have the old reliable clamp screws. In either case, these locking mechanisms are used frequently and require

regular lubrication. To oil the cams properly you need to remove the tool rest base and the tailstock from the lathe bed, turn them over, clean the bearing surface of the cams and lubricate thoroughly—*Photo 1*.

There are several types of tool rest clamps, but regardless of design, all clamp screws must be lubricated. The clamp screws in the tool rest and tailstock are critical because they are located near dust and dirt, including abrasive material from sanding. Remove the screw completely, clean and oil the threads thoroughly before reassembly—*Photos 2 and 3*.

Tailstocks

After you have removed the tailstock ram lock screw, you should go ahead and remove the ram completely from the tailstock casting—*Photo 4*. Unwind the feed screw all the way and pull the ram out. Many modern lathes have clamp screws that come completely out of their keyways if they are unscrewed more than a couple of turns. This leaves the ram free to rotate, and if it does before the clamp screw is tightened again, it might tighten on the finished surface instead of in the keyway where



Photos 2 & 3—Remove the screws completely, clean them, and oil generously before reassembly.

it belongs. This causes damage to the surface of the ram that eventually has adverse effects on the precision fit of the ram in the tailstock casting. These problems are caused by failure to design sufficient keying. If there are any 'dings' on the ram, file off any raised material with a very fine file (#3 Swiss or finer), then clean the outside, lubricate the thread and the outside surface and reassemble—*Figure 1*.

Ergonomics

Make sure the lathe is the right height for you. The spindle should be at the height of your elbow when your arms are down at your side in a natural position. If the lathe is too high, you could experience stress to your elbows, shoulders and wrist joints because they are too cramped or flexed at an unnatural angle.

As with all craft, good light is essential. Do not attempt to work with fluorescent light only because it is too soft. You need direct focused light to create shadows that will reveal irregularities in the turned surface. For spindle turning, use two focused lights so that both sides of a bead or a vee will be equally illuminated. Clamp-lights on a rail offer the adjustability you need as you move to various parts of the spindle turning.

Make sure there are no sharp edges on any parts of the lathe, especially around handles. Carefully check the tool rest for sharp edges, because this is the part of the lathe your hands are always touching. Spend some time filing or grinding the tool rest if necessary to remove all rough or sharp edges. A stationary belt sander is excellent for smoothing the top of a tool rest—*Photo 5*.

Bearings

Most modern lathes have sealed ball bearings in the spindle that need no attention. The only exception I can think of is the Record. Lathes made before 1930 usually have the old fashioned plain bearings (usually bronze or babbitt metal). These should be oiled at the first start-up of the day and after every hour of steady use. Some have oil reservoirs in the bearing housing, and only need to be checked periodically.

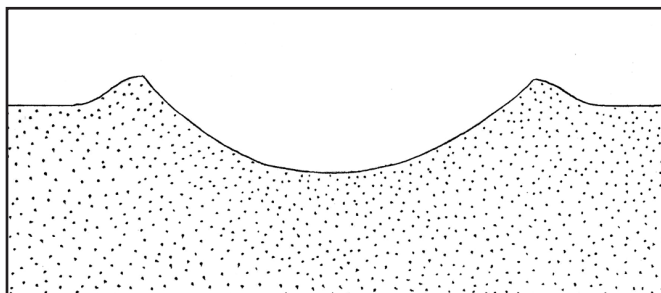


Figure 1—The illustration shows how metal, such as a lathe bed, reacts when dented by a hard object. Metal does not have the ability to compress much, so it flows away from the pressure in every direction—including above the original surface. The resulting raised bumps, which sometimes can be quite sharp, cause damage to mating surfaces of sliding parts.



Photo 4—Remove the ram completely, check for damage to the surface, lubricate the threaded hole and the outside surface before reassembly. On small lathes, the ram is threaded externally and has no central screw.

Motor bearings are also frequently equipped with sealed ball bearings. But again, some older ones need periodic attention. Most motor bearings are designed to go for a reasonable time between lubrication, but don't forget about them.

The Bed

Preventive maintenance of the lathe bed includes: cleaning thoroughly after woodturnings are sanded to remove the stray grit that falls on the bed; covering the bed if finishing materials are used at the lathe; trying not to drop anything on the bed that would damage the surface. *Figure 1* show how dents in metal actually rise above the surface, causing difficult sliding of parts, and accelerating wear of mating surfaces.

If there are any damaged spots on the lathe bed, the best way to smooth them is to lap the surface with a large stone. This will remove any raised material around the dents and scratches. You could also use a file if it is very flat and fine grade (Swiss #3 or finer). Do not attempt to remove rough spots with sandpaper because it is too soft. A stone or file is rigid and will only take off the high spots, which is what you want.

After you have smoothed and cleaned the bed, lubricate the surface so the tool rest and tailstock will slide easily. The perfect lube for this is paraffin wax sold in grocery stores for canning. A lump of wax is much better than paste wax in a can because it is more convenient (you don't need to open a can or get your fingers sticky) and it is almost free. In fact I have pieces of paraffin all over my shop, because I use it in many places: table saw, jointer, planer, handsaws and planes. At the lathe, I keep the wax nearby because I not only use it on the lathe bed, but also on the top of the tool rest—*Photo 6*.



Photo 5—Smooth the top surface and remove all sharp edges from the tool rest with a belt machine as shown, or with a file.

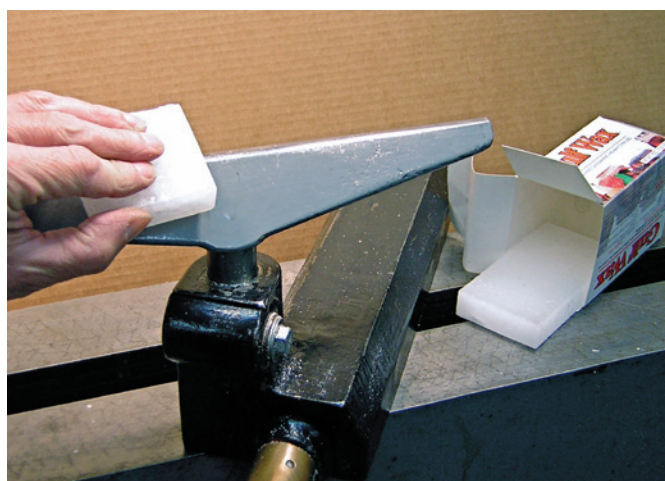


Photo 6—Paraffin wax is a convenient, inexpensive way to lubricate the tool rest and the lathe bed.

Upgrades to Consider

Speed Control

The 21st century has brought the miracle of the Variable Frequency Drive (VFD)—*Photo 7*. This is the type of variable speed motor control used on the most expensive lathes such as the OneWay and the Powermatic. This revolutionary device has made all the old belt systems obsolete (step pulleys and variable speed belt drives). Like all computerized devices, the prices keep coming down, and you can add a VFD to any lathe for a few hundred dollars. If you have an old lathe with a four-step pulley, you are not getting the most from your machine. The common problem with these old belt systems is that the slowest speed is not slow enough, and if you are turning bowls from out-of-balance blanks, then you need to start out at a very low speed. The advantage of the VFD is that the speed can be turned down almost to zero. See Peter James' article in *The Journal*—Vol. 3, No. 3. Also, it is extremely valuable to be able to 'tune-in' the exact speed that does not coincide with any harmonic oscillations of the lathe, to provide the smoothest running and best stability. A variable speed motor drive is a worthwhile investment to upgrade an old lathe.



Photo 7—In the 20th century, motors were either “on” or “off”. It's a new world now with the Variable Frequency Drive (VFD).

Tool Rests

The tool rest should be adjustable at least from $\frac{3}{4}$ " below to $\frac{3}{4}$ " above the centerline—*Photos 8 and 9*. I don't think this is too much to ask, ($1\frac{1}{2}$ " total adjustment) yet many lathe designers have not been able to accomplish it. Without this range of adjustability you will be constantly compromising your tool angle—often leading to a 'catch' or loss of control of the chisel.

Low limit: Usually the top of the tool rest base (banjo) is 2" to 2½" below the centerline (more on very large lathes). The height of the body of the tool rest is about 1½", so on average this should give the necessary adjustability in the low range.

High limit: The shank of the tool rest needs to be long enough to raise the top $\frac{3}{4}$ " above the centerline and still have the clamp screw grip the shank properly (at least 1" above the bottom end of the shank).

If your tool rest does not have this adjustability, then you should consider replacing the tool rest, the base (banjo) or both, especially if the assembly is not very rigid or not easily adjusted. Fortunately, tool rest assemblies are one part of wood lathes that are readily interchangeable from one machine to another—you just need the proper tee-nut underneath. You may find that a tool rest upgrade will greatly improve your working experience at the lathe. ■



Photo 8—For spindle turning, and often on the outside of a bowl, the tool rest is placed above center. It should be possible to raise the tool rest at least $\frac{3}{4}$ " above center.



Photo 9—To reach the center of a face turning, the tool rest must be below center. It should be possible to lower the tool rest at least $\frac{3}{4}$ " below center.