

# Z-axis Backlash Modification

## Reason for the design change

Since its original design, the Sherline mill column has been produced in the same manner. The weight of the motor/speed control unit is ultimately transferred to the handwheel set screw. In almost 30 years, this has caused almost no problems; however, in some cases, the set screw can “settle” on the leadscrew, allowing backlash to increase. This is aggravated by pounding on the drawbolt in the spindle to release a #1 Morse taper on a chuck or tool. To reduce the possibility of this happening, Sherline introduced a production change. As of January 2001, new Sherline mills include a screw that goes through the center of the Z-axis handwheel and into the end of the leadscrew to help distribute this load. It is still a good idea to support the headstock when tapping on a drawbolt so the shock isn't transferred to the supporting parts and fasteners.

## Modifying your existing mill Z-axis

Because of the many leadscrew/handwheel combinations, “upgrade kits” to convert older mills are not offered, but it is a simple process to do it yourself. A mill owner can simply center drill the handwheel and leadscrew and install a support screw. We use a 5-40 x 3/8" screw for this purpose. On standard handwheels, this is a button head cap screw P/N 45014. A #6 flat washer (P/N 45012) goes under the head of the screw. On adjustable “zero” handwheels, the screw must be countersunk flush with the surface so that it does not interfere with the locking collar. For this purpose, we use a 5-40 flat head socket head screw P/N 45013. The screws and washer can be

purchased from Sherline by part number or you can use similar screws from any supplier of small fasteners.

## Installing all new components

For those who wish to purchase new leadscrews rather than center drilling their existing ones, simply order a new leadscrew of the proper part number for your existing machine. See the exploded view in your instruction manual to get the part number. All new Z-axis leadscrews in stock are drilled and tapped, but the part numbers have not changed. The same goes for the handwheel bodies should you choose to order a new one rather than drill your old one. Just order the proper Z-axis handwheel for your machine, and it will come predrilled.

## Installing and adjusting the screw

To adjust tension on the screw, first remove all Z-axis backlash in the conventional manner by lifting the motor/speed control unit by hand while tightening the handwheel set screw on a “fresh” quadrant of the leadscrew to avoid picking up any previous indentations. Once adjusted, tighten the new center screw only until it is “finger tight”. Use a very small amount of Loc-tite® on the end of the screw to keep it in place. (Do not coat the threads or the screw may become impossible to remove.) Overtightening the screw will cause the handwheel to become hard to turn. The purpose of the screw is not to adjust backlash, but rather to keep it from increasing once it is properly adjusted. Do not try to use the screw to pull out additional backlash. The small 5-40 threads are not strong enough for this task.

