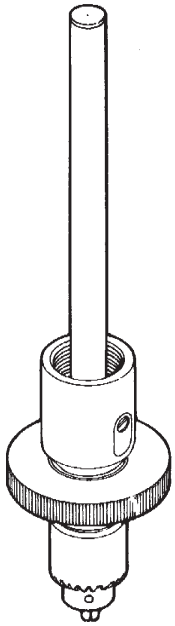


SHERLINE PRODUCTS
INCORPORATED 1974

Sensitive Drilling Attachment

P/N 1012

Purpose of the sensitive drilling attachment

Drilling holes with small diameter drills requires a certain "touch" that is hard to achieve when using a standard drill press. Small drills are easily broken if pushed too hard, and being able to feel the cut offers better feedback, allowing you more control over the feed rate. Remember, however, that larger size drills require significant force, and that for holes larger than 1/16" or so you might be better off with the leverage of the handwheel feed when drilling hard materials.

Note that several design features enhance the operation of this attachment. For example, rather than a simple pin that will wear and eventually cause jerky movement, a brass key with flat sides was used in the shaft slot. The brass tube is simply a spacer to cover the shaft and to provide a support for the end of the spring.

Installation

The drill attachment body simply screws onto the external thread of the spindle. To insert the brass tube into the spindle, you will have to either remove the headstock or raise it almost to the top of its travel. To assure the drill attachment runs true, before installing it, check the spindle threads to make sure they are not damaged and are free of chips. Also check to see that the spindle shoulder at the end of the threads is not dented and that there are no chips present that could keep the drill body from seating squarely.

Changing return spring tension

The spring can be changed to provide more or less return pull. You can purchase other extension springs and substitute them for the one provided or you can shorten the one installed by cutting off some of its length and forming a new loop at the end if you want a more positive return. Any 2.5" overall length extension spring with an overall diameter of .25" or less can be used. To remove the spring, pry up the cap and pull it away from the body. Hold the spring and remove the hook on the cap from the end of the spring. Release the spring and slide off the brass tube. With a small drift, remove the pin that goes through the shaft. Install a new spring in the reverse order.

Lubrication

Smooth movement and proper "feel" require that the shaft remain properly lubricated. Any good lubricating oil will work. Clean the shaft when done with your job and apply fresh oil before putting it away.

Use of the drilling attachment

Spring tension holds the drill chuck up against the spindle. To drill a hole, set the speed control to zero, turn on the motor and then adjust the speed control. Grasp the red, knurled ring and pull the drill down. A bearing allows the drill to turn inside the ring while the ring does not turn.

Remember that the rules for clearing your drill of chips are even more important when drilling very small holes. Failure to properly clear the chips from the hole and/or lack of cutting fluid can result in broken drill bits. The first pass is drilled two drill diameters deep. Subsequent passes are drilled one diameter deep and then the drill is withdrawn to clear the chips.

Example: To drill a 1/16" diameter hole 1/2" deep:

Pass No.	Pass depth	Total depth
1	2 times drill diameter or 1/8"	1/8"
2	1 times diameter or 1/16"	3/16"
3	1 times diameter or 1/16"	1/4"
4	Continue to desired depth…	etc.

This means that for a .015" drill, the first pass will be only .030" deep with each subsequent pass only .015" deep.

Coolant/Lubrication

Other than brass which is cut dry, most drilling operations are best accomplished with the aid of lubrication. Apply a bit of cutting fluid to the drill before beginning the cut

and replenish as necessary. Stainless steel is in a league of its own and requires slow spindle speed, constant feed pressure and sharp tools as well.

Other drilling tips

• Accurate hole location requires the use a center drill to start the hole in the proper location. They do not have a tendency to "walk" on the surface when entering like standard drills. They are particularly helpful when drilling into a surface that is round or at an angle to the drill.

• Use only sharp, high quality, high speed steel drills. Sharpen or replace them as needed. Dull drills can drill up to 10% oversize.

• Tighten the chuck evenly and firmly with the key provided. Make sure drills are held tightly so they can't slip and spin in the chuck jaws. This will score the shaft and ruin the drill and can also damage the chuck jaws.

• It is difficult to maintain tolerances closer than +.003" -.000 with drills. If greater accuracy is required, a reamer should be employed.

• Remember that the rules for withdrawing the drill to clear chips still apply to small bits, so withdraw the bit after two times the diameter of the drill bit on the first pass and an amount equal to the diameter of the bit on each successive pass. On tiny drills that can be a very small amount. For example, on a #80 drill of .0135" in diameter, your first depth would be .027" (2 x .0135") and each successive "peck" would be only .0135" in depth.

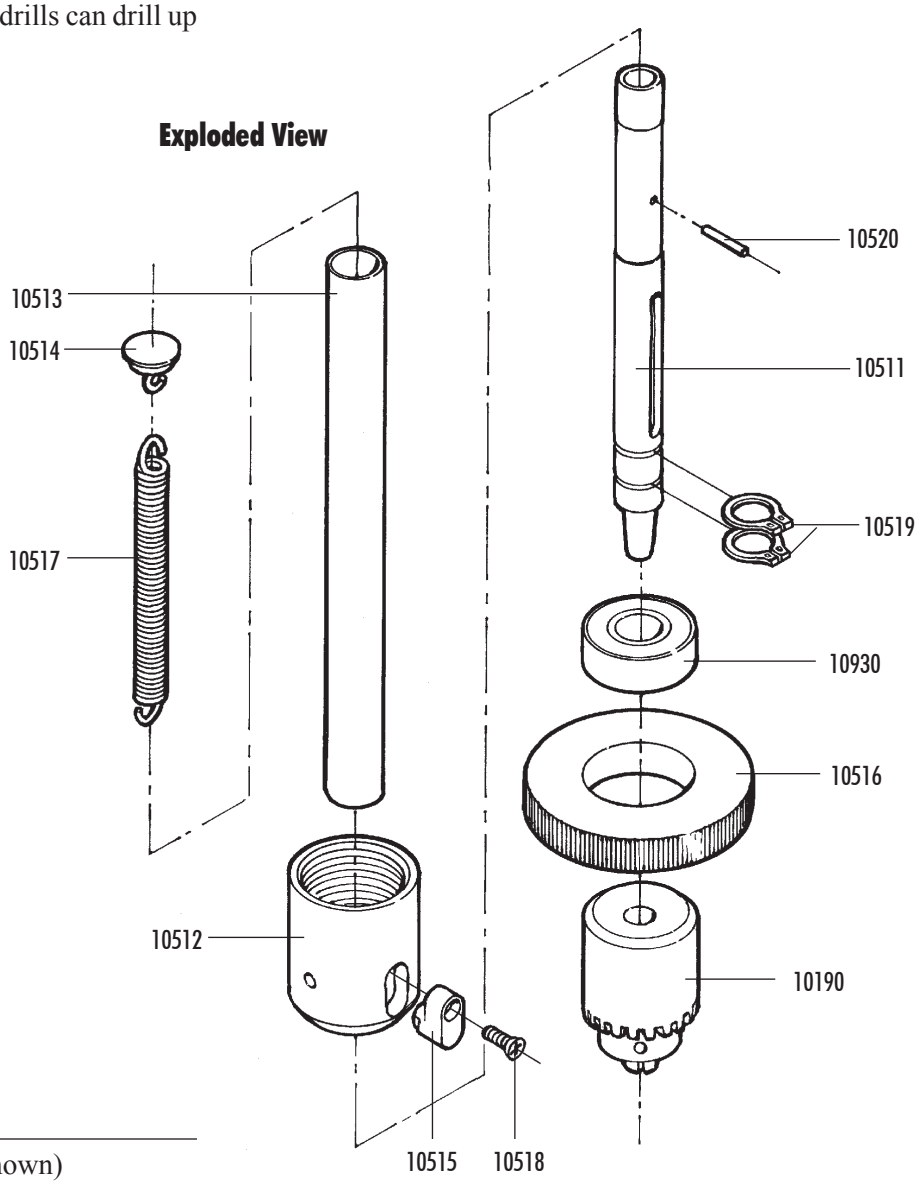
—Joe Martin

CAUTION!

High Speed Operation

The sensitive drilling attachment was designed for use with the normal Sherline pulley set that offers a maximum speed of 2800 RPM. If used with the optional 10,000 RPM pulley set, spindle speed should not be set to exceed 3000 RPM.

Exploded View



Parts List

NO. REQ.	PART NO.	DESCRIPTION
1	10180	5/32" Chuck key (not shown)
1	10190	5/32" 0 Jacobs taper drill chuck
1	10511	Main shaft
1	10512	Drill body
1	10513	5" Brass tube x 13/32" dia.
1	10514	Cap w/ hook
1	10515	Drive key (brass)
1	10516	1-3/4" Feed ring
1	10517	2.25" x .028" Extension spring
1	10518	4-40 x 1/4" Stainless steel slotted screw
2	10519	3/8" Snap ring
1	10520	1/16" x 3/8" steel dowel pin
1	10930	3/8" Ball bearing