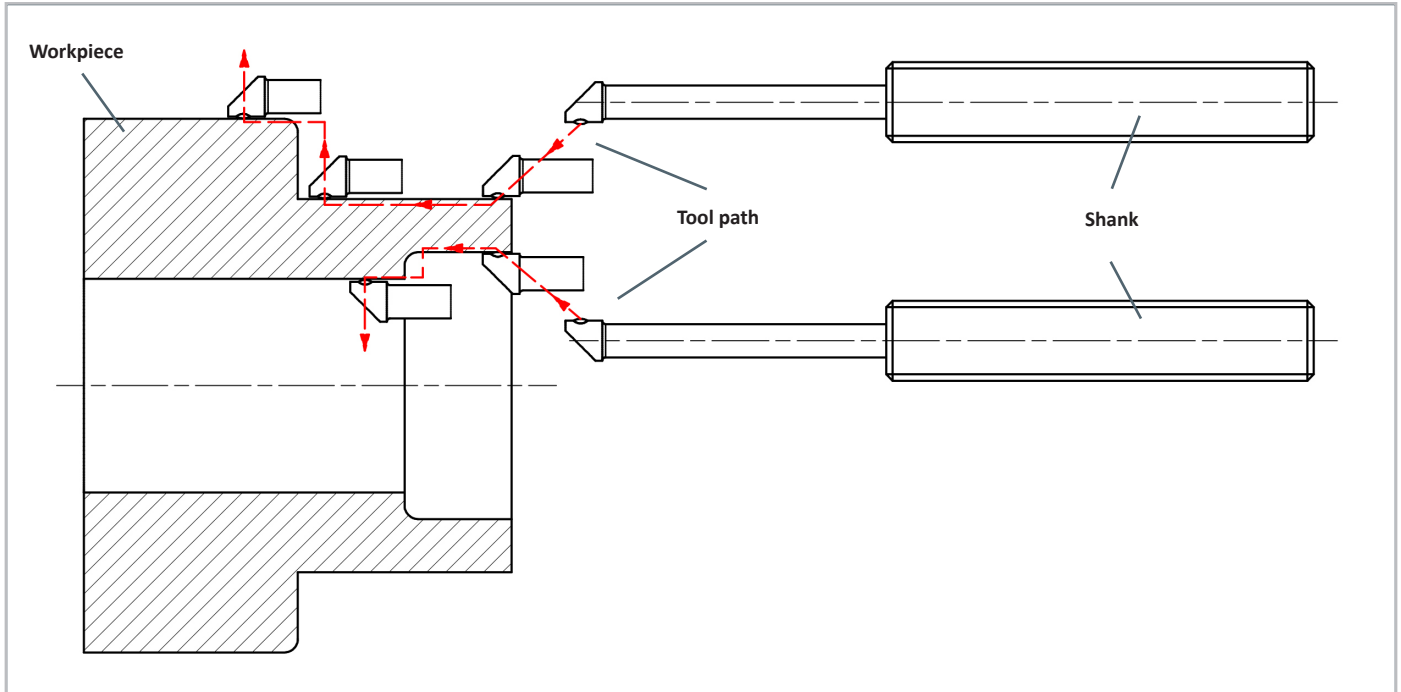


DIAMOND BORING BAR STYLE BURNISHING TOOL

INSTALLATION AND OPERATING INSTRUCTIONS



Operating Instructions:

Part preparation: 80-100 μ -inch Ra (2.0-2.5 μ -m Ra)

Part hardness: 40Rc or under. Consult factory for harder materials.

Feed Rate: .003"/.004" IPR (0.076-.100mm/rev)

Speed: 200-500 SFM, 750 Max SFM (60-150 meters/min, 230 meters/min Max)

Coolant Required: Water soluble or oil

Maximum Tool Reach: 2.860" (72.6mm)

Minimum Hole Diameter: .500" (12.7mm)

Minimum Clearance Requirement: .140" (3.6mm)

The Elliott Boring-Bar Style Diamond Burnishing Tool is designed for lathes or similar turning machines to provide an improved surface finish on a manufactured part.

This burnishing tool can be used on most metals with a hardness below HRC40.

Tool Set Up and Operation:

Mount the burnishing tool so that the center of the diamond is on-center and perpendicular to the wall of the hole being burnished.

Flood coolant on the part that is going to be burnished. Turn the machine on and feed the diamond stem into the hole. Position the diamond so that it contacts the wall of the hole.

Once the diamond is in contact with the wall, move the diamond approximately .020" to .030" (0.51mm to 0.76mm) toward the wall. This will apply tool-to-part pressure required to displace the material in the burnishing process. (The amount of pressure required will vary from application to application.)

Feed the burnishing tool forward into the hole (see suggested feed rate on other side). Continue flooding the tool with plenty of coolant.

Once you have achieved the required depth, move the diamond away from the wall and then remove it from the hole.

Once the burnishing tool has been removed from the hole, stop the machine and check the finish. If the result is not to the required specification, repeat the above steps on another part.* On the next part, move the stem 0.003" (0.076mm) against the wall. This will apply more pressure on the surface being burnished.

*Note: Burnishing is a one pass process. Repeated burnishing on the same surface will not give you accurate feed, speed and pressure data needed for burnishing other parts.

Tool Tips:

If you cannot get enough tension on the stem, try the following:

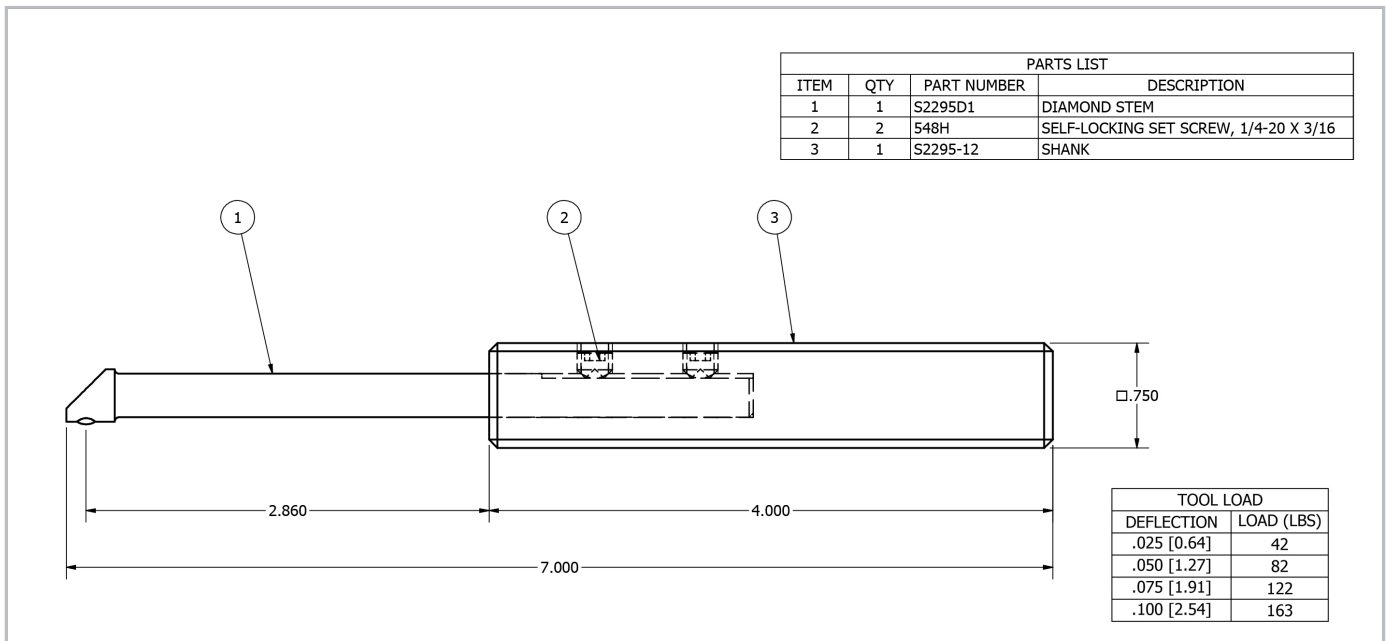
1. Angle the tool slightly. This will provide more clearance for the tool to flex.
2. Cut the stem off at a desired length. This will increase your tension, but decrease your reach.

Caution!:

1. Do not deflect the stem any more than .120" (3.0mm) after you have made contact with the wall. More than .120" (3.0mm) may cause the stem to break or permanently bend.
2. Do not feed the tool on or off the part that is being burnished.
3. Do not burnish intermittent part surfaces.
4. Use coolant at all times. The diamond's precision ground surface can be damaged if the tool is used without a flood of coolant on the diamond.

Tool Maintenance

To replace the diamond stem, loosen the two set screws on the shank with 1/8" hex key and pull the diamond stem out. Insert the new diamond stem into shank, and tighten the two set screws firmly.

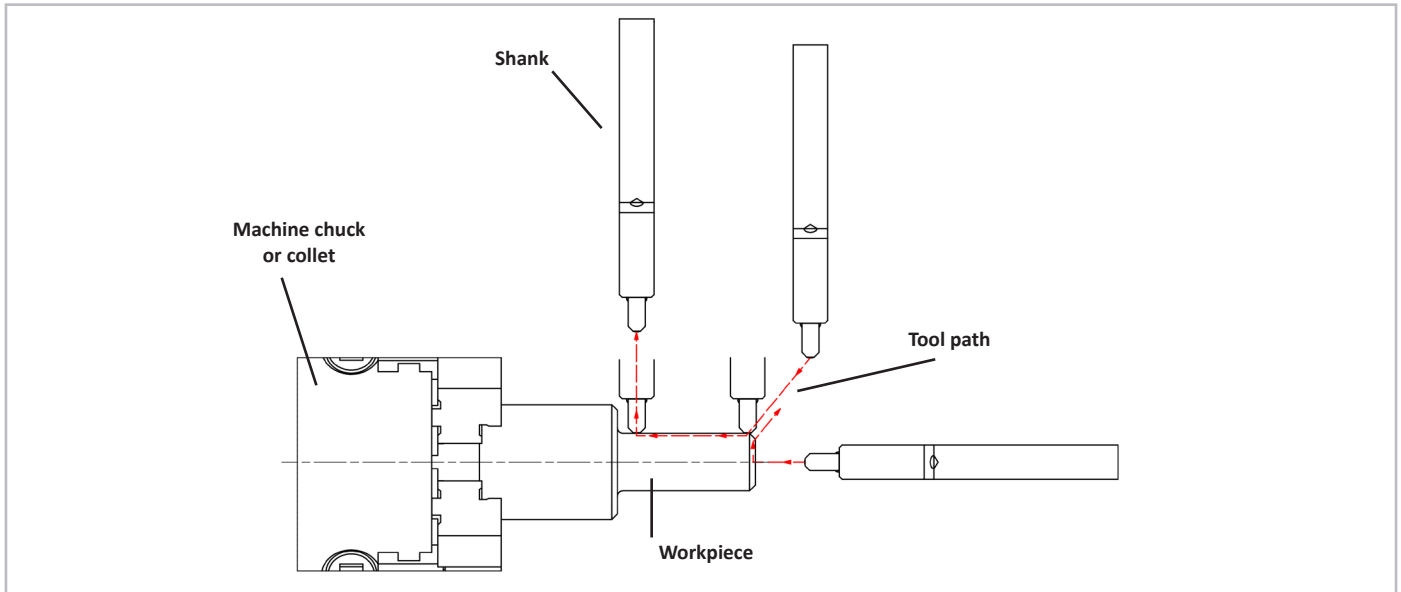


For additional technical support:

1-800-332-0447
 sales@elliott-tool.com
 www.elliott-tool.com

DIAMOND STICK BAR STYLE BURNISHING TOOL

INSTALLATION AND OPERATING INSTRUCTIONS



Operating Instructions:

Part preparation : 80-100 μ -inch Ra (2.0-2.5 μ -m Ra)

Part hardness : 40 Rc or under. Consult factory for harder materials

Feed Rate : 0.003-0.004 Inch/Rev or IPR, (0.076-0.100 mm/Rev)

Speed : 200-500 SFM, 750 SFM max, (60-150 M/min, 230 M/min max). These speeds are in reference to diameter of part.

Common starting values: 0.004 IPR & 500 SFM, (0.10 mm/rev & 150 M/min)

NOTE: Please run a safe speed for your lathe and set up! It is okay to use less speed than the minimum shown. Consult us for any questions about operating parameters.

Coolant Required: Use water soluble 6% minimum concentration (8-10% is ideal) or straight cutting oil. NEVER run tool without coolant or oil applied to the part.

Mounting:

The tools have various shank sizes in both inch and metric. Extend tool from the machine's tool pocket enough to allow for proper machine clearances when deflected completely, approximately 0.200" (5.1 mm) radially. Ensure that the centerline of the diamond is on the centerline of the part.

Spring Load:

The S2300-00 diamond burnishing tool has a max working spring deflection of 0.200" (5.1 mm).

Tool Setting (ID and OD Surfaces):

Before the tool can be operated, it must be determined how much spring deflection is required and the proper feed rate.

Softer materials such as non-ferrous metals and soft steels should not require a lot of deflection (tool pressure) to burnish properly whereas harder steels and cast irons may require much more deflection (tool pressure).

Initial Set Up:

Spring deflection should be determined first. With the spindle turning and coolant applied bring the diamond tip in contact with the workpiece. Deflect accordingly: for softer materials, use .025" (0.64mm) per side deflection. For harder materials, use 0.075" per side deflection (tool pressure).

Tool Setting:

Immediately upon deflection, feed the tool across the surface at initial starting values. Check finish to determine if acceptable.

If the finish is not smooth enough there are two adjustments:

- 1) Increase the spring deflection between tool & part. When increasing the deflection, use 0.025" (0.64 mm) increments each time. NOTE: At max tool deflection of 0.200" (5.1 mm), there will be almost 112 pounds (51 kg) of force against the part. Use caution when applying this much pressure to keep from bending the part or pushing it from the holding device.

OR (continued on next page)

2) Decrease feedrate by 0.001" IPR (0.025 mm/rev) increments. If the surface starts getting too rough or starts flaking, back off deflection (tool pressure).

NOTE: After making adjustments to deflection (tool pressure) or feedrate, do not burnish over the same area more than two times or the material may flake due to too much tool pressure.

Alternate method for tool pressure setting (such as O-ring grooves, keyways, snap ring grooves or to feed on and off part):

Before this method can be used, the proper deflection (tool pressure) must first be determined by the Initial Set Up method on an area without the interruptions.

From the factory, the cap screw has been screwed in just far enough to touch the stem to the spring, eliminating any slack in the assembly with approximately 5 lbs (2.37 kg) worth of preload.

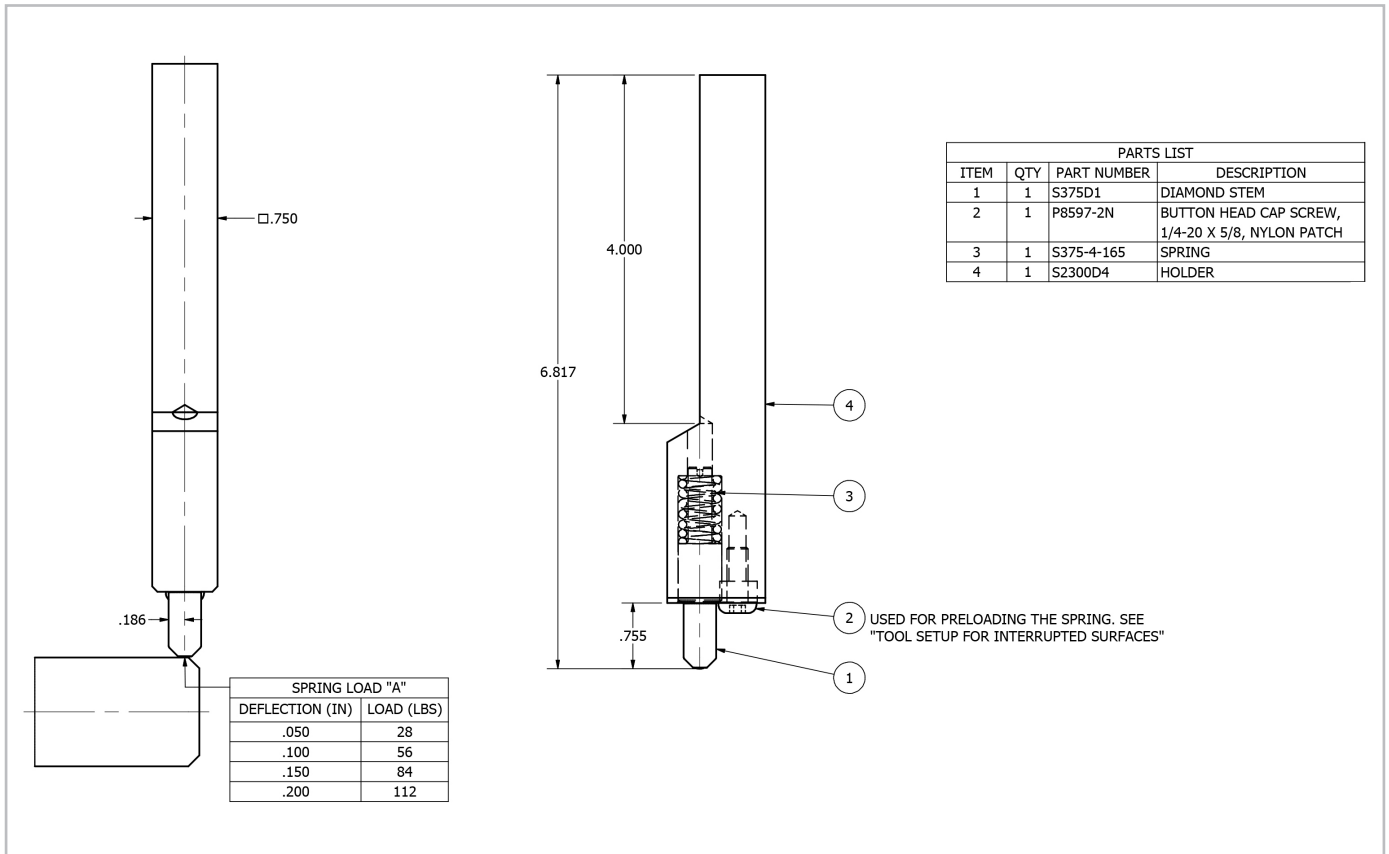
Using a 5/32" (0.156") hex key wrench, turn the cap screw 1/2 clockwise to advance the screw approximately 0.025" (0.635 mm). Continue to tighten the screw in until you reach the amount of deflection you determined in **Initial Set Up**. Now, use only approximately 0.002-0.003" (0.051-0.076 mm) worth of deflection to burnish the part and you will have the same tool pressure as in the **Initial Set Up** process.

Face Burnishing Parts:

Use same the methods outlined above, except turn tool 90 degrees to the face making sure the diamond is on center with the part.

To replace the diamond stem, remove the cap screw and the used diamond stem. Insert the new diamond stem and re-adjust the cap screw to remove any play in the stem. If you used the preload method, then you will need to adjust the cap screw to the previous value.

****PLEASE BE ADVISED THAT THE STEMS (S375D1) ARE NO LONGER ABLE TO BE MODIFIED IN ANY WAY****



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