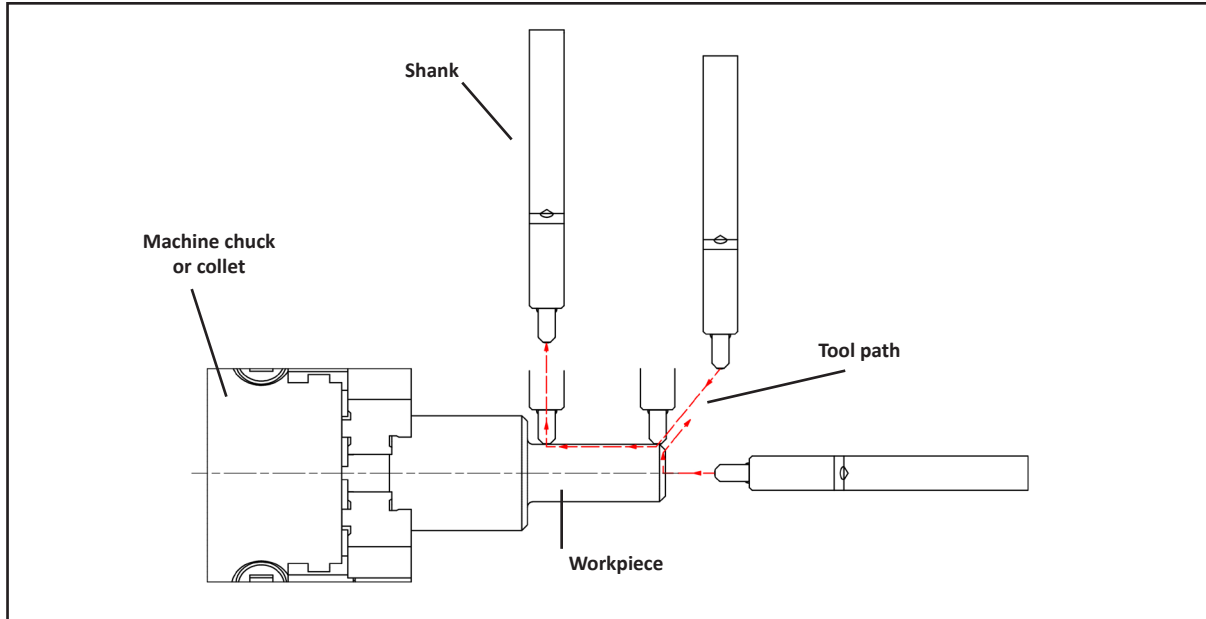


# ELLIOTT DIAMOND BURNISHING TOOL

## INSTALLATION AND OPERATING INSTRUCTIONS



### Operating Instructions:

Part preparation : 80-100  $\mu$ -inch Ra (2.0-2.5  $\mu$ -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% min 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 Elliott 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 (cont'd)

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\*\***

The technical drawing shows a diamond stem assembly with the following dimensions: a diameter of 0.750 inches, a stem length of 4.000 inches, a total assembly height of 6.817 inches, and a bottom section height of 0.755 inches. A detail view shows a diameter of 0.186 inches. A table titled 'SPRING LOAD "A"' provides deflection and load data. A parts list table is also included.

PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	S375D1	DIAMOND STEM
2	1	P8597-2N	BUTTON HEAD CAP SCREW, 1/4-20 X 5/8, NYLON PATCH
3	1	S375-4-165	SPRING
4	1	S2300D4	HOLDER

SPRING LOAD "A"		
DEFLECTION (IN)	LOAD (LBS)	
.050	28	
.100	56	
.150	84	
.200	112	

For additional technical support:

