

## How it works

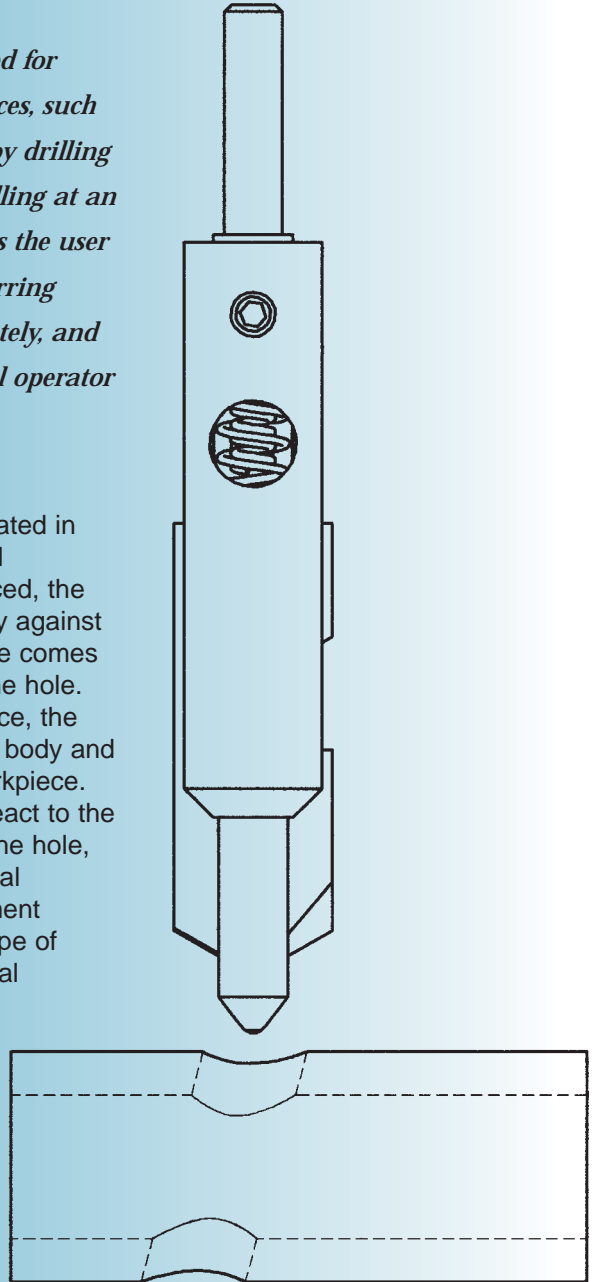
# Ellipti-Bur

*The ELLIPTI-BUR® is designed for deburring irregular hole surfaces, such as those which are generated by drilling into curved surfaces, or by drilling at an angle. The ELLIPTI-BUR enables the user to perform these difficult deburring operations quickly and accurately, and without jigs, fixtures, or special operator skills.*

As the pilot of the tool is located in the hole, the tool is seated and centered. As the tool is advanced, the pilot is forced into the tool body against the shank spring, and the blade comes into contact with the edge of the hole. As the tool continues to advance, the pilot is further pressed into the body and the blade is driven into the workpiece.

The blade remains free to react to the irregular surface geometry of the hole, allowing for both radial and axial displacement- radial displacement resulting from the elliptical shape of angularly-drilled holes, and axial displacement ("rise and fall") from the saddle-shaped configuration of holes drilled in cylindrical surfaces.

This automatic self-guiding feature produces a relatively uniform break on the edge of the hole.



## Design features

The ELLIPTI-BUR features a spring-loaded and self-centering conical pilot to locate and seat the tool for consistent results. All essential tool parts are hardened and ground for durability.

Three models cover a range of hole sizes from 5/32 to one inch (3.96 to 25.4mm).

The blade, which has two diametrically opposed cutting edges, is made from hardened high-speed steel and finish ground. A supplemental surface treatment provides for increased wear resistance.



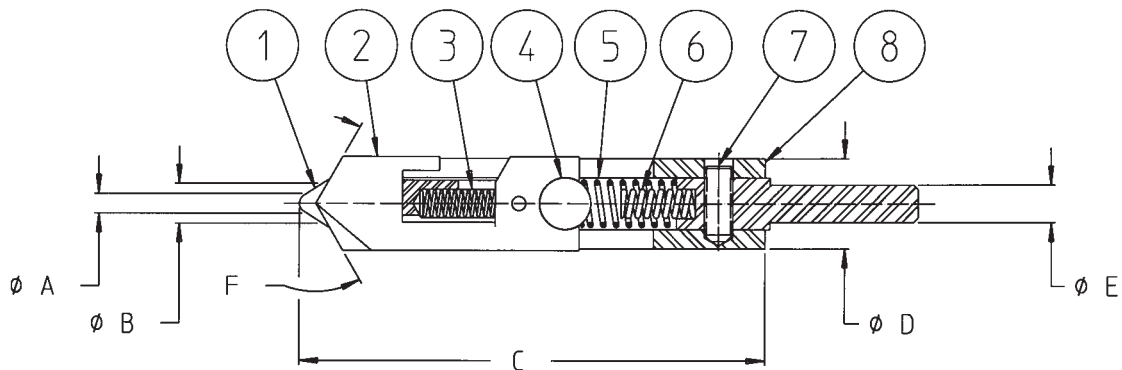
# Standard tool specifications

## Ellipti-Bur®

TOOL NO.	OPERATING RANGE				"C"		"D"		"E"		"F" DEGREE
	"A" (min.)		"B" (max.)		LENGTH		BODY		SHANK		
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	
EL-5	.156	3.96	.312	7.93	3.125	79.37	.625	15.87	.250	6.35	120°
*EL-5XT	.156	3.96	.312	7.93	3.125	79.37	.625	15.87	.250	6.35	120°
EL-8	.250	6.35	.500	12.7	3.250	82.55	.750	19.05	.250	6.35	120°
EL-16	.375	9.52	1.000	25.4	4.750	120.65	1.000	25.4	.500	12.7	120°

\*Blades for the EL-5XT are made from a premium grade high speed steel and recommended for applications where longer tool life is desired, such as when coolant is unavailable.

Note: Operating range is determined by pilot diameter, not by cutter width.



- 1) Pilot
- 2) Blade
- 3) Spring-Pilot
- 4) Ball
- 5) Spring-Cutter
- 6) Shank-Spring Assembly
- 7) Set Screw
- 8) Body

# Tool adjustment & operating recommendations

## Versatile, fast, safe, and easy

ELLIPTI-BUR® tools can be used on portable power tools and drill motors, drill presses, automatic equipment, CNC machines, or on virtually any type of shop equipment.

The tool is fast, safe, and easy to handle. The pilot engages the hole. The blade, *not* the tool body, reacts to accommodate the irregular hole geometry.

## Speeds and feeds

The most desirable speed for a particular application can best be determined by trial. Spindle speeds must be relatively slow to enable the blade to accommodate a continuously changing path in the course of each revolution.

The speed recommendations below will serve as a guideline:

- Speeds up to 600 RPM are generally recommended where the following conditions exist:
  - (1) Where holes are drilled into a flat surface at an angle not exceeding 15°.
  - (2) Where holes are drilled into a cylindrical part with a diameter which is 6 or more times *greater* than the hole size.
- Speeds of 100-300 RPM may be required where more difficult conditions exist, such as:
  - (1) Holes drilled at a severe angle.
  - (2) Holes drilled into a cylindrical part where the diameter is *less* than 6 times the hole size.

Feeds are not a critical issue with the ELLIPTI-BUR. Only a light

contact pressure is required to deburr and produce a small edge break. The amount of stock removal is determined by the pressure applied and the dwell time.

## Application considerations

A proper drilling technique is necessary in order to maximize the effectiveness of the ELLIPTI-BUR. The following guidelines will help you *avoid creating an excessive burr*:

- Drill points should have a 130-150° included angle, rather than the conventional 118°.
- Slow-spiral drills generally allow better breakthrough than fast-spiral drills.
- A uniformly controlled feed rate (preferably power feed) is required in order to prevent an accelerated advance of the drill at the point of breakthrough.
- The workpiece should be held securely.

## Application restrictions

The ELLIPTI-BUR is generally *not* recommended for:

- Extremely soft, ductile metals.
- Applications where the diameter of a cylindrical part having a cross-drilled hole is *less* than 2-1/2 times the diameter of the drilled hole. (Note: The softer and more ductile the material, the more this limitation applies.)

## Blade replacement and regrinding

The ELLIPTI-BUR blade can be easily replaced by following this procedure (refer to the details drawing on page 22):

- 1.Remove Detail 7 Retaining Screw. (*Note:* Tool is spring-loaded.)
- 2.Remove Det. 6 Shank Spring Assembly.
- 3.Remove Det. 3 Blade Spring.
- 4.Remove Det. 4 Chrome Steel Retaining Ball.
- 5.Slide Det. 1 Pilot and Det. 2 Blade from Det. 8 Tool Body.
- 6.Remove Pilot from Blade. (*Note:* spring-loaded.)
- 7.Replace Blade.
- 8.Reassemble in reverse order. (*Important:* Blade must be inserted in tool body so that it can float freely.)

Replacement blades are inexpensive; however, the blades can be reground in the user's shop. Please refer to Figure 3 for proper regrind procedure.

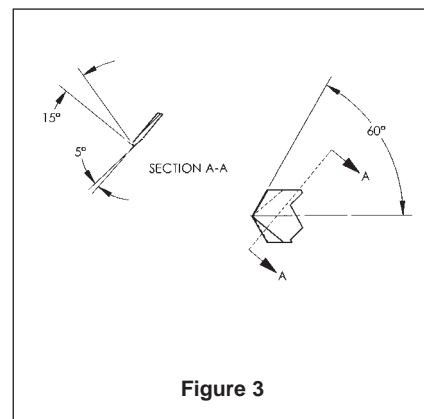


Figure 3