Operating Instructions

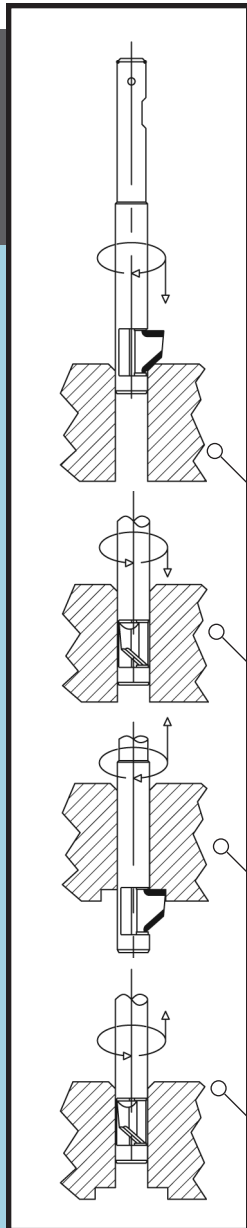## Operation Flipcut™

How it works

NOTE: The tool operation sequence shown depicts the tool with a standard cutter machining a **back spotface** and a **front chamfer** in one set-up. Tool operation is similar when using a standard cutter to machine **back and front chamfers**.

1. The front chamfer is machined upon entry into the bore, using right hand rotation (clockwise) of the machine spindle at the appropriate speed (refer to chart on page 10), and .002 IPR (0.05mm/rev).

2. Left hand rotation (counterclockwise) at a maximum of .008 IPR (0.20mm/rev) will effect mechanical closure of the cutter (aided by centrifugal force) so that the tool can feed through the bore.

3. The back spotface is machined, using right hand rotation (clockwise) at the appropriate speed (refer to chart on page 10), and .002 IPR (0.05 mm/rev).

4. Left hand rotation (counterclockwise) at a maximum of .008 IPR (0.20mm/rev) will close the cutter so that the tool can be retracted from the bore.

Operating guidelines

■ Always ensure that the cutter rotates freely in the arbor and that no end float can be detected. This can be accomplished by adjusting the retaining screw (see photo below) until the cutter binds, then backing off approximately 5 degrees. Using the locking screw, lock the retaining screw at this position.

■ Ensure that the spindle speed is sufficient to allow the cutter to open.

■ After the cut has been completed, and the tool withdrawn from the hole, make sure that enough coolant is supplied to the end of the tool to flush away any remaining chips that might prevent the tool from opening and closing freely in subsequent operations.

■ NEVER run the tool without coolant.

■ The tool cannot be used in a lathe with a static turret, since it must be rotated in order for the cutter to extend and retract. The tool may only be used in a live spindle in lathe applications.

■ After completing the cut, always feed the tool off the part before stopping the spindle and reversing for withdrawal.

NOTE: In some cases, the cutter may not close fully into the arbor when the spindle is reversed. This should be considered as normal; the cutter will close fully as it passes back through the bore on the return stroke. The retraction feed should be the same as the machining feed until the cutter is fully closed and sheltered by the arbor; then rapid feed may be introduced.

Retaining screw

Locking screw
(Hidden from view)
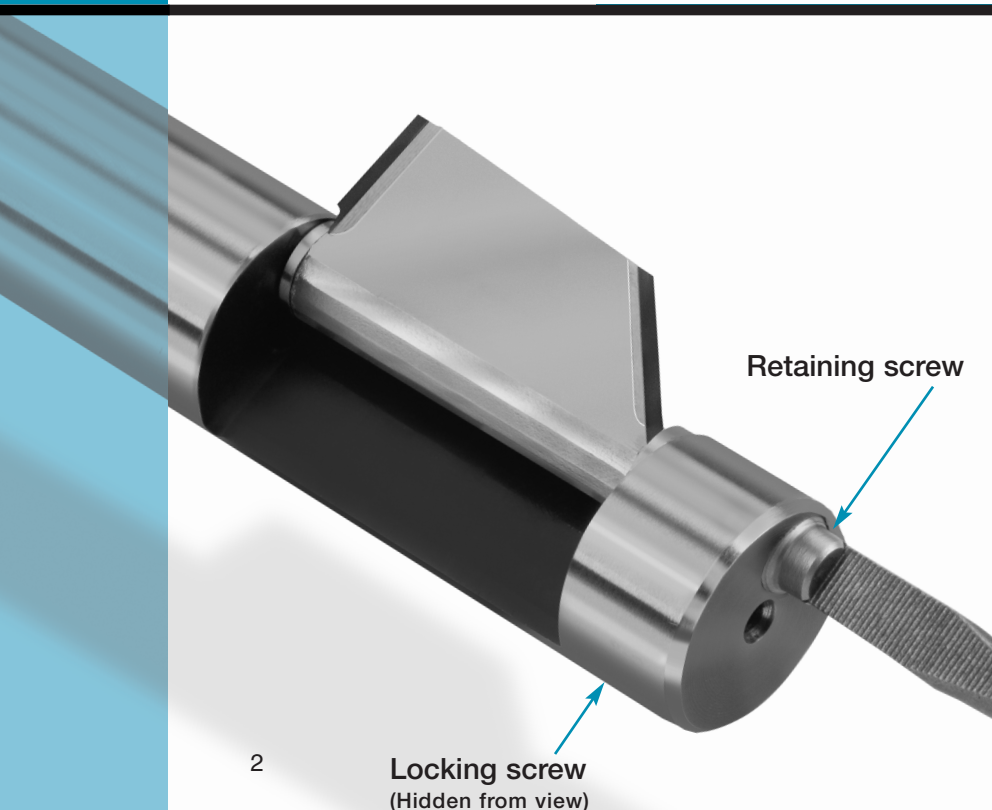
To ensure that the cutter rotates freely in the arbor, with no end float, adjust the retaining screw until the cutter binds, then back off approximately 5 degrees. Use the locking screw to lock the retaining screw at this position.

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Speeds and feeds

HOLE SIZE IN (mm)	SPINDLE SPEED	FEED RATE*
0.344 (8.00)	600 rpm	
0.689 (17.50)	550 rpm	0.002 in/rev
0.813 (21.0)	350 rpm	(0.05mm/rev)
1.000 (25.50)	275 rpm	
1.344 (34.00)	250 rpm	

NOTE: For horizontal applications, the tool should be run at two times the recommended speed.

*Feed rate is the maximum value. When feeding the tool through the hole, prior to the back-spotfacing operation, use reverse spindle rotation and .008 IPR (0.20 mm/rev) maximum feed rate.

Coolant

Coolant flow is necessary and should be directed to the arbor pocket and cutting edge to lubricate and flush chips away. Straight cutting oil, water soluble, or synthetic coolant can be used. The coolant should be clean and have good lubricity.

Cycle

The tool must be able to rotate in both clockwise and counterclockwise directions. The tool should run in counterclockwise rotation at the recommended speed and should feed in and out of the bore at .008 IPR (0.20 mm/rev) maximum.

The cutter should be clear of the part when changing the direction of rotation.

Maintenance

The Flipcut™ tool should be inspected periodically for cutter axial movement, and the retaining screw adjusted accordingly. The tool should also be inspected periodically for wear, and the cutter changed or sharpened when necessary. The retaining screw should be inspected closely for wear or damage and replaced if necessary.

Cutter installation and setting

When the cutter is worn, loosen the locking screw (refer to the drawing below). Remove both locking screw and pad. Loosen the retaining screw and remove the worn cutter. The cutter may be reground (see page 12, "Cutter Regrinding") or replaced.

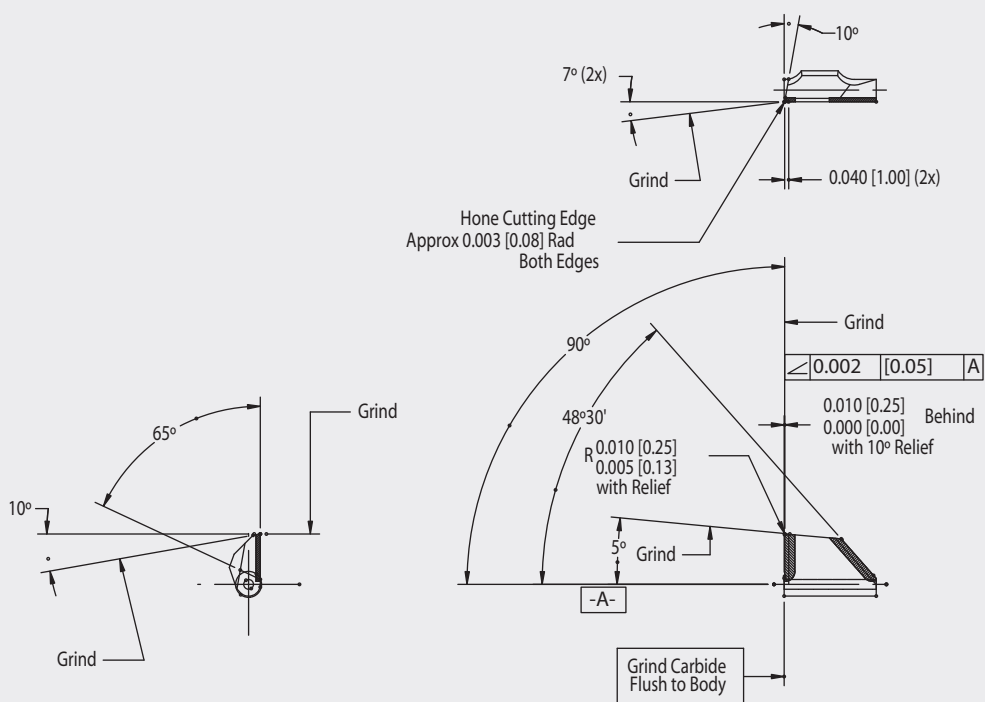Clean all components thoroughly and apply light lubricating oil to each part for assembly.

Referring to diagram below…

1| Place and hold (2) **spacers** at the front and rear barrel diameter of the **cutter** while assembling into the slot on the arbor.

2| With **cutter** and **spacers** in place, insert **retaining screw** through the threaded hole in the end of the **arbor** and then through the first **spacer**, the hole through the **cutter**, the second **spacer**, and into the hole at the furthest end of the **arbor** slot.

3| When all components are aligned and positioned correctly thread the **retaining screw** into the threaded hole in the end of the **arbor** until it makes contact with the **spacer** and the **cutter** goes tight. The **cutter** should **NOT** pivot freely at this point.

4| Assemble the **pad** and **locking screw** into the threaded hole in the front outside diameter of the **arbor**.

5| Tighten the **locking screw** lightly.

6| Unscrew the **retaining screw** very slightly until the **cutter** freely hinges between the fully open and fully closed positions.

7| Check that the axial movement in the **cutter** is at the minimum but still allowing free hinging movement of the **cutter**. Measured axial gap should be 0.005 to 0.010 inches, (0.013 to 0.025mm).

8| When satisfied that the cutter assembly is correct, tighten the **locking screw**.
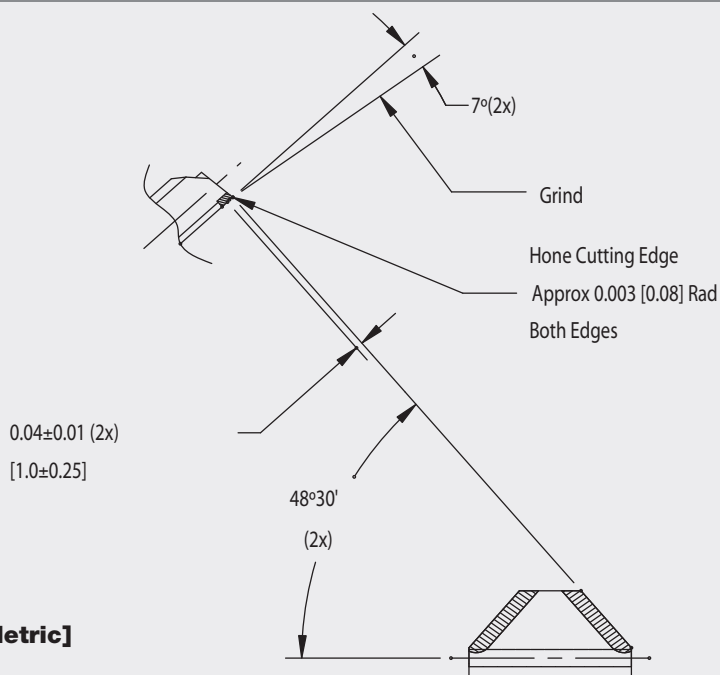
Cutter

Spacer (x2)

Retaining Screw

Arbor

Pad

Locking Screw
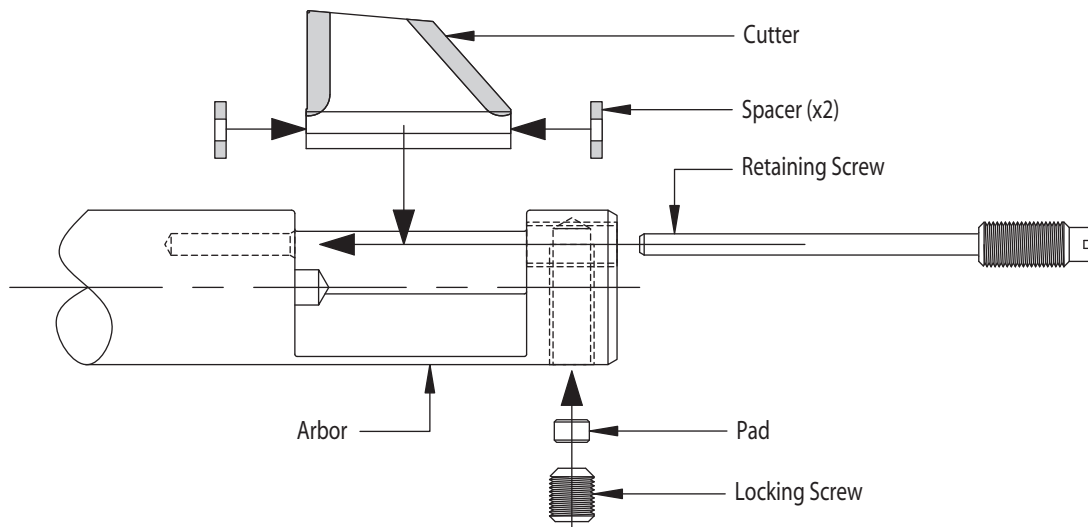
Cutter regrinding

Regrind procedure for standard cutter for machining back spotface and front chamfer

10°

7° (2x)

Grind

0.040 [1.00] (2x)

Hone Cutting Edge
Approx 0.003 [0.08] Rad
Both Edges

Grind

90°

0.002 | [0.05] | A

48°30'

0.010 [0.25]
0.000 [0.00]   Behind
with 10° Relief

R 0.010 [0.25]
0.005 [0.13]
with Relief

65°

Grind

10°

5°   Grind

-A-

Grind

Grind Carbide
Flush to Body

Inch [Metric]

Regrind procedure for standard cutter for machining back and front chamfers

7°(2x)

Grind

Hone Cutting Edge

Approx 0.003 [0.08] Rad

Both Edges

0.04±0.01 (2x)

[1.0±0.25]

48°30'

(2x)

Inch [Metric]

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