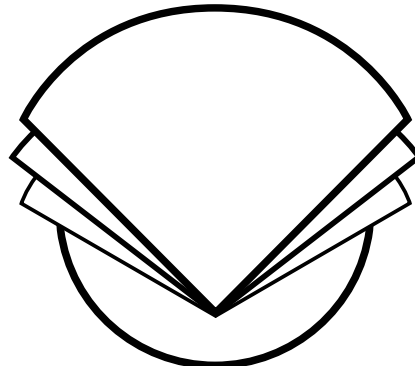
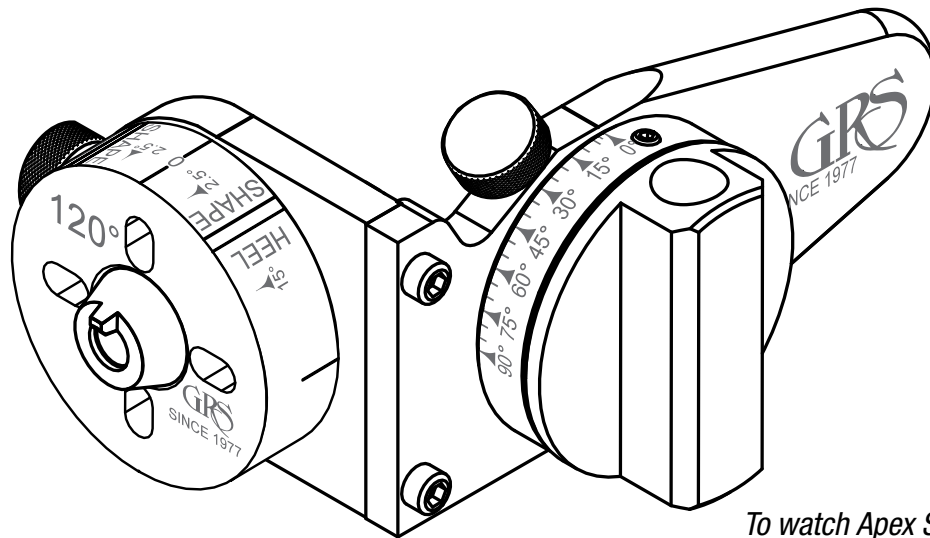




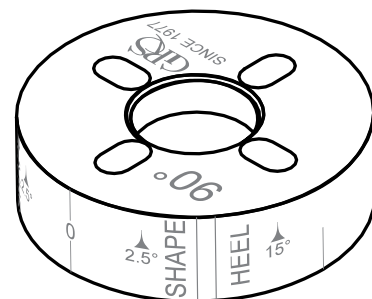
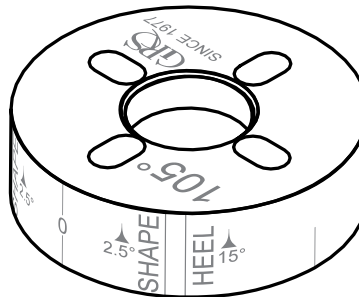
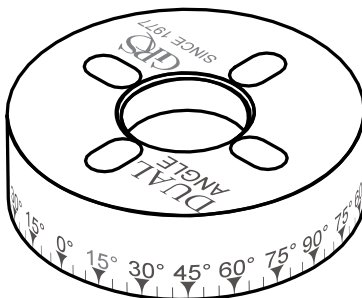
GRS[®]

APEX

DUAL ANGLE



To watch Apex Sharpening
Fixture how-to videos, visit
youtube.com/grstools.

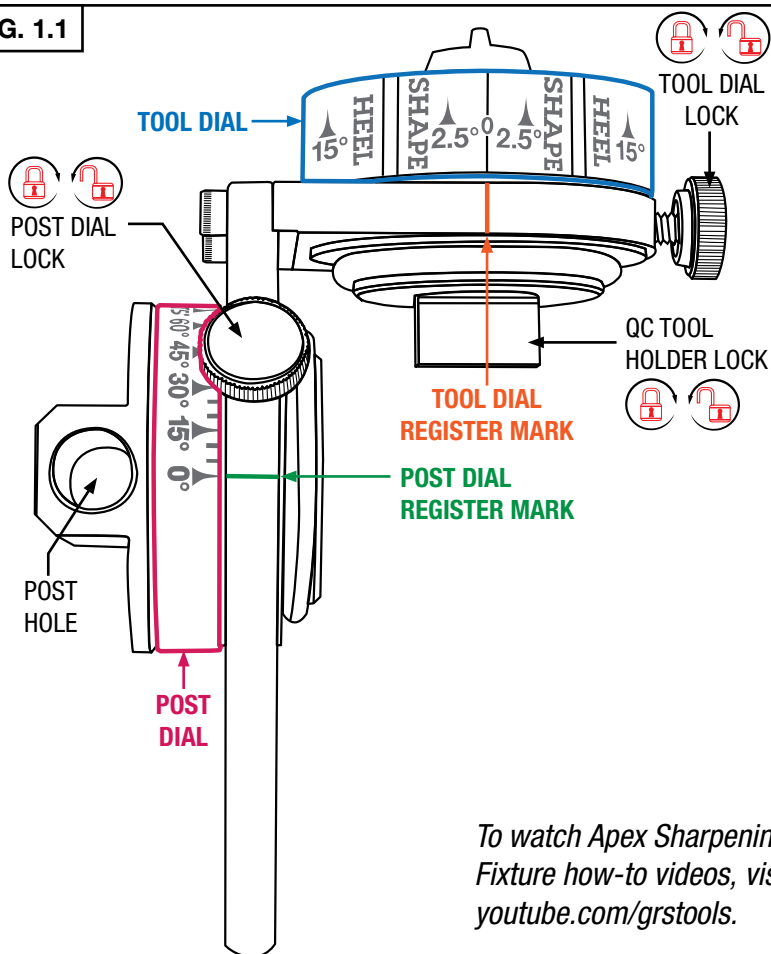


Sharpening Fixture

INSTRUCTIONS • #003-760, 003-761, 003-765, and 003-765-220

1. OVERVIEW

FIG. 1.1



To watch Apex Sharpening Fixture how-to videos, visit youtube.com/grstools.

FIG. 1.2

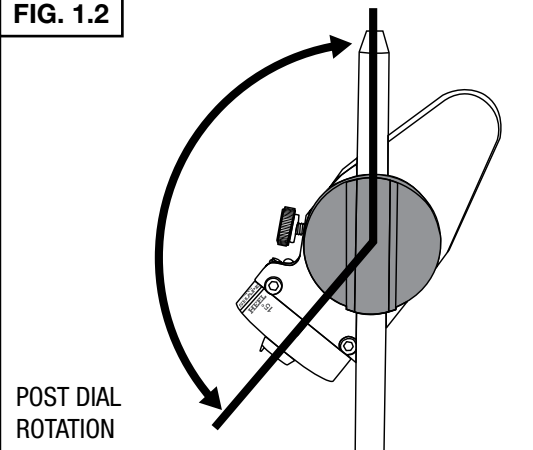


FIG. 1.3

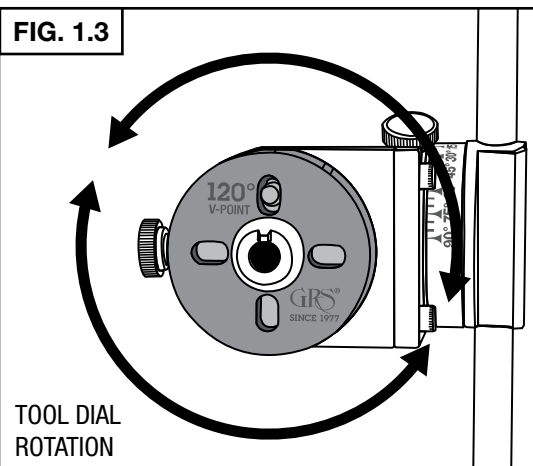


FIG. 1.4

Text notes which part of the graver you are sharpening.

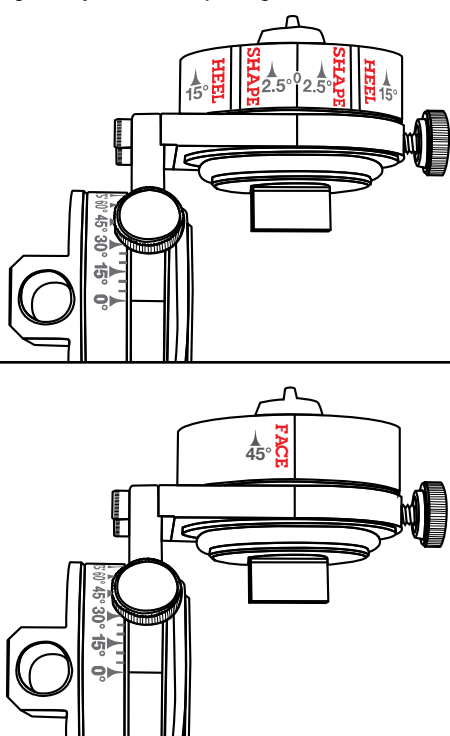


FIG. 1.5

Match lines to tool dial register mark to shape each surface of the graver.

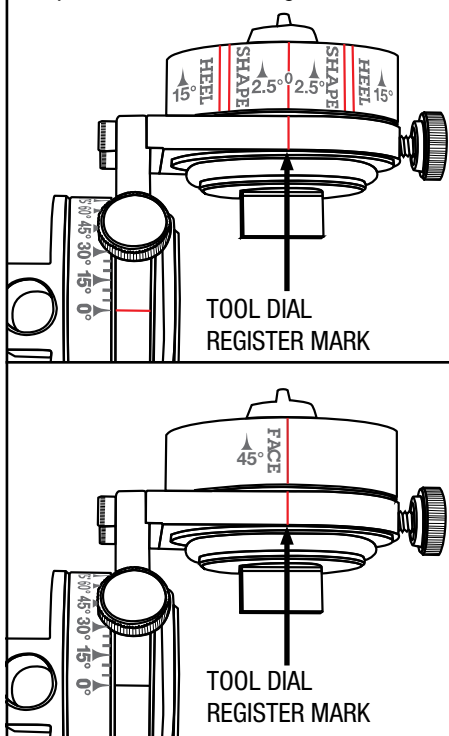
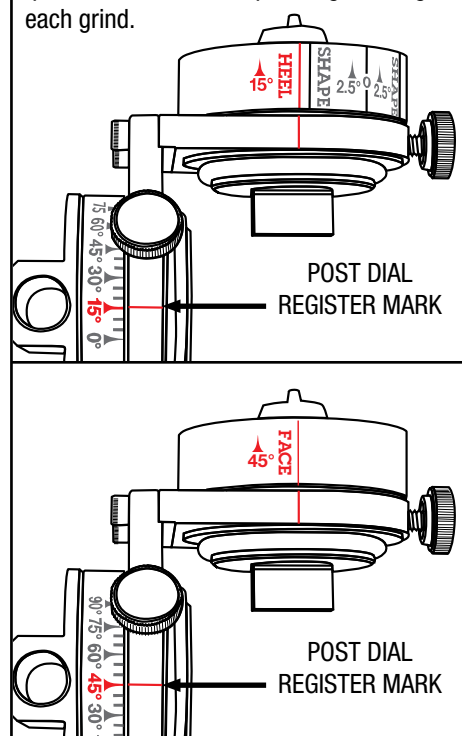


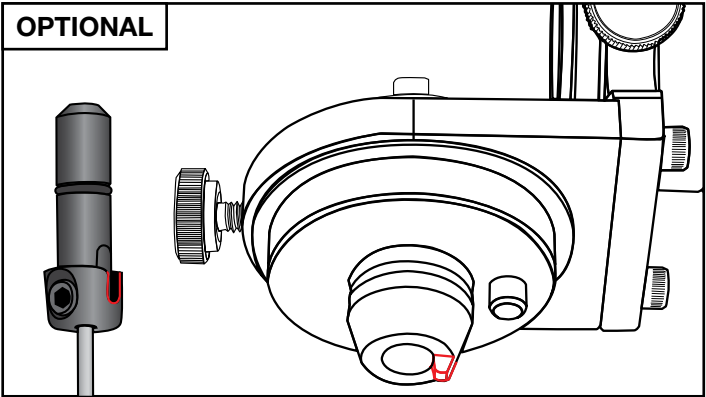
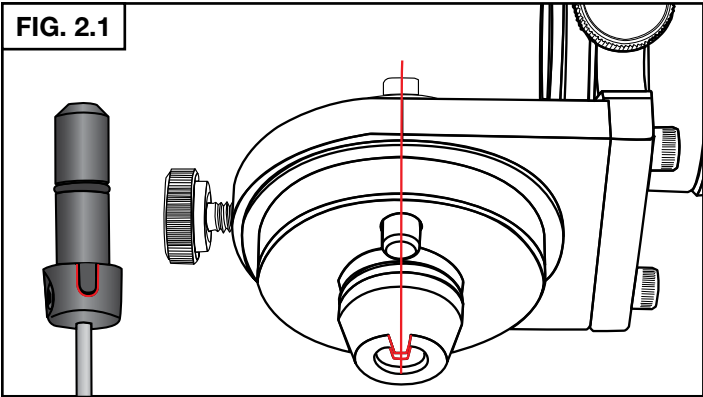
FIG. 1.6

The numbers on the tool dial provide a quick reference for the post angle during each grind.



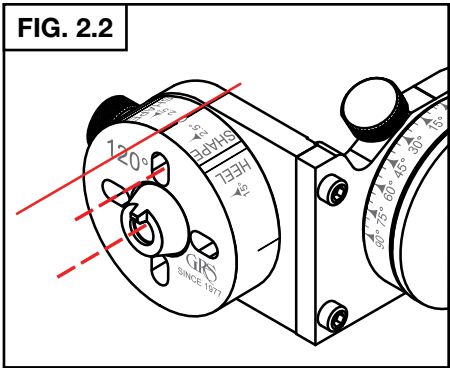
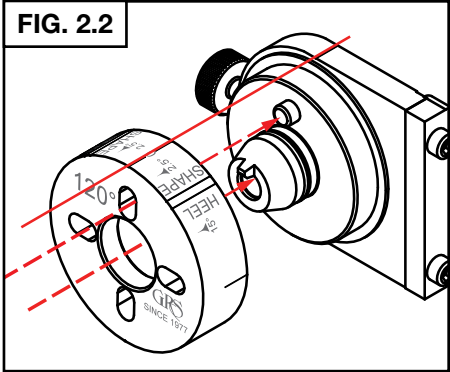
2. SET UP

ORIENTATION OF THE TOOL DIAL SEAT

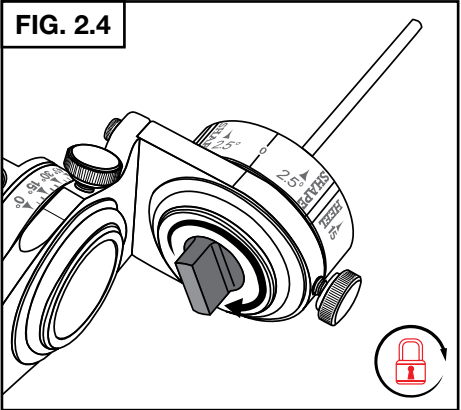
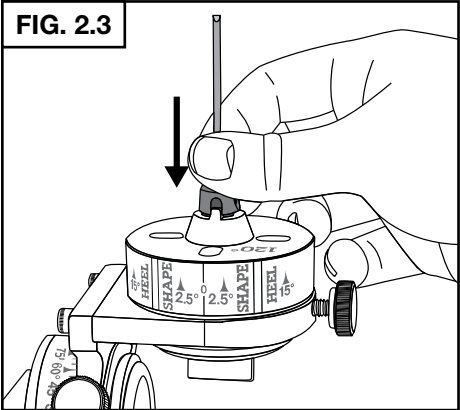


SELECTION AND INSTALLATION OF TOOL DIAL

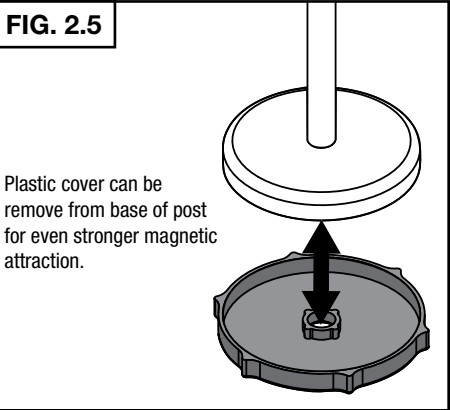
TABLE 2.1 Tool Dial Options			
90° GRAVER	105° GRAVER	120° GRAVER	ANY GRAVER GEOMETRY
• Easy to control, forgiving graver • Good basic graver for cutting lines • Breaks more easily in harder metals	• Offers good balance of graver strength and control • Can be tilted to create flare cuts	• Strong graver point • Harder to control — less forgiving • Best for tilting graver to create flare cuts	<i>For more information about using the Dual Angle Dial, see page 6.</i>



GRAVER INSTALLATION



FIXTURE POST



3. SHARPENING WITH THE APEX DIAL

FACE (TOP OF THE GRAVER)

The face angle is the cutting angle of your graver. This will vary according to the hardness of the material to be cut.

1 Grind

260 Grit → 600 Grit → 1200 Grit → Ceramic Sharpening Wheels

FIG. 3.1

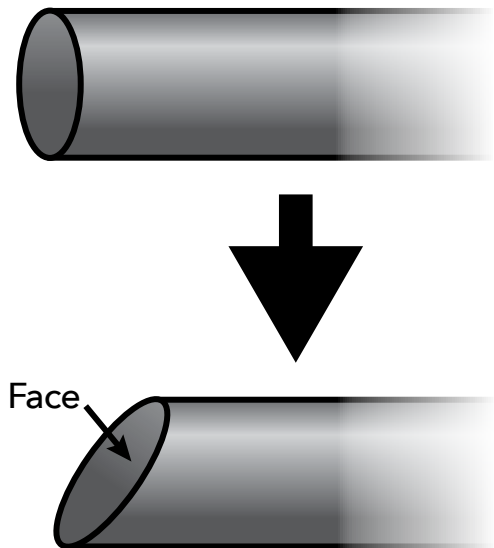
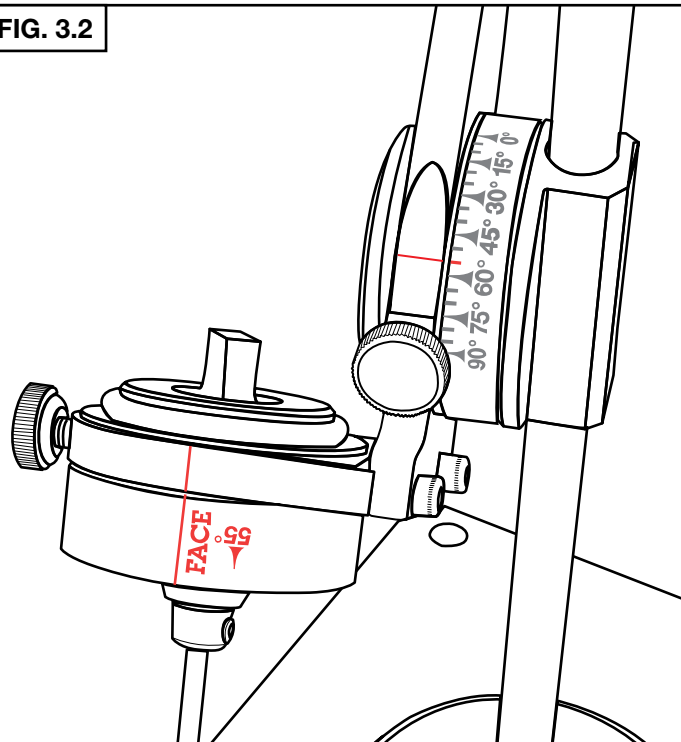


FIG. 3.2



V-ANGLE RESHAPING (BOTTOM OF THE GRAVER)

2 Grinds

260 Grit → 600 Grit → (OPTIONAL) 1200 Grit Sharpening Wheels

FIG. 3.3

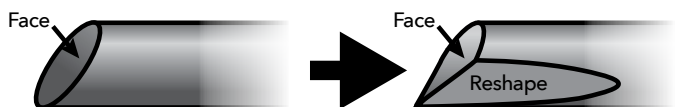
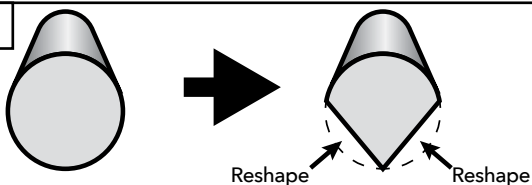


FIG. 3.4

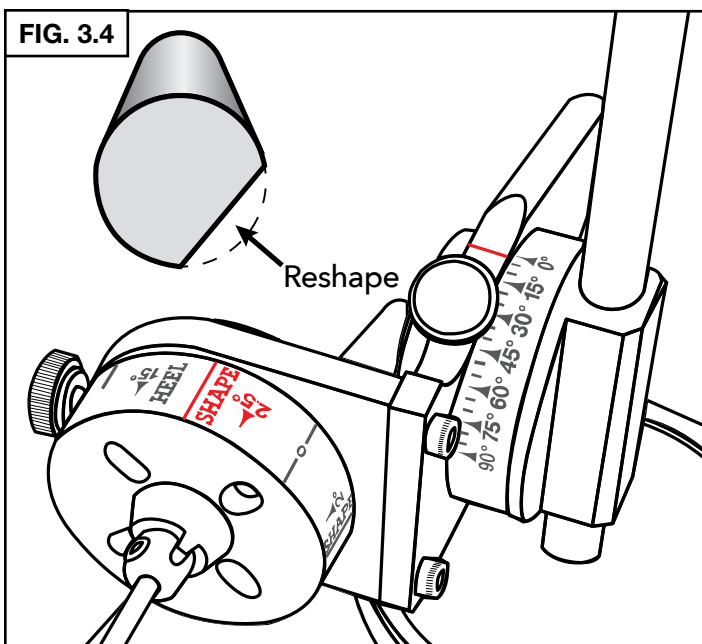
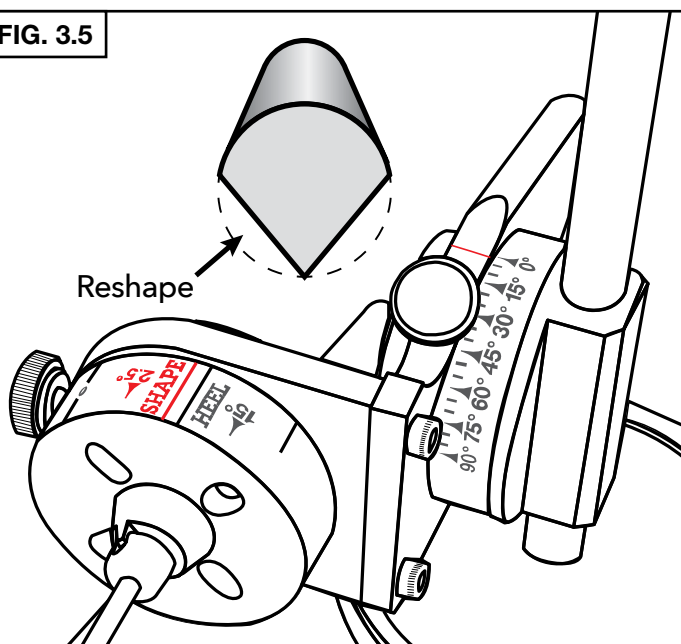


FIG. 3.5



3. SHARPENING WITH THE APEX DIAL (Continued)

HEELS (BOTTOM OF THE GRAVER)

The heel is what allows you to control the depth of your cut much the same way a lever and fulcrum work.

2 Grinds

1200 Grit → Ceramic Sharpening Wheels

Without power on the Power Hone, swipe the graver across the wheel to create the heel.

FIG. 3.6

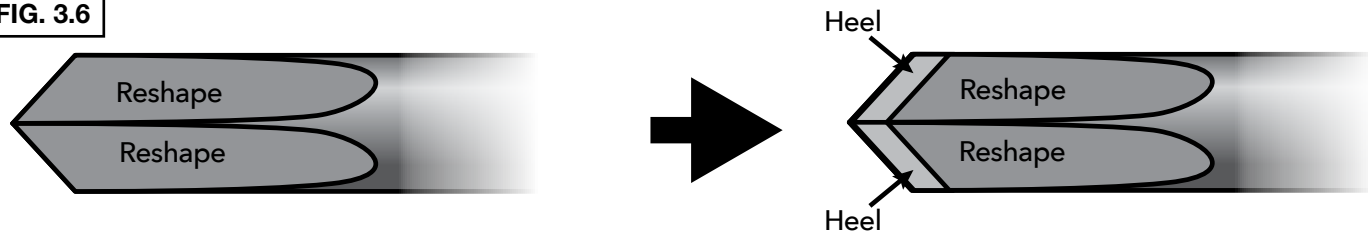


FIG. 3.7

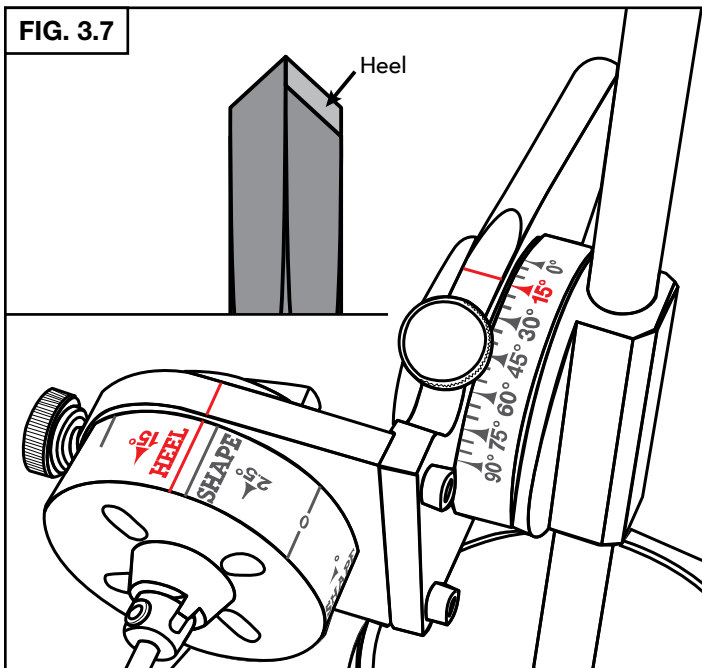
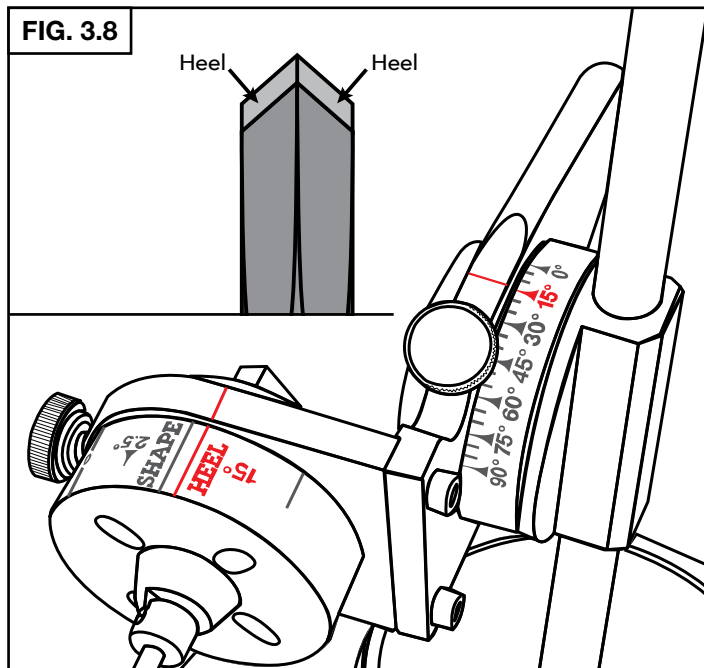


FIG. 3.8



ADDITIONAL END REDUCTION (OPTIONAL)

FIG. 3.9

TOP REDUCTION

Set the post dial to 2° and the tool dial to "Face" to reduce the top of the graver.

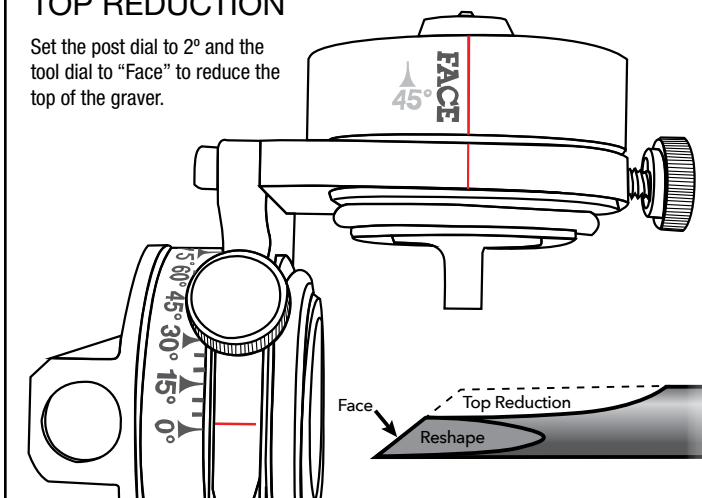
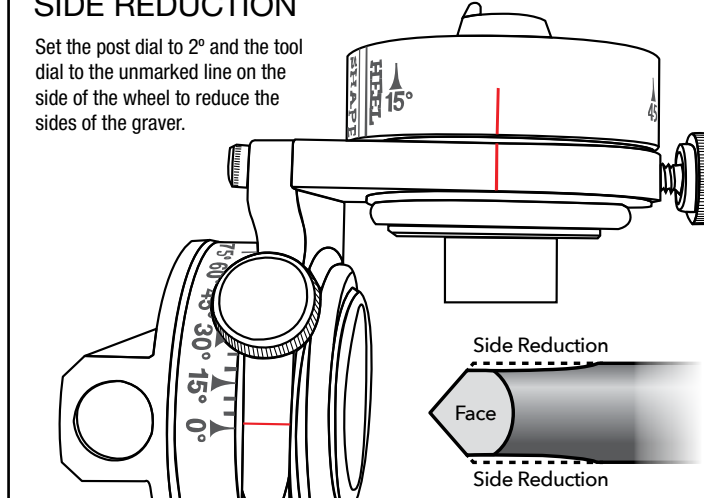


FIG. 3.10

SIDE REDUCTION

Set the post dial to 2° and the tool dial to the unmarked line on the side of the wheel to reduce the sides of the graver.



4. SHARPENING WITH THE DUAL ANGLE DIAL

FACE (TOP OF THE GRAVER)

The face angle is the cutting angle of your graver. This will vary according to the hardness of the material to be cut.

1 Grind

260 Grit ➔ 600 Grit ➔ 1200 Grit ➔ Ceramic Sharpening Wheels

Turn the tool dial to "F" and set the post angle to sharpen the face. Face angle is generally 45° - 55° . The steeper the face angle, the stronger your graver is. However, the steeper the face angle, the harder it is to see and place the point of your graver.

FIG. 4.1

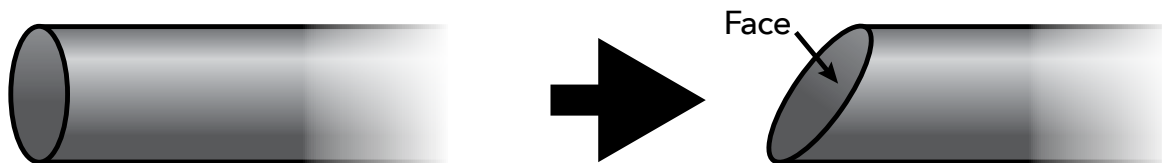


FIG. 4.2

55° Face:

- Steep Angle
- Difficult to see graver point
- Stronger graver



45° Face:

- Shallow Angle
- Easier to see graver point
- Weaker graver



V-ANGLE RESHAPING (BOTTOM OF THE GRAVER)

2 Grinds

260 Grit ➔ 600 Grit ➔ (OPTIONAL) 1200 Grit Sharpening Wheels

GA, or graver angle is the angle of the graver such as a 90° or 120° .

A straight line is a 180° angle. Angles "A" + "A" + "GA" = 180° (FIG. 4.3). Using this formula and a little simple math, you can grind your own shaped gravers.

Set the post angle at 2.5° . Start with the tool dial set at 0 and rotate clockwise until angle "A" (see TABLE 4.1 or 4.2) is lined up with the tool dial register mark. Reshape the graver. Rotate the tool dial counterclockwise past 0 to the second angle "A" and reshape the second surface.

FIG. 4.3

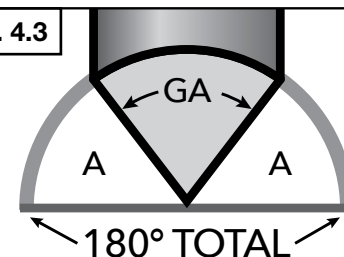
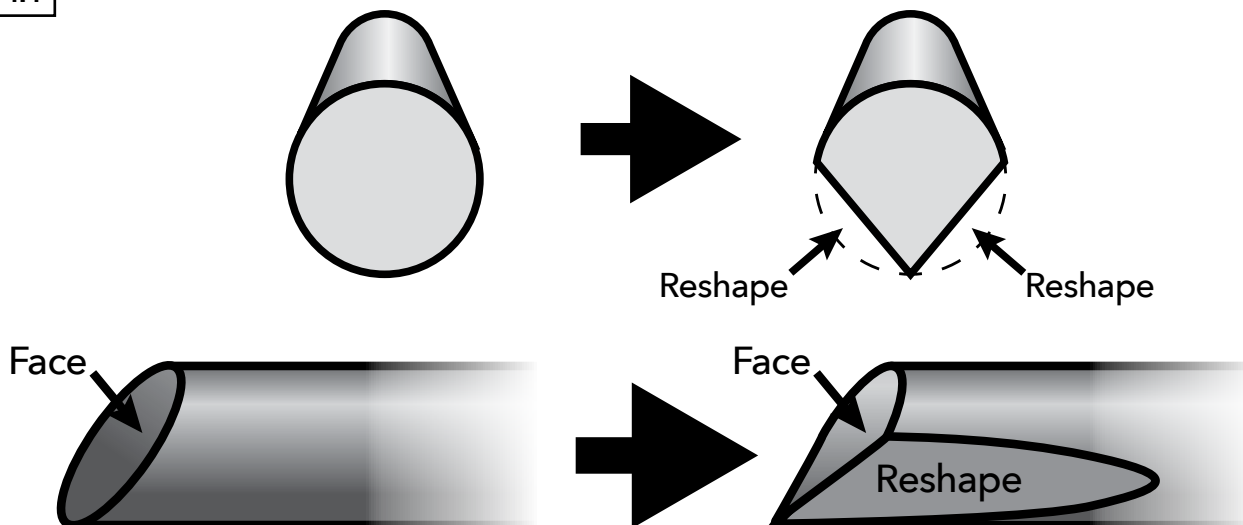


FIG. 4.4



4. SHARPENING WITH THE DUAL ANGLE DIAL (continued)

HEELS (BOTTOM OF THE GRAVER)

The heel is what allows you to control the depth of your cut, much the same way a lever and fulcrum work.

- Heel angle is generally 15° - 20°
- The steeper the heel angle, the higher you must hold the back of the handpiece for proper cutting. Higher heel angles are great for cutting deep backgrounds that need a little extra clearance.

2 Grinds

1200 Grit → Ceramic Sharpening Wheels

Without power on the Power Hone, swipe the graver across the wheel to create the heel.

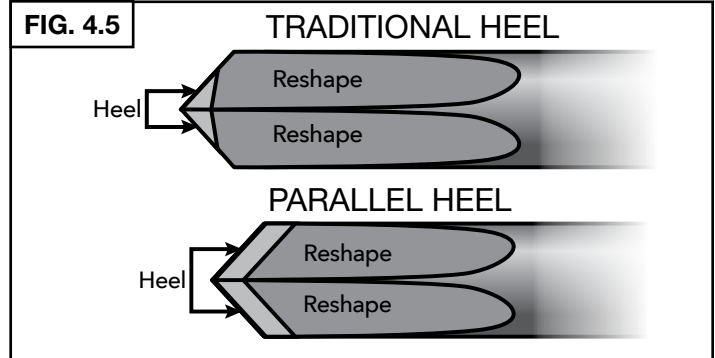


TABLE 4.1 Graver with Traditional Heel

GRAVER ANGLE					
"GA" Graver Angle / Shape	70	90	105	110	120
FACE ANGLE SET TOOL DIAL TO "F"					
Post Dial Angle	45-55	45-55	45-55	45-55	45-55
V-ANGLE RESHAPE SET POST DIAL TO 2.5°					
Tool Dial Angle 2 Grinds Angle "A" (180 - GA) / 2 = A	55	45	37.5	35	30
TRADITIONAL HEEL SET POST DIAL TO 15° - 20°					
Tool Dial Angle 2 Grinds • No power	55	45	37.5	35	30

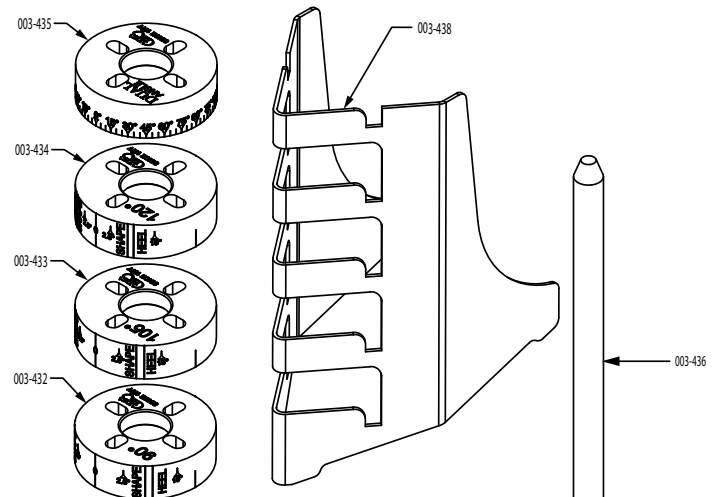
TABLE 4.2 Graver with Parallel Heel

GRAVER ANGLE					
"GA" Graver Angle / Shape	70	90	105	110	120
FACE ANGLE SET TOOL DIAL TO "F"					
Post Dial Angle	50	50	50	50	50
V-ANGLE RESHAPE SET POST DIAL TO 2.5°					
Tool Dial Angle 2 Grinds Angle "A" (180 - GA) / 2 = A	55	45	37.5	35	30
PARALLEL HEEL SET POST DIAL TO 15°					
Tool Dial Angle 2 Grinds • No power	65.5	54	45.5	42.5	36.5

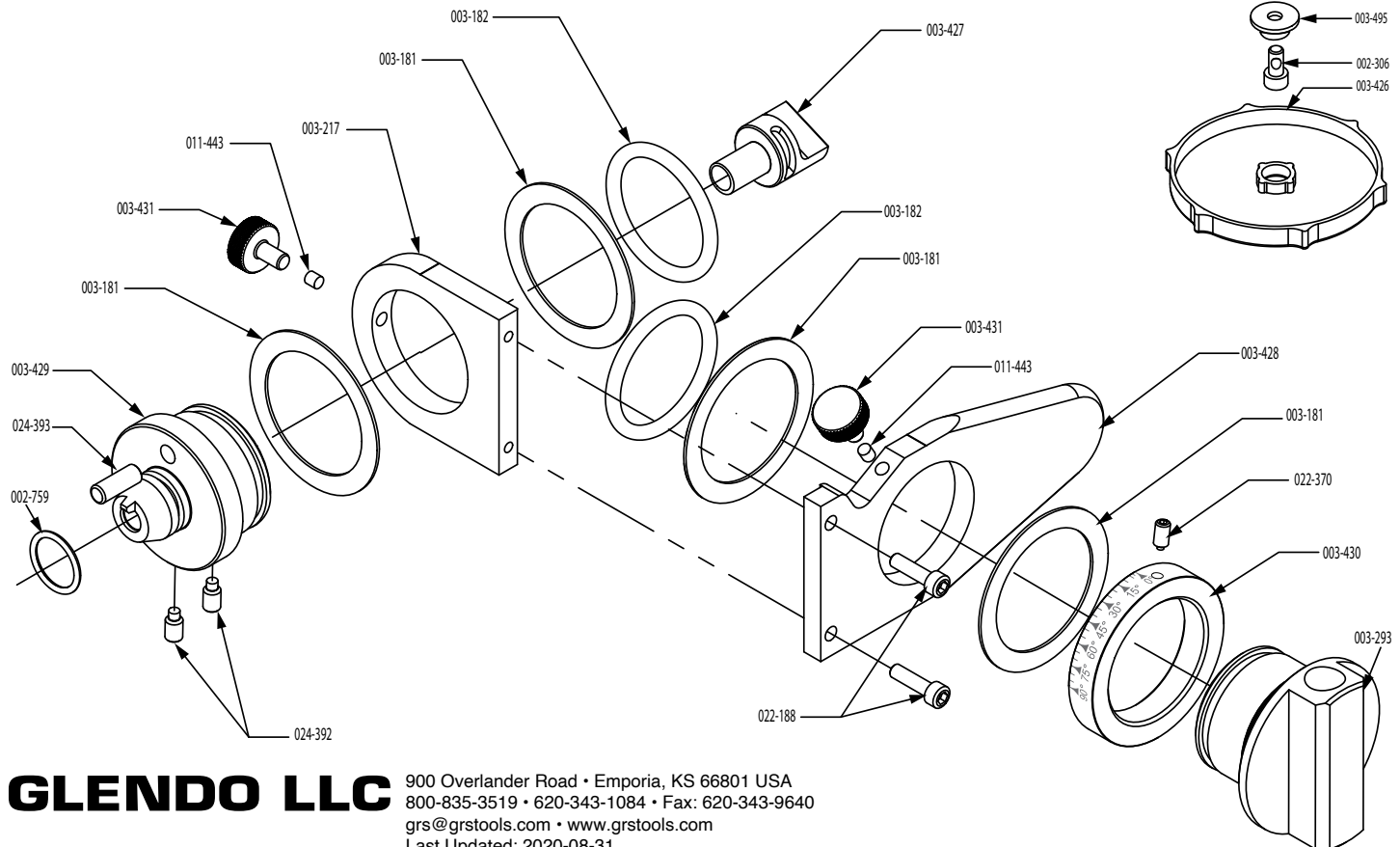
Apex Dual Angle Sharpening Fixture

PARTS LIST • #003-760, 003-761, 003-765, and 003-765-220

PART #	DESCRIPTION	QTY.
Fixture		
002-759	O-RING, .625"OD .500"ID	1
003-181	PLASTIC WASHER	4
003-182	O-RING	2
003-217	LEG FOR DUAL ANGLE FIXTURE	1
003-293	SLIDING PIVOT FOR DUAL ANGLE FIXTURE	1
003-427	QC TOOL LOCK 1/4 TURN KNOB	1
003-428	QC TEMPLATE SHARPENER ARM	1
003-429	QC TOOL SHARPENER HEAD FOR TEMPLATE SHARPENER SYSTEM	1
003-430	QC TEMPLATE FIXTURE ELEVATION DEGREE RING	1
003-431	8-32 THUMB SCREW FOR SHAPRENING FIXTURES	2
011-443	NYLON PILL	2
022-188	6-32 X .500 SHCS BLK	2
022-370	NYLON TIPPED SET SCREW FOR DEG DIAL	1
024-392	8-32 X 5/16 FULL DOG SHSS	2
024-393	3/16 X .500 DOWEL PIN	1
Wheels and Storage Rack		
003-435	DUAL ANGLE TOOL DIAL	1
003-432	90° APEX TOOL DIAL	1
003-433	105° APEX TOOL DIAL	1
003-434	120° APEX TOOL DIAL	1
003-438	TEMPLATE WHEEL STORAGE RACK FOR QC TEMPLATE SHARPENER	1
Sharpening Fixture Post		
002-306	10-32 x .375 SHCS WITH NYLON PATCH	1
003-426	MAGNET COVER TO REDUCE PULL	1
003-436	EXTENDED LENGTH SHARPENING POST WITH PILOT DIAMETER	1
003-495	MAGNET COVER RETAINER TO HOLD ON I.D. OF MOLDED COVER	1
022-363	POT MAGNET (CERAMIC)	1



To watch Apex Sharpening Fixture how-to videos, visit [youtube.com/grstools](https://www.youtube.com/grstools).



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