

Resharpener Companion

10950



**Correct Angles, Pictures,
and Step-By-Step Instructions**

The Resharpener Companion is meant to be a guide and quick reference to help you resharpen. It is not meant to replace your operators manual. Please read thoroughly, your operators manual and this guide before you attempt resharpening.

Index

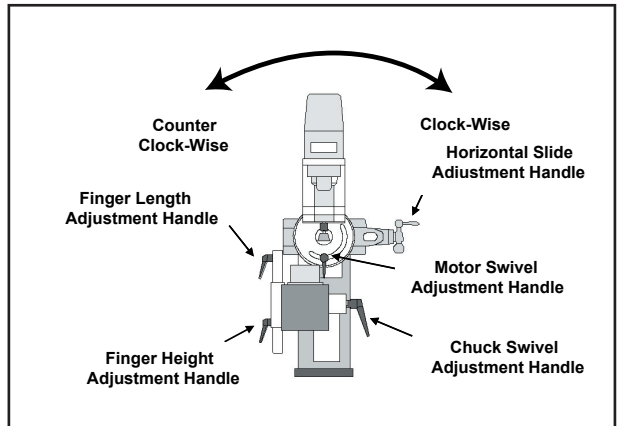
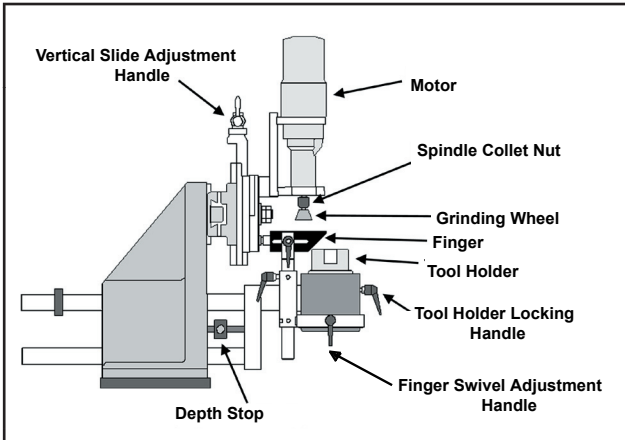
Setup.....	2
Parts and Safety.....	3
Anatomy of Cutters.....	4
Gullets.....	5
Primary Inclination Angle.....	6
Outside Inclination Angle.....	7
Hougen-Edge Cutters.....	8-9
Exploded View.....	10
Parts List.....	11
Tips and Time Savers.....	12

Bench / Stand support for your new Sharpening Machine

- * Your new Model 10950 may be mounted to a bench-top with a thickness of 5/8" to 3/4" using the socket head cap screws provided. If your bench top thickness is not in this range, alternate screws must be used to properly secure the machine.
WARNING: Do not attempt to operate the machine without properly securing it to a Bench Top or stand.
1. Remove the chuck assembly from its packaging and install it into the linear bearing in the main housing. Attach the pivot arm to the chuck assembly. Finger tighten the adjustable handle. **(DO NOT OVER TIGHTEN)**
 2. Remove the motor assembly from its packaging and install the motor into the bracket with the motor handle facing you. Tighten the motor bracket screws with the hex wrench provided after you have ensured the motor is firmly mounted in the bracket. **(DO NOT OVER TIGHTEN)**
 3. Your sharpening machine was factory adjusted prior to shipping. Check and make sure all adjustable handles are secure and did not vibrate loose during shipment.

Setting Up your machine

1. Position the template on the bench in the desired area of machine location. The front of the housing should be placed no further than 2-1/2" from the bench or table edge. Take note of the intended clearances to be provided for in the location of the machine as illustrated on the template.
2. Mark the hole location centerpoint for each of the four bolt holes.
3. Drill each hole to provide clearance for a 5/16" socket head cap screw 11/32" (.343) drill size recommended.
4. Mount your Model 10950 by inserting and tightening the four 5/16"-18 x 1-1/4" screws and hex nuts from the bottom surface of the bench. For the optional stand assembly Hougen part number (04118), contact Hougen Customer Service.



Important Safety Instructions



Read and follow operator's manual. Check and comply with all applicable federal, state, local, and company safety standards. If you cannot locate your operator's manual, call or write to Houghton Mfg., Inc. for additional FREE copy.



Unplug from power when changing tools or servicing machine. Keep fingers away from grinding area during operation. Never place fingers in grinding area or on grinding wheel during operation. Never use damaged or broken grinding tools.



Any tool can shatter. Eye protection must be worn by all people using this machine and by people in the vicinity of the machine during use. Do not use grinding wheels rated below 26,500 R.P.M.



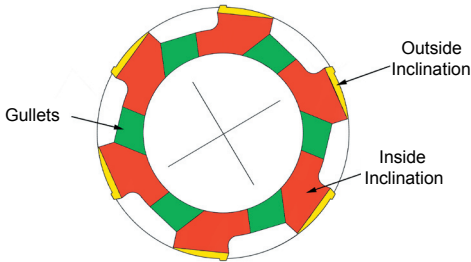
Do not use machine in damp area or where it may become wet.



A clean dust mask should be worn during resharpening to prevent inhaling of metal particles.

Anatomy of a Cutter

“12,000-Series” Standard Cutter up to 1- 5/16”

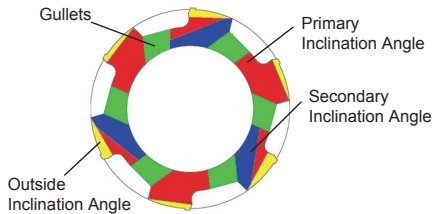


Regrinding Order

1. Gullets (If needed)
2. Inside Inclination Angle
3. Outside Inclination Angle

See Instructions Starting on Page 5

“12,000 - Series” Cutters 1-3/8” Dia. and Above



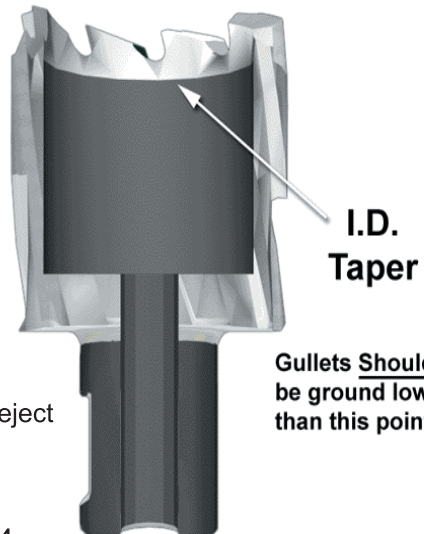
Regrinding Order

1. Gullets (If needed)
2. Primary Inclination Angle
3. Secondary Inside Inclination Angle
4. Outside Inclination Angle

See Instructions Starting on Page 8

Color Legend

- Primary Inclination Angle
- Secondary Inclination Angle
- Gullets
- Outside Inclination Angle

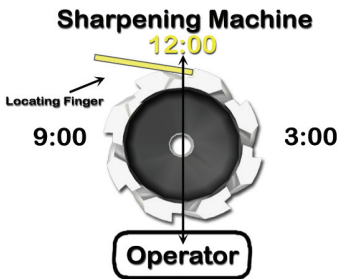
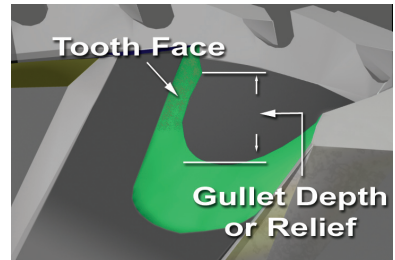


Gullets should not go below I.D. Taper Line. When they do the slug may not eject and personal injury may occur.

Gullets Should Not
be ground lower
than this point.

Gullets

- It is not necessary to deepen the gullets every time you sharpen the teeth. A new cutter has .075 to .125" of gullet depth. When the gullet depth is reduced and becomes less than .065" you must grind the gullet to increase the depth.
- Gullets are cut in roughly the 12:00 o'clock position.



- Install the gullet grinding wheel into the motor. Swing the motor assembly clockwise to match the appropriate gullet rake angle. (See chart) This setting depends on the size of the cutter you are working on. Keep inner teeth slightly ahead of center and set your chuck to 0 degrees.

- Slide the cutter into position, adjusting the vertical and horizontal slides as you do. Rotate the cutter so that the rake angle matches the

back side of the gullet grinding wheel. Once you have accomplished this, lock the tool holder into position. Set the locating finger into the flute of the tooth that is being ground, keeping the point of the finger as close to the end of the cutter as possible without interfering with the operation of the grinding wheel.

Gullet Depth for
"12,000-Series"
Standard Cutters
up to 1-5/16" dia.

CUTTER SIZE	RAKE ANGLE	NO. OF TEETH	GULLET DEPTH	GULLET WIDTH
7/16	16	3	.075	.2170
12MM				
1/2	17			
13MM				
17/32	18	4	.095	.100
14MM				
9/16				
15MM				
5/8	19	5	.105	.125
16MM				
21/32				
17MM				
11/16	20	6	.125	.150
18MM				
19MM				
3/4				
25/32	21	7	.135	.165
20MM				
13/16				
21MM				
22MM	22	8	.145	.175
7/8				
23MM				
15/16				
24MM	23	9	.155	.185
25MM				
1				
26MM				
1-1/16	24	10	.165	.195
27MM				
28MM				
1-1/8				
29MM	25	11	.175	.205
30MM				
1-3/16				
31MM				
1-1/4	26	12	.185	.215
32MM				
33MM				
1-5/16				
34MM				

Gullet Settings:

12,000-Series - Dia. up to 1-5/16"

- Chuck Setting 0 degrees
- Motor/Swivel plate 69-74 degrees clockwise
- Position 11-12:00 o'clock

12,000-Series - 1-3/8" Dia. and Larger

- Chuck Setting 0 degrees
- Motor/Swivel plate 68 degrees clockwise
- Position 11-12:00 o'clock

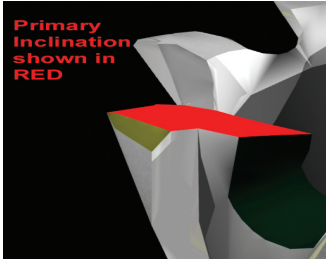
Stack Cut Cutters - (Any Size)

- Chuck Setting 0 degrees
- Motor/Swivel plate 69-74 degrees clockwise
- Position 11-12:00 o'clock

- Be sure to set your depth stop so that you do not go too far in. Now loosen the tool holder locking handle.

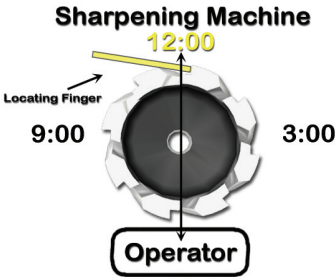
- Next turn the depth stop to allow the grinding wheel to move in slightly. Upon verification of the rake angle and the gullet angle, turn on the motor and grind the face of each tooth. Then grind the gullet depth by rotating the cutter back and forth slightly.

Primary Inclination Angle



- Install the cup-grinding wheel into the motor. Insert the shank of the cutter you are going to sharpen into the tool holder. Align the flat on the shank of the cutter with the set screw. Tighten the set screw.
- Loosen the spindle-locking handle and rotate the cutter to the 12:00 o'clock position. Use a steel rule, if necessary, to align the cutter in the proper position. Upon aligning the cutter, tighten the tool holder locking handle.

- Line up the finger so that the tip of the finger is on the tooth face, shortly below the end of the tooth. Set the locating finger into the flute of the tooth that is being ground, keeping the point of the finger as close to the end of the cutter as possible without interfering with the operation of the grinding wheel. After adjusting the finger to the proper position, loosen the spindle locking handle and turn the cutter clockwise. As the next tooth comes into position you should hear a crisp snap of the locating finger. If this does not occur readjust the locating finger until you do.



- Loosen the motor swivel Adj. handle and rotate the motor to the proper position. Loosen the chuck swivel adjustment handle and rotate the chuck and cutter to the proper position. Move the motor into position by adjusting the vertical and horizontal slides. Position the grinding wheel just above the tooth to be ground. Center the cup wheel with the center on the tooth to be ground. Adjust the depth stop so that the Rotabroach cutter will only be allowed to move enough to grind the tooth. Check all teeth prior to proceeding.

Primary Inclination Angle Settings:

12,000-Series- Dia. up to 1-5/16"

- Chuck Setting 25 degrees toward frame
- Motor/Swivel plate 12 degrees clockwise
- Position 12:00 o'clock

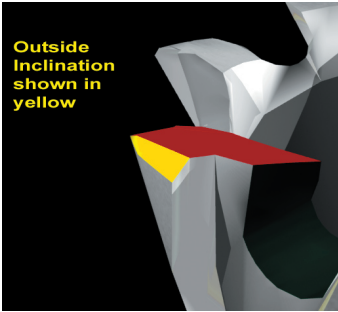
Stack Cut Cutters - (Any Size)

- Chuck Setting 11 degrees forward
- Motor/Swivel plate 6 degrees clockwise
- Position 3:00 o'clock

- Adjust the vertical slide so that the cup wheel just touches the tooth. Start the motor and slide the chuck in and out two times or as needed until you no longer see sparks. Pull the chuck back and rotate the cutter one tooth. Repeat this process until you come back to the tooth you started with.

- Continue by adjusting the vertical slide .002 to .003" lower. Resharpener all teeth again. Repeat this process until you have cleaned up the surface of all teeth.

Outside Inclination Angle



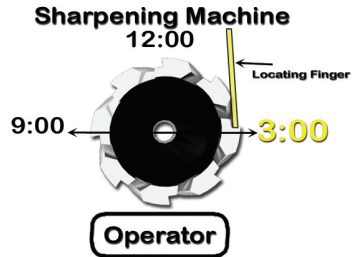
- Install the cup-grinding wheel into the motor. Loosen the spindle-locking handle and rotate the cutter to a 3:00 o'clock position. Use your steel ruler to align the cutter in the proper position. Upon aligning the cutter, tighten the spindle locking handle.

- Set the locating finger into the flute of the tooth that is being ground, keeping the point of

the finger as close to the end of the cutter as possible without interfering with the operation of the grinding wheel. After adjusting the finger in the proper position, loosen the spindle locking handle and turn the cutter clockwise. As the next tooth comes into position listen for the crisp snap of the locating finger. If this does not occur readjust the locating finger until you do. Recheck all adjustable handles and make sure they are finger tight.

- Loosen the motor swivel adjustment handle and rotate the motor to the proper position. Loosen the chuck swivel adjustment handle and rotate the chuck and cutter to the proper position. Move the motor into position by adjusting the vertical and horizontal slides. Position the cup wheel next to the tooth to be ground. Center the cup wheel with the center of the tooth to be ground.

- Adjust the depth stop so that the chuck and cutter will only be allowed to move enough to cut the tooth at the 3:00 o'clock position. Check each tooth.



Outside Inclination Angle Settings:

12,000-Series - Dia. up to 1-5/16"

- | | |
|----------------------|-------------------------|
| • Chuck Setting | 14 degrees toward frame |
| • Motor/Swivel plate | 35 degrees clockwise |
| • Position | 3:00 o'clock |

Stack Cut Cutters - (Any Size)

- | | |
|----------------------|-------------------------|
| • Chuck Setting | 14 degrees toward frame |
| • Motor/Swivel plate | 25 degrees clockwise |
| • Position | 3:00 o'clock |

- Adjust the vertical slide so that the cup wheel just touches the tooth. A few sparks should fly. After touching the tooth, slide the chuck in and out two times or as needed until you no longer see sparks. Pull the chuck back and rotate the cutter one tooth. Repeat this process until you come back to the tooth you started with.

- Continue by adjusting the vertical slide .002 to .003" lower. Resharpener all teeth again. Repeat this process until you have cleaned up the surface of all teeth.

Hougen-Edge® Cutters

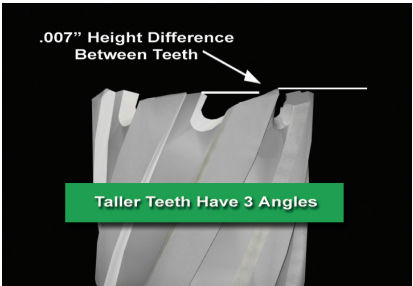
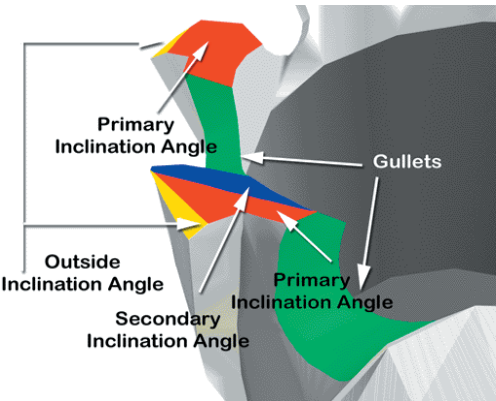
Cutters 1-3/8" and Larger

- The larger "12,000-Series" cutters (1-3/8" and larger) are more complex and have four major surfaces on the cutter.

The surfaces are identified by:

- Primary Inclination Angle
- Secondary Inclination Angle
- Outside Inclination Angle
- Gullets

- In addition to the three major surfaces on the face of the cutter you have to keep in mind that you have a tooth height variation of .007".



- These particular cutters take more time to resharpen but with practice you can resharpen these too. Prior to installing the cutter in your machine you need to look at your cutter and determine which teeth are high and which teeth are low. The teeth that are high have 3 angles: the primary and secondary inclination angle and a wide outside inclination angle. The lower teeth only 2 angles: a primary inclination angle and an outside inclination angle.
- You need to mark one high tooth on the inside of the cutter so that it is easy to see when you are resharpening. This will be the same tooth that you'll start with.

Hougen-Edge Angle Settings:

12,000-Series - 1-3/8" Dia. and Larger

Primary Inclination Angle

- Chuck Setting 15 degrees toward frame
- Motor/Swivel plate 12 degrees clockwise
- Position 12:00 o'clock

Secondary Inclination Angle

- Chuck Setting 30 degrees toward frame
- Motor/Swivel plate 12 degrees clockwise
- Position 12:00 o'clock

Outside Inclination Angle

- Chuck Setting 13 degrees toward frame
- Motor/Swivel plate 20 degrees
- Position 3:00 o'clock

Gullets

- Chuck Setting 0 degrees
- Motor/Swivel plate 68 degrees
- Position 11-12:00 o'clock

- Continued on the Next Page -

- Continued -

- Install the cutter in the machine. These cutters are installed just like the smaller, cutter sizes.

Gullets (Refer to Page 5)

- If the gullet is less than .065 you will need to deepen the gullets. To deepen the gullets use the same procedures as the standard cutters.

Primary Inclination Angle (Refer to Page 6)

- Line up the high tooth that you marked, in the 12:00 o'clock position. Set your finger accordingly. We'll be lowering the teeth using the primary inclination angle. Set your motor and chuck to the proper settings. If you have a lot of wear or damage you'll need to make all the teeth the same height so this process may take a little time.
- Once you have cleaned up all the teeth, position the high tooth at the twelve o'clock position.
- Rotate your cutter tooth clockwise, so that you are on the lower tooth. Mark the top of all tall teeth: this helps in easily recognizing the teeth that you Do Not want to lower. Lower the unmarked teeth .007". Do this in small increments of .002 to .003" at a time. Remember this is every other tooth.

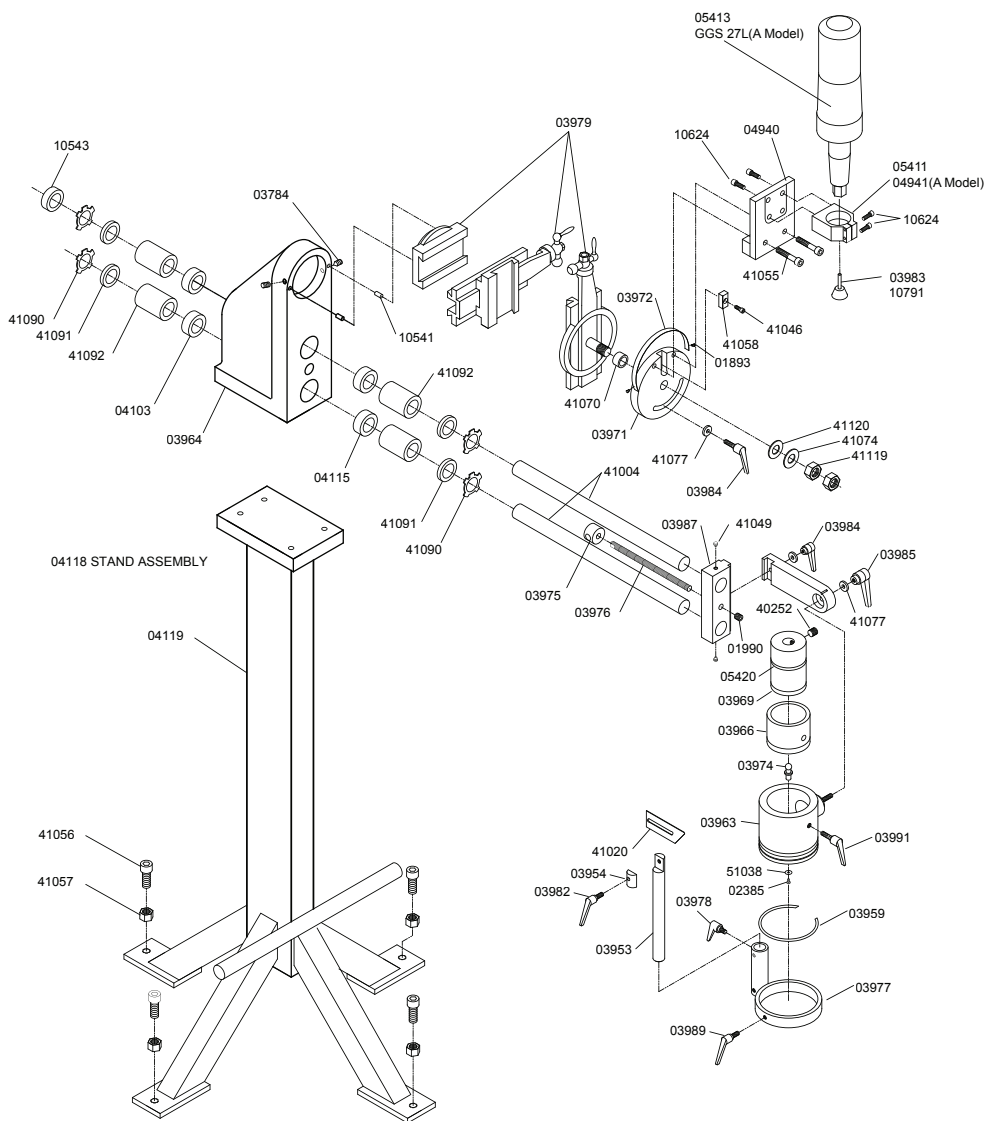
Secondary Inclination Angle (Only 1-3/8" Dia. Cutters and larger)

- After you have completed lowering every other tooth, it is time to cut the secondary inclination angle. Reset your chuck to thirty degrees tilted toward the frame. The only teeth that get the secondary inclination angle is the taller teeth. That is, the teeth that you marked. This is a radical cut so be careful. Remember to set your depth stop nut prior to grinding the tooth.

Outside Inclination Angle (Refer to page 7)

- Once the secondary inclination angle is finished, you need to set up your machine for the outside inclination angle. This is also set up just like the smaller cutters. Upon setting up your cutter in the 3:00 o'clock position, position the finger, and set the motor and chuck to their proper angles.
- Cut your outside inclination angle by doing each and every tooth. Remember that you have shorter teeth so the cut might not show up until a few passes have been made. Continue making passes until you have the outside inclination angle cut and the smallest width is .030". This is measured on the shorter teeth.
- Finally on the high teeth (marked ones) lower the outside inclination angle an additional .007". This should measure about .060" width when completed. The teeth with 3 angles have a high primary inclination angle, a secondary inclination angle, and a low (visually wide) outside inclination angle. The teeth with the 2 angles have a low primary inclination angle and a high (visually narrow) outside inclination angle

10950 Exploded View

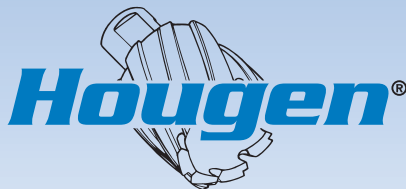


Parts List

Part #	Description	Qty
01893	Screw - Drive #2 x 3/16 Stainless	2
01990	Screw SOC Set 3/8-16 x 1/4 Cup	1
02385	Screw BHC #6-32 x 1/4	1
03784	Screw SOC Set 5/16-18 x 1/2 Cup	2
03953	Rod Finger	1
03954	Clamp - Finger Rod	1
03959	Retaining Ring	1
03963	Housing Assy - Chuck	1
03964	Housing - Main	1
03966	Bronze Bushing	1
03969	Holder Tool	1
03970	Pivot Arm	1
03971	Swivel Plate	1
03972	Scale 40-0-120	1
03974	Ball - Tooling	1
03975	Quick Adjusting Nut	1
03976	Feed Adjustment Rod	1
03977	Finger Bracket	1
03978	Adjustment Handle	1
03979	Slide - 2 Axis	1
03982	Adjustment Handle	1
03983	Borazon Cup Wheel	1
03984	Adjustment Handle	2
03985	Adjustment Handle	1
03987	Plate Assy - Rod w/ Inserts	1
03989	Handle Assy	1
03991	Handle Assy	1
04103	Spacer	2
04115	Wick Oil	2
04940	Motor Base Plate	1
04941	Motor Bracket (A Model)	1
05411	Motor Bracket	1
05413	Motor	1
05420	Ring-Retaining for 2-1/4 OD	1
10541	Dowel Pin - 1/4 Dia x 1/2 Lg	2
10543	Collar - Shaft 1" Bore	1
10624	Screw SHC 1/4-20 x 3/4	6
10791	Whl Brz Grd 1" Dia	1
40252	Screw SOC Set 7/16-14	1
41004	Bar Guide 1" Dia	2
41020	Locating Finger	1
41046	Screw SHC #10-32 x 1/2	1
41049	Screw Set 1/4-20 x 1/4 Half Dog	2
41055	Screw SHC 5/16-18 x 1-3/4	2
41058	Key 1/2 x 1/2	1
41074	Washer 5/8	1
41077	Washer HD 11/16 x 1/4 x 1/8	3
41090	Retaining Ring	4
41091	Seal 1" ID	4
41092	Bmg-BI 1" ID	4
41103	Wick Oil	4
41119	Nut - Hex Jam 5/8-18	2
41120	Washer Rubber	1
51038	Washer Flat #6	1
GGS 27L	Bosch Motor (A Model)	1

Tips and Time Savers

- Practice, Practice, Practice. This is the only way to become familiar with the machine and cutters. Take your time and practice on old cutters to get the feel for the angles both on the cutters and on the 10950 machine.
- Be sure to read your Operators Manual thoroughly before attempting to resharpen.
- There should always be a crisp snap of the locating finger. If not readjust it until you do.
- After resharpening the primary inclination angle, if you have more of the exact same size of cutter to do, you could go ahead and do all the primary inclination angles on all the cutters. It will save you time on setups because you won't have to reset the finger.
- Be careful not to burn a cutter. The more material you remove the hotter the cutter gets. When the cutter gets hot resharpening becomes difficult because of fluctuations in the metal. If you have removed a lot of material, stop and let the cutter cool before continuing. To avoid this only remove .002 to .003" of material at a time.
- Never push in the motor locking pin while the motor is running. You can severely damage the motor.
- Stack Cut Cutters are setup the same as standard cutters . The only difference is that the angles are different.
- The gullet depth Does Not have to be done every time you resharpen a tool. The gullet depth only has to be increased if it is less than .040". A new cutter has sufficient gullet depth, roughly .050 to .090".
- More time must be taken with Hougen-Edge Cutters. Remember they have a height variation of .007".
- After resharpening a cutter use a soft bristle brush to remove burrs from the edges of the teeth.
- Dress the grinding wheel everytime you switch it out.
- Try out some of the cutters you resharpen. Just because they look sharp doesn't mean they will cut right.
- When in doubt...call Hougen Technical Service (800) 426-7818
- Practice, Practice, Practice.



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