Work Sharp 3000 tool sharpener

System was DONATED to the Greenville Woodworkers Guild Education Center at our request by Klingspor's Woodworking Shop to enable us to maintain shop chisels and plane blades. In this process, we need to educate our members in the proper use of the Work Sharp system. Klingspor only asked that we acknowledge their support of the Guild in exchange for the gift.

These discussions pertains only to sharpening plane and chisel blades and is intended to familiarize the member using shop tools with the procedure for re-sharpening or repairing nicked edges.

Overview of operation:

The Work Sharp system is a self contained machine with a rotating, six inch glass disk. Sandpaper is attached to the glass disk to provide the abrasive surface. Glass is usually mounted with the abrasive side down. The blade is briefly brought into contact with the abrasive from beneath the rotating glass. The blade is guided by a ramp and fence positioned under the edge of the rotating glass. The ramp angle is adjustable to 20°, 25°, 30° or 35° bevel angles. Shop planes and chisels will be sharpened using only the 25 degree setting. After making brief (1-2 seconds), light pressure contact with the abrasive, the blade is withdrawn down the ramp until the tip of the back of the blade has "scraped" on the sandpaper abrasive attached to the ramp. This action removes the burr from the back of the blade. Repeated "plunge and pull" motions sharpen the blade without heat buildup. If contact is too forceful, or too long, there will be a rapid buildup of heat and debris on the sandpaper requiring frequent paper changes.

Most problems (and abuse) occur from using too much force when touching the blade to the abrasive. The drive motor is very small and cannot overcome these pressures. In addition, heat will build up instantly melting the PSA glue backing, causing wrinkles in the sandpaper and rendering it useless, or causing heavy debris deposits on the abrasive that cannot be "erased".

Several grits are provided to achieve increasingly sharper bevels on the blade.

- 80 grit is used only to repair a blade that is (i) badly out of square, (ii) deeply chipped, (iii) have a bad bevel angle, or (iv) is new and needing the initial geometry established.
- 120 grit is used to repair minor flaws as described with the 80 grit or to smoothen out the surface after initial grinding with 80 grit.
- 220 grit and 400 grit disks are used to sharpen tools once the proper bevel angle is established and it is imperative that the "plunge and pull" method use very light pressures with these finer grits.
- The finest grits (3000 and 6000) are available but should not be used by the general member. If this level of polish and honing is needed, it is recommended that the Supervisor on Duty perform the operation because the abrasive is very expensive and easily damaged.

The back of the blade is typically flattened during the initial sharpening process. If this needs to be repeated, the glass disk is mounted with the abrasive side up, and flattening is done as with any other system using light pressure and going up through the grits to 400. In this process, take care not to contact the tip of the cutting edge with the abrasive first as this will round the back of the blade. Rather, contact the blade at the center of the back and rock the blade forward until it is flat on the disk.

Safety considerations:

- This system operates on 110v. The plug and chord should be inspected for damage prior to use.
- Because the Work Sharp abrades steel under power, some powered debris is produced. Do not place your face in the area of the grinding to avoid getting dust in the eye. Wear safety glasses.
- Clean machine before storing it. Give careful attention to the area near the ramp and under the glass. Heavy accumulations can cause electrical shorts or overheat the machine.
- Do not operate the system in dusty areas or where sawdust is present. Sparks from the sharpening operation could ignite the dust and cause a fire.

Using the Work Sharp System

1) Verify or adjust the bevel angle

- a) The bevel angle is displayed in a small window above the On-Off switch. It will normally read 25°.
 - i) All GWG shop tools (i.e. chisels and planes) are ground to 25°.
 - ii) Consistent use of 25° bevel will avoid the needless regrinding to a different angle, and then restoring the original angle consuming both abrasive paper and blade material.
- b) If a different setting is required, raise or lower the Bevel Angle Adjustment Lever bar located just below the Sharpening Port.
 - i) To change the bevel angle, place thumb onto the Sharpening Port ramp and fingers under the Bevel Angle Selection Lever.
 - ii) Squeeze to release the mechanism and rock the assemble up (lower bevel angle) or down (higher bevel angle) to the desired position.

2) Mount the desired glass plate

- a) To sharpen items larger than 2" wide, or to flatten the back of a blade, place the plate over the rotator spindle with the desired abrasive facing up and clamp in place with the Top Knob
- b) To sharpen a blade edge up to 2" wide, mount the glass plate with the abrasive facing down.
- c) To restore the edge on a properly ground blade, begin with the 220 grit plate
- d) To repair damage or create the initial bevel on a new blade, begin with the 80 grit plate
- e) Handle the glass with extreme care. Each plate costs about \$20 and the sandpaper on each side of the plate can cost up to \$15. If broken through neglect, the Member should be asked to pay for the plate.

3) Adjust the Sharpening Port Fence

- a) Narrow blades, up to ½" wide, are positioned on the left side of the Fence, wide blades, over ½", are sharpened on the right side of the Fence. This prevents over-heating small blade by moving the contact toward the center of the disk where sandpaper velocities are lower.
- b) Place blade onto the Sharpening Port ramp against the desired Alignment fence, bevel side up.
- c) Adjust the Sharpening Port Fence using the Fence Adjustment Knob, located on the right side of the machine, until the fence makes light contact with the blade.
- d) Slightly loosen the contact with the blade until it slides freely on the Sharpening Port ramp with a minimum of clearance to maintain a square cutting edge.

4) Sharpening the Blade

- a) Holding the blade firmly in contact with the Sharpening Port ramp, slide the blade up to contact the abrasive disk for 1-2 seconds. Withdraw the blade slightly, then repeat contact for 1-2 seconds.
- b) Retract the blade, while maintaining full contact with the ramp, until the edge of the blade is visible. This action causes the abrasive on the ramp to remove the burr (wire) on the back of the blade.
- c) Repeat steps a) and b) two or three times, and inspect the blade.
- d) If more than three contacts are required, change to a coarser grit and start the process over.
- e) If the bevel grind is consistent, change the glass to the next grit and repeat the procedure.

5) Forming a micro-bevel

- a) If a Micro-bevel is to be ground on the blade, the primary bevel should be made at 5° less than the Micro-bevel; i.e. if a 25° micro-bevel is to be used, the primary bevel should be created at 20°.
- b) Once the primary has been completely formed, (a) install the 1,000 grit disk, (b) increase the bevel angle 5° and (c) grind the micro-bevel .

6) Cleanup

- a) Each time the glass plate is used, the debris needs to be cleaned from the abrasive using the crepe (rubber) stick.
 - i) Contact the spinning disk near the center knob
 - ii) Apply moderate downward pressure.
 - iii) Slowly pull the crepe block to the outer edge
- b) With the glass plate removed, vacuum dust and debris from the Sharpening Port and top surfaces of the motor housing.
- c) Inspect the Sharpening Port ramp abrasive, and clean using the crepe block
- d) Inspect the sandpaper disks and replace is the paper is worn through or is wrinkled.

7) Skew alignment

- a) This adjustment IS NOT intended to accommodate skew chisels or plane blades and should not be required as the setting is made at the factory.
- b) Verify that the sharpened edge of the blade is square with the side of the blade using a shop square. Adjust the skew as necessary.
 - i) Remove glass plate
 - ii) Locate the Skew Cam Adjustment Lever (located on the right side of the Sharpening Port ramp) and Skew Cam Set Screw (Phillips head screw above the lever)
 - iii) Loosen, but do not remove the Skew Cam Set Screw.
 - iv) Adjust the Skew Cam Adjustment Lever to the desired position. "Up" raises the right side of the ramp to correct a blade edge sloping down and to the left (i.e., "up" raises the left corner of the blade cutting edge).
 - v) Gently retighten the Skew Cam Set Screw (caution, the threads are soft and easily damaged.)
 - vi) Sharpen a test blade and check it for square.
 - vii)Repeat steps iii through vi as often as necessary until the test blade is square.
- c) Changing the setting should be discouraged, but if done, the user is then required to properly restore the factory setting.

Maintenance:

8) Replacing sandpaper disks and ramps

a) Replacing the disk

- i) Peal old sandpaper disk from glass disk. Use a sharp razor blade and alcohol or mineral spirits to remove PSA residue. Plate must be clean to attach new disk.
- ii) Lay glass plate on a firm, flat surface
- iii) Remove backing from sandpaper disk
- iv) Holding the opposite sides of the disk between your thumbs and forefingers, bow the disk with the PSA side facing down.
- v) Slowly bring the sandpaper disk into contact with the glass plate, centering the hole in the sandpaper on the hole in the glass.
 - (1) If the sandpaper does not have a center hole, attach the sandpaper disk centered on the glass plate and cut the hole using a sharp pen knife.
 - (2) It will also be necessary to trim the outside diameter to match the glass (which is 5⁷/₈" diameter).
- b) **Replacing the ramp sandpaper** (2"x2" squares of 400 grit PSA paper)
 - i) Turn the Fence Adjustment Knob CCW until the adjustable fence is all the way to the left exposing the ramp surface.
 - ii) Peal old sandpaper disk from the ramp. Use a sharp razor blade and alcohol or mineral spirits to remove PSA residue. Plate must be clean to attach new disk.
 - iii) Remove backing from sandpaper square.
 - iv) Align the right edge of the sandpaper with the right had lip of the Heat Sink, and attach the sandpaper in a rolling motion to prevent bubbles and wrinkles.
 - v) Return the Adjustable Fence to the center of the ramp area.
- **9)** Accessories for the Work Sharp system The Education Center carries PSA abrasive disks in 80 grit, 120 grit, 220 grit, 400 grit and 1,000 grit disks and we have one each 3600 and 6,000 grit micro-mesh disk . In addition, a leather honing disk with lapping compound is maintained.
- 10) Personal use of the system Members desiring to restore their own, personal tools should purchase and use a set of five disks (one each 80, 120, 220, 400 and 1000 grit in a zip-lock bag) for \$2.00/package.
- 11) Abuse Members damaging glass plates through abuse should be required to pay \$25 for replacement disk and paper. If the disk has the lapping and honing grits (3,600 and 6,000), add \$15 for a total of \$40.



(Leather disk and honing compound accessory available.)

WORK SHARP™ Wood Tool Sharpener Component Checklist

